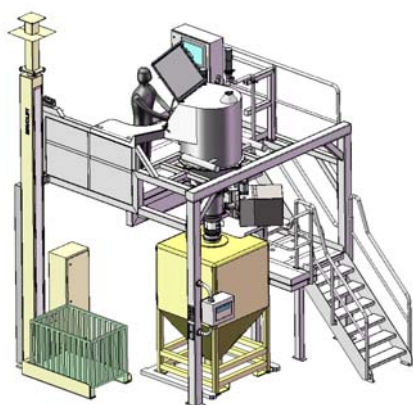


OPERATING INSTRUCTIONS

Crusher and Grinding Installation DelumpWitt (ProFi-Sword & ConiWitt-250)



**NOVARTIS SINGAPORE
PHARMACEUTICAL**

Customer:

SG-Singapore

Ref. :

PRO-14-0012

Serial Nr:

14001235183 - Installation

14001243013 - **Crusher** Unit ProFi-Sword
14001219097 - **Grinding** Unit ConiWitt-250

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Lifting Tower Servolift documentation
Balance Mettler Toledo documentation

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Quality Certificate ISO 9001 / ISO 14001
Conductivity test Profitest 60204
FAT Protocols

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Related documentation

OVERVIEW



DelumpWitt

In one step, the new DelumpWitt takes pharmaceutical and chemical bulk materials that have become hardened and lumpy over time and sizes them into free-flowing powder

DelumpWitt

Excellent for small batch production or for integration in turn-key systems

The DelumpWitt is particularly well-suited for disagglomeration, even of frozen products.

The DelumpWitt design considerably increases efficiency.

In sizing, it sets new benchmarks with regard to modularity, user and maintenance friendliness, while delivering more performance at lower costs.

The advantages are obvious

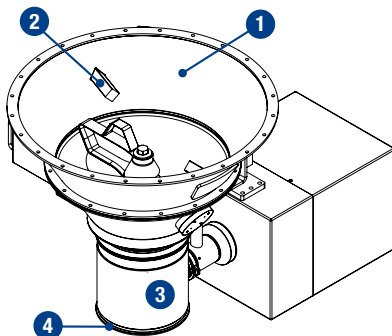
- Pregrinding, fine milling, and desizing with one machine.
- Intelligent design reduces the number of moving parts to a minimum.
- Using tri-clamp connections, the milling head can be swiveled out from the pregrinder in a few easy steps.
- CIP design and low risk of cross contamination. Quick, easy cleaning and maintenance assure higher operational availability at lower operating costs.

Other applications

- For applications in a minimum of available space, as it carries out two process steps in one module.
- It can be operated as a stand-alone-system and can be easily integrated into turnkey production facilities.
- The DelumpWitt is ideal for the demanding production requirements of the pharmaceutical, food, and chemicals industry.



The DelumpWitt Sizing Process



- 1 Inlet funnel for blocks as large as 60 x 30 x 20 cm
- 2 Lump breaker rotor
- 3 Lump rasp with rotor
- 4 Tri-clamp DN 300 outlet connection for fine, free-flowing, disagglomerated powder

The advantages of the round inlet funnel of the DelumpWitt compared to the rectangular inlet funnels of other systems reside in simplified processing of large lumps and in simplified integration in existing overall systems. In one step, the patented design turns blocks as large as 60 x 30 x 20 cm into 500 µm free-flowing powder.

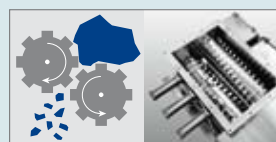
Milling forces



The DelumpWitt quickly and gently processes the product with pressure and grinding forces, and does so at a high flow rate.

The DelumpWitt is part of Frewitt's complete installations.

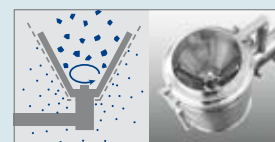
Blocks from 25 kg can be processed in one step to free-flowing powder.



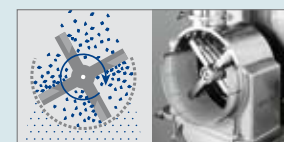
30 cm 2 cm
Crusher
CCD-450
CC-310



5 cm 250 µm
Oscillating sieve mill
MF-Lab
MF-3
MF-6
MF-8



2 cm 150 µm
Conical sieve mill
TC-Lab
ConiWitt-150
ConiWitt-200
ConiWitt-250



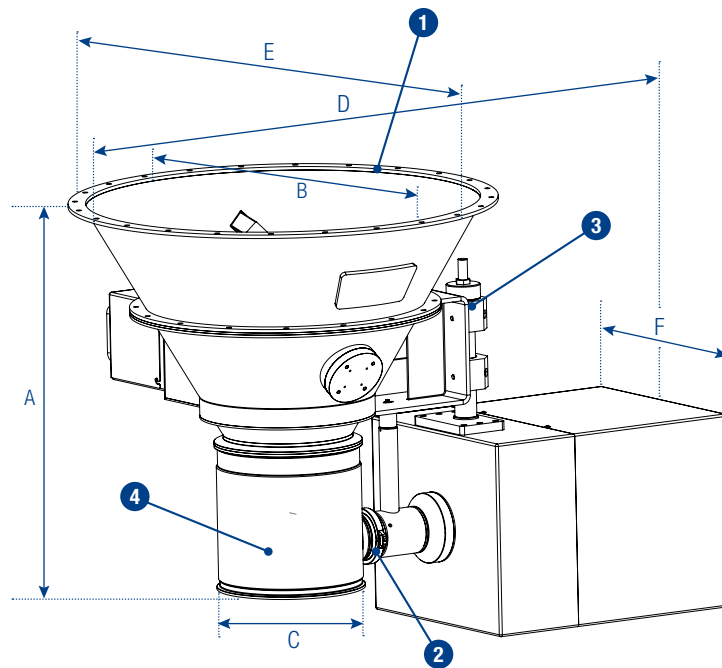
1 cm 50 µm
Hammer mill
HammerWitt-Lab
MFH-6
MFH-15



Particle size



The DelumpWitt in Detail



The DelumpWitt at a Glance

- 1 Inlet funnel for blocks as large as 60 x 30 x 20 cm
- 2 Milling head easily detachable with tri-clamp connections
- 3 Safety prompt (standard), no outside cables
- 4 Conical sieve (assortment of inserts of round/square openings, rasps)
- Lip seal easily replaced with gearbox closed
- Bottom-welded down-driver
- Durable shaft lip seal
- Rated for ATEX Zone 0/20 inside use
- Easy to clean
- Screwless access cover
- Easy to attach

Installation	A	D	E	F	B - INFEED	C - DISCHARGE
DelumpWitt	898	1525	1086	510	Ø980/900 - 24 x Ø12	Tri-clamp DN 300 ISO 2852

Advantages

Ergonomic and User Friendly

- Modular, compact design.
- Rotor and sieve easy to change.
- Mobile base on request.
- Lightweight, detachable milling head.
- The "Error Proof System" guarantees correct installation and removal of rotor and sieve.

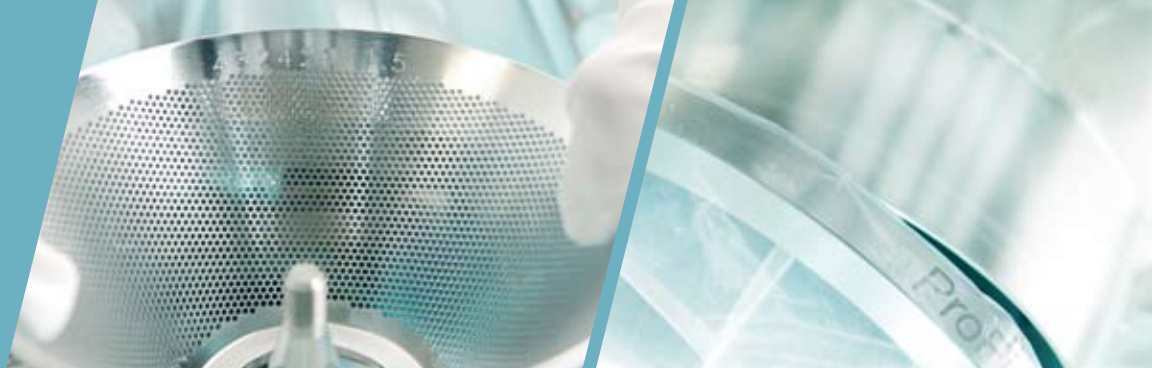
Cleaning according to the strictest Health Standards

- Milling head autoclavable.
- The crushing and milling chamber is made from AISI-316L stainless steel.
- The polished, even surfaces allow the product to flow through without friction and without leaving residues.
- Complies with both, the Washing in Place (WIP) and the Cleaning in Place (CIP) standards.

Less Maintenance and greater workplace Safety

- Lip seal can be changed in only 15 minutes, with the gearbox closed.
- Approved for ATEX Zone 0/20 inside, Zone 1/21 outside.





Significantly more flexibility and performance

- High flow rate: up to 9000 kg/hr (depending on the product).
- Compact, modular design with round inlet and outlet funnels.
- Easily integrated in existing manufacturing processes (turn key systems).
- Batchwise or continuous infeed of blocks, can handle lumps and/or agglomerates (the conical infeed serves as an inlet funnel).
- The desired particle size can be adjusted as needed, by changing screen 7 rasp.
- Sizing and metering can be combined.
- The modular design allows rapid dismantling of the device for inspection and servicing.

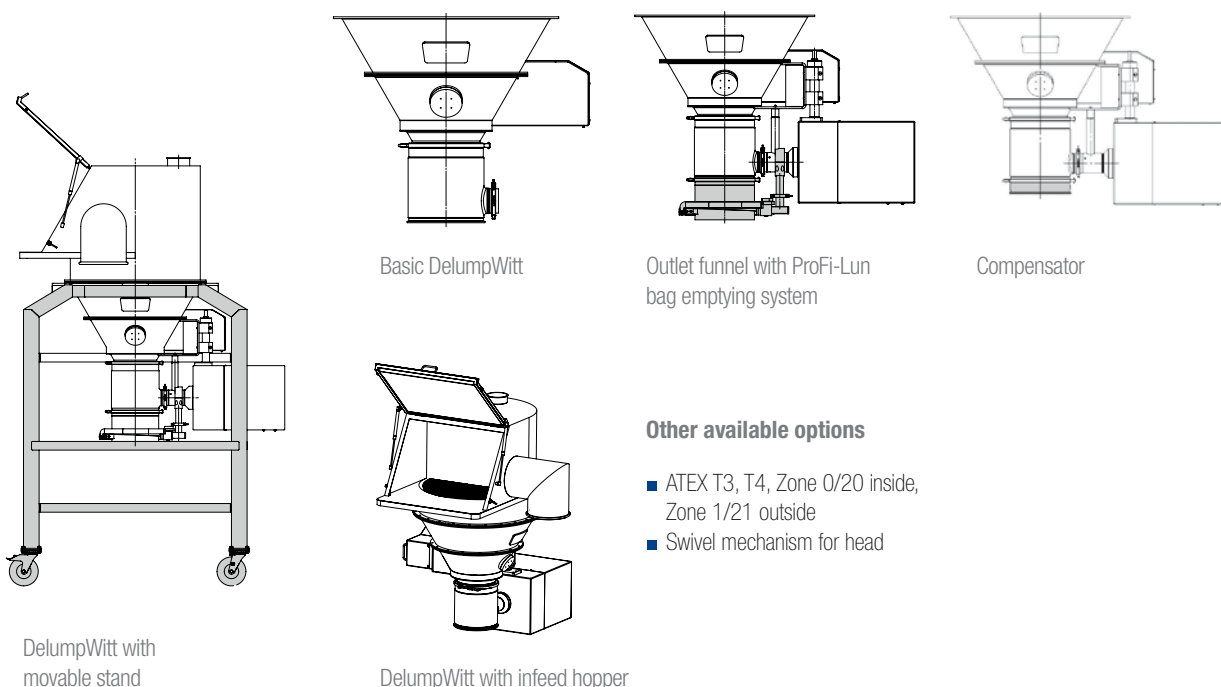


		Flow rate*	Voltage	Rotor speed	Power	Net weight
DelumpWitt	Non Ex	up to 9000 kg/h	400 V	24min-1 / 630 min-1	Max 7.5 kW	~ 370 kg
	ATEX	up to 9000 kg/h	400 V	24min-1 / 630 min-1	Max 5.5 kW	~ 370 kg

* The flow rate depends on the product and its properties

Execution	Parts in contact with the product	Parts not in contact with the product
Material	1.4435 / 1.4404 (AISI-316L)	1.4301 / 1.4305 (AISI-304)
Seals	FDA compliant plastics (EPDM / PTFE)	Various plastics
Surface	Ra ≤ 0.8 µm polished / head Ra ≤ 0.4 µm polished	Ra ≤ 1.4 µm polished
Welding seams	Ground and polished	treated and brushed
Rotor	Rotor with square profile arms	
Sieve / rasp	Round openings Ø 0.5 mm – 10 mm / square openings 3.0 mm – 10.0 mm / rasp 1.1 mm – 8.0 mm	
Distance rotor / sieve	No mechanical contact (metal abrasion)	

Options for custom-made solutions



Other available options

- ATEX T3, T4, Zone 0/20 inside, Zone 1/21 outside
- Swivel mechanism for head



Examples of applications

The DelumpWitt, due to its efficiency, ensures your disagglomeration of raw materials, salts, and many other products, is no longer a problem. The DelumpWitt can be operated as a stand alone unit or integrated into your existing production system. Let us advise you for optimal utilisation, albeit you need a stand alone unit or a complete turnkey oriented solution.



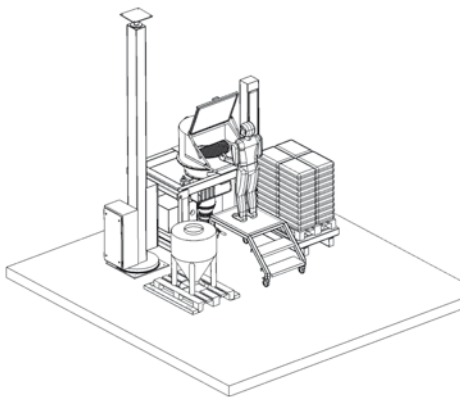
DelumpWitt as a stand alone unit. Large agglomerates are completely broken down into particles as small as 500 µm in the DelumpWitt.



Blocks as large as 60 cm are introduced into the inlet funnel.



In one step from blocks to granules.



DelumpWitt integrated in an existing inline system.



Quick and efficient CIP, employing a the swivel mechanism.



User-friendly inline system. One operator, two process steps in one machine.

Modular in conception, it offers, user friendliness, and easy maintenance, the DelumpWitt can be easily and quickly integrated anywhere. Call us to discuss your application.



Worldwide presence

References

Arena Pharmaceutical GmbH
 Bayer Schering AG
 BASF Orgamol SA
 Boehringer Ingelheim GmbH
 Ciba Spezialitätenchemie AG
 Cilag AG

Clariant Produkte AG
 F. Hoffmann-La Roche AG
 Firmenich SA
 Grünenthal GmbH
 Hobako AG
 Lonza AG

Merck & Cie KG
 Nestlé SA
 Novartis Consumer Health SA
 Pfizer
 Pharmasynthese
 Sanofi Aventis

Sanofi Chimie
 Siegfried LTD
 UCB Farchim SA
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ProFi-Sword/Dos/Bant/Lun

*Discharge, Dosing, and Filling Equipment for High Containment
Powder Processing for all Applications in the Pharmaceutical,
Food and Fine Chemical Industries*

ProFi-Sword/Dos/Bant/Lun

ProFi-Sword

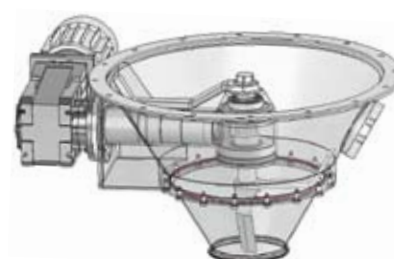
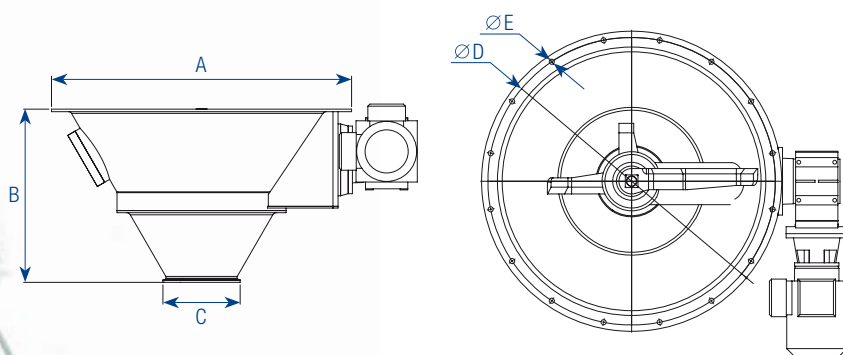
Powder delivered in free-flow

Dust-proof discharge aided with three rotating blades or «swords» (with different shapes) gently maintain the product in constant movement (fluidization).

Brief overview

- Contamination of the product is avoided thanks to the secure drive, bearing, and seal concept
- The ProFi-Sword is used in the pharmaceutical, chemical, and food products industries
- The bottom blades are adapted and aligned to the outlet pipe
- Available in ATEX design
- Delivery of heavy powder (bridging, sticking, settling)

Execution	Parts in contact with the product
Material	1.4435 / 1.4404 (AISI-316L)
Surface quality	Ra ≤ 0.8 µm
Sealing band	EPDM, FEP-O-SEAL, PTFE
Connections	ISO 2852-compliant Tri-Clamp
Weld seams	Ground and polished



	A	B	C	D	E
ProFi-Sword DN 150	Ø 710	410	(Ø 163.1)	Ø 680	16 x Ø 12

	Voltage	Power	Net Weight
ProFi-Sword	3 x 400 V - 50 Hz	0.75 kW	~ 120 kg

ProFi-Dos

The precise dosing device

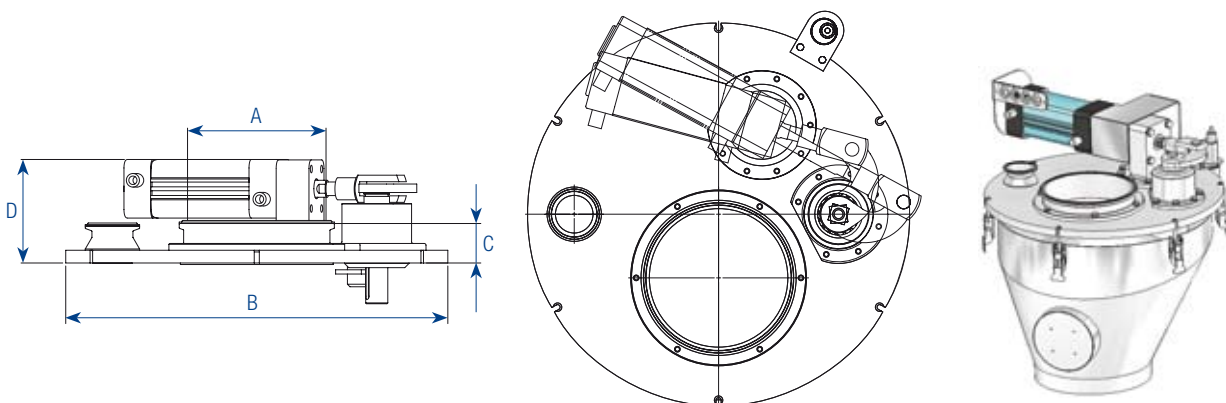
Precise and efficient dosing of powders and granulates.

The ProFi-Dos dosing model consists of a pneumatically operated gate valve. Low installation height combined with highly precise dosing are special features of the ProFi-Dos.

Brief overview

- Three different dosing phases (coarse, medium, fine) assure precise dosing.
- The ProFi-Dos is ideal for use in the pharmaceutical, chemical, and food products industries as:
 - High precision dosing equipment
 - As an OPEN/CLOSE shutoff mechanism
- Low installation height
- Available in ATEX design

Execution	Parts in contact with the product
Material	1.4435 / 1.4404 (AISI-316L)
Surface quality	Ra ≤ 0.8 µm
Sealing band	EPDM, FEP-O-SEAL, PTFE, Silicon
Connections	ISO 2852-compliant Tri-Clamp
Weld seams	Ground and polished



	A	B	C	D
ProFi-Dos DN 150	(∅ 163.1)	∅ 450	46.5	166

	Compressed air	Compressed air flow rate	Net weight
ProFi-Dos DN 150	Min. 5 bar	500 N.L/Min. kW	~ 31 kg





ProFi-Bant

Pneumatic dust-proof bag Holding Device

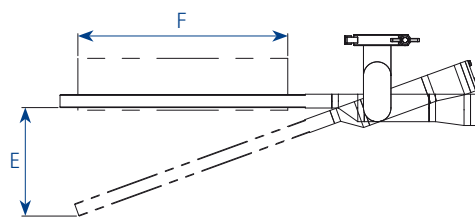
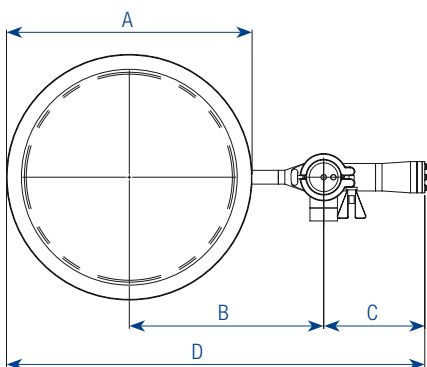
The quick, easy, and efficient inflatable gasket bag attachment method.

Brief overview

- The dust-proof connections prevent contamination of the product
- Operates independently of other power sources such as electricity (all that is needed is compressed air for the inflatable gasket)
- Suitable for filling paper and plastic bags as well as Big Bags
- Quick and easy cleaning
- Designed for use in the pharmaceutical, chemical, and food products industries
- Available in ATEX design



Execution	
Material	1.4301 / 1.4305 (AISI-304L)
Surface quality	Ra ≤ 1.4 µm
Sealing band	Silicon
Weld seams	Ground and polished



	A	B	C	D	E	F
ProFi-Bant DN 200	∅ 274	300	160	596.6	150	∅ 219.1
ProFi-Bant DN 300	∅ 379	300	160	649.1	167.4	∅ 323.9

ProFi-Bant	Compressed air	Net weight
	Max. 1.5 bar	~ 4 kg





ProFi-Lun

Manual dust-proof Big Bag Holding Device

The dust-proof connection system.

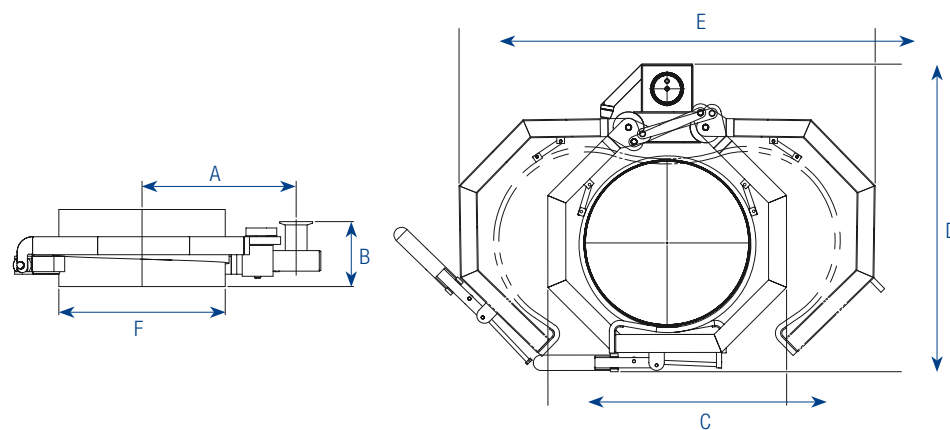
This manually-operated connection device can also be used in areas where there is no additional power source such as compressed air or electricity.

Brief overview

- Compact, space-saving, hygienic design
- Stainless steel construction, compliant with ATEX Directive 94/9/EG
- Quick and easy cleaning
- Designed for use in the pharmaceutical, chemical, and food products industries



Execution	
Material	1.4435 / 1.4404 (AISI-316L)
Surface quality	Ra ≤ 1.4 µm
Sealing band	Silicon, PTFE
Other plastics	CR NEOPREN
Weld seams	Ground and polished



	A	B min.	C	D	E	F
ProFi-Lun DN 200	300	100	380	543	687	∅ 219.1
ProFi-Lun DN 300	300	100	465	599	810	∅ 323.9

	Operation	Net weight
ProFi-Lun	Manual	~ 10 kg





Worldwide presence

References

Arena Pharmaceutical GmbH
 Bayer Schering AG
 BASF Orgamol SA
 Boehringer Ingelheim GmbH
 Ciba Spezialitätenchemie AG
 Cilag AG

Clariant Produkte AG
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 Grünenthal GmbH
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 Sanofi Aventis

Sanofi Chimie
 Siegfried LTD
 UCB Farchim SA
 etc.



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Address agent:



General notes :

1. Material of construction :

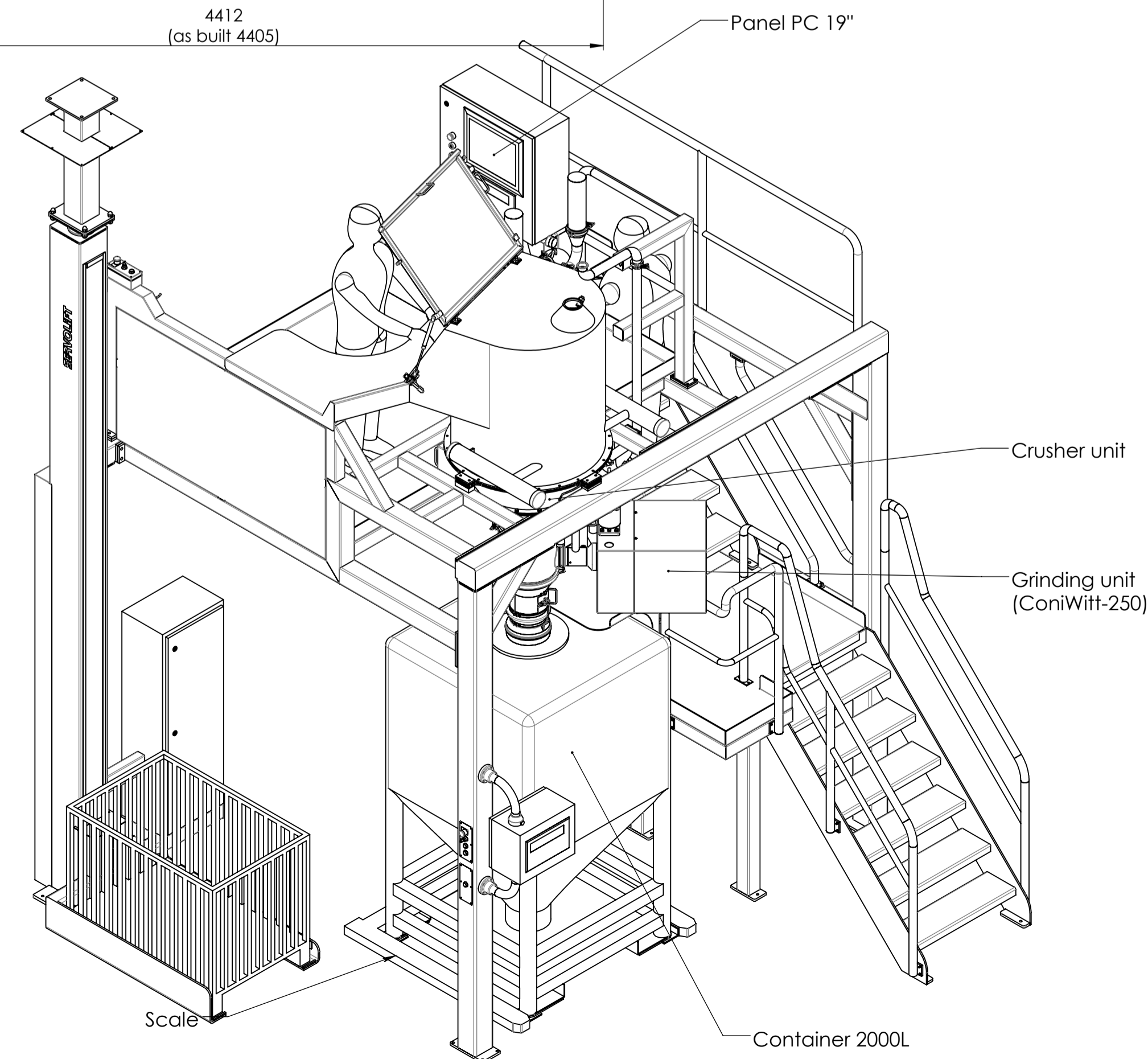
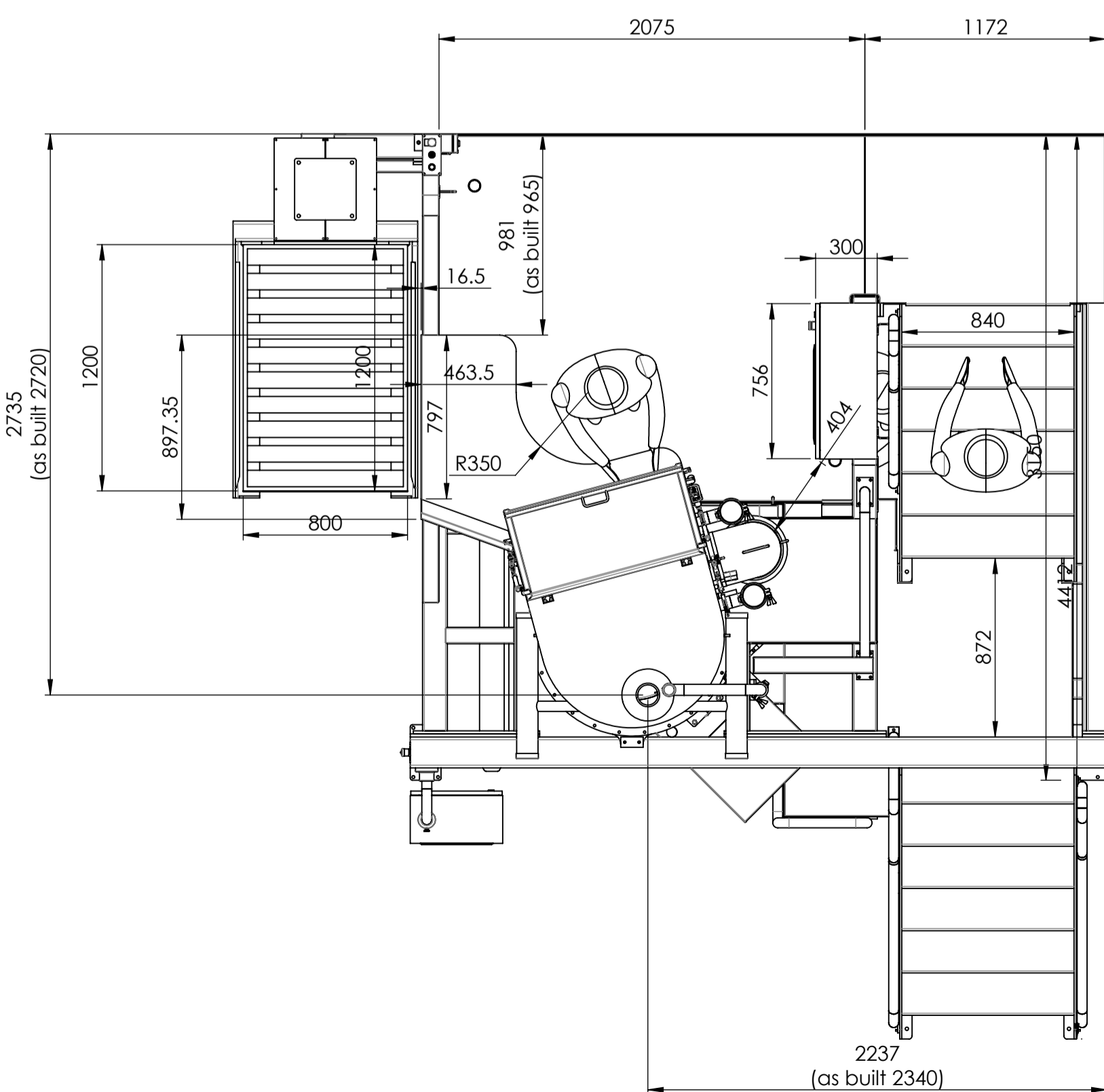
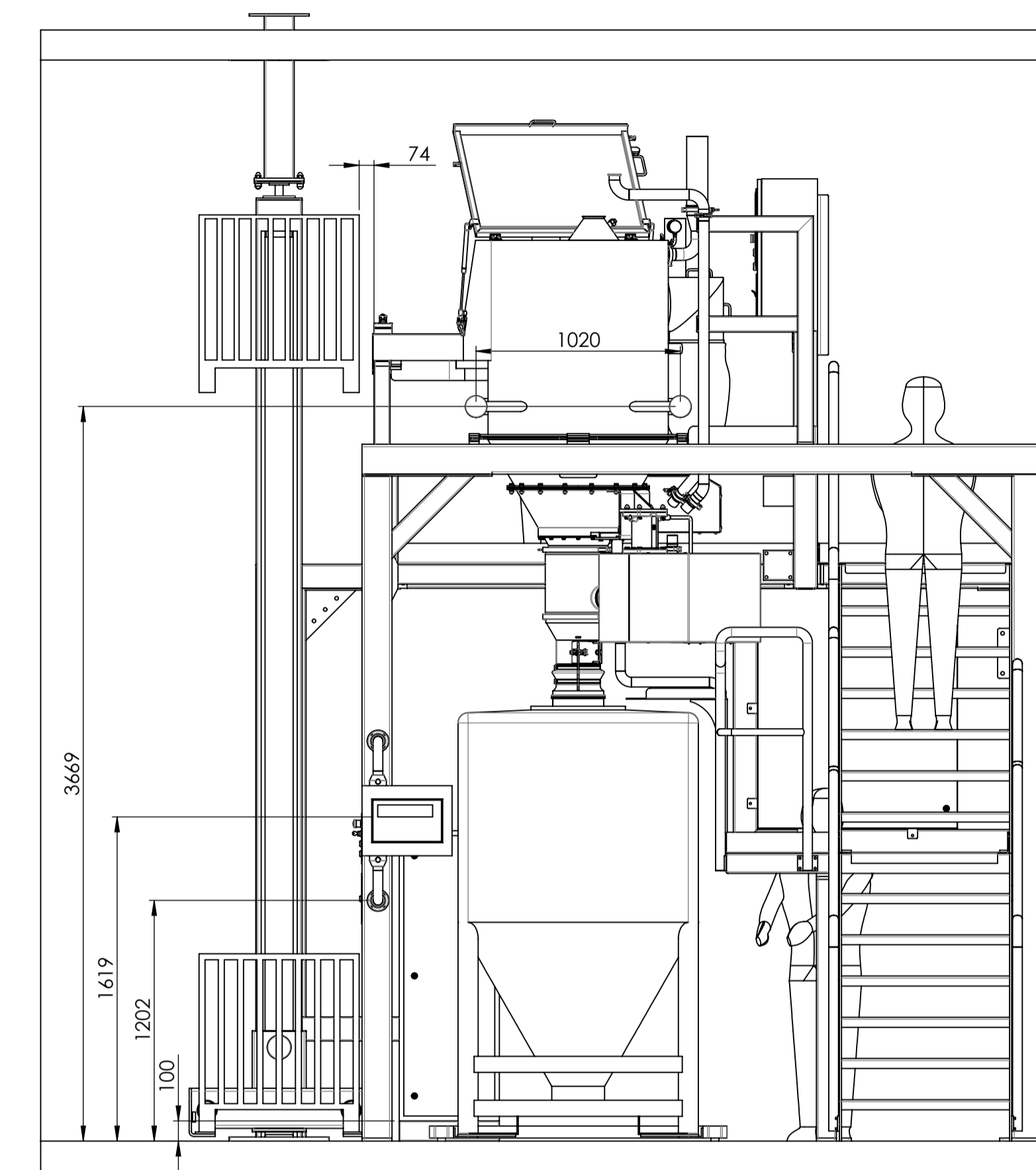
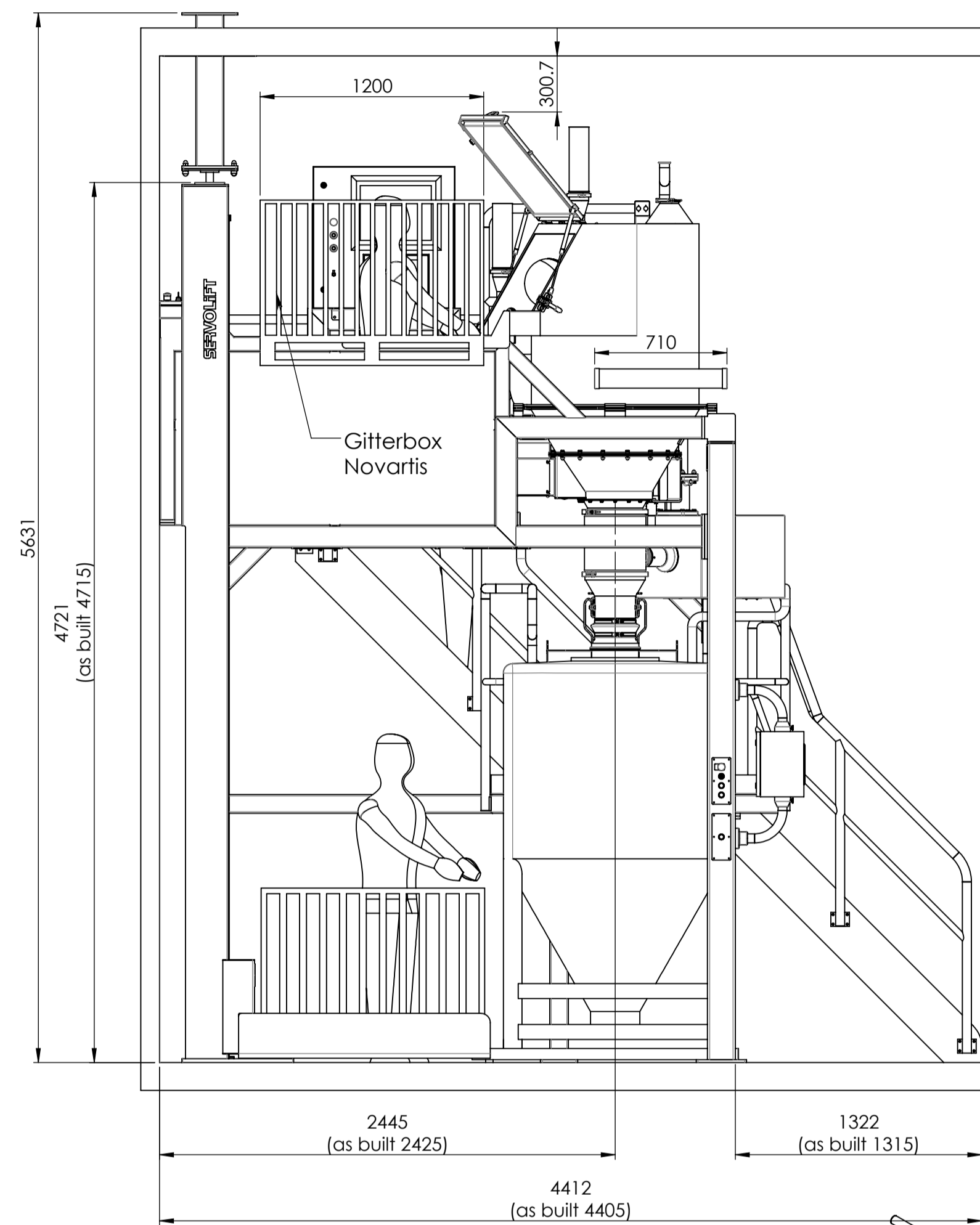
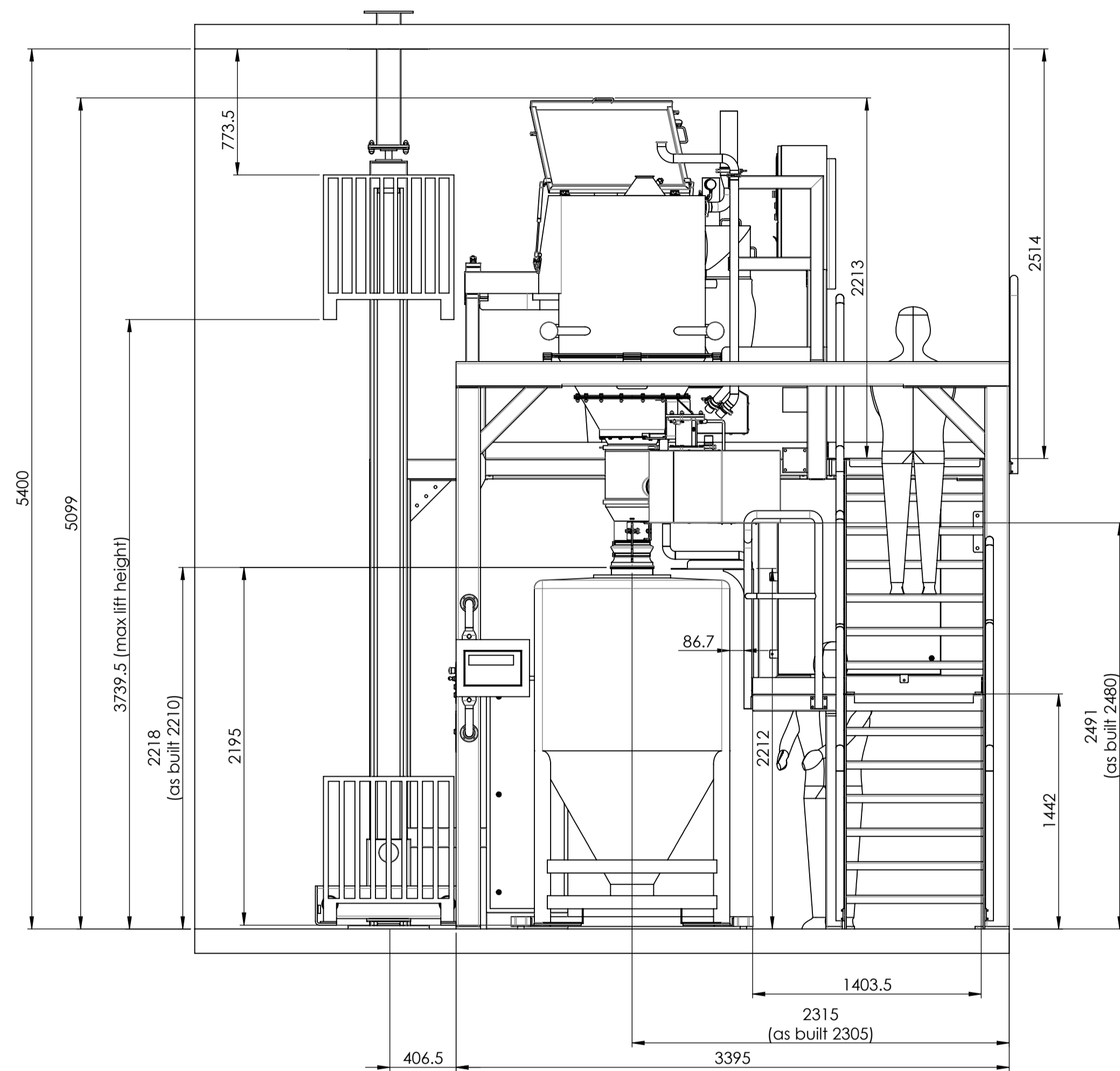
- Product contact parts AISI 316/316L
- Non-product contact parts AISI 304/304L

2. Surface finish :

- Product contact part < Ra 0.4
- Non-product contact parts < Ra 1.4

3. All non-metallic parts in contact with product shall be FDA approved food grad

4. Design fabrication shall comply with GMP requirement with no sharp corners, dead legs, easily drainable and crevices free



Total installed empty weight : 3000kg

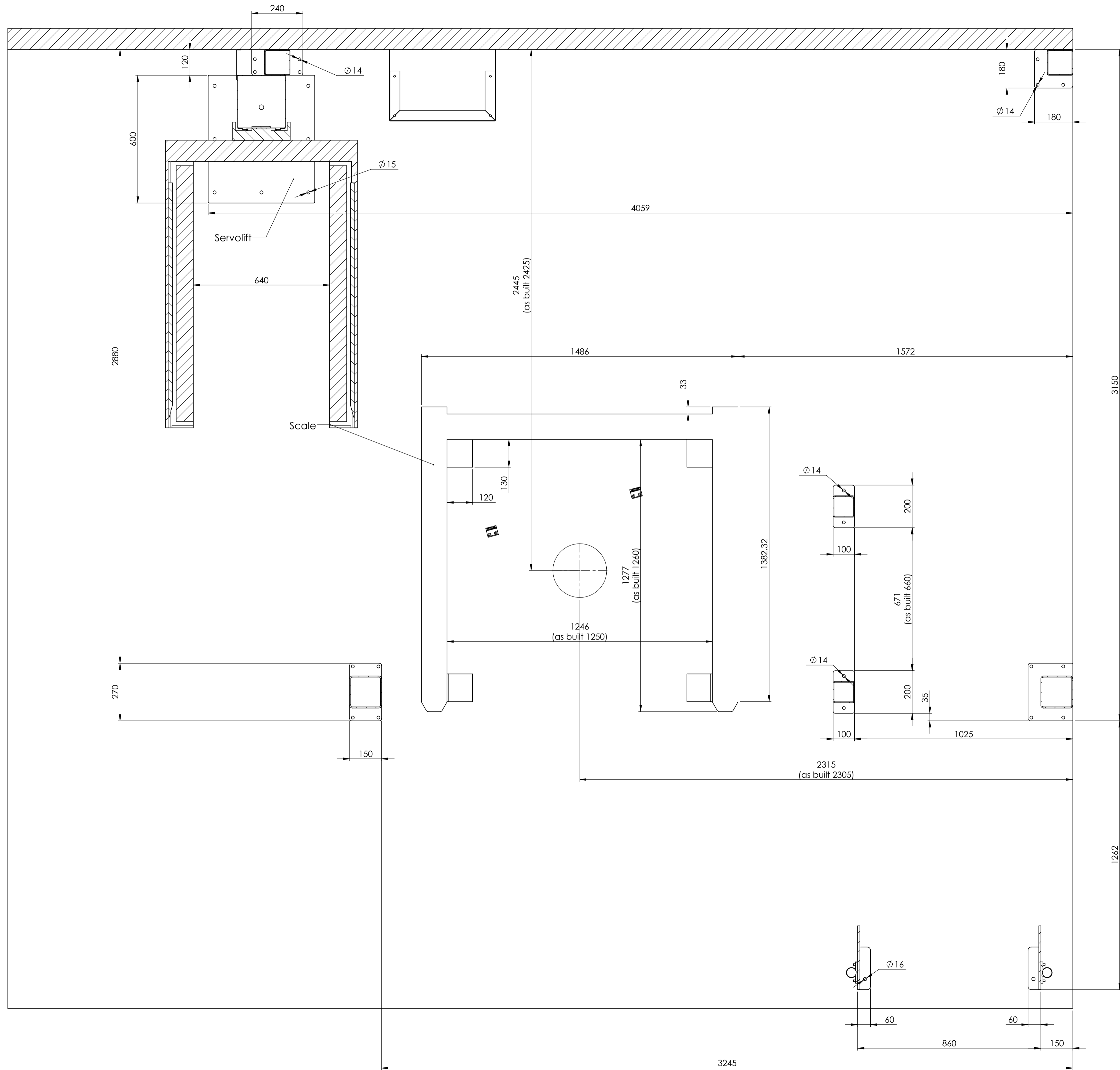
Total operating weight : 4000kg

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Sous réserve de modifications
Subject to modifications
Änderungen vorbehalten

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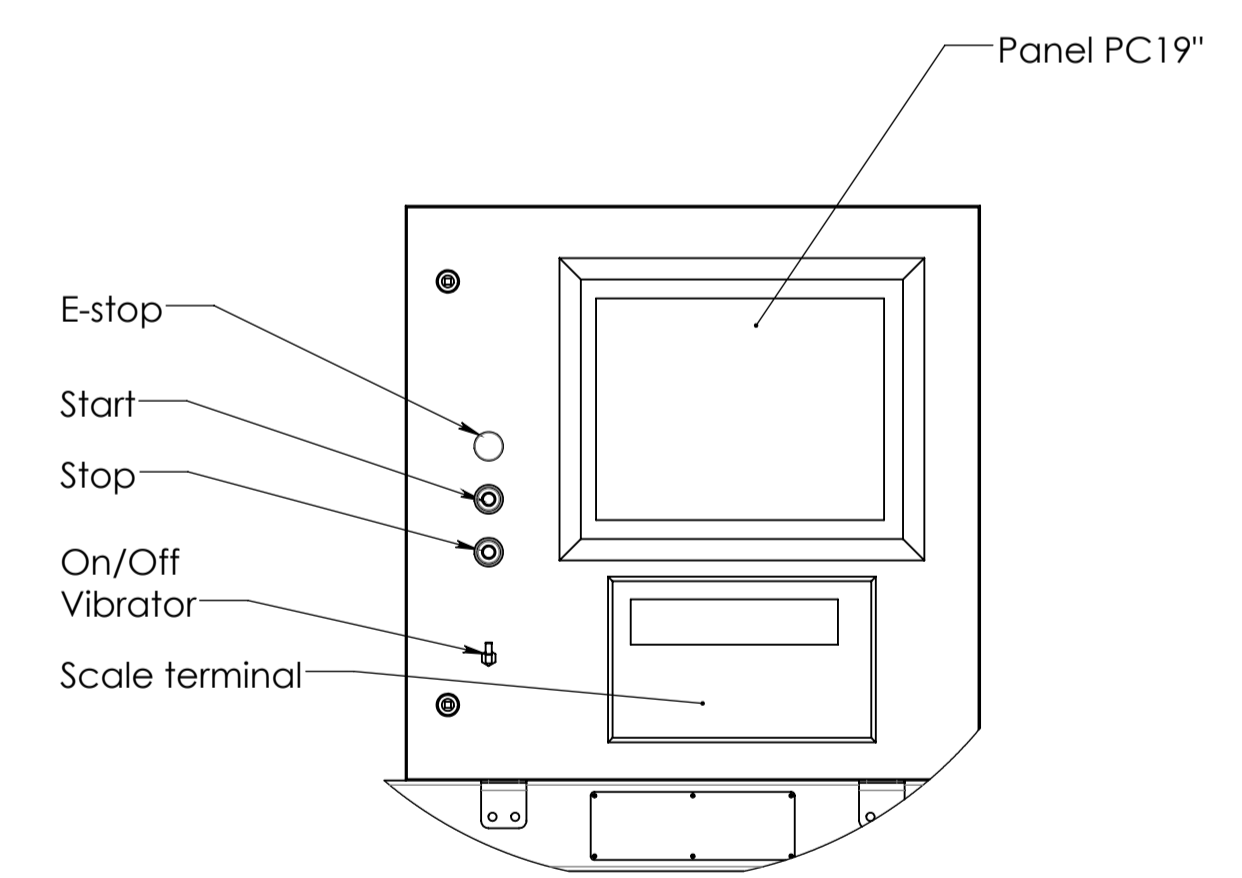
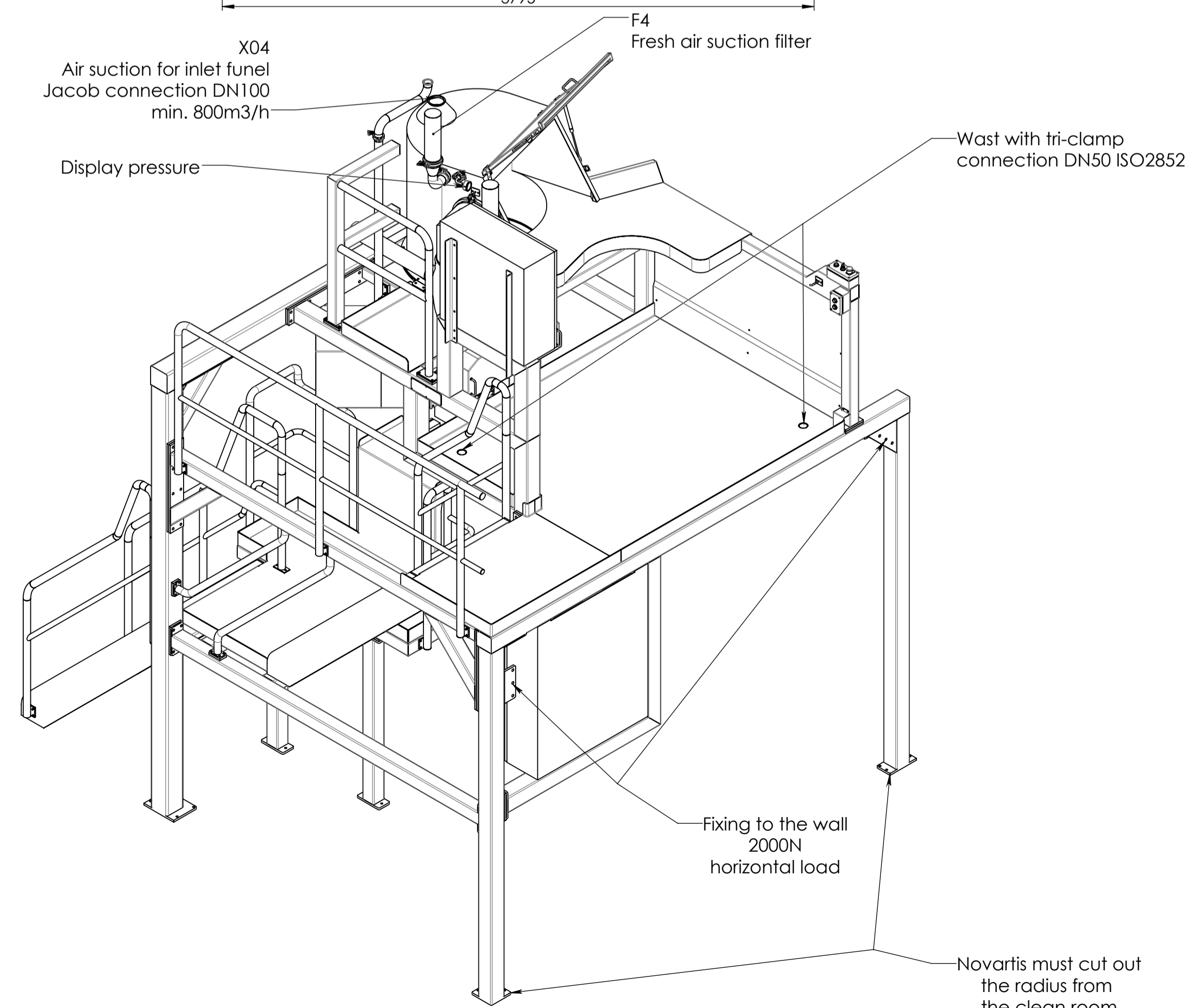
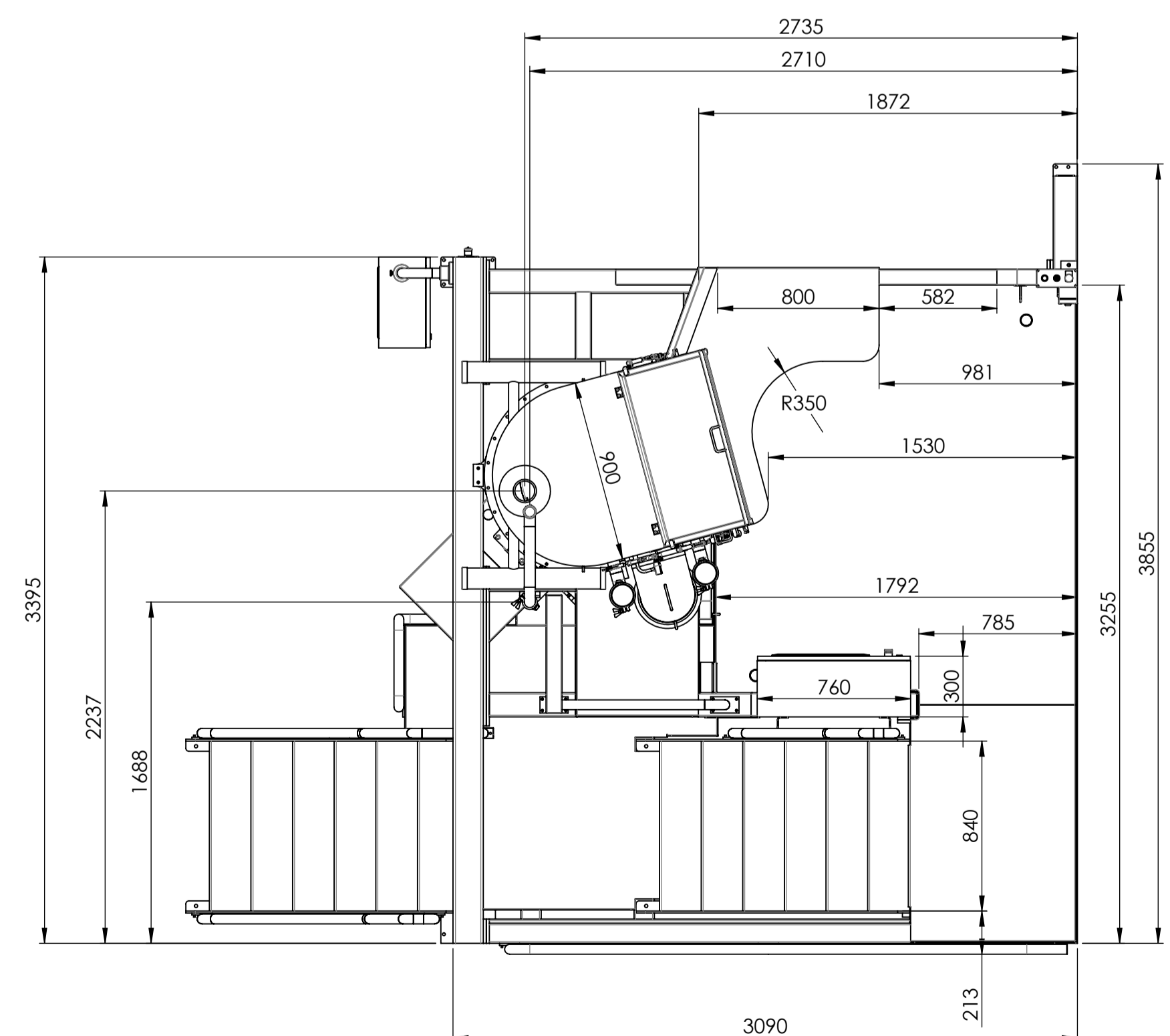
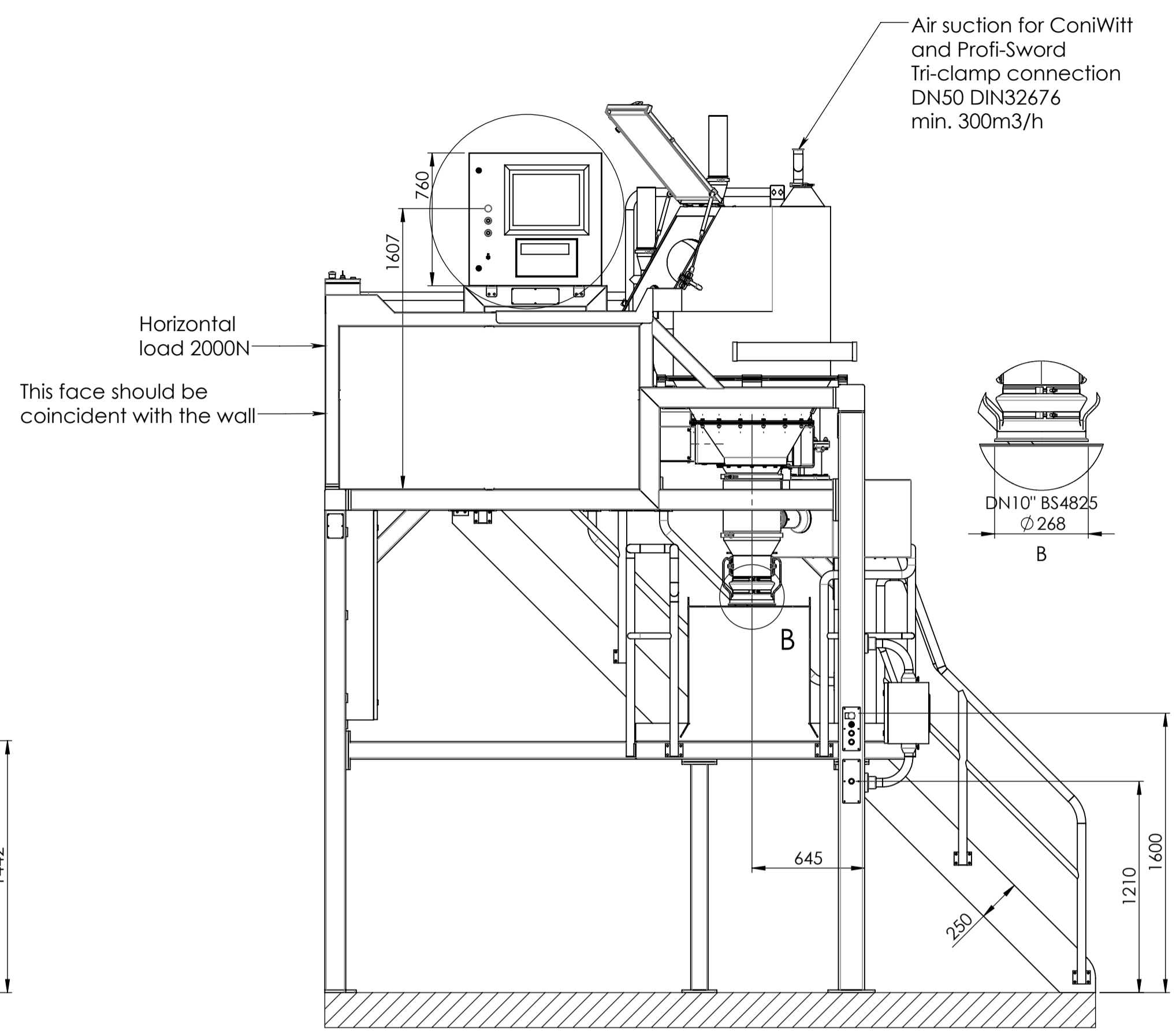
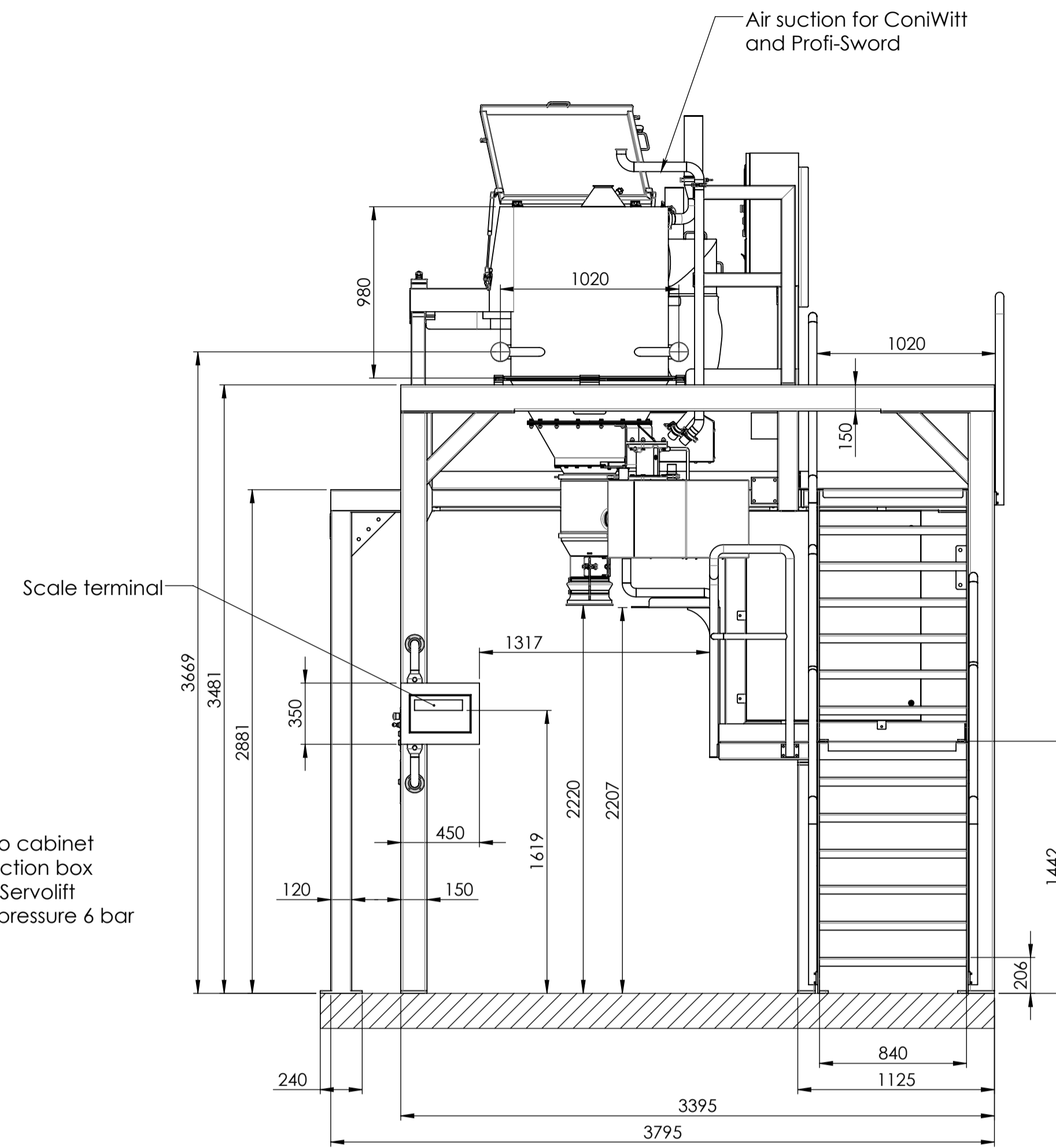
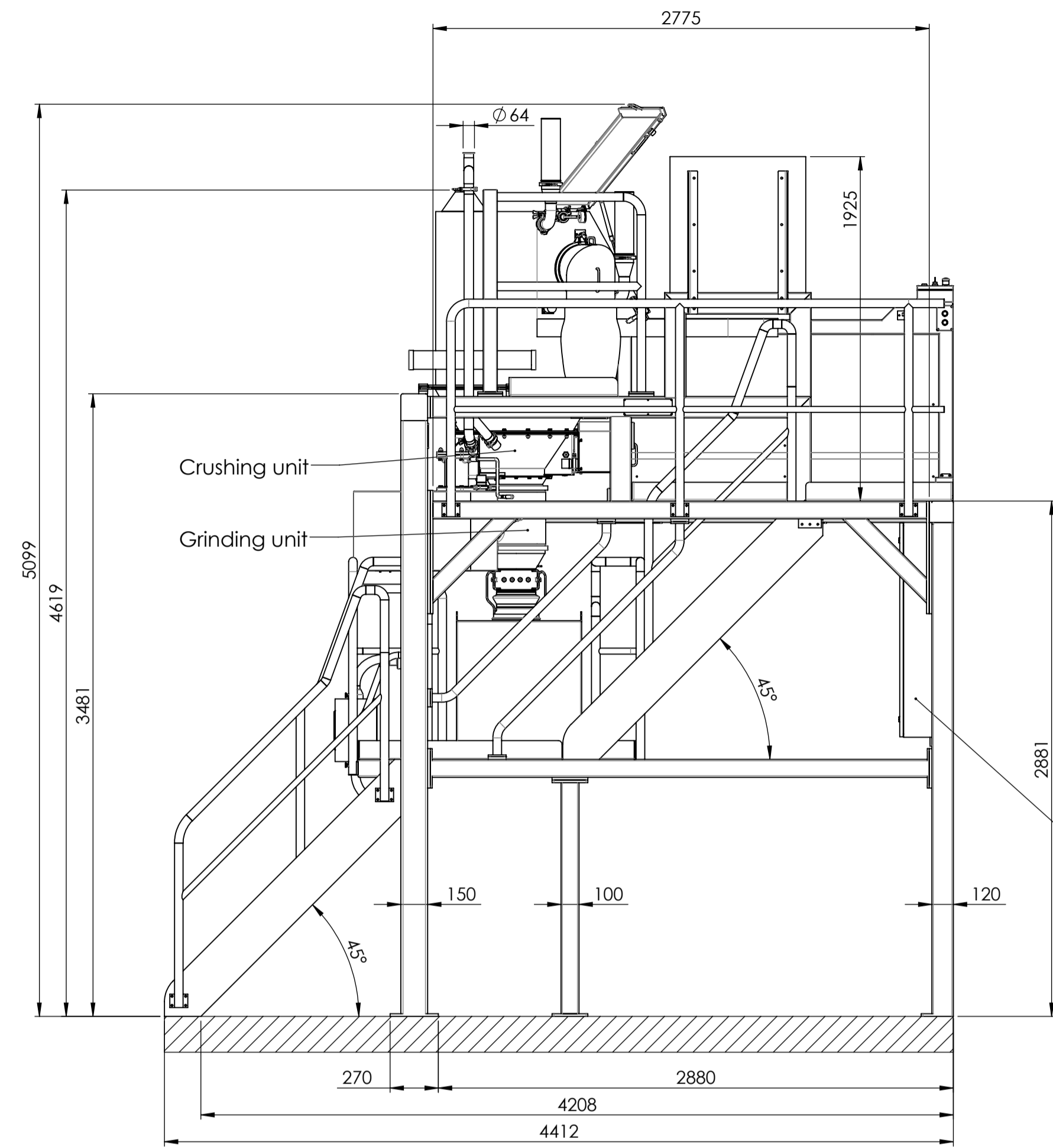
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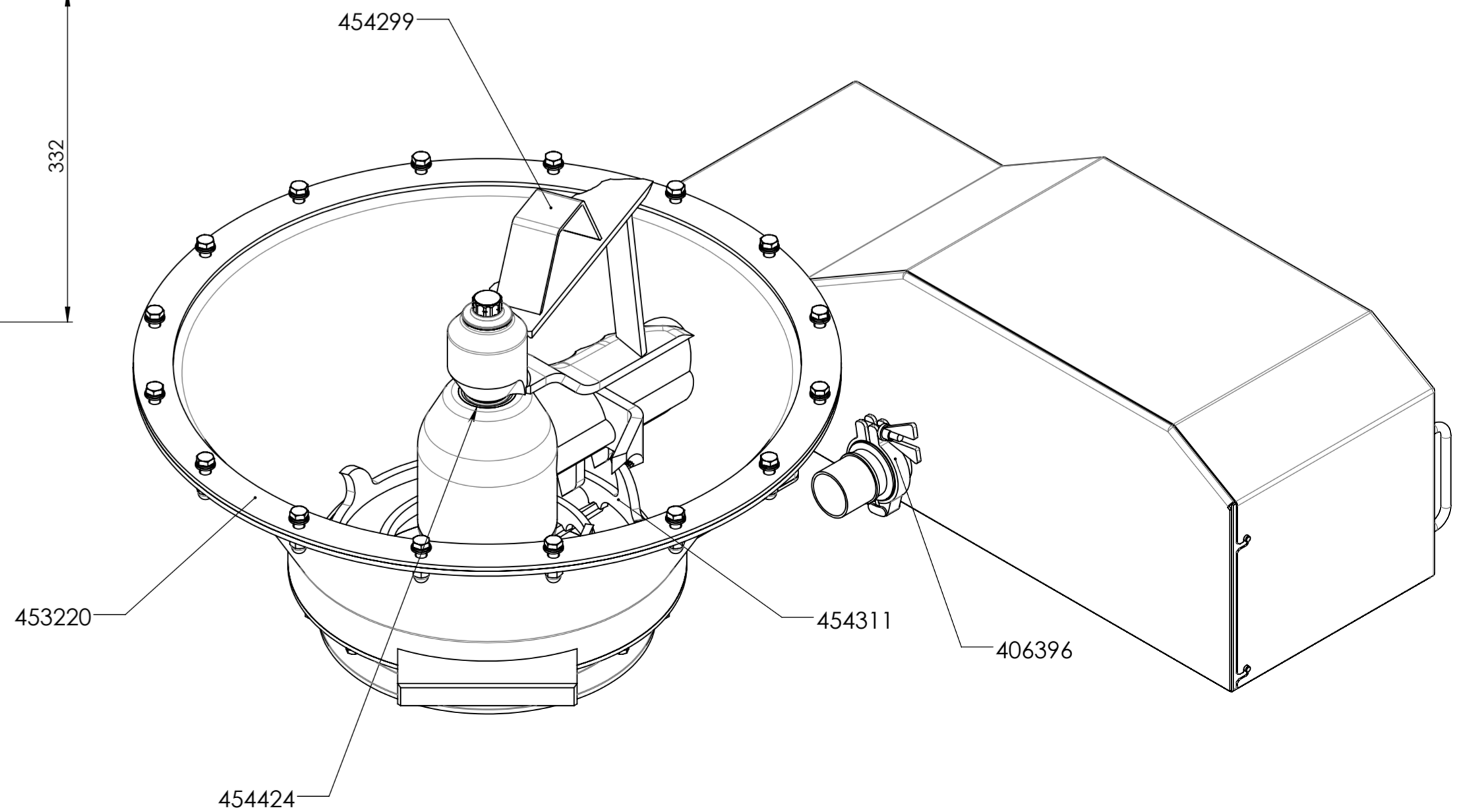
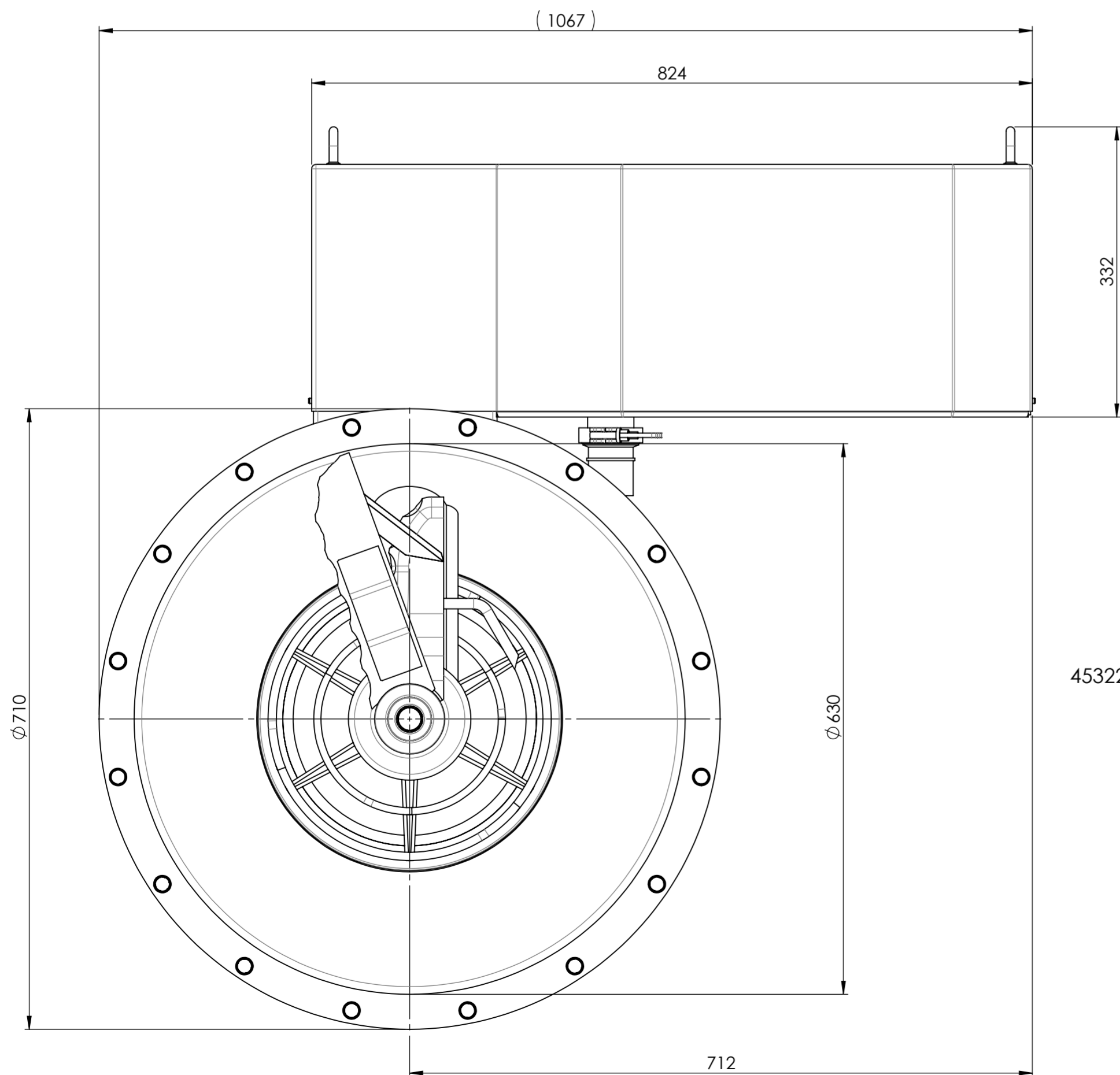
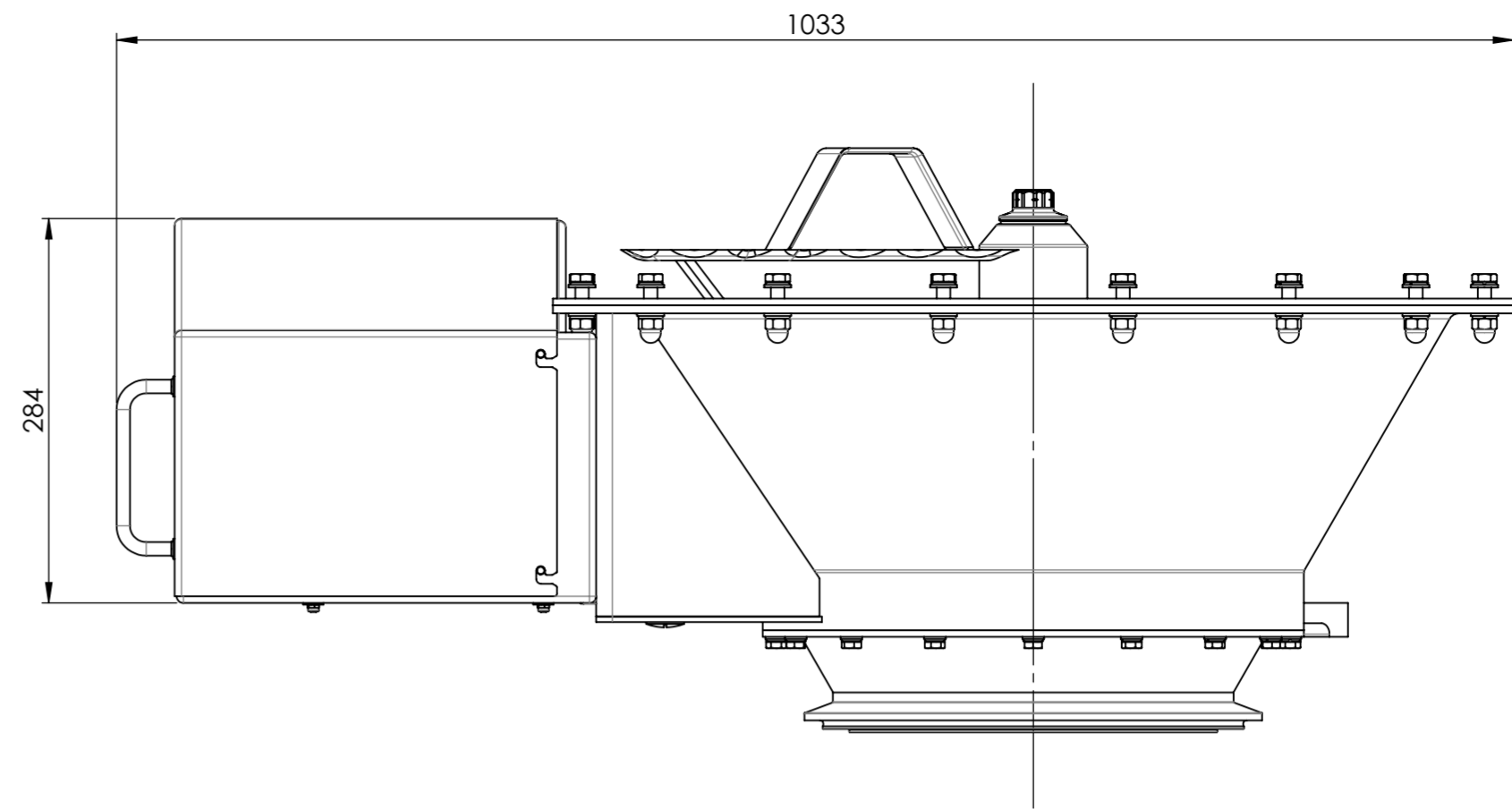
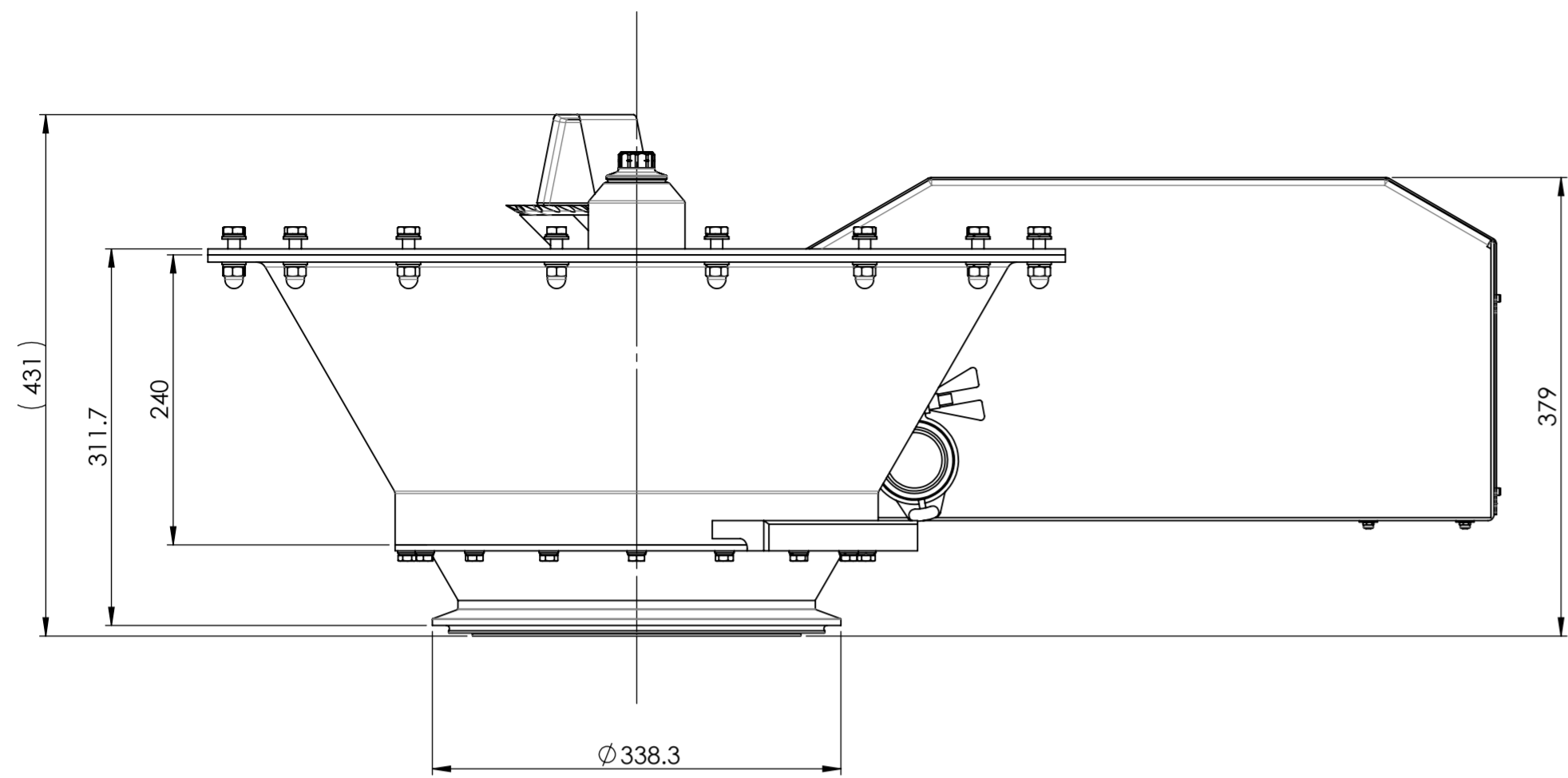


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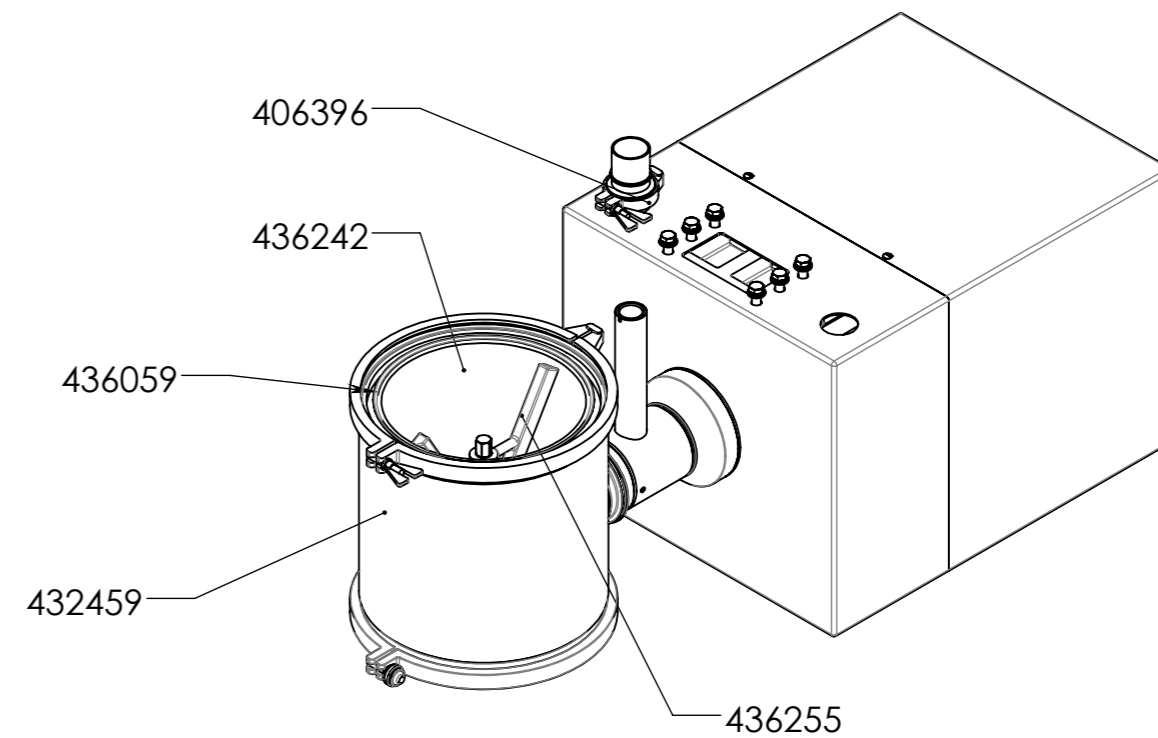
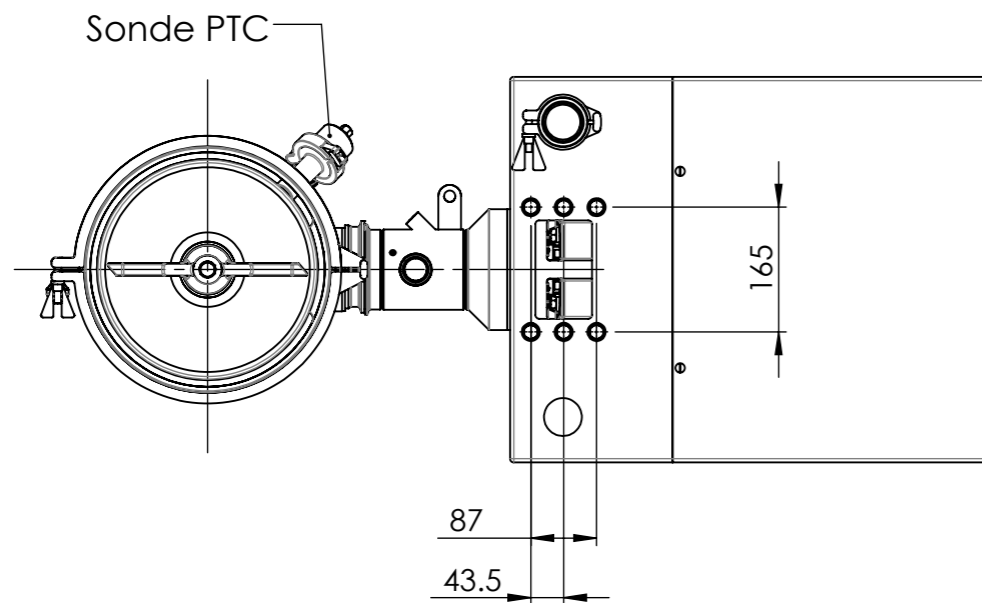
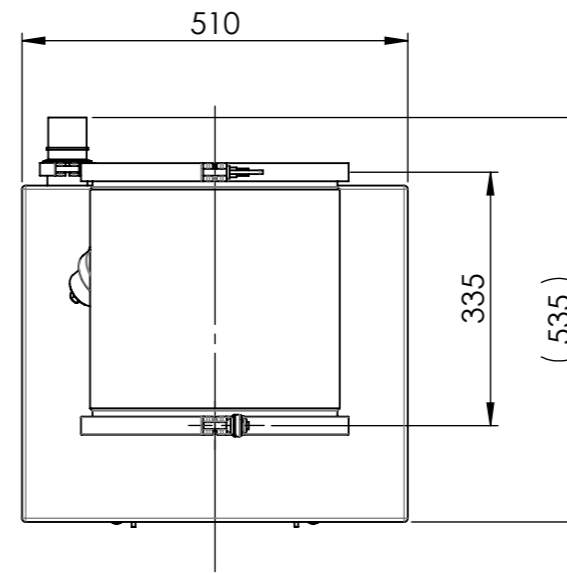
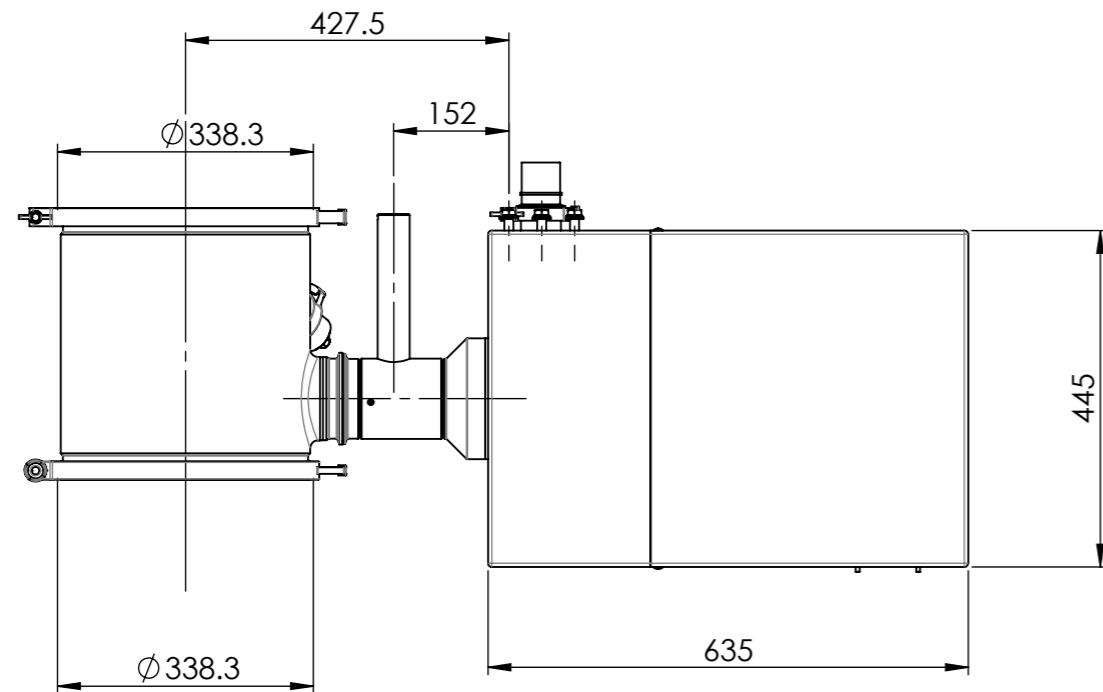
Sous réserve de modifications
Subject to modifications
Änderungen vorbehalten

Dimension without tolerance [mm]	above	6	30	120	400	1000	2000	MATERIAL : N/A	
up to	6	30	120	400	1000	2000			
Machining ISO 2768-m	+0.10	+0.20	+0.30	+0.50	+0.80	+1.20			
Welding Assembly: ISO 2768-c	+0.30	+0.50	+0.80	+1.20	+2.00	+3.00			
Scale	Similar			Designed	20/02/2014	edgu			
Weight [kg]	N/A			Controlled	25/04/2014	edgu			
Weight [kg]	N/A			Revised	25/04/2014	edgu			
Page	Ver.								
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ATEX category	IIID / II3D		Scale	Machined dim.	ISO 2768-m
Voltage [V]		Power [kW]	%	Welded dim.	ISO 2768-c
Frequency [Hz]		Speed [min ⁻¹]		Designed	18/02/2014 edgu
PRO-14-0012 / Profi-Sword			A2	Controlled	18/02/2014 edgu
				Revised	18/02/2014 edgu
<small>Any and all information received by you from us shall be held and kept confidential and shall not be disclosed by you to any third party except with prior written consent of FREWITT SA.</small>				FREWITT SA: Milling and Handling of Powders P.O.B. 615, CH-1701 Fribourg, SWITZERLAND tel: +41 26 460 74 00 / fax: +41 26 460 74 01 info@frewitt.com / www.frewitt.com	
				473841-LAY	Page 1/1 Ver. A



ATEX category	II 1GD / II3D		Machined dim.	ISO 2768-m
Voltage [V]		Power [kW]	Welded dim.	ISO 2768-c
Frequency [Hz]		Speed [min-1]	Designed	18/02/2014 edgu
PRO-14-0012 / ConiWitt-250			Controlled	18/02/2014 edgu
			Revised	18/02/2014 edgu
<small>Any and all information received by you from us shall be held and kept confidential and shall not be disclosed by you to any third party except with prior written consent of FREWITT SA.</small>				<small>Frewitt SA: Milling and Handling of Powders P.O.B. 615, CH-1701 Fribourg, SWITZERLAND tel: +41 26 460 74 00 / fax: +41 26 460 74 01 info@frewitt.com / www.frewitt.com</small>
			Page	Ver.
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473746-LAY

Customer:

**NOVARTIS SINGAPORE
PHARMACEUTICAL
SG-Singapore**

Serial Nr.:

14001235183

Swiss Made		CH-1763 Granges-Paccot SUISSE			
Type	Installation	Année	2014	N° série	14001235183
int.			II	1G IIB T4 1D IIB T130°C	
ext.			II	3D IIB T130°C	
Please read the user manual before start-up !					

Name plate






2

Customer :

Serial Nr :

**Novartis Pharma
SG-Singapore**

14001243013

Swiss Made		CH-1763 Granges-Paccot SWITZERLAND			
Type	ProFi-Sword	Year : 2014	Serial Nr: 14001243013		
Network :	400 V	Frequency :	50 Hz	Amp. :	2A
int.		1258		II	1G c b IIB T4 X 1D c b T130°C IP65 X
ext.		1258		II	3D c T130°C IP65 X
Please read the user manual before start-up !					

Name plate






2

Customer :






Serial Nr :

**Novartis Pharma
SG-Singapore**


14001219097

Swiss Made				CH-1763 Granges-Paccot SWITZERLAND	
Type	ConiWitt-250	Year :	2014	Serial Nr:	14001219097
Network :	400 V	Frequency :	50 Hz	Amp. :	13.3 A
int.	 1258		II	1G c k b IIB T4 X 1D c k b T130°C IP65 X	
ext.	 1258		II	3D c Ex tD IIB T130°C IP65 X	
Please read the user manual before start-up !					

Name plate for the body

Swiss Made				CH-1763 Granges-Paccot SWITZERLAND	
Type	ConiWitt-250	Year :	2014	Serial Nr:	14001219097
int.	 1258		II	1G c k b IIB T4 X 1D c k b T130°C IP65 X	
ext.	 1258		II	3D c Ex tD IIB T130°C IP65 X	
Please read the user manual before start-up !					

Name plate for the head

	MANAGEMENT MANUAL	Document: 173155-1-en			
		Version: 01	Established: 16 May 14	by: edgu	Page: 1 de 2
Formular Datasheet		Process: 1 DelumpWitt FREWITT (ConiWitt-250 / ProFi-Sword)			

Manufacturer

FREWITT Maschinenfabrik AG
Rte du Coteau 7
CH - 1763 Granges-Paccot

Customer

Novartis Pharmaceutical
10, Tuas Bay Lane
69115 Singapore

Type	1 DelumpWitt FREWITT (ConiWitt-250 / ProFi-Sword)
Installation number	ProFi-Sword 14001243013 / ConiWitt-250 14001219097
Project number	PRO-14-0012PRO-14-0012
Order	CDC-14-0112 / 3000949997
Novartis Equipment Tag	SG.TBP.202.M.5234/I001, I0

DelumpWitt FREWITT

Execution

ATEX execution	Milling chamber: ATEX II 1G/1D cb Ex T13030 °C IP65
Protection	Outside: ATEX II 3D ATEX II 3D c Ex tD T13030 °C IP65

Part in contact with the product	Stainless steel AISI-316, Ra ≤ 0,4 µm, Sieve AISI-316 Seals made of silicone, EPDM, Novaflon and PTFE
other part	AISI-304, Ra ≤ 1.4 µm (grain 220)
Construction	According to GMP guidelines

Inlet hopper With inlet cone

hopper with cover, vibrator, safety magnet on the door. Suction connection DN100 Jacob. 2 Filters on side of the hopper. DN250 chute bag clamped on side of the hopper.

Inlet cone


The inlet cone serves as a connecting piece, crushing assistance as well as a security unit between the crusher module and customer's dispensing device for hardened and lumpy powdery solid blocks. The inlet cone is provided with stators enabling the pre-crushing process of large blocks.

Crusher module

- § Machine cone equipped with flange for fixation of vibrator
- § Inlet flange specific to be connected to the outlet of the inlet cone
- § Outlet transition funnel fitted with a cone for connection to the sizing unit

Tools

- § Upper sword for the primary crushing

	MANAGEMENT MANUAL	Document: 173155-1-en			
		Version: 01	Established: 16 May 14	by: edgu	Page: 2 de 2
Formular Datasheet		Process: 1 DelumpWitt FREWITT (ConiWitt-250 / ProFi-Sword)			

- § Lower crown for the secondary crushing

Drive unit

- § Motor with 0.7 kW with frequency converter for stepless speed adjustment of rotor speed.

With Motor protection

Grinding unit

Basic equipment

- § Inlet milling head with special TriClamp flange
- § Safety device inlet magnetic safety switch ELOBAU at inlet to stop the machine if the crusher module is not mounted
- § Outlet milling head with TriClamp flange DN 300 (ISO 2852)
- § Bearing rotor drive housing cast in one piece preventing any risk of leakage and product contamination
- § Connection channel between machine head and control box

Tools

- § 1xConical Rasp 3mm 436241
- § Rotor with 2 arms

Drive unit

- § Motor with 5,5 kW with frequency converter for stepless speed adjustment of rotor speed
- § With Motor protection

Manual lifting and swivelling system

- § The grinding unit is mounted on the manual lifting and swivelling system allowing its easily disconnection without using external lift device (for example to change the tools) with the crusher module.

Outlet funnel Tri-Clamp connection DN300 ISO2852. Compensator antistatic for manual docking.


Outlet funnel For Cleaning Tri-Clamp connection DN300 outlet DN50 with two wash nozzles.

Inlet flange for Cleaning Tri-Clamp connection DN250 with two wash nozzles.

Connection
Electrical connection 3x400V, 3P+N+PE, 50 Hz

Control
Control panel for the above system, for controlling the actuators, solenoid valves, limit switches, etc. The installation is equipped with a PLC (Siemens S7 – 300) with all the necessary switching and control devices.

Gas control system
installed in the control cabinet:
- Electo-pneumatic solenoid valve

	MANAGEMENT MANUAL	Document: 173155-1-en			
		Version: 01	Established: 16 May 14	by: edgu	Page: 3 de 2
Formular Datasheet		Process: 1 DelumpWitt FREWITT (ConiWitt-250 / ProFi-Sword)			

- Filter unit
- Pressure reducing valve for gas flow control.

Tubular steel support frame

Tubular steel support frame square tube dimensions as per Layout 464769

Scale

Mettler wight scale with terminal

Hoist

Servolift lifting hoist for DelupWitt

SAFETY

Safety

In order to use the installation in a completely safe manner, it is indispensable to follow the instructions stated in these operating instructions. All safety parts protecting either the operators and/or the machine (such as safety switches, safety grids, etc...) must not in any case be dismantled, modified or bypassed. Follow specifically the guidelines indicated by the following symbols:

Symbols

The following symbols are employed to provide practical guidelines regarding safety and operation of the installation. They advise the user against possible accidents to both person and equipment and provide practical guidelines for the use of the installation.



Danger: This symbol warns you regarding mortal danger or serious injuries. These types of accidents may be produced when the directions within these operating instructions are not strictly or only partially followed.



Warning: This symbol warns you about a potential risk regarding injuries, installation damage or other serious damages. An accident can occur if the directions in the operating instructions are not or only partially followed. Disregard of these may cause the manufacturer's warranty to be void.



Risk of generation of electrostatic charges: This symbol warns you about a risk of fire or explosion that may be generated due to electrostatic discharges. This risk can be substantially decrease by following the directions provided in these operating instructions step by step.



Recommendation: This symbol provides you with complementary indications about installation allowing an optimum use of your installation.



Maintenance: Maintenance or development jobs that are represented by this symbol should only be carried out by qualified maintenance personnel that have the specific skills to do so, and have read these operating instructions. They should only use specific tools designated for this purpose.



Danger cutting hazard: This symbol alerts you that there is a risk of serious injury in case of contact with the moving rotor. Please always wait until the rotor stops completely before reaching inside the housing.

Operators and maintenance staff

Operators and maintenance staff should provide themselves with appropriate personal protection and have prior knowledge of the directions contained within these operating instructions for every use and maintenance intervention.

The start-up of the installation should only be carried out by personnel specifically trained for such purpose. Work on electric components should be carried out only by qualified and trained staff.

Initial adjustments are carried out in the factory. In normal operation mode, installation only requires the supervision of the operator.

Regarding cleaning and maintenance tasks, these should be only carried out by personnel authorized and trained for such activity. The directions provided in these operating instructions should be carefully followed.

In order to avoid any risk of getting trapped or caught up in the machine, users of the installations shouldn't wear baggy clothes. Long hair should be tied back or retained in a proper way (net, rubber band, etc.)

The safety nuts may only be unscrewed during cleaning or maintenance work. Only properly trained cleaning and maintenance staff may have access to the special tools required for the safety nuts

Electrostatic charging hazards

Incorrect earthing may lead to electrostatic charging, which could cause an explosion. Earth connections must be checked regularly.

Electrical hazards

In the event of contact with live or current-carrying parts, there is a risk of electrical discharge which could cause serious injury or death. Never touch damaged cables. Before carrying out any maintenance work on the electrical equipment, the installation must be turned off and disconnected from the power supply. Replace defective cables or fuses immediately.

Compressed air hazards

The release of compressed air gives rise to a mechanical risk of injury, particularly for the eyes but also for the ears. When handling the pneumatic system, wear glasses and ear protection. When servicing the compressed air system, the main inlet for the compressed air must be closed and the system cleared using a discharge valve. The pneumatic oil is toxic. Do not ingest. Avoid contact with the eyes and mucous membranes. Beware of ejection and oil residues.

Product hazards

These operating instructions are only concerned about the installation's operation and use. The specific risks resulting from the products to be transformed are not included in these operating instructions and should be discussed separately. The person responsible for the installation should state clearly in his/her own operating instructions the risks and safety instructions inherent to the products to be transformed. Operators should follow these indications carefully.

Residual risks

Residual risks are those unforeseeable risks that, despite proper safety precautions, cannot be excluded when using the installation. These residual risks are not easy to detect and may be a possible health hazard, related to injuries or danger (see European standards EN ISO 12100-1, paragraph 4). If such a risk arises, the installation should be switched off immediately and the person responsible for the installation should be advised. He/she should apply all appropriate measures in order to definitely avoid these risks. In all such cases the manufacturer should always be informed.

Other risks

The installation under operation can have a high noise level. When operating the installation, wear ears protection.

Integration

If the installation of Frewitt has to be integrated in a final installation, the user should ensure that the proper safety systems are operational in order to avoid the introduction of members at the fragmentation zone near the installation's inlet-outlet.

Warranty Limit

The warranty of Frewitt is valid in so far as the installation is operated within the technical limits, conditions and applications stated in the customer specifications and confirmed by Frewitt. The warranty of Frewitt is not valid if the customer or the user does not comply with operating instructions and/or if modifications are done without the written consent of Frewitt.

Limitation of responsibility of the product manufacturer

Frewitt provides an installation that complies with CE standards regarding safety or the applicable standards in the destination's country. Any damage to people, material and merchandises belonging to the user or a third party due to the use or maintenance of the installation is the exclusive responsibility of the customer, respectively the user.

Emergencies

In the event of an accident involving injury, immediately apply recognised first aid procedures and inform the medical personnel.

Information about explosives zones

Since a dangerous, potentially explosive atmosphere may not exist all the time within an area with an explosion hazard, these areas are divided into zones, according to the probability of the dangerous atmosphere being present. Here an extract of classification.

Gases, vapors, mists

Ex zones	Covers areas in which a dangerous, potentially explosive atmosphere is ...	We are in general...	Operation without effective ignition source.
Zone 0	Present continuously or for lengthy periods. [> 1000 hours/year]	Only inside containers or the space inside apparatus.	<ul style="list-style-type: none"> - Fault-free operation - Rare operational faults - Frequent operational faults
Zone 1	Present occasionally. [10 - 1000 hours/year]	The immediate surroundings of zone 0, of loading openings, filling/emptying devices, etc.	<ul style="list-style-type: none"> - Fault-free operation - Frequent operational faults
Zone 2	Present infrequently and then only for a short time. [<10 hours/year]	The areas surrounding zone 0 and 1 or around flange connections.	<ul style="list-style-type: none"> - Fault-free operation

Dust

Ex zones	Covers areas in which a dangerous, potentially explosive atmosphere is ...	We are in general...	Operation without effective ignition source.
Zone 20	In the form of a combustible cloud of dust in the air. Present continuously or for lengthy periods. [> 1000 hours/year]	Only inside apparatus, containers (mills, dryers, mixers), piping	<ul style="list-style-type: none"> - Fault-free operation - Rare operational faults - Frequent operational faults
Zone 21	In the form of swirls of deposits dust. Present occasionally. [10 - 1000 hours/year]	In surrounding area e.g. by dust removal or at filling stations or areas of dust deposits.	<ul style="list-style-type: none"> - Fault-free operation for whirled-up dust - Rare operational faults for dust deposits
Zone 22	Present infrequently and then only for a short time [<10 hours/year]	In areas in which dust may emerge from seals and from deposits.	<ul style="list-style-type: none"> - Fault-free operation

The installer or operator of an installation must judge whether there is an explosion hazard within an area, and make the zoning accordingly.

For ATEX installations, refer to chapter "ATEX (EN 94/9/CE)"

Type de machine / Maschinentyp / Type of machine:

DelumpWitt

Appareil de mesure / Messgerät / Measuring unit :

Testo 815

N° de série / Serien Nr. / Serial Nr. :

30811293/105

Norme / Norm / Standard :

dBA (DIN 45635)

Conditions de mesure

La mesure est faite:

- à 1 m
- à hauteur de la chambre de broyage
- avec l'outillage monté
- avec les accessoires montés
- à vide (sans produit)

Messbedingungen

Die Messung wird gemacht:

- bei einer Distanz von 1 m
- auf Mahlkammerhöhe
- mit montiertem Werkzeug
- mit montiertem Ein- und Auslaufzubehör
- Mahlkammer leer (ohne Produkt)

Measuring conditions

Measurement is made:

- at a distance of 1 m
- at height of milling chamber
- with installed tools
- with installed inlet and outlet accessories
- Milling chamber empty (without product)

		ConiWitt-250	ProFi-Sword	dBA
Vitesse				
Geschwindigkeit	mini	400 T/min	13 T/min	63.4
Speed				
Vitesse				
Geschwindigkeit	maxi	750 T/min	20 T/min	69.1
Speed				

Protocole établi par (visa)

Protokoll erstellt von (Visa)

Report established by (visa)

H.Rey



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on

06.2009

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GENERAL

Description of the unit

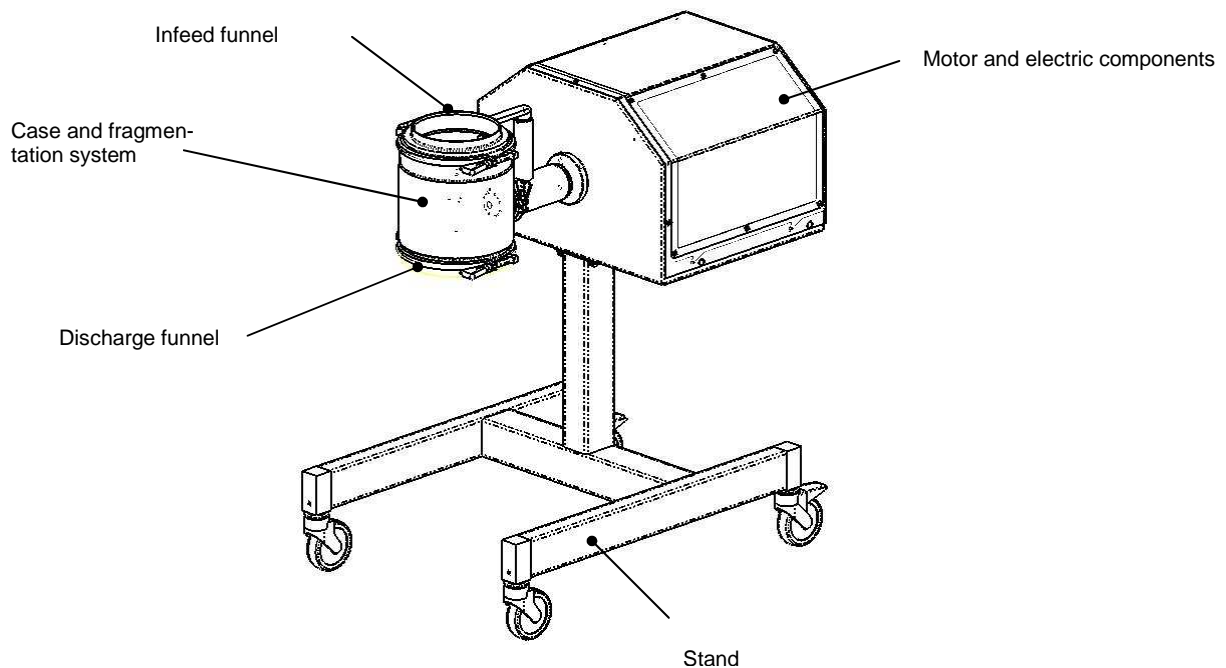
General information

This machine is designed for the fragmentation of a wide diversity of products in the pharmaceutical, chemical, and food industries.

Principle components of the unit

- Case and fragmentation system
- Motor and electric components
- Stand (Optional)
- Infeed funnel
- Discharge funnel

Diagram



Phases

Setup

Personnel qualification

Licensed mechanic or electrician.

Restrictions

The customer must familiarize himself with the service manual prior to setup.

Operation

Personnel qualification

None

Special requirements

- Thorough knowledge of user manual
- Thorough knowledge of the safety rules

Restrictions

None

Maintenance and cleaning

Improper maintenance of the unit is a contributing factor to accidents such as in-service rupture or danger of electrocution.

The safety regulations in effect in the country where the unit is installed must be followed when performing maintenance tasks.

Prohibited

For personnel who have not received minimum instruction on the cleaning and maintenance of the unit

Personnel qualification

None

Special requirements

- Thorough knowledge of user manual
- Thorough knowledge of the safety rules

Restrictions

None

Comments

One must still study the instructions for the new machine even if one has knowledge of the operation of an older Frewitt machine.

Repairs

Prohibited

For personnel who are not licensed mechanics and/or electricians.

Personnel qualification

Licensed mechanic or electrician.

Special requirements

- Thorough knowledge of user manual
- Ability to read and understand technical diagrams and folders
- Thorough knowledge of the safety rules
- The proper tools for dismantling and assembly.

Restrictions

The person performing repair work must use the original documentation supplied with the unit and no other.

Only Frewitt parts may be used.

Comments

One must still study the instructions for the new machine even if one has knowledge of the operation of an older Frewitt machine.

Risk analysis - mechanical

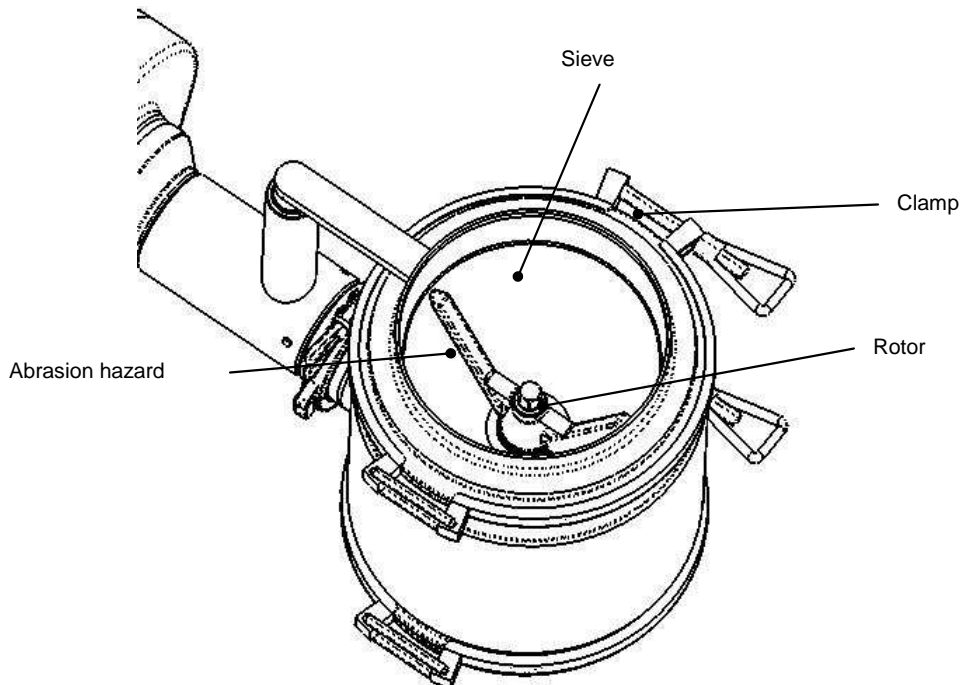
Abrasion

Type of hazard(s) :	Description/location :
Abrasion	Case and fragmentation system

Definition of the hazards:

There is a hazard of abrasion of the rotor against the sieve if the clamp holding the infeed funnel is loosened during the operation of the machine.

Diagram



Precautions:

Always make sure that the machine has stopped before loosening the infeed clamp

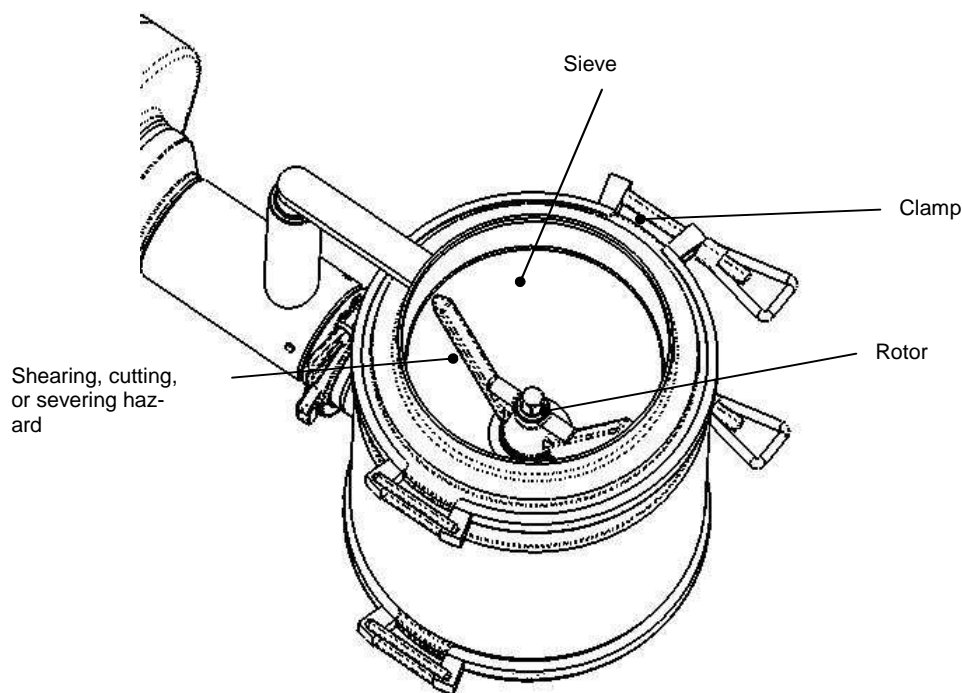
Shearing, cutting, or severing at the infeed

Type of hazard(s):	Description/location :
Shearing, cutting, severing	Case and fragmentation system

Definition of the hazards:

The introduction of upper limbs inside the fragmentation system, between the rotor and the sieve, via the infeed of the machine poses a shearing, cutting, or severing hazard.

Diagram



Precautions:

"Stand alone" Machine:
 None.

In-Line Machine:
 When integrating the machine in the final in-line installation, the user must make sure that adequate safety systems are in place to prevent the introduction of limbs into the fragmentation zone via either the infeed of the machine.

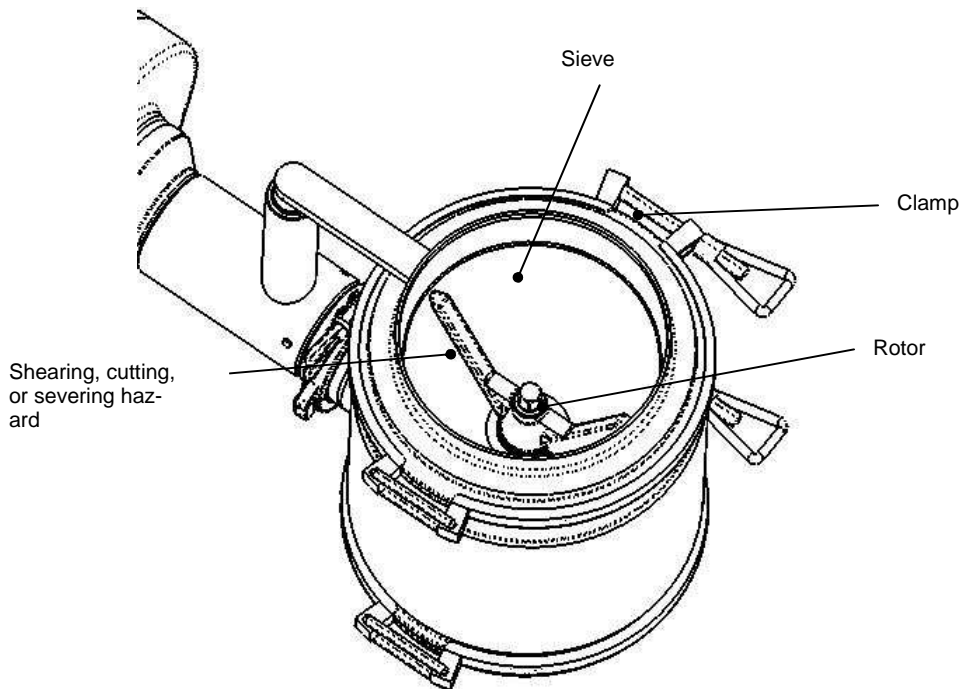
Shearing, cutting, or severing at the discharge

Type of hazard(s) : Shearing, cutting, severing	Description/location : Discharge of the unit
---	--

Definition of the hazards:

The rotor poses a shearing, cutting, or severing hazard to upper limbs if they are introduced via the discharge of the machine into the fragmentation system if the sieve is not installed.

Diagram



Precautions:

"Stand alone" Machine and In-Line Machine

Under no circumstances must the machine be started without the sieve if the rotor is installed. There is a shearing, cutting, or severing hazard to upper limbs introduced via the discharge into the fragmentation system when the system is running without the sieve and with the rotor installed in the machine.

Catching, entanglement (rotor)

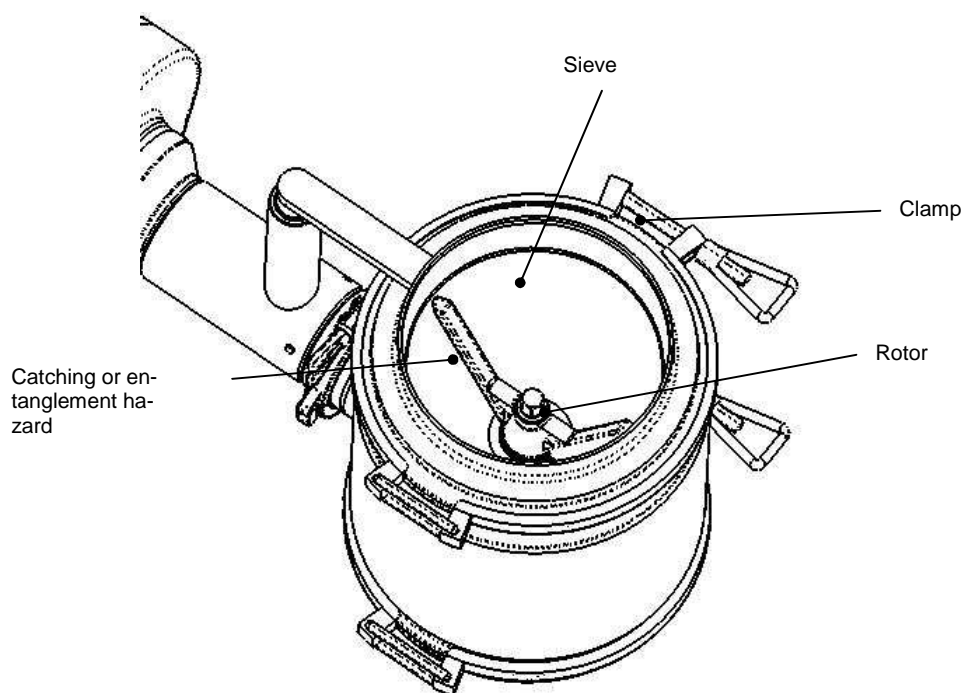
Hazards : Mechanical hazards	Hazard zone : Case and fragmentation system
--	---

Definition of the hazards:

Catching, entanglement hazard

There is a catching or entanglement hazard posed by the rotor if hair or clothing is introduced into the fragmentation system.

Diagram



Precautions:

In order to avoid all risks of catching or entanglement, the users of the unit must not wear clothing that is too loose. Long hair should be tied back or restrained by some suitable means (hair net, rubber band, etc.).

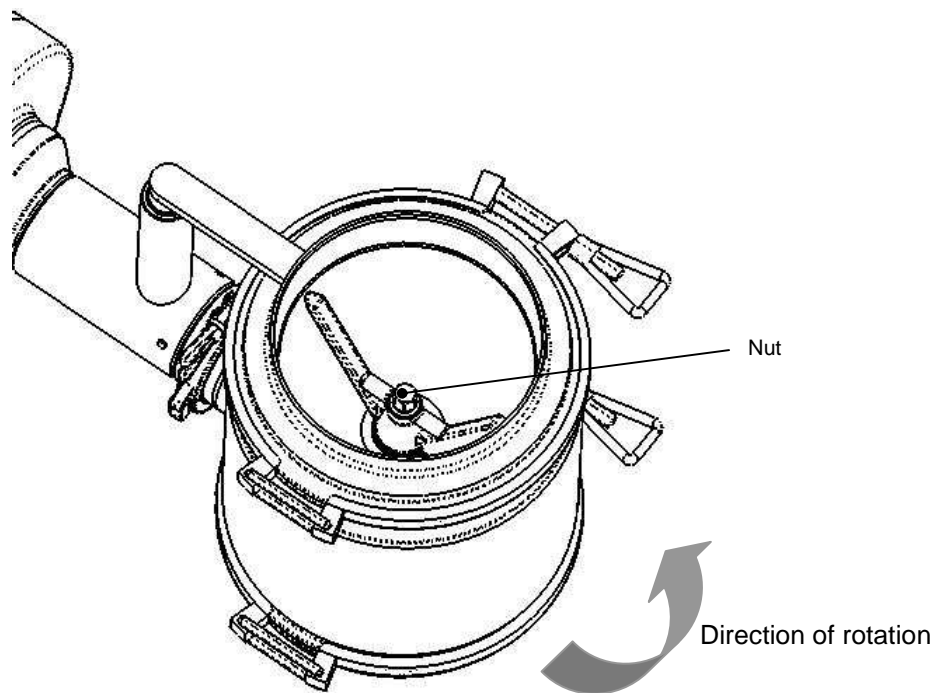
Ejection of objects

Type of hazard(s):	Description/location :
Ejection of objects	Case and fragmentation system

Definition of the hazards:

The fragmentation rotor is held in place on the shaft by a right-hand threaded nut. This nut is tightened by the rotor rotating in the proper direction. If the rotor does not rotate in the proper direction, there is a hazard of this nut being ejected.

Diagram



Precautions:

During setup, make sure that the direction of rotation of the rotor corresponds to the arrow marked on the case of the machine. If the direction of rotation is not correct, reverse the polarity of two power wires on the motor.

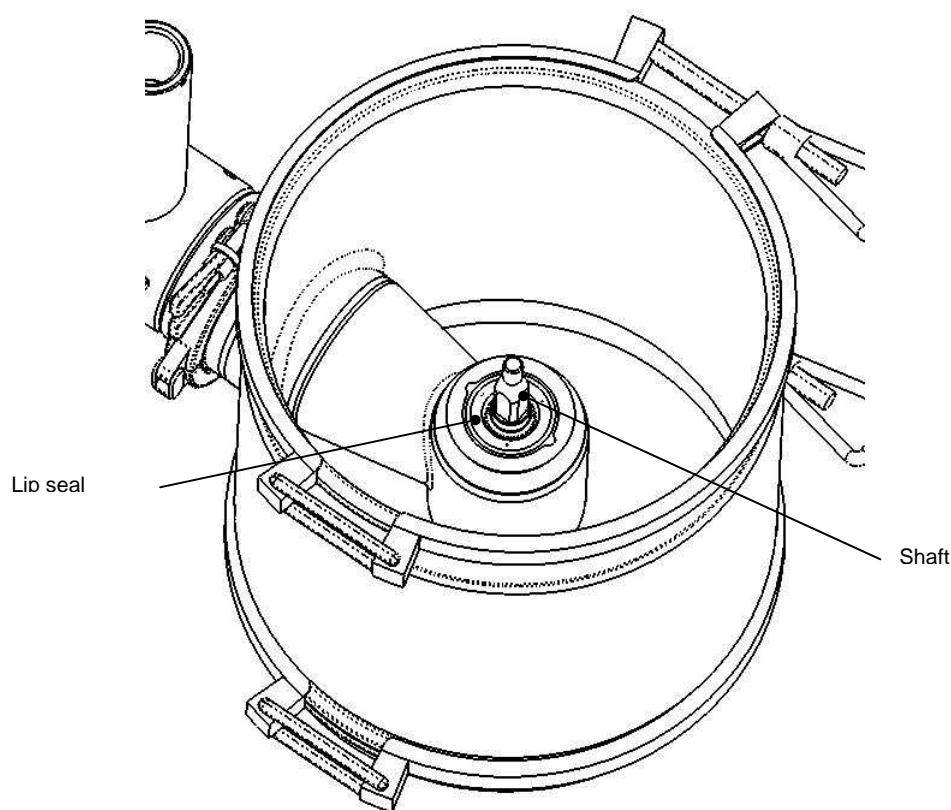
Burns

Type of hazard(s):	Description/location :
Burns	Drive

Definition of the hazards:

The friction of the lip seal against the shaft of the machine causes the shaft to heat up, potentially to very high temperatures (100°C). This heat ing up is limited to ca. 40°C if the rotor is attached to the shaft. As it rotates, the rotor acts as a propeller and generates an airflow that maintains the temperature of the shaft at an acceptable level.

Diagram



Precautions (machine not inertized):

The friction of the lip seal against the shaft of the machine causes the shaft to heat up, potentially to very high temperatures (100°C). This heat ing up is limited to ca. 40°C if the rotor is attached to the shaft. As it rotates, the rotor acts as a propeller and generates an airflow that maintains the temperature of the shaft at an acceptable level. To prevent damage to the lip seal, it is strongly advised not to run the machine without the rotor.

Other risks

Crushing hazard of the unit

Hazards : Crushing hazard	Hazard zone : Machine
-------------------------------------	---------------------------------

Definition of the hazards:

Crushing hazard if the unit tips.

Precautions:

If the unit has casters, they must be removed and the unit must always be fastened to a pallet for transport.

Materials and products

Hazards : Risks posed by the materials and products	Hazard zone : Case and fragmentation system
---	---

Definition of the hazards:

Risks posed by the materials and products

The manufacturer is not familiar with every potential product used in the units. The user of the unit is therefore responsible for the protection of the unit and personnel from damages caused by the products being processed.

Precautions:

The user of the unit is responsible for the protection of the unit and personnel from damages caused by the products being processed.

Hazards from operation under pressure

Hazards : Ejection of fluid under pressure	Hazard zone : Unit
--	------------------------------

Definition of the hazards:

Risks of fluid ejection caused by pressurization of the unit.

Precautions:

It is prohibited to operate the unit under a pressure greater than the value indicated on the unit (CE label).

Personnel must remain at least three meters away from the unit during pressurization.

Temperatures

Hazards : burn	Hazard zone : Installation, infeed plate, discharge funnel
--------------------------	--

Definition of the hazards:

Burn hazard to personnel coming in contact with the case of the unit, the door, the infeed plate, or the discharge funnel.

The sides of the unit may become very hot when it is pressurized with steam.

Precautions:

Do not touch the unit during pressurization.

Wait an hour before touching the unit after depressurization, or use appropriate burn protection means.

Electrostatic charge buildup in the powder

Type of hazard(s):	Description/location : electrostatic charge buildup in the powder
---------------------------	---

Definition of the hazards

When the unit is running, there is a risk of an electrostatic charge building up in the powder. The explosion hazard is proportional to the speed of the rotor.

When moving the unit, there is a risk of an electrostatic charge building up in the powder. The explosion hazard is proportional to how fast the unit is moved.

Precautions:

This user manual refers only to the functioning and operation of the unit. The specific hazards resulting from the products to be processed are not covered in this user manual and must be dealt with separately. The person in charge of the unit must clearly state in his own instructions for use the hazards inherent to the products to be processed, as well as the safety instructions specific to them. Personnel operating the unit must follow these instructions to the letter.

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General

Description of the unit

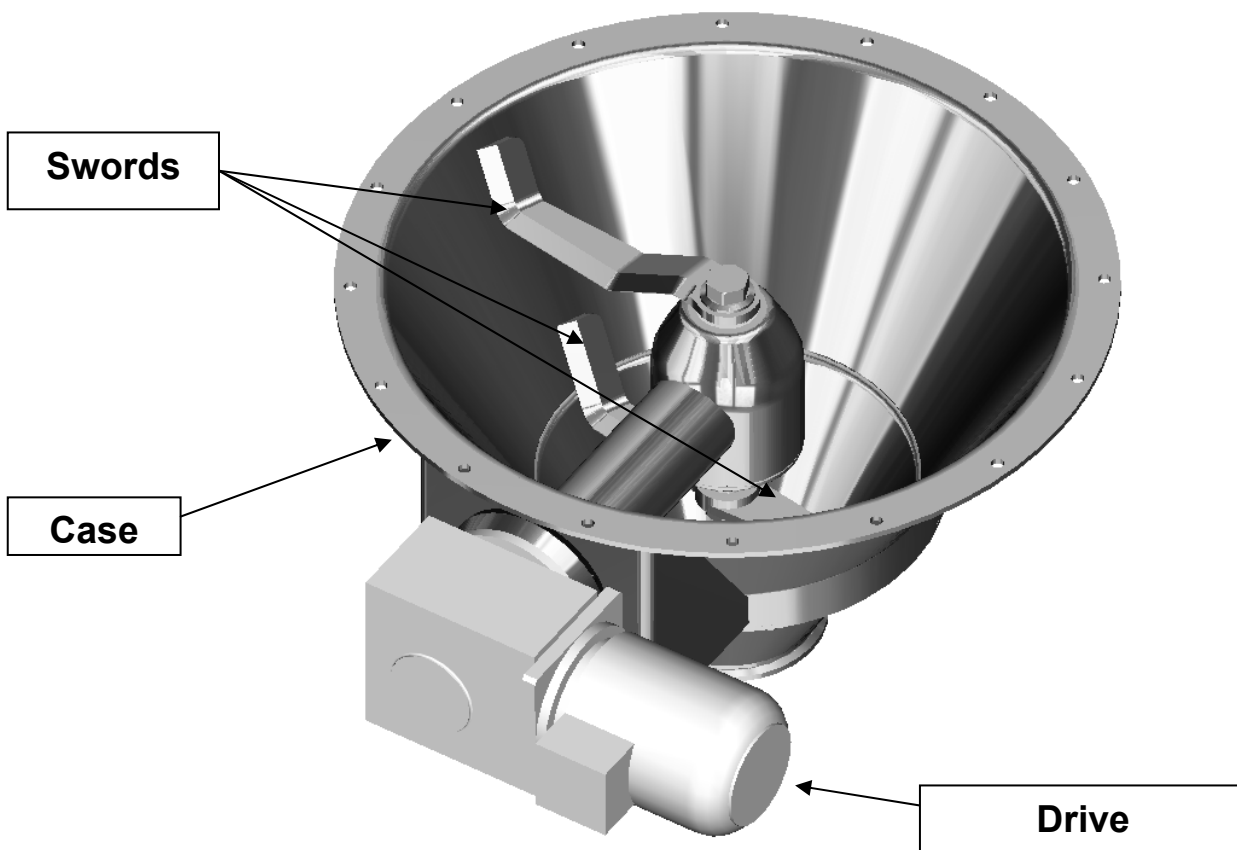
General information

This machine is designed to prevent powder products such as those used in the pharmaceutical, chemical, and food industries from forming bridges in dosing-filling equipment.

Principle components of the unit

- Case
- Cleaning swords (fins)
- Drive, Motor

Diagram



Phases

Setup

Personnel qualification

Licensed mechanic or electrician.

Restrictions

The customer must familiarize himself with the service manual prior to setup.

Operation

Personnel qualification

None

Special requirements

- Thorough knowledge of user manual
- Thorough knowledge of the safety rules

Restrictions

None

Maintenance and cleaning

Improper maintenance of the unit is a contributing factor to accidents such as in-service rupture or danger of electrocution.

The safety regulations in effect in the country where the unit is installed must be followed when performing maintenance tasks.

Prohibited

For personnel who have not received minimum instruction on the cleaning and maintenance of the unit.

Personnel qualification

None

Special requirements

- Thorough knowledge of user manual
- Thorough knowledge of the safety rules

Restrictions

None

Comments

One must still study the instructions for the new machine even if one has knowledge of the operation of an older Frewitt machine.

Repairs

Prohibited

For personnel who are not licensed mechanics and/or electricians.

Personnel qualification

Licensed mechanic or electrician.

Special requirements

- Thorough knowledge of user manual
- Ability to read and understand technical diagrams and folders
- Thorough knowledge of the safety rules
- The proper tools for dismantling and assembly.

Restrictions

The person performing repair work must use the original documentation supplied with the unit and no other.

Only Frewitt parts may be used.

Comments

One must still study the instructions for the new machine even if one has knowledge of the operation of an older Frewitt machine.

Mechanical risks

Shearing hazard at the infeed

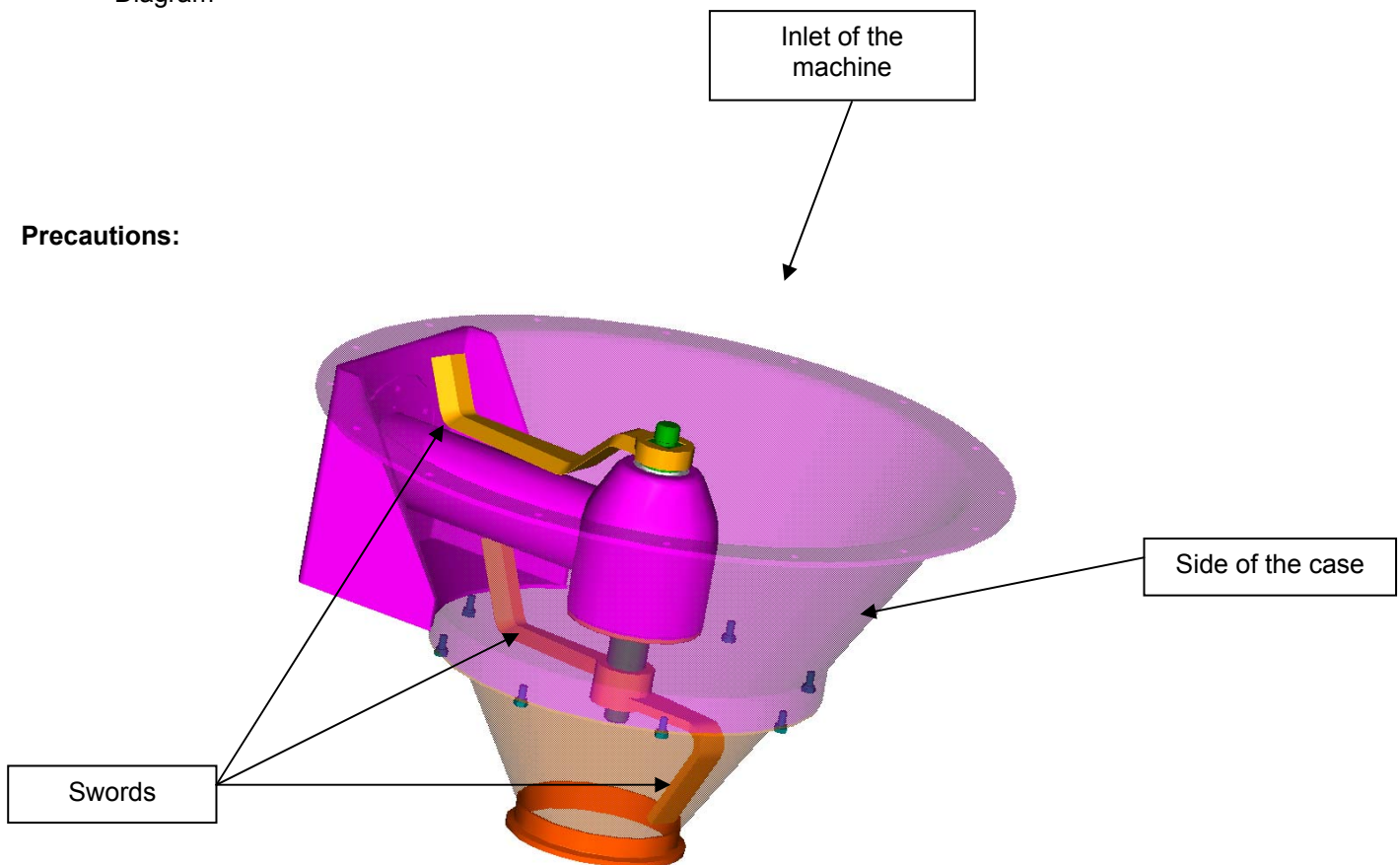
Hazard(s): Shearing	Danger zone: Case and powder cleaning system
-------------------------------	--

Definition of the hazards:

The introduction of upper limbs inside the powder cleaning system, between the side and the rotating swords, via the infeed of the machine poses a shearing, cutting, or severing hazard.

Diagram

Precautions:



In-Line Machine:

When integrating the machine in the final in-line installation, the user must make sure that adequate safety systems are in place to prevent the introduction of limbs into the danger zone via either the infeed of the machine.

Before performing any maintenance or repair work, all pneumatic or electric lines enabling the ProFi-Sword to be started must be disconnected.

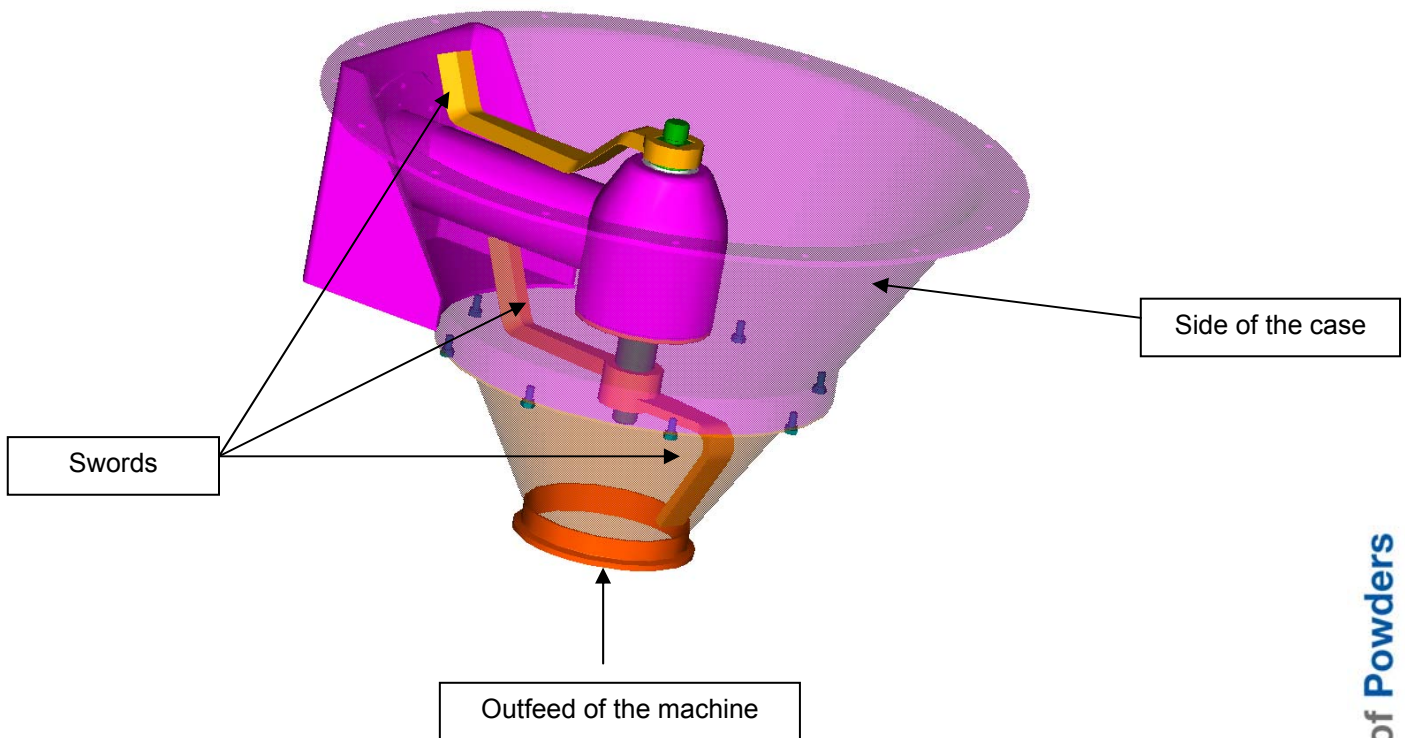
Shearing hazard at the outfeed

Hazard(s): Shearing	Danger zone: Case and powder cleaning system
-------------------------------	--

Definition of the hazards:

The introduction of upper limbs inside the powder cleaning system, between the side and the rotating swords, via the outfeed of the machine poses a shearing, cutting, or severing hazard.

Diagram



Precautions:

"Stand alone" Machine
None.

In-Line Machine:

When integrating the machine in the final in-line installation, the user must make sure that adequate safety systems are in place to prevent the introduction of limbs into the danger zone via either the outfeed of the machine.

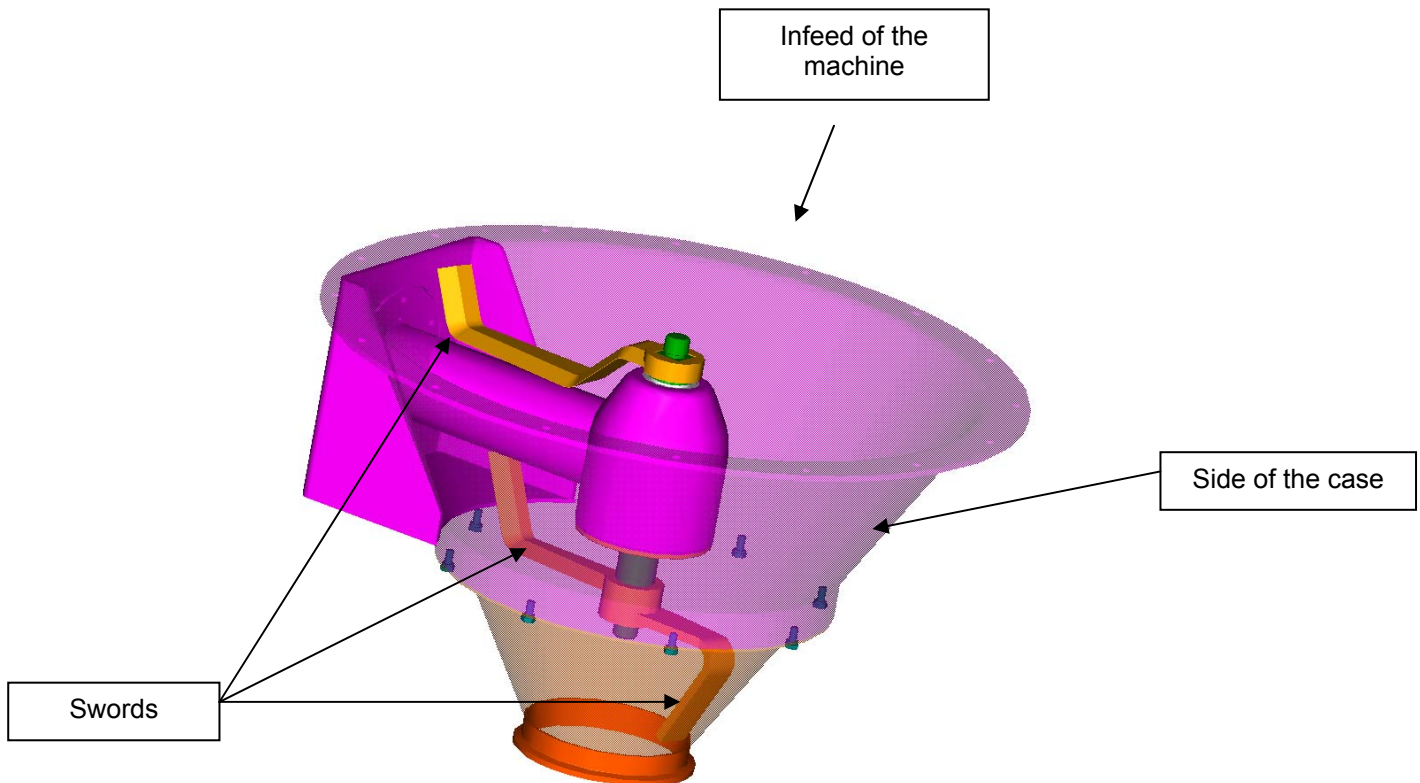
Crushing hazard at the infeed

Hazard(s): Crushing	Danger zone: Case and powder cleaning system
-------------------------------	--

Definition of the hazards:

The introduction of upper limbs inside the powder cleaning system, between the side and the rotating swords, via the infeed of the machine poses a crushing hazard.

Diagram



Precautions:

In-Line Machine:

When integrating the machine in the final in-line installation, the user must make sure that adequate safety systems are in place to prevent the introduction of limbs into the danger zone via either the infeed of the machine.

Before performing any maintenance or repair work, all pneumatic or electric lines enabling the ProFi-Sword to be started must be disconnected.

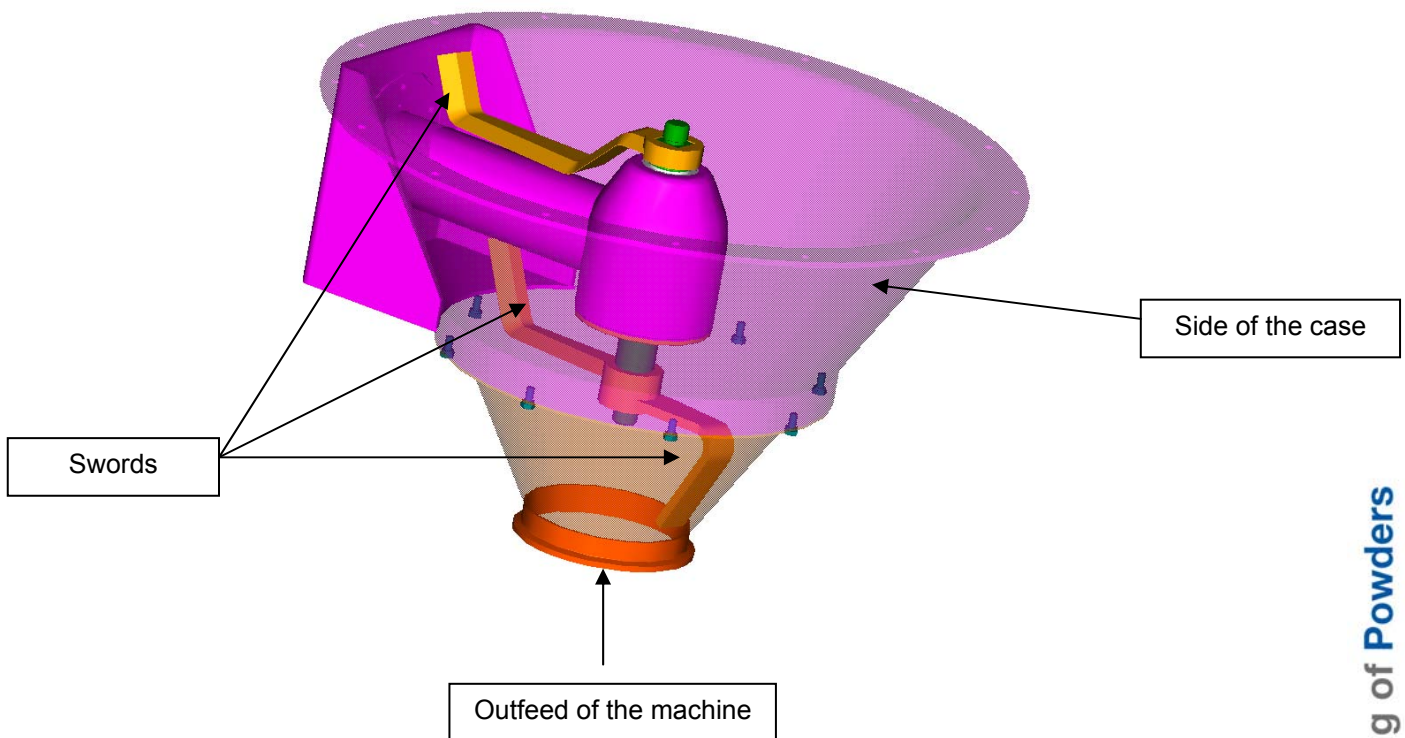
Crushing hazard at the outfeed

Hazard(s): Crushing	Danger zone: Case and powder cleaning system
-------------------------------	--

Definition of the hazards:

The introduction of upper limbs inside the powder cleaning system, between the side and the rotating swords, via the outfeed of the machine poses a crushing hazard.

Diagram



Precautions:

Machine « Stand alone »
None

In-Line Machine:

When integrating the machine in the final in-line installation, the user must make sure that adequate safety systems are in place to prevent the introduction of limbs into the danger zone via either the outfeed of the machine.

Entanglement hazard at the infeed

Hazards:

Mechanical hazards

Danger zone:

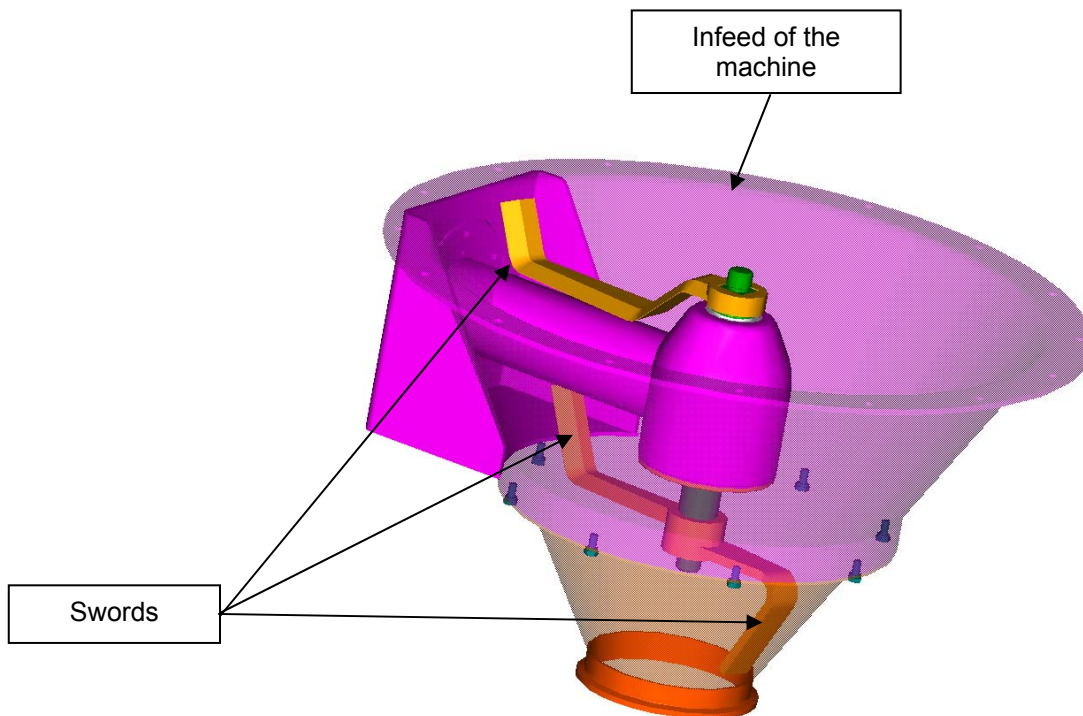
Case and powder cleaning system

Definition of the hazards:

1.4 Catching, entanglement hazard

There is a catching or entanglement hazard posed by the swords of the ProFi-Sword if hair or clothing is introduced at the infeed into the inside of the machine.

Diagram


Precautions:

In order to avoid all risks of catching or entanglement, the users of the unit must not wear clothing that is too loose. Long hair should be tied back or restrained by some suitable means (hair net, rubber band, etc.).

Before performing any maintenance or repair work, all pneumatic or electric lines enabling the ProFi-Sword to be started must be disconnected.

Entanglement hazard at the outfeed

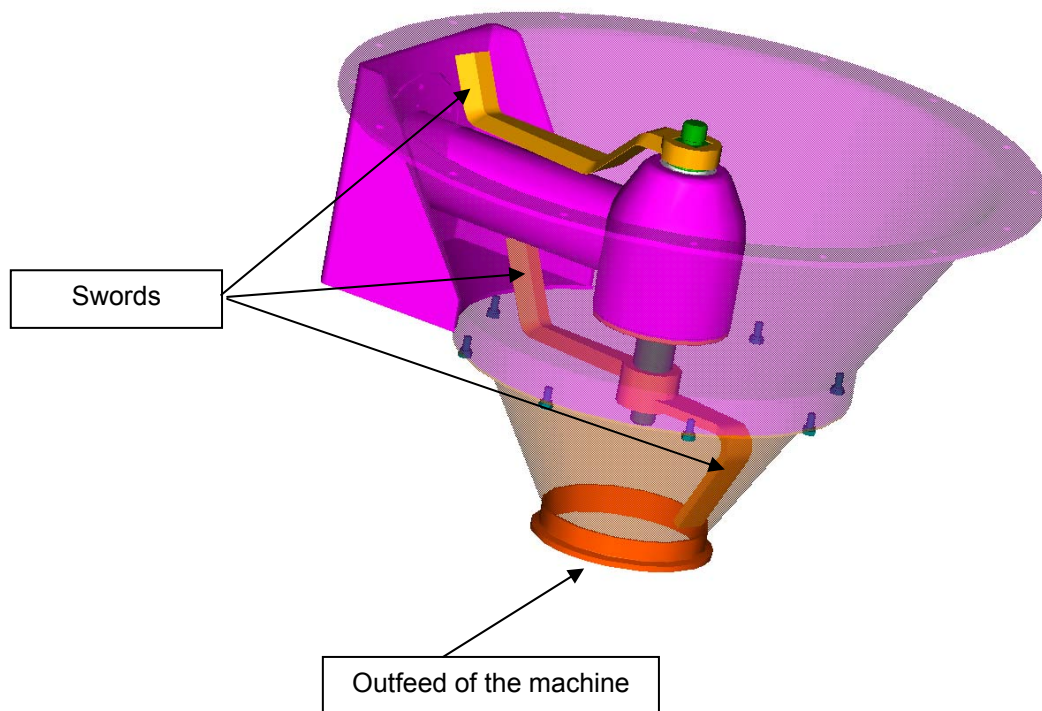
<p>Hazards: Mechanical hazards</p>	<p>Danger zone: Case and powder cleaning system</p>
---	--

Definition of the hazards:

1.4 Catching, entanglement hazard

There is a catching or entanglement hazard posed by the swords of the ProFi-Sword if hair or clothing is introduced at the infeed into the inside of the machine.

Diagram



Precautions:

In order to avoid all risks of catching or entanglement, the users of the unit must not wear clothing that is too loose. Long hair should be tied back or restrained by some suitable means (hair net, rubber band, etc.).

Before performing any maintenance or repair work, all pneumatic or electric lines enabling the ProFi-Sword to be started must be disconnected.

Other risks

Thermal hazard

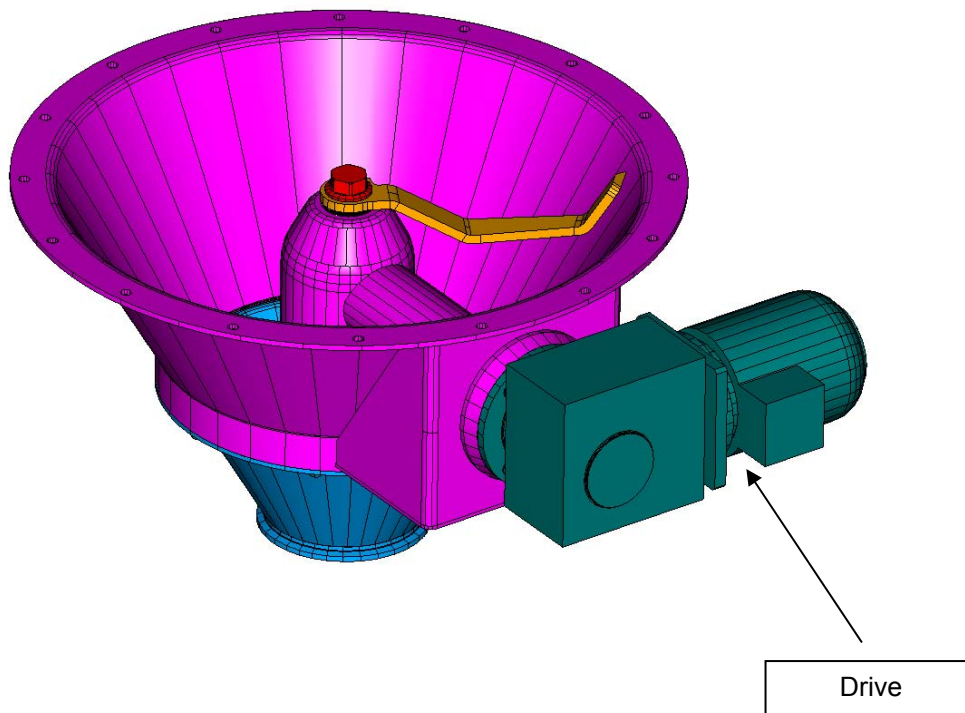
Hazards: Thermal hazards	Danger zone: Drive
------------------------------------	------------------------------

Definition of the hazards:

Burn hazard

After an intensive use of the machine there is a burn hazard, if a person touches the motor or the gear box. The temperature of these elements can reach up to 60-70°C.

Diagram



Precautions:

After an extended use of the machine, the temperature of the drive can be elevated (60-70°C). Therefore we recommend always wearing protective gloves during the operation of the machine.

Abrasion hazard

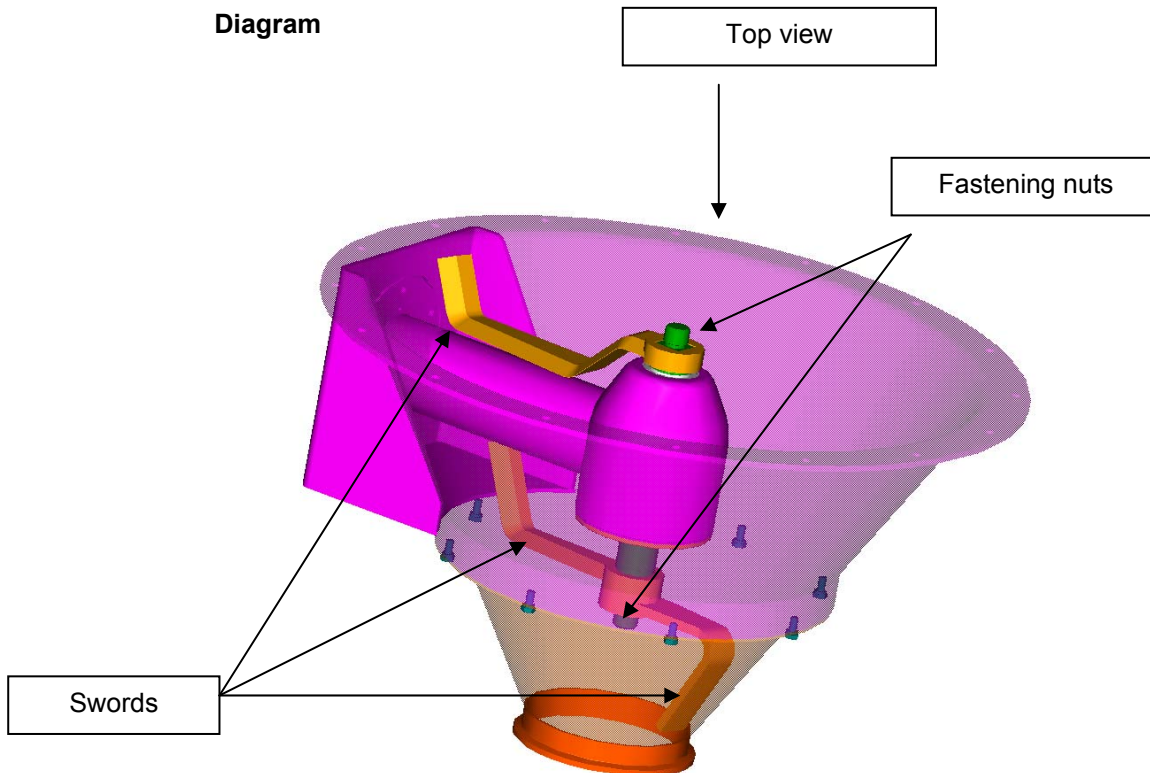
<p>Hazards: Mechanical hazards</p>	<p>Danger zone: Case and swords</p>
---	--

Definition of the hazards:

Abrasion hazard

There is a hazard of abrasion between the two swords and the side of the machine, if the swords were not correctly tightened when mounted or, if during the operation, the sense of rotation of the swords is incorrect and causes the loosening of these fastening nuts.

Diagram



Precautions:

The fastening nuts of the swords must be tightened by a torque wrench with a torque of 50Nm.

Before the setup of the machine, please verify that the swords turn anti-clockwise from top view of ProFi-Sword.

In contrary case inverse the 2 phases of the motor input line.

Crushing hazard of the unit

Hazards: Crushing hazard	Danger zone: Machine
------------------------------------	--------------------------------

Definition of the hazards:

Crushing hazard, if the unit tips.

Precautions:

If the unit has casters, they must be removed and the unit must always be fastened to a pallet for transport.

Materials and products

Hazards: Risks posed by the materials and products	Danger zone: Case and powder cleaning system
--	--

Definition of the hazards:

Risks posed by the materials and products

The manufacturer is not familiar with every potential product used in the units. The user of the unit is therefore responsible for the protection of the unit and personnel from damages caused by the products being processed.

Precautions:

The user of the unit is responsible for the protection of the unit and personnel from damages caused by the products being processed.

Hazards from operation under pressure

Hazards: Ejection of fluid under pressure	Danger zone: Unit
---	-----------------------------

Definition of the hazards:

Risks of fluid ejection caused by pressurization of the unit.

Precautions:

It is prohibited to operate the unit under a pressure greater than the value indicated on the unit (CE label).

Personnel must remain at least three meters away from the unit during pressurization.

Temperatures

Hazards: Burn	Danger zone: Drive
-------------------------	------------------------------

Definition of the hazards:

Burn hazard to personnel coming in contact with the case of the unit, the door, the infeed plate, or the discharge funnel.
The sides of the unit may become very hot when it is pressurized with steam.

Precautions:

Do not touch the unit during pressurization.
Wait an hour before touching the unit after depressurization, or use appropriate burn protection means.

Electrostatic charge buildup in the powder

Hazard(s):	Designation: electrostatic charge buildup in the powder
-------------------	---

Definition of the hazards:

When the unit is running, there is a risk of an electrostatic charge building up in the powder. The explosion hazard is proportional to the speed of the rotor.

When moving the unit, there is a risk of an electrostatic charge building up in the powder. The explosion hazard is proportional to how fast the unit is moved.

Precautions:

This user manual refers only to the functioning and operation of the unit. The specific hazards resulting from the products to be processed are not covered in this user manual and must be dealt with separately. The person in charge of the unit must clearly state in his own instructions for use the hazards inherent to the products to be processed, as well as the safety instructions specific to them. Personnel operating the unit must follow these instructions to the letter.

START-UP

Avant la première mise en service, vérifiez les points suivants:

- Contrôler visuellement l'état de l'installation.
- Contrôler la fixation de l'installation. (peut varier selon l'exécution de l'installation)
- Contrôler le branchement électrique et pneumatique.
- Contrôler la mise à terre si nécessaire.
- Contrôler la fixation du bâti, la bride clamp doit être bien serrée.
- Si l'outillage est monté, contrôler que celui-ci est monté correctement selon chapitre 5.
- Si les accessoires sont montés, contrôler que ceux-ci sont montés correctement selon chapitre 5.

Prüfen Sie folgende Punkte vor der ersten Inbetriebnahme:

- Den Zustand der Anlage optisch kontrollieren
- Die Befestigung der Anlage kontrollieren. (Kann je nach Ausführung ändern)
- Kontrolle des elektrischen und pneumatischen Anschlusses.
- Die Erdung kontrollieren, sofern notwendig.
- Die Befestigung des Gehäuses kontrollieren, der Clamp-Spannring muss fest angezogen sein.
- Sofern die Werkzeuge montiert sind, kontrollieren, ob diese korrekt montiert sind, gemäß Kapitel 5.
- Wenn die Aufsätze montiert sind, kontrollieren, ob diese korrekt montiert sind, gemäß Kapitel 5.

Before first start-up, check the following points:

- Visually control of the installation status.
- Control installation fastening. (May vary according installation's execution)
- Control electric and pneumatic connections.
- Control the grounding if necessary.
- Control the fixing of the housing, the support clamp must be well tight.
- If tools are assembled, control that these are properly assembled according to Chapter 5.
- If accessories are assembled, control that these are properly assembled according to Chapter 5.

Lors du branchement de l'installation au réseau électrique, contrôlez la tension qui doit correspondre à celle indiquée sur la plaquette signalétique.

Beim Anschluss der Anlage an das Stromnetz ist die Spannung zu überprüfen. Sie muss mit den Angaben des Typenschildes der Maschine übereinstimmen.

Check voltage before the installation is connected to the electric network. the voltage must be identical to the indication shown on the type plate.



Le DelumpWitt ne peut pas fonctionner sans convertisseur de fréquence



Die DelumpWitt kann ohne Frequenzumrichter nicht funktionieren



The DelumpWitt can not operate without frequency converter

Le sens de rotation de l'entraînement doit correspondre à la flèche se trouvant sur le bâti.

Die Drehrichtung muss mit dem Pfeil auf dem Gehäuse übereinstimmen.

The direction of rotation of the rotor motion has to correspond to the arrow shown on the housing.

Votre installation est prévue pour

Ihre Installation ist mit...

Your installation is to supply with

400V 50Hz 3LNPE 32A

... zu speisen

Si les installations équipées d'un variateur de fréquence sont branchées sur un réseau électrique équipé d'un disjoncteur différentiel à courant de défaut, celui-ci doit être adapté (Type B).

Wenn die Anlagen, die mit einem Frequenzumformer ausgestattet wurden, auf einem Stromversorgungsnetz angeschlossen werden, das mit einem Fehlerstromschutzschalter ausgestattet wurde, muß dieser angepaßt werden (Typ B).

If the installations equipped with a frequency converter are connected to an electrical network including a residual current circuit-breaker, this one must be adapted (Type B).

OPERATING INSTRUCTIONS

Functional Design Specification (Hardware +Software description)

Project PRO-14-0012
 Novartis Singapore
 NSPM MELT EXTRUSION LINE

DelumpWitt
 SG.TBP.202.M.5234

ATEX Mill Inside Zone 20
 Outside Zone 22

Name	Signature Reason	Function/ Department	Signature	Date
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E.Gumy Frewitt SA	Reviewer	Frewitt (Project Manager)		
Ho Sook Hwa	Reviewer	Qualification Coordination		
Christina Chen	Approver	NSPM Process Engineer		
Shivabalan Kanesan	Approver	NSPM Automation Engineer		
Panicker Shreekumar	Approver	NSPM Technical Project Manager		

Versions control

Date	Revision	Reason of change
14.02.2014	0	Initial Version

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1 Introduction

1.1 Specifications

- Described is the DelumpWitt from Frewitt. This description is built according the basic module of the GAMP 5-standards.
- GAMP Level 3: WIN CE/Microsoft and WIN CC Siemens (Standard software package)
- GAMP Level 3: Application: S7_Programm and HMI-Application

1.2 Basic documents

This document is based on:

- Quotation Frewitt OFC-2527
- FS of DelumpWitt at Novartis PRO-11-0076
- Several Meeting reports
- The R&I drawing 473871

1.3 Power requirements and Conditions

- Ex Zone : inside the mill Zone 20, outside around the mill Zone 22
- Electrical power feed: 400VAC, PE
- Control voltage 24VDC
- Pneumatic feeding: minimum 5 bar

2 Overview

2.1 Equipment

The DelumpWitt consists of the following elements:

- ProFi-Sword with crusher module
- Mill CW250
- Electrical cabinet outside of production room with PLC, Inverters
- Interface to lifting units
- Interface to printer
- Interface Ethernetcard for PLC to connect to HMI and to external (logon/clock synchronization)

The Delumpwitt shall have following features:

-
-

The mill, delumper, and frame is designed for simple and efficient operational tasks, including:

- Manual assembly, disassembly of the mill
- Docking and undocking of the 2000 L IBC to the mill.
- Material handling and charging at the charging area.
- Screen change from 10mm (Square) to 3mm (Rasp) in the middle of batch processing.
- Removal of the mill frame for cleaning

-
-

The mill is settable to a particular number of rotations. Regulation of mill rotations should be possible from minimum to maximum rotations.

- Number of rotations: 100 – 700 rpm
- Tolerance: +/- 5% or better

-

Insertable sieve:

- Conical sieve
- Two interchangeable sieves of hole size : 10mm (Square) and 3mm (rasp)

Supplied sieves are to be tagged suitably with indication of application area and hole size.

-

For prevention of (cross) contaminations the mill will get a double action bearing flushing (compressed air) to efficiently prevent leaking of dust, lubricants etc. through the shaft seal (rotor / drive unit). Monitoring of this flushing is to be provided.

Manual activation of flushing (without monitoring) must be possible for shutdown equipment as well (cleaning).

- A suitable compressed air filter should be provided to filter compressed air for flushing. Micron rating ≤ 1.2 micron.
-
- Product contact parts material of construction shall be FDA compliant and suitable for Pharmaceutical applications. All product and cleaning fluids contact parts manufactured with AISI 316 L. or equivalent,
- Ra ≤ 0.5 μm . Non product metal contact surfaces in the production zone: AISI 304. Ra. ≤ 1.2 μm .
-

Lubricants: Lubricated bearings for which an entry into the product may not be excluded absolutely:

Oils/grease conforming to food with appropriate admission (for instance USDA class H1), as far as possible according to stock list Novartis Singapore.

The HMI shall be connected to UPS so that at the occurrence of a power failure, the HMI shall be still be powered by UPS.

2.2 Safety

2.2.1 Unlock

Before working on the motors the power has to be cut with the service/maintenance switch. The switch in safe position can be locked. After finished the work the maintenance switch has to be closed again to start the machine.

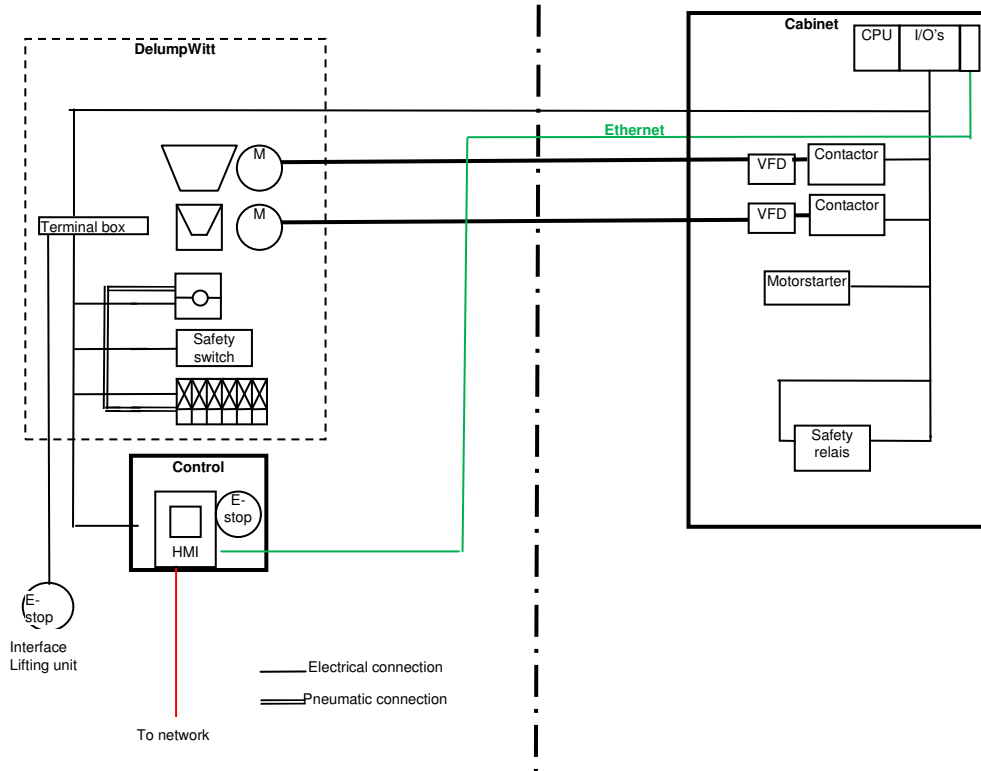
2.2.2 Safety circuits

With a safety solenoid switch between the cover and ConiWitt the lump breaker is protected. If this cover is removed, the input of both motor contactors are opened by hardware. In addition, is generated by software, the error message. The opening of the bag chute raises the same safety relay. At the DelumpWitt there is a control station with an emergency stop button, next to the column with the emergency stop button integrated into the Emergency stop chain. The triggering of the emergency- stop opens the emergency stop relay, which also leads to a hardware drop on the input contactors. All temperature control loops of PTC have a hardware contact which interrupts the motor contactors, and so causes a safety shutdown.

2.3 Control system

2.3.1 Architecture

Technical room (not ATEX)



The DelumpWitt is controlled by the Siemens-PLC (S7-300) delivered from Frewitt. The human /machine Interface(HMI) is realized by a IPC677C 19" :

- A panel from Siemens (screen touch) communicates with the PLC over an Ethernet connection.
- Via Ethernet the HMI is connected to an external network for logon and clock synchronization. The batch report is stored locally and can be printed over the network. At the end of each batch the report is automatically transmitted to the memory of the IPC677C.
- The batch report is saved automatically via PDF creator(default printer). It is stored to a dedicated path in which every minute the arrival of a new file is checked. With a script over Java 7 the batch ID is added and sent to a second path where the final version is stored. The file name of the batch report follows the following format:
M5234_BatchID_date_time.pdf

On the HMI there is a maintenance screen for all sensors and actuators. All valves and motors can manually be controlled. For this function the necessary login rights are needed.

The PLC is placed inside the electrical cabinet

2.3.2 Scope of supply Frewitt

The control system contains of the following elements:

- A complete cabinet with inverters, motor starters etc.
- PLC
- IPC677C, 19" Touch panel
- all Motors
- all necessary instruments cabled to the PLC
- spare terminals according the wishes of Novartis

2.3.3 Cabling

The electrical cabling between DelumpWitt and electrical cabinet is done by Novartis. All needed cables between the cabinet and the machine are delivered by Novartis. Cable tray and all installation material is delivered by Novartis.

2.3.4 Components

The PLC from Siemens, Typ SIMATIC S7-300, contains of:

Number	Description
1	CPU315C-2DP 6ES7 315-2AH14-0AB0 or its compatibility
2	Modul 4AI/2AO
2	Modul 16DI
1	Modul 16DO
1	Ethernet card 6AG1343-1EX30-4XE0 or its compatibility

The electrical control contains:

Component	Type	Supplier
DC power supply	SITOP	Siemens
Contactore 24VDC	3RT..	Siemens
Protection switch, motor protection	5SY6.. / 3RV..	Siemens
Relays	PLC-RSC...	Siemens
E-stop relays	PNOZ	Pilz
Safety relays for 24VDC safety switches	462.121-G1U	Elobau
Inverters		Lenze
Control relays PTC 24VDC	3RN10	Siemens
Pulse control relays	CM-WDS...	ABB
Ex-i converter	KFD...,	Pepperl-Fuchs
Ex-i Zener Barrier for PTC	9002/77...	Stahl
UPS	SITOP UPS 500S	Siemens

The user's control consists of:

Component	Type	Supplier
Button		Stahl
Panel	IPC677C, No. 6AV7894-3JA10-0BE0	Siemens

2.4 Operation

The DelumpWitt is switched on with the button ON. This turns on the mill (ConiWitt) and the crusher (ProFi-Sword) simultaneously.

Turning off DelumpWitt via the button OFF.

2.4.1 Operator procedure

After switching on the main switch and booting the PLC and HMI the active alarms must be reset. A user must log in to start the machine.

The operator has recipes with different product numbers and names to select. With the screening the desired speed of crusher and ConiWitt, and the upper and lower limits of ConiWitt are selected. The next step is then entered on the main screen a batch number. Only then the DelumpWitt can be started.

2.4.2 Recipes

To create or modify existing recipes the following steps are needed:

On the screen "Save recipes", which is accessible only for supervisor and administrator, all recipes are created or modified. There, the product number or product name for "product" and the screenings (name, speed reference values lower or upper limit) are created and stored. The operator can simply call them on the main screen.

2.4.3 Error display

The following fault indications are displayed as pop up on each screen of the HMI

- 1 Safety stop E-stop
- 2 GSA(Z) G10/G20 Error safety protection
- 3 PSA- U10.P10 Error flow control purge bearing mill
- 4 TSA+ (Z)T11 Error PTC mill sieve
- 5 TSA+ (Z)T12 Error PTC mill bearing
- 6 TSA+ (Z)T21 Error PTC crusher bearing
- 7 TSA+ (Z)T22 Error PTC crusher bearing
- 8 TSA+ (Z)T20 Error PTC motor crusher
- 9 TSA+ (Z)T10 Error PTC motor mill
- 10 M20 Error motor protection switch crusher(Q3)
- 11 M10 Error motor protection switch mill(Q2)
- 12 Error Watchdog
- 13 M20 Error motor crusher
- 14 M10 Error motor mill
- 15 FIA- F01 Exhaust missing
- 16 FSA- F10 Error flow control purge bearing
- 17 M10 Motor mill maintenance switch open
- 18 M20 Motor crusher maintenance switch open
- 19 Error S10+ Exceed maximum motor speed mill
- 20 Error S10- Fall under minimum speed mill
Missing input screening, product number, batch number,
- 21 login
- 22 TIA+T13 PT100 Error temperature bottom
- 23 TIA+T23 PT100 Error temperature top
- 26 Element still in manual mode
- 27 *
- 28 G30 Container not detected
- 29 Power loss HMI and PLC powered by UPS

All errors result directly in switching off the DelumpWitt.

The following messages are just warnings, which are only mentioned in batch report:

- 24 Stop active
- 25 Start active

* = not used any more.

2.4.4 Cleaning

For cleaning there is a separate connection for compressed air to be able to purge the valves even when the mill is switched off.

2.5 Process screens

The control of the DelumpWitt is realized with a IPC677C 19" touchpanel.

On all process screens on the left and right sight there are the common touch buttons for all screens. The different functions are explained in 2.5.

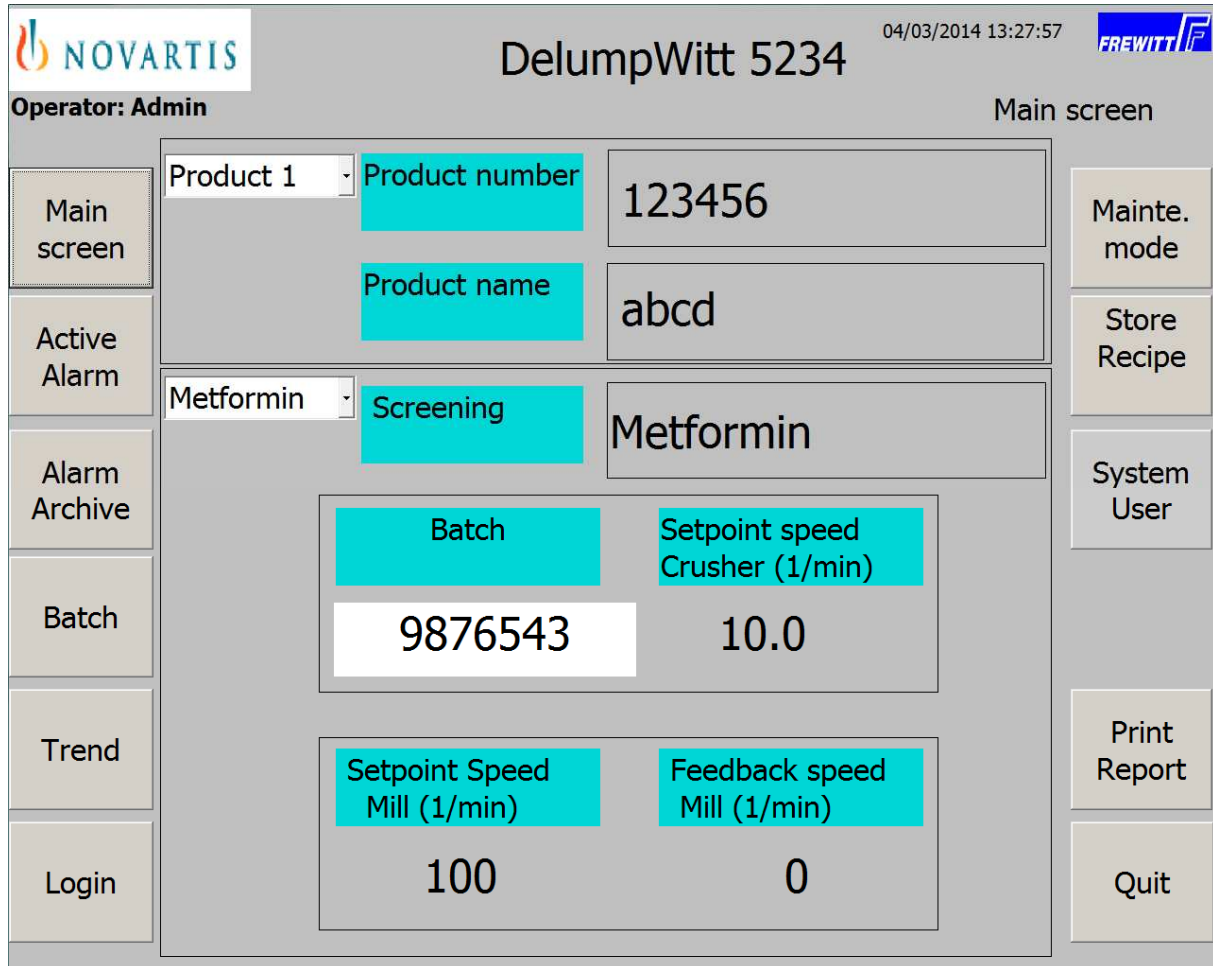
To change a protected setpoint the operator has to connect with a help of a user ID and a password. The login screen pops up automatically when touching a protected setpoint or function. To interrupt without login the "cancel" can be pressed.



Also the login button can be pressed.

Description of application

2.5.1 Main screen



NOVARTIS 04/03/2014 13:27:57 **FREWITT**

DelumpWitt 5234

Operator: Admin Main screen

Main screen	Product 1	Product number	123456	Maintenance mode
		Product name	abcd	
Active Alarm	Metformin	Screening	Metformin	Store Recipe
Alarm Archive		Batch	Setpoint speed Crusher (1/min)	System User
Batch		9876543	10.0	
Trend		Setpoint Speed Mill (1/min)	Feedback speed Mill (1/min)	Print Report
Login		100	0		Quit

From this screen you can reach the following functional screens:

Maintenance screen	2.5.2
Recipe store	2.5.3
Trend	2.5.4
Batch	2.5.6
System	2.5.8
Active Alarm	2.5.9.1
Alarm archive	2.5.9.2

Direct functional touch buttons are:

Logout	the user is not logged any more
Login	opens the screen to fill the user's name and password for login.
Print report	the report of the actual/last batch is printed
Batch end	ends the batch and creates the batch report
Quit	reset all alarms and error messages

2.5.2 Maintenance mode

On this screen only service, supervisor and administrator has access. Here each single element (actuator) can be selected and switched on/off in manual mode. For the sensors the status is indicated.

This screen gives an overview of the machine and permits:

- All valves and motors to control manually
- To show the status of all valves and motors in automatic and manual mode
- To show the status of all pressure switches and safety switches

Elements	Man. Mode	Deactivated	Activated	fault
valve	M	Magenta	Green	Red
Motor	M	Magenta	Green	Red

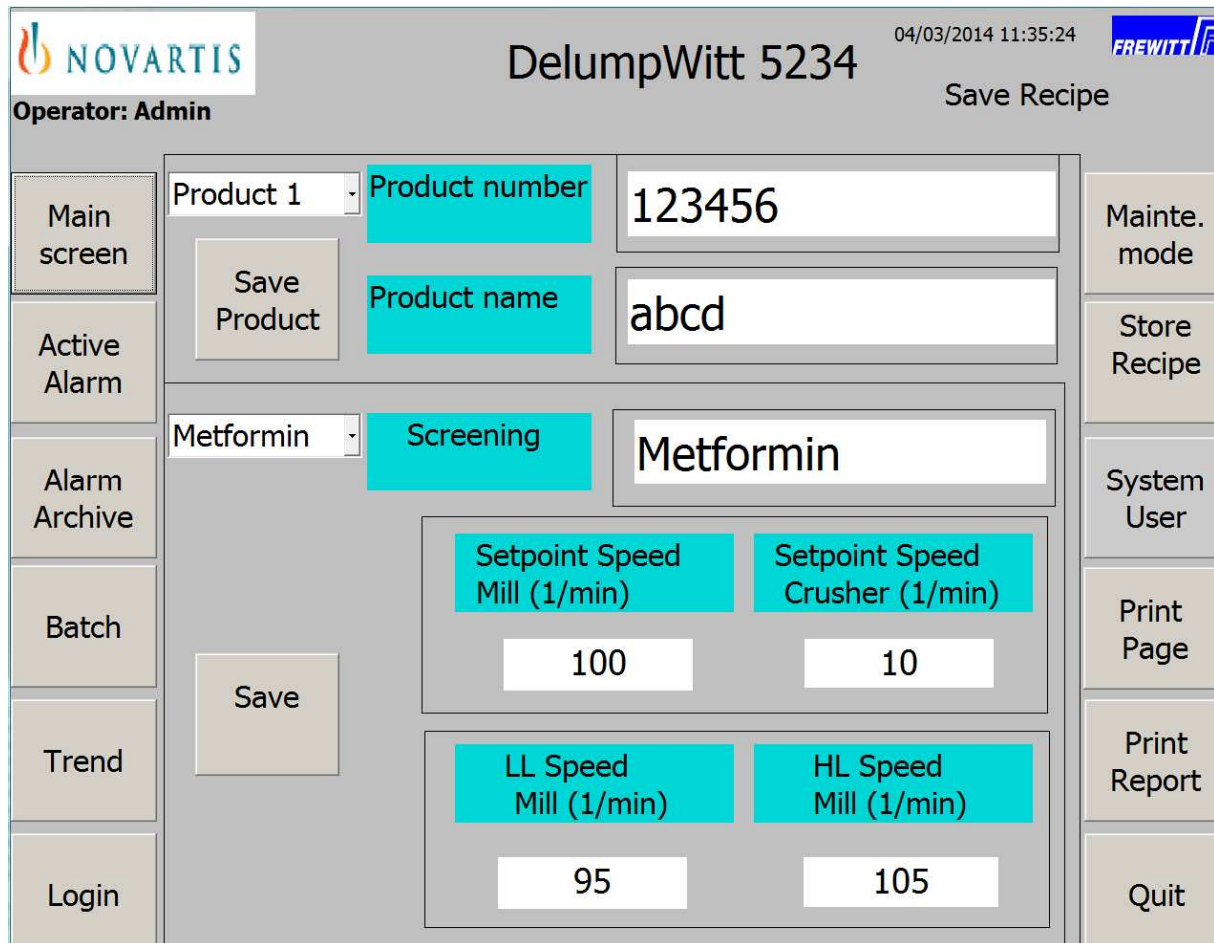
Element	Deactivated (-)	Deactivated (+)	Activated (-)	Activated (+)
Safety switch	Red	Red	Green	Green
Pressure switch	Magenta	Magenta	Green	Green
Ultrasonic switch	Red	Red	Green	Green

In order to control an element in manual or automatic mode, the operator must select the item and then press the "Manual" button or "Auto". If the item is in the "M" (manual) it can be switched on/off with the buttons ON/OPEN and OFF/CLOSE.

Only the selected and displayed element (a M flashes next to the item) can be controlled in manual mode.

2.5.3 Recipe

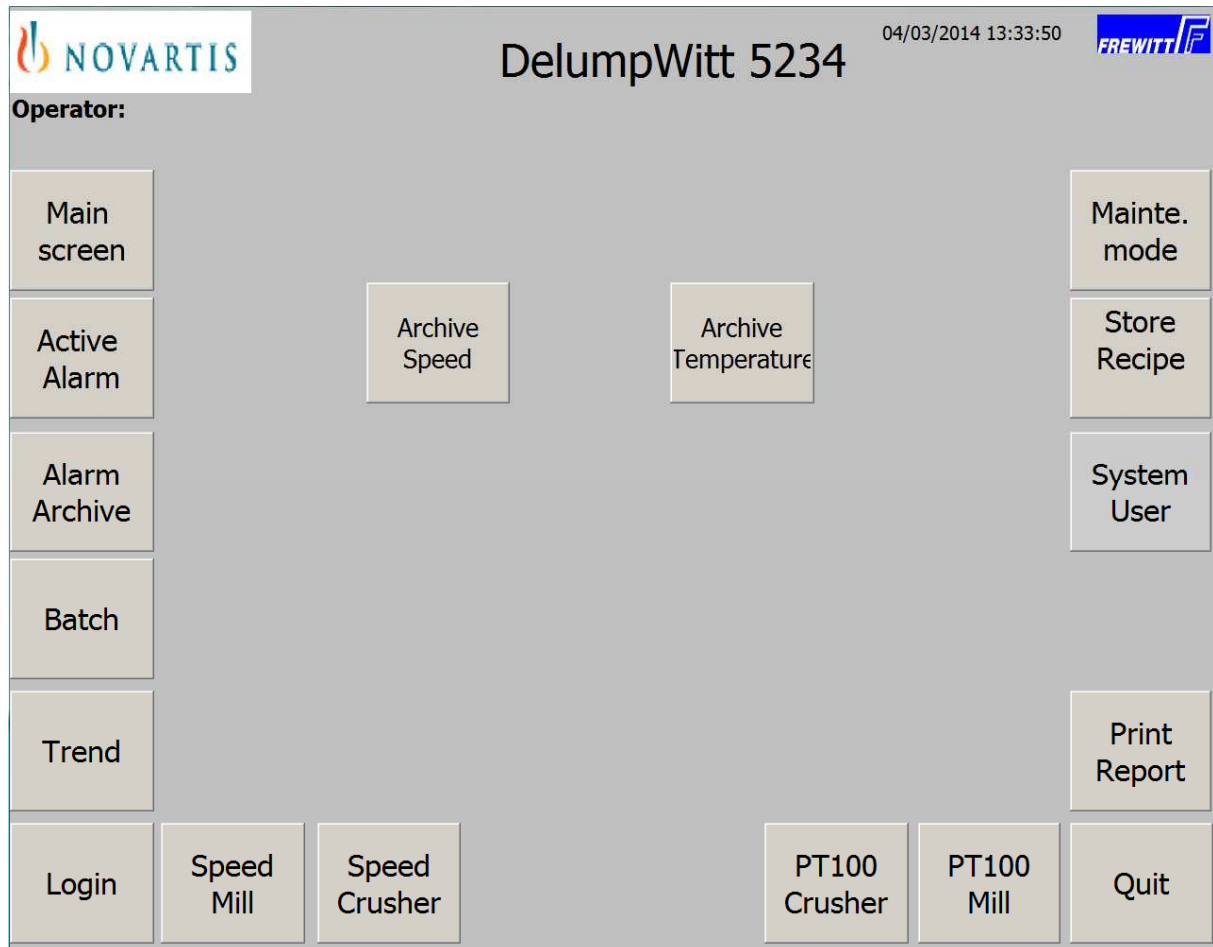
The access to this screen is limited to the supervisor and the administrator. On this screen the recipes are created and changed. The lower and upper limits of the mill speed are fixed.




Here the screening and the production name und number datas are stored.

2.5.4 Trend

This is the screen to give access to the trending and archive curves.




Here you find access to the trends of the PT100. For the mill motor speed as well as the speed of the crusher (only set point) trends are created. Also the archives can be reached.



DelumpWitt 5234

04/03/2014 13:09:58



Operator: Admin

n min

Speed mill (1/min)

n max

95

100

105

Main screen

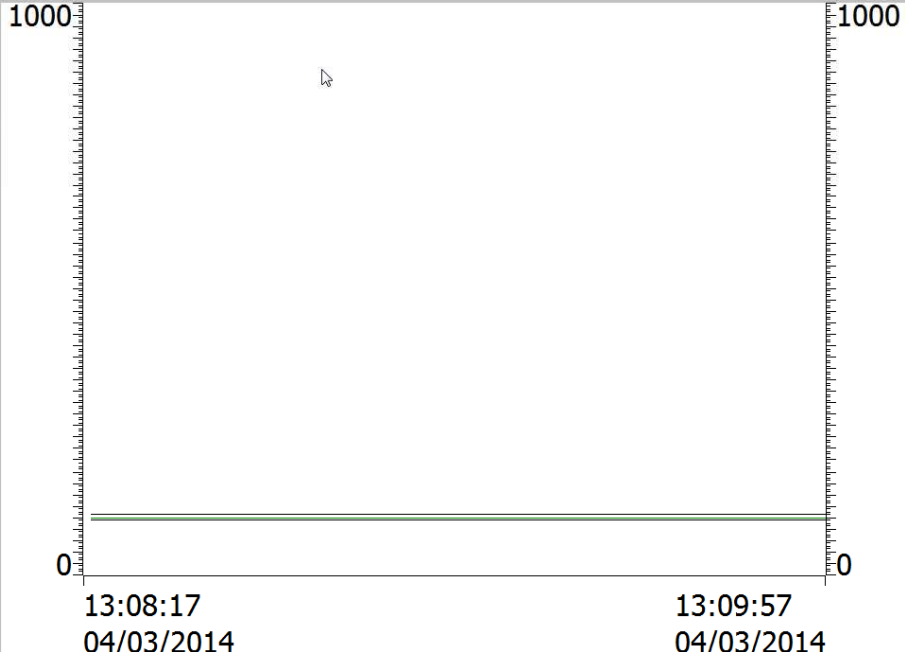
Active Alarm

Alarm Archive

Batch

Trend

Login



13:08:17
04/03/2014

13:09:57
04/03/2014

Mainte. mode


Store Recipe

System User

Print Page

Print Report


Quit



NOVARTIS

Operator: Admin

DelumpWitt 5234

04/03/2014 13:12:19 

Speed crusher (1/min)

10

Main screen

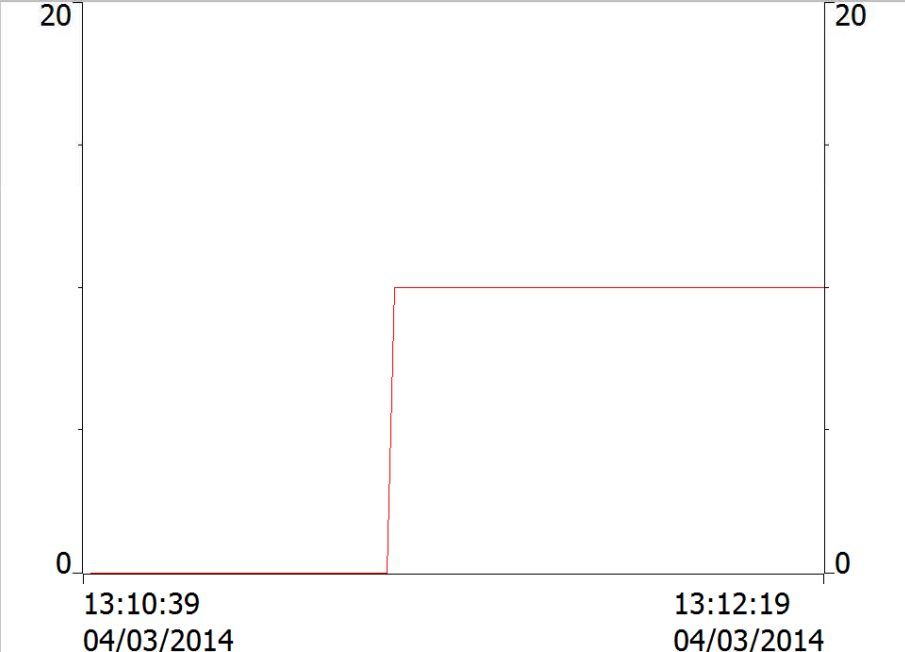
Active Alarm

Alarm Archive

Batch

Trend

Login



13:10:39 04/03/2014 13:12:19 04/03/2014

Mainte. mode


Store Recipe

System User

Print Page

Print Report


Quit



DelumpWitt 5234

Operator: Admin

04/03/2014 13:11:31



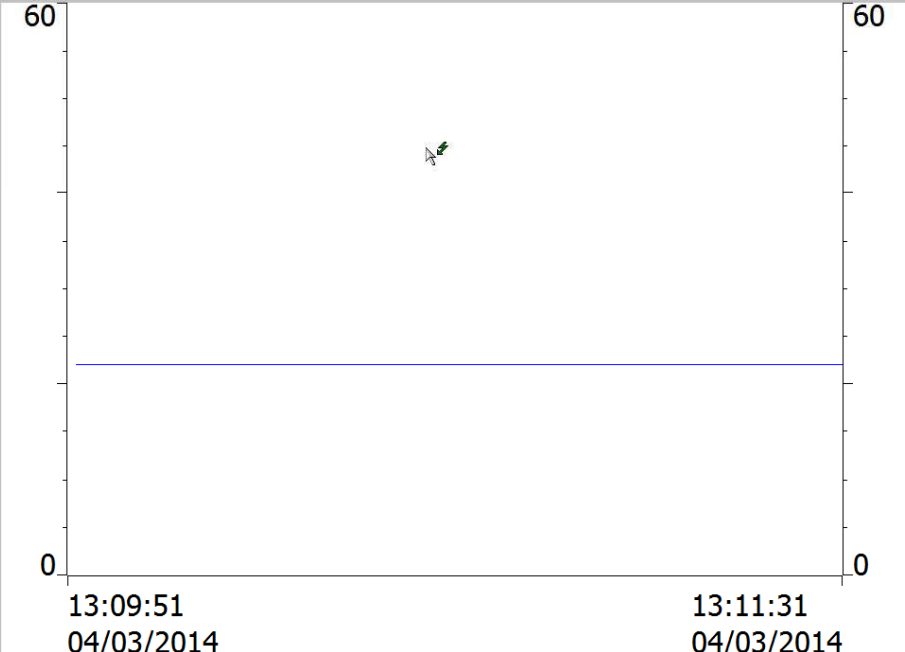
PT 100 crusher maximum temperature 40°C

Main screen

22.0

Mainte. mode

Active Alarm



Store Recipe

Alarm Archive

System User

Batch


Print Page

Trend

Print Report

Login


Quit



DelumpWitt 5234

Operator: Admin

04/03/2014 13:11:57



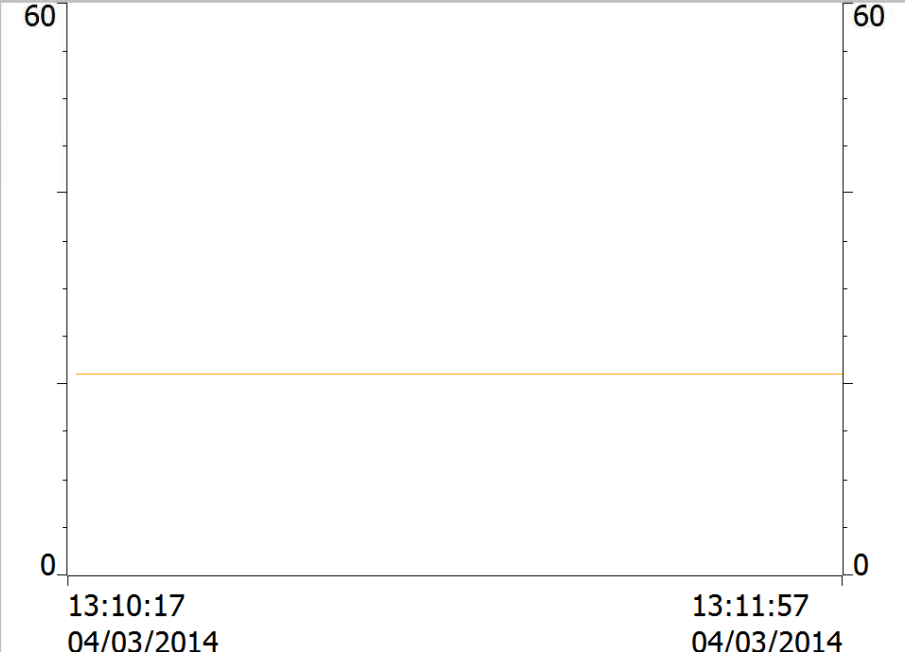
PT 100 Mill maximum Temperature 40°C

Main screen

21.0

Mainte. mode

Active Alarm



Store Recipe

Alarm Archive

System User

Batch

Print Page

Trend

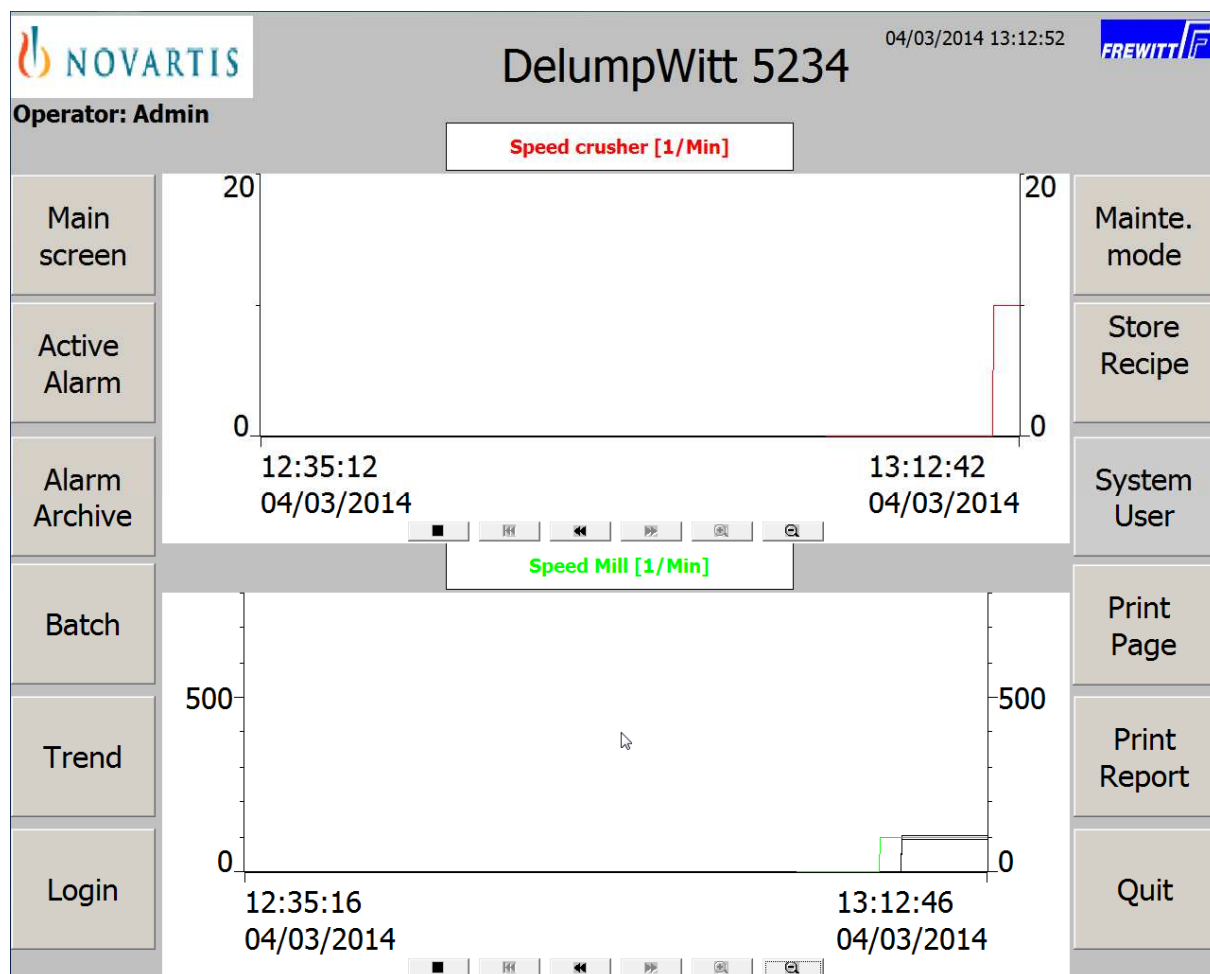
Print Report


Login

Quit

2.5.5 Archive curve


Besides the trendings the feedbacks are also stored as trend in an archive.





DelumpWitt 5234

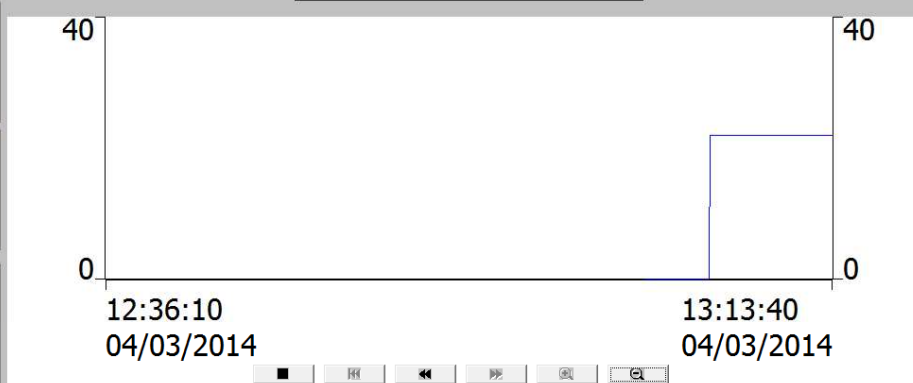
04/03/2014 13:13:42



Operator: Admin

PT 100 crusher (°C)

Main screen



12:36:10
04/03/2014
13:13:40
04/03/2014

Mainte. mode

Active Alarm

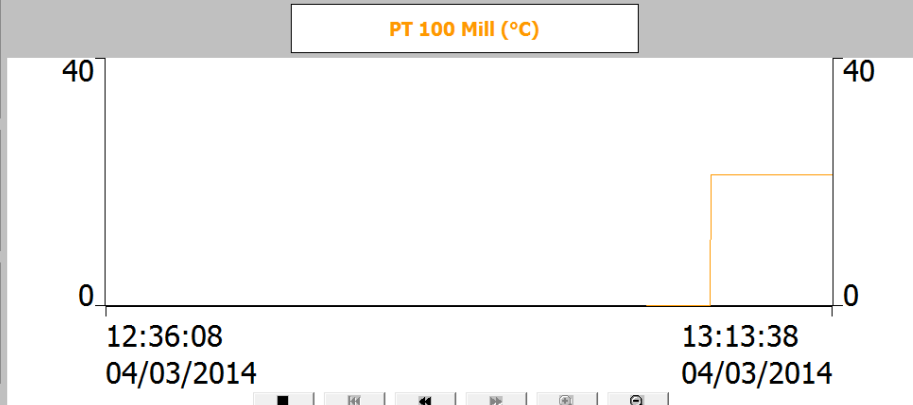
Store Recipe

Alarm Archive

System User

PT 100 Mill (°C)

Batch



12:36:08
04/03/2014
13:13:38
04/03/2014

Print Page

Trend

Print Report

Login

Quit

2.5.6 Batch

To start the DelumpWitt the main screen has to be filled. In addition the operator has to be logged. The Batch screen indicates all datas including the start and end time of the batch. The end of the batch stops the DelumpWitt.

NOVARTIS		DelumpWitt 5234		04/03/2014 11:34:49		FREWITT	
Operator: Admin				Batch			
Main screen	Batch name	9876543		Mainte. mode			
Active Alarm	Product number	123456		Store Recipe			
Alarm Archive	Product name	abcd		System User			
Batch	Screening	Metformin					
	Start batch	01/01/1999 12:00:00					
	Batch end	01/01/1999 12:00:00					
Trend				Print Report			
Login				Quit			

DelumpWitt SG.TBP.202.M.5234

Batch report

01/01/1999 12:00:00

RecordID	TimeStamp	DeltaToUTC	UserID
0	14.02.2014 11:44:32	-1:00	System
ObjectID: Application: Description: New log file during run of on device . Project: ' - 0' Build 216, created with WinCC flexible 2008 SP3 Advanced.WinCC flexible RT 2008 SP3WinCC flexible RT 2008 SP3WinCC flexible RT 2008 SP3WinCC flexible RT 2008 SP3			
1	14.02.2014 11:45:02	-1:00	Admin
ObjectID: User administration Description: User 'Admin' logged on with group 'Administrator'.			
2	14.02.2014 11:45:12	-1:00	Admin
ObjectID: Tag: PAR.product Description: Change the value of the 'PAR.product' tag from '1' to '2' by entering '2'.			

Date : _____

Signature : _____

Page : 2

Total pages : ____

2.5.8 System

This view allows:

- The HMI has a time synchronization from the network. The PLC is synchronized automatically from the HMI.
- Creating and changing user password
- To return to the operating system WinCE

On this screen, which is only accessible for the administrator the batch end button which has to be pressed each time a new PLC application is charged. All other "Batch end" buttons are new visible if a batch has been started.

The passwords can be created or modified by pressing the corresponding button and entering the desired parameter. This function is password protected.

Name	description
user	User name (Login)
Password	User's password. It has to have 8 characters
Group	Authorization of the user-level
Logoff time	Validation time (0 to 60 min, at 0 no automatic logoff)

These user's groups are used:

Rights (G▶K)	Name	Description
9	Administrator	All access rights on the HMI (Administrator)
8	Supervisor	Access to all screens except system
7	Service	Access to all screens except system and recipe
1	Operator	Login necessary, access to limited screens and functions

0 unauthorized no Login, no access, only display

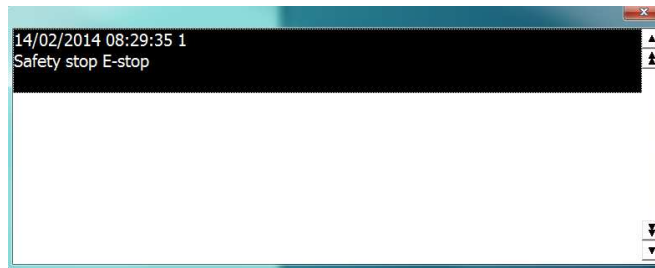
For the following functions the user must have at least the following rights:

Button	Rights
Recipe Maintenance,	Supervisory Service
Input batch datas, batch end	Operator
Trend, Alarm archive, Active Alarm, Logout, Login, Quit, Print report	all

Functions	Rights
System: back to WinCE	Administrator
Alarme: back	alle

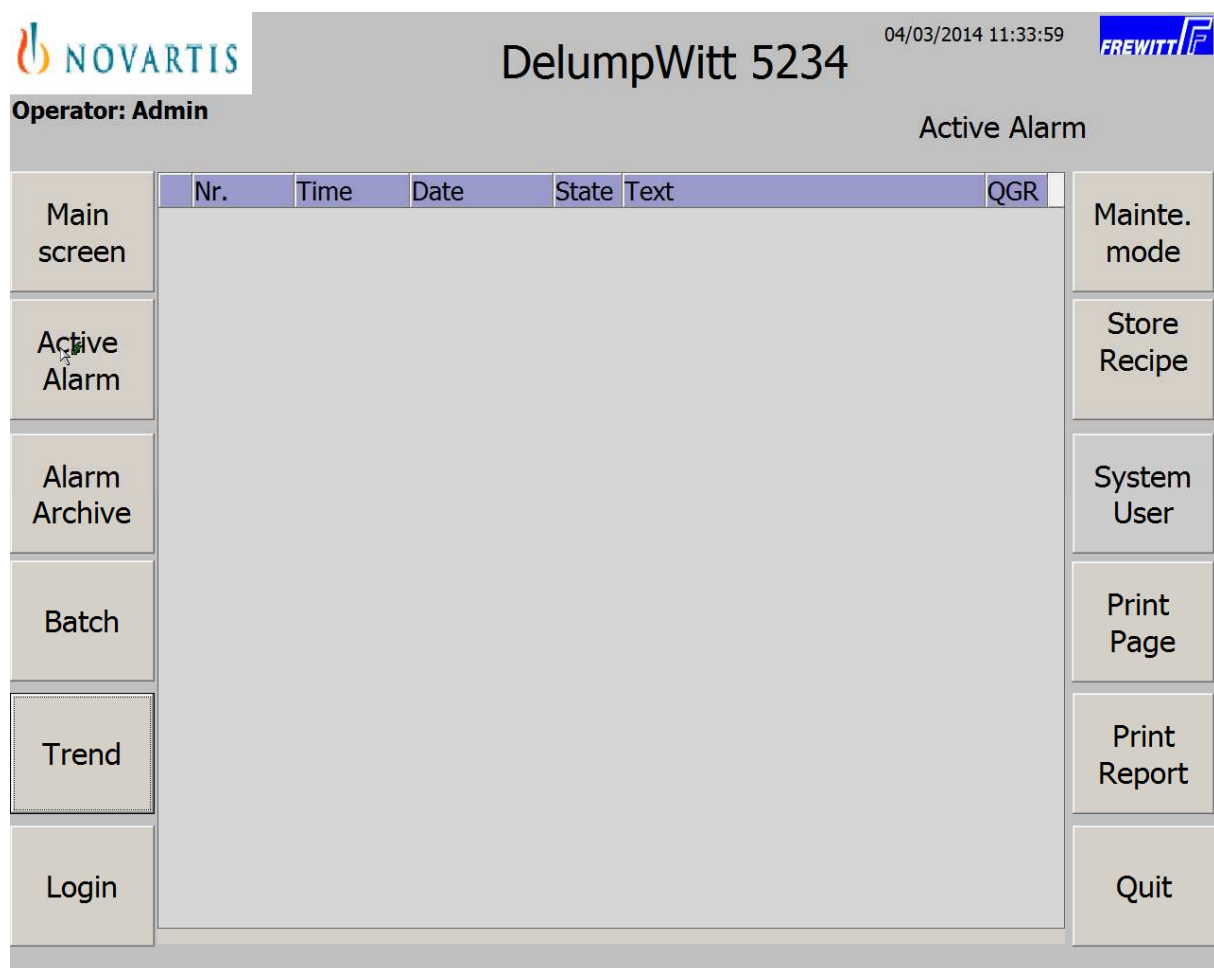
Input of parameters (setpoints)	Rights
Main screen	Operator

2.5.9 Alarmmessages



If an alarm is activated it is shown on the pop-up together with the message date, time and alarm number.

2.5.9.1 Active Alarm

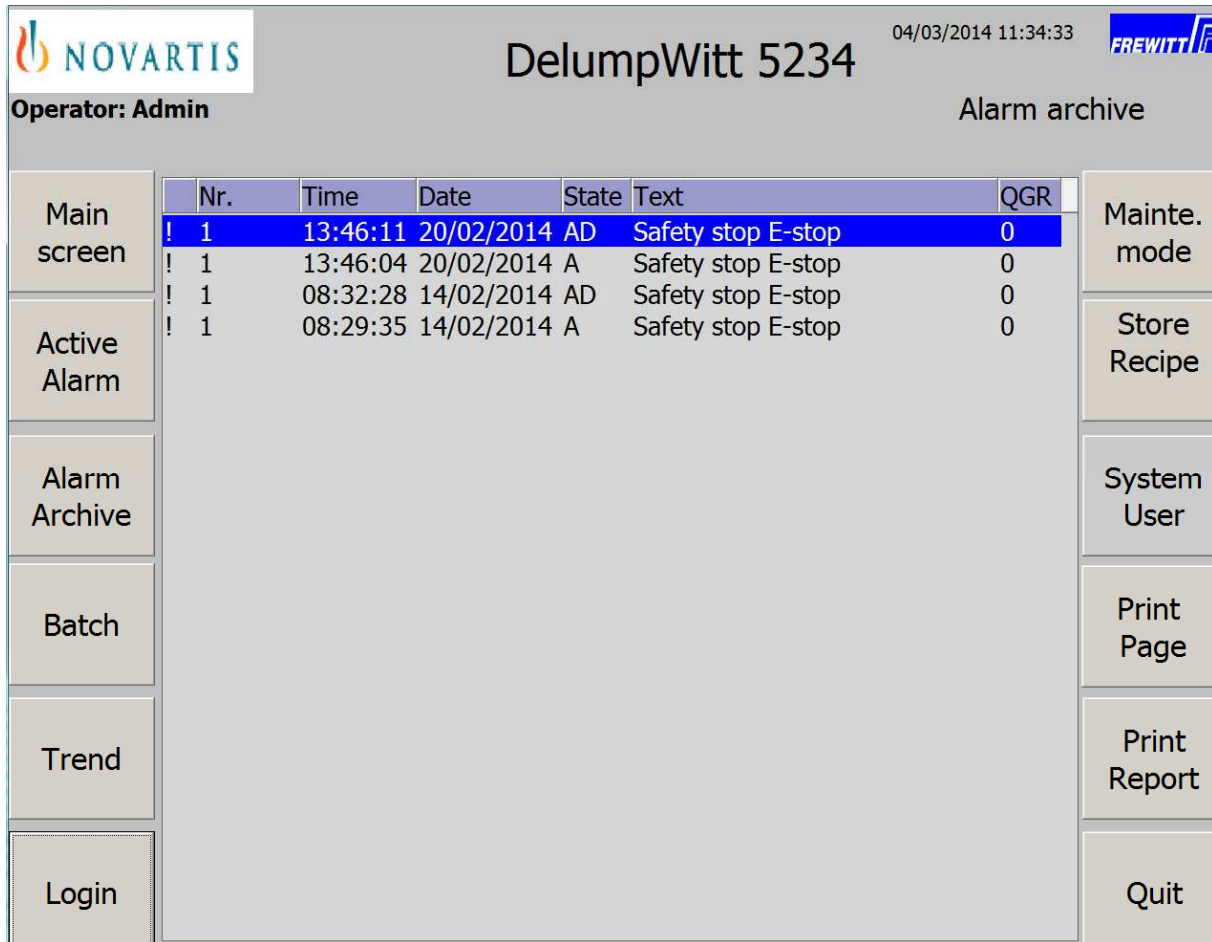


Nr.	Time	Date	State	Text	QGR

This screen shows the active alarms

2.5.9.2 Alarm archive

All alarms are stocked in an archive with the text, number, date, and time.



NOVARTIS DelumpWitt 5234 04/03/2014 11:34:33 FREWITT

Operator: Admin Alarm archive

	Nr.	Time	Date	State	Text	QGR	
Main screen	! 1	13:46:11	20/02/2014	AD	Safety stop E-stop	0	Mainte. mode
	! 1	13:46:04	20/02/2014	A	Safety stop E-stop	0	
	! 1	08:32:28	14/02/2014	AD	Safety stop E-stop	0	
Active Alarm	! 1	08:29:35	14/02/2014	A	Safety stop E-stop	0	Store Recipe
Alarm Archive							System User
Batch							Print Page
Trend							Print Report
Login							Quit

2.5.10 Parameter Ranges

Parameter	Range
Revolution Crusher	10- 14 r/min
Revolution Mill	100- 700 r/min

3 Function of crusher (ProFi-Sword)

3.1 Description

During production, it is possible that a higher torque is demanded by the product (blocking of motor of crusher module). For this reason, a motor current monitoring is realized inside the frequency converter. When the current reaches 150% of motor nominal current, the converter generates a pulse. If the drag obtained, a second pulse is generated which changes the rotation sense of the crusher for approximately 1 second. With this function even big hard blocks can be crushed.

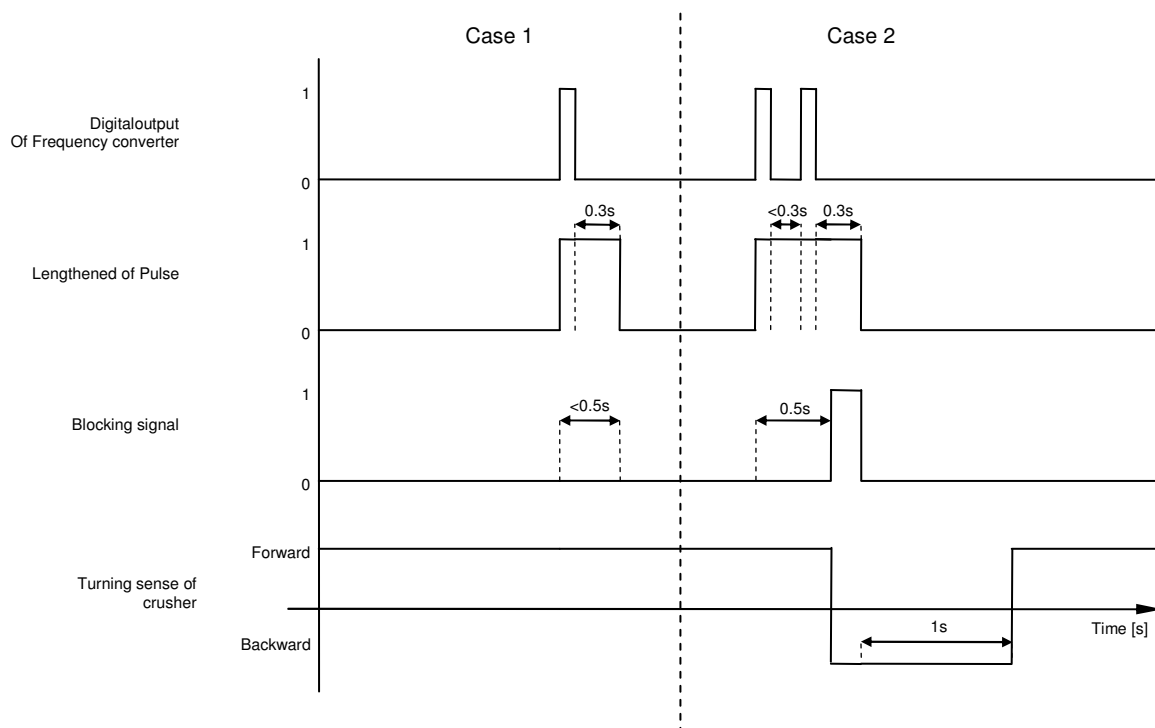
3.2 Function of turning the sense of rotation

Case 1 : The product gives way after strongly pushing

Case 2 : The product blocks the crusher

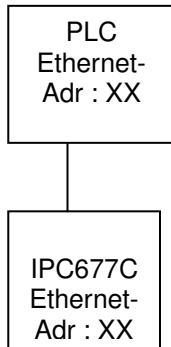
- Blocking the crusher with the product
- 150% of motor current is reached
- One pulse is formed
- The pulse is lengthened to 0.3 sec.
- Pushing the crusher with maximum torque (<0.5sec)
- The product gives way

- Blocking the crusher with the product
- 150% of motor current is reached
- One pulse is formed
- The pulse is lengthened to 0.3 sec
- Pushing the crusher with maximum torque (<0.5sec)
- A second pulse is formed
- The pulse is lengthened to 0.3 sec
- The sense of rotation is turned for 1 second



4 Software design

4.1 PLC Hardware configuration



PLC Ethernet Adresse: ??		
Description	Input	Output
DI16xDC24V	0...1	
DI16xDC24V	4...5	
DO16		3...4
AI 4/AO2	128..134	128...132
AI 4/AO2	135..141	133...137

4.2 Software-Design

According GAMP5 Level 3 basic blocks are used.

4.2.1 Programming software

Name	Version
SIMATIC STEP 7	V5.5
SIMATIC WinCC Flexible Advanced	2008+SP3

Programming language of the project: FUP (Function plan)

4.2.2 General description

The program is composed of the following groups:

FB	Name	Description
10	Basic control	Handles all the function blocks for each element type
100	Phase control	Handles all the function blocks for the automatic process
200	Supervision and communication	Handles all the function blocks for the HMI panel and the PLC

All these blocks are handled in the organisation block OB1 “_MAIN_PROGRAM”.

FB	Name	Description
600	Biblio	Library containing all the function blocks reusable for all the program with each time an other instance

The blocks of this group are handled in different blocks with each time another instance.

4.2.3 FB10: Basic control

All the data of this block are stored in the instance data block DB10 “BC”.

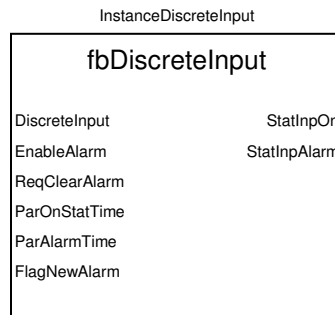
The following function blocks are handled in the FB10 “_BASIC_CONTROL”:

- One FB for all the discrete inputs FB11
- One FB for all the analogue inputs FB12
- One FB for all the valves FB13
- One FB for all the motors FB14
- One FB for all the discrete outputs FB38
- One FB for all the analogue outputs FB39

4.2.3.1 FB11: Discrete Inputs

All the data of this block are stored in the instance data block DB11 “DI”.

The function block used to manage the discrete inputs is the FB601 “fbDiscreteInput” and belongs to the group “_BIBLIO”. The FB601 may be called up several times in the FB11 with each time an other instance.



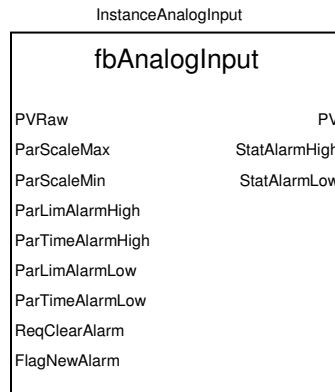
Inputs	Function
DiscreteInput	Discrete input to manage
EnableAlarm	Condition enabling the alarm appearance
ReqClearAlarm	Alarm clear request: Reset alarm
ParOnStatTime	Waiting time parameter before activation of StatInpOn
ParAlarmTime	Waiting time parameter before alarm generation (default value: 10 ms) Alarm deactivated if value = 0
FlagNewAlarm	Flag new alarm: set at the appearance of an alarm. Have to be reset by the alarm processing routine

Outputs	Function
StatInpOn	State input ON: Output state after waiting time if input = 1
StatInpAlarm	State input alarm: =1, if EnableAlarm=1 and DiscreteInput = 0 during more than “ParAlarmTime” seconds. Have to be reset by ReqClearAlarm

4.2.3.2 FB12 : Analogue Inputs

All the data of this block are stored in the instance data block DB12 "AI".

The function block used to handle the discrete inputs is the FB607 "fbAnalogInput" and belongs to the group "_BIBLIO". The FB607 may be called several times in the FB12 with each time an other instance.



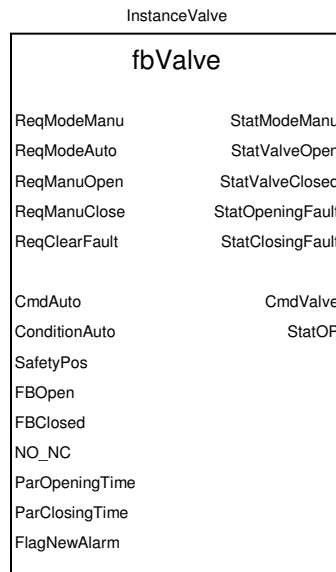
Inputs	Function
PVRaw	Raw process value from analogue module
ParScaleMax	Maximal scale value parameter
ParScaleMin	Minimal scale value parameter
ParLimAlarmHigh	High limit parameter for alarm
ParTimeAlarmHigh	Waiting time parameter before alarm generation high limit (default value: 10 ms) Alarm deactivated if value = 0
ParLimAlarmLow	Low limit parameter for alarm
ParTimeAlarmLow	Waiting time parameter before alarm generation low limit (default value: 10 ms) Alarm deactivated if value = 0
ReqClearAlarm	Alarm clear request: Reset alarm low and high limits
FlagNewAlarm	Flag new alarm: set at the appearance of an alarm. Have to be reset by the alarm processing routine

Outputs	Function
PV	Process value scaled
StatAlarmHigh	State alarm high limit (PV > high limit during ParLimAlarmHigh). Have to be reset by ReqClearFault
StatAlarmLow	State alarm low limit (PV < low limit during ParLimAlarmLow). Have to be reset by ReqClearFault

4.2.3.3 FB13: Valves

All the data of this block are stored in the instance data block DB13 “VA”.

The function block used to manage the discrete inputs is the FB604 “fbValve” and belongs to the group “_BIBLIO”. The FB604 may be called up several times in the FB13 with each time an other instance.



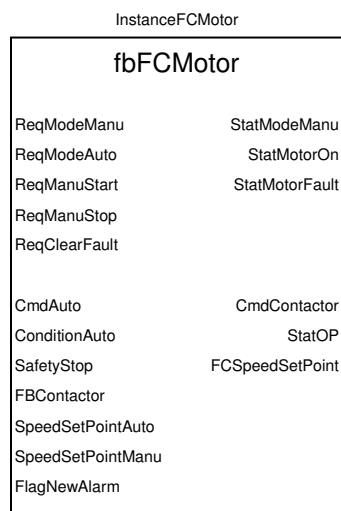
Inputs	Function
ReqModeManu	Manual mode request: switches the valve in manual mode
ReqModeAuto	Automatic mode request: switches the valve in automatic mode
ReqManuOpen	Opening request in manual mode: opens the valve in manual mode
ReqManuClose	Closing request in automatic mode: closes the valve in manual mode
ReqClearFault	Request clear default: acknowledge of valve defaults
CmdAuto	Automatic command: command of valve opening in automatic mode
ConditionAuto	Automatic condition: condition for opening in automatic mode
SafetyPos	Safety position: condition for activation of output CmdValve in automatic and manual modes. According to the opening sense NO_NC, it does a condition for the opening and the closing
FBOpen	Feed back valve open
FBClosed	Feed back valve closed
NO_NC	Without energy, valve normally open or normally closed. If 0, valve closed if output deactivated; If 1, valve open if output deactivated
ParOpeningTime	Waiting time parameter before opening default generation (default value: 5 s) Alarm deactivated if value = 0
ParClosingTime	Waiting time parameter before closing default generation (default value: 5 s) Alarm deactivated if value = 0
FlagNewAlarm	Flag new alarm: set at the appearance of an alarm. Have to be reset by the alarm processing routine

Outputs	Function
StatModeManu	State manual mode: =1 if valve in manual mode
StatValveOpen	State open valve: =1 if valve open
StatValveClosed	State closed valve: =1 if valve closed
StatOpeningFault	State valve in opening default =1 if FBOpen=0 during ParOpeningTime after the activation of CmdValve (or deactivation according to opening sense). Have to be reset by ReqClearFault
StatClosingFault	State valve in closing default =1 if FBClosed=0 during ParClosingTime after the deactivation of CmdValve (or activation according to opening sense). Have to be reset by ReqClearFault
CmdValve	Valve command : Automatic mode, normally closed (StatModeManu=0, NO_NC=0) =1 if CmdAuto=1 and ConditionAuto=1 and SafetyPos=0 Automatic mode, normally open (StatModeManu=0, NO_NC=1) =0 if CmdAuto=1 and ConditionAuto=1 or SafetyPos=1 Manual mode, normally closed (StatModeManu=1, NO_NC=0) =0 if ReqManuClose=1 or SafetyPos=1 =1 if ReqManuOpen=1 and SafetyPos=0 Manual mode, normally open (StatModeManu=1, NO_NC=1) =0 if ReqManuOpen=1 and SafetyPos=0 =1 if ReqManuClose=1 or SafetyPos=1 In case of commutation automatic -> manual, the valve keeps the state in automatic mode
StatOP	Valve state on panel (closed, open, fault)

4.2.3.4 FB14: Motors

All the data of this block are stored in the instance data block DB14 "MO".

The function block used to manage the motors with frequency converter is the FB605 "fbFCMotor" and belongs to the group "_BIBLIO". The FB605 may be called several times in the FB14 with each time an other instance.



Inputs	Function
ReqModeManu	Manual mode request: switches the motor in manual mode
ReqModeAuto	Automatic mode request: switches the motor in automatic mode
ReqManuStart	Starting request in manual mode: starts the motor in manual mode
ReqManuStop	Stopping request in automatic mode: stops the motor in manual mode
ReqClearFault	Request clear default: acknowledge of motor default
CmdAuto	Automatic command: command of motor starting in automatic mode
ConditionAuto	Automatic condition: condition for motor starting in automatic mode
SafetyStop	Safety stop: condition for the starting in automatic and manual mode
FBContactor	Feed back contactor: state of motor contactor
SpeedSetPointAuto	Speed setpoint for the automatic mode
SpeedSetPointManu	Speed setpoint for the manual mode
FlagNewAlarm	Flag new alarm: set at the appearance of an alarm. Have to be reset by the alarm processing routine

Outputs	Function
StatModeManu	State manual mode: =1 if motor in manual mode
StatMotorOn	State motor ON: =1 if motor started
StatMotorFault	State motor default =1 if FBContactor=0 500ms after the activation of CmdContactor. Have to be reset by ReqClearFault
CmdContactor	Contactor command: Automatic mode (StatModeManu=0) =1 if CmdAuto=1 and ConditionAuto=1 and SafetyPos=0 Manual mode (StatModeManu=1) =1 if ReqManuStart=1 and SafetyPos=0 =0 if ReqManuStop=1 or SafetyPos=1 In case of commutation automatic -> manual, the motor keeps the state in automatic mode
StatOP	Motor state on panel (ON, OFF, fault)
FCSpeedSetpoint	Speed setpoint on the input of the frequency converter

4.2.3.5 FB38: Digitaloutput

All the data of this block are stored in the instance data block DB38 "DO".

This block treats the digitals output signals like triggering relays, acknowledgment of safety relay and E-stop relays. For these functions not special function block is created.

4.2.3.6 FB39: Analogoutput

All the data of this block are stored in the instance data block DB39 "AO".

The used functional block of the analog outputs is the Siemens standard function FC106"Unscale".

4.2.4 FB200: Supervision and communication

All the data of this block are stored in the instance data block DB10 "BC".

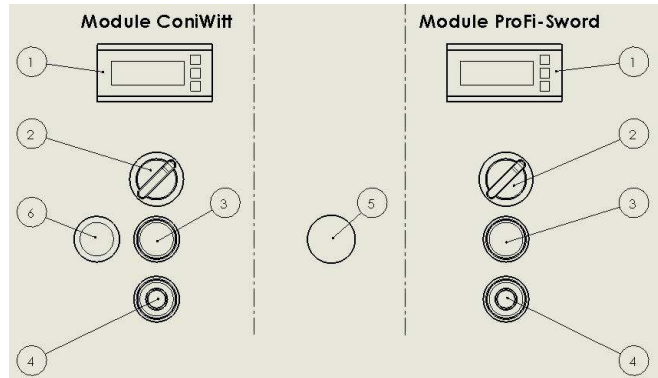
There is a function block for each supervision system and HMI.

The following function blocks are called up in FB200:

FB	Data stored in	Description
210 "Panel"	Instanz-DB210 "HMI"	Synchronization of date/time HMI
222 "Alarms"	Instanz-DB222 "AL"	Alarms management

Controls

- 1. Speedometer
- 2. Speed control
- 3. Start
- 4. Stop
- 5. Emergency off
- 6. Gas monitor

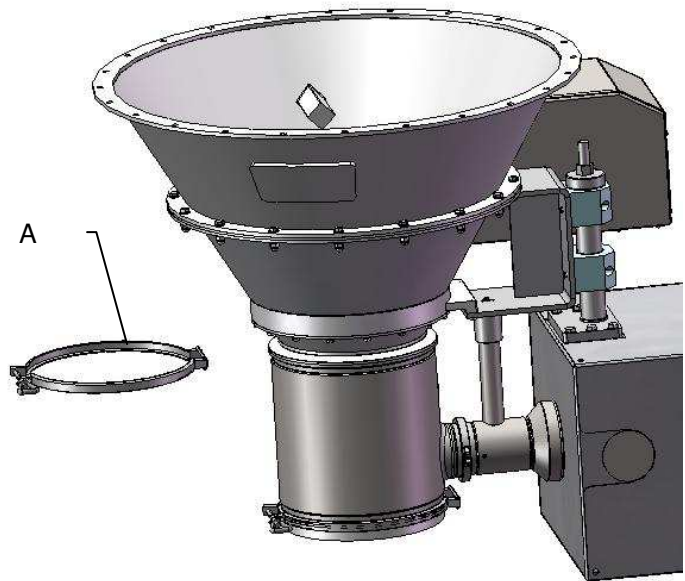


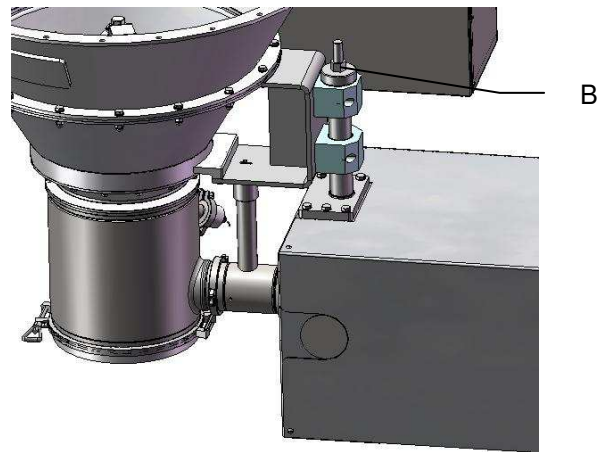
Removing the ConiWitt module



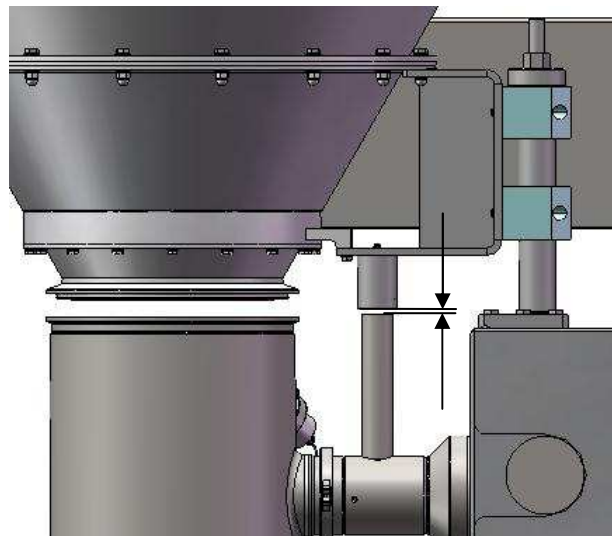
Before performing any work on this unit, it must be turned off and all electric and pneumatic lines must be disconnected. The operator is responsible for preventing risks of contamination by the product.

- Remove the clamp (A)

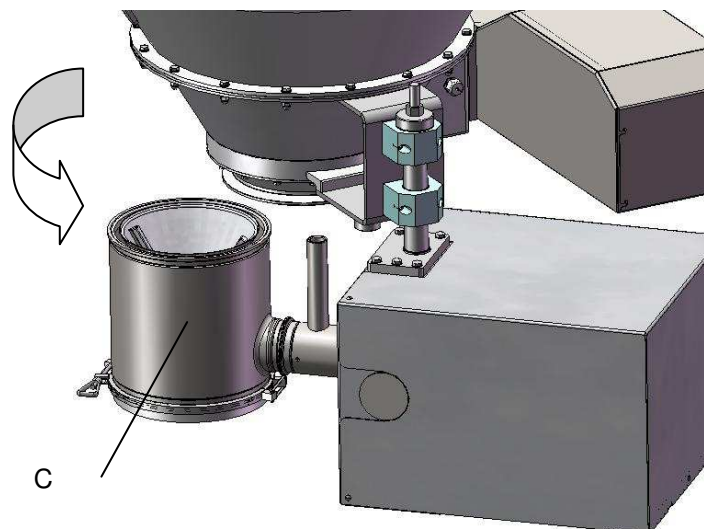




- Loosen the height adjustment screw (B) until the 2 modules are separated



- Pivot the ConiWitt module (C)



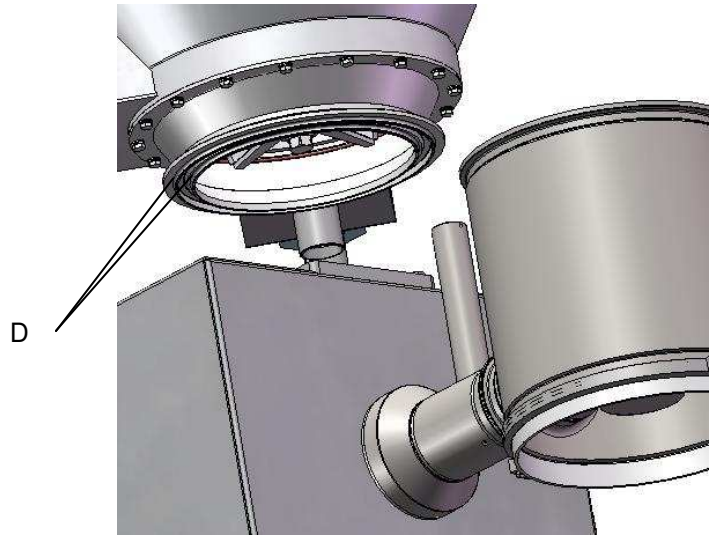
- See chapter 5 –Instructions for operating the ConiWitt

Installing the ConiWitt module

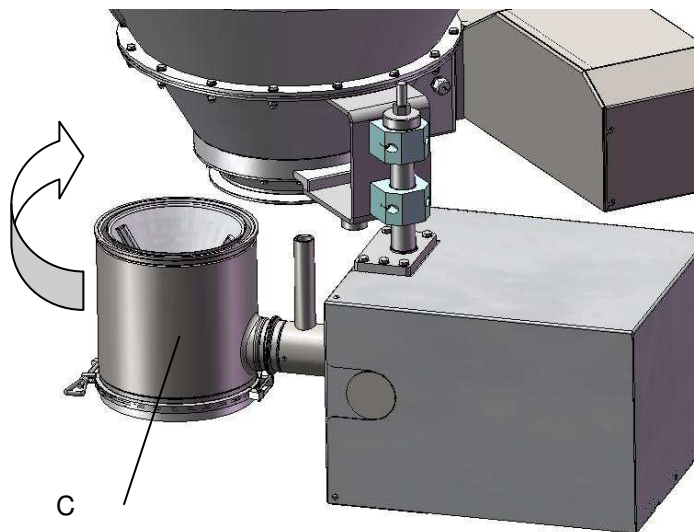


Before performing any work on this unit, it must be turned off and all electric and pneumatic lines must be disconnected.
 The operator is responsible for preventing risks of contamination by the product.

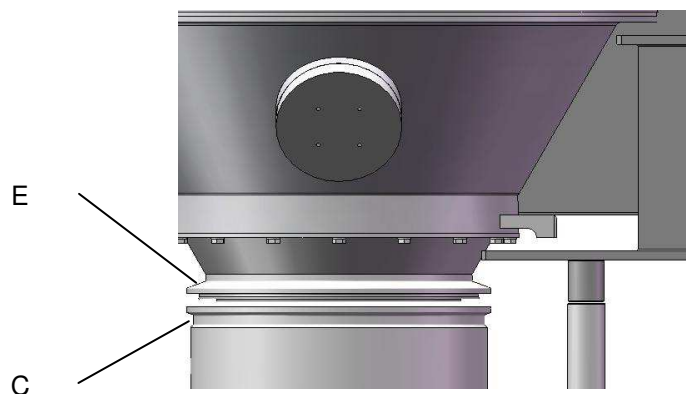
- Check to make sure that the seals (D) are in place and correctly installed.
- See chapter 5 – Installing/removing accessories



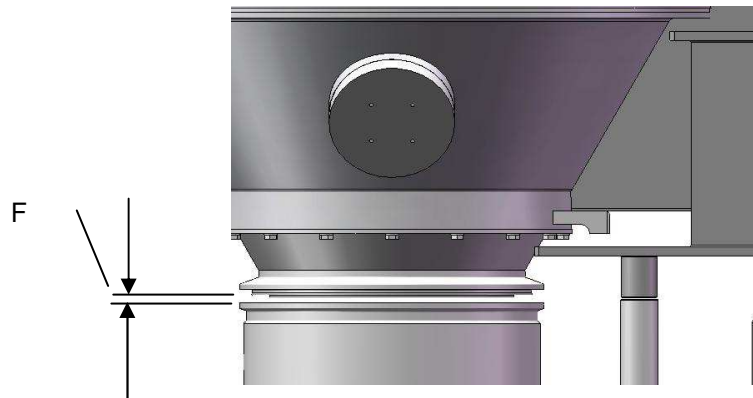
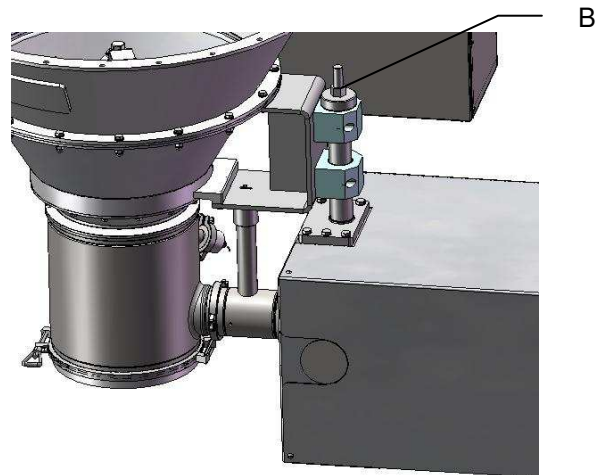
- Pivot the ConiWitt module (C)



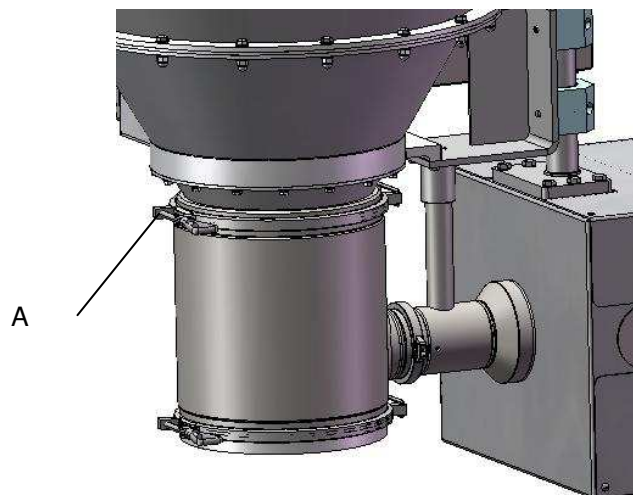
- Align the ConiWitt module (C) with the ProFi-Sword module (E)



- Manually hold the 2 modules in alignment and tighten the screw (B) until the play (F) between the modules is 1 to 2 mm



- Install the clamp (A) as shown in the instructions in chapter 5 - Installing/removing accessories



Voir documents suivants.

Siehe folgende Dokumente.

See following documents

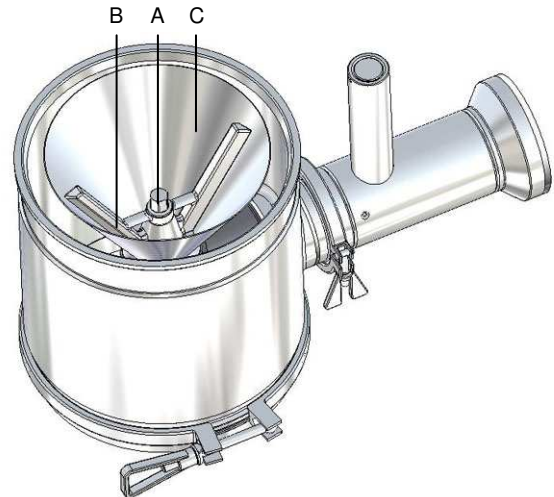
Dismantling the machinery



Prior to any operation, turn off the installation and disconnect the power and pneumatic supplies.

The user must eliminate any risk of contamination by the product.

- Remove the inlet funnel as per chapter 5 - Removal of inlet/outlet funnel.
- Unscrew the nut (A) on the rotor (B) with the socket wrench supplied with the installation.
- Remove the rotor (B).
- Remove the sieve (C).



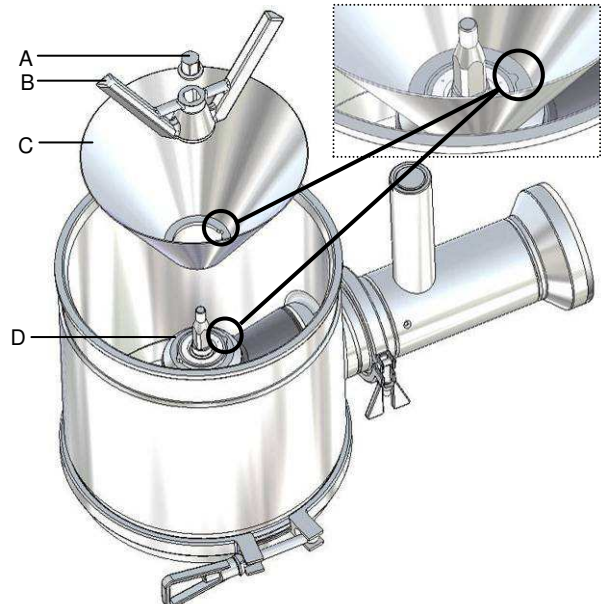
Assembling the machinery



Prior to any operation, turn off the installation and disconnect the power and pneumatic supplies.

The user must eliminate any risk of contamination by the product.

- Attach the sieve (C) by sliding it onto the transmission bearing (D). Ensure the sieve is correctly fitted by checking that the guide pins on the bearing match up with the grooves in the sieve.
- Slide the rotor (B) onto the drive shaft.
- Screw the nut (A) on the rotor (B) and tighten with the socket wrench supplied while holding the rotor with one hand.



How to install the tools plus (optional) temperature sensor



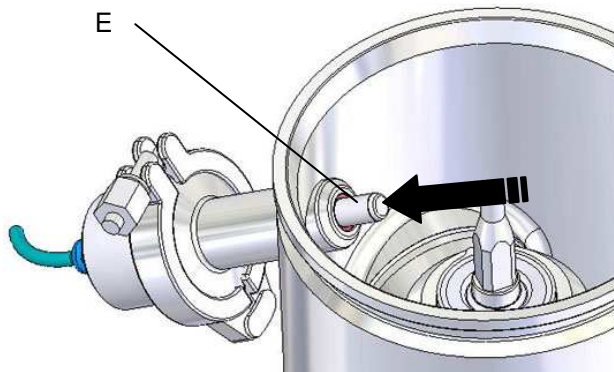
Before performing any work on the unit, it must be turned off and disconnected from the electrical and pneumatic power supplies. The user must avoid any risk of the product contaminating the mechanism.

- Press on the sensor (E) in order to make sure it slides freely.

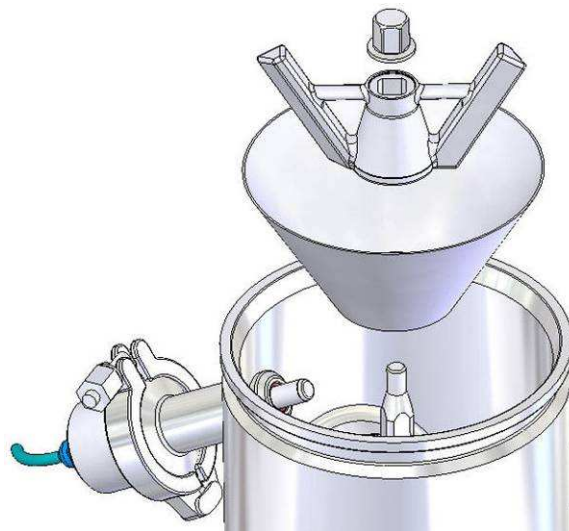


If the sensor does not slide freely, it must be dismantled and cleaned, see chapter 6 – Cleaning instructions.

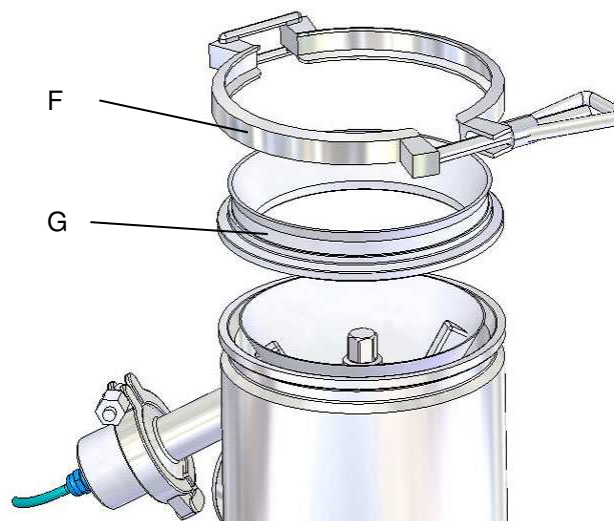
Contact Frewitt customer service if after cleaning the sensor still will not slide, see chapter 5 – Troubleshooting.



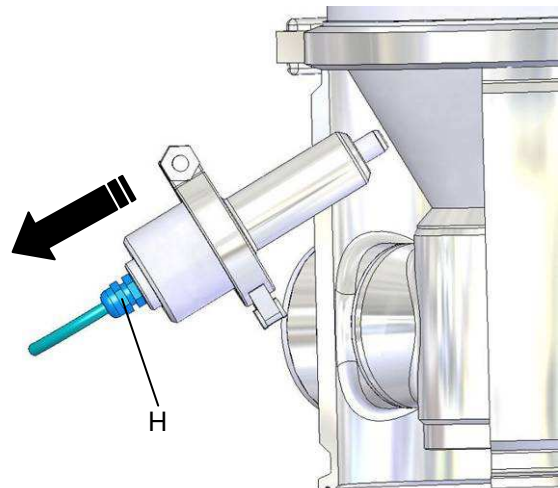
- Install the tools according to chapter 5 – Installing the tools.



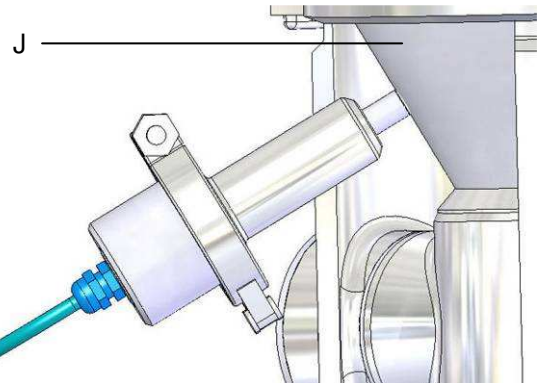
- Install the accessories of the inlet funnel (G) and tighten the clamp (F).



- Grasp the sensor by the cable gland (H) and pull it back to the stop position.



- Release the sensor and let it come to rest against the sieve (J).



Never push the sensor against the sieve. Doing so could damage the sieve.



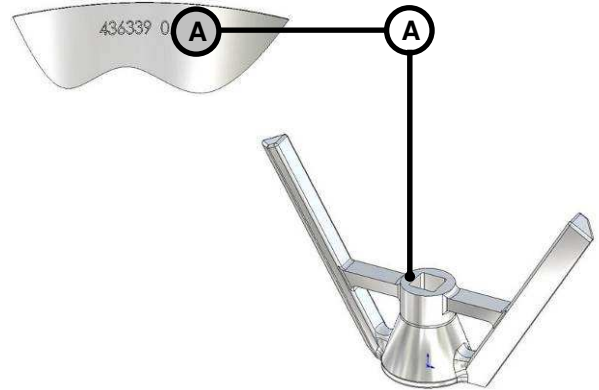
If the screen (or rasp) is not installed in the body, and the machine is running; the rotor will damage the detector.

Compatibility the conical grating plates to the rotor

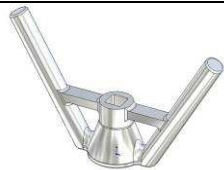



It is essential that the rotor type matches the etching on the cone-shaped rough file as shown in the drawing below, so as to maintain the play between the rotor arm and the cone-shaped rough file.

The etching on the conical grating plates must match the etching on the rotor.



Compatibility the conical screens to the rotor

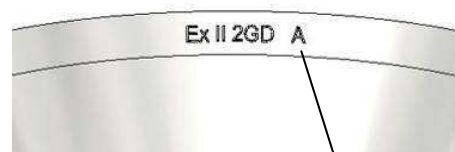
	Wet crushing (wc), round arms	Dry crushing (dfc), square arms
All conical screens may be fitted with the rotors without etching and with round or square arms.		

Compatibility conical wire screen sieve – to the rotor

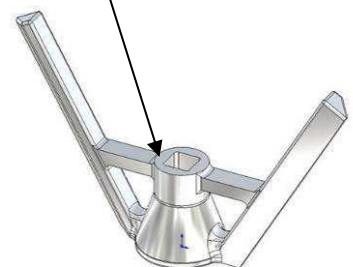


The rotor type must match the etching on the conical sieve/screen as in the drawing below in order to allow the proper play between the rotor arm and the conical sieve/screen.

The etching on the conical wire screen sieves must match the etching on the rotor.



The sieves/screens must not be used in category 0 and 20 explosion zones.



Dismantling the inlet/outlet funnel



Prior to any operation, turn off the installation and disconnect the power and pneumatic supplies.
The user must eliminate any risk of contamination by the product.

- Loosen the mountings of the funnel to be removed.
- Remove the funnel (A) from the housing (may vary according to the design of the installation).
- Be careful not to lose the two O-Ring seals on the inlet funnel (A) and the clamp seal on the outlet funnel (A).



Assembling the inlet/outlet funnel



Prior to any operation, turn off the installation and disconnect the power and pneumatic supplies.
The user must eliminate any risk of contamination by the product.

- Check the two **O-Rings** between the housing and the inlet funnel (E), and the **clamp seal** between the frame and the outlet funnel (E) are present and in good condition. Replace them if necessary.

Montage the seal

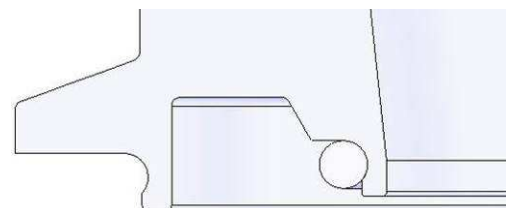
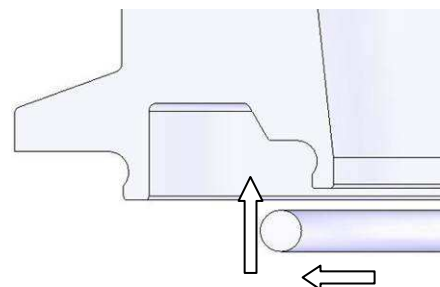
- Extend the seal
- Insert the seal
-



The seal must be mounted properly. He assured the tightness and prevents all contacts between the rotor and the sieve.

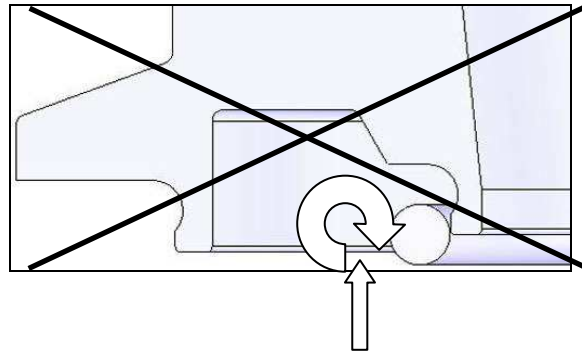


The installation should not function without this seal. The friction between the rotor and the sieve can cause sparks and the risk of explosion is not excluded

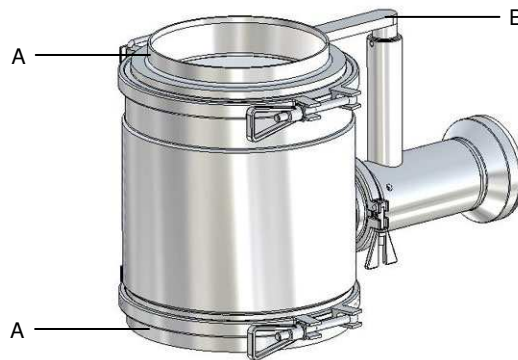




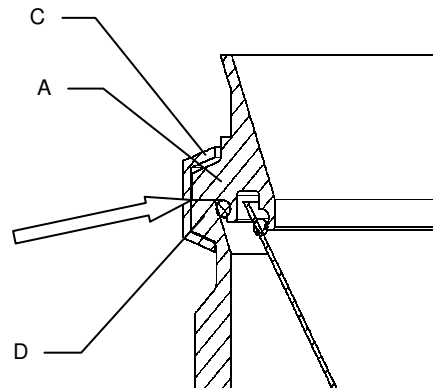
Do not roll the seal because it distorts and stepped out of his groove.



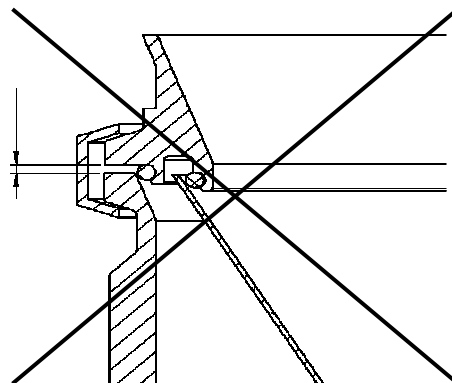
- Place the funnel to be fitted (A) in position (may vary according to the design of the installation).
- Check that safety fitting (B) is correctly aligned with the detector.



- Tighten the clamp (C) until the inlet funnel (A) is in full contact with the side of the housing flange (D).



- It should not be a space between the inlet funnel (A) and the housing (D).



Dismantling the housing



Prior to any operation, turn off the installation and disconnect the power and pneumatic supplies.

The user must eliminate any risk of contamination by the product.



Before loosening the clamp to remove the frame, make sure the frame is appropriately supported so it doesn't fall.

Weight of complete frame with bearing:

ConiWitt 150: 20kg

ConiWitt 200: 24kg

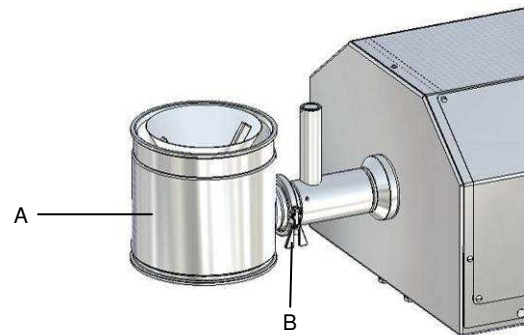
ConiWitt 250: 35kg



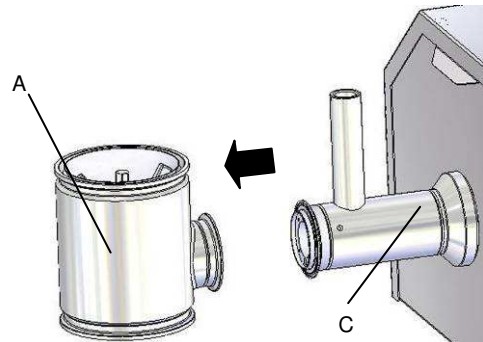
For installations conforming to the ATEX standard:

When dismantling the frame, be particularly careful not to damage the temperature sensor fitted in the arm.

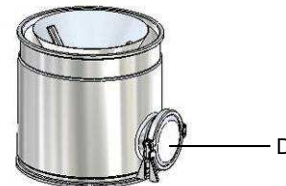
- Remove the inlet/outlet funnels as explained in Section 5 – Removing the inlet/outlet funnel.
- Ensure the housing (A) is appropriately supported so that it doesn't fall when the clamp (B) is loosened.
- Loosen and remove the clamp (B) while holding the housing (A) in place.



- Carefully pull the housing (A) off the arm (C).

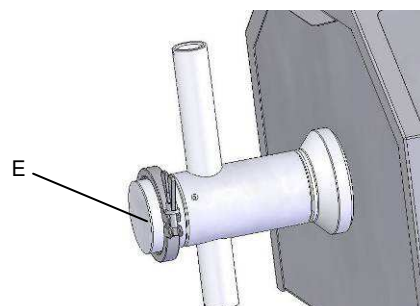


- Fit the cleaning cover (D) on the frame.



Fit the cleaning cover (E) on the arm (supplied as an optional extra). (Supplied on request, see Chapter 6-cleaning equipment).

-



Assembling the frame



Prior to any operation, turn off the installation and disconnect the power and pneumatic supplies.

The user must eliminate any risk of contamination by the product.



Before loosening the clamp to remove the housing, make sure the frame is appropriately supported so it doesn't fall.

Weight of complete frame with bearing:

ConiWitt 150: 20kg

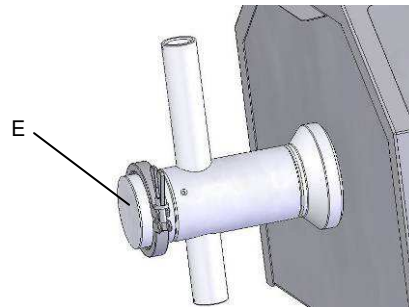
ConiWitt 200: 24kg

ConiWitt 250: 35kg

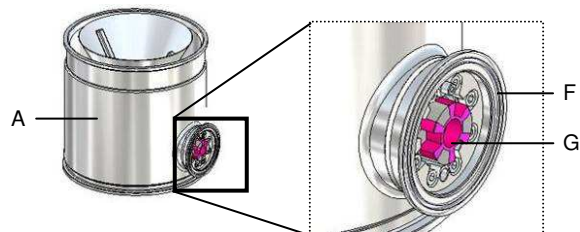
- Remove the cleaning cover (D) from the housing (A).



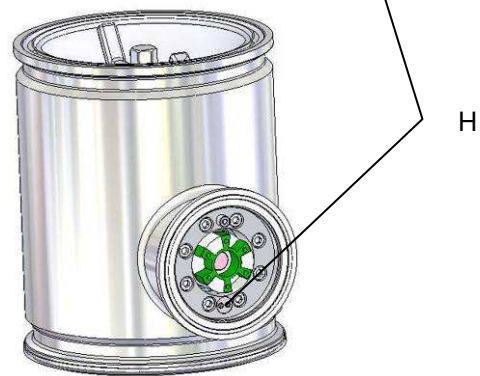
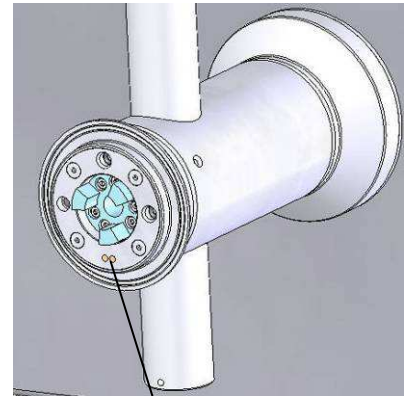
- Remove the cleaning cover (E) from the arm (supplied as an optional extra).



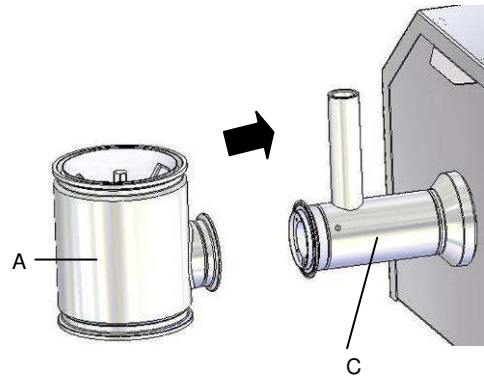
- Check the DN-80 clamp seal (F) between the housing (A) and the arm is present and in good condition. Change if necessary.
- Check the transmission star (G) is fitted to the drive shaft and is in good condition. Change it if necessary, following the directions in Section 7 – Checking and Replacing Elastomer Stars on the Transmission Universal Joint.



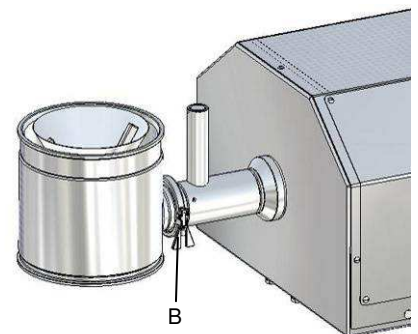
- For installations with temperature sensor in the bearing, control and clean, if necessary, contact (H) into the arm and the head.



- Hold the housing (A) horizontally, in line with the arm (C).
- Carefully push the housing onto the arm.



- Attach and tighten the clamp (B).
- Fit the inlet/outlet funnels as per Section 5 - Fitting the inlet/outlet funnels.

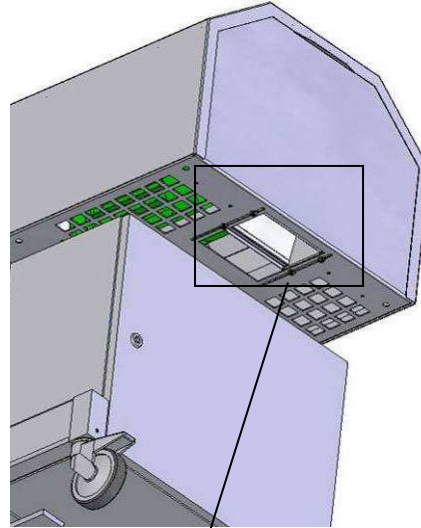


Dismantling the suction filter **only for No Ex systems**



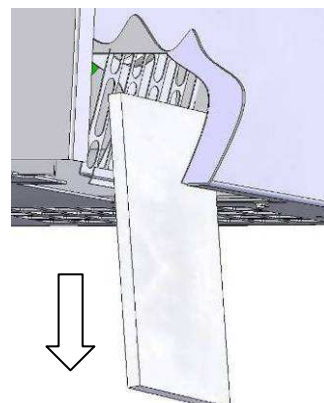
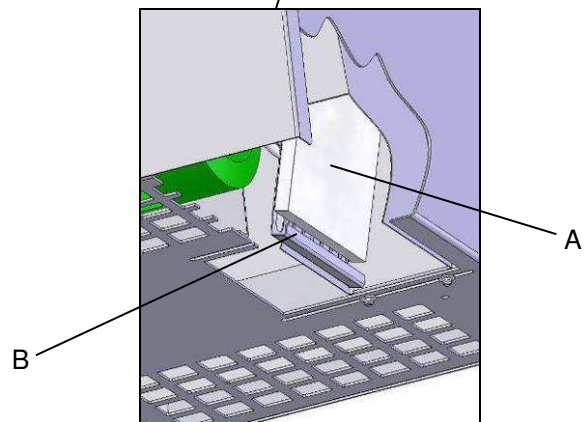
Before any action is taken, the system must be stopped and the power and gas supplies must be turned off.

The user must eliminate any risk of contamination by the product.



- Push the filter (A) upwards to free it from its holder (B).
- Pull the filter (A) downwards to remove it.

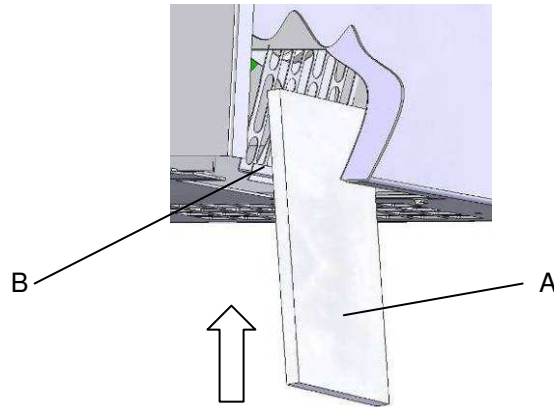
For information on how often the filter should be changed, see Section 7 – Maintenance.



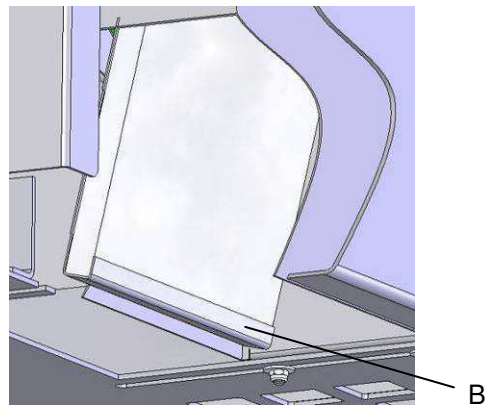
Assembling the suction filter

Before any action is taken, the system must be stopped and the power and gas supplies must be turned off.
The user must eliminate any risk of contamination by the product.

- Inspect the condition of the filter (A).
- Insert the filter (A) into its holder (B).



- Push the filter (A) upwards to secure it in its holder (B).

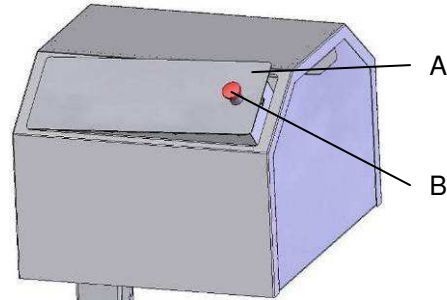


Dismantling the protective casing



Before any action is taken, the system must be stopped and the power and gas supplies must be turned off.
The user must eliminate any risk of contamination by the product.

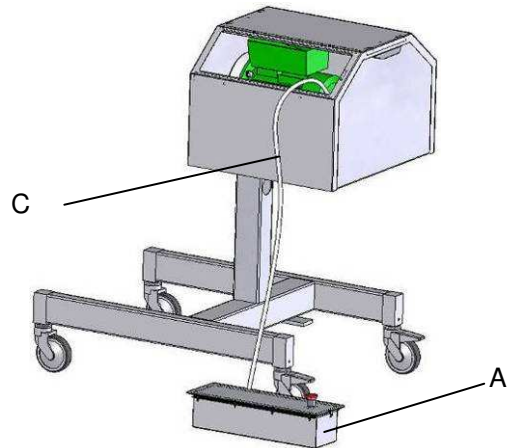
- Free the control box (A) by pulling the control knob (B) located on the right-hand side (may vary depending on the system configuration).



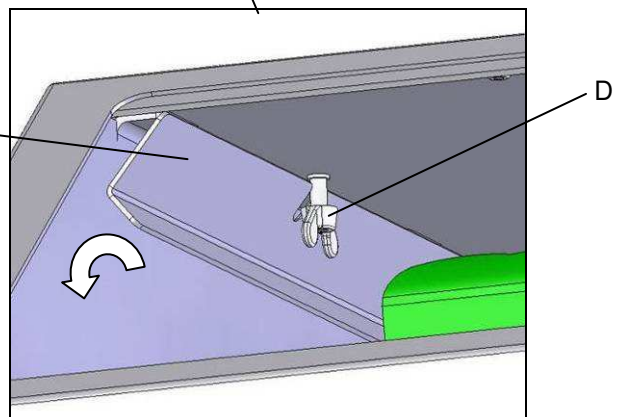
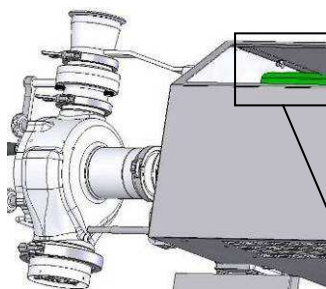
- Place the control box (A) to one side.



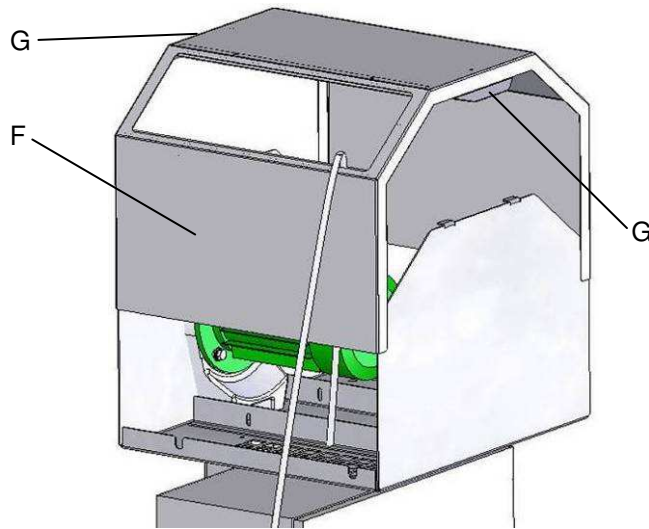
Take the necessary precautions to ensure the electric cable (C) is not damaged.



- Unscrew the nut (D) but do not lift it out.
- Remove the attachment bracket (E) by pivoting it.
- Do the same on the other side of the protective casing.



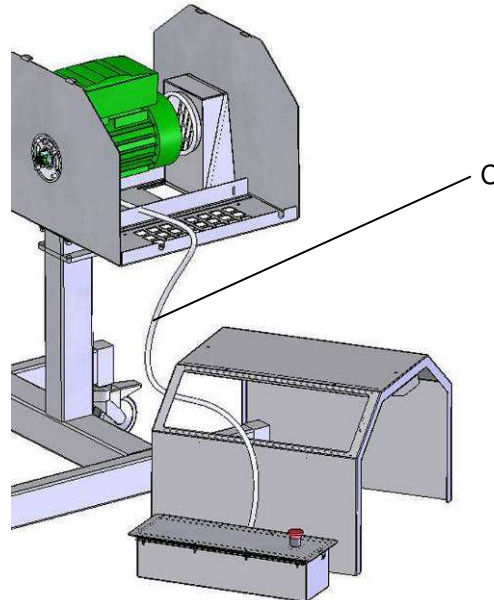
- Lift the cover (F) using the handles (G).



- Place the cover to one side.



Take the necessary precautions to ensure the electric cable (C) is not damaged.

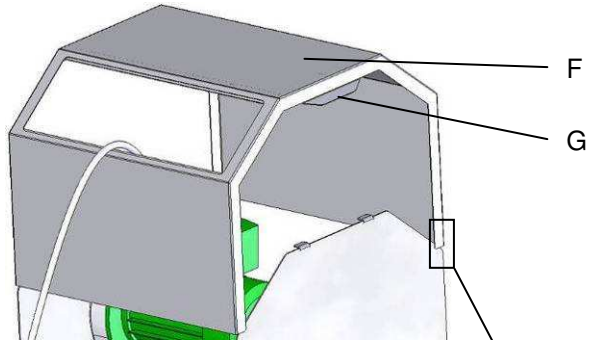


Assembling the protective casing

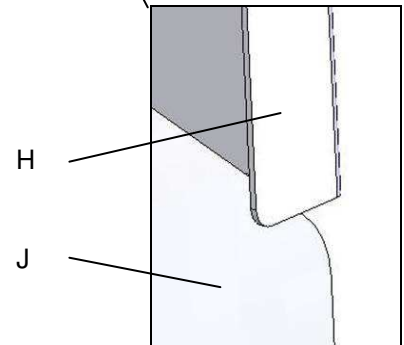


Before any action is taken, the system must be stopped and the power and gas supplies must be turned off.
The user must eliminate any risk of contamination by the product.

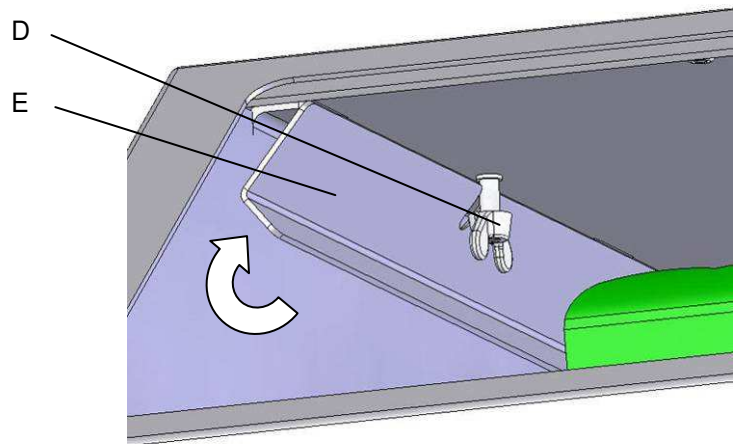
- Slide the cover (F) back on using the handles (G).
- Check that the edges (H) of the cover are outside the fixed casing (J).



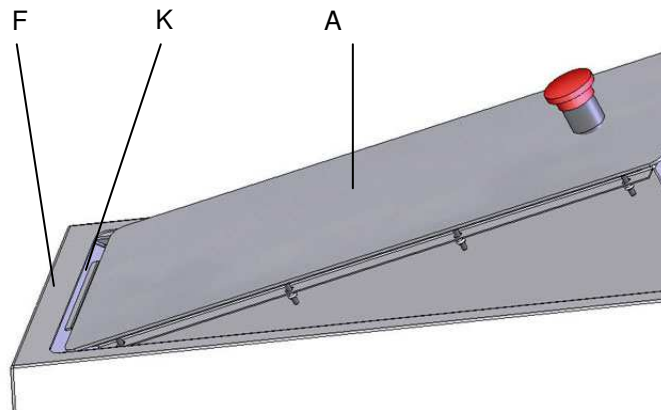
Take the necessary precautions to ensure the electric cable (C) is not damaged.



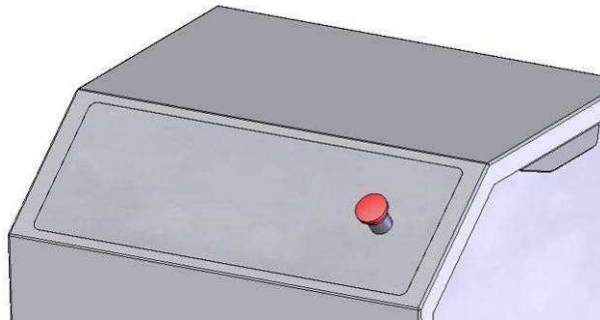
- Mount the attachment bracket (E) by pivoting it.
- Screw in the nut (D).
- Do the same on the other side of the protective casing.



- Insert the control box (A) into the cover (F) by passing the tab (K) through the opening in the cover.
- Place the surplus electric cable inside the protective casing, taking all necessary precautions to ensure it is not damaged.



- Press on the right-hand side of the box so that it clicks into place.

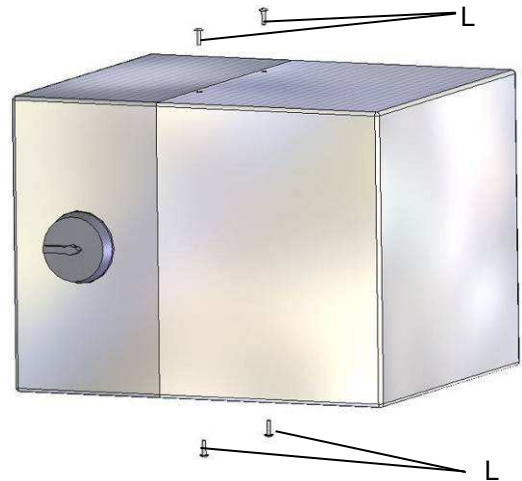


Assembling / Dismantling the little protective casing (optional)

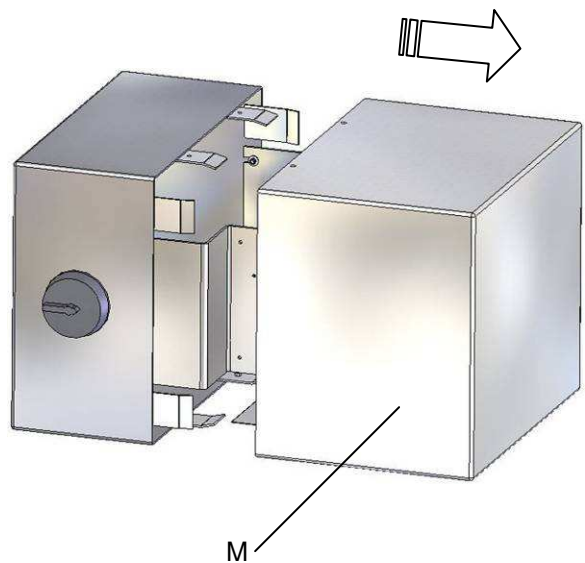


Before any action is taken, the system must be stopped and the power and gas supplies must be turned off.
 The user must eliminate any risk of contamination by the product.

- Unscrew the 4 screws (L)



- Remove the cover removable (M)



Tools disassembly



After prolonged use of the machine, the temperature of the drive system may be relatively high (60-70°C). Always wear protective gloves when using the machine.

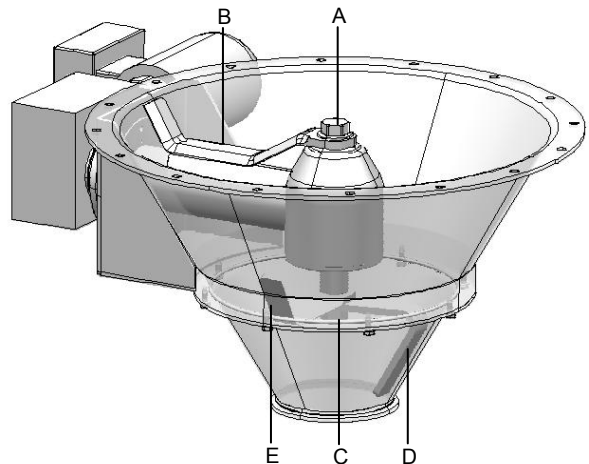


The plant must be turned off and the power and air pressure supplies disconnected before any maintenance work is commenced. The user must eliminate any risk of product contamination.



The tools disassembly requires full access to the ProFi-Sword inlet and outlet.

- Unscrew the nut (A) in an anti-clockwise direction using a socket wrench
- Remove the upper blade (B)
- Unscrew the nut (C) in a clockwise direction using a socket wrench
- Remove the second lower blade (D) by pivoting it to release it from the shaft square end
- Remove the first lower blade (E)



Tools Assembly

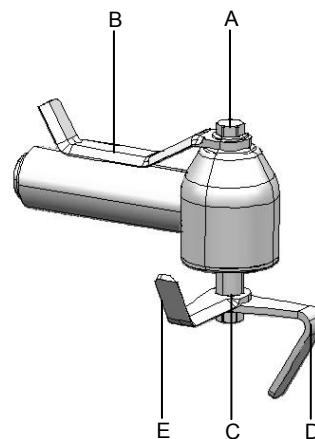


The plant must be turned off and the power and air pressure supplies disconnected before any maintenance work is commenced. The user must eliminate any risk of product contamination.



The tools assembly requires full access to the ProFi-Sword inlet and outlet.

- Place the first lower blade (E) as in the diagram on the right
- Place the second lower blade (D) at 90° to the first lower blade (E) as shown in the diagram on the right
- Screw the nut (C) in an anti-clockwise direction using a socket wrench to the torque specified in section 7 – “Torque”
- Place the upper blade (B) at 180° to the second lower blade (D) as shown in the diagram on the right
- Screw the nut (A) in a clockwise direction using a socket wrench to the torque specified in section 7 – “Torque”

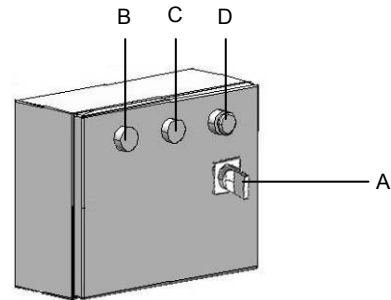


Controls

- (A) Main switch
- (B) On
- (C) Off
- (D) Emergency stop

The position, number, and type of control components, as well as the dimensions and position of the control box may vary depending on the set-up of the plant.

If the ProFi-Sword is part of a plant, the controls may be integrated into a central control panel. In this case, refer to the user manual for the plant.



Les tamis et les râpes sont des pièces de rechange.

Die Siebe und die Raspeln sind Ersatzteile.

The sieve and the rasps are spare parts.



Leur remplacement est nécessaire lorsque, par exemple :

Ihre Ersatz ist nötig wenn, zum Beispiel :

Their replacement is required when, for example :

1. La pièce est déformée
2. La pièce présente des griffures importantes
3. La pièce est endommagée

1. Das Stück ist deformiert
2. Das Stück hat grosse Schrammen
3. Das Stück ist beschädigt

1. The part is deformed
2. The part has significant scratches
3. The part is damaged

1.



2.



3.



Vitesse Geschwindigkeit Speed	HammerWitt-Lab	ConiWitt-150	ConiWitt-200 TurboWitt-C20
m/s	rpm	rpm	rpm
3.0		400	
3.5		460	330
4.0		530	370
4.5		600	420
5.0		660	470
5.5		730	510
6.0		800	560
6.5	650	860	610
7.0		930	660
7.5		990	700
8.0	800	1060	750
8.5		1130	800
9.0		1190	840
9.5		1260	890
10.0	990	1330	940
10.5		1390	980
11.0		1460	1030
11.5		1530	1080
12.0	1190	1590	1120
12.5		1660	1170
13.0		1720	1220
13.5		1790	1260
14.0	1390	1860	1310
14.5		1920	1360
15.0		1990	1400
15.5		2060	1450
16.0	1590	2120	1500

Vitesse Geschwindigkeit Speed	HammerWitt-Lab	ConiWitt-150	ConiWitt-200 TurboWitt-C20
m/s	rpm	rpm	rpm
16.5		2190	1540
17.0		2250	1590
17.5		2320	1640
18.0	1790	2390	1690
18.5			1730
19.0			1780
22	2190		
24	2390		
26	2590		
28	2790		
30	2980		
32	3180		
34	3380		
36	3580		
38	3780		
40	3980		
42	4180		
44	4380		
46	4580		
48	4770		
50	4970		
52	5170		
54	5370		
56	5570		
58	5770		
60	5970		
60.3	* 6000		
62	6170		
64	6370		
66	6570		
68	6760		
70	6960		
70.4	* 7000		

*** Remarque**

6000 rpm pour exécution ATEX / für ATEX-Ausführung / for execution ATEX
 7000 rpm pour exécution normale / für normale Ausführung / for normal execution

L'installation ne démarre pas

Déclencher l'interrupteur principal.

Contrôler que l'installation est branchée à une source d'énergie électrique.

Contrôler que l'arrêt d'urgence est déclenché.

Contrôler que toutes les sécurités sont bien positionnées par rapport au détecteur.

Enclencher l'interrupteur principal.

Démarrer l'installation.

Die Anlage läuft nicht an

Hauptschalter ausschalten.

Kontrollieren, ob die Anlage an einer Stromquelle angeschlossen ist.

Kontrollieren, ob der Not-Aus-Schalter nicht betätigt ist.

Kontrollieren, ob alle Sicherheiten gegenüber den Sensoren richtig positioniert sind.

Hauptschalter einschalten.

Installation einschalten.

The installation does not start

Switch off the main switch.

Check that the installation is connected to a electric power supply.

Check that the emergency stop is started.

Check that all safety measures are in place regarding the detector.

Switch on the main switch.

Start the installation.

L'installation ne démarre toujours pas

Pour les installations avec palier ventilés et l'option système de distribution de gaz, contrôler que l'arrivée de gaz est branchée.

Contrôler la pression et le débit de la distribution de gaz.

Pour les installations avec sonde température dans le palier, contrôler l'état des contacts entre le bras et le palier.

Die Anlage läuft immer noch nicht an

Für die Anlagen mit gasespülter Dichtung und der Option Gas-Versorgung, muss kontrolliert werden, ob die Gaszufuhr angeschlossen ist.

Den Druck und die Durchflussmenge der Gas-Versorgung kontrollieren.

Für die Anlagen mit Temperaturfühler in dem Lager, kontrollieren den Zustand der Kontakte zwischen dem Arm und dem Lager.

The installation still does not start

For installations with ventilated bearing and the gas supply option, check connection of the gas input.

Check the gas supply's pressure and flow.

For installations with temperature sensor into the bearing, check the good condition of the contacts between the arm and the bearing.

L'installation ne démarre toujours pas

Contacter le service après-vente de Frewitt.

Die Anlage läuft immer noch nicht an

Kontaktieren Sie den Frewitt Kundendienst.

The installation still does not start

Contact Frewitt after-sales service.

FREWITT SA
phone ++41 / 26 460 74 52 (direct)
fax ++41 / 26 460 74 01
e-mail: customerservice@frewitt.com

CLEANING



“Cleaning Recommendation”

Granules

CIP-Cleaning & Disinfection

PHARMACOS

Application / Method:

Milling

Typical residues:

Granules







Specific application area:

Solid production

Company: Location: Department

Frewitt SA 1763 Granges Paccot

Cleaning interval: After each production batch

Cleaning Procedure & Chemicals	%	°C	min.	Notes
 Pre-cleaning water	-	-	-	Pre-cleaning either with water or steam depending on the solubility or melting point of residue Demineralized water improves the removal of TiO ₂ -residues
 Alkaline Cleaning P3-cosa® CIP 95	2.0	80	20	
 Intermediate Rinse water	-	-	-	Rinse until pH- neutral
 Acid Cleaning P3-cosa® CIP 72	1.5	60	20	We recommend P3-cosa CIP 77 in case of Iron oxide residues (10% P3-cosa CIP 77 // 85°C // 20 min)
 Intermediate Rinse water	-	-	-	
 Final Rinse water	-	-	-	Until quality assurance accepted level

Remark:

USA:

Use P3-cosa CIP 95NA instead of P3-cosa CIP 95

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For any more assistance, do not hesitate to contact your responsible Ecolab service.
Ecolab Technical Pharmacos Support: +49 211 9893729



Important additional remarks!

Due to the diversity of materials and applications the information given below represents only a non binding guideline and is not intended to supersede the manufacturers specifications, limitations and recommendations. It is compulsory to follow the manufacturers limitations, especially concerning pH and temperature stability of the materials. The cleaning process should be individually optimised.



"Cleaning Recommendation"

Manual cleaning

CIP-Cleaning & Disinfection

PHARMACOS

Application / Method:

Small equipment

Typical residues:

All kind of residues

Specific application area:

Manual cleaning

Company:



Frewitt SA

Location:

1763 Granges Paccot

Department

Cleaning interval: After each production batch

Cleaning Procedure & Chemicals	%	°C	min.	Notes
 Pre Rinse water	-	-	-	
Neutral cleaning P3-cosa® FOAM 40	1.0	≥ 45		
 Final Rinse water	-	cold	-	Until quality assurance accepted level

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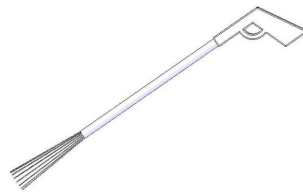
For any more assistance, do not hesitate to contact your responsible Ecolab service.



Important additional remarks!

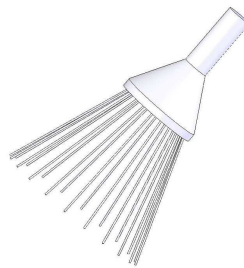
Due to the diversity of materials and applications the information given below represents only a non binding guideline and is not intended to supersede the manufacturers specifications, limitations and recommendations. It is compulsory to follow the manufacturers limitations, especially concerning pH and temperature stability of the materials. The cleaning process should be individually optimised.

Key to the symbols



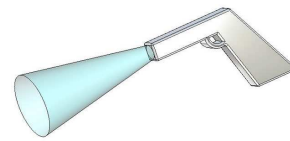
High pressure (> 4 bar)
water jet

Min. cleaning distance
50 cm



Low pressure (\leq 4 bar)
water jet

Min. cleaning distance
50 cm



Compressed air

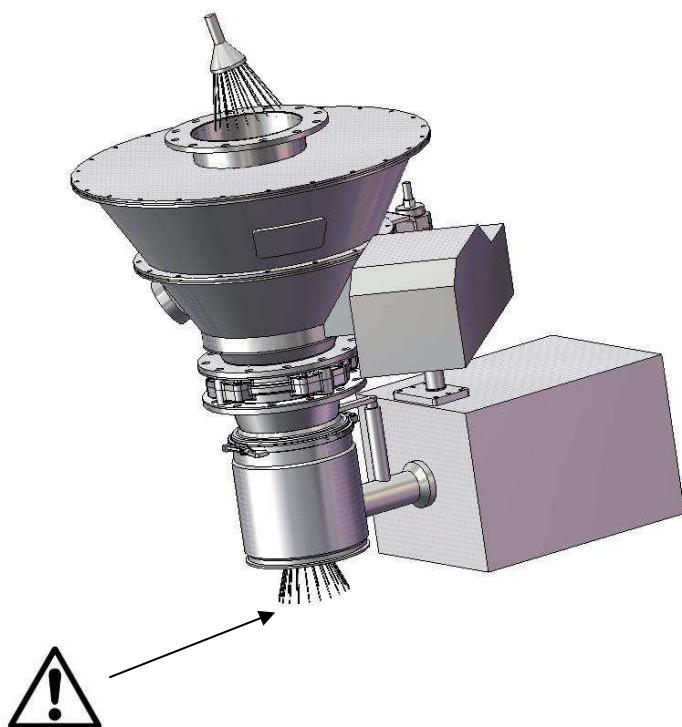
Cleaning the unit

- Flush the unit with water
- Catch the water at the outlet of the case



The water must be able to drain from the case

- Start the unit and let it run for a few minutes
- Turn the unit off



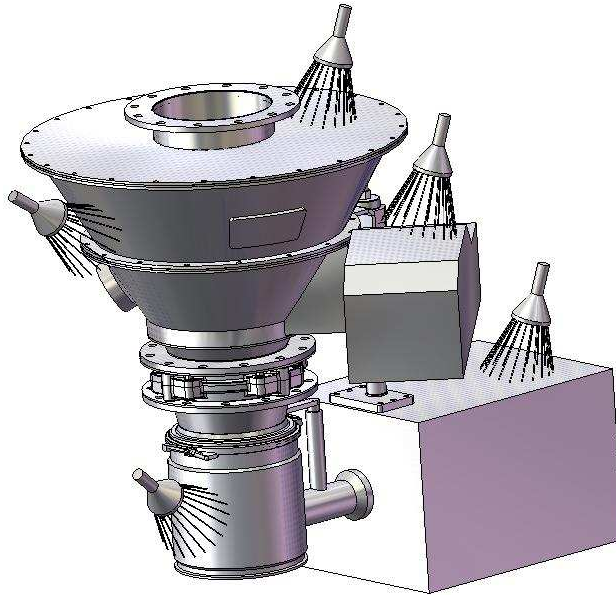


Before performing any work on this unit, it must be turned off and the electric and pneumatic lines must be disconnected.
The operator is responsible for preventing risks of contamination by the product.

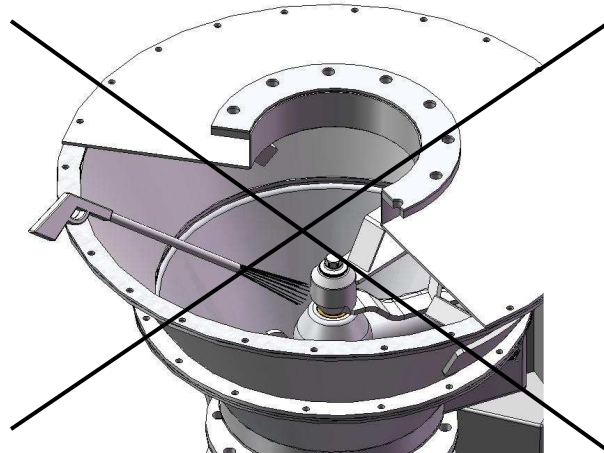
- The unit can be cleaned:
- With a low pressure water jet
or
- With a dry or damp cloth



- Do not use pointed or sharp tools. Doing so may damage the components of the unit.



- Do not use a high pressure water jet to clean the bearing seals

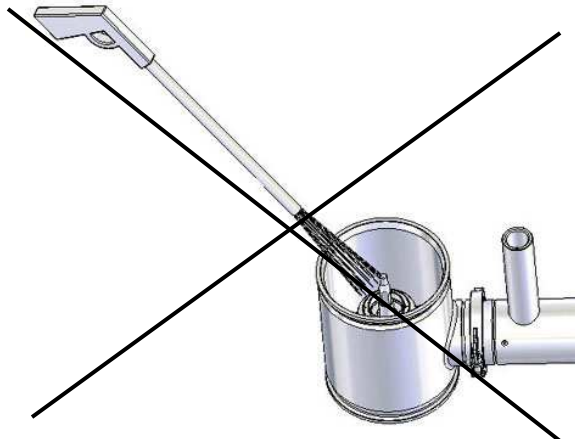


The seals may be cleaned:

- With a low pressure water jet
or
- With a damp cloth

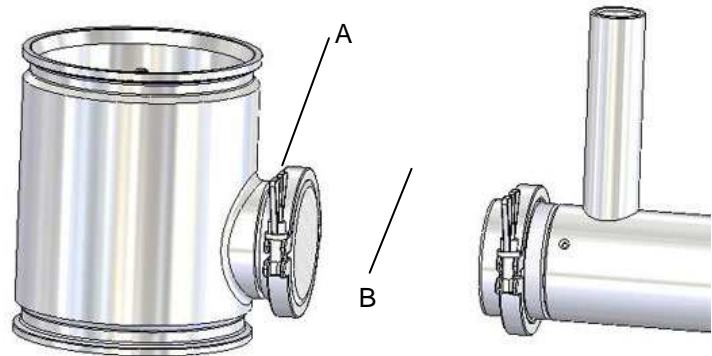


- Do not use any solvents other than alcohol for cleaning the plastic parts.





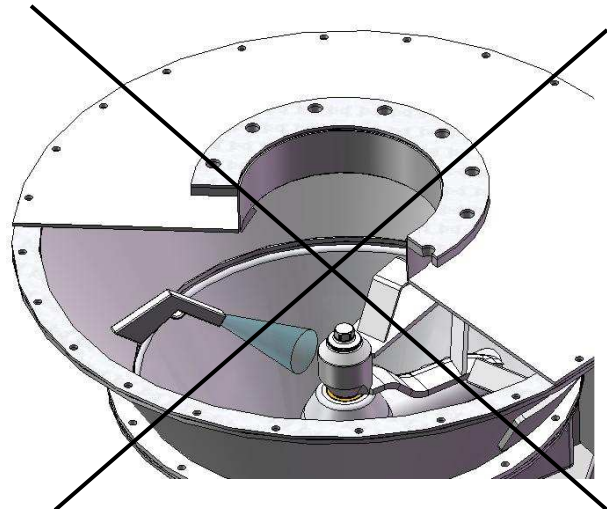
If the case of the ConiWitt module is removed, the covers for the case (A) and the arm (B) absolutely must be installed, see chapter 6- "Cleaning equipment"



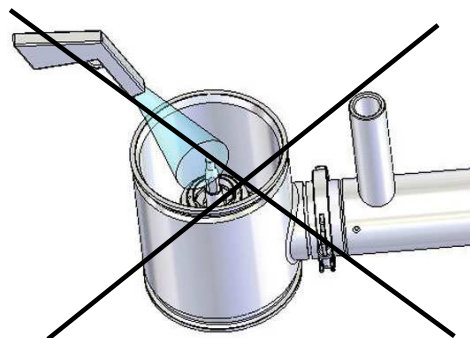
Drying the unit

The unit can be:

- Allowed to air-dry
or
- Dried with a cloth
or
- Dried in an environment heated to 60°C maximum.



- Do not use compressed air to dry the bearing seals. Doing so may damage them.
- Dry the seals with a cloth



Cleaning the tools and the inlet-outlet accessories

- Remove the tools and the accessories as instructed in chapter 5 – "Removing the tools and the inlet-outlet accessories"

The tools/inlet-outlet accessories can be cleaned:

- With a damp cloth
or
- With a low pressure water jet
or
- With a high pressure water jet



- Do not use pointed or sharp tools. Doing so may damage the tools/inlet-outlet accessories.



Sterilization

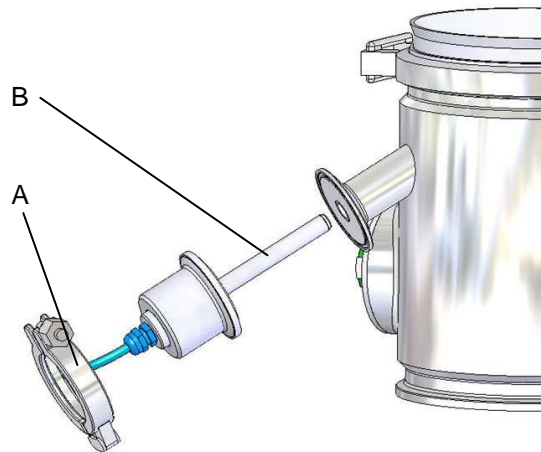
- The case, the tools, and the inlet-outlet accessories can be sterilized at a temperature of 125°C.

Cleaning the case of the ConiWitt module equipped with a temperature sensor (option)

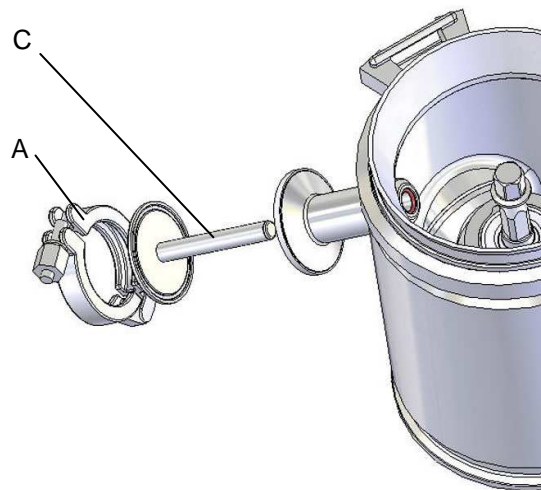


Before performing any work on this unit, it must be turned off and the electric and pneumatic lines must be disconnected. The operator is responsible for preventing risks of contamination by the product.

- Loosen the clamp (A)
- Remove the temperature sensor (B)
- Protect the sensor if necessary

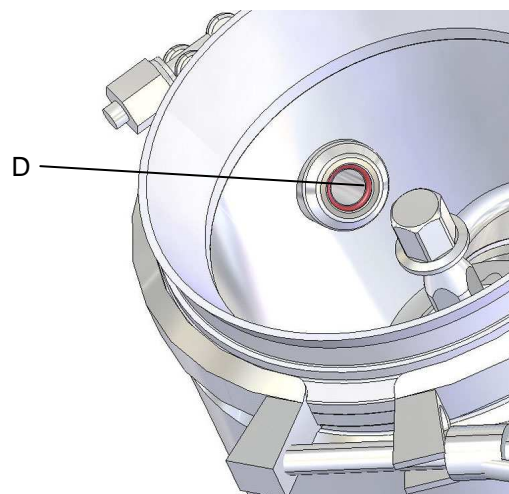


- Insert the plug (C)
- Tighten the clamp (A)
- Clean the case



The sensor bushing must always be kept clean. The sensor must always be able to slide freely within it.

- Check the condition of the seal (D)
- Replace it if necessary



Chemical resistance list

(italiano: vedi pagina 17)

The information on the following pages is based on tests under various different conditions. Many of the values have been determined at room temperature with a reaction time of 7 days (150 hours). In individual cases observations may differ between laboratory and practical tests. Because of differences in conditions of use and the composition of fluids the data given are only guidelines and should not be taken as binding. For these reasons we cannot give any guarantees as to the correctness of our recommendations in individual cases. If your operating conditions are unusual please feel free to discuss them with us.

Definition of information given in the table:

On request:

Information on resistance for ACM, IIR, SBR, AU/EU and NR is available

	NBR	FPM	MVQ	EPDM	CR	MFQ	FFKM	FEP ^①	FPA ^②	PTFE ^②	Nichel alloy X-750 mat. nr. 2.4669 ^③
A											
Acetaldehyde	C	D	B	B	C	D	A ^①	A	A		
Acetamide	A	C	B	A	A	A	A ^①	A			
Acetate of copper	B	D	D	A	B	D	A	A		B	
Acetic acid											
	concentrated (glacial acetic acid)	B	D	B	B	D	D	A	A	B	
	hot	D	D	C	C	D	D	A	A	B	
Acetic anhydride	D	D	B	B	B	D	A	A		B	
Acetoacetic ester	D	D	B	B	D	D	A	A			
Acetone	D	D	D	A	D	D	A	A		A	
Acetophenone	D	D	D	A	D	D	A	A			
Acetyl chloride	D	A	C	D	D	A	A	A		A	
Acetylacetone	D	D	D	A	D	D	A	A			
Acetylene, Ethene	A	A	B	A	B	A	A	A		A	
Acrylic acid ethyl ester	D	D	B	B	D	D	A ^②	A			
Acrylonitrile	D	C	D	D	D	D	A ^①	A			
Aero Shell 7A	A	A	B	D	B	A	A	A			
Aero Shell 17	A	A	B	D	B	A	A	A			
Aero Shell 750	B	A	D	D	D	B	A	A			
Aero Shell Fluid 4	A	A	D	D	D	A	A	A			
Aerosafe 2300	D	D	C	A	D	C	-	A			
Aerosafe 2300 W	D	D	C	A	D	C	-	A			
Air	A	A	A	A	A	A	A	A		A	
Air oil-free											
	100°C	A	A	A	A	A	A	A		A	
	150°C	B	A	A	B	B	A	A		A	
	200°C	D	A	A	D	D	B	A		A	
Alkazene [®]	D	B	D	D	D	B	A	A			
Aluminium acetate	B	D	D	A	B	D	A	A			
Aluminium bromide	A	A	A	A	A	A	A	A			
Aluminium chloride	A	A	B	A	A	A	A	A		B	
Aluminium fluoride	A	A	B	A	A	A	A	A			
Aluminium nitrate	A	A	B	A	A	B	A	A		A	
Aluminium phosphate	A	A	A	A	A	A	A	A			
Aluminium sulphate	A	A	A	A	A	A	A	A		C	
Alums	A	A	B	A	A	D	A	A		A	
Ammonia gas											
	(cold)	A	D	A	A	A	D	A ^①	A	B	
	gas (hot)	D	D	B	B	B	D	A ^①	A	B	
	liquid (anhydrous)	B	D	B	A	A	D	A ^①	A	B	

① depending of compound, we suggest to discuss with us!

② for virgin PTFE O-Rings and O-Rings covered with FEP and PFA

③ for metal O-Rings and C-Rings

A stable

B can be used (static applications)

C limited stability (use not recommended)

D not stable

	NBR	FPM	MVQ	EPDM	CR	MFQ	FFKM	FEP ^① FPA ^② PTFE ^③	Nichel alloy X-750 mat. nr. 2.4669 ^③
Ammonium carbonate	C	B	D	A	A	D	A	A	A
Ammonium chloride	A	A	B	A	A	A	A	A	B
3 molar solution	A	B	A	A	A	A	A	A	A
Ammonium hydroxide concentrated	D	C	A	A	A	A	A ^①	A	A
Ammonium nitrate	A	B	B	A	A	A	A	A	B
Ammonium nitrite	A	-	B	A	A	-	A	A	
Ammonium persulphate	D	-	-	A	A	-	A	A	B
Ammonium persulphate solution	D	-	-	A	A	-	A	A	
Ammonium phosphate	D	-	-	A	A	-	A	A	
Ammonium phosphate									
primary	A	B	B	A	B	B	A	A	B
secondary	A	B	B	A	B	B	A	A	B
tertiary	A	B	B	A	B	B	A	A	B
Ammonium sulphate	A	C	A	A	A	C	A	A	
Ammonium sulphide	A	D	B	A	A	B	A	A	B
Amyl acetate	A	D	B	A	A	B	A	A	
Amyl alcohol	D	D	D	A	D	D	A	A	A
Amyl borate	B	B	D	A	B	A	A	A	A
Amyl chloride	A	A	-	D	A	-	A	A	
Amyl chloronaphthalene	D	A	D	D	D	B	A	A	B
Amyl naphthalene	D	A	D	D	D	B	A	A	
Aniline (aniline oil)	D	A	D	D	D	A	A	A	
Aniline dyes	D	C	D	B	D	C	A	A	B
Aniline hydrochloride	D	B	C	B	B	B	A	A	
Animal fat	A	A	B	B	B	A	A	A	
Aqua regia	D	B	D	C	D	C	A ^①	A	C
Argon	B	B	C	B	D	B	A	A	
Aromatic fuels (Fuel C) 50 %	A	A	A	A	A	A	A	A	
Arsenic acid (arsenic trichloride)	A	D	D	D	B	A	A	A	
Asphalt	A	A	A	A	A	A	A	A	C
ASTM-oil									
No. 1	B	A	D	D	B	B	A	A	A
No. 2	A	A	A	D	A	A	A	A	A
No. 3	A	A	D	D	B	A	A	A	A
No. 4	A	A	C	D	D	A	A	A	A
ASTM-reference									
fuel A	B	A	D	D	D	B	A	A	A
fuel B	A	A	D	D	B	A	A	A	A
fuel C	A	A	D	D	D	A	A	A	A
ATF-oil	B	A	D	D	D	B	A	A	A

B

Barium chloride	A	A	A	A	A	A	A	A	B
Barium hydroxide	A	A	A	A	A	A	A	A	B
Barium sulphide	A	A	A	A	A	A	A	A	
Beer	A	A	A	A	A	A	A	A	A
Benzaldehyde	D	D	D	A	D	D	A	A	B
Benzene	D	A	D	D	D	A	A	A	A
Benzene-sulphonic acid 10 %	D	A	D	D	B	B	A	A	
Benzoic									
acid	D	A	D	B	D	B	A	A	A
benzyl ester	D	A	-	D	D	A	A	A	
methyl ester	D	A	D	D	D	A	A	A	
Benzophenone	-	A	-	B	-	A	A	A	
Benzoyl chloride	D	A	-	A	D	A	A	A	
Benzyl									
alcohol	D	A	B	B	B	B	A	A	A

① depending of compound, we suggest to discuss with us!

② for virgin PTFE O-Rings and O-Rings covered with FEP and PFA

③ for metal O-Rings and C-Rings

A stable

B can be used (static applications)

C limited stability (use not recommended)

D not stable

		NBR	FPM	MVQ	EPDM	CR	MG	FFKM	FEP ^① FPA ^② PTFE ^③	Nichel alloy X-750 mat. nr. 2.4669 ^③
Benzyl chloride		D	A	D	D	D	A	A	A	A
Black liquor		B	A	B	B	B	B	-	-	A
Blast furnace gas		D	A	A	D	D	B	A	A	
Bleaching lye		D	A	B	A	D	B	B	A	
Borax		B	A	B	A	D	B	B	A	A
Bordeaux mixture		B	A	B	A	B	B	A	A	
Boric acid		A	A	A	A	A	A	A	A	B
Boron liquid (HEF)		B	A	D	D	D	B	-	A	
Bromine		D	A	D	D	D	B	A	A	C
	water	D	A	D	D	D	B	A	A	
Bromobenzol		D	A	D	D	D	B	B	B	
Bromochloromethane		D	A	D	B	D	B	A	A	
Bromochlorotrifluoroethane		D	A	D	D	D	B	A	B	
Bromopentafluoride		D	D	D	D	D	D	B	B	
Bromotrifluoride		D	D	D	D	D	D	B	B	
Butadiene (monomer)		D	A	D	D	D	A	A	A	A
Butan-2-one (methyl ethyl ketone, MEK)		D	D	D	A	D	D	A	A	
Butane		A	A	D	D	A	A	A	A	A
Butanol (butyl alcohol)		A	A	B	B	A	A	A	A	A
Butene		B	A	D	D	C	B	A	A	
Butter		A	A	B	A	B	A	A	A	A
Butyl	acetate	D	D	D	B	D	D	A	A	B
	acetylricinoleate	B	A	-	A	B	B	A	A	
	acrylate	D	D	D	D	D	D	A ^①	A	
	alcohol	A	A	B	B	A	A	A	A	A
	butyrate	D	A	-	A	D	A	A	A	
	carbitol	D	C	D	A	C	D	A	A	
	catechol	D	A	-	B	B	A	A	A	
	cellosolve	D	D	D	B	D	D	A	A	
	glycol	C	D	B	B	C	D	A	A	
	glycoladipate	D	B	B	B	D	B	A	A	
	mercaptan	D	A	D	D	D	-	A	A	
	oleate	D	A	-	D	D	B	A	A	
	stearate	B	A	B	D	D	B	A	-	
Butylooo n-Butyl ether		C	D	D	C	D	C	A	A	
Butylamine, n-Butylamine		C	D	B	D	D	D	A ^①	A	
Butyraldehyde		D	D	D	B	D	D	A ^①	A	
Butyric acid		D	B	D	B	D	D	A	A	C

C

Calcium	acetate	B	D	D	A	B	D	A	A	
	bisulphite	A	A	A	D	A	A	A	A	
	chloride	A	A	A	A	A	A	A	A	A
	cyanide	A	-	A	A	A	-	A	A	
	hydroxide	A	A	B	A	A	A	A	A	B
	hypochloride	B	A	B	A	B	B	A	A	C
	lysulphide	A	A	A	A	A	A	A	A	
	nitrate (nitrate of lime)	A	A	B	A	A	A	A	A	A
	silicate	A	A	-	A	A	-	A	A	
	sulphite	A	A	A	A	A	A	A	A	
	thiosulphate	B	A	A	A	A	A	A	A	
Caliche solution (Chile saltpetre)		A	A	B	A	A	A	A	A	

① depending of compound, we suggest to discuss with us!

② for virgin PTFE O-Rings and O-Rings covered with FEP and PFA

③ for metal O-Rings and C-Rings

A stable

B can be used (static applications)

C limited stability (use not recommended)

D not stable

		NBR	FPM	VMQ	EPDM	CR	MFQ	FFKM	FEP ^② FPA ^② PTFE ^③	Nichel alloy X-750 mat. nr. 2.4669 ^③
Caproic aldehyde (Hexanal)		-	D	B	B	-	D	A ^①	A	
Carbamates		D	A	-	B	B	A	A	-	
Carbitol/Diethylene glycol monoethyl ether		B	B	B	B	B	B	A	A	
Carbolic acid (phenol)		D	A	D	D	D	B	A	A	
Carbon dioxide	dry	A	B	B	B	B	B	A	-	A
	moist	A	B	B	B	B	B	A	-	
Carbon	disulphide	D	A	D	D	D	A	A	A	A
	monoxide	A	A	A	A	B	B	A	-	A
	tetrachloride	B	A	D	D	D	B	B	B	A
Carbonic acid		B	A	A	A	A	A	A	A	A
Castor oil		A	A	A	B	A	A	A	A	A
Cellosolve (Ethylene glycol ethyl ether)		D	D	D	B	D	D	A	A	
Cellosolve acetate		D	D	D	B	D	D	A	A	
Cetane (Hexadecane)		A	A	D	D	B	C	A	A	
Chloracetone		D	D	D	A	D	D	A	A	
Chlorax		B	A	-	B	B	A	A	A	
Chlordane		B	A	D	D	C	B	A	A	
Chlordecane		D	A	D	D	D	A	A	A	
Chloracetic acid		D	D	D	B	D	D	A	A	B
Chlorextol		B	A	D	D	B	B	A	A	
Chlorinated carbonic acid ethyl ester		D	A	D	D	D	B	A	A	
Chlorine dioxide		D	A	D	C	D	B	A	A	A
	8 % Cl as CaClO in solution	D	A	D	D	D	B	A	A	
Chlorine	dry	D	B	D	D	D	A	A	A	A
	moist	C	A	-	B	D	B	B	A	
	naphthaline	D	A	D	D	D	B	A	A	
	trifluoride	D	D	D	D	D	D	B	-	
	1-chlorine-1-nitroethane	D	D	D	D	D	D	A	A	
Chloroacetic acid		D	A	D	D	D	B	A	A	
Chlorobenzene (monochlorobenzene)		D	A	D	D	D	B	A	A	B
Chloroform (Trichloromethane)		D	A	D	D	D	B	A	A	A
Chloroprene		D	A	D	D	D	B	A	A	
Chlorosulphonic acid		D	D	D	D	D	D	A	A	B
Chlortoluene		D	A	D	D	D	B	A	A	
Chrome bath electrolyte		D	A	B	B	D	B	A	A	
Chromic alum		A	A	A	A	A	-	A	A	A
Citric acid		A	A	A	A	A	A	A	A	A
Cobalt chloride		A	A	B	A	A	A	A	-	
	2n	A	A	A	A	A	A	A	-	
Coconut oil		A	A	A	C	C	A	A	A	A
Cod liver oil		A	A	B	A	B	A	A	A	A
Coffee		A	A	A	A	A	A	A	A	A
Colamine (ethanolamine)		D	D	B	B	D	D	A ^①	A	
Coliche-solution		B	-	-	B	A	-	-	A	
Compressed air supply (oil-free)		A	A	A	A	A	A	A	A	A
Coolanal (Monsanto), Silicone oil		A	A	D	D	A	B	A	A	
Copper chloride		A	A	A	A	B	A	A	A	A
Copper cyanide		A	A	A	A	A	A	A	-	
Cotton seed oil		A	A	A	C	C	A	A	A	A
Creosote, carbolineum		A	A	D	D	B	A	A	A	A
Cresilic acid		D	A	D	D	D	B	-	A	
Crude oil		B	A	D	D	D	B	A	A	A

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C limited stability (use not recommended)

D not stable

	NBR	FPM	MVQ	EPDM	CR	MFQ	FFKM	FEP ^①	FPA ^②	PTFE ^③	Nichel alloy X-750 mat. nr. 2.4669 ^③
Cumene (isopropylbenzene)	D	A	D	D	D	B	A	-			
Cyclohexane	A	A	D	D	C	A	A	A			A
Cyclohexanol	A	A	D	D	B	A	A	A			
Cyclohexanon	D	D	D	B	D	D	A	A			

D

Decane	A	A	B	D	C	A	A	A			
Delco brake fluid	C	D	C	A	B	D	A	A			
Denatured alcohol	A	A	A	A	A	A	A	A			
Detergent dissolved in water	A	A	A	A	B	A	A	A			A
Developer (photo)	A	A	A	B	A	A	A	A			
Diacetone alcohol	D	D	D	A	D	D	A	A			
Diazinone (insecticide)	C	B	D	D	C	B	-	A			
Dibenzyl	ether	D	D	D	B	D	D	A	A		
	sebacate	D	B	C	B	D	C	A	A		
Dibromethyl benzol	D	A	D	D	D	B	A	A			
Dibromodifluoromethane	D	-	D	B	D	D	B	-			
Dibutyl	amine	D	D	C	D	C	D	A ^①	A		
	ether	D	C	D	C	D	C	A	A		
	phthalate	D	C	C	B	D	C	A	A		
	sebacate	D	B	B	B	D	B	A	A		
Dichlorobutane (Tetramethylene chloride)	B	A	D	D	D	B	A	A			
Dichloroisopropylether	D	C	D	C	D	C	A	A			
Dichloromethane (Methylene chloride)	D	B	D	D	D	B	A	A			
Dicyclohexylamine	C	D	D	D	D	D	A ^①	A			
Diesel fuel	A	A	D	D	C	A	A	A			A
Diethyl	ether	D	D	D	D	C	C	A	A		
	sebacate	D	B	B	B	D	B	A	A		
Diethylamine	B	D	B	B	B	D	A ^①	A			
Diethylene glycol	A	A	B	A	A	A	A	A			
Diisobutylene	B	A	D	D	D	C	A	A			
Diisooctyl sebacate	C	B	C	C	D	C	A	A			
Diisopropyl ketone	D	D	D	A	D	D	A	A			
Dilute nitric acid	3-molar	D	A	D	B	D	C	A	A		C
	concentrated	D	A	D	D	D	C	A	A		C
	red, fumingoooo	D	B	D	D	D	D	B	A		C
Dimethyl formamide (DMF)	C	D	B	B	C	D	A	A			
2,2-Dimethylbutane	A	A	D	D	B	A	A	A			
2,3-Dimethylbutane	A	A	D	D	B	A	A	A			
Dimethylether (Methylether)	A	A	A	A	C	A	A	A			
Dimethylhydrazine	B	D	D	A	B	D	A	A			
2,4-Dimethylpentane	A	A	D	D	B	C	A	A			
Dimethylphthalate	D	B	-	B	D	B	A	A			
Dinitrogen monoxide (laughing gas)	A	A	A	B	A	A	A	A			
Dinitrotoluene	D	D	D	D	D	D	A	-			
Dioctyl phthalate (DOP)	D	B	C	B	D	B	A	A			
Dioctyl sebacate (DOS)	D	B	C	B	D	C	A	A			
Dioxan	D	D	D	B	D	D	A	A			
Dioxolan	D	D	D	B	D	D	A	A			
Dipentene (paint solvent)	B	A	D	D	D	C	A	A			
Diphenyl (biphenyl)	D	A	D	D	D	B	A	A			
Diphenyl ether	D	A	C	D	D	B	A	A			A

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		NBR	FPM	MVG	EPDM	CR	MEQ	FFKM	FEP ^② FPA ^② PTFE ^③	Nichel alloy X-750 mat. nr. 2.4669 [®]
Dowtherm A thermal oil		D	A	D	D	D	B	A	A	
Dowtherm E thermal oil		D	A	D	D	D	B	A	A	
Drilling oil		A	A	D	D	B	A	A	A	
Dye solvent		D	B	D	D	D	B	A	A	

E

Electroplating solution	chrome	D	A	B	B	D	B	A	A	
	other metals	-	A	D	A	-	-	A	A	
Epichlorhydrin		D	D	D	B	D	D	A	A	A
Epoxy resins		-	D	-	A	A	-	A	A	
Ethan		A	A	D	D	B	B	A	A	A
Ethane		A	A	B	B	B	A	A	A	A
Ethane thiol		D	B	C	D	C	-	A	A	
Ethanol (ethyl alcohol)		A	C	A	A	A	A	A	A	A
Ethanolamine (Colamin)		B	D	B	B	B	D	A ^①	A	
Ether (various)		D	C	D	C	D	C	A	A	A
Ethyl	acetate	D	D	B	B	D	D	A	A	B
	acrylic acid	D	-	D	B	B	D	A ^①	A	
	alcohol (ethanol)	A	C	A	A	A	A	A	A	A
	benzoate	D	A	D	D	D	A	A	A	
	bromide	B	A	D	D	D	A	A	A	
	chloride	A	A	D	A	A	A	A	A	A
	cyclopentane	A	A	D	D	C	A	A	A	
	dichloride	D	B	D	D	D	B	A	A	
	ether	C	D	D	C	D	C	A	A	A
	oxalate	D	A	D	A	D	B	A	A	
	pentachlorobenzene	D	A	D	D	D	B	A	A	
silicate	A	A	B	A	A	A	A	A		
Ethylbenzene		D	A	D	A	D	A	A	A	A
Ethylcellulose		B	D	B	B	B	D	A	A	B
Ethylene	chlorhydrin	D	A	C	B	B	B	A	A	A
	dibromide	D	A	D	C	D	C	A	A	
	dichloride	D	A	D	C	D	C	A	A	A
	glycol (glycol)	A	A	A	A	A	A	A	A	B
	oxide	D	D	D	C	D	D	A ^①	A	A
	oxide (12 %) and Freon (80 %)	C	D	D	B	D	D	A ^①	A	
	trichloride («Tri»)	D	A	D	D	D	B	A	A	
2-ethyl-1-hexanol (Isooctanol)	A	A	B	A	A	A	A	A		
Ethylenediamine		A	D	A	A	A	D	A ^①	A	

F

Fatty acids		B	A	B	C	B	A	A	A	A
Fluorolub		A	B	A	A	A	B	-	-	
Formaldehyde		C	D	B	B	C	D	A ^①	A	A
Formic acid methylester		D	D	-	B	B	-	A	A	B
Freon	11	B	B	D	D	C	B	B	A	
	12	A	A	D	B	A	D	B	A	
	12 and ASTM oil no. 2 (50 : 50 mix)	B	A	D	D	C	B	B	A	
	12 and Suniso 4G (50 : 50 mix)	B	A	D	D	C	B	B	A	
	13	A	A	D	A	A	D	B	-	
	13 B1	A	A	D	A	A	B	B	-	
14	A	A	D	A	A	B	B	-		

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Freon	21	D	D	D	D	B	B	A	-	
	22	D	D	D	A	A	B	B	A	
	22 and ASTM oil no. 2 (50:50 mix)	D	B	D	D	B	B	B	A	
	31	D	D	D	A	A	B	B	-	
	32	A	D	D	A	A	B	B	-	
	112	B	A	D	D	B	B	B	-	
	113	A	B	D	D	A	D	B	A	
	114	A	A	D	A	A	B	B	-	
	114 B2	B	B	D	D	A	B	B	-	
	115	A	A	D	A	A	B	B	-	
	502	B	B	A	A	A	-	B	-	
	BF	B	A	D	D	B	-	B	-	
	C 318	A	B	D	A	A	B	B	-	
	K-142b	A	D	-	A	A	-	B	-	
	K-152a	A	D	-	A	A	-	B	-	
	MF	B	B	D	D	D	-	B	-	
PCA	A	B	D	D	A	-	B	-		
TF	A	B	D	D	A	D	A	A		
Fuel oil		A	A	D	D	B	A	A	A	A
Fumaric acid		A	B	D	D	B	D	A	A	
Fural (2-furaldehyde)		D	D	D	B	D	D	A ^①	A	B
Furan		D	D	D	D	D	D	A	A	
Furfur alcohol		D	D	D	B	D	D	A	A	
Furyl carbinol		D	-	D	B	D	D	-	A	

G

Gallic acid		B	A	A	B	B	A	A	A	
Gallotannic acid	tannin	A	A	B	A	B	A	A	A	
	10%	A	A	B	A	A	A	A	A	
Gear oil type A		A	A	B	D	B	A	A	A	
Gelatines		A	A	A	A	A	A	A	A	A
Generator gas		A	A	B	D	B	B	A	A	
Girling brake fluid		C	D	-	A	B	D	A	A	
Glacial acetic acid (100 % acetic acid)		B	D	B	B	D	D	A	A	
Glauber salt (Sodium sulphate)		D	A	A	B	B	A	A	A	
Glucose		A	A	A	A	A	A	A	A	A
Glycerine		A	A	A	A	A	A	A	A	A
	triacetate	B	D	B	A	B	D	A	A	
Glycol (ethylene glycol)		A	A	A	A	A	A	A	A	
Green Liquor		B	A	-	A	B	B	A	A	
Groundnut oil		A	A	A	C	C	A	A	A	A

H

Halon 1301		A	A	D	A	A	B	B	A	
Halothane (narcotic)		D	A	D	D	D	B	A	A	
Halowax oil		D	A	D	D	D	A	A	A	
Heavy water		A	A	A	A	B	A	A	A	
Helium		A	A	A	A	A	A	A	A	
n-heptane		A	A	D	D	B	A	A	A	
n-hexaldehyde		D	D	B	A	A	D	A ^①	A	
n-hexane		A	A	D	D	B	A	A	A	
1-n-hexene		B	A	D	D	B	A	A	-	

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Hexylalcohol		A	A	B	C	B	B	A	A	
Houghto-Safe	271 (water/glycol, HFC)	A	B	B	A	B	B	A	A	
	620 (water/glycol, HFC)	A	B	B	A	B	B	A	A	
	1010 (phosphate ester, HFD-R)	D	A	C	A	D	B	A	A	
	1055 (phosphate ester, HFD-R)	D	A	C	A	D	B	A	A	
	1120 (phosphate ester, HFD-R)	D	A	C	A	D	B	A	A	
	5040 (water/oil emulsion)	A	A	C	D	B	B	A	A	
Hydraulic fluid (mineral oil based)		A	A	B	D	B	A	A	A	A
Hydrazine		B	B	B	A	B	B	A	A	C
Hydrobromic acid		D	A	D	A	D	C	A	A	C
Hydrobromic acid 40%		D	A	D	A	D	C	A	A	C
Hydrochloric acid	3-molar	C	A	D	A	C	B	A	A	C
	concentrated	D	A	D	C	D	C	A	A	C
Hydrocyanic acid		B	A	C	A	B	B	A	A	B
	< 65% cold	C	A	D	A	A	D	A ^①	A	B
	> 65% cold	D	A	D	C	D	D	B	A	B
	< 65% hot	D	C	D	D	C	D	B	A	B
	> 65% hot	D	C	D	D	D	D	B	A	B
Hydrofluosilicic acid		B	A	D	A	B	D	B	B	
Hydrogen fluoride (hydrofluoric acid, anhydrous)		D	D	D	A	D	D	B	A	C
Hydrogen gas	cold	A	A	C	A	A	C	A	A	
	hot	A	A	C	A	A	C	A	A	
Hydrogen peroxide	90 %	D	A	B	C	D	B	A	A	B
	dilute	B	A	A	A	A	A	A	A	B
Hydrogen sulphide	dry, cold	A	D	C	A	A	C	A	A	B
	dry, hot	D	D	C	A	B	C	A	A	B
	moist, cold	D	D	C	A	A	C	A	A	B
	moist, hot	D	D	C	A	B	C	A	A	B
Hydroquinone		C	B	D	D	D	B	A	A	A
Hydyn		B	D	D	A	B	D	A	A	
I										
Iodine		B	A	-	B	D	A	A	A	
	pentafluoride	D	D	D	D	D	D	B	-	
Iron chloride		A	A	B	A	B	A	A	A	C
	nitrate	A	A	B	A	A	A	A	A	C
Isobutyl alcohol (isobutanol)		B	A	A	A	A	B	A	A	
Isobutyl-n-butyrate		D	A	-	A	D	A	A	A	
Isododecane		A	A	D	D	B	A	A	A	
Iso-octane		A	A	D	D	B	A	A	A	
Isophoron (ketone)		D	D	D	A	D	D	A	A	
Isopropanol (Isopropyl alcohol)		B	A	A	A	B	B	A	A	
Isopropyl	benzene	D	A	D	D	D	B	A	A	
	chloride	D	A	D	D	D	B	A	A	
Isopropylacetat		D	D	D	B	D	D	A	A	
Isopropylacetate		B	D	D	D	C	C	A	A	
Isopropylalkohol (Isopropanol)		B	A	A	A	B	B	A	A	
J										
JP 3 (MIL-J-5624)		A	A	D	D	D	A	A	A	
JP 4 (MIL-J-5624)		A	A	D	D	D	B	A	A	
JP 5 (MIL-J-5624)		A	A	D	D	D	B	A	A	

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JP 6 (MIL-J-5624)		A	A	D	D	D	B	A	A	
JP X (MIL-F-25604)		A	D	D	D	B	D	-	A	
K										
Kaliumcyanidoooo		A	A	A	A	A	A	A	A	B
Kerosine		A	A	D	D	B	A	A	A	A
L										
Lactams		D	D	-	B	B	D	A	-	
Lactic acid	cold	A	A	B	A	A	A	A	A	B
	hot	D	A	B	D	D	B	A	A	B
Lard, animal fat		A	A	B	B	B	A	A	A	A
Lavender oil		B	A	D	D	D	B	A	A	A
Lead	acetate (sugar of lead)	B	D	D	A	B	D	B	A	A
	nitrate	A	A	B	A	A	A	B	A	A
	sulphate	B	A	B	A	A	A	A	A	
Light crude oil (crude benzene)		A	A	D	D	B	A	A	A	A
Light lubricants		A	A	D	D	D	A	A	A	A
Lime milk		A	A	B	A	B	A	A	A	A
Linoleic acid		B	B	B	D	B	-	A	A	
Linseed oil		A	A	A	C	C	A	A	A	A
Liquid gas (Propane, Butane, Propylene)		A	A	C	D	B	C	A	A	
Liquimoly		A	A	D	D	B	A	A	A	
Lubricating oils	di-ester based	B	A	D	D	C	B	A	A	A
	petroleum based	A	A	D	D	B	A	A	A	A
	SAE 10, 20, 30, 40, 50	A	A	C	D	B	A	A	A	A
M										
Magnesium chloride		A	A	A	A	A	A	A	A	A
	hydroxide	B	A	A	A	B	A	A	A	A
	sulphate	A	A	A	A	A	A	A	A	A
Maize oil		A	A	A	C	C	A	A	A	A
Malathion (insecticide)		B	A	D	D	-	B	A	A	
Maleic acid		D	A	D	D	D	-	A	A	B
	anhydrous	D	D	-	B	D	-	A	A	
Malic acid		A	A	D	D	B	D	A	A	A
Mercury		A	A	A	A	A	A	A	A	A
Mercury	chloride	A	A	A	A	A	A	A	A	C
	vapour	A	A	A	A	A	-	A	A	
Mesityl oxide (ketone)		D	D	D	B	D	D	A	A	
Methacrylic acid		D	C	D	B	B	D	A	A	
Methane		A	A	D	D	B	B	A	A	A
Methyl	2-Methyl pentane	A	A	D	D	B	C	A	A	
	3-Methyl pentane	A	A	D	D	B	C	A	A	
	acetate	D	D	D	B	B	D	A	A	
	aceto acetate	D	D	B	B	D	D	A	A	
	alcohol (methanol)	A	D	A	A	A	A	A	A	A
	bromide	B	A	D	D	D	A	A	A	
	butyl ketone	D	D	D	A	D	D	A	A	
	carbonate	D	A	D	D	D	B	A	A	
	cellulose	B	D	B	B	B	D	A	A	
	chloride	D	A	D	C	D	B	A	A	A

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Methyl	chloroform	D	A	D	D	D	B	A	A	
	ether (dimethyl ether)	A	A	A	A	C	A	A	A	
	ethyl ketone (butanon, MEK)	D	D	D	A	D	D	A	A	B
	ethyl ketone peroxide	D	D	B	D	D	D	A ^①	A	
	glycol	C	D	D	B	C	D	A	A	
	isobutyl ketone (MIBK)	D	D	D	C	D	D	A	A	
	methacrylate	D	D	D	D	D	D	A ^①	-	
	oleate	D	A	-	B	D	B	A	A	
Methylaniline		D	B	-	D	D	-	A	A	
Methylcyclopentane		D	A	D	D	D	B	A	A	
Methylene chloride (dichloromethane)		D	B	D	D	D	B	A	A	
Methylisopropylketone		D	D	D	B	D	D	A	A	
Metilacrilato		D	D	D	B	B	D	A	-	
Milk		A	A	A	A	A	A	A	A	A
Mineral oils		A	A	B	D	B	A	A	A	A
Mixed amines		D	D	B	B	B	D	A ^①	A	
Molten sulphur		D	A	C	C	C	C	A	-	A
Monochlorobenzene (chlorobenzene)		D	A	D	D	D	B	A	A	B
Mopar brake fluid		C	D	C	A	B	D	A	A	

N

Naphtha		B	A	D	D	D	B	A	A	
Naphthaline		D	A	D	D	D	A	A	A	A
Naphthenic acid		B	A	D	D	D	A	A	A	A
Natural gas		A	A	A	D	A	C	A	A	A
n-Butyl benzoate		D	A	-	A	D	A	A	A	
Neat's foot oil		A	A	B	B	D	A	A	A	
Neon		A	A	A	A	A	A	A	A	
Neville and Winther's acid		D	A	D	B	D	B	A	A	
Nickel acetate		B	D	D	A	B	D	A	A	
	chloride	A	A	A	A	B	A	A	A	B
	sulphate	A	A	A	A	A	A	A	A	A
Nitrobenzene		D	B	D	D	D	D	A	A	B
Nitroethane		D	A	D	B	B	D	A	A	
Nitrogen		A	A	A	A	A	A	A	A	A
Nitromethane		D	A	D	B	C	D	A	A	
Nitropropane		D	A	D	B	D	D	A	A	
Nitrotoluene (40 % + dinitrotoluene 60 % mix)		D	C	D	D	D	C	A	A	
Non-mineral oil based brake fluid		C	D	C	A	B	D	A	A	A
n-propyl acetone		D	D	D	A	D	D	A	A	

O

Octachlorotoluene		D	A	D	D	D	B	A	A	
Octadecane		A	A	D	D	B	A	A	A	
Octyl alcohol		B	A	B	A	B	B	A	A	
Oleic acid		C	B	D	D	D	B	A	A	A
Oleum (fuming sulphuric acid)		D	A	D	D	D	D	A	A	A
Olive oil		A	A	A	B	B	A	A	A	
Ortho-chloroethyl benzene		D	A	D	D	D	B	A	A	
Orthochlorophenol		D	A	D	D	D	B	A	A	
Ortho-dichlorobenzene		D	A	D	D	D	B	A	A	
Ortho-n-octane		B	A	D	D	D	B	A	A	

① depending of compound, we suggest to discuss with us!

② for virgin PTFE O-Rings and O-Rings covered with FEP and PFA

③ for metal O-Rings and C-Rings

A stable

B can be used (static applications)

C limited stability (use not recommended)

D not stable

	NBR	FPM	MVQ	EPDM	CR	MFQ	FFKM	FEP ^① FPA ^② PTFE ^③	Nichel alloy X-750 mat. nr. 2.4669 ^③
Oxalic acid	B	A	B	A	B	A	A	A	B
Oxygen, liquid	D	D	D	D	D	D	A ^①	A	A
Ozone	D	A	A	A	C	A	A ^①	A	A
P									
Paint thinners	D	D	D	D	D	D	A	A	A
Paints	B	A	D	D	D	B	A	A	A
Palmitic acid	A	A	D	B	B	A	A	A	A
n-pentane	A	A	D	D	A	C	A	A	
Perchloric acid 2-molar	D	A	D	B	B	A	A	A	
Petrol	A	A	D	D	B	A	A	A	A
Phenol	D	A	D	D	D	B	A	A	A
Phenyl ethyl ether	D	D	D	D	D	D	A	-	
Phenylhydrazine	D	A	D	D	D	D	A	A	
Phoron	D	D	D	A	D	D	A	A	
Phosphate of calcium	A	A	A	A	B	A	A	A	
Phosphoric acid, 3-molar aqueous solution	D	A	B	A	C	B	A	A	A
Phosphoric acid, 3-molar concentrated molten	D	A	C	B	D	B	A	A	A
Phosphoric acid, 3-molar Phosphorous chloride	D	A	D	A	D	A	A	A	
Picric acid	aqueous solution	A	A	B	A	A	B	A	A
	molten	B	A	D	B	B	B	A	A
Pine oil	A	A	D	D	D	A	A	A	
Pinene	B	A	D	D	C	A	A	A	
Piperidine	D	D	D	D	D	D	A ^①	-	
Polyvinyl acetate emulsion	-	-	-	A	B	-	A	A	
Potassium	acetate	B	D	D	A	B	D	A	A
	chloride	A	A	A	A	A	A	A	A
	copper ferricyanide	A	A	A	A	A	A	A	A
	dichromate	A	A	A	A	A	A	A	B
	hydroxide solutions (dilute)	B	B	B	A	B	B	A	A
	hydroxide caustic potash 50 %	B	D	C	A	B	C	A	A
	nitrate	A	A	A	A	A	A	A	B
	sulphate	A	A	A	A	A	A	A	A
sulphite	A	A	A	A	A	A	A	A	
Prestune antifreeze	A	A	A	A	A	A	A	A	
Propane	A	A	D	D	B	B	A	A	A
Propionitrile	A	A	D	D	B	C	A	A	
Propyl	acetate	D	D	D	B	D	D	A	A
	alcohol (Propanol)	A	A	A	A	A	A	A	A
	nitrate	D	D	D	B	D	D	A	A
Propylene	D	A	D	D	D	B	A	A	A
Propylene oxide	D	D	D	B	D	D	A ^①	A	
Pyradine	D	D	D	B	D	D	A	A	A
Pyranol, transformer oil (postchlorinated biphenylene)	A	A	D	D	B	A	A	A	
Pyrolube	D	A	B	B	D	B	-	A	
Pyrrole	D	D	B	D	D	D	A	A	
R									
Radioactive radiation	C	D	C	C	C	D	-	D	
Rape oil	A	A	D	A	B	A	A	A	A

① depending of compound, we suggest to discuss with us!

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③ for metal O-Rings and C-Rings

A stable

B can be used (static applications)

C limited stability (use not recommended)

D not stable

		NBR	FPM	MVQ	EPDM	CR	MFQ	FFKM	FEP ^① FPA ^② PTFE ^③	Nichel alloy X-750 mat. nr. 2.4669 ^③
S										
Salicylic acid		B	A	A	A	A	A	A	A	B
Salts of	ammonium	A	B	B	A	B	B	A	A	B
	barium	A	A	A	A	A	A	A	A	
	calcium	A	A	B	A	A	A	A	A	
	copper	A	A	A	A	A	A	A	A	
	magnesium	A	A	A	A	A	A	A	A	A
	nickel	A	A	A	A	B	A	A	A	
	potassium	A	A	A	A	A	A	A	A	A
	sodium	A	A	A	A	B	A	A	A	A
	zinc	A	A	A	A	A	A	A	A	B
Seawater	containing chlorine and salt	D	A	D	D	D	A	A	A	
	salt water	A	A	A	A	A	A	A	A	A
Silicate ester		B	A	D	D	A	A	A	A	A
Silicone greases		A	A	D	A	A	A	A	A	A
Silicone oils		A	A	D	A	A	A	A	A	A
Silver nitrate		B	A	A	A	A	A	A	A	B
Soda (sodium carbonate)		A	A	A	A	A	A	A	A	A
Soapy water		A	A	A	A	B	A	A	A	A
Sodium	acetate	B	D	D	A	B	D	A	A	B
	bicarbonate (baking soda)	A	A	A	A	A	A	A	A	B
	bisulphate ^{oooo}	A	A	A	A	A	A	A	A	B
	borate (Borax)	A	A	A	A	A	A	A	A	
	carbonate (soda) ^{oooo}	A	A	A	A	A	A	A	A	B
	chloride (common salt)	A	A	A	A	A	A	A	A	B
	cyanide	A	A	A	A	A	A	A	A	
	hydroxide (caustic soda) 3 molar	B	B	A	A	B	B	A	A	A
	hypochlorite	C	A	C	C	B	B	A	A	A
	metaphosphate (Calgon)	A	A	-	A	B	A	A	A	A
	metasilicate	A	A	-	A	A	-	A	A	A
	nitrate (saltpetre)	B	A	D	A	B	A	A	A	A
	perborate	B	A	B	A	B	A	A	A	
	peroxide	B	A	D	A	B	A	A	A	B
	phosphate primary	A	A	D	A	B	A	A	A	A
	phosphate secondary	A	A	D	A	B	A	A	A	A
	phosphate tertiary	A	A	A	A	B	A	A	A	A
sulphate (Glauber's salt)	A	A	A	A	A	A	A	A	A	
sulphide	A	A	A	A	A	A	A	A	A	
sulphite	A	A	A	A	A	A	A	A		
thiosulphate (fixer)	B	A	A	A	A	A	A	A		
Soya oil		A	A	A	C	C	A	A	A	A
St										
Stannic chloride		A	A	B	A	D	A	A	A	
	50%	A	A	B	A	D	A	A	A	
Stannous chloride		A	A	B	A	A	A	A		
Steam	below 150°C	D	C	C	A	D	D	A	A	A
	above 150°C	D	D	D	B	D	D	A	A	A
Stearic acid		B	A	B	B	B	A	A	A	A
Styrene (monomer)		D	B	D	D	D	C	A ^①	A	
Sugar cane solution		A	A	A	A	A	A	A	A	A
Sugar solutions		A	A	A	A	B	A	A	A	A
Sugar-beet juice		A	A	A	A	B	A	A	A	A

① depending of compound, we suggest to discuss with us!

② for virgin PTFE O-Rings and O-Rings covered with FEP and PFA

③ for metal O-Rings and C-Rings

A stable

B can be used (static applications)

C limited stability (use not recommended)

D not stable

		NBR	FPM	MVQ	EPDM	CR	MFQ	FFKM	FEP ^① FPA ^② PTFE ^③	Nichel alloy X-750 mat. nr. 2.4669 ^③
Sulphur		D	A	B	A	A	A	A	A	A
Sulphur chloride	D	A	C	D	D	A	A	A	A	
Sulphur dioxide	aqueous	D	D	B	A	B	B	A	A	A
	dry	D	D	B	A	D	B	A	A	A
	liquid under pressure	D	D	B	A	D	B	A	A	
Sulphur hexafluoride		B	C	B	A	A	B	B	-	
Sulphur trioxide, dry		D	A	B	B	D	B	A	A	A
Sulphuric acid	3-molar	D	A	D	B	C	C	A	A	B
	concentrated	D	A	D	D	D	D	A	A	C
	fuming (20/25 % oleum)	D	A	D	D	D	D	A	A	C
Sulphurous acid		B	A	D	B	B	B	A	A	B
Supergrade petrol		A	A	D	D	B	B	A	A	A
T										
Tar (bituminous)		B	A	B	D	C	A	A	A	A
Tartaric acid		A	A	A	B	B	A	A	A	B
Tetrabromethane		D	A	D	D	D	B	A	A	
Tetrabutyl titanate		B	A	-	A	B	A	A	A	
Tetrachloroethylene (perchloroethylene dry cleaning fluid)		B	A	D	D	D	B	B	B	
Tetraethyl lead		B	A	D	D	B	D	A	A	
	chips	B	A	D	D	D	B	A	A	
Tetrahydrofuran		D	D	D	B	D	D	A	A	
Tetraline		D	A	D	D	D	A	A	A	
Titanium (IV) chloride		B	A	D	D	D	B	A	A	
Toluene		D	A	D	D	D	B	A	A	A
Toluylene diisocyanate		D	D	D	B	D	D	A	A	
Transformer oil		A	A	B	D	B	A	A	A	
Transmission fluid type A		A	A	B	D	B	A	A	A	
Triaryl phosphate		D	A	C	A	D	B	A	A	
Tributoxyethyl phosphate		D	A	-	A	D	B	A	A	
Tributyl	mercaptan	D	A	D	D	D	C	A	A	
	phosphate	D	D	D	A	D	D	A	A	
Trichloroacetic acid		B	C	C	B	D	D	A	A	A
Trichloroethane		D	A	D	D	D	B	A	A	A
Trichloroethylene (Trilene)		D	A	D	D	D	B	A	A	B
Trichloromethane (Chloroform)		D	A	D	D	D	B	A	A	
Triethanolamine		C	D	D	B	B	D	A ^①	A	
Trifluoroethane		D	A	D	D	D	B	B	A	
Trinitrotoluene		D	B	-	D	B	B	A	-	
Trioctyl phosphate		D	B	C	A	D	B	A	A	
Trionthocresylphosphate («TOCP»)		D	B	C	A	D	B	A	-	
Tripolyphosphate		D	B	C	A	C	A	A	A	
Tung oil (China wood oil)		A	A	D	D	B	B	A	A	
Turbine oil		A	A	D	D	D	A	A	A	
Turpentine		A	A	D	D	D	B	A	A	A
V										
Vaseline		A	A	D	D	B	A	A	A	
Vegetable oils		A	A	A	C	C	A	A	A	A
Vinegar (5% acetic acid)		B	A	A	A	B	C	A	A	A
Vinyl acetylene		A	A	B	A	B	-	A	A	

① depending of compound, we suggest to discuss with us!

② for virgin PTFE O-Rings and O-Rings covered with FEP and PFA

③ for metal O-Rings and C-Rings

A stable

B can be used (static applications)

C limited stability (use not recommended)

D not stable

	NBR	FPM	MVQ	EPDM	CR	MFQ	FFKM	FEP ^②	FPA ^②	PTFE ^③	Nichel alloy X-750 mat. nr. 2.4669 ^③
W											
Waste water	A	A	A	A	B	A	A	A	A		
Water (for industrial use) up to	70 °C	A	B	A	A	B	A	A	A		
	100 °C	B	B	B	A	C	C	A	A		
White oil	A	A	D	D	B	A	A	A			
White pine oil	B	A	D	D	D	A	A	A			
Wine and whisky	A	A	A	A	A	A	A	A			A
Wolman's salt (wood impregnation)?	A	A	A	A	B	A	A	A			
Wood oil	A	A	D	D	B	B	A	A			
Wood vinegar	D	D	-	B	D	D	A	A			
X											
Xenon	A	A	A	A	A	A	A	A			
Xylene	D	A	D	D	D	A	A	A			A
Xylidine (mixture of aromatic amines)	C	D	D	D	D	D	A ^①	A			
Z											
Zeolites	A	A	A	A	A	A	A	A			
Zinc acetate		B	D	D	A	B	D	A	A		
	chloride	A	A	A	A	A	A	A	A		A
	sulphate	A	A	A	A	A	A	A	A		B

① depending of compound, we suggest to discuss with us!

② for virgin PTFE O-Rings and O-Rings covered with FEP and PFA

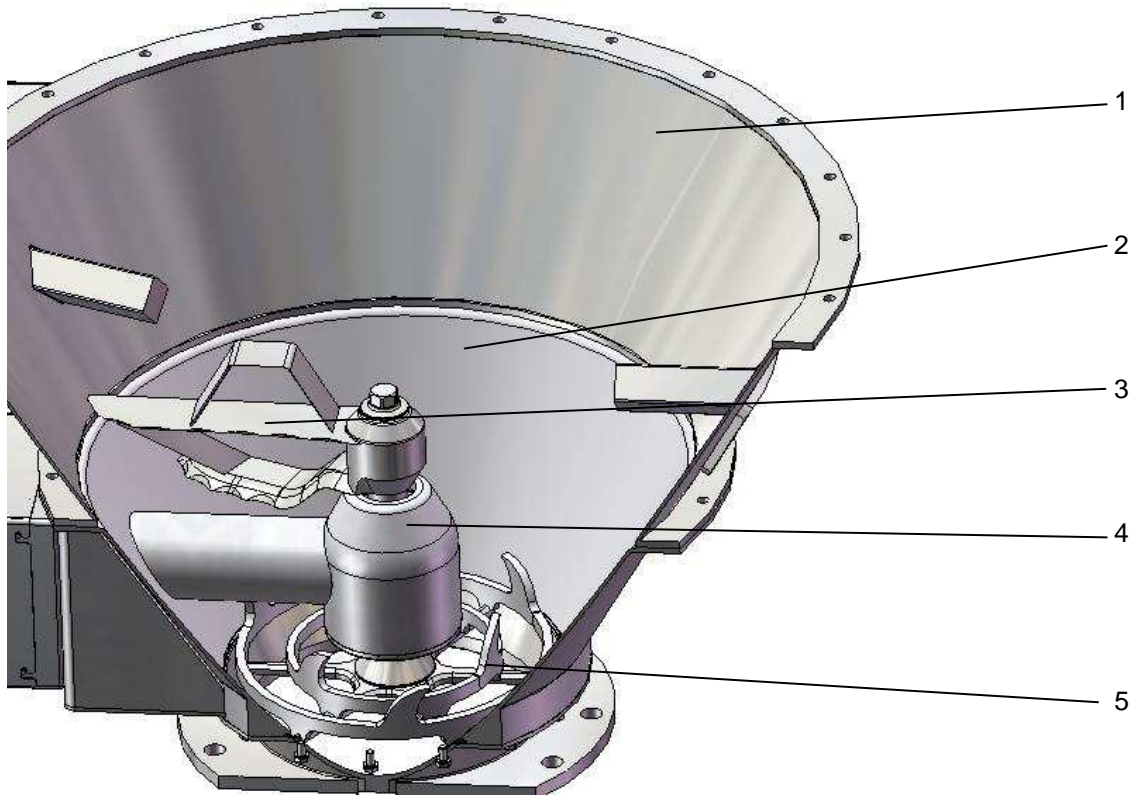
③ for metal O-Rings and C-Rings

A stable

B can be used (static applications)

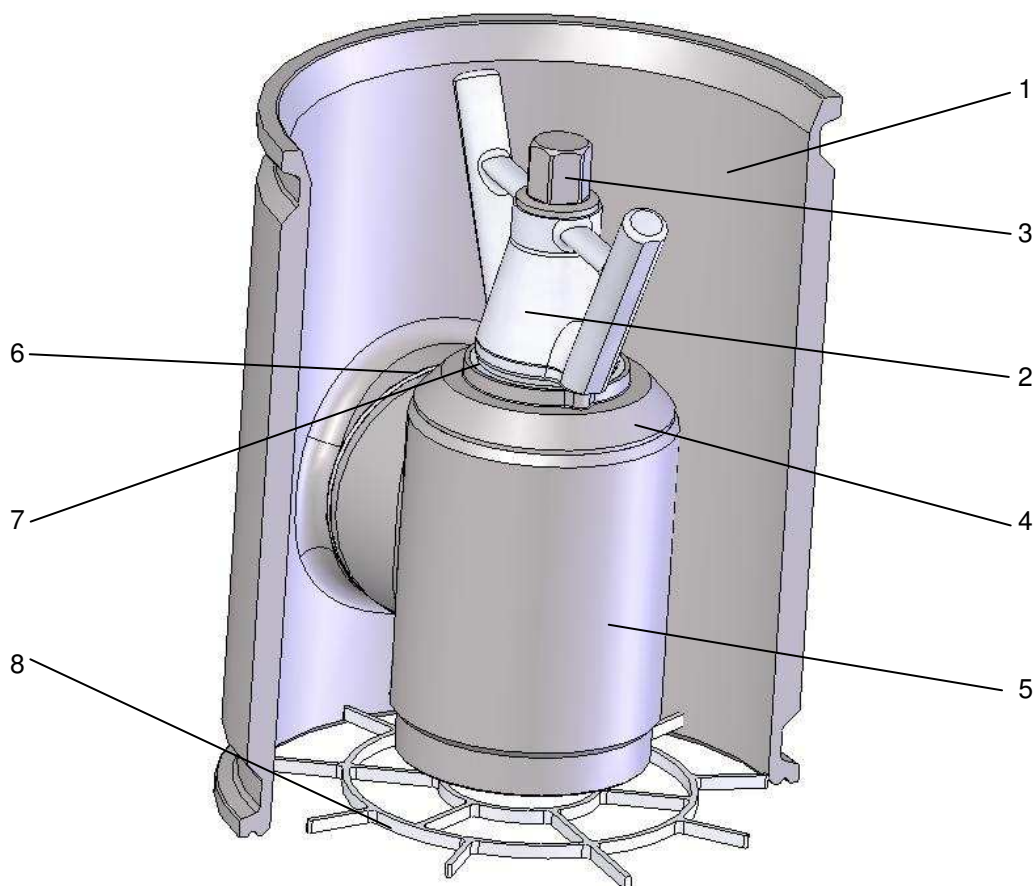
C limited stability (use not recommended)

D not stable

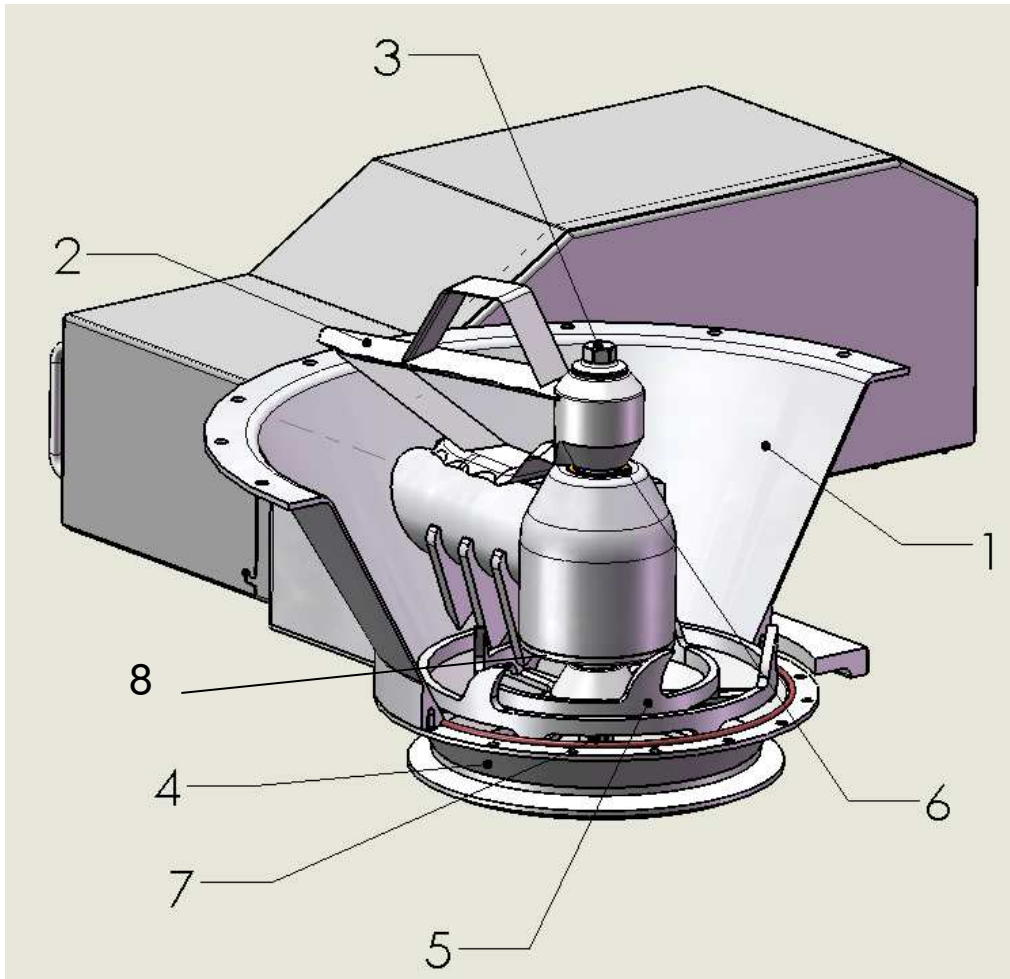


Pos.	Description / Bezeichnung / Description	Quantité Menge Quantity	Surface/cm ² Fläche Area
1	Entonnoir entrée / Einlauftrichter / Inlet funnel	1	6770
2	Bâti / Gehäuse / Housing	1	3902
3	Couteau supérieur / Oberes Messer / Upper knife	1	1271
4	Palier / Lager / Bearing	1	1672
5	Couteau intermédiaire / Mittels Messer / Intermediary knife	1	1554

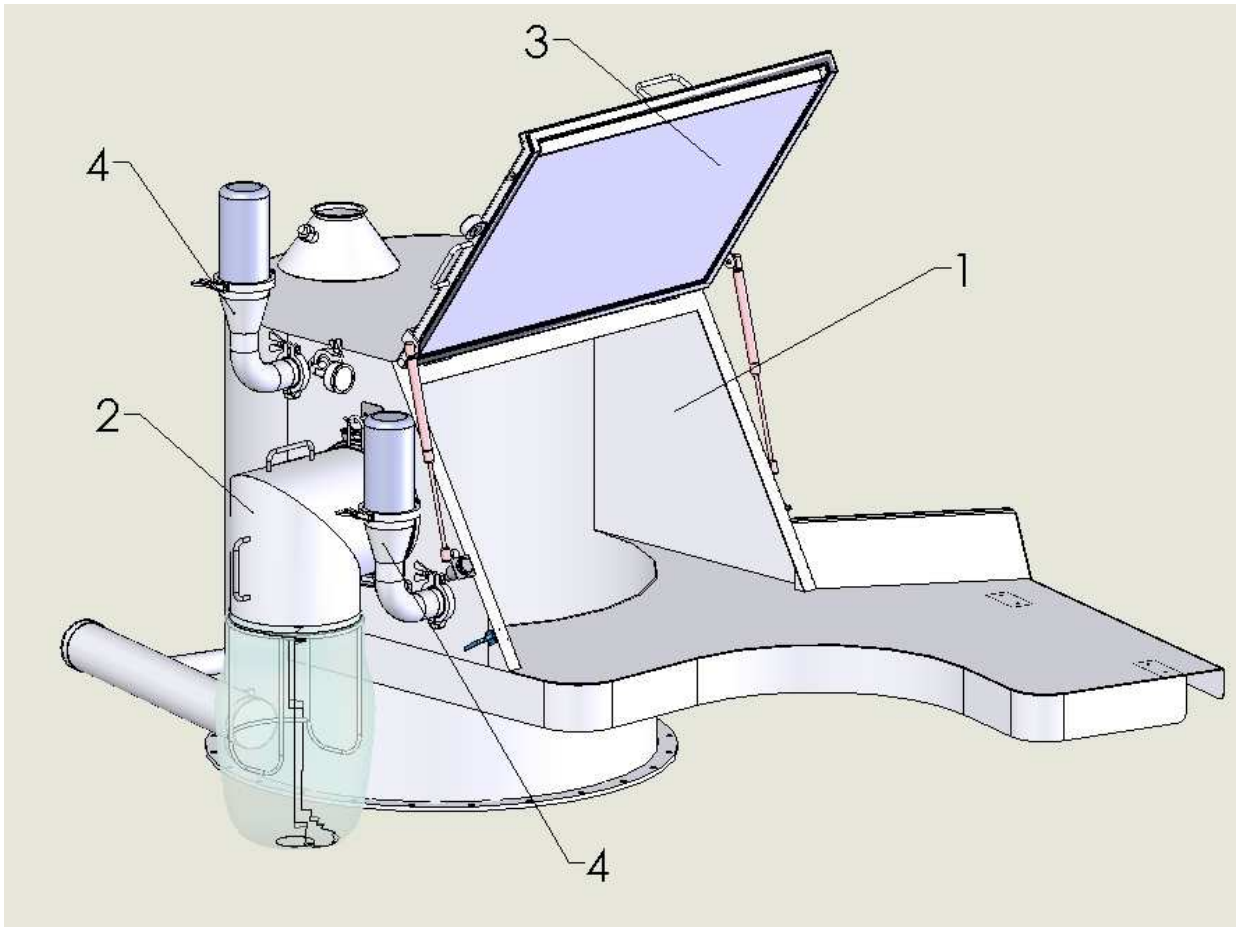
Total cm² 15169



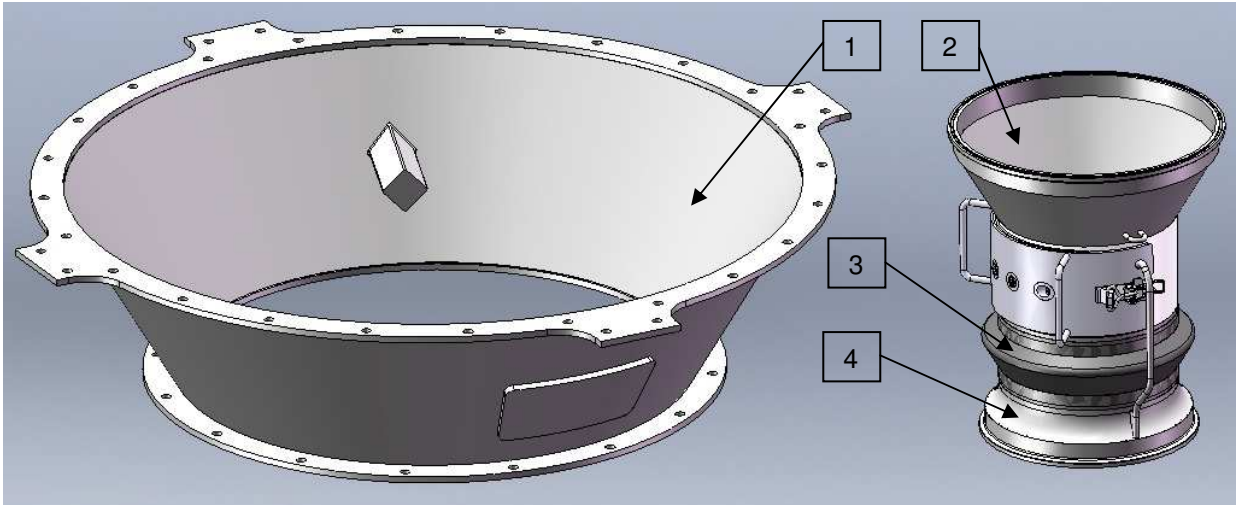
	1	Bâti / Gehäuse / Housing	1	3222
	2	Rotor / Rotor / Rotor	1	388
	3	Ecrou / Mutter / Nut	1	26.5
	4	Couvercle / Deckel / Cover	1	85.5
	5	Palier / Lager / Bearing	1	717.5
	6	Joint / Dichtung / seal	1	13.5
	7	Bague / Ring / Ring	1	6
Optional	8	Grille / Gitter / Grid	1	409
			Total cm²	4868



Pos.	Description / Bezeichnung / Description	Quantité Menge Quantity	Surface/cm ² Fläche Area
1	Bâti / Gehäuse / Housing	1	6059
2	Rotor / Rotor / Rotor	1	1273
3	Ecrou / Mutter / Nut	1	37.54
4	Couvercle / Deckel / Cover	1	815.9
5	Rotor / Rotor / Rotor	1	1517.5
6	Bague / Ring / Ring	1	2.6
7	Ecrou / Mutter / Nut	1	37.54
8	Couvercle / Deckel / Cover	1	173
Total cm²			9916.08



Pos.	Description / Bezeichnung / Description	Quantité Menge Quantity	Surface/cm ² Fläche Area
1	473648 : Housing	1	30235
2	473688 : Pipe	1	3371
3	473934 : Couver	1	6380
4	473706 : Elbow	2	1354
Total cm²			41340



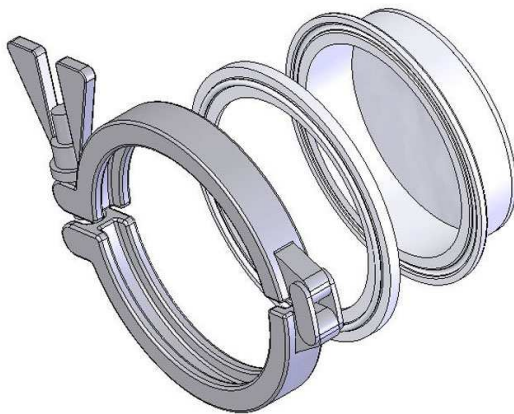
Pos.	Description / Bezeichnung / Description	Quantité Menge Quantity	Surface/cm ² Fläche Area
1	456221 : Frame	1	7039.3
2	464846 : Funel	1	3041.7
3	437890 : Flexible rubber	1	496.2
4	464847 : Funel	1	649.6
Total cm²			11226.8

L'équipement de nettoyage ne fait pas partie de la fourniture standard de l'installation. Vous pouvez les commander en indiquant le type de machine et le numéro de série à l'adresse indiquée à la fin de ce document.

Die Reinigungsausrüstung gehört nicht zur Standardausrüstung der Anlage. Sie können diese bestellen, indem Sie den Maschinentyp und die Seriennummer bei der unten aufgeführten Adresse dieses Dokuments angeben.

The cleaning equipment is not included as part of the installation standard supplies. You can order these pieces indicating the type of machine and the serial number at the address indicated at the end of this document.

Couvercle de fermeture du bras
 Abschlussdeckel des Armes
 Closing cover of the arm



	N° article
HammerWitt-Lab	443636
ConiWitt-150/200	
TurboWitt-C20	
ConiWitt-250	443642
TurboWitt-C25	

Bouchon de fermeture (pour sonde)
 Abschlussstopfen (für Fühler)
 Closing cap (for sensor)



	N° article
ConiWitt-150/200	445154
TurboWitt-C20	
ConiWitt-250	
TurboWitt-C25	

Tel: +41 26 460 74 15
 Fax +41 26 460 74 01
 E-mail: customerservice@frewitt.com

MAINTENANCE AND SUPPORT

Liste des lubrifiants utilisés et tableau de graissage.

Liste der angewendeten Schmiermittel und Schmier-Anweisung

Instruction and list of used lubricants and lubrication chart

Réducteur	Stirnradgetriebe	Gearbox
	M2-Q2-T4-F5-3-()	
Surfaces de friction	Gleitflächen	Frictions surfaces
	M3-Q4-T2-F2-()	
Entraînement	Antrieb	Drive
	M1-Q1-T1-F1-1-()	

	Mode de lubrification	Art der Schmierung	Type of lubrication
M1	Garnissage de graisse	Fettpackung	Packed grease
M2	Bain d'huile	Öelbad	Oil bath
M3	Application de graisse	Schmieranwendung	Grease application

	Qualité	Qualität	Quality
Q1	Graisse lubrifiante	Schmierfett	Lubricating grease
Q2	Huile	Getriebeöl	Gearbox oil
Q3	Huile haute pression	Hochdrucköl	High pressure oil
Q4	Pâte de montage	Montagepaste	Paste for assembly

	Type	Typ	Type
T1		Klübersynth UH1 14-151	
T2		Klüberpaste UH1 84-201	
T3		Klüberoil 4UH1-32 N	
T4		Klüberoil 4UH1-220 N	

	Fréquence [H]	Schmierfrequenz [H]	Frequency [H]
F1	Seulement en cas de remplacement entraînement / Nur bei Antriebswechsel / Only for drive change		
F2		4000	
F3		10000	
F4		16000	
F5	Lubrifié à vie	Immerwährende Einmalschmierung	Once for a life lubrication

	Quantité [cc]	Menge [cc]	Quantity [cc]
1		10	
2		700	
3		1200	

	Information complémentaire	Zusatzinformation	Additional information

M2 - Q2 - T4 - F4 - 2 - (ISO VG 220 DIN 51519)

Liste des lubrifiants utilisés et tableau de graissage.

Liste der angewendeten Schmiermittel und Schmier-Anweisung

Instruction and list of used lubricants and lubrication chart

Palier d'entraînement	Antriebslager	Drive bearing
M1-Q1-T1-F1-1-(ISO VG 68 DIN 51519)		
Surfaces de friction	Gleitflächen	Frictions surfaces
M2-Q2-T2-F2-2-()		

	Mode de lubrification	Art der Schmierung	Type of lubrication
M1	Bain d'huile	Oelbad	Oil bad
M2	Application de graisse	Schmieranwendung	Grease application

	Qualité	Qualität	Quality
Q1	Huile lubrifiante synthétique	Synthetisches Schmieroel	Synthetic lubricating oil
Q2	Pâte de montage	Montagepaste	Paste for assembly

	Type	Typ	Type
T1		Klüberoil 4 UH 1 68 N	
T2		Klüberpaste UH1 84-201	

	Fréquence [H]	Schmierfrequenz [H]	Frequency [H]
F1		A vie / lebenslänglich / for life	
F2		4000	

	Quantité [ml]	Menge [ml]	Quantity [ml]
1		CW-150 = 60 CW-200 = 85 CW-250 = 140	
2		---	

	Information complémentaire	Zusatzinformation	Additional information

M1 -
 Q1 -
 T1 -
 F1 -
 1 -
 (ISO VG 68 DIN 51519)

Pièces mécaniques / Mechanische Teile / Mecanical parts

Désignation Beschreibung Description	Fréquence de contrôle Kontrollhäufigkeit Frequency of control	Recommandation de changement Austauschempfehlung Recommendation of change
Palier Lager Bearing		~ 5000 h
Etoile élastomère (1) Stern des Kardansgelen (1) Elastomer star (1)	A chaque démontage Bei jeder Demontage To each disassembly	Selon l'état Je nach Abnutzung Depending on the condition
Cardan (1) Kardanwelle (1) Transmission (1)		
Clamp Klemme Clamp		

Joint / Dichtung / Seal

Désignation Beschreibung Description	Fréquence de contrôle Kontrollhäufigkeit Frequency of control	Recommandation de changement Austauschempfehlung Recommendation of change
Joint à lèvres Lippendichtung Lip gasket	A chaque nettoyage Nach jeder Reinigung To each cleaning	~ 1500 h
Joint plat Flachdichtung Flat gasket		Selon l'état Je nach Abnutzung Depending on the condition
Joint O-Ring O-Ringdichtung O-ring gasket		

Outillage / Werkzeuge / Tools

Désignation Beschreibung Description	Fréquence de contrôle Kontrollhäufigkeit Frequency of control	Recommandation de changement Austauschempfehlung Recommendation of change
Rotor	A chaque nettoyage Nach jeder Reinigung To each cleaning	Selon l'état Je nach Abnutzung Depending on the condition
Tamis (1) Siebtrommel (1) Screen (1)		
Râpe (1) Raspeltrommel (1) Grating (1)		
Couteau supérieur (2) Oberes Messer (2) Upper knife (2)		

Composants électriques / Elektrische Komponente / Electrical components

Désignation Beschreibung Description	Fréquence de contrôle Kontrollhäufigkeit Frequency of control	Recommandation de changement Austauschempfehlung Recommendation of change
Sécurité (accessoire entrée/sortie) Sicherheit (Einlauf/Auslaufsätze) Security (inlet/outlet funnel)	1 x par année 1 x pro Jahr 1 x per year	
Sonde température Temperaturfühler Temperature sensor		

Graissage / Schmierung / Lubrication

Selon chapitre 7 – Tableau de graissage
 Gemäss Kapitel 7 – Schmiertabelle
 According chapter 7 – Lubricating chart

Valable seulement pour / Gültig nur für / Valid only for

- (1) Module ConiWitt
- (2) Module ProFi-Sword

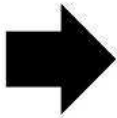
Restriction

Under no circumstances may the customer dismantle the drive of the ProFi-Sword module. Doing so will void the warranty. Contact customer service (see chapter 8 for addresses and phone numbers) if the unit requires maintenance work other than that described in this chapter.

Replacing the upper blade and its seals

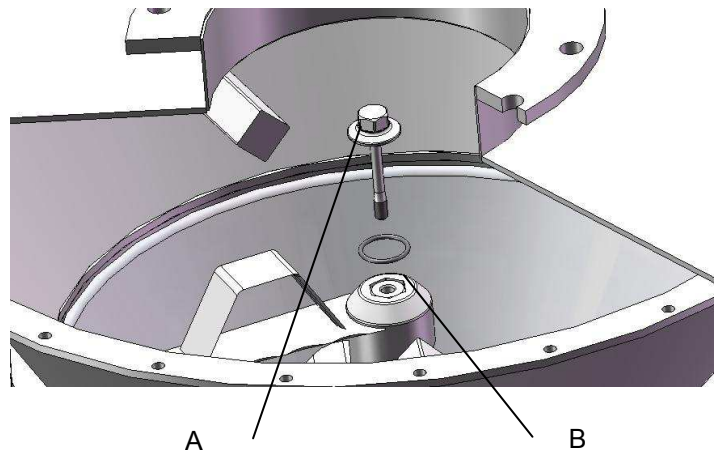


Before performing any work on this unit, it must be turned off and the electric and pneumatic lines must be disconnected. The operator is responsible for preventing any risks of contamination from the product.

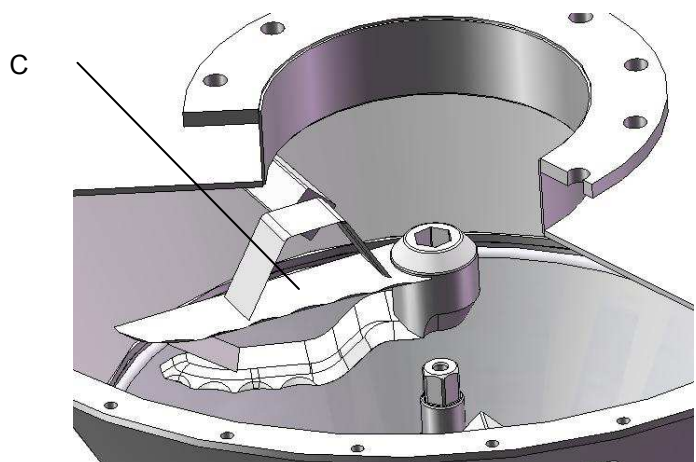


This operation requires complete access to the inlet of the ProFi-Sword module.

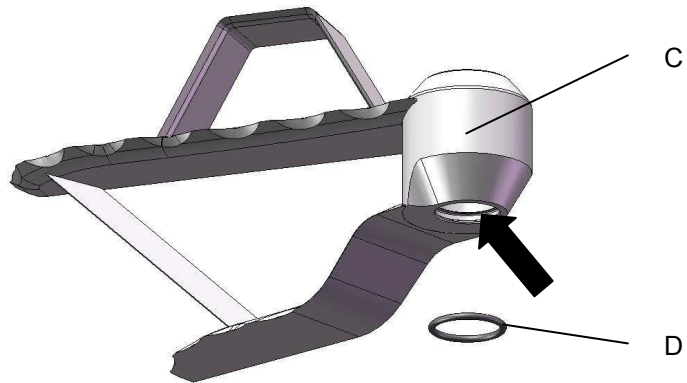
- Loosen the screw (A) by turning it counter-clockwise and remove it.
- Remove the seal (B)



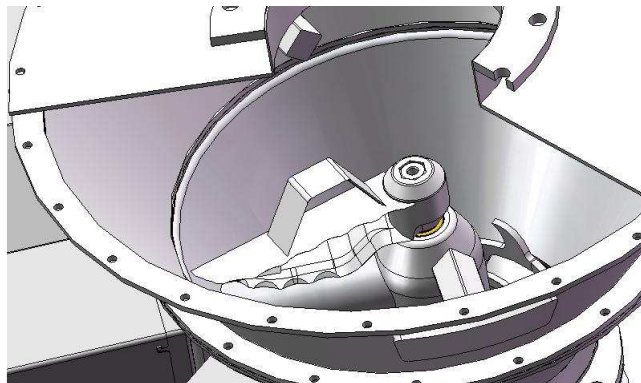
- Remove the blade (C)



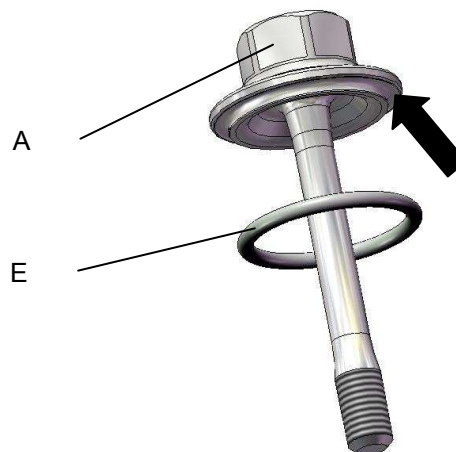
- Place the new seal (D) on the new blade (C)



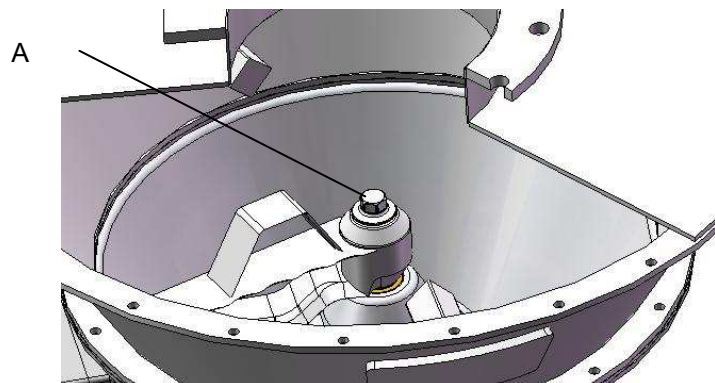
- Install the blade (C)



- Place the new seal (E) on the screw (A)



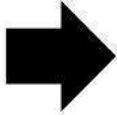
- Tighten the screw (A) by turning it clockwise to the torque specified in chapter 7 – Torques



Replacing the screw seal of the middle blade

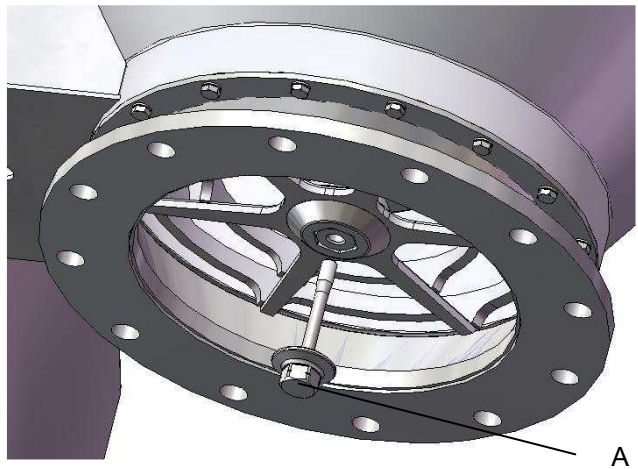


Before performing any work on this unit, it must be turned off and the electric and pneumatic lines must be disconnected. The operator is responsible for preventing any risks of contamination from the product.

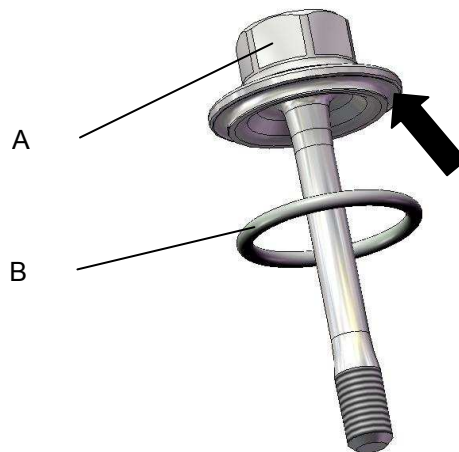


This operation requires complete access to the outlet of the ProFi-Sword module.

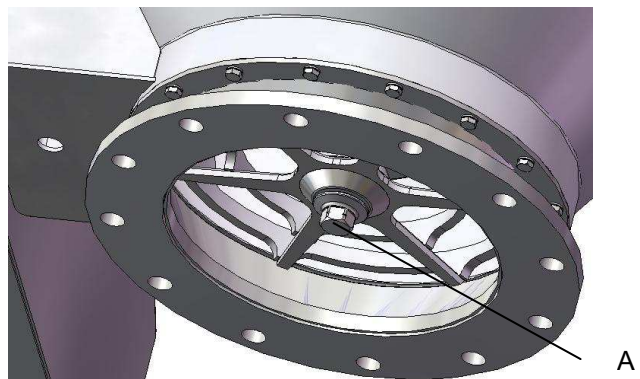
- Loosen the screw (A) **by turning it clockwise** and remove it



- Place the new seal (B) on the screw (A)



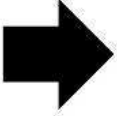
- Tighten the screw (A) **by turning it counter-clockwise** to the torque indicated in chapter 7 – Torques



Replacing the middle blade seal

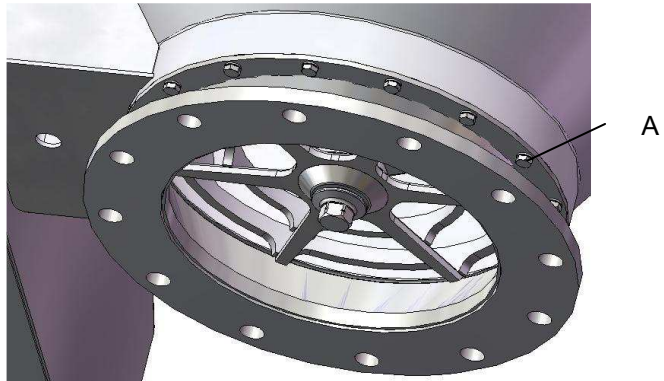


Before performing any work on this unit, it must be turned off and the electric and pneumatic lines must be disconnected.
The operator is responsible for preventing any risks of contamination from the product.

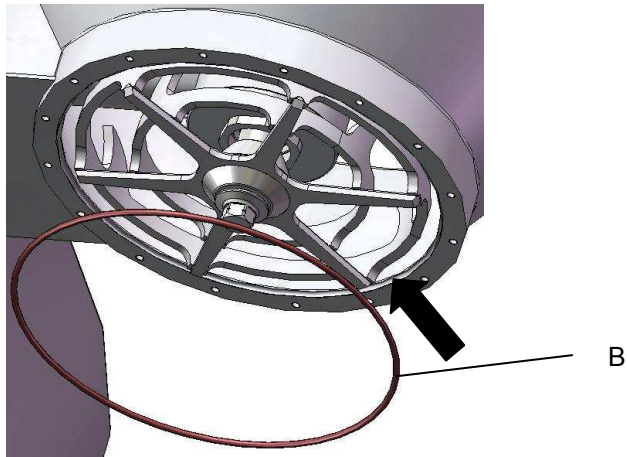


This operation requires complete access to the outlet of the ProFi-Sword module.

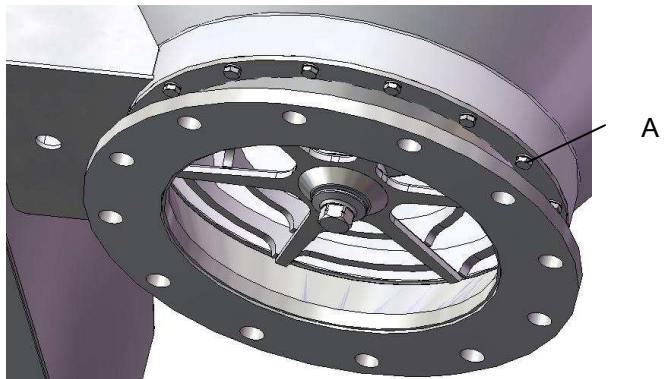
- Loosen and remove the screws (A)



- Remove the old seal and position the new seal (B) in its seating



- Tighten the screws (A) to the torque indicated in chapter 7 – Torques



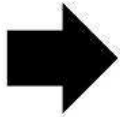
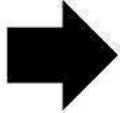
Replacing the lip seals



Before performing any work on this unit, it must be turned off and the electric and pneumatic lines must be disconnected.

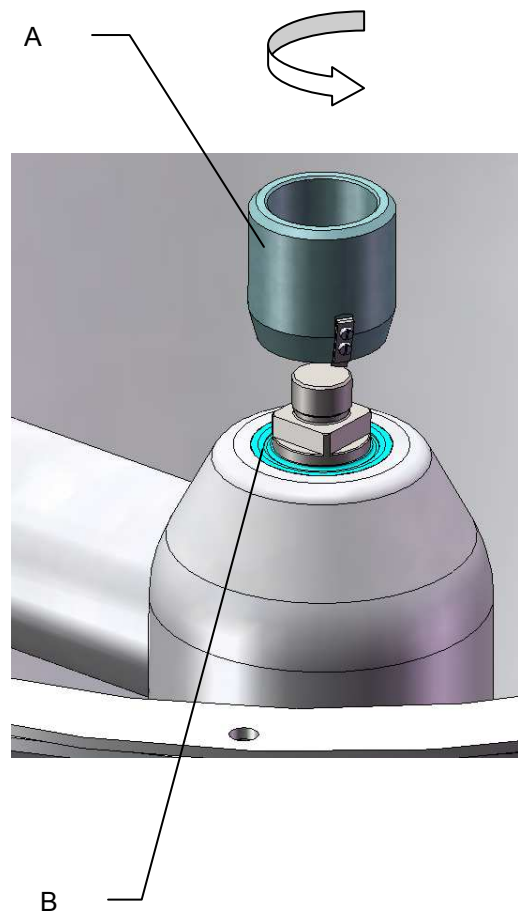
The operator is responsible for preventing any risks of contamination from the product.

This procedure applies to the 2 lip seals (upper and lower bearing). This operation requires complete access to both the inlet and the outlet of the ProFi-Sword module.

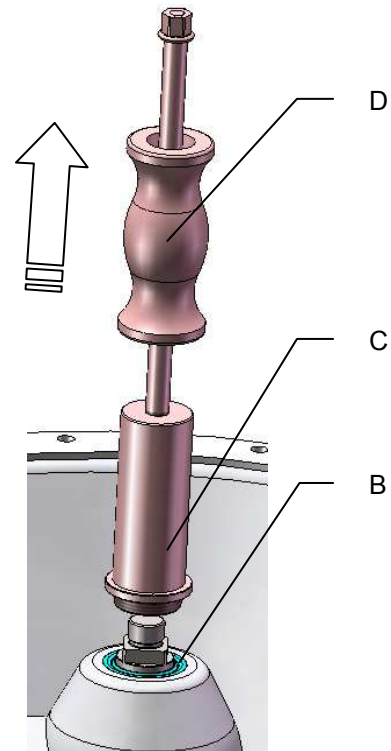


Tools for maintenance, see chapter 7 – Special tools

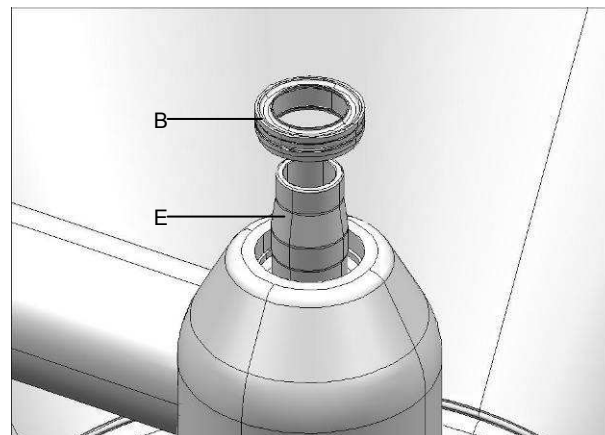
- Place the knife (A)
- Turn for cut the seal (B)



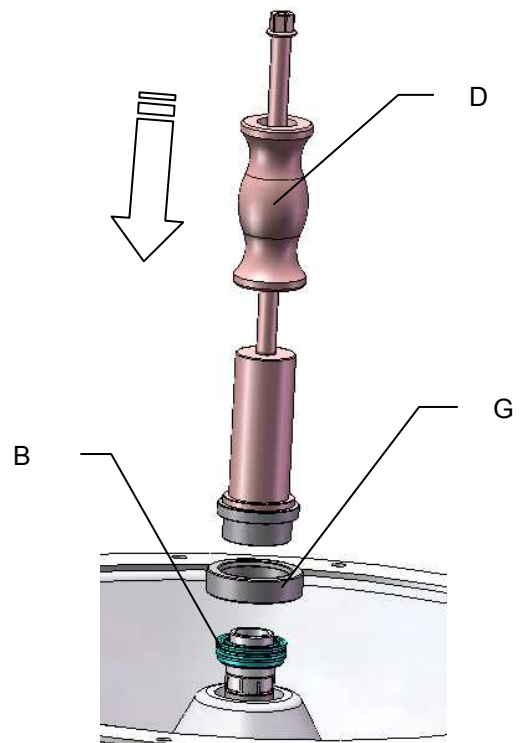
- Screw the extraction tool (C) in the seal (B)
- Pull out the seal (B) with the weight (D)



- Fit the assembly cone (E) onto the shaft
- Grease the surfaces of the new seal (B) around the O-ring
- Slide the new seal (B) onto the assembly cone (E) as far as possible, without forcing it



- Insert the ring (G) into the new seal (B)
- Insert the tool into the ring (G)
- Push the new seal (B) with the weight (D)



The procedure is the same for the second seal that is located in the lower part of the bearing

Voir documents suivants.

Siehe folgende Dokumente.

See following documents

Replacement of the double lip gasket of the bearing



Before performing any work on this unit, it must be shut down and disconnected from all electric and pneumatic power supplies.

The user must eliminate the risks of contamination by the product.



The replacement of the double lip gasket may only be performed by qualified maintenance personnel who possess the specific knowledge required for the job and who have read this instruction manual. They shall only use the proper tools.



The gasket (G) assures that the drive bearing remains sealed during the replacement of the double lip gasket (E).

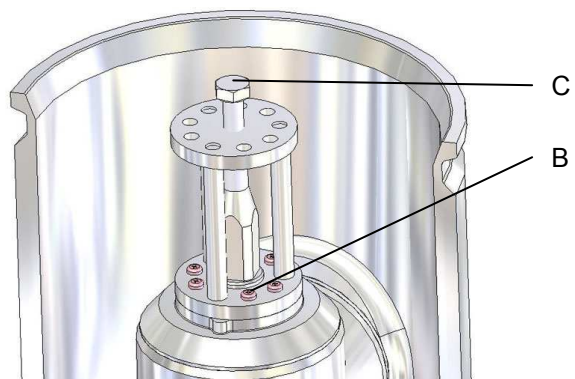
- Dismantle the equipment according to chapter 5 – Dismantling the equipment.



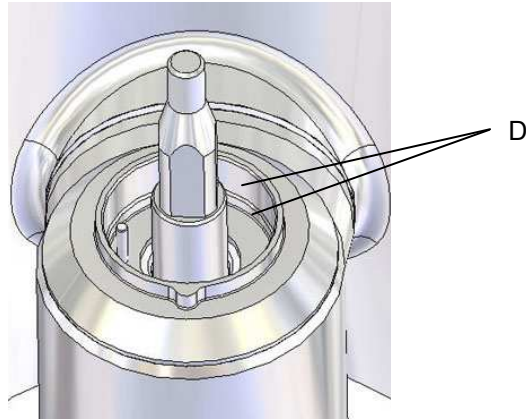
- Insert the seal extraction tool (A), see Section 7 – Special Tools.



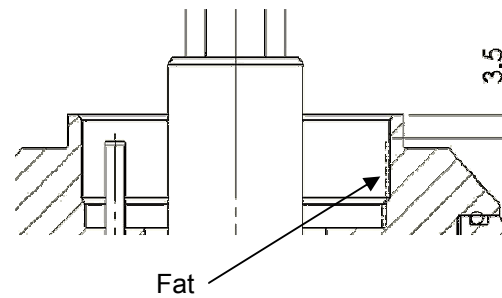
- Screw the screws (B) into the seal.
- Tighten the screw (C) to extract the seal.



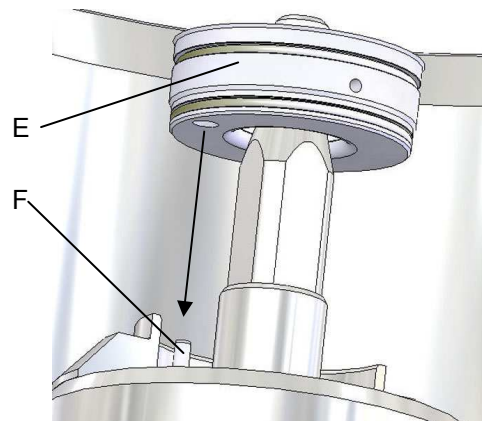
- Clean and degrease the surfaces (D).



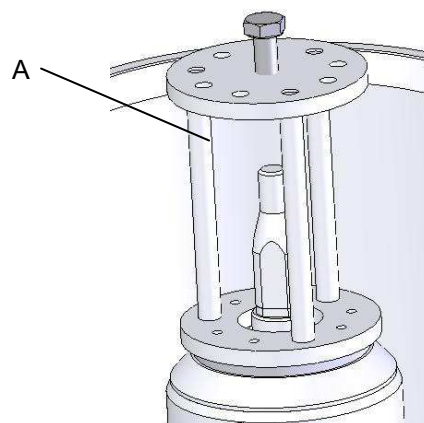
- Grease, according chapter 7 – Table of lubricating, the surface (D) at the distance shown on the sketch.



- Align the hole of the seal with the pin (F)
- Insert the new seal (E).



- Insert the seal extraction tool (A).
- Using a plastic hammer, carefully knock in the seal as far as it will go.



Replacement of the ConiWitt-150 drive bearing



Before performing any work on this unit, it must be shut down and disconnected from all electric and pneumatic power supplies.

The user must eliminate the risks of contamination by the product.



The drive bearing is considered a replacement part. The customer is not authorized to dismantle this element. The only piece that the customer may replace on this element is the double lip gasket.

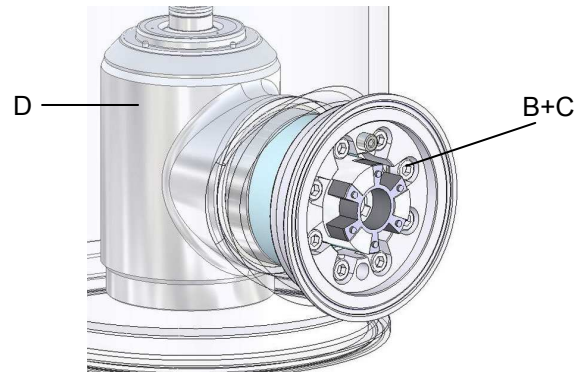


The replacement of the drive bearing may only be performed by qualified maintenance personnel who possess the specific knowledge required for the job and who have read this instruction manual. They shall only use the proper tools.

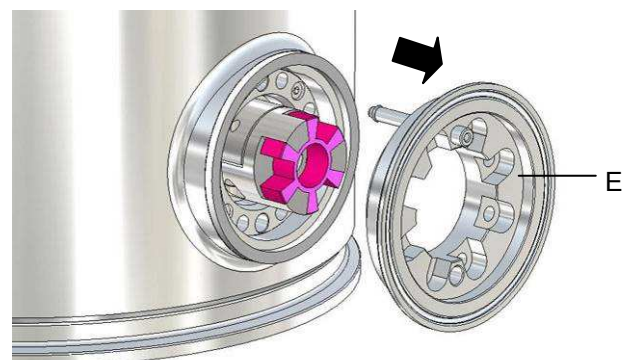
- Remove the ConiWitt case according to the instructions in chapter 5 – Removing the case.
- Remove the cleaning cover (A) from the case (if it is installed).



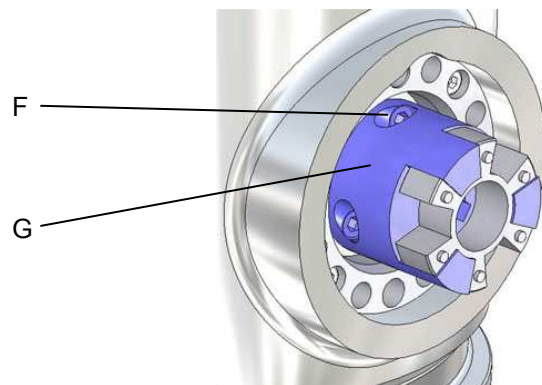
- While holding the drive bearing (D), unscrew and set aside the 8 bearing fastening screws (B) and their corresponding washers (C).



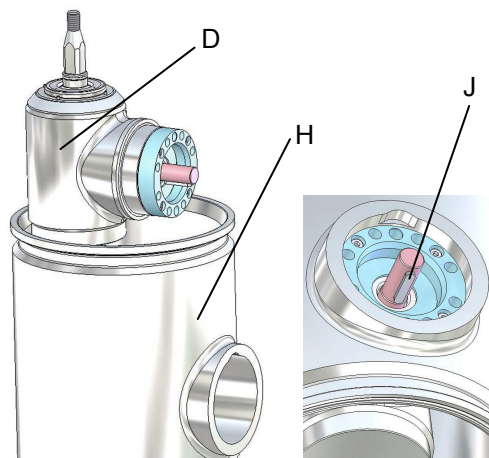
- Remove the case - bearing restraint (E) and clean it.



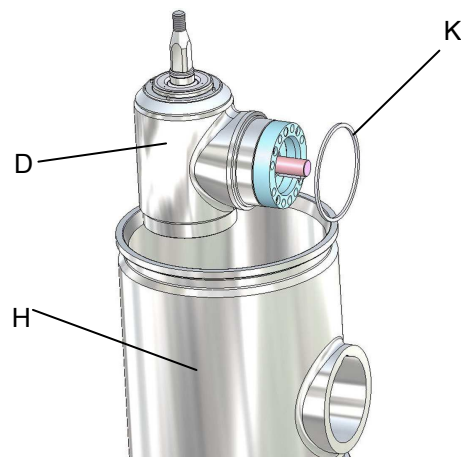
- Unscrew the 2 screws (F) with a shortened wrench (see chapter 7 – Special tools) and remove the hub (G).



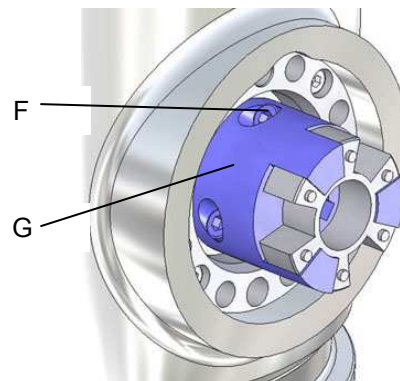
- Carefully remove the drive bearing (D) from the case (H). To make this operation easier, turn the key (J) so that it faces downward.
- Clean the case (H).



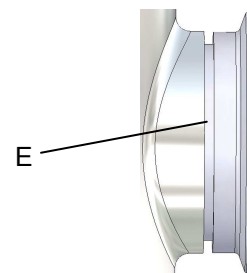
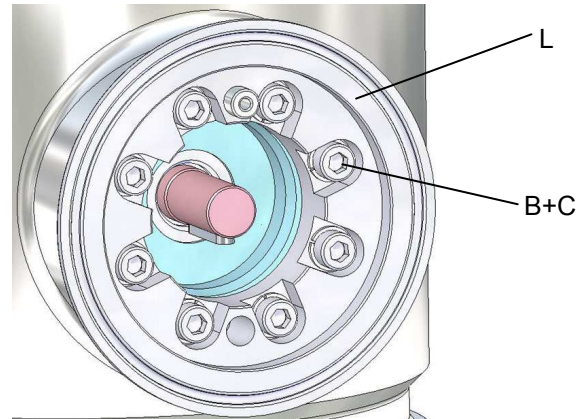
- Grasp the new drive bearing (D).
- Remove the gasket (K). The bearing should only be removed again and the gasket compressed one time.
- Insert the drive bearing (D) in the case (H), positioning the key towards the bottom.



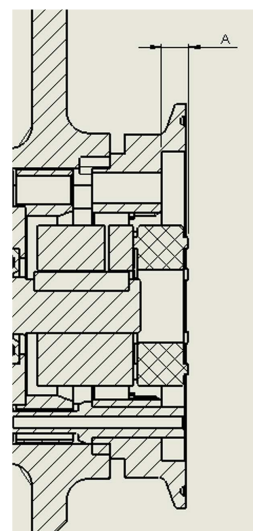
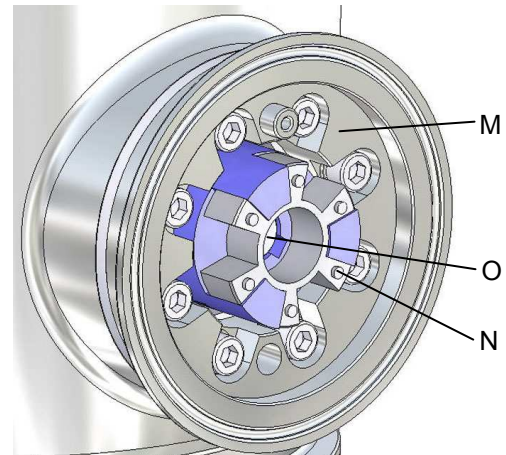
- Attach the hub (G) and screw in the 2 screws (F) with a shortened wrench (see chapter 7 – Special tools).



- Remove the gasket (L). The restraint should only be removed again and the gasket compressed one time.
- Attach the restraint (E).
- Insert the 8 bearing fastening screws (B) with their washers (C) and tighten them gently without jamming them.

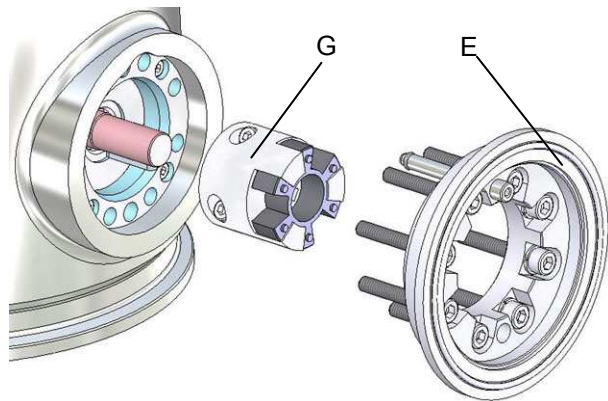


- Measure the distance between the support side (M) and the nipple of the elastomer star (N) on the new bearing.
- The correct distance is given in the sketch below.
- Because the hub must be positioned without the restraint, measure a reference distance, for example: the distance between the end of the shaft (O) and the nipple of the elastomer star (N).

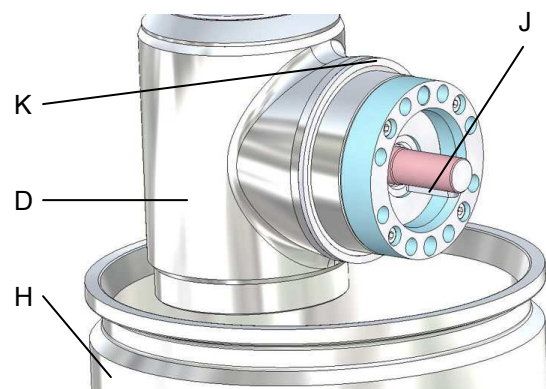


$$A = 7 \quad 0/+0.5$$

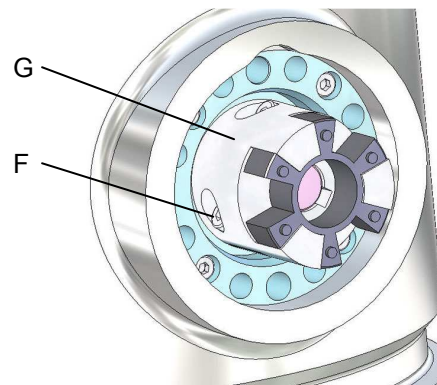
- Remove the case - bearing restraint (E).
- Remove the hub (G).



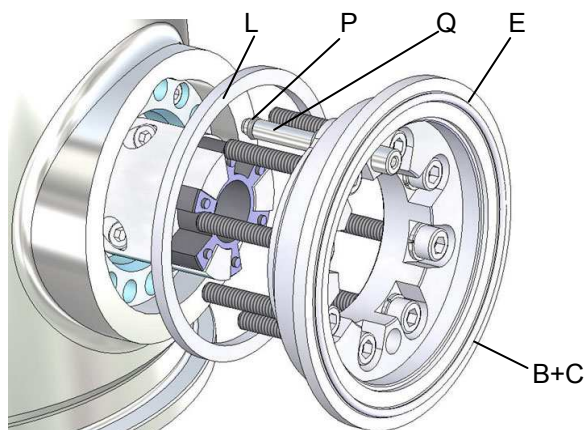
- Gently remove the drive bearing (D) from the case (H). To make this operation easier, turn the key (J) so that it is facing downward.
- Insert the gasket (K).
- Insert the bearing (D) in the case (H).



- Attach the hub (G)
- Adjust the reference distance, taking the difference between the value measured previously and the correct value into account.
- Tighten the screws (F) with a shortened wrench (see chapter 7 – Special tools).



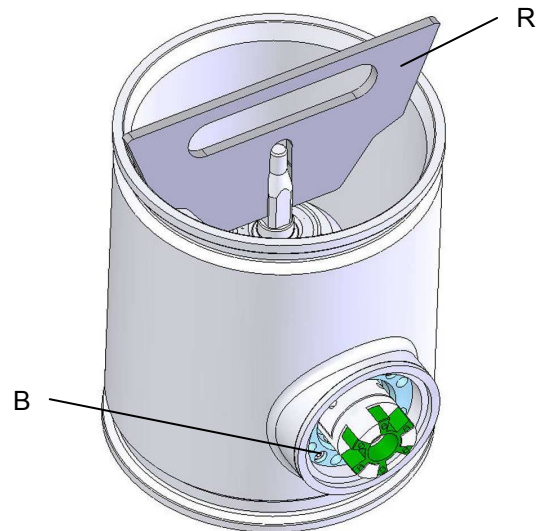
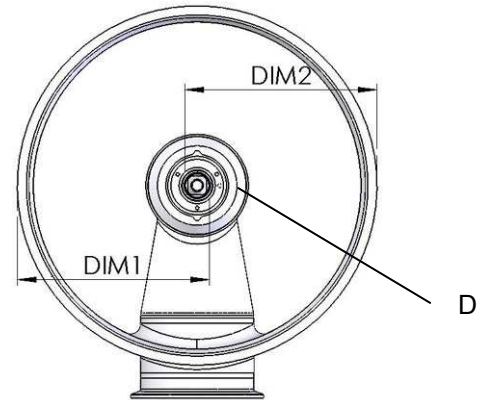
- Insert the gasket (L) on the restraint (E).
- Make sure that there is an O-ring gasket (P) on the inertization tube (Q) and that it is in good condition.
- Insert the screws (B) and the washers (C) in the restraint (E).
- Assemble the restraint (E) in the drive bearing (D).
- Gently screw in the screws (B) without jamming them.



- Center the bearing (D). To do so, take two measurements (DIM1 and DIM2) with the aid of a gauge, as shown in the drawing to the right. The difference between the two measurements must not exceed 0.1 mm.

or

- To use the centring device of bearing (R) (see chapter 7 - special Tools).
- Tighten the 8 bearing fastening screws (B), applying a torque as specified in chapter 7 – Tightening torques.
- Attach the case according to the instructions in chapter 5 – Attaching the case.



Replacement of the ConiWitt-200/250 drive bearing



Before performing any work on this unit, it must be shut down and disconnected from all electric and pneumatic power supplies. The user must eliminate the risks of contamination by the product.

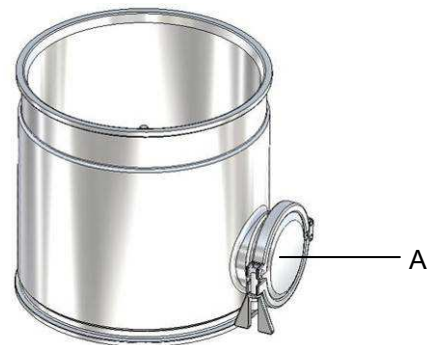


The drive bearing is considered a replacement part. The customer is not authorized to dismantle this element. The only piece that the customer may replace on this element is the double lip gasket.

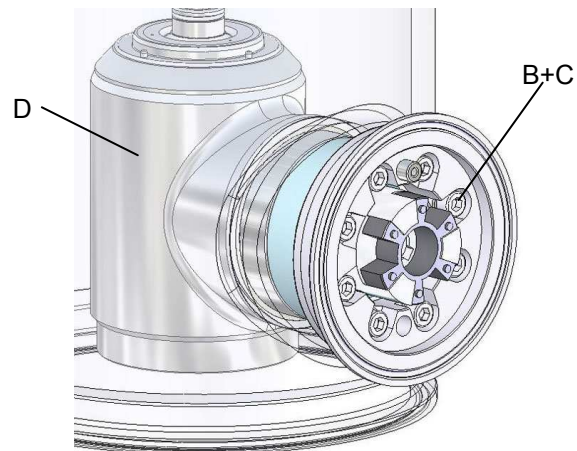


The replacement of the drive bearing may only be performed by qualified maintenance personnel who possess the specific knowledge required for the job and who have read this instruction manual. They shall only use the proper tools.

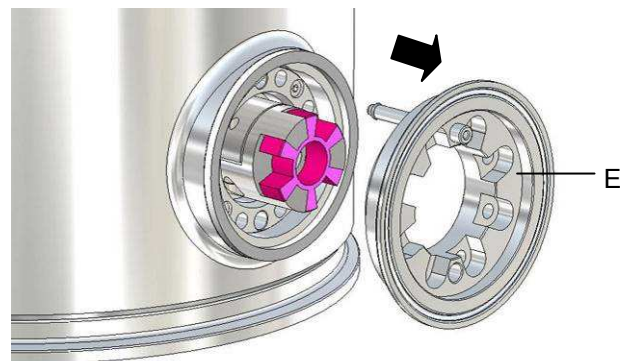
- Remove the ConiWitt case according to the instructions in chapter 5 – Removing the case.
- Remove the cleaning cover (A) [sic] from the case (if it is installed).



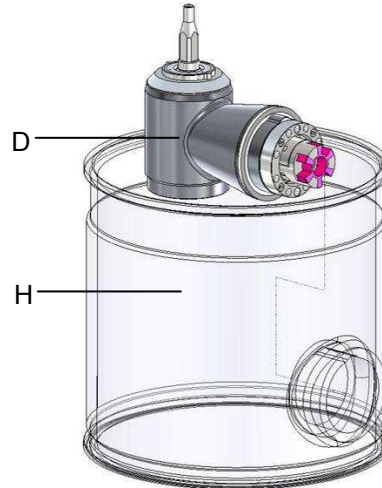
- While holding the drive bearing (D), unscrew and set aside the 8 bearing fastening screws (B) and their corresponding washers (C).



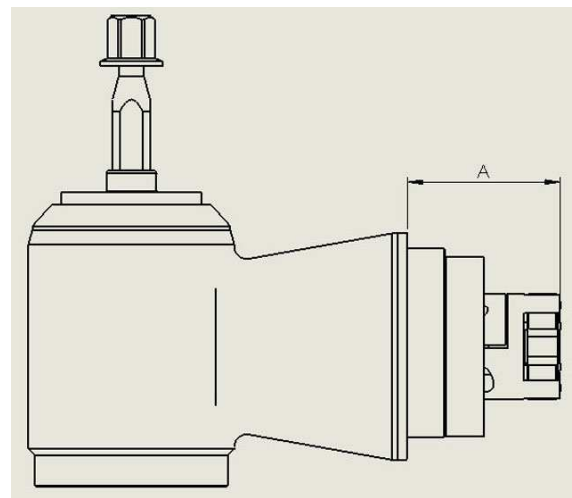
- Remove the case - bearing restraint (E).



- Carefully remove the drive bearing (D) from the case (H).
- Clean the case (H) and the case - bearing restraint (E).

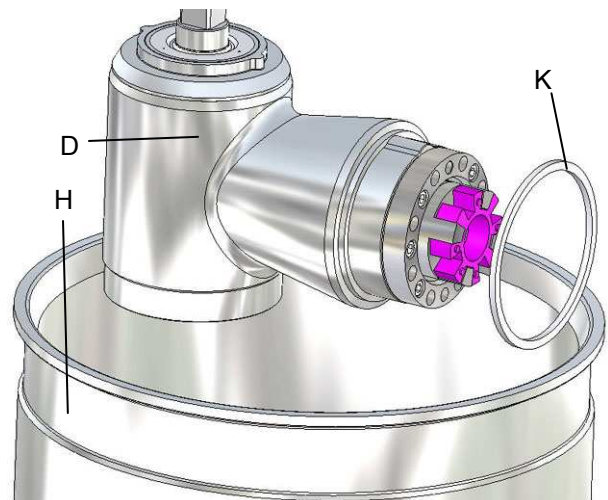


- Grasp the new drive bearing (D).
- Remove the gasket (K).
- Check the distance A.
- If necessary, correct this distance.

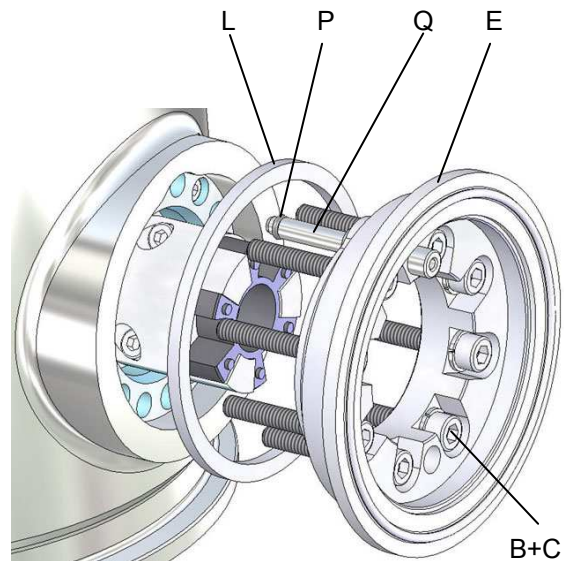


	ConiWitt-200	ConiWitt-250
A	60.9 0/+0.2	61.4 0/+0.2

- Grasp the new bearing (D).
- Insert the gasket (K).
- Insert the bearing (D) in the case (H).

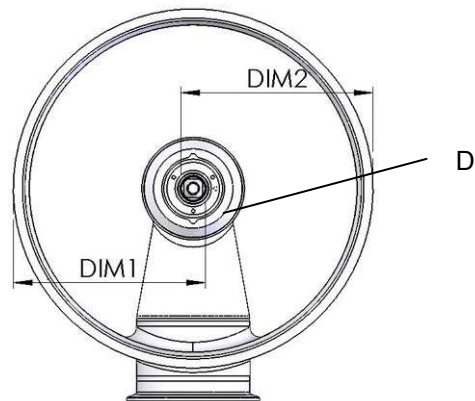


- Insert the gasket (L) on the restraint (E)
- Check to make sure there is an O-ring gasket (P) on the inertization tube (Q) and that it is in good condition.
- Insert the screws (B) and the washers (C) in the restraint (E)
- Assemble the restraint (E) in the drive bearing (D).
- Gently screw in the screws (B) without jamming them.



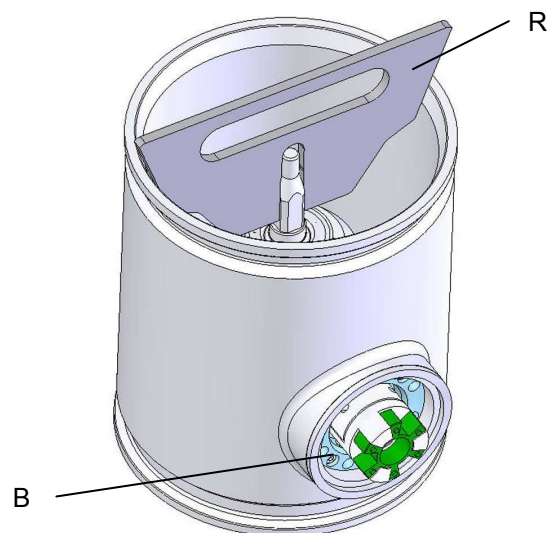
- Center the bearing (D). To do so, take two measurements (DIM1 and DIM2) with the aid of a gauge, as shown in the drawing to the right. The difference between the two measurements must not exceed 0.1 mm.

or



- To use the centring device of bearing (R) (see chapter 7 - special Tools)

- Tighten the 8 bearing fastening screws (B), applying a torque as specified in chapter 7 – Tightening torques.
- Attach the case according to the instructions in chapter 5 – Attaching the case.



Replacing the bearing temperature sensor

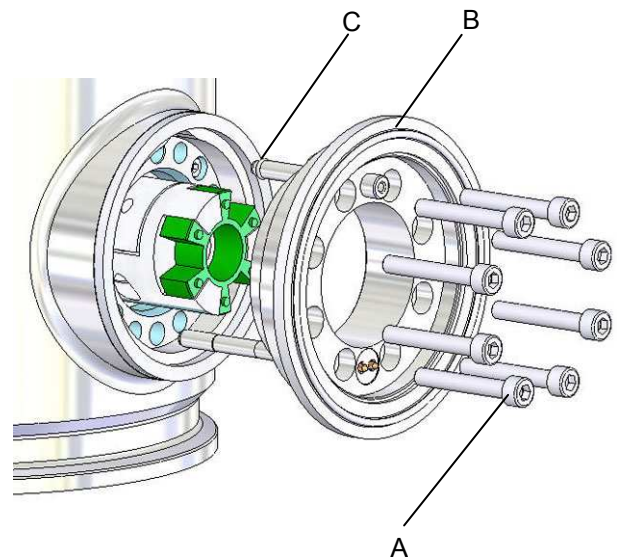


Before performing any work on this unit, it must be shut down and disconnected from all electric and pneumatic power supplies.
The user must eliminate the risks of contamination by the product.



The checking and replacing of the temperature sensor may only be performed by qualified maintenance personnel who possess the specific knowledge required for the task and who have read this instruction manual. They shall only use the proper tools.

- Remove the inlet/outlet funnels according chapter 5 – Removing the inlet/outlet funnels.
- Remove the housing according chapter 5 – Dismantling the housing.
- Unscrew the screws (A).
- Pull out the complete flange (B).
- Check the presence of the seal (C) on the new flange.
- Insert delicately the new flange (B) into the drive bearing.
- Tighten the screws (A) to the torque specified in chapter 7 – Torques.



Checking and replacing the elastomer stars of the universal joint



Before performing any work on this unit, it must be shut down and disconnected from all electric and pneumatic power supplies.

The user must eliminate the risks of contamination by the product.



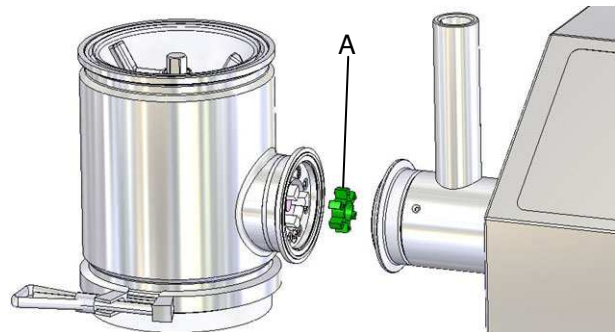
The checking and replacing of the elastomer stars of the universal joint may only be performed by qualified maintenance personnel who possess the specific knowledge required for the task and who have read this instruction manual. They shall only use the proper tools.



A check of the elastomer stars is recommended every 500 hours.

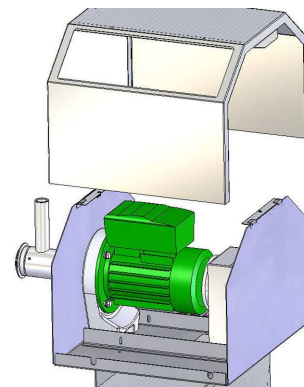
Checking the elastomer stars

- Remove the case according to the instructions in chapter 5 – Removing the case.
- Remove and visually check the universal joint elastomer star (A) on the case side.
- If the universal joint elastomer star (A) shows significant signs of wear or damage, the universal joint elastomer star (A) on the case side **and** the universal joint elastomer star (A) on the motor side must be replaced, according to the following instructions.

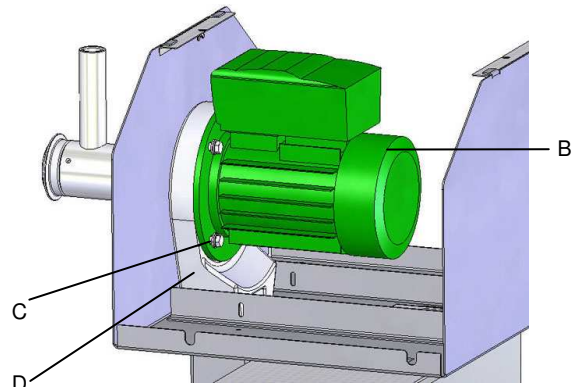


Replacement of the elastomer stars

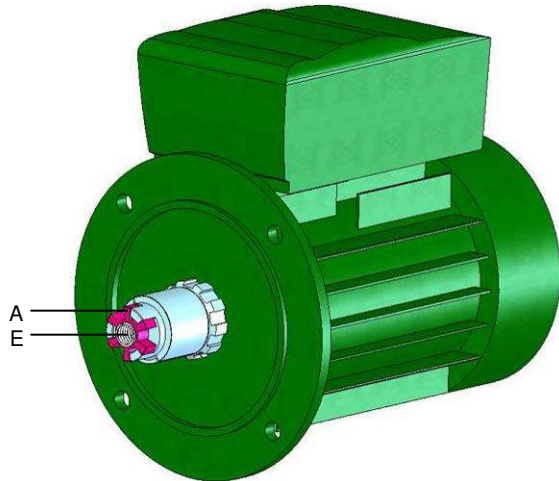
- Remove the housing according chapter 5 - Dismantling the housing.
- Remove the protective casing according chapter 5 – Dismantling the protective casing.



- Support the drive motor (B) (May vary, depending on the design of the unit) with a jacking device suited for this purpose.
- Loosen and remove the drive motor fastening screws (C).
- Gently free the drive motor (B) from the motor support (D).



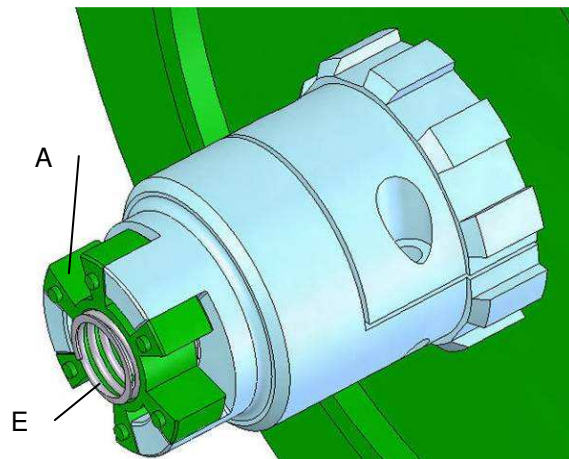
- Remove the elastomer star (A) and the contact spring (E).
- Clean the coupling.



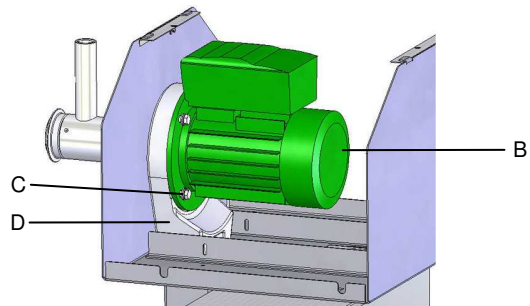
- Fit the elastomer star (A).
- Fit the contact spring (E).



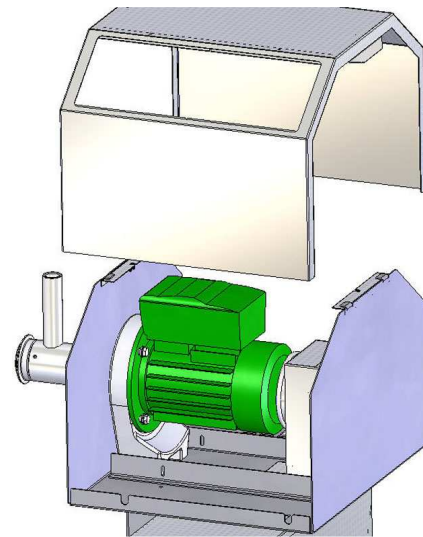
The spring (G) earths the drive system.
Check that it is in place and fitted correctly.



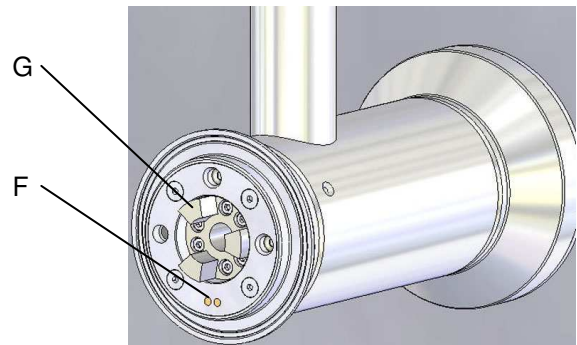
- Place the drive motor (B) in position against the motor support (D).
- Lubricate and screw in the 4 motor fastening screws (C) without forgetting a flat washer and a spring washer for each screw.
- Tighten the 4 motor fastening screws (C), applying a torque as specified in chapter 7 – Tightening torques.



- Assemble the protective casing according chapter 5 – Assembling the protective casing.

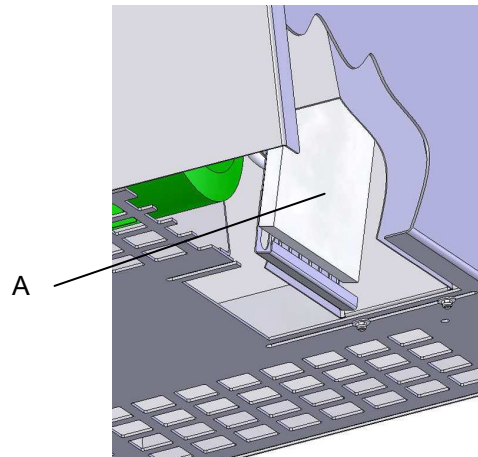


- Clean the coupling (F) and the contacts (G) on the case side.
- Replace the elastomer star (A) on the case side.
- Reattach the case according to chapter 5- Attaching the case.



Replacement of the suction filter (for not Ex machine only)

- Remove the filter holder according to chapter 5
– Removing the air filter.
- Replace the filter (A).
- Reassemble the filter holder according to chapter 5 – Attaching the air filter.



Changing schedule

- Every 3 months for units operated in very dusty areas.
- Every 6 months for units used in normal areas.
- Once a year for units operated in clean rooms.

Dismantling the lip gasket of the temperature sensor 12 bars (optional)

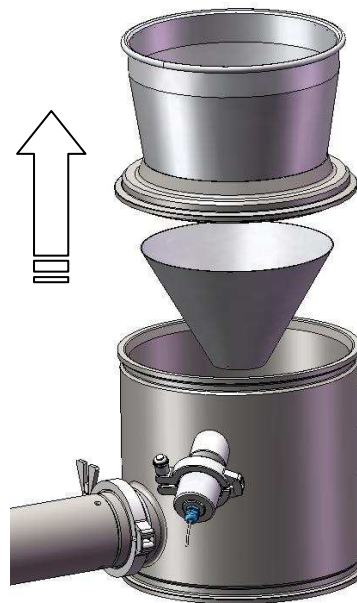


Before performing any work on this unit, it must be shut down and disconnected from all electric and pneumatic power supplies.
The user must eliminate the risks of contamination by the product.

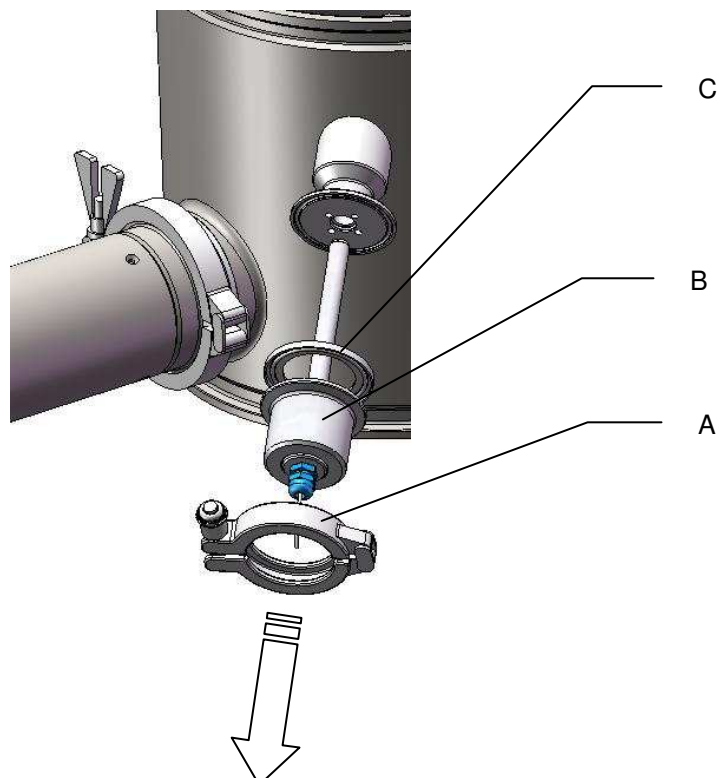


This operation may only be performed by qualified maintenance personnel who possess the specific knowledge required for the job and who have read this instruction manual.
They shall only use the proper tools.

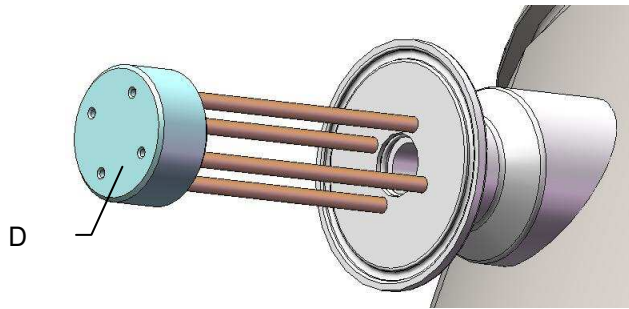
- Remove the equipment according to chapter 5



- Remove the clamp (A)
- Go out cautiously the sensor (B) of the housing
- Remove the seal (C)

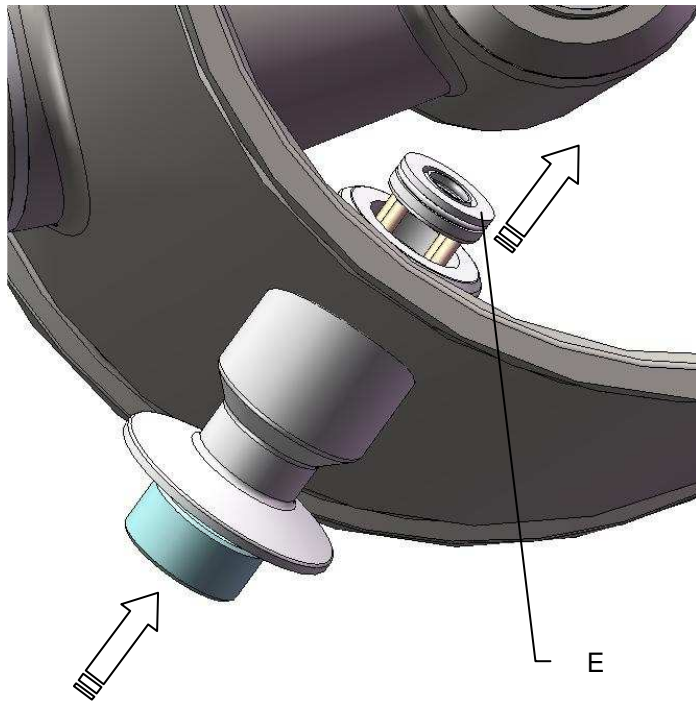


- Insert the tool * (D) in the housing



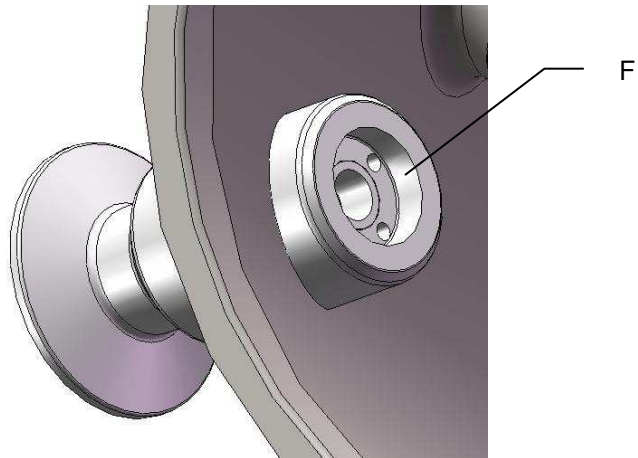
- * Look chapter 7 – Special tools

- Eject the seal (E)

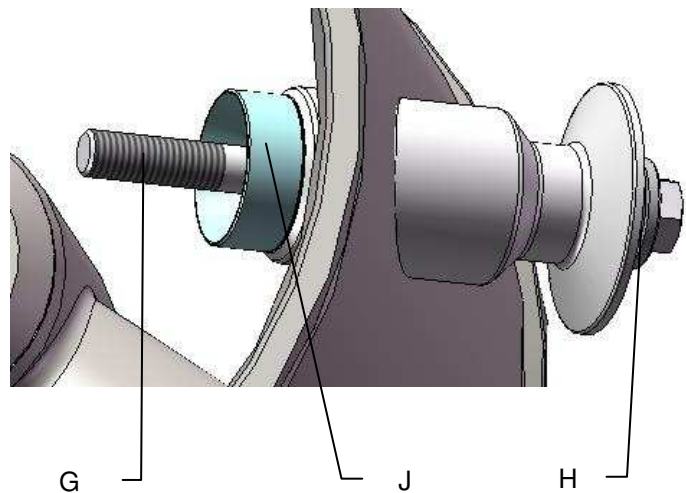


Assembling the lip gasket of the temperature sensor 12 bars (optional)

- Clean and grease light the surface (F)



- Insert the conus (G), the ball bearing (H) and the screw (J) of the special tool *

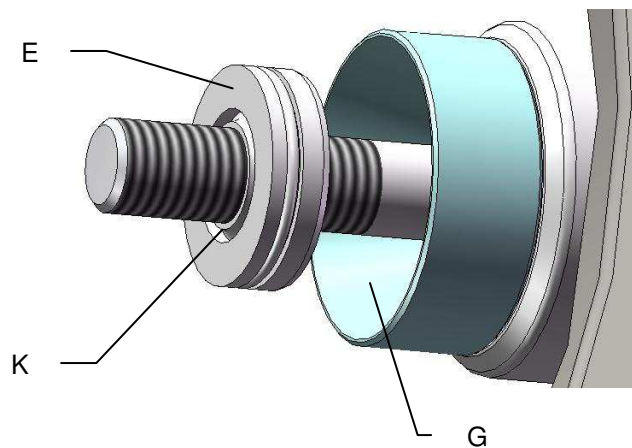


* Look chapter 7 – Special tools

- Insert the new seal (E) in the conus (G)

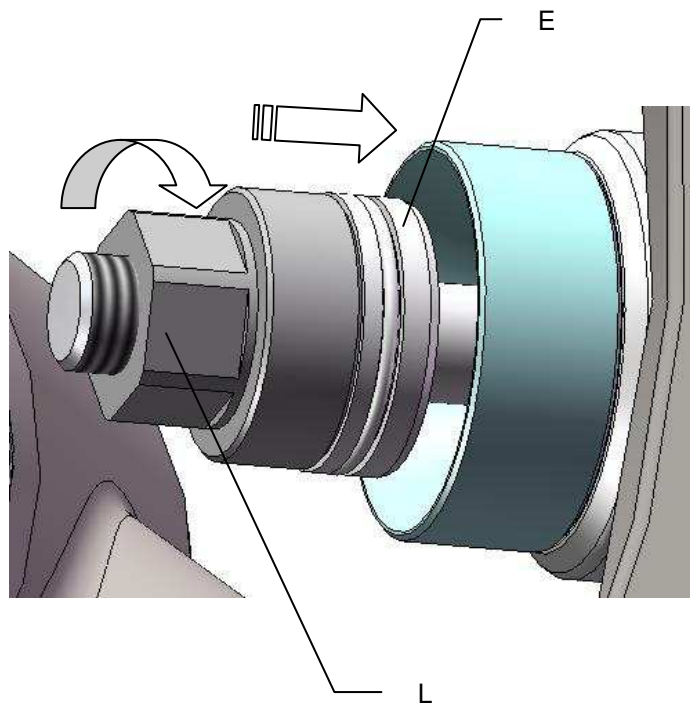


The lip (K) of the seal must be positioned inside the housing

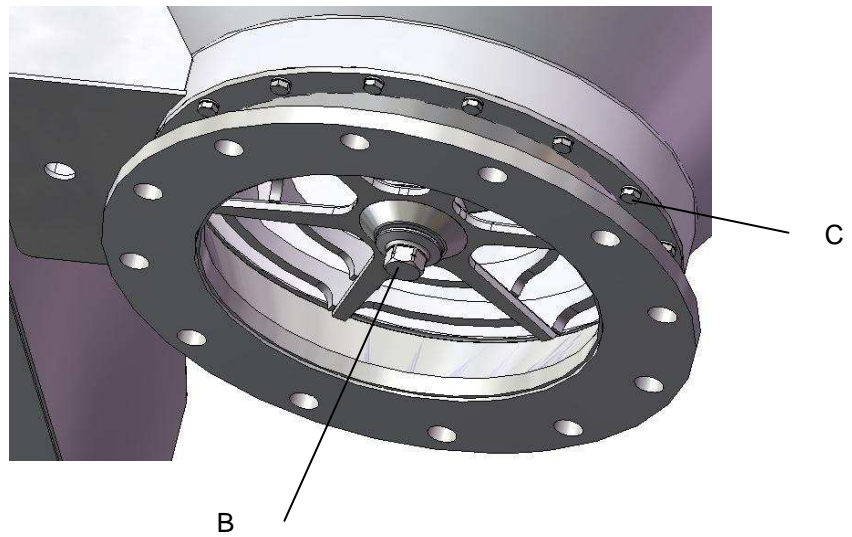
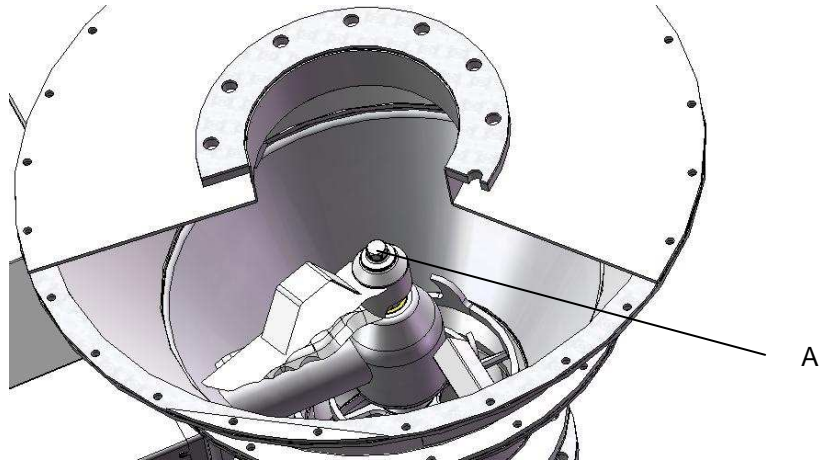


- Screw the nut (L) of the special toll for push the seal (E)

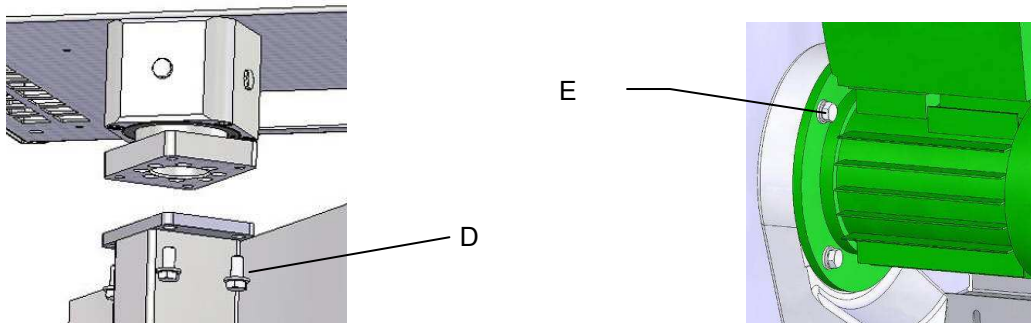
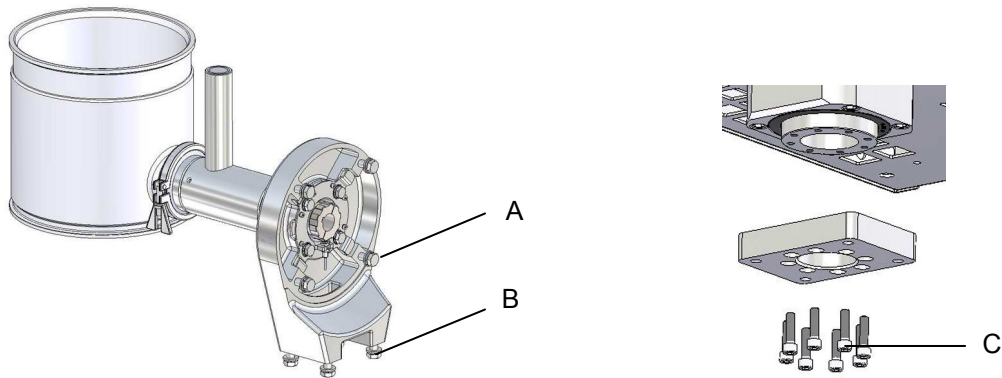
* Look chapter 7 – Special tools



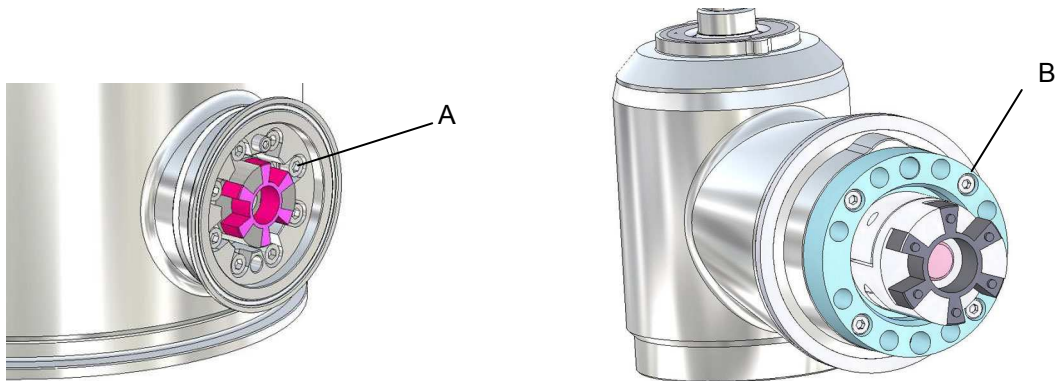
- Reassemble the temperature sensor
- Reassemble the equipment according to chapter 5



	Nm	Remarque / Bermerkungen / Remarks
A	70	Graisser / Einfetten / Grease
B	70	Graisser / Einfetten / Grease
C	21	Graisser / Einfetten / Grease



	ConiWitt 150/200 TurboWitt-C20	ConiWitt 250 TurboWitt-C25	Remarques / Bemerkungen / Remarks
A	44Nm	74 Nm	Graisser / Einfetten / Grease
B	74Nm		Graisser / Einfetten / Grease
C	74Nm		Graisser / Einfetten / Grease
D	21.4 Nm		Graisser / Einfetten / Grease
E	74Nm		Graisser / Einfetten / Grease



	ConiWitt 150/200	ConiWitt 250	Remarques / Bemerkungen / Remarks
A	8.8 Nm	21.4 Nm	Graisser / Einfetten / Grease
B	2.6 Nm	8.8 Nm	Coller / Kleben / Paste

Les outils spéciaux ne font pas partie de la fourniture standard de l'installation. Vous pouvez les commander en indiquant le type de machine et le numéro de série à l'adresse indiquée à la fin de ce document.

Die Spezialwerkzeuge gehören nicht zur Standardausrüstung der Anlage. Sie können die bestellen, indem Sie den Maschinentyp und die Seriennummer bei der unten aufgeführten Adresse dieses Dokuments angeben.

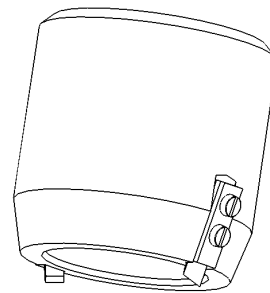
The special tools are not included as part of the installation standard supplies. You can order these pieces indicating the type of machine and the serial number at the address indicated at the end of this document.

Cône de montage
Montagekonus
Assembly cone



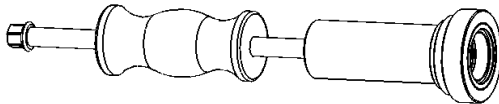
N° article Artikelnummer Item Number
455409

Couteau
Messer
Knife



N° article Artikelnummer Item Number
461088

Outil d'extraction
Abziehwerkzeug
Extraction tool

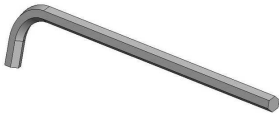



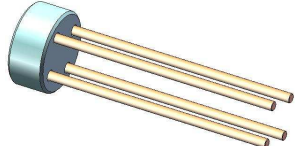
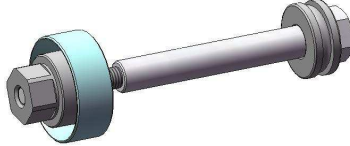


N° article Artikelnummer Item Number
461094

Les outils spéciaux ne font pas partie de la fourniture standard de l'installation. Vous pouvez les commander en indiquant le type de machine et le numéro de série à l'adresse indiquée à la fin de ce document.

Die Spezialwerkzeuge gehören nicht zur Standardausrüstung der Anlage. Sie können die bestellen, indem Sie den Maschinentyp und die Seriennummer bei der unten aufgeführten Adresse dieses Dokuments angeben.

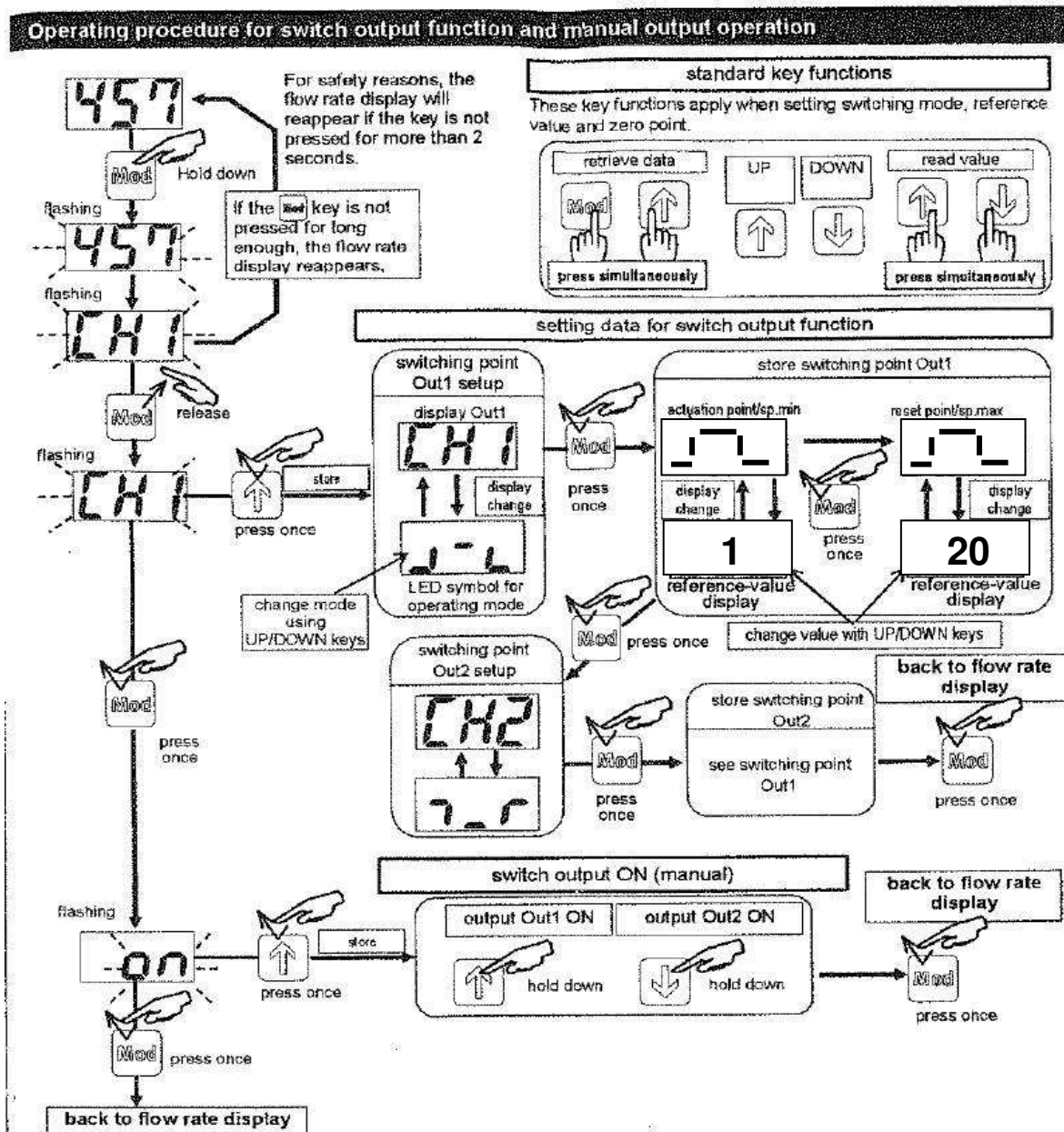
The special tools are not included as part of the installation standard supplies. You can order these pieces indicating the type of machine and the serial number at the address indicated at the end of this document.

<p style="text-align: center;">Clé raccourcie Gekürzter Schlüssel Shortened key</p>  <table border="1"> <thead> <tr> <th></th> <th>N° article</th> </tr> </thead> <tbody> <tr> <td>ConiWitt-150</td> <td>440850</td> </tr> <tr> <td>ConiWitt-200 / TurboWitt-C20</td> <td></td> </tr> <tr> <td>ConiWitt-250 / TurboWitt-C25</td> <td></td> </tr> </tbody> </table>		N° article	ConiWitt-150	440850	ConiWitt-200 / TurboWitt-C20		ConiWitt-250 / TurboWitt-C25		<p style="text-align: center;">Centreur de palier Lagerzentrierwerkzeug Centring device of bearing</p>  <table border="1"> <thead> <tr> <th></th> <th>N° article</th> </tr> </thead> <tbody> <tr> <td>ConiWitt-150</td> <td>441918</td> </tr> <tr> <td>ConiWitt-200 / TurboWitt-C20</td> <td>441035</td> </tr> <tr> <td>ConiWitt-250 / TurboWitt-C25</td> <td>441919</td> </tr> </tbody> </table>		N° article	ConiWitt-150	441918	ConiWitt-200 / TurboWitt-C20	441035	ConiWitt-250 / TurboWitt-C25	441919
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ConiWitt-200 / TurboWitt-C20	441035																
ConiWitt-250 / TurboWitt-C25	441919																
<p style="text-align: center;">Extracteur Abziehwerkzeug Extraction tool</p>  <table border="1"> <thead> <tr> <th></th> <th>N° article</th> </tr> </thead> <tbody> <tr> <td>ConiWitt-150</td> <td rowspan="2">444321</td> </tr> <tr> <td>ConiWitt-200 / TurboWitt-C20</td> </tr> <tr> <td>ConiWitt-250 / TurboWitt-C25</td> <td>444329</td> </tr> </tbody> </table>		N° article	ConiWitt-150	444321	ConiWitt-200 / TurboWitt-C20	ConiWitt-250 / TurboWitt-C25	444329	<p style="text-align: center;">Cône de montage CIP Montagekonus CIP Assembly cone CIP</p>  <table border="1"> <thead> <tr> <th></th> <th>N° article</th> </tr> </thead> <tbody> <tr> <td>ConiWitt-150/200</td> <td>458302</td> </tr> <tr> <td>ConiWitt-250</td> <td>458329</td> </tr> </tbody> </table>		N° article	ConiWitt-150/200	458302	ConiWitt-250	458329			
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ConiWitt-200/250	459060																
	N° article																
ConiWitt-200/250	459651																

Tel: +41 26 460 74 15
Fax +41 26 460 74 01
E-mail: customerservice@frewitt.com

Object:	Miniatur flowsensor Serie SFE3
Installation:	DelumpWitt CW-250 NOVARTIS
Project Nr.:	PRO-14-0012
Date; visa:	16.05.14 vri

Attention: NO AIR should be in during the flowsensor calibration





Antriebsregler LENZE 8200 VECTOR

7

Frequency inverter LENZE 8200 VECTOR

Variateur de vitesse LENZE 8200 VECTOR

Anlage / Installation / Installation

DelumpWitt Crusher unit

Serien Nr. / Serial Nr. / N° série

14001243013

Projekt Nr. / Project Nr. / N° projet

PRO-14-0012

Datum; Visum / Date; visa / Date; visa

19.05.2014 vri

Programmierung / Programming / Configuration
mit Integral Motor / with Integral motor / avec moteur integral

Code

No.	Name	Selection
C0007	Fixed configuration of digital inputs	14
C0008	Fixed configuration of relay output K1 (relay)	255
C0010	Minimum output frequency	32
C0011	Maximum output frequency	52.5
C0012	Acceleration time main setpoint	1
C0013	Decelaration time main setpoint	1
C0014	Control mode	2
C0022	I max motor	150
C0078	Integral action time I _{max} controller	15ms
C0094	User password	250
C0108	Gain analog output X3/62 (AOUT1-GAIN)	214
C0109	Offset analog output X3/62 (AOUT1-OFFSET)	
C0111	Configuration analog output X3/62 (AOUT1-IN)	
C0117	Fixed configuration of digital output (DIGOUT1)	
C0156	Current threshold	140
C415-1	Configuration relay output	25
C415-2	Configuration digital output	31

Programmierung / Programming / Configuration
ohne Integral Motor / withouth Integral motor / sans moteur integral

C0087	Rated motor speed	1445
C0088	Rated motor current	1.7
C0089	Rated motor frequency	50
C0090	Rated motor voltage	400
C0091	Motor cos φ	0.75
C0120	I ² t switch off	100



Antriebsregler LENZE 8200 VECTOR

7

Frequency inverter LENZE 8200 VECTOR

Variateur de vitesse LENZE 8200 VECTOR

Anlage / Installation / Installation

DelumpWitt Grinding unit

Serien Nr. / Serial Nr. / N° série

14001219097

Projekt Nr. / Project Nr. / N° projet

PRO-14-0012

Datum; Visum / Date; visa / Date; visa

19.05.2014 vri

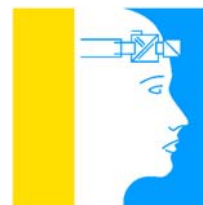
**Programmierung / Programming / Configuration
mit Integral Motor / with Integral motor / avec moteur integral**

Code

No.	Name	Selection
C0007	Fixed configuration of digital inputs	14
C0008	Fixed configuration of relay output K1 (relay)	1
C0010	Minimum output frequency	7.5
C0011	Maximum output frequency	52.5
C0012	Acceleration time main setpoint	1
C0013	Decelaration time main setpoint	1
C0014	Control mode	2
C0094	User password	250
C0108	Gain analog output X3/62 (AOUT1-GAIN)	214
C0109	Offset analog output X3/62 (AOUT1-OFFSET)	
C0111	Configuration analog output X3/62 (AOUT1-IN)	
C0117	Fixed configuration of digital output (DIGOUT1)	
C0415-1	Configuration relay output	25

**Programmierung / Programming / Configuration
ohne Integral Motor / withouth Integral motor / sans moteur integral**

C0087	Rated motor speed	965
C0088	Rated motor current	12.6
C0089	Rated motor frequency	50
C0090	Rated motor voltage	400
C0091	Motor cos φ	0.68
C0120	I ² t switch off	100%



KF*-UFC-* FDT

Description de l'appareil

Appareils	KF*-UFC-* FDT
Fabricant	PEPPERL+FUCHS GmbH
Version	1.4.110.70 / 2014-05-19
Description	Digital Input
Classification	dtmSpecific

Paramètres de l'appareil

Nom	Valeur	Etat	Description	Zone	Unit List
Offline Parameters					
Information					
Device		ok	Device description, read-only		
Serial Number		ok	Serial number of connected device, read-only		
Firmware Version		ok	Firmware version of connected device, read-only		
Hardware Version		ok	Hardware version of connected device, read-only		
Device Language	English	ok	Language on device display		
Device Type	Ex	ok	Preselection of device type (Ex / Non-Ex). Depending on selected device type limits of parameters can be different.		
Password					
Active	0	ok			
Description					
Tag Number	U8	ok	Unique identity		
Tag Description		ok	Description of tag number		
Company		ok	Name of company		
Order Number		ok	Order number		
Location		ok	Description of sensor mounting point		

Nom	Valeur	Etat	Description	Zone	Unit List
Hazard Description		ok	Danger advice		
Project		ok	Description of project		
Input					
Unit	rpm	ok	Unit in [Hz], [rpm], [rps], [l/min], [l/h], [m ³ /h], [m/s] or [km/h] (dependent on selected firmware version)		
Smoothing	2 [s]	ok	Smoothing for oscillating measurement values, 0s (no smoothing) ... 255s (max. smoothing)	0 - 255 [s]	
Divider	10 [pulse/unit]	ok	For all units except Hz: relation between pulses and selected unit	1 - 65000 [pulse/unit]	
Startup Override	Startup Override	ok	Selection, shorting across terminals 13 and 14, pulse suppression takes place or a startup override timer is started		
Startup Override Time	2 [s]	ok	For startup override: time during which a slower rotational speed is ignored for startup, 1..1000s	1 - 1000 [s]	
Firmware Version	Version < 3	ok	Preselection of firmware version for offline parameterization		
Detect Lead Breakage					
Active	1	ok			
Detect Short Circuit					
Active	1	ok			
Debounce Filter (Max. 10 Hz)					
Active	0	ok			
Output					
Relay Output 1					
Function	Trip	ok	Selectable Function: trip, fault indication, pulse repeater , pulse divider		
Trip Value (1)	600.0 [rpm]	ok	For trip: value which causes the relay to switch	0.0 - 29703.0 [rpm]	
Hysteresis (2)	300.0 [rpm]	ok	For trip: value of the hysteresis	6.0 - 30000.0 [rpm]	
Switching	Min	ok	For trip: Setting for relay to switch if		

Nom	Valeur	Etat	Description	Zone	Unit List
Direction (3)			input exceeds trip value (max) or falls below trip value (min)		
Operation Mode (4)	Inactive	ok	For trip: Setting for relay switch direction: active (normally opened) or inactive (normally closed)		
Divider Value	1.000	ok	For pulse divider: relation between input pulses and output pulses. No fixed frequency output	1.000 - 99990.000	
Impulse Length	250 ms	ok	For pulse divider: length of output pulse		
Alarm Freeze					
Active	0	ok			
Relay Output 2					
Function	Trip	ok	Selectable Function: trip, fault indication, pulse repeater , pulse divider		
Trip Value (1)	6000 [rpm]	ok	For trip: value which causes the relay to switch	0 - 29703 [rpm]	
Hysteresis (2)	3000 [rpm]	ok	For trip: value of the hysteresis	60 - 30000 [rpm]	
Switching Direction (3)	Min	ok	For trip: Setting for relay to switch if input exceeds trip value (max) or falls below trip value (min)		
Operation Mode (4)	Inactive	ok	For trip: Setting for relay switch direction: active (normally opened) or inactive (normally closed)		
Divider Value	1.000	ok	For pulse divider: relation between input pulses and output pulses. No fixed frequency output	1.000 - 99990.000	
Impulse Length	250 ms	ok	For pulse divider: length of output pulse		
Alarm Freeze					
Active	0	ok			
Transistor Output					
Function	Pulse Repeater	ok	Selectable Function: trip, fault indication, pulse repeater , pulse divider		
Trip Value (1)	6000 [rpm]	ok	For trip: value which causes the transistor output to switch	0 - 29703 [rpm]	

Nom	Valeur	Etat	Description	Zone	Unit List
Hysteresis (2)	3000 [rpm]	ok	For trip: value of the hysteresis	60 - 30000 [rpm]	
Switching Direction (3)	Min	ok	For trip: Setting for transistor output to switch if input exceeds trip value (max) or falls below trip value (min)		
Operation Mode (4)	Inactive	ok	For trip: Setting for relay switch direction: active (normally opened) or inactive (normally closed)		
Divider Value	1.000	ok	For pulse divider: relation between input pulses and output pulses. No fixed frequency output	1.000 - 99990.000	
Impulse Length	250 ms	ok	For pulse divider: length of output pulse		
Alarm Freeze					
Active	0	ok			
Current Output					
Characteristic (1)	0..20mA	ok	Type of current output: 0..20mA, 4..20mA unlimited or 4..20mA according to NE43		
Start Value (2)	0.000 [rpm]	ok	Value which is represented by lower limit of current output (0/4mA)	0.000 - 30000.000 [rpm]	
End Value (3)	1200 [rpm]	ok	Value which is represented by upper limit of current output (20mA)	0 - 30000 [rpm]	
Error Indication	Upscale	ok	Behavior of current output in case of fault: upscale (current exceeds upper limit), downscale (current falls below lower limit) or hold (current is held)		
Invert Characteristic					
Active	0	ok			



KF*-UT2-* FDT

Description de l'appareil

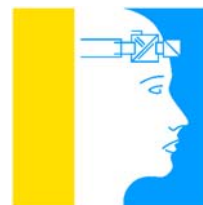
Appareils	KF*-UT2-* FDT
Fabricant	PEPPERL+FUCHS GmbH
Version	1.4.110.70 / 2014-05-19
Description	Temperature
Classification	temperature

Paramètres de l'appareil

Nom	Valeur	Etat	Description	Zone	Unit List
Offline Parameters					
Information					
Device		ok	Device description, read-only		
Serial Number		ok	Serial number of connected device, read-only		
Firmware Version		ok	Firmware version of connected device, read-only		
Hardware Version		ok	Hardware version of connected device, read-only		
Supply Frequency	50Hz	ok	Mains supply frequency. Improves device noise rejection.		
Quantity of Channels	1 channel Version	ok	1 or 2 channel version of device		
Output Type	Current Output	ok	Setting for the correct PACTware display of output units, according to customers device configuration (V or mA)		
Description					
Tag Number Input 1	U11	ok	Unique identity given to input 1		
Tag Description Input 1	PRO-11-0076	ok	Description of tag number on input 1		
Text Field	Novartis	ok	Text field for further comments		
Input					
Input 1					
Sensor	PT100	ok	Sensor type selection. Several RTDs, TCs		

Nom	Valeur	Etat	Description	Zone	Unit List
			are available as well as voltage and potentiometer		
Connection Mode	4-wire	ok	Depending on selected sensor type: 2-, 3-, 4- wire connection, adjustment to TC (read-only) or voltage range		
Unit	°C	ok	Unit in [°C], [K], [°F], [mV] (voltage only), ratio and ohm (potentiometer only)		
Cold Junction Compensation	Internal (K-CJC)	ok	For TC sensors: Selection between internal (CJC Sensor) or external cold junction compensation (reference temperature) For using CJC in a mixed configuration, when both TC and RTD sensors are to be used with one device, the TC must always be connected to input 1		
Ext. Ref. Temp.	25.00 [---]	ok	For TC sensors with selected external reference temperature: Value of external reference temperature	-100.00 - 320.00 [---]	
Lead Resistance	0.00 [Ohm]	ok	For 2-wire connection: Manual entry of lead resistance	0.00 - 650.00 [Ohm]	
Rate	Standard	ok	Setting of measurement rate (slow, standard)		
Firmware Version	Version >= 1.35	ok	Preselection of firmware version for offline parameterization		
Detect Sensor Breakage					
Active	1	ok			
Detect Sensor Short Circuit					
Active	1	ok			
Output					
Analogue Output 1					
Assigned Input	Input 1	ok	Setting, if analogue output shall represent input 1 or input 2		
Charachteristic (1)	0..20mA	ok	This selection must be made manually on HiD2082. Type of analogue output: 0..20mA (0..5V), 4..20mA (1..5V) limited, 4..20mA (1..5V) unlimited or 4..20mA (1..5V) according to NE43		
Start Value (2)	0.00 [°C]	ok	Value which is represented by lower limit of analogue output (0/4mA, 0/1V)	-200.00 - 839.50 [°C]	

Nom	Valeur	Etat	Description	Zone	Unit List
End Value (3)	100.00 [° C]	ok	Value which is represented by upper limit of analogue output (20mA or 5V)	-189.50 - 850.00 [° C]	
Error Indication	Downscale	ok	Behavior of analogue output in case of fault: Upscale (current / voltage exceeds upper limit), downscale (current / voltage falls below lower limit), hold (current / voltage is held) or up-/downscale (dependent on fault)		
Output Invert					
Active	0	ok			



KF*-UT2-* FDT

Description de l'appareil

Appareils	KF*-UT2-* FDT
Fabricant	PEPPERL+FUCHS GmbH
Version	1.4.110.70 / 2014-05-19
Description	Temperature
Classification	temperature

Paramètres de l'appareil

Nom	Valeur	Etat	Description	Zone	Unit List
Offline Parameters					
Information					
Device		ok	Device description, read-only		
Serial Number		ok	Serial number of connected device, read-only		
Firmware Version		ok	Firmware version of connected device, read-only		
Hardware Version		ok	Hardware version of connected device, read-only		
Supply Frequency	50Hz	ok	Mains supply frequency. Improves device noise rejection.		
Quantity of Channels	1 channel Version	ok	1 or 2 channel version of device		
Output Type	Current Output	ok	Setting for the correct PACTware display of output units, according to customers device configuration (V or mA)		
Description					
Tag Number Input 1	U12	ok	Unique identity given to input 1		
Tag Description Input 1	PRO-11-0076	ok	Description of tag number on input 1		
Text Field	Novartis	ok	Text field for further comments		
Input					
Input 1					
Sensor	PT100	ok	Sensor type selection. Several RTDs, TCs		

Nom	Valeur	Etat	Description	Zone	Unit List
			are available as well as voltage and potentiometer		
Connection Mode	4-wire	ok	Depending on selected sensor type: 2-, 3-, 4- wire connection, adjustment to TC (read-only) or voltage range		
Unit	°C	ok	Unit in [°C], [K], [°F], [mV] (voltage only), ratio and ohm (potentiometer only)		
Cold Junction Compensation	Internal (K-CJC)	ok	For TC sensors: Selection between internal (CJC Sensor) or external cold junction compensation (reference temperature) For using CJC in a mixed configuration, when both TC and RTD sensors are to be used with one device, the TC must always be connected to input 1		
Ext. Ref. Temp.	25.00 [---]	ok	For TC sensors with selected external reference temperature: Value of external reference temperature	-100.00 - 320.00 [---]	
Lead Resistance	0.00 [Ohm]	ok	For 2-wire connection: Manual entry of lead resistance	0.00 - 650.00 [Ohm]	
Rate	Standard	ok	Setting of measurement rate (slow, standard)		
Firmware Version	Version >= 1.35	ok	Preselection of firmware version for offline parameterization		
Detect Sensor Breakage					
Active	1	ok			
Detect Sensor Short Circuit					
Active	1	ok			
Output					
Analogue Output 1					
Assigned Input	Input 1	ok	Setting, if analogue output shall represent input 1 or input 2		
Characteristic (1)	0..20mA	ok	This selection must be made manually on HiD2082. Type of analogue output: 0..20mA (0..5V), 4..20mA (1..5V) limited, 4..20mA (1..5V) unlimited or 4..20mA (1..5V) according to NE43		
Start Value (2)	0.00 [°C]	ok	Value which is represented by lower limit of analogue output (0/4mA, 0/1V)	-200.00 - 839.50 [°C]	

Nom	Valeur	Etat	Description	Zone	Unit List
End Value (3)	100.00 [° C]	ok	Value which is represented by upper limit of analogue output (20mA or 5V)	-189.50 - 850.00 [° C]	
Error Indication	Downscale	ok	Behavior of analogue output in case of fault: Upscale (current / voltage exceeds upper limit), downscale (current / voltage falls below lower limit), hold (current / voltage is held) or up-/downscale (dependent on fault)		
Output Invert					
Active	0	ok			

SPARE PARTS

N° Série:

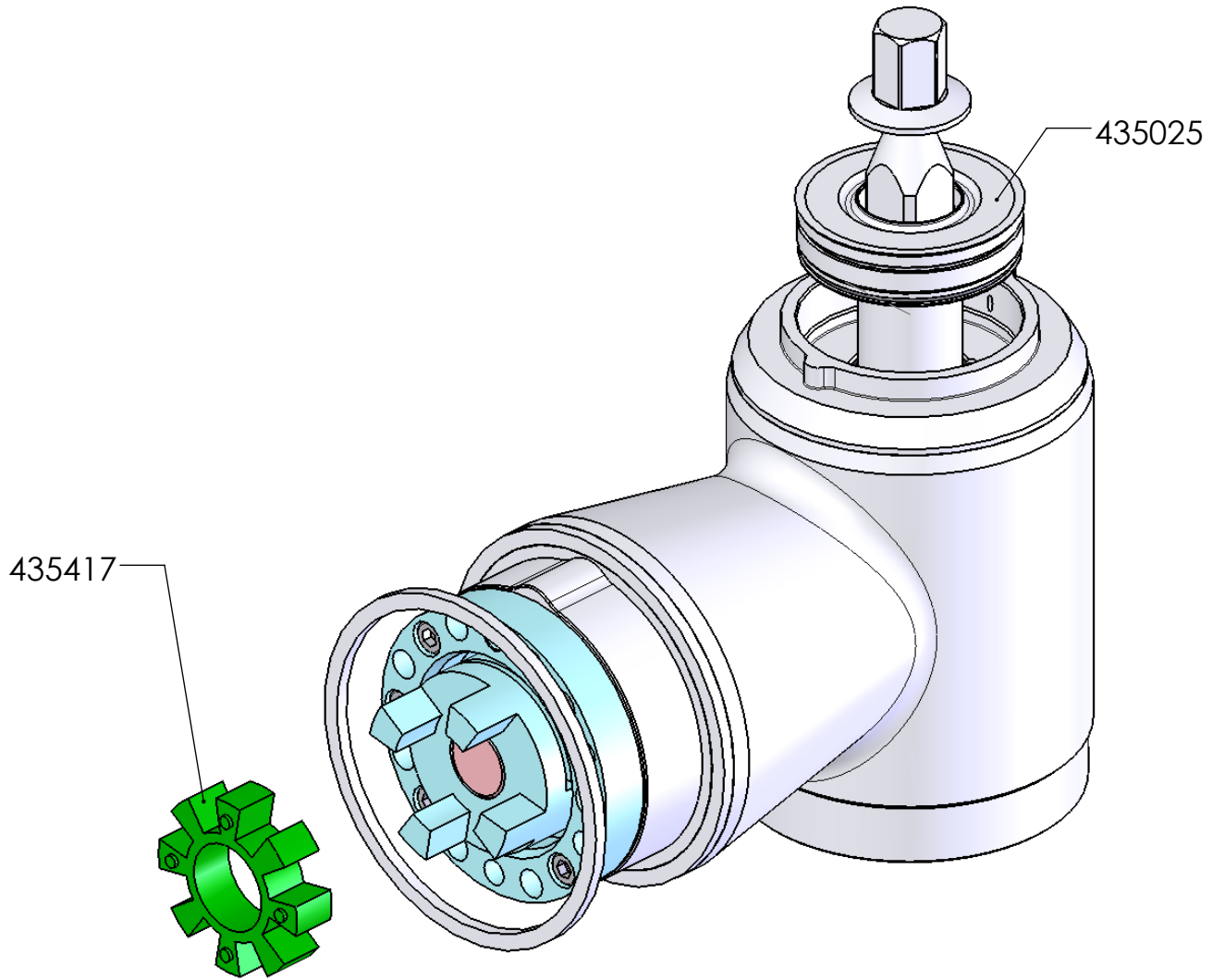
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Serial Nr.

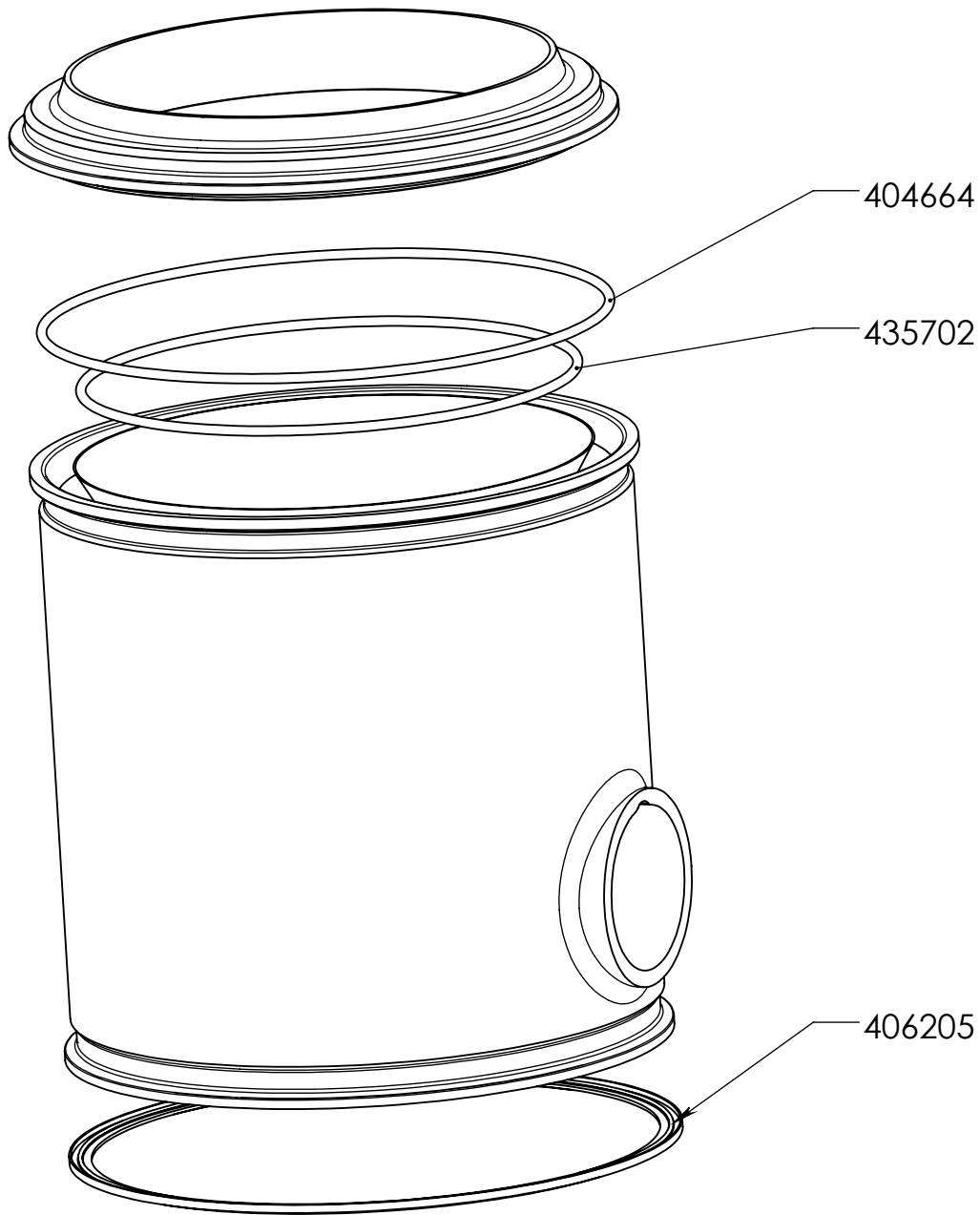
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REF: **473463**

Article N° Artikel Nr. Article ID.	Description Beschreibung Description	Quantité Menge Quantity	Unité Einheit Unit	No Dessin Zeichnungs-Nr Drawing ID
... 435025	Double lip seal ConiWitt-250	1	Pce	432459
... 435417	Elastomer Star R+W EK/60, Type B	1	Pce	432459
... 435702	O-Ring 266.07x5.33 EPDM 70 FDA RAL 1013	1	Pce	436059
... 406205	Silicone Seal ISO 300, Ø 338.5/318.9, FDA	1	Pce	436059
... 404664	O-Ring 304.17x5.34 EPDM 70 FDA RAL 1013	1	Pce	436059
... 410115	Clamp Seal 4p silicone ID 100.0	1	Pce	443022
... 431459	O-Ring 4.00x1.50 FKM 75.5/VA75F HITEC□11 4007 1040 ORM 0040 15	1	Pce	443022
... 432332	O-Ring 4.00x2.50 FKM 75.5/VA75F HITEC□11 4007 2504 ORM 0040 25	1	Pce	443044
... 435417	Elastomer Star R+W EK/60, Type B	1	Pce	445063
... 431768	O-Ring 347.00x5.33 FEP-O-SEAL MVQ	1	Pce	454424
... 451767	Seal Ø40/52x7 Forme A, FKM 80.445-01	1	Pce	454424
... 454357	O-RING 40.00X4.00 FKM 75.5/VA75F HITEC	4	Pce	454424
... 459448	Double lip seal PS Ø40	2	Pce	454424
.. 456272	Muffler Typ MH 24-35 12.2111.3510	6	Pce	473599
.. 456271	Muffler Typ MH 24-55 12.2111.5510	4	Pce	473599
.. 457663	Flat seal rd 980/903x5 novafon 500	1	Pce	473599
.. 453974	Clamp Seal SILICONE ISO50, ID56.3 A 77.5	2	Pce	473599
... 458146	Gas spring St.steel 304, 180mm, F1=300N, L=405, L total=445mm	2	Pce	473649
... 453974	Clamp Seal SILICONE ISO50, ID56.3 A 77.5	2	Pce	473649
... 438974	Clamp Seal ISO15 silicone white, 241.050.019	1	Pce	473649
... 459561	Silicone seal 25x25/4 profil Ti-Xane 703	1	Pce	473649
... 462542	Clamp Seal (silicone) DIN100	2	Pce	473649
... 437890	Bellow EPDM-antistat. Ø260/216x80	1	Pce	473713
... 436242	Conical rasp 3.0mm, thick 1.0mm, ConiWitt-250, 316/316L	1	Pce	473746
... 436255	Rotor (dry sizing) for rasp C, ConiWitt-250	1	Pce	473746
... 436059	Tightness EPDM-Silicone	1	Pce	473746
... 406396	Seal for clamp EPDM noir DIN 50, Ø 64/50.2, edge, FDA	1	Pce	473746
... 453220	Flat Seal rd 710/630x5 Novafon 500, FDA	1	Pce	473841
... 454424	Tightness	1	Pce	473841
... 454299	Cutter (superior)	1	Pce	473841
... 454311	Cutter (Intermediate)	1	Pce	473841
... 406396	Seal for clamp EPDM noir DIN 50, Ø 64/50.2, edge, FDA	1	Pce	473841
... 406396	Seal for clamp EPDM noir DIN 50, Ø 64/50.2, edge, FDA	3	Pce	473843



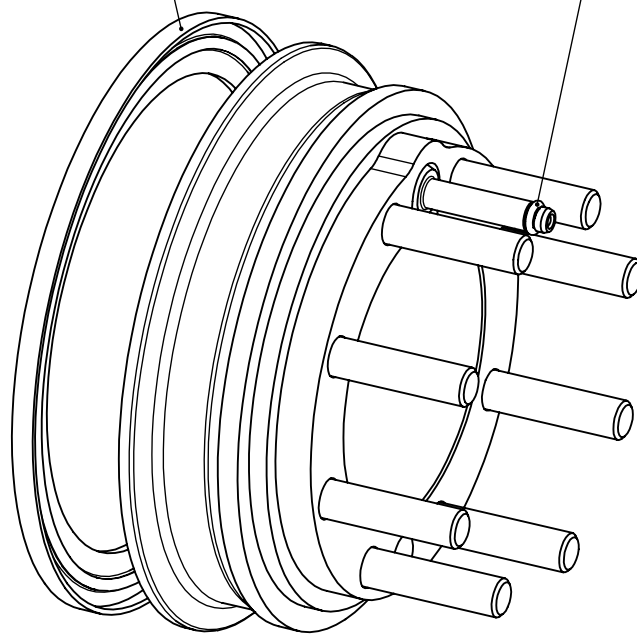
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	up to	6	30	120	400	1000	2000				Controlled	17/02/2010	wwi		
Machining: ISO 2768-m		±0.10	±0.20	±0.30	±0.50	±0.80	±1.20	Palier	Weight [kg]	Revised	17/02/2010	wwi			
Welding Assembly: ISO 2768-c		±0.30	±0.50	±0.80	±1.20	±2.00	±3.00				Atex				
									A4	11.992					
Any and all information received by you from us shall be held and kept confidential and shall not be disclosed by you to any third party except with prior written consent of FREWITT SA.									 Frewitt SA: Milling and Handling of Powders P.O.B. 615, CH-1701 Fribourg, SWITZERLAND Tel: +41 26 460 74 00 / fax: +41 26 460 74 01 info@frewitt.com / www.frewitt.com			432459-PRE		Page	Ver.
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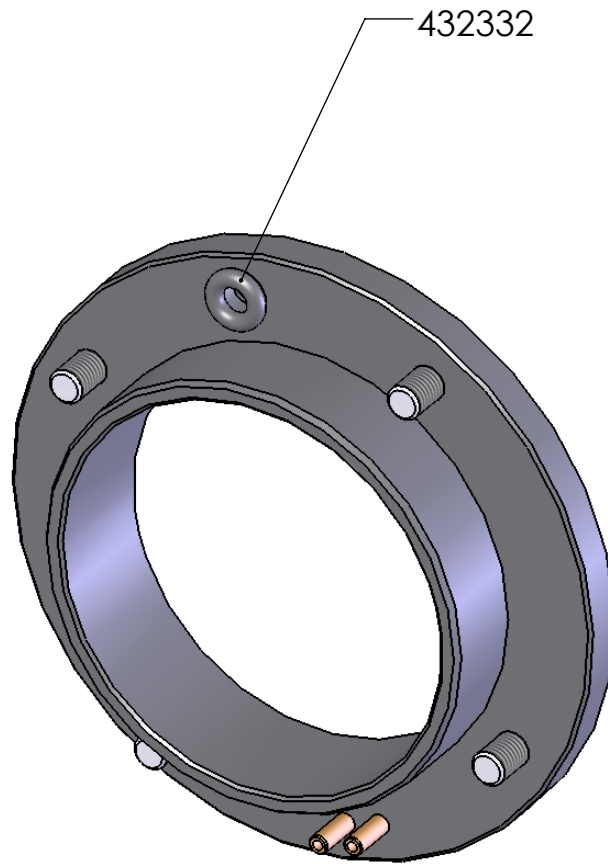
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Machining: ISO 2768-m		±0.10	±0.20	±0.30	±0.50	±0.80	±1.20	Scale %	Similar	Designed	27/09/2010	wwi	
Welding Assembly: ISO 2768-c		±0.30	±0.50	±0.80	±1.20	±2.00	±3.00			Controlled	23/08/2012	jbe	
Etanchéité EPDM-silicone								⊕	Weight [kg]	Revised	23/08/2012	jbe	
								A4	0.10	Atex			
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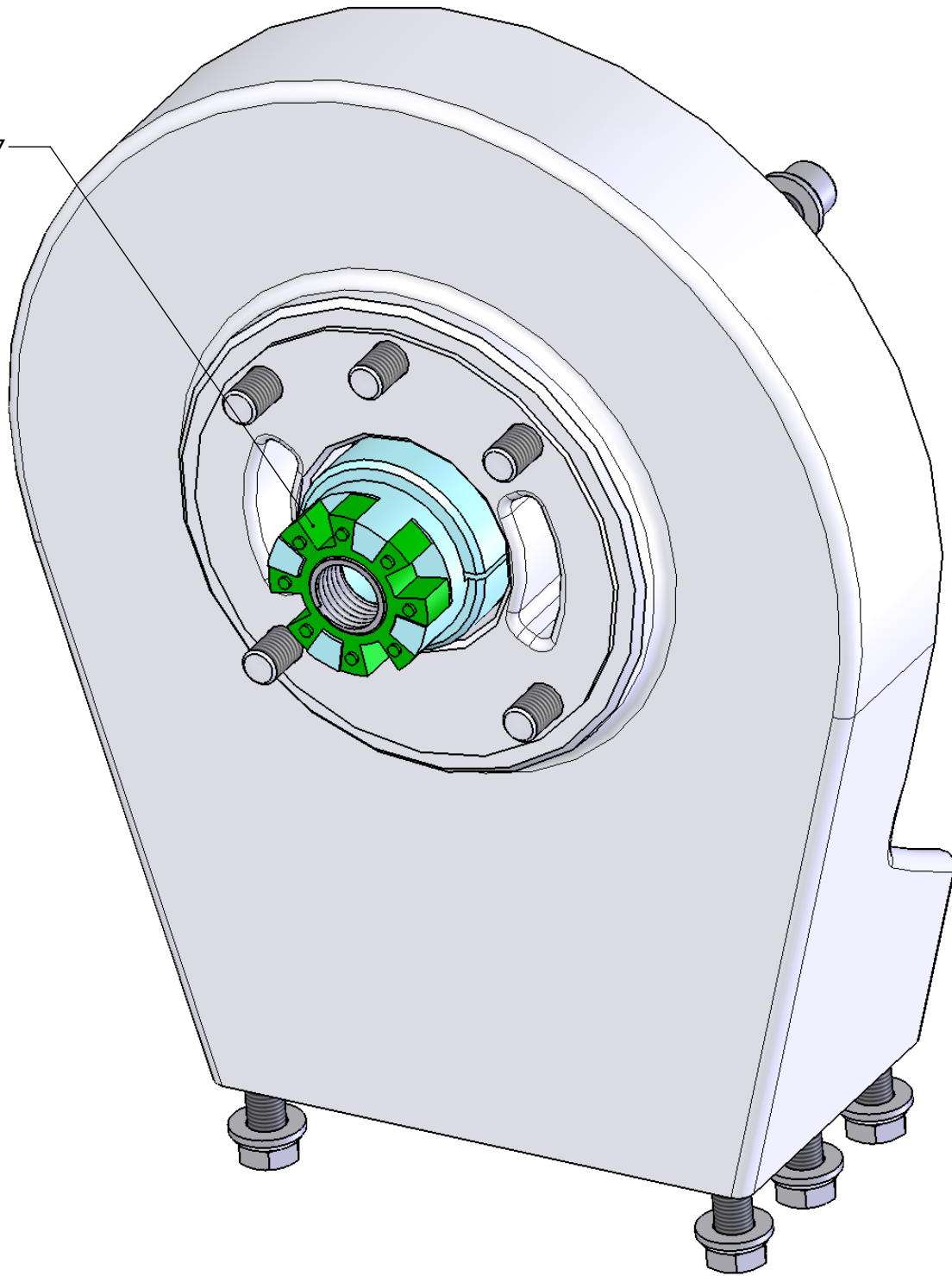



Dimensions without tolerance [mm]	above		6	30	120	400	1000	MATERIAL : Matériau <non spécifié>	Scale	Similar	Designed	17/02/2010	wwi		
	up to	6	30	120	400	1000	2000				Controlled	28/07/2011	jbe		
Machining: ISO 2768-m		±0.10	±0.20	±0.30	±0.50	±0.80	±1.20	Ens. bride bâti-palier	⊕	Weight [kg]	Revised	28/07/2011	jbe		
Welding Assembly: ISO 2768-c		±0.30	±0.50	±0.80	±1.20	±2.00	±3.00				A4	1.419	Atex		
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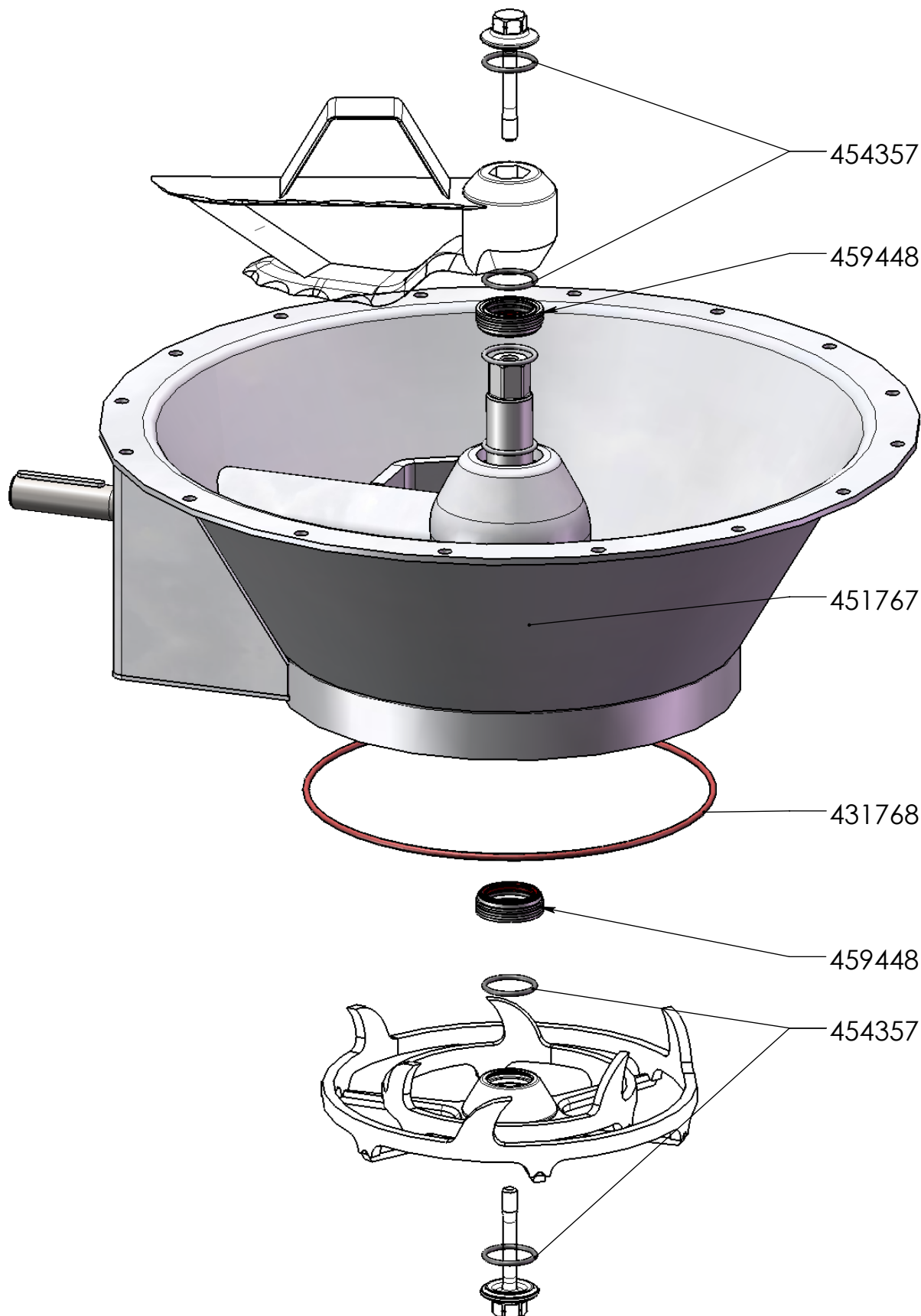


Dimensions without tolerance [mm]	above		6	30	120	400	1000	MATERIAL : Matériau <non spécifié>				
	up to	6	30	120	400	1000	2000		Scale	Similar	Designed	18/02/2010	wwi
Machining: ISO 2768-m		±0.10	±0.20	±0.30	±0.50	±0.80	±1.20	%		Controlled	18/02/2010	wwi
Welding Assembly: ISO 2768-c		±0.30	±0.50	±0.80	±1.20	±2.00	±3.00		Weight [kg]	Revised	18/02/2010	wwi
Bride de retenue cardan									A4	0.036	Atex	
								<small>Any and all information received by you from us shall be held and kept confidential and shall not be disclosed by you to any third party except with prior written consent of FREWITT SA.</small>				<small>Frewitt SA; Milling and Handling of Powders P.O.B. 615, CH-1701 Fribourg, SWITZERLAND Tel: +41 26 460 74 00 / fax: +41 26 460 74 01 info@frewitt.com / www.frewitt.com</small>
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Dimensions without tolerance [mm]	above up to	6	30	120	400	1000	MATERIAL : Matériau <non spécifié>					
Machining: ISO 2768-m		±0.10	±0.20	±0.30	±0.50	±0.80	±1.20	Scale	Similar	Designed	17/02/2010	wwi
Welding Assembly: ISO 2768-c		±0.30	±0.50	±0.80	±1.20	±2.00	±3.00	%		Controlled	17/02/2010	wwi
Ensemble support moteur								⊕	Weight [kg]	Revised	17/02/2010	wwi
								A4	27.722	Atex		
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Dimensions without tolerance [mm]	above		6	30	120	400	1000
	up to	6	30	120	400	1000	2000
Machining: ISO 2768-m		±0.10	±0.20	±0.30	±0.50	±0.80	±1.20
Welding Assembly: ISO 2768-c		±0.30	±0.50	±0.80	±1.20	±2.00	±3.00

MATERIAL : Matériau <non spécifié>

Scale %	Similar	Designed	17/03/2010	tgr
		Controlled	25/08/2010	jbe
Weight [kg]	A4	Revised	25/08/2010	jbe
		Atex		

Etanchéité

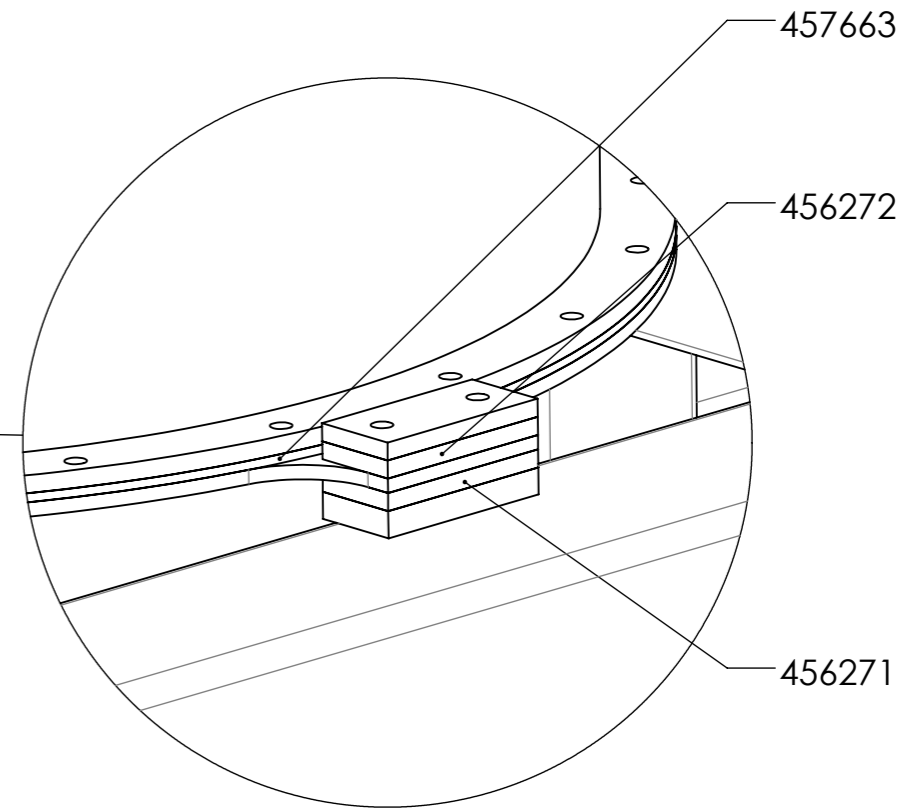
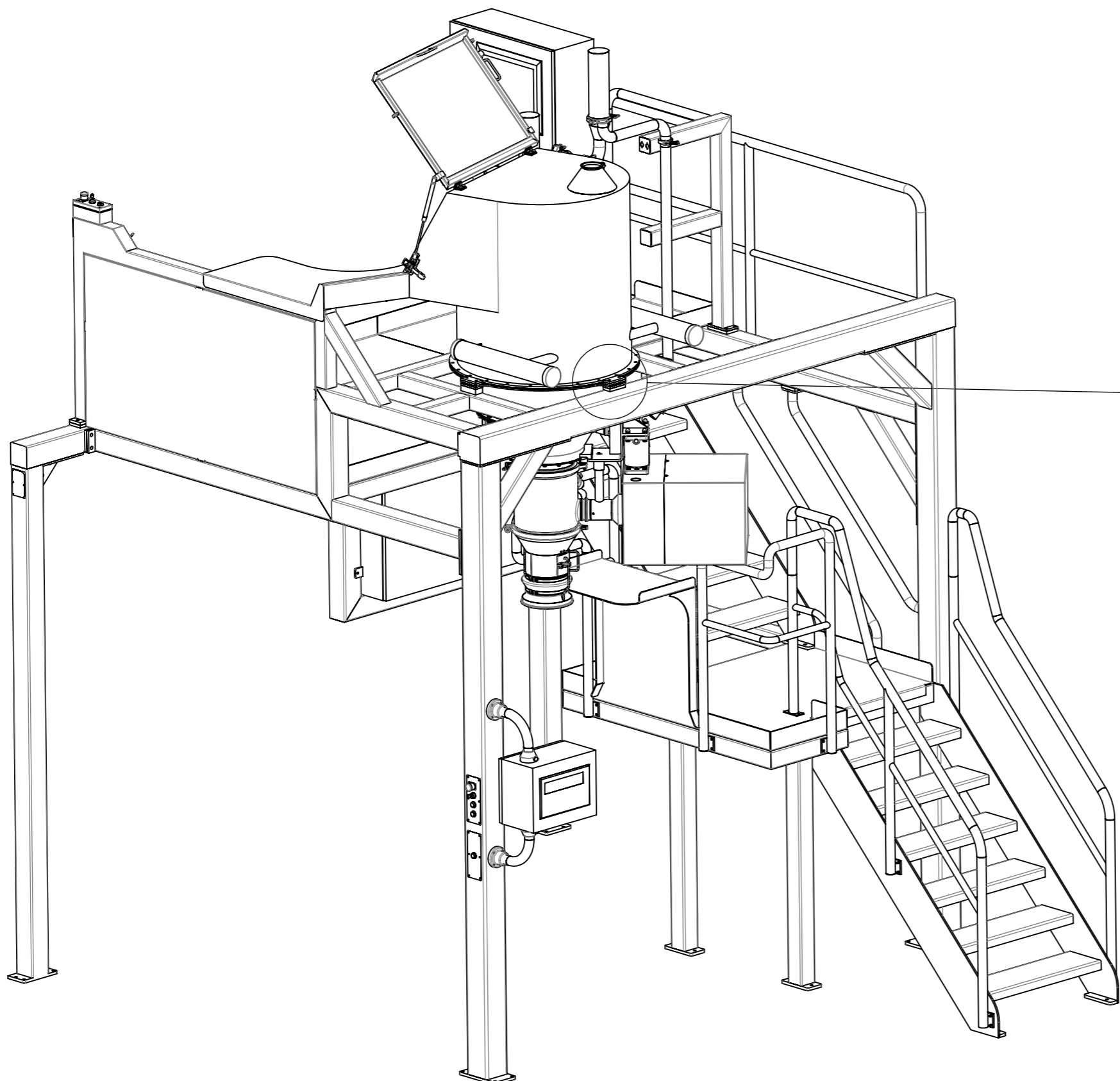
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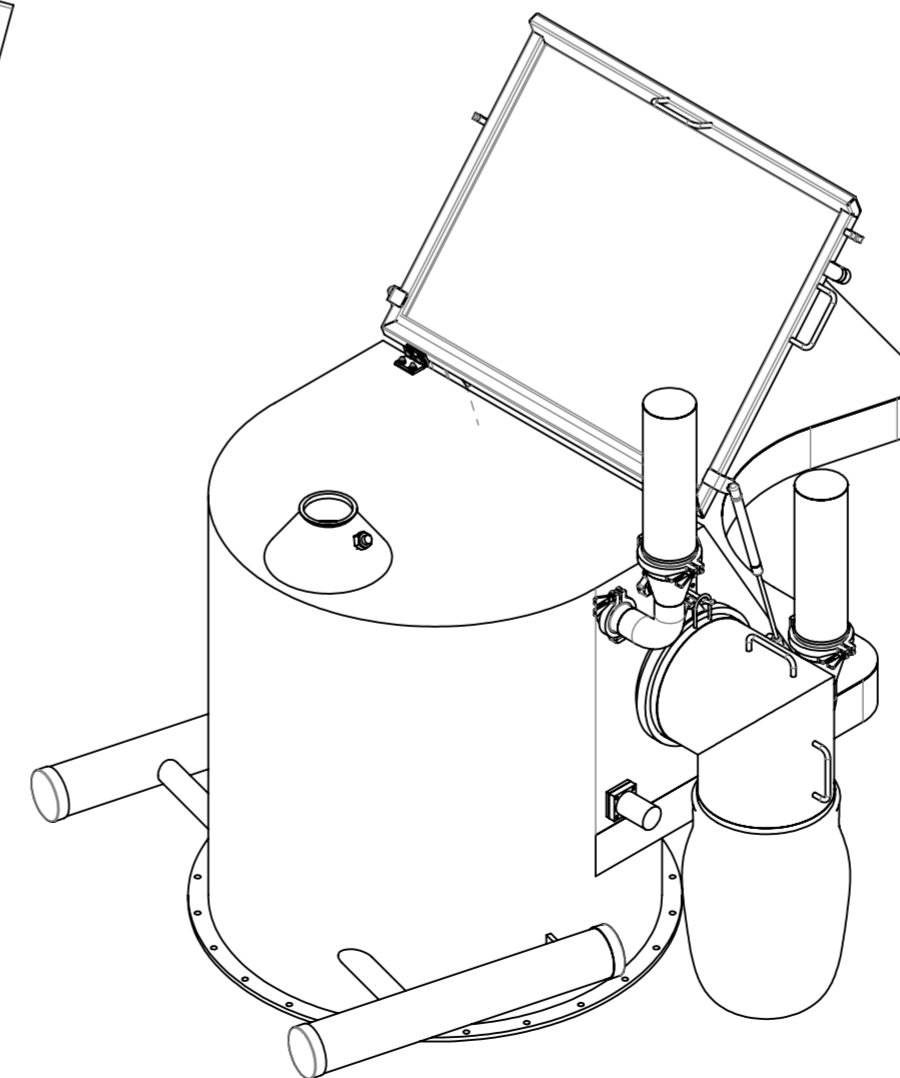
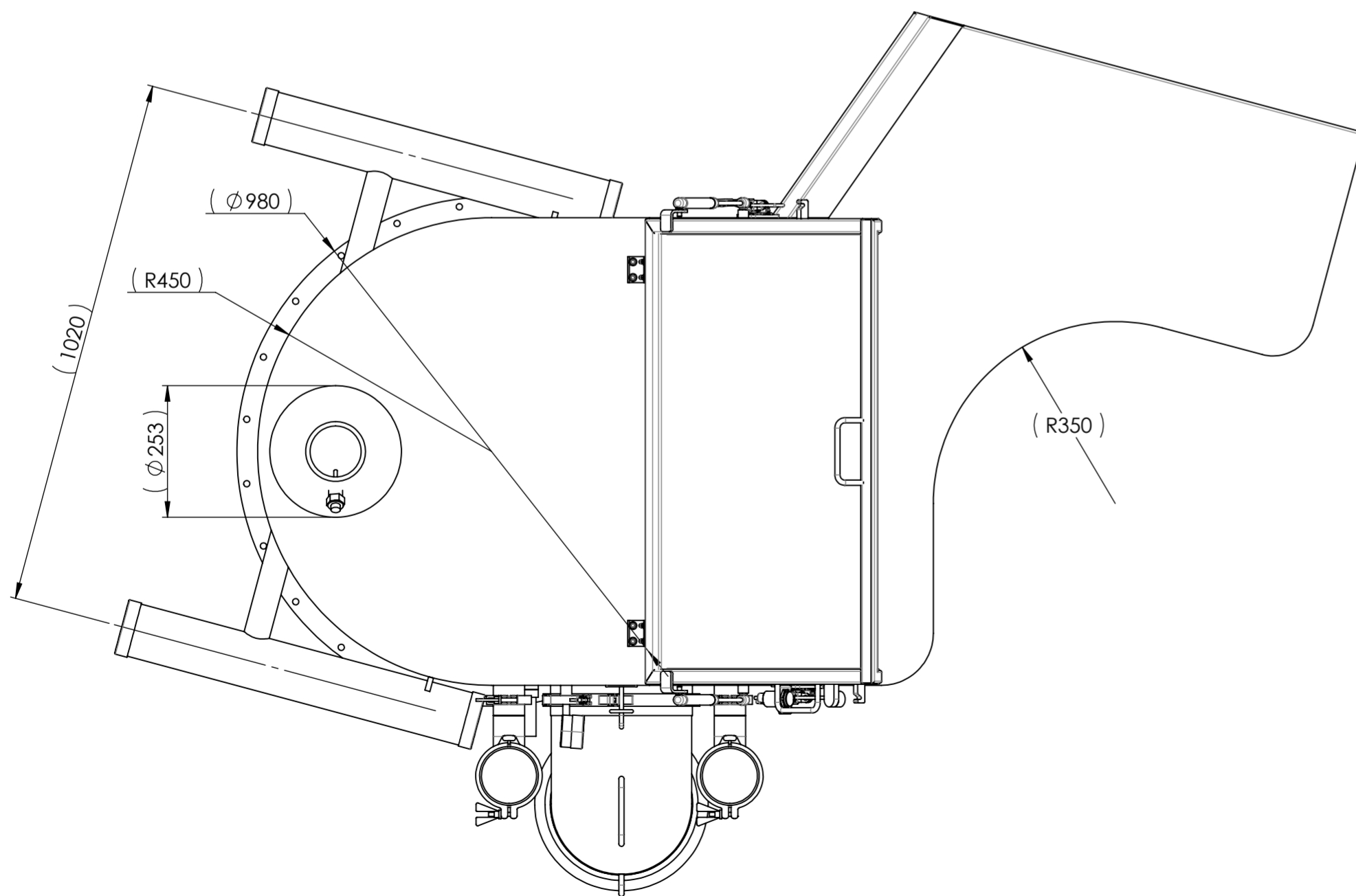
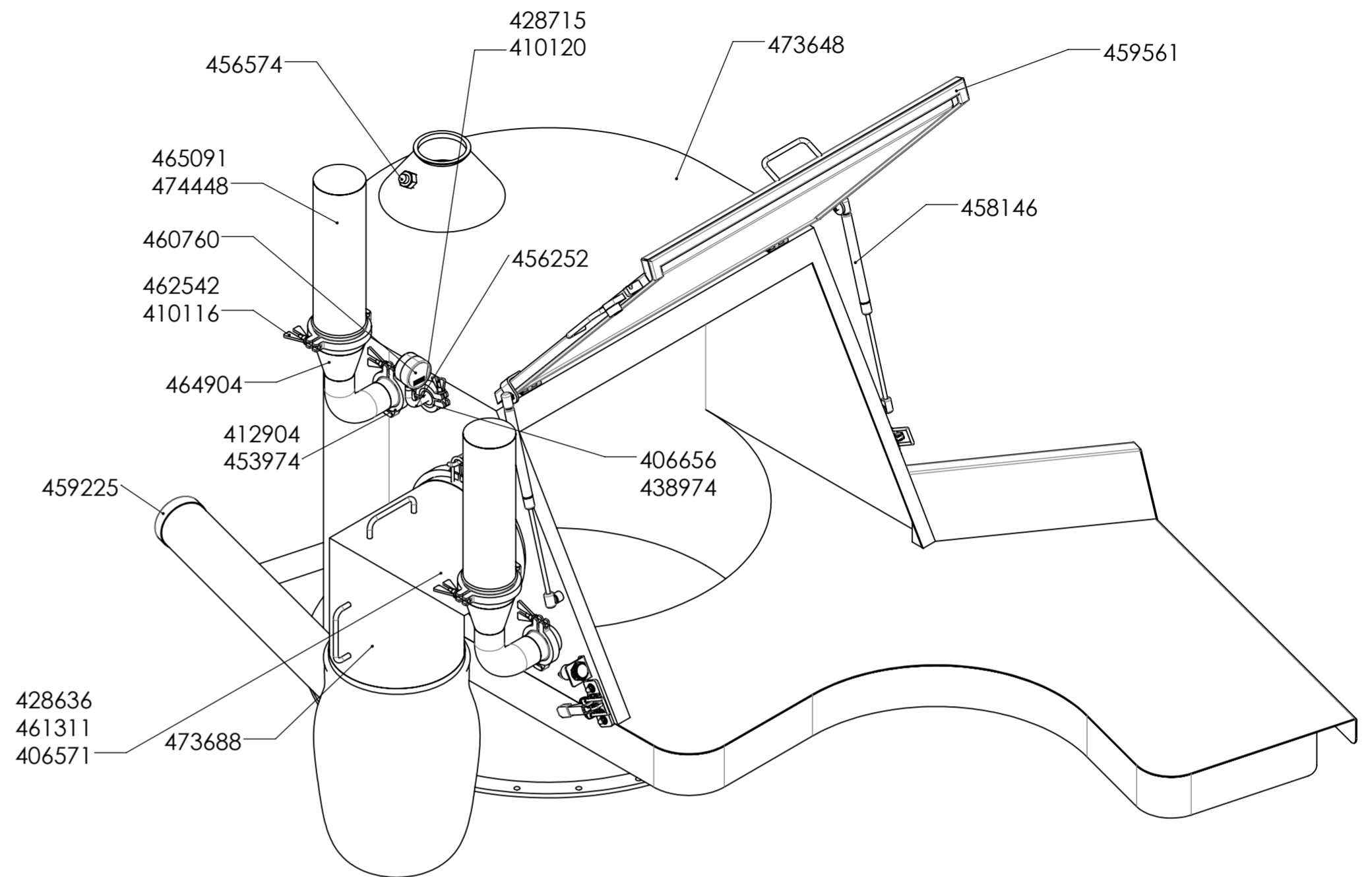
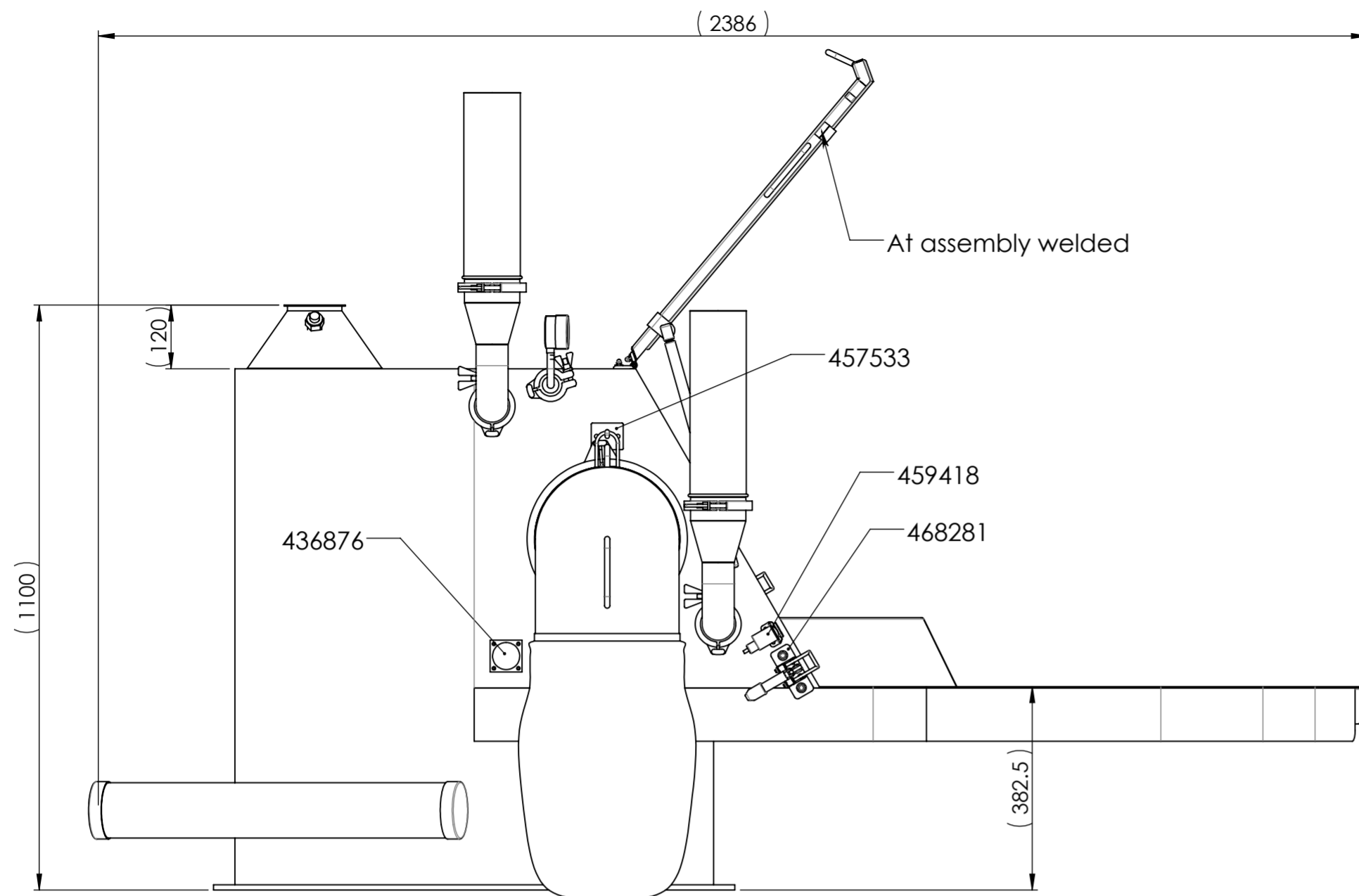
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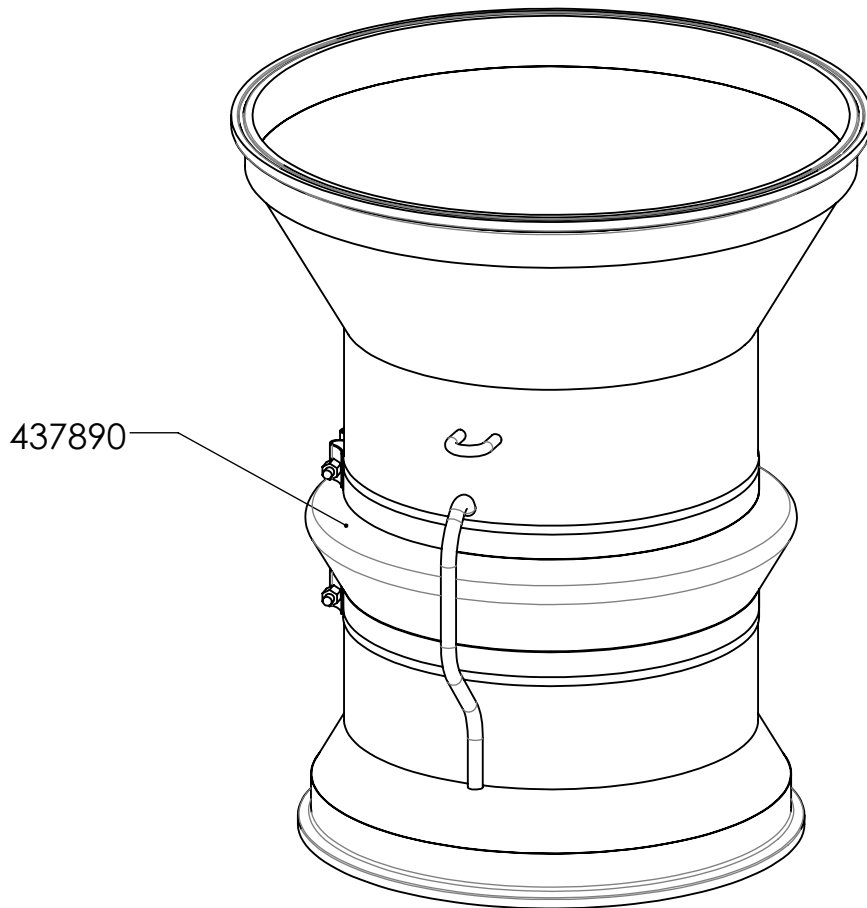


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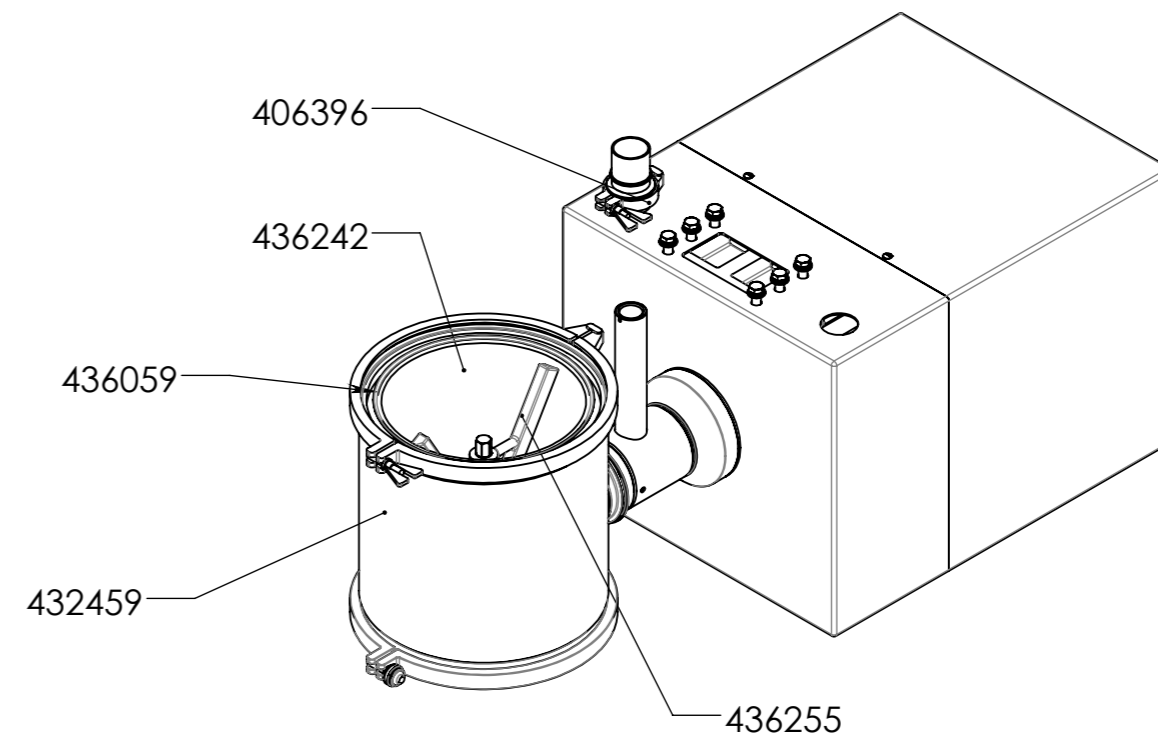
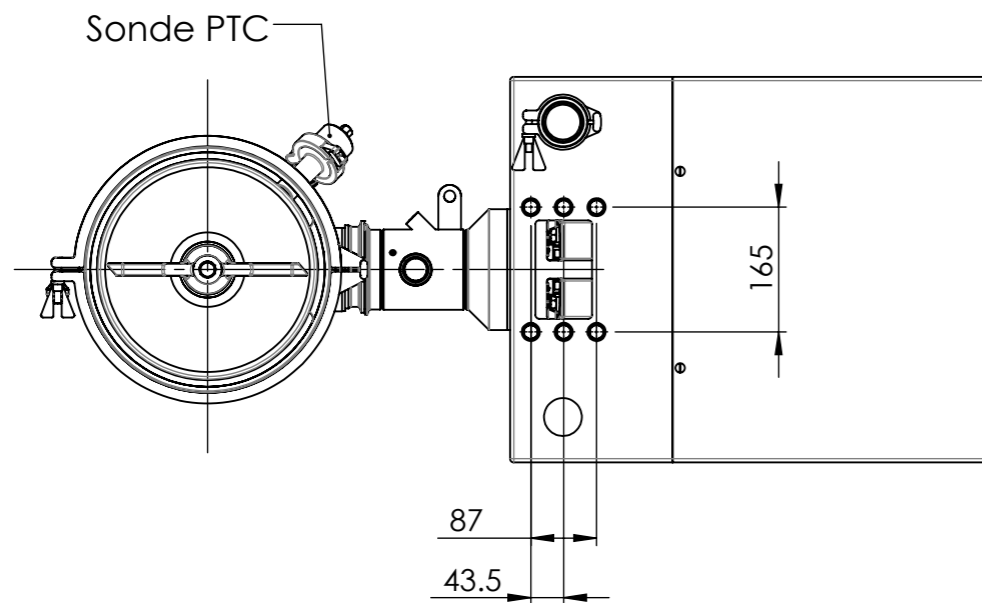
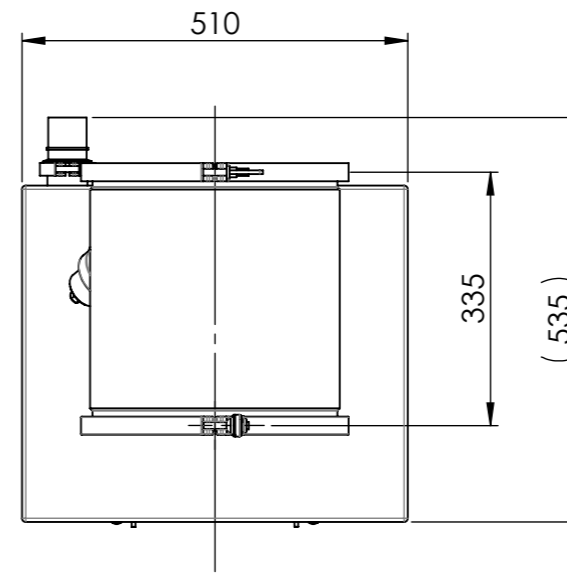
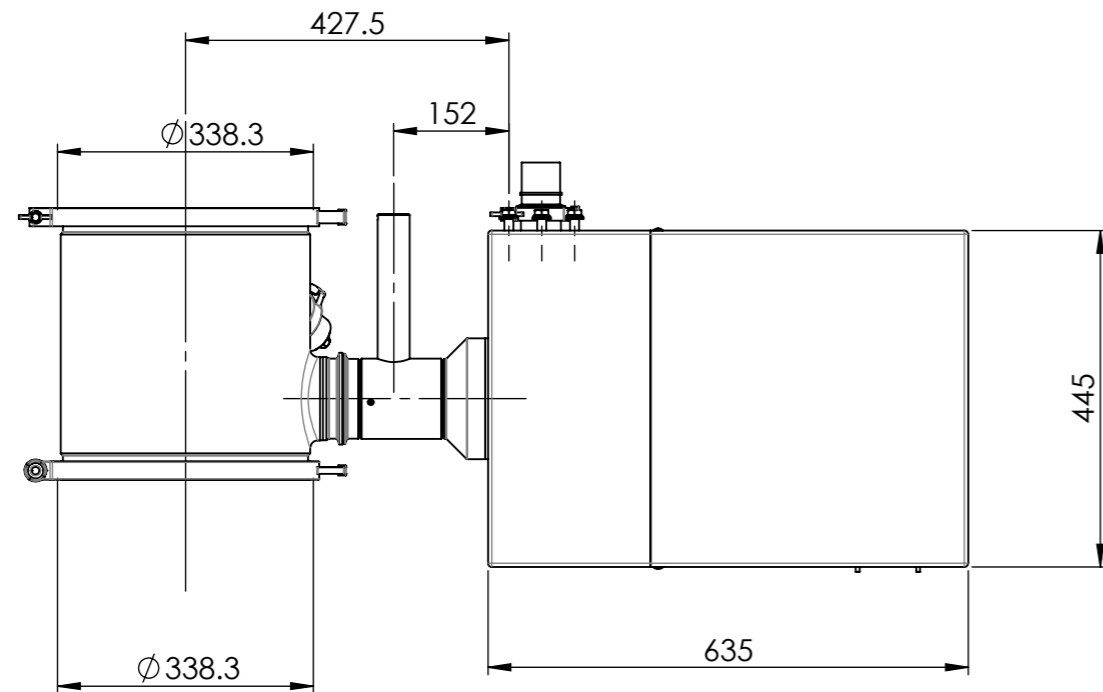
Dimensions without tolerance [mm]	above	6	30	120	400	1000	MATERIAL : N/A					
	up to	6	30	120	400	1000				2000		
Machining: ISO 2768-m		±0.10	±0.20	±0.30	±0.50	±0.80	±1.20	Scale	Similar	Designed	24/04/2014	edgu
Welding Assembly: ISO 2768-c		±0.30	±0.50	±0.80	±1.20	±2.00	±3.00	%		Controlled	24/04/2014	edgu
PRO-14-0012 / DelumpWitt								⊕	Weight [kg]	Revised	24/04/2014	edgu
								A3	N/A	Atex		
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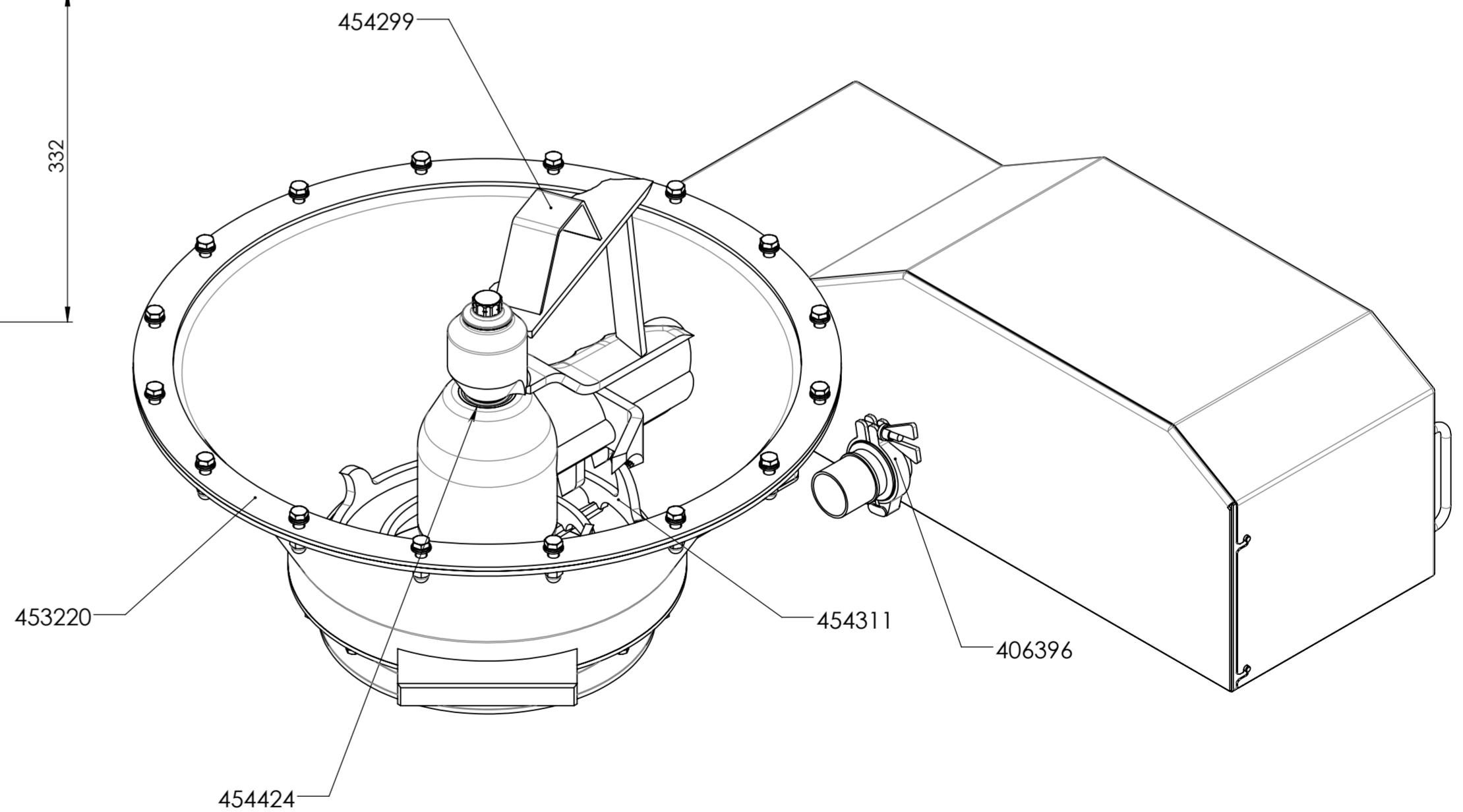
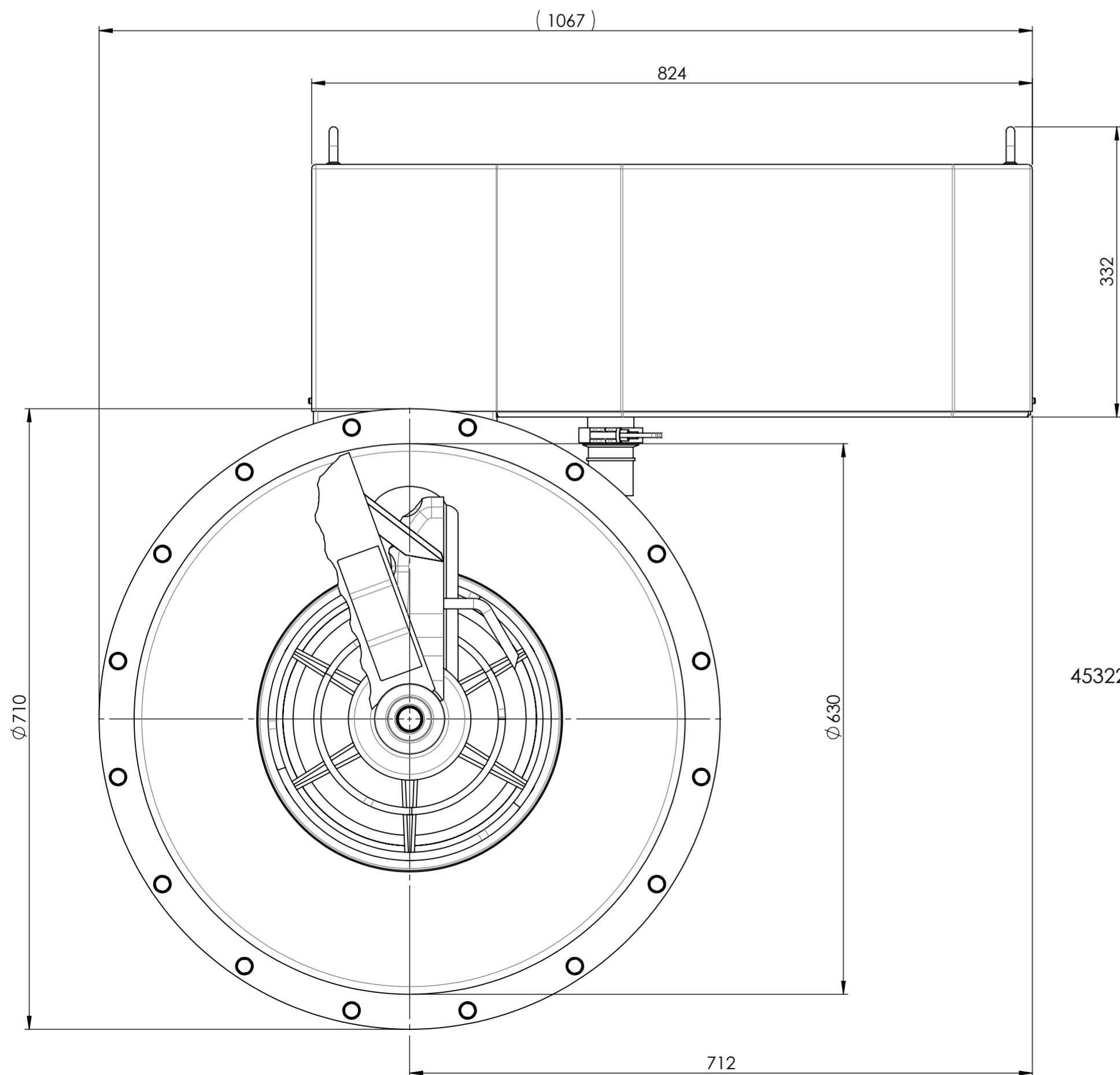
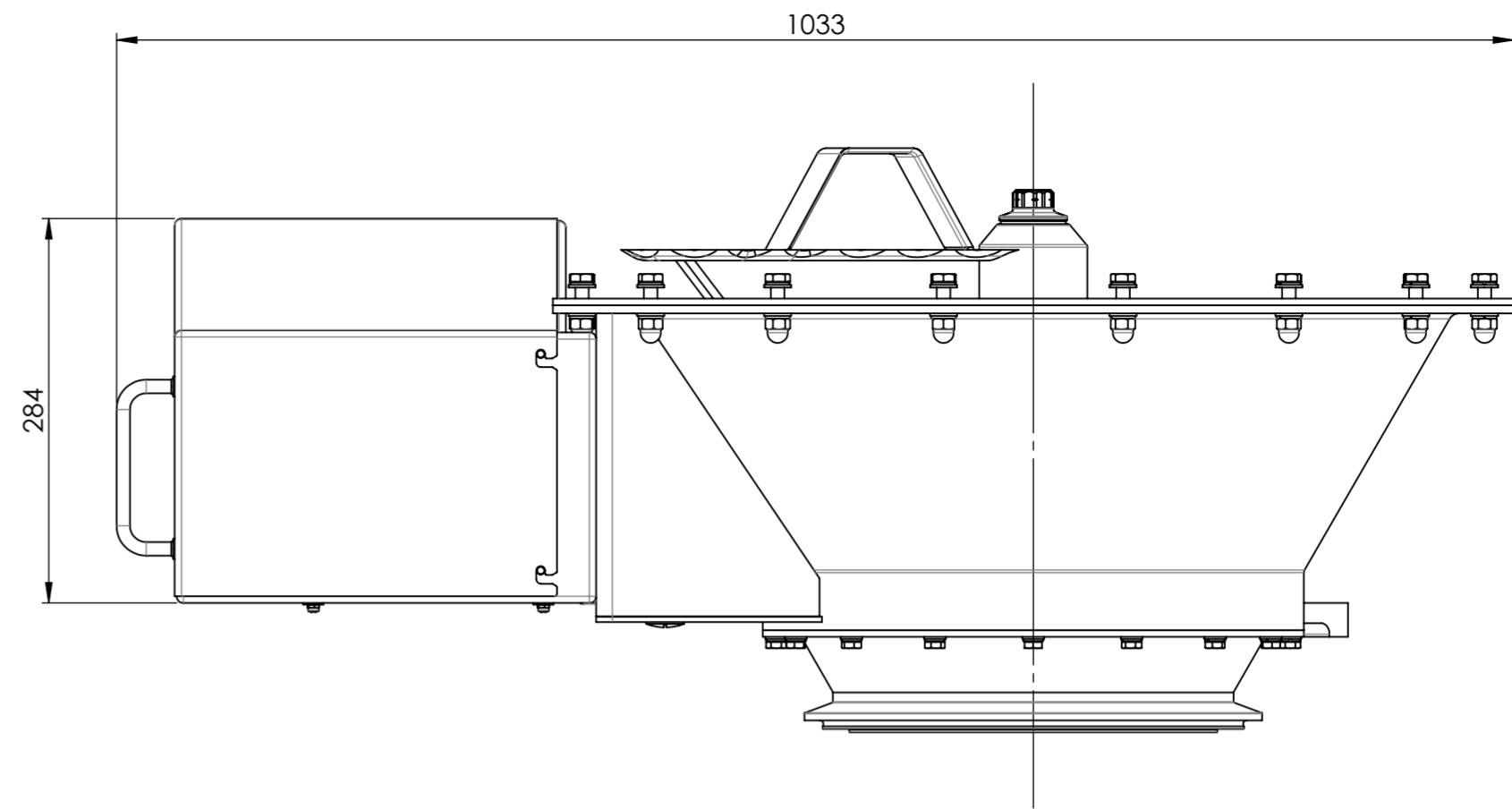
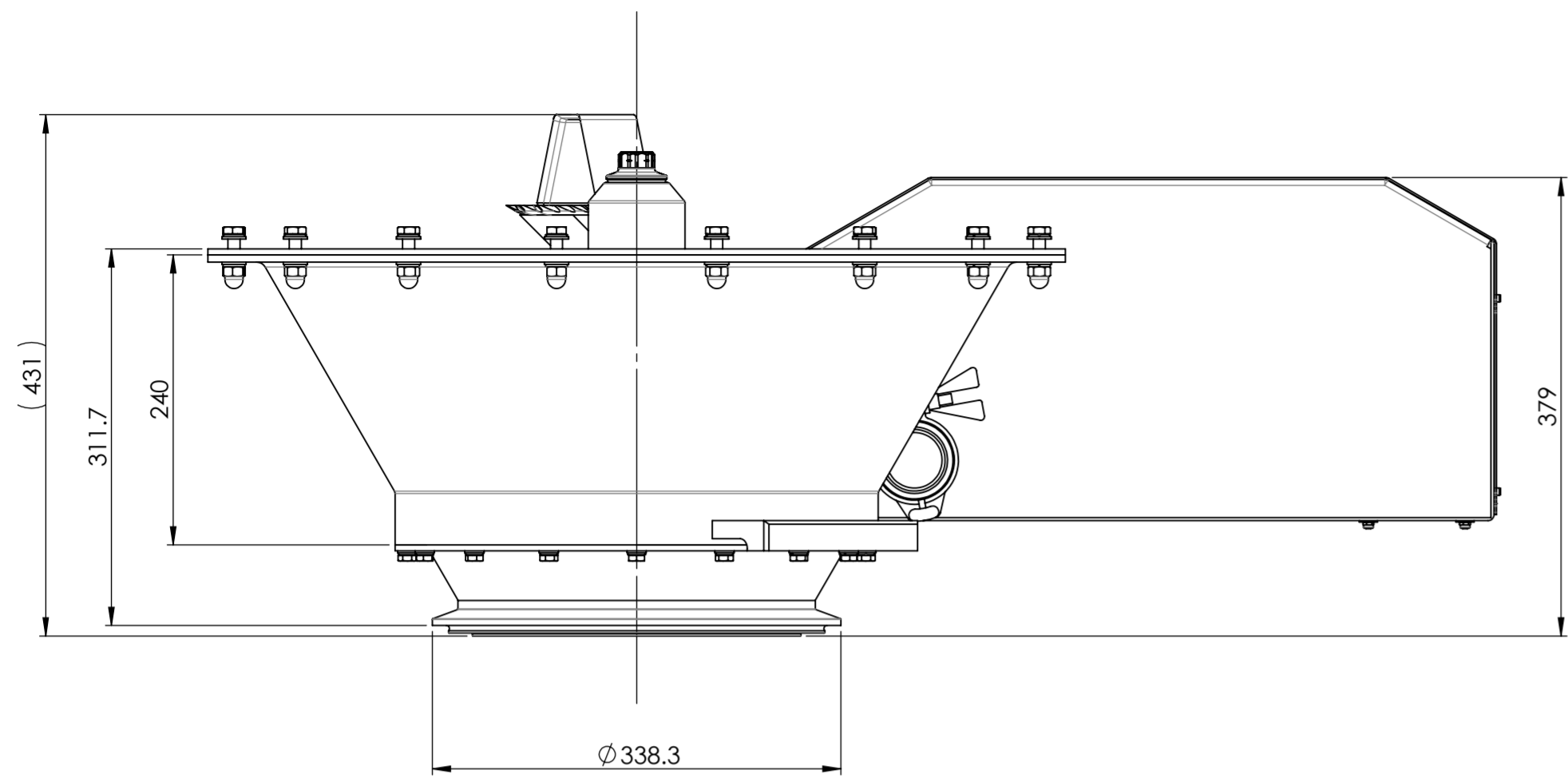
Dimensions without tolerance [mm]	above up to	6	30	120	400	1000	MATERIAL : 316L					
Machining: ISO 2768-m		±0.10	±0.20	±0.30	±0.50	±0.80	Scale %	Similar	Designed	18/02/2014	edgu	
Welding Assembly: ISO 2768-c		±0.30	±0.50	±0.80	±1.20	±2.00	Weight [kg]	464821	Controlled	20/05/2014	edgu	
Ensemble cuve trémie DN900							A2	148.010	Revised	20/05/2014	edgu	
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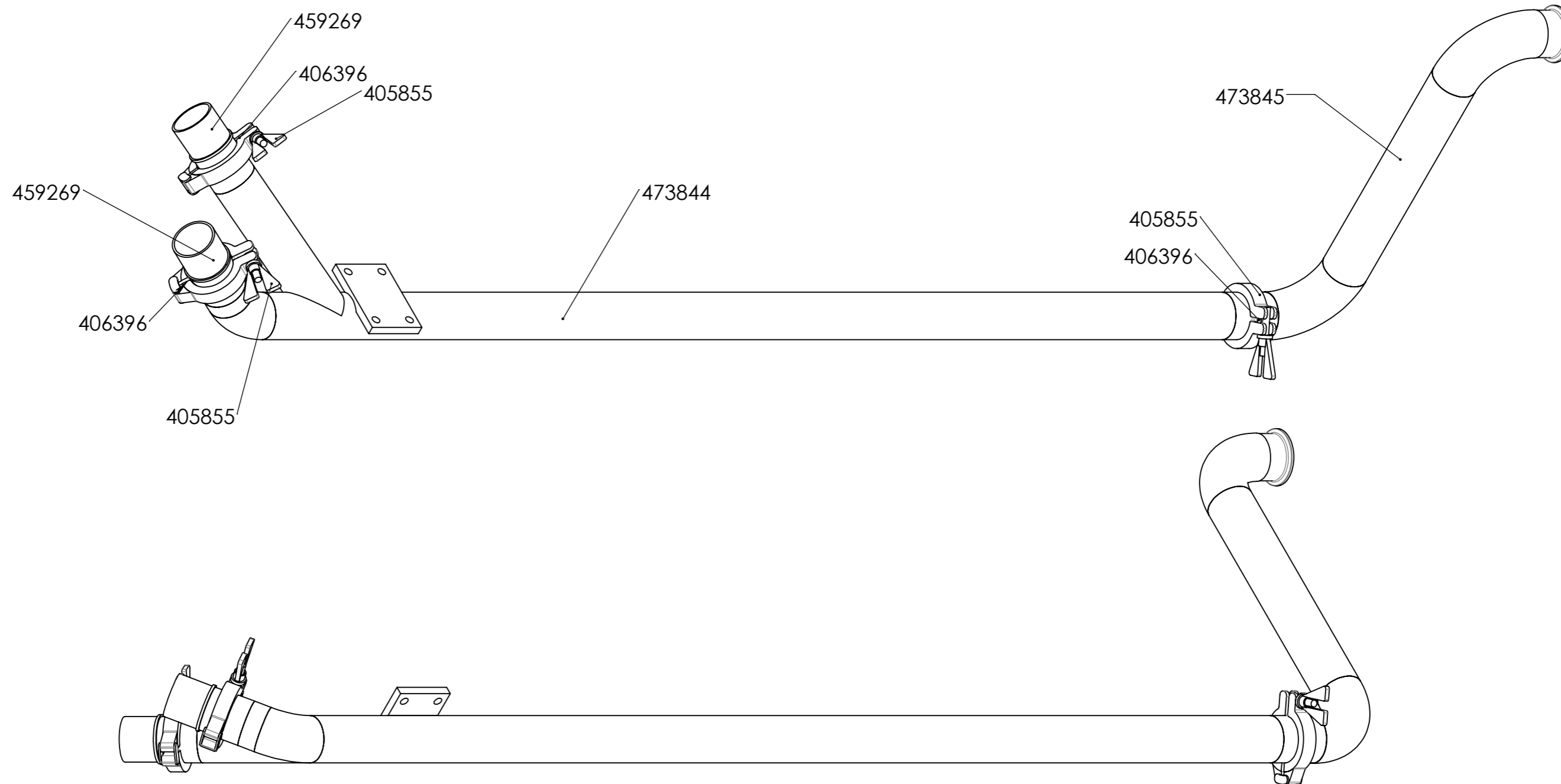
Dimensions without tolerance [mm]	above up to	6	30	120	400	1000	MATERIAL : N/A						
Machining: ISO 2768-m		±0.10	±0.20	±0.30	±0.50	±0.80	±1.20	Scale %	Similar	Designed	04/02/2014	edgu	
Welding Assembly: ISO 2768-c		±0.30	±0.50	±0.80	±1.20	±2.00	±3.00	Weight [kg]		Controlled	04/02/2014	edgu	
Ensemble entonnoir sortie									A4	N/A	Revised	04/02/2014	edgu
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ATEX category	II 1GD / II3D		Machined dim.	ISO 2768-m		
Voltage [V]		Power [kW]	Scale	Welded dim.		
Frequency [Hz]		Speed [min-1]	%	Designed	18/02/2014	
PRO-14-0012 / ConiWitt-250			A3	Controlled	18/02/2014	
				Revised	18/02/2014	
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			473746-LAY		1/1	A



ATEX category	IIID / II3D		Machined dim.	ISO 2768-m	
Voltage [V]		Power [kW]	Welded dim.	ISO 2768-c	
Frequency [Hz]		Speed [min ⁻¹]	Scale	18/02/2014 edgu	
PRO-14-0012 / Profi-Sword			 A2	Designed	18/02/2014 edgu
				Controlled	18/02/2014 edgu
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			Page	Ver.	
			473841-LAY	1/1 A	



ATEX category				Machined dim.		ISO 2768-m					
Voltage [V]		Power [kW]		Scale		Welded dim.					
Frequency [Hz]		Speed [min-1]		%		Designed					
Tube de ventilation ConiWitt-250/Profi-Sword						18/02/2014		edgu			
						Controlled		18/02/2014		edgu	
				A3		Revised		18/02/2014		edgu	
<small>Any and all information received by you from us shall be held and kept confidential and shall not be disclosed by you to any third party except with prior written consent of FREWITT SA.</small>								<small>Frewitt SA: Milling and Handling of Powders P.O.B. 615, CH-1701 Fribourg, SWITZERLAND tel: +41 26 460 74 00 / fax: +41 26 460 74 01 info@frewitt.com / www.frewitt.com</small>			
						473843		Page		Ver.	
								1/1		A	

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Für Bestellungen oder Preisanfragen für Ersatzteile steht Ihnen unser Kundendienst gerne zur Verfügung. Sie erreichen uns wie folgt :

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Tel: +41 26 460 74 00
Fax +41 26 460 74 07
E-mail: customerservice@frewitt.com

Formulaire de commande / d'offre au verso.

Bestellformular / Angebotsformular auf der Rückseite

Order / Inquiry form on the back

TOOLS

ConiWitt-250



Râpes coniques
Raspeleinsätze
Conical grating plates

316L



Surface utile
 Wirksame Fläche
 Useful surface

994 cm²

Article Produkt Product	Perforations Oeffnungen Perforations mm	Epaisseur Blechdicke Thickness mm	Prix Preis Price	Surface ouverte Offene Siebfläche Open area %	Rotor
462029	Ø 1.0	0.6	Sur demande Auf Anfrage On request	14.5	type A
445191	Ø 1.2	0.6		14.5	
445193	Ø 1.5	0.6		15.7	
445196	Ø 2.0	0.6		17.1	
445198	Ø 3.0	0.8		18.8	
445200	Ø 4.0	0.8		19.2	
445202	Ø 5.0	0.8		19.7	type B
445205	Ø 6.0	0.8		19.4	
445207	Ø 8.0	0.8		19.7	
445210	Ø 10.0	0.8		20.1	

Ø = ouvertures rondes / runde Oeffnungen / circular openings



**Use original Frewitt spare and wear parts only.
 Using non Frewitt parts may lead to dangerous situations (explosion or injury)
 and will void the ATEX certification**

ConiWitt-250



Tamis coniques
Konische Siebeinsätze **316L**
Conical screens



Surface utile Wirksame Fläche Useful surface	1023 cm²
--	----------------------------

Article Produkt Product	Perforations Oeffnungen Perforations mm	Epaisseur Blechdicke Thickness mm	Prix Preis Price	Surface ouverte Offene Siebfläche Open area %
444301	Ø 0.50	0.50	Sur demande Auf Anfrage On request	28.50
445158	Ø 0.60	0.60		29.10
445160	Ø 0.70	0.60		28.00
445162	Ø 0.80	0.80		40.00
445170	Ø 1.00	1.00		40.00
444303	Ø 1.20	1.00		40.00
435872	Ø 1.50	1.00		40.00
435881	Ø 2.00	1.00		41.00
435887	Ø 2.50	1.00		46.00
435889	Ø 3.00	1.00		50.00
435894	Ø 3.50	1.00		54.00
435896	Ø 4.00	1.00		57.00
435912	Ø 5.00	1.00		56.00
435917	Ø 6.00	1.00		56.00
435922	Ø 8.00	1.00		58.00
435928	Ø 10.00	1.00		57.00
435958	■ 3.00	0.60		62.00
435967	■ 4.00	1.00		63.00
435969	■ 5.00	1.00		63.00
435971	■ 6.00	1.00		63.00
435973	■ 8.00	1.00	65.00	
435977	■ 10.00	1.00	54.00	

Ø = ouvertures rondes / runde Oeffnungen / circular openings
 ■ = ouvertures carrées / eckige Oeffnungen / square openings



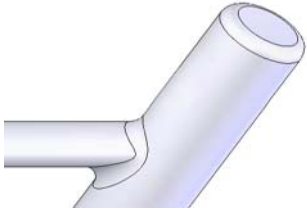
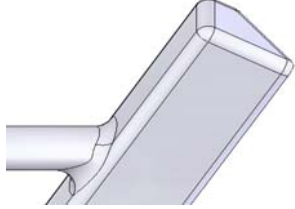
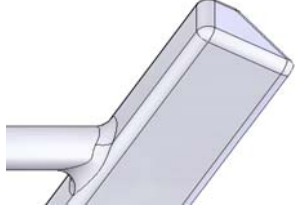
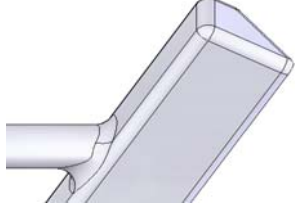
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ConiWitt-250



Rotor

316L

Article Produkt Product		Prix Preis Price	
435307		Sur demande Auf Anfrage On request	Broyage humide Feuchtzerkleinerung Wet milling
435384			Broyage sec Trockenzerkleinerung Dry milling
436253			Rotor pour râpe A Rotor für Raspeleinsätze A Rotor for conicla rasps A
436254			Rotor pour râpe B Rotor für Raspeleinsätze B Rotor for conicla rasps B



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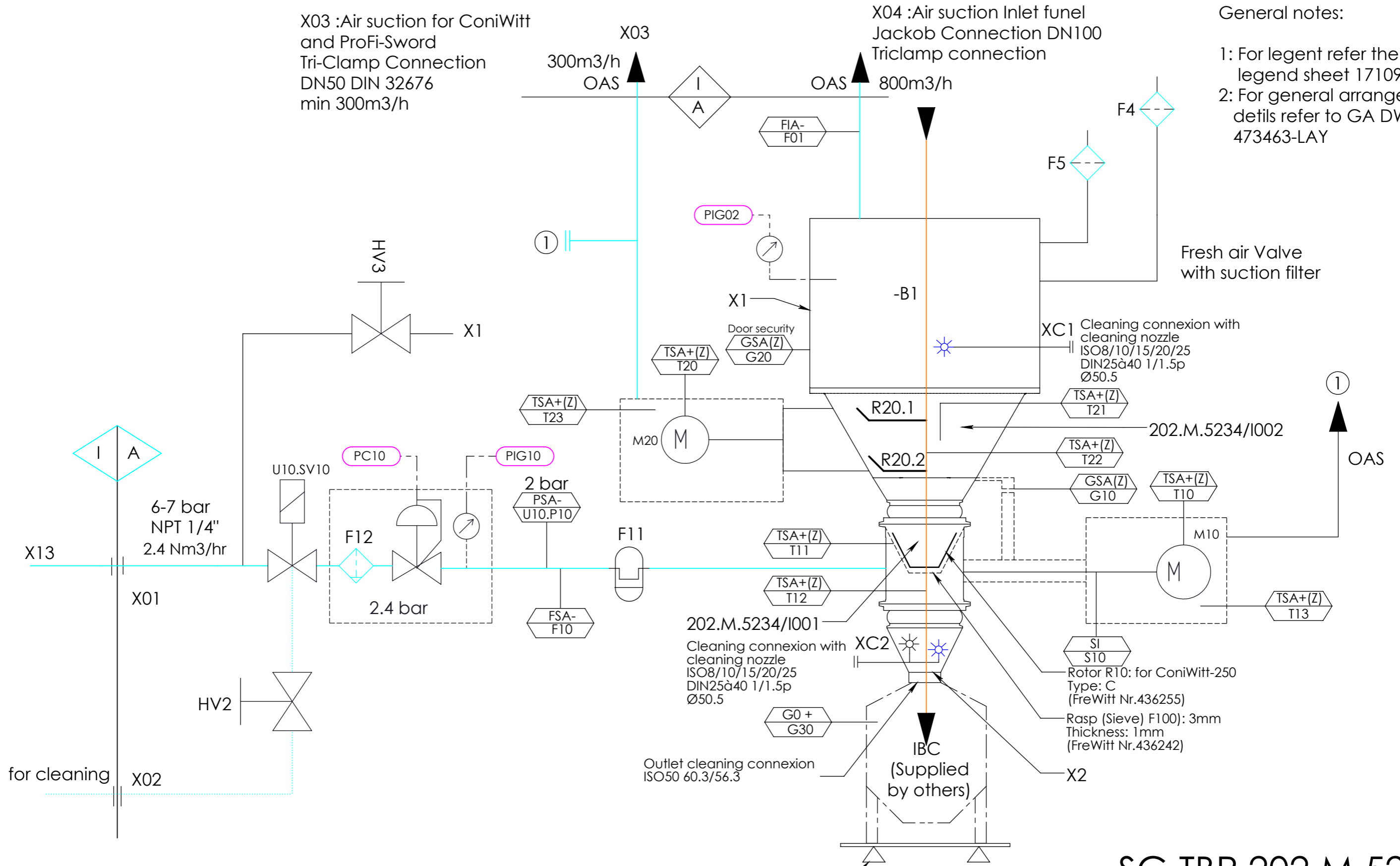
R & I PID / ELECTRIC / DRIVE / PNEUMATICS

X03 :Air suction for ConiWitt and ProFi-Sword
Tri-Clamp Connection
DN50 DIN 32676
min 300m3/h

X04 :Air suction Inlet funnel
Jacob Connection DN100
Triclamp connection

General notes:

- 1: For legend refer the legend sheet 171097
- 2: For general arrangement details refer to GA DWG 473463-LAY



SG.TBP.202.M.5234

U type Weighing Scale
202.M.0914/W013

I=Infrastructure
A=Installation
(Z)=Security

ATEX category	Int. II 1G/ID Ext. 3D			Machined dim.	ISO 2768-m	
Voltage [V]	400	Power [kW]	5.0 / 0.75 / 1.5	Welded dim.	ISO 2768-c	
Frequency [Hz]	50	Speed [min-1]	200-600	Designed	19/02/2014	edgu
R und I PID PRO-14-0012 / DelumpWitt				Controlled	20/05/2014	edgu
				Revised	20/05/2014	edgu
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				473871		Ver.
				1/1		B

Customer: NOVARTIS SINGAPORE

Serial-Nr. DelumpWitt 14001235184

P&ID Diagram 473871 Rev. A

R&I Article R&I Artikel R&I Article	Article N° Artikel Nr. Article ID.	Description Beschreibung Description	Fournisseur Hersteller Supplier	Quantité Menge Quantity
F10	457071	Flow sensor SFE3-F500-L-W18-2PB-K3	FESTO	1
F01	456574	Flow sensor Exi G1/2, Exi, 1G/D, P11206, STS 212 S	BACHOFEN AG	1
F11	457102	Sterile filter for air – P-SRF N 0006 G 1/4" – Element P-SRF N 03/10	Donaldson	1
F12	(453536)	Filter F.01 HA4 G1/4	UNIVER	1
F4	465745	Filter NF 07-351-600 NFIA	FreWitt	1
F5	465745	Filter NF 07-351-600 NFIA	FreWitt	1
G10	404567	Magnet 304 200 00 V2	ELOBAU	1
G10	404568	Magnetic safety switch 671 271 MU0 5	ELOBAU	1
G20	404567	Magnet 304 200 00 V2	ELOBAU	1
G20	404568	Magnetic safety switch 671 271 MU0 5	ELOBAU	1
G30	473759	Proximity Switches P43-T4Y-2D-001-200EEX	Waycon	1
HV2	422158	Valve for cleaning	ASCO / NUMATICS GMBH	1
HV3	422158	Valve for Vibrator	ASCO / NUMATICS GMBH	1
M10	461226	Motor 5kW 6P Ex II2D Ex tD IP65 T125°C 400V 50Hz	LEROY-SOMER SA	1
M20	461218	Motor 0.7 kW 4P, 230/400/50, B14, Ex II2D IP65 125°C	LEROY-SOMER SA	1
PC10	(453536)	Regulator R.01 G1/4 0.2-6 bar	TECSIS	1
PIG02	456254	Vacumeter VMA-63-V1/0-1/4-CT-183522 inox	FESTO SA	1
PIG10	(453536)	Manometer P1415B073001 G1/8	UNIVER	1
S10	406886	Proximity Switches EXI M8 NCB 1,5-8GM25-NO	PEPPERL+FUCHS	1
T10	(452856)	PTC Sensor	(LEROY-SOMER SA)	1
T11	443351	Sensor 3XPTC 60°C EN SÉRIE K401300, KD60	TRELCO AG	1
T12	443351	Sensor 3XPTC 60°C EN SÉRIE K401300, KD60	TRELCO AG	1
T20	(450798)	PTC Sensor	(LEROY-SOMER SA)	1
T21	443351	Sensor 3XPTC 60°C EN SÉRIE K401300, KD60	TRELCO AG	1
T22	443351	Sensor 3XPTC 60°C EN SÉRIE K401300, KD60	TRELCO AG	1
T13	459090	PT 100 M10, 902050/40-378-1011-3-10-20-115-11-5000/000	JUMO	1
T23	459090	PT 100 M10, 902050/40-378-1011-3-10-20-115-11-5000/000	JUMO	1
U10.P10	(453536)	Pressure Swiches 40500211211	Layher	1
U10.SV10	(453536)	Solenoid valve PV G356A002VMS	ASCO JOUCOMATIC	1
B1	459229	Sachschütte	FreWitt	1
I002	459271	ProFi-Sword	FreWitt	1
I001	459286	ConiWitt-250	FreWitt	1
XC1	459332	Cleaning connection	FreWitt	1
XC2	456364	Cleaning connection	FreWitt	1
R10	436255	Rotor fs Type C	FreWitt	1
F100	436242	Raspel Sieb 3mm Dicke 1mm	FreWitt	1
R20.1	454299	Rotor ProFi-Sword	FreWitt	1
R20.2	454311	Rotor ProFi-Sword	FreWitt	1
X1	436876	Vibrator NTP25B+C SE Inox	Netter	1
X2	470252	Magnetic separator Type Neoflux Cleanflow magnet SEC38333F	Goudsmit / Frewitt	1
W013	473792	Weighing (Typ IND590 / PTA459-F1500T)	Mettler Toledo	1

Customer: NOVARTIS SINGAPORE

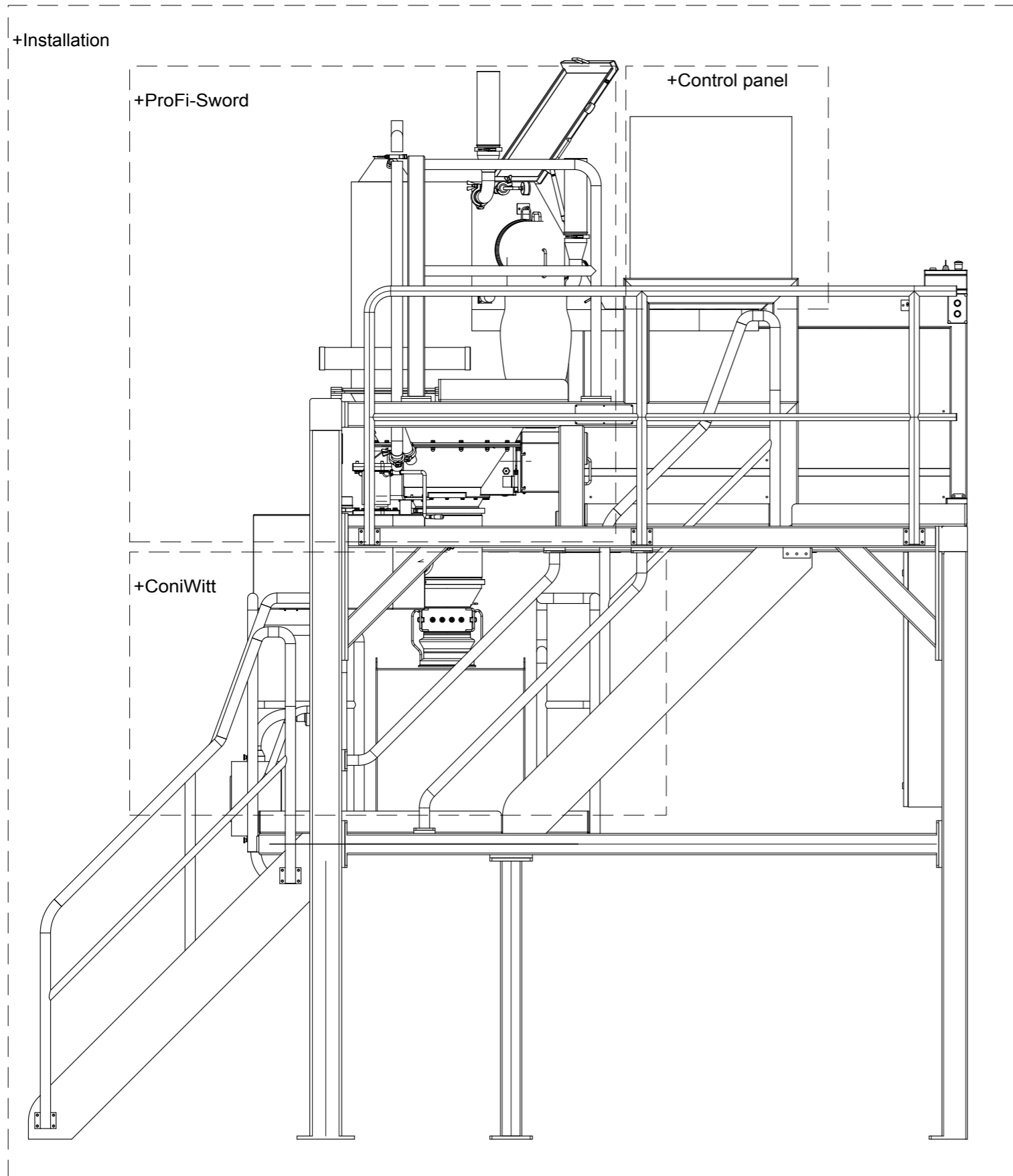
Serial-Nr. DelumpWitt 14001235184

P&ID Diagram 473871 Rev. B

R&I Article R&I Artikel R&I Article	Article N° Artikel Nr. Article ID.	Description Beschreibung Description	Fournisseur Hersteller Supplier	Quantité Menge Quantity
F10	457071	Flow sensor SFE3-F500-L-W18-2PB-K1	FESTO	1
F01	456574	Flow sensor Exi G1/2, Exi, 1G/D, P11206, STS 212 S	BACHOFEN AG (EGE)	1
F11	457102	Sterile filter for air – P-SRF N 0006 G 1/4" – Element P-SRF N 03/10	Donaldson	1
F12	(453536)	Filter F.01 HA4 G1/4	UNIVER	1
F4	465745	Filter NF 07-351-600 NFIA	FreWitt	1
F5	465745	Filter NF 07-351-600 NFIA	FreWitt	1
G10	404567	Magnet 304 200 00 V	ELOBAU	1
G10	404568	Magnetic safety switch 671 271 MU0 10	ELOBAU	1
G20	404567	Magnet 304 200 00 V	ELOBAU	1
G20	404568	Magnetic safety switch 671 271 MU0 10	ELOBAU	1
G30	473759	Proximity Switches P43-T4Y-2D-001-200EEX	Waycon	1
HV2	422158	Valve for cleaning	ASCO / NUMATICS GMBH	1
HV3	422158	Valve for Vibrator	ASCO / NUMATICS GMBH	1
M10	461226	Motor 5kW 6P Ex II2D Ex tD IP65 T125°C 400V 50Hz	LEROY-SOMER SA	1
M20	473196	Motor 0.75 kW 4P, 230/400/50, B14, Ex II2D IP65 125°C	LEROY-SOMER SA	1
PC10	(453536)	Regulator R.01 G1/4 0.2-6 bar	UNIVER (TECSIS)	1
PIG02	460760	Vacumeter 632.050.063 -100...0 mbar G1/4 B inox	WIKA	1
PIG10	(453536)	Manometer P1415B073001 G1/8	Tesis (UNIVER)	1
S10	406886	Proximity Switches EXI M8 NCB 1,5-8GM25-NO	PEPPERL+FUCHS	1
T10	(452856)	PTC Sensor	(LEROY-SOMER SA)	1
T11	443351	Sensor 3XPTC 60°C EN SÉRIE K401300, KD60	TRELCO AG (ZIEHL)	1
T12	443351	Sensor 3XPTC 60°C EN SÉRIE K401300, KD60	TRELCO AG (ZIEHL)	1
T20	(450798)	PTC Sensor	(LEROY-SOMER SA)	1
T21	443351	Sensor 3XPTC 60°C EN SÉRIE K401300, KD60	TRELCO AG (ZIEHL)	1
T22	443351	Sensor 3XPTC 60°C EN SÉRIE K401300, KD60	TRELCO AG (ZIEHL)	1
T13	459090	PT 100 M10, 902050/40-378-1011-3-10-20-115-11-5000/000	JUMO	1
T23	459090	PT 100 M10, 902050/40-378-1011-3-10-20-115-11-5000/000	JUMO	1
U10.P10	(453536)	Pressure Swiches 40500211211	Layher	1
U10.SV10	(453536)	Solenoid valve PV G356A002VMS	ASCO JOUCOMATIC	1
B1	459229	Sachschütte	FreWitt	1
I002	459271	ProFi-Sword	FreWitt	1
I001	459286	ConiWitt-250	FreWitt	1
XC1	459332	Cleaning connection	FreWitt	1
XC2	456364	Cleaning connection	FreWitt	1
R10	436255	Rotor fs Type C	FreWitt	1
F100	436242	Raspel Sieb 3mm Dicke 1mm	FreWitt	1
R20.1	454299	Rotor ProFi-Sword	FreWitt	1
R20.2	454311	Rotor ProFi-Sword	FreWitt	1
X1	436876	Vibrator NTP25B+C SE Inox	Netter	1
X2	470252	Magnetic separator Type Neoflux Cleanflow magnet SEC38333F	Goudsmit / Frewitt	1
W013	473792	Weighing (Typ IND590 / PTA459-F1500T)	Mettler Toledo	1

Project : PRO-14-0012

SG.TBP 202.M.5234



Type : PF - Installation
 Carrying out: 400V,50Hz,3P+N+PE
 Rated output power: 17 kW
 Rated current: 30 A



Wire colors :

Power	400VAC - L1	Brown	6mm ²
Power	400VAC - L2	Black	6mm ²
Power	400VAC - L3	Gray	6mm ²
Power	N	Light blue	6mm ²
Power	PE	Green/Yellow	6mm ²
Control voltage	24VDC	Violet	0.5 to 0.75mm ²
Control voltage	0VDC	Violet-White	0.5 to 0.75mm ²
Control voltage	Ex-i	Blue	0.75mm ²
External voltage	...	Orange	0.75mm ²

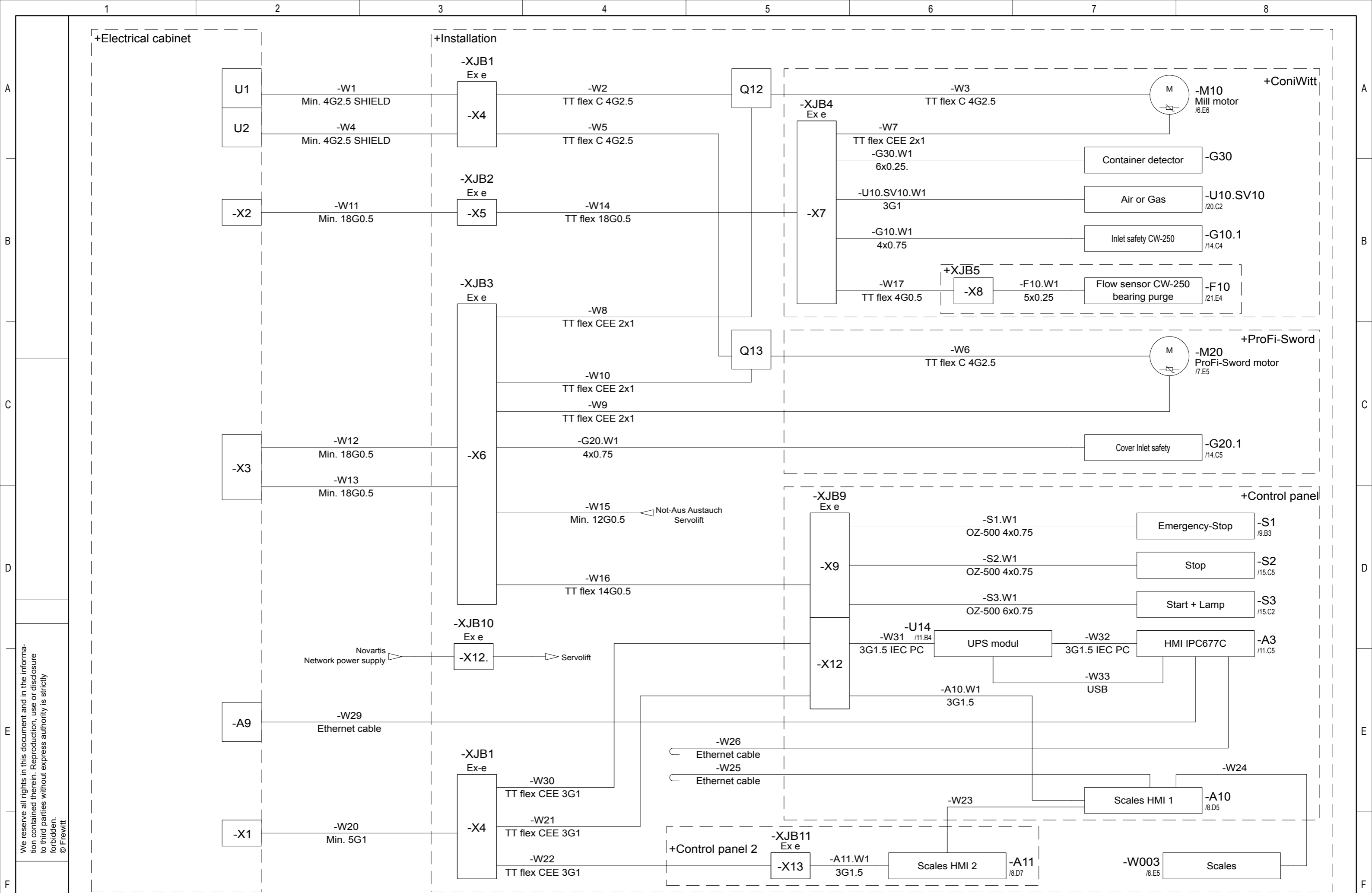
White	WH	Blue	BU
Brown	BN	Red	RD
Green	GN	Black	BK
Yellow	YE	Violet	VT
Gray	GY	Orange	OG
Pink	PK		

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B	Project closure	19.05.2014	vri	User	phha
C	Project follow-up	22.05.2014	vri	Proved	phha
Status	Change	Date	Name	Standard	Origin

Novartis Singapore, SG-Singapore				Frewitt SA: Milling and Handling of Powders P.O.B. 615, CH-1701 Fribourg, SWITZERLAND tel: +41 26 460 74 00 / fax: +41 26 460 74 01 info@frewitt.com / www.frewitt.com	
Origin	Repl. f.	Repl. by			

00 - Cover sheet		473825		Page	1 / 53
DelumpWitt					



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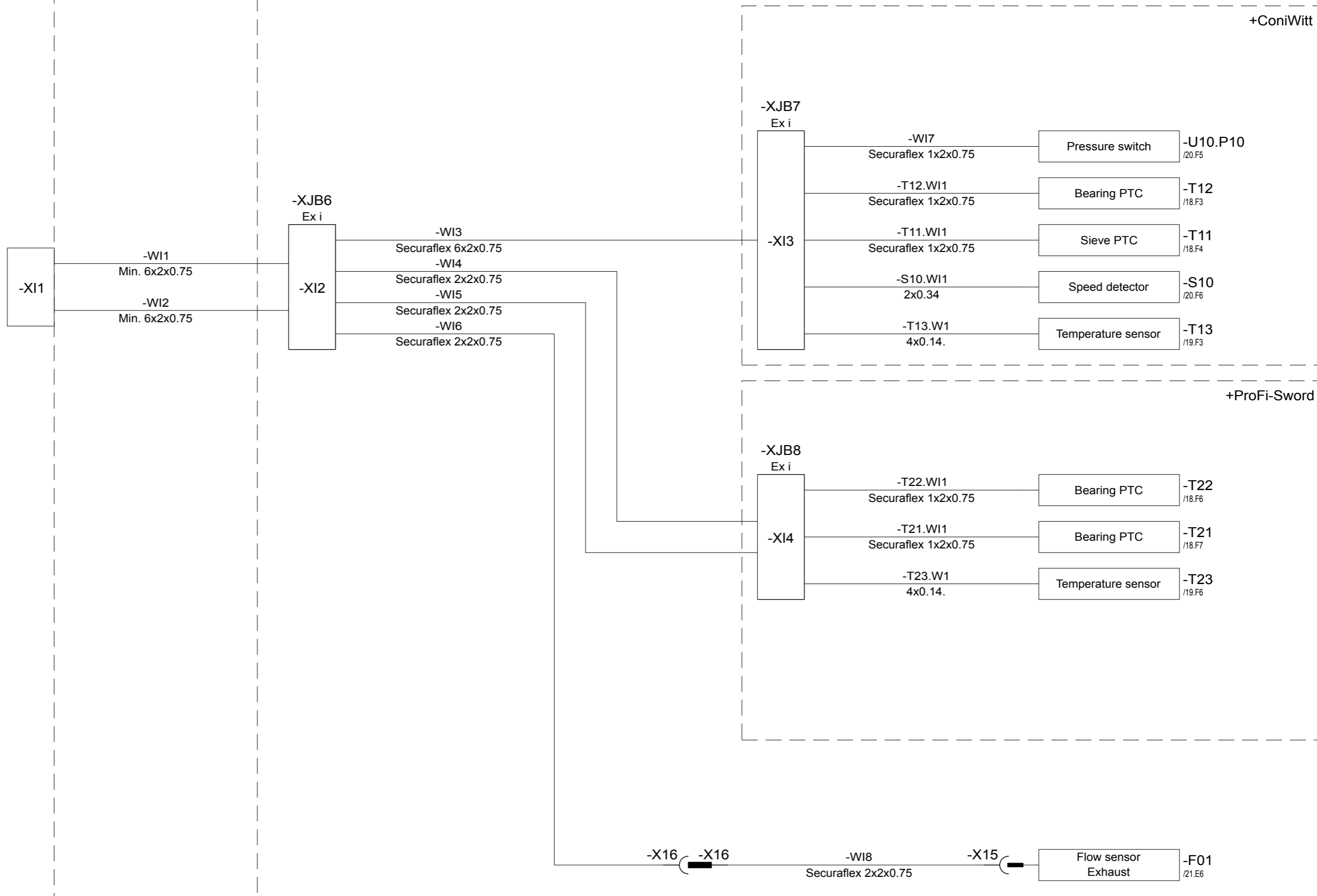
A	Initial version	14.02.2014	phha	Date	14.02.2014	Novartis Singapore, SG-Singapore PRO-14-0012 400V,50Hz,3P+N+PE	Frewitt SA: Milling and Handling of Powders P.O.B. 615, CH-1701 Erlibourg, SWITZERLAND tel: +41 26 460 74 00 / fax: +41 26 460 74 01 info@frewitt.com / www.frewitt.com	01 - Overview Instruments location	Type : PF - Installation	473825	Page 2 / 53
B	Project closure	19.05.2014	vri	User	phha						
C	Project follow-up	22.05.2014	vri	Proved	phha						
Status	Change	Date	Name	Standard	Origin	Repl. f.	Repl. by				

+Electrical cabinet

+Installation

+ConiWitt

+ProFi-Sword



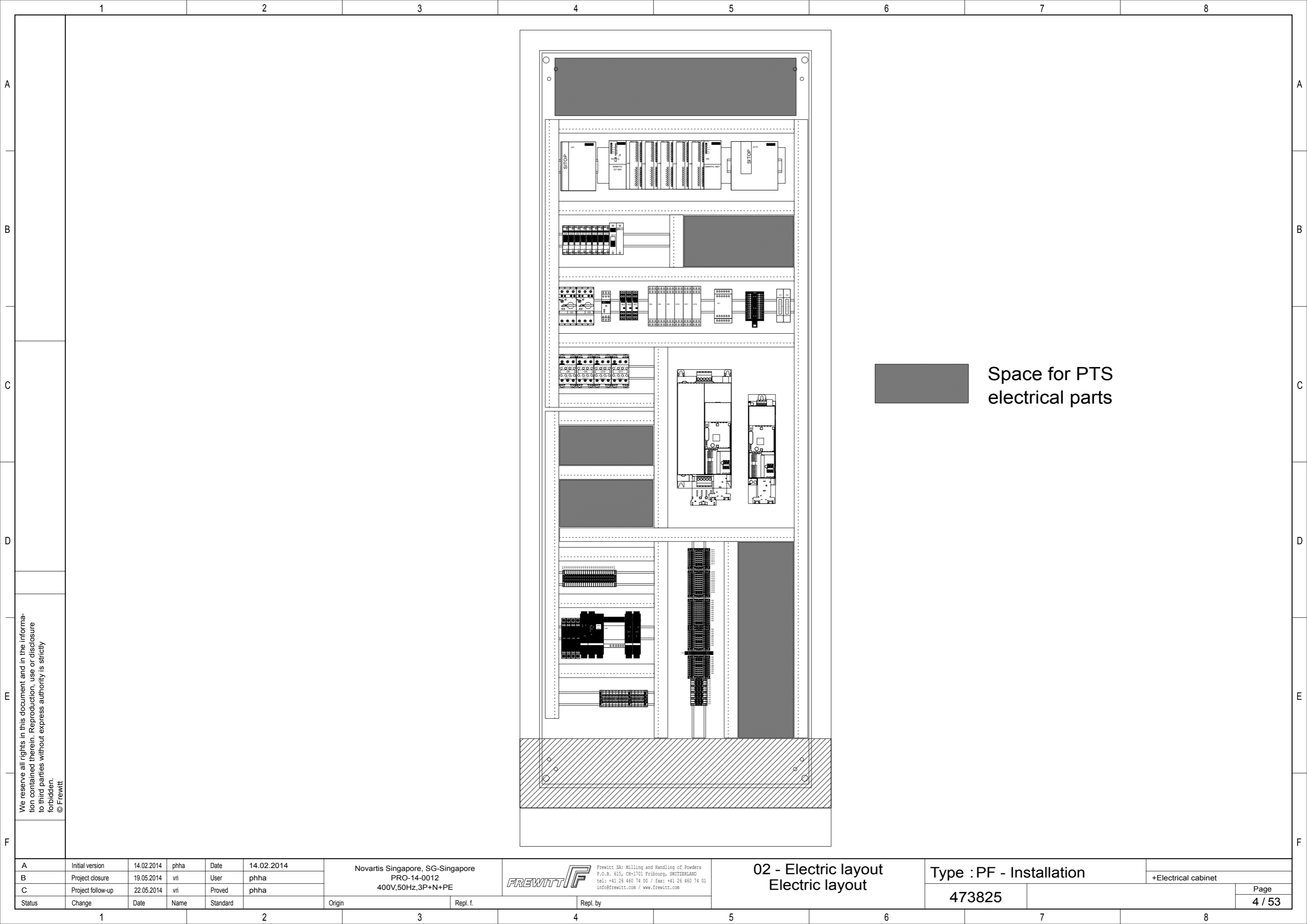
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C	Project follow-up	22.05.2014	vri	Proved	phha
Status	Change	Date	Name	Standard	

Novartis Singapore, SG-Singapore PRO-14-0012 400V,50Hz,3P+N+PE			Frewitt SA: Milling and Handling of Powders P.O.B. 615, CH-1701 Erlibourg, SWITZERLAND tel: +41 26 460 74 00 / fax: +41 26 460 74 01 info@frewitt.com / www.frewitt.com	
Origin	Repl. f.		Repl. by	

**01 - Overview
Instruments location**

Type : PF - Installation		
473825		Page 3 / 53



 Space for PTS electrical parts

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Status	Change	Date	Name	Standard	

Novartis Singapore, SG-Singapore	
PRO-14-0012	
400V,50Hz,3P+N+PE	
Origin	Repl. f.

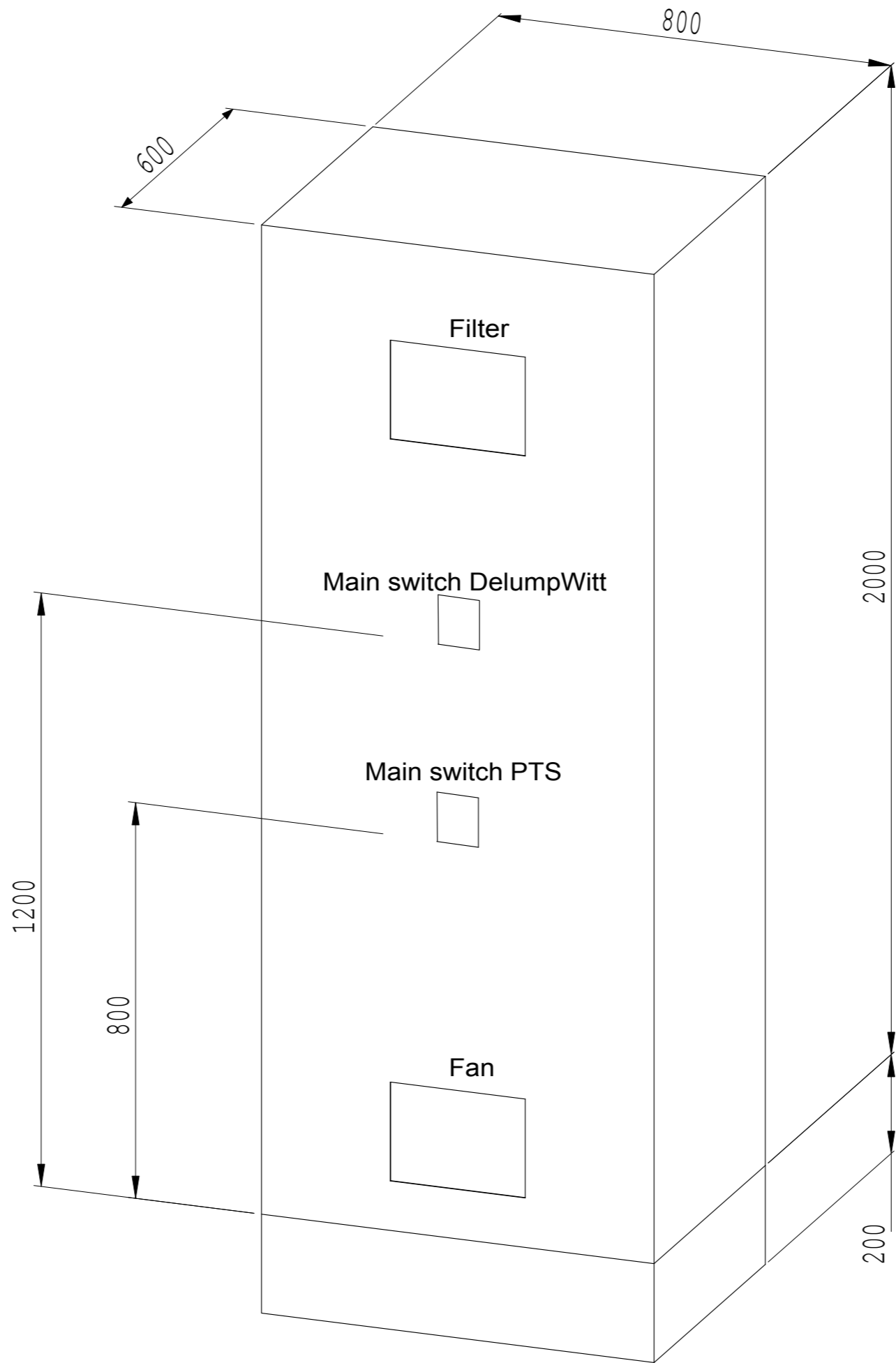
FREWITT 

Frewitt SA: Milling and Handling of Powders
P.O.B. 615, CH-1701 Erlibourg, SWITZERLAND
tel: +41 26 460 74 00 / fax: +41 26 460 74 01
info@frewitt.com / www.frewitt.com

02 - Electric layout
Electric layout

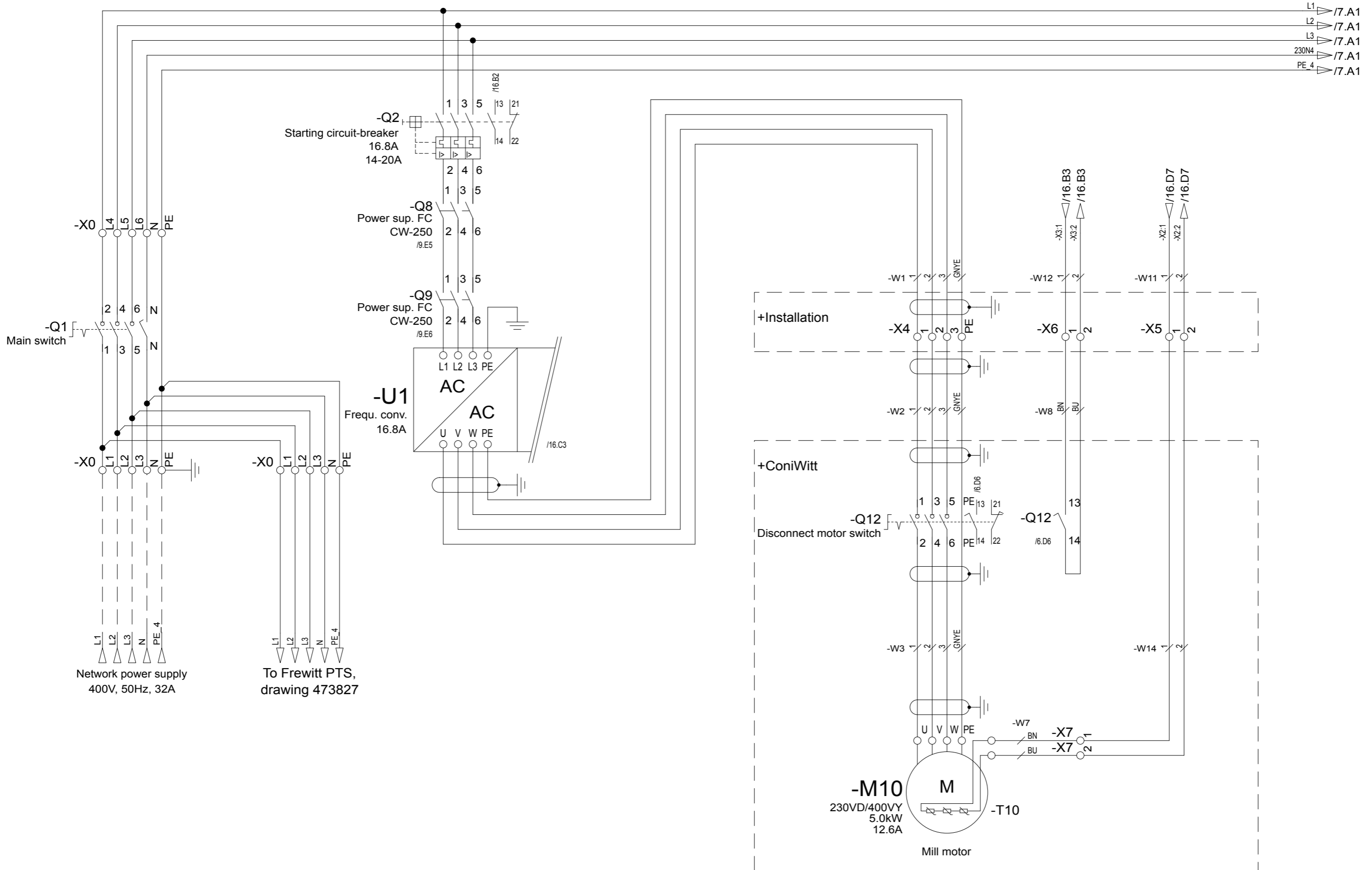
Type : PF - Installation		+Electrical cabinet	
473825		Page	4 / 53

Housing steel: 1.5mm
 Door steel: 2mm
 Door open from left to right



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B	Project closure	19.05.2014	vri	User	phha				473825	Page	
C	Project follow-up	22.05.2014	vri	Proved	phha				5 / 53		
Status	Change	Date	Name	Standard	Origin	Repl. f.	Repl. by				



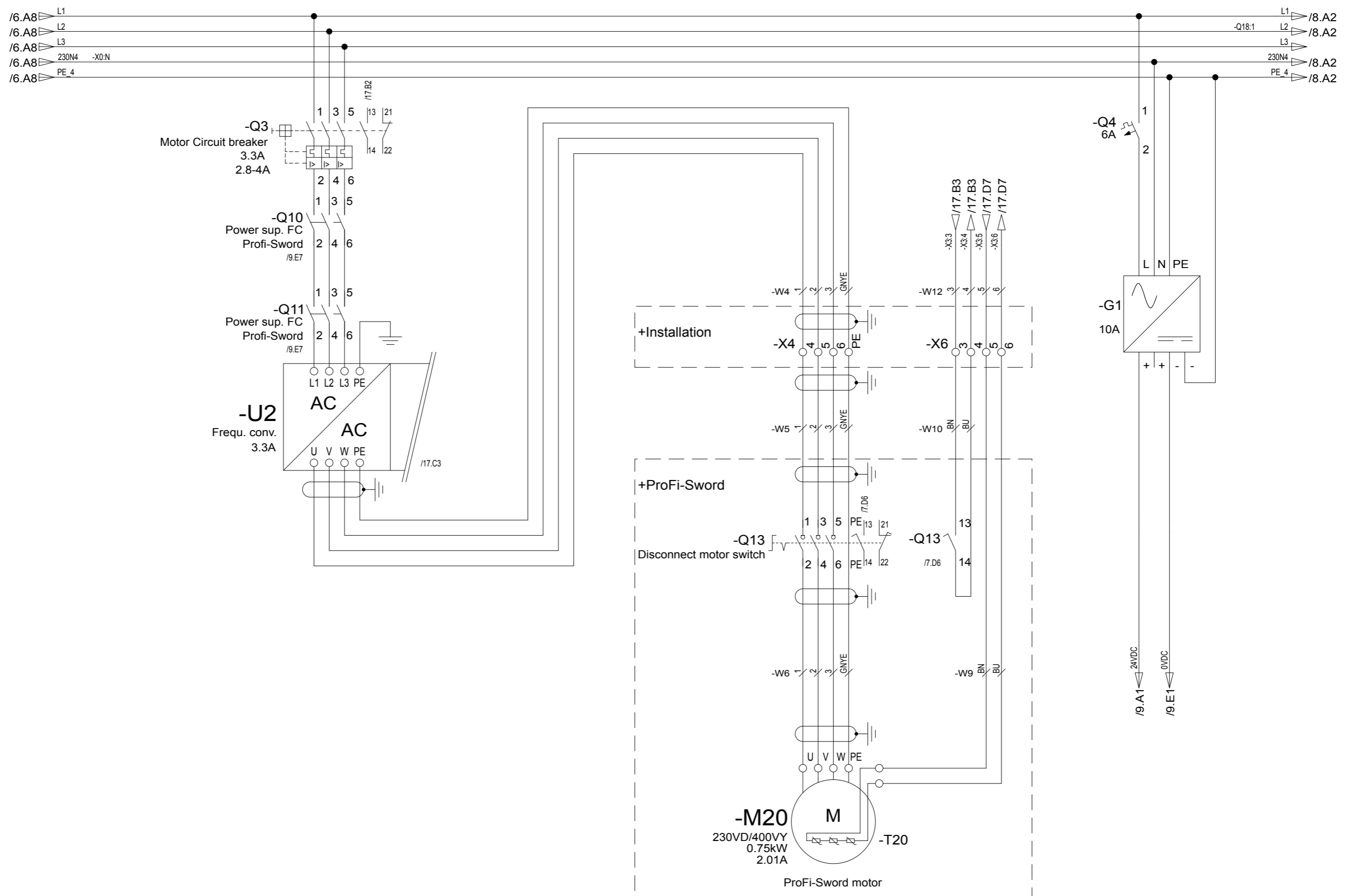
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B	Project closure	19.05.2014	vri	User	phha
C	Project follow-up	22.05.2014	vri	Proved	phha
Status	Change	Date	Name	Standard	

Novartis Singapore, SG-Singapore		Frewitt SA: Milling and Handling of Powders P.O.B. 615, CH-1701 Erlibourg, SWITZERLAND tel: +41 26 460 74 00 / fax: +41 26 460 74 01 info@frewitt.com / www.frewitt.com
PRO-14-0012		
400V,50Hz,3P+N+PE		
Origin	Repl. f.	Repl. by

03 - Electrical diagram
Power

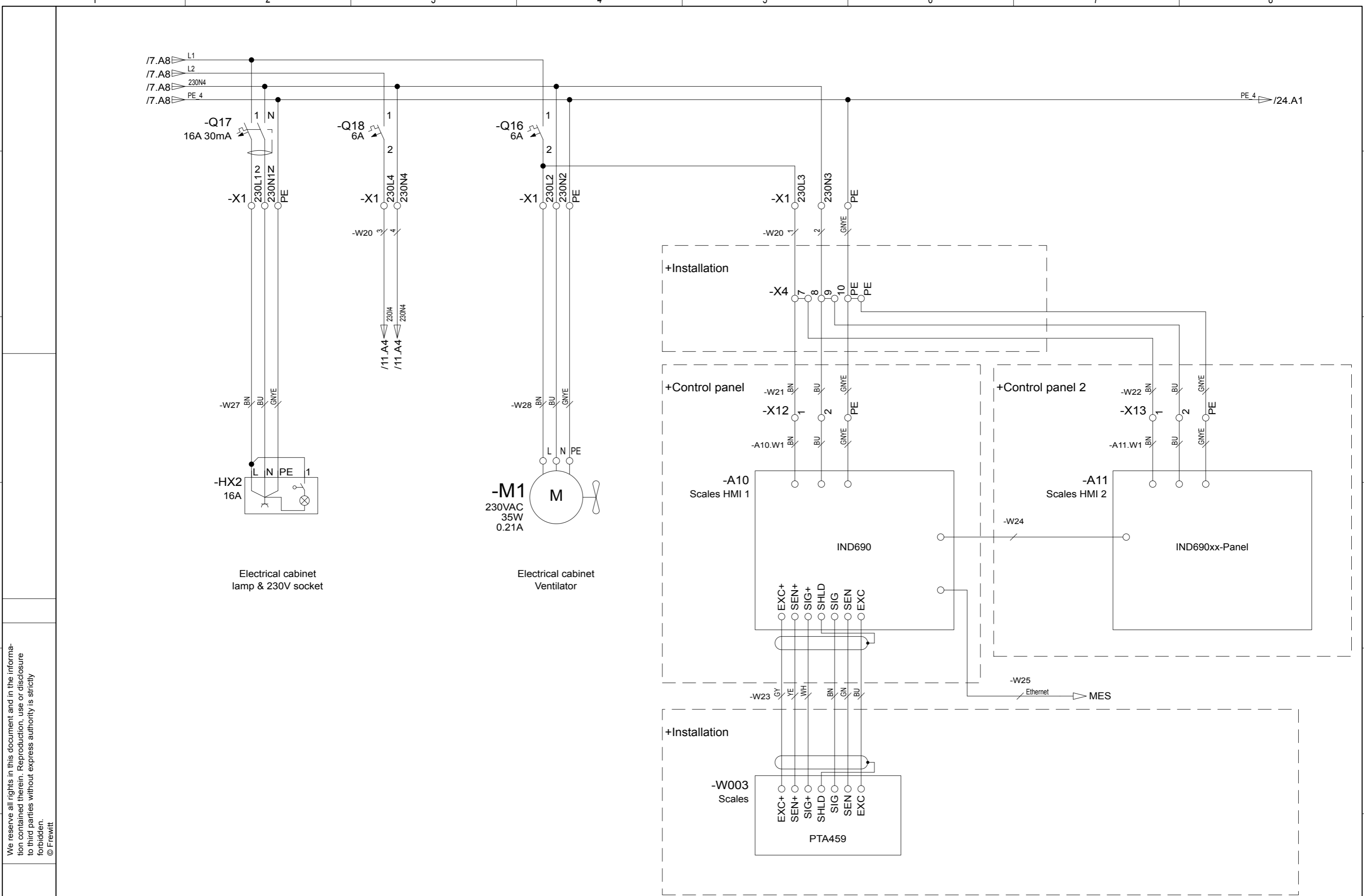
Type : PF - Installation	+Electrical cabinet
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Crusher module

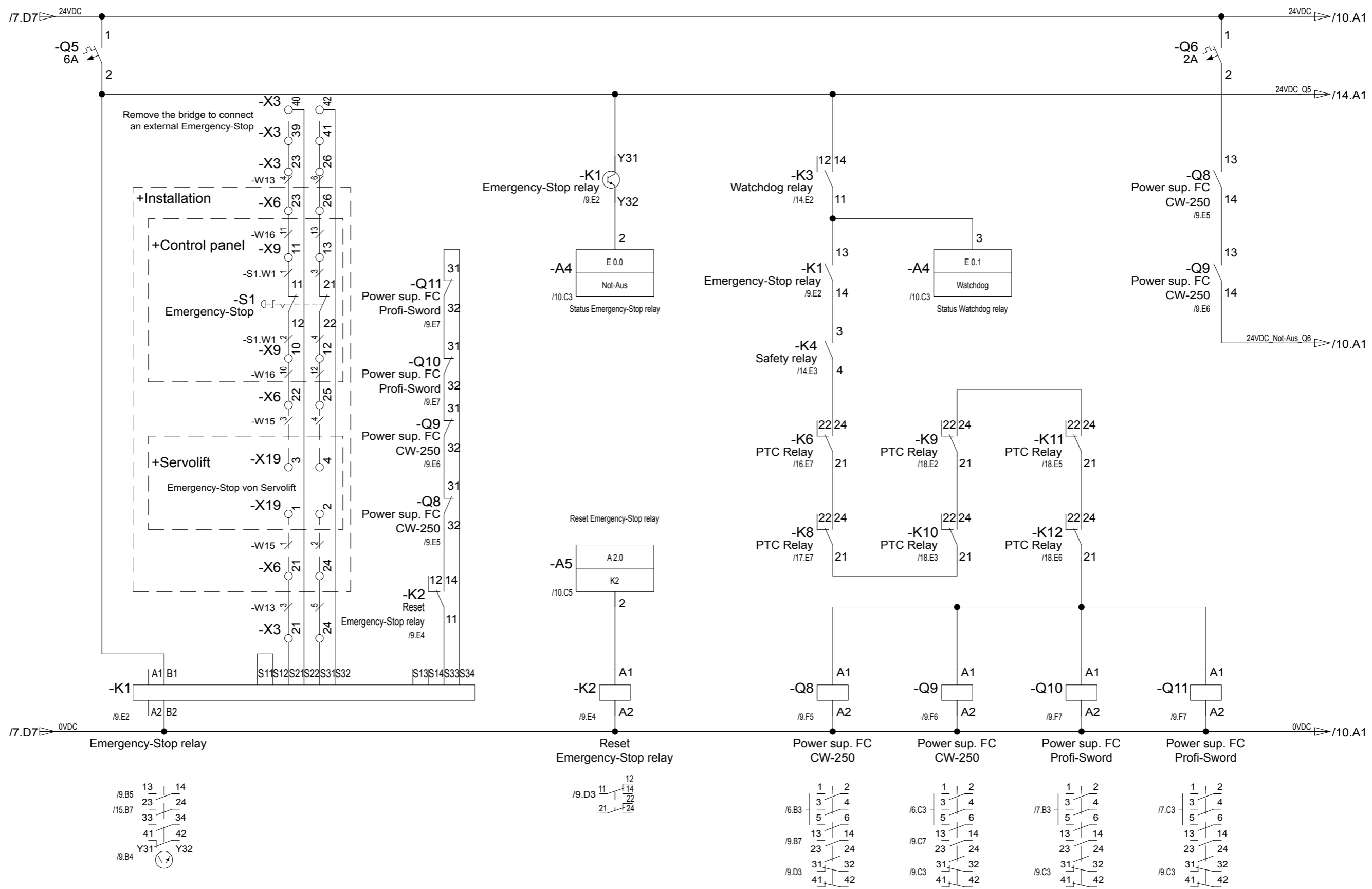
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C	Project follow-up	22.05.2014	vri	Proved	phha						
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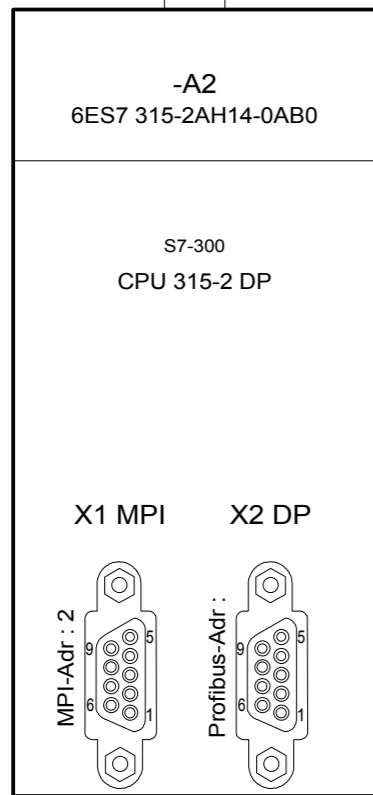
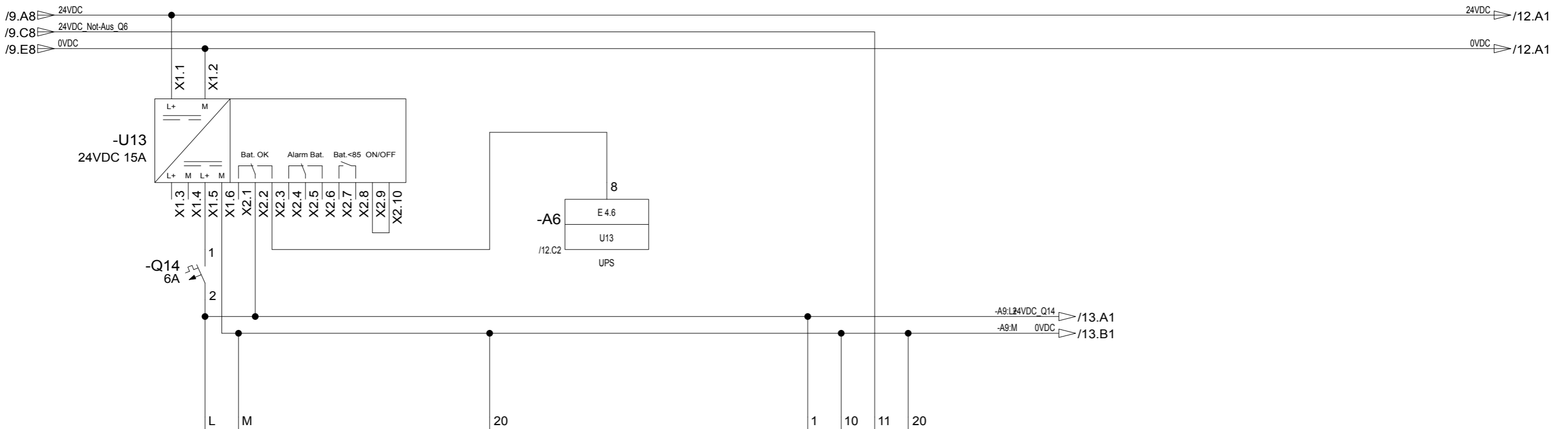
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C	Project follow-up	22.05.2014	vri	Proved	phha							
Status	Change	Date	Name	Standard	Origin	Repl. f.	Repl. by					



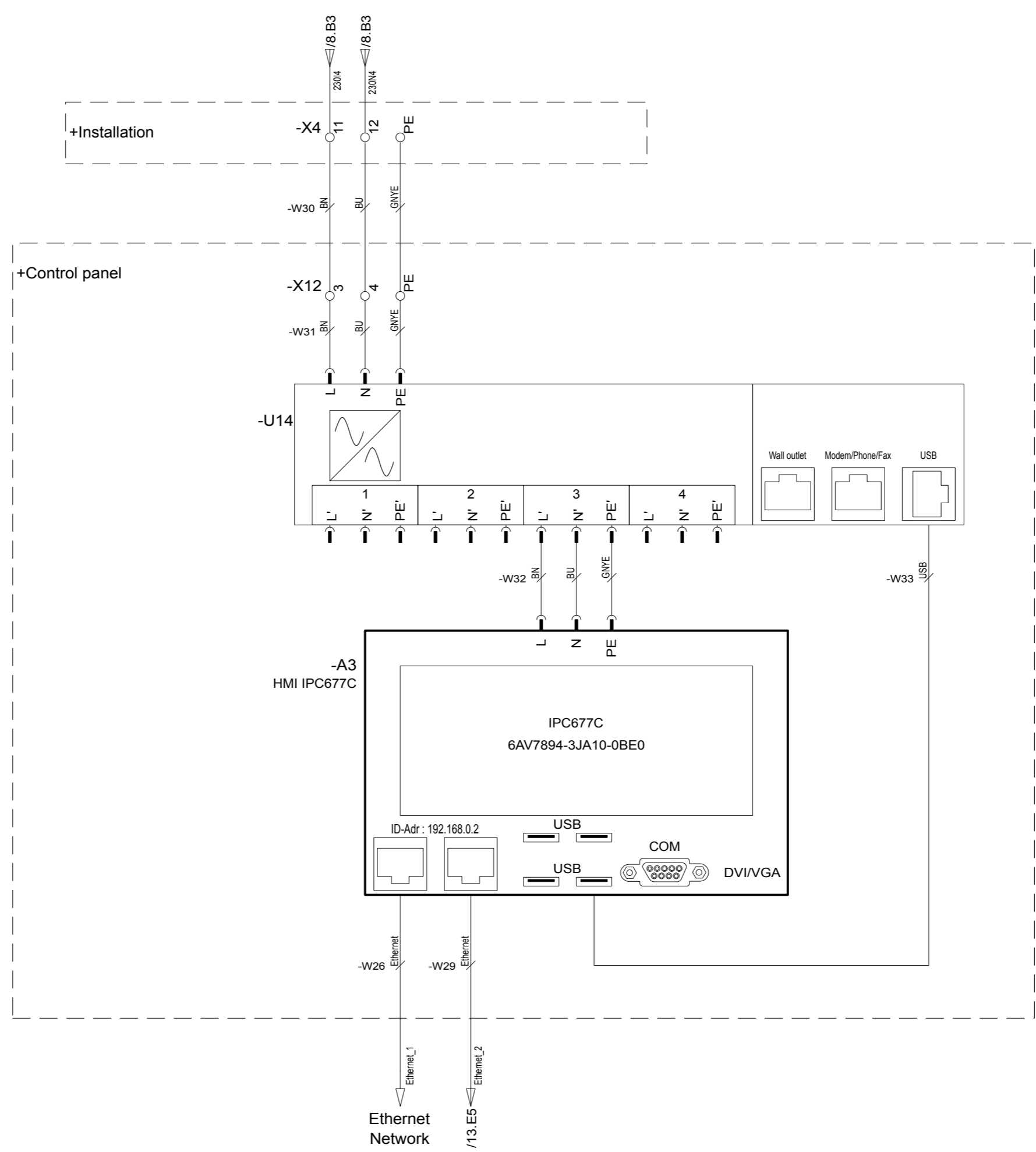
24V DC		M		-A4	
S7-300		SM 321		6ES7 321-1BH02-0AA0	
○ 2	E 0.0	/9.B4	Not-Aus	Status Emergency-Stop relay	
○ 3	E 0.1	/9.B6	Watchdog	Status Watchdog relay	
○ 4	E 0.2	/14.C6	G10	Inlet safety CW-250	
○ 5	E 0.3	/16.C6	StörungU1	Fault Frequ. conv. CW-250	
○ 6	E 0.4	/16.C7	T10	PTC Motor CW-250	
○ 7	E 0.5	/17.C6	StörungU2	Fault Frequ. conv. ProFi-Sword	
○ 8	E 0.6	/17.D3	M20Blockiert	ProFi-Sword locked signal	
○ 9	E 0.7	/17.C8	T20	PTC Motor ProFi-Sword	
○ 12	E 1.0	/18.C2	T12	Bearing PTC CW-250	
○ 13	E 1.1	/18.C4	T11	Sieve PTC CW-250	
○ 14	E 1.2	/18.C5	T22	Bearing PTC ProFi-Sword	
○ 15	E 1.3	/18.C7	T21	Bearing PTC ProFi-Sword	
○ 16	E 1.4	/20.C5	U10.P10	Pressure switch CW-250	
○ 17	E 1.5	/16.C2	Q2	Motor Circuit breaker CW-250	
○ 18	E 1.6	/17.C2	Q3	Motor Circuit breaker ProFi-Sword	
○ 19	E 1.7	/15.D2	S3Taster	Push button ON	

24V DC		M		-A5	
S7-300		SM 322		6ES7 322-1BH01-0AA0	
○ 2	A 2.0	/9.D4	K2	Reset Emergency-Stop relay	
○ 3	A 2.1	/14.D2	K3Imp	Impulse Watchdog relay	
○ 4	A 2.2	/14.D3	K3Res	Reset Watchdog relay	
○ 5	A 2.3	/14.D6	K5	Reset Safety relay	
○ 6	A 2.4	/17.D6	RücklaufM20	Reverse rotation direction ProFi-Sword	
○ 7	A 2.5	/15.B3	S3Lampe	Lamp ON	
○ 8	A 2.6	/22.D2	Reserve	Reserve	
○ 9	A 2.7	/22.D3	Reserve	Reserve	
○ 12	A 3.0	/16.B4	StartM10	Starting CW-250	
○ 13	A 3.1	/17.B4	StartM20	Starting ProFi-Sword	
○ 14	A 3.2	/20.B2	U10.SV10	Air or Gas CW-250	
○ 15	A 3.3	/22.D4	Reserve	Reserve	
○ 16	A 3.4	/22.D5	Reserve	Reserve	
○ 17	A 3.5	/22.D6	Reserve	Reserve	
○ 18	A 3.6	/22.D6	Reserve	Reserve	
○ 19	A 3.7	/22.D7	Reserve	Reserve	

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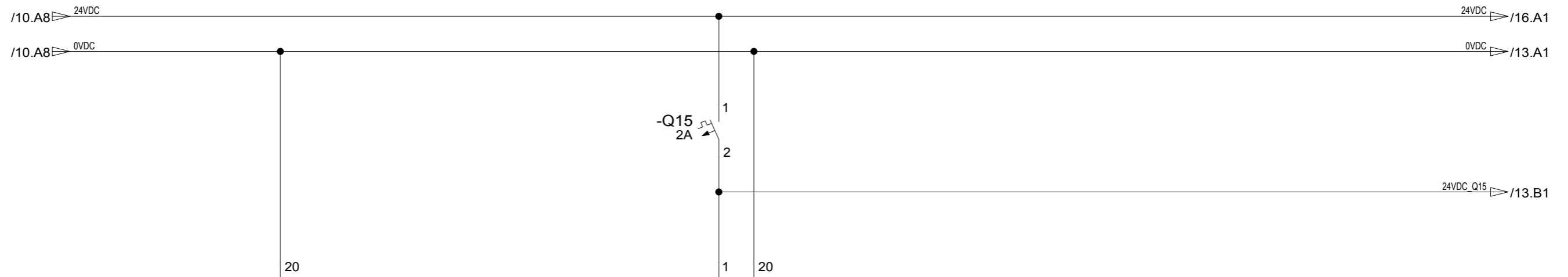
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03 - Electrical diagram		Type : PF - Installation		+Electrical cabinet	
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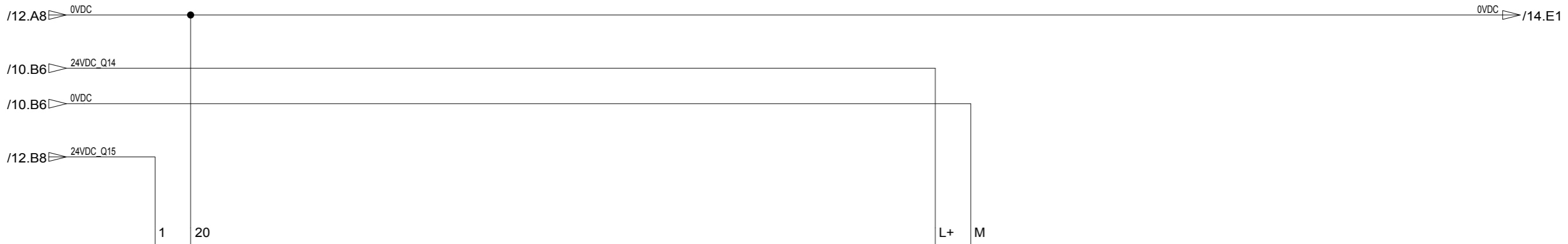


24V DC S7-300 SM 321		-A6 6ES7 321-1BH02-0AA0		
○				
○ 2	E 4.0	/15.D4	S2	Stop button
○ 3	E 4.1	/21.C5	F10	Flow sensor CW-250
○ 4	E 4.2	/21.C7	F01	Exhaust measure
○ 5	E 4.3	/16.B3	Q12	ConiWitt Motor disconnect switch
○ 6	E 4.4	/17.B3	Q13	Sword Motor disconnect switch
○ 7	E 4.5	/21.C3	G30	Container detector
○ 8	E 4.6	/10.B3	U13	UPS
○ 9	E 4.7	/22.B4	Reserve	Reserve
○				
○ 12	E 5.0	/22.B5	Reserve	Reserve
○ 13	E 5.1	/22.B6	Reserve	Reserve
○ 14	E 5.2	/22.B6	Reserve	Reserve
○ 15	E 5.3	/22.B7	Reserve	Reserve
○ 16	E 5.4	/23.B2	Reserve	Reserve
○ 17	E 5.5	/23.B2	Reserve	Reserve
○ 18	E 5.6	/23.B3	Reserve	Reserve
○ 19	E 5.7	/23.B4	Reserve	Reserve
○				

L+ M 24V DC S7-300 SM 334		-A7 6ES7 334-0CE01-0AA0		
○	Channel	U / I	Adresse	
○ 2		MV0+		
○ 3	CH0	M0-	PEW 128	/20.D7 S10 Speed detector CW-250
○ 4		M10+		
○ 5		MV1+		
○ 6	CH1	M1-	PEW 130	/16.D4 LeistungU1 Power CW-250
○ 7		M11+		
○ 8		MV2+		
○ 9	CH2	M2-	PEW 132	/17.D4 LeistungU2 Power ProFi-Sword
○ 10		M12+		
○ 11		MV3+		
○ 12	CH3	M3-	PEW 134	/23.B5 Reserve Reserve
○ 13		M13+		
○ 14		QV0		
○ 15	CH0	QMANA	PAW 128	/16.B5 GeschwM10 Speed adjustment CW-250
○ 16		QI0		
○ 17		QV1		
○ 18	CH1	QMANA	PAW 132	/17.B5 GeschwM20 Speed adjustment ProFi-Sword
○ 19		QI1		
○				

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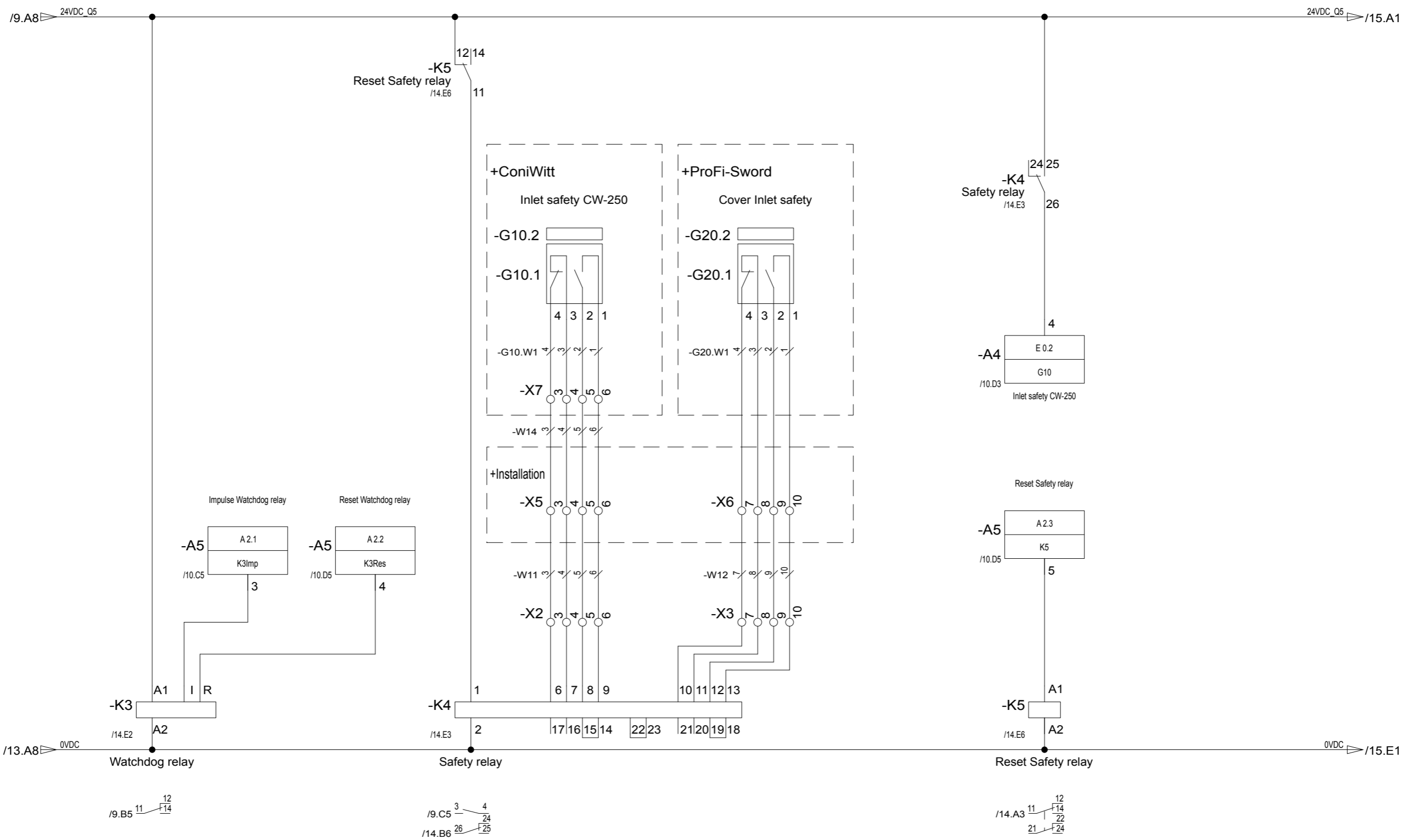


L+		M		24V DC			
				S7-300		-A8	
				SM 334		6ES7 334-0CE01-0AA0	
Channel	U / I	Adresse					
2	MV0+	PEW 136	/19.D4 T13	Temperature control 1			
3	M0-						
4	MI0+						
5	MV1+						
6	M1-	PEW 138	/19.D7 T23	Temperature control 2			
7	MI1+						
8	MV2+						
9	M2-	PEW 140	/23.B7 Reserve	Reserve			
10	MI2+						
11	MV3+						
12	M3-	PEW 142	/23.B7 Reserve	Reserve			
13	MI3+						
14	QV0						
15	QMANA	PAW 134	/23.D7 Reserve	Reserve			
16	QI0						
17	QV1						
18	QMANA	PAW 136	/23.D7 Reserve	Reserve			
19	QI1						



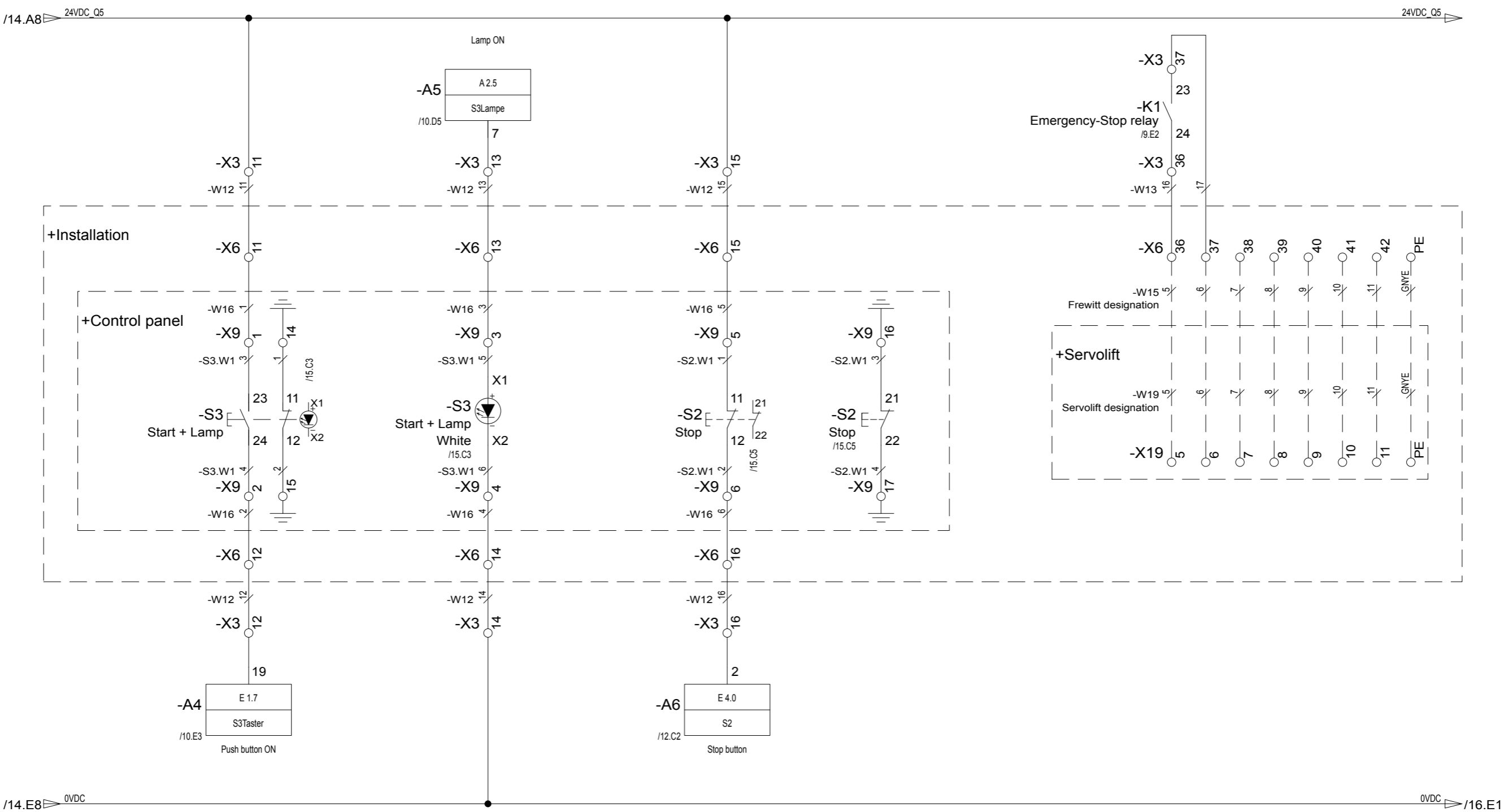
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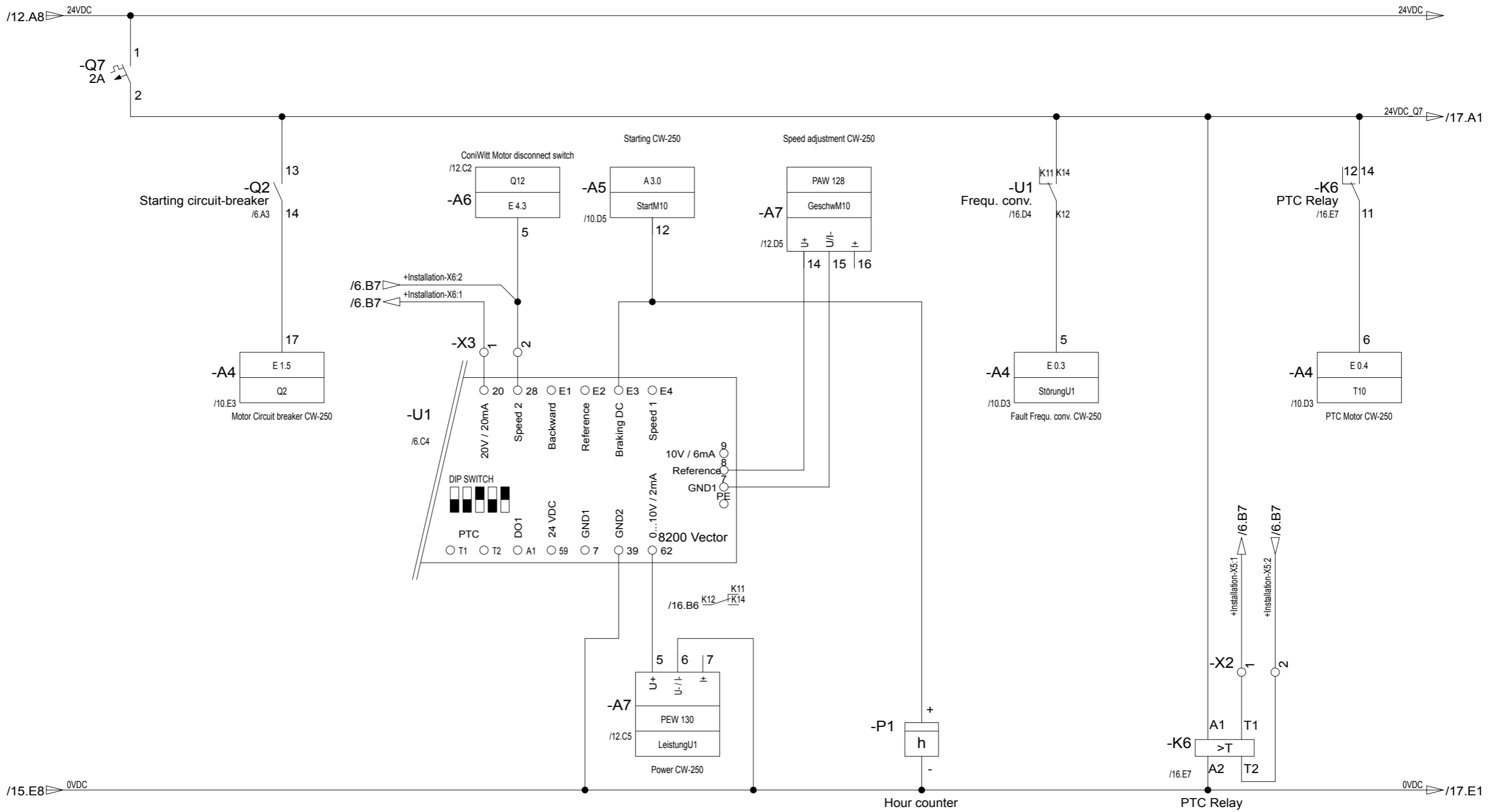
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03 - Electrical diagram
Buttons and lamps

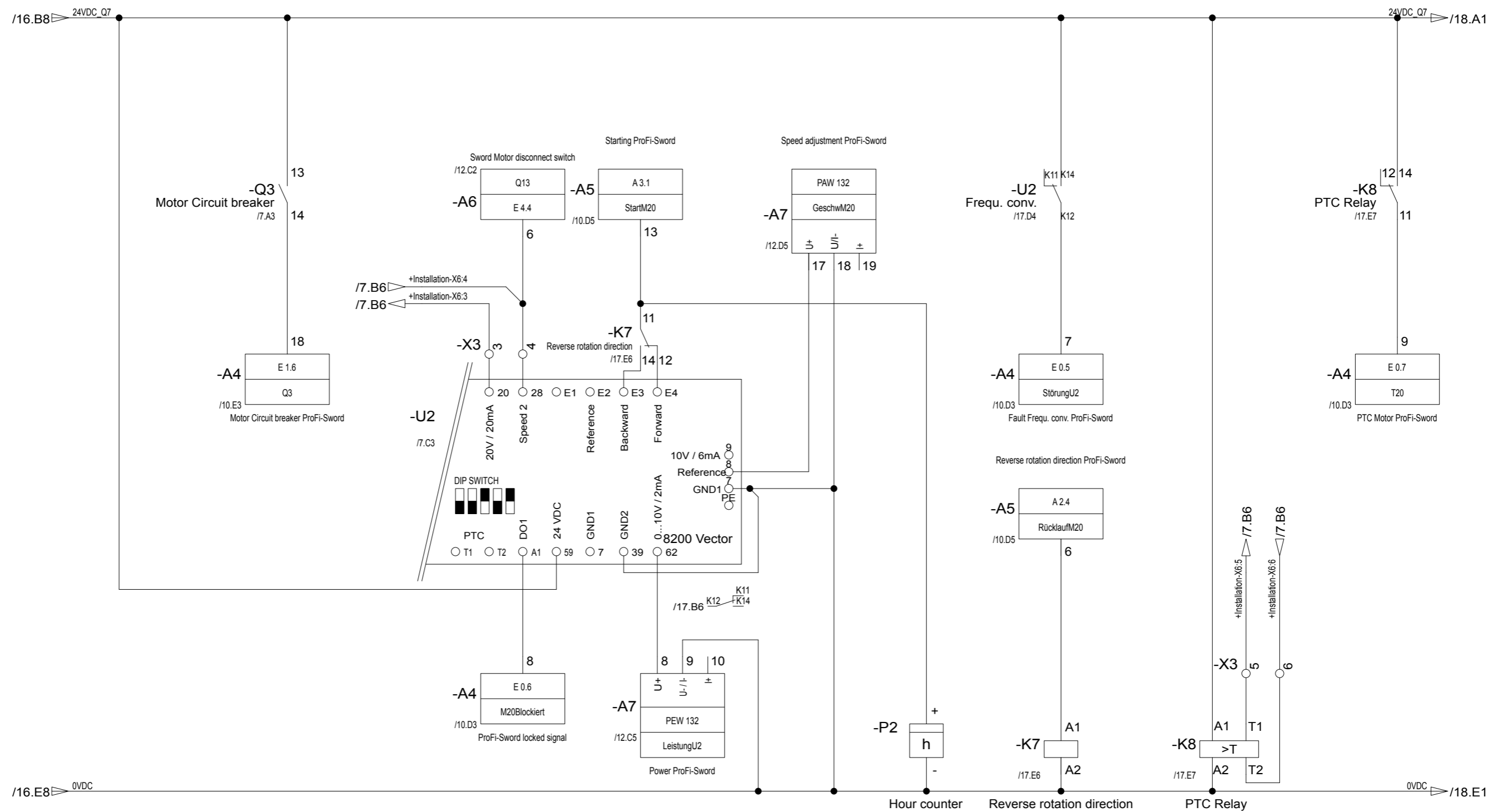
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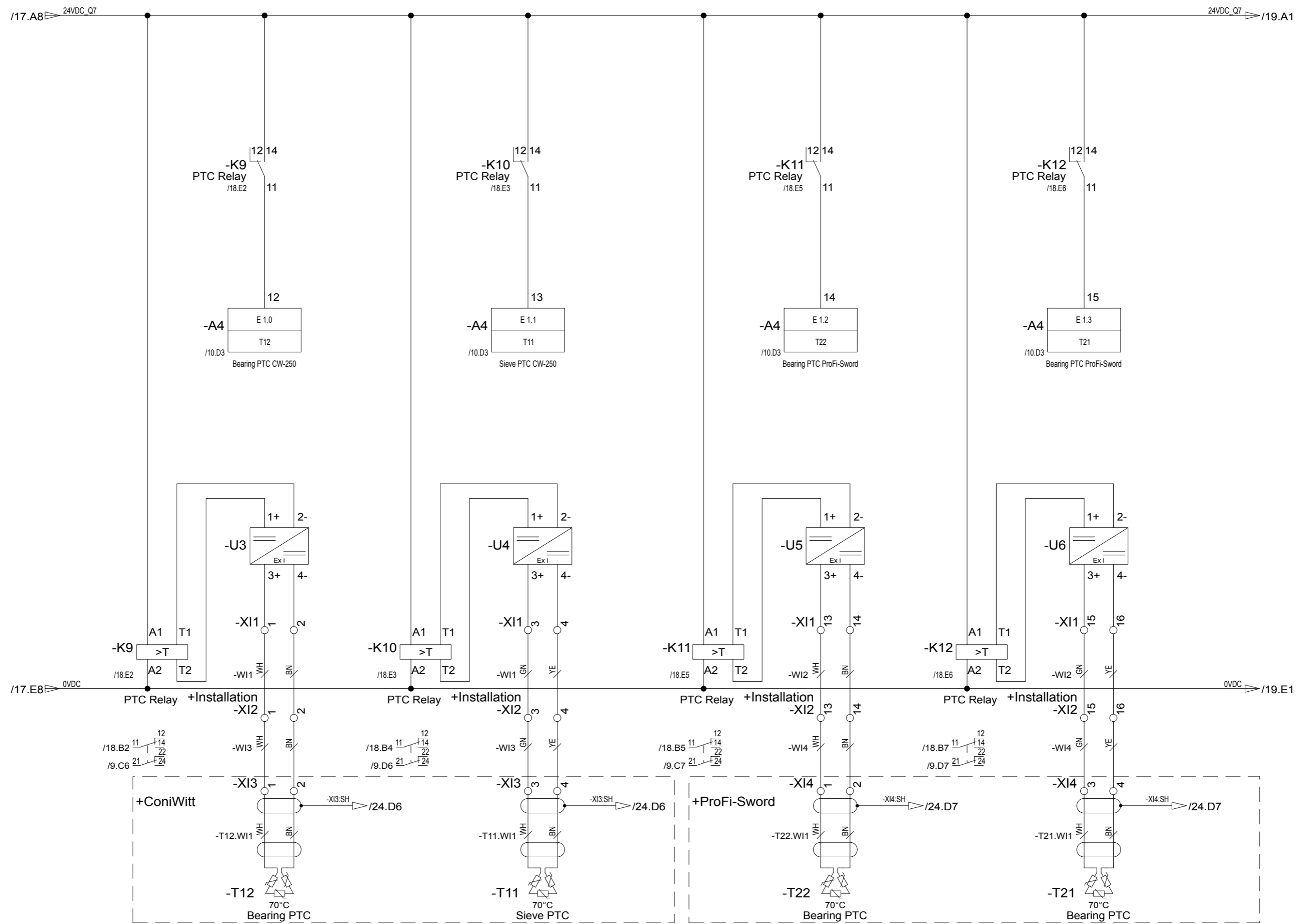


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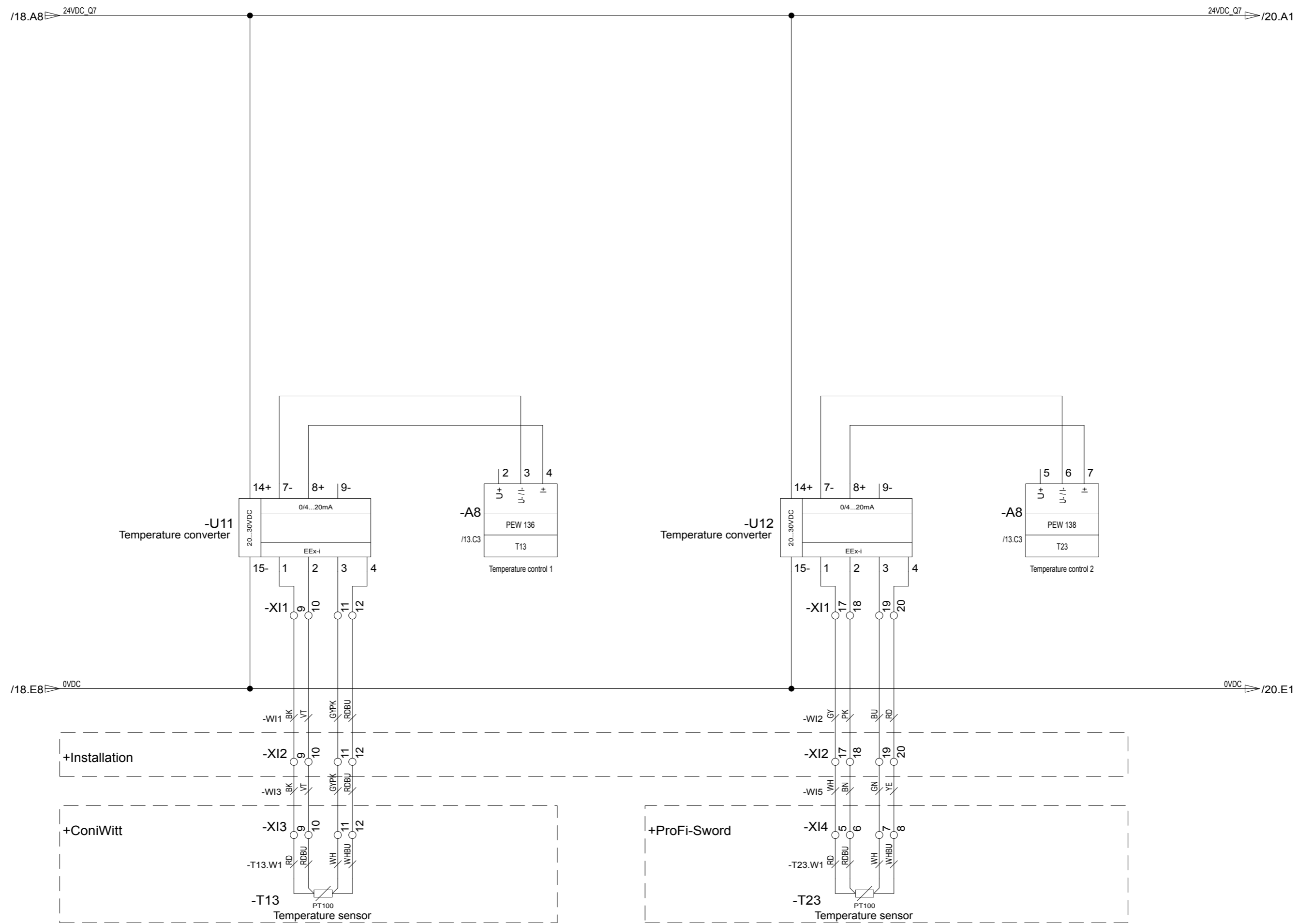
03 - Electrical diagram ProFi-Sword		Type : PF - Installation		+Electrical cabinet	
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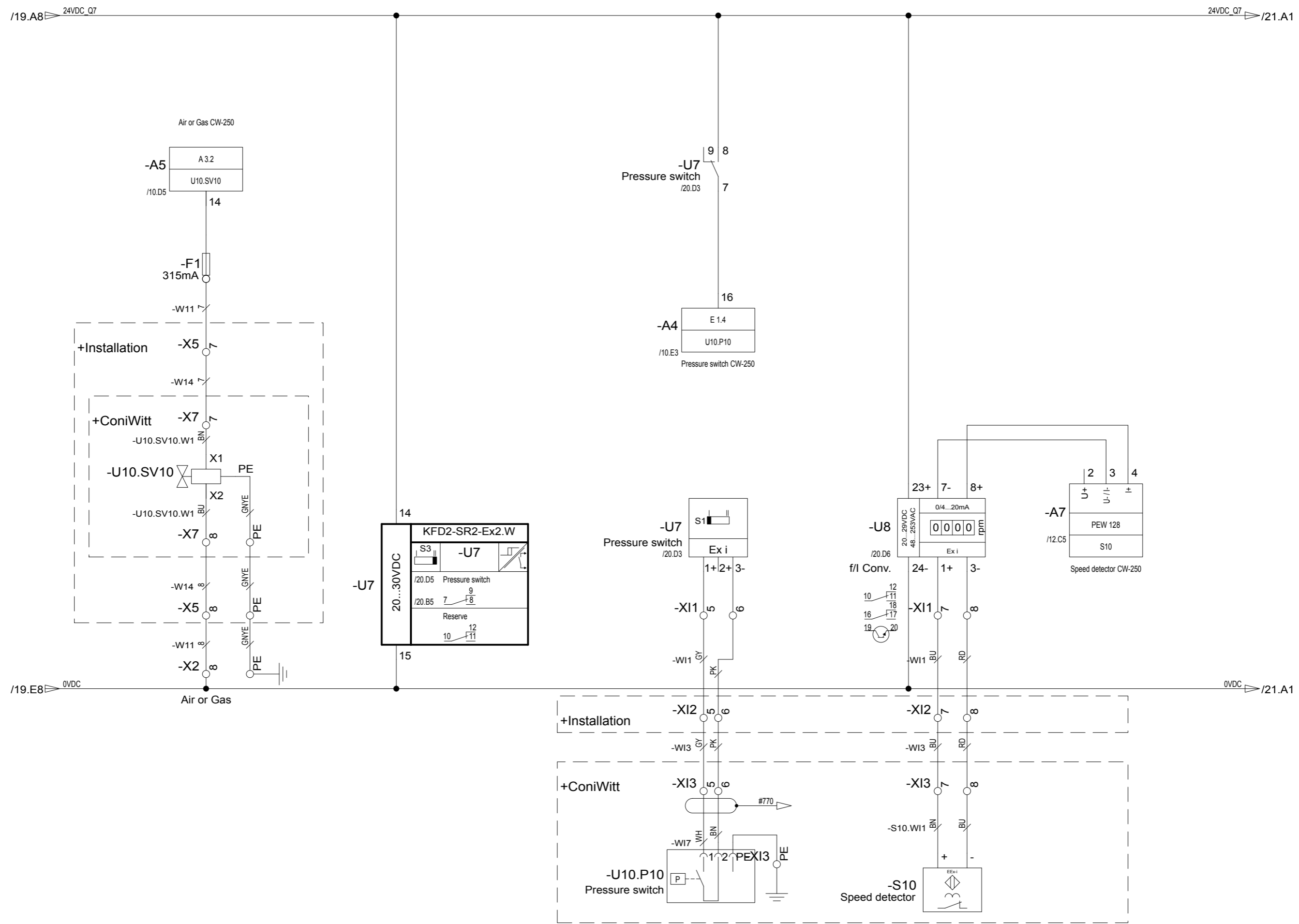


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03 - Electrical diagram PT100		Type : PF - Installation		+Electrical cabinet	
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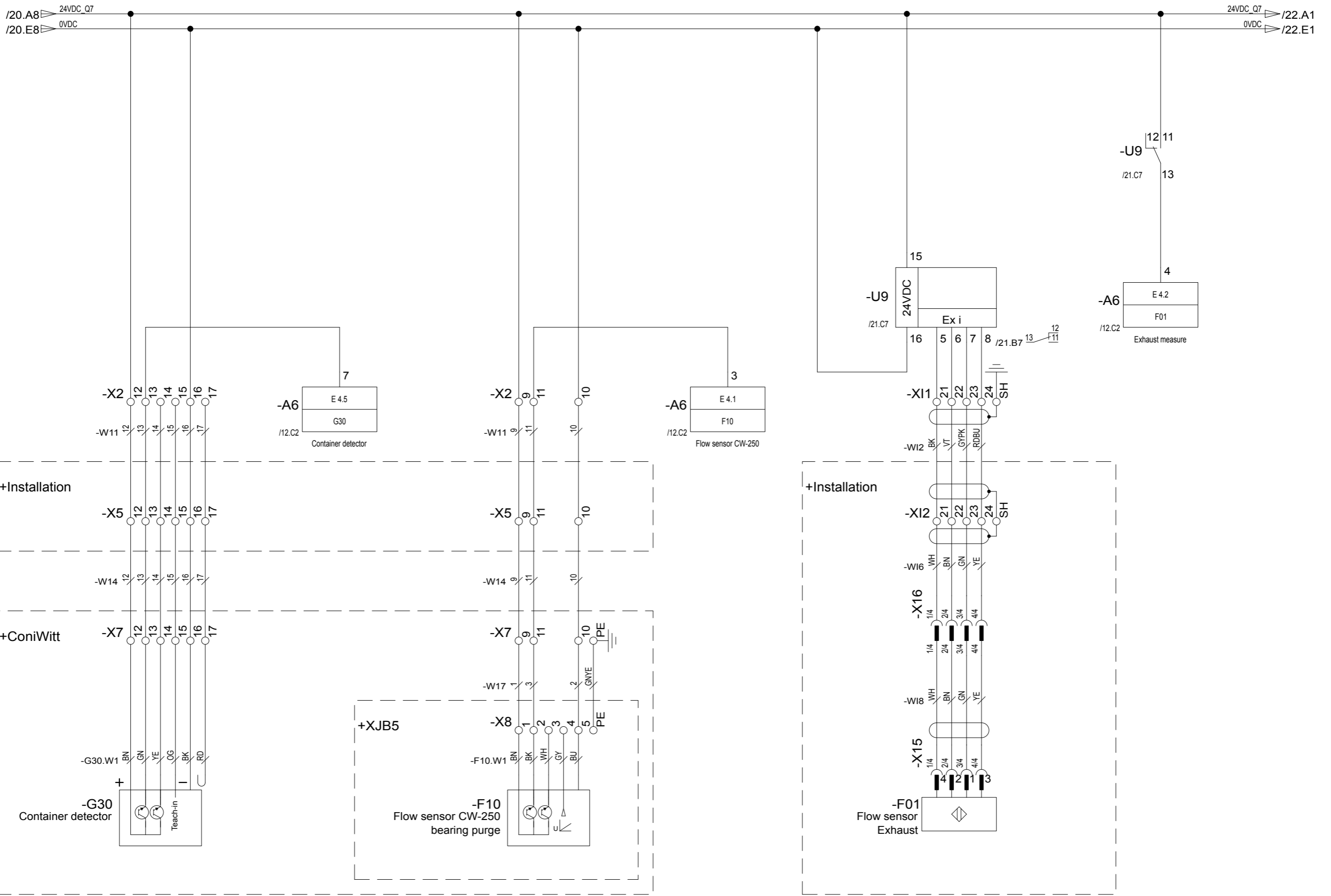
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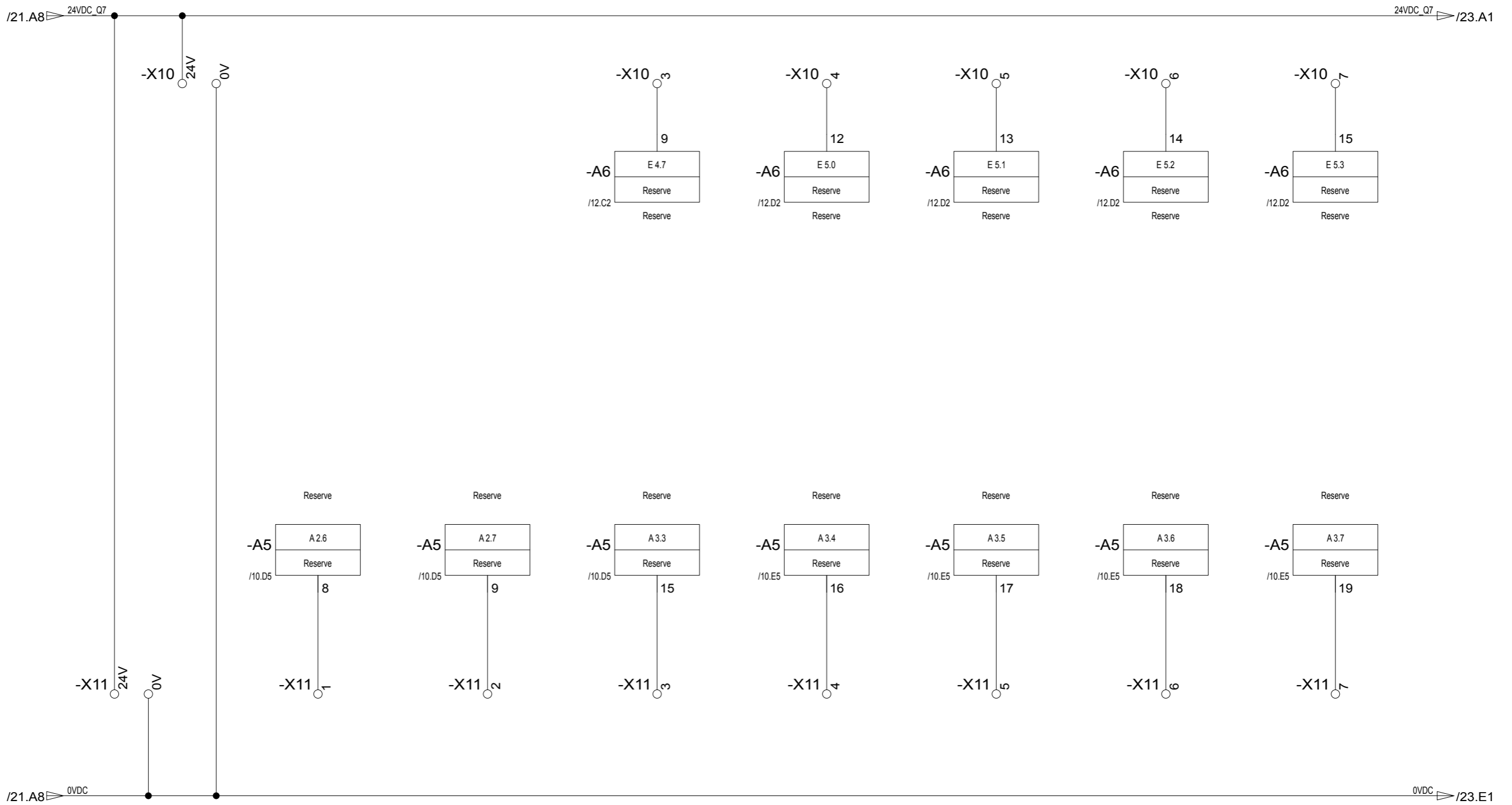
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PRO-14-0012		
400V,50Hz,3P+N+PE		
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03 - Electrical diagram
Flow sensor

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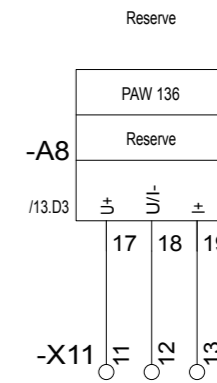
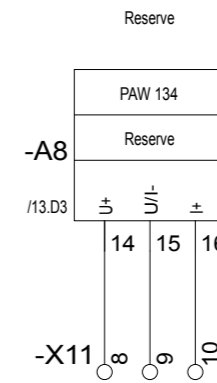
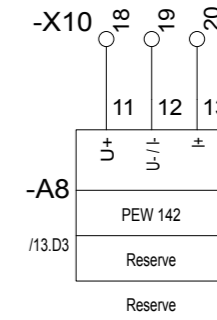
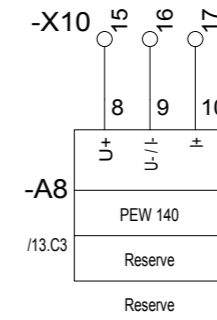
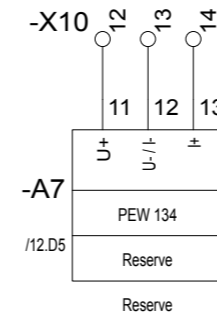
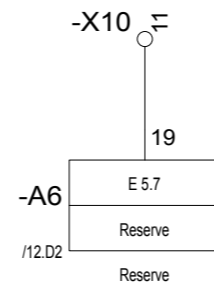
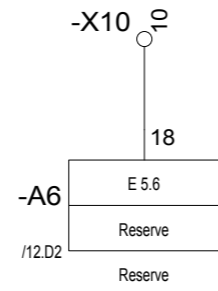
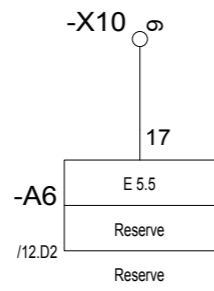
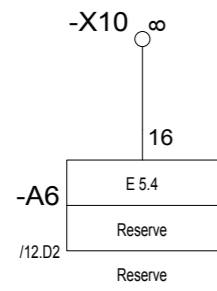
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C	Project follow-up	22.05.2014	vri	Proved	phha
Status	Change	Date	Name	Standard	

Novartis Singapore, SG-Singapore PRO-14-0012 400V,50Hz,3P+N+PE			Frewitt SA: Milling and Handling of Powders P.O.B. 615, CH-1701 Erlibourg, SWITZERLAND tel: +41 26 460 74 00 / fax: +41 26 460 74 01 info@frewitt.com / www.frewitt.com	
Origin	Repl. f.		Repl. by	

03 - Electrical diagram
Reserve

Type : PF - Installation		Page 22 / 53
473825	+Electrical cabinet	

/22.A8 24VDC_Q7 24VDC_Q7



/22.E8 0VDC 0VDC

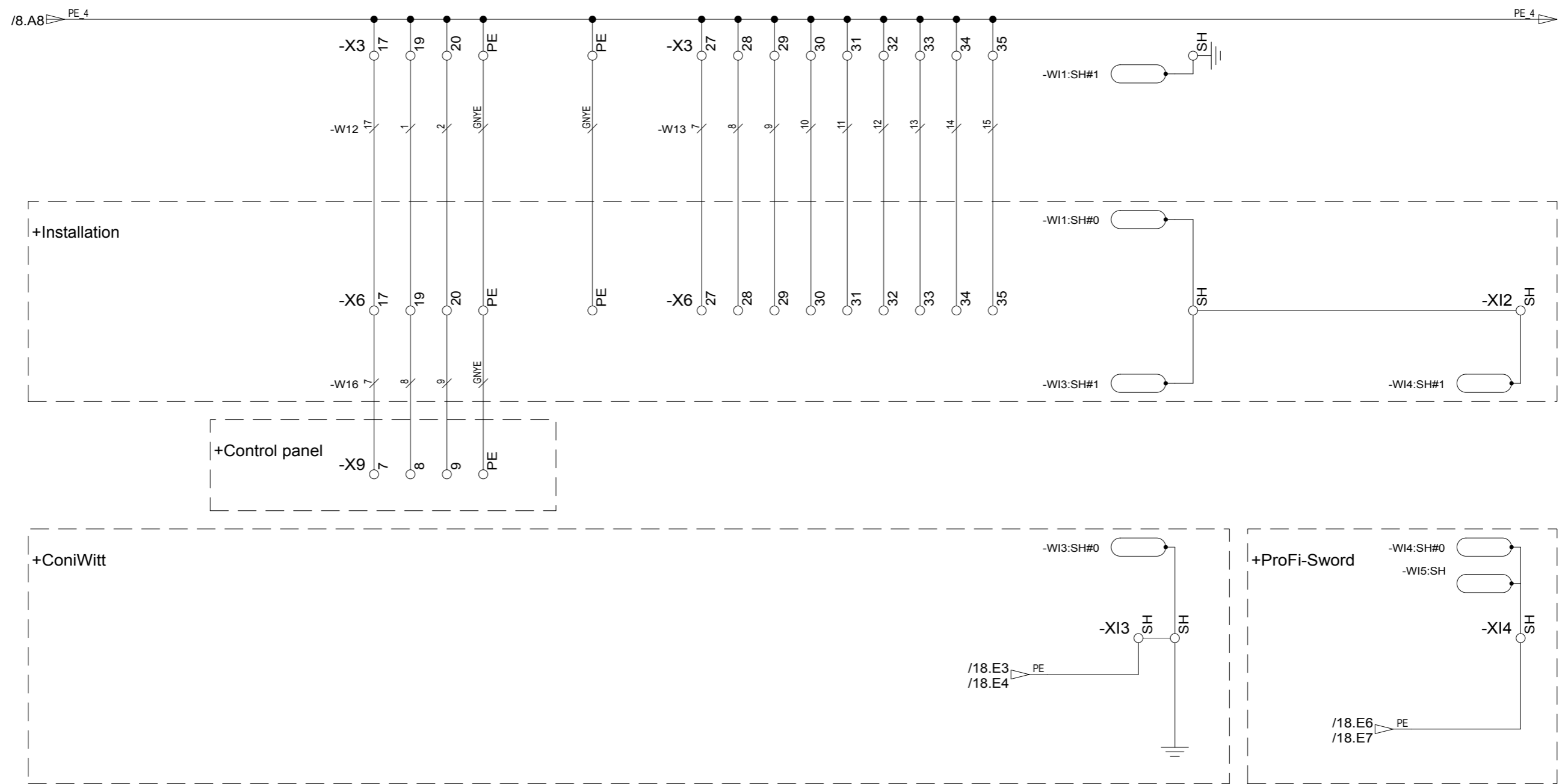
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B	Project closure	19.05.2014	vri	User	phha
C	Project follow-up	22.05.2014	vri	Proved	phha
Status	Change	Date	Name	Standard	

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Origin	Repl. f.		Repl. by	

03 - Electrical diagram
Reserve

Type : PF - Installation		Page 23 / 53
473825	+Electrical cabinet	



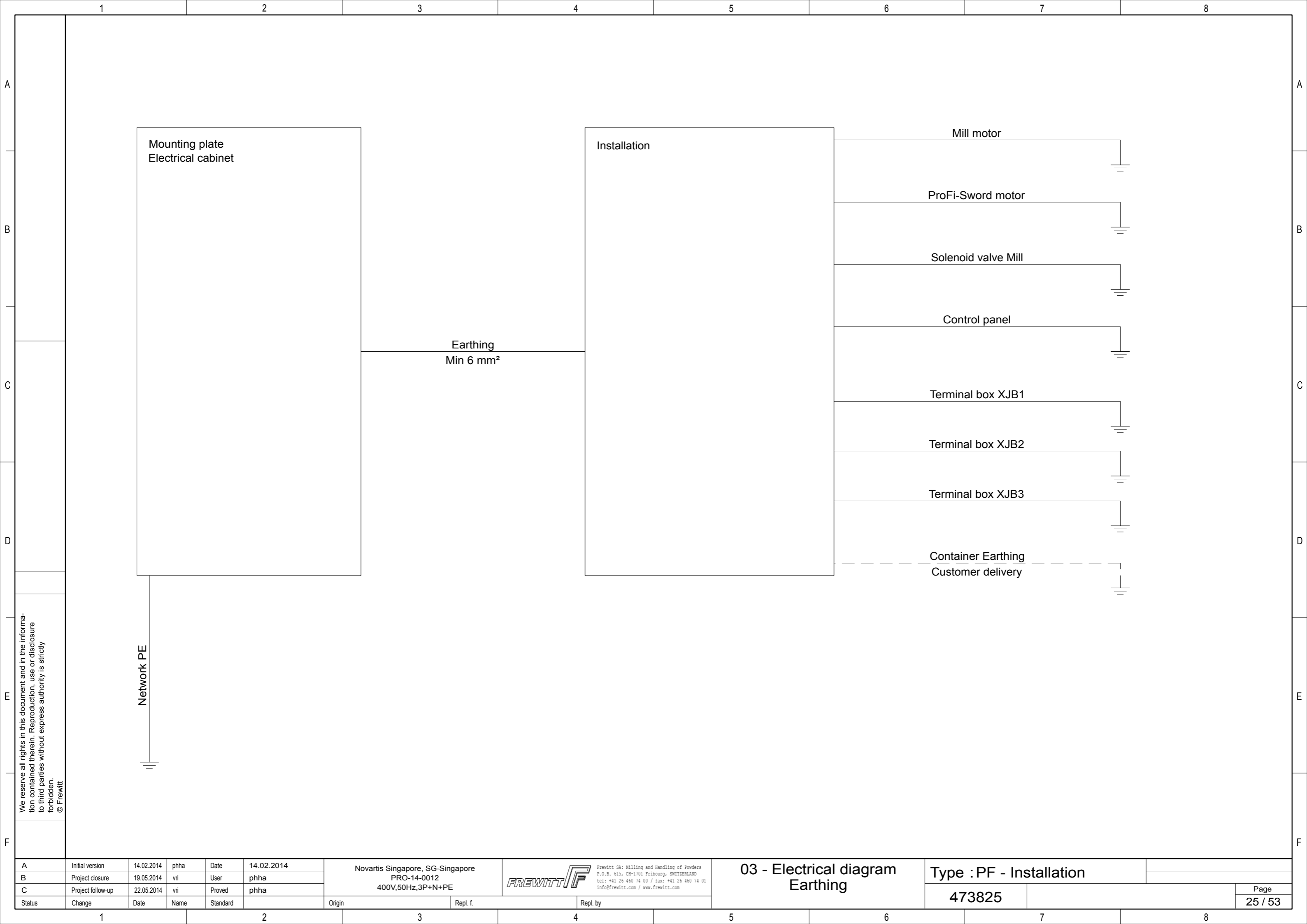
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Origin	Repl. f.	
	Repl. by	

03 - Electrical diagram
Spare Cable

Type : PF - Installation		+Electrical cabinet
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Status	Change	Date	Name	Standard	

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Origin	Repl. f.		

03 - Electrical diagram
Earthing

Type : PF - Installation		Page 25 / 53
473825		

Terminal strip -X0	Cable type	Cable designations																					
	Placement in Schematics		/6.D2	/6.D1	/6.D2	/6.D1	/6.D2	/6.D1	/6.D2	/6.D3	/6.D3	/6.B1	/6.B1	/6.B1	/6.B2	/6.B2							
	Target Internal		: /6.D2	: /6.D1		: /6.D1		: /6.D2		: /6.D3		: /6.B1		: /6.B1		: /6.B2							
	Target External		+Electrical cabinet -PE1	+Electrical cabinet -Q1	+Electrical cabinet -Q1	+Electrical cabinet -Q1	+Electrical cabinet -Q1	+Electrical cabinet -Q1	+Electrical cabinet -Q1		+Electrical cabinet -Q1	+Electrical cabinet -Q1	+Electrical cabinet -Q1	+Electrical cabinet -Q1									
	Jumpers																						
	Terminal number	PE	L1	L1	L2	L2	L3	L3	N	N	PE	L4	L5	L6	N	PE							
	Potential	PE_4	L1	L1	L2	L2	L3	L3	N	N	PE_4	L1	L2	L3	230N4	PE_4							
	Cable type	Cable designations																					

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B	Project closure	19.05.2014	vri	User	phha				-X0		473825		
C	Project follow-up	22.05.2014	vri	Proved	phha								26 / 53
Status	Change	Date	Name	Standard	Origin	Repl. f.	Repl. by						

Terminal UK6 N [L1 - L6]
 Terminal UK6 N BU [N - N]
 Terminal USLKG 6 N [PE - PE]

Terminal type

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Terminal strip -X1

Terminal number	Potential	Target External	Target Internal	Placement in Schematics	Cable type	Cable designations
PE						
230L1	:2	+Electrical cabinet -Q17	+Electrical cabinet -HX2	/8.B2		-W28
230N1	:N	+Electrical cabinet -Q17	+Electrical cabinet -HX2	/8.B2		-W27
PE	PE_4		+Electrical cabinet -HX2	/8.B2		BN
230L2	L1		+Electrical cabinet -M1	/8.B4		BU
230N2	230N4		+Electrical cabinet -M1	/8.B4		BN
PE	PE_4		+Electrical cabinet -M1	/8.B4		BU
230L3	L1	+Installation -X4		/8.B5		BN
230N3	230N4	+Installation -X4		/8.B5		BU
PE	PE_4	+Installation -X4		/8.B5		BN
230L4	230L4	+Installation -X4		/8.B3		BU
230N4	230N4	+Installation -X4		/8.B3		BN
PE						



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400V,50Hz,3P+N+PE

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04 - Terminals Block
-X1

Type : PF - Installation
473825

+Electrical cabinet

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- Terminal UK 3 N [230L1 - 230L4]
- Terminal UK 3 N BU [230N1 - 230N4]
- Terminal USLKG 3 [PE - PE]

Terminal type

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Terminal strip -X2

-X2



Cable type		Cable designations		Placement in Schematics		Target Internal		Jumpers		Terminal number		Potential		Target External	
Min. 18G0.5	-W11	1		:T1	/16.D7	+Electrical cabinet -K6			PE	1	0VDC	:1	+Installation -X5		
		2		:T2	/16.D7	+Electrical cabinet -K6				2	24VDC_Q7	:2	+Installation -X5		
		3		:6	/14.D4	+Electrical cabinet -K4				3	0VDC	:3	+Installation -X5		
		4		:7	/14.D4	+Electrical cabinet -K4				4	0VDC	:4	+Installation -X5		
		5		:8	/14.D4	+Electrical cabinet -K4				5	0VDC	:5	+Installation -X5		
		6		:9	/14.D4	+Electrical cabinet -K4				6	0VDC	:6	+Installation -X5		
		8			/20.E2					8	0VDC	:8	+Installation -X5		
		9			/21.C4					9	24VDC_Q7	:9	+Installation -X5		
		10			/21.C4					10	0VDC	:10	+Installation -X5		
		11			/21.C4	+Electrical cabinet -A6				11	0VDC	:11	+Installation -X5		
		12			/21.C2					12	24VDC_Q7	:12	+Installation -X5		
		13			/21.C2	+Electrical cabinet -A6				13	0VDC	:13	+Installation -X5		
		14			/21.C2					14	0VDC	:14	+Installation -X5		
		15			/21.C2					15	0VDC	:15	+Installation -X5		
		16			/21.C2					16	0VDC	:16	+Installation -X5		
		17			/21.C2					17	0VDC	:17	+Installation -X5		
					/20.E2					18	0VDC	:18	+Installation -X5		
										PE	0VDC	:PE	+Installation -X5		

Terminal UKK 3 [1 - 18]
Terminal UKK 5-PE [PE - PE]
Terminal

Terminal type

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04 - Terminals Block -X2	Type : PF - Installation 473825	+Electrical cabinet Page 28 / 53
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Terminal strip -X3

Cable type	Cable designations	Terminal number	Potential	Target External	Jumpers	Target Internal	Placement in Schematics
Min. 18G0.5	-W12	1	:1	+Installation-X6		+Electrical cabinet-U1	/16.C3
Min. 18G0.5	-W13	2	:2	+Installation-X6		+Electrical cabinet-A6	/16.C4
		3	:3	+Installation-X6		+Electrical cabinet-U1	/16.C4
		4	:4	+Installation-X6		+Electrical cabinet-U2	/17.C3
		5	:5	+Installation-X6		+Electrical cabinet-A6	/17.C4
		6	:6	+Installation-X6		+Electrical cabinet-U2	/17.C4
		7	:7	+Installation-X6		+Electrical cabinet-K8	/17.D7
		8	:8	+Installation-X6		+Electrical cabinet-K8	/17.D7
		9	:9	+Installation-X6		+Electrical cabinet-K4	/14.D5
		10	:10	+Installation-X6		+Electrical cabinet-K4	/14.D5
		11	:11	+Installation-X6		+Electrical cabinet-K4	/14.D5
		12	:12	+Installation-X6		+Electrical cabinet-K4	/14.D5
		13	:13	+Installation-X6		+Electrical cabinet-K4	/14.D5
		14	:14	+Installation-X6		+Electrical cabinet-K4	/14.D5
		15	:15	+Installation-X6		+Electrical cabinet-A4	/15.B2
		16	:16	+Installation-X6		+Electrical cabinet-A5	/15.D2
		17	:17	+Installation-X6		+Electrical cabinet-A6	/15.B3
		18					/15.D3
		19	:19	+Installation-X6			/15.B5
		20	:20	+Installation-X6			/15.D5
		21	:21	+Installation-X6			/24.A3
		22					
		23	:23	+Installation-X6			/9.B3
		24	:24	+Installation-X6			/9.D3
		25					
		26	:26	+Installation-X6			/9.B3
		27	:27	+Installation-X6			/24.A4
		28	:28	+Installation-X6			/24.A4
		29	:29	+Installation-X6			/24.A5
		30	:30	+Installation-X6			/24.A5
		31	:31	+Installation-X6			/24.A5
		32	:32	+Installation-X6			/24.A5
		33	:33	+Installation-X6			/24.A5
		34	:34	+Installation-X6			/24.A5

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Novartis Singapore, SG-Singapore
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04 - Terminals Block
-X3

Type : PF - Installation
473825

+Electrical cabinet

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Terminal UKK 3 [1 - 34]
Terminal UKK 5-PE [PE - PE]
Terminal

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Terminal strip -X4

Cable type	Cable designations	Terminal number	Potential	Target External	Target Internal	Placement in Schematics
Min. 5G1	-W20					
Min. 4G2.5 SHIELD	-W4					
Min. 4G2.5 SHIELD	-W1					
Cable type	Cable designations					
		PE				
	+Electrical cabinet -U1	1	L1	:1	:U	/6.C6
	+Electrical cabinet -U1	2	L1	:3	:V	/6.C6
	+Electrical cabinet -U1	3	L1	:5	:W	/6.C6
	+Electrical cabinet -U1	PE	PE_4	:PE	:PE	/6.C6
	+Electrical cabinet -U2	4	230N4	:1	:U	/7.C5
	+Electrical cabinet -U2	5	230N4	:3	:V	/7.C5
	+Electrical cabinet -U2	6	230N4	:5	:W	/7.C5
	+Electrical cabinet -U2	PE	PE_4	:PE	:PE	/7.C6
	+Electrical cabinet -X1	7	L1	:1	:230L3	/8.B5
		8	L1	:1		/8.B5
	+Electrical cabinet -X1	9	230N4	:2	:230N3	/8.B5
		10	230N4	:2		/8.B5
	+Electrical cabinet -X1	PE	PE_4	:PE	:PE	/8.B5
		PE	PE_4	:PE		/8.B6
	+Electrical cabinet -X1	11	230I4	:3	:230L4	/11.A4
	+Electrical cabinet -X1	12	230N4	:4	:230N4	/11.A4
	+Electrical cabinet -X1	PE	PE_4	:PE		/11.A4

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04 - Terminals Block	Type : PF - Installation	+Installation
-X4	473825	Page 31 / 53

Terminal UK 3 N [1 - 12]
Terminal USLKG 3 [PE - PE]
Terminal

Terminal type

A	1	2	3	4	5	6	7	8	
B	TT flex 18G0.5	-W14	1	2	3	4	5	6	
C	Cable type	Cable designations	1	2	3	4	5	6	
D	Terminal strip -X5	Placement in Schematics	/6.C7	/6.C7	/14.D4	/14.D4	/14.D4	/14.D4	
E		Target Internal	:1	:2	:3	:4	:5	:6	
F		Jumpers							
A		Terminal number	PE	1	2	3	4	5	
B		Potential							
C		Target External	:1	:2	:3	:4	:5	:6	
D			+Electrical cabinet -X2	+Electrical cabinet -X2	+Electrical cabinet -X2	+Electrical cabinet -X2	+Electrical cabinet -X2	+Electrical cabinet -X2	
E		Cable type	Cable designations						
F		Min. 18G0.5	-W11	1	2	3	4	5	
A									
B									
C									
D									
E									
F									
A									
B									
C									
D									
E									
F									
A	Initial version	14.02.2014	phha	Date	14.02.2014	Novartis Singapore, SG-Singapore	Frewitt SA: Milling and Handling of Powders	04 - Terminals Block	Type : PF - Installation
B	Project closure	19.05.2014	vri	User	phha	PRO-14-0012	P.O.B. 615, CH-1701 Fribourg, SWITZERLAND	-X5	473825
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D	Status	Change	Date	Name	Standard	Origin	Repl. f.	Repl. by	+Installation
E									Page
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A									
B									
C									
D									
E									
F									

Terminal UK 3 N [1 - 17]
Terminal USLKG 3 [PE - PE]
Terminal

Terminal type

Terminal strip		-X6	
Cable type	Cable designations	Terminal number	Potential
4x0.75	-G20.W1	PE	PE_4
TT flex CEE 2x1	-W9	1	:1
TT flex CEE 2x1	-W10	2	:2
TT flex CEE 2x1	-W8	3	:3
TT flex 14G0.5	-W16	4	:4
Cable type	Cable designations	5	:5
		6	:6
		7	:7
		8	:8
		9	:9
		10	:10
		11	:11
		12	:12
		13	:13
		14	:14
		15	:15
		16	:16
		17	:17
		18	:18
		19	:19
		20	:20
		21	:21
		22	:22
		23	:23
		24	:24
		25	:25
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		32	:32
		33	:33
		34	:34

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PRO-14-0012		
400V,50Hz,3P+N+PE		
Origin	Repl. f.	Repl. by

04 - Terminal Block		Type : PF - Installation	+Installation
-X6		473825	Page 33 / 53

Terminal UK 3 N [1 - 34]
Terminal USLKG 3 [PE - PE]
Terminal

A B C D E F

A B C D E F

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Terminal strip -X7

Cable type	Cable designations	Terminal number	Potential	Target External	Target Internal	Placement in Schematics	Jumpers
6x0.25	-G30.W1						
TT flex 4G0.5	-W17						
3G1	+ConiWitt-U10.SV10.W1						
4x0.75	-G10.W1						
TT flex CEE 2x1	-W7						
Cable type	Cable designations						
		PE				/6.E7	
	+ConiWitt-M10	1		+Installation-X5		: /6.E7	
	+ConiWitt-M10	2		+Installation-X5		: /6.E7	
	+ConiWitt-G10.1	3		+Installation-X5		: /14.C4	
	+ConiWitt-G10.1	4		+Installation-X5		: /14.C4	
	+ConiWitt-G10.1	5		+Installation-X5		: /14.C4	
	+ConiWitt-G10.1	6		+Installation-X5		: /14.C4	
	+ConiWitt-U10.SV10	7		+Installation-X5		: /14.C4	
	+ConiWitt-U10.SV10	8	0VDC	+Installation-X5		: /20.C2	
	+ConiWitt-U10.SV10	9	PE	+Installation-X5		: /20.D2	
	+XJB5-X8	10	24VDC_Q7	+Installation-X5		: /20.D2	
	+XJB5-X8	11	0VDC	+Installation-X5		: /21.D4	
	+XJB5-X8	12	0VDC	+Installation-X5		: /21.D4	
	+ConiWitt-G30	13	24VDC_Q7	+Installation-X5		: /21.D4	
	+ConiWitt-G30	14	0VDC	+Installation-X5		: /21.D2	
	+ConiWitt-G30	15	0VDC	+Installation-X5		: /21.D2	
	+ConiWitt-G30	16	0VDC	+Installation-X5		: /21.D2	
	+ConiWitt-Res1	17	0VDC	+Installation-X5		: /21.D2	
	+XJB5-X8	PE		+Installation-X5		: /21.D4	

Terminal type

Terminal UK 3 N [1 - 17]

Terminal USLKG 3 [PE - PE]

Terminal

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Terminal strip -X9

Cable type	Cable designations	Terminal number	Potential	Target External	Target Internal	Placement in Schematics	Jumpers
OZ-500 4x0.75	-S1.W1	PE	PE_4	:PE		/24.C3	
OZ-500 4x0.75	-S2.W1	1	24VDC_Q5	:11	:23	/15.C2	+Control panel -S3
OZ-500 6x0.75	-S3.W1	2		:12	:24	/15.C2	+Control panel -S3
		3		:13	:X1	/15.C3	+Control panel -S3
		4	0VDC	:14	:X2	/15.C3	+Control panel -S3
		5	24VDC_Q5	:15	:11	/15.C5	+Control panel -S2
		6		:16	:12	/15.C5	+Control panel -S2
		7	PE_4	:17		/24.C3	
		8	PE_4	:19		/24.C3	
		9	PE_4	:20		/24.C3	
		10		:22	:12	/9.C3	+Control panel -S1
		11		:23	:11	/9.B3	+Control panel -S1
		12		:25	:22	/9.C3	+Control panel -S1
		13		:26	:21	/9.B3	+Control panel -S1
			PE				
		14		:	:11	/15.C2	+Control panel -S3
		15		:	:12	/15.C2	+Control panel -S3
		16		:	:21	/15.C5	+Control panel -S2
		17		:	:22	/15.C5	+Control panel -S2

A	Initial version	14.02.2014	phha	Date	14.02.2014
B	Project closure	19.05.2014	vri	User	phha
C	Project follow-up	22.05.2014	vri	Proved	phha
Status	Change	Date	Name	Standard	

Novartis Singapore, SG-Singapore
PRO-14-0012
400V,50Hz,3P+N+PE

Frewitt SA: Milling and Handling of Powders
P.O.B. 615, CH-1701 Fribourg, SWITZERLAND
tel: +41 26 460 74 00 / fax: +41 26 460 74 01
info@frewitt.com / www.frewitt.com

<h2 style="margin: 0;">04 - Terminals Block</h2> <h3 style="margin: 0;">-X9</h3>	<h2 style="margin: 0;">Type : PF - Installation</h2> <h3 style="margin: 0;">473825</h3>	<p style="margin: 0;">+Control panel</p> <p style="margin: 0;">Page 37 / 53</p>
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Terminal type

Terminal UK 3 N [1 - 17]

Terminal USLKG 3 [PE - PE]

Terminal

A	1	2	3	4	5	6	7	8
B	1	2	3	4	5	6	7	8
C	1	2	3	4	5	6	7	8
D	1	2	3	4	5	6	7	8
E	1	2	3	4	5	6	7	8
F	1	2	3	4	5	6	7	8


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Terminal strip -X10

Cable type	Cable designations	Placement in Schematics	Target Internal	Jumpers	Terminal number	Potential	Target External
		/22.A2			PE	24VDC_Q7	
		/22.A2			0V	0VDC	
					1		
					2		
					3		
		/22.A4	+Electrical cabinet -A6 :9		4		
		/22.A5	+Electrical cabinet -A6 :12		5		
		/22.A6	+Electrical cabinet -A6 :13		6		
		/22.A7	+Electrical cabinet -A6 :14		7		
		/22.A7	+Electrical cabinet -A6 :15		8		
		/23.A2	+Electrical cabinet -A6 :16		9		
		/23.A3	+Electrical cabinet -A6 :17		10		
		/23.A3	+Electrical cabinet -A6 :18		11		
		/23.A4	+Electrical cabinet -A6 :19		12		
		/23.A5	+Electrical cabinet -A7 :11		13		
		/23.A5	+Electrical cabinet -A7 :12		14		
		/23.A6	+Electrical cabinet -A7 :13		15		
		/23.A7	+Electrical cabinet -A8 :8		16		
		/23.A7	+Electrical cabinet -A8 :9		17		
		/23.A7	+Electrical cabinet -A8 :10		18		
		/23.A7	+Electrical cabinet -A8 :11		19		
		/23.A8	+Electrical cabinet -A8 :12		20		
		/23.A8	+Electrical cabinet -A8 :13		PE		

Terminal UKK 3 [0V - 24V]
Terminal UKK 5-PE [PE - PE]
Terminal

Terminal type


A	Initial version	14.02.2014	phha	Date	14.02.2014	Novartis Singapore, SG-Singapore PRO-14-0012 400V,50Hz,3P+N+PE	 Frewitt SA: Milling and Handling of Powders P.O.B. 615, CH-1701 Fribourg, SWITZERLAND tel: +41 26 460 74 00 / fax: +41 26 460 74 01 info@frewitt.com / www.frewitt.com	04 - Terminals Block		Type : PF - Installation		+Electrical cabinet	
B	Project closure	19.05.2014	vri	User	phha			-X10		473825		Page	
C	Project follow-up	22.05.2014	vri	Proved	phha							38 / 53	
Status	Change	Date	Name	Standard	Origin	Repl. f.	Repl. by						

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Terminal strip -X11

Cable type	Cable designations	Placement in Schematics	Target Internal	Jumpers	Terminal number	Potential	Target External
		/22.D2			PE	24VDC_Q7	
		/22.D2			24V	0VDC	
		/22.D3	:8		1		
		/22.D3	:9		2		
		/22.D4	:15		3		
		/22.D5	:16		4		
		/22.D6	:17		5		
		/22.D7	:18		6		
		/22.D7	:19		7		
		/23.D7	:14		8		
		/23.D7	:15		9		
		/23.D7	:16		10		
		/23.D7	:17		11		
		/23.D8	:18		12		
		/23.D8	:19		13		
					14		
					PE		

Terminal UKK 3 [0V - 24V]
 Terminal UKK 5-PE [PE - PE]
 Terminal
 Terminal type

A	1	2	3	4	5	6	7	8					
<p style="text-align: center;">Terminal strip</p> <p style="font-size: 2em; text-align: center;">-X12</p>	3G1.5 IEC PC	-W31				BN	BU	GNYE					
	3G1.5	-A10.W1	BN	BU	GNYE								
	Cable type	Cable designations											
	Target Internal	Placement in Schematics	: /8.C5	: /8.C5	: /8.C5	: /11.B4	: /11.B4	: /11.B4					
	Target External	Jumpers											
		Terminal number	1	2	PE	3	4	PE					
		Potential	L1	230N4	PE_4	2304	230N4	PE_4					
		Cable type	Cable designations										
		TT flex CEE 3G1	-W21	BN	BU	GNYE							
		TT flex CEE 3G1	-W30			BN	BU	GNYE					
F	Initial version	14.02.2014	phha	Date	14.02.2014	<p style="text-align: center;">Novartis Singapore, SG-Singapore</p> <p style="text-align: center;">PRO-14-0012</p> <p style="text-align: center;">400V,50Hz,3P+N+PE</p>	 <p style="font-size: 0.8em;">Frewitt SA: Milling and Handling of Powders P.O.B. 615, CH-1701 Fribourg, SWITZERLAND tel: +41 26 460 74 00 / fax: +41 26 460 74 01 info@frewitt.com / www.frewitt.com</p>	<p style="font-size: 1.2em; text-align: center;">04 - Terminals Block</p> <p style="font-size: 1.2em; text-align: center;">Terminals Block</p> <p style="font-size: 1.2em; text-align: center;">-X12</p>	<p style="font-size: 1.2em; text-align: center;">Type : PF - Installation</p>	<p style="font-size: 1.2em; text-align: center;">473825</p>	<p style="text-align: center;">+Control panel</p>	<p style="text-align: center;">Page</p> <p style="text-align: center;">40 / 53</p>	
B	Project closure	19.05.2014	vri	User	phha								
C	Project follow-up	22.05.2014	vri	Proved	phha								
F	Change	Date	Name	Standard	Origin	Repl. f.	Repl. by						
	1	2	3	4	5	6	7	8					


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Terminal UK 3 N [1 - 4]
 Terminal US LKG 3 [PE - PE]
 Terminal
Terminal type

<p style="writing-mode: vertical-rl; transform: rotate(180deg);">We reserve all rights in this document and in the information contained therein. Reproduction, use or disclosure to third parties without express authority is strictly forbidden. © Frewitt</p>	<h1>Terminal strip -X13</h1>		Cable type		3G1.5		-A11.W1		BN	BU	GNVE			
			Placement in Schematics				/B.C7	/B.C7	/B.C8					
			Target Internal		+Control panel 2 -A11		:	:	:					
			Target External		+Installation -X4		:8	:10	:PE					
			Terminal number		1		2	PE						
			Potential		L1		230N4	PE_4						
			Jumpers											
			Cable type		TT flex CEE 3G1		-W22		BN	BU	GNVE			
			Cable designations											

Terminal	UK 3 N [1 - 2]
Terminal	USLKG 3 [PE]
Terminal	

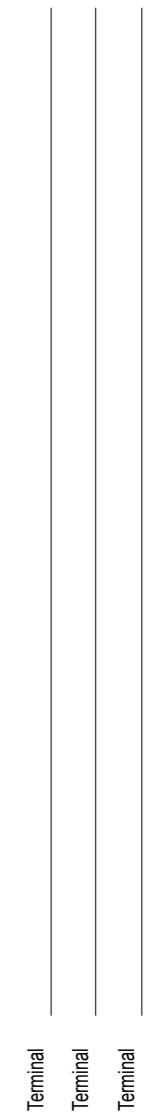
Terminal type

A	Initial version	14.02.2014	phha	Date	14.02.2014	Novartis Singapore, SG-Singapore PRO-14-0012 400V,50Hz,3P+N+PE	 Frewitt SA: Milling and Handling of Powders P.O.B. 615, CH-1701 Fribourg, SWITZERLAND tel: +41 26 460 74 00 / fax: +41 26 460 74 01 info@frewitt.com / www.frewitt.com	04 - Terminals Block Terminals Block -X13		Type : PF - Installation 473825		+Control panel 2 Page 41 / 53	
B	Project closure	19.05.2014	vri	User	phha								
C	Project follow-up	22.05.2014	vri	Proved	phha								
Status	Change	Date	Name	Standard	Origin	Repl. f.	Repl. by						

A	1	2	3	4	5	6	7	8								
B	Cable type	Cable designations	Placement in Schematics	/9.D3	/9.D3	/9.C3	/9.C3	/15.C7	/15.C7	/15.C7	/15.C7	/15.C7	/15.C7	/15.C8	/15.C8	
C	Terminal number	1	2	3	4	5	6	7	8	9	10	11	PE			
D	Potential	:21	:24	:22	:25	:36	:37	:38	:39	:40	:41	:42	:PE			
E	Cable type	Cable designations	+Installation-X6	+Installation-X6	+Installation-X6	+Installation-X6	+Installation-X6	+Installation-X6	+Installation-X6	+Installation-X6	+Installation-X6	+Installation-X6	+Installation-X6			
F	Min. 12G0.5	-W15	1	2	3	4	5	6	7	8	9	10	11	GNVE		
A	Initial version	14.02.2014	phha	Date	14.02.2014	Novartis Singapore, SG-Singapore	PRO-14-0012	400V,50Hz,3P+N+PE	Frewitt SA: Milling and Handling of Powders	P.O.B. 615, CH-1701 Fribourg, SWITZERLAND	tel: +41 26 460 74 00 / fax: +41 26 460 74 01	info@frewitt.com / www.frewitt.com	04 - Terminals Block	Type : PF - Installation	+Servolift	
B	Project closure	19.05.2014	vri	User	phha	FREWITT	F	42 / 53	42 / 53	42 / 53	42 / 53	42 / 53	42 / 53	42 / 53	42 / 53	
C	Project follow-up	22.05.2014	vri	Proved	phha	Repl. f.	Repl. by	Repl. f.	Repl. by	Repl. f.	Repl. by	Repl. f.	Repl. by	Repl. f.	Repl. by	
D	Change	Date	Name	Standard	Origin	Repl. f.	Repl. by	Repl. f.	Repl. by	Repl. f.	Repl. by	Repl. f.	Repl. by	Repl. f.	Repl. by	
E	Status	Change	Date	Name	Standard	Origin	Repl. f.	Repl. by	Repl. f.	Repl. by	Repl. f.	Repl. by	Repl. f.	Repl. by	Repl. f.	Repl. by
F	Status	Change	Date	Name	Standard	Origin	Repl. f.	Repl. by	Repl. f.	Repl. by	Repl. f.	Repl. by	Repl. f.	Repl. by	Repl. f.	Repl. by

**Terminal strip
-X19**

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**04 - Terminals Block
Terminals Block
-X19**

**Type : PF - Installation
473825**

1	2		3		4		5		6		7		8	
A	Terminal strip													
	-XI1													
B	Cable type	Cable designations	Placement in Schematics	Target Internal	Jumpers	Terminal number	Potential	Target External						
C	Cable type	Cable designations												
	Min. 6x2x0.75	-WI1	WH	BN	GN	YE	GY	PK	BU	RD	BK	VT	GYPK	RDBU
D	Min. 6x2x0.75	-WI2												
E														
F														
A	Initial version	14.02.2014	phha	Date	14.02.2014	Novartis Singapore, SG-Singapore	PRO-14-0012	400V,50Hz,3P+N+PE	Repl. f.	Repl. by	04 - Terminals Block	Type : PF - Installation	+Electrical cabinet	
B	Project closure	19.05.2014	vri	User	phha	FREWITT	FREWITT	FREWITT	FREWITT	FREWITT	FREWITT	FREWITT	FREWITT	FREWITT
C	Project follow-up	22.05.2014	vri	Proved	phha	FREWITT SA: Milling and Handling of Powders	P.O.B. 615, CH-1701 Frickburg, SWITZERLAND	tel: +41 26 460 74 00 / fax: +41 26 460 74 01	info@frewitt.com / www.frewitt.com	-XI1	473825	Page	43 / 53	
Status	Change	Date	Name	Standard	Origin									

Terminal UK3 NBU [1 - 24, SH - SH]

Terminal USLKG 3 [PE - PE]

Terminal

Terminal type

A	1	2	3	4	5	6	7	8
B	1	2	3	4	5	6	7	8
C	1	2	3	4	5	6	7	8
D	1	2	3	4	5	6	7	8
E	1	2	3	4	5	6	7	8
F	1	2	3	4	5	6	7	8


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Terminal strip -X14

Cable type		Cable designations																			
4x0.14		+ProFi-Sword -T23.W1						RD		RDBU		WH		WHBU							
Securaflex 1x2x0.75		+ProFi-Sword -T21.W1						BN				WH		BN							
Securaflex 1x2x0.75		+ProFi-Sword -T22.W1		WH		BN						WH		BN							
Cable type		Cable designations																			
Target Internal		Placement in Schematics																			
		: /18.E6		: /18.E6		: /18.E7		: /18.E7		: /19.F6		: /19.F6		: /19.F6		: /19.F6		: /24.D8			
Target External		Jumpers																			
		Terminal number		PE		1		2		3		4		5		6		7		8	
Target External		Potential																			
		:13		:14		:15		:16		:17		:18		:19		:20		PE		PE	
Cable type		Cable designations																			
Securaflex 2x2x0.75		-WI4		WH		BN		GN		YE		WH		BN		GN		YE			
Securaflex 2x2x0.75		-WI5										SH									

Terminal type

Terminal	UK 3 NBU [1 - 8, SH]
Terminal	USLKG 3 [PE - PE]
Terminal	

A	Initial version	14.02.2014	phha	Date	14.02.2014	Novartis Singapore, SG-Singapore PRO-14-0012 400V,50Hz,3P+N+PE	 Frewitt SA: Milling and Handling of Powders P.O.B. 615, CH-1701 Fribourg, SWITZERLAND tel: +41 26 460 74 00 / fax: +41 26 460 74 01 info@frewitt.com / www.frewitt.com	04 - Terminals Block -X14		Type : PF - Installation 473825		+ProFi-Sword		Page	
B	Project closure	19.05.2014	vri	User	phha									46 / 53	
C	Project follow-up	22.05.2014	vri	Proved	phha										
Status	Change	Date	Name	Standard	Origin	Repl. f.	Repl. by								

Bill of material

Article Number	Description	Manufacturer	Reference	Device	Quantity
452558	Wiring plan pockets	RITTAL	TS4118.000	-A1	1
452561	Rail for shielding bracket	RITTAL	SZ2388.800	-A1	1
452562	EMC shielding bracket	RITTAL	SZ2388.100	-A1	5
452563	EMC shielding bracket	RITTAL	SZ2388.200	-A1	5
452564	Cable clamp	RITTAL	SZ2388.140	-A1	5
452565	Cable clamp	RITTAL	SZ2388.180	-A1	5
452566	Cable clamp	RITTAL	SZ2388.220	-A1	5
454680	Electrical cabinet	RITTAL	TS8806.500	-A1	1
454681	Side panels	RITTAL	TS8106.235	-A1	1
463136	Plinth front-rear	RITTAL	TS8602.800	-A1	1
463137	Plinth side	RITTAL	TS8602.050	-A1	1
463256	EMC shielding bracket	RITTAL	SZ2388.280	-A1	10
463257	Cable clamp	RITTAL	DK7097.220	-A1	5
418213	CPU	SIEMENS	6ES7 315-2AH14-0AB0 / Serial nbr : C-E2V15838	-A2	1
428608	Memory card	SIEMENS	6ES7 953-8LG20-0AA0	-A2	1
473840	Operator panel	SIEMENS	6AV7894-3JA10-0BE0	-A3	1
418216	Digital input module	SIEMENS	6ES7 321-1BH02-0AA0 / Serial nbr : C-E2TD2565	-A4	1
418220	Front connector	SIEMENS	6ES7 392-1AJ00-0AA0	-A4	1
418217	Digital output module	SIEMENS	6ES7 322-1BH01-0AA0 / Serial nbr : C-E2TB82226	-A5	1
418220	Front connector	SIEMENS	6ES7 392-1AJ00-0AA0	-A5	1
418216	Digital input module	SIEMENS	6ES7 321-1BH02-0AA0 / Serial nbr : C-E2TD2490	-A6	1
418220	Front connector	SIEMENS	6ES7 392-1AJ00-0AA0	-A6	1
418220	Front connector	SIEMENS	6ES7 392-1AJ00-0AA0	-A7	1
418221	Analog I/O module	SIEMENS	6ES7 334-0CE01-0AA0 / Serial nbr : C-E1VW1918	-A7	1
418220	Front connector	SIEMENS	6ES7 392-1AJ00-0AA0	-A8	1
418221	Analog I/O module	SIEMENS	6ES7 334-0CE01-0AA0 / Serial nbr : C-E1VW1917	-A8	1
460068	Communication processor	SIEMENS	6AG1343-1EX30-4XE0 / Serial nbr : L-BED369008	-A9	1
414554	Fuse Terminal	PHOENIX CONTACT	UK5-HESI	-F1	1
422517	Fuse	SCHURTER	0034.3112	-F1	1

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B	Project closure	19.05.2014	vri	User	phha							
C	Project follow-up	22.05.2014	vri	Proved	phha							
Status	Change	Date	Name	Standard	Origin	Repl. f.	Repl. by					

Bill of material

Article Number	Description	Manufacturer	Reference	Device	Quantity
456574	Flow sensor	EGE	STS 212 S P11206	-F01	1
457071	Flow sensor	FESTO	SFE3-F500-L-W18-2PB-K3	-F10	1
426509	Power supply	SIEMENS	6EP1 334-3BA00 / Serial nbr : YSU/E2128448	-G1	1
404567	Magnet	ELOBAU	304 200 00 V2	-G10	1
404568	Magnet safety switch	ELOBAU	671 271 MU0 5	-G10	1
404567	Magnet	ELOBAU	304 200 00 V2	-G20	1
428806	Magnet safety switch	ELOBAU	671 271 MU0 10	-G20	1
417815	Cable for Cabinet light	RITTAL	SZ4315.100	-HX2	1
452560	Cabinet light	RITTAL	SZ4139.190	-HX2	1
422766	Emergency-Stop relay	PILZ	PNOZ X3 / 774 318	-K1	1
456536	Relay	SIEMENS	LZS:RT4A4L24	-K2	1
452578	Watchdog relay	ABB	CM-WDS	-K3	1
456657	Safety relay	ELOBAU	462 121 E1 01 / Serial nbr : 3079760	-K4	1
456536	Relay	SIEMENS	LZS:RT4A4L24	-K5	1
454256	PTC Relay	SIEMENS	3RN10 11-1BB00	-K6	1
456536	Relay	SIEMENS	LZS:RT4A4L24	-K7	1
454256	PTC Relay	SIEMENS	3RN10 11-1BB00	-K8	1
454256	PTC Relay	SIEMENS	3RN10 11-1BB00	-K9	1
454256	PTC Relay	SIEMENS	3RN10 11-1BB00	-K10	1
454256	PTC Relay	SIEMENS	3RN10 11-1BB00	-K11	1
454256	PTC Relay	SIEMENS	3RN10 11-1BB00	-K12	1
464050	Ventilator	RITTAL	SK 3240.600	-M1	1
464051	Filter	RITTAL	SK 3240.060	-M1	1
461226	Motor	LEROY-SOMER	LSPX132M	-M10	1
473196	Motor	LEROY-SOMER	LSPX80LG	-M20	1
418219	Rail	SIEMENS	6ES7390-1AE80-0AA0	-MR1	1
463735	Hour counter	ABB	E233-12/48	-P1	1
463735	Hour counter	ABB	E233-12/48	-P2	1
456655	Main switch	SIEMENS	3LD2203-1TL53	-Q1	1

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B	Project closure	19.05.2014	vri	User	phha							
C	Project follow-up	22.05.2014	vri	Proved	phha							
Status	Change	Date	Name	Standard	Origin	Repl. f.	Repl. by					

Bill of material

Article Number	Description	Manufacturer	Reference	Device	Quantity
456529	Motor Circuit breaker	SIEMENS	3RV10214BA15	-Q2	1
456530	Motor Circuit breaker	SIEMENS	3RV10211EA15	-Q3	1
456538	Protection switch	SIEMENS	5SY6 106-7	-Q4	1
456538	Protection switch	SIEMENS	5SY6 106-7	-Q5	1
456537	Protection switch	SIEMENS	5SY6 102-7	-Q6	1
456537	Protection switch	SIEMENS	5SY6 102-7	-Q7	1
456533	Contactor	SIEMENS	3RT10251BB44	-Q8	1
456533	Contactor	SIEMENS	3RT10251BB44	-Q9	1
456534	Contactor	SIEMENS	3RT10241BB44	-Q10	1
456534	Contactor	SIEMENS	3RT10241BB44	-Q11	1
456715	Motor maintenance switch	SIEMENS	3LD2103-1TP51	-Q12	1
465949	Grounding module	SIEMENS	3LD9220-2B	-Q12	1
456715	Motor maintenance switch	SIEMENS	3LD2103-1TP51	-Q13	1
465949	Grounding module	SIEMENS	3LD9220-2B	-Q13	1
456538	Protection switch	SIEMENS	5SY6 106-7	-Q14	1
456537	Protection switch	SIEMENS	5SY6 102-7	-Q15	1
456538	Protection switch	SIEMENS	5SY6 106-7	-Q16	1
465089	Residual current circuit-breaker	SIEMENS	5SU1354-6KK16	-Q17	1
456538	Protection switch	SIEMENS	5SY6 106-7	-Q18	1
405190	Emergency-Stop button	STAHL	8003/123-010	-S1	1
445287	Pushbutton	STAHL	8003/123-001	-S2	1
438080	Illuminated pushbutton	STAHL	8018/3113	-S3	1
406886	Proximity Switch	PEPPERL+FUCHS	NCB 1.5-8GM25-NO	-S10	1
443351	PTC sensor	ZIEHL	KD60	-T11	1
443351	PTC sensor	ZIEHL	KD60	-T12	1
459090	PT100 sensor	JUMO	902050/40-378-1011-3-10-20-115-11-5000/000	-T13	1
443351	PTC sensor	ZIEHL	KD60	-T21	1
443351	PTC sensor	ZIEHL	KD60	-T22	1
459090	PT100 sensor	JUMO	902050/40-378-1011-3-10-20-115-11-5000/000	-T23	1

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C	Project follow-up	22.05.2014	vri	Proved	phha						
Status	Change	Date	Name	Standard	Origin	Repl. f.	Repl. by				

Bill of material

Article Number	Description	Manufacturer	Reference	Device	Quantity
418881	Operating module	LENZE	E82ZBC	-U1	1
453193	Frequency converter	LENZE	E82EV552K4C / Serial nbr : 0008	-U1	1
453888	Function module	LENZE	E82ZAFSC100/S	-U1	1
418881	Operating module	LENZE	E82ZBC	-U2	1
453190	Frequency converter	LENZE	E82EV751K4C / Serial nbr : 0035	-U2	1
453888	Function module	LENZE	E82ZAFSC100/S	-U2	1
425177	Safety barrier Ex-i	STAHL	9002/77-093-300-001	-U3	1
425177	Safety barrier Ex-i	STAHL	9002/77-093-300-001	-U4	1
425177	Safety barrier Ex-i	STAHL	9002/77-093-300-001	-U5	1
425177	Safety barrier Ex-i	STAHL	9002/77-093-300-001	-U6	1
411946	Ex-i Switch Amplifier	PEPPERL+FUCHS	KFD2-SR2-Ex2.W	-U7	1
417735	f/l converter	PEPPERL+FUCHS	KFU8-UFC-Ex1.d / Serial nbr : 40000028155094	-U8	1
438902	Flow controller	EGE	SZA400 24VDC P10708 / Serial nbr : 21348	-U9	1
453536	Pneumat. preparation unit	Frewitt	453536	-U10	1
=>	Pressure switch	UNIVER	405 002 112 11	-U10.P10	1
=>	Solenoid valve	ASCO JOUCOMATIC	PV E374A016MS	-U10.SV10	1
443422	Ex-i T/I converter	PEPPERL+FUCHS	KFD2-UT2-Ex1	-U11	1
443422	Ex-i T/I converter	PEPPERL+FUCHS	KFD2-UT2-Ex1	-U12	1
466205	UPS module	SIEMENS	6EP1933-2EC51 / Serial nbr : Q6E2A1TBFMF	-U13	1
473853	UPS module	APC	APC Back-Ups USV 350VA BK350	-U14	1
403949	Cable	HEINIGER	888 854 043 / TT flex C 4G2.5	-W2	1
403949	Cable	HEINIGER	888 854 043 / TT flex C 4G2.5	-W3	1
403949	Cable	HEINIGER	888 854 043 / TT flex C 4G2.5	-W5	1
403949	Cable	HEINIGER	888 854 043 / TT flex C 4G2.5	-W6	1
411612	Cable	HEINIGER	888 802 023 / TT flex CEE 2x1	-W7	1
411612	Cable	HEINIGER	888 802 023 / TT flex CEE 2x1	-W8	1
411612	Cable	HEINIGER	888 802 023 / TT flex CEE 2x1	-W9	1
411612	Cable	HEINIGER	888 802 023 / TT flex CEE 2x1	-W10	1
435708	Cable	HEINIGER	888 830 183 / TT flex 18G0.5	-W14	1

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Status	Change	Date	Name	Standard	Origin	Repl. f.	Repl. by					

Bill of material

Article Number	Description	Manufacturer	Reference	Device	Quantity
435942	Cable	HEINIGER	888 830 143 / TT flex 14G0.5	-W16	1
453844	Cable	HEINIGER	888 830 043 / TT flex 4G0.5	-W17	1
403954	Cable	HEINIGER	888 802 033 / TT flex CEE 3G1	-W21	1
403954	Cable	HEINIGER	888 802 033 / TT flex CEE 3G1	-W22	1
403954	Cable	HEINIGER	888 802 033 / TT flex CEE 3G1	-W27	1
403954	Cable	HEINIGER	888 802 033 / TT flex CEE 3G1	-W28	1
403954	Cable	HEINIGER	888 802 033 / TT flex CEE 3G1	-W30	1
451303	Cable	HEINIGER	777 923 062 / Securaflex 6x2x0.75	-WI3	1
451301	Cable	HEINIGER	777 923 022 / Securaflex 2x2x0.75	-WI4	1
451301	Cable	HEINIGER	777 923 022 / Securaflex 2x2x0.75	-WI5	1
451301	Cable	HEINIGER	777 923 022 / Securaflex 2x2x0.75	-WI6	1
451300	Cable	HEINIGER	777 925 002 / Securaflex 1x2x0.75	-WI7	1
451301	Cable	HEINIGER	777 923 022 / Securaflex 2x2x0.75	-WI8	1
456540	Terminal	PHOENIX CONTACT	3004524	-X0	9
456542	Terminal	PHOENIX CONTACT	0442079	-X0	3
457042	Terminal	PHOENIX CONTACT	3004977	-X0	3
456539	Terminal	PHOENIX CONTACT	3001501	-X1	4
456541	Terminal	PHOENIX CONTACT	0441083	-X1	5
456548	Terminal	PHOENIX CONTACT	3001514	-X1	4
456543	Terminal	PHOENIX CONTACT	2770011	-X2	9
456544	Terminal	PHOENIX CONTACT	2774211	-X2	2
456543	Terminal	PHOENIX CONTACT	2770011	-X3	21
456544	Terminal	PHOENIX CONTACT	2774211	-X3	4
456539	Terminal	PHOENIX CONTACT	3001501	-X4	12
456541	Terminal	PHOENIX CONTACT	0441083	-X4	6
456539	Terminal	PHOENIX CONTACT	3001501	-X5	17
456541	Terminal	PHOENIX CONTACT	0441083	-X5	2
456539	Terminal	PHOENIX CONTACT	3001501	-X6	42
456541	Terminal	PHOENIX CONTACT	0441083	-X6	4

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Bill of material

Article Number	Description	Manufacturer	Reference	Device	Quantity
456539	Terminal	PHOENIX CONTACT	3001501	-X7	17
456541	Terminal	PHOENIX CONTACT	0441083	-X7	3
456539	Terminal	PHOENIX CONTACT	3001501	-X8	5
456541	Terminal	PHOENIX CONTACT	0441083	-X8	2
456539	Terminal	PHOENIX CONTACT	3001501	-X9	17
456541	Terminal	PHOENIX CONTACT	0441083	-X9	3
456543	Terminal	PHOENIX CONTACT	2770011	-X10	11
456544	Terminal	PHOENIX CONTACT	2774211	-X10	2
456543	Terminal	PHOENIX CONTACT	2770011	-X11	8
456544	Terminal	PHOENIX CONTACT	2774211	-X11	2
456539	Terminal	PHOENIX CONTACT	3001501	-X12	4
456541	Terminal	PHOENIX CONTACT	0441083	-X12	2
456539	Terminal	PHOENIX CONTACT	3001501	-X12.	3
456541	Terminal	PHOENIX CONTACT	0441083	-X12.	2
456539	Terminal	PHOENIX CONTACT	3001501	-X13	2
456541	Terminal	PHOENIX CONTACT	0441083	-X13	1
452064	Female connector	PEPPERL+FUCHS	V1-G-PG9	-X15	1
406306	Female connector	AMPHENOL	C016 20G003 100 12	-X16	1
406308	Protection cap	AMPHENOL	C016 00U000 010 12	-X16	1
406309	Protection cap	AMPHENOL	C016 00V000 000 12	-X16	1
409686	Male connector	AMPHENOL	T 3108 001	-X16	1
443449	Protection cap	BINDER	16-0565-00-00	-X16	1
456541	Terminal	PHOENIX CONTACT	0441083	-XI1	2
456548	Terminal	PHOENIX CONTACT	3001514	-XI1	24
456541	Terminal	PHOENIX CONTACT	0441083	-XI2	2
456548	Terminal	PHOENIX CONTACT	3001514	-XI2	28
456541	Terminal	PHOENIX CONTACT	0441083	-XI3	2
456548	Terminal	PHOENIX CONTACT	3001514	-XI3	14
456541	Terminal	PHOENIX CONTACT	0441083	-XI4	2

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Voir documents suivants.

Siehe folgende Dokumente.

See following documents

461226

Date : 10.05.2012

Induction motor with options

6P LSPX132M 5,0kW Ex II 2 D Ex tb III C T125°C Db IP65 B5 230VD/400VY 50Hz

Thermal protection 1xPTC ;

Utilisation : Environment ATEX standard - Dust ; Ambiance Non corrosive ; Zone 21 - Dusty ; Type of protection Ex II 2 D Ex tb III C T125°C Db IP65; General applications ; **Ambient temperature -16 +50 °C** ; Maximum altitude 1000 m ; Maximum surface temperature 125°C



Motor characteristics : Aluminium alloy housing ; Cast iron DE endshield ; Cast iron NDE endshield.

Motor definition

Protection type	Ex II 2 D Ex tb III C T125°C Db IP65	Rated speed (min-1)	960
Efficiency class	-	Application	General applications
Number of phases	3	Main voltage (V)	400
Number of speed	1V	Connection	DY
Polarity	6P	Starting type	DOL
Motor serie	LSPX	Motor winding (V)	230VD/400VY
Frame size (mm)	132	Rated Frequency (Hz)	50
Length code	M	Operation position	IM3001(IMB5)
HS rated power (kW)	5.00	Index of protection	IP65
LS rated power (kW)	-	Index of cooling	IC411
Starting torque (N.m)	136.00	Insulation class	F

Common definitions

Paint shade	RAL1007 - Yellow
Paint system	1a (1 polyurethane coat 20/30 microns)

Motor mechanical interface

Mounting flange	FF265	Second shaft extension	-
Drive end shaft type	IEC STANDARD shaft end	Diameter NDE shaft (mm)	-
Diameter DE shaft (mm)	38k6	Second shaft end length (mm)	-
Length DE shaft (mm)	80	Drive end bearing type	DE ball bearing
Shaft material type	Steel shaft	DE bearing	6308 ZZ C3
Nuance of shaft material	-	DE bearing mounting	Locked

Motor electrical interface

Connection network type	Terminal box	Number of leads	-
Connection network material	Aluminium alloy	Cable gland material	Brass cable gland
Connection network position	A	Main cable gland type	1xPE CMDEL ISO M20x1.5
Connection network orientation	up	Principal cable gland position	Right (1)
Connection network relative position	0	Auxiliary cable gland type	1xPE ISO M16 -

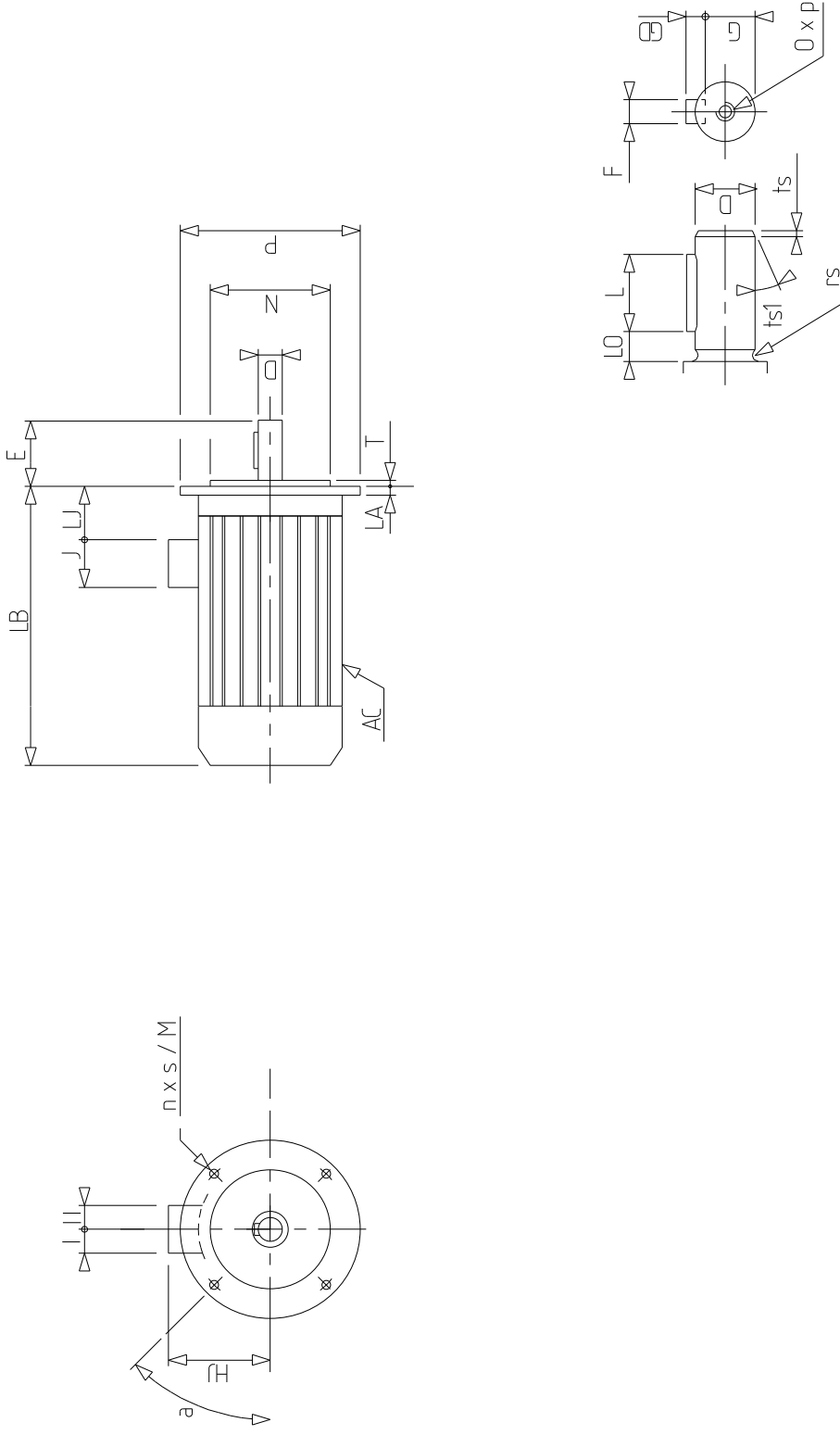
Motor options

Vibration class	A (25µm; 1.6mm/s; 2.5m/s²)	Cover	Metal cover
Balancing type	Half-key (H)	Drip proof cover option	-
Impregnation type	< 90% ; -16+40°C (T)	Forced ventilation type	-
Thermal protection	1xPTC	Forced ventilation characteristics	-
Space heater	-	Encoder type	-
Draining plugs position	6H	Encoder characteristics	-
Nameplate material	Aluminium nameplate	Screw material	Steel screw

Motor characteristics

Rated speed (min-1)	960	Motor weight (kg)	59.4
Rated current (A)	13.3	NDE bearing	6207 ZZ C3
No-load current (A)	-	Power factor at 4/4 of the load	0,71
Id / In	5.5	Power factor at 3/4 of the load	0,65
Rated torque (N.m)	54,7	Power factor at 2/4 of the load	0,52
Starting torque (N.m)	136.0	Efficiency at 4/4 (IEC 60 034-2) of the load (%)	84,1
Maximum torque (N.m)	152	Efficiency at 3/4 (IEC 60 034-2) of the load (%)	83,5
Average starting torque (N.m)		Efficiency at 2/4 (IEC 60 034-2) of the load (%)	80
Rotor locked time (cold) (s)		Efficiency at 4/4 (IEC 60 034-2-1) of the load (%)	
Unload maximum starting frequency (d/h)	-	Efficiency at 3/4 (IEC 60 034-2-1) of the load (%)	
Acoustic pressure level (dB(A))	55	Efficiency at 2/4 (IEC 60 034-2-1) of the load (%)	
Moment of inertia J (kg.m²)	0.0390000		

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Motor
(° & mm)

A	-	LO2	-
a	45	LP	-
AA	-	M	265
AB	-	N	230
AC	280.00	n	4
AD	140	O	M12
AD1	45	OA	-
B	-	P	300
BB	-	p	28
C	-	pA	-
D	38k6	rs	0.5
DA	-	rs2	-
DTP	-	S	14.5
E	80	T	4
EA	-	ts	2
EC	-	ts1	20
F	10	ts2	-
FA	-	ts3	-
G	33	x	-
GB	-		
GD	8		
GF	-		
H	-		
HA	-		
HJ	177.0		
I	57		
IB	-		
II	73		
J	110		
JC	-		
JD	-		
JE	-		
JH	-		
JP	-		
K	-		
L	63		
L2	-		
LA	14		
LB	385.0		
LC	-		
LD	-		
LE	-		
LH	-		
LJ	25.0		
LO	10		

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473196

Induction motor with options

4P LSPX80LG 0.75kW LS2/IE2 Ex II2D Ex tb IIIC T125°C Db B14 230VD/400VY 50Hz -

Metal cover ; 1xPTC (winding) ;

Utilisation : Environment ATEX standard - Dust ; Ambiance Non corrosive ; Finition - ; Zone 21 - Dusty ; Type of protection Ex II2D Ex tb IIIC T125°C Db ; General applications ; **Ambient temperature -16 +40 °C** ; Maximum altitude 1000 m ; Maximum surface temperature 125°C



Motor characteristics : Aluminium alloy housing ; Cast iron DE endshield ; Aluminium alloy NDE endshield.

Motor definition

Protection type	Ex II2D Ex tb IIIC T125°C Db	Rated speed (min-1)	1445
Generation code	LS2	Application	General applications
Efficiency class	IE2	Main voltage (V)	400
Number of phases	3	Connection	DY
Number of speed	1V	Starting type	DOL
Polarity	4P	Motor winding (V)	230VD/400VY
Motor serie	LSPX	Rated Frequency (Hz)	50
Frame size (mm)	80	Operation position	IM3601(IMB14)
Lenght code	LG	Index of protection	IP65
HS rated power (kW)	0.750	Index of cooling	IC411
LS rated power (kW)	-	Insulation class	F
Starting torque (N.m)	9.10	Finition	-

Common definitions

Paint shade	RAL1007
Paint system	1a (1 polyurethane coat 20/30 microns)

Motor mechanical interface

Mounting flange	FT100	Shaft material type	Steel shaft
Drive end shaft type	IEC STANDARD shaft end	Nuance of shaft material	-
Diameter DE shaft (mm)	19j6	Second shaft extension	-
Length DE shaft (mm)	40	Diameter NDE shaft (mm)	-
DE bearing mounting	Locked	Second shaft end length (mm)	-
DE bearing type	DE ball bearing	NDE bearing type	NDE ball bearing
DE bearing	6205 C3	NDE bearing	6204 C3

Motor electrical interface

Connection network type	Terminal box	Cable type	-
Connection network material	Aluminium alloy	Cable gland material	Cable gland not supplied, holes tapped with polyamide cork
Connection network position	A	Main cable gland type	1xM20 ; With plugs
Connection network orientation	up	Principal cable gland position	Right (1)
Connection network relative position	0	Auxiliary cable gland type	-

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Induction motor with options - 4P LSPX80LG 0.75kW LS2/IE2 Ex II2D Ex tb IIIC T125°C Db B14 230VD/400VY 50Hz -

Motor options

Vibration level	A (25µm ; 1.6mm/s ; 2.5m/s ²)	Cover	Metal cover
Balancing type	Half-key (H)	Drip proof cover option	-
Impregnation type	< 95% ; -16+40°C (T)	Forced ventilation type	-
Winding thermal protection	1xPTC (winding)	Forced ventilation characteristics	-
Space heater	-	Encoder type	-
Draining plugs position	6H	Encoder characteristics	-
Nameplate material	Aluminium nameplate	Screw material	Steel screw
Endshield thermal protection	-	Adaptation pour capteur de vibration	-

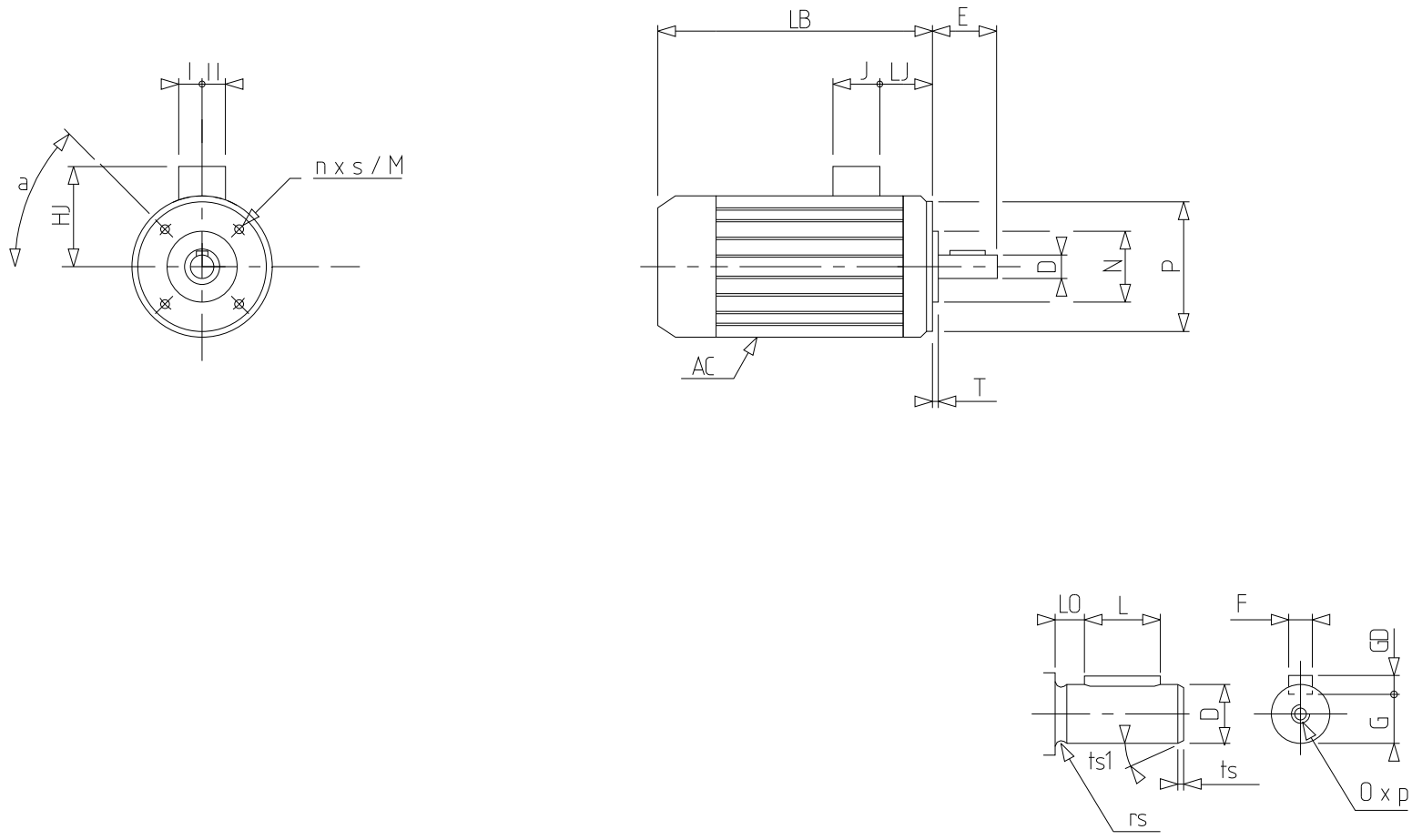
Motor characteristics (alimentation sur réseau)

Rated speed (min-1)	1445	Motor weight (kg)	11.7
Rated current (A)	1.7	Moment of inertia J (kg.m ²)	0.0026100
No-load current (A)	-	Power factor at 4/4 of the load	0.77
Id / In	5.65	Power factor at 3/4 of the load	0.69
Rated torque (N.m)	5	Power factor at 2/4 of the load	0.55
Starting torque (N.m)	9.1	Efficiency at 4/4 (IEC 60 034-2) of the load (%)	
Maximum torque (N.m)	13	Efficiency at 3/4 (IEC 60 034-2) of the load (%)	
Average starting torque (N.m)		Efficiency at 2/4 (IEC 60 034-2) of the load (%)	
Rotor locked time (cold) (s)		Efficiency at 4/4 (IEC 60 034-2-1) of the load (%)	80.10
Unload maximum starting frequency (d/h)	-	Efficiency at 3/4 (IEC 60 034-2-1) of the load (%)	80.80
Acoustic pressure level (dB(A))	47	Efficiency at 2/4 (IEC 60 034-2-1) of the load (%)	79.00

VV LSPX 80-132 (Plaquette réseau, plaquette vitesse variable, sondes CTP)

Data sheet 473196

Induction motor with options - 4P LSPX80LG 0.75kW LS2/IE2 Ex II2D Ex tb IIIC T125°C Db B14 230VD/400VY 50Hz -



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Induction motor with options - 4P LSPX80LG 0.75kW LS2/IE2 Ex II2D Ex tb IIIC T125°C Db B14 230VD/400VY 50Hz -

*Motor**(° & mm)*

A	-	LO2	-
a	45	LP	-
AA	-	M	100
AB	-	N	80
AC	185.00	n	4
AD	-	O	M6
AD1	-	OA	-
B	-	P	120
BB	-	p	16
C	-	pA	-
D	19j6	rs	0.5
DA	-	rs2	-
DTP	-	S	M6
E	40	T	3
EA	-	ts	2
EC	-	ts1	20
F	6	ts2	-
FA	-	ts3	-
G	15.5	x	-
GB	-		
GD	6		
GF	-		
H	-		
HA	-		
HJ	137.0		
I	53		
IB	-		
II	53		
J	90		
JC	-		
JD	-		
JE	-		
JH	-		
JP	-		
K	-		
L	30		
L2	-		
LA	0		
LB	243.0		
LC	-		
LD	-		
LE	-		
LH	-		
LJ	24.5		
LO	6		

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No article Frewitt		
Frewitt Artikel Nr.	:	439572
Frewitt Article ID		
Type réducteur		
Typ Getriebe	:	GKR 05-2N HAK/7C-ATEX
Type gearbox		
Rapport de réduction		
Übersetzung	:	I=49.133
Ratio		
Rapport de réduction total min/max		
Übersetzung total Min/Max	:	-
Ratio totally min/max		
Puissance d'entrée maxi	:	0.75 kW
Vitesse de sortie		
Ausgangsdrehzahl	:	28.5 tr/min pour n1=1400 tr/min
Speed		1/min
Couple de sortie		
Drehmoment	:	240
Torque		Nm
Exécution	<input type="checkbox"/> Normale / Normal	<input checked="" type="checkbox"/> 2G <input type="checkbox"/> 3G <input type="checkbox"/> T3 125°C <input type="checkbox"/> Eexk
Ausführung	<input checked="" type="checkbox"/> ATEX II <input type="checkbox"/> A <input type="checkbox"/> B <input checked="" type="checkbox"/> C	<input checked="" type="checkbox"/> 2D <input type="checkbox"/> 3D <input checked="" type="checkbox"/> T4 <input checked="" type="checkbox"/> Eexck
Execution		
Arbre de sortie réducteur	:	Arbre creux 30
Abtriebswelle Getriebe	:	-
Output shaft gearbox	:	-
Flasque de sortie réducteur		
Flansch Ausgang Getriebe	:	Bride côté sortie K - 160 trous lisses, pos.5
Flange output gearbox		
Exécution de la flasque du réducteur	:	-
Ausführung Flansch Getriebe	:	-
Execution Flange gearbox	:	-
Forme de construction réducteur		
Bauform Getriebe	:	A - avec pattes, avec centrage
Forme assembly gearbox		
Position de l'arbre de sortie réducteur		
Position Abtriebswelle Getriebe	:	-
Position output shaft gearbox		
Face d'appui de montage	:	Position de montage A
Auflagefläche	:	-
Mounting surface	:	-
Voyant d'huile	:	-
Ölschauglas	:	-
Oil sight glass	:	-
Taille entraînement		
Antriebsgrösse	:	7C
Drive size		

Lubrification	:	CLP HC 220 USDA H1
Schmierung	:	-
Lubrication	:	-
Quantité		
Menge	:	-
Quantity		
Intervalle de vidange	:	-
Ölwechselintervall	:	-
Oil changing interval	:	-

Couleur		
Farbe	:	RAL 7012
Color		

Dossier technique de maintenance		Manuel du moteur en français, allemand et anglais.
Technische Dokumentation	<input checked="" type="checkbox"/>	Betriebsanleitung des Motors auf französisch, deutsch und englisch.
Technical documentation	<input checked="" type="checkbox"/>	Operating instructions in french, german and english.
	<input type="checkbox"/>	Liste de pièces du moteur. Ersatzteilliste. Spare parts list.
	<input checked="" type="checkbox"/>	Liste des huiles et graisses utilisées. Liste der verwendeten Schmiermittel. List of used lubricants.
	<input type="checkbox"/>	Le certificat d'essai du fabricant moteur Prüfbericht des Herstellers. Test report of the manufacturer.

Annexes		Dessin fournisseur
Anhänge	<input type="checkbox"/>	Lieferantenzeichnung
Appendices		Supplier drawing
	<input type="checkbox"/>	Dessin Frewitt Frewitt Zeichnung Frewitt Drawing
	<input type="checkbox"/>	Autre: Anderes: Other:

Certificats		
Zertifikate	<input checked="" type="checkbox"/>	ATEX
Certificates		

Voir documents suivants.

Siehe folgende Dokumente.

See following documents

Doc No: 102674-1

EDK82EV113
13167992



Lenze

D

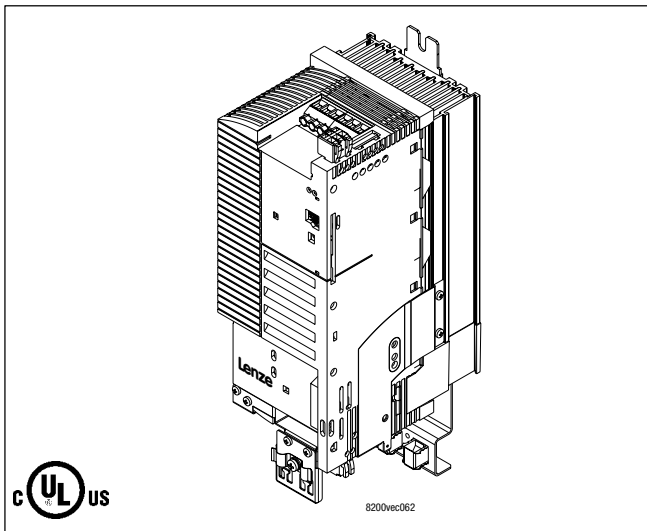
Montageanleitung

GB

Mounting Instructions

F

Instructions de montage



Global Drive

8200 vector

3 kW ... 11 kW



Lesen Sie zuerst die Montageanleitung, bevor Sie mit den Arbeiten beginnen!

Beachten Sie die enthaltenen Sicherheitshinweise.

Das Systemhandbuch mit ausführlicher Information zum Frequenzumrichter 8200 vector können Sie bei Ihrem Lenze-Vertriebspartner bestellen.

Read the Mounting Instructions before you start working!

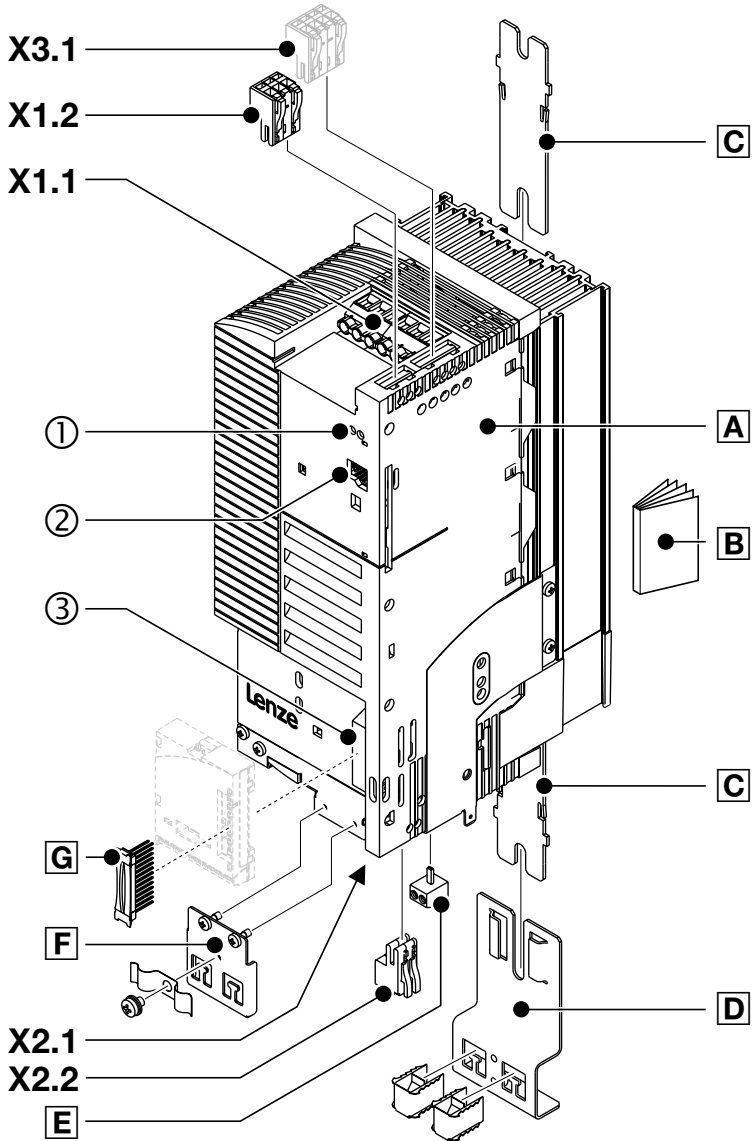
Please observe all safety information given.

The manual with detailed information about the 8200 vector can be ordered directly from Lenze or Lenze representatives.

Lire attentivement les instructions de montage avant toute opération !

Respecter les consignes de sécurité.

Le manuel comprenant une description complète du convertisseur de fréquence 8200 vector peut être commandé auprès de votre agence Lenze.



Items supplied

Position	Description	
A	8200 vector frequency inverters	
B	Mounting Instructions and Getting Started	
C	Holder for standard mounting	📖 95
D	EMC shield sheet with shield clips for the motor cable and the supply for the motor temperature monitoring	📖 97
E	2-pole terminal strip for motor PE and motor shield at X2.1	📖 97
F	EMC shield sheet with mounting screws and shield clamps for shielded control cables	📖 97
G	2*13-pole plug connector for function modules at FIF interface	📖 109
X1.1	Mains connection and DC-power supply (integrated terminal strip)	📖 99 📖 102
X1.2	Terminal strip of relay output	📖 106
X2.1	Motor connection, connection brake resistor (option) (integrated terminal strip)	📖 105
X2.2	Terminal strip for PTC connection or thermal contact (NC contact) of the motor	
X3.1	Special design: Terminal strip for feedback contact - only for varian "Safe standstill" E82VxxxKxCx4x	📖 107

Interfaces and displays

Position	Description	Function	
①	2 LEDs (red, green)	Status display	📖 152
②	AIF interface (Automation interface)	Plug-in station for communication modules keypad E82ZBC, keypad XT EMZ9371BC Fieldbus modules type 21XX, e. g. INTERBUS 2111, PROFIBUS-DP 2133, ...	📖 113
③	FIF interface (Function interface)	With cover for operation with function module	
		or plug-in station for function modules Standard I/O E82ZAFSC Application I/O E82ZAFAC Fieldbus function modules type E82ZAFXC, e. g. INTERBUS E82ZAFIC, PROFIBUS-DP E82ZAFPC, ...	📖 109



Note!

Current documentation and software updates for Lenze products can be found on the internet in the "Downloads" area under

<http://www.Lenze.com>



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Safety and application notes for Lenze controllers

(in conformity with Low-Voltage Directive 73/23/EEC)

General

Lenze controllers (frequency inverters, servo inverters, DC controllers) can include live and rotating parts - depending on their type of protection - during operation. Surfaces can be hot.

Non-authorized removal of the required cover, inappropriate use, incorrect installation or operation, creates the risk of severe injury to persons or damage to material assets.

For more detailed information please see the documentation.

All operations concerning transport, installation, and commissioning as well as maintenance must be carried out by qualified, skilled personnel (IEC 364 and CENELEC HD 384 or DIN VDE 0100 and IEC report 664 or DIN VDE 0110 and national regulations for the prevention of accidents must be observed).

According to this basic safety information qualified skilled personnel are persons who are familiar with the installation, assembly, commissioning and operation of the product and who have the qualifications necessary for their occupation.

Application as directed

Drive controllers are components which are designed for installation in electrical systems or machinery. They are not to be used as appliances. They are intended exclusively for professional and commercial purposes according to EN 61000-3-2. The documentation includes information on compliance with the EN 61000-3-2.

When installing the drive controllers in machines, commissioning (i.e. starting of operation as directed) is prohibited until it is proven that the machine complies with the regulations of the EC Directive 98/37/EC (Machinery Directive); EN 60204 must be observed.

Commissioning (i.e. starting of operation as directed) is only allowed when there is compliance with the EMC Directive (89/336/EEC).

The drive controllers meet the requirements of the Low Voltage Directive 73/23/EEC. The harmonised standards of the series EN 50178/DIN VDE 0160 apply to the controllers.

The technical data and information on the connection conditions must be obtained from the nameplate and the documentation. They must be observed in any case.

Warning: The availability of controllers is restricted according to EN 61800-3. These products can cause radio interference in residential areas. In this case, special measures can be necessary.

Transport, storage

Please observe the notes on transport, storage and appropriate handling.

Observe the climatic conditions according to EN 50178.

Installation

The controllers must be installed and cooled according to the regulation and instructions given in the corresponding documentation.

Ensure proper handling and avoid mechanical stress. Do not bend any components and do not change any insulation distances during transport or handling. Do not touch any electronic components and contacts.

Controllers contain electrostatically sensitive components, which can easily be damaged by inappropriate handling. Do not damage or destroy any electrical components since this might endanger your health!

Electrical connection

When working on live drive controllers, the applicable national regulations for the prevention of accidents (e.g. VBG 4) must be observed.

The electrical installation must be carried out according to the appropriate regulations (e.g. cable cross-sections, fuses, PE connection). Additional information can be obtained from the documentation.

The documentation contains information about installation in compliance with EMC (shielding, grounding, filters and cables). These notes must also be observed for CE-marked controllers. The manufacturer of the system or machine is responsible for the compliance with the required limit values demanded by the EMC legislation.

Operation

Systems including controllers must be equipped with additional monitoring and protection devices according to the corresponding standards (e.g. technical equipment, regulations for prevention of accidents, etc.). If necessary, adapt the controllers to your application. Please observe the corresponding information given in the Instructions.

After the controller has been disconnected from the supply voltage, live components and power connection must not be touched immediately since capacitors could be charged. Please observe the corresponding notes on the controller.

All covers and doors must be closed during operation.

Information for UL approved systems with integrated controllers: UL warnings are notes which apply to UL systems. The documentation contains special information about UL.

Safe standstill

Variant V004 of the controller series 9300 and 9300 vector, variante x4x of the controller series 8200 vector and axis controller ECSxAxxx support the function "Safe standstill", protection against unintended start, according to the requirements of Appendix I, No. 1.2.7 of the EC Directive "Machinery" 98/37/EG, DIN EN 954-1 category 3 and DIN EN 1037. It is absolutely necessary to observe the information about the function "Safe standstill" in the corresponding documentation and instructions.

Maintenance and servicing

Please observe the information given in the documentation.

The product-specific safety and application notes in these instructions must also be observed!

Protection of persons

- Before working on the controller check that no voltage is applied to the power terminals, the relay output and the pins of the FIF interface,
 - because the power terminals U, V, W, +UG, -UG, BR1 and BR2 remain live for at least 3 minutes after mains switch-off.
 - because the power terminals L1, L2, L3; U, V, W, +UG, -UG, BR1 and BR2 remain live when the motor is stopped.
 - because the relay outputs K11, K12, K14 can remain live when the controller is disconnected from the mains.
- If you use the non-fail safe function "Selection of direction of rotation" via the digital signal DCTRL1-CW/CCW (C0007 = 0 ... 13, C0410/3 ≠ 255):
 - In the event of an open circuit or failure of the control voltage, the drive can change its direction of rotation.
- If you use the function "Flying-restart circuit" (C0142 = 2, 3) with machines with a low moment of inertia and a minimum friction:
 - After controller enable in standstill, the motor can start for a short time or change its direction of rotation for a short time.
- The heatsink of the controller has an operating temperature of > 80°C:
 - Direct skin contact with the heatsink results in burnings.

Controller protection

- All pluggable connection terminals must only be connected or disconnected when no voltage is applied!
- **Cyclic** connection and disconnection of the supply voltage can overload and destroy the input current limitation of the controller:
 - In case of cyclic mains switching over a longer period of time three minutes have to pass between two starting operations!

Motor protection

- Depending on the controller settings, the connected motor can be overheated:
 - For instance, longer DC-braking operations.
 - Longer operation of self-ventilated motors at low speed.

Controller/system protection

- Drives can reach dangerous overspeeds (e.g. setting of inappropriately high field frequencies):
 - The controllers do not offer any protection against these operating conditions. For this, use additional components.
- **Contactors in the motor cable** Switching with inhibited controller only.
If contactors in the motor cable are switched with the controller enabled,
 - monitoring functions of the controller can be activated.
 - the controller can be destroyed under unfavourable operating conditions.



Warnings!

- The device has no overspeed protection.
- Must be provided with external or remote overload protection.
- Suitable for use on a circuit capable of delivering not more than 5000 rms symmetrical amperes, 240 V maximum (240 V devices) or 500 V maximum (400/500 V devices) resp.
- Use 60/75 °C or 75 °C copper wire only.
- Shall be installed in a pollution degree 2 macro-environment.

Layout of safety instructions

All safety instructions given in these Instructions have got the same structure:

Pictograph (indicates the type of danger)



Danger! (indicates the degree of danger)

Note (describes the danger and explains how to avoid it)

Pictograph	Signal word		
		Meaning	Consequences if disregarded
 Dangerous electrical voltage	Danger!	Impending danger for persons	Death or most severe injuries
	Warning!	Possible, very dangerous situation for persons	Death or most severe injuries
	Caution!	Possible, dangerous situation for persons	Injuries
 General danger	Stop!	Possible material damage	Damage of the drive system or its surroundings
	Note!	Useful tip If you observe it, handling of the drive system will be easier.	

Normes et application conditions

Standards		
Conformity	CE	Low-Voltage Directive (73/23/EEC)
Approvals	UL 508C	Power Conversion Equipment (File-No. E132659)

Environmental conditions			
Climatic conditions			
Storage	IEC/EN 60721-3-1	1K3 (-25 ... +60 °C)	< 6 month
		1K3 (-25 ... +40 °C)	> 6 month > 2 years: anodizing of DC-bus capacitors
Transport	IEC/EN 60721-3-2	2K3 (-25 ... +70 °C)	
Operation	IEC/EN 60721-3-3	3K3 (-10 ... +55 °C) 8200 vector 15 ... 90 kW: 3K3 (-10 ... +50 °C) Power derating above +40 °C: 2.5 %/°C	
Installation height		0 ... 4000 m amsl Power derating at 1000 ... 4000 m amsl: 5 %/1000 m	
Pollution	EN 61800-5-1	Degree of pollution 2	
Vibration resistance	Germanischer Lloyd	General conditions: acceleration resistance up to 0.7g	

Application conditions			
Mounting positions		vertical	
Free space			
above/below		≥100 mm	
to the sides		Side-by-side mounting with a distance of 3 mm	
Max. permissible motor cable length	For rated mains voltage and chopper frequency of 8 kHz without additional output filters		
shielded		50 m	For compliance with EMC regulations, the permissible cable lengths must be changed
unshielded		100 m	
DC group drives		possible, except E82xV251K2C und E82xV371K2C	

General technical data

EMC	Compliance with EN 61800-3/A11		
Noise emission	Compliance with limit value classes A and B to EN 55011		
	E82EVxxxKxC0xx	without additional measures	
	E82EVxxxKxC2xx	by means of external filters	
Noise immunity	Requirements to EN 61800-3 incl. A11		
	Requirements	Standard Severities	
	ESD	EN 61000-4-2	3, i.e. 8 kV with air discharge, 6 kV with contact discharge
	high frequency in cables	EN 61000-4-6	150 kHz ... 80 MHz, 10 V/m 80 % AM (1kHz)
	RF interference (enclosure)	EN 61000-4-3	80 MHz ... 1000 MHz, 10 V/m 80 % AM (1kHz)
	Burst	EN 61000-4-4	3/4, i. e. 2 kV/5 kHz
	Surge (Surge on mains cable)	EN 61000-4-5	3, i.e. 1,2/50 µs, 1 kV phase-phase, 2 kV phase-PE
Insulation resistance	Overvoltage category III acc. to VDE 0110		
Discharge current to PE (to EN 50178)	> 3.5 mA, i. e. fixed installation and double PE connection are required.		
Enclosure	IP20		
Protection measures against	Short circuit, earth fault (earth-fault protected during operation, limited earth-fault protection during power up), motor stalling, motor overtemperature (input for PTC or thermal contact, I ^{2t} monitoring)		
Insulation of control circuits	Safe mains isolation: Double/reinforced insulation to EN 61800-5-1		
permissible mains types	Operation at TT systems, TN systems or systems with grounded star point without additional measures		
	Operation at IT systems is only possible with a variant		
Permissible mains voltage ranges	Frequency range		
	45 Hz - 0 % ... 65 Hz + 0 %	DC power supply	
1/N/PE AC 230/240 V	180 V - 0 % ... 264 V + 0 %	DC 140 V - 0 % ... 370 V + 0 %	
2/N/PE AC 230/240 V			
3/PE AC 230/240 V	100 V - 0 % ... 264 V + 0 %	DC 140 V - 0 % ... 370 V + 0 %	
3/PE AC 400 V	320 V - 0 % ... 440 V + 0 %	DC 450 V - 0 % ... 625 V + 0 %	
3/PE AC 500 V	320 V - 0 % ... 550 V + 0 %	DC 450 V - 0 % ... 775 V + 0 %	

Operation with rated power (normal operation)

Type	Power [kW]	Rated mains voltage	Mains current [A]		Output current [A] ¹⁾		Weight [kg]
			①	②	I _r	I _{max} (60 s) ²⁾	
E82EV302K2C	3.0	3/PE AC 230/240 V 50 Hz DC 325 V	15.6	12.0	12.0	18.0	2,9
E82EV402K2C	4.0		21.3	16.0	16.5	24.8	
E82EV552K2C	5.5		29.3	21.0	22.5	33.8	3.6
E82EV752K2C	7.5		-	28.0	28.6	42.9	
E82EV302K4C	3.0	3/PE AC 400 V 50 Hz DC 565 V	9.0	7.0	7.3	11.0	2,9
E82EV402K4C	4.0		12,3	8.8	9,5	14.2	
E82EV552K4C	5.5		16.8	12.0	13.0	19.5	3.6
E82EV752K4C	7.5		21.5	15.0	16.5	24.8	
E82EV113K4C	11.0	-	21.0	23.5	35.3		
E82EV302K4C	3.0	3/PE AC 500 V 50 Hz DC 710 V	7.2	5.6	5.8	11.0	2,9
E82EV402K4C	4.0		9,8	7.0	7.6	14.2	
E82EV552K4C	5.5		13.4	9.6	10.4	19.5	3.6
E82EV752K4C	7.5		17.2	12.0	13.2	24.8	
E82EV113K4C	11.0	-	16.8	18.8	35.3		

① without mains choke

② With mains choke

1) With rated mains voltage and chopper frequency of 8 kHz

2) Currents for periodic load change: 1 min overcurrent with I_{max} and 2 min basic load with 75 % I_r

Operation with increased rated power

Under the application conditions described here the controller can be operated in continuous operation with a motor of higher performance. The overload capacity is reduced to 120 %.

Typical applications are pumps with square-law load characteristic or blowers.



Note!

Operation with increased rated power is only permissible

- with the drive controllers mentioned
- within the mains voltage range mentioned
- with the chopper frequency mentioned
- with the prescribed fuses, cable cross-sections and mains chokes

Type	Power [kW]	Rated mains voltage	Mains current [A]		Output current [A] ¹⁾	
			①	②	I _r	I _{max} (60 s) ²⁾
E82EV302K2C	3.0	3/PE AC 230/240 V 50 Hz DC 325 V	18.7	14.4	14.4	18.0
E82EV402K2C	4.0		Operation not possible			
E82EV552K2C	5.5		-	25.7	27	33.8
E82EV752K2C	7.5		Operation not possible			
E82EV302K4C	3.0	3/PE AC 400 V 50 Hz DC 565 V	10.8	8.4	8.7	11.0
E82EV402K4C	4.0		-	10.6	11.4	14.2
E82EV552K4C	5.5		Operation not possible			
E82EV752K4C	7.5		-	18.0	19.8	24.8
E82EV113K4C	11.0		Operation not possible			

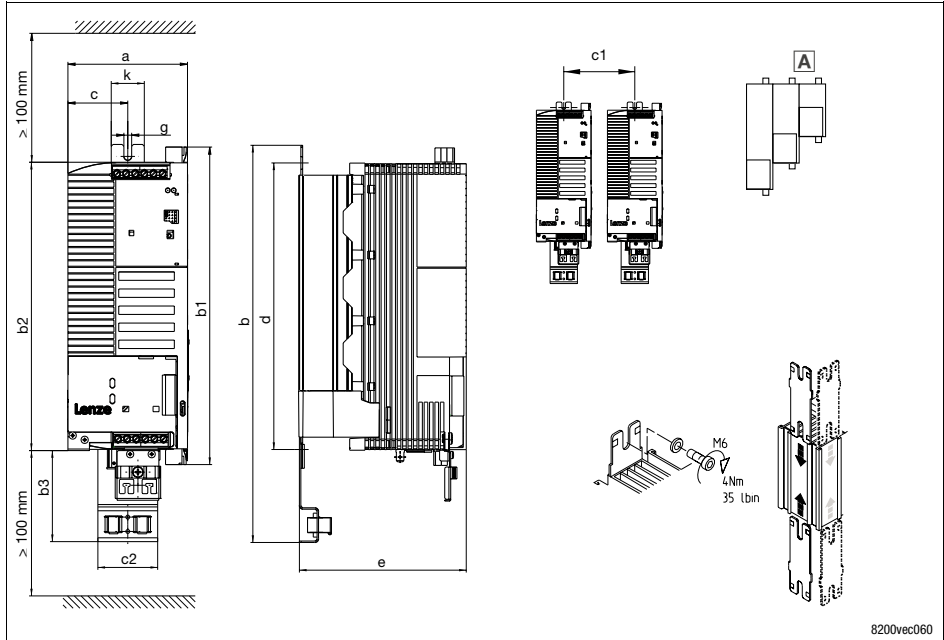
① without mains choke

② With mains choke

1) For rated mains voltage and chopper frequency 2 kHz or 4 kHz

2) Currents for periodic load change: 1 min overcurrent with I_{max} and 2 min basic load with 75 % I_r

8200 vector 3 ... 11 kW



8200vec060

- A** Different sizes can only be mounted side-by-side when the smaller units are mounted to the right-hand-side of the bigger units!

Dimensions in mm	a	b	b1	b2	b3	c	c1	c2	d	e	g	k		
E82EV302K2C	100	333	268	240	78	50	103	50	255	140	6.5	28		
E82EV402K2C							103							
E82EV552K2C ¹⁾	125	333				359 ²⁾	62.5		128	128			255	140
E82EV752K2C ¹⁾														
E82EV302K4C	100	333				50	103		255	140				
E82EV402K4C							103							
E82EV552K4C	125	333	62.5	128	255	140								
E82EV752K4C ¹⁾							280 ... 295 ²⁾	162 ²⁾						
E82EV113K4C ¹⁾														

1) Side mounting only possible with swivel holding unit E82ZJ006 (accessories)

2) with E82ZJ006

3

Electrical installation

Wiring of terminal strips

The enclosed terminal strips are tested according to the specifications of the

- DIN VDE 0627:1986-06 (partially)
- DIN EN 60999:1994-04 (partially)

Checked and tested are, for instance, mechanical, electrical and thermal load, vibration, damage of conductors, loose conductors, corrosion, ageing.

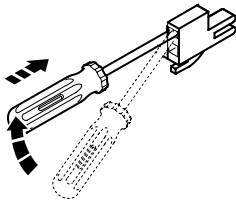


Stop!

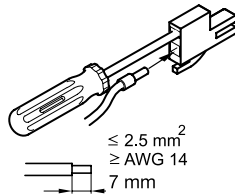
Proceed as follows to avoid damage of the contacts:

- Mount only when the controller is not connected to the mains.
- Wire the terminal strips before connecting them!
- Unused terminal strips must also be plugged in to protect the contacts.

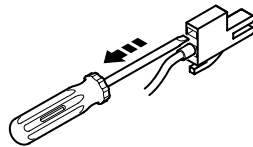
①



②



③



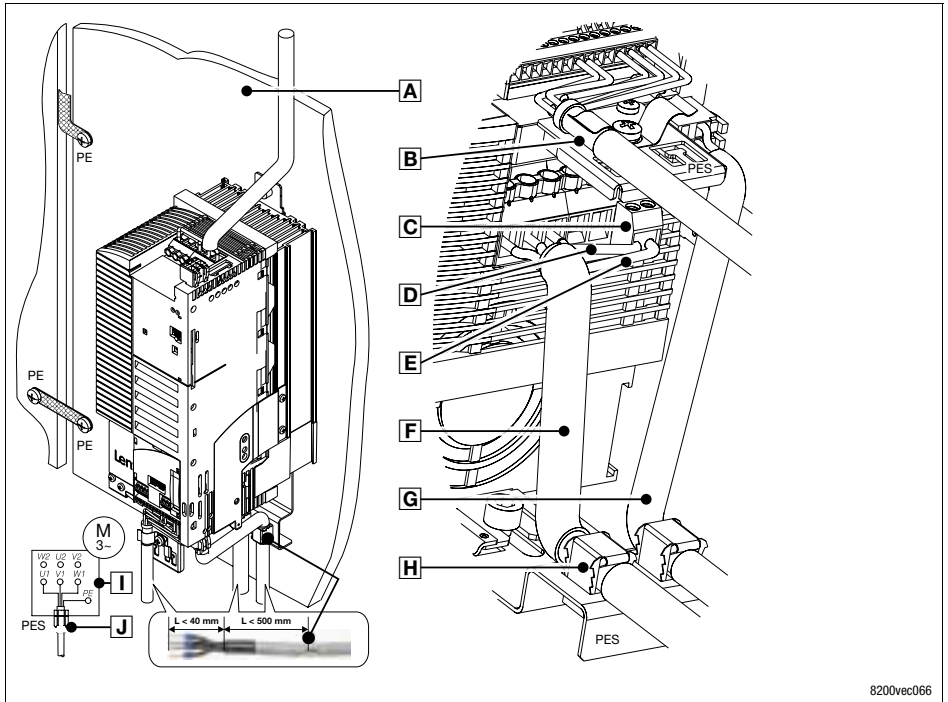
8200vec015



Note!

Wiring without wire end ferrules is always possible.


Installation according to EMC requirements (CE-typical drive system)



8200vec066

3

Electrical installation**Installation according to EMC requirements (CE-typical drive system)****Stop!**

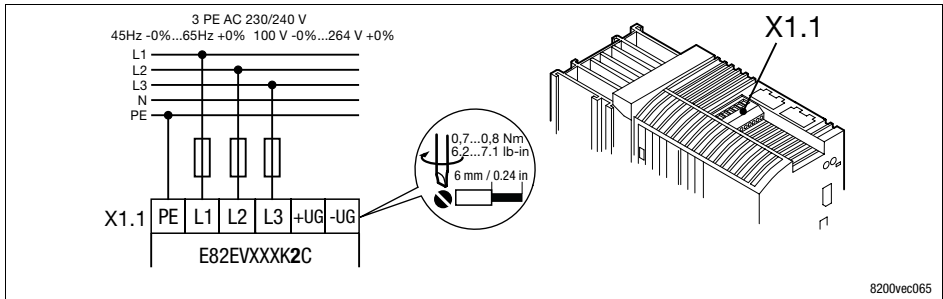
- Control cables and mains cables must be separated from the motor cable to avoid interferences.
- Control cable must always be shielded.
- We recommend to shield the supply cable for the PTC or thermal contact and route it separately from the motor cable.
- If the cores for motor connection and PTC or thermal contact are together in one cable with a common shield:
 - In order to reduce interference injections on the PTC cable, we recommend to install additionally the PTC module type E82ZPE.
- An optimum HF shield connection of the motor cable can be reached by using the terminal  for motor PE and motor shield.

A	Mounting plate with electrically conductive surface
B	Control cable to function module, connect the shielding to the EMC shield sheet (PES) with a surface as large as possible
C	2-pole terminal for motor PE and motor shield
D	PE of the motor cable
E	Shield of the motor cable
F	shielded motor cable, low.capacity (core/core up to 1,5 mm ² ≤ 75 pF/m; from 2,5 mm ² ≤ 100 pF/m; core/shield ≤ 150 pF/m)
G	shielded PTC cable or thermal contact cable
H	Connect cable shields to the EMC shield sheet (PES) with a surface as large as possible. Use enclosed clamps.
I	Star or delta connection as indicated on the motor nameplate
J	EMC-cable connector (not included in the delivery package)



Stop!

- Controller type E82EVxxxK **2C** must only be connected to a mains voltage of 3/PE AC 100 ... 264 V. Higher mains voltages will destroy the controller!
- The discharge current to PE is > 3.5 mA. EN 50178 requires a fixed installation. Double PE connection required.



E82EV752K2C	Operation only with mains choke
X1.1/+UG, X1.1/-UG	DC supply (DC-bus operation - see Operating Instructions)

Fuses and cable cross-section (operation with rated power)

		Operation without mains choke					FI	
		Installation to EN 60204-1			Installation to UL 1)			
8200 vector		mains	①	②	L1, L2, L3, PE [mm ²]	①	L1, L2, L3, PE [AWG]	FI
Type	[kW]							
E82EV302K2C	3.0	3/PE AC 100 ... 264 V; 45 ... 65 Hz	M20 A	B20 A	4	20 A	12	≥ 300 mA ²⁾ ≥ 30 mA ³⁾
E82EV402K2C	4.0		M25 A	B25 A	4	25 A	10	
E82EV552K2C	5.5		M35 A	-	6 ⁴⁾	35 A	8	
E82EV752K2C	7.5		Operation only with mains choke					

		Operating with mains choke					FI	
		Installation to EN 60204-1			Installation to UL 1)			
8200 vector		mains	①	②	L1, L2, L3, PE [mm ²]	①	L1, L2, L3, PE [AWG]	FI
Type	[kW]							
E82EV302K2C	3.0	3/PE AC 100 ... 264 V; 45 ... 65 Hz	M16 A	B16 A	2.5	15 A	14	≥ 300 mA ²⁾ ≥ 30 mA ³⁾
E82EV402K2C	4.0		M20 A	B20 A	4	20 A	12	
E82EV552K2C	5.5		M25 A	B25 A	4	25 A	10	
E82EV752K2C	7.5		M35 A	-	6 ⁴⁾	35 A	8	

① Fuse

② E.I.c.b.

- 1) Use UL-approved cables, fuses and fuse holders only.
UL fuse: voltage 240 V, tripping characteristic "H", "K5" or "CC"
- 2) All-current sensitive e.I.c.b. for use with E82EVxxxK2C0xx
- 3) All-current sensitive e.I.c.b. for use with E82EVxxxK2C2xx
- 4) Flexible cable can only be connected using pin end connectors.

Observe national and regional regulations (e. g. VDE 0113, EN 60204)

Fuses and cable cross-sections (operation with increased rated power)

			Operation without mains choke					FI
			Installation to EN 60204-1			Installation to UL 1)		
8200 vector		mains	①	②	L1, L2, L3, PE [mm ²]	①	L1, L2, L3, PE [AWG]	FI
Type	[kW]		①	②	①	②		
E82EV302K2C	3.0	3/PE AC	M25 A	B25 A	4	25 A	10	≥ 300 mA ²⁾ ≥ 30 mA ³⁾
E82EV552K2C	5.5	100 ... 264 V; 45 ... 65 Hz	Operation only with mains choke					

			Operating with mains choke					FI
			Installation to EN 60204-1			Installation to UL 1)		
8200 vector		mains	①	②	L1, L2, L3, PE [mm ²]	①	L1, L2, L3, PE [AWG]	FI
Type	[kW]		①	②	①	②		
E82EV302K2C	3.0	3/PE AC	M20 A	B20 A	4	20 A	12	≥ 300 mA ²⁾ ≥ 30 mA ³⁾
E82EV552K2C	5.5	100 ... 264 V; 45 ... 65 Hz	M32 A	B32 A	6 ⁴⁾	35 A	8	

① Fuse

② E.I.c.b.

1) Use UL-approved cables, fuses and fuse holders only.
UL fuse: voltage 240 V, tripping characteristic "H", "K5" or "CC"

2) All-current sensitive e.I.c.b. for use with E82EVxxxK2C0xx

3) All-current sensitive e.I.c.b. for use with E82EVxxxK2C2xx

4) Flexible cable can only be connected using pin end connectors.

Observe national and regional regulations (e. g. VDE 0113, EN 60204)

Please observe the following when using e.I.c.bs:

- E.I.c.bs must only be installed between mains supply and controller.
- E.I.c.bs can trip incorrectly because of
 - capacitive leakage currents of the cable shields during operation (especially with long, shielded motor cables),
 - simultaneous connection of several controllers to the mains supply,
 - use of additional RFI filters.

3

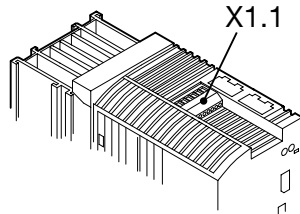
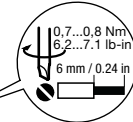
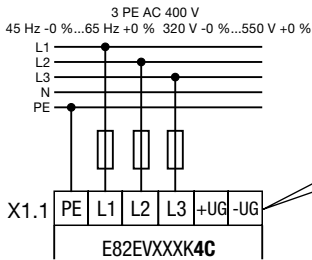
Electrical installation

Mains connection 400 V/500 V



Stop!

- Controller type E82EVxxxK **4C** must only be connected to a mains voltage of 3/PE AC 320 ... 550 V. Higher mains voltages will destroy the controller!
- The discharge current to PE is > 3.5 mA. EN 50178 requires a fixed installation. Double PE connection required.



8200vec067

X1.1/+UG, X1.1/-UG

DC supply (DC-bus operation - see Operating Instructions)

Fuses and cable cross-section (operation with rated power)

		Operation without mains choke						FI
		Installation to EN 60204-1			Installation to UL 1)			
		①	②	L1, L2, L3, PE [mm ²]	①	L1, L2, L3, PE [AWG]		
8200 vector	mains							
Type	[kW]							
E82EV302K4C	3.0	3/PE AC 320 ... 550 V; 45 ... 65 Hz	M16 A	B16 A	2.5	15 A	14	≥ 300 mA ²⁾ ≥ 30 mA ³⁾
E82EV402K4C	4.0		M16 A	B16 A	2.5	15 A	14	
E82EV552K4C	5.5		M25 A	B25 A	4	20 A	12	
E82EV752K4C	7.5		M32 A	B32 A	6 ⁴⁾	25 A	10	
E82EV113K4C	11		Operation only with mains choke					

		Operating with mains choke						FI
		Installation to EN 60204-1			Installation to UL 1)			
		①	②	L1, L2, L3, PE [mm ²]	①	L1, L2, L3, PE [AWG]		
8200 vector	mains							
Type	[kW]							
E82EV302K4C	3.0	3/PE AC 320 ... 550 V; 45 ... 65 Hz	M10 A	B10 A	1.5	10 A	16	≥ 300 mA ²⁾ ≥ 30 mA ³⁾
E82EV402K4C	4.0		M16 A	B16 A	2.5	15 A	14	
E82EV552K4C	5.5		M20 A	B20 A	4	20 A	12	
E82EV752K4C	7.5		M20 A	B20 A	4	20 A	12	
E82EV113K4C	11		M32 A	B32 A	6 ⁴⁾	25 A	10	

① Fuse

② E.l.c.b.

1) Use UL-approved cables, fuses and fuse holders only.
UL fuse: Voltage 500 ... 600 V, tripping characteristic "H", "K5" or "CC"

2) All-current sensitive e.l.c.b. for use with E82EVxxxK4C0xx

3) All-current sensitive e.l.c.b. for use with E82EVxxxK4C2xx

4) Flexible cable can only be connected using pin end connectors.

Observe national and regional regulations (e. g. VDE 0113, EN 60204)

Fuses and cable cross-sections (operation with increased rated power)

			Operation without mains choke					FI
			Installation to EN 60204-1			Installation to UL 1)		
8200 vector		mains	①	②	L1, L2, L3, PE [mm ²]	①	L1, L2, L3, PE [AWG]	≥ 300 mA ²⁾ ≥ 30 mA ³⁾
Type	[kW]							
E82EV302K4C	3.0	3/PE AC	M16 A	B16 A	2.5	15 A	14	
E82EV402K4C	4.0	320 ... 440 V;	Operation only with mains choke					
E82EV752K4C	7.5	45 ... 65 Hz	Operation only with mains choke					

			Operating with mains choke					FI
			Installation to EN 60204-1			Installation to UL 1)		
8200 vector		mains	①	②	L1, L2, L3, PE [mm ²]	①	L1, L2, L3, PE [AWG]	≥ 300 mA ²⁾ ≥ 30 mA ³⁾
Type	[kW]							
E82EV302K4C	3.0	3/PE AC	M10 A	B10 A	1.5	10 A	16	
E82EV402K4C	4.0	320 ... 440 V;	M16 A	B16 A	2.5	15 A	14	
E82EV752K4C	7.5	45 ... 65 Hz	M25 A	B25 A	4	25 A	10	

① Fuse

② E.l.c.b.

1) Use UL-approved cables, fuses and fuse holders only.

UL fuse: Voltage 500 ... 600 V, tripping characteristic "H", "K5" or "CC"

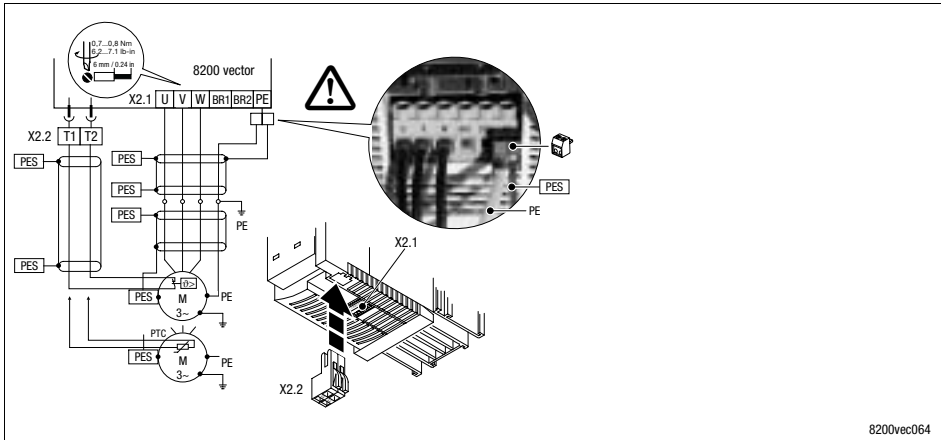
2) All-current sensitive e.l.c.b. for use with E82EVxxxK4C0xx

3) All-current sensitive e.l.c.b. for use with E82EVxxxK4C2xx

Observe national and regional regulations (e. g. VDE 0113, EN 60204)

Please observe the following when using e.l.c.bs:

- E.l.c.bs must only be installed between mains supply and controller.
- E.l.c.bs can trip incorrectly because of
 - capacitive leakage currents of the cable shields during operation (especially with long, shielded motor cables),
 - simultaneous connection of several controllers to the mains supply,
 - use of additional RFI filters.



Use low-capacity motor cables! (core/core up to 1.5 mm² ≤ 75 pF/m; from 2.5 mm² ≤ 100 pF/m; core/shield ≤ 150 pF/m)
The shorter the motor cables, the better the drive response!

PES	HF-shield end by PE connection through shield bracket or EMC cable connection.
X2.1/PE	Earthing of the 8200 vector at the output side
X2.1/BR1, X2.1/BR2	Connection terminals for the brake resistor (For information about the operation with brake resistor see the Operating Instructions)
X2.2/T1, X2.2/T2	Connection terminals motor temperature monitoring through PTC thermistors or thermal contacts Activate motor temperature monitoring under C0119 (e. g. C0119 = 1)!

Cable cross-sections U, V, W, PE

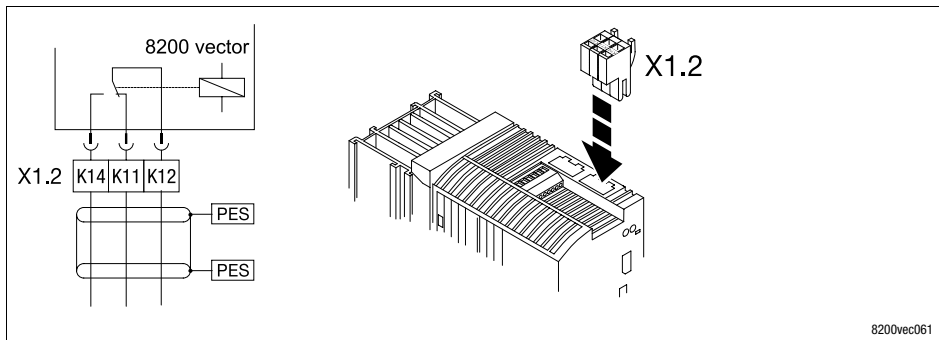
Type	mm ²	AWG	Type	mm ²	AWG
E82EV302K2C	2.5	12	E82EV302K4C	1	16
E82EV402K2C	4	10	E82EV402K4C	1.5	14
E82EV552K2C	6	10	E82EV552K4C	2.5	12
E82EV752K2C	6	10	E82EV752K4C	4	10
			E82EV113K4C	4	10



Danger!

- After the connection of a PTC thermistor or thermal contact all control terminals only have a basic insulation (single insulating distance).
- Protection against contact in the event of a defective insulating distance can only be ensured by external measures (e.g. double insulation).

5

Electrical installation**Connection of relay output**

8200vec061

	Function	Relay position set	Message (Lenze setting)	Technical data
X1.2/K11	Relay output normally-closed contact	open	TRIP	AC 250 V/3 A DC 24 V/2 A ... DC 240 V/0.16 A
X1.2/K12	Mid position contact			
X1.2/K14	Relay output - normally-open contact	closed	TRIP	
PES	HF-shield end by PE connection through shield bracket.			

**Note!**

- For switching the control signals use shielded cables and establish an HF shield termination by PE connection.
- For mains potential switching unshielded cables are sufficient.
- With inductive or capacitive loads a corresponding protective circuit is required in order to protect the relay contacts!
- The service life of the relay depends on the type of load (ohmic, inductive or capacitive) and the value of the switching capacity.
- The output message can be changed under C0008 or C0415/1.

Connection of relay output K_{SR} for "Safe standstill"

(only active at variant E82EVxxxK4Cx 4 x)

Variant x 4 x of the controller supports the safety function "Safe standstill", protection against unexpected start, according to the requirements of the EN 954-1 "control category 3" and EN 1037.

For this purpose the controllers have an integrated safety relay with feedback contact. The safety relay switches off the voltage supply of the optocoupler for pulse transfer to the IGBT. It must be externally controlled with DC +24 V.

- Only skilled personnel is authorized to install and commission the function "Safe standstill".
- All safety-relevant external cables (e.g. control cable for the safety relay, feedback contact) must be protected, e. g. in the cable duct. Ensure that short-circuits and lateral connection cannot occur!
- If external forces act on the drive axes, additional brakes are necessary. Especially consider the force of gravity acting on suspended loads!
- After the initial commissioning the operator must check the function of the safety circuits. This must be repeated periodically.

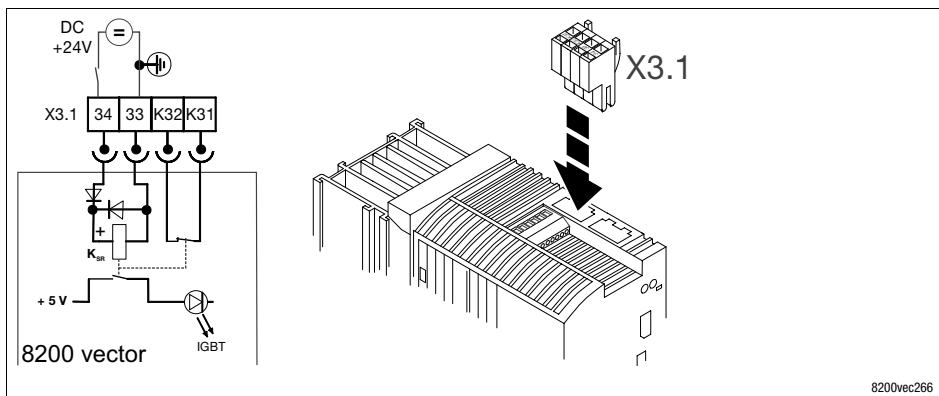
**Danger!**

- The electrical reference point for the coil of the safety relay must be connected with the protective circuit (DIN EN 60204-1 Abs. 9.4.3)!
 - Only in this way the protection against faulty operation is guaranteed.
- Without additional measures the function "Safe standstill" does not provide an "Emergency-off":
 - There is neither an electrical isolation between motor and controller nor a "service switch" or a "repair switch"
 - An "Emergency-off" requires an electrical isolation, e.g. by means of a central mains contactor!

5

Electrical installation

Connection of relay output K_{SR} for "Safe standstill"



8200vec266

Fig. 1 Relay K_{SR}

Terminal assignment		Data		
33	Reference potential for the input safety shutdown	Safety relay	Coil voltage at +40°C	DC +24 V (+19.5 ... 36 V)
			Coil current at 24 V DC	30 mA
34	Input safety shutdown	Safety relay	Test voltage contact → coil	AC 1500 V _{eff} for 1 min
			Test voltage contact → contact	AC 1500 V _{eff} for 1 min
			Electrical endurance at rated load	~ 10 ⁷ switching operations
			Mechanical endurance	~ 10 ⁷ switching operations
K31	Feedback contact	Feedback contact	Switching voltage	DC 24 V
K32			Continuous current	5 ... 700 mA

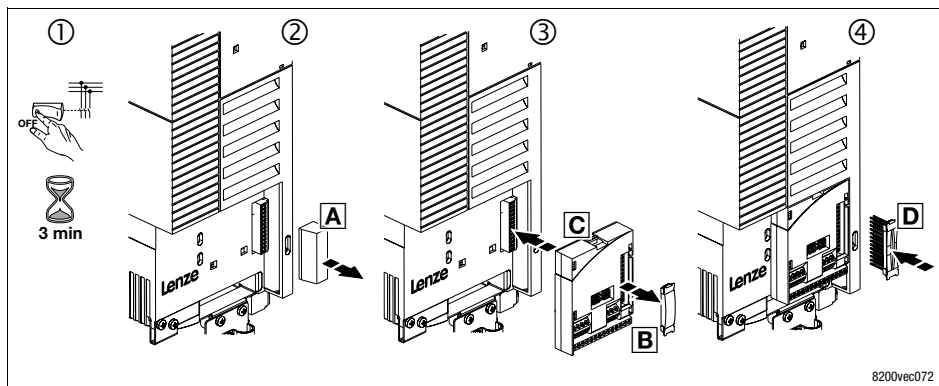
Important notes

The basic controller version is not equipped with control terminals. The controllers can be equipped with control terminals by using different I/O function modules for the FIF interface.

Dismount the function module only if it is absolutely necessary (e.g. when the controller is replaced).

The plug connector which is used to connect the function module is part of the contact system of the controller. It has not been designed for repeated connection and disconnection of the function module.

Mounting of function modules



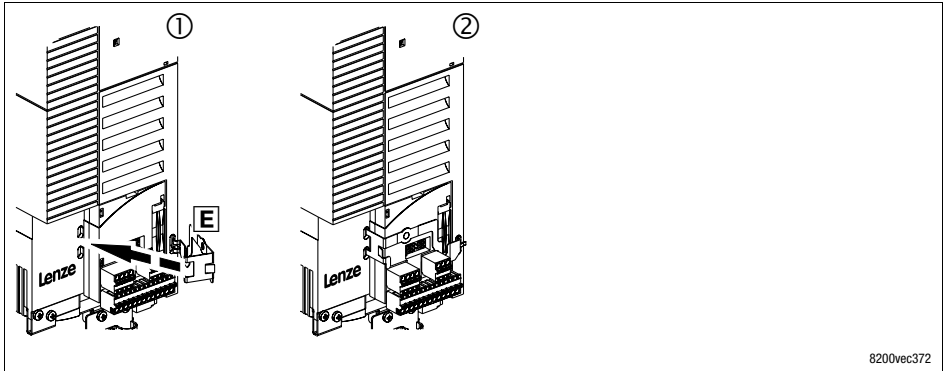
8200vec072

1. **Disconnect the controller from the mains and wait for at least 3 minutes!**
2. Remove the FIF protection cover **A** and keep it.
3. Remove the protection cover **B** of the function module.
4. Plug the function module **C** onto the FIF interface.
5. Plug the plug connector **D** into the contact bank of the function module until it is snapped into place.
6. For wiring see Mounting Instructions for the function module.


6 *Function module (optional)*

Mounting

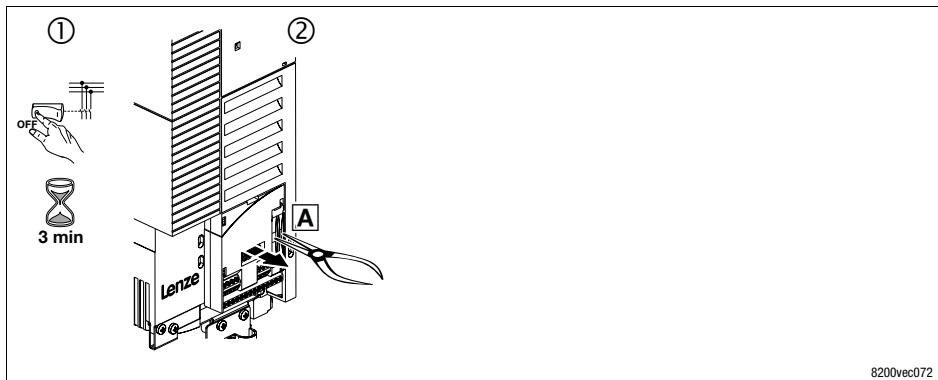
Mounting of function modules in "PT" version



In addition fix the safety clip, so that the module is prevented from being pulled out together with the terminal strips:

1. Turn the safety clip  in the openings.
2. Fold the safety clip over the function module until it snaps into place.

Dismounting of the function modules

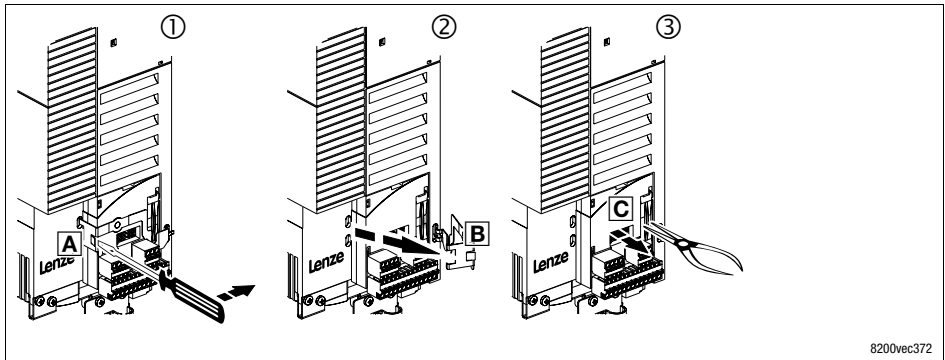


1. **Disconnect the controller from the mains and wait for at least 3 minutes!**
2. Catch the bar of the plug connector with pliers and pull. **A** Plug connector and function module are dismounted together.

6 Function module (optional)

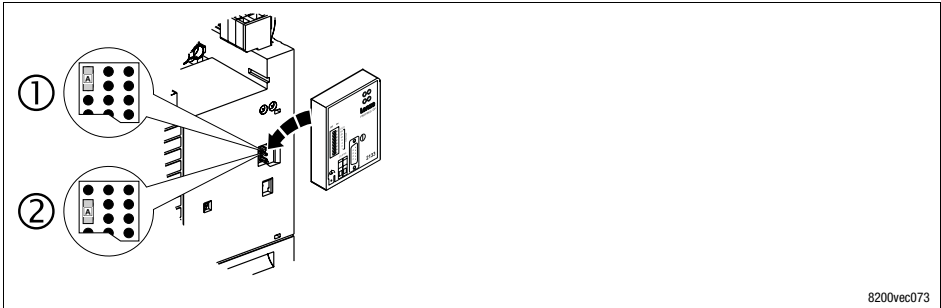
Dismounting

Dismounting of the function module version "PT"



After the function module version "PT" has been switched off, first of all the safety clip must be removed.

1. Position the screw driver between safety clip and function module **A**. The safety clip is disengaged by pressing to the right.
2. Turn the safety clip **B** to the right.
3. Catch the bar of the plug connector with pliers and pull **C**. Plug connector and function module are dismounted together.



8200vec073

- Ⓐ Jumper for selecting the voltage supply
- ① External voltage supply (delivery state)
- ② Voltage supply via internal voltage source

Attach/detach the communication module to/from the AIF interface. This is also possible during operation.

Possible combinations	Communication module on AIF								
Function module in FIF (Design: Standard or PT)	Keypad E82ZBC ¹⁾ Keypad XT EMZ9371BC ¹⁾	LECOM -A/B 2102.V001 -LI 2102.V003 -A 2102.V004 ¹⁾	LECOM-B (RS485) 2102.V002	INTERBUS 2111/2113 INTERBUS- Loop 2112	PROFIBUS- DP 2131/2133	System bus (CAN) 2171/2172	CANopen / DeviceNet 2175	LON 2141	
Standard I/O	E82ZAFSC	✓✓	✓✓	✓✓	✓✓	✓✓	✓✓	✓✓	
Application I/O	E82ZAFAC	✓✓	✓	✓	✓	✓	✓	✓	
INTERBUS	E82ZAFIC	✓✓	(✓)	☒	☒	☒	☒	☒	
PROFIBUS-DP	E82ZAFPC	✓✓	(✓)	☒	☒	☒	☒	☒	
LECOM-B (RS485)	E82ZAFLC	✓✓	(✓)	☒	☒	☒	☒	☒	
System bus (CAN)	E82ZAFCC								
System bus I/O-RS	E82ZAFCC100	✓✓	✓✓	✓✓	✓✓	✓✓	✓✓	✓✓	
System bus I/O	E82ZAFCC200								
CANopen / DeviceNet ²⁾	E82ZAFD	✓✓	✓✓	☒	☒	☒	☒	☒	
AS-i	E82ZAFFC	✓✓	✓✓	☒	☒	☒	☒	☒	

- 1) Independently of the jumper position always supplied internally.
- 2) In preparation
- ✓✓ Combination possible, internal or external supply of the communication module
- ✓ Combination possible, external supply!
- (✓) Combination possible, communication module can only be used for parameter setting.
- ☒ Combination not possible

**Note!**

- Do not change the switch-on sequence.
- In the event of an error during commissioning, please see the chapter "Fault detection and elimination".

To avoid injury to persons or damage to property, check...

... before the mains voltage is connected:

- The wiring for completeness, short circuit and earth fault
- "Emergency-off" function of the whole system
- Motor connection (star/delta) must be adapted to output voltage of controller.
- If you do not use a function module, ensure that the FIF cover is mounted properly (as delivered).
- If the internal voltage supply X3/20 of e.g. the standard I/O is used, the terminals X3/7 and X3/39 must be jumpered.

... the most important drive parameter settings before the controller is enabled:

- Are the drive parameters relevant for your application set correctly?
 - E.g. configuration of analog and digital inputs and outputs

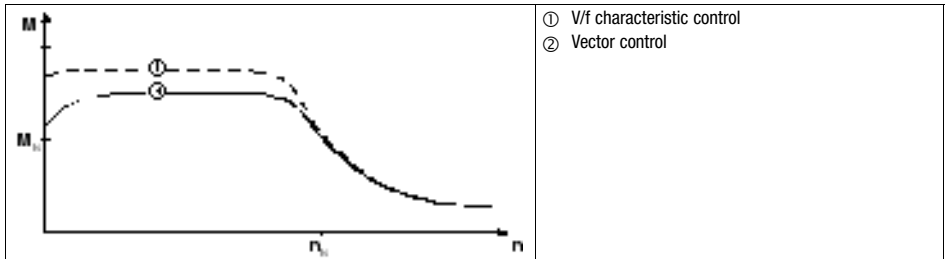
Selection of the correct operating mode

The following table helps you to find the correct control mode for standard applications. You can choose between V/f characteristic control, vector control and sensorless torque control:

V/f characteristic control is the classic control mode for standard applications.

The vector control provides better control features than the V/f characteristic control because of:

- a higher torque over the whole speed range
- higher speed accuracy and smooth running features
- higher efficiency



7

Commissioning**Selection of the correct operating mode**

Application	Operating mode	
	Setting in C0014	
Stand-alone drives	recommended	alternatively
with extremely alternating loads	4	2
with heavy start conditions	4	2
with speed control (speed feedback)	2	4
with high dynamic response (e. g. positioning and infeed drives)	2	-
with torque setpoint	5	-
with torque limitation (power control)	2	4
Three-phase AC reluctance motors	2	-
Three-phase sliding rotor motors	2	-
Three-phase motors with fixed frequency-voltage characteristic	2	-
Pump and fan drives with square-law load characteristic	3	2 or 4
Group drives (several motors connected to controller)		
identical motors and identical loads	2	-
different motors and/or changing loads	2	-

C0014 = 2: linear V/f characteristic control

C0014 = 3: square-law V/F characteristic control

C0014 = 4: Vector control

C0014 = 5: sensorless torque control

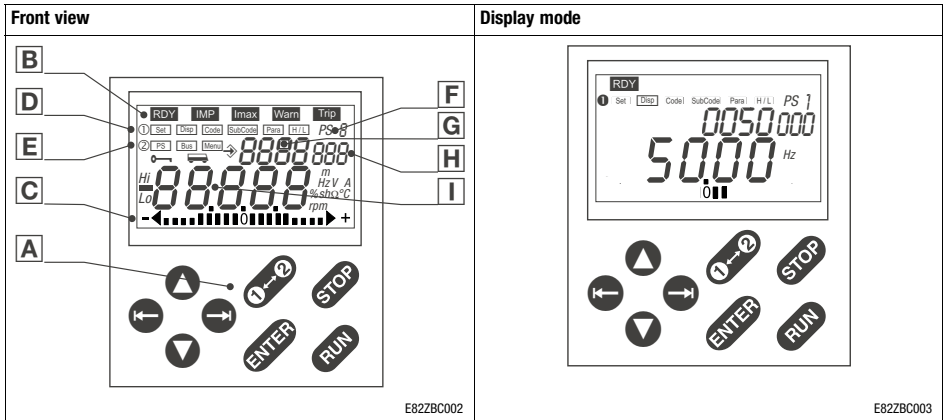
Using the keypad E82ZBC - Parameter setting

Description

The keypad is available as accessory. A full description of the keypad can be obtained from the Instructions included in the keypad delivery.








Plugging in the keypad

It is possible to plug in the keypad onto the AIF interface or remove it during operation. As soon as the keypad is supplied with voltage, it carries out a self-test. The keypad is ready for operation if it is in display mode.



Displays and operating elements

A	Function keys	
Press key	Function	Explanation
RUN	Enable controller	For operation with function module, the terminal X3/28 must be set to HIGH level
STOP	Inhibit controller (CINH) or quick stop (QSP)	Configuration in C0469
1-2	Change to function bar 1 ↔ Function bar 2	
← →	To right/left in active function bar	The current function is framed
▲ ▼	Increase/decrease value Quick change: Keep key pressed.	Only blinking values can be changed
ENTER	Parameters can be stored if → blinking Confirmation by <i>STO-E</i> in the display	

B Status display		
Display	Meaning	Explanation
RDY	Ready for operation	
IMP	Pulse inhibit active	Power outputs inhibited
Imax	Adjusted current limitation is exceeded in motor-mode or generator-mode	C0022 (motor mode) or C0023 (generator mode)
Warn	Warning active	
Trip	Fault active	
C Bargraph display		
	Value set under C0004 in % (Lenze setting: Controller load C0056)	Display range: - 180 % ... + 180 % (every bar = 20 %)
D Function bar 1		
Function	Meaning	Explanation
Set	Setpoint selection via 	Not possible when password protection is active (display = "L0c")
Disp	Display function: • User menu, memory location 1 (C0517/1), display • Display active parameter set	Active after every main connection
Code	Code selection	Display of active code in 4-digit display 
SubCode	Subcode selection	Display of active subcode number in 3-digit display 
Para	Change of parameter value of a (sub)code	Display of current value in 5-digit display 
H/L	Display of values longer than 5 digits H: higher value locations L: lower value locations	Display "HI" Display "LO"
E Function bar 2		
Function	Meaning	Explanation
PS	Select parameter set 1 ... parameter set 4 for changing	<ul style="list-style-type: none"> • Display, e.g. PS 2 () • The parameter sets can only be activated via digital signals (configuration with C0410)
Bus	Selection of system bus (CAN) devices	The selected device can be parameterised by the current drive  = function active
Menu	Select menu The user menu is active after mains switching	 SEr List of codes in the user menu (C0517) ALL List of all codes Func1 Only specific codes for bus function modules, e.g. INTERBUS, PROFIBUS-DP and LECOM-B

Using the keypad E82ZBC - Parameter setting

Change and save parameters

**Note!**

The menu *STO-E* is active after mains switching. Change to the menu *ALL* to address all codes.

Action	Keys	Result	Note
1. Plug in the keypad		[Disp] XX.XX Hz	Function [Disp] is activated. The first code in the user menu will be displayed (C0517/1, Lenze setting: C0050 = output frequency).
2. If necessary change to the menu "ALL"	0-2	2	Change to function bar 2
3.	←→	[Menu]	
4.	↕	<i>ALL</i>	Select menu "ALL" (list of all codes)
5.	0-2	1	Confirm selection and change to function bar 1
6. Inhibit controller	STOP	RDY IMP	Only necessary if you want to change C0002, C0148, C0174 and/or C0469
7. Set parameters	←→	[Code]	
8.	↕	XXXX	Select code
9.	↶	[SubCode] 001	For codes without subcodes: Jump automatically to [Para]
10.	↕	XXX	Select subcode
11.	↶	[Para]	
12.	↕	XXXXX	Set parameters
13.	ENTER	<i>STO-E</i>	Confirm entry if ↶ blinking
	←→		Confirm entry if ↶ is not blinking; ENTER is not active
14.			Restart the "loop" at 7. to set other parameters.

Menu structure

All parameters for controller setting or monitoring are saved in codes. The codes are numbered and labelled in the documentation with a "C". Some codes store the parameters in numbered "subcodes", so that a clear parameter setting is ensured (e. g.: C0517 User menu).

The codes are described in detail in the system manual of the drive controller.

For easy operation the codes are divided in two groups:

- The menu *USER*
 - is active after every mains switching or keypad attachment during operation.
 - contains all codes for a standard application with linear V/f characteristic control (Lenze setting).
 - can be modified as required under C0517.
- The menu *ALL*
 - contains all codes.
 - shows a list of all codes in ascending order.

Using the keypad E82ZBC - Parameter setting

The menu $\cup 5E_r$ - The 10 most important drive parameters

After mains switching or plugging in the keypad during operation, the 10 codes defined in code C0517 are immediately available.

In default setting the menu $\cup 5E_r$ contains all codes required for a standard application with linear V/f characteristic control.

Code	Name	Lenze setting				
C0050	Output frequency		Display: Output frequency without slip compensation			
C0034	Setpoint selection range	0	Standard I/O X3/8: 0 ... 5 V / 0 ... 10 V / 0 ... 20 mA			
			Application I/O X3/1U: 0 ... 5 V / 0 ... 10 V X3/2U: 0 ... 5 V / 0 ... 10 V			
C0007	Fixed configuration of digital inputs	0	E4	E3	E2	
			CW/CCW	DCB	JOG2/3	JOG1/3
			CW/CCW rotation	DC injection brake	Selection of fixed setpoints	
C0010	Minimum output frequency	0.00 Hz				
C0011	Maximum output frequency	50.00 Hz				
C0012	Acceleration time main setpoint	5.00 sec				
C0013	Deceleration time main setpoint	5.00 sec				
C0015	V/f rated frequency	50.00 Hz				
C0016	V_{\min} boost	Depending on the controller				
C0002	Parameter set management		Restore default setting; Transfer parameter sets with keypad; save, load or copy own basic settings			

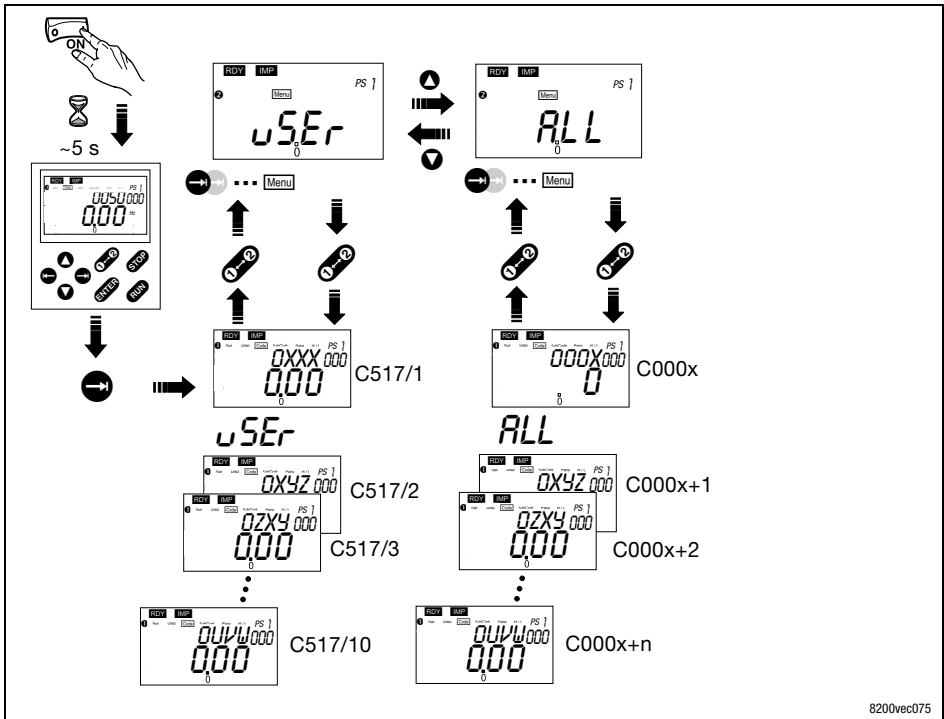
**Note!**

Use C0002 "Parameter set transfer/restorage of default setting" to transfer configurations from one controller to the other with keypad or restore the default setting by loading the Lenze setting (e.g. if you lost track during parameter setting).

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Commissioning

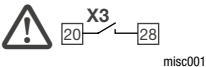
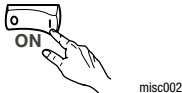




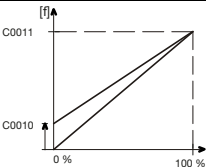
Using the keypad E82ZBC - Parameter setting



8200vec075

Using the keypad E82ZBC - Linear V/f characteristic control

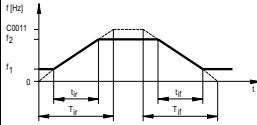
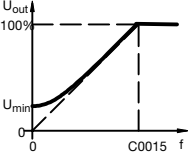
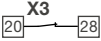

The following instructions apply to controllers equipped with a standard-I/O function module and a three-phase AC motor which has been selected according to a power-based assignment.

Switch-on sequence		Note	
1.	Attach the keypad		
2.	Ensure that controller inhibit is active after mains connection.		Terminal X3/28 = LOW
3.	Switch on the mains		
4.	The keypad is in "Disp" mode after approx. 2 s and indicates the output frequency (C0050)		The menu <i>USER</i> is active
5.	Change to the Code mode to configure the basic settings for your drive		Blinking on the display: <i>0050</i>
6.	Adapt the voltage range/current range to the analog setpoint (C0034) Lenze setting: -0-, (0 ... 5 V/0 ... 10 V/0 ... 20 mA)		Set the DIP switch on the standard I/O to the same range (see Mounting Instructions for the standard I/O)
7.	Adapt the terminal configuration to the wiring (C0007) Lenze setting: -0-, i. e. E1: JOG1/3 fixed setpoint selection E2: JOG2/3 E3: DCB DC brake E4: CW/CCW operation		
8.	Set the minimum output frequency (C0010) Lenze setting: 0.00 Hz		
9.	Set the maximum output frequency (C0011) Lenze setting: 50.00 Hz		

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Commissioning

Using the keypad E82ZBC - Linear V/f characteristic control

Switch-on sequence		Note
10.	Set the acceleration time T_{ir} (C0012) Lenze setting: 5.00 s	
11.	Set the deceleration time T_{if} (C0013) Lenze setting: 5.00 s	
12.	Set the V/f-rated frequency (C0015) Lenze setting: 50.00 Hz	
13.	Set the V_{min} boost (C0016) Lenze settings: Depending on the controller type	
14.	If you want to change the settings, please go to the menu <i>ALL</i> .	activate e. g. JOG frequencies (C0037, C0038, C0039) or motor temperature monitoring (C0119)
When you are ready with parameter setting:		
15.	Setpoint selection	e. g. via potentiometer at the terminals 7, 8, 9
16.	Enable the controller.	 misc002
17.	The drive should be running now at e.g. 30 Hz	

$$T_{ir} = t_{ir} \cdot \frac{C0011}{f_2 - f_1}$$

t_{ir} = acceleration time wanted

$$T_{if} = t_{if} \cdot \frac{C0011}{f_2 - f_1}$$

t_{if} = deceleration time wanted

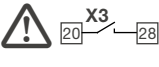
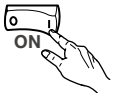

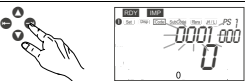
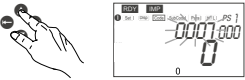
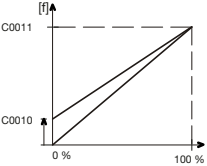
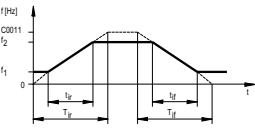
The Lenze setting is suitable for all common applications

Terminal X3/28 = HIGH

If the drive does not start, press **RUN** in addition.

Using the keypad E82ZBC - Vector control

The following instructions apply to controllers equipped with a standard-I/O function module and a three-phase AC motor which has been selected according to a power-based assignment.

Switch-on sequence		Note
1.	Attach the keypad	
2.	Ensure that controller inhibit is active after mains connection.	 misc001
3.	Switch on the mains	 misc002
4.	The keypad is in "Disp" mode after approx. 2 s and indicates the output frequency (C0050)	
5.	Change to the menu <i>ALL</i>	
6.	Change to the Code mode to configure the basic settings for your drive	
7.	Adapt the terminal configuration to the wiring (C0007) Lenze setting: 0, i. e. E1: JOG1/3 fixed setpoint selection E2: JOG2/3 E3: DCB DC brake E4: CW/CCW operation	
8.	Set the minimum output frequency (C0010) Lenze setting: 0.00 Hz	
9.	Set the maximum output frequency (C0011) Lenze setting: 50.00 Hz	
10.	Set the acceleration time T_{ir} (C0012) Lenze setting: 5.00 s	
11.	Set the deceleration time T_{if} (C0013) Lenze setting: 5.00 s	

$$T_{ir} = t_{ir} \cdot \frac{C0011}{f_2 - f_1}$$

t_{ir} = acceleration time wanted



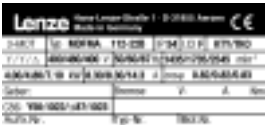
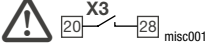
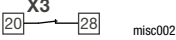
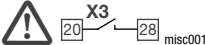
$$T_{if} = t_{if} \cdot \frac{C0011}{f_2 - f_1}$$

t_{if} = deceleration time wanted

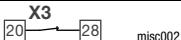

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Commissioning

Using the keypad E82ZBC - Vector control

Switch-on sequence		Note
12.	<p>Activate the control mode "vector control" (C0014 = 4) Lenze setting: Linear V/f characteristic control (C0014 = 2)</p> 	
13.	<p>Adapt the voltage/current range to the analog setpoint (C0034) Lenze setting: 0, (0 ... 5 V/0 ... 10 V/0 ... 20 mA)</p> 	Set the DIP switch on the standard-I/O to the same range (see Mounting Instructions for the standard-I/O)
14.	Enter the motor data	See motor nameplate
A	<p>Rated motor speed (C0087) Lenze setting: 1390 rpm</p>	
B	<p>Rated motor current (C0088) Lenze setting: Depending on the controller</p>	
C	<p>Rated motor frequency (C0089) Lenze setting: 50 Hz</p>	
D	<p>Rated motor voltage (C0090) Lenze setting: Depending on the controller</p>	
E	<p>Motor-cosφ (C0091) Lenze setting: Depending on the controller</p>	
15.	Start the motor parameter identification (C0148)	Only when the motor is cold!
A	Ensure that the controller is inhibited	
B	Set C0148 = 1	Press ENTER in addition
C	Enable the controller.	 <ul style="list-style-type: none"> Terminal X3/28 = HIGH The identification starts: <ul style="list-style-type: none"> The segment IMP Off The motor makes a high-pitched tone. The motor does not rotate!
D	If the segment becomes active after approx. 30 s, IMP inhibit the controller once again	 <ul style="list-style-type: none"> Terminal X3/28 = LOW Identification is completed. Calculated and stored: <ul style="list-style-type: none"> V/f rated frequency (C0015) Slip compensation (C0021) Motor stator inductance (C0092) Measured and stored: <ul style="list-style-type: none"> Motor stator resistance (C0084) = Total resistance of motor cable and motor

Using the keypad E82ZBC - Vector control

Switch-on sequence		Note
16.	If necessary, adjust more parameters	Activate e. g. JOG frequencies (JOG) (C0037, C0038, C0039 or motor parameter monitoring (C0119))
After parameter setting:		
17.	Setpoint selection	E. g. via potentiometer at terminals 7, 8, 9
18.	Enable the controller.	 Terminal X3/28 = HIGH
19.	The drive should now be running at e.g. 30 Hz	 If the drive does not start, press RUN in addition

Vector control optimisation

In general, the vector control is ready for operation after the motor parameters have been identified. Vector control must only be optimised for the following drive performance:

Drive performance	Remedy
Rough motor run and motor current (C0054) > 60 % rated motor current in idle running (stationary operation)	<ol style="list-style-type: none"> 1. Reduction of motor inductance (C0092) by 10 % 2. Check of motor current under C0054 3. If the motor current (C0054) > 50 % rated motor current: <ul style="list-style-type: none"> – C0092 must be reduced until the motor current amounts to 50 % of the rated motor current – Reduce C0092 by max. 20 %!
Torque too low for frequencies $f < 5$ Hz (starting torque)	Increase of motor resistance (C0084) or increase of motor inductance (C0092)
Poor constant speed at high loads (setpoint and motor speed are not proportional).	Increase of slip compensation (C0021) Overcompensation results in drive instability!
Error messages OC1, OC3, OC4 or OC5 during acceleration times (C0012) < 1 s (drive controller is no longer able to follow the dynamic processes)	Change readjustment time of the I_{\max} controller (C0078): <ul style="list-style-type: none"> • Reduction of C0078 = I_{\max} controller becomes quicker (more dynamic) • Increase of C0078 = I_{\max} controller becomes slower ("smoother")

7 Commissioning

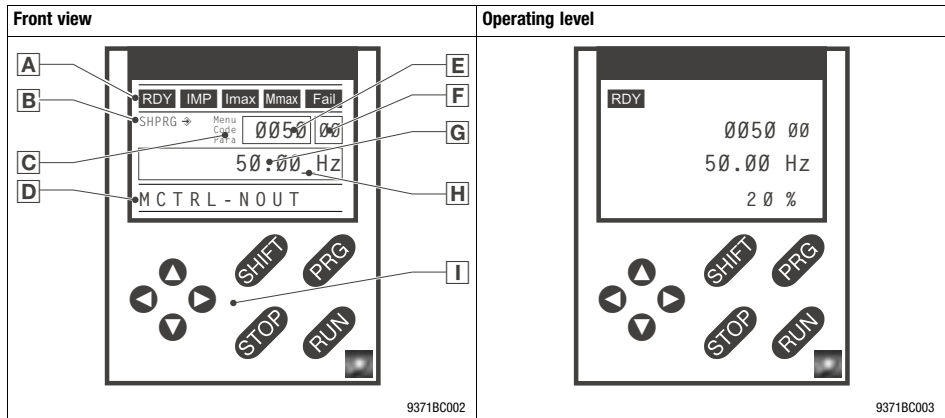
Using the keypad XT EMZ9371BC - Parameter setting

Description

The keypad is available as accessory. A full description of the keypad can be obtained from the Instructions included in the keypad delivery.

Plug in the keypad

It is possible to plug in the keypad onto the AIF interface or remove it during operation. As soon as the keypad is supplied with voltage, it carries out a self-test. The operation level indicates, when the keypad is ready for operation.



Display elements

Display	Meaning	Explanation
RDY	Ready for operation	
IMP	Pulse inhibit active	Power outputs inhibited
Imax	Adjusted current limitation is exceeded in motor-mode or generator-mode	
Mmax	Speed controller 1 in limitation	Drive torque-controlled
Fail	Active fault	

Using the keypad XT EMZ9371BC - Parameter setting

B	Adoption of parameters		
	Display	Meaning	Explanation
	→	Parameters are adopted immediately	Basic device operates immediately with the new parameter value
	SHPRG →	Parameter must be confirmed with SHIFT PRG	Basic device operates with the new parameter value, after it was confirmed
	SHPRG	In case of controller inhibit the parameter must be confirmed with SHIFT PRG	Basic device operates with the new parameter value, after the controller has been enabled
none	Display parameter	Change not possible	
C	Active level		
	Display	Meaning	Explanation
	Menu	Menu level active	Select main menu and submenus
	Code	Code level active	Select codes and subcodes
	Para	Parameter level active	Change parameters in the codes or subcodes
	none	Operation level active	Display operation parameters: <ul style="list-style-type: none"> • User menu, memory location 1 (C0517/1) • Status display C0004 in % • Active fault
D	Short text		
	Display	Meaning	Explanation
	max. 13 characters	Contents of menus, meaning of codes and parameters In operation level display of C0004 in % and active fault	
E	Number		
	Active level	Meaning	Explanation
	Menu level	Menu number	Display only active when operating with the basic device series 8200 vector or 8200 motec
Code level	four-digit code number		
F	Number		
	Active level	Meaning	Explanation
	Menu level	Submenu number	Display only active when operating with the basic device series 8200 vector or 8200 motec
Code level	two-digit subcode number		
G	Parameter value		
		Parameter value with unit	
H	Cursor		
		In the parameter level the number above the cursor can be directly changed	
I	Function keys		
		For description see the following table	

Function keys



Note!

Press the key combinations with **SHIFT**:

SHIFT and keep them pressed, then additionally press the second key.

Press key	Function			
	Menu level	Code level	Parameter level	Operation level
PRG		Change to the parameter level	Change to the operation level	Change to the code level
SHIFT PRG	Load predefined configurations in the menu "Short setup" ¹⁾		Accept parameter, if SHPRG → or SHPRG is displayed	
▲ ▼	Change between menu points	Change code number	Change number above cursor	
SHIFT ▲ SHIFT ▼	Change quickly between menu points	Change code quickly	Change number above cursor quickly	
▶ ◀	Change between main menu, submenus and code level		Cursor to the right Cursor to the left	
RUN	Cancel function of key STOP the LED in the key disappears			
STOP	Inhibit the controller, LED in the key lights up			
	Reset fault (TRIP-Reset): 1. Remove cause of malfunction 2. STOP press 3. RUN press			

¹⁾ only active when operating with the basic device series 8200 vector or 8200 motec

Using the keypad XT EMZ9371BC - Parameter setting

Change and save parameters

All parameters for controller setting or monitoring are saved in codes. The codes are numbered and labelled in the documentation with a "C". Some codes store the parameters in numbered "subcodes", so that a clear parameter setting is ensured (e. g.: C0517 User menu).

The codes are described in detail in the system manual of the drive controller.

**Note!**

Your settings in the menus are always stored in the parameter set 1.

If you want to store settings in the parameter set 2, 3 or 4, two menus can be used:

- In menu 2 "Code list" it is possible to access to all available codes.
- In menu 7 "Param managm" it is possible to copy parameter set 1 into the other parameter sets.
 - **Please note, that with copying the "own basic setting" will be overwritten by the settings of parameter set 1!**

Step	Keys	Action
1. Select menu	⬅ ➡ ⬆ ⬇	Select the desired menu with arrow keys
2. Change to the code level	➡	Display of first code in the menu
3. Select code or subcode	⬇ ▲	Display of current parameter value
4. Change to parameter level	PRG	
5. If SHPRG is displayed, inhibit controller	STOP	The drive is idling
6. Change parameters		
	A ➡ ⬅	Move cursor under the digit to be changed
	B ⬇ ▲	Change digit
	SHIFT ⬇	Change digit quickly
	SHIFT ▲	
7. Accept changed parameter		
Display of SHPRG or SHPRG ⇄	SHIFT PRG	Confirm change to accept parameter Display "OK"
Display ⇄	-	The parameter was accepted immediately
8. If necessary, enable controller	RUN	The drive should be running again
9. Change to the code level		
	A PRG	Display of operation level
	B PRG	Display of the code with changed parameters
10. Change further parameters		Restart "loop" at step 1. or step 3.

Menu structure

Main menu		Submenus		Description
No.	Display	No.	Display	
1	USER menu			Defined codes in C0517
2	Code list			All available codes
		2.1	ALL	All available codes in ascending order (C0001 ... C7999)
		2.2	Para set 1	Codes in parameter set 1 (C0001 ... C1999)
		2.3	Para set 2	Codes in parameter set 2 (C2001 ... C3999)
		2.4	Para set 3	Codes in parameter set 3 (C4001 ... C5999)
		2.5	Para set 4	Codes in parameter set 4 (C6001 ... C7999)
3	Remote para	See description of the keypad		Remote parameter setting Only active with function module system bus (CAN)
4	Quick start			Quick commissioning of standard applications
		4.1	Keypad quick	Function check Linear V/f-characteristic control Frequency setpoint via keypad
		4.2	V/f quick	Linear V/f-characteristic control Frequency setpoint selectable analogically via potentiometer, fixed setpoints (JOG) selectable via terminal
		4.3	VectorCtrl qu	Vector control Frequency setpoint selectable analogically via potentiometer, fixed setpoints (JOG) selectable via terminal
5	Short setup	See description of the keypad		Quick configuration of predefined applications
6	Diagnostic			Diagnostics
		6.1	Fault history	Error analysis with history buffer
		6.2	Status words	Display of status words
		6.3	Monit drive	Display codes in order to monitor drive
		6.4	Monit FIF	Display codes in order to monitor a field bus function module
7	Param managm			Parameter set management
		7.1	Load/Store	Parameter set transfer, restore delivery status
		7.2	Copy PAR1 ->2	Copy parameter set 1 into parameter set 2
		7.3	Copy PAR1 ->3	Copy parameter set 1 into parameter set 3
		7.4	Copy PAR1 ->4	Copy parameter set 1 into parameter set 4

Using the keypad XT EMZ9371BC - Parameter setting

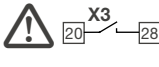
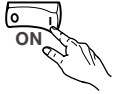
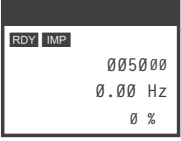
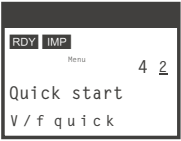

Main menu		Submenus		Description
No.	Display	No.	Display	
8	Main FB	See description of the keypad		Configuration of function blocks
9	Controller	See description of the keypad		Configuration of internal control parameters
10	Terminal I/O	See description of the keypad		Linkage of inputs and outputs with internal signals and display of the signal levels at the terminals
11	LECOM/AIF	See description of the keypad		Configuration of operation with communication modules
12	FIF system bus	See description of the keypad		Configuration of operation with function module system bus (CAN) and display of the contents of the CAN objects Only active with function module system bus (CAN)
13	FIF-field bus	See description of the keypad		Configuration of operation with field bus function modules Only active with fieldbus function module
14	Motor/Feedb.			Input of motor data, configuration of speed feedback
		14.1	Motor data	Motor data
		14.2	Feedback DFIN	Frequency input, encoder
15	Identify			Identification
		15.1	Drive	Software version controller
		15.2	Keypad	Software version keypad
		15.3	FIF module	Software version and function module type

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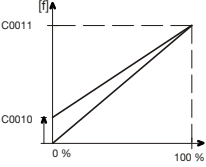
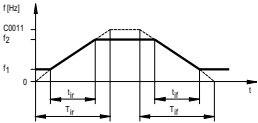
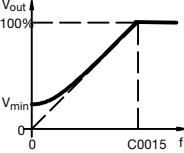
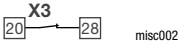
Commissioning

Using the keypad XT EMZ9371BC - Linear V/f characteristic control

The following instructions apply to controllers equipped with a standard-I/O function module and a three-phase AC motor which has been selected according to a power-based assignment.

Switch-on sequence			Note
1.	Attach the keypad		
2.	Ensure that controller inhibit is active after mains connection.	 misc001	Terminal X3/28 = LOW
3.	Switch on the mains	 misc002	
4.	The keypad is in the operation level and indicates the output frequency (C0050) and device load (C0056)	 9371BC004	
5.	For quick commissioning select the menu "Quick start"	 9371BC007	The submenu "V/f quick" contains the codes you need for the commissioning of a standard application. The digital inputs are configured in the Lenze setting: X3/E1, X3/E2: Activation of JOG setpoints X3/E3: Activation of DC-injection brake (DCB) X3/E4: CW rotation/CCW rotation
A	Change to the menu level with PRG		
B	Change to the menu "Quick start" and there select the submenu "V/f quick" with ▲ ▲ ▲ ▲		
C	Change to the code level in order to parameterise you drive with ▶	 9371BC008	
6.	Adapt the voltage range/current range to the analog setpoint (C0034) Lenze setting: 0, (0 ... 5 V/0 ... 10 V/0 ... 20 mA)		Set the DIP switch on the standard I/O to the same range (see Mounting Instructions for the standard I/O)
7.	If necessary, adapt the JOG setpoints.		
A	JOG 1 (C0037) Lenze setting: 20 Hz		Activation: X3/E1 = HIGH, X3/E2 = LOW
B	JOG 2 (C0038) Lenze setting: 30 Hz		Activation: X3/E1 = LOW, X3/E2 = HIGH
C	JOG 3 (C0039) Lenze setting: 40 Hz		Activation: X3/E1 = HIGH, X3/E2 = HIGH

Using the keypad XT EMZ9371BC - Linear V/f characteristic control

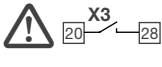
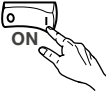
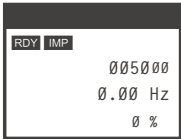


Switch-on sequence		Note
8. Set the minimum output frequency (C0010) Lenze setting: 0.00 Hz		
9. Set the maximum output frequency (C0011) Lenze setting: 50.00 Hz		
10. Set the acceleration time T_{ir} (C0012) Lenze setting: 5.00 s		$T_{ir} = t_{ir} \cdot \frac{C0011}{f_2 - f_1}$ $t_{ir} = \text{acceleration time wanted}$
11. Set the deceleration time T_{if} (C0013) Lenze setting: 5.00 s		$T_{if} = t_{if} \cdot \frac{C0011}{f_2 - f_1}$ $t_{if} = \text{deceleration time wanted}$
12. Set the V/f-rated frequency (C0015) Lenze setting: 50.00 Hz		
13. Set the V_{min} boost (C0016) Lenze setting: dependent on the controller type		The Lenze setting is suitable for all common applications
14. Activate the motor temperature monitoring (C0119) if a PTC or thermal contact is connected to the terminal X2.2. Lenze setting: switched-off		Setting possibilities: (□) 148)
15. Setpoint selection	e. g. via potentiometer at the terminals 7, 8, 9	
16. Enable the controller.		Terminal X3/28 = HIGH
17. The drive should be running now		CW rotation: X3/E4 = LOW CCW rotation: X3/E4 = HIGH If the drive does not start, press RUN



Note!

In the menu "Diagnostic" the most important drive parameters can be monitored

The following instructions apply to controllers equipped with a standard-I/O function module and a three-phase AC motor which has been selected according to a power-based assignment.

Switch-on sequence		Note	
1.	Attach the keypad		
2.	Ensure that controller inhibit is active after mains connection.	 misc001	Terminal X3/28 = LOW
3.	Switch on the mains	 misc002	
4.	The keypad is in the operation level after approx. 3 sec and indicates the output frequency (C0050) and device load (C0056)	 9371BC004	
5.	For quick commissioning select the menu "Quick start"	 9371BC006  9371BC008	The submenu "VectorCtrl qu" contains the codes you need for the commissioning of a standard application. The digital inputs are configured in the Lenze setting: X3/E1, X3/E2: Activation of JOG setpoints X3/E3: Activation of DC-injection brake (DCB) X3/E4: CW rotation/CCW rotation
A	Change to the menu level with PRG		
B	Change to the menu "Quick start" and there select the submenu "VectorCtrl qu" with ▲ ▲ ▲ ▲ ▲		
C	Change to the code level in order to parameterise you drive with ▶		
6.	Adapt the voltage range/current range to the analog setpoint (C0034) Lenze setting: 0, (0 ... 5 V/0 ... 10 V/0 ... 20 mA)		Set the DIP switch on the standard I/O to the same range (see Mounting Instructions for the standard I/O)
7.	If necessary, adapt the JOG setpoints.		
A	JOG 1 (C0037) Lenze setting: 20 Hz		Activation: X3/E1 = HIGH, X3/E2 = LOW
B	JOG 2 (C0038) Lenze setting: 30 Hz		Activation: X3/E1 = LOW, X3/E2 = HIGH
C	JOG 3 (C0039) Lenze setting: 40 Hz		Activation: X3/E1 = HIGH, X3/E2 = HIGH








Using the keypad XT EMZ9371BC - Vector control

Switch-on sequence			Note
8.	Set the minimum output frequency (C0010) Lenze setting: 0.00 Hz		
9.	Set the maximum output frequency (C0011) Lenze setting: 50.00 Hz		
10.	Set the acceleration time T_{ir} (C0012) Lenze setting: 5.00 s		$T_{ir} = t_{ir} \cdot \frac{C0011}{f_2 - f_1}$ $t_{ir} = \text{acceleration time wanted}$
11.	Set the deceleration time T_{if} (C0013) Lenze setting: 5.00 s		$T_{if} = t_{if} \cdot \frac{C0011}{f_2 - f_1}$ $t_{if} = \text{deceleration time wanted}$
12.	Set the control mode "Vector control" (C0014 = 4) Lenze setting: Linear V/f characteristic control (C0014 = 2)		
13.	Enter the motor data		See motor nameplate
A	Rated motor speed (C0087) Lenze setting: 1390 rpm		
B	Rated motor current (C0088) Lenze setting: Depending on the controller		Enter the value for the motor connection type (star/delta) selected!
C	Rated motor frequency (C0089) Lenze setting: 50 Hz		
D	Rated motor voltage (C0090) Lenze setting: Depending on the controller		Enter the value for the motor connection type (star/delta) selected!
E	Motor-cosφ (C0091) Lenze setting: Depending on the controller		

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Commissioning

Using the keypad XT EMZ9371BC - Vector control

Switch-on sequence		Note
14.	Start the motor parameter identification (C0148)	Only when the motor is cold!
A	Ensure that the controller is inhibited	  misc001
B	Set C0148 = 1	SHIFT PRG press
C	Enable the controller.	 misc002 <ul style="list-style-type: none"> Terminal X3/28 = HIGH The identification starts: <ul style="list-style-type: none"> The segment IMP Off The motor makes a high-pitched tone. The motor does not rotate!
D	If the segment becomes active after approx. 30 s, IMP inhibit the controller once again.	  misc001 <ul style="list-style-type: none"> Terminal X3/28 = LOW Identification is completed. Calculated and stored: <ul style="list-style-type: none"> V/f rated frequency (C0015) Slip compensation (C0021) Motor stator inductance (C0092) Measured and stored: <ul style="list-style-type: none"> Motor stator resistance (C0084) = Total resistance of motor cable and motor
15.	Activate the motor temperature monitoring (C0119), if a PTC or thermal contact is connected to the terminal X2.2 Lenze setting: switched-off	Setting possibilities:  148)
16.	Setpoint selection	e. g. via potentiometer at the terminals 7, 8, 9
17.	Enable the controller.	 misc002 Terminal X3/28 = HIGH
18.	The drive should be running now	CW rotation: X3/E4 = LOW CCW rotation: X3/E4 = HIGH If the drive does not start, press RUN

**Note!**

In the menu "Diagnostic" the most important drive parameters can be monitored

Using the keypad XT EMZ9371BC - Vector control

Vector control optimisation

In general, the vector control is ready for operation after the motor parameters have been identified. Vector control must only be optimised for the following drive performance:

Drive performance	Remedy
Rough motor run and motor current (C0054) > 60 % rated motor current in idle running (stationary operation)	<ol style="list-style-type: none"> 1. Reduction of motor inductance (C0092) by 10 % 2. Check of motor current under C0054 3. If the motor current (C0054) > 50 % rated motor current: <ul style="list-style-type: none"> – C0092 must be reduced until the motor current amounts to 50 % of the rated motor current – Reduce C0092 by max. 20 %!
Torque too low for frequencies $f < 5$ Hz (starting torque)	Increase of motor resistance (C0084) or increase of motor inductance (C0092)
Poor constant speed at high loads (setpoint and motor speed are not proportional).	Increase of slip compensation (C0021) Overcompensation results in drive instability!
Error messages OC1, OC3, OC4 or OC5 during acceleration times (C0012) < 1 s (drive controller is no longer able to follow the dynamic processes)	Change readjustment time of the I_{\max} controller (C0078): <ul style="list-style-type: none"> • Reduction of C0078 = I_{\max} controller becomes quicker (more dynamic) • Increase of C0078 = I_{\max} controller becomes slower ("smoother")

**Note!**

- The following table describes in detail the codes mentioned in the examples for commissioning!
- Do not change codes, the meaning of which is unknown to you! All codes are described in detail in the System Manual.

How to read the code table

Column	Abbreviation		Meaning
Code	Cxxxx		Code Cxxxx
		1	Subcode 1 of Cxxxx
		2	Subcode 2 of Cxxxx
	*	Parameter value of the code is the same in all parameter sets	
	ENTER	Keypad E82ZBC	Changed parameters will be accepted after pressing ENTER
		Keypad XT EMZ9371BC	Changed parameters will be accepted after pressing SHIFT PRG
	STOP	Keypad E82ZBC	Changed parameters will be accepted after pressing ENTER if the controller is inhibited
		Keypad XT EMZ9371BC	Changed parameters will be accepted after pressing SHIFT PRG if the controller is inhibited
	(A)	Code, subcode or selection are only available when using an Application-I/O	
	USER	With Lenze setting the code is available in the USER-menu	
Name	Name of the code		
Lenze	Lenze setting (value at delivery or after restoring the delivery state with C0002)		
	→ Further information can be obtained from "IMPORTANT"		
Selection	1 {%}	99	Min. value {unit} Max. value
IMPORTANT	-		Brief, important explanations

The most important codes for commissioning

Code		Possible settings		IMPORTANT		
No.	Name	Lenze	Selection			
C0002* STOP 5Er	Parameter set management	0	0 Ready	PAR1 ... PAR4: <ul style="list-style-type: none"> Parameter sets of the controller PAR1 ... PAR4 also contain parameters for Standard-I/O, Application-I/O, AS interface or system bus (CAN) FPAR1: <ul style="list-style-type: none"> Module-specific parameter set of the fieldbus function modules INTERBUS, PROFIBUS-DP, LECOM-B, DeviceNet/CANopen FPAR1 is saved in the function module 		
	Restorage of default setting		1		Lenze setting ⇔ PAR1	Restorage of default setting in the selected parameter set
			2		Lenze setting ⇔ PAR2	
			3		Lenze setting ⇔ PAR3	
			4		Lenze setting ⇔ PAR4	
			31		Lenze setting ⇔ FPAR1	Restorage of default setting in the fieldbus function module
			61		Lenze setting ⇔ PAR1 + FPAR1	Restorage of default setting in the selected parameter set of the controller and the fieldbus function module
			62		Lenze setting ⇔ PAR2 + FPAR1	
			63		Lenze setting ⇔ PAR3 + FPAR1	
	64	Lenze setting ⇔ PAR4 + FPAR1				
C0002* STOP 5Er (cont.)	Parameter set transfer using the keypad		Keypad ⇔ Controller	Use the keypad to transfer parameter sets to other controllers. During transfer the parameters cannot be accessed via other channels! All available parameter sets (PAR1 ... PAR4, and FPAR1) are overwritten with the corresponding keypad data		
			70		With function module Application-I/O, INTERBUS, PROFIBUS-DP, LECOM-B, DeviceNet/CANopen	
			10		With all other function modules	

Code		Possible settings		IMPORTANT	
No.	Name	Lenze	Selection		
C0002* STOP 5Er (cont.)	Parameter set transfer using the keypad		Keypad ⇒ PAR1 (+ FPAR1)	Overwrite selected parameter set and, if necessary, FPAR1 with the corresponding keypad data	
			71		With function module Application-I/O, INTERBUS, PROFIBUS-DP, LECOM-B, DeviceNet/CANopen
			11		With all other function modules
			72		Keypad ⇒ PAR2 (+ FPAR1)
			72		With function module Application-I/O, INTERBUS, PROFIBUS-DP, LECOM-B, DeviceNet/CANopen
			12		With all other function modules
			73		Keypad ⇒ PAR3 (+ FPAR1)
			73		With function module Application-I/O, INTERBUS, PROFIBUS-DP, LECOM-B, DeviceNet/CANopen
			13		With all other function modules
			74		Keypad ⇒ PAR4 (+ FPAR1)
74	With function module Application-I/O, INTERBUS, PROFIBUS-DP, LECOM-B, DeviceNet/CANopen				
14	With all other function modules				
80	Controller ⇒ Keypad	All available parameter sets (PAR1 ... PAR4, and FPAR1) are copied to the keypad			
80	With function module Application-I/O, INTERBUS, PROFIBUS-DP, LECOM-B, DeviceNet/CANopen				
20	With all other function modules	Overwrite the module-specific parameter set FPAR1 only			
40	Keypad ⇒ Function module				
40	Only with function module INTERBUS, PROFIBUS-DP, LECOM-B, DeviceNet/CANopen	Copy the module-specific parameter set FPAR1 only			
50	Function module ⇒ Keypad				
50	Only with function module INTERBUS, PROFIBUS-DP, LECOM-B, DeviceNet/CANopen				

The most important codes for commissioning

Code		Possible settings		IMPORTANT
No.	Name	Lenze	Selection	
C0002* STOP ↳SEr (cont.)	Saving of own settings		9 PAR1 ⇔ Own settings	<p>You can save your own basic settings for a controller (e.g. machine delivery status):</p> <ol style="list-style-type: none"> 1. Ensure that parameter set 1 is active 2. Controller inhibit 3. Set C0003 = 3, acknowledge with ENTER 4. Set C0002 = 9, acknowledge with ENTER, to save your own basic settings 5. Set C0003 = 1, acknowledge with ENTER 6. Enable the controller.
C0002* STOP ↳SEr (cont.)	Loading/copying of your own basic settings			Using this function, PAR1 can be copied to parameter sets PAR2 ... PAR4
			5 Own settings ⇔ PAR1	Restorage of own basic setting in the selected parameter set
			6 Own settings ⇔ PAR2	
			7 Own settings ⇔ PAR3	
	8 Own settings ⇔ PAR4			
C0003* ENTER	Non-volatile parameter saving	1	0 Parameter not saved in EEPROM	Data loss after mains disconnection
			1 Parameter always saved in EEPROM	<ul style="list-style-type: none"> • Active after every mains connection • Cyclic parameter changes via bus module are not allowed.
			3 Own settings saved in EEPROM	Subsequently save parameter set 1 as own basic setting with C0002 = 9

Code		Possible settings				IMPORTANT		
No.	Name	Lenze	Selection					
C0007 ENTER ↵SEr	Fixed configuration of digital inputs	0	E4	E3	E2	E1	<p>Change under C0007 will be copied to the corresponding subcode of C0410. Free configuration under C0410 sets C0007 = 255!</p> <ul style="list-style-type: none"> • CW/CCW = CW rotation/CCW rotation • DCB = DC injection brake • QSP = Quick stop • PAR = Parameter set changeover (PAR1 ↔ PAR2) <ul style="list-style-type: none"> – PAR1 = LOW, PAR2 = HIGH – The terminal must be assigned to the function "PAR" in PAR1 and PAR2. – Configurations with "PAR" are only allowed if C0988 = 0 • TRIP set = external fault 	
			0	CW/CCW	DCB	JOG2/3		JOG1/3
			1	CW/CCW	PAR	JOG2/3		JOG1/3
			2	CW/CCW	QSP	JOG2/3		JOG1/3
			3	CW/CCW	PAR	DCB		JOG1/3
			4	CW/CCW	QSP	PAR		JOG1/3
			5	CW/CCW	DCB	TRIP set		JOG1/3
			6	CW/CCW	PAR	TRIP set		JOG1/3
			7	CW/CCW	PAR	DCB		TRIP set
			8	CW/CCW	QSP	PAR		TRIP set
			9	CW/CCW	QSP	TRIP set		JOG1/3
10	CW/CCW	TRIP set	UP	DOWN				
C0007 ENTER ↵SEr (cont.)			E4	E3	E2	E1	<ul style="list-style-type: none"> • JOG1/3, JOG2/3 = Selection of fixed setpoints <ul style="list-style-type: none"> – Activate JOG1: JOG1/3 = HIGH; JOG2/3 = LOW – Activate JOG2: JOG1/3 = LOW; JOG2/3 = HIGH – Activate JOG3: JOG1/3 = HIGH; JOG2/3 = HIGH • UP/DOWN = motor potentiometer functions 	
			11	CW/CCW	DCB	UP		DOWN
			12	CW/CCW	PAR	UP		DOWN
			13	CW/CCW	QSP	UP		DOWN
			14	CCW/QSP	CW/QSP	DCB		JOG1/3
			15	CCW/QSP	CW/QSP	PAR		JOG1/3
			16	CCW/QSP	CW/QSP	JOG2/3		JOG1/3
			17	CCW/QSP	CW/QSP	PAR		DCB
			18	CCW/QSP	CW/QSP	PAR		TRIP set
			19	CCW/QSP	CW/QSP	DCB		TRIP set

The most important codes for commissioning

Code		Possible settings				IMPORTANT		
No.	Name	Lenze	Selection					
C0007 ENTER ↵SEr (cont.)			E4	E3	E2	E1	<ul style="list-style-type: none"> • H/Re = Hand/remote changeover • PCTRL1-I-OFF = Switch off process controller I component • DFIN1-ON = Digital frequency input 0 ... 10 kHz • PCTRL1-OFF = Switch off process controller 	
			20	CCW/QSP	CW/QSP	TRIP set		JOG1/3
			21	CCW/QSP	CW/QSP	UP		DOWN
			22	CCW/QSP	CW/QSP	UP		JOG1/3
			23	H/Re	CW/CCW	UP		DOWN
			24	H/Re	PAR	UP		DOWN
			25	H/Re	DCB	UP		DOWN
			26	H/Re	JOG1/3	UP		DOWN
			27	H/Re	TRIP set	UP		DOWN
			28	JOG2/3	JOG1/3	PCTRL1-I-OFF		DFIN1-ON
			29	JOG2/3	DCB	PCTRL1-I-OFF		DFIN1-ON
30	JOG2/3	QSP	PCTRL1-I-OFF	DFIN1-ON				
C0007 ENTER ↵SEr (cont.)			E4	E3	E2	E1		
			31	DCB	QSP	PCTRL1-I-OFF		DFIN1-ON
			32	TRIP set	QSP	PCTRL1-I-OFF		DFIN1-ON
			33	QSP	PAR	PCTRL1-I-OFF		DFIN1-ON
			34	CW/QSP	CCW/QSP	PCTRL1-I-OFF		DFIN1-ON
			35	JOG2/3	JOG1/3	PAR		DFIN1-ON
			36	DCB	QSP	PAR		DFIN1-ON
			37	JOG1/3	QSP	PAR		DFIN1-ON
			38	JOG1/3	PAR	TRIP set		DFIN1-ON
			39	JOG2/3	JOG1/3	TRIP set		DFIN1-ON
40	JOG1/3	QSP	TRIP set	DFIN1-ON				

Code		Possible settings				IMPORTANT		
No.	Name	Lenze	Selection					
C0007 ENTER SEr (cont.)				E4	E3	E2	E1	
			41	JOG1/3	DCB	TRIP set	DFIN1-ON	
			42	QSP	DCB	TRIP set	DFIN1-ON	
			43	CW/CCW	QSP	TRIP set	DFIN1-ON	
			44	UP	DOWN	PAR	DFIN1-ON	
			45	CW/CCW	QSP	PAR	DFIN1-ON	
			46	H/Re	PAR	QSP	JOG1/3	
			47	CW/QSP	CCW/QSP	H/Re	JOG1/3	
			48	PCTRL1-OFF	DCB	PCTRL1-OFF	DFIN1-ON	
			49	PCTRL1-OFF	JOG1/3	QSP	DFIN1-ON	
			50	PCTRL1-OFF	JOG1/3	PCTRL1-OFF	DFIN1-ON	
			51	DCB	PAR	PCTRL1-OFF	DFIN1-ON	
			255	Free configuration under C0410					Only display Do not change C0007 since settings under C0410 can be lost
C0010 SEr	Minimum output frequency	0.00	0.00 → 14.5 Hz	{0.02 Hz}	650.00	<ul style="list-style-type: none"> • C0010 is not effective with bipolar setpoint selection (-10 V ... + 10 V) • C0010 only limits the analog input 1 		
C0011 SEr	Maximum output frequency	50.00	7.50 → 87 Hz	{0.02 Hz}	650.00	→ Speed setting range 1 : 6 for Lenze geared motors: Setting absolutely required for operation with Lenze geared motors.		
C0012 SEr	Acceleration time main setpoint	5.00	0.00	{0.02 s}	1300.00	Reference: frequency change 0 Hz ... C0011 <ul style="list-style-type: none"> • Additional setpoint ⇔ C0220 • Acceleration times can be activated via digital signals ⇔ C0101 		
C0013 SEr	Deceleration time main setpoint	5.00	0.00	{0.02 s}	1300.00	Reference: frequency change C0011 ... 0 Hz <ul style="list-style-type: none"> • Additional setpoint ⇔ C0221 • Deceleration times can be activated via digital signals ⇔ C0103 		

The most important codes for commissioning

Code		Possible settings			IMPORTANT	
No.	Name	Lenze	Selection			
C0014 ENTER	Operating mode	2	2	V/f characteristic control $V \sim f$ (Linear characteristic with constant V_{\min} boost)	<ul style="list-style-type: none"> Commissioning without motor parameter identification possible Benefit of identification with C0148: <ul style="list-style-type: none"> – Improved smooth running at low speed – V/f rated frequency (C0015) and slip (C0021) are calculated and stored. They do not have to be entered 	
			3	V/f characteristic control $V \sim f^2$ (Square-law characteristic with constant V_{\min} boost)		
			4	Vector control		
			5	Sensorless torque control with speed limitation <ul style="list-style-type: none"> Torque setpoint via C0412/6 Speed limitation via setpoint 1 (NSET1-N1), if C0412/1 is assigned, if not via max. frequency (C0011) 		
C0015 SEr	V/f rated frequency	50.00	7.50	{0.02 Hz}	960.00	<ul style="list-style-type: none"> C0015 is calculated and stored under C0148 when the motor parameters are identified Settings applies to all possible mains voltages
C0016 SEr	U_{\min} boost	→	0.00	{0.01 %}	40.00	→ Depending on the controller Setting applies to all mains voltages permitted
C0034* ENTER SEr	Setpoint selection range Standard-I/O (X3/8)		0	0	Unipolar voltage 0 ... 5 V / 0 ... 10 V Current 0 ... 20 mA	Observe the switch position of the function module!
			1	1	Current 4 ... 20 mA	
			2	2	Bipolar voltage -10 V ... +10 V	<ul style="list-style-type: none"> Minimum output frequency (C0010) not effective Individual adjustment of offset and gain
			3	3	Current 4 ... 20 mA open-circuit monitored	TRIP Sd5, if $I < 4$ mA Changing the direction of rotation is only possible with a digital signal.

Code		Possible settings			IMPORTANT	
No.	Name	Lenze	Selection			
C0034* ENTER (A) uSEr	Setpoint selection range Application I/O				Observe the jumper setting of the function module!	
1	X3/1U, X3/1I	0	0	Unipolar voltage 0 ... 5 V / 0 ... 10 V		
2	X3/2U, X3/2I		1	Bipolar voltage -10 V ... +10 V	Minimum output frequency (C0010) not effective	
			2	Current 0 ... 20 mA		
			3	Current 4 ... 20 mA	Changing the direction of rotation is only possible with a digital signal.	
			4	Current 4 ... 20 mA open-circuit monitored	Changing the direction of rotation is only possible with a digital signal. TRIP Sd5 if I < 4 mA	
C0037	JOG1	20.00	-650.00	{0.02 Hz}	650.00	JOG = fixed setpoint
C0038	JOG2	30.00	-650.00	{0.02 Hz}	650.00	Additional fixed setpoints ⇔ C0440
C0039	JOG3	40.00	-650.00	{0.02 Hz}	650.00	
C0087	Rated motor speed	→	300	{1 rpm}	16000	→ Depending on the controller
C0088	Rated motor current	→	0.0	{0.1 A}	650.0	→ Depending on the controller 0.0 ... 2.0 x rated output current of the controller
C0089	Rated motor frequency	50	10	{1 Hz}	960	
C0090	Rated motor voltage	→	50	{1 V}	500	→ 230 V with 230 V controllers, 400 V with 400 V controllers
C0091	Motor cos φ	→	0.40	{0.1}	1.0	→ Depending on the controller
C0119 ENTER	Configuration of motor temperature monitoring (PTC input) / earth fault detection	0	0	PTC input not active	Earth fault detection active	<ul style="list-style-type: none"> Signal output configuration under C0415 If several parameter sets are used, the monitoring must be separately adjusted for each parameter set. Deactivate the earth fault detection, if it has been activated unintentionally. If the earth fault detection is active, the motor starts after controller enable with a delay of approx. 40 ms.
			1	PTC input active, TRIP set		
			2	PTC input active, Warning set	Earth fault detection inactive	
			3	PTC input not active		
			4	PTC input active, TRIP set		
			5	PTC input active, Warning set		

The most important codes for commissioning

Code		Possible settings			IMPORTANT	
No.	Name	Lenze	Selection			
C0140*	Additive frequency setpoint (NSET1-NADD)	0.00	-650.00	{0.02 Hz}	650.00	<ul style="list-style-type: none"> Selection via function [Set] of the keypad or the parameter channel Is added to main setpoint Value is stored when switching the mains or removing the keypad
C0148* STOP	Motor parameter identification	0	0	Ready		<p>Only when the motor is cold!</p> <ol style="list-style-type: none"> Inhibit controller, wait until drive is in standstill Enter the correct motor data under C0087, C0088, C0089, C0090, C0091 (see motor nameplate). C0148 = set 1 by [ENTER] Enable controller The identification <ul style="list-style-type: none"> starts, [IMP] is off takes approx. 30 s is completed when [IMP] is on again Controller inhibit
C0517* ENTER	User menu					<ul style="list-style-type: none"> After mains switching or when using the function [Disp] the code from C0517/1 will be displayed. In Lenze setting, the user menu contains the most important codes for starting-up the control mode "V/f characteristic control with linear characteristic" When the password protection is activated, only the codes entered under C0517 are freely accessible. Enter the required code numbers in the subcodes. <p>Codes, which are only active when being used together with an Application-I/O, cannot be entered!</p>
1	Memory 1	50	C0050	Output frequency (MCTRL1-NOUT)		
2	Memory 2	34	C0034	Analog setpoint selection range		
3	Memory 3	7	C0007	Fixed configuration - digital input signals		
4	Memory 4	10	C0010	Minimum output frequency		
5	Memory 5	11	C0011	Maximum output frequency		
6	Memory 6	12	C0012	Acceleration time main setpoint		
7	Memory 7	13	C0013	Deceleration time main setpoint		
8	Memory 8	15	C0015	V/f rated frequency		
9	Memory 9	16	C0016	U _{min} boost		
10	Memory 10	2	C0002	Parameter set transfer		

Fault	Cause	Remedy
Motor does not rotate	DC-bus voltage too low (Red LED is blinking every 0.4 s; keypad display <i>LL</i>)	Check mains voltage
	Controller inhibited (Green LED is blinking, keypad display: IMP)	Remove the controller inhibit, controller inhibit can be set through several sources
	Automatic start inhibited (C0142 = 0 or 2)	LOW-HIGH edge at X3/28 If necessary, correct start condition (C0142)
	DC injection brake (DCB) active	Deactivate DC injection brake
	Mechanical motor brake is not released	Manual or electrical release of mechanical motor brake
	Quick stop (QSP) active (keypad display: IMP)	Remove quick stop
	Setpoint = 0	Select setpoint
	JOG setpoint activated and JOG frequency = 0	Select JOG setpoint (C0037 ... C0039)
	Active fault	Eliminate fault
	Wrong parameter set active	Change to correct parameter set via terminal
	Operating mode C0014 = -4-, -5-, but no motor parameter identification executed	Motor parameter identification (C0148)
	Under C0410 several functions which exclude each other, are assigned to the same signal source.	Correct configuration in C0410
	Use of internal voltage source X3/20 for function modules Standard I/O, INTERBUS, PROFIBUS-DP or LECOM-B (RS485): Jumper between X3/7 and X3/39 is missing	Jumper terminals
Motor does not rotate smoothly	Defective motor cable	Check motor cable
	Maximum current set too low (C0022, C0023)	Adapt settings to the application
	Motor underexcited or overexcited	Check parameter setting (C0015, C0016, C0014)
	C0084, C0087, C0088, C0089, C0090, C0091 and/or C0092 are not adapted to the motor data	Manual adaptation or identification of motor parameters (C0148)
Current consumption of motor too high	Setting of C0016 too high	Correct setting
	Setting of C0015 too low	Correct setting
	C0084, C0087, C0088, C0089, C0090, C0091 and/or C0092 are not adapted to the motor data	Manual adaptation or identification of motor parameters (C0148)
Motor rotates, setpoints are "0"	With the function Set of the keypad a setpoint has been selected.	Set the setpoint to "0" via C0140 = 0

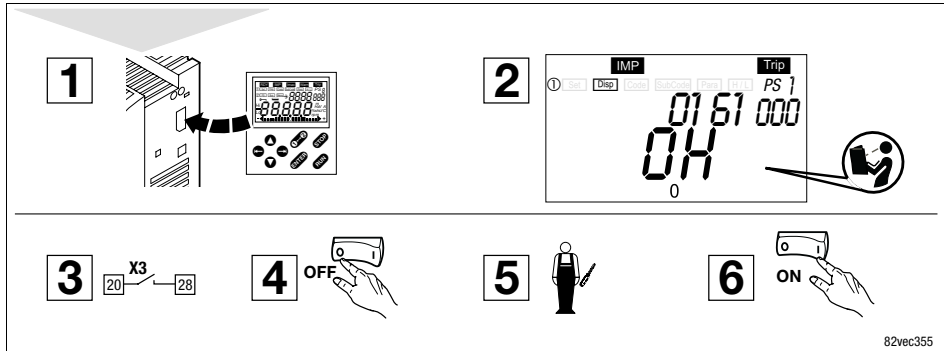
Fault	Cause	Remedy
Motor parameter identification stops with error LP1	Motor too small compared with rated device power	
	DC injection brake active via terminal	
Unacceptable drive response with vector control	various	Optimise vector control (□ 127)
Torque dip in the field weakening range	various	Contact Lenze
Stalling of the motor when operating in the field weakening range		

8 Fault detection and elimination

Fault messages

LED's at the drive controller (status display)

LED		Operating status	
red ①	green ②		
off	on	Controller enabled	
on	on	Mains switched on and automatic start inhibited	
off	slowly blinking	Controller inhibited	
off	fast blinking	Motor parameter identification	
fast blinking	off	Undervoltage switch-off	
slowly blinking	off	Fault active, check under C0161	



Reset the drive controller in this way if a fault occurs (TRIP reset):

1. Plug the keypad onto the AIF interface during operation.
2. Read and take down fault message on the keypad display.
3. Inhibit controller.
4. Disconnect controller from the mains.
5. Carry out a fault analysis and eliminate the faults.
6. Restart the controller.

Error messages at the keypad or in the parameter setting program Global Drive Control

Keypad	PC ¹⁾	Error	Cause	Remedy
nDEr	0	No fault	-	-
ccr Trip	71	System fault	Strong interferences on control cables Ground or earth loops in the wiring	Shield control cables
cE0 Trip	61	Communication fault to AIF (configurable in C0126)	Faulty transmission of control commands via AIF	Insert the communication module into the hand terminal
cE1 Trip	62	Communication fault to CAN-IN1 with Sync control	CAN-IN1 object receives faulty data or communication is interrupted	<ul style="list-style-type: none"> ● Plug-in connection - bus module ↔ ● Check FIF ● Check transmitter ● Increase monitoring time under C0357/1 if necessary
cE2 Trip	63	Communication error to CAN-IN2	CAN-IN2 object receives faulty data or communication is interrupted	<ul style="list-style-type: none"> ● Plug-in connection - bus module ↔ ● Check FIF ● Check transmitter ● Increase monitoring time under C0357/2 if necessary
cE3 Trip	64	Communication error to CAN-IN1 with event or time control	CAN-IN1 object receives faulty data or communication is interrupted	<ul style="list-style-type: none"> ● Plug-in connection - bus module ↔ ● Check FIF ● Check transmitter ● Increase monitoring time under C0357/3 if necessary
cE4 Trip	65	BUS-OFF (many communication faults occurred)	Controller has received too many incorrect telegrams via the system bus and has been disconnected	<ul style="list-style-type: none"> ● Check whether bus terminator available ● Check screen contact of the cables ● Check PE connection ● Check bus load, if necessary, reduce the baud rate
cE5 Trip	66	CAN Time-Out (configurable in C0126)	For remote parameter setting via system bus (C0370): Slave does not answer. Communication monitoring time exceeded. For operation with module in FIF: Internal fault	<ul style="list-style-type: none"> ● Check system bus wiring ● Check system bus configuration Contact Lenze
cE6 Trip	67	Function module system bus (CAN) on FIF has set "Warning" or "BUS-OFF" (configurable in C0126)	CAN controller sets "Warning" or "BUS OFF"	<ul style="list-style-type: none"> ● Check whether bus terminator available ● Check screen contact of the cables ● Check PE connection ● Check bus load, if necessary, reduce the baud rate

Keypad	PC ¹⁾	Error	Cause	Remedy
cE7 Trip	68	Communication fault during remote parameter setting via system bus (C0370) (configurable in C0126)	Participant does respond or is not available	<ul style="list-style-type: none"> • Check whether bus terminator available • Check screen contact of the cables • Check PE connection • Check bus load, if necessary, reduce the baud rate
EEr Trip	91	External fault (TRIP-SET)	A digital input assigned to the TRIP-Set function has been activated.	Check external encoder
H05 Trip	105	Internal fault		Contact Lenze
IdI Trip	140	Faulty parameter identification	Motor not connected	Connect motor
LPI Trip	32	Fault in motor phase (is displayed if C0597 = 1)	<ul style="list-style-type: none"> • Failure of one/several motor phase(s) • Motor current too low 	<ul style="list-style-type: none"> • Check motor cables • Check V_{\min} boost • Connect motor to corresponding power or adapt the motor under C0599.
LPI	182	Fault in motor phase (is displayed if C0597 = 2)		
LU IMP	-	DC-bus undervoltage	Mains voltage too low DC-bus voltage too low 400 V controller connected to 240 V mains	Check mains voltage Check supply module Connect controller to the appropriate mains voltage
DC1 Trip	11	Short circuit	Short circuit	<ul style="list-style-type: none"> • Find reason for short circuit; check motor cable • Check braking resistor and cable for braking resistor
			Excessive capacitive charging current of the motor cable	Use shorter motor cables with lower charging current
DC2 Trip	12	Earth fault	Grounded motor phase	Check motor, check motor cable
			Excessive capacitive charging current of the motor cable	Use shorter motor cables with lower charging current
				Deactivate earth-fault detection for testing purposes
DC3 Trip	13	Overload inverter during acceleration or short circuit	Acceleration time too short (C0012)	<ul style="list-style-type: none"> • Increase acceleration time • Check drive selection
			Defective motor cable	Check wiring
			Interturn fault in the motor	Check motor
DC4 Trip	14	Overload controller during deceleration	Deceleration time set too short (C0013)	<ul style="list-style-type: none"> • Increase deceleration time • Check size of external brake resistor
DC5 Trip	15	Controller overload in stationary operation	Frequent and long overload	Check drive selection

Keypad	PC ¹⁾	Error	Cause	Remedy
OC6 Trip	16	Motor overload ($I^2 \times t$ overload)	Motor is thermally overloaded, for instance, because of <ul style="list-style-type: none"> impermissible continuous current frequent or too long acceleration processes 	<ul style="list-style-type: none"> Check drive selection Check setting of C0120
OH Trip	50	Heat sink temperature > +85 °C	Ambient temperature too high	Allow controller to cool and ensure better ventilation
OH Warn	-	Heat sink temperature > +80 °C	Heat sink very dirty Impermissibly high currents or too frequent and too long acceleration	Clean heat sink <ul style="list-style-type: none"> Check drive selection Check load, if necessary, replace defective bearings
OHS Trip	53	PTC monitoring (TRIP) (is displayed if C0119 = 1 or 4)	Motor too hot because of excessive currents or frequent and too long accelerations PTC not connected	Check drive selection Connect PTC or switch off monitoring
OH4 Trip	54	Controller overtemperature	Controller too hot inside	<ul style="list-style-type: none"> Reduce controller load Improve cooling Check fan in the controller
OHS1	203	PTC monitoring (is displayed if C0119 = 2 or 5)	Motor too hot because of excessive currents or frequent and too long accelerations PTC not connected	Check drive selection Connect PTC or switch off monitoring
OU IMP	-	DC-bus overvoltage	Mains voltage too high Braking operation Earth leakage on the motor side	Check voltage supply <ul style="list-style-type: none"> Prolong deceleration times. Operation with external brake resistor: <ul style="list-style-type: none"> Check dimensioning, connection and cable of the brake resistor. Increase the deceleration times Check motor cable and motor for earth fault (disconnect motor from inverter)

8

Fault detection and elimination**Fault messages**

Keypad	PC ¹⁾	Error	Cause	Remedy
<i>P_r</i> Trip	75	Faulty parameter transfer when using the keypad	All parameter sets are defective	It is absolutely necessary to repeat the data transfer or load the Lenze setting before enabling the controller.
<i>P_{r-1}</i> Trip	72	Wrong PAR1 transfer when using the keypad.	PAR1 is defective.	
<i>P_{r-2}</i> Trip	73	Wrong PAR2 transfer when using the keypad.	PAR2 is defective.	
<i>P_{r-3}</i> Trip	77	Wrong PAR3 transfer when using the keypad.	PAR3 is defective	
<i>P_{r-4}</i> Trip	78	Wrong PAR4 transfer when using the keypad.	PAR4 is defective	
<i>P_{r-5}</i> Trip	79	Internal fault		Contact Lenze
<i>P_{t-5}</i> Trip	81	Time fault during parameter set transfer	Data flow from keypad or PC interrupted, e. g. keypad was disconnected during transfer	It is absolutely necessary to repeat the data transfer or load the Lenze setting before enabling the controller.
<i>r5t</i> Trip	76	Faulty auto-TRIP reset	More than 8 fault messages in 10 minutes	Depends on the error message
<i>Sd5</i> Trip	85	Wire breakage analog input 1	Current at analog input < 4 mA at setpoint range 4 ... 20 mA	Close circuit at analog input
<i>Sd7</i> Trip	87	Wire breakage analog input 2		

¹⁾ LECOM-fault number, display in parameter setting program Global Drive Control (GDC)

EDK82EV222
13140348



Lenze

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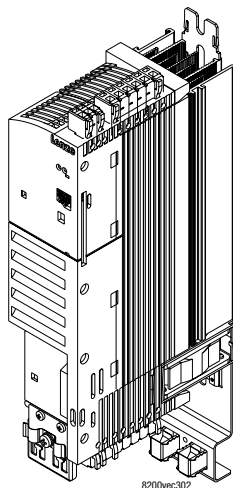
Montageanleitung

GB

Mounting Instructions

F

Instructions de montage



8200vec302



Global Drive

8200 vector

0.25 kW ... 2.2 kW



Lesen Sie zuerst die Montageanleitung, bevor Sie mit den Arbeiten beginnen!

Beachten Sie die enthaltenen Sicherheitshinweise.

Das Systemhandbuch mit ausführlicher Information zum Frequenzumrichter 8200 vector können Sie bei Ihrem Lenze-Vertriebspartner bestellen.

Read the Mounting Instructions before you start working!

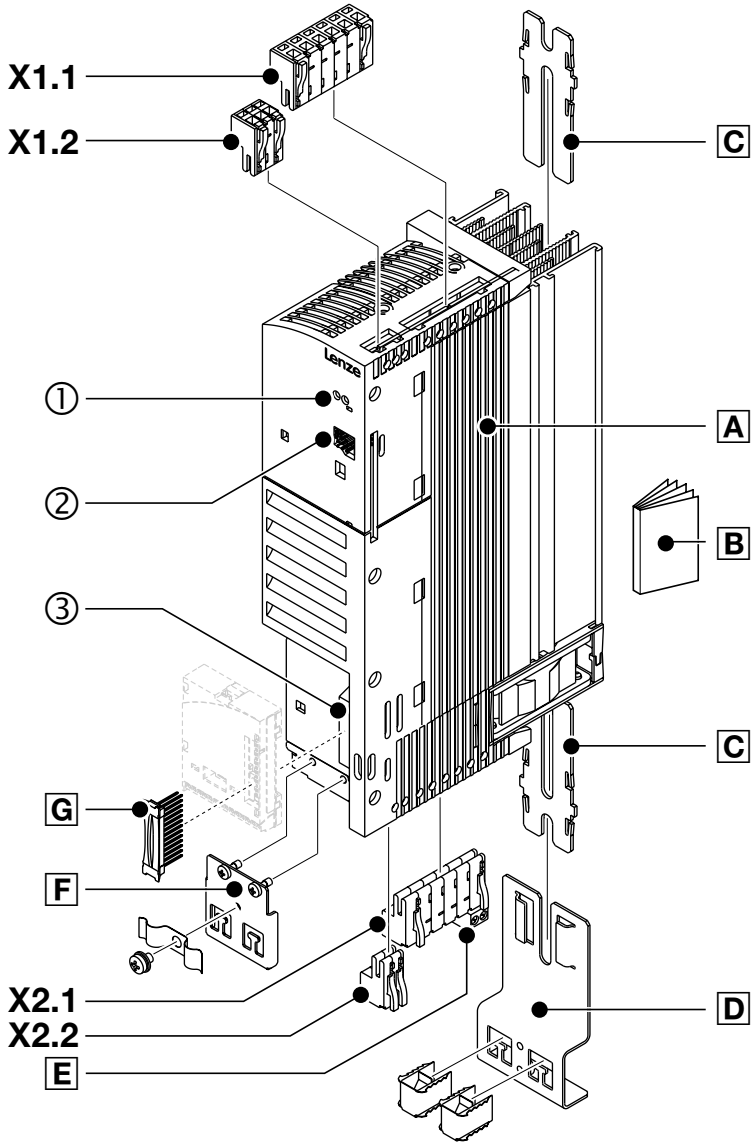
Please observe all safety information given.

The manual with detailed information about the 8200 vector can be ordered directly from Lenze or Lenze representatives.

Lire attentivement les instructions de montage avant toute opération !

Respecter les consignes de sécurité.

Le manuel comprenant une description complète du convertisseur de fréquence 8200 vector peut être commandé auprès de votre agence Lenze.



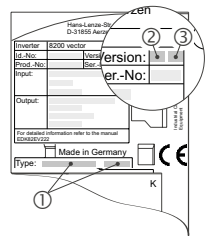
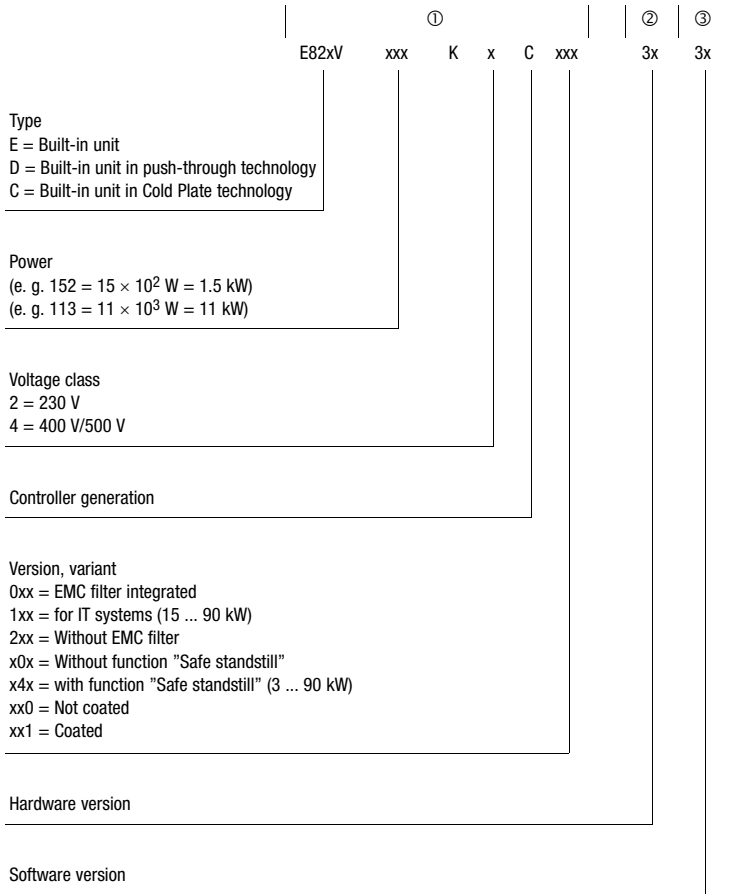
Items supplied

Position	Description	
A	8200 vector frequency inverter	
B	Mounting Instructions and Getting Started	
C	Holder for standard mounting	📖 93
D	EMC shield sheet with shield clips for the motor cable and the supply for the motor temperature monitoring	📖 95
E	2-pole terminal strip for motor PE and motor shield at X2.1	📖 95
F	EMC shield sheet with mounting screws and shield clamps for shielded control cables	📖 95
G	2*13-pole plug connector for function modules at FIF interface	📖 106
X1.1	Terminal strip for mains connection, DC-power supply (3 - 7-pole according to controller type)	📖 97 📖 101
X1.2	Terminal strip of relay output	📖 105
X2.1	Terminal strip for motor connection, connection brake resistor (option)	
X2.2	Terminal strip for PTC connection or thermal contact (NC contact) of the motor	📖 104

Interfaces and displays

Position	Description	Function	
①	2 LEDs (red, green)	Status display	📖 149
②	AIF interface (Automation interface)	Plug-in station for communication modules keypad E82ZBC, keypad XT EMZ9371BC Fieldbus modules type 21XX, e. g. INTERBUS 2111, PROFIBUS-DP 2133, ...	📖 110
③	FIF interface (Function interface)	With cover for operation with function module or plug-in station for function modules Standard I/O E82ZAFSC Application I/O E82ZAFAC Fieldbus function modules type E82ZAFXC, e. g. INTERBUS E82ZAFIC, PROFIBUS-DP E82ZAFPC, ...	📖 106

This documentation is only valid for 8200 vector frequency inverters as of version:





Note!

Current documentation and software updates for Lenze products can be found on the internet in the "Downloads" area under

<http://www.Lenze.com>



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Safety and application notes for Lenze controllers

(in conformity with Low-Voltage Directive 73/23/EEC)

General

Lenze controllers (frequency inverters, servo inverters, DC controllers) can include live and rotating parts - depending on their type of protection - during operation. Surfaces can be hot.

Non-authorized removal of the required cover, inappropriate use, incorrect installation or operation, creates the risk of severe injury to persons or damage to material assets.

For more detailed information please see the documentation.

All operations concerning transport, installation, and commissioning as well as maintenance must be carried out by qualified, skilled personnel (IEC 364 and CENELEC HD 384 or DIN VDE 0100 and IEC report 664 or DIN VDE 0110 and national regulations for the prevention of accidents must be observed).

According to this basic safety information qualified skilled personnel are persons who are familiar with the installation, assembly, commissioning and operation of the product and who have the qualifications necessary for their occupation.

Application as directed

Drive controllers are components which are designed for installation in electrical systems or machinery. They are not to be used as appliances. They are intended exclusively for professional and commercial purposes according to EN 61000-3-2. The documentation includes information on compliance with the EN 61000-3-2.

When installing the drive controllers in machines, commissioning (i.e. starting of operation as directed) is prohibited until it is proven that the machine complies with the regulations of the EC Directive 98/37/EC (Machinery Directive); EN 60204 must be observed.

Commissioning (i.e. starting of operation as directed) is only allowed when there is compliance with the EMC Directive (89/336/EEC).

The drive controllers meet the requirements of the Low Voltage Directive 73/23/EEC. The harmonised standards of the series EN 50178/DIN VDE 0160 apply to the controllers.

The technical data and information on the connection conditions must be obtained from the nameplate and the documentation. They must be observed in any case.

Warning: The availability of controllers is restricted according to EN 61800-3. These products can cause radio interference in residential areas. In this case, special measures can be necessary.

Transport, storage

Please observe the notes on transport, storage and appropriate handling.

Observe the climatic conditions according to EN 50178.

Installation

The controllers must be installed and cooled according to the regulation and instructions given in the corresponding documentation.

Ensure proper handling and avoid mechanical stress. Do not bend any components and do not change any insulation distances during transport or handling. Do not touch any electronic components and contacts.

Controllers contain electrostatically sensitive components, which can easily be damaged by inappropriate handling. Do not damage or destroy any electrical components since this might endanger your health!

Electrical connection

When working on live drive controllers, the applicable national regulations for the prevention of accidents (e.g. VBG 4) must be observed.

The electrical installation must be carried out according to the appropriate regulations (e.g. cable cross-sections, fuses, PE connection). Additional information can be obtained from the documentation.

The documentation contains information about installation in compliance with EMC (shielding, grounding, filters and cables). These notes must also be observed for CE-marked controllers. The manufacturer of the system or machine is responsible for the compliance with the required limit values demanded by the EMC legislation.

Operation

Systems including controllers must be equipped with additional monitoring and protection devices according to the corresponding standards (e.g. technical equipment, regulations for prevention of accidents, etc.). If necessary, adapt the controllers to your application. Please observe the corresponding information given in the Instructions.

After the controller has been disconnected from the supply voltage, live components and power connection must not be touched immediately since capacitors could be charged. Please observe the corresponding notes on the controller.

All covers and doors must be closed during operation.

Information for UL approved systems with integrated controllers: UL warnings are notes which apply to UL systems. The documentation contains special information about UL.

Safe standstill

Variant V004 of the controller series 9300 and 9300 vector, variante x4x of the controller series 8200 vector and axis controller ECSxAxxx support the function "Safe standstill", protection against unintended start, according to the requirements of Appendix I, No. 1.2.7 of the EC Directive "Machinery" 98/37/EG, DIN EN 954-1 category 3 and DIN EN 1037. It is absolutely necessary to observe the information about the function "Safe standstill" in the corresponding documentation and instructions.

Maintenance and servicing

Please observe the information given in the documentation.

The product-specific safety and application notes in these instructions must also be observed!

Protection of persons

- Before working on the controller check that no voltage is applied to the power terminals, the relay output and the pins of the FIF interface,
 - because the power terminals U, V, W, +UG, -UG, BR1 and BR2 remain live for at least 3 minutes after mains switch-off.
 - because the power terminals L1, L2, L3; U, V, W, +UG, -UG, BR1 and BR2 remain live when the motor is stopped.
 - because the relay outputs K11, K12, K14 can remain live when the controller is disconnected from the mains.
- If you use the non-fail safe function "Selection of direction of rotation" via the digital signal DCTRL1-CW/CCW (C0007 = 0 ... 13, C0410/3 ≠ 255):
 - In the event of an open circuit or failure of the control voltage, the drive can change its direction of rotation.
- If you use the function "Flying-restart circuit" (C0142 = 2, 3) with machines with a low moment of inertia and a minimum friction:
 - After controller enable in standstill, the motor can start for a short time or change its direction of rotation for a short time.
- The heatsink of the controller has an operating temperature of > 80°C:
 - Direct skin contact with the heatsink results in burnings.

Controller protection

- All pluggable connection terminals must only be connected or disconnected when no voltage is applied!
- **Cyclic** connection and disconnection of the supply voltage can overload and destroy the input current limitation of the controller:
 - In case of cyclic mains switching over a longer period of time three minutes have to pass between two starting operations!

Motor protection

- Depending on the controller settings, the connected motor can be overheated:
 - For instance, longer DC-braking operations.
 - Longer operation of self-ventilated motors at low speed.

Controller/system protection

- Drives can reach dangerous overspeeds (e.g. setting of inappropriately high field frequencies):
 - The controllers do not offer any protection against these operating conditions. For this, use additional components.
- **Contactors in the motor cable** Switching with inhibited controller only.
If contactors in the motor cable are switched with the controller enabled,
 - monitoring functions of the controller can be activated.
 - the controller can be destroyed under unfavourable operating conditions.



Warnings!

- The device has no overspeed protection.
- Must be provided with external or remote overload protection.
- Suitable for use on a circuit capable of delivering not more than 5000 rms symmetrical amperes, 240 V maximum (240 V devices) or 500 V maximum (400/500 V devices) resp.
- Use 60/75 °C or 75 °C copper wire only.
- Shall be installed in a pollution degree 2 macro-environment.

Layout of safety instructions

All safety instructions given in these Instructions have got the same structure:

Pictograph (indicates the type of danger)



Danger! (indicates the degree of danger)

Note (describes the danger and explains how to avoid it)

Pictograph	Signal word		
		Meaning	Consequences if disregarded
 Dangerous electrical voltage	Danger!	Impending danger for persons	Death or most severe injuries
	Warning!	Possible, very dangerous situation for persons	Death or most severe injuries
	Caution!	Possible, dangerous situation for persons	Injuries
 General danger	Stop!	Possible material damage	Damage of the drive system or its surroundings
	Note!	Useful tip If you observe it, handling of the drive system will be easier.	

Standards and application conditions

Conformity	CE	Low-Voltage Directive (73/23/EEC)
Approvals	UL 508C	Underwriter Laboratories (File-No. E132659) Power Conversion Equipment
Max. permissible motor cable length	For rated mains voltage and chopper frequency of 8 kHz without additional output filters	
shielded	50 m	For compliance with EMC regulations, the permissible cable lengths must be changed
unshielded	100 m	
Vibration resistance	Acceleration resistance up to 0.7g (Germanischer Lloyd, general conditions)	
Climatic conditions	Class 3K3 to EN 50178 (without condensation, average relative humidity 85 %)	
Degree of pollution	VDE 0110 part 2 pollution degree 2	
Packaging (DIN 4180)	Dust packaging	
Permissible temperature ranges		
Transport	-25 °C ... +70 °C	
storage	-25 °C ... +60 °C	
operation	-10 °C ... +55 °C	above +40 °C the rated output current is to be reduced by 2,5 %/°C
Permissible installation height	0 ... 4000 m amsl	above 1000 m amsl the rated output current is to be reduced by 5 %/1000 m
Mounting positions	vertical	
Free space		
above/below	≥100 mm	
to the sides	Side-by-side mounting with a distance of 3 mm	
DC group drives	possible, except E82EV251K2C and E82EV371K2C	

General technical data

EMC	Compliance with EN 61800-3/A11	
Noise emission	Compliance with limit value classes A and B to EN 55011	
	E82EVxxxKxC0xx	without additional measures
	E82EVxxxKxC2xx	by means of external filters

Noise immunity	Requirements to EN 61800-3 incl. A11		
	Requirements	Standard	
	ESD	EN 61000-4-2	
	high frequency in cables	EN 61000-4-6	
	RF interference (enclosure)	EN 61000-4-3	
	Burst	EN 61000-4-4	
Surge (Surge on mains cable)	EN 61000-4-5	3, i.e. 1,2/50 μ s, 1 kV phase-phase, 2 kV phase-PE	
Insulation resistance	Overvoltage category III acc. to VDE 0110		
Discharge current to PE (to EN 50178)	> 3.5 mA, i. e. fixed installation and double PE connection are required.		
Enclosure	IP20		
Protection measures against	Short circuit, earth fault (earth-fault protected during operation, limited earth-fault protection during power up), motor stalling, motor overtemperature (input for PTC or thermal contact, I ² t monitoring)		
Insulation of control circuits	Safe mains isolation: Double/reinforced insulation to EN 50178		
permissible mains types	Operation at TT systems, TN systems or systems with grounded star point without additional measures		
	Operation at IT systems is only possible with a variant (in preparation)		
Permissible mains voltage ranges	Frequency range		
	45 Hz - 0 % ... 65 Hz + 0 %	DC power supply	
	1/N/PE AC 230/240 V	180 V - 0 % ... 264 V + 0 %	DC 140 V - 0 % ... 370 V + 0 %
	2/N/PE AC 230/240 V		
	3/PE AC 230/240 V	100 V - 0 % ... 264 V + 0 %	DC 140 V - 0 % ... 370 V + 0 %
	3/PE AC 400 V	320 V - 0 % ... 440 V + 0 %	DC 450 V - 0 % ... 625 V + 0 %
	3/PE AC 500 V	320 V - 0 % ... 550 V + 0 %	DC 450 V - 0 % ... 775 V + 0 %
Operation in public supply networks	Limitation of harmonic currents according to EN 61000-3-2		
	Total power connected to the mains	Compliance with the requirements ¹⁾	
	< 0.5 kW	With mains choke	
	0.5 kW ... 1 kW	with active filter (in preparation)	
	> 1 kW	without additional measures	

¹⁾ The additional measures described only ensure that the controllers meet the requirements of the EN 61000-3-2. The machine/system manufacturer is responsible for the compliance with the regulations of the machine!

Operation with rated power (normal operation)

Type	Power [kW]	Rated mains voltage	Mains current [A]		Output current [A] ¹⁾		Weight [kg]
			①	②	I _r	I _{max} (60 s) ²⁾	
E82EV251K2C ³⁾	0.25	1/N/PE AC 230/240 V 2/PE AC 230/240 V 50 Hz DC 325 V	3.4	3.0	1.7	2.5	0.8
E82EV371K2C ³⁾	0.37		5.0	4.2	2.4	3.6	
E82EV551K2C	0.55		6.0	5.6	3.0	4.5	1.2
E82EV751K2C	0.75		9.0	7.5	4.0	6.0	
E82EV152K2C	1.5		15.0	12.5	7.0	10.5	1.6
E82EV222K2C	2.2	-	18.0	9.5	14.2		
E82EV551K2C	0.55	3/PE AC 230/240 V 50 Hz DC 325 V	3.9	2.7	3.0	4.5	1.2
E82EV751K2C	0.75		5.2	3.6	4.0	6.0	
E82EV152K2C	1.5		9.1	6.3	7.0	10.5	1.6
E82EV222K2C	2.2		12.4	9.0	9.5	14.2	
E82EV551K4C	0.55		3/PE AC 400 V 50 Hz DC 565 V	2.5	2.0	1.8	2.7	1.2
E82EV751K4C	0.75	3.3		2.3	2.4	3.6	
E82EV152K4C	1.5	5.5		3.9	3.9	5.9	1.6
E82EV222K4C	2.2	7.3		5.1	5.6	8.4	
E82EV551K4C ⁴⁾	0.55	3/PE AC 500 V 50 Hz DC 710 V		2.0	1.4	1.4	2.7	1.2
E82EV751K4C ⁴⁾	0.75		2.6	1.8	1.9	3.6	
E82EV152K4C ⁴⁾	1.5		4.4	3.1	3.1	5.9	1.6
E82EV222K4C ⁴⁾	2.2		5.8	4.1	4.5	8.4	

① Without mains choke

② With mains choke

1) For rated mains voltage and chopper frequency of 8 kHz

2) Currents for periodic load change: 1 min overcurrent with I_{max} and 2 min basic load with 75 % I_{rx}

3) DC power supply not possible

4) For the variants of basic devices ...0xx with mains voltages of 484 V -0% ... 550 V +0%:
The operation is only permitted with a brake resistor.

Operation with increased rated power

Under the application conditions described here the controller can be operated in continuous operation with a motor of higher performance. The overload capacity is reduced to 120 %.

Typical applications are pumps with square-law load characteristic or blowers.



Note!

Operation with increased rated power is only permissible

- with the drive controllers mentioned
- within the mains voltage range mentioned
- with the chopper frequency mentioned
- with the prescribed fuses, cable cross-sections and mains chokes

Type	Power [kW]	Rated mains voltage	Mains current [A]		Output current [A] ¹⁾	
			①	②	I _r	I _{max} (60 s) ²⁾
E82EV251K2C ³⁾	0.25	1/N/PE AC 230/240 V 2/PE AC 230/240 V 50 Hz DC 325 V	4.1	3.6	2.0	2.5
E82EV371K2C ³⁾	0.37		Operation not possible			
E82EV551K2C	0.55		-	6.7	3.6	4.5
E82EV751K2C	0.75		-	9.0	4.8	6.0
E82EV152K2C	1.5		18	15	8.4	10.5
E82EV222K2C	2.2	Operation not possible				
E82EV551K2C	0.55	3/PE AC 230/240 V 50 Hz DC 325 V	-	3.3	3.6	4.5
E82EV751K2C	0.75		-	4.4	4.8	6.0
E82EV152K2C	1.5		10.4	7.6	8.4	10.5
E82EV222K2C	2.2		Operation not possible			
E82EV551K4C	0.55		2.9	2.4	2.2	2.7
E82EV751K4C	0.75	-	2.8	2.9	3.6	
E82EV152K4C	1.5	Operation not possible				
E82EV222K4C	2.2	-	6.1	6.7	8.4	

① Without mains choke

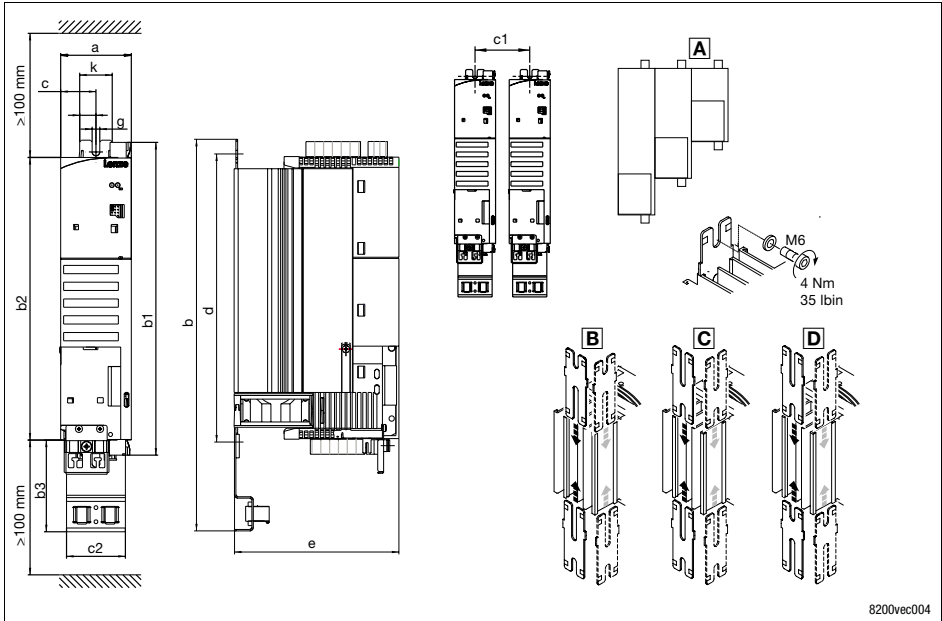
② With mains choke

1) For rated mains voltage and chopper frequency 2 kHz or 4 kHz

2) Currents for periodic load change: 1 min overcurrent with I_{max} and 2 min basic load with 75 % I_r

3) DC power supply not possible

8200 vector 0.25 ... 2.2 kW



8200vec004

- A** Different sizes can only be mounted side-by-side when the smaller units are mounted to the right-hand-side of the bigger units!

Dimensions in mm	a	b			b1	b2	b3	c	c1	c2	d			e	g	k
		B	C	D							B	C	D			
E82EV251K2C E82EV371K2C	60	213	243	263	148	120	78	30	63	50	130...140	120...170	110...200	140	6.5	28
E82EV551KxC E82EV751KxC		273	303	323	208	180					190...200	180...230	170...260			
E82EV152KxC 1) E82EV222KxC 1)		333 359 2)	363	-	268	240					250...260 280...295 2)	240...290	-	140 162 2)	6.5	28

- 1) Lateral mounting only possible with swivel mounting unit E82ZJ001 (accessories)
2) with E82ZJ001

3

Electrical installation

Wiring of terminal strips

The enclosed terminal strips are tested according to the specifications of the

- DIN VDE 0627:1986-06 (partially)
- DIN EN 60999:1994-04 (partially)

Checked and tested are, for instance, mechanical, electrical and thermal load, vibration, damage of conductors, loose conductors, corrosion, ageing.

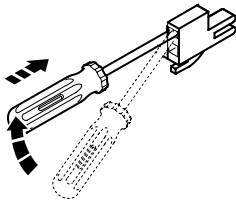


Stop!

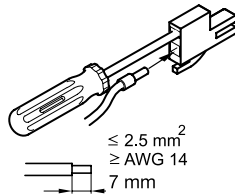
Proceed as follows to avoid damage of the contacts:

- Mount only when the controller is not connected to the mains.
- Wire the terminal strips before connecting them!
- Unused terminal strips must also be plugged in to protect the contacts.

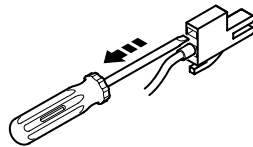
①



②



③



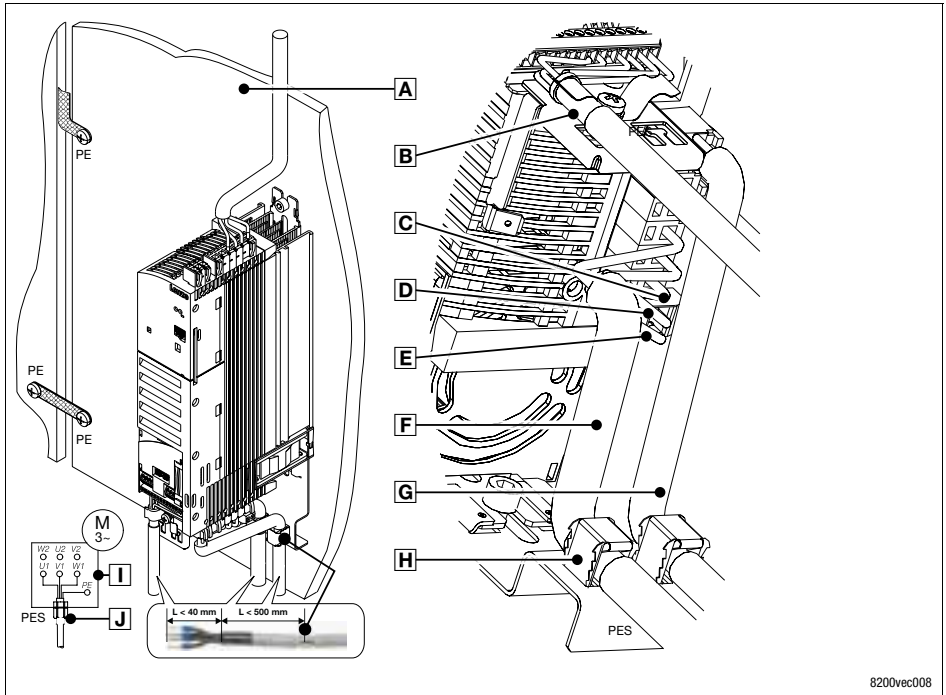
8200vec015



Note!

Wiring without wire end ferrules is always possible.

Installation according to EMC requirements (CE-typical drive system)



8200vec008


3

Electrical installation

Installation according to EMC requirements (CE-typical drive system)



Stop!

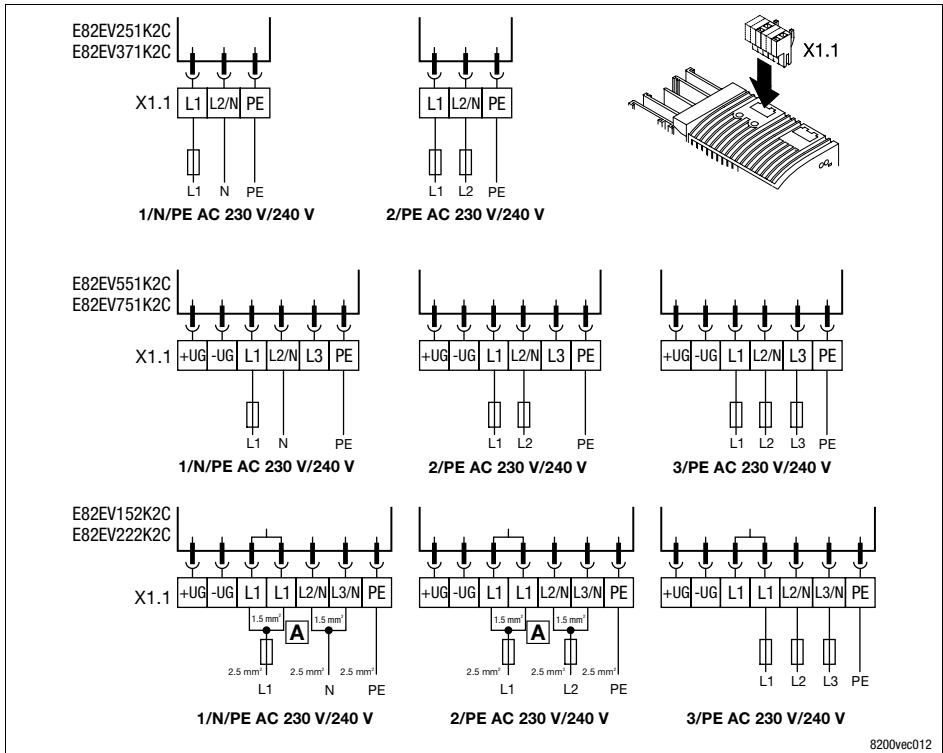
- Control cables and mains cables must be separated from the motor cable to avoid interferences.
- Control cable must always be shielded.
- We recommend to shield the supply cable for the PTC or thermal contact and route it separately from the motor cable.
- If the cores for motor connection and PTC or thermal contact are together in one cable with a common shield:
 - In order to reduce interference injections on the PTC cable, we recommend to install additionally the PTC module type E82ZPE.
- An optimum HF shield connection of the motor cable can be reached by using the terminal  for motor PE and motor shield.

A	Mounting plate with electrically conductive surface
B	Control cable to function module, connect the shielding to the EMC shield sheet (PES) with a surface as large as possible
C	2-pole terminal for motor PE and motor shield
D	PE of the motor cable
E	Shield of the motor cable
F	shielded motor cable, low.capacity (core/core up to 1,5 mm ² ≤ 75 pF/m; from 2,5 mm ² ≤ 100 pF/m; core/shield ≤ 150 pF/m)
G	shielded PTC cable or thermal contact cable
H	Connect cable shields to the EMC shield sheet (PES) with a surface as large as possible. Use enclosed clamps.
I	Star or delta connection as indicated on the motor nameplate
J	EMC-cable connector (not included in the delivery package)



Stop!

- Controller type E82EVxxxK **2C** must only be connected to a mains voltage of 1/N/PE AC 180 ... 264 V or 3/PE AC 100 ... 264 V. Higher mains voltages will destroy the controller!
- The discharge current to PE is > 3.5 mA. EN 50178 requires a fixed installation. Double PE connection required.



8200vec012

E82EV222K2C	Operation only with mains choke
A	Use two separate cables 1.5 mm ² to connect the terminals!
X1.1/+UG, X1.1/-UG	DC supply (DC-bus operation - see Operating Instructions)

Fuses and cable cross-sections (operation with rated power)

		Operation without mains choke					FI	
		Installation to EN 60204-1			Installation to UL 1)			
8200 vector		mains	①	②	L1, L2, L3, PE [mm ²]	①	L1, L2, L3, PE [AWG]	
Type	[kW]							
E82EV251K2C	0.25	1/N/PE AC	M10 A	C10 A	1.5	10 A	16	≥ 30 mA ²⁾
E82EV371K2C	0.37		M10 A	C10 A	1.5	10 A	16	
E82EV551K2C	0.55	2/PE AC	M10 A	B10 A	1.5	10 A	16	
E82EV751K2C	0.75	180 ... 264 V; 45 ... 65 Hz	M16 A	B16 A	2.5	15 A	14	
E82EV152K2C	1.5		M20 A	B20 A	2 x 1.5	20 A	2 x 16	
E82EV222K2C	2.2		Operation only with mains choke					
E82EV551K2C	0.55	3/PE AC 100 ... 264 V; 45 ... 65 Hz	M6 A	B6 A	1	5 A	18	≥ 30 mA ³⁾
E82EV751K2C	0.75		M10 A	B10 A	1.5	10 A	16	
E82EV152K2C	1.5		M16 A	B16 A	2.5	15 A	14	
E82EV222K2C	2.2		M16 A	B16 A	2.5	15 A	14	

		Operating with mains choke					FI	
		Installation to EN 60204-1			Installation to UL 1)			
8200 vector		mains	①	②	L1, L2, L3, PE [mm ²]	①	L1, L2, L3, PE [AWG]	
Type	[kW]							
E82EV251K2C	0.25	1/N/PE AC	M10 A	C10 A	1.5	10 A	16	≥ 30 mA ²⁾
E82EV371K2C	0.37		M10 A	C10 A	1.5	10 A	16	
E82EV551K2C	0.55	2/PE AC	M10 A	B10 A	1.5	10 A	16	
E82EV751K2C	0.75	180 ... 264 V; 45 ... 65 Hz	M10 A	B10 A	1.5	10 A	16	
E82EV152K2C	1.5		M16 A	B16 A	2 x 1.5	15 A	2 x 16	
E82EV222K2C	2.2		M20 A	B20 A	2 x 1.5	20 A	2 x 16	
E82EV551K2C	0.55	3/PE AC 100 ... 264 V; 45 ... 65 Hz	M6 A	B6 A	1	5 A	18	≥ 30 mA ³⁾
E82EV751K2C	0.75		M6 A	B6 A	1	5 A	18	
E82EV152K2C	1.5		M10 A	B10 A	1.5	10 A	16	
E82EV222K2C	2.2		M10 A	B10 A	1.5	10 A	16	

① Fuse

② E.I.c.b.

1) Use UL-approved cables, fuses and fuse holders only.

UL fuse: 240 V voltage, tripping characteristic "H", "K5" or "CC"

2) Pulse-current or universal-current sensitive earth leakage circuit breaker

3) All-current sensitive e.I.c.b.

Observe national and regional regulations (e. g. VDE 0113, EN 60204)

Fuses and cable cross-sections (operation with increased rated power)

			Operation without mains choke					FI
			Installation to EN 60204-1			Installation to UL 1)		
			①	②	L1, L2, L3, PE [mm ²]	①	L1, L2, L3, PE [AWG]	
8200 vector		mains						
Type	[kW]							
E82EV251K2C	0.25	1/N/PE AC 180 ... 264 V; 45 ... 65 Hz	M10 A	C10 A	1.5	10 A	16	
E82EV551K2C	0.55		Operation only with mains choke					≥ 30 mA ²⁾
E82EV751K2C	0.75		Operation only with mains choke					
E82EV152K2C	1.5		M20 A	B20 A	2 x 1.5	20 A	2 x 16	
E82EV551K2C	0.55	3/PE AC 100 ... 264 V; 45 ... 65 Hz	Operation only with mains choke					≥ 30 mA ³⁾
E82EV751K2C	0.75		Operation only with mains choke					
E82EV152K2C	1.5			M16 A	B16 A	2.5	15 A	14

			Operating with mains choke					FI
			Installation to EN 60204-1			Installation to UL 1)		
			①	②	L1, L2, L3, PE [mm ²]	①	L1, L2, L3, PE [AWG]	
8200 vector		mains						
Type	[kW]							
E82EV251K2C	0.25	1/N/PE AC 180 ... 264 V; 45 ... 65 Hz	M10 A	C10 A	1.5	10 A	16	
E82EV551K2C	0.55		M10 A	B10 A	1.5	10 A	16	≥ 30 mA ²⁾
E82EV751K2C	0.75		M10 A	B10 A	1.5	10 A	16	
E82EV152K2C	1.5		M16 A	B16 A	2 x 1.5	15 A	2 x 16	
E82EV551K2C	0.55	3/PE AC 100 ... 264 V; 45 ... 65 Hz	M6 A	B6 A	1	5 A	18	≥ 30 mA ³⁾
E82EV751K2C	0.75		M10 A	B10 A	1.5	10 A	16	
E82EV152K2C	1.5			M10 A	B10 A	1.5	10 A	16

① Fuse

② E.l.c.b.

- 1) Use UL-approved cables, fuses and fuse holders only.
UL fuse: 240 V voltage, tripping characteristic "H", "K5" or "CC"
- 2) Pulse-current or universal-current sensitive earth leakage circuit breaker
- 3) All-current sensitive e.l.c.b.

Observe national and regional regulations (e. g. VDE 0113, EN 60204)

3

Electrical installation

Mains connection 230 V/240 V

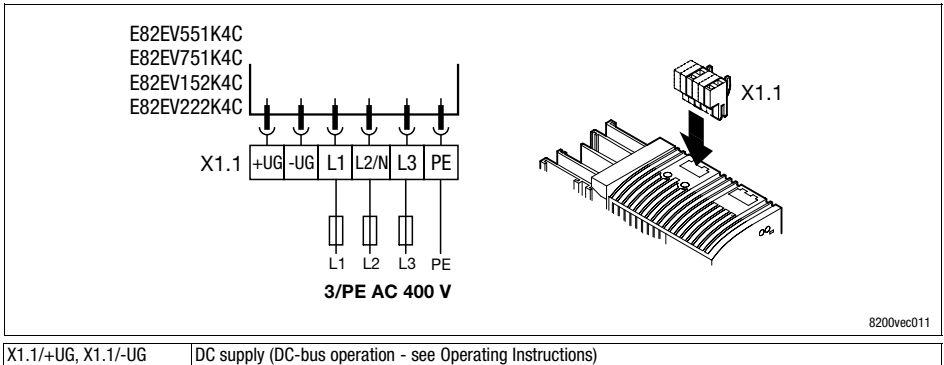
Please observe the following when using e.l.c.bs:

- E.l.c.bs must only be installed between mains supply and controller.
- E.l.c.bs can trip incorrectly because of
 - capacitive leakage currents of the cable shields during operation (especially with long, shielded motor cables),
 - simultaneous connection of several controllers to the mains supply,
 - use of additional RFI filters.



Stop!

- Controller type E82EVxxxK **4C** must only be connected to a mains voltage of 3/PE AC 320 ... 550 V. Higher mains voltages will destroy the controller!
- The discharge current to PE is > 3.5 mA. EN 50178 requires a fixed installation. Double PE connection required.



Fuses and cable cross-sections (operation with rated power)

		Operation without mains choke					FI
		Installation to EN 60204-1		Installation to UL 1)			
8200 vector		mains	①	②	L1, L2, L3, PE	①	L1, L2, L3, PE
Type	[kW]						
E82EV551K4C	0.55	3/PE AC 320 ... 550 V; 45 ... 65 Hz	M6 A	B6 A	1	5 A	18
E82EV751K4C	0.75		M6 A	B6 A	1	5 A	18
E82EV152K4C	1.5		M10 A	B10 A	1.5	10 A	16
E82EV222K4C	2.2		M10 A	B10 A	1.5	10 A	16
							≥ 300 mA ²⁾ ≥ 30 mA ³⁾
		Operating with mains choke					FI
		Installation to EN 60204-1		Installation to UL 1)			
8200 vector		mains	①	②	L1, L2, L3, PE	①	L1, L2, L3, PE
Type	[kW]						
E82EV551K4C	0.55	3/PE AC 320 ... 550 V; 45 ... 65 Hz	M6 A	B6 A	1	5 A	18
E82EV751K4C	0.75		M6 A	B6 A	1	5 A	18
E82EV152K4C	1.5		M10 A	B10 A	1.5	10 A	16
E82EV222K4C	2.2		M10 A	B10 A	1.5	10 A	16
							≥ 300 mA ²⁾ ≥ 30 mA ³⁾

① Fuse

② E.I.c.b.

1) Use UL-approved cables, fuses and fuse holders only.

UL fuse: Voltage 500 ... 600 V, tripping characteristic "H", "K5" or "CC"

2) All-current sensitive e.I.c.b. for the use with E82EVxxxK4C0xx

3) All-current sensitive e.I.c.b. for the use with E82EVxxxK4C2xx

Observe national and regional regulations (e. g. VDE 0113, EN 60204)

Fuses and cable cross-sections (operation with increased rated power)

			Operation without mains choke					FI
			Installation to EN 60204-1			Installation to UL 1)		
8200 vector		mains	①	②	L1, L2, L3, PE [mm ²]	①	L1, L2, L3, PE [AWG]	≥ 300 mA ²⁾ ≥ 30 mA ³⁾
Type	[kW]							
E82EV551K4C	0.55	3/PE AC	M6 A	B6 A	1	5 A	18	
E82EV751K4C	0.75	320 ... 440 V;	Operation only with mains choke					
E82EV222K4C	2.2	45 ... 65 Hz	Operation only with mains choke					

			Operating with mains choke					FI
			Installation to EN 60204-1			Installation to UL 1)		
8200 vector		mains	①	②	L1, L2, L3, PE [mm ²]	①	L1, L2, L3, PE [AWG]	≥ 300 mA ²⁾ ≥ 30 mA ³⁾
Type	[kW]							
E82EV551K4C	0.55	3/PE AC	M6 A	B6 A	1	5 A	18	
E82EV751K4C	0.75	320 ... 440 V;	M6 A	B6 A	1	5 A	18	
E82EV222K4C	2.2	45 ... 65 Hz	M10 A	B10 A	1.5	10 A	16	

① Fuse

② E.I.c.b.

1) Use UL-approved cables, fuses and fuse holders only.
UL fuse: Voltage 500 ... 600 V, tripping characteristic "H", "K5" or "CC"

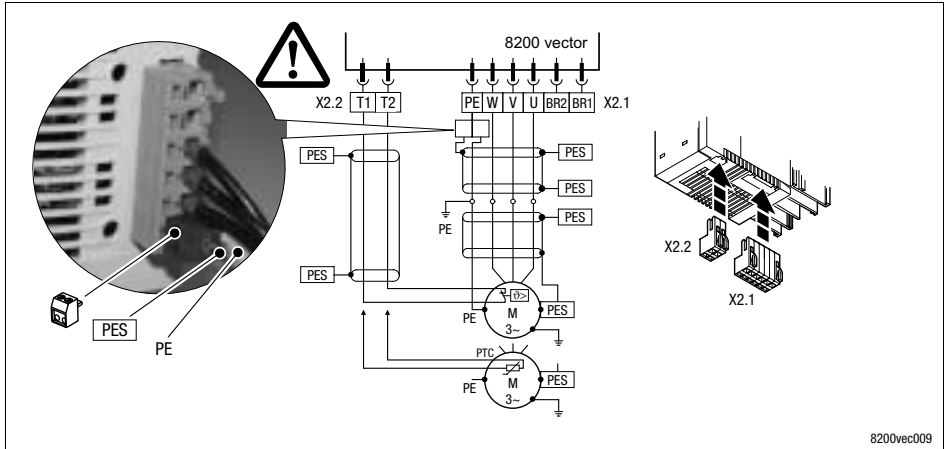
2) All-current sensitive e.I.c.b. for the use with E82EVxxxK4C0xx

3) All-current sensitive e.I.c.b. for the use with E82EVxxxK4C2xx

Observe national and regional regulations (e. g. VDE 0113, EN 60204)

Please observe the following when using e.I.c.bs:

- E.I.c.bs must only be installed between mains supply and controller.
- E.I.c.bs can trip incorrectly because of
 - capacitive leakage currents of the cable shields during operation (especially with long, shielded motor cables),
 - simultaneous connection of several controllers to the mains supply,
 - use of additional RFI filters.



Use low-capacity motor cables! (core/core up to 1.5 mm² ≤ 75 pF/m; from 2.5 mm² ≤ 100 pF/m; core/shield ≤ 150 pF/m)
The shorter the motor cables, the better the drive response!

PES	HF-shield end by PE connection through shield bracket or EMC cable connection.
X2.1/PE	Earthing of the 8200 vector at the output side
X2.1/BR1, X2.1/BR2	Connection terminals for the brake resistor (For information about the operation with brake resistor see the Operating Instructions)
X2.2/T1, X2.2/T2	Connection terminals motor temperature monitoring through PTC thermistors or thermal contacts Activate motor temperature monitoring under C0119 (e. g. C0119 = 1)!

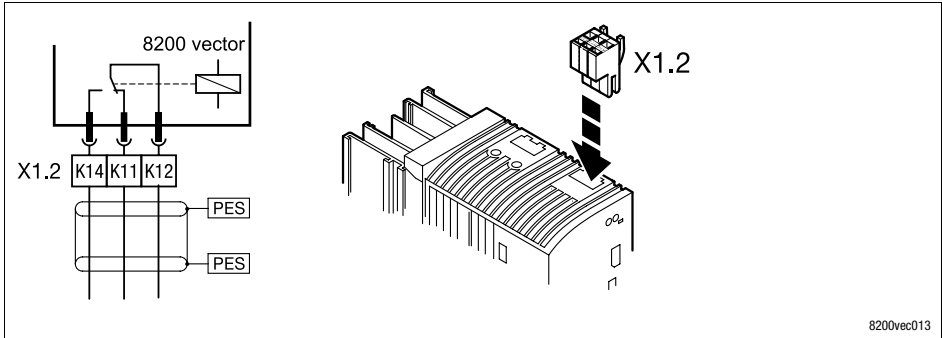
Cable cross-sections U, V, W, PE

Type	mm ²	AWG	Type	mm ²	AWG
E82EV251K2C / E82EV371K2C	1	18			
E82EV551K2C / E82EV751K2C	1	18	E82EV551K4C / E82EV751K4C	1	18
E82EV152K2C / E82EV222K2C	1.5	16	E82EV152K4C / E82EV222K4C	1.5	16



Danger!

- After the connection of a PTC thermistor or thermal contact all control terminals only have a basic insulation (single insulating distance).
- Protection against contact in the event of a defective insulating distance can only be ensured by external measures (e.g. double insulation).



8200vec013

	Function	Relay position set	Message (Lenze setting)	Technical data
X1.2/K11	Relay output normally-closed contact	open	TRIP	AC 250 V/3 A DC 24 V/2 A ... DC 240 V/0.16 A
X1.2/K12	Mid position contact			
X1.2/K14	Relay output - normally-open contact	closed	TRIP	
PES	HF-shield end by PE connection through shield bracket.			



Note!

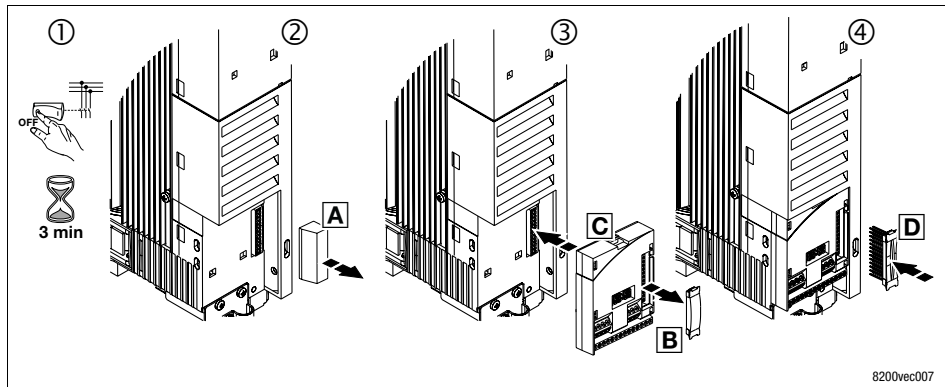
- For switching the control signals use shielded cables and establish an HF shield termination by PE connection.
- For mains potential switching unshielded cables are sufficient.
- With inductive or capacitive loads a corresponding protective circuit is required in order to protect the relay contacts!
- The service life of the relay depends on the type of load (ohmic, inductive or capacitive) and the value of the switching capacity.
- The output message can be changed under C0008 or C0415/1.

Important notes

The basic controller version is not equipped with control terminals. The controllers can be equipped with control terminals by using different I/O function modules for the FIF interface.

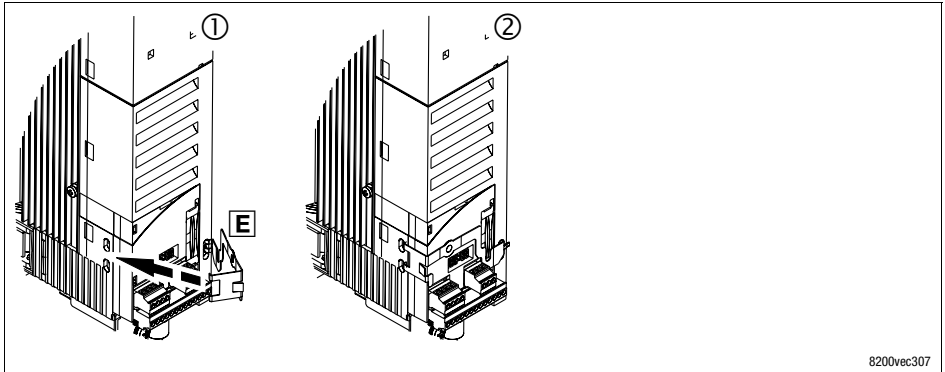
Dismount the function module only if it is absolutely necessary (e.g. when the controller is replaced).

The pin strip which is used to connect the function module is part of the contact system of the controller. It has not been designed for repeated connection and disconnection of the function module.

Mounting of function modules

1. **Disconnect the controller from the mains and wait for at least 3 minutes!**
2. Remove the FIF protection cover **A** and keep it.
3. Remove the protection cover **B** of the function module.
4. Plug the function module **C** onto the FIF interface.
5. Plug the plug connector **D** into the contact bank of the function module until it is snapped into place.
6. For wiring see Mounting Instructions for the function module.

Mounting of function modules in "PT" version



In addition fix the safety clip, so that the module is prevented from being pulled out together with the terminal strips:

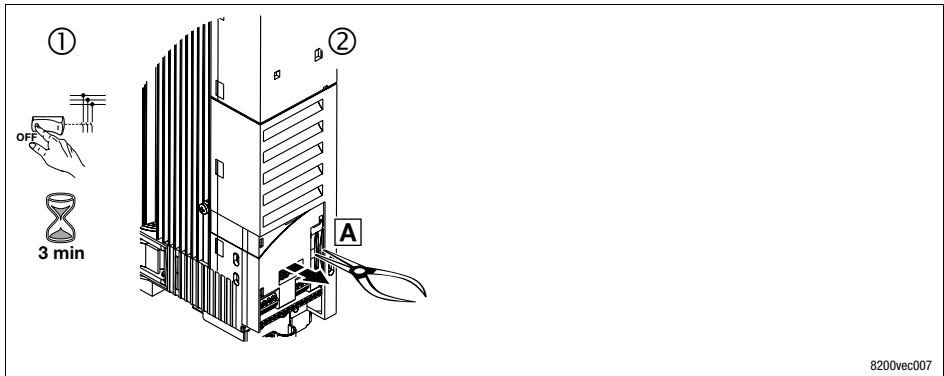
1. Turn the safety clip **E** in the openings.
2. Fold the safety clip over the function module until it snaps into place.

6

Function module (optional)

Dismounting

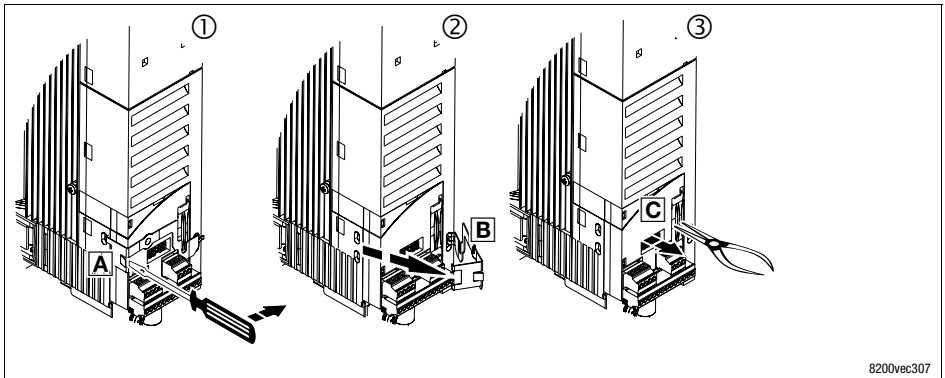
Dismounting of the function modules



8200vec007

1. **Disconnect the controller from the mains and wait for at least 3 minutes!**
2. Catch the bar of the plug connector with pliers and pull. **A** Plug connector and function module are dismounted together.

Dismounting of the function module version "PT"

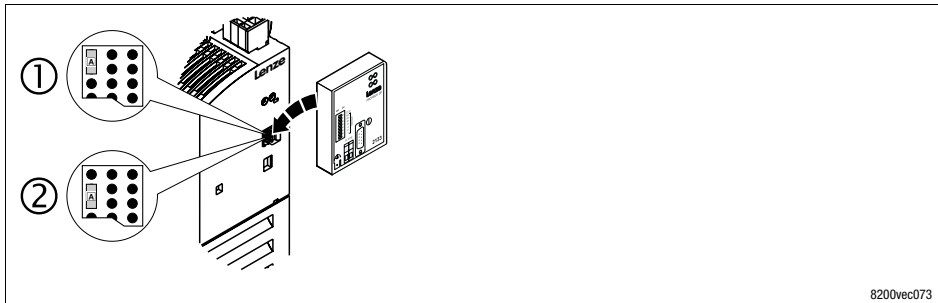


After the function module version "PT" has been switched off, first of all the safety clip must be removed.

1. Position the screw driver between safety clip and function module **A**. The safety clip is disengaged by pressing to the right.
2. Turn the safety clip **B** to the right.
3. Catch the bar of the plug connector with pliers and pull **C**. Plug connector and function module are dismounted together.

6 Communication module (Option)

Mounting/dismounting



8200vec073

A Jumper for selecting the voltage supply

- ① External voltage supply (delivery state)
- ② Voltage supply via internal voltage source

Attach/detach the communication module to/from the AIF interface. This is also possible during operation.

Possible combinations	Communication module on AIF							
	Keypad E82ZBC ¹⁾ Keypad XT EMZ9371BC ¹⁾	LECOM -A/B 2102.V001 -LI 2102.V003 -A 2102.V004 ¹⁾	LECOM-B (RS485) 2102.V002	INTERBUS 2111/2113 INTERBUS- Loop 2112	PROFIBUS- DP 2131/2133	System bus (CAN) 2171/2172	CANopen / DeviceNet 2175	LON 2141
Standard I/O	E82ZAFSC	✓✓	✓✓	✓✓	✓✓	✓✓	✓✓	✓✓
Application I/O	E82ZAFAC	✓✓	✓	✓	✓	✓	✓	✓
INTERBUS	E82ZAFIC	✓✓	(✓)	☒	☒	☒	☒	☒
PROFIBUS-DP	E82ZAFPC	✓✓	(✓)	☒	☒	☒	☒	☒
LECOM-B (RS485)	E82ZAFLC	✓✓	(✓)	☒	☒	☒	☒	☒
System bus (CAN)	E82ZAFCC	✓✓	✓✓	✓✓	✓✓	✓✓	✓✓	✓✓
System bus I/O-RS	E82ZAFCC100							
System bus I/O	E82ZAFCC200							
CANopen / DeviceNet ²⁾	E82ZAFD	✓✓	✓✓	☒	☒	☒	☒	☒
AS-i	E82ZAFFC	✓✓	✓✓	☒	☒	☒	☒	☒

1) Independently of the jumper position always supplied internally.

2) In preparation

✓✓ Combination possible, internal or external supply of the communication module

✓ Combination possible, external voltage supply!

(✓) Combination possible, communication module can only be used for parameter setting.

☒ Combination not possible



Note!

- Do not change the switch-on sequence.
- In the event of an error during commissioning, please see the chapter "Fault detection and elimination".

To avoid injury to persons or damage to property, check...

... before the mains voltage is connected:

- The wiring for completeness, short circuit and earth fault
- "Emergency-off" function of the whole system
- Motor connection (star/delta) must be adapted to output voltage of controller.
- If you do not use a function module, ensure that the FIF cover is mounted properly (as delivered).
- If the internal voltage supply X3/20 of e.g. the standard I/O is used, the terminals X3/7 and X3/39 must be jumpered.

... the most important drive parameter settings before the controller is enabled:

- Are the drive parameters relevant for your application set correctly?
 - E.g. configuration of analog and digital inputs and outputs

7

Commissioning

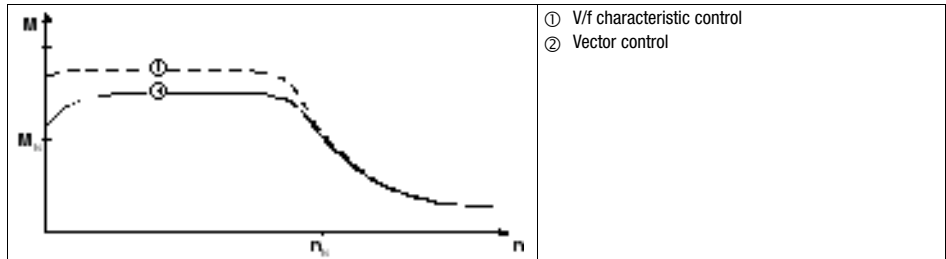
Selection of the correct control mode

The following table helps you to find the correct control mode for standard applications. You can choose between V/f characteristic control, vector control and sensorless torque control:

V/f characteristic control is the classic control mode for standard applications.

The vector control provides better control features than the V/f characteristic control because of:

- a higher torque over the whole speed range
- higher speed accuracy and smooth running features
- higher efficiency



Selection of the correct control mode

Application	Operating mode	
	Setting in C0014	
Stand-alone drives	recommended	alternatively
with extremely alternating loads	4	2
with heavy start conditions	4	2
with speed control (speed feedback)	2	4
with high dynamic response (e. g. positioning and infeed drives)	2	-
with torque setpoint	5	-
with torque limitation (power control)	2	4
Three-phase AC reluctance motors	2	-
Three-phase sliding rotor motors	2	-
Three-phase motors with fixed frequency-voltage characteristic	2	-
Pump and fan drives with square-law load characteristic	3	2 or 4
Group drives (several motors connected to controller)		
identical motors and identical loads	2	-
different motors and/or changing loads	2	-

C0014 = 2: linear V/f characteristic control

C0014 = 3: square-law V/F characteristic control

C0014 = 4: Vector control

C0014 = 5: sensorless torque control

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Commissioning

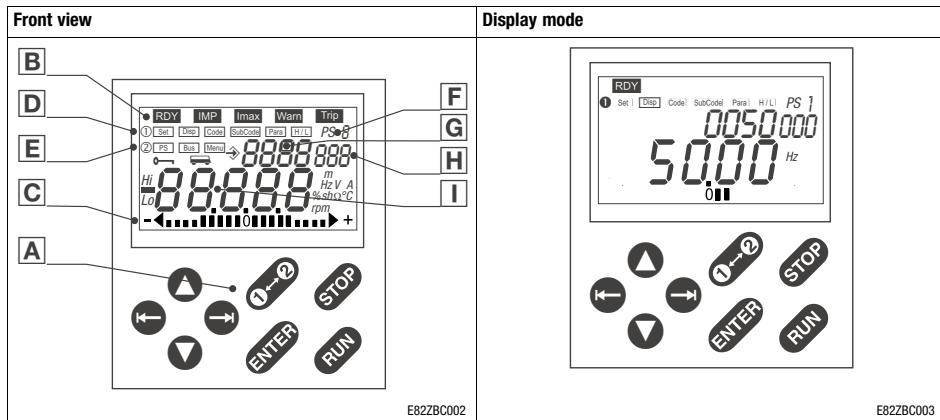
Using the keypad E82ZBC - Parameter setting

Description

The keypad is available as accessory. A full description of the keypad can be obtained from the Instructions included in the keypad delivery.

Plugging in the keypad



It is possible to plug in the keypad onto the AIF interface or remove it during operation. As soon as the keypad is supplied with voltage, it carries out a self-test. The keypad is ready for operation if it is in display mode.



Displays and operating elements

Function keys	Press key	Function	Explanation
RUN		Enable controller	For operation with function module, the terminal X3/28 must be set to HIGH level
STOP		Inhibit controller (CINH) or quick stop (QSP)	Configuration in C0469
1-2		Change to function bar 1 ↔ Function bar 2	
↔		To right/left in active function bar	The current function is framed
▲▼		Increase/decrease value Quick change: Keep key pressed.	Only blinking values can be changed
ENTER		Parameters can be stored if ↔ blinking Confirmation by STO-E in the display	

Using the keypad E82ZBC - Parameter setting

B Status display		
Display	Meaning	Explanation
RDY	Ready for operation	
IMP	Pulse inhibit active	Power outputs inhibited
Imax	Adjusted current limitation is exceeded in motor-mode or generator-mode	C0022 (motor mode) or C0023 (generator mode)
Warn	Warning active	
Trip	Fault active	
C Bargraph display		
	Value set under C0004 in % (Lenze setting: Controller load C0056)	Display range: - 180 % ... + 180 % (every bar = 20 %)
D Function bar 1		
Function	Meaning	Explanation
Set	Setpoint selection via 	Not possible when password protection is active (display = "L0c")
Disp	Display function: • User menu, memory location 1 (C0517/1), display • Display active parameter set	Active after every main connection
Code	Code selection	Display of active code in 4-digit display G
SubCode	Subcode selection	Display of active subcode number in 3-digit display H
Para	Change of parameter value of a (sub)code	Display of current value in 5-digit display I
H/L	Display of values longer than 5 digits	
	H: higher value locations L: lower value locations	Display "HI" Display "LO"
E Function bar 2		
Function	Meaning	Explanation
PS	Select parameter set 1 ... parameter set 4 for changing	<ul style="list-style-type: none"> • Display, e.g. PS 2 (F) • The parameter sets can only be activated via digital signals (configuration with C0410)
Bus	Selection of system bus (CAN) devices	The selected device can be parameterised by the current drive  = function active
Menu	Select menu	SEr List of codes in the user menu (C0517)
	The user menu is active after mains switching	ALL List of all codes
		FuncI Only specific codes for bus function modules, e.g. INTERBUS, PROFIBUS-DP and LECOM-B

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Commissioning

Using the keypad E82ZBC - Parameter setting

Change and save parameters



Note!

The menu *USER* is active after mains switching. Change to the menu *ALL* to address all codes.

Action	Keys	Result	Note
1. Plug in the keypad		[Disp] XX.XX Hz	Function [Disp] is activated. The first code in the user menu will be displayed (C0517/1, Lenze setting: C0050 = output frequency).
2. If necessary change to the menu "ALL"		2	Change to function bar 2
3.		[Menu]	
4.		<i>ALL</i>	Select menu "ALL" (list of all codes)
5.		1	Confirm selection and change to function bar 1
6. Inhibit controller		RDY IMP	Only necessary if you want to change C0002, C0148, C0174 and/or C0469
7. Set parameters		[Code]	
8.		XXXX	Select code
9.		[SubCode] 001	For codes without subcodes: Jump automatically to [Para]
10.		XXX	Select subcode
11.		[Para]	
12.		XXXXX	Set parameters
13.		<i>STO-E</i>	Confirm entry if is blinking
			Confirm entry if is not blinking; is not active
14.			Restart the "loop" at 7. to set other parameters.

Using the keypad E82ZBC - Parameter setting

Menu structure

All parameters for controller setting or monitoring are saved in codes. The codes are numbered and labelled in the documentation with a "C". Some codes store the parameters in numbered "subcodes", so that a clear parameter setting is ensured (e. g.: C0517 User menu).

The codes are described in detail in the system manual of the drive controller.

For easy operation the codes are divided in two groups:

- The menu *USER*
 - is active after every mains switching or keypad attachment during operation.
 - contains all codes for a standard application with linear V/f characteristic control (Lenze setting).
 - can be modified as required under C0517.
- The menu *ALL*
 - contains all codes.
 - shows a list of all codes in ascending order.

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Commissioning

Using the keypad E82ZBC - Parameter setting

The menu $\cup 5E_r$ - The 10 most important drive parameters

After mains switching or plugging in the keypad during operation, the 10 codes defined in code C0517 are immediately available.

In default setting the menu $\cup 5E_r$ contains all codes required for a standard application with linear V/f characteristic control.

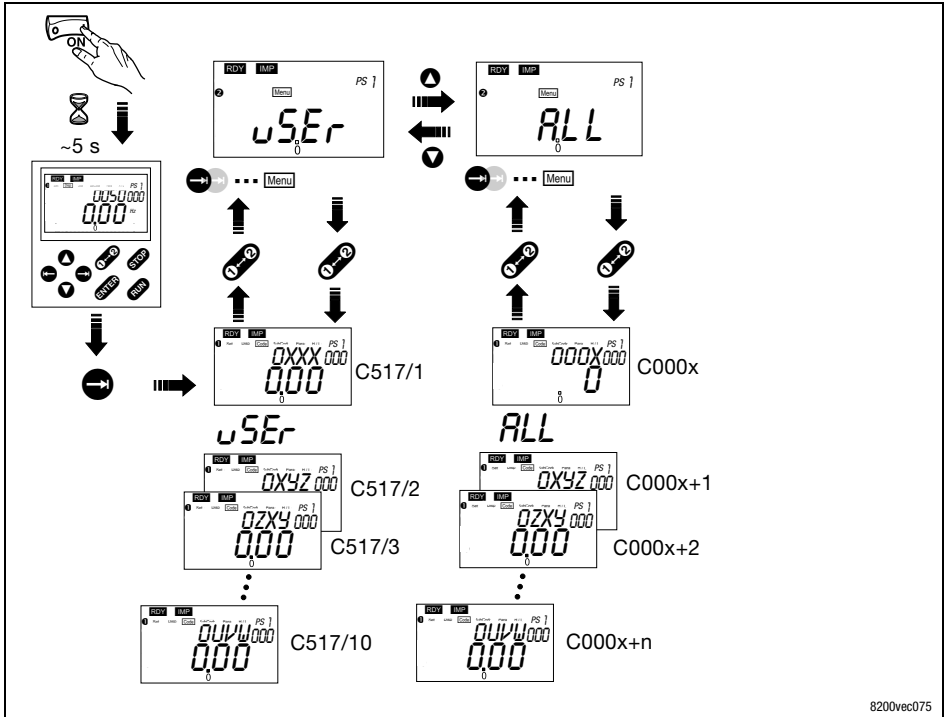
Code	Name	Lenze setting						
C0050	Output frequency		Display: Output frequency without slip compensation					
C0034	Setpoint selection range	0	Standard I/O	X3/8:	0 ... 5 V / 0 ... 10 V / 0 ... 20 mA			
			Application I/O	X3/1U:	0 ... 5 V / 0 ... 10 V	X3/2U:	0 ... 5 V / 0 ... 10 V	
C0007	Fixed configuration of digital inputs	0	E4	E3	E2	E1		
			CW/CCW		DCB	JOG2/3	JOG1/3	
			CW/CCW rotation		DC injection brake	Selection of fixed setpoints		
C0010	Minimum output frequency	0.00 Hz						
C0011	Maximum output frequency	50.00 Hz						
C0012	Acceleration time main setpoint	5.00 sec						
C0013	Deceleration time main setpoint	5.00 sec						
C0015	V/f rated frequency	50.00 Hz						
C0016	V_{\min} boost	Depending on the controller						
C0002	Parameter set management		Restore default setting; Transfer parameter sets with keypad; save, load or copy own basic settings					



Note!

Use C0002 "Parameter set transfer/restoration of default setting" to transfer configurations from one controller to the other with keypad or restore the default setting by loading the Lenze setting (e.g. if you lost track during parameter setting).

Using the keypad E82ZBC - Parameter setting



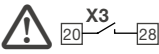
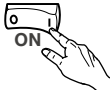







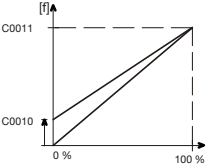
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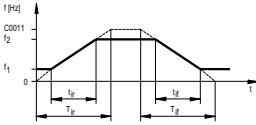
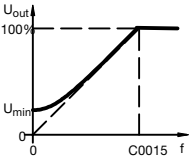
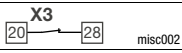

Commissioning

Using the keypad E82ZBC - Linear V/f characteristic control

The following instructions apply to controllers equipped with a standard-I/O function module and a three-phase AC motor which has been selected according to a power-based assignment.

Switch-on sequence		Note	
1.	Attach the keypad		
2.	Ensure that controller inhibit is active after mains connection.	 <p>misc001</p>	Terminal X3/28 = LOW
3.	Switch on the mains	 <p>misc002</p>	
4.	The keypad is in "Disp" mode after approx. 2 s and indicates the output frequency (C0050)		The menu <i>USER</i> is active
5.	Change to the Code mode to configure the basic settings for your drive	 	Blinking on the display: <i>0050</i>
6.	Adapt the voltage range/current range to the analog setpoint (C0034) Lenze setting: -0-, (0 ... 5 V/0 ... 10 V/0 ... 20 mA)	 	Set the DIP switch on the standard I/O to the same range (see Mounting Instructions for the standard I/O)
7.	Adapt the terminal configuration to the wiring (C0007) Lenze setting: -0-, i. e. E1: JOG1/3 fixed setpoint selection E2: JOG2/3 E3: DCB DC brake E4: CW/CCW operation	 	
8.	Set the minimum output frequency (C0010) Lenze setting: 0.00 Hz		
9.	Set the maximum output frequency (C0011) Lenze setting: 50.00 Hz		

Using the keypad E82ZBC - Linear V/f characteristic control

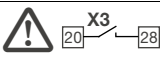
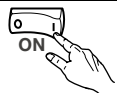





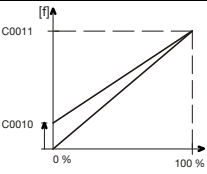
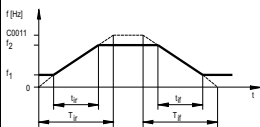
Switch-on sequence		Note	
10.	Set the acceleration time T_{ir} (C0012) Lenze setting: 5.00 s		
11.	Set the deceleration time T_{if} (C0013) Lenze setting: 5.00 s		
12.	Set the V/f-rated frequency (C0015) Lenze setting: 50.00 Hz		
13.	Set the V_{min} boost (C0016) Lenze settings: Depending on the controller type		
14.	If you want to change the settings, please go to the menu <i>ALL</i> .	activate e. g. JOG frequencies (C0037, C0038, C0039) or motor temperature monitoring (C0119)	
When you are ready with parameter setting:			
15.	Setpoint selection	e. g. via potentiometer at the terminals 7, 8, 9	
16.	Enable the controller.		Terminal X3/28 = HIGH
17.	The drive should be running now at e.g. 30 Hz		If the drive does not start, press RUN in addition.

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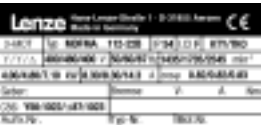

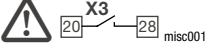
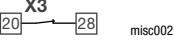
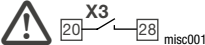
Commissioning

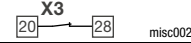

Using the keypad E82ZBC - Vector control

The following instructions apply to controllers equipped with a standard-I/O function module and a three-phase AC motor which has been selected according to a power-based assignment.

Switch-on sequence		Note	
1.	Attach the keypad		
2.	Ensure that controller inhibit is active after mains connection.	 <p>misc001</p>	Terminal X3/28 = LOW
3.	Switch on the mains	 <p>misc002</p>	
4.	The keypad is in "Disp" mode after approx. 2 s and indicates the output frequency (C0050)		The menu <i>USER</i> is active
5.	Change to the menu <i>ALL</i>		
6.	Change to the <i>Code</i> mode to configure the basic settings for your drive	 	Blinking on the display: <i>000!</i>
7.	Adapt the terminal configuration to the wiring (C0007) Lenze setting: 0, i. e. E1: JOG1/3 fixed setpoint selection E2: JOG2/3 E3: DCB DC brake E4: CW/CCW operation	 	
8.	Set the minimum output frequency (C0010) Lenze setting: 0.00 Hz		
9.	Set the maximum output frequency (C0011) Lenze setting: 50.00 Hz		
10.	Set the acceleration time T_{ir} (C0012) Lenze setting: 5.00 s		$T_{ir} = t_{ir} \cdot \frac{C0011}{f_2 - f_1}$ $t_{ir} = \text{acceleration time wanted}$
11.	Set the deceleration time T_{if} (C0013) Lenze setting: 5.00 s		$T_{if} = t_{if} \cdot \frac{C0011}{f_2 - f_1}$ $t_{if} = \text{deceleration time wanted}$

Using the keypad E82ZBC - Vector control

Switch-on sequence		Note
12.	Activate the control mode "vector control" (C0014 = 4) Lenze setting: Linear V/f characteristic control (C0014 = 2)	
13.	Adapt the voltage/current range to the analog setpoint (C0034) Lenze setting: 0, (0 ... 5 V/0 ... 10 V/0 ... 20 mA)	
14.	Enter the motor data	See motor nameplate
A	Rated motor speed (C0087) Lenze setting: 1390 rpm	
B	Rated motor current (C0088) Lenze setting: Depending on the controller	
C	Rated motor frequency (C0089) Lenze setting: 50 Hz	
D	Rated motor voltage (C0090) Lenze setting: Depending on the controller	
E	Motor-cosφ (C0091) Lenze setting: Depending on the controller	
15.	Start the motor parameter identification (C0148)	
A	Ensure that the controller is inhibited	
B	Set C0148 = 1	Press ENTER in addition
C	Enable the controller.	 <ul style="list-style-type: none"> Terminal X3/28 = HIGH The identification starts: <ul style="list-style-type: none"> The segment IMP Off The motor makes a high-pitched tone. The motor does not rotate!
D	If the segment becomes active after approx. 30 s, IMP inhibit the controller once again	 <ul style="list-style-type: none"> Terminal X3/28 = LOW Identification is completed. Calculated and stored: <ul style="list-style-type: none"> V/f rated frequency (C0015) Slip compensation (C0021) Motor stator inductance (C0092) Measured and stored: <ul style="list-style-type: none"> Motor stator resistance (C0084) = Total resistance of motor cable and motor

Switch-on sequence		Note	
16.	If necessary, adjust more parameters	Activate e. g. JOG frequencies (JOG) (C0037, C0038, C0039 or motor parameter monitoring (C0119)	
After parameter setting:			
17.	Setpoint selection	E.g. via potentiometer at terminals 7, 8, 9	
18.	Enable the controller.		Terminal X3/28 = HIGH
19.	The drive should now be running at e.g. 30 Hz		If the drive does not start, press RUN in addition

Vector control optimisation

In general, the vector control is ready for operation after the motor parameters have been identified. Vector control must only be optimised for the following drive performance:

Drive performance	Remedy
Rough motor run and motor current (C0054) > 60 % rated motor current in idle running (stationary operation)	<ol style="list-style-type: none"> 1. Reduction of motor inductance (C0092) by 10 % 2. Check of motor current under C0054 3. If the motor current (C0054) > 50 % rated motor current: <ul style="list-style-type: none"> – C0092 must be reduced until the motor current amounts to 50 % of the rated motor current – Reduce C0092 by max. 20 %!
Torque too low for frequencies $f < 5$ Hz (starting torque)	Increase of motor resistance (C0084) or increase of motor inductance (C0092)
Poor constant speed at high loads (setpoint and motor speed are not proportional).	Increase of slip compensation (C0021) Overcompensation results in drive instability!
Error messages OC1, OC3, OC4 or OC5 during acceleration times (C0012) < 1 s (drive controller is no longer able to follow the dynamic processes)	Change readjustment time of the I_{\max} controller (C0078): <ul style="list-style-type: none"> • Reduction of C0078 = I_{\max} controller becomes quicker (more dynamic) • Increase of C0078 = I_{\max} controller becomes slower ("smoother")

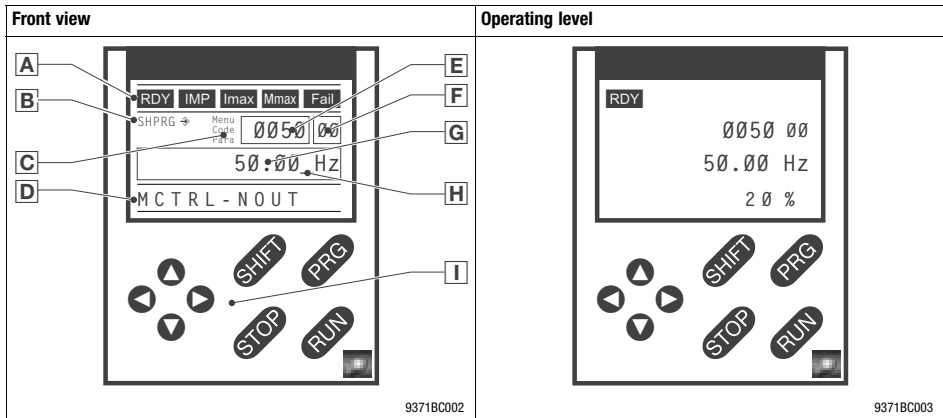
Using the keypad XT EMZ9371BC - Parameter setting

Description

The keypad is available as accessory. A full description of the keypad can be obtained from the Instructions included in the keypad delivery.

Plug in the keypad

It is possible to plug in the keypad onto the AIF interface or remove it during operation. As soon as the keypad is supplied with voltage, it carries out a self-test. The operation level indicates, when the keypad is ready for operation.



Display elements

A Status display basic device		
Display	Meaning	Explanation
RDY	Ready for operation	
IMP	Pulse inhibit active	Power outputs inhibited
I _{max}	Adjusted current limitation is exceeded in motor-mode or generator-mode	
M _{max}	Speed controller 1 in limitation	Drive torque-controlled
Fail	Active fault	

7 Commissioning

Using the keypad XT EMZ9371BC - Parameter setting

B	Adoption of parameters		
	Display	Meaning	Explanation
	→	Parameters are adopted immediately	Basic device operates immediately with the new parameter value
	SHPRG →	Parameter must be confirmed with SHIFT PRG	Basic device operates with the new parameter value, after it was confirmed
	SHPRG	In case of controller inhibit the parameter must be confirmed with SHIFT PRG	Basic device operates with the new parameter value, after the controller has been enabled
none	Display parameter	Change not possible	
C	Active level		
	Display	Meaning	Explanation
	Menu	Menu level active	Select main menu and submenus
	Code	Code level active	Select codes and subcodes
	Para	Parameter level active	Change parameters in the codes or subcodes
	none	Operation level active	Display operation parameters: <ul style="list-style-type: none"> • User menu, memory location 1 (C0517/1) • Status display C0004 in % • Active fault
D	Short text		
	Display	Meaning	Explanation
	max. 13 characters	Contents of menus, meaning of codes and parameters In operation level display of C0004 in % and active fault	
E	Number		
	Active level	Meaning	Explanation
	Menu level	Menu number	Display only active when operating with the basic device series 8200 vector or 8200 motec
Code level	four-digit code number		
F	Number		
	Active level	Meaning	Explanation
	Menu level	Submenu number	Display only active when operating with the basic device series 8200 vector or 8200 motec
Code level	two-digit subcode number		
G	Parameter value		
		Parameter value with unit	
H	Cursor		
		In the parameter level the number above the cursor can be directly changed	
I	Function keys		
		For description see the following table	

Using the keypad XT EMZ9371BC - Parameter setting

Function keys

**Note!**

Press the key combinations with **SHIFT**:

SHIFT and keep them pressed, then additionally press the second key.

Press key	Function			
	Menu level	Code level	Parameter level	Operation level
PRG		Change to the parameter level	Change to the operation level	Change to the code level
SHIFT PRG	Load predefined configurations in the menu "Short setup" ¹⁾		Accept parameter, if SHPRG → or SHPRG is displayed	
▲ ▼	Change between menu points	Change code number	Change number above cursor	
SHIFT ▲ SHIFT ▼	Change quickly between menu points	Change code quickly	Change number above cursor quickly	
▶ ◀	Change between main menu, submenus and code level		Cursor to the right Cursor to the left	
RUN	Cancel function of key STOP the LED in the key disappears			
STOP	Inhibit the controller, LED in the key lights up			
	Reset fault (TRIP-Reset):			
	1. Remove cause of malfunction			
	2. STOP press			
	3. RUN press			

1) only active when operating with the basic device series 8200 vector or 8200 motec

Change and save parameters

All parameters for controller setting or monitoring are saved in codes. The codes are numbered and labelled in the documentation with a "C". Some codes store the parameters in numbered "subcodes", so that a clear parameter setting is ensured (e. g.: C0517 User menu).

The codes are described in detail in the system manual of the drive controller.



Note!

Your settings in the menus are always stored in the parameter set 1.

If you want to store settings in the parameter set 2, 3 or 4, two menus can be used:

- In menu 2 "Code list" it is possible to access to all available codes.
- In menu 7 "Param managm" it is possible to copy parameter set 1 into the other parameter sets.
 - **Please note, that with copying the "own basic setting" will be overwritten by the settings of parameter set 1!**

Step		Keys	Action
1.	Select menu	⬅ ➡ ⬆ ⬇	Select the desired menu with arrow keys
2.	Change to the code level	➡	Display of first code in the menu
3.	Select code or subcode	⬇ ⬆	Display of current parameter value
4.	Change to parameter level	PRG	
5.	If SHPRG is displayed, inhibit controller	STOP	The drive is idling
6.	Change parameters	A ➡ ➡	Move cursor under the digit to be changed
		B ⬇ ⬆	Change digit
		SHIFT ⬇ SHIFT ⬆	Change digit quickly
7.	Accept changed parameter		
	Display of SHPRG or SHPRG ⇌	SHIFT PRG	Confirm change to accept parameter Display "OK"
	Display ⇌	-	The parameter was accepted immediately
8.	If necessary, enable controller	RUN	The drive should be running again
9.	Change to the code level		
	A	PRG	Display of operation level
	B	PRG	Display of the code with changed parameters
10.	Change further parameters		Restart "loop" at step 1. or step 3.

Using the keypad XT EMZ9371BC - Parameter setting

Menu structure

Main menu		Submenus		Description
No.	Display	No.	Display	
1	USER menu			Defined codes in C0517
2	Code list			All available codes
		2.1	ALL	All available codes in ascending order (C0001 ... C7999)
		2.2	Para set 1	Codes in parameter set 1 (C0001 ... C1999)
		2.3	Para set 2	Codes in parameter set 2 (C2001 ... C3999)
		2.4	Para set 3	Codes in parameter set 3 (C4001 ... C5999)
		2.5	Para set 4	Codes in parameter set 4 (C6001 ... C7999)
3	Remote para	See description of the keypad		Remote parameter setting Only active with function module system bus (CAN)
4	Quick start			Quick commissioning of standard applications
		4.1	Keypad quick	Function check Linear V/f-characteristic control Frequency setpoint via keypad
		4.2	V/f quick	Linear V/f-characteristic control Frequency setpoint selectable analogically via potentiometer, fixed setpoints (JOG) selectable via terminal
		4.3	VectorCtrl qu	Vector control Frequency setpoint selectable analogically via potentiometer, fixed setpoints (JOG) selectable via terminal
5	Short setup	See description of the keypad		Quick configuration of predefined applications
6	Diagnostic			Diagnostics
		6.1	Fault history	Error analysis with history buffer
		6.2	Status words	Display of status words
		6.3	Monit drive	Display codes in order to monitor drive
		6.4	Monit FIF	Display codes in order to monitor a field bus function module
7	Param managm			Parameter set management
		7.1	Load/Store	Parameter set transfer, restore delivery status
		7.2	Copy PAR1 ->2	Copy parameter set 1 into parameter set 2
		7.3	Copy PAR1 ->3	Copy parameter set 1 into parameter set 3
		7.4	Copy PAR1 ->4	Copy parameter set 1 into parameter set 4

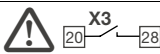
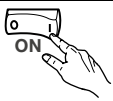
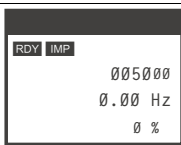
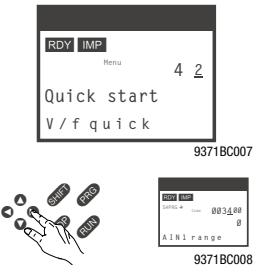
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Commissioning**Using the keypad XT EMZ9371BC - Parameter setting**

Main menu		Submenus		Description
No.	Display	No.	Display	
8	Main FB	See description of the keypad		Configuration of function blocks
9	Controller	See description of the keypad		Configuration of internal control parameters
10	Terminal I/O	See description of the keypad		Linkage of inputs and outputs with internal signals and display of the signal levels at the terminals
11	LECOM/AIF	See description of the keypad		Configuration of operation with communication modules
12	FIF system bus	See description of the keypad		Configuration of operation with function module system bus (CAN) and display of the contents of the CAN objects Only active with function module system bus (CAN)
13	FIF-field bus	See description of the keypad		Configuration of operation with field bus function modules Only active with fieldbus function module
14	Motor/Feedb.			Input of motor data, configuration of speed feedback
		14.1	Motor data	Motor data
		14.2	Feedback DFIN	Frequency input, encoder
15	Identify			Identification
		15.1	Drive	Software version controller
		15.2	Keypad	Software version keypad
		15.3	FIF module	Software version and function module type

Using the keypad XT EMZ9371BC - Linear V/f characteristic control

The following instructions apply to controllers equipped with a standard-I/O function module and a three-phase AC motor which has been selected according to a power-based assignment.

Switch-on sequence		Note
1.	Attach the keypad	
2.	Ensure that controller inhibit is active after mains connection.	 misc001
3.	Switch on the mains	 misc002
4.	The keypad is in the operation level and indicates the output frequency (C0050) and device load (C0056)	 9371BC004
5.	For quick commissioning select the menu "Quick start"	The submenu "V/f quick" contains the codes you need for the commissioning of a standard application. The digital inputs are configured in the Lenze setting: X3/E1, X3/E2: Activation of JOG setpoints X3/E3: Activation of DC-injection brake (DCB) X3/E4: CW rotation/CCW rotation
A	Change to the menu level with PRG	
B	Change to the menu "Quick start" and there select the submenu "V/f quick" with ▲ ▲ ▲ ▲	
C	Change to the code level in order to parameterise you drive with ▶	 9371BC007 9371BC008
6.	Adapt the voltage range/current range to the analog setpoint (C0034) Lenze setting: 0, (0 ... 5 V/0 ... 10 V/0 ... 20 mA)	Set the DIP switch on the standard I/O to the same range (see Mounting Instructions for the standard I/O)
7.	If necessary, adapt the JOG setpoints.	
A	JOG 1 (C0037) Lenze setting: 20 Hz	Activation: X3/E1 = HIGH, X3/E2 = LOW
B	JOG 2 (C0038) Lenze setting: 30 Hz	Activation: X3/E1 = LOW, X3/E2 = HIGH
C	JOG 3 (C0039) Lenze setting: 40 Hz	Activation: X3/E1 = HIGH, X3/E2 = HIGH

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Commissioning

Using the keypad XT EMZ9371BC - Linear V/f characteristic control

Switch-on sequence			Note
8.	Set the minimum output frequency (C0010) Lenze setting: 0.00 Hz		
9.	Set the maximum output frequency (C0011) Lenze setting: 50.00 Hz		
10.	Set the acceleration time T_{ir} (C0012) Lenze setting: 5.00 s		$T_{ir} = t_{ir} \cdot \frac{C0011}{f_2 - f_1}$ $t_{ir} = \text{acceleration time wanted}$
11.	Set the deceleration time T_{if} (C0013) Lenze setting: 5.00 s		$T_{if} = t_{if} \cdot \frac{C0011}{f_2 - f_1}$ $t_{if} = \text{deceleration time wanted}$
12.	Set the V/f-rated frequency (C0015) Lenze setting: 50.00 Hz		
13.	Set the V_{min} boost (C0016) Lenze setting: dependent on the controller type		The Lenze setting is suitable for all common applications
14.	Activate the motor temperature monitoring (C0119) if a PTC or thermal contact is connected to the terminal X2.2. Lenze setting: switched-off		Setting possibilities: (□) 145)
15.	Setpoint selection	e. g. via potentiometer at the terminals 7, 8, 9	
16.	Enable the controller.		Terminal X3/28 = HIGH
17.	The drive should be running now		CW rotation: X3/E4 = LOW CCW rotation: X3/E4 = HIGH If the drive does not start, press RUN

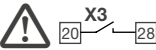
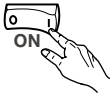
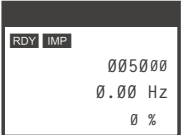





Note!

In the menu "Diagnostic" the most important drive parameters can be monitored

Using the keypad XT EMZ9371BC - Vector control

The following instructions apply to controllers equipped with a standard-I/O function module and a three-phase AC motor which has been selected according to a power-based assignment.

Switch-on sequence			Note
1.	Attach the keypad		
2.	Ensure that controller inhibit is active after mains connection.	 misc001	Terminal X3/28 = LOW
3.	Switch on the mains	 misc002	
4.	The keypad is in the operation level after approx. 3 sec and indicates the output frequency (C0050) and device load (C0056)	 9371BC004	
5.	For quick commissioning select the menu "Quick start"		The submenu "VectorCtrl qu" contains the codes you need for the commissioning of a standard application. The digital inputs are configured in the Lenze setting: X3/E1, X3/E2: Activation of JOG setpoints X3/E3: Activation of DC-injection brake (DCB) X3/E4: CW rotation/CCW rotation
A	Change to the menu level with PRG	 9371BC006	
B	Change to the menu "Quick start" and there select the submenu "VectorCtrl qu" with ▲ ▲ ▲ ▲ ▲		
C	Change to the code level in order to parameterise you drive with ▶	 9371BC008	
6.	Adapt the voltage range/current range to the analog setpoint (C0034) Lenze setting: 0, (0 ... 5 V/0 ... 10 V/0 ... 20 mA)		Set the DIP switch on the standard I/O to the same range (see Mounting Instructions for the standard I/O)
7.	If necessary, adapt the JOG setpoints.		
A	JOG 1 (C0037) Lenze setting: 20 Hz		Activation: X3/E1 = HIGH, X3/E2 = LOW
B	JOG 2 (C0038) Lenze setting: 30 Hz		Activation: X3/E1 = LOW, X3/E2 = HIGH
C	JOG 3 (C0039) Lenze setting: 40 Hz		Activation: X3/E1 = HIGH, X3/E2 = HIGH

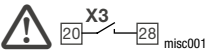
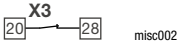
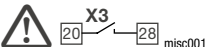

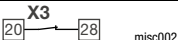
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Commissioning

Using the keypad XT EMZ9371BC - Vector control

Switch-on sequence			Note
8.	Set the minimum output frequency (C0010) Lenze setting: 0.00 Hz		
9.	Set the maximum output frequency (C0011) Lenze setting: 50.00 Hz		
10.	Set the acceleration time T_{ir} (C0012) Lenze setting: 5.00 s		$T_{ir} = t_{ir} \cdot \frac{C0011}{f_2 - f_1}$ $t_{ir} = \text{acceleration time wanted}$
11.	Set the deceleration time T_{if} (C0013) Lenze setting: 5.00 s		$T_{if} = t_{if} \cdot \frac{C0011}{f_2 - f_1}$ $t_{if} = \text{deceleration time wanted}$
12.	Set the control mode "Vector control" (C0014 = 4) Lenze setting: Linear V/f characteristic control (C0014 = 2)		
13.	Enter the motor data		See motor nameplate
A	Rated motor speed (C0087) Lenze setting: 1390 rpm		
B	Rated motor current (C0088) Lenze setting: Depending on the controller		Enter the value for the motor connection type (star/delta) selected!
C	Rated motor frequency (C0089) Lenze setting: 50 Hz		
D	Rated motor voltage (C0090) Lenze setting: Depending on the controller		Enter the value for the motor connection type (star/delta) selected!
E	Motor-cosφ (C0091) Lenze setting: Depending on the controller		

Using the keypad XT EMZ9371BC - Vector control

Switch-on sequence			Note
14.	Start the motor parameter identification (C0148)		Only when the motor is cold!
A	Ensure that the controller is inhibited		Terminal X3/28 = LOW
B	Set C0148 = 1	SHIFT PRC press	
C	Enable the controller.		<ul style="list-style-type: none"> Terminal X3/28 = HIGH The identification starts: <ul style="list-style-type: none"> The segment IMP Off The motor makes a high-pitched tone. The motor does not rotate!
D	If the segment becomes active after approx. 30 s, IMP inhibit the controller once again.		<ul style="list-style-type: none"> Terminal X3/28 = LOW Identification is completed. Calculated and stored: <ul style="list-style-type: none"> V/f rated frequency (C0015) Slip compensation (C0021) Motor stator inductance (C0092) Measured and stored: <ul style="list-style-type: none"> Motor stator resistance (C0084) = Total resistance of motor cable and motor
15.	Activate the motor temperature monitoring (C0119), if a PTC or thermal contact is connected to the terminal X2.2 Lenze setting: switched-off		Setting possibilities:  145)
16.	Setpoint selection	e. g. via potentiometer at the terminals 7, 8, 9	
17.	Enable the controller.		Terminal X3/28 = HIGH
18.	The drive should be running now		CW rotation: X3/E4 = LOW CCW rotation: X3/E4 = HIGH If the drive does not start, press RUN

**Note!**

In the menu "Diagnostic" the most important drive parameters can be monitored

Vector control optimisation

In general, the vector control is ready for operation after the motor parameters have been identified. Vector control must only be optimised for the following drive performance:

Drive performance	Remedy
Rough motor run and motor current (C0054) > 60 % rated motor current in idle running (stationary operation)	<ol style="list-style-type: none"> 1. Reduction of motor inductance (C0092) by 10 % 2. Check of motor current under C0054 3. If the motor current (C0054) > 50 % rated motor current: <ul style="list-style-type: none"> – C0092 must be reduced until the motor current amounts to 50 % of the rated motor current – Reduce C0092 by max. 20 %!
Torque too low for frequencies $f < 5$ Hz (starting torque)	Increase of motor resistance (C0084) or increase of motor inductance (C0092)
Poor constant speed at high loads (setpoint and motor speed are not proportional).	Increase of slip compensation (C0021) Overcompensation results in drive instability!
Error messages OC1, OC3, OC4 or OC5 during acceleration times (C0012) < 1 s (drive controller is no longer able to follow the dynamic processes)	Change readjustment time of the I_{\max} controller (C0078): <ul style="list-style-type: none"> • Reduction of C0078 = I_{\max} controller becomes quicker (more dynamic) • Increase of C0078 = I_{\max} controller becomes slower ("smoother")

The most important codes for commissioning

**Note!**

- The following table describes in detail the codes mentioned in the examples for commissioning!
- Do not change codes, the meaning of which is unknown to you! All codes are described in detail in the System Manual.

How to read the code table

Column	Abbreviation		Meaning	
Code	Cxxxx		Code Cxxxx	<ul style="list-style-type: none"> • The parameter value of a code can be different in every parameter set. • Parameter value accepted immediately (ONLINE)
		1	Subcode 1 of Cxxxx	
		2	Subcode 2 of Cxxxx	
		*		Parameter value of the code is the same in all parameter sets
		ENTER		Keypad E82ZBC Changed parameters will be accepted after pressing ENTER
				Keypad XT EMZ9371BC Changed parameters will be accepted after pressing SHIFT PRC
		STOP		Keypad E82ZBC Changed parameters will be accepted after pressing ENTER if the controller is inhibited
			Keypad XT EMZ9371BC Changed parameters will be accepted after pressing SHIFT PRC if the controller is inhibited	
	(A)		Code, subcode or selection are only available when using an Application-I/O	
	USER		With Lenze setting the code is available in the USER-menu	
Name			Name of the code	
Lenze			Lenze setting (value at delivery or after restoring the delivery state with C0002)	
	→		Further information can be obtained from "IMPORTANT"	
Selection	1	{%}	99	Min. value {unit} Max. value
IMPORTANT	-		Brief, important explanations	

Code		Possible settings		IMPORTANT		
No.	Name	Lenze	Selection			
C0002* STOP 5Er	Parameter set management	0	0 Ready	PAR1 ... PAR4: <ul style="list-style-type: none"> Parameter sets of the controller PAR1 ... PAR4 also contain parameters for Standard-I/O, Application-I/O, AS interface or system bus (CAN) FPAR1: <ul style="list-style-type: none"> Module-specific parameter set of the fieldbus function modules INTERBUS, PROFIBUS-DP, LECOM-B, DeviceNet/CANopen FPAR1 is saved in the function module 		
		Restorage of default setting	1		Lenze setting ⇔ PAR1	Restorage of default setting in the selected parameter set
			2		Lenze setting ⇔ PAR2	
			3		Lenze setting ⇔ PAR3	
			4		Lenze setting ⇔ PAR4	
			31		Lenze setting ⇔ FPAR1	Restorage of default setting in the fieldbus function module
			61		Lenze setting ⇔ PAR1 + FPAR1	Restorage of default setting in the selected parameter set of the controller and the fieldbus function module
			62		Lenze setting ⇔ PAR2 + FPAR1	
			63		Lenze setting ⇔ PAR3 + FPAR1	
		64	Lenze setting ⇔ PAR4 + FPAR1			
C0002* STOP 5Er (cont.)	Parameter set transfer using the keypad			Use the keypad to transfer parameter sets to other controllers. During transfer the parameters cannot be accessed via other channels!		
		70	Keypad ⇔ Controller With function module Application-I/O, INTERBUS, PROFIBUS-DP, LECOM-B, DeviceNet/CANopen		All available parameter sets (PAR1 ... PAR4, and FPAR1) are overwritten with the corresponding keypad data	
		10	With all other function modules			







The most important codes for commissioning

Code		Possible settings		IMPORTANT		
No.	Name	Lenze	Selection			
C0002* STOP 5Er (cont.)	Parameter set transfer using the keypad		71	Keypad ⇔ PAR1 (+ FPAR1) With function module Application-I/O, INTERBUS, PROFIBUS-DP, LECOM-B, DeviceNet/CANopen	Overwrite selected parameter set and, if necessary, FPAR1 with the corresponding keypad data	
			11	With all other function modules		
			72	Keypad ⇔ PAR2 (+ FPAR1) With function module Application-I/O, INTERBUS, PROFIBUS-DP, LECOM-B, DeviceNet/CANopen		
			12	With all other function modules		
			73	Keypad ⇔ PAR3 (+ FPAR1) With function module Application-I/O, INTERBUS, PROFIBUS-DP, LECOM-B, DeviceNet/CANopen		
			13	With all other function modules		
			74	Keypad ⇔ PAR4 (+ FPAR1) With function module Application-I/O, INTERBUS, PROFIBUS-DP, LECOM-B, DeviceNet/CANopen		
			14	With all other function modules		
			80	Controller ⇔ Keypad With function module Application-I/O, INTERBUS, PROFIBUS-DP, LECOM-B, DeviceNet/CANopen		All available parameter sets (PAR1 ... PAR4, and FPAR1) are copied to the keypad
			20	With all other function modules		
40	Keypad ⇔ Function module Only with function module INTERBUS, PROFIBUS-DP, LECOM-B, DeviceNet/CANopen	Overwrite the module-specific parameter set FPAR1 only				
50	Function module ⇔ Keypad Only with function module INTERBUS, PROFIBUS-DP, LECOM-B, DeviceNet/CANopen	Copy the module-specific parameter set FPAR1 only				

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Commissioning

The most important codes for commissioning

Code		Possible settings		IMPORTANT
No.	Name	Lenze	Selection	
C0002*  5Er (cont.)	Saving of own settings		9 PAR1 ⇒ Own settings	<p>You can save your own basic settings for a controller (e.g. machine delivery status):</p> <ol style="list-style-type: none"> 1. Ensure that parameter set 1 is active 2. Controller inhibit 3. Set C0003 = 3, acknowledge with  4. Set C0002 = 9, acknowledge with  5. Set C0003 = 1, acknowledge with  6. Enable the controller.
C0002*  5Er (cont.)	Loading/copying of your own basic settings			Using this function, PAR1 can be copied to parameter sets PAR2 ... PAR4
			5 Own settings ⇒ PAR1	Restorage of own basic setting in the selected parameter set
			6 Own settings ⇒ PAR2	
			7 Own settings ⇒ PAR3	
		8 Own settings ⇒ PAR4		
C0003* 	Non-volatile parameter saving	1	0 Parameter not saved in EEPROM	Data loss after mains disconnection
			1 Parameter always saved in EEPROM	<ul style="list-style-type: none"> • Active after every mains connection • Cyclic parameter changes via bus module are not allowed.
			3 Own settings saved in EEPROM	Subsequently save parameter set 1 as own basic setting with C0002 = 9

The most important codes for commissioning

Code		Possible settings				IMPORTANT	
No.	Name	Lenze	Selection				
C0007 ENTER SEr	Fixed configuration of digital inputs					<p>Change under C0007 will be copied to the corresponding subcode of C0410. Free configuration under C0410 sets C0007 = 255!</p> <ul style="list-style-type: none"> • CW/CCW = CW rotation/CCW rotation • DCB = DC injection brake • QSP = Quick stop • PAR = Parameter set changeover (PAR1 ↔ PAR2) <ul style="list-style-type: none"> – PAR1 = LOW, PAR2 = HIGH – The terminal must be assigned to the function "PAR" in PAR1 and PAR2. – Configurations with "PAR" are only allowed if C0988 = 0 • TRIP set = external fault 	
		0	E4	E3	E2		E1
		0	CW/CCW	DCB	JOG2/3		JOG1/3
		1	CW/CCW	PAR	JOG2/3		JOG1/3
		2	CW/CCW	QSP	JOG2/3		JOG1/3
		3	CW/CCW	PAR	DCB		JOG1/3
		4	CW/CCW	QSP	PAR		JOG1/3
		5	CW/CCW	DCB	TRIP set		JOG1/3
		6	CW/CCW	PAR	TRIP set		JOG1/3
		7	CW/CCW	PAR	DCB		TRIP set
		8	CW/CCW	QSP	PAR		TRIP set
C0007 ENTER SEr (cont.)			E4	E3	E2	E1	<ul style="list-style-type: none"> • JOG1/3, JOG2/3 = Selection of fixed setpoints <ul style="list-style-type: none"> – Activate JOG1: JOG1/3 = HIGH; JOG2/3 = LOW – Activate JOG2: JOG1/3 = LOW; JOG2/3 = HIGH – Activate JOG3: JOG1/3 = HIGH; JOG2/3 = HIGH • UP/DOWN = motor potentiometer functions
		11	CW/CCW	DCB	UP	DOWN	
		12	CW/CCW	PAR	UP	DOWN	
		13	CW/CCW	QSP	UP	DOWN	
		14	CCW/QSP	CW/QSP	DCB	JOG1/3	
		15	CCW/QSP	CW/QSP	PAR	JOG1/3	
		16	CCW/QSP	CW/QSP	JOG2/3	JOG1/3	
		17	CCW/QSP	CW/QSP	PAR	DCB	
		18	CCW/QSP	CW/QSP	PAR	TRIP set	
		19	CCW/QSP	CW/QSP	DCB	TRIP set	

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Commissioning

The most important codes for commissioning

Code		Possible settings				IMPORTANT			
No.	Name	Lenze	Selection						
C0007 ENTER 5Er (cont.)				E4	E3	E2	E1	<ul style="list-style-type: none"> • H/Re = Hand/remote changeover • PCTRL1-I-OFF = Switch off process controller I component • DFIN1-ON = Digital frequency input 0 ... 10 kHz • PCTRL1-OFF = Switch off process controller 	
			20	CCW/QSP	CW/QSP	TRIP set	JOG1/3		
			21	CCW/QSP	CW/QSP	UP	DOWN		
			22	CCW/QSP	CW/QSP	UP	JOG1/3		
			23	H/Re	CW/CCW	UP	DOWN		
			24	H/Re	PAR	UP	DOWN		
			25	H/Re	DCB	UP	DOWN		
			26	H/Re	JOG1/3	UP	DOWN		
			27	H/Re	TRIP set	UP	DOWN		
			28	JOG2/3	JOG1/3	PCTRL1-I-OFF	DFIN1-ON		
			29	JOG2/3	DCB	PCTRL1-I-OFF	DFIN1-ON		
30	JOG2/3	QSP	PCTRL1-I-OFF	DFIN1-ON					
C0007 ENTER 5Er (cont.)				E4	E3	E2	E1		
			31	DCB	QSP	PCTRL1-I-OFF	DFIN1-ON		
			32	TRIP set	QSP	PCTRL1-I-OFF	DFIN1-ON		
			33	QSP	PAR	PCTRL1-I-OFF	DFIN1-ON		
			34	CW/QSP	CCW/QSP	PCTRL1-I-OFF	DFIN1-ON		
			35	JOG2/3	JOG1/3	PAR	DFIN1-ON		
			36	DCB	QSP	PAR	DFIN1-ON		
			37	JOG1/3	QSP	PAR	DFIN1-ON		
			38	JOG1/3	PAR	TRIP set	DFIN1-ON		
			39	JOG2/3	JOG1/3	TRIP set	DFIN1-ON		
			40	JOG1/3	QSP	TRIP set	DFIN1-ON		

The most important codes for commissioning

Code		Possible settings				IMPORTANT		
No.	Name	Lenze	Selection					
C0007 ENTER ↷SEr (cont.)				E4	E3	E2	E1	
			41	JOG1/3	DCB	TRIP set	DFIN1-ON	
			42	QSP	DCB	TRIP set	DFIN1-ON	
			43	CW/CCW	QSP	TRIP set	DFIN1-ON	
			44	UP	DOWN	PAR	DFIN1-ON	
			45	CW/CCW	QSP	PAR	DFIN1-ON	
			46	H/Re	PAR	QSP	JOG1/3	
			47	CW/QSP	CCW/QSP	H/Re	JOG1/3	
			48	PCTRL1-OFF	DCB	PCTRL1-I-OFF	DFIN1-ON	
			49	PCTRL1-OFF	JOG1/3	QSP	DFIN1-ON	
			50	PCTRL1-OFF	JOG1/3	PCTRL1-I-OFF	DFIN1-ON	
			51	DCB	PAR	PCTRL1-I-OFF	DFIN1-ON	
	255	Free configuration under C0410				Only display Do not change C0007 since settings under C0410 can be lost		
C0010 ↷SEr	Minimum output frequency	0.00	0.00 → 14.5 Hz	{0.02 Hz}	650.00	<ul style="list-style-type: none"> • C0010 is not effective with bipolar setpoint selection (-10 V ... + 10 V) • C0010 only limits the analog input 1 		
C0011 ↷SEr	Maximum output frequency	50.00	7.50 → 87 Hz	{0.02 Hz}	650.00	→ Speed setting range 1 : 6 for Lenze geared motors: Setting absolutely required for operation with Lenze geared motors.		
C0012 ↷SEr	Acceleration time main setpoint	5.00	0.00	{0.02 s}	1300.00	Reference: frequency change 0 Hz ... C0011 <ul style="list-style-type: none"> • Additional setpoint ⇔ C0220 • Acceleration times can be activated via digital signals ⇔ C0101 		
C0013 ↷SEr	Deceleration time main setpoint	5.00	0.00	{0.02 s}	1300.00	Reference: frequency change C0011 ... 0 Hz <ul style="list-style-type: none"> • Additional setpoint ⇔ C0221 • Deceleration times can be activated via digital signals ⇔ C0103 		

Code		Possible settings			IMPORTANT	
No.	Name	Lenze	Selection			
C0014 <small>ENTER</small>	Operating mode	2	2	V/f characteristic control V ~ f (Linear characteristic with constant V _{min} boost)	<ul style="list-style-type: none"> Commissioning without motor parameter identification possible Benefit of identification with C0148: <ul style="list-style-type: none"> – Improved smooth running at low speed – V/f rated frequency (C0015) and slip (C0021) are calculated and stored. They do not have to be entered 	
			3	V/f characteristic control V ~ f ² (Square-law characteristic with constant V _{min} boost)		
			4	Vector control		
			5	Sensorless torque control with speed limitation <ul style="list-style-type: none"> Torque setpoint via C0412/6 Speed limitation via setpoint 1 (NSET1-N1), if C0412/1 is assigned, if not via max. frequency (C0011) 	For initial selection enter the motor data and identify the motor parameters with C0148 Otherwise commissioning is not possible	
C0015 <small>SEr</small>	V/f rated frequency	50.00	7.50	{0.02 Hz}	960.00	<ul style="list-style-type: none"> C0015 is calculated and stored under C0148 when the motor parameters are identified Settings applies to all possible mains voltages
C0016 <small>SEr</small>	U _{min} boost	→	0.00	{0.01 %}	40.00	→ Depending on the controller Setting applies to all mains voltages permitted
C0034* <small>ENTER</small> <small>SEr</small>	Setpoint selection range Standard-I/O (X3/8)		0	0	Unipolar voltage 0 ... 5 V / 0 ... 10 V Current 0 ... 20 mA	
			1	Current 4 ... 20 mA	Changing the direction of rotation is only possible with a digital signal.	
			2	Bipolar voltage -10 V ... +10 V	<ul style="list-style-type: none"> Minimum output frequency (C0010) not effective Individual adjustment of offset and gain 	
			3	Current 4 ... 20 mA open-circuit monitored	TRIP Sd5, if I < 4 mA Changing the direction of rotation is only possible with a digital signal.	

The most important codes for commissioning

Code		Possible settings			IMPORTANT	
No.	Name	Lenze	Selection			
C0034* ENTER (A) 5Er	Setpoint selection range Application I/O				Observe the jumper setting of the function module!	
1	X3/1U, X3/1I	0	0	Unipolar voltage 0 ... 5 V / 0 ... 10 V		
2	X3/2U, X3/2I		1	Bipolar voltage -10 V ... +10 V	Minimum output frequency (C0010) not effective	
			2	Current 0 ... 20 mA		
			3	Current 4 ... 20 mA	Changing the direction of rotation is only possible with a digital signal.	
			4	Current 4 ... 20 mA open-circuit monitored	Changing the direction of rotation is only possible with a digital signal. TRIP Sd5 if I < 4 mA	
C0037	JOG1	20.00	-650.00	{0.02 Hz}	650.00	JOG = fixed setpoint
C0038	JOG2	30.00	-650.00	{0.02 Hz}	650.00	Additional fixed setpoints ⇔ C0440
C0039	JOG3	40.00	-650.00	{0.02 Hz}	650.00	
C0087	Rated motor speed	→	300	{1 rpm}	16000	→ Depending on the controller
C0088	Rated motor current	→	0.0	{0.1 A}	650.0	→ Depending on the controller 0.0 ... 2.0 x rated output current of the controller
C0089	Rated motor frequency	50	10	{1 Hz}	960	
C0090	Rated motor voltage	→	50	{1 V}	500	→ 230 V with 230 V controllers, 400 V with 400 V controllers
C0091	Motor cos φ	→	0.40	{0.1}	1.0	→ Depending on the controller
C0119 ENTER	Configuration of motor temperature monitoring (PTC input) / earth fault detection	0	0	PTC input not active	Earth fault detection active	<ul style="list-style-type: none"> Signal output configuration under C0415 If several parameter sets are used, the monitoring must be separately adjusted for each parameter set. Deactivate the earth fault detection, if it has been activated unintentionally. If the earth fault detection is active, the motor starts after controller enable with a delay of approx. 40 ms.
1			PTC input active, TRIP set			
2			PTC input active, Warning set	Earth fault detection inactive		
3			PTC input not active			
4			PTC input active, TRIP set			
5			PTC input active, Warning set			

Code		Possible settings			IMPORTANT	
No.	Name	Lenze	Selection			
C0140*	Additive frequency setpoint (NSET1-NADD)	0.00	-650.00	{0.02 Hz}	650.00	<ul style="list-style-type: none"> • Selection via function [Set] of the keypad or the parameter channel • Is added to main setpoint • Value is stored when switching the mains or removing the keypad
C0148* STOP	Motor parameter identification	0	0	Ready	<p>Only when the motor is cold!</p> <ol style="list-style-type: none"> 1. Inhibit controller, wait until drive is at standstill 2. Enter the correct motor data under C0087, C0088, C0089, C0090, C0091 (see motor nameplate). 3. Set C0148 = 1 by ENTER 4. Enable controller The identification <ul style="list-style-type: none"> – starts, IMP goes off – the motor makes a high-pitched tone, but does not rotate! – takes approx. 30 s – is completed when IMP is on again 5. Inhibit controller 	
			1	Start identification <ul style="list-style-type: none"> • V/f-rated frequency (C0015), slip compensation (C0021) and motor stator inductivity (C0092) are calculated and saved. • The motor stator resistance (C0084) = total resistance of motor cable and motor is measured and saved 		
C0517* ENTER	User menu				<ul style="list-style-type: none"> • After mains switching or when using the function [Disp] the code from C0517/1 will be displayed. • In Lenze setting, the user menu contains the most important codes for starting-up the control mode "V/f characteristic control with linear characteristic" • When the password protection is activated, only the codes entered under C0517 are freely accessible. • Enter the required code numbers in the subcodes. <p>Codes, which are only active when being used together with an Application-I/O, cannot be entered!</p>	
1	Memory 1	50	C0050	Output frequency (MCTRL1-NOUT)		
2	Memory 2	34	C0034	Analog setpoint selection range		
3	Memory 3	7	C0007	Fixed configuration - digital input signals		
4	Memory 4	10	C0010	Minimum output frequency		
5	Memory 5	11	C0011	Maximum output frequency		
6	Memory 6	12	C0012	Acceleration time main setpoint		
7	Memory 7	13	C0013	Deceleration time main setpoint		
8	Memory 8	15	C0015	V/f rated frequency		
9	Memory 9	16	C0016	U _{min} boost		
10	Memory 10	2	C0002	Parameter set transfer		

Fault	Cause	Remedy
Motor does not rotate	DC-bus voltage too low (Red LED is blinking every 0.4 s; keypad display <i>LL</i>)	Check mains voltage
	Controller inhibited (Green LED is blinking, keypad display: IMP)	Remove the controller inhibit, controller inhibit can be set through several sources
	Automatic start inhibited (C0142 = 0 or 2)	LOW-HIGH edge at X3/28 If necessary, correct start condition (C0142)
	DC injection brake (DCB) active	Deactivate DC injection brake
	Mechanical motor brake is not released	Manual or electrical release of mechanical motor brake
	Quick stop (QSP) active (keypad display: IMP)	Remove quick stop
	Setpoint = 0	Select setpoint
	JOG setpoint activated and JOG frequency = 0	Select JOG setpoint (C0037 ... C0039)
	Active fault	Eliminate fault
	Wrong parameter set active	Change to correct parameter set via terminal
	Operating mode C0014 = -4-, -5-, but no motor parameter identification executed	Motor parameter identification (C0148)
	Under C0410 several functions which exclude each other, are assigned to the same signal source.	Correct configuration in C0410
	Use of internal voltage source X3/20 for function modules Standard I/O, INTERBUS, PROFIBUS-DP or LECOM-B (RS485): Jumper between X3/7 and X3/39 is missing	Jumper terminals
Motor does not rotate smoothly	Defective motor cable	Check motor cable
	Maximum current set too low (C0022, C0023)	Adapt settings to the application
	Motor underexcited or overexcited	Check parameter setting (C0015, C0016, C0014)
	C0084, C0087, C0088, C0089, C0090, C0091 and/or C0092 are not adapted to the motor data	Manual adaptation or identification of motor parameters (C0148)
Current consumption of motor too high	Setting of C0016 too high	Correct setting
	Setting of C0015 too low	Correct setting
	C0084, C0087, C0088, C0089, C0090, C0091 and/or C0092 are not adapted to the motor data	Manual adaptation or identification of motor parameters (C0148)
Motor rotates, setpoints are "0"	With the function Set of the keypad a setpoint has been selected.	Set the setpoint to "0" via C0140 = 0

8

Fault detection and elimination**Malfunction of the drive**

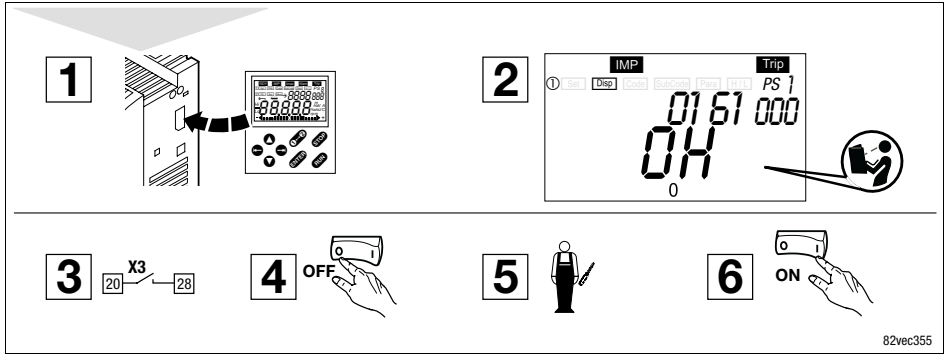
Fault	Cause	Remedy
Motor parameter identification stops with error LP1	Motor too small compared with rated device power	
	DC injection brake active via terminal	
Unacceptable drive response with vector control	various	Optimise vector control (☐ 124)
Torque dip in the field weakening range	various	Contact Lenze
Stalling of the motor when operating in the field weakening range		

LED's at the drive controller (status display)

LED		Operating status	
red ①	green ②		
off	on	Controller enabled	
on	on	Mains switched on and automatic start inhibited	
off	slowly blinking	Controller inhibited	
off	fast blinking	Motor parameter identification	
fast blinking	off	Undervoltage switch-off	
slowly blinking	off	Fault active, check under C0161	

8 Fault detection and elimination

Fault messages



Reset the drive controller in this way if a fault occurs (TRIP reset):

1. Plug the keypad onto the AIF interface during operation.
2. Read and take down fault message on the keypad display.
3. Inhibit controller.
4. Disconnect controller from the mains.
5. Carry out a fault analysis and eliminate the faults.
6. Restart the controller.

Keypad	PC ¹⁾	Error	Cause	Remedy
rDEr	0	No fault	-	-
ccr Trp	71	System fault	Strong interferences on control cables Ground or earth loops in the wiring	Shield control cables
cE0 Trp	61	Communication fault to AIF (configurable in C0126)	Faulty transmission of control commands via AIF	Insert the communication module into the hand terminal
cE1 Trp	62	Communication fault to CAN-IN1 with Sync control	CAN-IN1 object receives faulty data or communication is interrupted	<ul style="list-style-type: none"> ● Plug-in connection - bus module ↔ Check FIF ● Check transmitter ● Increase monitoring time under C0357/1 if necessary
cE2 Trp	63	Communication error to CAN-IN2	CAN-IN2 object receives faulty data or communication is interrupted	<ul style="list-style-type: none"> ● Plug-in connection - bus module ↔ Check FIF ● Check transmitter ● Increase monitoring time under C0357/2 if necessary
cE3 Trp	64	Communication error to CAN-IN1 with event or time control	CAN-IN1 object receives faulty data or communication is interrupted	<ul style="list-style-type: none"> ● Plug-in connection - bus module ↔ Check FIF ● Check transmitter ● Increase monitoring time under C0357/3 if necessary
cE4 Trp	65	BUS-OFF (many communication faults occurred)	Controller has received too many incorrect telegrams via the system bus and has been disconnected	<ul style="list-style-type: none"> ● Check whether bus terminator available ● Check screen contact of the cables ● Check PE connection ● Check bus load, if necessary, reduce the baud rate
cE5 Trp	66	CAN Time-Out (configurable in C0126)	For remote parameter setting via system bus (C0370): Slave does not answer. Communication monitoring time exceeded.	<ul style="list-style-type: none"> ● Check system bus wiring ● Check system bus configuration
			For operation with application I/O: Faulty parameter setting of parameter set changeover	In all parameter sets the signal "parameter set changeover" (C0410/13, C0410/14) must be combined with the same source
			For operation with module in FIF: Internal fault	Contact Lenze
cE6 Trp	67	Function module system bus (CAN) on FIF has set "Warning" or "BUS-OFF" (configurable in C0126)	CAN controller sets "Warning" or "BUS OFF"	<ul style="list-style-type: none"> ● Check whether bus terminator available ● Check screen contact of the cables ● Check PE connection ● Check bus load, if necessary, reduce the baud rate

Keypad	PC ¹⁾	Error	Cause	Remedy
cE7 Trip	68	Communication fault during remote parameter setting via system bus (C0370) (configurable in C0126)	Participant does respond or is not available	<ul style="list-style-type: none"> • Check whether bus terminator available • Check screen contact of the cables • Check PE connection • Check bus load, if necessary, reduce the baud rate
			For operation with application I/O: Faulty parameter setting of parameter set changeover	In all parameter sets the signal "parameter set changeover" (C0410/13, C0410/14) must be combined with the same source
EEr Trip	91	External fault (TRIP-SET)	A digital input assigned to the TRIP-Set function has been activated.	Check external encoder
E-PO ... E-PI9 Trip	-	Communication abort between keypad and basic device	Various	Contact Lenze
FRnI Trip	95	E82ZMV fan module (only 8200 motec 3 ... 7,5 kW)	Fan module is defect	Replace fan module
	-	TRIP or warning configurable under C0608	Fan module is not connected	Connect fan module Check wiring
H05 Trip	105	Internal fault		Contact Lenze
IdI Trip	140	Faulty parameter identification	Motor not connected	Connect motor
LPI Trip	32	Fault in motor phase (is displayed if C0597 = 1)	<ul style="list-style-type: none"> • Failure of one/several motor phase(s) • Motor current too low 	<ul style="list-style-type: none"> • Check motor cables • Check V_{min} boost • Connect motor to corresponding power or adapt the motor under C0599.
LPI	182	Fault in motor phase (is displayed if C0597 = 2)		
LU IMP	-	DC-bus undervoltage	Mains voltage too low	Check mains voltage
			DC-bus voltage too low	Check supply module
			400 V controller connected to 240 V mains	Connect controller to the appropriate mains voltage
QC1 Trip	11	Short circuit	Short circuit	<ul style="list-style-type: none"> • Find reason for short circuit; check motor cable • Check braking resistor and cable for braking resistor
			Excessive capacitive charging current of the motor cable	Use shorter motor cables with lower charging current

Keypad	PC ¹⁾	Error	Cause	Remedy
OC2 Trip	12	Earth fault	Grounded motor phase	Check motor, check motor cable
			Excessive capacitive charging current of the motor cable	Use shorter motor cables with lower charging current Deactivate earth-fault detection for testing purposes
OC3 Trip	13	Overload inverter during acceleration or short circuit	Acceleration time too short (C0012)	<ul style="list-style-type: none"> ● Increase acceleration time ● Check drive selection
			Defective motor cable	Check wiring
			Interturn fault in the motor	Check motor
OC4 Trip	14	Overload controller during deceleration	Deceleration time set too short (C0013)	<ul style="list-style-type: none"> ● Increase deceleration time ● Check size of external brake resistor
OC5 Trip	15	Controller overload in stationary operation	Frequent and long overload	Check drive selection
OC6 Trip	16	Motor overload ($I^2 \times t$ overload)	Motor is thermally overloaded, for instance, because of <ul style="list-style-type: none"> ● impermissible continuous current ● frequent or too long acceleration processes 	<ul style="list-style-type: none"> ● Check drive selection ● Check setting of C0120
OH Warn	-	Heatsink temperature > +85 °C	Ambient temperature too high	Allow controller to cool and ensure better ventilation
			Heatsink very dirty	Clean heatsink
			Impermissibly high currents or too frequent and too long acceleration	<ul style="list-style-type: none"> ● Check drive selection ● Check load, if necessary, replace defective bearings
OH3 Trip	53	PTC monitoring (TRIP) (is displayed if C0119 = 1 or 4)	Motor too hot because of excessive currents or frequent and too long accelerations	Check drive selection
			PTC not connected	Connect PTC or switch off monitoring
OH4 Trip	54	Controller overtemperature	Controller too hot inside	<ul style="list-style-type: none"> ● Reduce controller load ● Improve cooling ● Check fan in the controller
DHS1	203	PTC monitoring (is displayed if C0119 = 2 or 5)	Motor too hot because of excessive currents or frequent and too long accelerations	Check drive selection
			PTC not connected	Connect PTC or switch off monitoring

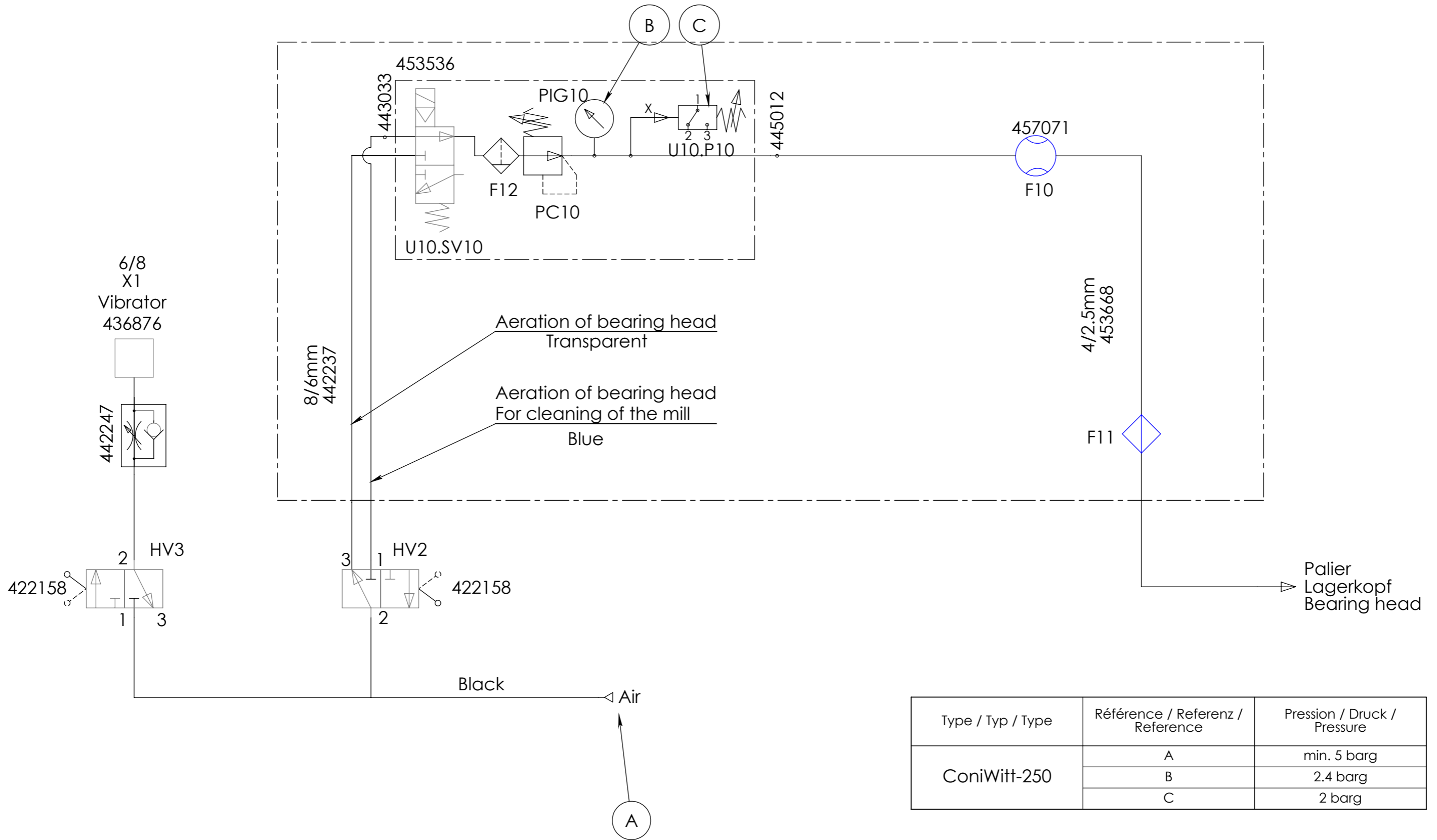
Keypad	PC ¹⁾	Error	Cause	Remedy
OU IMP	-	DC-bus overvoltage (Warning or TRIP configurable under C0310)	Mains voltage too high	Check voltage supply
QUE Trip	22		Braking operation	<ul style="list-style-type: none"> • Prolong deceleration times. • Operation with external brake resistor: <ul style="list-style-type: none"> – Check dimensioning, connection and cable of the brake resistor. – Increase the deceleration times
			Earth leakage on the motor side	Check motor cable and motor for earth fault (disconnect motor from inverter)
Pr Trip	75	Faulty parameter transfer when using the keypad	All parameter sets are defective	It is absolutely necessary to repeat the data transfer or load the Lenze setting before enabling the controller.
Pr-1 Trip	72	Wrong PAR1 transfer when using the keypad.	PAR1 is defective.	
Pr-2 Trip	73	Wrong PAR2 transfer when using the keypad.	PAR2 is defective.	
Pr-3 Trip	77	Wrong PAR3 transfer when using the keypad.	PAR3 is defective	
Pr-4 Trip	78	Wrong PAR4 transfer when using the keypad.	PAR4 is defective	
Pr-5 Trip	79	Internal fault	EEPROM is defective		Contact Lenze
PE5 Trip	81	Time fault during parameter set transfer	Data flow from keypad or PC interrupted, e. g. keypad was disconnected during transfer	It is absolutely necessary to repeat the data transfer or load the Lenze setting before enabling the controller.
r5t Trip	76	Faulty auto-TRIP reset	More than 8 fault messages in 10 minutes	Depends on the error message
Sd5 Trip	85	Wire breakage analog input 1	Current at analog input < 4 mA at setpoint range 4 ... 20 mA	Close circuit at analog input
Sd7 Trip	87	Wire breakage analog input 2		

¹⁾ LECOM-fault number, display in parameter setting program Global Drive Control (GDC)

Voir documents suivants.

Siehe folgende Dokumente.

See following documents





















Type / Typ / Type	Référence / Referenz / Reference	Pression / Druck / Pressure
ConiWitt-250	A	min. 5 barg
	B	2.4 barg
	C	2 barg

Dimensions without tolerance [mm]	above up to	6	30	120	400	1000	MATERIAL :						
Machining: ISO 2768-m		±0.10	±0.20	±0.30	±0.50	±0.80	±1.20	Scale	Similar	Designed	04/05/2011	thle	
Welding Assembly: ISO 2768-c		±0.30	±0.50	±0.80	±1.20	±2.00	±3.00	%	457598	Controlled	20/05/2014	edgu	
Schéma pneumatique ATEX DelumpWitt Novartis								Weight [kg]		Revised	20/05/2014	edgu	
								A3		Atex			
Any and all information received by you from us shall be held and kept confidential and shall not be disclosed by you to any third party except with prior written consent of FREWITT SA.										Frewitt SA: Milling and Handling of Powders P.O.B. 615, CH-1701 Fribourg, SWITZERLAND tel: +41 26 460 74 00 / fax: +41 26 460 74 01 info@frewitt.com / www.frewitt.com		Page	Ver.
								464782-SCH		1/1	B		

Pneumatics 464782_B

Article N° Artikel Nr. Article ID.	Description Beschreibung Description	Quantité Menge Quantity	Unité Einheit Unit	No Dessin Zeichnungs-Nr Drawing ID
. 422158	Manual control divider NF+NO	1.0000	Pce	464782
. 442075	Push-in L-fitting QSL-B-1/8-6-20, 130927	2.0000	Pce	464782
. 443033	Connection QSM-B-M5-6-20, 130896	1.0000	Pce	464782
. 445012	Push-in L-fitting QLS-B-1/4-4, 130929	1.0000	Pce	464782
. 457071	Sensor SFE3-F500-L-W18-2PB-K1	1.0000	Pce	464782
. 453536	Preparation unit ATEX 2GD	1.0000	Pce	464782
. 457102	Filter inox FDA 0.2 µm G1/4 1.4404 (Off.3169-10-01)	1.0000	Pce	464782

<i>Technical Datasheets PRO-14-0012 [173129 - 2.1]</i>		Page
 ELOBAU Safety sensors Series 671 [19316 - 1.1]		3
 Techn. data Namur NCB1,5-8GM25 [29005 - 0.1]		5
 _ZIEHL MINIKA Op.instructions [56827 - 0.1]		11
 _FESTO - SFE3 - Operating Instructions [113075 - 1.1]		15
 Techn.data VMA-63-V1/0-1/4-CT-183522 inox [120556 - 2.1]		17
 Motor technical datasheet 6P LSPX132M 5.0kW - 461226 [123523 - 2.1]		19
 SEFAR Staple Fibre Filter - Datasheet [135420 - 1.1]		23
 Technical Datasheet Pressure switch [139345 - 1.1]		25
 Goudsmit - Data sheet SECF383337-A [156442 - 1.1]		27
 Techn.Datasheet Preparation Unit ATEX 2GD, art.453536 [157897 - 1.1]		29
 Motor technical datasheet 4P LSPX80LG 0.75kW, Art.473196 [166243 - 1.1]		31
 Techn. Data Filter P-EG <Donaldson> [172948 - 1.1]		35
 Techn.Data Vibrator NTP25B <Netter> [172951 - 1.1]		37
 techn.Data Distance Sensor or Proximity Switch Series P43 Atex [173151 - 1.1]		39
 TEchn. Data Distributor man. NF&NO [173152 - 1.1]		43
 JUMO-Screw-in RTD temperature probes - Techn.Data [173195 - 1.1]		45
 Tech. data Flow sensor Exi G1/2, Exi, Art.456574 [173199 - 1.1]		51
 techn.Data Solenoid Valves 3/2,s.374 AscoJoucomatic [173203 - 1.1]		53

Customer: NOVARTIS SINGAPORE

Serial-Nr. DelumpWitt 14001235184

Ref.: P&ID Diagram 473871

R&I Article R&I Artikel R&I Article	Article N° Artikel Nr. Article ID.	Description Beschreibung Description	Fournisseur Hersteller Supplier	Quantité Menge Quantity
F10	457071	Flow sensor SFE3-F500-L-W18-2PB-K1	FESTO	113075
F01	456574	Flow sensor Exi G1/2, Exi, 1G/D, P11206, STS 212 S	BACHOFEN AG (EGE)	173199
F11	457102	Sterile filter for air – P-SRF N 0006 G ½" – Element P-SRF N 03/10	Donaldson	172948
F12	(453536)	Filter F.01 HA4 G1/4	UNIVER	157897
F4	465745	Filter NF 07-351-600 NFIA	FreWitt	135420
F5	465745	Filter NF 07-351-600 NFIA	FreWitt	135420
G10	404567	Magnet 304 200 00 V	ELOBAU	-
G10	404568	Magnetic safety switch 671 271 MU0 10	ELOBAU	19316
G20	404567	Magnet 304 200 00 V	ELOBAU	-
G20	404568	Magnetic safety switch 671 271 MU0 10	ELOBAU	19316
G30	473759	Proximity Switches P43-T4Y-2D-001-200EEX	Waycon	173151
HV2	422158	Valve for cleaning	ASCO / NUMATICS GMBH	173152
HV3	422158	Valve for Vibrator	ASCO / NUMATICS GMBH	173152
M10	461226	Motor 5kW 6P Ex II2D Ex tD IP65 T125°C 400V 50Hz	LEROY-SOMER SA	123523
M20	473196	Motor 0.75 kW 4P, 230/400/50, B14, Ex II2D IP65 125°C	LEROY-SOMER SA	166243
PC10	(453536)	Regulator R.01 G1/4 0.2-6 bar	UNIVER (TECSIS)	157897
PIG02	460760	Vacumeter 632.050.063 -100...0 mbar G1/4 B inox	WIKA	120556
PIG10	(453536)	Manometer P1415B073001 G1/8	Tesis (UNIVER)	120556
S10	406886	Proximity Switches EXI M8 NCB 1,5-8GM25-NO	PEPPERL+FUCHS	29005
T10	(452856)	PTC Sensor	(LEROY-SOMER SA)	-
T11	443351	Sensor 3XPTC 60°C EN SÉRIE K401300, KD60	TRELCO AG (ZIEHL)	56827
T12	443351	Sensor 3XPTC 60°C EN SÉRIE K401300, KD60	TRELCO AG (ZIEHL)	56827
T20	(450798)	PTC Sensor	(LEROY-SOMER SA)	-
T21	443351	Sensor 3XPTC 60°C EN SÉRIE K401300, KD60	TRELCO AG (ZIEHL)	56827
T22	443351	Sensor 3XPTC 60°C EN SÉRIE K401300, KD60	TRELCO AG (ZIEHL)	56827
T13	459090	PT 100 M10, 902050/40-378-1011-3-10-20-115-11-5000/000	JUMO	173195
T23	459090	PT 100 M10, 902050/40-378-1011-3-10-20-115-11-5000/000	JUMO	173195
U10.P10	(453536)	Pressure Swiches 40500211211	Layher	139345
U10.SV10	(453536)	Solenoid valve PV G356A002VMS	ASCO JOUCOMATIC	173203
B1	459229	Sachschütte	FreWitt	-
I002	459271	ProFi-Sword	FreWitt	-
I001	459286	ConiWitt-250	FreWitt	-
XC1	459332	Cleaning connection	FreWitt	-
XC2	456364	Cleaning connection	FreWitt	-
R10	436255	Rotor fs Type C	FreWitt	-
F100	436242	Raspel Sieb 3mm Dicke 1mm	FreWitt	-
R20.1	454299	Rotor ProFi-Sword	FreWitt	-
R20.2	454311	Rotor ProFi-Sword	FreWitt	-
X1	436876	Vibrator NTP25B+C SE Inox	Netter	172951
X2	470252	Magnetic separator Type Neoflux Cleanflow magnet SEC38333F	Goudsmit / Frewitt	156442
W013	473792	Weighing (Typ IND590 / PTA459-F1500T)	Mettler Toledo	-

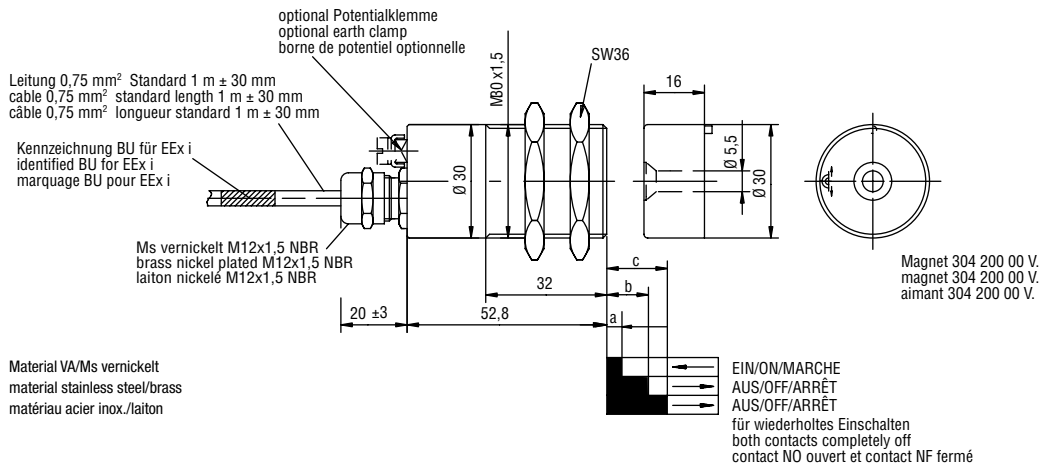
Sicherheitssensoren
safety sensors
Détecteurs de sécurité



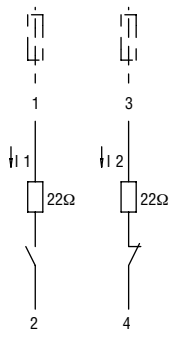
IP 68

671 271 ..0..

Sensor mit Zulassung nach RL 94/9/EG (ATEX)
Sensor with approval RL 94/9/EG (ATEX)
Détecteur avec approbation RL 94/9/EG (ATEX)



Schaltbild
circuit diagram
schéma du circuit



-ia- 1G; 1/2 G, 2G, 1D, 2D externe Sicherheitsbarriere nötig
 external safety barrier required
 barrière de sécurité externe nécessaire

-m- 2G; 2D externe Sicherung nötig
 external protection required
 protection externe nécessaire

Bitte beachten Sie vor der Verwendung der Sensoren die Betriebsanleitung „Maschinensicherheitssensoren Serie 671“.

Before installing this sensor, please read the instruction “machine safety switch sensors series 671” and the operation manual.

Avant l'installation de ce détecteur, veuillez vous reporter à la notice d'utilisation «Inter. de sécurité magnétique, série 671».

Typen Nr. type no. référence	einsetzbar in can be installed in zone zone d'utilisation	explosiongeschützte Ausführung explosion protection types type de protection	Zertifikat-Nr. certificate no. n° de certificat
671 271 ..0 ..	Cat. 1G / Zone 0 (ia)*	Ex II 1G Ex ia IIC T5/T6 Ga	BVS 03 ATEX E 126 X
	Cat. 1/2 G / Trennwand/partition wall zone/mur de separation Zone 0/1 (ia)	Ex II 1/2G Ex ia IIC T5/T6 Ga/Gb	
	Cat. 2G / Zone 1 (ia)	Ex II 2G Ex ia IIC T5/T6 Gb	
	Cat. 2G / Zone 1 (mb)	Ex II 2G Ex mb II T5/T6 Gb	
	Cat. 2D / Zone 1 (mb)	Ex II 2D Ex mb IIIC IP68 T105°C Db	
	Cat. 1D / Zone 0 (ia)	Ex II 1D Ex ia IIIC IP68 T105°C Da	
	Cat. 2D / Zone 1 (ib)	Ex II 2D Ex ib IIIC IP68 T105°C Db	

* nur mit geschirmter Leitung / only with shielded line / seulement avec câble blindé

Technische Änderungen vorbehalten.
 We reserve the right to change specifications without notice.
 Sous réserve de modifications techniques.

Kabelsätze siehe S. 170 (Type K 04 ..0.)
 Cable sets see p. 170 (type no. K 04 ..0.)
 Câbles associés voir p. 170 (réf. K 04 ..0.)

Achtung: bei Ausschöpfung aller Versatztoleranzen und des gesamten Temperaturbereichs ist eine Verkürzung des Schaltabstandes möglich.
 Caution: If all offset tolerances and the entire temperature range have been exhausted, this may result in a reduction of the operating distance.
 Attention: si le détecteur est utilisé en dehors des tolérances de positionnement et de la plage de température, alors la distance de commutation sera réduite.

671 271 ..0.. Sensor mit Zulassung nach RL 94/9/EG (ATEX)
Sensor with approval RL 94/9/EG (ATEX)
DéTECTEUR avec approbation RL 94/9/EG (ATEX)

671 271 ..0..

Zählnummern
(wird von elobau vergeben)

counting numbers
(issued by elobau)

numéros d'article
(adjudger à elobau)

Kabel
U = UL-Zulassung (PVC)
4 = PVC abgeschirmt 0,5 mm²
(für Kat. 1 G/Zone 0-ia)

cable
U = UL registration (PVC)
4 = PVC screened 0,5 mm²
(to cat. 1 G/zone 0-ia)

câble
U = UL registration (PVC)
4 = PVC blindé 0,5 mm²
(pour cat. 1 G/zone 0-ia)

Ex-Ausführung
M = vergussgekapselt (mb)
ohne Potentialklemme ¹⁾
N = vergussgekapselt (mb)
mit Potentialklemme ¹⁾
I = eigensicher (ia)
ohne Potentialklemme ^{1) 2)}
K = eigensicher (ia)
mit Potentialklemme ^{1) 2)}

Ex-version
M = encapsulation (mb)
without potential clamp ¹⁾
N = encapsulation (mb)
with potential clamp ¹⁾
I = intrinsically safe (ia)
without potential clamp ^{1) 2)}
K = intrinsically safe (ia)
with potential clamp ^{1) 2)}

Ex-version
M = encapsulage (mb)
sans borne de potentiel ¹⁾
N = encapsulage (mb)
avec borne de potentiel ¹⁾
I = sécurité intrinsèque (ia)
sans borne de potentiel ^{1) 2)}
K = sécurité intrinsèque (ia)
avec borne de potentiel ^{1) 2)}

¹⁾ Der Sensor muss elektrostatisch geerdet werden!
The sensor must be electrostatically grounded!
L'interrupteur doit être raccordé à la terre!

²⁾ Angabe der Einbauzone erforderlich
please specify mounting zone
zone de montage à spécifier

- Zone 0/1 (Cat. 1/2) Trennwand/partition wall/mur de séparation
- Zone 0 (Cat. 1)

Typen Nr. type no. référence	Material material matériau	Magnetsystem magnet system aimant codé	Luftspalte für sichere Schaltfunktion air gaps for reliable switching function distances pour une commutation efficace		
			a	b	c
671 271 ..0..	VA/stainless steel/acier inoxydable	304 200 00 V. 304 200 00 VS/SH	> 0,5 ≤ 4mm > 3 ≤ 7mm	min. 11mm min. 17mm	min. 16mm min. 23mm

Typen Nr. type no. référence	Widerstand resistance résistance	Schutzart protection class protection	Kontaktform contact form type de contact
671 271 ..0..	DCA 1206/22 Ω/0,25 W	IP 68 10 bar	Schließer/Öffner / N/O/N/C / NO/NF

EEX-m	Typen Nr. type no. référence	Schaltspannung switching voltage tension de commut.	Schaltstrom I ₁ , I ₂ (max. 2 s) switching current I ₁ , I ₂ courant de commut. I ₁ , I ₂	Schaltleistung switching power pouvoir de coupure	Nennstrom I ₁ +I ₂ nominal current I ₁ +I ₂ courant nominal I ₁ +I ₂	Temperaturbereich T5/2D temperature range T5/2D plage de température T5/2D	T6 T6 T6
	671 271 ..0..	24 V AC/DC	0,5 A	5 W/VA	max. 60 mA	-25...+85°C	-25...+70°C
					max. 150 mA	-25...+70°C	-25...+50°C

EEX-ia	Typen Nr. type no. référence	Nennspannung nominal voltage tension nominale	Schaltstrom I ₁ , I ₂ (max. 2 s) switching current I ₁ , I ₂ courant de commut. I ₁ , I ₂	Leistung power pouvoir	Nennstrom I ₁ +I ₂ nominal current I ₁ +I ₂ courant nominal I ₁ +I ₂	Temperaturbereich T5 temperature range T5 plage de température T5	T6 T6 T6
	671 271 ..0..	Ui = 24 V AC/DC	Ii = 0,5 A	Pi = 0,5 W	max. 60 mA	-25...+85°C	-25...+70°C
					max. 150 mA	-25...+70°C	-25...+50°C

Achtung: bei Ausschöpfung aller Versatztoleranzen und des gesamten Temperaturbereichs ist eine Verkürzung des Schaltabstandes möglich.

Caution: If all offset tolerances and the entire temperature range have been exhausted, this may result in a reduction of the operating distance.

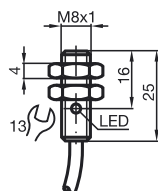
Attention: si le détecteur est utilisé en dehors des tolérances de positionnement et de la plage de température, alors la distance de commutation sera réduite.

Technische Änderungen vorbehalten.
We reserve the right to change specifications without notice.
Sous réserve de modifications techniques.

Inductive proximity switches

NCB1,5-8GM25-N0

Comfort series
1.5 mm embeddable

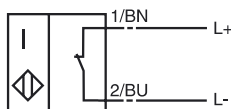


CE 0102

General specifications	
Switching element function	NAMUR NC
Rated operating distance s_n	1,5 mm
Installation	embeddable
Assured operating distance s_a	0 ... 1,215 mm
Reduction factor r_{AI}	0,22
Reduction factor r_{Cu}	0,19
Reduction factor r_{V2A}	0,65
Nominal ratings	
Nominal voltage U_o	8 V
Switching frequency f	0 ... 5000 Hz
Hysteresis H	1 ... 10 typ. 3 %
Reverse polarity protection	Protected against reverse polarity
Short-circuit protection	yes
Current consumption	
Measuring plate not detected	≥ 3 mA
Measuring plate detected	≤ 1 mA
Indication of the switching state	LED, yellow
Standard conformity	
EMC in accordance with	EN 60947-5-2
Standards	DIN EN 60947-5-6 (NAMUR)
Ambient conditions	
Ambient temperature	-25 ... 100 °C (248 ... 373 K)
Storage temperature	-40 ... 100 °C (233 ... 373 K)
Mechanical specifications	
Connection type	2 m, PVC cable
Core cross-section	0.14 mm ²
Housing material	Stainless steel
Sensing face	PBT
Protection degree	IP67
General information	
Use in the hazardous area	see instruction manuals
Category	1G; 2G; 3G; 1D; 3D

Connection type:

N / N0



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Inductive proximity switches

NCB1,5-8GM25-N0

ATEX 1G

Instruction

Device category 1G

Directive conformity

Standard conformity

CE symbol

Ex-identification

EC-Type Examination Certificate

Appropriate type

Effective internal capacitance C_i

Effective internal inductance L_i

Cable length

Explosion group IIA

Explosion group IIB

Explosion group IIC

General

Highest permissible ambient temperature

Installation, Commissioning

Maintenance

Special conditions

Protection from mechanical danger

Electrostatic charging

Manual electrical apparatus for hazardous areas

BR for use in hazardous areas with gas, vapour and mist

94/9/EG

EN 50014:1997; EN 50020:1994; EN 50284:1999

Ignition protection "Intrinsic safety"

Use is restricted to the following stated conditions

CE 0102

Ex II 1G EEx ia IIC T6

PTB 00 ATEX 2048 X

NCB1,5...M...N0...

≤ 90 nF ; a cable length of 10 m is considered.

≤ 100 μH ; a cable length of 10 m is considered.

Dangerous electrostatic charges on the fixed connection cable must be taken into account for lengths equal to and exceeding the following values:

147 cm

73 cm

11 cm

The apparatus has to be operated according to the appropriate data in the data sheet and in this instruction manual.

The EU prototype test certificate must be observed. The special conditions must be adhered to!

Directive 94/9/EG and hence also EU prototype test certificates apply in general only to the use of electrical apparatus under atmospheric conditions.

The temperature ranges, according to temperature class, are given in the EU prototype test certificate. Note: Use the temperature table for category 1 !!! The 20 % reduction in accordance with EN 1127-1 has already been applied to the temperature table for category 1.

Laws and/or regulations and standards governing the use or intended usage goal must be observed.

The intrinsic safety is only assured in connection with an appropriate related apparatus and according to the proof of intrinsic safety.

The associated apparatus must satisfy the requirements of category ia.

Due to the possible danger of ignition, which can arise due to faults and/or transient currents in the equipotential bonding system, galvanic isolation of the power supply and signal circuit is preferable. Associated apparatus without electrical isolation must only be used if the appropriate requirements of IEC 60079-14 are met.

No changes can be made to apparatus, which are operated in hazardous areas. Repairs to these apparatus are not possible.

The sensor must not be mechanically damaged.

When used in the temperature range below -20°C the sensor should be protected from knocks by the provision of an additional housing.

Electrostatic charges must be avoided on the mechanical housing components. Dangerous electrostatic charges on the mechanical housing components can be avoided by incorporating these in the equipotential bonding.

Inductive proximity switches

NCB1,5-8GM25-N0

ATEX 2G

Instruction

Device category 2G

Directive conformity

Standard conformity

CE symbol

Ex-identification

EC-Type Examination Certificate

Appropriate type

Effective internal capacitance C_i

Effective internal inductance L_i

General

Highest permissible ambient temperature

Installation, Commissioning

Maintenance

Special conditions

Protection from mechanical danger

Electrostatic charging

Manual electrical apparatus for hazardous areas

for use in hazardous areas with gas, vapour and mist
94/9/EG

EN 50014:1997, EN 50020:1994

Ignition protection "Intrinsic safety"

Use is restricted to the following stated conditions

CE 0102

⊕ II 1G EEx ia IIC T6

PTB 00 ATEX 2048 X

NCB1,5...M...N0...

≤ 90 nF ; a cable length of 10 m is considered.

≤ 100 μH ; a cable length of 10 m is considered.

The apparatus has to be operated according to the appropriate data in the data sheet and in this instruction manual. The EU prototype test certificate must be observed. The special conditions must be adhered to!

Directive 94/9/EG and hence also EU prototype test certificates apply in general only to the use of electrical apparatus under atmospheric conditions.

The temperature ranges, according to temperature class, are given in the EU prototype test certificate.

Laws and/or regulations and standards governing the use or intended usage goal must be observed. The intrinsic safety is only assured in connection with an appropriate related apparatus and according to the proof of intrinsic safety.

No changes can be made to apparatus, which are operated in hazardous areas. Repairs to these apparatus are not possible.

The sensor must not be mechanically damaged.

When used in the temperature range below -20°C the sensor should be protected from knocks by the provision of an additional housing.

Electrostatic charges must be avoided on the mechanical housing components. Dangerous electrostatic charges on the mechanical housing components can be avoided by incorporating these in the equipotential bonding.

Inductive proximity switches

NCB1,5-8GM25-N0

ATEX 1D

Instruction

Device category 1D

Directive conformity

Standard conformity

CE symbol

Ex-identification

EC-Type Examination Certificate

Appropriate type

Effective internal capacitance C_i

Effective internal inductance L_i

General

Maximum housing surface temperature

Installation, Commissioning

Maintenance

Special conditions

Electrostatic charging

Manual electrical apparatus for hazardous areas

for use in hazardous areas with combustible dust

94/9/EG

IEC 61241-11:2002: draft; prEN61241-0:2002

type of protection intrinsic safety "iD"

Use is restricted to the following stated conditions

CE 0102

Ex II 1D Ex iaD 20 T 108 °C

ZELM 03 ATEX 0128 X

NCB1,5...M...N0...

≤ 90 nF ; a cable length of 10 m is considered.

≤ 100 μH ; a cable length of 10 m is considered.

The apparatus has to be operated according to the appropriate data in the data sheet and in this instruction manual.

The EU prototype test certificate must be observed.

The special conditions must be adhered to!

The maximum surface temperature of the housing is given in the EC-Type Examination Certificate.

Laws and/or regulations and standards governing the use or intended usage goal must be observed.

The intrinsic safety is only assured in connection with an appropriate related apparatus and according to the proof of intrinsic safety.

The associated apparatus must satisfy at least the requirements of category ia IIB or iaD. Because of the possibility of the danger of ignition, which can arise due to faults and/or transient currents in the equipotential bonding system, galvanic isolation in the power supply and signal circuits is preferable. Associated apparatus without electrical isolation must only be used if the appropriate requirements of IEC 60079-14 are met.

The intrinsically safe circuit has to be protected against influences due to lightning.

When used in the isolating wall between Zone 20 and Zone 21 or Zone 21 und Zone 22 the sensor must not be exposed to any mechanical danger and must be sealed in such a way, that the protective function of the isolating wall is not impaired. The applicable directives and standards must be observed.

No changes can be made to apparatus, which are operated in hazardous areas. Repairs to these apparatus are not possible.

Electrostatic charges must be avoided on the mechanical housing components. Dangerous electrostatic charges on the mechanical housing components can be avoided by incorporating these in the equipotential bonding.

The connection cables are to be laid in accordance with EN 50281-1-2 and must not normally be subjected to chaffing during use.

Inductive proximity switches

NCB1,5-8GM25-N0

ATEX 3D

Instruction

Device category 3D

Directive conformity

Standard conformity

CE symbol

Ex-identification

General

Installation, Commissioning

Maintenance

Special conditions

Minimum series resistance R_V

Maximum operating voltage U_{Bmax}

Maximum heating (Temperature rise)

at $U_{Bmax}=9\text{ V}$, $R_V=562\ \Omega$

using an amplifier in accordance with EN 60947-5-6

Protection from mechanical danger

Electrostatic charging

Protection of the connection cable

Manual electrical apparatus for hazardous areas

for use in hazardous areas with non-conducting combustible dust

94/9/EG

EN 50281-1-1

Protection via housing

Use is restricted to the following stated conditions

CE 0102

Ex II 3D IP67 T 111 °C X

The apparatus has to be operated according to the appropriate data in the data sheet and in this instruction manual.

The data stated in the data sheet are restricted by this operating instruction! The special conditions must be adhered to!

Laws and/or regulations and standards governing the use or intended usage goal must be observed.

No changes can be made to apparatus, which are operated in hazardous areas. Repairs to these apparatus are not possible.

A minimum series resistance R_V is to be provided between the power supply voltage and the proximity switch in accordance with the following list. This can also be assured by using a switch amplifier.

The maximum permissible operating voltage U_{Bmax} must be restricted to the values given in the following list. Tolerances are not permitted.

Values can be obtained from the following list, depending on the max. operating voltage U_b max and the minimum series resistance R_V .

11 °C

11 °C

The sensor must not be mechanically damaged.

Electrostatic charges must be avoided on the mechanical housing components. Dangerous electrostatic charges on the mechanical housing components can be avoided by incorporating these in the equipotential bonding.

The connection cable must be prevented from being subjected to tension and torsional loading.

Inductive proximity switches

NCB1,5-8GM25-N0

ATEX 3G (nL)

Instruction

Device category 3G (nL)

Directive conformity

Standard conformity

CE symbol

Ex-identification

Effective internal capacitance C_i

Effective internal inductance L_i

General

Installation, Commissioning

Maintenance

[Fett]Special conditions

Maximum permissible ambient temperature T_{Umax} at $U_i = 20 V$

for $P_i=34 mW$, $I_i=25 mA$, T6

for $P_i=34 mW$, $I_i=25 mA$, T5

for $P_i=34 mW$, $I_i=25 mA$, T4-T1

for $P_i=64 mW$, $I_i=25 mA$, T6

for $P_i=64 mW$, $I_i=25 mA$, T5

for $P_i=64 mW$, $I_i=25 mA$, T4-T1

for $P_i=169 mW$, $I_i=52 mA$, T6

for $P_i=169 mW$, $I_i=52 mA$, T5

for $P_i=169 mW$, $I_i=52 mA$, T4-T1

for $P_i=242 mW$, $I_i=76 mA$, T6

for $P_i=242 mW$, $I_i=76 mA$, T5

for $P_i=242 mW$, $I_i=76 mA$, T4-T1

Protection from mechanical danger

Electrostatic charging

Connection parts

Manual electrical apparatus for hazardous areas

for use in hazardous areas with gas, vapour and mist

94/9/EG

EN 50021:2000 Ignition protection category "n"

Use is restricted to the following stated conditions

CE 0102

II 3G EEx nL IIC T6 X

$\leq 90 nF$; a cable length of 10 m is considered.

$\leq 100 \mu H$; A cable length of 10 m is considered.

The apparatus has to be operated according to the appropriate data in the data sheet and in this instruction manual. The data stated in the data sheet are restricted by this operating instruction!

The special conditions must be observed!

Directive 94/9EG is generally applicable only to the use of electrical apparatus operating at atmospheric conditions.

Laws and/or regulations and standards governing the use or intended usage goal must be observed. The sensor must only be operated with an energy-limited circuit, which satisfies the requirements of IEC 60079-15. The explosion group complies with the connected, supplying, power limiting circuit.

No changes can be made to apparatus, which are operated in hazardous areas. Repairs to these apparatus are not possible.

70 °C

85 °C

100 °C

69 °C

84 °C

100 °C

51 °C

66 °C

85 °C

39 °C

54 °C

67 °C

The sensor must not be mechanically damaged.

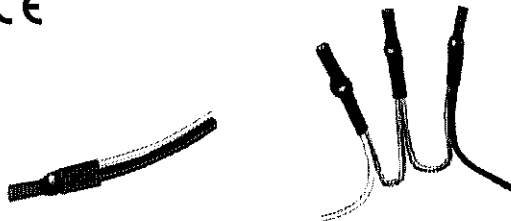
When used in the temperature range below -20°C the sensor should be protected from knocks by the provision of an additional housing.

Electrostatic charges must be avoided on the mechanical housing components. Dangerous electrostatic charges on the mechanical housing components can be avoided by incorporating these in the equipotential bonding.

The connection parts are to be installed, such that a minimum protection class of IP20 is achieved, in accordance with IEC 60529.

Betriebsanleitung

Kaltleiter-Tempertursensoren Typ MINIKA®



Ausführungsformen:

NAT °C	Typ*	Anschlussfarben*
60 ±5	K.. 60	weiß - grau
70 ±5	K.. 70	weiß - braun
80 ±5	K.. 80	weiß - weiß
90 ±5	K.. 90	grün - grün
100 ±5	K.. 100	rot - rot
110 ±5	K.. 110	braun - braun
120 ±5	K.. 120	grau - grau
130 ±5	K.. 130	blau - blau
140 ±5	K.. 140	weiß - blau
150 ±5	K.. 150	schwarz - schwarz
160 ±5	K.. 160	blau - rot
170 ±5	K.. 170	weiß - grün
180 ±5	K.. 180	weiß - rot

Item No. :

Order No. :

Checked :

443 351
08-2117
Reg K
1.11.08

- * MINIKA® Einzelsensoren Typ K 60... K 180 entsprechen DIN 44081
MINIKA® Drillingssensoren Typ KD 60... KD 180 entsprechen DIN 44082

Anwendung und Kurzbeschreibung

Kaltleiter-Temperatursensoren, auch PTC-Widerstände oder Thermistoren genannt, sind temperaturabhängige Halbleiterwiderstände, die die Eigenschaft haben, dass sich ihr elektrischer Widerstand bei Temperaturänderungen im Bereich der Nenn-Ansprechtemperatur NAT (TNF) sprunghaft ändert.

Eingesetzt werden Kaltleiter vorwiegend für den Übertemperaturschutz von Wicklungen in Elektromotoren oder Transformatoren. Weitere Einsatzbereiche sind Maschinen und Werkzeugmaschinen, speziell Maschinenlager und die Temperaturüberwachung von Leistungshalbleitern oder Kühlkörpern.

Detaillierte Beschreibung

Der Widerstand jedes einzelnen Sensors, (Messung mit max. 2,5 V) muss bei Temperaturen, die auf die Nennansprechtemperatur (NAT) bezogen sind, folgende Werte haben:

≤250 Ω bei Temperaturen von -20°C bis NAT -20°C

≤550 Ω bei einer Temperatur von NAT -5°C

≥1330 Ω bei einer Temperatur von NAT +5°C

≥4000 Ω bei einer Temperatur von NAT +15°C

Die genauen Widerstandswerte in den Temperaturbereichen sind ohne Bedeutung. Der Kaltwiderstand einwandfreier Sensoren muss zwischen 20 und maximal 250 Ω liegen.

Typische Werte (Raumtemperatur) liegen bei 50 -150 Ω.

Der Kaltwiderstand lässt, wenn er innerhalb der angegebenen Grenzen liegt, keinerlei Rückschlüsse auf die Funktionsfähigkeit zu.

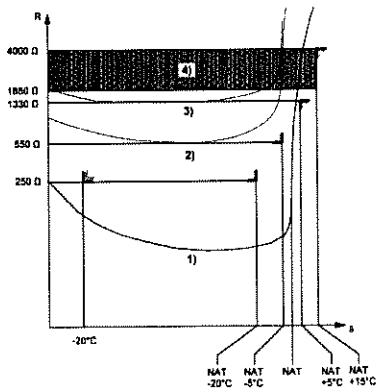
Auslösegeräte schalten (nach Norm) zwischen 1850 Ω und 4000 Ω (Bereich 4).

Damit ergibt sich bei gleichmäßiger Erwärmung einer verschiedenen Anzahl von Temperatursensoren, die in Reihe an ein Auslösegerät angeschlossen sind, folgender Abschaltpunkt:

1 PTC schaltet
spätestens bei NAT +15°C,
frühestens bei NAT +5°C
(Kennlinie 1)

3 PTC (typischer Fall) schalten
spätestens bei NAT +5°C,
frühestens bei NAT -5°C
(Kennlinie 2)

6 PTC schalten
spätestens bei NAT,
frühestens bei NAT -20°C.
(Kennlinie 3)
(Absolut gleichmäßige
Erwärmung aller Sensoren
kommt hier kaum vor.)



Wichtige Hinweise

Isolationsklassen:

Wir empfehlen folgende Werte der Nennansprechtemperatur NAT (TNF) eingebauter Kaltleiter für Maschinen, die in ihrer zulässigen Erwärmung entsprechend der Isolierstoffklasse voll ausgenutzt sind.

Diese Werte können für Maschinen mit geringerer Ausnutzung entsprechend vermindert werden. Es kann in einigen Fällen erforderlich sein, durch Versuche oder aufgrund von Erfahrungen von den empfohlenen Werten der Tabelle abweichende Werte der Nennansprechtemperatur (NAT) festzulegen. Wenn eine Vorwarnung vorgesehen ist, wird als Nennansprechtemperatur hierfür ein Wert empfohlen der jeweils um 20°C unterhalb der Ausschalttemperatur liegt.

Isolierstoffklasse			
120 (E)	130 (B)	155 (F)	180 (H)
120°C	130°C	150°C	180°C

Prüfung:

Bei der Isolationsprüfung der eingebauten Temperatursensoren gegen Gehäuse und Wicklung mit Hochspannung beide Zuleitungen zu den Temperatursensoren miteinander verbinden. Die maximale Prüfspannung beträgt 2500 V effektiv. Nach Lösen der Kurzschlussbrücke kann der Widerstand des Kaltleiters geprüft werden. Bei Widerständen zwischen 20 und 250 Ω je Einzel-Temperatursensoren (Drillingskaltleiter = 3 Einzeitemperatursensoren) sind diese fehlerfrei in den Motor eingebaut. Für die Messung sind übliche Widerstandsmessgeräte zu benutzen, die garantieren, dass die Messspannung je Sensor < 2,5 V ist.



Achtung!

Prüfen Sie die Kaltleiter nur mit Messspannungen <2,5 V.

Einbau der Kaltleiter-Temperatursensoren

Der Einbau der Kaltleiter kann nur vor dem Imprägnieren der Wicklung durch eine Motorenfabrik vorgenommen werden. Ein nachträglicher Einbau ist nicht möglich. Jeder Wicklungsstrang erhält einen Temperatursensor. Das bedeutet, dass in eintourigen Motoren 3 und in polumschaltbaren Motoren 6 Temperatursensoren eingebaut sind. Die Sensoren sind in Serienschaltung angeordnet und an separate Klemmen im Klemmenkasten geführt.

Die Messkreisleitungen sind als getrennte Steuerleitungen zu verlegen. Die Verwendung von Adern der Speiseleitung des Motors oder anderer Hauptstromleitungen ist nicht zulässig. Sind induktive oder kapazitive Einstreuungen durch parallel liegende Starkstromleitungen zu erwarten, so sind geschirmte Steuerleitungen zu verwenden.

Die maximale Leitungslänge bei Kabelquerschnitt 0,5 mm² beträgt ca. 500 m. Bei größeren entsprechend mehr. Bei Geräten mit Kurzschlussüberwachung wird bei einem Leitungswiderstand > 20 Ω ein Kurzschluss am Sensor nicht erkannt.

Der Einbau der Kaltleiter sollte möglichst im wärmsten Wickelkopf, also an der Abluftseite der elektrischen Maschine erfolgen. Beim Einbau ist besonders auf einen guten Wärmekontakt der Sensoren mit der Wicklung zu achten. Je inniger die Kaltleiter mit der Wicklung verbunden sind, desto besser können sie, vor allem bei steilen Temperaturanstiegen, der Wicklungstemperatur folgen. Aus diesem Grund sind die Temperatursensoren in die Mitte der Wickelköpfe einzubetten, so dass sie allseitig vom Wicklungskupfer umgeben sind.

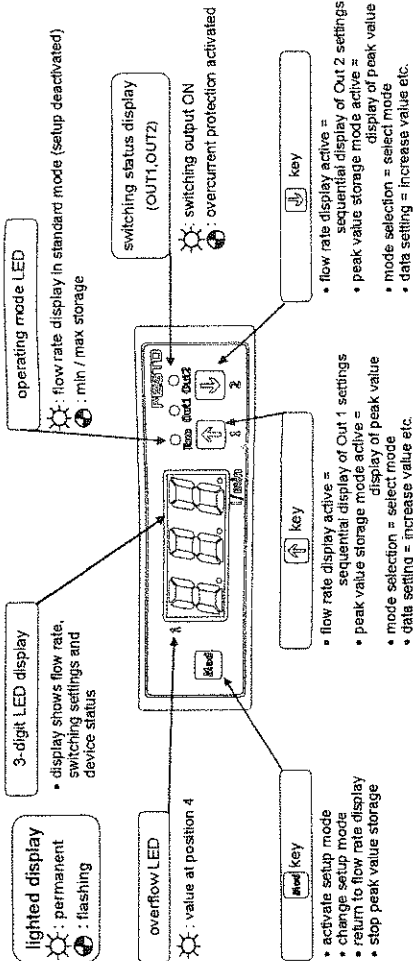
Zum Einbau der Temperatursensoren werden die fertig geformten Wickelköpfe mit einem Wickelholz in der Mitte aufgespreizt. Die Temperatursensoren sind parallel zu den Wickeldrähten einzulegen. Dabei ist darauf zu achten, dass die Wicklungsdrähte an den Temperatursensoren anliegen. Hohlräume und Luftpockets verschlechtern den Wärmekontakt und sind durch Anpressen der Wicklungsdrähte an die Sensoren mit Handkraft auf ein Minimum zu verringern. An der Einbaustelle der Sensoren sind die Wicklungsdrähte des Wicklungskopfes fest zu bandagieren. Bei Drahtstärken über 1 mm² sollten die Zwischenräume mit einem mit Quarzmehl gefüllten Harz ausgefüllt werden. Wenn der Motorenhersteller besondere Imprägniermittel oder Tränklacke verwendet, die kein chemisch neutrales Verhalten zeigen, oder besondere Arbeitsmethoden anwendet, muß er die Widerstandsfähigkeit der Temperatursensoren unter den von ihm verwendeten Einsatzbedingungen selbst erproben. Zur Vermeidung von Störspannungsspitzen durch Schleifenbildung empfehlen wir die Rückführung der Anschlusslitze auf derselben Seite wie die Zuleitung.

Technische Daten

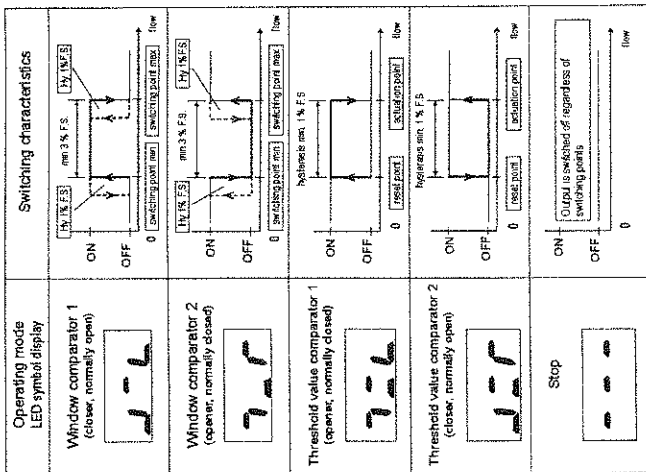
Bauform	K	KD
Max. Betriebsspannung		25 V DC
Messspannung bei		
NAT+15K		≤7,5 V DC
-20...NAT+5K		≤2,5 V DC
Nennansprechtemperatur NAT		60...180°C
Toleranz NAT		± 5 K
Nennwiderstand -20...NAT-20K, VPTC ≤2,5 V	R ≤250 Ω	≤750 Ω
Betriebstemperaturbereich		-20°C...NAT+20°C
Themische Ansprechzeit t _a		≤5 s
Lagertemperaturbereich		-25°C...+65°C
Prüfbedingungen		EN 60947-8
Nennisolationsspannung U _{eff}		690 V
Isolationsprüfspannung U _{eff}		2500 V AC

Technische Änderungen vorbehalten

Display and operation



Switching operation modes



Note 1: During continuous operation, there should be an interval of at least 3% of the measuring range's final value between two switching points. A hysteresis of 1% of the measuring range's final value (FS) is automatically added to the ON and OFF switching points.

Note 2: During threshold value operation, there should be an interval of at least 1% of the measuring range's final value (FS) between two switching points. If both switching points are identical, no switching operation is initiated or the operation is unstable.

Note 3: The left-hand side of the circuit symbol corresponds to a low flow rate, the right-hand side to a high flow rate.

Note 4: The sensor's switching characteristics may be unstable if, e.g., the pressure of the medium fluctuates. Stable switching characteristics must be ensured. This requires either the determination of a sufficient interval between the two switching points or employing the sensor in an area without pressure fluctuation.

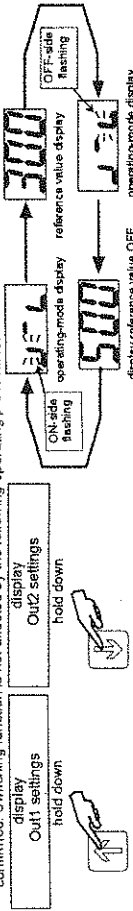
Note 5: The ratio between actuation and reset point is determined during the setting of the operation mode. A reversal of the ratio is impossible. Implementing the set switching characteristics has priority for this device. The ratio is automatically determined when the two switching points are entered. Both values are assigned and processed in a pre-determined manner as the actuation and reset point. In other words: even if the two switching points are entered in reverse order, the allocation is carried out correctly and the operating mode corresponds to specifications.

Example

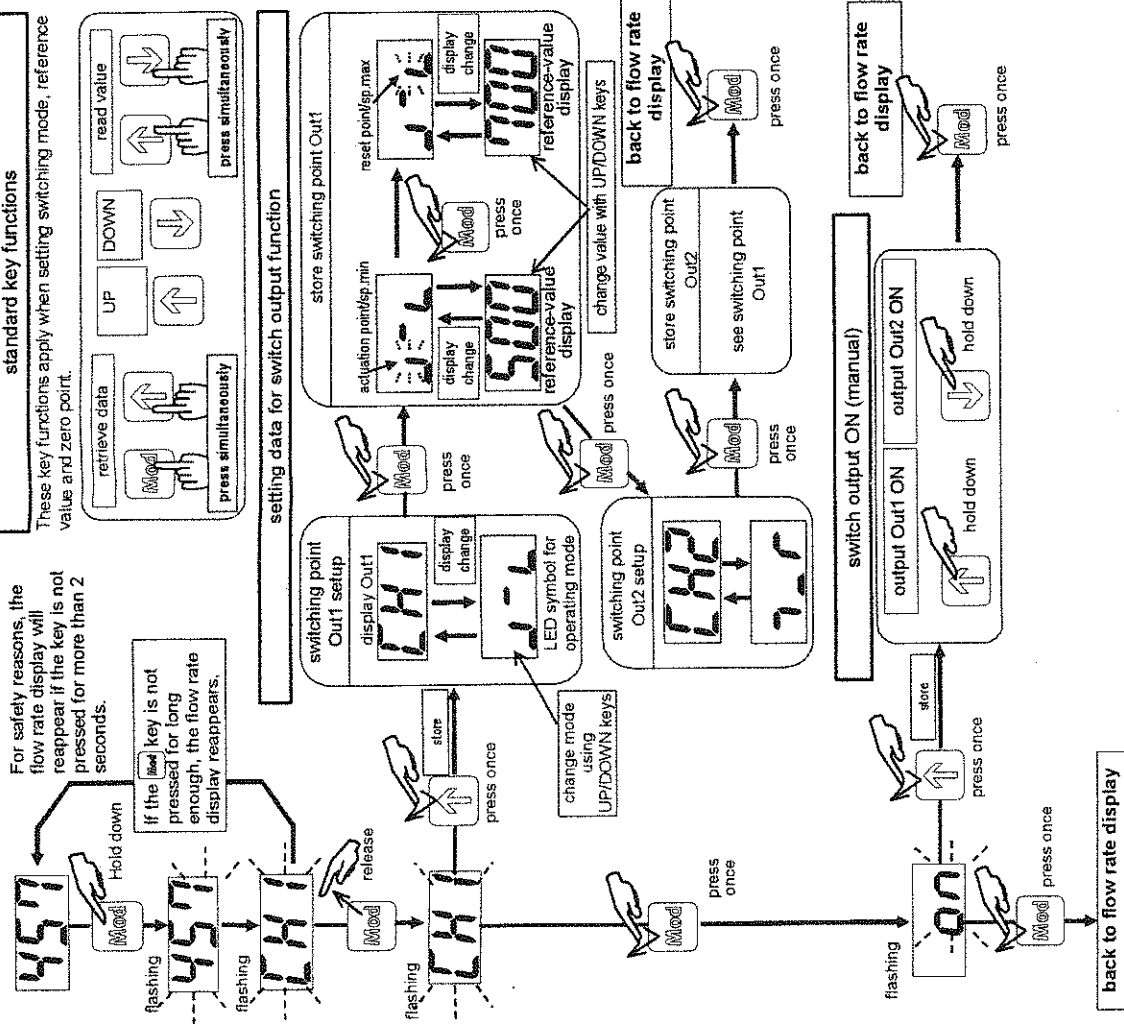
Out	LED symbol	actuation point	reset point
1		200	350
2		300	250

Checking the settings

If keys are pressed while the flow rate is being displayed, switch-on and switch-off points as well as the LED symbols can be displayed and confirmed. Switching function is not affected by the following operating procedures:

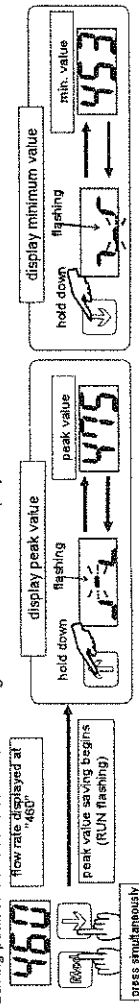


Operating procedure for switch output function and manual output operation



Saving peak value

Minimal and maximal flow rates for a certain time period are displayed. Saving peak values does not affect switching function or flow rate display.



Capsule Pressure Gauges Stainless Steel Series Model 632.50/633.50, without/with Liquid Filling

WIKA Data Sheet PM 06.03



Applications

- With liquid filled case for applications with high dynamic pressure pulsations or vibrations
- For gaseous, dry and aggressive media, also in aggressive ambience
- Process industry: chemical/petro-chemical, pharmaceutical, biotechnology, machine and power generation industries

Special Features

- Zero adjustment in front
- All stainless steel construction
- Special connection location on request
- Low scale ranges from 0 ... 2.5 mbar



Capsule Pressure Gauge Model 632.50

Description

Design

EN 837-3

Nominal size in mm

63, 100, 160

Accuracy class

1.6

Scale ranges

NS 63: 0 ... 40 mbar to 0 ... 600 mbar

NS 100: 0 ... 16 mbar to 0 ... 600 mbar

NS 160: 0 ... 2.5 mbar to 0 ... 600 mbar

or all other equivalent vacuum or combined pressure and vacuum ranges

Pressure limitation

Steady: full scale value

Fluctuating: 0.9 x full scale value

Operating temperature

Ambient: -20 ... +60 °C

Medium: +100 °C maximum

Temperature effect

When the temperature of the measuring system deviates from the reference temperature (+20 °C):

max. $\pm 0.6\%$ /10 K of full scale value

Ingress protection

IP 54 per EN 60 529 / IEC 529

(with liquid filling IP 65)

Standard version

Process connection

Stainless steel 316L,
lower mount (LM) or lower back mount (LBM) ¹⁾
NS 63: G ¼ B (male)
NS 100, 160: G ½ B (male)

Pressure element

Stainless steel 316L

Sealing

FPM/FKM

Movement

Stainless steel

Zero adjustment

In front

Dial

Aluminium, white, black lettering

Pointer

Aluminium, black

Case

Stainless steel

Window

Laminated safety glass
(with liquid filling: acrylic glass)

Bezel ring

Cam ring (bayonet type), stainless steel

Liquid filling (for model 633.50):

NS 100 and 160 from scale ranges ≥ 100 mbar
Glycerine 86.5 %

Options

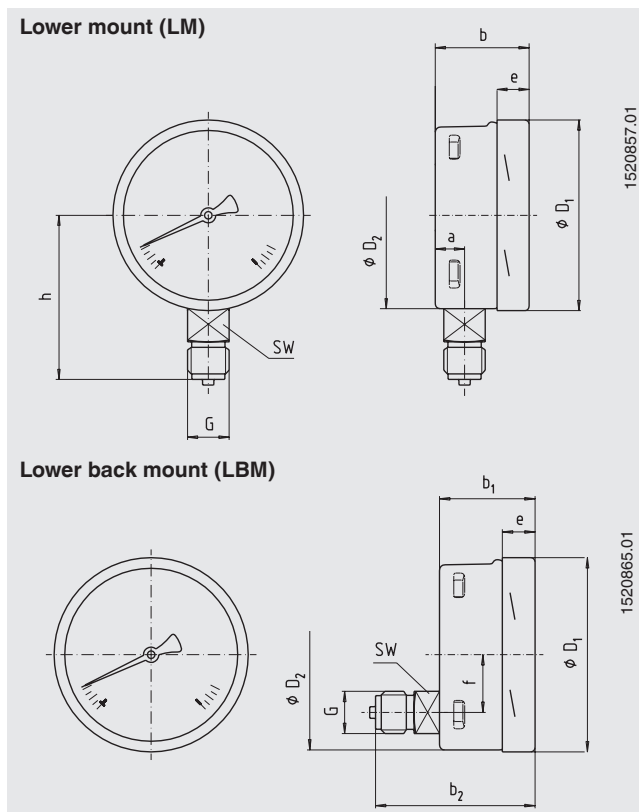
- Other process connection
- Accuracy class higher: class 1.0
- Admissible ambient temperature -40 ... +60 °C

Further options

- Overpressure and vacuum safety with scale ranges > 25 mbar: 10 x full scale value
scale ranges ≤ 25 mbar: 3 x full scale value
- Surface mounting flange
- NS 100 and 160: panel mounting flange
- NS 100 and 160: triangular bezel with clamp
- NS 100: from scale ranges ≥ 60 mbar transmitter (model 89X.34, data sheet AC 08.02)
- NS 100 and 160: from scale ranges ≥ 100 mbar switch contacts (model 831, data sheet AC 08.01)
- Version per ATEX Ex II 2 GD c TX

Dimensions in mm

Standard version



NS	Dimensions in mm										Weight in kg	
	a	b	b ₁	b ₂	D ₁	D ₂	e	f	G	h ± 1	SW	
63	9.5	42	42	63	64	62	22	- ¹⁾	G ¼ B	52	14	0.19
100	15.5	49.5	49.5	83	101	99	17.5	30	G ½ B	87	22	0.60
160	15.5	49.5	49.5	83	161	159	17.5	50	G ½ B	118	22	1.10

Process connection per EN 837-1 / 7.3

¹⁾ With NS 63: Centre back mount (CBM)

Ordering information

Model / Nominal size / Scale range / Connection size / Connection location / Options

The specifications given in this document represent the state of engineering at the time of publishing.
We reserve the right to make modifications to the specifications and materials.



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www.wika.de

461226

Date : 10.05.2012

Induction motor with options

6P LSPX132M 5,0kW Ex II 2 D Ex tb III C T125°C Db IP65 B5 230VD/400VY 50Hz

Thermal protection 1xPTC ;

Utilisation : Environment ATEX standard - Dust ; Ambiance Non corrosive ; Zone 21 - Dusty ; Type of protection Ex II 2 D Ex tb III C T125°C Db IP65; General applications ; **Ambient temperature -16 +50 °C** ; Maximum altitude 1000 m ; Maximum surface temperature 125°C



Motor characteristics : Aluminium alloy housing ; Cast iron DE endshield ; Cast iron NDE endshield.

Motor definition

Protection type	Ex II 2 D Ex tb III C T125°C Db IP65	Rated speed (min-1)	960
Efficiency class	-	Application	General applications
Number of phases	3	Main voltage (V)	400
Number of speed	1V	Connection	DY
Polarity	6P	Starting type	DOL
Motor serie	LSPX	Motor winding (V)	230VD/400VY
Frame size (mm)	132	Rated Frequency (Hz)	50
Length code	M	Operation position	IM3001(IMB5)
HS rated power (kW)	5.00	Index of protection	IP65
LS rated power (kW)	-	Index of cooling	IC411
Starting torque (N.m)	136.00	Insulation class	F

Common definitions

Paint shade	RAL1007 - Yellow
Paint system	1a (1 polyurethane coat 20/30 microns)

Motor mechanical interface

Mounting flange	FF265	Second shaft extension	-
Drive end shaft type	IEC STANDARD shaft end	Diameter NDE shaft (mm)	-
Diameter DE shaft (mm)	38k6	Second shaft end length (mm)	-
Length DE shaft (mm)	80	Drive end bearing type	DE ball bearing
Shaft material type	Steel shaft	DE bearing	6308 ZZ C3
Nuance of shaft material	-	DE bearing mounting	Locked

Motor electrical interface

Connection network type	Terminal box	Number of leads	-
Connection network material	Aluminium alloy	Cable gland material	Brass cable gland
Connection network position	A	Main cable gland type	1xPE CMDEL ISO M20x1.5
Connection network orientation	up	Principal cable gland position	Right (1)
Connection network relative position	0	Auxiliary cable gland type	1xPE ISO M16 -

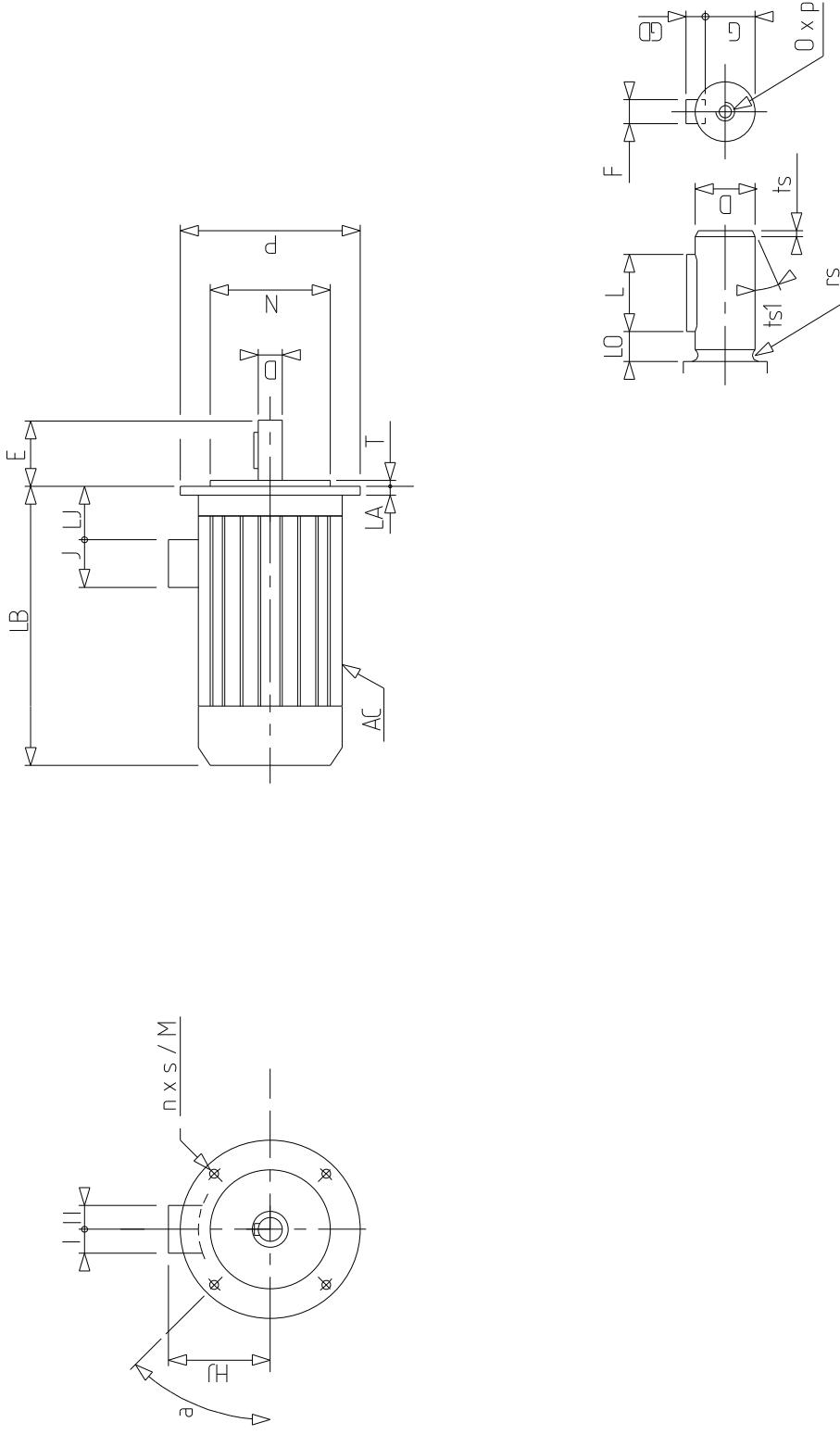
Motor options

Vibration class	A (25µm; 1.6mm/s; 2.5m/s²)	Cover	Metal cover
Balancing type	Half-key (H)	Drip proof cover option	-
Impregnation type	< 90% ; -16+40°C (T)	Forced ventilation type	-
Thermal protection	1xPTC	Forced ventilation characteristics	-
Space heater	-	Encoder type	-
Draining plugs position	6H	Encoder characteristics	-
Nameplate material	Aluminium nameplate	Screw material	Steel screw

Motor characteristics

Rated speed (min-1)	960	Motor weight (kg)	59.4
Rated current (A)	13.3	NDE bearing	6207 ZZ C3
No-load current (A)	-	Power factor at 4/4 of the load	0,71
Id / In	5.5	Power factor at 3/4 of the load	0,65
Rated torque (N.m)	54,7	Power factor at 2/4 of the load	0,52
Starting torque (N.m)	136.0	Efficiency at 4/4 (IEC 60 034-2) of the load (%)	84,1
Maximum torque (N.m)	152	Efficiency at 3/4 (IEC 60 034-2) of the load (%)	83,5
Average starting torque (N.m)		Efficiency at 2/4 (IEC 60 034-2) of the load (%)	80
Rotor locked time (cold) (s)		Efficiency at 4/4 (IEC 60 034-2-1) of the load (%)	
Unload maximum starting frequency (d/h)	-	Efficiency at 3/4 (IEC 60 034-2-1) of the load (%)	
Acoustic pressure level (dB(A))	55	Efficiency at 2/4 (IEC 60 034-2-1) of the load (%)	
Moment of inertia J (kg.m²)	0.0390000		

It is the user's responsibility to check that his configurator's version is updated.
The above mentioned data are for information, and should be subject to a special agreement from LEROY-SOMER to become contractual.
LEROY-SOMER is reserving the right to change these data without previous notice.



It is the user's responsibility to check that his configurator's version is updated.
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Motor
(° & mm)

A	-	LO2	-
a	45	LP	-
AA	-	M	265
AB	-	N	230
AC	280.00	n	4
AD	140	O	M12
AD1	45	OA	-
B	-	P	300
BB	-	p	28
C	-	pA	-
D	38k6	rs	0.5
DA	-	rs2	-
DTP	-	S	14.5
E	80	T	4
EA	-	ts	2
EC	-	ts1	20
F	10	ts2	-
FA	-	ts3	-
G	33	x	-
GB	-		
GD	8		
GF	-		
H	-		
HA	-		
HJ	177.0		
I	57		
IB	-		
II	73		
J	110		
JC	-		
JD	-		
JE	-		
JH	-		
JP	-		
K	-		
L	63		
L2	-		
LA	14		
LB	385.0		
LC	-		
LD	-		
LE	-		
LH	-		
LJ	25.0		
LO	10		

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SEFAR TETEX NF 07-351-600 NFIA

Datenblatt Data Sheet

Fasermaterial
Fibre Material

PET, Staple Fibre

Gewicht [g/m²]
Weight [g/m²]

350 +/- 10

Dicke [mm]
Thickness [mm]

1.8

Luftdurchlässigkeit [(n)/m²s]
bei 2 mbar
Air Permeability [(n)/dm²min] at
2 mbar

600 +/- 20

360 +/- 20

Reissfestigkeit
Tensile strength

**Longit N/5 cm: > 450
Transiv N/5 cm: > 450**

Bruchdehnung
Elongation to break

**Longit %: < 25
Transiv %: < 25**

Temperaturbeständigkeit
Resistance to temperature dry
gas K

150° C

Qualität
Quality

**Thermofixed, one side singed and calendered with approx.
2% non magnetic stainless steel fibers**

Verfahren
Treatment

Oleophobic and hydrophobic

All stated values are arithmetic means of samples
Alle Angaben sind Stichproben-Mittelwerte
Les données indiquées sont des valeurs moyennes.

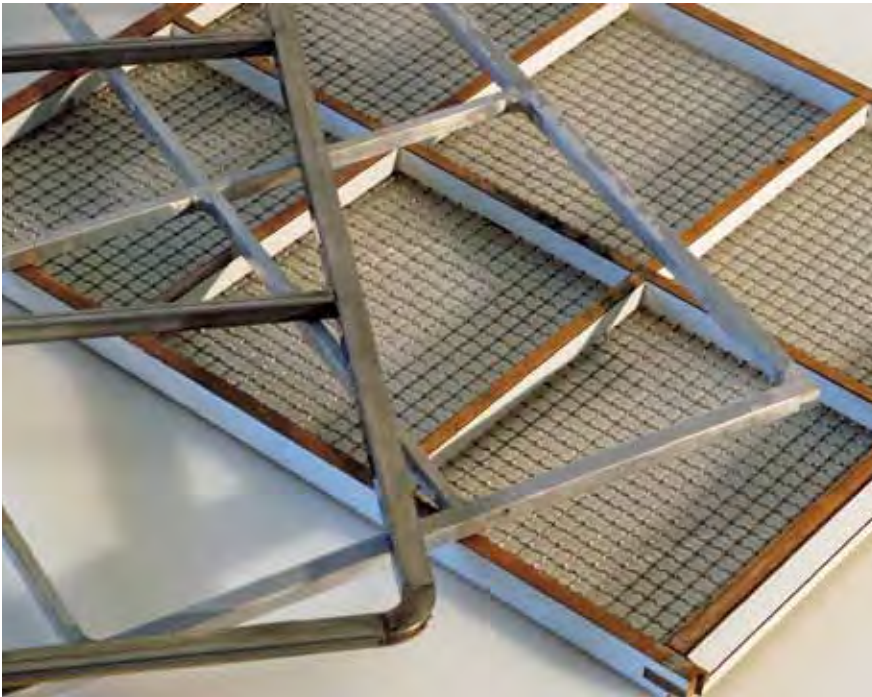
SEFAR AG

6/29/2011/07-351-600 NFIA.docx/st

In accordance with the SEFAR policy of continuously improving our products, the data in this specification are subject to change.
The user is responsible for determining fitness, merchantability and suitability of purpose before use.

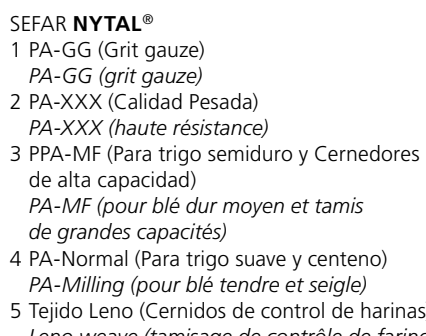
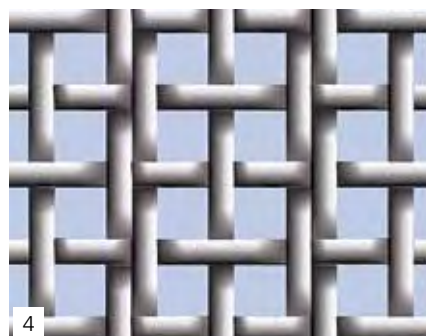
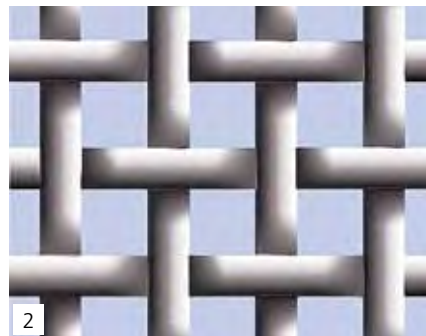
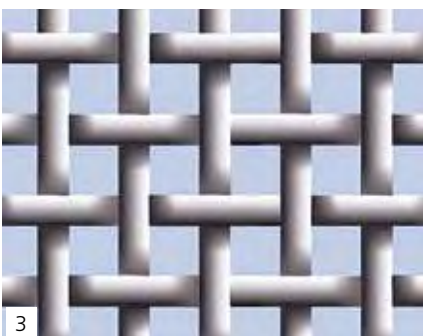
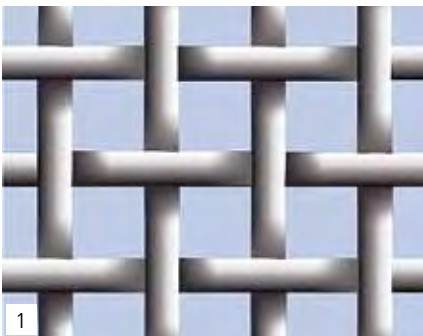
Im Einklang mit der SEFAR Geschäftspolitik, die die dauernde Kontrolle und Verbesserung der SEFAR Gewebe definiert, behalten wir uns die Änderung der technischen Daten jederzeit vor. Der Endverbraucher ist verpflichtet, die verwendeten Produkte auf deren Eignung zum Verwendungszweck vor dem Einsatz zu prüfen.

**Cernedores
Plansichter**



Bastidores de Cernedores
Cadres pour plansichter

Cernedores
Plansichter



Compatibilidad alimentaria

Los tejidos de la gama SEFAR NYTAL® se fabrican bajo las exigencias de las «FDA Code of Federal Regulations (EE.UU.), Food and Drugs, título 21, parte 177.1500 para PA 177.1630, respectivamente, para el PET (aditivos alimentarios indirectos: Polímeros)» y el «EC COMISIÓN DIRECTIVE del 2002», incluido todas modificaciones hasta 2008/39 de la EC Comisión, que se refiere a los materiales plásticos y objetos destinados a estar en contacto con productos alimenticios.

Compatibilité alimentaire

Les tissus de la gamme SEFAR NYTAL® sont tissés à partir de fils répondant aux exigences de la «FDA Code of federal Regulation (USA), Food and Drugs, Art 21, paragraphe 177.1500 pour le PA, et paragraphe 177.1630 pour le PET (Indirect food additives: Polymers)» et de la Directive Européenne de 2002 inclu tous les changements jusqu'au 2008/39 de la Commission EC. Se référant aux matières plastiques et articles entrant en contact avec les aliments.

SEFAR NYTAL®

- 1 PA-GG (Grit gauze)
PA-GG (grit gauze)
- 2 PA-XXX (Calidad Pesada)
PA-XXX (haute résistance)
- 3 PPA-MF (Para trigo semiduro y Cernedores de alta capacidad)
PA-MF (pour blé dur moyen et tamis de grandes capacités)
- 4 PA-Normal (Para trigo suave y centeno)
PA-Milling (pour blé tendre et seigle)
- 5 Tejido Leno (Cernidos de control de harinas)
Leno weave (tamisage de contrôle de farine)

FICHE TECHNIQUE

Article Numéro: 453536

**Univer AG
Sumpfstasse 26
6312 Steinhausen**

Pos.	Article Numéro	Quantité	Désignation
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Unité de préparation d'air 'ATEX'

U20090300b

v/no 453536

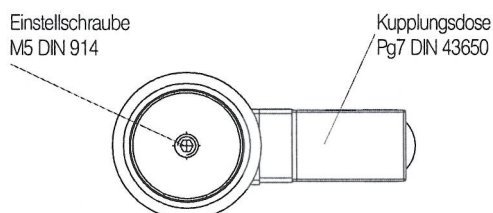
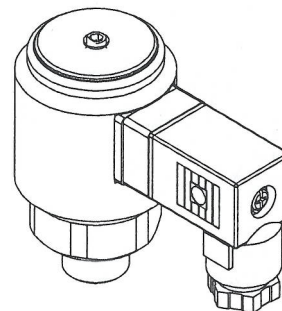
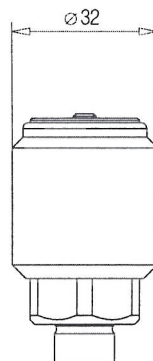
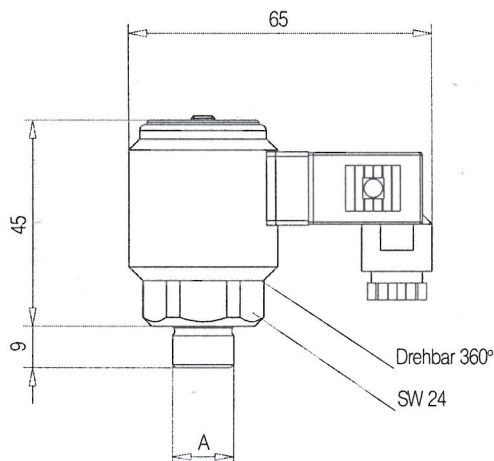
composé par:

- 1 UNIVER-Filtre
F.01 HA4 G1/4
- 1 UNIVER-Régulateur
R.01 G1/4 0,2 – 6 bar
- 1 Tecsis-Manomètre
P1415B073001
0 – 4 bar, ø40, G1/8 arrière
- 1 UNIVER-Distributeur étroit
Z.01 G1/4
- 1 Layher-Pressostat
405 002 112 11
0,3 – 2 bar, G1/8
- 1 Joint en Polyamid
RA 080 1/8
- 1 UNIVER-Equerre de fixation
ZW.00
- 2 UNIVER-Joints d'assemblage
KP.00
- 1 Sistem P-Mamelon conique
S10440 G1/4 – G1/4

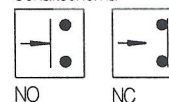
Pressure Switch



Schließer oder Öffner



Schaltschema



TECHNISCHE DATEN

Bestellnummer	405 002	405 010	405 070	405 200
Druckeinstellbereich	0,3 – 2 bar	1 – 10 bar	10 – 70 bar	50 – 200 bar
Arbeitsdruck max.	2 bar	10 bar	70 bar	200 bar
Berstdruck	5 bar	20 bar	120 bar	300 bar
Bauart	Membrane federbelastet		Kolben federbelastet	
Membrane / Dichtung	NBR, Sonderausführung VITON, CR, EPDM, KALREZ		UR, Sonderausführung NBR, VITON	
Befestigungsart	über Außengewinde			
Anschlußgewinde >A<	G 1/4", G 1/8", M12 x 1,5, M10 x 1 kegelig			
Einbaulage	beliebig			
Umgebungstemperatur	-25°C bis + 85°C, höhere Temperaturen auf Anfrage			
Medien	Luft, Hydrauliköl, Ölemulsion, Wasser, andere Medien auf Anfrage			
Verstellbarkeit	unter Druck			
Rückschaltdifferenz	10% – 15%			
Mechanische Lebensdauer	10 ⁶			
Werkstoff	Stahl verzinkt, Sonderausführung Messing, VA			
Gewicht	150 g			
Schaltelement	Kontakte versilbert, Sonderausführung vergoldet			
Bemessungsspannung	250 V			
Bemessungsfrequenz	nicht über 100 Hz			
Schaltthäufigkeit max.	200/min.			
Maximalbelastung	2 A			
Elektrischer Anschluß	über Kupplungsdose Pg 7			
Schutzart	IP65 DIN 40 050			
Schalteleistung	100 VA			

In induktiv belasteten Gleichstromkreisen z. B. Magneten, sind Einrichtungen zur Funkenlöschung vorzusehen.

Data sheet SECF383337-A

Specifications

General

<u>Description</u>	Neoflux® Cleanflow magnet DN200
<u>Summary</u>	Connection DN200 - 4 extractor bars Ø23 mm - GSN-42 magnet quality
<u>Appliance</u>	Free flowing powder and granular products, such as plastics, flour, sugar and coffee beans, not suited for fatty powders. For little Fe-pollution (cleaning up to 2x/day).
<u>Working principle</u>	The product makes contact with the magnet, and passing Fe-particles are caught
<u>Capacity</u>	8 to 20 m ³ /h (depending on product type)
<u>Max particle size</u>	10 mm
<u>Fe-particle size that can be caught</u>	≥30 µm
<u>Cleaning/Fe-particles disposal</u>	Manual
<u>Build-in length</u>	120 mm
<u>Interface/connection dim's</u>	DN200 mm
<u>Materials - product touched</u>	SS 1.4404 (AISI316L)
<u>Materials housing</u>	SS 1.4404 (AISI316L)
<u>Material gaskets/seals</u>	EPDM, Food Safe / FDA
<u>Surface treatment/finishing</u>	SF5, Ra 0.4 µm
<u>Maximum operating/product temperature</u>	60°C
<u>Min/max surrounding temperature</u>	-20°C to 40°C

Magnet info

<u>Magnet system type</u>	Magnet bars
<u>Magnet dimensions</u>	bar Ø23 mm
<u>No of magnets</u>	4
<u>Magnet quality</u>	NdFeB GSN-42, Br 13.200 Gauss (at 20° C), Tmax 80° C
<u>Magnetic field strength</u>	10.700 Gauss on magnet

Physical info

<u>Length x Width x Height</u>	228 x 270 x 120 mm
<u>Weight</u>	

Overview of technical documents in delivery

- User Manual
- Declaration of Incorporation
- Data sheet
- Main drawing: SECF383337-A
- Food Safe / FDA declaration

FICHE TECHNIQUE

Article Numéro: 453536

**Univer AG
Sumpfstasse 26
6312 Steinhausen**

Pos.	Article Numéro	Quantité	Désignation
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Unité de préparation d'air 'ATEX'

U20090300b

v/no 453536

composé par:

- 1 UNIVER-Filtre
F.01 HA4 G1/4
- 1 UNIVER-Régulateur
R.01 G1/4 0,2 – 6 bar
- 1 Tecsis-Manomètre
P1415B073001
0 – 4 bar, ø40, G1/8 arrière
- 1 UNIVER-Distributeur étroit
Z.01 G1/4
- 1 Layher-Pressostat
405 002 112 11
0,3 – 2 bar, G1/8
- 1 Joint en Polyamid
RA 080 1/8
- 1 UNIVER-Equerre de fixation
ZW.00
- 2 UNIVER-Joints d'assemblage
KP.00
- 1 Sistem P-Mamelon conique
S10440 G1/4 – G1/4

473196

Induction motor with options

4P LSPX80LG 0.75kW LS2/IE2 Ex II2D Ex tb IIIC T125°C Db B14 230VD/400VY 50Hz -

Metal cover ; 1xPTC (winding) ;

Utilisation : Environment ATEX standard - Dust ; Ambiance Non corrosive ; Finition - ; Zone 21 - Dusty ; Type of protection Ex II2D Ex tb IIIC T125°C Db ; General applications ; **Ambient temperature -16 +40 °C** ; Maximum altitude 1000 m ; Maximum surface temperature 125°C



Motor characteristics : Aluminium alloy housing ; Cast iron DE endshield ; Aluminium alloy NDE endshield.

Motor definition

Protection type	Ex II2D Ex tb IIIC T125°C Db	Rated speed (min-1)	1445
Generation code	LS2	Application	General applications
Efficiency class	IE2	Main voltage (V)	400
Number of phases	3	Connection	DY
Number of speed	1V	Starting type	DOL
Polarity	4P	Motor winding (V)	230VD/400VY
Motor serie	LSPX	Rated Frequency (Hz)	50
Frame size (mm)	80	Operation position	IM3601(IMB14)
Length code	LG	Index of protection	IP65
HS rated power (kW)	0.750	Index of cooling	IC411
LS rated power (kW)	-	Insulation class	F
Starting torque (N.m)	9.10	Finition	-

Common definitions

Paint shade	RAL1007
Paint system	1a (1 polyurethane coat 20/30 microns)

Motor mechanical interface

Mounting flange	FT100	Shaft material type	Steel shaft
Drive end shaft type	IEC STANDARD shaft end	Nuance of shaft material	-
Diameter DE shaft (mm)	19j6	Second shaft extension	-
Length DE shaft (mm)	40	Diameter NDE shaft (mm)	-
DE bearing mounting	Locked	Second shaft end length (mm)	-
DE bearing type	DE ball bearing	NDE bearing type	NDE ball bearing
DE bearing	6205 C3	NDE bearing	6204 C3

Motor electrical interface

Connection network type	Terminal box	Cable type	-
Connection network material	Aluminium alloy	Cable gland material	Cable gland not supplied, holes tapped with polyamide cork
Connection network position	A	Main cable gland type	1xM20 ; With plugs
Connection network orientation	up	Principal cable gland position	Right (1)
Connection network relative position	0	Auxiliary cable gland type	-

It is the user's responsibility to check that his configurator's version is updated.
The above mentioned data are for information, and should be subject to a special agreement from LEROY-SOMER to become contractual.
LEROY-SOMER is reserving the right to change these data without previous notice.

Induction motor with options - 4P LSPX80LG 0.75kW LS2/IE2 Ex II2D Ex tb IIIC T125°C Db B14 230VD/400VY 50Hz -

Motor options

Vibration level	A (25µm ; 1.6mm/s ; 2.5m/s ²)	Cover	Metal cover
Balancing type	Half-key (H)	Drip proof cover option	-
Impregnation type	< 95% ; -16+40°C (T)	Forced ventilation type	-
Winding thermal protection	1xPTC (winding)	Forced ventilation characteristics	-
Space heater	-	Encoder type	-
Draining plugs position	6H	Encoder characteristics	-
Nameplate material	Aluminium nameplate	Screw material	Steel screw
Endshield thermal protection	-	Adaptation pour capteur de vibration	-

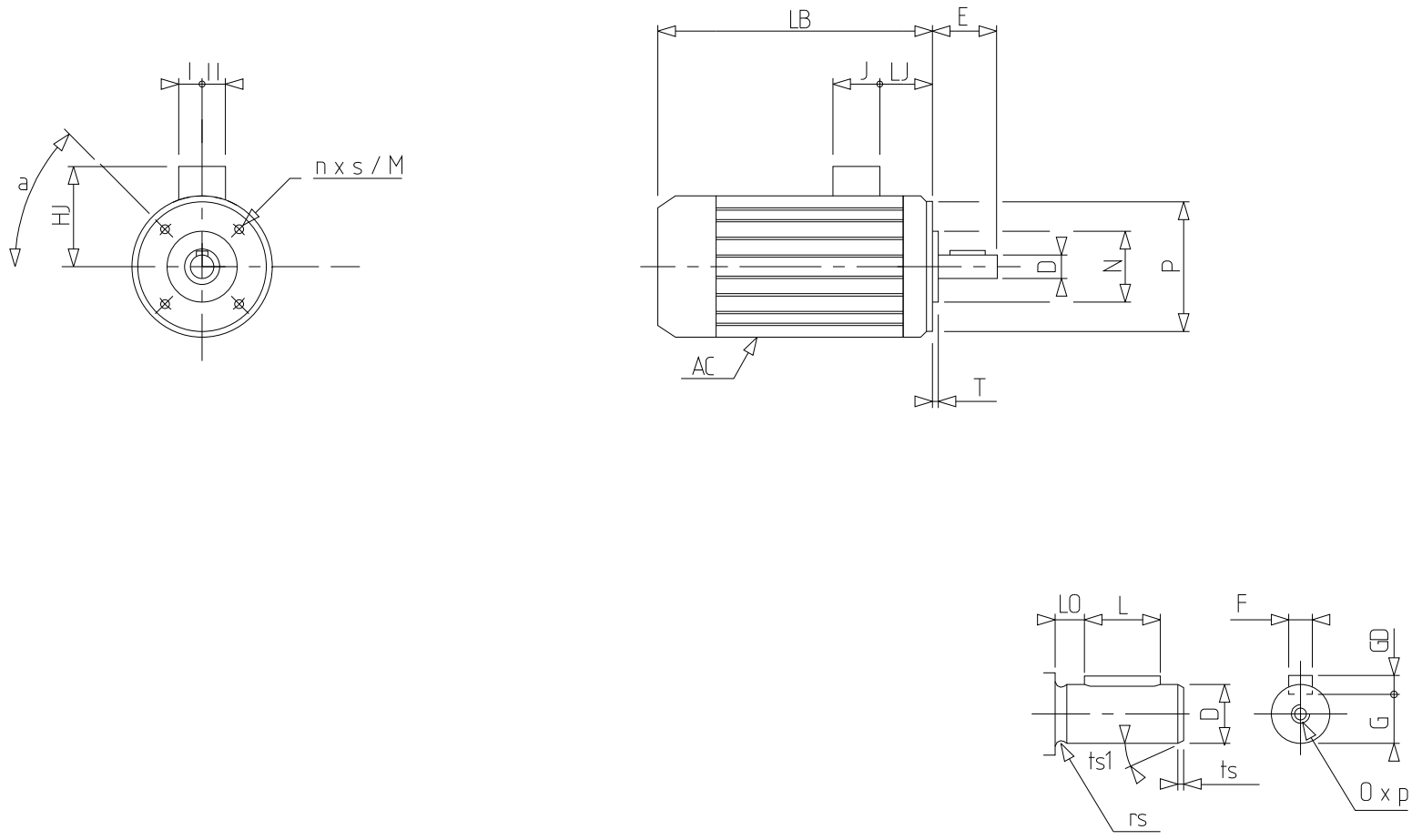
Motor characteristics (alimentation sur réseau)

Rated speed (min-1)	1445	Motor weight (kg)	11.7
Rated current (A)	1.7	Moment of inertia J (kg.m ²)	0.0026100
No-load current (A)	-	Power factor at 4/4 of the load	0.77
Id / In	5.65	Power factor at 3/4 of the load	0.69
Rated torque (N.m)	5	Power factor at 2/4 of the load	0.55
Starting torque (N.m)	9.1	Efficiency at 4/4 (IEC 60 034-2) of the load (%)	
Maximum torque (N.m)	13	Efficiency at 3/4 (IEC 60 034-2) of the load (%)	
Average starting torque (N.m)		Efficiency at 2/4 (IEC 60 034-2) of the load (%)	
Rotor locked time (cold) (s)		Efficiency at 4/4 (IEC 60 034-2-1) of the load (%)	80.10
Unload maximum starting frequency (d/h)	-	Efficiency at 3/4 (IEC 60 034-2-1) of the load (%)	80.80
Acoustic pressure level (dB(A))	47	Efficiency at 2/4 (IEC 60 034-2-1) of the load (%)	79.00

VV LSPX 80-132 (Plaquette réseau, plaquette vitesse variable, sondes CTP)

Data sheet 473196

Induction motor with options - 4P LSPX80LG 0.75kW LS2/IE2 Ex II2D Ex tb IIIC T125°C Db B14 230VD/400VY 50Hz -



It is the user's responsibility to check that his configurator's version is updated.
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LEROY-SOMER is reserving the right to change these data without previous notice.

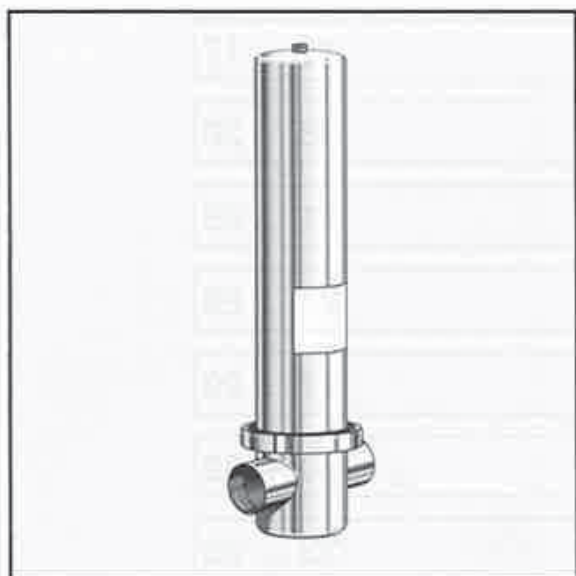
Induction motor with options - 4P LSPX80LG 0.75kW LS2/IE2 Ex II2D Ex tb IIIC T125°C Db B14 230VD/400VY 50Hz -

*Motor**(° & mm)*

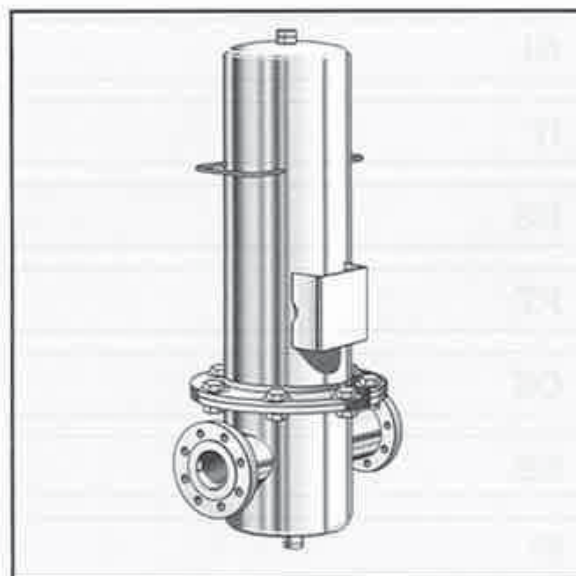
A	-	LO2	-
a	45	LP	-
AA	-	M	100
AB	-	N	80
AC	185.00	n	4
AD	-	O	M6
AD1	-	OA	-
B	-	P	120
BB	-	p	16
C	-	pA	-
D	19j6	rs	0.5
DA	-	rs2	-
DTP	-	S	M6
E	40	T	3
EA	-	ts	2
EC	-	ts1	20
F	6	ts2	-
FA	-	ts3	-
G	15.5	x	-
GB	-		
GD	6		
GF	-		
H	-		
HA	-		
HJ	137.0		
I	53		
IB	-		
II	53		
J	90		
JC	-		
JD	-		
JE	-		
JH	-		
JP	-		
K	-		
L	30		
L2	-		
LA	0		
LB	243.0		
LC	-		
LD	-		
LE	-		
LH	-		
LJ	24.5		
LO	6		

It is the user's responsibility to check that his configurator's version is updated.
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Donaldson® Ultrafilter



single



multiple

P-EG



Donaldson.

Functional elements

Pictures FIG. 1 / FIG. 2, pages 39+40

P-EG

- A Plug
- B Gasket
- C Screw locking ring
- D Upper housing bowl
- E Filter element(s)
- F Sealing ring
- G Lower housing bowl
- H Hexagonal screw
- I Tension nut
- J Spring
- K Bracket plate
- L Tie rod
- M Gasket
- N Hexagonal nut
- O Washer

For your safety



The relevant safety at work and accident prevention regulations, plus the operating instructions, shall apply for operation of the pressure vessel. The pressure vessel has been constructed in accordance with the generally recognized rules of engineering. It complies with the requirements of directive 97/23/EC concerning pressure vessels.

The relevant applicable national regulations in force at the place of installation concerning the operation and routine testing of pressure vessels must be complied with.

You as operator / user of the unit should make yourself familiar with the function, installation and start-up of the unit through these operating instructions.

It is essential that you follow these safety notes and this information in order to ensure trouble-free operation of the unit.

All the safety information is always intended to ensure your personal safety!

- The max. working pressure and the max. permissible working temperature of the pressure vessel are detailed on the type plate.
- Ensure that the permitted operational temperatures are complied with, regardless of the ambient temperatures prevailing at the place of installation.
- It is necessary to ensure that the unit is equipped with the corresponding safety and test devices to prevent the permissible operating parameters from being exceeded.
- The pressure vessel must be at a safe distance of min. 5 m to prevent heating up in the event of a fire.
- The pressure vessel has been designed for a primarily static pressure loading with a maximum of 1000 cycles to and from the full load. Rapid changes of load with more than 10% of the max. working pressure are not allowed.
- Ensure that the pressure vessel is not subjected to vibrations that could cause fatigue fractures.
- The pressure vessel is not to be subjected to stresses arising from traffic, wind and earthquakes.
- The medium used may not have any corrosive components that could attack the materials of the pressure vessel in a way that is not permitted.
- All Installation and maintenance work on the pressure vessel may only be carried out by trained and experienced specialists.

- ❑ It is forbidden to carry out any kind of work on the pressure vessel and piping, this covering welding and constructional changes, etc. Breaking this rule means extreme danger for you and your colleagues.
- ❑ Attention! If the pressure vessel is operated at temperatures over 60°C, suitable protection to prevent contact must be provided.
- ❑ A pressure gauge that shows the operational pressure must be installed in the unit.
- ❑ Depressurize the system before carrying out any work on the pressure vessel.
- ❑ Clean the piping before carrying out the installation work.
- ❑ The unit must be installed vertically in the piping.
- ❑ Ensure that the pressure vessel is installed without any stresses.
- ❑ Disconnect the power supply when carrying out electrical work.

Only for fluids of group 1:

Attention!

Observe Hazardous Substances Ordinance!



Danger of explosion!

It is forbidden to smoke or use naked lights when working with inflammable/ explosive fluids.

Appropriate use

The equipment may only be used for its intended purpose. The equipment has been built exclusively for:

- ❑ Fluids of **group 1** (except unstable gases such as acetylene) resp. **group 2** as per Pressure Equipment Directive 97/23/EC, for which the declared operating parameters are mentioned on page 44 (**Technical Data**).

Attention!

The equipment, which is not mentioned in the manufacturer certificate resp. declaration of conformity, will receive a separate declaration of conformity with technical data.

- ❑ To separate out microbiological organisms so as to produce 100% sterile compressed air.
- ❑ For the filtration of saturated steam.

Any other form of use or one going beyond this shall be considered as inappropriate. We shall have no liability whatsoever for any damage incurred as a result!

Notes on starting up



PICTURES 1 - 10 (single), page 41

PICTURES 1 - 10 (multiple), page 42

Before initial commissioning

- The filter elements are not already installed in the state in which they are supplied!
- All the screwed connections of the pressure vessel must be done up to the required and max. permissible tightening torques for the screws and bolts.
- Make a visual check! There must be no external damage visible.
- Make a check for leaks!

Initial commissioning

- Slowly** apply pressure to the system by first opening the downstream valve (9).

Information concerning maintenance



PICTURES 11 - 16 (single), page 41

PICTURES 11 - 17 (multiple), page 42

- Before starting any maintenance work, ensure that the pressure vessel has been depressurized and has cooled down, and cannot be put back into operation during the maintenance work.
- The filter elements must be changed at regular intervals. At the latest, once the permissible differential pressure has been reached!

The following recommendations apply:

Depending on wear, after 12 months at the latest.

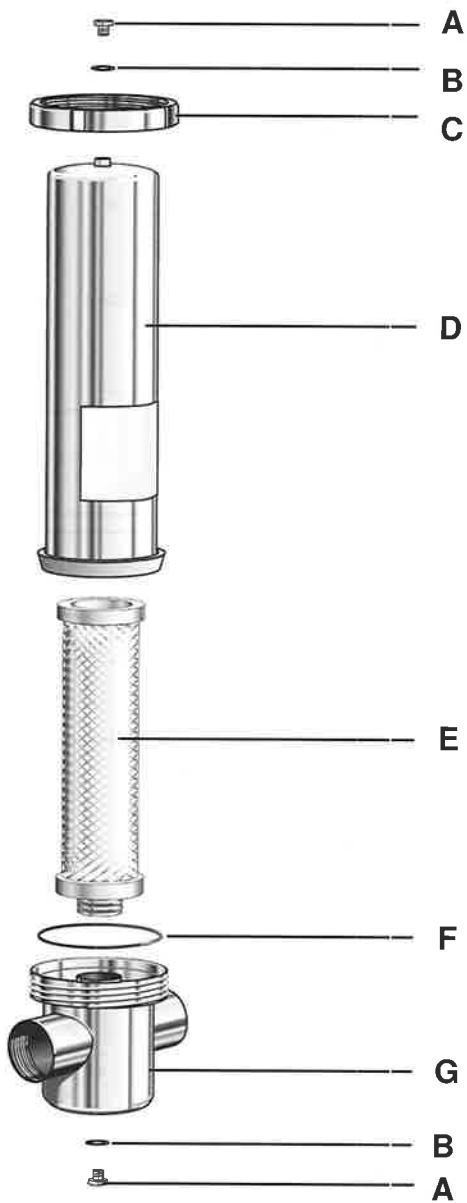
- Damaged components are to be replaced by new ones. If a marked degree of damage is found, the entire vessel is to be replaced.
- The pressure vessel has been designed for a life of 10 years.
- The sealing ring of the housing or the gasket respectively must also be changed when changing a filter (14).
- Carry out a check for leaks once the maintenance work has been finished!

Protection of the environment

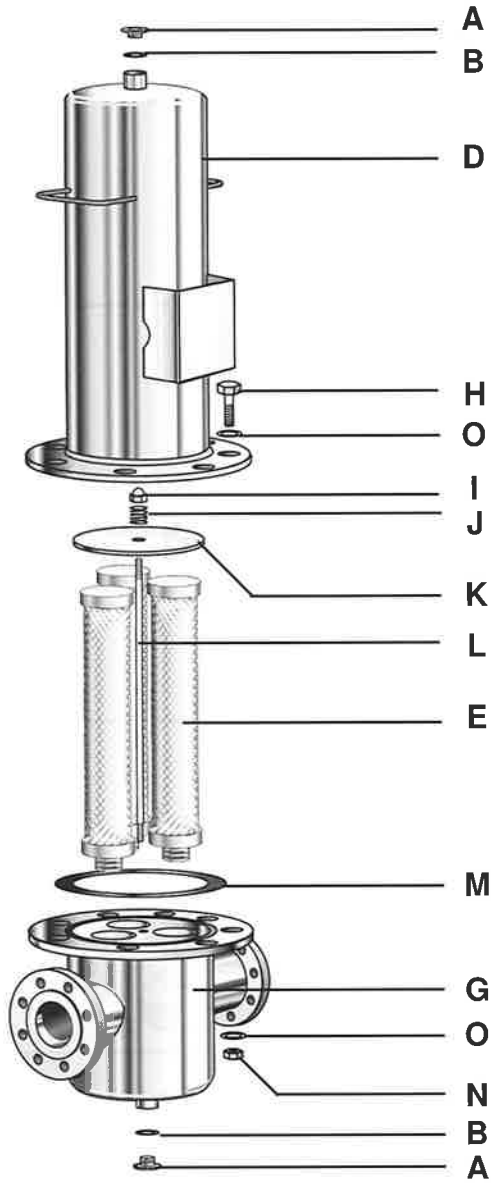


- The packing material and the unit itself and its accessories are produced from recyclable materials.
- Separating the remaining materials in an appropriate way helps in the recycling of materials.
- Used filter elements can be returned to the manufacturer.

FIG. 1



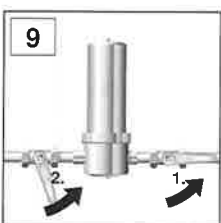
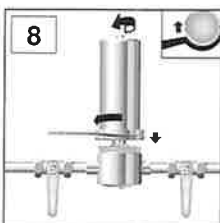
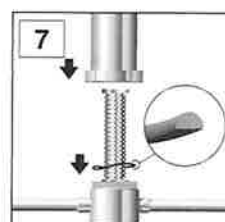
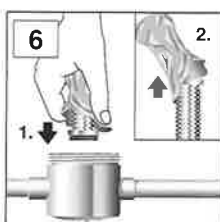
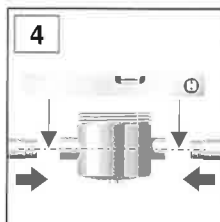
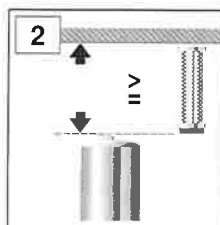
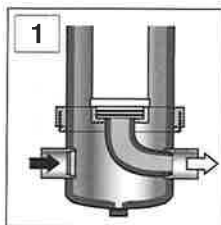
**P-EG
(single)**

FIG. 2

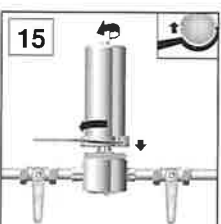
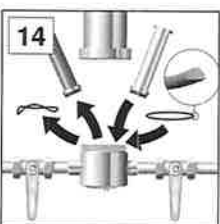
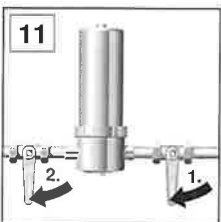
**P-EG
(multiple)**



P-EG (single)

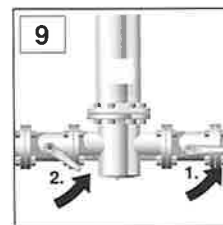
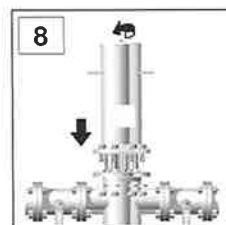
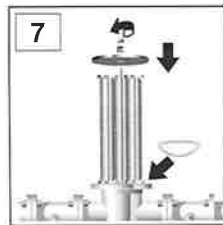
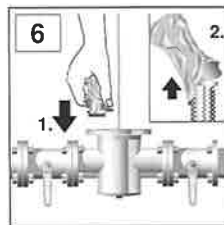
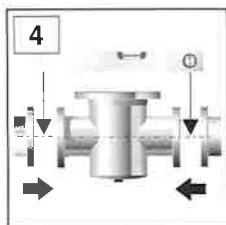
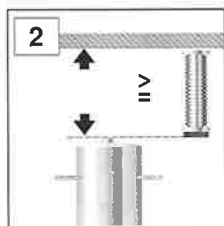
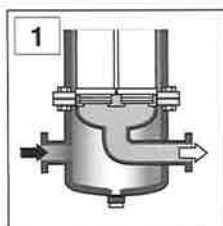


P-EG (single)

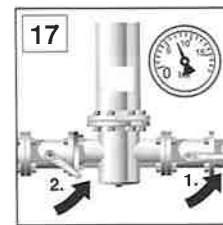
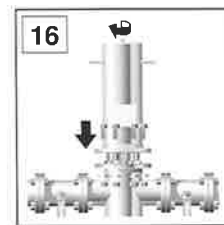
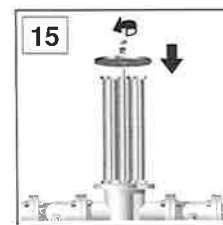
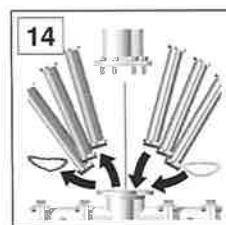
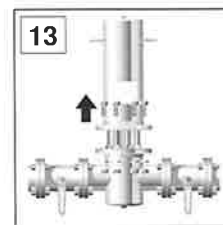
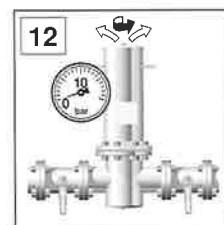
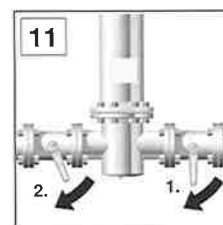




**P-EG
(multiple)**



**P-EG
(multiple)**



Accessories

- Zubehör • Accessoires • Accessoires • Accessori • Accesorios • Acessórios • Tilbehør
- Tillbehör • Lisälaitteet • Принадлежности



Manual drain (single)

- Handableiter (single) • Dériveur à main (single) • Handkraan (single)
- Deviatore manuale (single) • Descargador manual (single)
- Purgador manual (single) • Håndafleder (single)
- Handmanövreradavledare (single) • Poistventtiili (single)
- Ручной отводчик (single)



≤ 10 bar

Screw-in flange (single)

- Einschraubflansch (single) • Bride fileté (single) • Schroeffiens (single)
- Flangia filettata (single) • Brida roscada (single) • Flange aparafusada (single)
- Indskruningsflange (single) • Inskruvningsfläns (single)
- Kierteellä varustettu laippa (single) • Винчиваемый фланец (single)



C-spanner (single)

- Hakenschlüssel (single) • Clé à griffe (single) • Haaksleutel (single)
- Chiave a gancio (single) • Llave fija de gancho (single)
- Chave fixa de gancho (single) • Hagenøgle (single) • Haknyckel (single)
- Haka-avain (single) • Крючковый ключ (single)

Spare Parts

- Ersatzteile • Pièces de rechange • Reserveonderdelen • Pezzi di ricambio
- Piezas de repuesto • Peças sobresselentes • Reservedele • Reservdelar • Varaosat
- Запчасти



DIN 11851

Sealing ring (single)

- Gehäusedichtring (single) • Joint du filtre (single) • Huispakking (single)
- Guarnizione del contenitore (single) • Junta de la carcasa (single)
- Vedação da housing (single) • Huset pakning (single) • Huspakning (single)
- Säiliön tiiviste (single) • Уплотнение корпуса (single)



DIN 2690

Gasket (multiple)

- Flachdichtung (multiple) • Joint plat (multiple) • Vlakke afdichting (multiple)
- Guarnizione piatta (multiple) • Junta plana (multiple) • Vedação plana (multiple)
- Planpakning (multiple) • Flat tätning (multiple) • Ohut tiiviste (multiple)
- Плоское уплотнение (multiple)


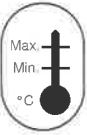



Filter elements

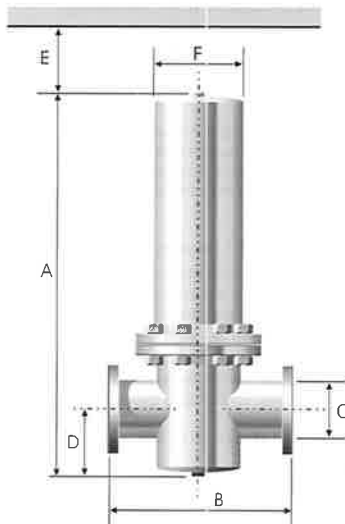
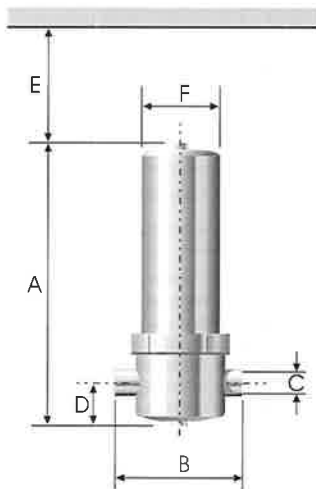
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- Elementos filtrantes • Elementos filtrantes • Filterelement • Filterelement
- Suodatinelementit • Фильтроэлементы

Technical Data

• Technische Daten • Données techniques • Technische gegevens • Dati tecnici • Datos técnicos
• Dados Técnicos • Tekniske data • Tekniska data • Tekniset tiedot • Технические данные

P-EG	Max. operating pressure  Max.	Min. / Max. operating temperature  Max. Min. °C	Filter element 	Fluids / groups Fluide / Gruppen Fluides / groupes Vloeistoffen / groepen Fluidi / gruppi Fluidos / grupos Fluidos / grupos Fluider / grupper Fluider / grupper Nesteille / ryhmät Жидкость / Группы	Category Kategorie Catégorie Categorie Categorìa Categorìa Kategori Kategoria Категория
	bar	°C			
0006	16	- 25 / +150	03/10	1 / 2	Art. 3, par. 3
0009	16	- 25 / +150	04/10	1 / 2	Art. 3, par. 3
0012	16	- 25 / +150	04/20	1 / 2	Art. 3, par. 3
0018	16	- 25 / +150	05/20	1 / 2	Art. 3, par. 3
0027	16	- 25 / +150	05/25	1 / 2	Art. 3, par. 3
0036	16	- 25 / +150	07/25	1 / 2	Art. 3, par. 3
0048	16	- 25 / +150	07/30	2	Art. 3, par. 3
				1	I (Module A)
0072	16	- 25 / +150	10/30	2	I (Module A)
				1	II (Module A1)
0108	16	- 25 / +150	15/30	2	I (Module A)
				1	II (Module A1)
0144	16	- 25 / +150	20/30	2	I (Module A)
				1	II (Module A1)
0192	16	- 25 / +150	30/30	2	I (Module A)
				1	II (Module A1)
0288	12	- 25 / +150	30/50	2	I (Module A)
				1	II (Module A1)
0432	10	- 25 / +150	3x 20/30	1	III (Module B1+D)
				2	II (Module A1)
0576	10	- 25 / +150	3x 30/30	1	III (Module B1+D)
				2	II (Module A1)
0768	10	- 25 / +150	4x 30/30	1	III (Module B1+D)
				2	II (Module A1)
1152	10	- 25 / +150	6x 30/30	1	IV (Module B+D or G)
				2	III (Module B1+D)
1536	10	- 25 / +150	8x 30/30	1	IV (Module B+D or G)
				2	III (Module B1+D)
1920	10	- 25 / +150	10x 30/30	1	IV (Module B+D or G)
				2	III (Module B1+D)

P-EG	Dimensions								Weight
	A mm	B mm	C ISO 228/1 EN 1092-1	C DIN 11850-2	C ISO 1127	D mm	E mm	F Ø mm	kg*
0006	215	108	G 1/4	13	17,2	55	90	70	1,7
0009	245	108	G 3/8	13	17,2	55	90	70	1,9
0012	245	108	G 1/2	19	21,3	55	120	70	1,9
0018	270	125	G 3/4	23	26,9	55	150	70	2,0
0027	300	125	G 1	29	33,7	75	150	85	2,6
0036	350	140	G 1 1/4	35	42,4	75	200	85	3,0
0048	380	170	G 1 1/2	41	48,3	80	200	104	4,3
0072	455	170	G 2	53	60,3	80	280	104	4,8
0108	580	170	G 2	53	60,3	80	450	104	5,3
0144	765	216	G 2 1/2	70	76,1	110	580	129	9,0
0192	1015	216	G 3	85	88,9	110	350	129	10,8
0288	1035	240	G 3	85	88,9	125	350	154	16,2
0432	1090	410	DN 100	---	---	200	580	219,1	43
0576	1350	410	DN 100	---	---	200	350	219,1	44
0768	1410	480	DN 150	---	---	240	350	273	70
1152	1460	540	DN 150	---	---	250	350	323,9	80
1536	1600	660	DN 200	---	---	300	350	406,4	135
1920	1600	660	DN 200	---	---	300	350	406,4	135



Herstellerbescheinigung

Richtlinie für Druckgeräte 97/23/EG

DE

Name und Anschrift des Herstellers:

Donaldson Filtration Deutschland GmbH
Büssingstraße 1
D-42781 Haan

Hiermit wird bescheinigt, dass die Fertigung und die Ergebnisse der Prüfungen an den unten genannten Druckgeräten, die Anforderung der Richtlinie 97/23/EG gemäß Artikel 3, Absatz 3 erfüllen.


Beschreibung der Druckgeräte:

P-EG 0006 für Fluide der Gruppe 1 und 2
 P-EG 0009 für Fluide der Gruppe 1 und 2
 P-EG 0012 für Fluide der Gruppe 1 und 2
 P-EG 0018 für Fluide der Gruppe 1 und 2
 P-EG 0027 für Fluide der Gruppe 1 und 2
 P-EG 0036 für Fluide der Gruppe 1 und 2
 P-EG 0048 für Fluide der Gruppe 2

Haan, 19.10.2011



P. Schaaf
Plant Manager



M. Pohlmann
Quality Manager

Konformitätserklärung

Richtlinie für Druckgeräte 97/23/EG

DE

Name und Anschrift des Herstellers:

Donaldson Filtration Deutschland GmbH
Büssingstraße 1
D-42781 Haan

Hiermit wird bescheinigt, dass die Fertigung und die Ergebnisse der Prüfungen an den unten genannten Druckgeräten, die Anforderung der Richtlinie 97/23/EG erfüllen.

Kategorie: I Modul: A

Die Druckgeräte sind mit dem abgebildeten Zeichen gekennzeichnet: **CE**

Beschreibung der Druckgeräte:

P-EG 0048 für Fluide der Gruppe 1
 P-EG 0072 für Fluide der Gruppe 2
 P-EG 0108 für Fluide der Gruppe 2
 P-EG 0144 für Fluide der Gruppe 2
 P-EG 0192 für Fluide der Gruppe 2
 P-EG 0288 für Fluide der Gruppe 2

Haan, 19.10.2011



P. Schaaf
Plant Manager



M. Pohlmann
Quality Manager

Manufacturer Certificate

Pressure Equipment Directive 97/23/EC

GB

Name and address of the manufacturer:

Donaldson Filtration Deutschland GmbH
Büssingstraße 1
D-42781 Haan

It is hereby certified that the manufacturing and the results of the tests fulfill the requirements of directive 97/23/EC, article 3, paragraph 3 on the following pressure vessels.

Description of the pressure vessels:

P-EG 0006 for fluids of group 1 and 2
 P-EG 0009 for fluids of group 1 and 2
 P-EG 0012 for fluids of group 1 and 2
 P-EG 0018 for fluids of group 1 and 2
 P-EG 0027 for fluids of group 1 and 2
 P-EG 0036 for fluids of group 1 and 2
 P-EG 0048 for fluids of group 2

Haan, 19.10.2011



P. Schaaf
Plant Manager



M. Pohlmann
Quality Manager

Declaration of Conformity

Pressure Equipment Directive 97/23/EC

GB

Name and address of the manufacturer:

Donaldson Filtration Deutschland GmbH
Büssingstraße 1
D-42781 Haan

It is hereby certified that the manufacturing and the results of the tests fulfill the requirements of directive 97/23/EC, on the following pressure vessels.

Kategorie: I Module: A

The pressure vessels are marked with the sign shown: **CE**

Description of the pressure vessels:

P-EG 0048 for fluids of group 1
 P-EG 0072 for fluids of group 2
 P-EG 0108 for fluids of group 2
 P-EG 0144 for fluids of group 2
 P-EG 0192 for fluids of group 2
 P-EG 0288 for fluids of group 2

Haan, 19.10.2011



P. Schaaf
Plant Manager



M. Pohlmann
Quality Manager

Donaldson Filtration Deutschland GmbH
 Büssingstraße 1
 D-42781 Haan
 Germany



www.donaldson.com

Quality certificate

We confirm that the Donaldson Filtration Deutschland high efficiency filter element

Type:	(P)-SRF N
Filter media:	Borosilicate
Absolute retention rate:	99,99998% at 0.2µm, 99,999998% at 0.02µm
Support material:	Stainless steel

is produced, packaged and shipped under the strictest control, and, at a minimum, conforms with exact quality and performance standards as specified in product data sheets. No changes in critical filter specifications will be made without notification in advance. All products have been inspected and released by Quality Assurance as having met the following requirements:

- The filter elements are completely assembled, tested and packaged in an accredited DIN EN ISO 9001 facility.
- All filter elements are 100% integrity tested according to EN 1822 and ASTM D 2986-91 (Aerosol Challenge Test). The retention rate complies with the product specification of 99,99998% at 0,2µm.
- All components comply to the FDA regulations for food contact use according to CFR (Code of Federal Regulations) Title 21.
- All filter elements are fabricated without the use of binders, adhesives, additives or surface-active agents.
- All filter elements are manufactured from high quality, non-toxic as well as biologically inert raw materials.
- This filter element was manufactured with a Borosilicate filter matrix which meets the criteria for a "non-fibre" releasing filter as defined in 21 CFR 210.3 (b)(6).
- The level of extractables of an 10" cartridge after 24 hours in a 70/30% IPA/Water mixture at 20°C was equal to or less than 35mg.
- The typical flow rate of a 10" filter element of this type is equal to or larger than 400 Nm³/h at a differential pressure of 50 mbar at 8 bar abs (20°C)
- All delivered filter elements (P)-SRF, (P)-SRF N and (P)-BE are not sterilized by plant.
- Do **NOT** use organic solvents to clean or disinfect the element prior to use!

Product Line Manager

Dr. P. Schwarz

Quality Representative

M. Pohlmann

Haan, September 2009

Donaldson Filtration Deutschland GmbH
 Büssingstraße 1
 D-42781 Haan
 Germany



www.donaldson.com

P-SRF N

Product description:

The P-SRF N is a pleated depth filter for sterile filtration of compressed air, process air, technical gases and vent applications. The retention rate is 99,99998% related to 0,2 µm. The P-SRF N combines great strength, long service life, high safety and high flow rates and can dramatically reduce costs by cartridge usage. All components meet the FDA requirements for the contact with food in accordance with the CFR requirements (Code of Federal Regulations), title 21. The filter is manufactured according to DIN EN ISO 9001.

Materials and CFR Title 21		
Filter Media	Borosilicate glass fibers	177 2260
Coating	PDMS	177 2260
Support	Stainless steel 1 4301	211 56
Cage / Core	Stainless steel 1 4301	211 56
End Caps	Stainless steel 1 4301	211 56
O-Rings	Silicone EPDM, Buna N	177 2600
Sealing Compound	Silicone	177 2600

Application:

The P-SRF N sterile filters are designed for the following applications:

- Food & Beverage Industry
- Pharmaceutical Industry
- Biotech Industry
- Health Care
- Aseptic Packaging
- Chemical Industry
- Breweries
- Dairies

Absolute Retention rate:

99,99998% related to 0,2 µm

Effective Filtration Area (nominal):

0,84 m² per 10" (254 mm) element
 For other sizes see correction factor CF

Bacterial / Viral Retention:

P-SRF N filter elements have been scientifically validated from an independent institute by:

- Brevundimonas (Pseudomonas) diminuta aerosol challenge, LRV >7 /cm²
- MS-2 Coliphages Aerosol Challenge, LRV >9 /cm²

Operating Conditions:

Maximum Differential Pressure:
 5 bar (75psid) (-20°C up to 150°C),
 independent of the system pressure or the flow direction

Typical Continuous Air Service Life: 12 months

Typical Vent Service Life: 6 months

Temperature Range:

-20 °C (-4 °F) to 200°C (400°F)
 >150°C (300°F) only for dry compressed air

Dimensions:

Element size	A [mm]	B [mm]	Ø C * [inch]	Ø D [mm]	CF
03/10	76	11	¾"	52	0,12
04/10	104	11	¾"	52	0,17
04/20	104	14	1"	52	0,17
05/20	128	14	1"	52	0,21
05/25	128	14	1"	62	0,29
07/25	180	14	1"	62	0,42
07/30	180	16	2"	86	0,70
10/30	254	16	2"	86	1,00
15/30	381	16	2"	86	1,28
20/30	510	16	2"	86	2,00
30/30	764	16	2"	86	2,56

* Plug-type connection with double-o-ring
 CF: Correction Factor filter area

Donaldson Filtration Deutschland GmbH
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 Germany



www.donaldson.com

Manual for Installation and Sterilization

Applicable to: (P)-SRF, (P)-SRF N, (P)-BE

This document is just a recommendation and will help you to operate and sterilize your Donaldson filter element in an optimum way retaining integrity and extending service life. All methods mentioned below have been tested in day to day practise. Please be aware that all sterilization methods potentially have to be adapted to your system and conditions. Our recommendation will not absolve you from the responsibility to validate your filtration system. Please refer to the manufacturer or to your sales representative for a detailed sterilization guide or if you have any further questions about this manual or other aspects regarding your filtration system.

Installation (1. – 6.) & De-installation (7.) of P-SRF N filter elements:

Donaldson filters are available in a number of different adapter and O-ring configurations designed to fit modern filter housings. The filter should fit snugly in the housing. Improper installation can impair filtration efficiency.

1. Verify that the correct filter part number for the application has been chosen.
2. If autoclave sterilization is used, sterilize the filter in a suitable sterilization bag before installation.
3. Keep the filter in its plastic bag to avoid contaminating the filter element as long as possible. Cut open the bag at the O-ring end. While holding the bagged filter element, if necessary lubricate the O-rings by dipping the O-rings into clean water or other suitable liquid compatible with the process fluid.
4. Line up the open end of the filter element with the housing seat and install using a slight twisting motion while holding the bagged filter near the O-ring end. Verify that the O-rings are fully seated and not twisted. If the cartridge has locking tabs, rotate the tabs into place with a clockwise motion until engaged. **Attention: only rotate cartridges while firmly grasping the O-ring end of the cartridge to prevent excessive torque damage to the filter (Picture 1 – 2).**
5. Repeat with additional filters, Remove protective bags from the filter elements. If present, install filter retainer system (plate or spring). Reassemble housing.
6. If inline sterilization is used, sterilize the filter before the first use.
7. To uninstall the element (e.g. for autoclave sterilization), grasp the filter firmly at the O-ring end and rotate it anticlockwise to release locking tabs. Pull the element carefully out of the seat in vertical direction using a slight twisting motion, **Avoid to cant the cartridge to prevent damage to the filter (Picture 3 – 4).**

Sterilization:

The sterilization time for inline-sterilization of filter cartridges differs depending on the used sterilization temperature. The complete sterilization cycle time consists of a heating and a cooling phase plus the sterilization phase.

Ø in °C	Sterilization phase	Heating & cooling phase	Entire sterilization cycle
121 - 125	30 min.	15 min. & 15 min.	60 min.
131 – 135	15 min.	15 min. & 15 min.	45 min.
141	10 min.	15 min. & 15 min.	40 min.

These sterilization times are valid for both steam in place and autoclave sterilization.

Donaldson Filtration Deutschland GmbH
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 Germany



www.donaldson.com

Inline-Sterilization (Steam in Place):

For Steaming in Place (SIP), the steam should be free of rust and other particulates. The housing should be cleaned before the cartridge is installed. To assure sterilization, steam pressure in the assembly must not be allowed to fall below 15 psi (1 bar) or 250°F (121°C). Condensate should be drained from the system during sterilization.

- Always vent trapped air from the housing.
- Upstream and downstream gauges must be provided to verify that the differential pressure across the filter does not exceed 5 psi (0,3 bar) during any of the sterilization steps.
- Drain condensate from the housing and pipes during sterilization.
- Fill the housing with the process liquid with air that has the same pressure as the used steam.
- Allow the system to cool and keep the system under pressure until ready for use.

Always use the lowest possible sterilizing temperature to avoid surplus stress on the element.

Autoclave sterilization:

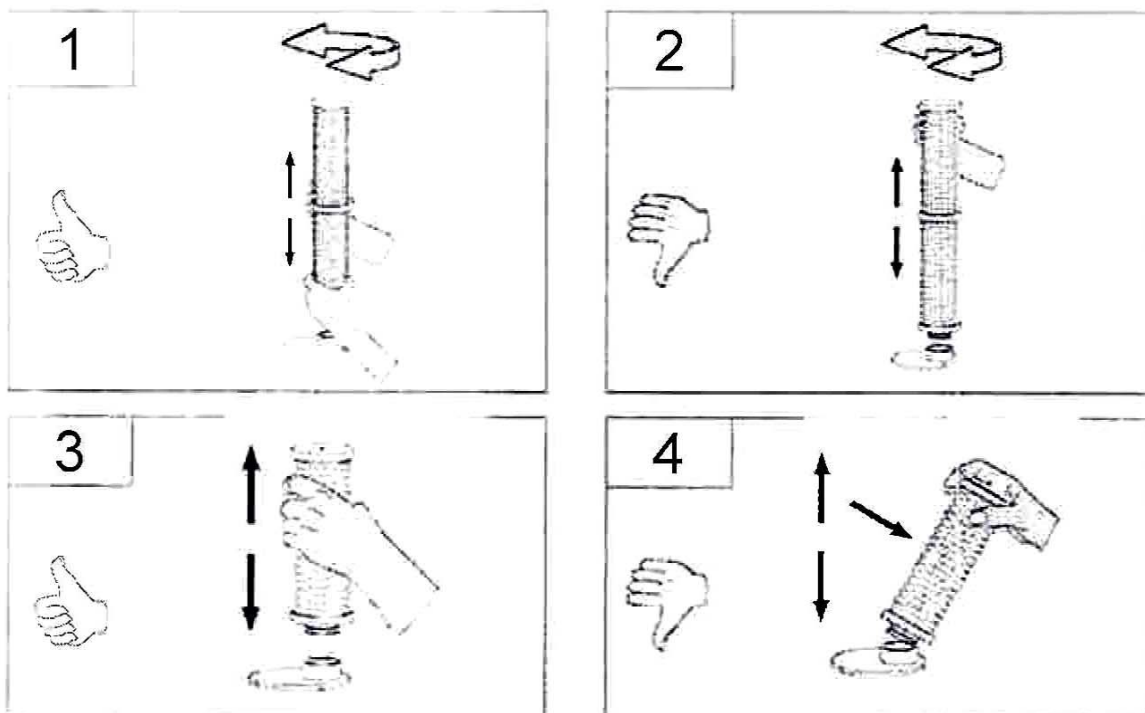
It is possible to sterilize the cartridge only or cartridge and housing together in an autoclave.

- To sterilize the filter element only, use a special sterilizing bag and insert it into the autoclave. The O-ring end should face down to allow condensate to flow out. Sterilize and dry the filter, then install it again using aseptic techniques.
- To sterilize both, filter element and housing, install the cartridge into the housing. Rinse the filter thoroughly with clean water and cover the inlet and outlet of the housing with autoclave wrap or aluminium foil. Vent and valve drains should be open. Sterilize the assembly, then allow the housing to cool and dry before aseptic installation.

After sterilization, integrity test the filter if desired.

Element drying:

To avoid damage of the filter after sterilization, start the fluid flow slowly. Allow the element to dry for several minutes, meanwhile keeping the flow so low as to maintain a differential pressure below 7 psi (0,5 bar).



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 D-42781 Haan
 Germany



www.donaldson.com

Sterile Air & Gas Filter (P)-SRF N Certificate of Conformance

We confirm that the Donaldson Filtration Deutschland high efficiency filter element

Type:	(P)-SRF N
Filter media:	Borosilicate
Absolute retention rate:	99,99998% at 0.2µm, 99,999998% at 0.02µm
Support material:	Stainless steel

is produced, packaged and shipped in a facility, whose Quality Management System is approved by an accredited registering body to the appropriate ISO9000 Quality Systems Standard and, at a minimum, conforms with exact quality and performance standards as specified in product data sheets. No changes in critical filter specifications will be made without notification in advance. All products have been inspected and released by Quality Assurance as having met the following requirements:

- All materials used in this filter construction are cited for food contact use in Code of Federal Regulations (CFR) Title 21, Part 177.2260, 177,2600 & 211.65 issued by the Food and Drug Administration (FDA).
- All materials used in this filter construction have been tested and approved for indirect food contact use according to the European Guideline EC/1935/2004.
- The filter elements are completely assembled, tested and packaged in an accredited DIN EN ISO 9001 facility.
- Each filter element (P)-SRF is controlled and 100% integrity tested according to EN ISO 1822.
- The integrity of each element (P)-SRF is tested by a Paraffin aerosol challenge test according to EN ISO 1822 and ASTM D 2986-91. The Paraffin oil used in this test is approved for Food Contact by the FDA according to CFR Title 21, Part 175.250.
- All filter elements are manufactured from high quality, non-toxic as well as biologically inert raw materials.
- This filter element was manufactured with a Borosilicate filter matrix which meets the criteria for a "non-fibre" releasing filter as defined in 21 CFR 210.3 (b)(6).
- All "plastic" – related component materials have been tested and meet the criteria for the USP Class VI Biological Test for Plastics.
- The filter element can be steam sterilized in both directions.
- The typical flow rate of a 10" filter element of this type is equal to or larger than 400 Nm³/h at a differential pressure of 50 mbar at 8 bar abs (20°C).
- All delivered filter elements (P)-SRF, (P)-SRF N and (P)-BE are not sterilized by plant.
- Do **NOT** use organic solvents to clean or disinfect the element prior to use!

Product Line Manager Process Filtration
 Dr. P. Schwarz
 Haan, March 2012

Quality Representative
 M. Pohlmann

Donaldson Filtration Deutschland GmbH
 Büssingstraße 1
 D-42781 Haan
 Germany



www.donaldson.com

Steriler Luft- und Gasfilter (P)-SRF N Konformitätszertifikat

Hiermit wird bestätigt, dass nachstehendes Filterelement der Donaldson Filtration Deutschland GmbH

Typ:	(P)-SRF N
Filtermedium:	Borosilikat
Absolute Abscheiderate:	99,99998% bei 0,2µm, 99,999998% bei 0,02µm
Stützgewebe:	Edelstahl

in einem Unternehmen produziert, verpackt und versendet wird, dessen Qualitätsmanagementsystem von einer akkreditierten Stelle nach dem Qualitätsstandardsystem ISO9000 genehmigt ist. Das Produkt entspricht in exakter Weise den Qualitäts- & Leistungsdaten, die in der Produktspezifikation hinterlegt sind. Änderungen in kritischen, produktspezifischen Eigenschaften werden nicht ohne vorherige Ankündigung durchgeführt. Alle Produkte werden von der Qualitätssicherung kontrolliert und freigegeben und entsprechen nachstehenden Kriterien:

- Alle verwendeten Materialien, sind für den Kontakt mit Lebensmitteln gemäß dem Code of Federal Regulations (CFR) Title 21, Part 177.2260, 177.2600, 177.1550 & 211.65, der von der Food and Drug Administration (FDA) herausgegeben wird, geeignet.
- Alle verwendeten Materialien, wurden nach der europäischen Richtlinie EC/1935/2004 für den indirekten Lebensmittelkontakt getestet und zugelassen.
- Die Filterelemente werden gemäß DIN EN ISO 9001 komplett hergestellt, getestet und verpackt.
- Jedes (P)-SRF N Filterelement wird kontrolliert und gemäß EN ISO 1822 100% auf Integrität getestet.
- Der Integritätstest jedes (P)-SRF N Elements ist nach der EN ISO 1822 und ASTM D 2986-91 mit einem Paraffinaerosoltest durchgeführt. Das Paraffinöl, das in diesem Test verwendet wird, ist gemäß der FDA nach CFR Title, Part 175.250 für den Lebensmittelkontakt geeignet.
- Alle Filterelemente werden aus hochwertigen, nicht toxischen und biologisch inerten Rohmaterialien gefertigt.
- Die extrahierbaren Bestandteile des Filters betragen 35mg oder weniger bei einem 10" Element nach 24h bei 20°C in 70/30% IPA/Wasser Gemisch.
- Dieses Filterelement wurde aus einer Borosilikat - Filtermatrix hergestellt, die die Kriterien eines nicht faserabgebenden Filters, wie sie in 21 CFR 210,3 (b)(6) definiert sind, erfüllt.
- Alle Materialkomponenten, die aus Kunststoff bestehen, wurden getestet und erfüllen die Kriterien der USP Class VI Biological Test für Plastics.
- Das Filterelement kann in beide Richtungen sterilisiert werden.
- Die typische Durchflussrate für ein 10" Element beträgt 400Nm³/h oder mehr bei einem Differenzdruck von 50mbar bei 8 bar abs. (20°C).
- Alle gelieferten Filterelemente (P)-SRF, (P)-SRF N und (P)-BE werden nicht im Werk sterilisiert.
- Verwenden Sie **keine** organischen Lösungsmittel, um das Element vor dem Gebrauch zu reinigen oder zu desinfizieren.

Produkt Manager, Prozess Filtration

Dr. P. Schwarz
 Haan, März 2012

Quality Manager

M. Pohlmann

2 Technical Data



Drive medium:

Clean (5 µm filter), lubricated compressed air or lubricated nitrogen
Unfiltered compressed air will lead to breakdown of the vibrators.

Operating pressure:

2 bar to 6 bar

The operating pressures must not be exceeded or fallen short of.

Temperature see type label*:

Standard 5°C to 40°C

The operating temperatures must not be exceeded or fallen short of.

Special designs available upon request

NTP E series piston vibrators are available in sizes 25 B E, 32 B E and 48 B E. In the basic version **B**, vibrator with base-plate, the piston strikes against a cushion of air. In version **C** an impact plate (elastomer plate) is inserted in the base plate which creates a rubber hammer effect.

Warning:




The operation of NTP B E vibrators without a base plate (hard-impacting, i.e. the piston strikes directly against the mounting surface) is not permitted.

Type	Frequency	Centrifugal force	Working moment	Air consumption	Noise level
	[min ⁻¹] 2 bar bis 6 bar	[N] 2 bar bis 6 bar	[cmkg] 2 bar bis 6 bar	[l/min] 2 bar bis 6 bar	dB(A) 2 bar bis 6 bar
NTP 25 B E	2.645 – 3.602	190 – 487	0,49 – 0,69	23 – 92	64 – 73
NTP 25 B+C E	5.848 – 8.784	269 – 830	0,14 – 0,20	33 – 108	68 – 82
NTP 32 B E	1.824 – 2.614	197 – 543	1,08 – 1,45	37 – 143	64 – 77
NTP 32 B+C E	2.959 – 5.040	289 – 926	0,60 – 0,66	50 – 198	71 – 86
NTP 48 B E	1.328 – 1.963	456 – 1.403	4,72 – 6,64	67 – 295	65 – 80
NTP 48 B+C E	2.618 – 4.320	782 – 2.039	2,08 – 1,99	96 – 336	78 – 90

B = with base plate (quiet, due to air cushion)

B+C = soft-impacting (impact plate C in base plate B)

The technical data are reference values and may vary depending on the application, further data available upon request. We recommend consultation of the Netter application engineers. Subject to technical changes without prior notification.

	 NetterVibration Germany, 55252 Mainz-Kastel Tel.: +49 (0) 6134 - 2901 - 0			
Category ⇒	 II 2 G D 135°C (T4)		⇐	Max. surface temp. (D)
Type identification ⇒	Type	5°C ≤ t_a ≤ 40°C	⇐	Min./Max. ambient temp.
Serial number ⇒	No.	Year	⇐	Year of construction
	Doc. No. NV 2004 001 X		⇐	Doc. No.

* 5°C to 40°C standard

-20°C to 40°C Low temperature version NT

5°C to 100°C High temperature version HT without elastomer insert

Noise Level:

The noise level is determined to a great extent by the surface upon which the vibrator is mounted (e.g. sheet metal). Depending on the type (with silencer), the noise level at an air pressure of 6 bar lies ≤ 80 dB(A), at lower air pressures it is below this level.

Non-muffled sheet steels increase the noise level.

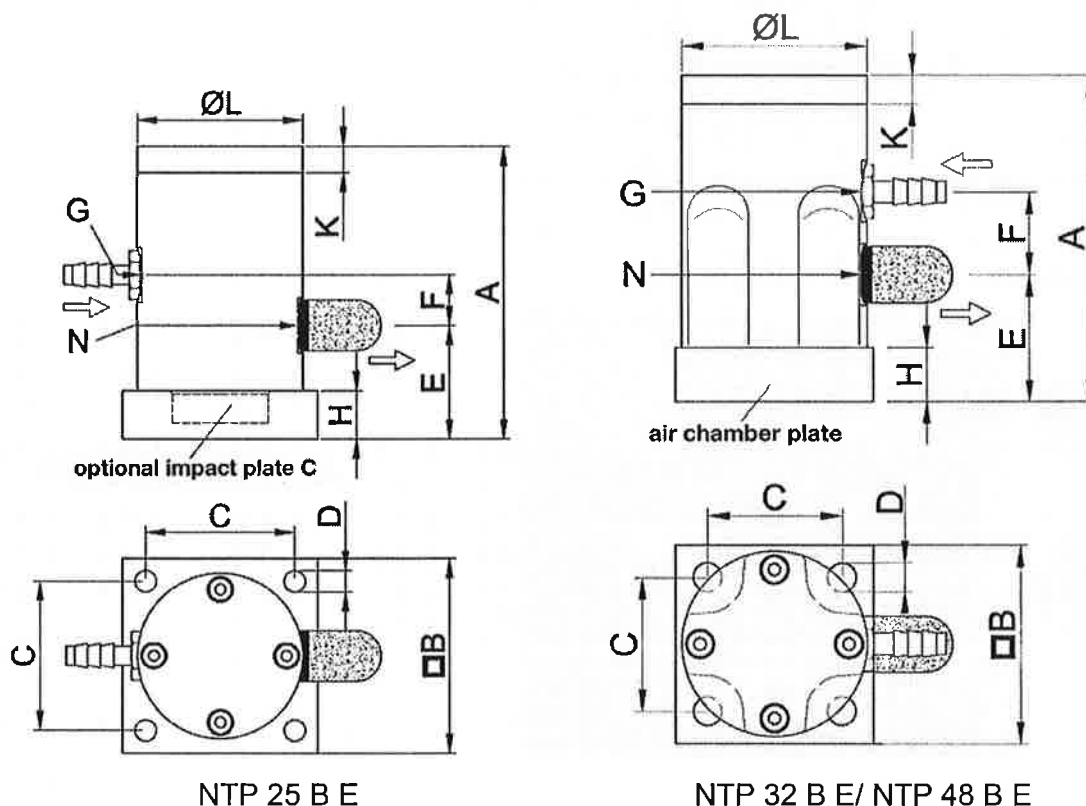
Duration of Operation:

Long periods of operation will change the technical performance data (wear).

**Considerations for selection:**

The basic version B can be supplemented with the elastomer insert at any time. It may then, however, only be operated in timed mode.

NTP B E piston vibrators will only start in every mounting position if a 3/2 way valve is fitted. If the air supply is regulated by means of a 3/2 way valve, the piston vibrators will come to a standstill immediately after switching off.

Dimensions:

Type NTP	A [mm]	B [mm]	C [mm]	Ø D [mm]	E [mm]	F [mm]	G	H [mm]	K [mm]	Ø L [mm]	N	Mass [kg]
25 B E	90	60	46	6,5	36	14,5	G1/8	15	8	51	G1/8	0,61
32 B E	140	75	51	11	48	32	G1/4	20	10	70	G1/4	1,47
48 B E	194	100	78	13	60	51	G3/8	25	15	95	G3/8	3,95

ULTRASONIC

Distance Sensor or Proximity Switch



Series P43 Atex

Key-Features:

- Measurement range 300...1500 mm
- According to ATEX II 3G EEx nA II T6 and II 3D IP67 T80°C
- Repeatability ± 0.2 %
- Linearity $< 0.3\%$ of full scale
- Ultrasonic distance sensor or 2 point proximity switch
- Measurement is independent of the targets material, surface, colour or transparency
- Protection class IP67
- 2 m cable output

Content:

Technical Data	....2
Technical Drawing	....2
Electrical Connection	....2
Teach-In Guide	....3
Sound Cone	....3
Order Code	....4

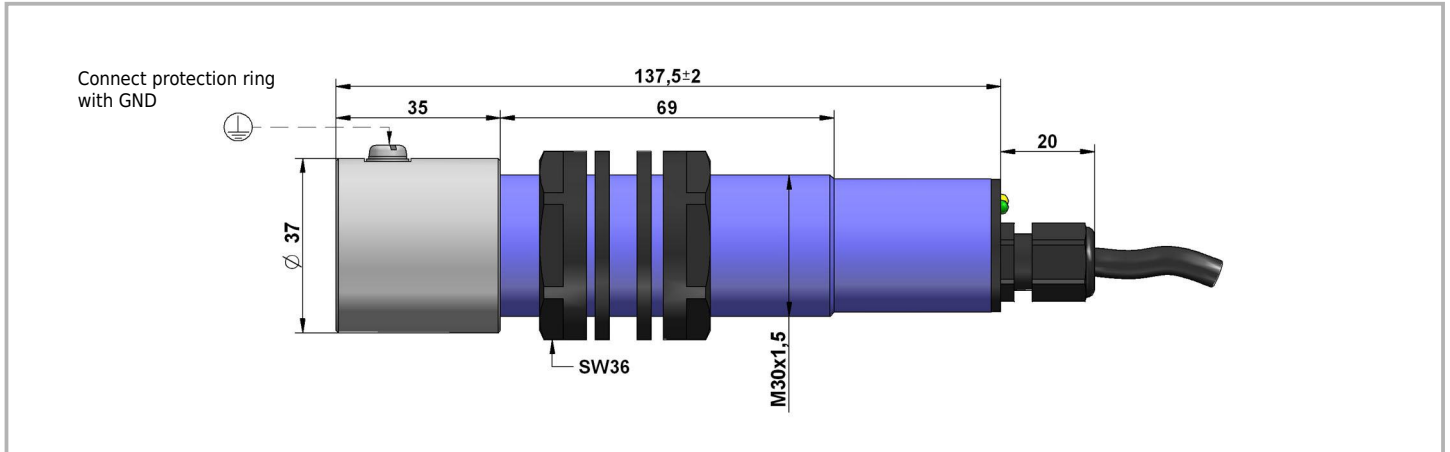
TECHNICAL DATA P43 SERIES

Model	P43-T4Y-2D-001-200EEX	P43-T4Y-2D-1C0-200EEX	P43-T4Y-2D-1D0-200EEX
Type	Proximity switch	Distance sensor	Distance sensor
Measurement range		300...1500 mm*	
Repeatability		±0.2 % / ±2 mm	
Linearity		<0.3 %	
Switching frequency/ response time	2 Hz		250 ms
Hysteresis	1%		-
Signal output	2 x PNP	0...10 V	4...20 mA
Teach In		yes	
Current consumption	<80 mA	<40 mA	<35 mA
Output current	max. 500 mA		-
Power supply	12...30 VDC		15...30 VDC
Inverted signal	-		yes
Control inputs		yes	
Safety features	Protection against reverse polarity and short circuit		
Working temperature	0...70 °C		
Connection	2 m cable output		
Design	M30x1,5		
Housing material	plastics		
Protection class	IP67		
Angle of the sound cone	8°		

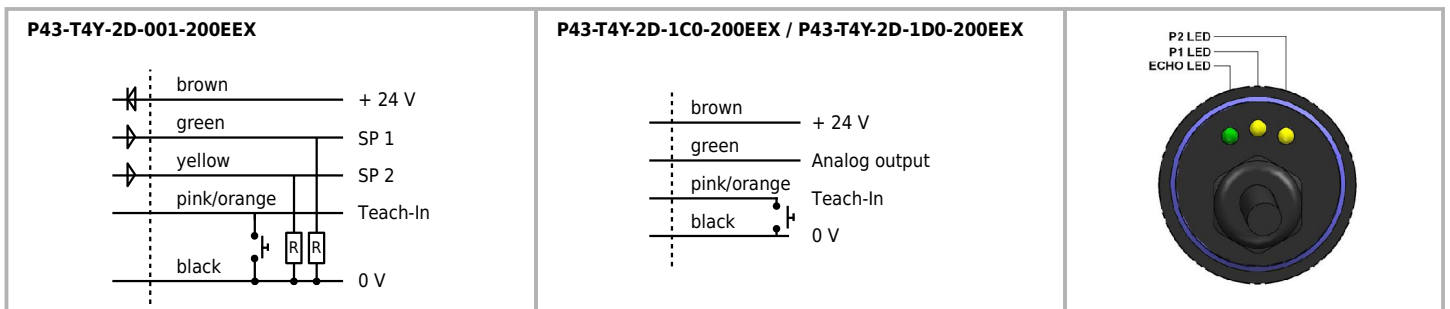
* The measurement range 150...300 mm can also be used with restriction in the linearity

Note: all specifications refer to a measurement at room temperature

TECHNICAL DRAWING



ELECTRICAL CONNECTION



TEACH-IN GUIDE ANALOGUE OUTPUT

Analogue Output 0...10 V / 4...20 mA (Teach-In)

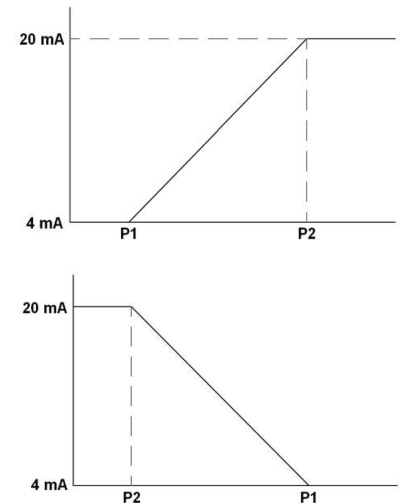
Normal operation:

EC (Echo LED) GREEN:	Activates whenever echo is received (support for orientation).
P1 LED, P2 LED YELLOW:	One of the lamps is lit whenever the target quits the zone between P1 and P2
Teach-In (Line):	Connect activating line to GND (time required for teach-in: approx. 30 sec).

Characteristic curve (P1 < P2): P1 = 0 V / 4 mA and P2 = 10 V / 20 mA

1. Teach-In must remain coupled to GND (approx. 6 - 8 sec.), until EC (Echo LED) and P1 start to flash (2 Hz) (UFP-200 only YELLOW).
2. Now P1 starts to flash (1 Hz), and EC (Echo) is ready to operate, serving as an aid for orientation. For UFP-200 model however, only YELLOW flashes (frequency ½ Hz). The reference object has to be positioned in position 0 V/4 mA. Acknowledge by interconnecting Teach-In and GND, just for a moment. From now on, the sensor works in normal operation with this selected P1 value.
3. Connect Teach-In to GND one more time (for approx. 15 - 16 sec.), until EC (Echo LED) and P2 start to flash (2 Hz). For model UFP-200, only YELLOW, frequency 1 Hz).
4. Procedure of step 2 is repeated for P2: As soon as the reference object has been installed in position 10 V / 20 mA (do not forget to confirm, as described above), the sensor accepts the new value for P2 and uses it for further operation.

Inverted characteristic curve (P2 < P1): P2 = 0 V / 4 mA and P1 = 10 V / 20 mA



TEACH-IN GUIDE PROXIMITY SWITCH

2 point proximity switch (Teach-In)

Normal operation:

EC (Echo LED) GREEN:	Is lit whenever echo is received (simplifies orientation).
P1 and P2 LED YELLOW:	State of break-over point SP1 resp. SP2
Teach-In:	Activating line (time required for teach-in: approx. 30 sec.)

Set-up procedure for switching point SP1

1. Teach-In line must be coupled to GND (approx. 6 - 8 sec.), until EC (Echo LED) and P1 start to flash (2 Hz). For UFP-200: Only YELLOW.
2. P1 starts to flash at a frequency of 1 Hz, and EC LED is active (for orientation purpose). For UFP-200 however, YELLOW flashes (only ½ Hz). The reference object has to be positioned. Acknowledge by shortly interconnecting Teach-In and GND.
3. During teach-in, LED P1 visualizes the behavior of switching point SP1. If the lamp is lit: NO for SP1. Lamp off: NC characteristics.

Set-up procedure for switching point SP2

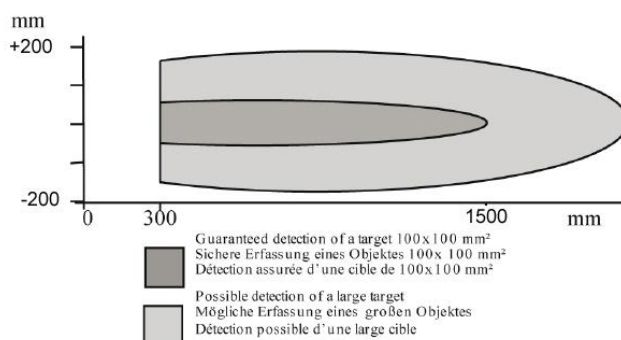
1. Teach-In line must be coupled to GND (approx. 14 - 18 sec.), until EC (Echo LED) and P2 start to flash (2 Hz). For UFP-200 only yellow (1 Hz).
2. P2 starts to flash at a frequency of 1 Hz, and EC LED is active (support for orientation). For UFP-200 however, only YELLOW flashes (½ Hz). The reference object has to be positioned. Acknowledge by shortly interconnecting Teach-In and GND). For UFP-200, the hysteresis distance should not be confirmed, before the yellow LED is illuminated.
3. During teach-in, LED P1 visualizes the behavior of switching point SP2. If the lamp is lit: NO for SP1. Lamp off: NC characteristics.

Window function / hysteresis function

1. If for UFP-200, teach-in procedure is carried out only for SP1, SP2 automatically is accepted for this distance + 1%.
2. If both P1 and P2 LED's are OFF, the sensor reads the window function. If an object is between P1 and P2, then: SP1 ON, SP2 OFF
3. If during Teach-In, both P1 and P2 LED's are lit, the sensor uses the hysteresis function. SP1 (normally open contact) and SP2 (normally closed contact) are at P1 and have the hysteresis of P1-P2.

SOUND CONE GEOMETRY

UFP-1500-EX



The exact geometry of the sound cone depends on the: air-pressure, temperature, humidity and size of the target.

ORDER CODE

P43-T4Y-2D-001-200EEX	2 point proximity switch, output signal 2 x PNP
P43-T4Y-2D-1C0-200EEX	Distance sensor, analogue output signal 0...10 V
P43-T4Y-2D-1D0-200EEX	Distance sensor, analogue output signal 4...20 mA

!! WARNING - SAFETY INFORMATION !!

These devices are not designed for critical safety or emergency shut-down purposes. Therefore they should never be used in an application, where a malfunction of the device could cause personal injury.

IMPORTANT NOTES**Hot water, steam:**

The sensor should never get in touch with hot water or water steam with a temperature > 50 °C.

Cleaning:

The sensors P43 (ATEX) must be cleaned of dust at least every 4 weeks, at the latest if the dust deposit reaches a height of 5 mm. Please do not remove the protection ring while cleaning the sensor.

Subject to change without further notice.

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50321 Brühl

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Fax +49 (0)2232 56 79 45

➡ Sorry, no English version available...

SPECIFICATIONS

FLUIDE DISTRIBUE	: Air ou gaz neutre, filtré, lubrifié
PRESSION D'UTILISATION	: 0 à 10 bar
TEMPERATURE ADMISSIBLE	: - 10°C à + 60°C
FONCTIONS	: 3/2 - 5/2
RACCORDEMENT	: G 1/8
DEBIT (Qv à 6 bar)	: 200 l/min (ANR)

CONSTRUCTION

Corps en alliage léger anodisé
 Embouts en alliage léger et résine acétal (POM)
 Pièces internes en alliage léger
 Joints d'étanchéité en nitrile (NBR)
 Bouton en résine synthétique
 Possibilité de montage en tableau (perçage Ø 16,5)
 Le distributeur 3/2 peut être utilisé en 3/2 NF ou 3/2 NO,
 en effectuant le raccordement comme indiqué ci-contre



Raccordement du 3/2	
NF	NO
1 = Pression	Echappement
2 = Utilisation	Utilisation
3 = Echappement	Pression
Raccordement du 5/2	
1 = Pression	
2,4 = Utilisations	
3,5 = Echappements	

SELECTION DU MATERIEL

	Symboles Fonction	Organes de pilotage		CODES
		Commande	Rappel	
3/2		Bouton poussoir	Ressort	55000040
		Bouton pousser-tirer		55000039
		Basculeur à 2 positions maintenues		55000043
5/2		Bouton poussoir	Ressort	55000009
		Bouton pousser-tirer		55000010
		Basculeur à 2 positions maintenues		55000011

G

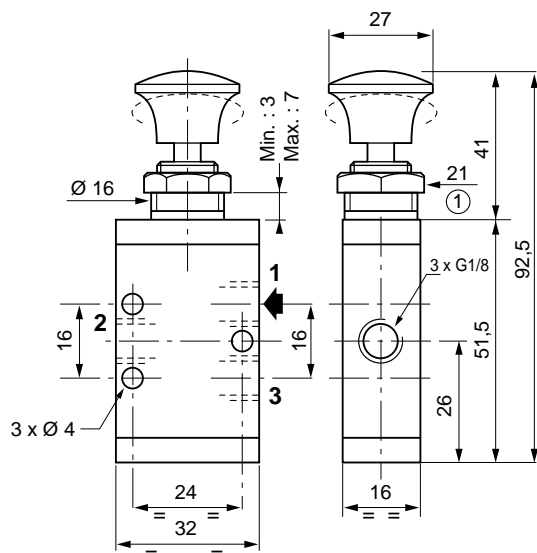
Série 550

ENCOMBREMENTS ET MASSES

3/2

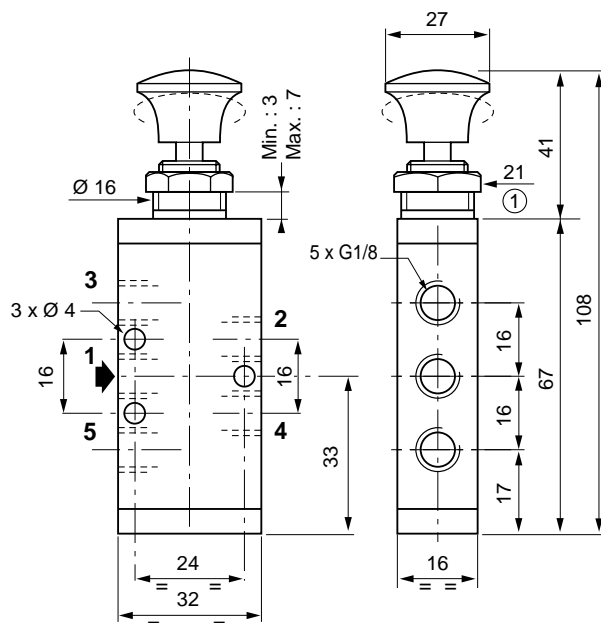
BOUTON POUSSOIR / RAPPEL RESSORT
BOUTON POUSSER-TIRER

Masse : 74 g



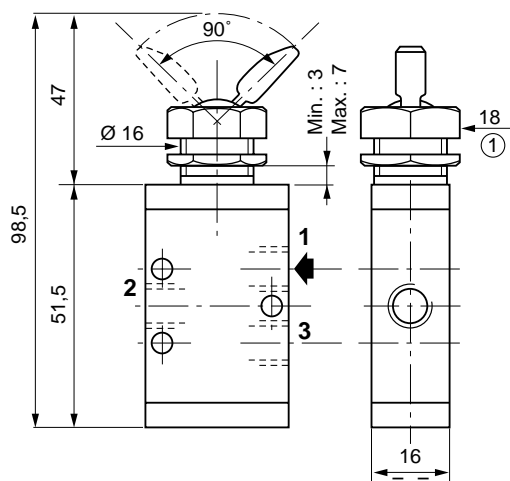
5/2

Masse : 94 g

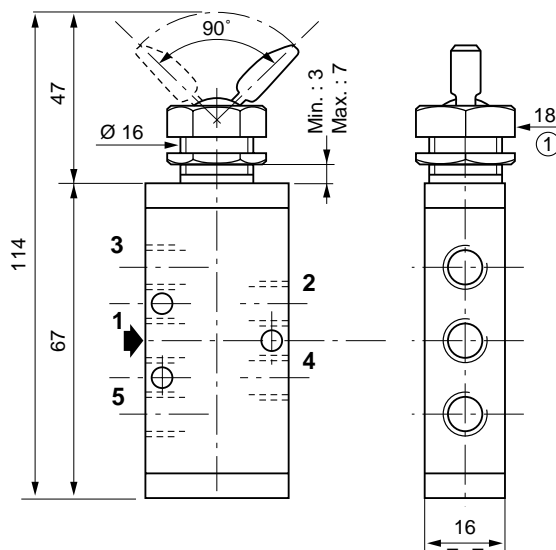


BASculeur à 2 POSITIONS MAINTENUES

Masse : 76 g



Masse : 92 g



① cotes sur plats

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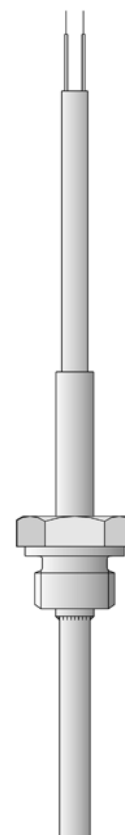
Screw-in RTD temperature probes with connecting cable

- for temperatures from -50 to +400°C
- as single or twin RTD temperature probe
- in 2-wire, 3-wire or 4-wire circuit
- connecting cable in PVC, silicone, PTFE or with metal braiding

Screw-in RTD temperature probes are mainly used for measuring temperatures in liquids and gases. An important selection criterion is their reliable sealing against both negative and positive pressures. Applications include HVAC, refrigeration, heating installations, ovens, furnaces and plant engineering.

Depending on the version, the connecting cables are suitable for use in dry and humid areas within the temperature range -50 to +350°C. The junction between cable and protection tube incorporates strain relief. A cable protector can be supplied as an option.

The measuring insert is normally fitted with a Pt100 temperature sensor to EN 60 751, Class B in 2-wire circuit. Versions with Pt500 or Pt1000 are also available. In addition, there is a choice of 3-wire or 4-wire circuit connections.



Technical data

Connection**Connecting cable****Process connection****Protection tube****Measuring insert****Response times****Accessories**

available with cable ends as: bare wires, with ferrules, receptacles or multipole connector

PVC, ambient temperature -5 to +80°C (+105°C)

silicone, ambient temperature -50 to +180°C

PTFE, ambient temperature -190 to +260°C

metal braiding, ambient temperature -50 to +350°C

connecting cable can optionally be supplied with shielding

thread, stainless steel 1.4571

stainless steel 1.4571 (Type 902050/30 Inconel 2.4816), 5mm, 5.4mm, 6mm and 8mm dia.

Pt100 temperature sensor, EN 60 751, Cl. B, 2-wire circuit

$t_{0.5}$ approx. 2sec, $t_{0.9}$ approx. 6sec, in water 0.2m/sec, 6mm dia.

pocket, see Data Sheet 90.9721 and 90.2440

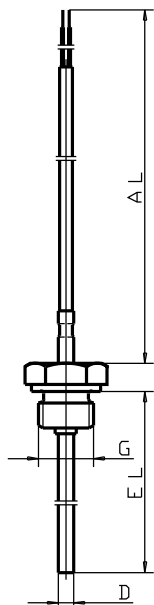
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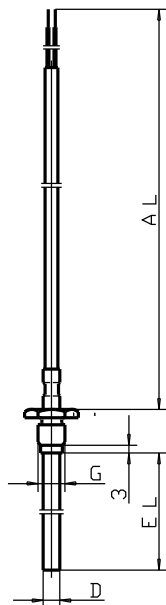
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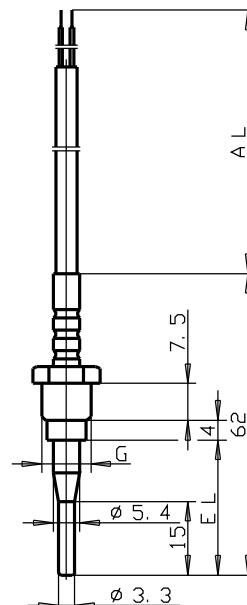
Dimensions



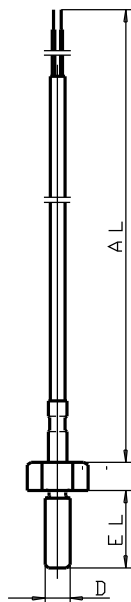
Type 902050/10



Type 902050/20



Type 902050/30



Type 902050/40

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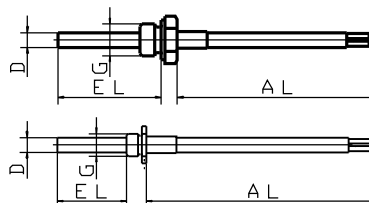


Order details: Screw-in RTD temperature probes with connecting cable

(1) Basic version

902050/10 Screw-in RTD temperature probe with fixed screw fitting

902050/20 Screw-in RTD temperature probe with loose screw fitting



(2) Operating temperature in °C / connecting cable

x	x	130	-200 to +400°C / metal braiding
x	x	380	-50 to +200°C / silicone
x	x	386	-50 to +260°C / PTFE
x	x	402	-50 to +400°C / metal braiding
x	x	724	-5 to +80°C / PVC
x	x	912	5 to 105°C / PVC (only with 1 x 2-wire or 3-wire circuit)

(3) Measuring insert

x	x	1001	1 x Pt100 in 3-wire circuit
x	x	1003	1 x Pt100 in 2-wire circuit
x	x	1011	1 x Pt100 in 4-wire circuit
x	x	2001	2 x Pt100 in 3-wire circuit
x	x	2003	2 x Pt100 in 2-wire circuit

(4) Tolerance class to EN 60 751

x	x	1	Class B (standard)
x	x	2	Class A

(5) Protection tube diameter D in mm

x	x	5	5mm
x	x	6	6mm

(6) Fitting length EL in mm (50 ≤ EL ≤ 500)

x		17	17mm
x		37	37mm
x	x	50	50mm
x	x	100	100mm
x	x	137	137mm
x	x	200	200mm
x	x	250	250mm
x	x	...	please specify in plain text (50mm steps)

(7) Process connection

x		102	thread 1/4" pipe
x		104	thread 1/2" pipe
x	x	114	thread M 10 x 1

(8) Connecting cable end

x	x	03	bare cable ends
x	x	11	ferrules to DIN 46 228 Part 4 (standard)
x	x	13	receptacle 6.3 to DIN 46 247
x	x	80	multipole connector (please specify type in plain text)
x	x	99	to customer specification

(9) Connecting cable length AL in mm (500 ≤ AL ≤ 500000)

x	x	2500	2500mm
x	x	...	please specify in plain text (500mm steps)

(10) Extra codes

x	x	000	no extra code
x	x	310	stepped protection tube
x	x	315	cable protector: coil
x	x	316	cable protector: tube
x	x	317	shielded connecting cable

Order code (1) (2) (3) (4) (5) (6) (7) (8) (9) (10) ...
 - - - - - - - - - / ...
Order example 902050/10 - 380 - 1001 - 1 - 6 - 100 - 104 - 11 - 2500 / 000¹

1. List extra codes in sequence, separated by commas.

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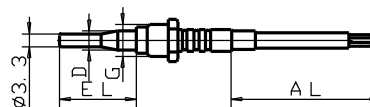
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Order details: Screw-in RTD temperature probes with connecting cable

(1) Basic version

	902050/30	Screw-in RTD temperature probe with loose screw fitting and stepped protection tube
x	380	(2) Operating temperature in °C / connecting cable -50 to +200°C / silicone
x	1001	(3) Measuring insert 1 x Pt100 in 3-wire circuit
x	1003	1 x Pt100 in 2-wire circuit
x	1	(4) Tolerance class to EN 60 751 Class B (standard)
x	2	Class A
x	5.4	(5) Protection tube diameter D in mm 5.4mm dia. stepped down to 3.3mm
x	27.5	(6) Fitting length EL in mm 27.5mm
x	114	(7) Process connection thread M 10 x 1
x	03	(8) Connecting cable end bare cable ends
x	11	ferrules to DIN 46 228 Part 4 (standard)
x	13	receptacle 6.3 to DIN 46 247
x	80	multipole connector (please specify type in plain text)
x	99	to customer specification
x	2500	(9) Connecting cable length AL in mm (500 ≤ AL ≤ 500000) 2500mm
x	...	please specify in plain text (500mm steps)
x	000	(10) Extra codes no extra code
x	315	cable protector: coil
x	316	cable protector: tube
x	317	shielded connecting cable



Order code (1) (2) (3) (4) (5) (6) (7) (8) (9) (10) ,...

Order example 902050/30 - 380 - 1003 - 1 - 5.4 - 27.5 - 114 - 11 - 2500 / 000¹

1. List extra codes in sequence, separated by commas.

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JUMO Instrument Co. Ltd.

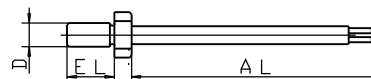
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Internet: www.jumo.us

**Order details: Screw-in RTD temperature probes with connecting cable****(1) Basic version**

902050/40 Screw-in RTD temperature probe, screw-in protection tube

**(2) Operating temperature in °C / connecting cable**

x	380	-50 to +200°C / silicone
x	390	-50 to +300°C / metal braiding
x	724	-5 to +80°C / PVC
x	912	5 to 105°C / PVC (only with 1 x 2-wire or 3-wire circuit)

(3) Measuring insert

x	1001	1 x Pt100 in 3-wire circuit
x	1003	1 x Pt100 in 2-wire circuit

(4) Tolerance class to EN 60 751

x	1	Class B (standard)
x	2	Class A

(5) Protection tube diameter D in mm

x	8	M 8
---	---	-----

(6) Fitting length EL in mm

x	25	25mm
---	----	------

(7) Process connection

x	111	thread M 8
---	-----	------------

(8) Connecting cable end

x	03	bare cable ends
x	11	ferrules to DIN 46 228 Part 4 (standard)
x	13	receptacle 6.3 to DIN 46 247
x	80	multipole connector (please specify type in plain text)
x	99	to customer specification

(9) Connecting cable length AL in mm (500 ≤ AL ≤ 500000)

x	2500	2500mm
x	...	please specify in plain text (500mm steps)

(10) Extra codes

x	000	no extra code
x	315	cable protector: coil
x	316	cable protector: tube
x	317	shielded connecting cable

Order code (1) (2) (3) (4) (5) (6) (7) (8) (9) (10) ,....

Order example 902050/40 - 390 - 1003 - 1 - 8 - 25 - 111 - 11 - 2500 / 000¹

1. List extra codes in sequence, separated by commas.

Stock versions:

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	Sales No.
902050/10	- 380	- 1001	- 1	- 6	- 100	- 104	- 11	- 2500	/ 316	90/00065232
902050/10	- 380	- 1001	- 1	- 6	- 250	- 104	- 11	- 2500	/ 316	90/00065235
902050/20	- 130	- 1003	- 1	- 6	- 37	- 114	- 11	- 2500	/ 315,317	90/00055644
902050/20	- 130	- 1001	- 1	- 6	- 37	- 114	- 11	- 2500	/ 315,317	90/00055646
902050/30	- 380	- 1001	- 1	- 5.4	- 27.5	- 114	- 11	- 2500	/ 316	90/00089972
902050/40	- 390	- 1003	- 1	- 8	- 25	- 111	- 11	- 2500	/ 315,317	90/00055722
902050/40	- 390	- 1001	- 1	- 8	- 25	- 111	- 11	- 2500	/ 315,317	90/00055732

BACHOFEN

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Référence: CONTRÔLEUR DE DEBIT - d'air EGE

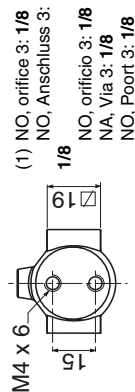
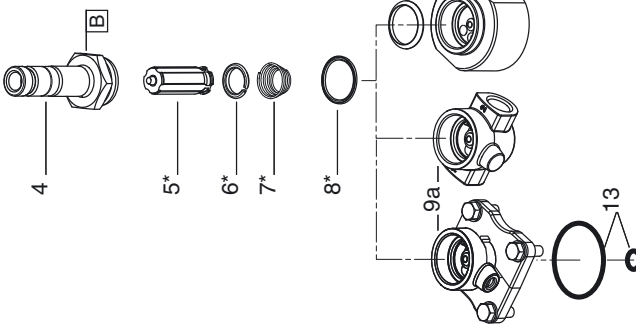
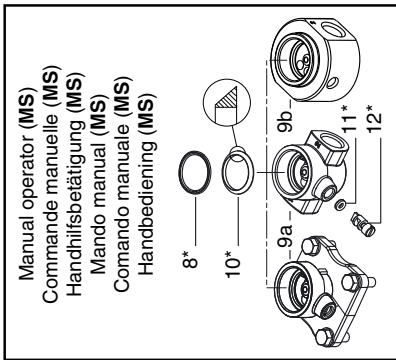
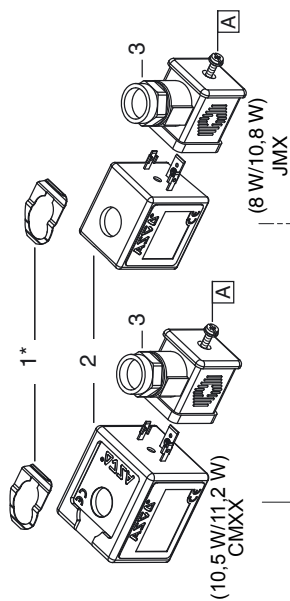
Adresse de facturation: Frewitt Fabrique de Machines SA, Route du Coteau 7, 1763 Granges-Paccot
 Adresse destinataire: Frewitt Fabrique de Machines SA, Route du Coteau 7, 1763 Granges-Paccot

Pos.	Notre N°	Votre N°	Quantité
	Art. 456574		
10	A142321 Contrôleur de débit d'air ATEX, EGE STS 212 S P11206 G1/2", L=65mm, pour zones 0 et 20 Poussière EX II 1D T 137 °C Gaz EX II 1G EEx ia IIC T4 détection de 2...25 m/s temp. du fluide: -20 ...+60 °C Pression max.: 10 bar Matériel: inox AISI 316 Ti Raccord électrique: M12, 4 pins IP 67		1 pce

 Installation and maintenance instructions 3/2 NC, NO and U solenoid valves, direct operated, brass or stainless steel body, 1/4" or pad mount, series 374		GB
<p>Series 374 valves are available as follows:</p> <ul style="list-style-type: none"> - Version with threaded 1/4" connections, 3 ports NC (normally closed), NO (normally open) and U (universal), brass or stainless steel body; - Pad-mount version, NC, brass body, for installation on: <ul style="list-style-type: none"> . single or joinable brass subbase, 1/4", . single aluminium subbase or gang-mounting rail, 1/2". <p>ATEX 94/9/EC versions:</p> <ul style="list-style-type: none"> - Special conditions for safe use". <p>SPECIAL CONDITIONS FOR SAFE USE</p> <p>For solenoid operators ATEX 49/9/EC, the instructions for use given in the specific Installation Instructions provided with the product must be strictly followed.</p> <p>Pad-mount versions:</p> <ul style="list-style-type: none"> - Brass subbases: Assembly of a standard solenoid valve with IP65 protection or solenoid operators for explosive atmospheres to ATEX with prefixes "SCDU" (10.5W/11.2W) II 3 D IP65, "NK"/Ex d, "PV"/Ex mb, "EM"/Ex e mb, "ZN"/EEEx nA. <p>INSTALLATION</p> <p>ASCO components are intended to be used only within the technical characteristics as specified on the nameplate. Damage may occur when liquids solidify above the specified minimum temperature.</p> <p>Changes to the equipment are only allowed after consulting the manufacturer or its representative. Before installation depressurise the piping system and clean internally.</p> <p>The equipment may be mounted in any position. The flow direction and pipe connection of valves are indicated on the body.</p> <p>The pipe connections have to be in accordance with the size indicated on the nameplate and fitted accordingly.</p> <p>CAUTION:</p> <ul style="list-style-type: none"> • Reducing the connections may cause improper operation or malfunctioning. • For the protection of the equipment install a strainer or filter suitable for the service involved in the inlet side as close to the product as possible. • If tape, paste, spray or a similar lubricant is used when tightening, avoid particles entering the system. • Use proper tools and locate wrenches as close as possible to the connection point. • To avoid damage to the equipment, DO NOT OVERTIGHTEN pipe connections. • Do not use valve or solenoid as a lever. • The pipe connections should not apply any force, torque or strain to the product. <p>ELECTRICAL CONNECTION</p> <p>In case of electrical connections, they are only to be made by trained personnel and have to be in accordance with the local regulations and standards.</p> <p>CAUTION:</p> <ul style="list-style-type: none"> • Turn off electrical power supply and de-energise the electrical circuit and voltage carrying parts before starting work. • All electrical screw terminals must be properly tightened according to the standards before putting into service. • Dependent upon the voltage electrical components 	<p>must be provided with an earth connection and satisfy local regulations and standards.</p> <p>The equipment can have one of the following electrical terminals:</p> <ul style="list-style-type: none"> • Spade plug connections according to ISO-4400 (when correctly installed this connection provides IP-65 protection). <p>PUTTING INTO SERVICE</p> <p>Before pressurising the system, first carry-out an electrical test. In case of solenoid valves, energise the coil a few times and notice a metal click signifying the solenoid operation.</p> <p>SERVICE</p> <p>Most of the solenoid valves are equipped with coils for continuous duty service. To prevent the possibility of personal or property damage do not touch the solenoid which can become hot under normal operation conditions. If the solenoid valve is easily accessible, the installer must provide protection preventing accidental contact.</p> <p>SOUND EMISSION</p> <p>The emission of sound depends on the application, medium and nature of the equipment used. The exact determination of the sound level can only be carried out by the user having the valve installed in his system.</p> <p>MAINTENANCE</p> <p>Maintenance of ASCO products is dependent on service conditions. Periodic cleaning is recommended, the timing of which will depend on the media and service conditions. During servicing, components should be examined for excessive wear. A complete set of internal parts is available as a spare parts kit. If a problem occurs during installation/maintenance or in case of doubt please contact ASCO or authorised representatives.</p> <p>VALVE DISASSEMBLY</p> <p>Disassemble in an orderly fashion. Pay careful attention to exploded views provided for identification of parts.</p> <ol style="list-style-type: none"> 1. Remove retaining clip (1) and remove the coil (2). 2. Unscrew the core-tube (4) and remove it from the valve body (9). 3. Remove the core, core guide and spring unit (5)(6) (7) as well as the o-ring (8). 4. Manual operator version: remove the retainer (10) to free the manual operator stem (12) and her o-ring (11) 5. All parts are now accessible for cleaning or replacement. <p>VALVE REASSEMBLY</p> <p>Reassemble in reverse order of disassembly paying careful attention to exploded views provided for identification and placement of parts.</p> <p>Make sure the retaining clip is correctly placed on the JMX coil (see drawing).</p> <p>NOTE:</p> <ol style="list-style-type: none"> 1. Lubricate all gaskets/O-rings with high quality silicone grease. 2. After maintenance, operate the solenoid valve a few times to be sure of proper operation. <p>Pad-mount version: Tighten the 4 fastening screws at the indicated torque "A".</p>	FR
<p>Instructions de mise en service et d'entretien Electrovanne 3/2 NF, NO et U, à commande directe corps laiton ou acier inox, 1/4" ou à applique, série 374</p> <p>DESCRIPTION</p> <p>Les électrovannes à commande directe de la série 374 sont des vannes :</p> <ul style="list-style-type: none"> - taraudé 1/4", à trois orifices NF (normalement fermée), NO (normalement ouverte) et U (universelle), corps laiton ou acier inox; - à applique, NF, corps laiton, pour montage sur embase: <ul style="list-style-type: none"> . en laiton, 1/4", simple ou juxtaposable; . en aluminium, 1/2", simple ou en barreaux. <p>versions ATEX 94/9/CE :</p> <p>Voir "conditions spéciales pour une utilisation sûre".</p> <p>CONDITIONS SPECIALES POUR UNE UTILISATION SURE</p> <p>Pour les têtes magnétiques ATEX 94/9/CE, suivre impérativement les prescriptions d'utilisation décrites dans chaque notice de mise en service spécifique fournie avec le produit.</p> <p>Versions à applique :</p> <ul style="list-style-type: none"> - Embases en laiton : montage électrovanne standard IP65 ou montage de têtes magnétiques pour atmosphères explosibles ATEX, préfixes "SCDU" (10.5W/11.2W) II 3 D IP65, "NK"/Ex d, "PV"/Ex mb, "EM"/Ex e mb, "ZN"/EEEx nA. <p>MONTAGE</p> <p>Les composants ASCO sont conçus pour les domaines de fonctionnement indiqués sur la plaque signalétique ou la documentation. Afin de prévenir tout dommage sur le matériel, éviter le risque de solidification des liquides aux basses températures et respecter les limites minimale et maximale.</p> <p>Aucune modification ne peut être réalisée sur le matériel sans l'accord préalable du fabricant ou de son représentant.</p> <p>Avant de procéder au montage, dépressuriser les canalisations et effectuer un nettoyage interne.</p> <p>Les électrovannes peuvent être montées dans n'importe quelle position.</p> <p>Le sens de circulation du fluide est indiqué par repères sur le corps et dans la documentation.</p> <p>La dimension des tuyauteries doit correspondre au raccordement indiqué sur le corps, l'étiquette ou la notice.</p> <p>ATTENTION :</p> <ul style="list-style-type: none"> • Une restriction des tuyauteries peut entraîner des dysfonctionnements. • Afin de protéger le matériel, installer une crépine ou un filtre adéquat en amont, aussi près que possible du produit. • En cas d'utilisation de ruban, pâte, aérosol ou un lubrifiant lors du serrage, veiller à ce qu'aucun corps étranger ne pénètre dans le circuit. • Utiliser un outillage approprié et placer les clés aussi près que possible du point de raccordement. • Afin d'éviter toute détérioration, NE PAS TROP SERRER les raccords des tuyauteries. • NE PAS se servir de la vanne ou de la tête magnétique comme d'un levier. • Les tubes de raccordement ne devront exercer aucun effort, couple ou contrainte sur le produit. <p>RACCORDMENT ÉLECTRIQUE</p> <p>Le raccordement électrique doit être réalisé par un personnel qualifié et selon les normes et règlements locaux.</p> <p>ATTENTION :</p> <ul style="list-style-type: none"> • Avant toute intervention, couper l'alimentation électrique pour mettre hors tension les composants. • Toutes les bornes à vis doivent être serrées correcte- 	<p>ment avant la mise en service.</p> <p>Selon la tension, les composants électriques doivent être mis à la terre conformément aux normes et règlements locaux.</p> <ul style="list-style-type: none"> • Raccordement électrique s'effectue par: <ul style="list-style-type: none"> • Connecteur débrochable ISO 4400 (degré de protection IP65 lorsque le raccordement est correctement effectué). <p>MISE EN SERVICE</p> <p>Avant de mettre le circuit sous pression, effectuer un essai électrique. Dans le cas d'une électrovanne, mettre la bobine sous tension plusieurs fois et écouter le "clic" métallique qui signale le fonctionnement de la tête magnétique.</p> <p>FONCTIONNEMENT</p> <p>La plupart des électrovannes comportent des bobinages prévus pour mise sous tension permanente. Pour éviter toute brûlure, ne pas toucher la tête magnétique qui, en fonctionnement normal et en permanence sous tension, peut atteindre une température élevée. Si l'électrovanne est facilement accessible, l'installateur doit prévoir une protection empêchant tout contact accidentel.</p> <p>BRUIT DE FONCTIONNEMENT</p> <p>Le bruit de fonctionnement varie selon l'utilisation, le fluide et le type de matériel employé. L'utilisateur ne pourra déterminer avec précision le niveau sonore émis qu'après avoir monté le composant sur l'installation.</p> <p>ENTRETIEN</p> <p>L'entretien nécessaire aux produits ASCO varie avec leurs conditions d'utilisation. Il est souhaitable de procéder à un nettoyage périodique de l'intervalle varie suivant la nature du fluide, les conditions de fonctionnement et le milieu ambiant. Lors de l'intervention, les composants doivent être examinés pour détecter toute usure excessive. Un ensemble de pièces internes est proposé en pièces de rechange pour procéder à la réparation. En cas de problème lors du montage/entretien ou en cas de doute, veuillez contacter ASCO ou ses représentants officiels.</p> <p>DEMONTAGE DE LA VANNE</p> <p>Démonter les pièces en suivant l'ordre indiqué sur les vues en éclaté de cette notice.</p> <ol style="list-style-type: none"> 1. Oter le clip de maintien (1) et enlever la bobine (2). 2. Dévisser le tube-culasse (4) et le séparer du corps de la vanne (9). 3. Enlever l'ensemble noyau-bague de guidage-ressort (5)(6)(7) et le joint d'étanchéité (8). 4. Version commandée manuelle : enlever la bague de retenue (10) pour libérer l'axe (12) et son joint (11) 5. Nettoyer ou remplacer toutes les pièces. <p>REMONTAGE DE LA VANNE</p> <p>Remonter les pièces suivant les vues éclatées et dans l'ordre inverse du démontage.</p> <p>S'assurer que le clip de maintien est correctement positionné, notamment sur la bobine JMX (voir dessin).</p> <p>NOTE :</p> <ol style="list-style-type: none"> 1. Lubrifier tous les joints d'étanchéité/joints toriques avec de la graisse silicone de haute qualité. 2. Après remontage, faire fonctionner l'électrovanne plusieurs fois afin de s'assurer qu'elle s'ouvre et se ferme correctement. <p>Versions à applique : Serrage des 4 vis de fixation, au couple indiqué "A".</p>	3834524-A (A) = (R8)
<p>Availability, design and specifications are subject to change without notice. All rights reserved.</p>	<p>Le bruit de fonctionnement varie selon l'utilisation, le fluide et le type de matériel employé. L'utilisateur ne pourra déterminer avec précision le niveau sonore émis qu'après avoir monté le composant sur l'installation.</p> <p>ENTRETIEN</p> <p>L'entretien nécessaire aux produits ASCO varie avec leurs conditions d'utilisation. Il est souhaitable de procéder à un nettoyage périodique de l'intervalle varie suivant la nature du fluide, les conditions de fonctionnement et le milieu ambiant. Lors de l'intervention, les composants doivent être examinés pour détecter toute usure excessive. Un ensemble de pièces internes est proposé en pièces de rechange pour procéder à la réparation. En cas de problème lors du montage/entretien ou en cas de doute, veuillez contacter ASCO ou ses représentants officiels.</p> <p>DEMONTAGE DE LA VANNE</p> <p>Démonter les pièces en suivant l'ordre indiqué sur les vues en éclaté de cette notice.</p> <ol style="list-style-type: none"> 1. Oter le clip de maintien (1) et enlever la bobine (2). 2. Dévisser le tube-culasse (4) et le séparer du corps de la vanne (9). 3. Enlever l'ensemble noyau-bague de guidage-ressort (5)(6)(7) et le joint d'étanchéité (8). 4. Version commandée manuelle : enlever la bague de retenue (10) pour libérer l'axe (12) et son joint (11) 5. Nettoyer ou remplacer toutes les pièces. <p>REMONTAGE DE LA VANNE</p> <p>Remonter les pièces suivant les vues éclatées et dans l'ordre inverse du démontage.</p> <p>S'assurer que le clip de maintien est correctement positionné, notamment sur la bobine JMX (voir dessin).</p> <p>NOTE :</p> <ol style="list-style-type: none"> 1. Lubrifier tous les joints d'étanchéité/joints toriques avec de la graisse silicone de haute qualité. 2. Après remontage, faire fonctionner l'électrovanne plusieurs fois afin de s'assurer qu'elle s'ouvre et se ferme correctement. <p>Versions à applique : Serrage des 4 vis de fixation, au couple indiqué "A".</p>	IM543-X

ASCO	DRAWING	ZEICHNUNG
	DISEGNO	TEKENING

CE SERIES 374



M4 x 6
 (1) NO, orifice 3: 1/8
 NO, Anschluss 3:
 1/8

NO, orificio 3: 1/8
 NA, Via 3: 1/8
 NO, Poort 3: 1/8

ASCO	DRAWING	ZEICHNUNG
	DISEGNO	TEKENING

GB	DESCRIPTION
1.	Retaining clip
2.	Coil
3.	Connector.
4.	Core-tube
5.	Core
6.	Core guide
7.	Spring
8.	O-ring
9a.	Brass body
9b.	Stainless steel body
10.	Retainer
11.	O-ring
12.	Manual operator
13.	O-ring

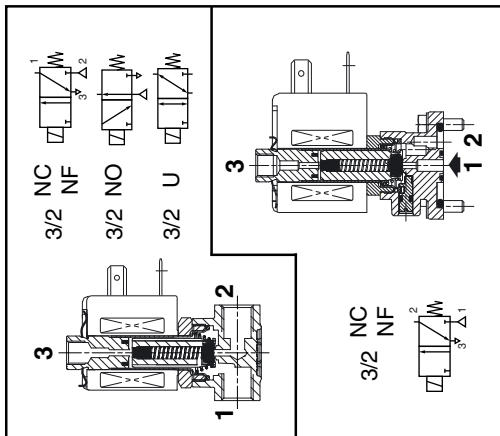
FR	DESCRIPTION
1.	Clip de maintien
2.	Bobine
3.	Connecteur.
4.	Tube-culasse
5.	Noyau
6.	Bague de guidage
7.	Ressort
8.	Joint torique
9a.	Corps laiton
9b.	Corps inox
10.	Bague de retenue
11.	Joint torique
12.	Commande manuelle
13.	Joint torique

DE	BESCHREIBUNG
1.	Halteclip
2.	Magnet
3.	Leitungsdose
4.	Führungsrohr
5.	Magnetanker
6.	Führungsring
7.	Feder
8.	O-Ring
9a.	Messinggehäuse
9b.	Edelstahlgehäuse
10.	Haltering
11.	O-Ring
12.	Handhilfsbetätigung
13.	O-Ring

ES	DESCRIPCION
1.	Clip de mantenimiento
2.	Bobina
3.	Conector.
4.	Tubo-culata
5.	Núcleo
6.	Anillo de guiado
7.	Resorte
8.	Junta tórica
9a.	Cuerpo latón
9b.	Cuerpo inox
10.	Anillo de retención
11.	Junta tórica
12.	Mando manual
13.	Junta tórica

IT	DESCRIZIONE
1.	Clip di fissaggio
2.	Bobina
3.	Connettore
4.	Cannotto
5.	Nucleo
6.	Anello di guida
7.	Molla
8.	OR
9a.	Cuerpo latón
9b.	Cuerpo inox
10.	Anello di blocco
11.	Guarnizione
12.	Comando manuale
13.	Guarnizione

NL	BESCHRIJVING
1.	Clip
2.	Spoel
3.	Steker
4.	Plunjerang
5.	Plunjer
6.	Plunjerleiding
7.	Veer
8.	O-ring
9a.	Messinggehäuse
9b.	Edelstahlgehäuse
10.	Clip
11.	O-ring
12.	Handbediening
13.	O-ring



Torque chart	
Couple de serrage	
Drehmoment	
Par de apriete	
Coppia di serraggio	
Aandraaimoment	
Items	Inch.Pounds
A	5±2
B	176±17

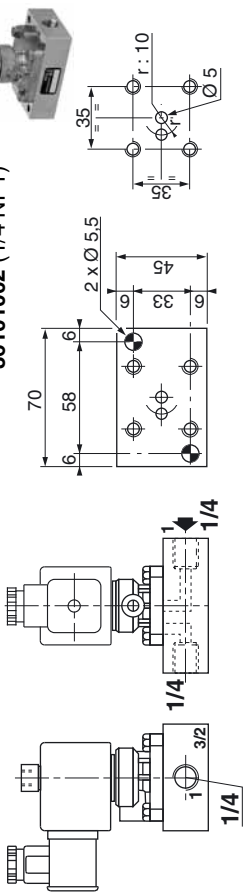
Spare part kit	Code pochette de recharge	Ersatzteilsatz	Código del kit de recambio	Kit parti di ricambio	Vervangingsset	JMX	CMXX-FT	EP	TP
								PM	PM
Ø	*							=	=
1/4 (1)	1-5-6-7-8	NC/NF	NC/NF	NO	U	C140038	C140037	C140038	C140038
1/4	1-5-6-7-8-13	NC/NF	NC/NF			C140039	-	C140039	C140039
1/4	1-5-6-7-8-13	NC/NF	NC/NF			C140042	-	C140042	C140042
1/4 (1)	8-10-11-12	NC/NF	MS (9a)	NO	U	C140160	C140161	C140160	C140160
1/4 (1)	8-10-11-12	NO	MS (9b)				C140048		
							C140072		

ASCO	DRAWING	ZEICHNUNG
	DISEGNO	TEKENING

CE
SERIES
S 374

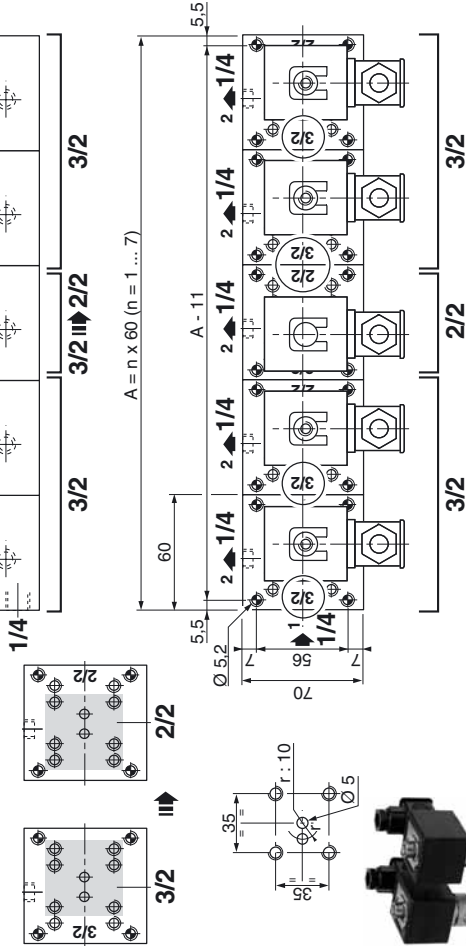
Brass single subbase / Embase simple en laiton / Einfachgrundplatte aus Messing
Base simple de latón / Sottobase individuale di ottone / Koperen enkelvoudige basisplaat

36101001 (G 1/4)
36101002 (1/4 NPT)



Brass joinable subbases / Embases juxtaposables en laiton / Anreihgrundplatten aus Messing
Bases acoplables de latón / Sottobasi di ottone aggungibili / Koperen rijgbare basisplaten

2/2 way can be combined with 3/2 way
2/2 voies peut être combiné avec 3/2 voies
2/2-Wege kann mit 3/2-Wege kombiniert werden
2/2 vías puede combinarse con 3/2 vías
La funz. 3/2 può essere combinata con la funz. 2/2
2/2 weg kan worden gecombineerd met 3/2 weg



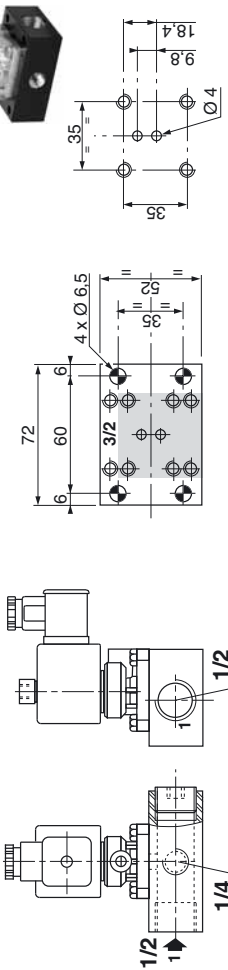
36101027 (G 1/4)
36101028 (1/4 NPT)

ASCO	DRAWING	ZEICHNUNG
	DISEGNO	TEKENING

CE
SERIES
S 374

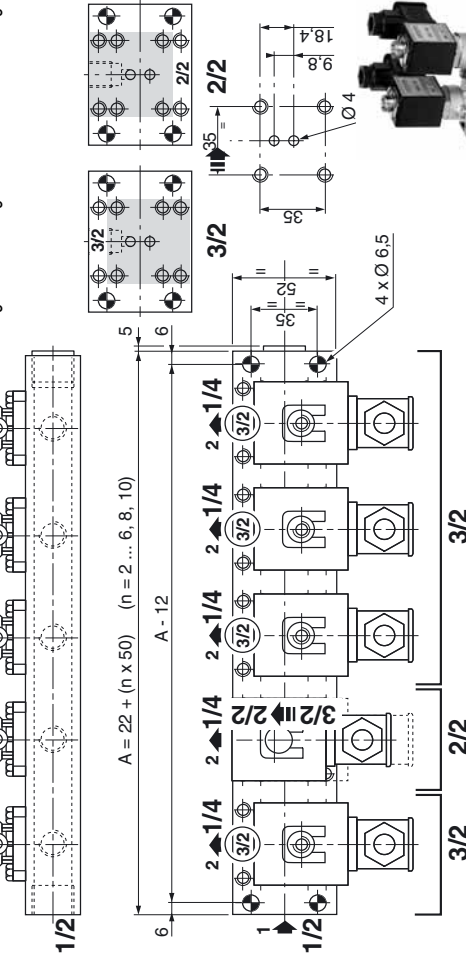
Aluminium single subbase / Embase simple en aluminium / Einfachgrundplatte aus Aluminium
Base simple de aluminio / Sottobase individuale di alluminio / Aluminium enkelvoudige basisplaat

36101029 (G)
36101037 (NPT)



Aluminium gang-mounting rail / Barreaux en aluminium / Anreihgrundplatten aus Aluminium
bases de aluminio / Barra di alluminio aggungibili / Aluminium rijgbare basisplaten

2/2 way can be combined with 3/2 way
2/2 voies peut être combiné avec 3/2 voies
2/2-Wege kann mit 3/2-Wege kombiniert werden
2/2 vías puede combinarse con 3/2 vías
La funz. 3/2 può essere combinata con la funz. 2/2
2/2 weg kan worden gecombineerd met 3/2 weg










(G) : 2 .. 6 (36101030 .. 36101034), 8 (36101035), 10 (36101036)
(NPT) : 2 .. 6 (36101038 .. 36101042), 8 (36101043), 10 (36101044)



NEOFLUX® CLEANFLOW MAGNET (GOUDSMIT)

(SEE FOLLOWING DOCUMENTS)

 GOUDSMIT-cleanflow magnet Documentation [173213 - 1.1]
 Goudsmit - Neoflux® cleanflow magnet - User Manual [144024 - 2.1]
 _Goudsmit CLEANFL SECF383337-A [156437 - 1.1]
 Goudsmit - Data sheet SECF383337-A [156442 - 1.1]
 Declaration d'incorporation GOUDSMIT - Cleanflow magnet, SECF [148067 - 2.1]
 _EX Declaration of Conformity - Magnetic rods Goudsmit [156447 - 1.1]
 Material certificate FDA PTFE <KWO> [162573 - 1.1]

GOUDSMIT

MAGNETIC SYSTEMS

User Manual

Quick-cleaning Neoflux® cleanflow magnet, series SECF...

- ☺ Suited for removal of ferromagnetic parts out of powders and granulates
- ☹ Not suited for badly flowing (sticky) products



*The descriptions and pictures in this manual, used for explanation, may differ from your execution.
We have enclosed the as-built drawing of the delivered article.*

GOUDSMIT magnetic systems b.v.

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Internet : www.goudsmit-magnetics.nl

E-mail : systems@goudsmit-magnetics.nl



Version overview of standard manual

Version overview:

Version	Date	Description
1.0	09-2004	First version of the English version of the user manual.
1.1	10-2006	<ol style="list-style-type: none"> 1. Revisions page added. 2. All types of SECF clean flows gathered in this general user manual. 3. Remarks regarding ATEX versions added (pages 7, 8, 9, 12, 19 and 22)
1.2	06-2008	Chapter Trouble shooting changed
2.0	08-2009	Specification sheet and declaration by the manufacturer separated from manual
2.1	12-2009	CE sign removed from front page and CE remark added to id. Plate on page 7

Foreword

Read this user manual thoroughly and ensure that you fully understand its contents before operating the device.

If you have any queries or require further explanation regarding any subject specifically related to the magnet, please do not hesitate to contact **GOUDSMIT magnetic systems**

All technical information contained in this manual, together with any relevant drawings and technical descriptions we supply, remain our property. It may not be used other than for the benefit of service to, or operation of the product. It may not be copied, duplicated or disclosed to any third parties without our prior written permission.

Extra manuals may be ordered by contacting our support staff. They will require the device description, article number and the order number (ORxxxxxx) on the identification plate.



- This manual and the declaration by the manufacturer should be valued as a part of your device
- Both should remain with the device if it is sold
- The manual must be made available to all operators, service technicians, and others who work with the device during its complete life-cycle.

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General

This Manual

This user manual contains information for the correct functioning and maintenance of your device. It also contains instructions for avoiding possible injury and serious damage and allowing a safe and as trouble-free functioning of the product as possible. Read this manual thoroughly before putting the device into operation, familiarise yourself with the operation and control of the device and follow all instructions precisely.

- *The data published in this instruction manual are based on the available information at the time of delivery. This is issued subject to later amendment.*
- *We retain the right to amend or modify the construction and/or model of our products at any time whatsoever without any obligation to modify any previously supplied products accordingly.*

Ferromagnetism

The working principle of the device rests on (Ferro)magnetism.

Ferromagnetism is the basic mechanism by which certain materials such as iron, cobalt and nickel form magnets or are attracted to magnets. Magnetics are formed by the application of an external magnetic field. Magnetics that remain magnetic after the external magnetic field is removed, are permanent magnets. Temporary magnets lose their magnetism after the external magnetic field is removed. Most alloys of iron, cobalt and nickel are magnetic. However, some stainless steel alloys like AISI304 or AISI316 are only slightly magnetic.

Because in most cases it will be Fe parts that will be Ferro-magnetically influenced, we will use the term 'Fe' in this user manual when we mean ferromagnetic material.

Conditions of supply and guarantee

The conditions of supply are the **“General Conditions for the supply and erection of mechanical, electrical and electronic products” (SE01)**, as in September 2001 published by **Orgalime**, in Brussels.

These conditions can also- if desired – be requested by writing to Goudsmit Magnetic Systems B.V., as also mentioned in our written quotation.

The guarantee prescriptions are mentioned in these conditions

The guarantee on your equipment will be void if:

- service and maintenance is not performed in accordance with the instruction manual or by servicemen who are not especially trained to do the work. We strongly recommend that specific magnetic service and maintenance be carried out by Goudsmit personnel);
- Modifications are made to the equipment without our prior written permission;
- non-original parts or non 100% exchangeable parts are used;
- lubrication products other than those prescribed are used;
- the equipment is used injudiciously, incorrectly, negligently or not in accordance with its intent and/or purpose (see chapter “Intended use / user instructions”).



All parts that are subject to wear are excluded from the guarantee

Remaining remarks / warnings:

- Use the device only for the application for which it has been designed (see chapter *“Intended use / user instructions”*);
- Use the device only when it is in technically perfect condition, and ensure that all protective hoods or inspection covers, including all safety circuits, have been fitted and installed in the correct manner;
- Ensure that device maintenance is appropriate and in accordance with the instructions provided in this user manual;
- Any eventual faults, in particular those that may influence safety, should be attended to immediately and remedied before renewed operation. Should you, after estimating the risks of an unsolved fault, still think it is safe to keep the device into operation, then warn the operators and maintenance staff of these faults and the danger(s) caused by these faults.

Delivery

General

Check the shipment immediately on delivery for:

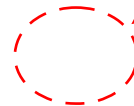
- Possible damage and/or shortcomings as a result of transport.
- Ask the transporter to draw up a transport damage report immediately in case of damage.
- Completeness of the delivery/deliveries, the absence of anything (additionally) ordered.



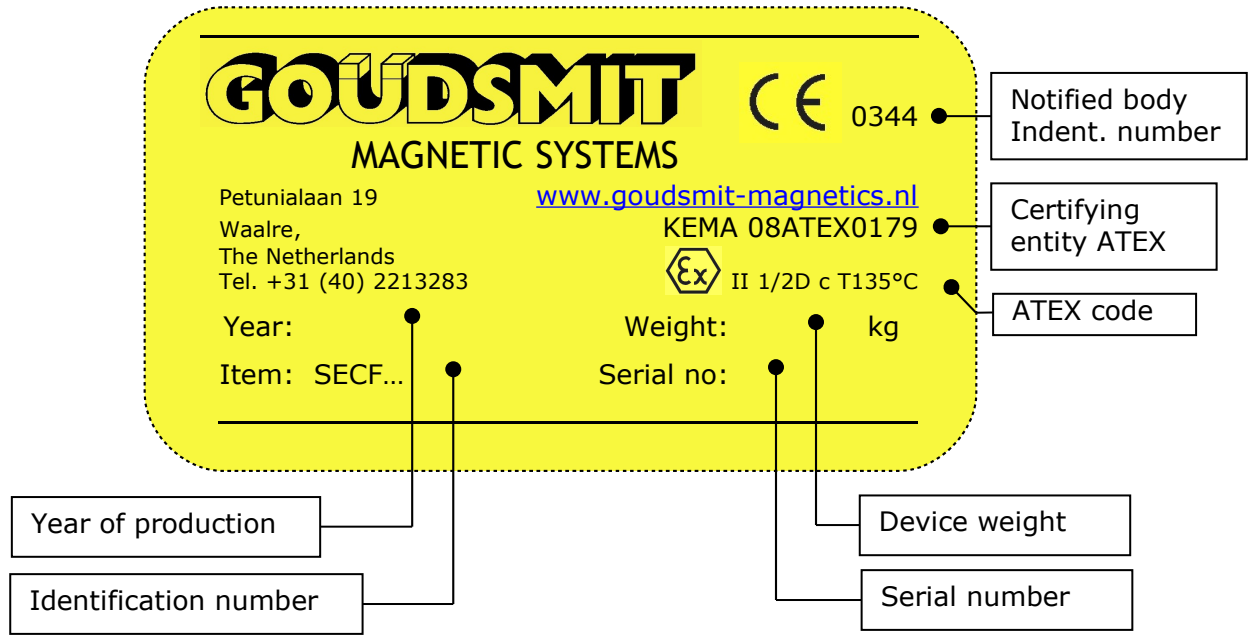
Always immediately contact **GOUDSMIT magnetic systems** in the event of any damage and/or mistaken delivery.

Identification plate

On the device you will find an identification plate as pictured below. **Information on this plate is of great importance in case of service.** That is why we advise to maintain this plate on the device at all times. Ensure that it is always legible by cleaning regularly (cleaning!). This is especially important if fast delivery of spare parts is requested




Only of application
in ATEX executions



Don't forget to make note of the Serial Number and the Item number in case of breakdown(s) and or delivery of spare parts.
If your identification plate is damaged, contact us and we will send a new one as soon as possible.

Description Goudsmit Ex code dust zones

When the device is ordered for use in a dust Ex zone, then a dust Ex code is added to the identification plate, which describes the category to which the device complies:

1. Code example:  II 1D/2D c T140°C
2. Explanation:
 - II → explosion group (I is underground mining, II is other)
 - 1D/2D → Category (1 = very high, 2 = high, 3 = normal) (D = dust)
 - Zone (20 , 21 , 22) (allowed to be used in)
 - 1D inside device / 2D outside device
 - c → Type of Ex protection used by Goudsmit
 - T140°C → Maximum surface temperature in relation to dust

When the device complies to category 1D, then the name and number of the certifying entity are also added to the identification plate, as also the certification number of the device.

ATEX explosive zone measures

3. If the device has been ordered for use in an Explosive area, then it is manufactured in compliance to the correct IP class. Ensure that no higher surface temperature arises than permitted by ATEX.

The ATEX marking on the Goudsmit identification plate only applies to the product produced by Goudsmit.

4. The ATEX certified magnetic device requires additional purchase parts to be carried out to the ATEX standard. This includes control units, connection box(es), switch(es), sensor(s) and pneumatic parts.

The ATEX purchase parts are provided with their own ATEX markings.



The final ATEX classification of the assembled apparatus may be lower than the ATEX marking indicated on the Goudsmit identification plate, if the mounted parts have a lower ATEX marking.

Safety

This chapter describes what dangers there are in connection with the device. Warning pictograms are placed on the device where necessary. This chapter explains the meaning of possibly placed pictograms.



Get to know the relevant warning pictograms!

- ! Regularly check that all warning pictograms are still present and legible, clean if necessary. Ensure that new pictograms are applied at the correct locations if there have been lost or damaged.

General

The device is provided with screens where necessary. Nevertheless, ensure that all persons in the vicinity of the device, or those working in the immediate surroundings, wear sufficient personal safety equipment such as overalls, safety glasses, ear protectors, helmet, steel-toed safety shoes, etc. Areas of the device considered dangerous are recognisable by the warning pictograms applied to the device. If the device remains easily accessible to persons, then extra safety precautions (e.g. fencing) should be installed. If safeguards are not possible then ensure that comprehensive instructions are given, possibly supplemented by work directions, part of which can be formed by this manual.

Danger of dust explosion

If this device is made according to an EX dust category (1D/2D/3D, acc. to ATEX 95-directive 94/9/EC) it can accordingly be used in a dust zone (20/21/22, acc. to (ATEX 137-directive 99/92/EC). The Ex category is then described on the identification plate → see also chapter General \ [Identification plate](#).

Ensure that the device complies to the right explosion category.



**Danger – dust
explosion**
(no sticker on device)



Also check whether **the identification plates of mounted parts** show the right Ex category for the Ex zone in which the device will be used.

Danger of magnetic field

The magnets generate a powerful magnetic field that strongly attracts ferromagnetic (Fe) materials. Always take into account that these materials may suddenly be very powerfully drawn towards the magnet. This applies to steel workbenches and steel tools, but also to Ferromagnetic materials carried on your person, such as coins in your wallet or your keys. Wherever possible make use of non-magnetic tools and workbenches fitted with a wooden worktop and preferably a non-Fe frame (for instance stainless steel).

! Always be aware that Ferromagnetic parts will be attracted -- even personal items - if you are closer than 0.3 meter to a magnet.



Danger - strong magnetic field

! People fitted with pacemakers should on no account enter the magnetic field (within a radius of at least 1 meters).



Prohibited for people with pacemakers

! Credit cards, chip cards, computer disks/tapes, computer screens, watches, etc. may be damaged or destroyed if they enter the magnetic field (within a radius of at least 0.5 meter).



Danger to magnetic cards

According to the latest scientific consensus, Magnetic radiation has no adverse effects to health.

Device description

Intended use / user indications

Products

- Suited for separating ferromagnetic* (Fe) particles out of free falling powder and granular product streams, grain size up to 10 mm, such as plastics, flour, sugar, coffee beans, etc.
- Not suited for fatty powders or raw materials with particle size over 10 mm.

Fe particles

- Suited for use in product streams with Fe particles of **30 µm** and larger, dependant on magnet type. *See product specs for exact values.*
- Product stream has to be free from Fe or other parts that can cause damage to the magnet bar tubes (like dents/bumps)

Temperatures

- Suited for surrounding temperatures of -20°C up to +40°C and
- Suited for product temperature range of -40°C up to +80°C or wider, dependant on magnet type. *See product specs for exact values.*

The magnet is to be protected against higher temperatures than prescribed, because the magnet might **lose magnetic force permanently** when exposed to high temperatures

Free space

Make sure that there is approximately 0,5 meter of free space around the clean flow magnet to perform and ease the inspection and maintenance operation, like mounting or dismounting the magnet bars

Air pressure

The (relative) over pressure in the product channel has to be less then 0,2 bar.

The (relative) under pressure in the product channel has to be less then 0,5 bar.

Noise level

Vibrations

The magnet is to be protected against strong external vibrations, because the magnet might **lose magnetic force permanently** and or the brittle ceramic magnet material might break.

Cleaning

Minimum 2x per day cleaning (Fe disposal) of the device is advised for an optimal magnetic Fe separation and to prevent Fe accumulation on the magnet bars and the problems that can be caused by that. Clean magnets have the best Fe separation result. So, make sure to clean more often than assumed to be necessary, to achieve a satisfactory result of the magnet device.

! Clean more often when necessary and less often when proven possible!

For dirt cleaning: see chapter [Maintenance](#)

Deliverable specials

High temperatures

When high temperatures occur, there is the possibility to use other magnet material than the (standard) applied Neoflux® or Ferroxdure magnet material.

Abrasive products

If you have an abrasive product, we can supply the magnet bars and /or inside housing with a protective coating, like for instance a tungsten carbide coating.

Use in FOOD product flows

The SECF can be adapted so that it can be used in your specific food flow. It's standard tubes executions already have little gaps in the, already complete SS, product channel. The product channel (or even complete housing + magnet bars) can be delivered in gap-free SS AISI304(L) or AISI316(L), or in combination with other – for instance prescribed or delivered by customer – food improved materials. Surface treatments like electrolytic polishing, staining, etc. are possible on request.

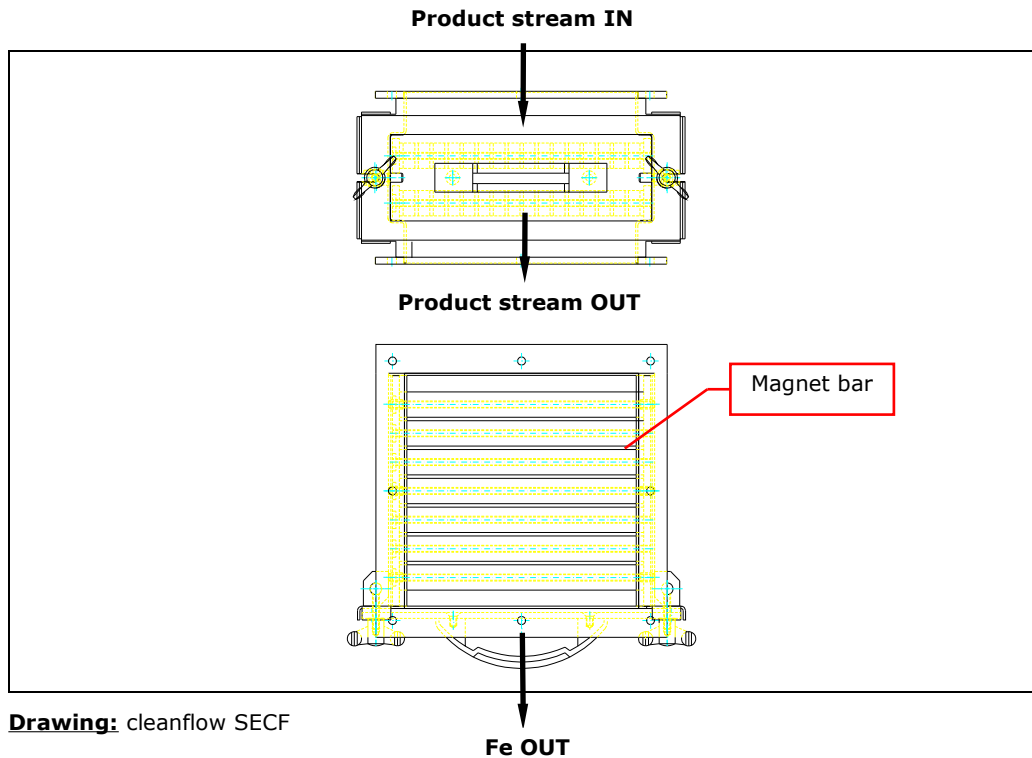
ATEX

The standard clean flow magnets SECF are ATEX II 1/2D executed, suited for use in dust explosive atmospheres zone 20 inside, zoned 21 outside.

It is however your own responsibility to take the right precautions when using the SECF in dust explosive atmospheres, like in-time cleaning to prevent for thick accumulating dust layers, and suitable grounding measures.

Read this manual thoroughly for all ATEX measures.

Working principle



Drawing: cleanflow SECF

- The SECF manual cleaning cleanflow magnet is designed to separate Fe (ferromagnetic*) parts out of a product stream falling through the cleanflow magnet.
- In the product channel **1 or more magnet bar layers** are placed. When more layers, the layers are placed over another in a way that the material stream passes the bars like in a cascade. The product stream will therefore always pass minimum 1 magnet bar very closely.
- The Fe particles in the product stream will be attracted by the magnets and will "cling" onto the tubes, while the cleaned material streams further.
- The Fe parts will stay on the tubes until it will be removed manually. This can be done by taking out the magnet unit (**Fe out**) and executing a cleaning / Fe disposal action.

*ferromagnetic: see chapter. *General/Ferromagnetism*

☹ *Unfortunately, product that gets stuck in-between and under separated Fe parts will fall off with it while cleaning the magnet bars of Fe parts, and thus cause some "material loss".*



Before each cleaning / Fe disposal cycle, the product stream has to be interrupted

For an extra description of the cleaning / Fe disposal process:

➔ Also see chapter Magnet bar cleaning / Fe disposal.

Construction

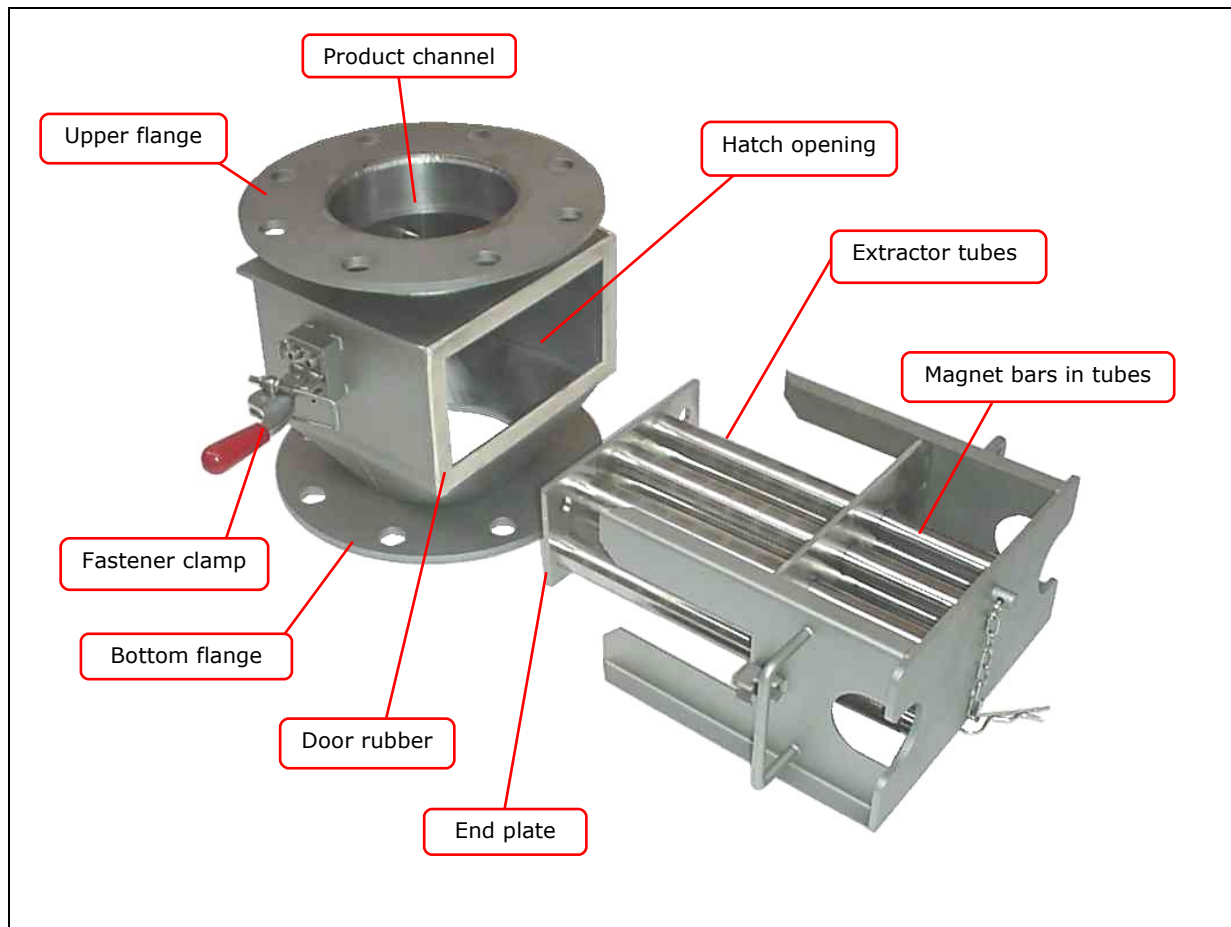


Photo: construction of Neoflux® extractor type SECF (other types: see next page)

- The standard SECF has flanges with bolt holes for easy mounting in your product channel. Other couplings can also be ordered.
- The SECF has **1 or more layers of magnet bars**. When more layers, the layers are placed over another in a way that the product passes the bars like in a cascade. The product will therefore always pass minimum 1 magnet bar very closely.
- The magnet bars consist of a magnet package with bushes, a magnet package in a surrounding SS tube, or a magnet package in a surrounding SS tube in a SS extractor tube – the extractor type. The tube versions are waterproof.
- If the magnet device is an extractor type, then the magnet bars and SS tubes are each welded to an **end plate**, which means that the extractor tubes and magnet bars can be shoved in and out of one another as complete units.
- The assembled magnet bar unit can be shoved into the product channel through the **hatch opening**.
- The hatch can be tightened and held dust-closed by the **fasteners** and the mounted door **rubber band**.

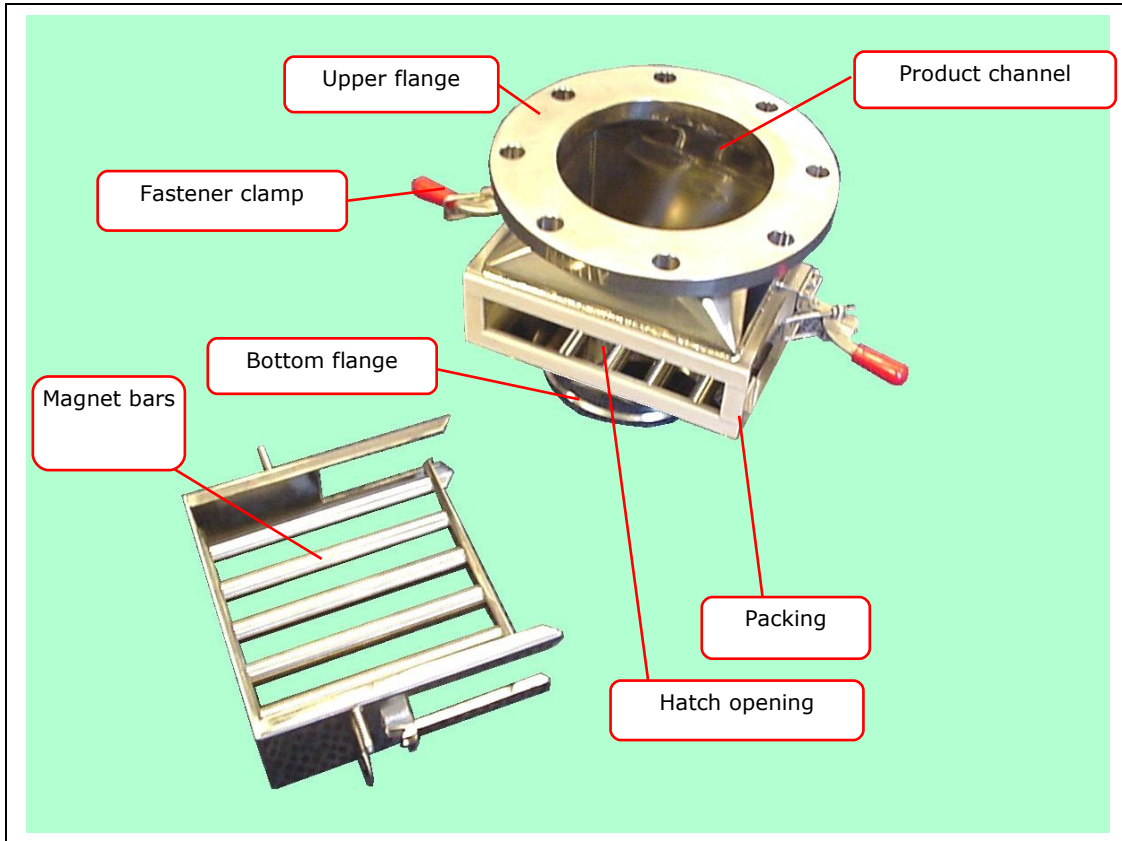


Photo: construction of Neoflux® (Neodymium) non-extractor type cleanflow SECF

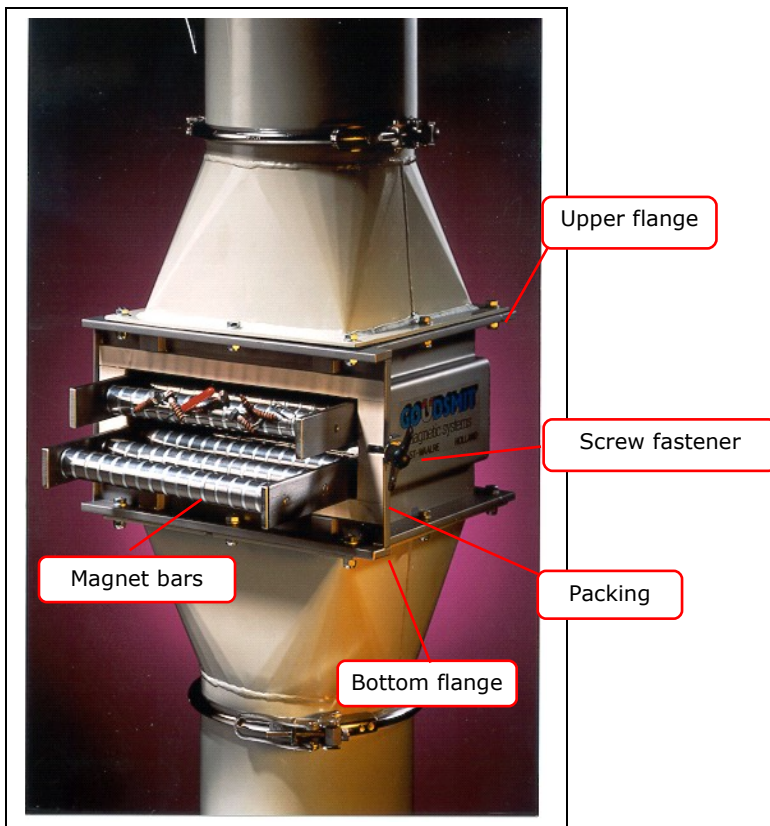


Photo: construction of Ferroxidure (ferrite) non-extractor type cleanflow SECF

Magnet bar cleaning / Fe disposal

Minimum 2x per day cleaning (Fe disposal) of the device is advised for an optimal magnetic Fe separation and to prevent Fe accumulation on the magnet bars and the problems that can be caused by that. Clean magnets have the best Fe separation result. So, make sure to clean more often than assumed to be necessary, to achieve a satisfactory result of the magnet device.

! Clean more often when necessary and less often when proven possible!

For dirt cleaning: see chapter **Maintenance**

Pay attention to personal dangers / wear protective clothing, glasses, shoes and hand gloves:

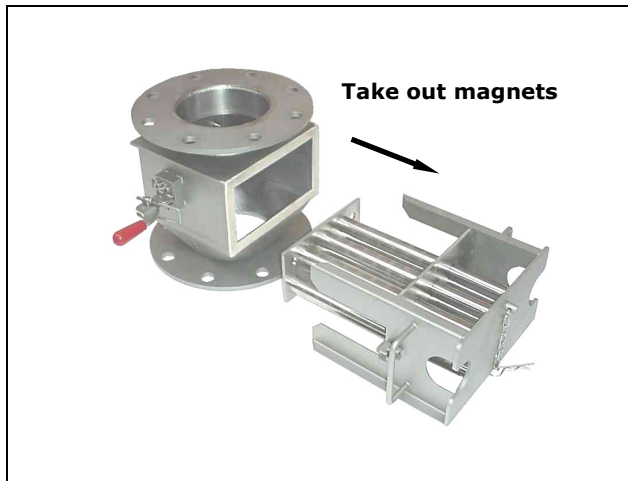


Photo: Cleaning of cleanflow SECF

Cleaning order of extractor type SECF:

1. Stop the product stream;
2. Loosen the door fasteners;
3. Shove the assembly of magnet bars + extractor tubes out of the housing;
4. Shove the magnet bar unit out of the extractor tube unit;
 - catch the Fe parts that now will fall off the tubes;
 - place the magnet bar unit far enough away from the extractor tube unit on a clean surface;
5. Wipe clean with a brush of soft cloth and or blow clean the extractor tubes (not in the direction of or over the magnet bars!);
6. Clean the magnet bars and or inside extractor tubes when necessary (with a soft cloth or a suitable cleaning fluid);
7. Shove back the magnet bar unit into the extractor tube unit; make sure that no (new) dirt gets trapped in-between the bars and tubes!
8. Shove the assembly of magnet bars and extractor tubes back into the housing;
9. Tighten the door fasteners;
10. (Re-)Start the product stream

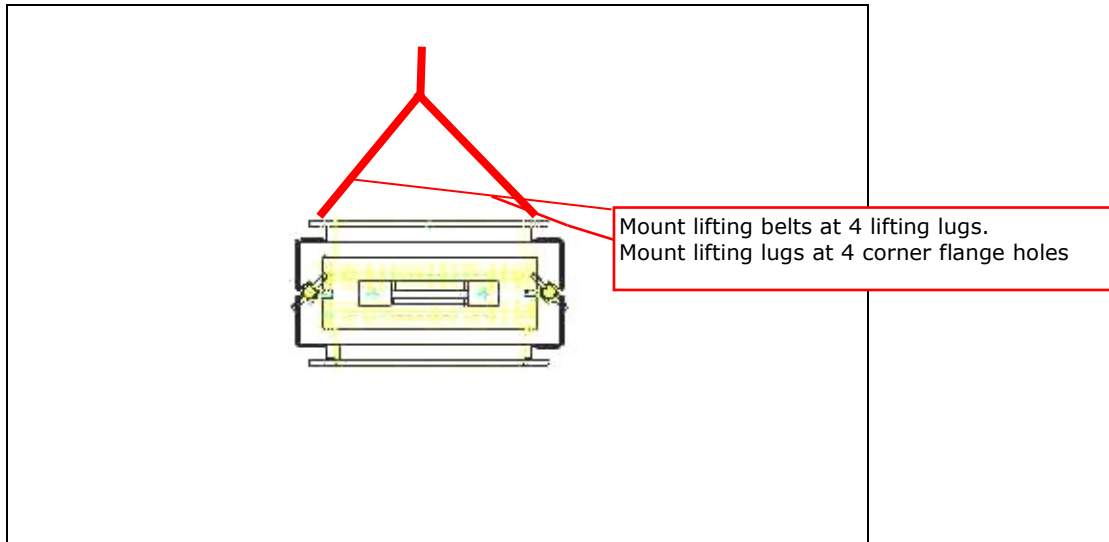
Cleaning order of non-extractor type SECF:

1. Stop the product stream;
2. Loosen the door fasteners and take away the hatch when it is a loose hatch;
3. Shove the magnet bar unit out of the housing;
4. Place the magnet bar unit far enough away from the housing on a clean surface;
5. Wipe the Fe off with a brush or soft cloth and after that blow clean the magnet bars when necessary;
6. Shove back the magnet bar unit into the housing;
7. Place the hatch when it is a loose hatch (not fixed to the magnet bar unit);
8. Tighten the door fasteners, so that the hatch closes the housing dust-tight;
9. (Re-)Start the product stream

Installation

Transport and placing procedures

- Bolt a lifting lug to each of the 4 corners of the top flange of the magnet housing for stable lifting and further transport. Keep each corner at the same level for proper alignment before installation. Pay attention to possible unequal weight distribution.



Drawing: SECF lifting and transport

- Use proper lifting devices that suit with device's weight.



The weight of the device is stated on the identification plate.

- Clear the area under the magnet during lifting and transport.
- Mount the flanges of the device tightly to the inlet and outlet flange of your product channel. Improper alignment and loose assembly may cause leakage of raw product.
- Ensure that the product channels are strong enough to support the weight of the clean flow magnet and raw product in it. Reinforce them when necessary.
- Install the cleanflow magnet device SECF in a well reachable height for the operators. A good height eases the working and cleaning process.
- Work safely; make sure there is enough working space, use proper scaffolding, ladders and other help materials, so the device can be installed without safety risks.

Magnet bar protection

- The cleanflow SECF has fragile tubes or bushes around the magnet material for protection. These tubes and bushes have a small wall thickness, which ensures an optimal grade of Fe separation. Disadvantage is however, that large, heavy Fe and or other particles in the product flow can create bumps in the tubes and bushes, and consequently damage the magnet material underneath.



Ensure that large, heavy parts are filtered out of your product flow before it passes the cleanflow!

Advise: place a sieve (filter) in front of the clean flow!

- see also chapter [Maintenance](#)



Damage to the magnet bars and/or damage caused by damaged bars is not covered by guarantee.

Closure material / grounding

Make sure that all closure and or packing material between the magnet device and your product channel has a surface resistance of less than 1 G Ω at (23 \pm 2) °C and (50 \pm 5)% relative humidity.

Sufficient grounding is also possible by placing a suitable grounding over the connections between the magnet device and your product channel.

Electrical connections & EX

When the device is placed in an Ex zone, everything you add or change to the device's electrical installation must be executed and documented according to the regulations for the specific Ex zone.

Startup

Checks before and during startup



It is essential to comply with the safety notes in this user manual during startup!

Before startup, make sure that:

- the device / the installation has no damages or malfunctions;
- all connections (electrical, mechanical, pneumatical) have been made properly;
- the device / the installation is placed and situated correctly;
- all protective covers (when of application) have been fitted correctly;
- there are no other sources of danger present

During startup, make sure that:

- the device / the installation has no damages or malfunctions;
- all other parts of the device / the installation function as described in chapter [Device description](#), completed with the function descriptions in the added data sheet.

Maintenance



Magnetic systems attract dust and Fe particles. Regular cleaning of any device fitted with a magnetic system is therefore essential. A clean magnet functions considerably more efficient than a heavily contaminated magnet.

All parts are best cleaned by pressurised air and/or soft cloth. Also it is possible to deep clean with special cleaning fluids that do not harm the materials



Regularly check that all warning pictograms and the identification plate are present at the correct locations on the device. If warning pictograms or the identification plate should get lost or damaged, then immediately apply new ones at the original locations.

Always inform operating personnel well in advance regarding planned inspections, maintenance, repairs and when attending to failures or breakdowns. Make someone responsible who also exercises supervision.

Magnet bars

- As a following of the passing product (abrasive or not) and the Fe contamination the magnet bars / extractor tubes can wear out.



Wear as a following of abrasive product can be reduced by coating the outside bars, with for instance tungsten carbide.
Please contact **GOUDSMIT magnetic systems** for advice.

- During maintenance and or cleaning one has to be careful with the magnet bars to prevent them from getting damaged.
- Heavy parts (Fe or product), may hit the bar in a way that bumps occur. The bumps will possibly block the movement of the magnet bars inside the SS tubes (extractor type) and so damage the magnet material, or damage the magnet material underneath the SS protection bushes or tubes (non-extractor type) .




When a magnet bar and or extractor tube is damaged it has to be replaced by another (spare) one immediately to prevent further damage to the magnet bar and or cleanflow. The damaged bar and or extractor tube can be sent to **Goudsmit Magnetic Systems** for repair/revision.

Cleaning & ATEX

Avoid dust clouds and dust build up to prevent explosion risk. If dust particles heat up they can create a burning deposit, which can ignite a dust cloud and cause an explosion. A dust cloud may also ignite if exposed to heat or flame.

Malfunctions/Service

	CAUTION!
	<p>Improper handling of the magnet device may lead to damages. Potential damage to body and property!</p> <ul style="list-style-type: none"> • Any repair to GOUDSMIT magnet devices may be performed by qualified personnel only. • Be aware that permanent magnetic material attracts ferromagnetic material with great force when it gets in reach of the magnetic field • Consult GOUDSMIT MAGNETIC SYSTEMS customer service

Malfunctions

In case of malfunctions, consult the following table in order to determine the cause of the malfunction and its possible remedy. In case a specific malfunction can't be found in the table, consult the GOUDSMIT Magnetic Systems customer service.

Malfunction	Possible cause	Possible remedy
Magnet does not separate ferromagnetic (Fe) particles out of the product stream, or separates them badly	Magnet bar is overloaded with Fe parts	Clean the magnet more frequently
	Not-attracted objects are not ferromagnetic	Check if particles to be separated are ferromagnetic, using a permanent magnet
	Fe parts close to the magnet reduces the magnetic field	Check if there is ferromagnetic material close to the magnet bars. If so try to replace the Fe construction
Magnets do not move in the extractor tubes any more or move badly (extractor types clean flow)	Tube is dented	Replace dented tube
	To much Fe on tube(s)	Clean magnet bars of caught Fe parts more often

Customer service

Please have the following information available if you require customer service assistance:

- Identification plate (complete)
- Type and extent of the problem
- Time the problem occurred and any accompanying circumstances
- Assumed cause

Spare Parts

As a result of the robustness and quality of **GOUDSMIT magnetic systems** products the device possesses high operational reliability.

If however a specific component requires replacement, the correct component may be ordered by quoting the type number stated on the *identification plate* or on one of the drawing(s) added to this user manual in the added data sheet.

The spare parts are mostly parts subject to wear, such as:

The extractor tube unit, magnet bars and door packing.

We advise to have one or more magnet bars and an extractor unit (extractor type) as a spare part when necessary!



Following mutual consultation **GOUDSMIT magnetic systems** will arrange rapid and correct delivery.

Storage and Dismantling

Storage:

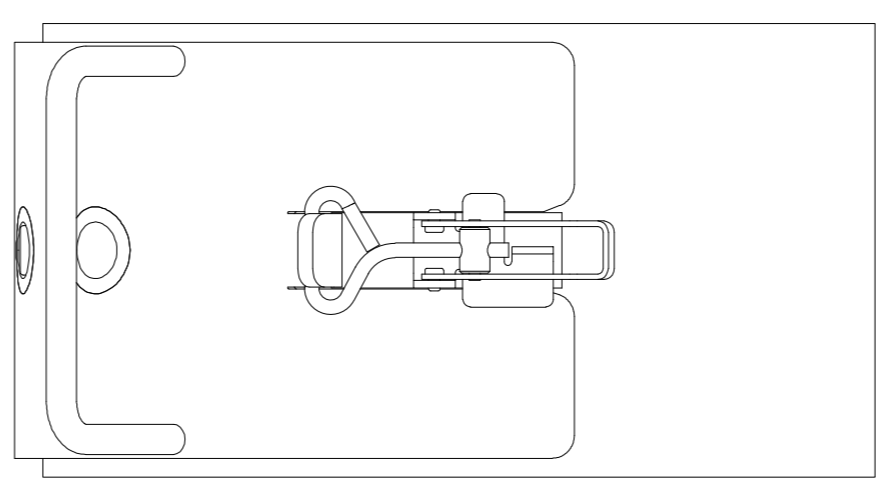
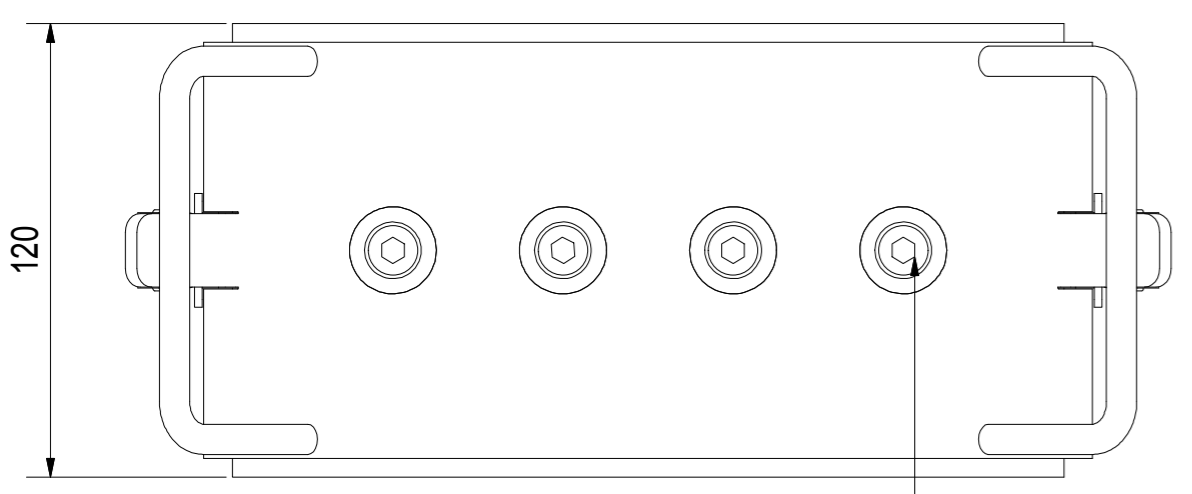
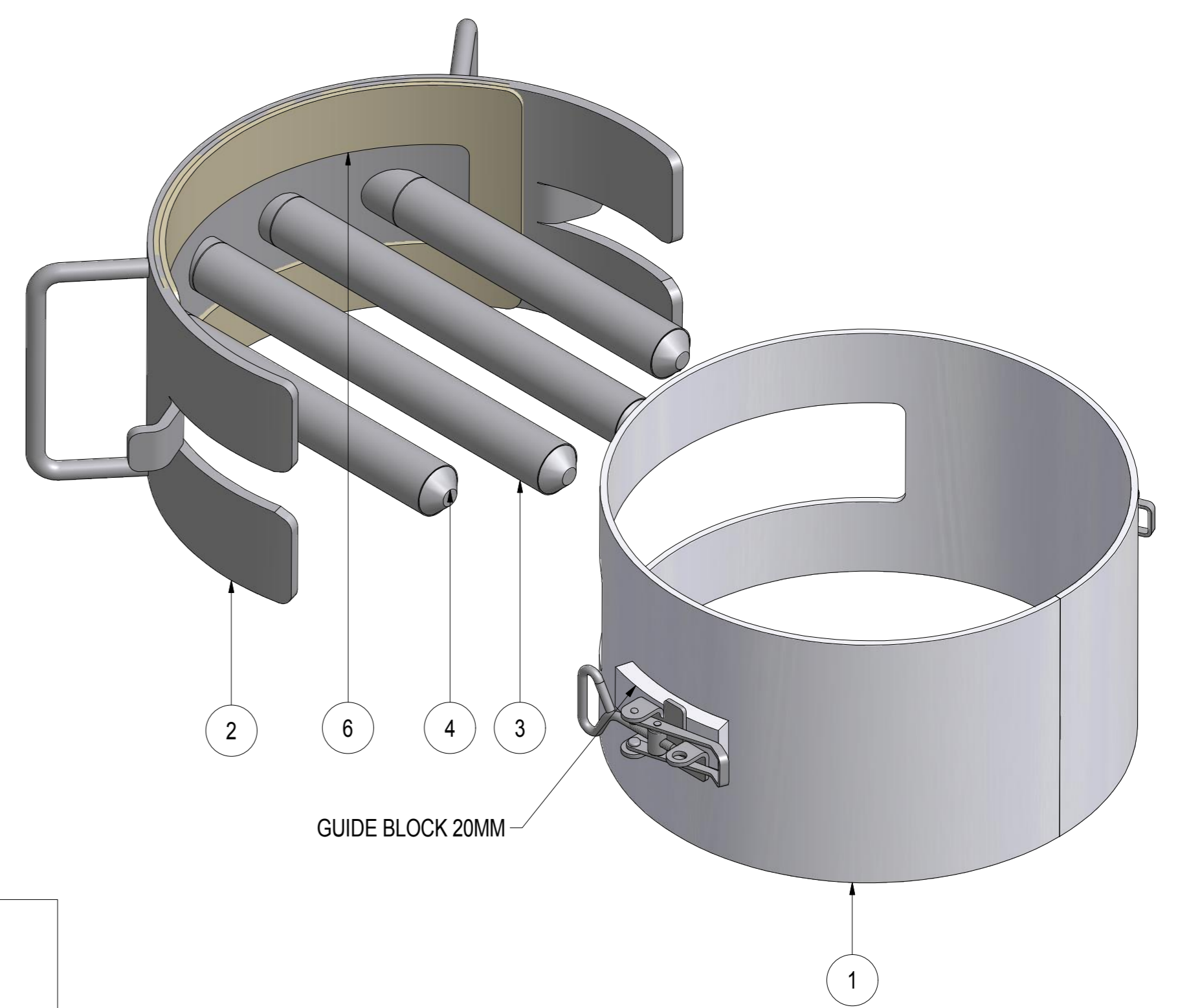
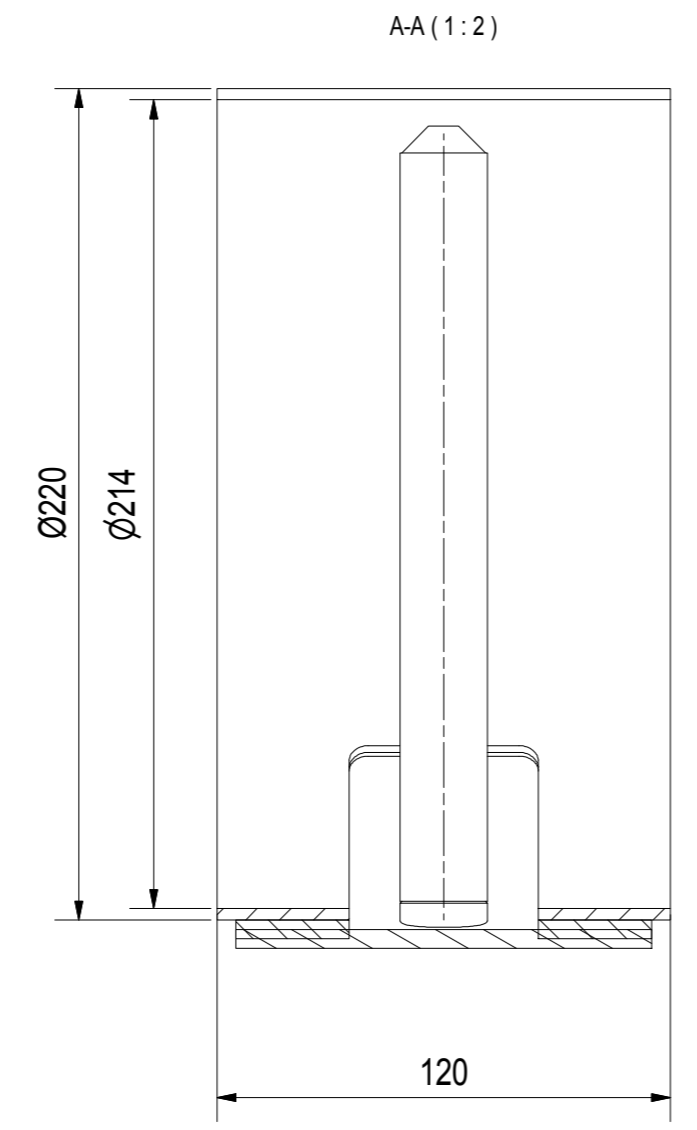
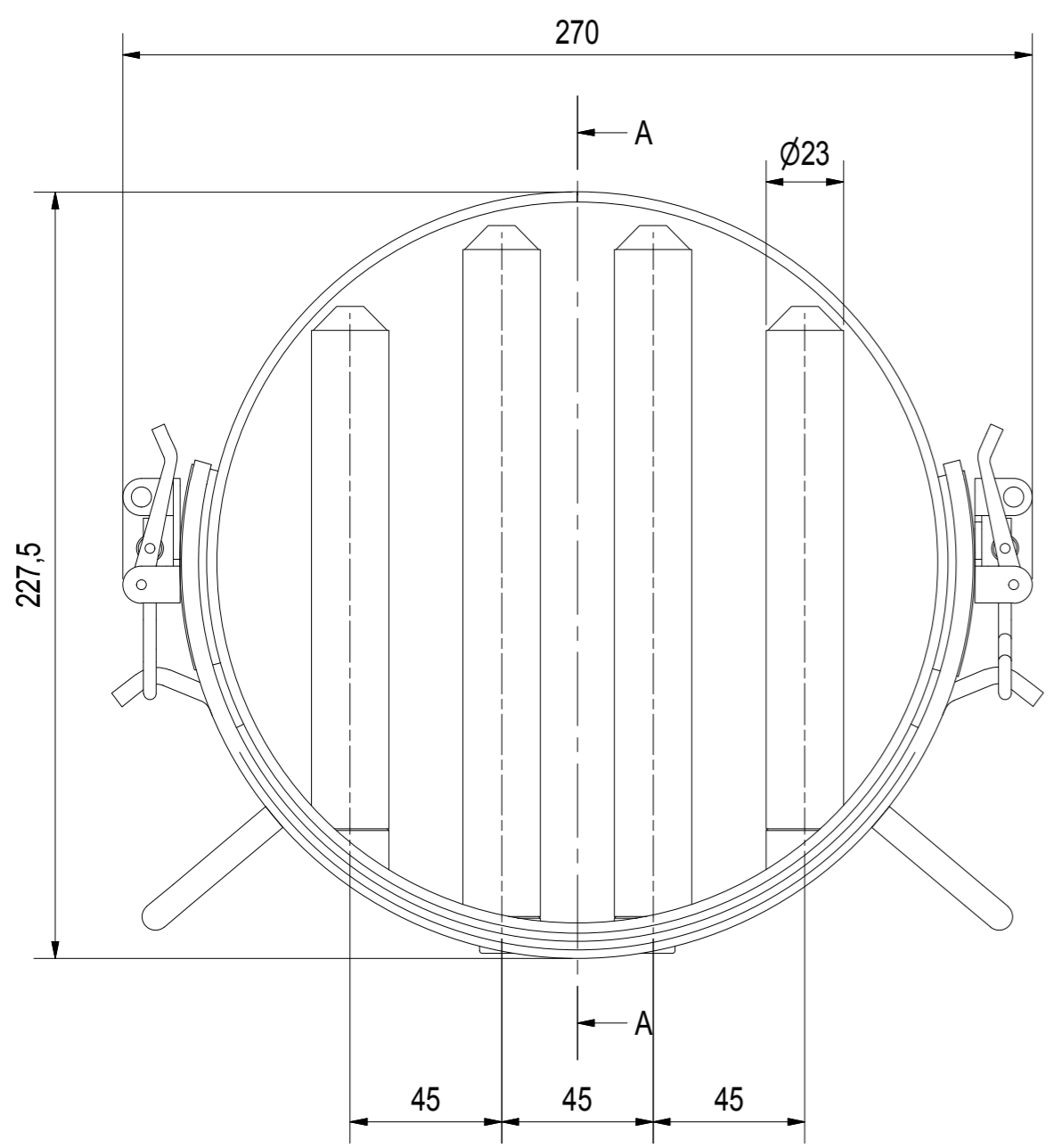
If the device will not be used for a long period of time, we advise to store the device in a dry, safe place and to conserve fragile and/or sensitive parts.

Dismantling / scrapping:

On scrapping and/or disposal of the device's parts separately, take into account the different nature of the components (magnets, iron, aluminium, electrical parts, insulating materials, etc.). Preferably entrust the task to a specialised company, and always observe the local regulations in regard to disposal of industrial waste.

Always be aware of magnetism. Inform the disposer about the dangers of magnetism. See also chapter [Safety](#).

6	DATE	BY	DESCRIPTION
REV	07-02-2013	FS	REFERENCE DRAWING A240697



ITEM	QTY	PART NUMBER	DESCRIPTION	DIMENSIONS
6	1	S240909	GASKET 5MM EPDM FDA	
5	4	51.0208016	SCHR CIL BZK M08x16 RVS A2	
4	2	SBANC100030-155	BAR N42 D23 M8 R316L P25 CON	
3	2	SBANC100030-205	BAR N42 D23 M8 R316L P25 CONE	
2	1	A240696	WELD ASSY MAGNET PLATE CF200	
1	1	A240695	CLEANFLOW DN200 NDFEB D23	

Scale: 1:2	Sheet: A2	General tolerance: ISO 2768 mK
Date: 07-02-2013	Drawn: FS	Unit: st
Drawn according to: ISO268 ISO1101 ISO2553		GOUDSMIT MAGNETIC SYSTEMS
Description: CLEANFL DN200 NDFEB D23 POLISH		
Lookup: SECF200		Rev: A
Artnr: SECF383337		

Data sheet SECF383337-A

Specifications

General

<u>Description</u>	Neoflux® Cleanflow magnet DN200
<u>Summary</u>	Connection DN200 - 4 extractor bars Ø23 mm - GSN-42 magnet quality
<u>Appliance</u>	Free flowing powder and granular products, such as plastics, flour, sugar and coffee beans, not suited for fatty powders. For little Fe-pollution (cleaning up to 2x/day).
<u>Working principle</u>	The product makes contact with the magnet, and passing Fe-particles are caught
<u>Capacity</u>	8 to 20 m ³ /h (depending on product type)
<u>Max particle size</u>	10 mm
<u>Fe-particle size that can be caught</u>	≥30 µm
<u>Cleaning/Fe-particles disposal</u>	Manual
<u>Build-in length</u>	120 mm
<u>Interface/connection dim's</u>	DN200 mm
<u>Materials - product touched</u>	SS 1.4404 (AISI316L)
<u>Materials housing</u>	SS 1.4404 (AISI316L)
<u>Material gaskets/seals</u>	EPDM, Food Safe / FDA
<u>Surface treatment/finishing</u>	SF5, Ra 0.4 µm
<u>Maximum operating/product temperature</u>	60°C
<u>Min/max surrounding temperature</u>	-20°C to 40°C

Magnet info

<u>Magnet system type</u>	Magnet bars
<u>Magnet dimensions</u>	bar Ø23 mm
<u>No of magnets</u>	4
<u>Magnet quality</u>	NdFeB GSN-42, Br 13.200 Gauss (at 20° C), Tmax 80° C
<u>Magnetic field strength</u>	10.700 Gauss on magnet

Physical info

<u>Length x Width x Height</u>	228 x 270 x 120 mm
<u>Weight</u>	

Overview of technical documents in delivery

- User Manual
- Declaration of Incorporation
- Data sheet
- Main drawing: SECF383337-A
- Food Safe / FDA declaration

Declaration of Incorporation / ATEX II 1D-2D

Declaration of Incorporation acc. to annex IIB of the Machinery Directive 2006/42/EC
and Declaration of Conformity acc. to ATEX 94/9/EG

We,

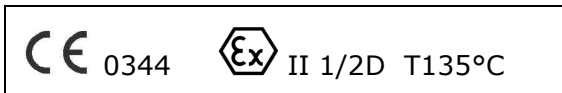
Goudsmit Magnetic Systems B.V.
Petunialaan 19
5582 HA Waalre
The Netherlands

herewith declare, on our own responsibility, that the device:

Article description: **Cleanflow magnet, series SECF...**

1. is in accordance with the conditions of the Machinery Directive 2006/42/EC;
2. as a component conforms to directive 94/9/EC and specifically to standards **EN 13463-1:2001, EN13463-5:2003** and **EN50281-1-1:1998+A1**

The machinery carries following marking and according may be used in dust zone 20 inside product chute / zone 21 outside product chute (according directive 99/92/EC):



Notified Body: DEKRA Certification B.V. Utrechtseweg 310, 6812 AR Arnhem, the Netherlands.

And if the device is supplied with electrical parts built-on:

3. as a component conforms to directive 2006/95/EC, relating to electrical equipment designed for use within certain voltage limits;
4. as a component conforms to directive 2004/108/EC, relating to electromagnetic compatibility.

And if the device is to be incorporated into machinery or assembled with other machinery and thereby:

5. has to be mechanically and/or electrically connected in the right manner and extended by safety protections where needed to constitute relevant machinery guidelines;

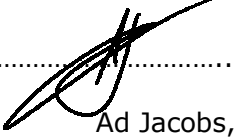
The underlying technical file is compiled under responsibility of mr. Ad Jacobs, Chief Technical Officer.

The partly completed machinery must not be put into service until the final machinery into which it is to be incorporated had been declared in conformity with the provisions of the Machinery Directive 2006/42/EC.

Waalre, The Netherlands, 14-11-2011

Signature manufacturer:

on behalf of Goudsmit:

.....


Ad Jacobs,
Chief Technical Officer

Ex Declaration

regarding the use of permanent magnets in potential explosive atmospheres in zones 0,1,2
and 20,21,22

We,

Goudsmit Magnetic Systems B.V.
Petunialaan 19
5582 HA Waalre
The Netherlands

hereby declare, that products:


Product description: Cleanflow Magnet

do not fall within the scope of application specified in directive 94/9/EC. A risk assessment has substantiated that permanent magnets do not have any internal potential sources of ignition. They can be used for their intended purpose in potentially explosive gas atmospheres in zones 0, 1 and 2, as well as in potentially explosive dust atmospheres in zones 20, 21 and 22.

Waalre, The Netherlands, 23-7-2012

on behalf of Goudsmit:

Signature manufacturer:



.....

Ad Jacobs,
Chief Technical Officer



DICHTUNGSTECHNIK-GmbH

Hofgartenstr. 8
83071 Stephanskirchen - Germany
Phone: +49 (0) 80 36-30 35-95
Fax: +49 (0) 80 36-30 35-44
e-mail: info@kwo-ptfe.de

Rev.: 18. April 2005
Erklärung zur Verwendung im Lebensmittelkontakt farbe
Druckdatum: 25.10.2005 10:06

Seite 1 von 2

Erklärung *zur Verwendung von Materialien* *im Lebensmittelkontakt* **- Heißschmelzklebstoff beschichtetes ePTFE-**

Wir erklären hiermit,

daß von uns zur Herstellung unserer Produkte ausschließlich Polytetrafluorethylen (PTFE) - Zusammensetzungen verwendet werden, die gemäß den Angaben unserer Lieferanten / Rohmaterialhersteller, die folgende Beurteilung gegenüber den Bestimmungen zum Lebensmittelkontakt in Europa und den USA erfahren:

Europäische Union

Entspricht den Bestimmungen unter der Voraussetzung, daß das Fertigteil die folgenden Migrationsgrenzwerte einhält:

OML: 10 mg/dm² oder 60 mg/kg (Artikel 2).
SML: - Tetrafluorethylen = 0,05 mg/kg

Dementsprechend werden ebenfalls die Bestimmungen der folgenden Länder erfüllt, in denen keine Positivlisten für Additive existieren:

Dänemark, England, Finnland, Griechenland, Irland, Luxemburg, Norwegen, Portugal, Schweden, Schweiz

Beurteilung für die Länder in denen zusätzliche Positivlisten für Additive bestehen, oder die Zulassungsschreiben fordern:

Belgien

Entspricht den Bestimmungen

Deutschland

Eine anwendbare Empfehlung existiert nicht.

Es wird jedoch von Herstellerseite die Meinung vertreten, daß sowohl aufgrund der Zulassung des Materials in anderen Ländern als auch der Aufführung seiner Komponenten in der Entwurfsliste der Europäischen Union (Synoptic 7) Lebensmittelbedarfsgegenstände, die ausschließlich aus dem obigen Material hergestellt wurden, die Forderungen des Lebensmittel- und Bedarfsgegenständegesetzes vom 08. Juli 1993, § 31, Abschnitt 1 erfüllen, insbesondere, daß von ihnen keine Stoffe auf Lebensmittel oder deren Oberfläche übergehen, ausgenommen gesundheitlich, geruchlich und geschmacklich unbedenkliche Anteile, die technisch unvermeidbar sind.



Frankreich

Entspricht den Bestimmungen

Holland

Entspricht den Bestimmungen

Italien

Entspricht den Bestimmungen

Österreich

Entspricht den Bestimmungen

Spanien

Entspricht den Bestimmungen

USA

Entspricht den FDA Bestimmungen 21 CFR 177.1550, § (a)(1) und (b) für spritzgegossene und extrudierte Lebensmittelbedarfsgegenstände.

Zu Extraktionsgrenzen: siehe 21 CFR 177.1550 § (e)(3).

ZUSATZ, Heißschmelzklebstoff

Wir erklären hiermit, daß von uns zur Herstellung unserer mit Heißschmelzklebstoff beschichteten Produkte ausschließlich Klebstoff-Materialien verwendet werden, die gemäß den Angaben unserer Lieferanten / Rohmaterialhersteller, die folgende Beurteilung gegenüber den Bestimmungen zum Lebensmittelkontakt erfahren:

FDA - Status: Entspricht den FDA Bestimmungen 21 CFR 175.105, für Klebstoffe.

Diese Erklärung beruht auf den Angaben unserer Rohmaterial-Lieferanten und auf eigenen Untersuchungen durch akkreditierte Prüflaboratorien. Wir übernehmen selbst keine Garantie, Gewährleistung oder sonstige Haftung für die in diesem Dokument enthaltenen Informationen fremder Untersuchungen.

KWO Dichtungstechnik-GmbH



ppa. Detlef Reichl, Dipl.-Ing. (FH)
(Technische Leitung)

CERTIFICATES

We declare that the security and design of the equipment described below are conform to the requirements of following European directives:

Machinery Directive : 2006/42/CE
Electromagnetic Compatibility Directive : 2004/108/CE
ATEX : 94/9/CE

Manufacturer : Frewitt SA, route du Coteau 7, CH-1763 Granges-Paccot

Description :	DelumpWitt	Type :	Installation
Year of manufacture :	2014	Serial Nr :	14001235183
	int.	 	II 1G IIB T4 1D IIB T130°C
	ext.	 	II 3D IIB T130°C



The following technical standards have been applied in order to implement the basic health and safety requirements mentioned in the EC directives in an appropriate manne :

General principles of construction EN ISO 12100
Safety distance EN ISO 13857
Design and ordering system EN ISO 13849-1
Prevention / protection of the explosion EN 1127-1
 general requirements EN 13463-1
 protection construction "c" EN 13463-5

Any alteration or inappropriate uses of this equipment makes this declaration invalid.

Index

- ▶ EC declaration of incorporation ConiWitt-250 14001219097
- ▶ EC declaration of incorporation ProFi-Sword 14001243013
- ▶ EC declaration of incorporation Lifting unit Servolift

Chief executive officer (CEO)
 Antoine Viridis



Technical department
 Olivier Bianchi / Yves Grossrieder



Granges-Paccot,



We declare that the security and design of the equipment described below are conform to the requirements of following European directives:

Electromagnetic Compatibility CEM :	2004/108/CE
Machinery Directive :	2006/42/CE
ATEX :	94/9/CE

Additional safety indications:

Additional information for EEx-Machines Special conditions « X »

Manufacturer :	Frewitt SA, route du Coteau 7, CH-1763 Granges-Paccot		
Notified Body :	Electrosuisse, Luppenstrasse 1, CH-8320 Fehraltorf		
Notified Body's identification Nr :	1258		
Quality assurance of production Nr :	SEV 09 ATEX 4137		
EC type examination Nr :	SEV 04 ATEX 0106 X	(mecanic)	
EC type examination Nr :	SEV 06 ATEX 0133	(electric)	

Description :	Powder delivered in free-flow	Type :	ProFi-Sword
Year of manufacture :	2014	Serial Nr :	14001243013
ATEX certification :	int.	CE 1258 	II 1G c b IIB T4 X 1D c b T130°C IP65 X
	ext.	CE 1258 	II 3D c T130°C IP65 X

The following technical standards have been applied in order to implement the basic health and safety requirements mentioned in the EC directives in an appropriate manne :

General principles of construction	EN ISO 12100-1/2
Safety distance	EN ISO 13857
Design and ordering system	EN ISO 13849-1
Prevention / protection of the explosion	EN 1127-1
Non-electrical equipment:	
general requirements	EN 13463-1
protection construction "c"	EN 13463-5
protected by control of ignition source "b"	EN 13463-6

The partly completed machinery must not put into service until the machinery into which it is to be incorporated has been declared in conformity with the provisions of the Machinery Directive 2006/42/EC.

We commit ourselves to transmit the relevant technical documentation by courier concerning the partly completed machinery to the national authorities on request.

Instructions for incorporation, including the special safety provisions are furnished with the partly completed machinery until this will be integrated in the final machinery.

Any alteration or inappropriate uses of this equipment makes this declaration invalid.

Chief executive officer (CEO)
Antoine Virdis



Technical department
Olivier Bianchi / Yves Grossrieder



Granges-Paccot, 4. mai 2014

We declare that the security and design of the equipment described below are conform to the requirements of following European directives:



Electromagnetic Compatibility CEM : 2004/108/CE
Machinery Directive : 2006/42/CE
ATEX : 94/9/CE

Additional safety indications:

Additional information for EEx-Machines Special conditions « X »

Manufacturer : Frewitt SA, route du Coteau 7, CH-1763 Granges-Paccot

Notified Body : Electrosuisse, Luppmenstrasse 1, CH-8320 Fehraltorf
 Notified Body's identification Nr : 1258
 Quality assurance of production Nr : SEV 09 ATEX 4137
 EC type examination Nr : SEV 06 ATEX 0124 X (mecanic)
 EC type examination Nr : SEV 06 ATEX 0133 (electric)

Description :	Conical sieve mill	Type :	ConiWitt-250
Year of manufacture :	2014	Serial Nr :	14001219097
ATEX certification :	int.	CE 1258 	II 1G c k b IIB T4 X 1D c k b T130°C IP65 X
	ext.	CE 1258 	II 3D c Ex tD IIB T130°C IP65 X

The following technical standards have been applied in order to implement the basic health and safety requirements mentioned in the EC directives in an appropriate manne :

General principles of construction EN ISO 12100-1/2
Safety distance EN ISO 13857
Design and ordering system EN ISO 13849-1
Prevention / protection of the explosion EN 1127-1
Non-electrical equipment:
 general requirements EN 13463-1
 protection construction "c" EN 13463-5
 protected by control of ignition source "b" EN 13463-6
 protected by immersion "k" EN 13463-8

The partly completed machinery must not put into service until the machinery into which it is to be incorporated has been declared in conformity with the provisions of the Machinery Directive 2006/42/EC.

We commit ourselves to transmit the relevant technical documentation by courier concerning the partly completed machinery to the national authorities on request.

Instructions for incorporation, including the special safety provisions are furnished with the partly completed machinery until this will be integrated in the final machinery.

Any alteration or inappropriate uses of this equipment makes this declaration invalid.

Chief executive officer (CEO)

Antoine Viridis



Technical department

Olivier Bianchi / Yves Grossrieder



Granges-Paccot, 4. mai 2014

SERVOLIFT

Declaration of Incorporation for partly completed Machinery (Directive 2006/42/EG)

This is to declare, that the following indicated machinery/ part of machinery, is intended for installation into a machinery or combined with a further machine to a machinery as defined by the European Machinery Directive 2006/42/EC in the version of its last alternation. Therefore the machinery/ part of machinery agrees to the following guidelines possibly only in parts.

The declaration will become invalid, if the machinery is modified in any way, which is not approved by us:

This declaration is only valid for directed use of the machinery by instructed personal.

Name / Type of machinery:	Pallet Lifter / HS
Serial No.:	13249
Year of construction:	2014
Applied EC guidelines:	- EC guidelines of European Machinery Directive 2006/42/EC - Low Voltage Directive 2006/95/EEC - EMC correct installation 2004/108/EEC

in case of **explosion proofed** machines refer to and note enclosed
- Declaration of Conformity of EX-proofed guidelines

Used EN and ISO standards:	DIN EN ISO 12100; 2011; DIN EN 60204-1; 2006 DIN EN ISO 13849-1
-----------------------------------	--

Applied essential health and safety requirements acc. annex I of a.m. directive	compl. or when applicable: No.1.1, 1.2, 1.3, 1.4, 1.5, 1.6, 1.7, as well as No. 2 et seq., 4 et seq.
---	--

Requirements to put into operation

Herewith we state, that the start up is prohibited, until the machinery or installation into which the machinery or part of machinery is installed, in all (that means inclusive the machinery / part of machinery for which this confirmation is issued) corresponds to the directive 2006/42/EC and the Declaration of Conformity is issued according to appendix IIA of this directive.


Attorney for technical documentation: SERVOLIFT GmbH

Servolift GmbH
Albert-Einstein-Str. 9
D- 77656 Offenburg

Telefon : +49 (0) 781/61 00-0
Fax : +49 (0) 781/61 00-400
E-Mail : sl@servolift.de
web : www.servolift.de

Offenburg, May 09. 2014
Place / Date

Jürgen Rieber, Managing Director
Name



Signature

Datei: 13249_EG-kon-IIB-engl.doc
Erstellt: Macke
Datum: 07.12.2005

Version: 5
Geprüft: G. Macke
Datum: 04.11.2008

QM- Dokumente/Aufzeichnungen
Freigegeben: Hasenpusch
Datum: 08.12.2005

1 / 1

Relevé de contrôle EN 10204-2.2 pour les matériaux des pièces utilisées.

Werkzeugnis EN 10204-2.2 für die Werkstoffe der produktberührenden Teile.

Test report EN 10204-2.2 for material of product contact parts

Client:

Kunde:

Customer:

**NOVARTIS SINGAPORE PHARMACEUTICAL
 SG-Singapore**

N° de série

Serien-Nr.
 11007635096

Serial Nr.

Nous certifions que les parties en contact avec le produit des pièces utilisés sont, soit en:

Hiermit bestätigen wir, dass die produktberührten Teile der obengenannten Zerkleinerungsmaschine aus folgenden Werkstoffen hergestellt sind:

We certify herewith that the used parts of above-mentioned device are made of:

Acier inoxydable:

Rostfreier Stahl:

Stainless steels:

AISI
316 / 316L

Joints (conforme FDA) :

Dichtungen (FDA-konform) :

Seals (FDA conform) :

<i>Ecoflon (PTFE)</i>
<i>EPDM</i>
<i>FEP-O-SEAL</i>
<i>FKM 75.5</i>
<i>Gylon</i>
<i>Novafion</i>
<i>Rulon</i>
<i>Silicone</i>
<i>Ecoflon (PTFE)</i>

En outre, nous certifions qu'aucun élément d'amiante n'a été utilisé dans nos machines.

Desweiteren bestätigen wir, dass in unserer Anlage keine asbesthaltigen Teile enthalten sind.

Furthermore, we certify that no asbestos material has been used for manufacturing the machine.

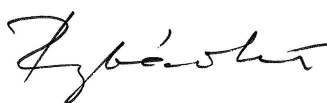
Les parties **pas en contact avec le produit** des pièces utilisés sont, soit en :

Nichtproduktberührten Teile aus folgenden Werkstoffen hergestellt sind :

The **used parts** of above-mentioned devise (**not in contact with the product**) are made of :

AISI
304 / 304L

Frewitt Fabrique de Machines SA



R. Rybarikova
 Documentalis
 Dokumentalist
 Documentalist

Voir documents suivants.

Siehe folgende Dokumente.

See following documents



Nonfood Compounds
Program Listed

October 2, 2008

Dr. Luciana Husfeld
KLUBER LUBRICATION MUNCHEN KG.
GEISENHAUSENER STR. 7
81379 MÜNCHEN
GERMANY

RE: Klüberoil® 4 UH1- 32 N
Category Code: H1
NSF Registration No. 121152

Dear Dr. Luciana Husfeld:

NSF has processed the application for Registration of **Klüberoil® 4 UH1- 32 N** to the NSF International Registration Guidelines for Proprietary Substances and Nonfood Compounds (2008), which are available at www.nsfwhitebook.org. The NSF Nonfood Compounds Registration Program is a continuation of the USDA product approval and listing program, which is based on meeting regulatory requirements including FDA 21 CFR for appropriate use, ingredient and labeling review.

This product is acceptable as a lubricant with incidental food contact (H1) for use in and around food processing areas. Such compounds may be used on food processing equipment as a protective anti-rust film, as a release agent on gaskets or seals of tank closures, and as a lubricant for machine parts and equipment in locations in which there is a potential exposure of the lubricated part to food. The amount used should be the minimum required to accomplish the desired technical effect on the equipment. If used as an anti-rust film, the compound must be removed from the equipment surface by washing or wiping, as required to leave the surface effectively free of any substance which could be transferred to food being processed.

NSF Registration of this product is current when the NSF Registration Number, Category Code, and Registration Mark appear on the NSF-approved product label, and the Registered product name is included in the current NSF White Book Listing of Nonfood Compounds at the NSF website (www.nsfwhitebook.org). The NSF Registration Mark can be downloaded by clicking the "Download Registration Mark" link on the NSF website (www.nsfwhitebook.org).

NSF Listing of all Registered Nonfood compounds by NSF International is not an endorsement of those compounds, or of any performance or efficacy claims made by the manufacturer.

Registration status may be verified at any time via the NSF website, at www.nsfwhitebook.org. Changes in formulation or label, without the prior written consent of NSF, will void Registration, and will supersede the on-line listing.

Sincerely,

Jennifer De France
NSF Nonfood Compounds Registration Program

Company No: N04391



March 16, 2001

Kluber Lubrication AG
Attn: Dr. Luciana Husfeld
Geisenhausenerstraße 7
81379 MUNCHEN
GERMANY

RE: KLUBEROIL 4 UH1-68 N
Category Code: H1
NSF Registration No. 121174

Dear Dr. Husfeld,

NSF has processed the application for Registration of **Kluberoil 4 UH1-68 N** to the *NSF Registration Guidelines for Proprietary Substances and Nonfood Compounds (2000)*, which are available at www.nsf.org/usda. The NSF Nonfood Compounds Registration Program is a continuation of the USDA product approval and listing program, which is based on meeting regulatory requirements for appropriate use, ingredient review and labeling verification.

This product is acceptable as a **lubricant with incidental food contact (H1)** for use in and around food processing areas. Such compounds may be used on food processing equipment as a protective anti-rust film, as a release agent on gaskets or seals of tank closures, and as a lubricant for machine parts and equipment in locations in which there is a potential exposure of the lubricated part to food. The amount used should be the minimum required to accomplish the desired technical effect on the equipment. If used as an anti-rust film, the compound must be removed from the equipment surface by washing or wiping, as required to leave the surface effectively free of any substance, which could be transferred, to food being processed.

This product is NSF Registered when the NSF Registration Number, Category Code, and Registration Mark appear on the NSF approved product label. The NSF Registration Mark can be downloaded from the NSF website, at http://www.nsf.org/mark/download_marks.html.

Registration of compounds by NSF International is in no way to be construed as an endorsement of the compounds, appropriate selection for use, or of any performance or efficacy claims made by the manufacturer.

Registration status may be verified at any time via the NSF website, at <http://www.nsf.org/usda>. Changes in the formulation or label, without prior written consent of NSF, will void registration, and will supersede the on-line listing.

Sincerely,

A handwritten signature in black ink that reads "Kenji Yano". The signature is written in a cursive style with a large, sweeping "Y" and "n" in "Yano".

Kenji Yano, Ph.D.
NSF Nonfood Compounds Registration and Listing Program



August 26, 2005

Dr. Luciana Husfeld
KLUBER LUBRICATION MUNCHEN KG.
GEISENHAUSENER STR. 7
81379 MÜNCHEN
GERMANY

RE: Kluberpaste® UH1 84-201
Category Code: H1
NSF Registration No. 136305

Dear Dr. Luciana Husfeld:

NSF has processed the application for Registration of **Kluberpaste® UH1 84-201** to the NSF Registration Guidelines for Proprietary Substances and Nonfood Compounds (2004), which are available at <http://www.nsf.org>. The NSF Nonfood Compounds Registration Program is a continuation of the USDA product approval and listing program, which is based on meeting regulatory requirements including FDA 21 CFR for appropriate use, ingredient and labeling.

This product is acceptable as a lubricant with incidental food contact (H1) for use in and around food processing areas. Such compounds may be used on food processing equipment as a protective anti-rust film, as a release agent on gaskets or seals of tank closures, and as a lubricant for machine parts and equipment in locations in which there is a potential exposure of the lubricated part to food. The amount used should be the minimum required to accomplish the desired technical effect on the equipment. If used as an anti-rust film, the compound must be removed from the equipment surface by washing or wiping, as required to leave the surface effectively free of any substance which could be transferred to food being processed.

NSF Registration of this product is current when the NSF Registration Number, Category Code, and Registration Mark appear on the NSF-approved product label, and the registered product name is included in the current NSF White Book Listing of Nonfood Compounds at the NSF website (<http://www.nsf.org>). The NSF Registration Mark can be downloaded from the NSF website, at http://www.nsf.org/business/about_NSF/nsf_marks_download.asp.

NSF Listing of all registered Nonfood compounds by NSF International is not an endorsement of those compounds, or of any performance or efficacy claims made by the manufacturer.

Registration status may be verified at any time via the NSF web site, at <http://www.nsf.org>. Changes in formulation or label, without the prior written consent of NSF, will void registration, and will supersede the on-line listing.

Sincerely,

A handwritten signature in black ink, appearing to read 'Carmen Grindatti'.

Carmen Grindatti
NSF Nonfood Compounds Registration Program

Company No: N04391



October 3, 2008

Dr. Luciana Husfeld
KLUBER LUBRICATION MUNCHEN KG.
GEISENHAUSENER STR. 7
81379 MÜNCHEN
GERMANY

RE: Klüberoil® 4 UH1- 220 N
Category Code: H1
NSF Registration No. 121171

Dear Dr. Luciana Husfeld:

NSF has processed the application for Registration of **Klüberoil® 4 UH1- 220 N** to the NSF International Registration Guidelines for Proprietary Substances and Nonfood Compounds (2008), which are available at www.nsfwhitebook.org. The NSF Nonfood Compounds Registration Program is a continuation of the USDA product approval and listing program, which is based on meeting regulatory requirements including FDA 21 CFR for appropriate use, ingredient and labeling review.

This product is acceptable as a lubricant with incidental food contact (H1) for use in and around food processing areas. Such compounds may be used on food processing equipment as a protective anti-rust film, as a release agent on gaskets or seals of tank closures, and as a lubricant for machine parts and equipment in locations in which there is a potential exposure of the lubricated part to food. The amount used should be the minimum required to accomplish the desired technical effect on the equipment. If used as an anti-rust film, the compound must be removed from the equipment surface by washing or wiping, as required to leave the surface effectively free of any substance which could be transferred to food being processed.

NSF Registration of this product is current when the NSF Registration Number, Category Code, and Registration Mark appear on the NSF-approved product label, and the Registered product name is included in the current NSF White Book Listing of Nonfood Compounds at the NSF website (www.nsfwhitebook.org). The NSF Registration Mark can be downloaded by clicking the "Download Registration Mark" link on the NSF website (www.nsfwhitebook.org).

NSF Listing of all Registered Nonfood compounds by NSF International is not an endorsement of those compounds, or of any performance or efficacy claims made by the manufacturer.

Registration status may be verified at any time via the NSF website, at www.nsfwhitebook.org. Changes in formulation or label, without the prior written consent of NSF, will void Registration, and will supersede the on-line listing.

Sincerely,

Jennifer De France
NSF Nonfood Compounds Registration Program

Company No: N04391

Safety Data Sheet
according to 1907/2006/EC, Article 31

Printing date 17.03.2009

Revision: 17.03.2009

1 Identification of the substance/preparation and of the company/undertaking

- **Product details**
- **Trade name:** Klüberoil 4 UH1- 32N
- **Article number:** 029037
- **Application of the substance / the preparation** Lubricating oil
- **Manufacturer/Supplier:**
KLÜBER LUBRICATION MÜNCHEN KG
Geisenhausenerstrasse 7
D-81379 München
Tel.: 0049 (0) 897876-0
Fax: 0049 (0) 897876-333
- **Further information obtainable from:**
Material Compliance Management
E-Mail: mcm@klueber.com
- **Information in case of emergency:** 0049 (0) 89 7876 700 (24 hrs)

2 Hazards identification

- **Hazard description:** Not applicable.
- **Information concerning particular hazards for human and environment:**
The product does not have to be labelled due to the calculation procedure of the "General Classification guideline for preparations of the EU" in the latest valid version.
- **Classification system:**
The classification is according to the latest editions of the EU-lists, and extended by company and literature data.

3 Composition/information on ingredients

- **Chemical characterization**
- **Description:**
Synthetic hydrocarbon oil
ester oil
- **Dangerous components:** Void
- **Additional information:** For the wording of the listed risk phrases refer to section 16.

4 First-aid measures

- **After inhalation:** Supply fresh air; consult doctor in case of complaints.
- **After skin contact:** Wash off with soap and plenty of water.
- **After eye contact:**
Rinse opened eye for several minutes under running water. If symptoms persist, consult a doctor.
- **After swallowing:** If symptoms persist consult doctor.

5 Fire-fighting measures

- **Suitable extinguishing agents:**
Water haze

(Contd. on page 2)

Safety Data Sheet

according to 1907/2006/EC, Article 31

Printing date 17.03.2009

Revision: 17.03.2009

Trade name: Klüberoil 4 UH1- 32N

(Contd. of page 1)

Foam

Fire-extinguishing powder

Carbon dioxide

- **For safety reasons unsuitable extinguishing agents:** Water with full jet
- **Special hazards caused by the substance, its products of combustion or resulting gases:**

In case of fire, the following can be released:

Carbon monoxide (CO)

Hydrocarbons

- **Protective equipment:**

Do not inhale explosion gases or combustion gases.

Standard procedure for chemical fires.

- **Additional information**

Cool endangered receptacles with water spray.

Dispose of fire debris and contaminated fire fighting water in accordance with official regulations.

6 Accidental release measures

- **Person-related safety precautions:** Particular danger of slipping on leaked/spilled product.
- **Measures for environmental protection:** Do not allow to enter sewers/ surface or ground water.
- **Measures for cleaning/collecting:**
Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust).
Dispose of the material collected according to regulations.

7 Handling and storage

- **Handling:**
- **Information for safe handling:** Prevent formation of aerosols.
- **Information about fire - and explosion protection:** No special measures required.
- **Storage:**
- **Requirements to be met by storerooms and receptacles:**
Store in cool, dry conditions in well sealed receptacles.
- **Information about storage in one common storage facility:**
Store away from foodstuffs.
Store away from oxidizing agents.
- **Further information about storage conditions:** None.

8 Exposure controls/personal protection

- **Additional information about design of technical facilities:** No further data; see item 7.
- **Ingredients with limit values that require monitoring at the workplace:**
The product does not contain any relevant quantities of materials with critical values that have to be monitored at the workplace.
- **Additional information:** The lists valid during the making were used as basis.
- **Personal protective equipment:**
- **General protective and hygienic measures:**
Do not inhale gases / fumes / aerosols.
Immediately remove all soiled and contaminated clothing
Avoid contact with the skin.
Be sure to clean skin thoroughly after work and before breaks.
- **Protection of hands:** Preventive skin protection by use of skin-protecting agents is recommended.
- **Eye protection:** Goggles recommended during refilling

GB

(Contd. on page 3)

Safety Data Sheet

according to 1907/2006/EC, Article 31

Printing date 17.03.2009

Revision: 17.03.2009

Trade name: Klüberoil 4 UH1- 32N

(Contd. of page 2)

9 Physical and chemical properties

· General Information

Form: Fluid
Colour: Colourless
Odour: Product specific

· Change in condition

Pour point ~ -35°C (DIN ISO 3016)

· **Flash point:** > 200°C (DIN ISO 2592)

· **Danger of explosion:** Product does not present an explosion hazard.

· **Density at 20°C:** ~ 0.84 g/cm³ (DIN 51757)

· **Solubility in / Miscibility with water:** Insoluble.

· Viscosity:

Kinematic at 40°C: ~ 32 mm²/s (DIN 51562)

10 Stability and reactivity

· Thermal decomposition / conditions to be avoided:

No decomposition if used and stored according to specifications.

· **Materials to be avoided:** oxidizing agents

· **Dangerous reactions** No dangerous reactions known.

· **Dangerous decomposition products:** none under normal use

11 Toxicological information

· Additional toxicological information:

Prolonged skin contact may cause skin irritation and/or dermatitis.

12 Ecological information

· Ecotoxicological effects:

· **Behaviour in sewage processing plants:** The product can be mechanically separated.

· **General notes:** Do not allow product to reach ground water, water course or sewage system.

13 Disposal considerations

· Product:

· Recommendation

Disposal must be made according to official regulations.

Can be reused after reprocessing.

· Waste disposal key:

For this product no waste disposal key according the European Waste Catalogue (EWC) can be determined, as only the purpose of application defined by the user enables an allocation. The waste code number has to be determined in accordance with the local waste disposer.

(Contd. on page 4)

Safety Data Sheet

according to 1907/2006/EC, Article 31

Printing date 17.03.2009

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Trade name: Klüberoil 4 UH1- 32N

(Contd. of page 3)

- **Uncleaned packaging:**
- **Recommendation:**
Empty contaminated packagings thoroughly. They may be recycled after thorough and proper cleaning.

14 Transport information

- **Land transport ADR/RID (cross-border)**
- **ADR/RID class:** -
- **Maritime transport IMDG:**
- **IMDG Class:** -
- **Air transport ICAO-TI and IATA-DGR:**
- **ICAO/IATA Class:** -
- **Transport/Additional information:**
Not classified as dangerous according to the above specifications.

15 Regulatory information

- **Labelling according to EU guidelines:**
The product is not subject to classification according to the calculation methods of the "General Classification Guideline for Preparations of the EU" as issued in the latest valid version.

16 Other information

This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

- **Department issuing MSDS:** Material Compliance Management
- **Contact:** +49(0)897876-1564
- * **Data compared to the previous version altered.**

GB

SAFETY DATA SHEET



Klüberoil 4 UH1- 68 N

Date of printing : 2011-08-19.

Date of issue 2011-08-19

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1 Product identifier

Product name : Klüberoil 4 UH1- 68 N
Product code : 029039
Product description : Lubricating oil

1.2 Relevant identified uses of the substance or mixture and uses advised against

Not applicable.

1.3 Details of the supplier of the safety data sheet

KLÜBER LUBRICATION MÜNCHEN KG
Geisenhausenerstrasse 7
D-81379 München
Tel: +49 (0) 897876-0
Fax: +49 (0) 897876-333

e-mail address of person responsible for this SDS : Material Compliance Management E-Mail: mcm@klueber.com

National contact

1.4 Emergency telephone number

Supplier

Emergency telephone number (with hours of operation) : 0049 (0) 897876-700 (24hrs)

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

Product definition : Mixture

Classification according to Regulation (EC) No. 1272/2008 [CLP/GHS]

Not classified.

Ingredients of unknown toxicity :

Ingredients of unknown ecotoxicity :

Classification according to Directive 1999/45/EC [DPD]

The product is not classified as dangerous according to Directive 1999/45/EC and its amendments.

Classification : Not classified.

See Section 16 for the full text of the R phrases or H statements declared above.

See Section 11 for more detailed information on health effects and symptoms.

2.2 Label elements

Hazard pictograms :

Signal word : No signal word.

Hazard statements : No known significant effects or critical hazards.

Precautionary statements

Prevention : Not applicable.

Response : Not applicable.

Storage : Not applicable.

Disposal : Not applicable.

Klüberoil 4 UH1- 68 N**SECTION 2: Hazards identification**

- Hazardous ingredients** :
- Supplemental label elements** : Not applicable.
- Special packaging requirements**
- Containers to be fitted with child-resistant fastenings** : Not applicable.
- Tactile warning of danger** : Not applicable.

2.3 Other hazards

- Other hazards which do not result in classification** : Not available.
- Additional warning phrases** : Not available.

SECTION 3: Composition/information on ingredients

- Substance/mixture** : Mixture
- Description** : ester oil Synthetic hydrocarbon oil
- Type**

[1] Substance classified with a health or environmental hazard

[2] Substance with a workplace exposure limit

[3] Substance meets the criteria for PBT according to Regulation (EC) No. 1907/2006, Annex XIII

[4] Substance meets the criteria for vPvB according to Regulation (EC) No. 1907/2006, Annex XIII

SECTION 4: First aid measures**4.1 Description of first aid measures**

- Eye contact** : Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Get medical attention if irritation occurs.
- Inhalation** : Remove victim to fresh air and keep at rest in a position comfortable for breathing. Get medical attention if symptoms occur.
- Skin contact** : Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Get medical attention if symptoms occur.
- Ingestion** : Wash out mouth with water. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Do not induce vomiting unless directed to do so by medical personnel. Get medical attention if symptoms occur.
- Protection of first-aiders** : No action shall be taken involving any personal risk or without suitable training.

4.2 Most important symptoms and effects, both acute and delayed**Potential acute health effects**

- Eye contact** : No known significant effects or critical hazards.
- Inhalation** : No known significant effects or critical hazards.
- Skin contact** : No known significant effects or critical hazards.
- Ingestion** : No known significant effects or critical hazards.

Over-exposure signs/symptoms

- Eye contact** : No specific data.
- Inhalation** : No specific data.
- Skin contact** : No specific data.
- Ingestion** : No specific data.

4.3 Indication of any immediate medical attention and special treatment needed

- Notes to physician** : Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.
- Specific treatments** : No specific treatment.

Klüberoil 4 UH1- 68 N

SECTION 5: Firefighting measures**5.1 Extinguishing media**

Suitable extinguishing media : Use an extinguishing agent suitable for the surrounding fire.

Unsuitable extinguishing media : None known.

5.2 Special hazards arising from the substance or mixture

Hazards from the substance or mixture : In a fire or if heated, a pressure increase will occur and the container may burst.

Hazardous combustion products : Decomposition products may include the following materials:
carbon dioxide
carbon monoxide

5.3 Advice for firefighters

Special precautions for fire-fighters : Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training.

Special protective equipment for fire-fighters : Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode. Clothing for fire-fighters (including helmets, protective boots and gloves) conforming to European standard EN 469 will provide a basic level of protection for chemical incidents.

SECTION 6: Accidental release measures**6.1 Personal precautions, protective equipment and emergency procedures**

For non-emergency personnel : No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Put on appropriate personal protective equipment.

For emergency responders : If specialised clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".

6.2 Environmental precautions

: Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).

6.3 Methods and materials for containment and cleaning up

Small spill : Stop leak if without risk. Move containers from spill area. Dilute with water and mop up if water-soluble. Alternatively, or if water-insoluble, absorb with an inert dry material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.

Large spill : Stop leak if without risk. Move containers from spill area. Prevent entry into sewers, water courses, basements or confined areas. Wash spillages into an effluent treatment plant or proceed as follows. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations (see section 13). Dispose of via a licensed waste disposal contractor. Note: see section 1 for emergency contact information and section 13 for waste disposal.

6.4 Reference to other sections

: See Section 1 for emergency contact information.
See Section 8 for information on appropriate personal protective equipment.
See Section 13 for additional waste treatment information.

Klüberoil 4 UH1- 68 N

SECTION 7: Handling and storage

The information in this section contains generic advice and guidance. The list of Identified Uses in Section 1 should be consulted for any available use-specific information provided in the Exposure Scenario(s).

7.1 Precautions for safe handling

- Protective measures** : Put on appropriate personal protective equipment (see Section 8).
- Advice on general occupational hygiene** : Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.

7.2 Conditions for safe storage, including any incompatibilities

- : Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see section 10) and food and drink. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabelled containers. Use appropriate containment to avoid environmental contamination.

7.3 Specific end use(s)

- Recommendations** : Not available.
- Industrial sector specific solutions** : Not available.

SECTION 8: Exposure controls/personal protection

The information in this section contains generic advice and guidance. The list of Identified Uses in Section 1 should be consulted for any available use-specific information provided in the Exposure Scenario(s).

8.1 Control parameters**Occupational exposure limits**

No exposure limit value known.

- Recommended monitoring procedures** : If this product contains ingredients with exposure limits, personal, workplace atmosphere or biological monitoring may be required to determine the effectiveness of the ventilation or other control measures and/or the necessity to use respiratory protective equipment. Reference should be made to European Standard EN 689 for methods for the assessment of exposure by inhalation to chemical agents and national guidance documents for methods for the determination of hazardous substances.

Derived effect levels

No DELs available.

Predicted effect concentrations

No PECs available.

8.2 Exposure controls

- Appropriate engineering controls** : No special ventilation requirements. Good general ventilation should be sufficient to control worker exposure to airborne contaminants. If this product contains ingredients with exposure limits, use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure below any recommended or statutory limits.

Individual protection measures

- Hygiene measures** : Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.
- Eye/face protection** : Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists, gases or dusts.

Skin protection

Klüberoil 4 UH1- 68 N**SECTION 8: Exposure controls/personal protection**

- Hand protection** : Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary.
- Body protection** : Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.
- Other skin protection** : Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.
- Respiratory protection** : Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.
- Environmental exposure controls** : Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

SECTION 9: Physical and chemical properties**9.1 Information on basic physical and chemical properties****Appearance**

- Physical state** : Liquid.
- Colour** : Colourless.
- Odour** : Characteristic.
- pH** : Not available.
- Melting point/freezing point** : Not available.
- Initial boiling point and boiling range** : Not available.
- Flash point** : Open cup: >200°C
- Flammability (solid, gas)** : Not available.
- Burning time** : Not applicable.
- Burning rate** : Not applicable.
- Upper/lower flammability or explosive limits** : Not available.
- Vapour pressure** : Not available.
- Density** : 0.85 g/cm³ [20°C]
- Bulk Density** : Not available.
- Solubility(ies)** : Insoluble in the following materials: cold water.
- Partition coefficient: n-octanol/water** : Not available.
- Auto-ignition temperature** : Not available.
- Decomposition temperature** : Not available.
- Viscosity** : Kinematic (40°C (104°F)): 0.68 cm²/s (68 cSt)
- Explosive properties** : Not available.
- Oxidising properties** : Not available.

9.2 Other information

No additional information.

SECTION 10: Stability and reactivity

- 10.1 Reactivity** : No specific test data related to reactivity available for this product or its ingredients.
- 10.2 Chemical stability** : The product is stable.
- 10.3 Possibility of hazardous reactions** : Under normal conditions of storage and use, hazardous reactions will not occur.

Klüberoil 4 UH1- 68 N

SECTION 10: Stability and reactivity**10.4 Conditions to avoid** : No specific data.**10.5 Incompatible materials** : No specific data.**10.6 Hazardous decomposition products** : Under normal conditions of storage and use, hazardous decomposition products should not be produced.**SECTION 11: Toxicological information****11.1 Information on toxicological effects****Acute toxicity****Conclusion/Summary** : Not available.**Acute toxicity estimates**

Not available.

Irritation/Corrosion**Conclusion/Summary** : Not available.**Sensitiser****Conclusion/Summary** : Not available.**Mutagenicity****Conclusion/Summary** : Not available.**Carcinogenicity****Conclusion/Summary** : Not available.**Reproductive toxicity****Conclusion/Summary** : Not available.**Teratogenicity****Conclusion/Summary** : Not available.**Specific target organ toxicity (single exposure)**

Not available.

Specific target organ toxicity (repeated exposure)

Not available.

Aspiration hazard

Not available.

Information on the likely routes of exposure : Not available.**Potential acute health effects****Inhalation** : No known significant effects or critical hazards.**Ingestion** : No known significant effects or critical hazards.**Skin contact** : No known significant effects or critical hazards.**Eye contact** : No known significant effects or critical hazards.**Symptoms related to the physical, chemical and toxicological characteristics****Inhalation** : No specific data.**Ingestion** : No specific data.**Skin contact** : No specific data.**Eye contact** : No specific data.**Delayed and immediate effects and also chronic effects from short and long term exposure****Short term exposure****Potential immediate effects** : Not available.**Potential delayed effects** : Not available.**Long term exposure**

Klüberoil 4 UH1- 68 N

SECTION 11: Toxicological information

Potential immediate effects : Not available.

Potential delayed effects : Not available.

Potential chronic health effects

Not available.

Conclusion/Summary : Not available.

General : No known significant effects or critical hazards.

Carcinogenicity : No known significant effects or critical hazards.

Mutagenicity : No known significant effects or critical hazards.

Teratogenicity : No known significant effects or critical hazards.

Developmental effects : No known significant effects or critical hazards.

Fertility effects : No known significant effects or critical hazards.

Other information : Not available.

SECTION 12: Ecological information**12.1 Toxicity**

Conclusion/Summary : Not available.

12.2 Persistence and degradability

Conclusion/Summary : Not available.

12.3 Bioaccumulative potential

Not available.

12.4 Mobility in soil

Soil/water partition coefficient (K_{oc}) : Not available.

Mobility : Not available.

12.5 Results of PBT and vPvB assessment

PBT : Not applicable.

vPvB : Not applicable.

12.6 Other adverse effects : No known significant effects or critical hazards.

SECTION 13: Disposal considerations

The information in this section contains generic advice and guidance. The list of Identified Uses in Section 1 should be consulted for any available use-specific information provided in the Exposure Scenario(s).

13.1 Waste treatment methods**Product**

Methods of disposal : The generation of waste should be avoided or minimised wherever possible. Significant quantities of waste product residues should not be disposed of via the foul sewer but processed in a suitable effluent treatment plant. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements.

Hazardous waste : Within the present knowledge of the supplier, this product is not regarded as hazardous waste, as defined by EU Directive 91/689/EEC.

Packaging

Methods of disposal : The generation of waste should be avoided or minimised wherever possible. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible.

Klüberoil 4 UH1- 68 N

SECTION 13: Disposal considerations

Special precautions : This material and its container must be disposed of in a safe way. Empty containers or liners may retain some product residues. Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers.

SECTION 14: Transport information

	ADR/RID	IMDG	IATA
14.1 UN number	Not regulated.	Not regulated.	Not regulated.
14.2 UN proper shipping name	-	-	-
14.3 Transport hazard class(es)	-	-	-
14.4 Packing group	-	-	-
14.5 Environmental hazards	No.	No.	No.
14.6 Special precautions for user	Not available.	Not available.	Not available.
Additional information	-	-	-

14.7 Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code : Not available.

SECTION 15: Regulatory information

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture

EU Regulation (EC) No. 1907/2006 (REACH)**Annex XIV - List of substances subject to authorisation****Substances of very high concern**

None of the components are listed.

Annex XVII - Restrictions on the manufacture, placing on the market and use of certain dangerous substances, mixtures and articles : Not applicable.

Other EU regulations

Europe inventory : Not determined.

Black List Chemicals : Not listed

Priority List Chemicals : Not listed

Integrated pollution prevention and control list (IPPC) - Air : Not listed

Integrated pollution prevention and control list (IPPC) - Water : Not listed

International regulations

Klüberoil 4 UH1- 68 N**SECTION 15: Regulatory information**

Chemical Weapons : Not listed
Convention List Schedule I
Chemicals

Chemical Weapons : Not listed
Convention List Schedule II
Chemicals

Chemical Weapons : Not listed
Convention List Schedule III
Chemicals

15.2 Chemical Safety Assessment : This product contains substances for which Chemical Safety Assessments are still required.

SECTION 16: Other information

✔ Indicates information that has changed from previously issued version.

Abbreviations and acronyms : ATE = Acute Toxicity Estimate
CLP = Classification, Labelling and Packaging Regulation [Regulation (EC) No. 1272/2008]
DNEL = Derived No Effect Level
EUH statement = CLP-specific Hazard statement
PNEC = Predicted No Effect Concentration
RRN = REACH Registration Number

Procedure used to derive the classification according to Regulation (EC) No. 1272/2008 [CLP/GHS]

Classification	Justification
Not classified.	

Full text of abbreviated H statements : Not applicable.

Full text of classifications [CLP/GHS] : Not applicable.

Full text of abbreviated R phrases : Not applicable.

Full text of classifications [DSD/DPD] : Not applicable.

Version : 1

Date of printing : 2011-08-19.

Date of issue : 2011-08-19

Date of previous issue : 2011-08-19.

Prepared by : Material Compliance Management
+49 (0) 89 7876 1564

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All information and instructions in this safety datasheets were compiled to the best of our knowledge and are based on the information available to us. The data provided are intended to describe the product in relation to the required safety measures; they are neither an assurance of characteristics nor a guarantee of the product's suitability for particular applications and do not justify any contractual legal relationships.

Material Safety Data Sheet

According to 91/155 EEC

Printing date 27.04.2006

Reviewed on 25.04.2006

1 Identification of the substance/preparation and of the company/undertaking

- **Product details**
- **Trade name:** Klüberpaste UH1 84-201
- **Article number:** 005113
- **Application of the substance / the preparation** Lubricant
- **Manufacturer/Supplier:**
KLÜBER LUBRICATION MÜNCHEN KG
Geisenhausenerstrasse 7
D-81379 München
Tel.: 0049 (0) 897876-0
Fax: 0049 (0) 897876-333
- **Further information obtainable from:** Material Compliance Management
- **Information in case of emergency:** 0011 49 89 7876 700 (24 hrs)

2 Composition/information on ingredients

- **Chemical characterization**
- **Description:**
Synthetic hydrocarbon oil
solid lubricant
PTFE

- **Dangerous components:**

	amine neutralized phosphoric acid ester of alkylated alcohols ☒ Xi, ☒ N; R 36/38-51/53	0.25-1%
CAS: 95-38-5 EINECS: 204-414-9	2-(2-heptadec-8-enyl-2-imidazolin-1-yl)ethanol ☒ C, ☒ N; R 22-34-50/53	0.25-1%
	Amine carboxylic acid compound ☒ Xi, ☒ N; R 38-41-50	0.25-1%

- **Additional information:** For the wording of the listed risk phrases refer to section 16.

3 Hazards identification

- **Hazard description:** Not applicable.
- **Information concerning particular hazards for human and environment:**
The product has to be labelled due to the calculation procedure of the "General Classification guideline for preparations of the EU" in the latest valid version.
R 52/53 Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
- **Classification system:**
The classification is according to the latest editions of the EU-lists, and extended by company and literature data.

4 First-aid measures

- **After inhalation:** Supply fresh air; consult doctor in case of complaints.
- **After skin contact:** Wash off with soap and plenty of water.

(Contd. on page 2)

Material Safety Data Sheet

According to 91/155 EEC

Printing date 27.04.2006

Reviewed on 25.04.2006

Trade name: Klüberpaste UH1 84-201

(Contd. of page 1)

- **After eye contact:**
Rinse opened eye for several minutes under running water. If symptoms persist, consult a doctor.
- **After swallowing:** If symptoms persist consult doctor.

5 Fire-fighting measures

- **Suitable extinguishing agents:**
Water haze
Foam
Fire-extinguishing powder
Carbon dioxide
- **For safety reasons unsuitable extinguishing agents:** Water with full jet
- **Special hazards caused by the substance, its products of combustion or resulting gases:**
In case of fire, the following can be released:
Carbon monoxide (CO)
Hydrocarbons
traces of fluorinated products
- **Protective equipment:**
Do not inhale explosion gases or combustion gases.
Standard procedure for chemical fires.
- **Additional information**
Cool endangered receptacles with water spray.
Dispose of fire debris and contaminated fire fighting water in accordance with official regulations.

6 Accidental release measures

- **Person-related safety precautions:** Not required.
- **Measures for environmental protection:** Do not allow to enter sewers/ surface or ground water.
- **Measures for cleaning/collecting:**
Pick up mechanically.
Dispose of the material collected according to regulations.

7 Handling and storage

- **Handling:**
- **Information for safe handling:** No special measures required.
- **Information about fire - and explosion protection:** No special measures required.
- **Storage:**
- **Requirements to be met by storerooms and receptacles:**
Store in cool, dry conditions in well sealed receptacles.
- **Information about storage in one common storage facility:**
Store away from foodstuffs.
Store away from oxidizing agents.
- **Further information about storage conditions:** None.

8 Exposure controls/personal protection

- **Additional information about design of technical facilities:** No further data; see item 7.
- **Ingredients with limit values that require monitoring at the workplace:**
The product does not contain any relevant quantities of materials with critical values that have to be monitored at the workplace.
- **Additional information:** The lists valid during the making were used as basis.

(Contd. on page 3)

Material Safety Data Sheet

According to 91/155 EEC

Printing date 27.04.2006

Reviewed on 25.04.2006

Trade name: Klüberpaste UH1 84-201

(Contd. of page 2)

- **Personal protective equipment:**
- **General protective and hygienic measures:**
Immediately remove all soiled and contaminated clothing
Avoid close or long term contact with the skin.
Be sure to clean skin thoroughly after work and before breaks.
Keep away from tobacco products.
- **Respiratory protection:** Not required.
- **Protection of hands:** Preventive skin protection by use of skin-protecting agents is recommended.
- **Eye protection:** Not required.

9 Physical and chemical properties

· General Information

Form:	Pasty
Colour:	White
Odour:	Product specific

· Change in condition

Drip point:	> 240°C (DIN ISO 2176)
--------------------	------------------------

Flash point:	not applicable
---------------------	----------------

Danger of explosion:	Product does not present an explosion hazard.
-----------------------------	---

Density at 20°C:	1.13 g/cm ³
-------------------------	------------------------

Solubility in / Miscibility with water:	Insoluble.
--	------------

10 Stability and reactivity

- **Thermal decomposition / conditions to be avoided:**
No decomposition if used and stored according to specifications.
- **Materials to be avoided:** oxidizing agents
- **Dangerous reactions** No dangerous reactions known.
- **Dangerous decomposition products:** > 280°C danger of forming toxic pyrolysis products.

11 Toxicological information

- **Additional toxicological information:**
Prolonged skin contact may cause skin irritation and/or dermatitis.

12 Ecological information

- **Ecotoxicological effects:**
- **Behaviour in sewage processing plants:** The product can be mechanically separated.
- **General notes:**
Harmful to aquatic organisms
Do not allow product to reach ground water, water course or sewage system.

13 Disposal considerations

- **Product:**
- **Recommendation** Can be incinerated in accordance with local and national regulations.

(Contd. on page 4)

Material Safety Data Sheet

According to 91/155 EEC

Printing date 27.04.2006

Reviewed on 25.04.2006

Trade name: Klüberpaste UH1 84-201

(Contd. of page 3)

- **Waste disposal key:**

For this product no waste disposal key according the European Waste Catalogue (EWC) can be determined, as only the purpose of application defined by the user enables an allocation. The waste code number has to be determined in accordance with the local waste disposer.

- **Uncleaned packaging:**

- **Recommendation:**

Empty contaminated packagings thoroughly. They may be recycled after thorough and proper cleaning.

14 Transport information

- **Land transport ADR/RID (cross-border)**

- **ADR/RID class:** -

- **Maritime transport IMDG:**

- **IMDG Class:** -

- **Air transport ICAO-TI and IATA-DGR:**

- **ICAO/IATA Class:** -

- **Transport/Additional information:**

Not classified as dangerous according to the above specifications.

15 Regulatory information

- **Labelling according to EU guidelines:**

The product has been classified and marked in accordance with EU Directives / Ordinance on Hazardous Materials.

- **Risk phrases:**

52/53 Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

- **Safety phrases:**

61 Avoid release to the environment. Refer to special instructions/safety data sheets.

16 Other information

This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

- **Relevant R-phrases**

22 Harmful if swallowed.

34 Causes burns.

36/38 Irritating to eyes and skin.

38 Irritating to skin.

41 Risk of serious damage to eyes.

50 Very toxic to aquatic organisms.

50/53 Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

51/53 Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

- **Department issuing MSDS:** Material Compliance Management

- **Contact:** +49(0)897876-1564

- *** Data compared to the previous version altered.**

Doc No: 104117-1

Safety Data Sheet

according to 1907/2006/EC, Article 31

Printing date 17.03.2009

Revision: 17.03.2009

1 Identification of the substance/preparation and of the company/undertaking

- **Product details**
- **Trade name:** Klüberoil 4 UH1- 220N
- **Article number:** 029042
- **Application of the substance / the preparation** Lubricating oil
- **Manufacturer/Supplier:**
KLÜBER LUBRICATION MÜNCHEN KG
Geisenhausenerstrasse 7
D-81379 München
Tel.: 0049 (0) 897876-0
Fax: 0049 (0) 897876-333
- **Further information obtainable from:**
Material Compliance Management
E-Mail: mcm@klueber.com
- **Information in case of emergency:** 0049 (0) 89 7876 700 (24 hrs)

2 Hazards identification

- **Hazard description:** Not applicable.
- **Information concerning particular hazards for human and environment:**
The product does not have to be labelled due to the calculation procedure of the "General Classification guideline for preparations of the EU" in the latest valid version.
- **Classification system:**
The classification is according to the latest editions of the EU-lists, and extended by company and literature data.

3 Composition/information on ingredients

- **Chemical characterization**
- **Description:**
Synthetic hydrocarbon oil
ester oil
- **Dangerous components:** Void
- **Additional information:** For the wording of the listed risk phrases refer to section 16.

4 First-aid measures

- **After inhalation:** Supply fresh air; consult doctor in case of complaints.
- **After skin contact:** Wash off with soap and plenty of water.
- **After eye contact:**
Rinse opened eye for several minutes under running water. If symptoms persist, consult a doctor.
- **After swallowing:** If symptoms persist consult doctor.

5 Fire-fighting measures

- **Suitable extinguishing agents:**
Water haze

(Contd. on page 2)

Safety Data Sheet

according to 1907/2006/EC, Article 31

Printing date 17.03.2009

Revision: 17.03.2009

Trade name: Klüberoil 4 UH1- 220N

(Contd. of page 1)

Foam

Fire-extinguishing powder

Carbon dioxide

- **For safety reasons unsuitable extinguishing agents:** Water with full jet
- **Special hazards caused by the substance, its products of combustion or resulting gases:**

In case of fire, the following can be released:

Carbon monoxide (CO)

Hydrocarbons

- **Protective equipment:**

Do not inhale explosion gases or combustion gases.

Standard procedure for chemical fires.

- **Additional information**

Cool endangered receptacles with water spray.

Dispose of fire debris and contaminated fire fighting water in accordance with official regulations.

6 Accidental release measures

- **Person-related safety precautions:** Particular danger of slipping on leaked/spilled product.
- **Measures for environmental protection:** Do not allow to enter sewers/ surface or ground water.
- **Measures for cleaning/collecting:**
Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust).
Dispose of the material collected according to regulations.

7 Handling and storage

- **Handling:**
- **Information for safe handling:** Prevent formation of aerosols.
- **Information about fire - and explosion protection:** No special measures required.
- **Storage:**
- **Requirements to be met by storerooms and receptacles:**
Store in cool, dry conditions in well sealed receptacles.
- **Information about storage in one common storage facility:**
Store away from foodstuffs.
Store away from oxidizing agents.
- **Further information about storage conditions:** None.

8 Exposure controls/personal protection

- **Additional information about design of technical facilities:** No further data; see item 7.
- **Ingredients with limit values that require monitoring at the workplace:**
The product does not contain any relevant quantities of materials with critical values that have to be monitored at the workplace.
- **Additional information:** The lists valid during the making were used as basis.
- **Personal protective equipment:**
- **General protective and hygienic measures:**
Do not inhale gases / fumes / aerosols.
Immediately remove all soiled and contaminated clothing
Avoid contact with the skin.
Be sure to clean skin thoroughly after work and before breaks.
- **Protection of hands:** Preventive skin protection by use of skin-protecting agents is recommended.
- **Eye protection:** Goggles recommended during refilling

GB

(Contd. on page 3)

Safety Data Sheet

according to 1907/2006/EC, Article 31

Printing date 17.03.2009

Revision: 17.03.2009

Trade name: Klüberoil 4 UH1- 220N

(Contd. of page 2)

9 Physical and chemical properties

- **General Information**

Form:	Fluid
Colour:	Colourless
Odour:	Product specific

- **Change in condition**

Pour point	~ -30°C (DIN ISO 3016)
-------------------	------------------------

- **Flash point:** > 200°C (DIN ISO 2592)

- **Danger of explosion:** Product does not present an explosion hazard.

- **Density at 20°C:** ~ 0.85 g/cm³ (DIN 51757)

- **Solubility in / Miscibility with water:**

Insoluble.

- **Viscosity:**

Kinematic at 40°C:	~ 220 mm ² /s (DIN 51562)
---------------------------	--------------------------------------

10 Stability and reactivity

- **Thermal decomposition / conditions to be avoided:**

No decomposition if used and stored according to specifications.

- **Materials to be avoided:** oxidizing agents

- **Dangerous reactions** No dangerous reactions known.

- **Dangerous decomposition products:** none under normal use

11 Toxicological information

- **Additional toxicological information:**

Prolonged skin contact may cause skin irritation and/or dermatitis.

12 Ecological information

- **Ecotoxicological effects:**

- **Behaviour in sewage processing plants:** The product can be mechanically separated.

- **General notes:** Do not allow product to reach ground water, water course or sewage system.

13 Disposal considerations

- **Product:**

- **Recommendation** Can be reused after reprocessing.

- **Waste disposal key:**

For this product no waste disposal key according the European Waste Catalogue (EWC) can be determined, as only the purpose of application defined by the user enables an allocation. The waste code number has to be determined in accordance with the local waste disposer.

- **Uncleaned packaging:**

- **Recommendation:**

Empty contaminated packagings thoroughly. They may be recycled after thorough and proper cleaning.

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(Contd. on page 4)

Safety Data Sheet

according to 1907/2006/EC, Article 31

Printing date 17.03.2009

Revision: 17.03.2009

Trade name: Klüberoil 4 UH1- 220N

(Contd. of page 3)

14 Transport information

- Land transport ADR/RID (cross-border)
- ADR/RID class: -
- Maritime transport IMDG:
- IMDG Class: -
- Air transport ICAO-TI and IATA-DGR:
- ICAO/IATA Class: -
- Transport/Additional information:
Not classified as dangerous according to the above specifications.

15 Regulatory information

- **Labelling according to EU guidelines:**
The product is not subject to classification according to the calculation methods of the "General Classification Guideline for Preparations of the EU" as issued in the latest valid version.

16 Other information

This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

- **Department issuing MSDS:** Material Compliance Management
- **Contact:** +49(0)897876-1564
- * **Data compared to the previous version altered.**

GB



February 25, 2004

Luciana Husfeld
KLUBER LUBRICATION MUNCHEN KG.
GEISENHAUSENER STR. 7
81379 MÜNCHEN
GERMANY

RE: Klubersynth® UH1 14-151
Category Code: H1
NSF Registration No. 056354

Dear Luciana Husfeld:

NSF has processed the application for Registration of **Klubersynth® UH1 14-151** to the *NSF Registration Guidelines for Proprietary Substances and Nonfood Compounds* (2004), which are available at www.nsf.org/usda. The NSF Nonfood Compounds Registration Program is a continuation of the USDA product approval and listing program, which is based on meeting regulatory requirements including FDA 21 CFR for appropriate use, ingredient and labeling.

This product is acceptable as a lubricant with incidental food contact (H1) for use in and around food processing areas. Such compounds may be used on food processing equipment as a protective anti-rust film, as a release agent on gaskets or seals of tank closures, and as a lubricant for machine parts and equipment in locations in which there is a potential exposure of the lubricated part to food. The amount used should be the minimum required to accomplish the desired technical effect on the equipment. If used as an anti-rust film, the compound must be removed from the equipment surface by washing or wiping, as required to leave the surface effectively free of any substance which could be transferred to food being processed.

NSF Registration of this product is current when the NSF Registration Number, Category Code, and Registration Mark appear on the NSF-approved product label, and the registered product name is included in the current NSF White Book Listing of Nonfood Compounds at the NSF website (<http://www.nsf.org/usda>). The NSF Registration Mark can be downloaded from the NSF website, at http://www.nsf.org/mark/download_marks.html.

NSF Listing of all registered Nonfood compounds by NSF International is not an endorsement of those compounds, or of any performance or efficacy claims made by the manufacturer.

Registration status may be verified at any time via the NSF web site, at <http://www.nsf.org/usda>. Changes in formulation or label, without the prior written consent of NSF, will void registration, and will supersede the on-line listing.

Sincerely,

A handwritten signature in black ink, appearing to read 'Carmen Grindatti', written in a cursive style.

Carmen Grindatti
NSF Nonfood Compounds Registration Program

Company No: N04391

Klübersynth® UH1 14-151

Lubricating grease for the food-processing industry



Description

Klübersynth UH1 14-151 was especially developed for the food processing and pharmaceutical industry.

This lubricant fulfills the requirements of the German law governing food products and associated ancillaries and complies with the "guidelines of sec. 21 CFR 178.3570 of FDA regulations". It has been authorized by the USDA for use in federally inspected meat and poultry plants (USDA H1).

Klübersynth UH1 14-151 shows good anti-wear properties, water resistance and corrosion protection as well as a high ageing and oxidation stability.

Application

Used for machines and equipment in the food-processing and pharmaceutical industry, particularly for lubrication points that may have incidental and technically unavoidable contact with the food product. However, we recommend using Klübersynth UH1 14-151 at all lubrication points, in order to avoid problems due to lubricant contamination.

This special grease lubricates rolling and sliding bearings, lifting cylinders, joints, guide bars, cams, etc.

Application notes

Klübersynth UH1 14-151 is applied by brush, spatula, grease gun and grease cartridge or by means of centralized lubrication systems.

Before substituting other greases with Klübersynth UH1 14-151 the bearings have to be cleaned and greased. If the greases are miscible, the grease can be exchanged by means of relubrication.

Minimum shelf life

The minimum shelf life is approx. 24 months if the product is stored in its unopened original container in a dry place.

Klübersynth UH1 14-151

- Synthetic
- Good wear resistance
- Can be used in centralized lubrication systems
- Good water resistance
- High ageing and oxidation stability
- Good corrosion protection
- USDA H1 registration

Pack size

400 g grease cartridge
1 kg tin
25 kg bucket

Product data

Colour	beige
Texture	homogeneous
Density, DIN 51 757, at 20 °C, g/cm ³ , approx.	0.92
Drop point, DIN ISO 2176, °C	> 220
Worked penetration at 25 °C, DIN ISO 2137; 0.1 mm, approx.	310 to 340
Spped factor, (n x d _m), approx.	3 x 10 ⁵
Consistency, NLGI grade, DIN 51 818	1
Service temperature range*, °C	- 45 to 120
Flow pressure, DIN 51 805, at - 45 °C, mbar	< 1400

* Service temperatures are guide values which depend on the lubricant's composition, the intended use and the application method. Lubricants change their consistency, apparent dynamic viscosity or viscosity depending on the mechano-dynamical loads, time, pressure and temperature. These changes in product characteristics may affect the function of a component.

The data in this product information is based on our general experience and knowledge at the time of printing and is intended to give information of possible applications to a reader with technical experience. It constitutes neither an assurance of product properties nor does it release the user from the obligation of performing preliminary tests with the selected product. We recommend contacting our Technical Consulting Staff to discuss your specific application. If required and possible we will be pleased to provide a sample for testing. Klüber products are continually improved. Therefore, Klüber Lubrication reserves the right to change all the technical data in this product information at any time without notice.



Klüber Lubrication, a member of the Freudenberg group

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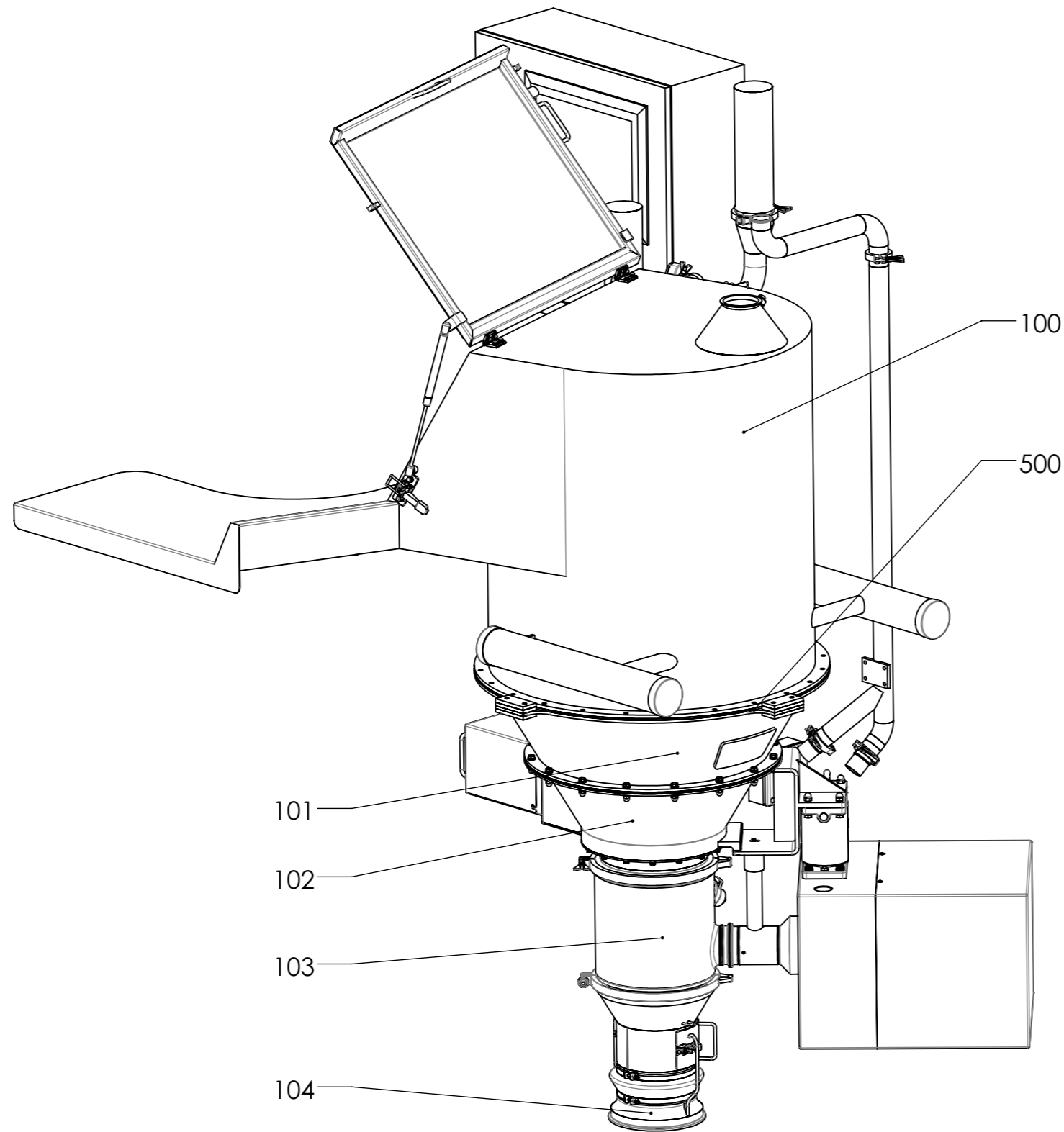
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Geisenhausenerstraße 7, 81379 München, Deutschland
☎ +49 89 7876-0, Telefax +49 89 7876-333, www.klueber.com

Voir documents suivants.

Siehe folgende Dokumente.

See following documents



Pos.	Item number	Control drawing	Materials certificates EN-10204-3.1B FDA	Surface quality certificates
100	473649	473649-CMA	X	X
101	473842	473842-CMA	X	X
102	473841	473841-CMA	X	X
103	473746	473746-CMA	X	X
104	473713	473713-CMA	X	X
500	457663	---	X	0

X = delivered
0 = undelivered

Dimensions without tolerance [mm]	above up to	6	30	120	400	1000	MATERIAL : N/A						
Machining: ISO 2768-m		±0.10	±0.20	±0.30	±0.50	±0.80	±1.20	Scale	Similar	Designed	24/04/2014	edgu	
Welding Assembly: ISO 2768-c		±0.30	±0.50	±0.80	±1.20	±2.00	±3.00	%	464769	Controlled	30/04/2014	edgu	
PRO-14-0012 / DelumpWitt								Weight [kg]	Revised	30/04/2014	edgu		
								A3	N/A	Atex			
<small>Any and all information received by you from us shall be held and kept confidential and shall not be disclosed by you to any third party except with prior written consent of FREWITT SA.</small>								FREWITT		<small>Frewitt SA: Milling and Handling of Powders P.O.B. 615, CH-1701 Fribourg, SWITZERLAND tel: +41 26 460 74 00 / fax: +41 26 460 74 01 info@frewitt.com / www.frewitt.com</small>		Page	Ver.
								473599-CMA		1/1	A		

Pos. 105		465091 Dessin / Zeichnung / Drawing : 465091-CMA																					
Mesure N° Mass Nr. Measure Nr.	Matière Material	%																					
		Al	Sb	Sn	Cd	Pd	Ag	Mo	Nb	Zr	Bi	Pb	Se	W	Zn	Cu	Ni	Co	Fe	Mn	Cr	V	Ti
1	316/316L	0.00	0.00	0.00	0.00	0.00	0.00	2.15	0.00	0.01	0.01	0.02	0.01	0.00	0.03	0.08	10.74	0.15	68.63	1.35	16.73	0.08	0.00
2	316/316L	0.00	0.00	0.02	0.00	0.00	0.00	2.11	0.03	0.00	0.01	0.01	0.00	0.07	0.00	0.46	10.16	0.20	68.09	1.68	17.10	0.05	0.02

Pos. 500-504		Dessin / Zeichnung / Drawing : 473649-CMA	
Mesure/Pos. N° Mass/Pos. Nr. Measure/Pos Nr.	Matière Material	Article Artikel Article	Certificat FDA N° FDA Zertifikat Nr. FDA certificate No :
500	Silicone	453974	56867
501	Silicone	438974	15186
502	Silicone	406571	17348
503*	Tetratex®	474448	172837
504	Silicone	462542	56867

Pos.101-Inlet cone-473842

Pos. 101		473842 Dessin / Zeichnung / Drawing : 473842-CMA																					
Mesure N° Mass Nr. Measure Nr.	Matière Material	%																					
		Al	Sb	Sn	Cd	Pd	Ag	Mo	Nb	Zr	Bi	Pb	Se	W	Zn	Cu	Ni	Co	Fe	Mn	Cr	V	Ti
1	316/316L	0.00	0.01	0.02	0.00	0.00	0.00	2.12	0.01	0.01	0.01	0.02	0.00	0.04	0.00	0.37	10.29	0.45	68.72	1.15	16.70	0.09	0.00
2	316/316L	0.00	0.01	0.02	0.00	0.00	0.01	2.09	0.01	0.00	0.00	0.01	0.00	0.08	0.00	0.30	10.13	0.33	69.14	1.03	16.76	0.07	0.00
3	316/316L	0.00	0.01	0.02	0.00	0.00	0.00	2.01	0.02	0.01	0.01	0.02	0.00	0.03	0.03	0.49	11.09	0.48	67.29	1.16	17.25	0.10	0.00
4	316/316L	0.00	0.01	0.02	0.01	0.00	0.00	2.15	0.03	0.01	0.01	0.01	0.00	0.00	0.03	0.41	11.26	0.37	67.36	1.23	16.99	0.11	0.00
5	316/316L	0.00	0.00	0.02	0.00	0.00	0.00	2.18	0.01	0.01	0.01	0.01	0.00	0.07	0.01	0.44	10.73	0.58	68.66	1.26	16.91	0.09	0.00

Pos.102-Crusher-473841

Pos. 1		464795 Dessin / Zeichnung / Drawing : 473841-CMA																					
Mesure N° Mass Nr. Measure Nr.	Matière Material	%																					
		Al	Sb	Sn	Cd	Pd	Ag	Mo	Nb	Zr	Bi	Pb	Se	W	Zn	Cu	Ni	Co	Fe	Mn	Cr	V	Ti
1	316/316L	0.00	0.00	0.01	0.00	0.00	0.00	2.23	0.02	0.00	0.02	0.01	0.00	0.07	0.01	0.47	10.76	0.44	67.53	1.49	16.85	0.10	0.00

Pos. 2		454215 Dessin / Zeichnung / Drawing : 473841-CMA																					
Mesure N° Mass Nr. Measure Nr.	Matière Material	%																					
		Al	Sb	Sn	Cd	Pd	Ag	Mo	Nb	Zr	Bi	Pb	Se	W	Zn	Cu	Ni	Co	Fe	Mn	Cr	V	Ti
1	316/316L	0.00	0.01	0.01	0.01	0.00	0.00	2.20	0.02	0.01	0.01	0.03	0.01	0.00	0.00	0.34	10.16	0.28	68.59	1.35	16.88	0.09	0.01

Pos. 3		464796 Dessin / Zeichnung / Drawing : 473841-CMA																					
Mesure N° Mass Nr. Measure Nr.	Matière Material	%																					
		Al	Sb	Sn	Cd	Pd	Ag	Mo	Nb	Zr	Bi	Pb	Se	W	Zn	Cu	Ni	Co	Fe	Mn	Cr	V	Ti
1	316/316L	0.00	0.01	0.01	0.01	0.00	0.00	2.33	0.02	0.00	0.00	0.01	0.01	0.00	0.00	0.42	12.12	0.33	68.21	1.38	16.58	0.08	0.00

Pos.100		454424 Dessin / Zeichnung / Drawing : 454424-CMA																					
Mesure N° Mass Nr. Measure Nr.	Matière Material	%																					
		Al	Sb	Sn	Cd	Pd	Ag	Mo	Nb	Zr	Bi	Pb	Se	W	Zn	Cu	Ni	Co	Fe	Mn	Cr	V	Ti
1	316Ti	0.00	0.00	0.00	0.01	0.00	0.00	2.19	0.03	0.01	0.01	0.01	0.00	0.00	0.00	0.21	10.83	0.00	68.11	1.01	17.36	0.06	0.16

Pos. 500		Dessin / Zeichnung / Drawing : 459448-CMA	
Mesure/Pos. N° Mass/Pos. Nr. Measure/Pos Nr.	Matière Material	Article Artikel Article	Certificat FDA N° FDA Zertifikat Nr. FDA certificate No :
500	Gylon	459448	127378

Pos. 500-501		Dessin / Zeichnung / Drawing : 454424-CMA	
Mesure/Pos. N° Mass/Pos. Nr. Measure/Pos Nr.	Matière Material	Article Artikel Article	Certificat FDA N° FDA Zertifikat Nr. FDA certificate No :
500	FKM	454357	111900
501	FEP-O-SEAL	431768	165314

Pos. 101		454299 Dessin / Zeichnung / Drawing : 454299-CMA																					
Mesure N° Mass Nr. Measure Nr.	Matière Material	%																					
		Al	Sb	Sn	Cd	Pd	Ag	Mo	Nb	Zr	Bi	Pb	Se	W	Zn	Cu	Ni	Co	Fe	Mn	Cr	V	Ti
1	316/316L	0.00	0.00	0.00	0.00	0.00	0.00	2.07	0.01	0.01	0.00	0.03	0.00	0.03	0.02	0.35	10.53	0.30	68.84	0.99	16.75	0.07	0.00
2	316/316L	0.00	0.00	0.01	0.00	0.00	0.01	2.10	0.01	0.01	0.01	0.01	0.00	0.03	0.02	0.43	10.73	0.00	68.20	1.50	16.85	0.07	0.02
3	316/316L	0.00	0.00	0.02	0.00	0.00	0.00	1.98	0.02	0.01	0.01	0.02	0.00	0.01	0.01	0.36	10.39	0.50	69.10	1.16	16.84	0.09	0.00
4	316/316L	0.00	0.00	0.02	0.00	0.00	0.00	2.08	0.01	0.00	0.01	0.03	0.00	0.00	0.01	0.25	9.91	0.39	69.05	1.35	16.80	0.08	0.00
5	316/316L	0.00	0.01	0.01	0.00	0.00	0.00	2.06	0.01	0.01	0.01	0.02	0.00	0.04	0.01	0.33	9.96	0.08	69.91	0.97	16.44	0.11	0.02

Pos. 102 **473848** Dessin / Zeichnung / Drawing : 473848-CMA

Mesure N° Mass Nr. Measure Nr.	Matière Material Material	%																					
		Al	Sb	Sn	Cd	Pd	Ag	Mo	Nb	Zr	Bi	Pb	Se	W	Zn	Cu	Ni	Co	Fe	Mn	Cr	V	Ti
1	316/316L	0.00	0.00	0.01	0.00	0.00	0.00	2.69	0.00	0.00	0.01	0.01	0.00	0.03	0.02	0.18	13.19	0.15	65.13	1.83	16.72	0.03	0.00
2	316/316L	0.00	0.01	0.02	0.01	0.00	0.00	2.69	0.01	0.00	0.00	0.02	0.00	0.02	0.01	0.45	10.57	0.23	67.47	1.36	17.07	0.06	0.00
3	316/316L	0.00	0.02	0.01	0.00	0.00	0.01	2.21	0.02	0.00	0.01	0.01	0.00	0.11	0.00	0.25	10.42	0.48	68.58	1.12	16.66	0.10	0.00
4	316/316L	0.00	0.02	0.01	0.01	0.00	0.01	2.05	0.01	0.01	0.00	0.03	0.00	0.04	0.03	0.41	10.15	0.11	68.60	1.75	16.70	0.06	0.00
5	316/316L	0.00	0.01	0.01	0.00	0.00	0.00	2.46	0.01	0.01	0.02	0.00	0.00	0.07	0.01	0.27	10.99	0.61	69.54	1.38	16.55	0.11	0.00
6	316/316L	0.00	0.00	0.02	0.00	0.00	0.00	2.08	0.01	0.00	0.00	0.03	0.00	0.02	0.01	0.38	9.85	0.49	68.57	1.00	17.43	0.10	0.01
7	316/316L	0.00	0.01	0.02	0.00	0.00	0.00	3.17	0.00	0.00	0.01	0.00	0.01	0.00	0.05	0.10	13.58	0.00	65.35	1.89	15.74	0.05	0.01
8	316/316L	0.00	0.00	0.03	0.01	0.00	0.01	2.68	0.02	0.00	0.01	0.02	0.00	0.02	0.01	0.26	13.60	0.27	64.26	1.81	16.97	0.03	0.00

Pos. 103 **454311** Dessin / Zeichnung / Drawing : 454311-CMA

Mesure N° Mass Nr. Measure Nr.	Matière Material Material	%																								
		Al	Sb	Sn	Cd	Pd	Ag	Mo	Nb	Zr	Bi	Pb	Se	W	Zn	Cu	Ni	Co	Fe	Mn	Cr	V	Ti			
1	316/316L	0.00	0.01	0.01	0.00	0.00	0.00	2.05	0.01	0.01	0.00	0.01	0.00	0.00	0.02	0.00	0.12	0.01	0.20	9.86	0.22	69.68	1.51	16.79	0.07	0.01
2	316/316L	0.00	0.00	0.00	0.00	0.00	0.00	2.12	0.00	0.00	0.02	0.00	0.00	0.12	0.01	0.20	9.86	0.22	69.68	1.51	16.79	0.07	0.01			
3	316/316L	0.00	0.00	0.01	0.01	0.00	0.00	2.09	0.00	0.01	0.00	0.01	0.00	0.00	0.04	0.34	9.80	0.51	69.59	1.53	16.95	0.12	0.00			
4	316/316L	0.00	0.00	0.02	0.00	0.00	0.00	2.20	0.02	0.00	0.01	0.01	0.00	0.03	0.01	0.50	10.71	0.14	67.59	1.93	16.68	0.09	0.06			

Pos. 104 **464798** Dessin / Zeichnung / Drawing : 464798-CMA

Mesure N° Mass Nr. Measure Nr.	Matière Material Material	%																					
		Al	Sb	Sn	Cd	Pd	Ag	Mo	Nb	Zr	Bi	Pb	Se	W	Zn	Cu	Ni	Co	Fe	Mn	Cr	V	Ti
1	316/316L	0.00	0.00	0.01	0.01	0.00	0.00	1.99	0.03	0.00	0.01	0.00	0.00	0.00	0.03	0.22	9.33	0.26	69.01	1.03	17.97	0.11	0.00
2	316/316L	0.00	0.01	0.02	0.00	0.01	0.01	2.30	0.01	0.02	0.01	0.00	0.00	0.00	0.03	0.40	10.62	0.43	68.47	1.37	13.73	0.05	0.02
3	316/316L	0.00	0.00	0.01	0.00	0.00	0.00	2.38	0.00	0.00	0.01	0.02	0.00	0.05	0.00	0.29	11.43	0.14	65.45	1.53	18.65	0.03	0.01

Pos. 500 Dessin / Zeichnung / Drawing : 473841-CMA

Mesure/Pos. N° Mass/Pos. Nr. Measure/Pos Nr.	Matière Material Material	Article Artikel Article	Certificat FDA N° FDA Zertifikat Nr. FDA certificate No :
500	Novaflo	453220	42422

Pos.103-Grinding-473746

Pos. 1 **436255** Dessin / Zeichnung / Drawing : 473746-CMA

Mesure N° Mass Nr. Measure Nr.	Matière Material Material	%																					
		Al	Sb	Sn	Cd	Pd	Ag	Mo	Nb	Zr	Bi	Pb	Se	W	Zn	Cu	Ni	Co	Fe	Mn	Cr	V	Ti
1	316/316L	0.00	0.00	0.01	0.00	0.00	0.00	2.28	0.00	0.00	0.00	0.02	0.01	0.00	0.00	0.33	9.99	0.34	67.67	0.42	18.85	0.06	0.01

Pos.100 **436059** Dessin / Zeichnung / Drawing : 436059-CMA
 Pos. 500-502 Dessin / Zeichnung / Drawing : 436059-CMA

Mesure/Pos. N° Mass/Pos. Nr. Measure/Pos Nr.	Matière Material Material	Article Artikel Article	Certificat FDA N° FDA Zertifikat Nr. FDA certificate No :
500	EPDM	404664	165274
501	EPDM	435702	165274
501	Silicone	406205	56867

Pos. 101 **436242** Dessin / Zeichnung / Drawing : 29961

Mesure N° Mass Nr. Measure Nr.	Matière Material Material	%																					
		Al	Sb	Sn	Cd	Pd	Ag	Mo	Nb	Zr	Bi	Pb	Se	W	Zn	Cu	Ni	Co	Fe	Mn	Cr	V	Ti
1	316/316L	0.00	0.00	0.02	0.00	0.00	0.00	2.08	0.01	0.00	0.00	0.02	0.00	0.00	0.00	0.66	10.07	0.39	68.39	1.45	16.83	0.05	0.03
2	316/316L	0.00	0.00	0.02	0.00	0.00	0.00	2.02	0.01	0.00	0.01	0.02	0.00	0.11	0.01	0.36	10.33	0.28	68.96	1.29	16.50	0.07	0.01

Pos. 102 **435843** Dessin / Zeichnung / Drawing : 435843-CMA

Mesure N° Mass Nr. Measure Nr.	Matière Material Material	%																					
		Al	Sb	Sn	Cd	Pd	Ag	Mo	Nb	Zr	Bi	Pb	Se	W	Zn	Cu	Ni	Co	Fe	Mn	Cr	V	Ti
1	316/316L	0.00	0.00	0.02	0.01	0.00	0.00	2.07	0.02	0.01	0.00	0.03	0.00	0.00	0.00	0.37	10.51	0.14	67.90	1.62	17.11	0.13	0.08

Pos. 500 Dessin / Zeichnung / Drawing : 435843-CMA

Mesure/Pos. N° Mass/Pos. Nr. Measure/Pos Nr.	Matière Material Material	Article Artikel Article	Certificat FDA N° FDA Zertifikat Nr. FDA certificate No :
500	FEP-O-SEAL	419771	165314

Pos. 103		Dessin / Zeichnung / Drawing : 432459-CMA																					
Mesure N° Mass Nr. Measure Nr.	Matière Material Material	%																					
		Al	Sb	Sn	Cd	Pd	Ag	Mo	Nb	Zr	Bi	Pb	Se	W	Zn	Cu	Ni	Co	Fe	Mn	Cr	V	Ti
1	316/316L	0.00	0.00	0.01	0.01	0.00	0.00	2.19	0.00	0.01	0.00	0.01	0.01	0.03	0.00	0.66	11.48	0.06	68.67	0.89	16.86	0.11	0.02
2	316/316L	0.00	0.00	0.02	0.00	0.00	0.01	2.60	0.05	0.01	0.00	0.01	0.00	0.00	0.01	0.37	10.65	0.28	69.06	1.52	16.85	0.06	0.00
3	316/316L	0.00	0.01	0.00	0.00	0.00	0.00	2.24	0.05	0.00	0.00	0.04	0.00	0.05	0.00	0.70	10.47	0.26	67.79	1.76	16.49	0.12	0.03
4	316/316L	0.00	0.00	0.01	0.00	0.00	0.00	2.49	0.00	0.00	0.01	0.01	0.00	0.03	0.00	0.36	10.64	0.24	67.92	0.01	18.23	0.06	0.00

Pos. 100		Dessin / Zeichnung / Drawing : 435025-CMA																					
Mesure N° Mass Nr. Measure Nr.	Matière Material Material	%																					
		Al	Sb	Sn	Cd	Pd	Ag	Mo	Nb	Zr	Bi	Pb	Se	W	Zn	Cu	Ni	Co	Fe	Mn	Cr	V	Ti
1	316/316L	0.00	0.02	0.02	0.00	0.00	0.00	2.17	0.03	0.01	0.01	0.01	0.00	0.14	0.01	0.15	11.66	0.12	65.55	1.57	18.51	0.04	0.00

Pos. 500 Dessin / Zeichnung / Drawing : 435025-CMA

Mesure/Pos. N° Mass/Pos. Nr. Measure/Pos Nr.	Matière Material Material	Article Artikel Article	Certificat FDA N° FDA Zertifikat Nr. FDA certificate No :
500	Rulon	432410	148886

Pos. 500 Dessin / Zeichnung / Drawing : 432459-CMA

Mesure/Pos. N° Mass/Pos. Nr. Measure/Pos Nr.	Matière Material Material	Article Artikel Article	Certificat FDA N° FDA Zertifikat Nr. FDA certificate No :
500	Ecoflon	432412	28248

Pos. 104		Dessin / Zeichnung / Drawing : 436011-CMA																					
Mesure N° Mass Nr. Measure Nr.	Matière Material Material	%																					
		Al	Sb	Sn	Cd	Pd	Ag	Mo	Nb	Zr	Bi	Pb	Se	W	Zn	Cu	Ni	Co	Fe	Mn	Cr	V	Ti
1	316/316L	0.00	0.01	0.02	0.00	0.00	0.00	2.18	0.03	0.00	0.02	0.01	0.00	0.07	0.00	0.36	9.96	0.30	68.44	0.35	18.18	0.07	0.00
2	316/316L	0.00	0.00	0.01	0.00	0.00	0.00	2.21	0.01	0.00	0.00	0.03	0.00	0.04	0.00	0.40	10.97	0.20	69.04	1.86	16.83	0.15	0.01

Pos.104-Outlet-473713

Pos. 100		Dessin / Zeichnung / Drawing : 473711-CMA																					
Mesure N° Mass Nr. Measure Nr.	Matière Material Material	%																					
		Al	Sb	Sn	Cd	Pd	Ag	Mo	Nb	Zr	Bi	Pb	Se	W	Zn	Cu	Ni	Co	Fe	Mn	Cr	V	Ti
1	316/316L	0.00	0.02	0.02	0.00	0.00	0.00	2.24	0.02	0.00	0.02	0.00	0.00	0.04	0.03	0.46	10.34	0.36	68.54	1.04	16.79	0.08	0.00
2	316/316L	0.00	0.01	0.01	0.00	0.00	0.01	2.06	0.00	0.01	0.01	0.01	0.00	0.09	0.02	0.32	10.32	0.66	68.54	0.98	16.84	0.10	0.03
3	316/316L	0.00	0.00	0.02	0.00	0.00	0.00	2.02	0.01	0.00	0.00	0.01	0.01	0.03	0.01	0.45	10.33	0.18	68.02	1.75	17.07	0.06	0.01
4	316/316L	0.00	0.00	0.02	0.00	0.00	0.00	2.13	0.04	0.01	0.00	0.04	0.00	0.02	0.01	0.39	11.26	0.24	69.92	1.89	16.90	0.12	0.00
5	316Ti	0.00	0.00	0.02	0.00	0.01	0.00	2.04	0.01	0.01	0.01	0.01	0.00	0.04	0.01	0.33	10.67	0.52	68.24	1.01	16.68	0.09	0.32
6	316/316L	0.00	0.01	0.02	0.00	0.00	0.00	2.09	0.00	0.00	0.00	0.02	0.00	0.02	0.00	0.40	9.87	0.58	68.77	0.97	17.14	0.08	0.00
7	316/316L	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.01	0.01	0.00	0.00	0.07	0.01	0.31	9.98	0.67	68.66	1.16	17.01	0.09	0.00

Pos. 101		Dessin / Zeichnung / Drawing : 473712-CMA																					
Mesure N° Mass Nr. Measure Nr.	Matière Material Material	%																					
		Al	Sb	Sn	Cd	Pd	Ag	Mo	Nb	Zr	Bi	Pb	Se	W	Zn	Cu	Ni	Co	Fe	Mn	Cr	V	Ti
1	316/316L	0.00	0.00	0.02	0.00	0.00	0.00	2.11	0.03	0.01	0.02	0.01	0.00	0.08	0.00	0.44	10.20	0.20	68.21	1.65	16.96	0.06	0.00
2	316/316L	0.00	0.00	0.01	0.01	0.01	0.00	2.19	0.02	0.01	0.01	0.03	0.00	0.06	0.00	0.38	10.32	0.27	68.20	1.87	16.57	0.06	0.00
3	316/316L	0.00	0.00	0.01	0.00	0.00	0.00	2.25	0.03	0.01	0.01	0.01	0.00	0.00	0.00	0.22	10.38	0.46	69.85	0.79	16.89	0.09	0.02

Pos. 500 Dessin / Zeichnung / Drawing : 473713-CMA

Mesure/Pos. N° Mass/Pos. Nr. Measure/Pos Nr.	Matière Material Material	Article Artikel Article	Certificat FDA N° FDA Zertifikat Nr. FDA certificate No :
500	EPDM	437890	169108

POS.500 Dessin / Zeichnung / Drawing : 473599-CMA

Mesure/Pos. N° Mass/Pos. Nr. Measure/Pos Nr.	Matière Material Material	Article Artikel Article	Certificat FDA N° FDA Zertifikat Nr. FDA certificate No :
500	Novafion	457663	118884

Protocole établi par (visa)			le
Protokoll erstellt von (visa)	H.Rey		am
Report established by (visa)			on
			30.04.2014

* Tetratex® ePTFE-Membran Polyester Nadelfilz antistatisch

Voir documents suivants.

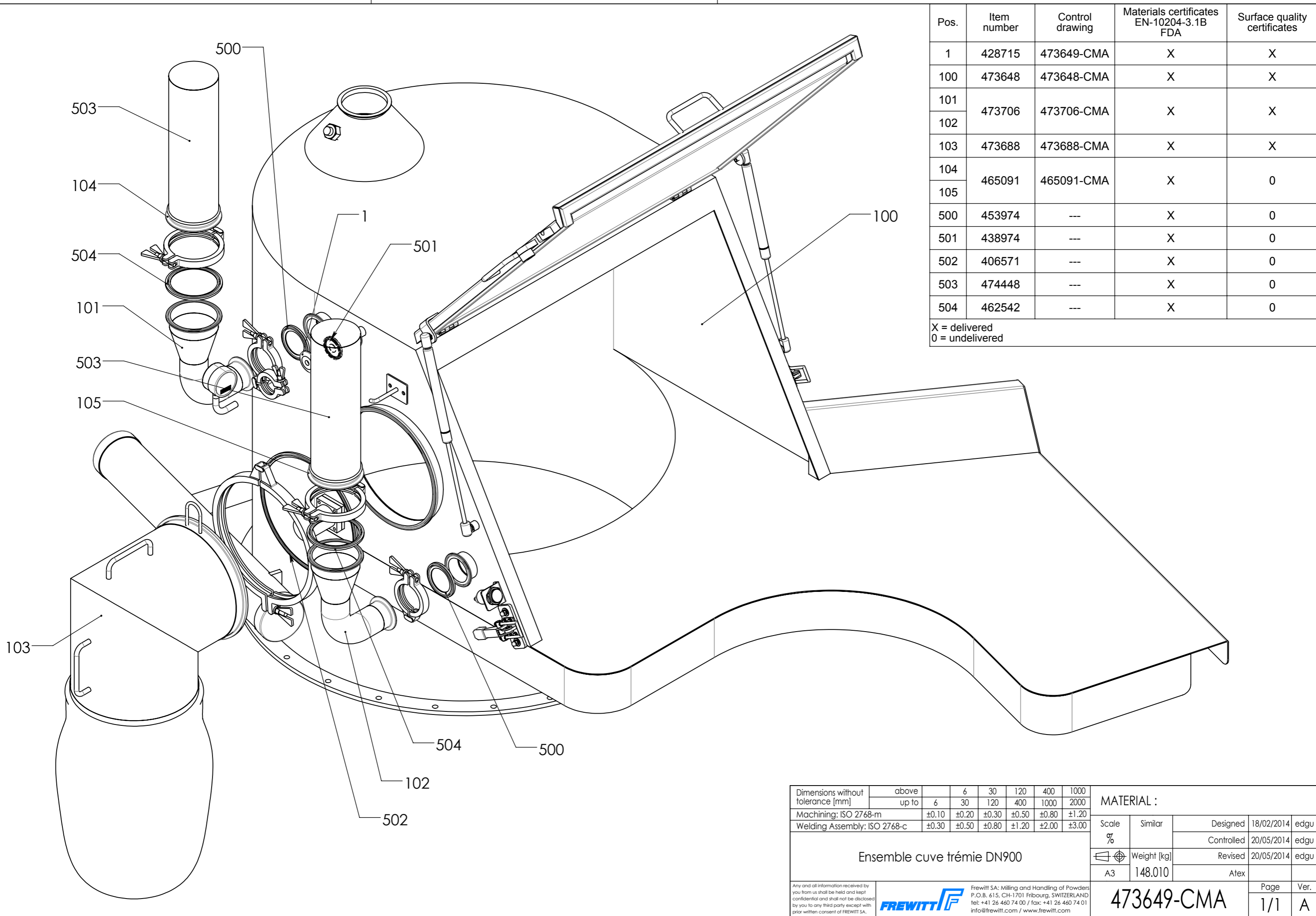
Siehe folgende Dokumente.

See following documents

Voir documents suivants.

Siehe folgende Dokumente.

See following documents



Pos.	Item number	Control drawing	Materials certificates EN-10204-3.1B FDA	Surface quality certificates
1	428715	473649-CMA	X	X
100	473648	473648-CMA	X	X
101	473706	473706-CMA	X	X
102				
103	473688	473688-CMA	X	X
104	465091	465091-CMA	X	0
105				
500	453974	---	X	0
501	438974	---	X	0
502	406571	---	X	0
503	474448	---	X	0
504	462542	---	X	0

X = delivered
0 = undelivered

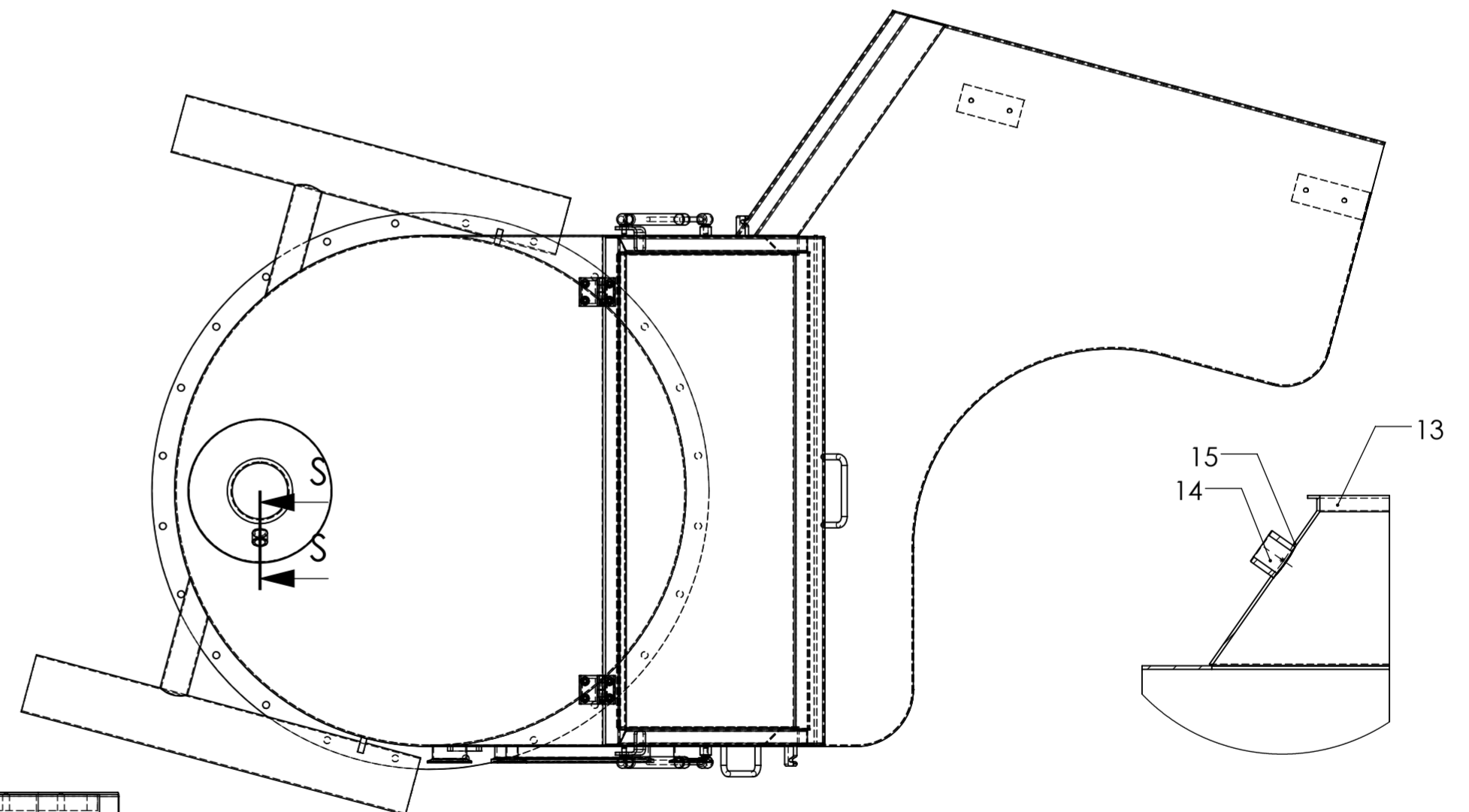
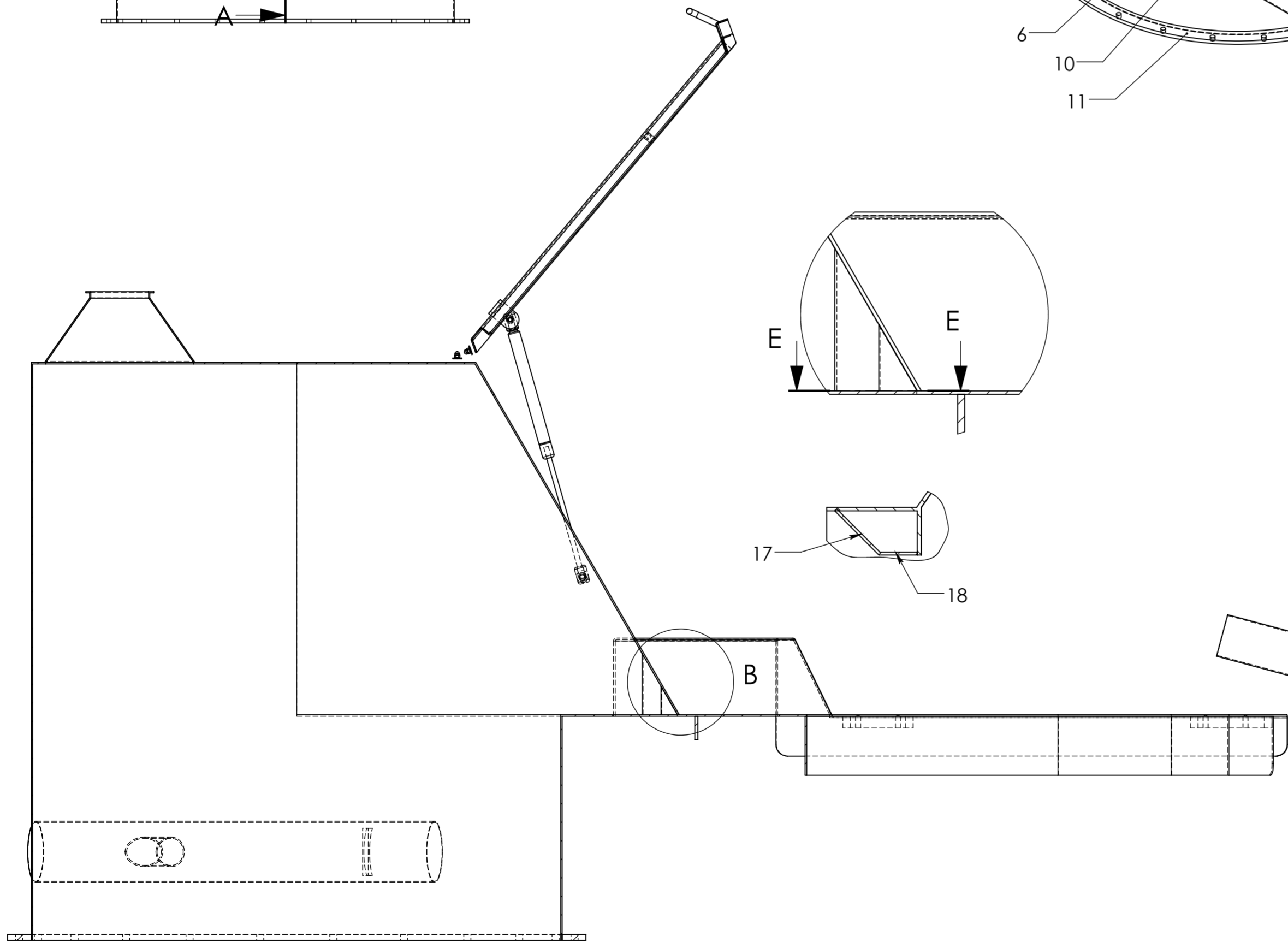
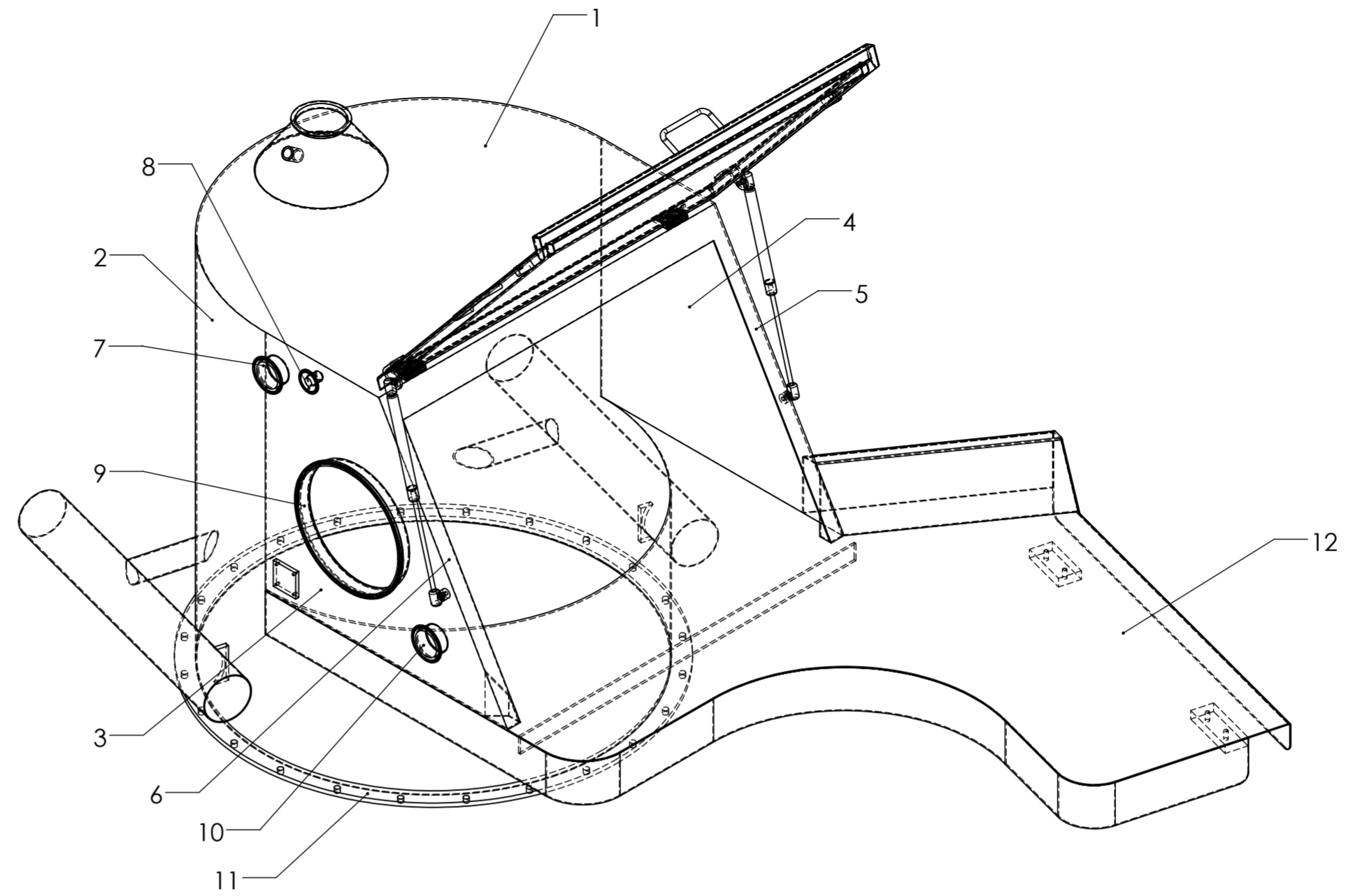
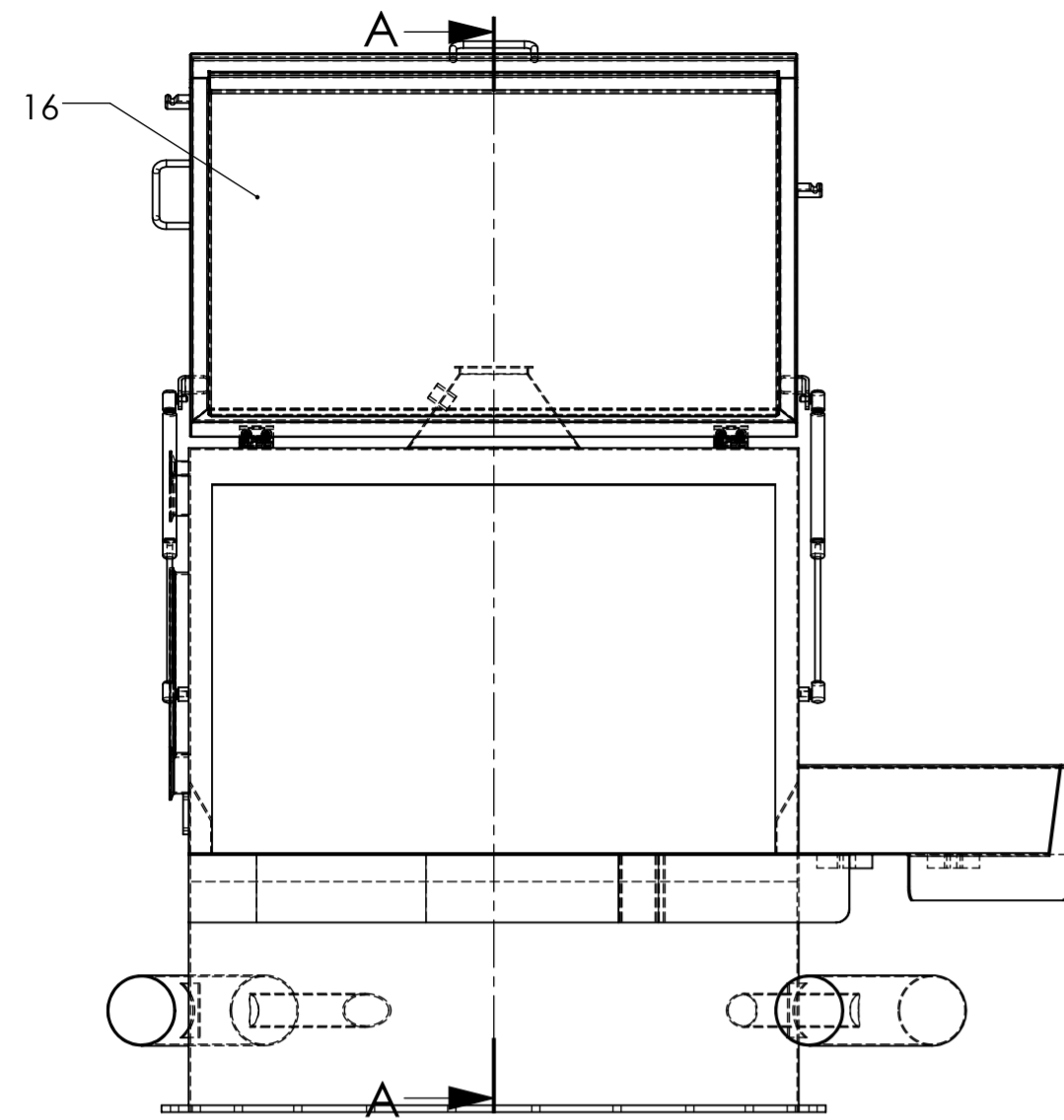
Dimensions without tolerance [mm]	above						
	up to	6	30	120	400	1000	2000
Machining: ISO 2768-m	±0.10	±0.20	±0.30	±0.50	±0.80	±1.20	
Welding Assembly: ISO 2768-c	±0.30	±0.50	±0.80	±1.20	±2.00	±3.00	

MATERIAL :				
Scale	Similar	Designed	18/02/2014	edgu
%		Controlled	20/05/2014	edgu
Weight [kg]	A3	Revised	20/05/2014	edgu
		Atex		
Ensemble cuve trémie DN900			Page	Ver.
			1/1	A

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tel: +41 26 460 74 00 / fax: +41 26 460 74 01
info@frewitt.com / www.frewitt.com

473649-CMA



Dimensions without tolerance [mm]	above up to	6	6	30	120	400	1000
Machining: ISO 2768-m		±0.10	±0.20	±0.30	±0.50	±0.80	±1.20
Welding Assembly: ISO 2768-c		±0.30	±0.50	±0.80	±1.20	±2.00	±3.00

MATERIAL : 316L			
Scale	Similar	Designed	11/02/2014
%		Controlled	26/02/2014
Weight [kg]		Revised	26/02/2014
A2	125.814	Atex	

Cuve trémie DN900

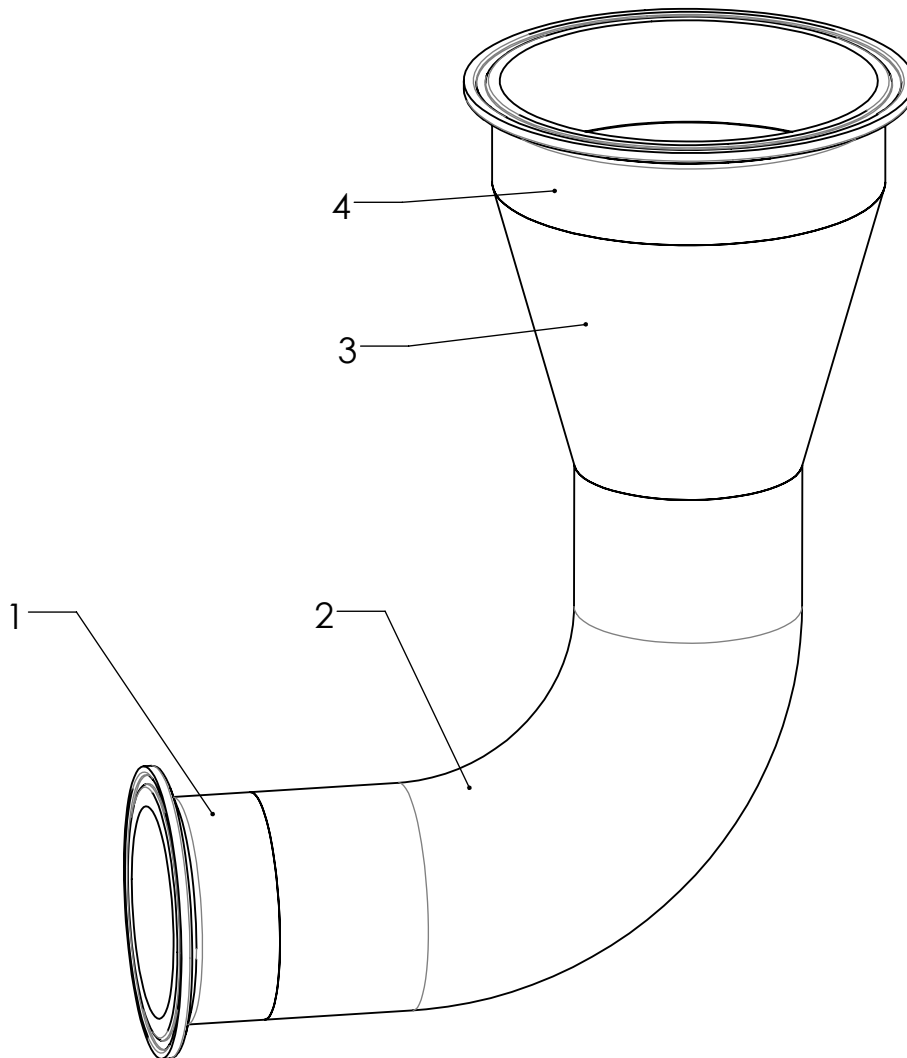
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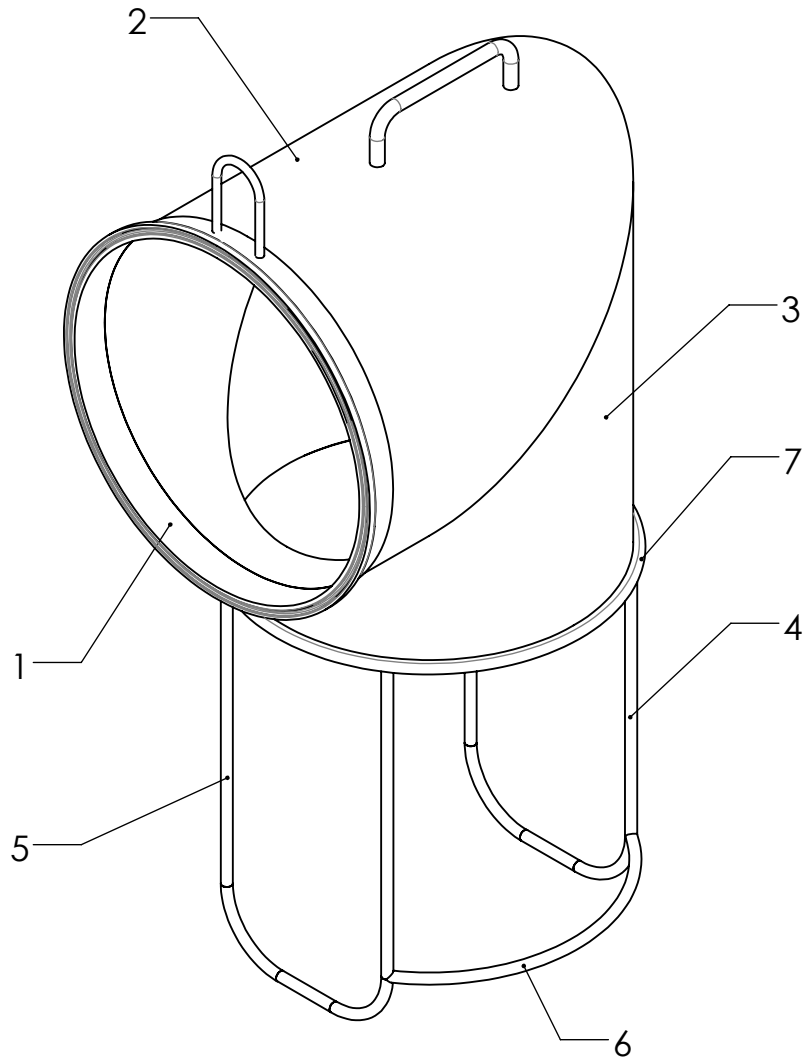
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473648-CMA

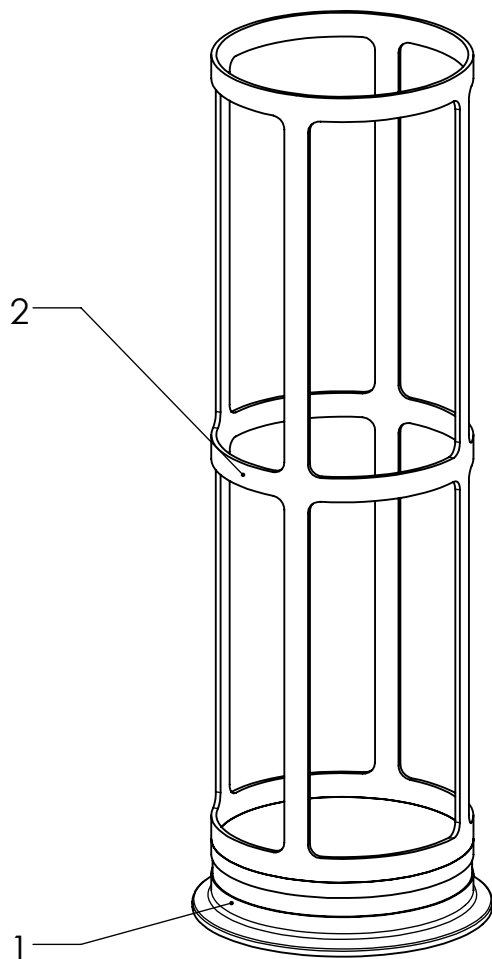
Page 1/1
Ver. A




Dimensions without tolerance [mm]	above		6	30	120	400	1000	MATERIAL : N/A				
	up to	6	30	120	400	1000	2000		Scale	Similar	Designed	04/02/2014
Machining: ISO 2768-m		±0.10	±0.20	±0.30	±0.50	±0.80	±1.20	Weight [kg]		Controlled	18/02/2014	edgu
Welding Assembly: ISO 2768-c		±0.30	±0.50	±0.80	±1.20	±2.00	±3.00		A4	N/A	Revised	18/02/2014
Coude 90°												
											Atex	
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										1/1	A	



Dimensions without tolerance [mm]	above		6	30	120	400	1000	MATERIAL : 316/316L				
	up to	6	30	120	400	1000	2000					
Machining: ISO 2768-m		±0.10	±0.20	±0.30	±0.50	±0.80	±1.20	Scale	Similar	Designed	03/02/2014	edgu
Welding Assembly: ISO 2768-c		±0.30	±0.50	±0.80	±1.20	±2.00	±3.00	%		Controlled	18/02/2014	edgu
Tube pour sache								Weight [kg]	Revised	18/02/2014	edgu	
									A4	6.98	Atex	
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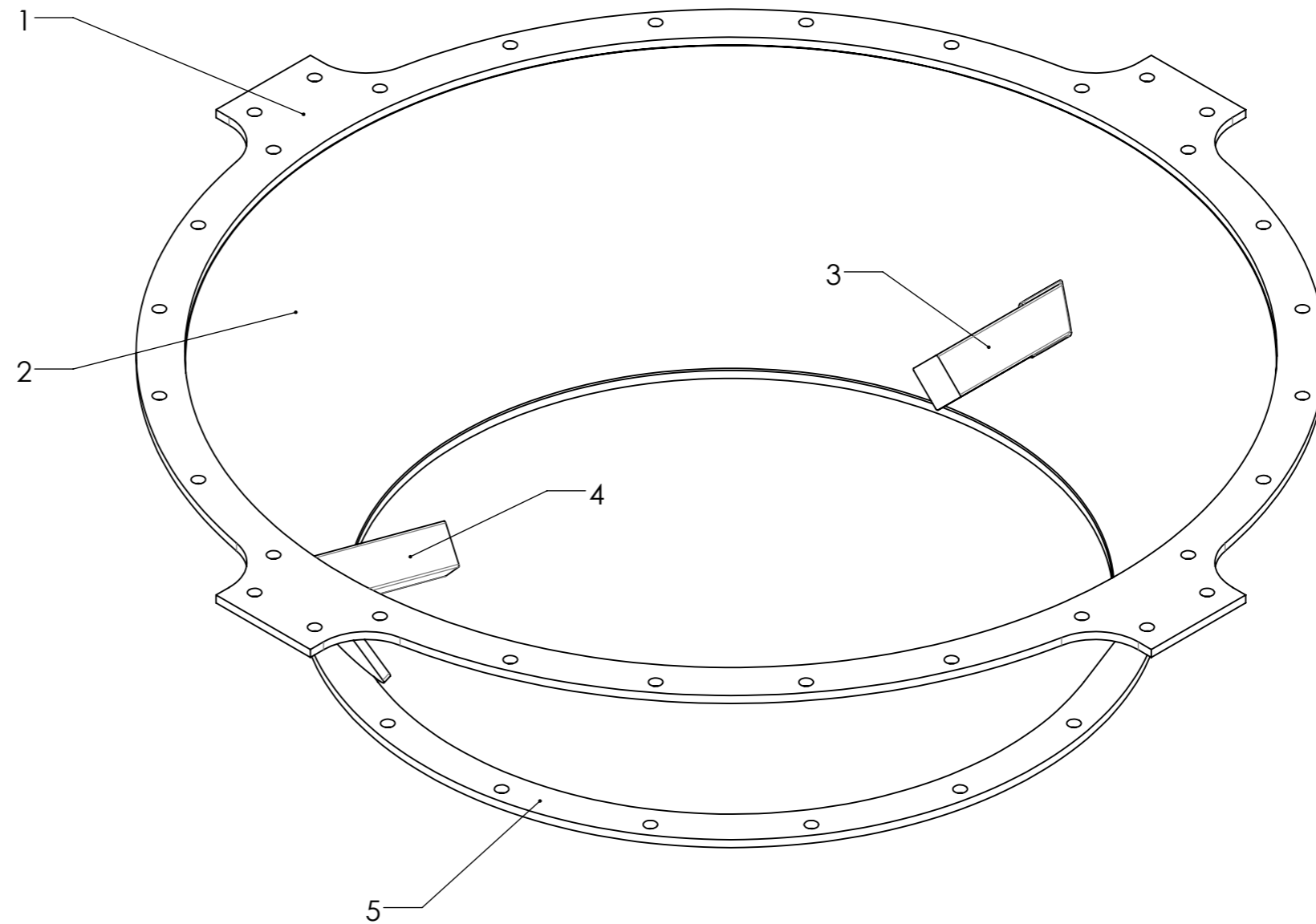



Dimensions without tolerance [mm]	above		6	30	120	400	1000	MATERIAL : 316/316L				
	up to	6	30	120	400	1000	2000					
Machining: ISO 2768-m		±0.10	±0.20	±0.30	±0.50	±0.80	±1.20	Scale	Similar	Designed	19/07/2011	thle
Welding Assembly: ISO 2768-c		±0.30	±0.50	±0.80	±1.20	±2.00	±3.00	%		Controlled	19/07/2011	thle
Cartouche pour filtre								⊕	Weight [kg]	Revised	19/07/2011	thle
								A4	N/A	Atex		
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										1/1	A	

Voir documents suivants.

Siehe folgende Dokumente.

See following documents

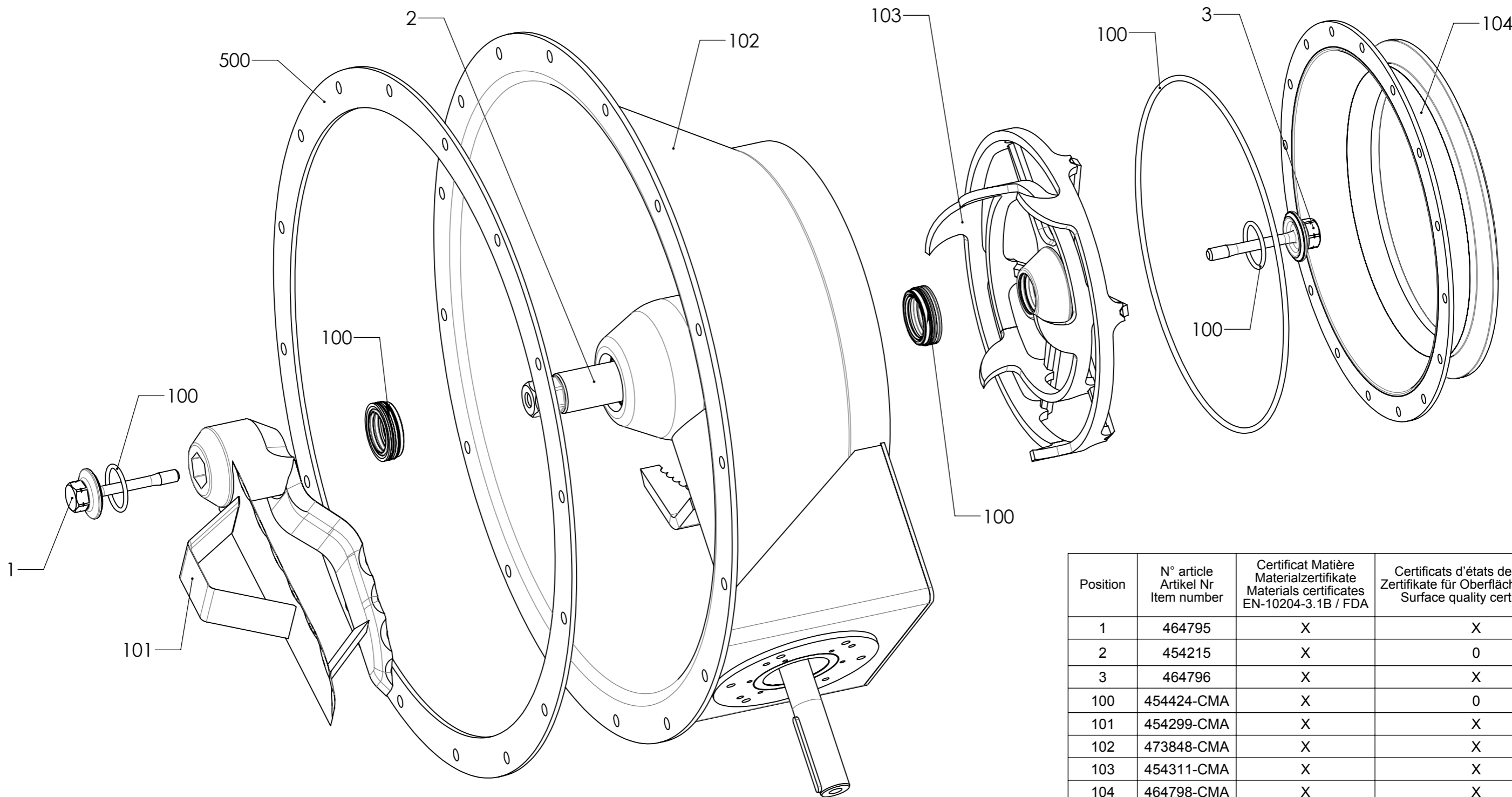


Dimensions without tolerance [mm]	above	6	30	120	400	1000	MATERIAL : -				
	up to	6	30	120	400	1000	Scale	Similar	Designed	17/02/2014	edgu
Machining: ISO 2768-m		±0.10	±0.20	±0.30	±0.50	±0.80	%		Controlled	18/02/2014	edgu
Welding Assembly: ISO 2768-c		±0.30	±0.50	±0.80	±1.20	±2.00	⊕	Weight [kg]	Revised	18/02/2014	edgu
Trémie de concassage							A3	35.595	Atex		
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										1/1	A

Voir documents suivants.

Siehe folgende Dokumente.

See following documents



Position	N° article Artikel Nr Item number	Certificat Matière Materialzertifikate Materials certificates EN-10204-3.1B / FDA	Certificats d'états de surface Zertifikate für Oberflächenqualität Surface quality certificates
1	464795	X	X
2	454215	X	0
3	464796	X	X
100	454424-CMA	X	0
101	454299-CMA	X	X
102	473848-CMA	X	X
103	454311-CMA	X	X
104	464798-CMA	X	X
500	453220	X	0

X = livré / geliefert / delivered
0 = non livré / ungeliefert / undelivered

Dimensions without tolerance [mm]	above	6	6	30	120	400	1000
	up to	6	30	120	400	1000	2000
Machining: ISO 2768-m		±0.10	±0.20	±0.30	±0.50	±0.80	±1.20
Welding Assembly: ISO 2768-c		±0.30	±0.50	±0.80	±1.20	±2.00	±3.00

MATERIAL :

Scale	Similar	Designed	18/02/2014	edgu
%		Controlled	19/05/2014	edgu
Weight [kg]	A3	Revised	19/05/2014	edgu
		Atex		

PRO-14-0012 / Profi-Sword

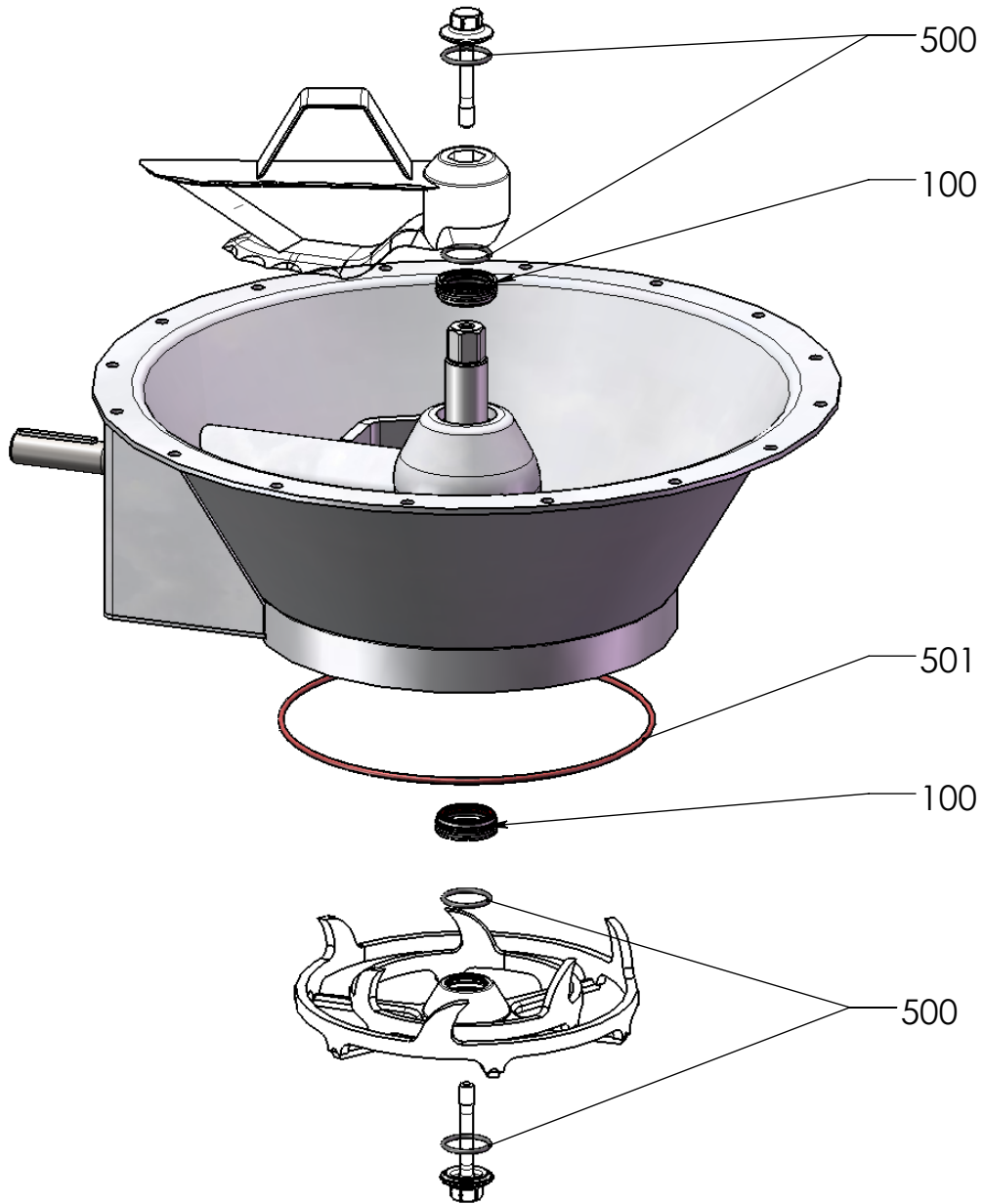
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tel: +41 26 460 74 00 / fax: +41 26 460 74 01
info@frewitt.com / www.frewitt.com

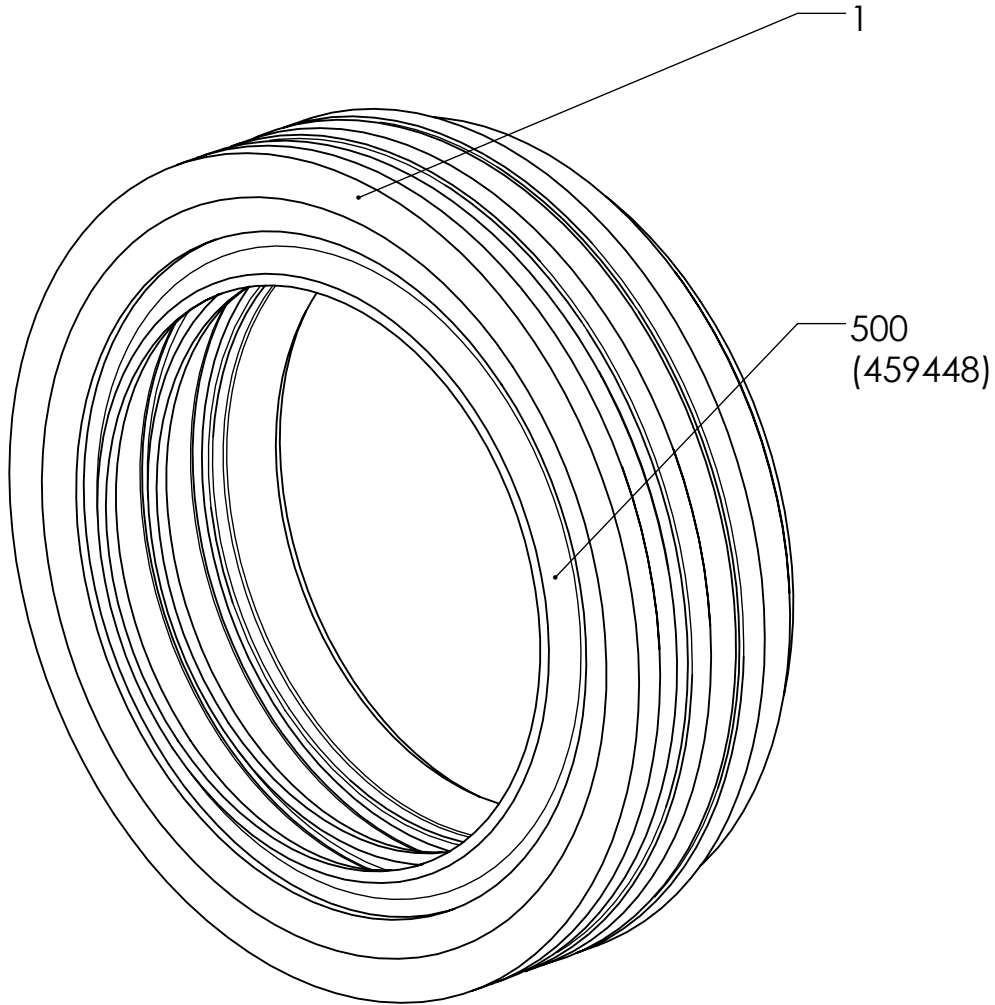
473841-CMA


Page 1/1
Ver. B

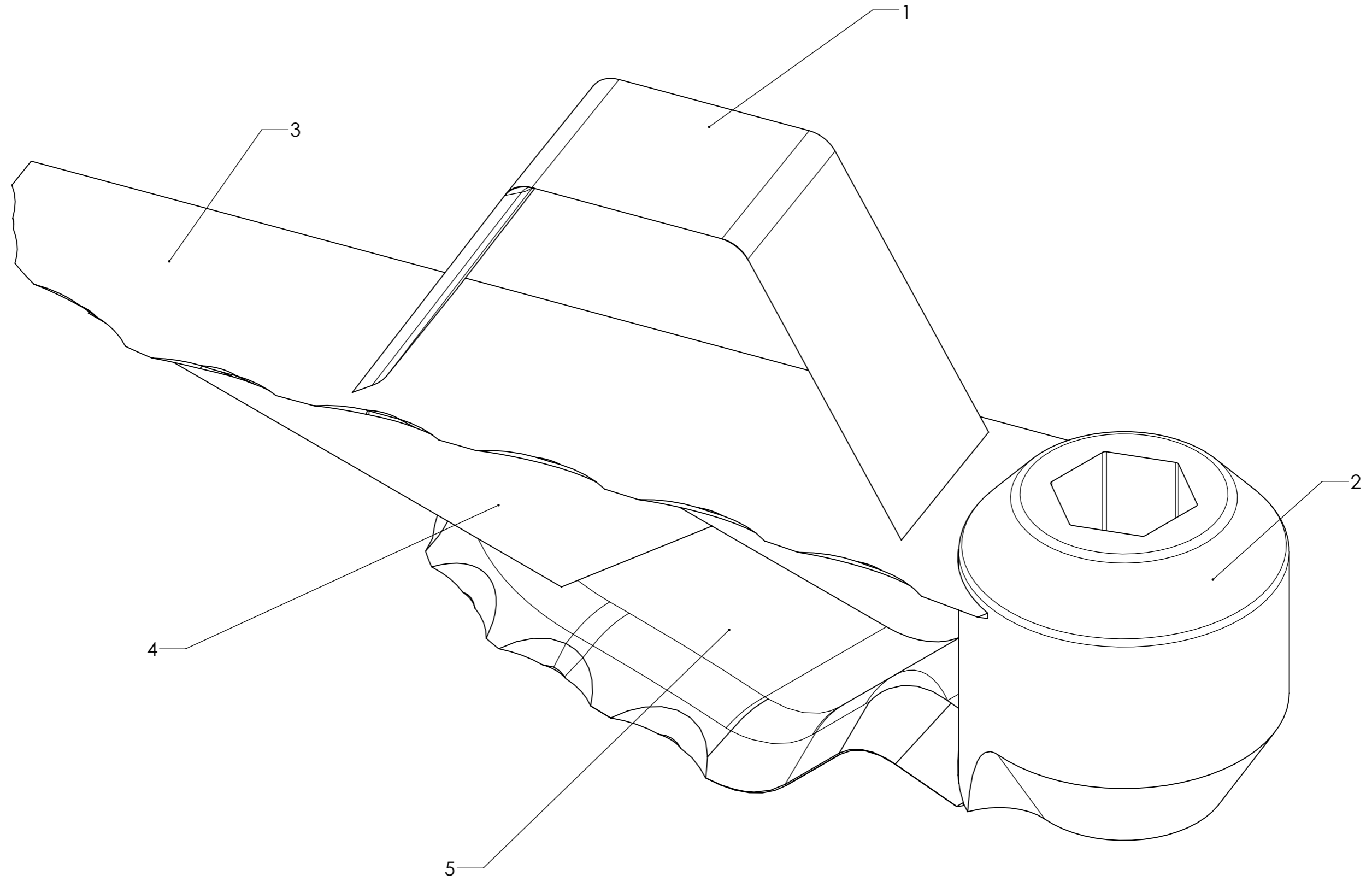


Position	N° article Artikel Nr Item number
100	459448-CMA
500	454357
501	431768

Dimensions without tolerance [mm]	above	6	30	120	400	1000	MATERIAL : Matériau <non spécifié>								
	up to	6	30	120	400	1000					2000				
Machining: ISO 2768-m		±0.10	±0.20	±0.30	±0.50	±0.80	±1.20	Scale	Similar	Designed	06/05/2010	jbe			
Welding Assembly: ISO 2768-c		±0.30	±0.50	±0.80	±1.20	±2.00	±3.00	%		Controlled	06/06/2011	wwi			
Etanchéité									Weight [kg]	Revised	06/06/2011	wwi			
										A4	59.99	Atex			
Any and all information received by you from us shall be held and kept confidential and shall not be disclosed by you to any third party except with prior written consent of FREWITT SA.										Frewitt SA: Milling and Handling of Powders P.O.B. 615, CH-1701 Fribourg, SWITZERLAND Tel: +41 26 460 74 00 / fax: +41 26 460 74 01 info@frewitt.com / www.frewitt.com		454424-CMA		Page	Ver.
										1/1		B			



Dimensions without tolerance [mm]	above		6	30	120	400	1000	MATERIAL :	Scale	Similar	Designed	25/08/2010	jbe
	up to	6	30	120	400	1000	2000						
Machining: ISO 2768-m		±0.10	±0.20	±0.30	±0.50	±0.80	±1.20				Controlled	10/05/2011	jbe
Welding Assembly: ISO 2768-c		±0.30	±0.50	±0.80	±1.20	±2.00	±3.00				Revised	10/05/2011	jbe
Joint à 2 lèvres PS								⊕	Weight [kg]		Atex		
								A4	0.000000				
Any and all information received by you from us shall be held and kept confidential and shall not be disclosed by you to any third party except with prior written consent of FREWITT SA.				Frewitt SA; Milling and Handling of Powders P.O.B. 615, CH-1701 Fribourg, SWITZERLAND Tel: +41 26 460 74 00 / fax: +41 26 460 74 01 info@frewitt.com / www.frewitt.com				459448-CMA		Page	Ver.		
										1/1	A		



Dimensions without tolerance [mm]	above						
	up to	6	30	120	400	1000	2000
Machining: ISO 2768-m		±0.10	±0.20	±0.30	±0.50	±0.80	±1.20
Welding Assembly: ISO 2768-c		±0.30	±0.50	±0.80	±1.20	±2.00	±3.00

MATERIAL :				
Scale	Similar	Designed	11/12/2009	ygr
%		Controlled	11/12/2009	ygr
Weight [kg]		Revised	11/12/2009	ygr
		Atex		

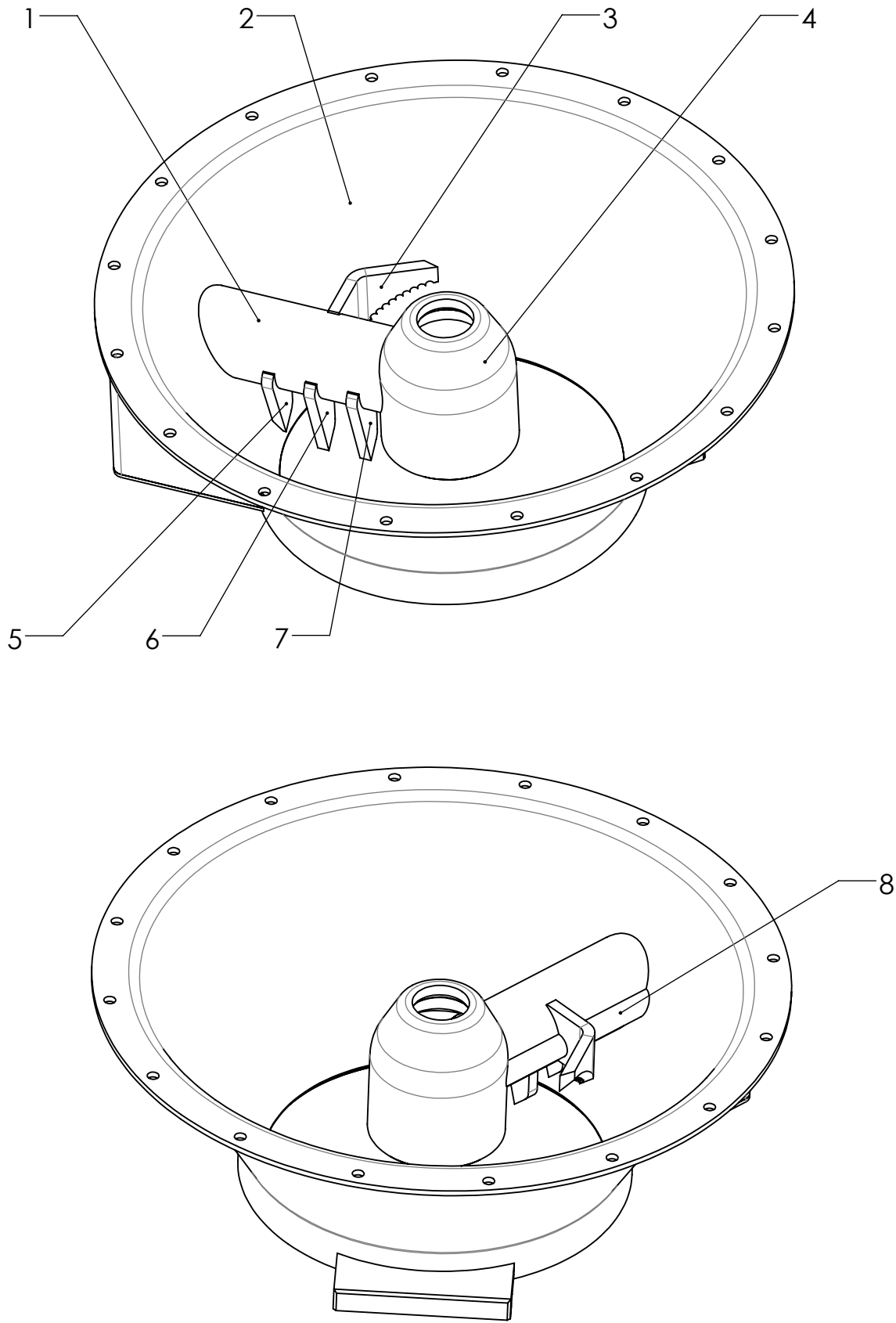
Couteau supérieur

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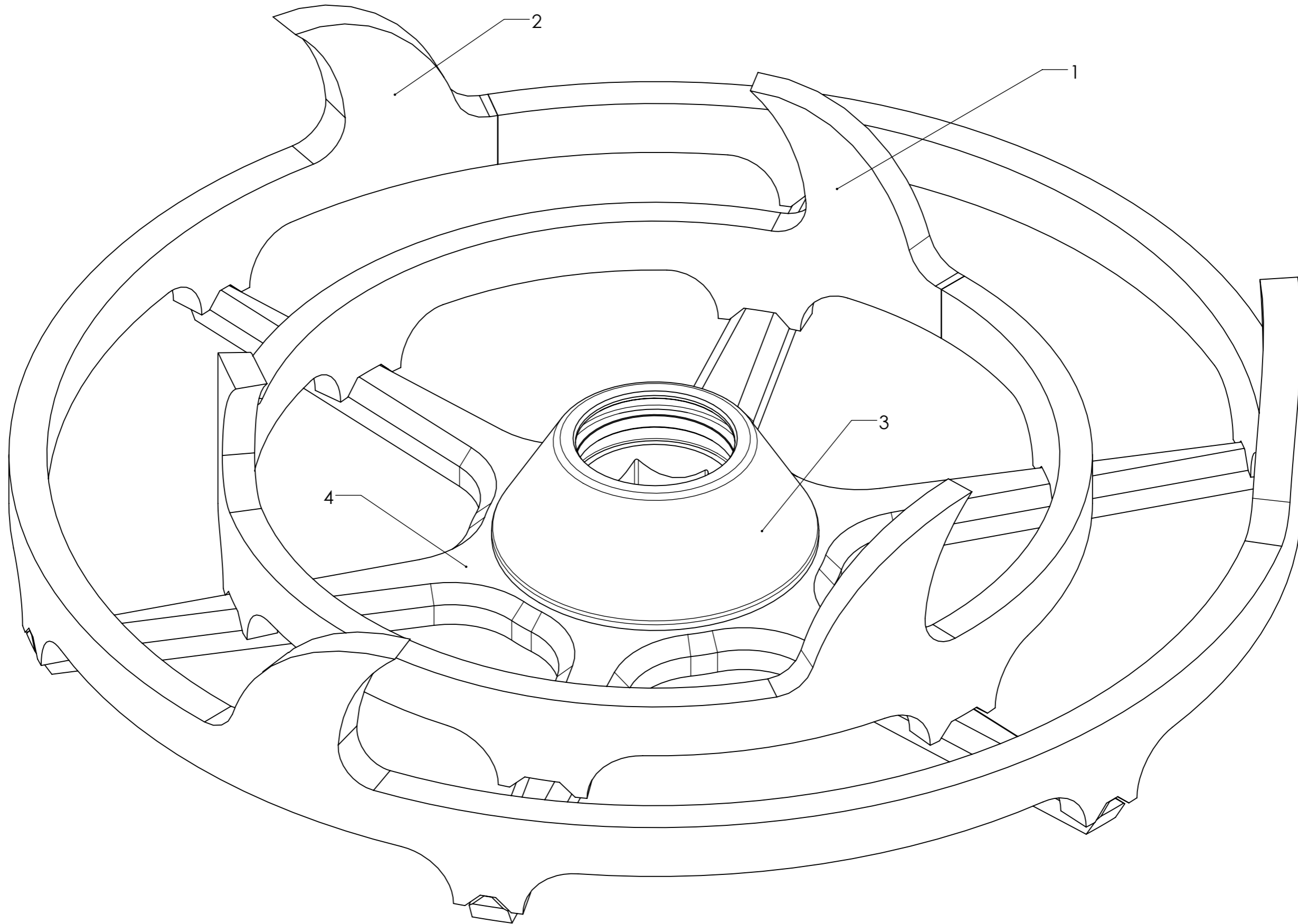
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454299-CMA

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1/1	A



Dimensions without tolerance [mm]	above up to	6	30	120	400	1000	MATERIAL : Matériau <non spécifié>					
Machining: ISO 2768-m		±0.10	±0.20	±0.30	±0.50	±0.80	±1.20	Scale %	Similar	Designed	18/02/2014	edgu
Welding Assembly: ISO 2768-c		±0.30	±0.50	±0.80	±1.20	±2.00	±3.00			Controlled	18/02/2014	edgu
Bâti usiné									Weight [kg]	Revised	18/02/2014	edgu
									A4	34.907	Atex	
Any and all information received by you from us shall be held and kept confidential and shall not be disclosed by you to any third party except with prior written consent of FREWITT SA.				Frewitt SA; Milling and Handling of Powders P.O.B. 615, CH-1701 Fribourg, SWITZERLAND Tel: +41 26 460 74 00 / fax: +41 26 460 74 01 info@frewitt.com / www.frewitt.com				473848-CMA		Page	Ver.	
										1/1	A	



Dimensions without tolerance [mm]	above	6	30	120	400	1000	
	up to	6	30	120	400	1000	
Machining: ISO 2768-m		±0.10	±0.20	±0.30	±0.50	±0.80	±1.20
Welding Assembly: ISO 2768-c		±0.30	±0.50	±0.80	±1.20	±2.00	±3.00

MATERIAL :					
Scale	Similar	Designed	11/12/2009	ygr	
%		Controlled	11/12/2009	ygr	
Weight [kg]	A3	Revised	11/12/2009	ygr	
		Atex			

Couteau intermédiaire

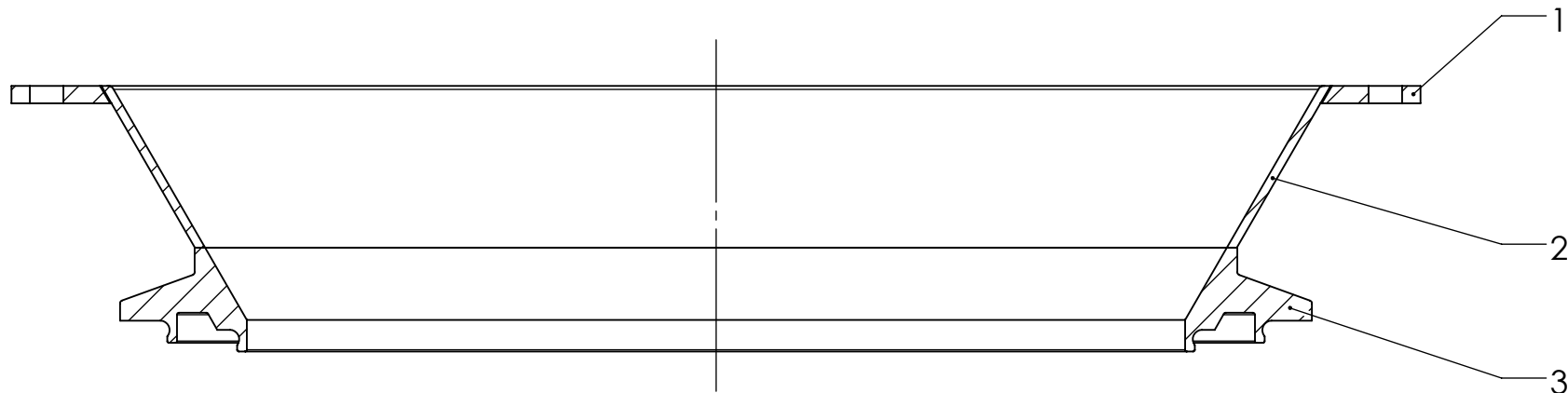
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Dimensions without tolerance [mm]	above		6	30	120	400	1000
	up to	6	30	120	400	1000	2000
Machining: ISO 2768-m		±0.10	±0.20	±0.30	±0.50	±0.80	±1.20
Welding Assembly: ISO 2768-c		±0.30	±0.50	±0.80	±1.20	±2.00	±3.00

MATERIAL : 316L

Bride de liaison Ra 0.4

Scale %	Similar	Designed	05/05/2011	thle
		Controlled	05/05/2011	thle
A4	Weight [kg] N/A	Revised	05/05/2011	thle
		Atex		

Any and all information received by you from us shall be held and kept confidential and shall not be disclosed by you to any third party except with prior written consent of FREWITT SA.



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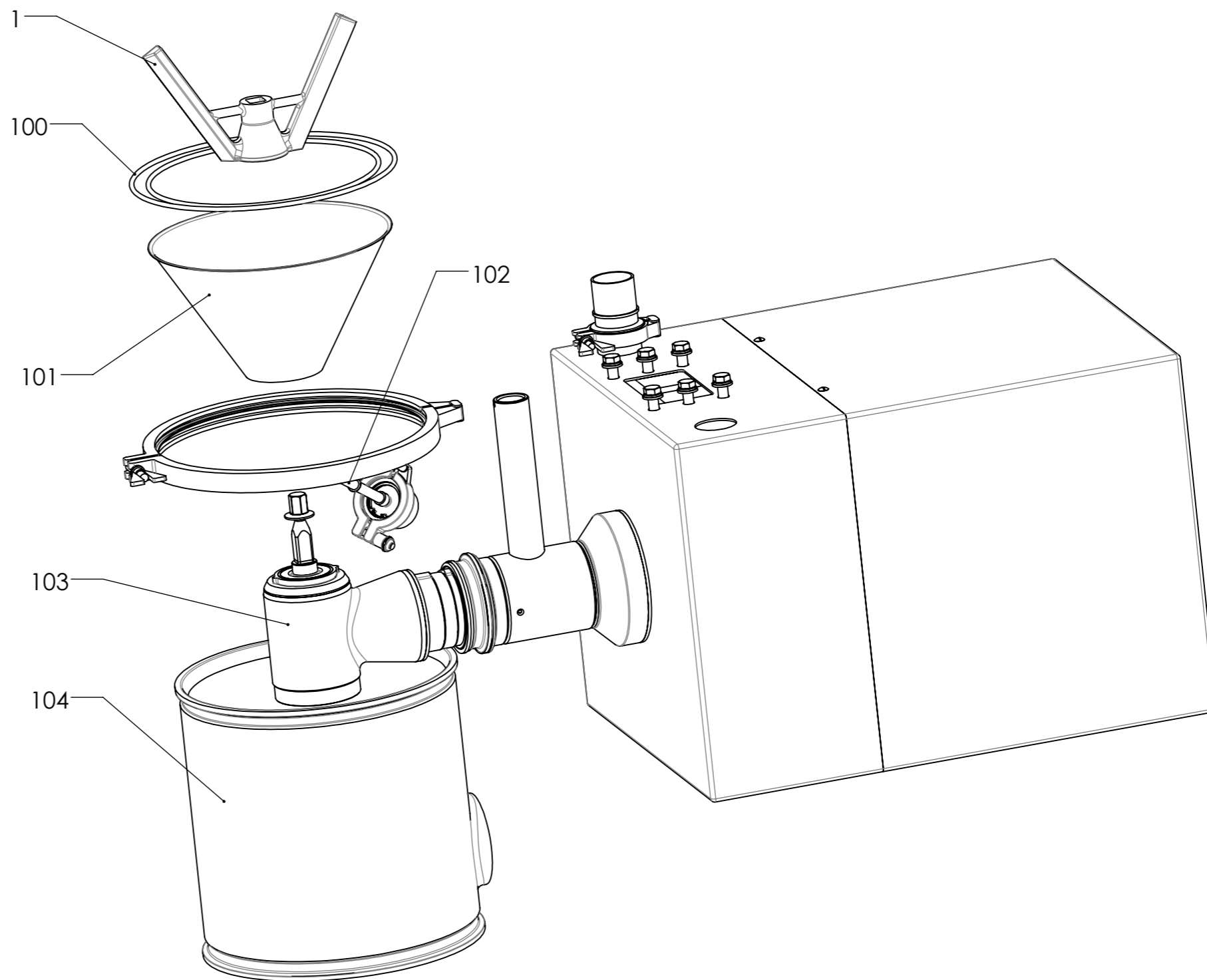
464798-CMA

Page	Ver.
1/1	A

Voir documents suivants.

Siehe folgende Dokumente.

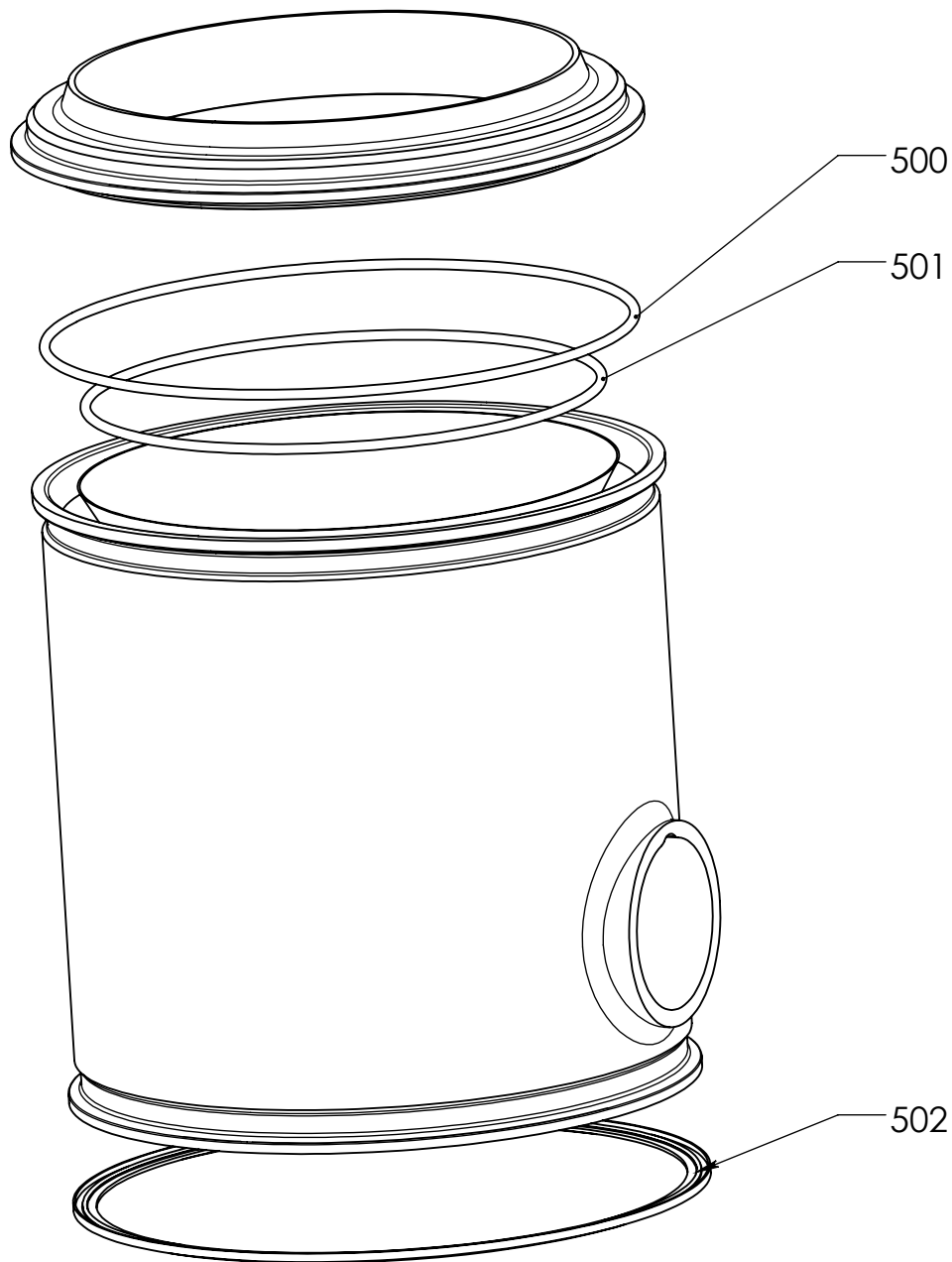
See following documents



Pos.	Item number	Control drawing	Materials certificates EN-10204-3.1B FDA	Surface quality certificates
1	436255	473746-CMA	X	X
100	436059	436059-CMA	X	0
101	436242	29961	X	0
102	435843	435843-CMA	X	X
103	432459	432459-CMA	X	X
104	436011	436011-CMA	X	X

X = delivered
0 = undelivered

ATEX category		II 1GD / II3D		Machined dim.		ISO 2768-m	
Voltage [V]		Power [kW]		Welded dim.		ISO 2768-c	
Frequency [Hz]		Speed [min-1]		Designed		18/02/2014	edgu
PRO-14-0012 / ConiWitt-250				Controlled		30/04/2014	edgu
				Revised		30/04/2014	edgu
<small>Any and all information received by you from us shall be held and kept confidential and shall not be disclosed by you to any third party except with prior written consent of FREWITT SA.</small>				<small>Frewitt SA: Milling and Handling of Powders P.O.B. 615, CH-1701 Fribourg, SWITZERLAND tel: +41 26 460 74 00 / fax: +41 26 460 74 01 info@frewitt.com / www.frewitt.com</small>		473746-CMA Page 1/1 Ver. A	



Position	Item number
500	404664
501	435702
502	406205

Dimensions without tolerance [mm]	above		6	30	120	400	1000
	up to	6	30	120	400	1000	2000
Machining: ISO 2768-m		±0.10	±0.20	±0.30	±0.50	±0.80	±1.20
Welding Assembly: ISO 2768-c		±0.30	±0.50	±0.80	±1.20	±2.00	±3.00

MATERIAL : Matériau <non spécifié>

Etanchéité EPDM-silicone	Scale	Similar	Designed	17/02/2010	wwi
	%		Controlled	23/08/2012	jbe
	⊕	Weight [kg]	Revised	23/08/2012	jbe
A4	0.10	Atex			

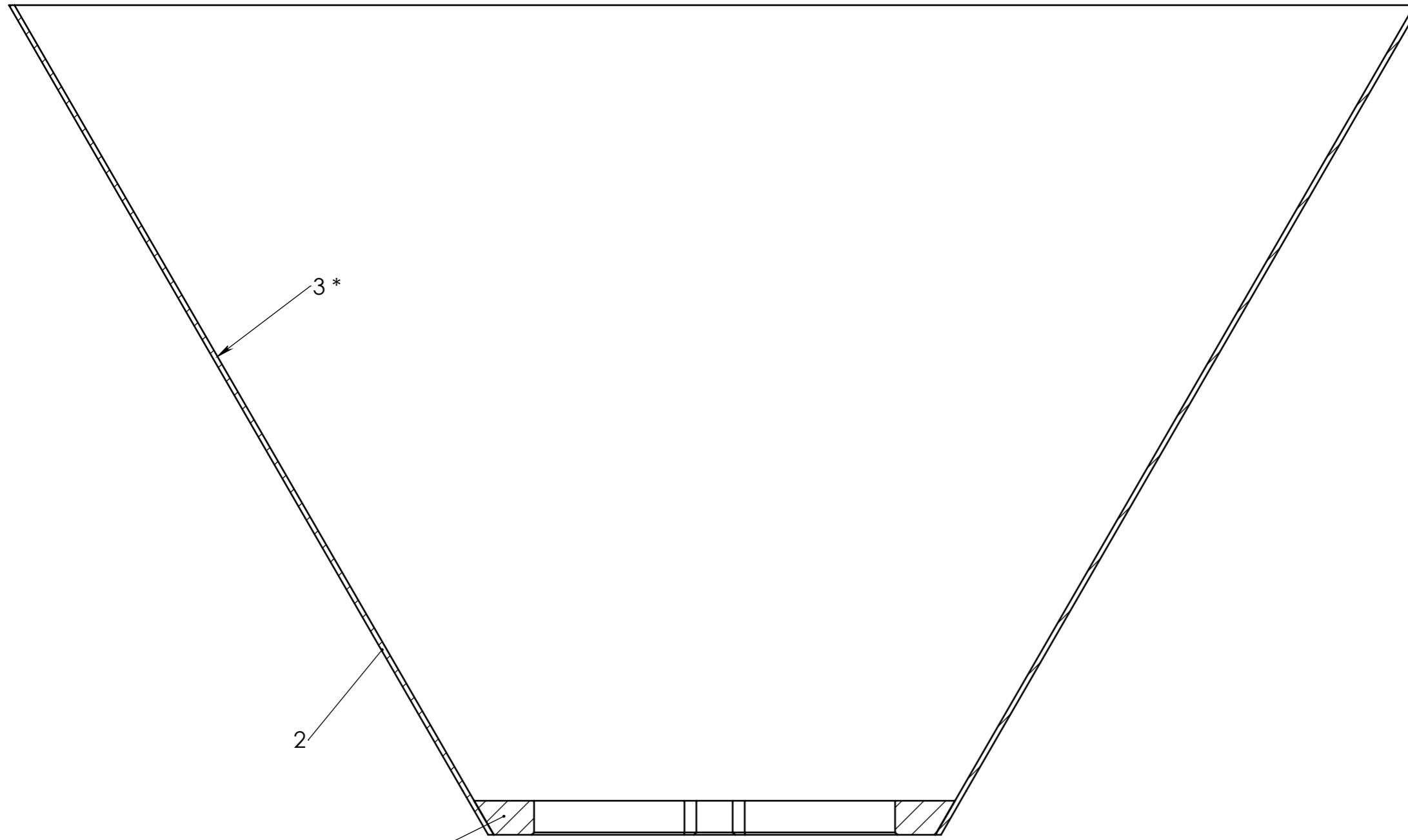
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436059-CMA

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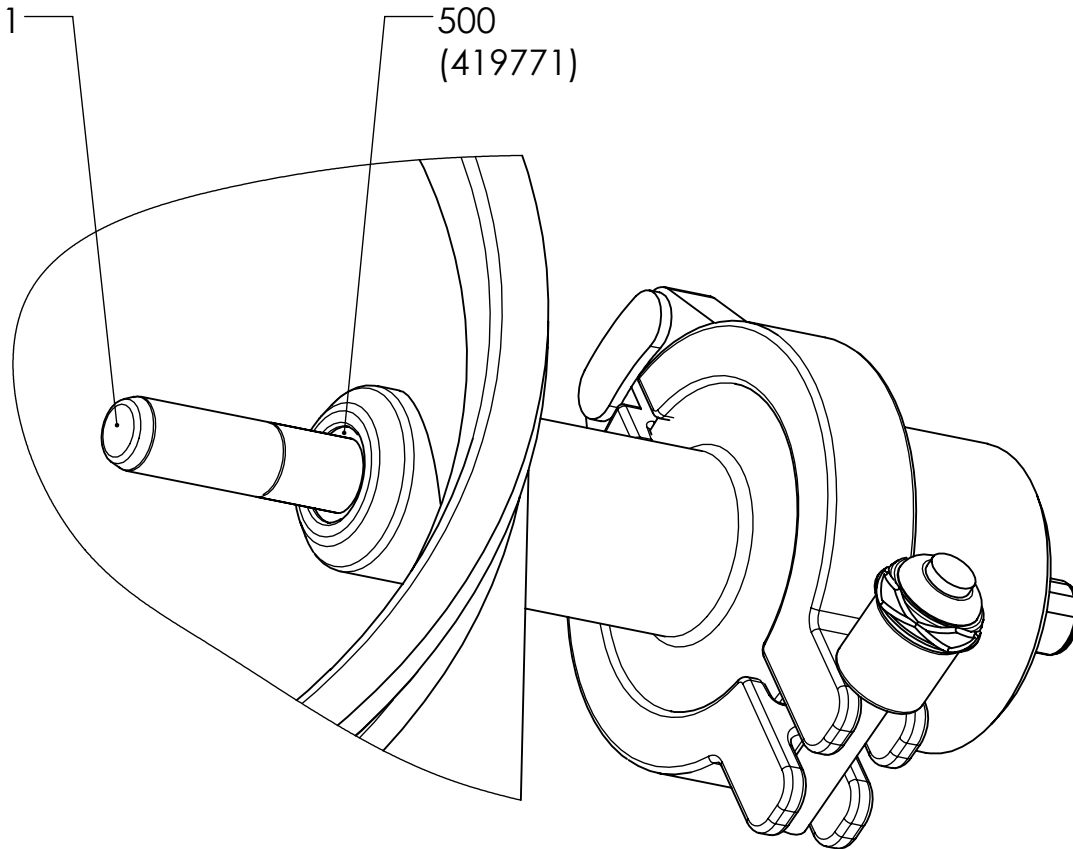
3 *

2

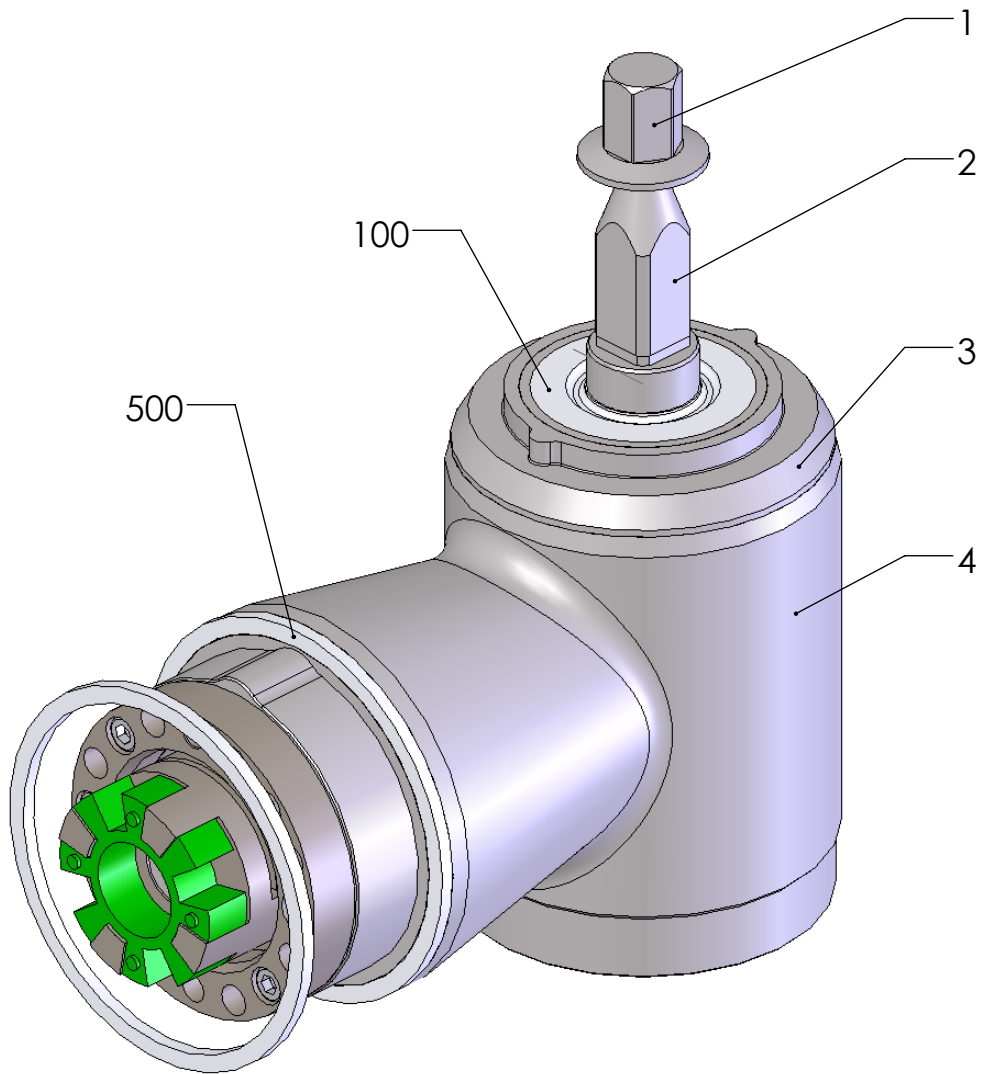
1

* seulement si treillis soudé à l'intérieur
 * only if wire mesh is welded inside

Pour dimensions sans tolérance	au-dessus de		6	30	120	400	1000	MATIERE :				
	jusqu'à	6	30	120	400	1000	2000					
Tolérance générale usinage [mm]		±0.10	±0.20	±0.30	±0.50	±0.80	±1.20	Echelle	Similaire	Dessiné	04.01.07	dma
Tolérance générale brut [mm]		±0.30	±0.50	±0.80	±1.20	±2.00	±3.00	%		Contrôlé	04.01.07	dma
Tamis / Râpe Ligne ConiWitt								⊕	Masse [kg]	Atex		-
								A3	1.088	Révisé	18.08.08	jbe
<small>This document may neither be reproduced nor be communicated to a third party without our written permission.</small>  Frewitt SA: Milling and Handling of Powders P.O.B. 615, CH-1701 Fribourg, SWITZERLAND tel: +41 26 460 74 00 / fax: +41 26 460 74 01 info@frewitt.com / www.frewitt.com								29961		Page	Rev.	
										1/1	1	



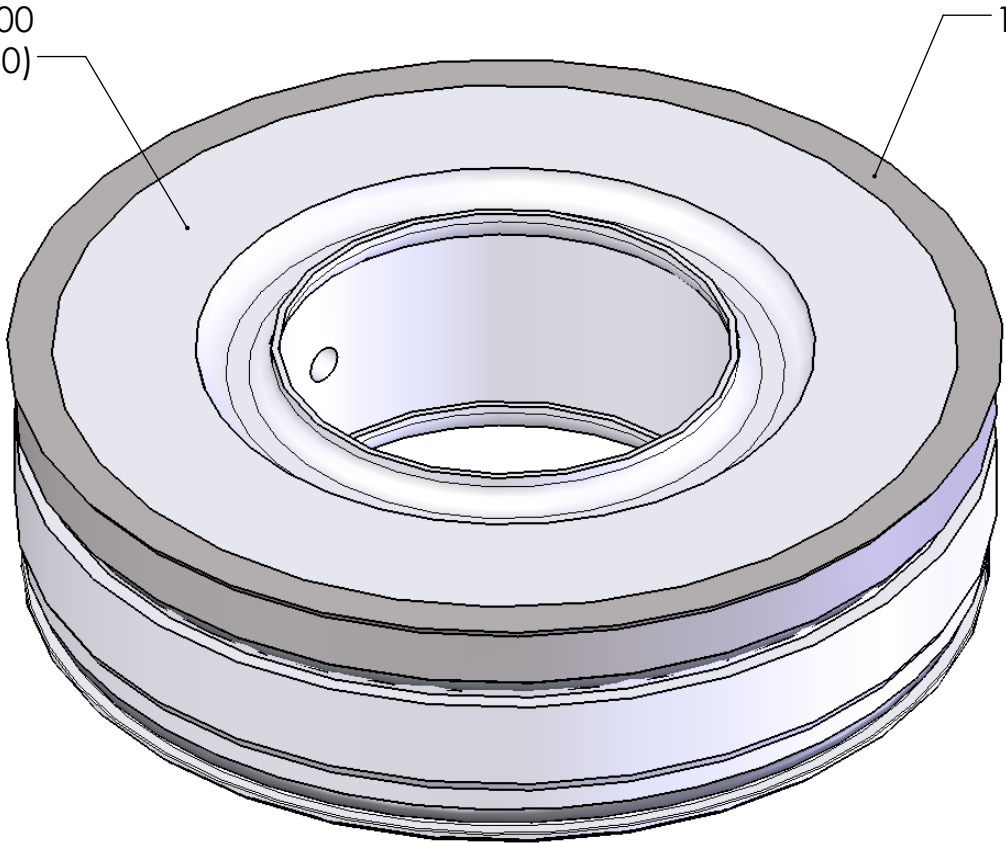
Dimensions without tolerance [mm]	above up to	6	30	120	400	1000	MATERIAL : Matériau <non spécifié>							
Machining: ISO 2768-m		±0.10	±0.20	±0.30	±0.50	±0.80	±1.20	Scale %	Similar	Designed	02/09/2010	wwi		
Welding Assembly: ISO 2768-c		±0.30	±0.50	±0.80	±1.20	±2.00	±3.00	Weight [kg]	Controlled	24/07/2013	jbe			
ENSEMBLE SONDE PTC TAMIS									A4	1.179	Revised	24/07/2013	jbe	
<small>Any and all information received by you from us shall be held and kept confidential and shall not be disclosed by you to any third party except with prior written consent of FREWITT SA.</small>										<small>Frewitt SA; Milling and Handling of Powders P.O.B. 615, CH-1701 Fribourg, SWITZERLAND Tel: +41 26 460 74 00 / fax: +41 26 460 74 01 info@frewitt.com / www.frewitt.com</small>		Page		Ver.
												435843-CMA		1/1	A




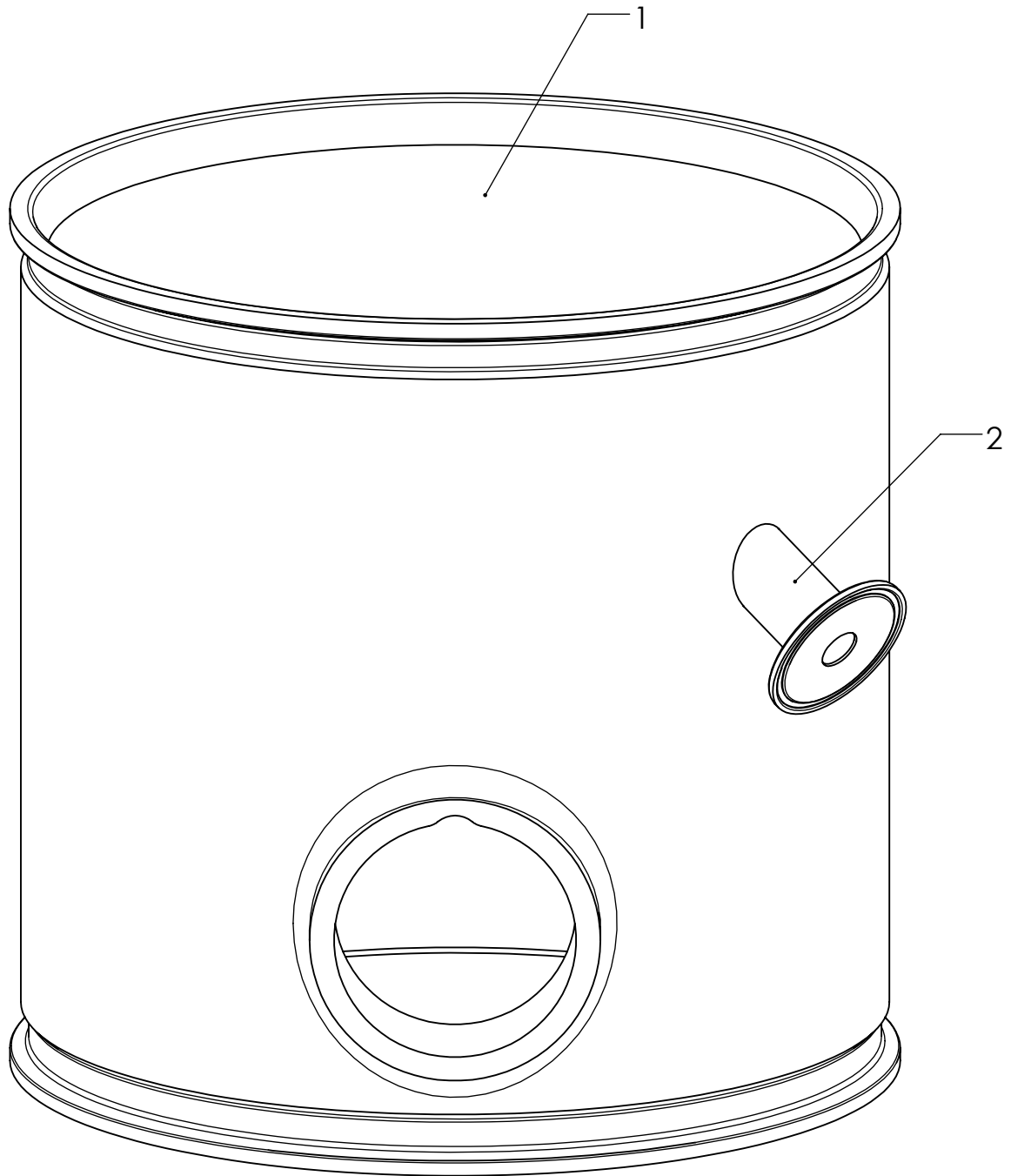
Position	N° article Artikel Nr Item number
1	---
2	---
3	---
4	---
100	435025-CMA
500	432412

Dimensions without tolerance [mm]	above	6	30	120	400	1000	MATERIAL : Matériau <non spécifié>						
	up to	6	30	120	400	1000	2000	Scale	Similar	Designed	17/02/2010	wwi	
Machining: ISO 2768-m		±0.10	±0.20	±0.30	±0.50	±0.80	±1.20	%		Controlled	01/06/2011	wwi	
Welding Assembly: ISO 2768-c		±0.30	±0.50	±0.80	±1.20	±2.00	±3.00			Revised	01/06/2011	wwi	
Palier							A4	Weight [kg]	11.977	Atex			
Any and all information received by you from us shall be held and kept confidential and shall not be disclosed by you to any third party except with prior written consent of FREWITT SA.				Frewitt SA: Milling and Handling of Powders P.O.B. 615, CH-1701 Fribourg, SWITZERLAND Tel: +41 26 460 74 00 / fax: +41 26 460 74 01 info@frewitt.com / www.frewitt.com				432459-CMA		Page	Ver.		
										1/1	A		

500
(432410)



Dimensions without tolerance [mm]	above		6	30	120	400	1000	MATERIAL :	Scale	Similar	Designed	03/09/2010	wwi
	up to	6	30	120	400	1000	2000						
Machining: ISO 2768-m		±0.10	±0.20	±0.30	±0.50	±0.80	±1.20		%		Controlled	10/05/2011	jbe
Welding Assembly: ISO 2768-c		±0.30	±0.50	±0.80	±1.20	±2.00	±3.00		⊕	Weight [kg]	Revised	10/05/2011	jbe
Joint à 2 lèvres complet								A4	0.110520	Atex			
								Any and all information received by you from us shall be held and kept confidential and shall not be disclosed by you to any third party except with prior written consent of FREWITT SA.				Frewitt SA: Milling and Handling of Powders P.O.B. 615, CH-1701 Fribourg, SWITZERLAND Tel: +41 26 460 74 00 / fax: +41 26 460 74 01 info@frewitt.com / www.frewitt.com	
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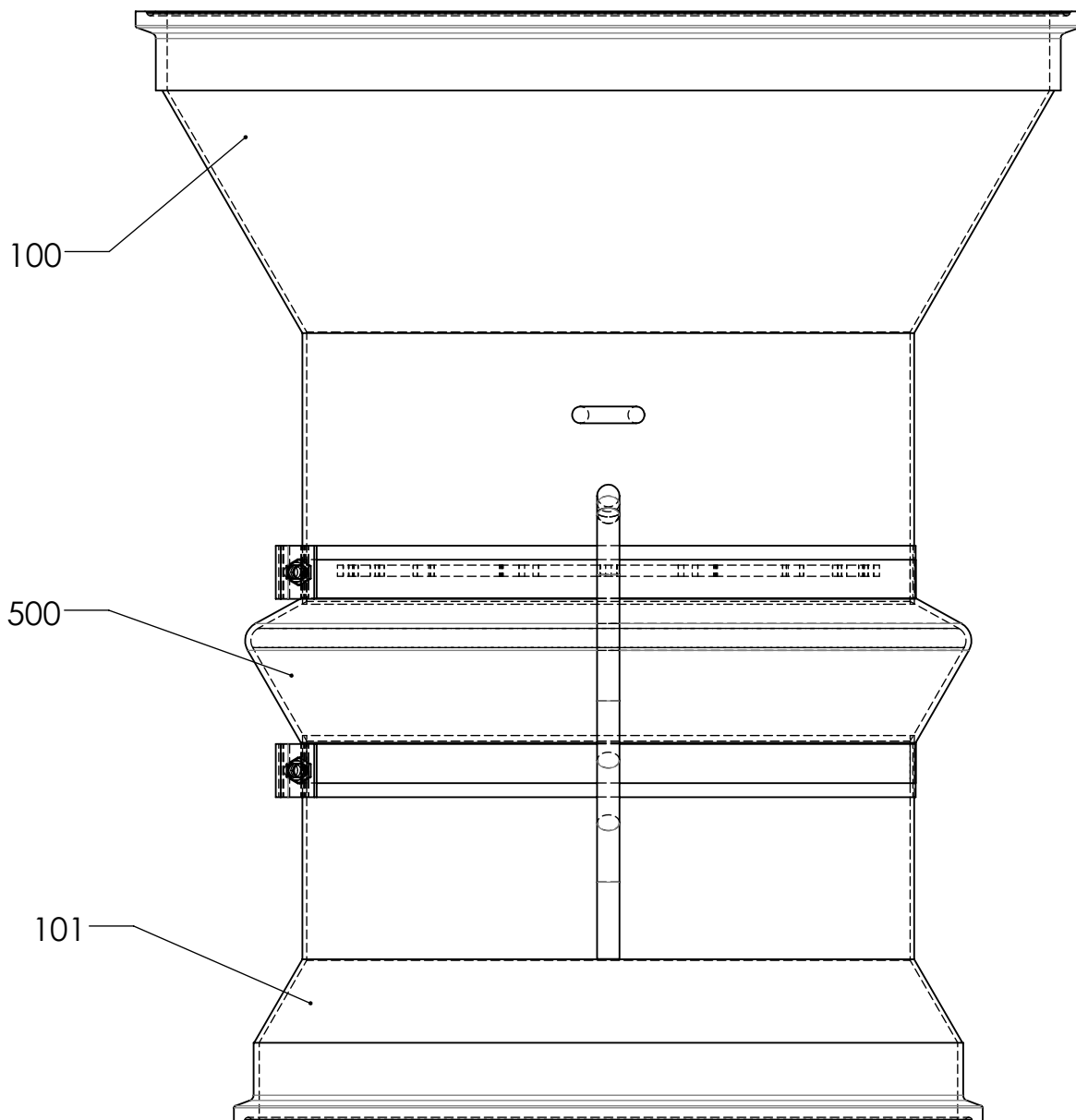


Dimensions without tolerance [mm]	above		6	30	120	400	1000	MATERIAL :	Scale	Similar	Designed	02/09/2010	wwi		
	up to	6	30	120	400	1000	2000								
Machining: ISO 2768-m		±0.10	±0.20	±0.30	±0.50	±0.80	±1.20				Controlled	02/09/2010	wwi		
Welding Assembly: ISO 2768-c		±0.30	±0.50	±0.80	±1.20	±2.00	±3.00				Revised	02/09/2010	wwi		
Bâti pour sonde								Weight [kg]	A4	27.179352	Atex				
Any and all information received by you from us shall be held and kept confidential and shall not be disclosed by you to any third party except with prior written consent of FREWITT SA.										Frewitt SA; Milling and Handling of Powders P.O.B. 615, CH-1701 Fribourg, SWITZERLAND Tel: +41 26 460 74 00 / fax: +41 26 460 74 01 info@frewitt.com / www.frewitt.com		436011-CMA		Page	Ver.
														1/1	A


Voir documents suivants.

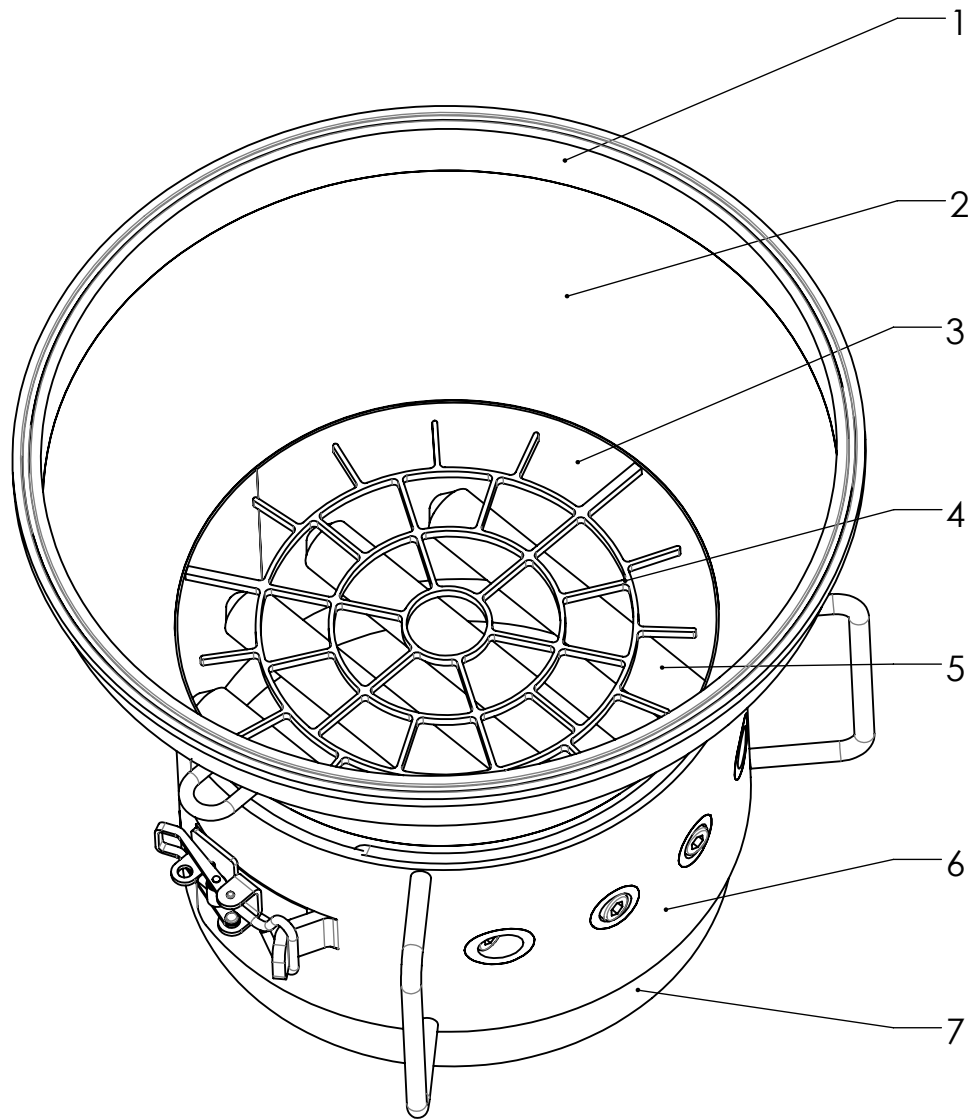
Siehe folgende Dokumente.


See following documents

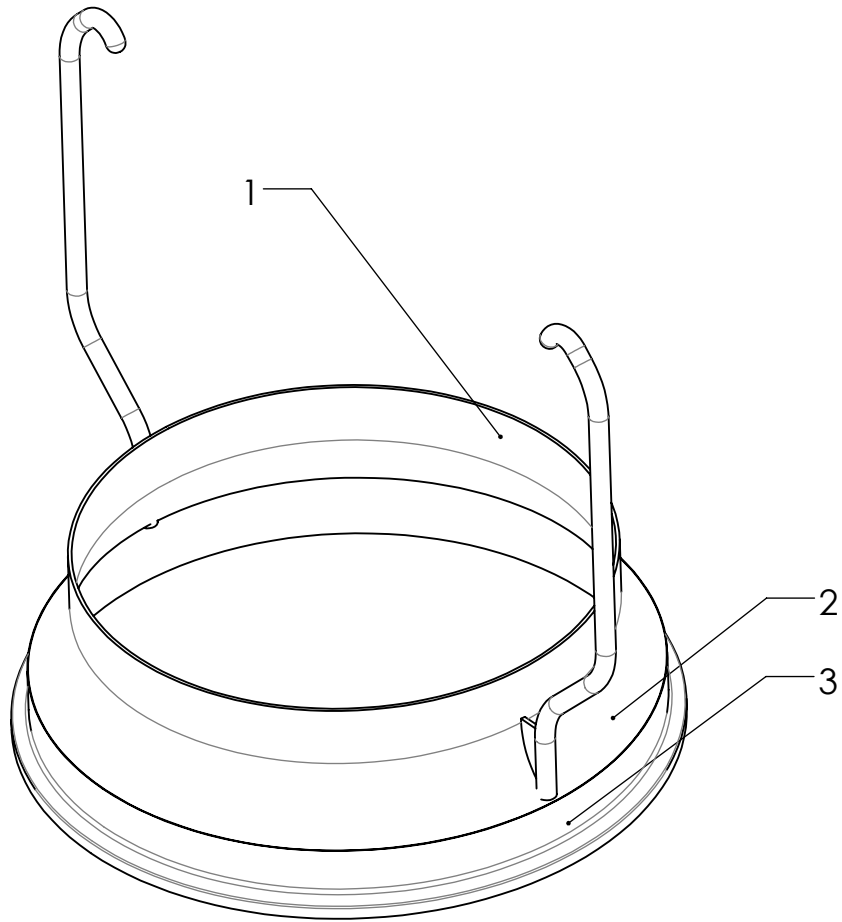


Position	Item number
100	473711-CMA
101	473712-CMA
500	437890

Dimensions without tolerance [mm]	above	6	30	120	400	1000	MATERIAL : N/A	Scale	Similar	Designed	04/02/2014	edgu
	up to	6	30	120	400	1000							2000
Machining: ISO 2768-m		±0.10	±0.20	±0.30	±0.50	±0.80	±1.20	%		Controlled	04/02/2014	edgu
Welding Assembly: ISO 2768-c		±0.30	±0.50	±0.80	±1.20	±2.00	±3.00	⊕	Weight [kg]	Revised	04/02/2014	edgu
Ensemble entonnoir sortie								A4	N/A	Atex		
								Any and all information received by you from us shall be held and kept confidential and shall not be disclosed by you to any third party except with prior written consent of FREWITT SA.				Frewitt SA: Milling and Handling of Powders P.O.B. 615, CH-1701 Fribourg, SWITZERLAND Tel: +41 26 460 74 00 / fax: +41 26 460 74 01 info@frewitt.com / www.frewitt.com			473713-CMA		Page	Ver.
											1/1	A



Dimensions without tolerance [mm]	above up to	6	30	120	400	1000	MATERIAL : 316L					
Machining: ISO 2768-m		±0.10	±0.20	±0.30	±0.50	±0.80	Scale	Similar	Designed	04/02/2014	edgu	
Welding Assembly: ISO 2768-c		±0.30	±0.50	±0.80	±1.20	±2.00	%		Controlled	24/04/2014	edgu	
Entonnoir 6							Weight [kg]	Revised	24/04/2014	edgu		
							A4	2.71	Atex			
Any and all information received by you from us shall be held and kept confidential and shall not be disclosed by you to any third party except with prior written consent of FREWITT SA.				Frewitt SA: Milling and Handling of Powders P.O.B. 615, CH-1701 Fribourg, SWITZERLAND Tel: +41 26 460 74 00 / fax: +41 26 460 74 01 info@frewitt.com / www.frewitt.com			473711-CMA		Page	Ver.		
								1/1	A			



Dimensions without tolerance [mm]	above up to	6	30	120	400	1000	2000	MATERIAL : 316-316L					
Machining: ISO 2768-m		±0.10	±0.20	±0.30	±0.50	±0.80	±1.20	Scale	Similar	Designed	04/02/2014	edgu	
Welding Assembly: ISO 2768-c		±0.30	±0.50	±0.80	±1.20	±2.00	±3.00	%		Controlled	11/04/2014	edgu	
Tube de liaison container									Weight [kg]	Revised	11/04/2014	edgu	
									A4	1.42	Atex		
Any and all information received by you from us shall be held and kept confidential and shall not be disclosed by you to any third party except with prior written consent of FREWITT SA.				Frewitt SA; Milling and Handling of Powders P.O.B. 615; CH-1701 Fribourg, SWITZERLAND Tel: +41 26 460 74 00 / fax: +41 26 460 74 01 info@frewitt.com / www.frewitt.com				473712-CMA		Page	Ver.		
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Voir documents suivants

(Certificats FDA sont dans l'ordre croissant)

Siehe folgende Dokumente

(FDA-Zertifikate werden in aufsteigender Reihenfolge)

See following documents

(FDA certificates are in ascending order)



CONNECTORS VERBINDUNGSTECHNIK AG

Konformitätserklärung – Certificate of Conformity

Connectors Dok.-Ref.: CVAG_K003_0001.9.doc

Wir bestätigen hiermit, dass die Elastomere Buna-N, EPDM, MVQ (Silikon) und FPM/FKM (z. B. VITON®) aus denen unsere Dichtungen hergestellt werden, durch die National Sanitation Foundation geprüft und zertifiziert wurden, dass sie in Übereinstimmung sind mit dem derzeit gültigen F.D.A. Code of Federal Regulations für Gummi und gummiähnliche Materialien unter Titel 21 CFR, §177.2600 und dass sie auch den Kriterien der Class-I Werkstoffklassifizierung der 3-A Gesundheitsnormen, U.S.D.A. und „Standard 51“, N.S.F., erfüllen.

Wir bestätigen hiermit, dass die Fluorkunststoffe PTFE und FEP (z.B. TEFLON®), aus denen unsere Teile produziert werden, Labor geprüft sind und als in Übereinstimmung befunden wurde mit dem derzeit gültigen F.D.A. Code of Federal Regulations für TEFLON®- und Fluorkunststoffe unter Titel 21 CFR, §177.1550 für den Einsatz in Kontakt mit Lebensmitteln und dass sie auch die Kriterien der Class-I Werkstoffklassifizierung der 3-A Gesundheitsnorm erfüllen.

Wir bestätigen hiermit, dass alle Elastomere und Fluorkunststoffe im Labor geprüft sind und als in Übereinstimmung befunden wurde mit der derzeit gültigen U.S. Pharmacopeia Klasse VI, Kapitel <88> biologische Reaktivität, in vivo (70°C).

Wir bestätigen hiermit, dass unsere Silikondichtungen ausschliesslich aus platinkatalysiertem Silikon hergestellt werden.

Wir bestätigen hiermit, dass die von uns verwendeten PEEK Polymere übereinstimmen mit dem derzeit gültigen F.D.A. Code of Federal Regulations nach Titel 21 CFR, §177.2415 für Applikationen im direkten Lebensmittelkontakt.

We hereby certify that the elastomer compounds, Buna-N, EPDM, MVQ (Silicone) and FPM/FKM (e.g. VITON®) from which our parts are manufactured have been tested and certified by the National Sanitation Foundation to be in compliance with the current F.D.A. Code of Federal Regulations for rubber and rubber-like materials under Title 21, §177.2600 and also meet the criteria of the current Class-I material classification of the 3-A Sanitary Standards, U.S.D.A., and „Standard 51“ of the N.S.F.

We hereby certify that the fluoropolymers PTFE and FEP (e.g. TEFLON®) from which our parts are produced have been tested in the laboratory and are found to be in compliance with the current F.D.A. Code of Federal Regulations for Teflon® and fluorocarbon resins under Title 21, §177.1550 for use in contact with food, and also meet the current criteria of the Class-I material classification of the 3-A Sanitary Standard.

We hereby certify that all elastomer compounds and Teflon® resins have been tested and certified by the Toxicon laboratory to be in compliance with the current criteria of the U.S. pharmacopeia Class VI, section <88> biological reactivity, in vivo (70°).

We hereby certify that all our Silicone gaskets are made from platinum cured silicone only.

We hereby certify that FDA-compliant PEEK polymer material-filled grades are approved for use in food processing and related industrial applications. Used to make articles or components that will come into repeated contact with food during processing, glass-filled grades comply with compositional requirements of FDA 21 CFR §177.2415 standard.

Tagelswangen, im März 2012

CONNECTORS Verbindungstechnik AG

Christian Wyniger (Quality Manager)

16.03.2012



Sponsor: Fluortecno S.r.l.
Via delle Imprese 34/36
24041 Brembate (BG)

Product info: Silicone tipo E2T

Ref. Your order CDF-13-0878
Ref. DDT 130134 dated 29/07/2013

Our comm. 410071

CERTIFICATE OF ANALYSIS AA17863 del 13/01/2006

Sample No: AA17863 Submittal date: 01/12/2005 Page 1 di 1

Analysis test	Unit of Measurement	Analytical results	M.Q.L. *	Limits	Methods
AQUEOUS FOODS					FDA-CFR 21 Parts 170 to 199 Item 177.2600
TOTAL EXTRACTIVES IN DISTILLED WATER AT REFLUX TEMPERATURE					
AFTER THE FIRST 7 HOURS OF EXTRACTION	mg/in ²	< M.Q.L.	0,1	20	
AFTER THE SUCCEEDING 2 HOURS OF EXTRACTION	mg/in ²	< M.Q.L.	0,1	1	
FATTY FOODS					FDA-CFR 21 Parts 170 to 199 Item 177.2600
TOTAL EXTRACTIVES IN n-HEXANE AT REFLUX TEMPERATURE					
AFTER THE FIRST 7 HOURS OF EXTRACTION	mg/in ²	< M.Q.L.	0,1	175	
AFTER THE SUCCEEDING 2 HOURS OF EXTRACTION	mg/in ²	< M.Q.L.	0,1	4	
The total extractives meet the FDA Specification for the use in contact with foods (CFR 21 Paris 170 to 199 Item.177.2600)					
*M.Q.L.: Minimum Quantitation Limit The analytical results are related only to the products or material submitted to these test This Certificate of Analysis could not be copied or partially copied without the explicit write approval of ChemService.					

Chemservice S.r.l. e-mail: info@chemservice.it
SOCIETA' SOGGETTA AL CONTROLLO E AL COORDINAMENTO
DA PARTE DI FINAGRO S. P. A. - I. P.I.C.I. GROUP CON SEDE IN MILANO
Sede legale ed operativa: Via F.lli Beltrami, 15
20026 Novate Milanese (Mi) - tel. 02 356 996.1 - fax 02 382 01446
REA 1132847 - R.I.224926
C.F. e P.IVA 01020820150 - Cap. Soc. Euro: 99.000 I.V.

Il Direttore
(Dr. A. Villanti)

IT TECH SA
Via Cantonale - CH - 6707 IRAGNA
Tel. 0041 (0)91 - 880 90 10/11
Fax 0041 (0)91 - 880 90 12
E-mail: info@pte.ch - Web: www.pte.ch

Doc No: 28248-1

SKF

CERTIFICATE

Item No. : 432412
Order No. : 11-1409
Checked : 18 sept 2014
PY 4

We herewith confirm the ECONOMOS material

ECOFLON 5

Polymer: PTFE modified, virgin
Colour: white
Hardness: 57 Shore D
Density: 2,17 g/cm³

which is intended as a sealing material for the use in food processing machinery is in accordance with

the positive list of § 177.1550, CFR21, "Rubber Articles Intended for Repeated Use" of the Food and Drug Administration, USA

and the EC regulations, 90/128/EEC.

Judenburg, 01. Juli 2004

We believe this information is the best currently available on the subject to our internal amendment routine. Economos is unable to guarantee and/or take any responsibility, obligation or liability whatsoever in connection with this information.

SKF Economos GmbH

Gabelhoferstraße 25, 8750 Judenburg, Austria

Tel +43 (0)3572 82555-0. Fax +43 (0)3572 82439. www.economos.com

ECONOMOS

CERTIFICATE OF CONFORMANCE

in accordance to the US Food and Drug Administration (FDA)

The following Frenzelit gasketing materials based on modified and multi-directionally expanded PTFE are in fully compliance with the FDA 177.1550 Perfluorocarbon regulation:

novaflon 100

novaflon 200

novaflon 300

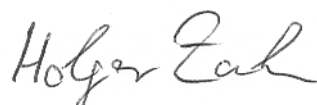
novaflon 500

Bad Berneck, March 2006

Frenzelit-Werke GmbH & Co. KG



Hans-Günther Koch
Head of Gasket Division



Holger Zahn
Quality Assurance

STAHLCON GMBH

VERTRIEB VON EINBAUELEMENTEN FÜR TECHNISCHE ANLAGEN

STAHLCON GMBH . KRINGSTRASSE 13 : D-71144 STEINENBRONN

Frewitt SA
Mme Christelle Thion
Route du Coteau 7
CH-1763 Granges-Paccot
Schweiz

FDA-Zertifikat

Nummer 68574
Datum 03.01.2013
Kunden-Nr. 40603
Lieferanten-Nr. 362400
Ihre Bestellung
Lieferdatum 03.01.2013
Erfasst AL

Pos	Artikel	Beschreibung	Menge
-----	---------	--------------	-------

Zertifizierung von Dichtungen nach FDA

Die oben aufgeführten Dichtungen stammen aus der EU und werden vom Hersteller wie folgt zertifiziert:

CERTIFICATION OF COMPLIANCE

We hereby certify that the elastomer compounds: Viton, EPDM, Silicone and Nitrile, used in the manufacture of our hygienic sealing gaskets are in compliance with the Food and Drug Association (FDA) Code of Federal Regulations for rubber and rubber-like materials. This under Title 21, paragraph 177.2600 and also meets the criteria of the Class I materials classification of the 3-A Sanitary Standards, U.S.D.A. and standard 51 of the N.S.F.

We hereby confirm that no Phthalate Esters are contained in any plasticisation agent used during the manufacturing process.

We hereby certify that the PTFE resins from which our solid and envelopped gaskets are produced have been tested in our suppliers laboratory and found to be in compliance with FDA code of Federal Regulations for PTFE and Fluorocarbons resins. This under Title 21 Paragraph 177.1550 for use in contact with foodstuffs. The material also meets the criteria of the Class I materials classification of the 3-A Sanitary standard 51 of the N.S.F.

Max Mönkemöller

Anschrift:
STAHLCON GMBH
Kringstraße 13
D-71144 Steinenbronn

TELEFON
+49(0)7157 5386-0
TELEFAX
+49(0)7157 5386-11

E-MAIL
info@stahlcon.de
INTERNET
www.stahlcon.de

GESCHÄFTSFÜHRER
Max Mönkemöller

REGISTERGERICHT
Böblingen HRB 5993
USt.Id Nr.: DE 147 865 860
St.Nr. 9906801903

SITZ DER GESELLSCHAFT
Steinenbronn



Linking science to progress

Product Certification Services

Doc No: 111900-1

CERTIFICATE

of compliance with the food packaging material regulation 21 CFR §177.2600 -
Rubber Articles Intended For Repeated Use

for

FKM 75.5/VA75F (FKM 75.16-04)

The detailed composition of above mentioned formulation has been disclosed to **RCC Product Certification Services, Itingen / Switzerland** by **Angst + Pfister AG, Zürich / Switzerland** on November 28th, 2007.

Based on this information we herewith can confirm that the formulation is in compliance with the appropriate food packaging material regulation 21 CFR §177.2600 (Rubber Articles Intended For Repeated Use) and therefore may be used in contact with food in the

UNITED STATES OF AMERICA

Please note: The material may not be used in contact with milk or edible oils. It is the responsibility of the manufacturer of the final article, that it complies with the specifications and limitations (end tests) in all applicable regulations.
This certificate is limited to the formulation disclosed to RCC as mentioned above. Any change of the formulation will void the certificate automatically. Also any changes in this formulation must be addressed to RCC immediately.

Dr. K. Hötzer



Dr. W. Nef

Itingen, November 29th, 2007
Expiration date: November 29th, 2010
RCC Project B66183 / NEW

**RCC Product
Certification Services**
Zelgliweg 1
4452 Itingen
Switzerland



RCC PRODUCT CERTIFICATION SERVICES – accredited by the Competent Authorities according to EN 45011 as CERTIFICATION BODY operating product certification – an individual department of RCC Ltd.
Accredited services are defined in the official directory of accredited Certification Bodies SCES 019



Frewitt Fabrique Machines SA
Case postale 615
1701 Fribourg

**DECLARATION OF
CONFORMITY**
in accordance with
DIN EN ISO/IEC 17050

Customer No.: 109507

Date: 16.03.2010
Phone: 022 979 28 21
Issuer: Michaud Christian
Initials: MCH

Declaration subject:

Item description:

Joint plat rd 980/903 x 5 mm Novaflon 500, Art.no. 457663

Item no.:

DT-37 6157 0006

Job no.:

A10.153165

Quantity:

1 pce

Country of origin:

(D)

Your purchase order:

CDF-10-0696

**The product described above meets the requirements stipulated in the following
guidelines/standards:**

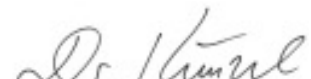
FDA 21 CFR §177.1550

Additional information:

Angst + Pfister Group Engineering



Walter Oertli
Senior Engineer



Heinz-Thomas Künzel
Senior Engineer

Zurich, 16.03.2010

(Place and date of issuance)

(Name and signature or equivalent authentication of authorized persons)

FDA Konformität

GYLON-Flachdichtungen

GYLON Standard (Style 3500, 3501E) und GYLON Weiß (Style 3510) erfüllen die FDA-Vorschriften 21 CFR 177.1550 . Diesen Ansprüchen genügen alle Bestandteile und Inhaltstoffe. Die Füllstoffe sind außerdem akzeptiert unter 21 CFR 177.2600 und die Farbpigmente (falls vorhanden) unter 21 CFR 182.5991, 21 CFR 182.8991 und 21 CFR 177.2600 .

Die Markierungsfarbe erfüllt die Vorschrift 21 CFR 175.300 .

GYLON Standard (Style 3500) hat außerdem die Freigabe des USDA für Anwendungen mit Direktkontakt bei Fleisch und Geflügel.

GYLON Blau (Style 3504) und GYLON Food (Style 3550) erfüllen die FDA-Vorschriften 21 CFR 177.1550 . Diesen Ansprüchen genügen die Hauptbestandteile bis auf die Füllstoffe. Die Füllstoffe sind in dem Food Chemicals Codex (FCC, 3rd Edition) aufgeführt und als grundsätzlich sicher anerkannt (GRAS – 21 CFR 170.30) für Anwendungen in Filtern und Lebensmittelprozessen.

Der zweite Füllstoff in GYLON Food erfüllt die FDA-Vorschrift 21 CFR 177.2600 .

Die Markierungsfarbe erfüllt die Vorschrift 21 CFR 175.300 .

GYLON Style 3545 erfüllt die FDA-Vorschriften 21 CFR 177.1550, 21 CFR 182.10, 21 CFR 182.1217 und 21 CFR 175.300 für seine Bestandteile. Die Menge der sich herauslösenden Materialien kann die Anforderungen nach 21 CFR 177.1550 überschreiten. Die sich herauslösenden Materialien erfüllen jedoch die FDA-Vorschriften 21 CFR 170.30 und sind als grundsätzlich sicher anerkannt (GRAS).

Die Markierungsfarbe erfüllt die Vorschrift 21 CFR 175.300 .

FDA	- Food and Drug Administration
USDA	- United States Department of Agriculture
CFR	- Code of Federal Regulations
FCC	- Food Chemicals Codex
GRAS	- Generally Recognized As Safe

Item No. : 43 2410
Order No. : 24ma: 2013
Checked : Jg K

FDA Konformitätserklärung

Auftraggeber	Frewitt SA 1701 Fribourg
Lieferdatum	17.05.2013 /
Artikel	FC72964 / 432410
U/Bestätigung	AB000101 / 02
Qualität	Rulon 641
Herstelldatum	Juli 2012 / 40801
Konformität	FDA 21CFR§177.1550

Zürich, 17.05.2013



KONFORMITÄTSBESCHEINIGUNG

Hiermit bestätigen wir, dass der von der Kubo Tech AG verwendete Werkstoff:

Aethylen-Propylen-Kautschuk, EPDM, 70 Shore A, weiss
Materialnummer 05-70-0105

den Vorgaben der amerikanischen **Food and Drug Administration** (FDA), wie im Code of Federal Regulations (Food and Drugs) Titel 21, § 177.2600 dokumentiert, entspricht.

Kubo Tech AG



André Bitzer
BSc ZFH in Maschinentechnik
Leiter Technik

Effretikon, 17. Oktober 2013

DECLARATION OF CONFORMITY

in accordance with
DIN EN ISO/IEC 17050

Customer No.:

Date: 04.12.2013
 Phone: +41 44 306 6257
 Issuer: MRI
 Initials: -

Declaration subject:

Item description:

FEP-O-SEAL O-Rings with Silicone- (VMQ) Core
 FEP-O-SEAL O-Rings with VITON- (FKM) Core

Item no.:

-

Job no.:

-

Quantity:

-

Country of origin:

GB / USA

Your purchase order:

-

The product described above meets the requirements stipulated in the following guidelines/standards:

FDA 21 CFR §177.1550
 3A Sanitary Standards
 USP Class VI (Valid for Temperature +121 °C)
 RoHS 2002/95/EG resp. 2011/65/EU
 EU Regulation 10/2011
 Animal (ADI) and BSE/TSE free

Additional information:

This Conformity refers to the FEP-Cover of the O-Rings, but not to the Core Material.
 This Declaration of Conformity will expire on 31.12.2014

Angst + Pfister Group Engineering



R. Mosimann

Engineering Data Administrator



G. Valente

Senior Engineer

Zurich, 04.12.2013

(Place and date of issuance)

(Name and signature or equivalent authentication of authorized persons)

Original document delivery (for internal use only):

to customer, pdf file
 to customer, with product shipment
 back to issuer, pdf file
 other (please specify separately)

FDA Konformitätserklärung

Auftraggeber	Frewitt SA 1701 Fribourg
Lieferdatum	div.
Artikel	Manchettes
U/Bestätigung	div.
Qualität	J-8129 EPDM, 40 ShA, noir, antistatique
Herstelldatum	div.
Konformität	FDA 21CFR§177.2600

Zürich, 21.02.2014
Thomas Flückiger



Johannsen AG
Im Langhag 5
CH-8307 Effretikon

Technisches Datenblatt
 Technical Data Sheet

**Art. Nr.: FG 8305 Tetratex® Contact Polyester Nadelfilz
 antistatisch**
 Product Code

Entspricht den Anforderungen nach EU 10/2011 und FDA CFR 21 § 177

Material Fibre	Polyester/Edelstahl
Stützgewebe Scrim	Polyester/Edelstahl
Gewicht (+/- 8 %) Weight	500 g/m ²
Materialdicke (+/- 0,3 mm) Thickness	1,4 mm
Luftdurchlässigkeit @ 200 Pa Air Permeability	40 – 80 l/dm ² min
Max. Betriebstemperatur Continuous Service Temperature	150 °C
Min. Reißfestigkeit Minimum Break Strength	Längs Warp 600 N/50 mm Quer Weft 1.000 N/50 mm
Max. Schwund nach 15 Minuten und 150 °C Max. Shrinkage Unrestricted	≤ 1,5 %
Ausrüstung Finish	Tetratex® ePTFE-Membran 'Contact'

Stand: 09.11

Technische Änderungen vorbehalten!
 Please note value given may be subject to change without notice.

Mit erscheinen dieses Datenblattes verlieren andere Versionen ihre Gültigkeit!
 Please note this data sheet will supersede any previous version.

Donaldson Filter Components Ltd
 7 The Parks
 Newton Le Willows
 WA12 0JQ
 United Kingdom

Tel: +44 (0) 1942 711711
 Fax: +44 (0) 1942 711571
 E-mail: membranes-europe@donaldson.com

Donaldson Filtration Deutschland GmbH
Membranes Division
 Industriestrasse 11
 48 249 Dülmen
 Deutschland

Tel: (+49) 02594 781692
 Fax: (+49) 02594 781693
 E-mail: membranes-de@donaldson.com

Tetratex® | Eingetragenes Warenzeichen der Donaldson Company Inc
 Besuchen Sie uns: www.donaldson.com

Attestation d'état de surfaces des éléments en contact avec le produit.	Bescheinigung der Oberflächenqualität für die produktberührten Elemente.	Certificate for surface quality of the parts in contact with the product.
---	--	---

Selon la méthode de mesure décrite dans la norme EN ISO 4288, nous certifions que les parties en contact avec le produit ont un état de surface conforme à la commande, soit:

Basierend auf die in der Norm EN ISO 4288 beschriebenen Messmethode, bestätigen wir, dass die Oberflächenqualität der produktberührten Teile der Bestellung entspricht, d.h.:

According to the procedure for roughness inspection EN ISO 4288, we guarantee that all product contact parts have been manufactured with a surface quality according to the order, i.e.:

Intérieur:

Innen:

Inside:

Ra ≤ 0.4 μm

Extérieur:

Aussen:

Outside:

Ra ≤ 1.4 μm

Frewitt Fabrique de Machines SA



R. Rybarikova
 Documentalis
 Dokumentalist
 Documentalist

N° Série:

Serien-Nr.
14001235183

Serial Nr.

REF.: 473463

Appareil de mesure / Messapparat / Measuring unit : Mitutoyo Sufitest SJ-301
N° série / Serien-Nr. / Serial Nr. : 400197
N° Etalon / Massstab-Nr. / Standard Nr. : 522

Position de mesure: Intérieur / Extérieur
Massnahmenposition: I = innen / E = Aussen
Measure position: Inside / Outside

Ref	Position mesure Massnahmenposition Measure position	Mesure N° Mass Nr. Measure Nr.	Norme Norm Stand	Profil Profil Profile	Filtre Filter Filter	Eva.-L Ausw.-L Eva.-L	λC	N	Vitesse Gesch. Speed	Drive Vorschub Drive	Ra
DATA pos. 100											
Pos.1											
428715	I	1	JIS2001	R	GAUSS	4.0mm	0.8mm	5.00	0.5mm/s	STAND	0.06um
428715	I	2	JIS2001	R	GAUSS	4.0mm	0.8mm	5.00	0.5mm/s	STAND	0.08um
Pos.100											
473648	I	1	JIS2001	R	GAUSS	4.0mm	0.8mm	5.00	0.5mm/s	STAND	0.20um
473648	I	2	JIS2001	R	GAUSS	4.0mm	0.8mm	5.00	0.5mm/s	STAND	0.23um
Pos.101											
476706	I	1	JIS2001	R	GAUSS	4.0mm	0.8mm	5.00	0.5mm/s	STAND	0.08um
476706	I	2	JIS2001	R	GAUSS	4.0mm	0.8mm	5.00	0.5mm/s	STAND	0.14um
Pos.102											
473706	I	1	JIS2001	R	GAUSS	4.0mm	0.8mm	5.00	0.5mm/s	STAND	0.10um
473706	I	2	JIS2001	R	GAUSS	4.0mm	0.8mm	5.00	0.5mm/s	STAND	0.10um
Pos.103											
473688	I	1	JIS2001	R	GAUSS	4.0mm	0.8mm	5.00	0.5mm/s	STAND	0.16um
473688	I	2	JIS2001	R	GAUSS	4.0mm	0.8mm	5.00	0.5mm/s	STAND	0.25um
DATA pos. 101											
Pos.101											
473842	I	1.00	JIS2001	R	GAUSS	4.0mm	0.8mm	5.00	0.5mm/s	STAND	0.06um
473842	I	2.00	JIS2001	R	GAUSS	4.0mm	0.8mm	5.00	0.5mm/s	STAND	0.10um
DATA pos. 102											
Pos.1											
464795	E	1.00	JIS2001	R	GAUSS	4.0mm	0.8mm	5.00	0.5mm/s	STAND	0.04um
464795	E	2.00	JIS2001	R	GAUSS	4.0mm	0.8mm	5.00	0.5mm/s	STAND	0.08um
Pos.3											
464796	E	1.00	JIS2001	R	GAUSS	4.0mm	0.8mm	5.00	0.5mm/s	STAND	0.22um
464796	E	2.00	JIS2001	R	GAUSS	4.0mm	0.8mm	5.00	0.5mm/s	STAND	0.13um
Pos.101											
454299	E	1.00	JIS2001	R	GAUSS	4.0mm	0.8mm	5.00	0.5mm/s	STAND	0.33um
454299	E	2.00	JIS2001	R	GAUSS	4.0mm	0.8mm	5.00	0.5mm/s	STAND	0.24um
Pos.102											
473848	I	1.00	JIS2001	R	GAUSS	4.0mm	0.8mm	5.00	0.5mm/s	STAND	0.34um
473848	I	2.00	JIS2001	R	GAUSS	4.0mm	0.8mm	5.00	0.5mm/s	STAND	0.05um
Pos.103											
454311	E	1.00	JIS2001	R	GAUSS	4.0mm	0.8mm	5.00	0.5mm/s	STAND	0.28um
454311	E	2.00	JIS2001	R	GAUSS	4.0mm	0.8mm	5.00	0.5mm/s	STAND	0.29um
Pos.104											
464798	I	1.00	JIS2001	R	GAUSS	4.0mm	0.8mm	5.00	0.5mm/s	STAND	0.08um
464798	I	2.00	JIS2001	R	GAUSS	4.0mm	0.8mm	5.00	0.5mm/s	STAND	0.09um

DATA pos. 103

Pos.1											
436255	E	1.00	JIS2001	R	GAUSS	4.0mm	0.8mm	5.00	0.5mm/s	STAND	0.04um
436255	E	2.00	JIS2001	R	GAUSS	4.0mm	0.8mm	5.00	0.5mm/s	STAND	0.09um
Pos.102											
435843	E	1.00	JIS2001	R	GAUSS	4.0mm	0.8mm	5.00	0.5mm/s	STAND	0.13um
435843	E	2.00	JIS2001	R	GAUSS	4.0mm	0.8mm	5.00	0.5mm/s	STAND	0.17um
Pos.103											
432459	E	1.00	JIS2001	R	GAUSS	4.0mm	0.8mm	5.00	0.5mm/s	STAND	0.09um
432459	E	2.00	JIS2001	R	GAUSS	4.0mm	0.8mm	5.00	0.5mm/s	STAND	0.23um
Pos.104											
436011	I	1.00	JIS2001	R	GAUSS	4.0mm	0.8mm	5.00	0.5mm/s	STAND	0.20um
436011	I	2.00	JIS2001	R	GAUSS	4.0mm	0.8mm	5.00	0.5mm/s	STAND	0.08um

DATA pos. 104

Pos.100											
473711	I	1.00	JIS2001	R	GAUSS	4.0mm	0.8mm	5.00	0.5mm/s	STAND	0.12um
473711	I	2.00	JIS2001	R	GAUSS	4.0mm	0.8mm	5.00	0.5mm/s	STAND	0.12um
Pos.101											
473712	I	1.00	JIS2001	R	GAUSS	4.0mm	0.8mm	5.00	0.5mm/s	STAND	0.07um
473712	I	2.00	JIS2001	R	GAUSS	4.0mm	0.8mm	5.00	0.5mm/s	STAND	0.09um

Protocole établi par (visa)
Protokoll erstellt von (Visa)
Report established by (Visa)

H.REY



le
am 30-04-2014
on

Projet / Projekt / Project: PRO-14-0012

Type / Typ / Type : DelumpWitt.....

N° de série / Serien Nr. / Serial Nr.: 14001235183 (14001243013 / 14001219097.....)

Client / Kunde / Customer : Novartis Pharmaceutical Manufacturing ; SG-Singapore

Used seals (FDA-conform)

Gylon (PTFE), EPDM, FEP-O-SEAL, Silikon, Ecoflon5, Novafion 500

Remarques / Bemerkungen / Remarks:

We confirm that the seals that are used by Novartis are resistant to the used cleaning agents like on previous delivered machines as long the cleaning agents have not be changed.
From experience the used seals on the installation are compatible with the under listed products as long this product was also used on the already delivered machines.

- 1) Metformin
- 2) Hydroxy Propyl Cellulose (HPC)
- 3) Magnesium Stearate
- 4) Vildagliptin

**Edouard Gummy****Chef de projet (Project Manager)**

Granges-Paccot, le 15.05.2014

Client:

Kunde:

Customer:

Novartis Pharma
 SG-Singapore

N° Série:

Serien-Nr.
 14001235183

Serial Nr.

Appareil de mesure / Messapparat / Measuring unit : TES 1350
 N° série / Serien-Nr. / Serial Nr. : 971205674
 Norme / Norm / Standard : dBA (DIN45635)

Conditions de mesure

La mesure est faite:

- à 1m
- à hauteur de la chambre de broyage
- à vitesse max.
- avec l'outillage monté
- avec les accessoires montés
- à vide (sans produit)

Messbedingungen

Die Messung wird gemacht:

- bei einer Distanz von 1 m
- auf Mahlkammerhöhe
- mit maximaler
Geschwindigkeit
- mit montiertem Werkzeug
- mit montiertem Ein- und
Auslaufzubehör

Measuring conditions

Measurement is made:

- at a distance of 1 m
- at height of milling chamber
- with maximum speed
- with installed tools
- with installed inlet and outlet
accessories

Lp [dBA] : 73.50

Protocole établi par (visa)

Protokoll erstellt von (Visa)

Report established by (Visa)

H. Rey

le

am

on

16.05.14

Doc No: 127802-1



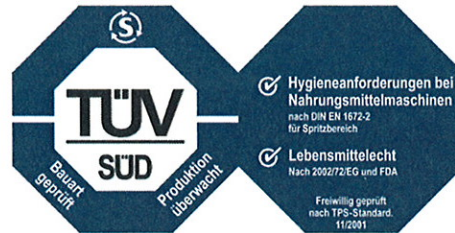
Product Service

ZERTIFIKAT

Nr. Z2 06 09 13277 076

Zertifikatsinhaber: Festo AG & Co. KGRuiter Str. 82
73734 Esslingen
DEUTSCHLAND**Produktions-
stätte(n):**

49331

Prüfzeichen:**Produkt:**

Pneumatikschlauchleitungen

Modell(e):PUN-H-Schläuche
PUN-H-DUO**Kenndaten:**

Größen mm:	3x0,5 / 4x0,75 / 6x1 / 8x1,25 10x1,5 / 12x2 / 16x2,5 DUO 4x0,75 / 6x1 / 8x1,25 / 10x1,5
Farben:	natur, blau, schwarz; DUO blau/schwarz
Material:	Polyurethan
Einsatztemperatur:	bis 60°C
Einsatzbereich:	nicht geeignet für Nahrungsmittel mit Alkoholanteil > 15 %

Geprüft nach:DIN EN 1672-2:2005
2002/72/EG
PPP 57006:2004
Code of Federal Regulations
Title 21 (FDA) § 177.2600, § 178.2010

Das Produkt wurde auf freiwilliger Basis auf die Einhaltung der grundlegenden Anforderungen geprüft und kann mit dem oben abgebildeten Prüfzeichen gekennzeichnet werden. Eine Veränderung der Darstellung des Prüfzeichens ist nicht erlaubt. Umseitige Hinweise sind zu beachten.

Prüfbericht Nr.:

71300186-001

Datum, 2006-10-13

Seite 1 von 1

Voir documents suivants.

Siehe folgende Dokumente.

See following documents



Certificate of calibration No. 258-16620-1

Translation

Subject

Revolution counter
Jaquet, DHO 907
S/N 0606.214692, METAS 411967

Order

Calibration at different speed of rotation

Applicant

Frewitt Fabrique de Machines SA
Route du Coteau 7
1763 Granges-Paccot

Traceability

The reported measurement values are traceable to national standards and thus to internationally supported realizations of the SI-units.

Date of calibration

31.07.2012

Marking

Calibration label METAS 07/12

3003 Bern-Wabern, 3. April 2013

For the Measurements

Nikola Misic

Sector Traffic, Acoustics and Vibration

Walter Fasel, Head of Sector

Certificate of calibration No. 258-16620-1**Extent of the Calibration**

The revolution counter was tested on your desired or in a specific measuring range by different revolutions per minutes (rpm).

Measurement Procedure

The revolution counter has been tested according to the design with a mechanical speed encoder or with electronic or optical signals.

Measurement Conditions

Temperature ambient: (22 ± 2) °C.

Measurement Results

A table and a detailed diagram can be found in the appendix.
The diameter of the perambulator is: 48.45 ± 0.1 mm.

Uncertainty of Measurement

The reported uncertainty of measurement is stated as the combined standard uncertainty multiplied by a coverage factor $k = 2$. The measured value (y) and the associated expanded uncertainty (U) represent the interval ($y \pm U$) which contains the value of the measured quantity with a probability of approximately 95 %. The uncertainty was estimated following the guidelines of the ISO (GUM:1995).

The measurement uncertainty contains contributions originating from the measurement standard, from the calibration method, from the environmental conditions and from the object being calibrated. The long-term characteristic of the object being calibrated is not included.

Model: **Jaquet**
Type: **DHO 907**

Metas Nr.: **411967**
Serial Nr.: **06.06.214692**

Appendix

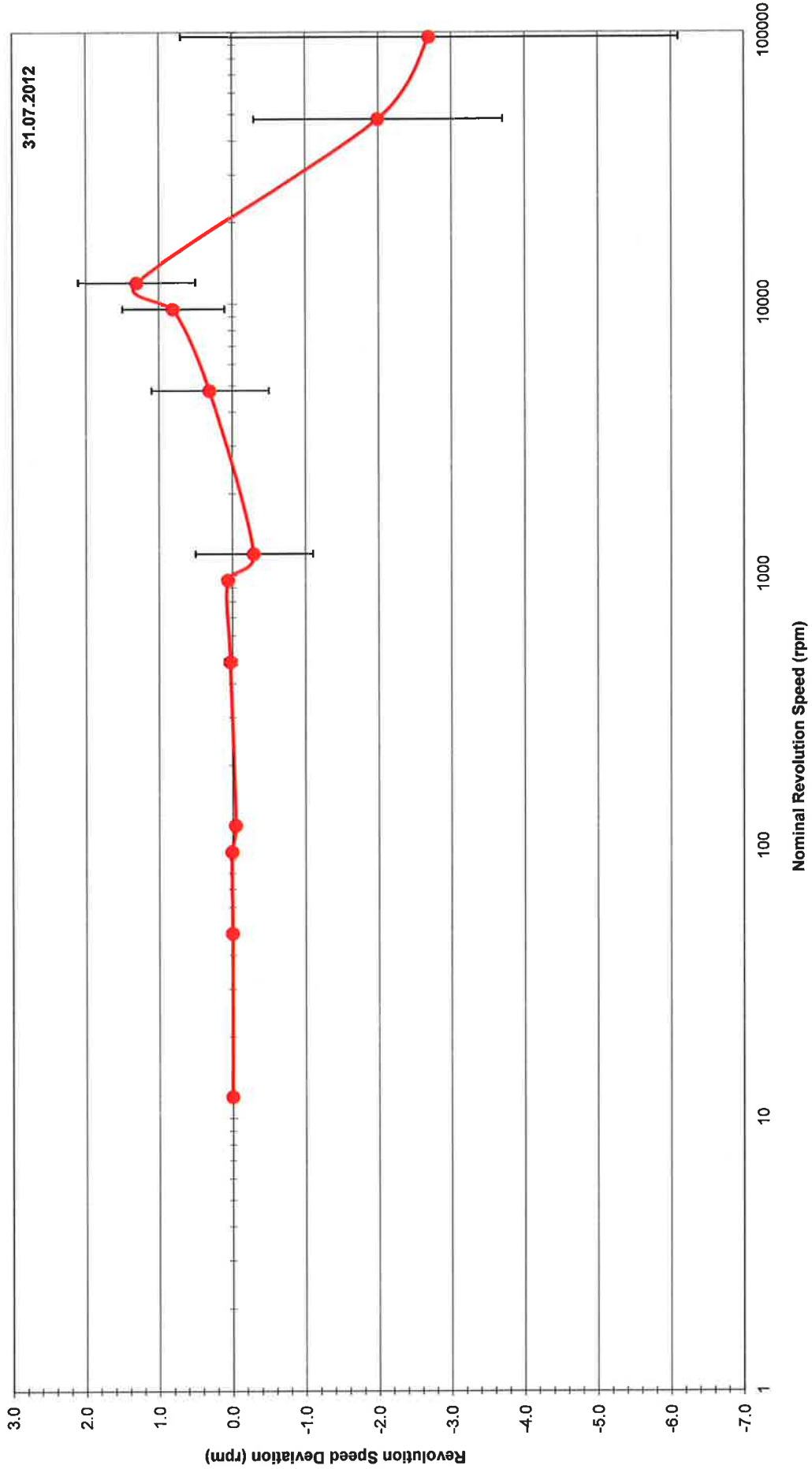
31.07.2012

Measurement Results

Rotation speed Range	Deviation rpm	Uncertainty of measure ± rpm
12	-0.005	0.007
48	-0.005	0.007
96	0	0.008
120	-0.05	0.07
480	0.02	0.08
960	0.05	0.07
1200	-0.3	0.8
4800	0.3	0.8
9600	0.8	0.7
12000	1.3	0.8
48000	-2	1.7
96000	-2.7	3.4

The specified values represent the mean value from 6 measurements.

Model: **Jaquet** Type: **DHO 907** Metas Nr.: **411967** Serial Nr.: **06.06.214692**





Formulaire : **Equipements de test et de mesure**

MANUEL DE MANAGEMENT

Document: 23806-3-fr.doc

P4 /Contrôle

du: 22.04.09

Page : 1 de 2

N° appareil N°: 305	Catégorie : Force
N° article Frewitt : 426113	Service utilisateur : Contrôle
Désignation : Tachymètre	Constructeur : Jaquet
Type : DHO 907 Combi	Vendeur : Jaquet AG - 4009 Bâle
N° de série : 214692	Année d'achat : 2006
Plage(s) : 10 - 10000 T/min	Prix d'achat : 370 CHF
Tolérance (s) : + - 1 %	

Etalonnage interne	Etalonnage externe
<u>Périodicité :</u> mois	<u>Périodicité :</u> 36 mois <u>Effectué chez :</u> Office fédéral de la métrologie - 3003 Berne-Wabern.
<u>Procédure de contrôle :</u>	<u>Procédure de contrôle :</u> Etalonnage entre 10 et 96000 T/min standard. Au laboratoire trafic, à l'att. de Mr. Fasel Walter.

Type de contrôle: Ctrl externe	(si ext.) Certificat reçu : OUI	Equipement conforme : OUI				
Mesure de référence	Mesure effective	Mesure après correction	Conforme ?	Date du ctrl	Contrôleur N°	Vi sa
mm	mm	mm	?	29/06/09	41	Hre
mm	mm	mm	?	<u>Remarque :</u>		
mm	mm	mm	?			

Type de contrôle: ?	(si ext.) Certificat reçu : ?	Equipement conforme : ?				
Mesure de référence	Mesure effective	Mesure après correction	Conforme ?	Date du ctrl	Contrôleur N°	Visa
mm	mm	mm	?			
mm	mm	mm	?	<u>Remarque :</u>		
mm	mm	mm	?			

Type de contrôle: ?	(si ext.) Certificat reçu : ?	Equipement conforme : ?				
Mesure de référence	Mesure effective	Mesure après correction	Conforme ?	Date du ctrl	Contrôleur N°	Vi sa
mm	mm	mm	?			
mm	mm	mm	?	<u>Remarque :</u>		
mm	mm	mm	?			

Type de contrôle: ?		(si ext.) Certificat reçu : ?		Equipement conforme : ?		
Mesure de référence	Mesure effective	Mesure après correction	Conforme ?	Date du ctrl	Contrôleur N°	Vi sa
mm	mm	mm	?			
mm	mm	mm	?			Remarque :
mm	mm	mm	?			

Type de contrôle: ?		(si ext.) Certificat reçu : ?		Equipement conforme : ?		
Mesure de référence	Mesure effective	Mesure après correction	Conforme ?	Date du ctrl	Contrôleur N°	Visa
mm	mm	mm	?			
mm	mm	mm	?			Remarque :
mm	mm	mm	?			

Type de contrôle: ?		(si ext.) Certificat reçu : ?		Equipement conforme : ?		
Mesure de référence	Mesure effective	Mesure après correction	Conforme ?	Date du ctrl	Contrôleur N°	Vi sa
mm	mm	mm	?			
mm	mm	mm	?			Remarque :
mm	mm	mm	?			

Type de contrôle: ?		(si ext.) Certificat reçu : ?		Equipement conforme : ?		
Mesure de référence	Mesure effective	Mesure après correction	Conforme ?	Date du ctrl	Contrôleur N°	Visa
mm	mm	mm	?			
mm	mm	mm	?			Remarque :
mm	mm	mm	?			

Type de contrôle: ?		(si ext.) Certificat reçu : ?		Equipement conforme : ?		
Mesure de référence	Mesure effective	Mesure après correction	Conforme ?	Date du ctrl	Contrôleur N°	Vi sa
mm	mm	mm	?			
mm	mm	mm	?			Remarque :
mm	mm	mm	?			

Certificate of Calibration



N° de Certificat : S - 110802-1R

Nous attestons que l'instrument ci-dessous atteint ou dépasse les spécifications électriques publiées par le fabricant, sur tous les points mesurés. Toutes les mesures sont traçables par des standards nationaux ou internationaux, ou ont été dérivées par une technique approuvée.

We certify that the below instrument meets or exceeds the manufacturers published electrical specifications at the points tested. All measurement are traceable to national or international standards or have been derived by approved ratio technique.

Page 1 de / of 1

CALIBRATION INFORMATION

Type / Model: FLUKE 87

N° de série / Serial Number: 60321248

N° d'inventaire / Asset Number: 111

Client / Customer : FREWITT SA

N° de Commande / Work Order : 11-160

Date de l'étalonnage: 2 août 2011

STANDARDS USED FOR CALIBRATION

<u>Asset Number</u>	<u>Description</u>	<u>Cal. Date</u>	<u>Due Date</u>
s2001	Fluke 5520A Multi product calibrator	28 mars 2011	28 mars 2012

Renato Ricci

Signed: 

Report of Calibration

Servilec SA

UNIT UNDER TEST: **FLUKE 87**
 SERIAL NUMBER : **60321248**
 ASSET NUMBER : **111**
 CERTIFICATE N° : **S-110802-1R**
 CUSTOMER : **FREWITT SA**
 TEMPERATURE : **(23 +/- 3) °C**
 HUMIDITY : **less than 70%**
 TEST RESULT : **PASS**
 PERFORMED ON : **02.08.2011**
 CALIBRATED BY : **Renato Ricci**



REMARKS:

Page 1 de 4

Standards Used

Asset	Description	Cal Date	Due Date
s2001	Fluke 5520A Multi product calibrator	28.mars 2011	28.mars 2012

Test Data

Test	Parameter	----- Unit Under Test -----			ERROR in (% of TOL)	User
		Reading	Tolerance	UUT Error		
DISPLAY TEST						
Result of Operator Evaluation						Pass
AC VOLTAGE TESTS						
400mV Range						
2	350.0 mV @ 60 Hz	349.0mV	2.90mV	-0.286%	35%	Pass
3	350.0 mV @ 1 kHz	349.2mV	3.90mV	-0.229%	21%	Pass
4	350.0 mV @ 5 kHz	346.8mV	7.40mV	-0.914%	43%	Pass
5	350.0 mV @ 20 kHz	349.4mV	9.00mV	-0.171%	7%	Pass
4V Range						
6	3.500 V @ 60 Hz	3.492V	27.00mV	-0.229%	30%	Pass
7	3.500 V @ 1 kHz	3.490V	39.00mV	-0.286%	26%	Pass
8	3.500 V @ 5 kHz	3.465V	74.00mV	-1.00%	47%	Pass
9	3.500 V @ 20 kHz	3.468V	90.00mV	-0.914%	36%	Pass
40V Range						
10	35.00 V @ 60 Hz	34.92V	270.00mV	-0.229%	30%	Pass
11	35.00 V @ 1 kHz	34.98V	390.00mV	-571ppm	5%	Pass
12	35.00 V @ 5 kHz	34.94V	740.00mV	-0.171%	8%	Pass

Test	Parameter	Reading	Tolerance	UUT Error	ERROR in (% of TOL)	User
13	35.00 V @ 20 kHz	34.90V	900.00mV	-0.286%	11%	Pass
400V Range						
14	350.0 V @ 60 Hz	349.2V	2.70V	-0.229%	30%	Pass
15	350.0 V @ 1 kHz	349.9V	3.90V	-286ppm	3%	Pass
16	350.0 V @ 5 kHz	349.4V	7.40V	-0.171%	8%	Pass
17	100.0 V @ 20 kHz	99.5V	4.00V	-0.500%	13%	Pass
18	200.0 V @ 20 kHz	199.8V	6.00V	-0.100%	3%	Pass
19	300.0 V @ 20 kHz	299.7V	8.00V	-0.100%	4%	Pass
20	350.0 V @ 10 kHz	348.5V	9.00V	-0.429%	17%	Pass
1000V Range						
21	900 V @ 60 Hz	903V	8.00V	0.333%	38%	Pass
22	900 V @ 1 kHz	904V	13.00V	0.444%	31%	Pass
23	900 V @ 5 kHz	903V	22.00V	0.333%	14%	Pass
FREQUENCY TESTS						
19.999kHz Range						
24	19.000 kHz @ 150 mV	18.999kHz	2.00Hz	-52.6ppm	50%	Pass
199.99kHz Range						
25	190.00 kHz @ 150 mV	189.99kHz	20.00Hz	-52.6ppm	50%	Pass
DC VOLTAGE TESTS						
4V Range						
26	3.500 V	3.501V	5.00mV	286ppm	20%	Pass
40V Range						
27	35.00 V	35.01V	50.00mV	286ppm	20%	Pass
28	-35.00 V	-35.00V	50.00mV	0.00ppm	0%	Pass
400V Range						
29	350.0 V	350.1V	500.00mV	286ppm	20%	Pass
1000V Range						
30	1000 V	1001V	2.00V	0.100%	50%	Pass
DC MILLIVOLT TEST						
400mV Range						
31	350.0 mV	350.1mV	500.00uV	286ppm	20%	Pass
RESISTANCE TESTS						
400 Ohm Range						
32	190.0 Ohm	190.10hm	500.00mOhm	526ppm	20%	Pass
40 kOhm Range						
33	19.00 kOhm	19.00kOhm	50.00Ohm	0.00ppm	0%	Pass
4 MOhm Range						
34	1.900 MOhm	1.903MOhm	5.00kOhm	0.158%	60%	Pass
40 MOhm Range						
35	19.00 MOhm	19.03MOhm	220.00kOhm	0.158%	14%	Pass
CONDUCTANCE TEST						
40nS Range						
36	10.00 nS	9.96nS	200.00pS	-0.400%	20%	Pass

Test	Parameter	----- Unit Under Test -----			ERROR in		User
		Reading	Tolerance	UUT Error	(% of TOL)		
CAPACITANCE TESTS							
5.00uF Range							
37	1.00 μ F	0.98 μ F	30.00nF	-2.00%	67%	Pass	
0.500uF Range							
38	0.470 μ F	0.468 μ F	7.00nF	-0.426%	29%	Pass	3.22
0.0500uF Range							
39	0.0470 μ F	0.0471 μ F	700.00pF	0.213%	14%	Pass	3.22
DIODE TEST							
40	3.000 V	2.990V	61.00mV	-0.333%	16%	Pass	
DC MILLIAMP TESTS							
DC MILLIAMP TESTS							
40mA Range							
40mA Range							
41	35.00 mA	35.02mA	90.00uA	571ppm	22%	Pass	
400mA Range							
42	350.0 mA	350.0mA	900.00uA	0.00ppm	0%	Pass	
AC MILLIAMP TESTS							
40mA Range							
43	35.00 mA @ 60 Hz	34.95mA	370.00uA	-0.143%	14%	Pass	
44	35.00 mA @ 1 kHz	35.00mA	370.00uA	0.00ppm	0%	Pass	
400mA Range							
45	350.0 mA @ 60 Hz	349.8mA	3.70mA	-571ppm	5%	Pass	
46	350.0 mA @ 1 kHz	350.2mA	3.70mA	571ppm	5%	Pass	
DC MICROAMP TESTS							
400uA Range							
47	350.0 μ A	350.1 μ A	1.00uA	286ppm	10%	Pass	
4000uA Range							
48	3500 μ A	3499 μ A	9.00uA	-286ppm	11%	Pass	
AC MICROAMP TESTS							
400uA Range							
49	350.0 μ A @ 60 Hz	349.4 μ A	3.70uA	-0.171%	16%	Pass	
50	350.0 μ A @ 1 kHz	349.9 μ A	3.70uA	-286ppm	3%	Pass	
4000uA Range							
51	3500 μ A @ 60 Hz	3495 μ A	37.00uA	-0.143%	14%	Pass	
52	3500 μ A @ 1 kHz	3499 μ A	37.00uA	-286ppm	3%	Pass	
DC AMP TESTS							
4000mA Range							
53	3500 mA	3500mA	9.00mA	0.00ppm	0%	Pass	4.00
10A Range							
54	10.00 A	10.00A	40.00mA	0.00ppm	0%	Pass	
AC AMP TESTS							
4000mA Range							
55	3500 mA @ 60 Hz	3496mA	37.00mA	-0.114%	11%	Pass	

Test	Parameter	----- Unit Under Test -----			ERROR in (% of TOL)	User
		Reading	Tolerance	UUT Error		
56	3500 mA @ 1 kHz	3500mA	37.00mA	0.00ppm	0%	Pass
10A Range						
57	10.00 A @ 60 Hz	10.05A	120.00mA	0.500%	42%	Pass
58	10.00 A @ 1 kHz	10.05A	120.00mA	0.500%	42%	Pass

End of Test Data



S Schweizerischer Kalibrierdienst
C Service suisse d'étalonnage
S Swiss Calibration Service

EN ISO/IEC 17025

Von der Schweizerischen Akkreditierungsstelle SAS akkreditierte Kalibrierstelle
Calibration Laboratory accredited by the Swiss Accreditation Service SAS

Akkr. Nr. **042**

**The Swiss Accreditation Service is one of the signatories to the EA
Multilateral Agreement for the recognition of calibration certificates**

Auftragsnummer: **1266**
Order number:

Zertifikat Nr.:
Certificate nr.:

7088b

Kalibrier-Zertifikat Certificate of Calibration

page 1 of 4 pages

Gegenstand: Sicherheitstester
Object:

Hersteller: GMC
Manufacturer:

Typ: Profitest 204
Model:

Ident. Nummer: 5522 8968
Ident. number:

Auftraggeber: GMC-Instruments Schweiz AG 8052 Zürich
Customer:

Bemerkungen: This instrument has been tested and calibrated in all functions.
Remarks: It meets the published specifications as given in the measuring protocol.

Datum der
Kalibrierung: 07.01.11
Date of calibration:

ELS-Elektronik GmbH
CH-8165 Schöfflisdorf
Datum:

Leiter der Kalibrierstelle:
Head of Calibration Laboratory:

K. Haus

Dieses Kalibrierzertifikat darf ohne die schriftliche Zustimmung des Laboratoriums nicht auszugsweise vervielfältigt werden. Messresultate, Messunsicherheiten mit Vertrauensbereich und Messverfahren sind auf den folgenden Seiten aufgeführt und sind Teil dieses Zertifikates. Dieses Kalibrierzertifikat dokumentiert die Rückführbarkeit auf nationale Normale zur Darstellung der physikalischen Einheiten (SI).

This calibration certificate shall not be reproduced except in full, without written approval of the laboratory. The measurements, the uncertainties with confidence probability and calibrations methods are given on the following pages and are part of the certificate. This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI).

ELS-Elektronik GmbH CH-8165 Schöfflisdorf elscal@elscal.ch www.elscal.ch Tel. ++41 (0) 44 856 14 92 Fax. ++41 (0) 44 856 16 67
Form. 2.910.017 3.3.05

Auftragsnummer: **1266**
Order number:Zertifikat Nr.:
Certificate nr.:**7088b****Kalibrierresultate / Calibration Results:**

Die angegebene erweiterte Messunsicherheit ist die Standardunsicherheit der Messung multipliziert mit einem Erweiterungsfaktor $k = 2$, was für eine Normalverteilung einem Vertrauensniveau von etwa 95 % entspricht.

The reported expanded uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor $k = 2$, which for a normal distribution corresponds to a coverage probability of approximately 95 %.

Test Conditions: Lab temperature $23^{\circ}\text{C} \pm 1^{\circ}\text{C}$, relative humidity $45 \pm 5 \%$

Object: Sicherheitstester
Manufacturer: GMC
Model: Profitest 204
Ident. nr.: 5522 8968**Measurement Instruments used:**

Manufacturer / Model	Ident. nr.	last calibration
Calibrator Fluke 5520 A	7120206	08.07.10
Electrical Safety Calibrator Fluke 5320 A	S/N 510900307	05.05.10
Multimeter Fluke 287 Labor 1	96560130	07.09.10

Auftragsnummer: **1266**
Order number:Zertifikat Nr.:
Certificate nr.:**7088b**

Angelegter Wert Nominal value	Anzeige Prüfung Indicated UUT	Dim.	Frequency	Bereich Range	Abweichung Deviation	Messunsicherheit Measurement uncertainty	Test
Schutzleitertest							
Protective conductor resistance							
IAC gemessen an							
IAC measured at	0.11089	Ohm			13.9 Aac	1.08E-02	OK
358.09	360	mOhm	50 Hz		0.53%	3.28E-03	OK
Isolationsprüfung							
Insulation resistance							
Insulation resistance							
UINS measured at 10 MOhm				100 Vdc			
UINS gemessen an				126 Vdc		1.59E-02	OK
1.50	1.50	MOhm	DC	100 V	0.00%	7.70E-03	OK
9.00	9.04				0.44%	1.29E-03	OK
50.00	50.3				0.60%	2.74E-03	OK
Isolationsprüfung							
Insulation resistance							
UINS measured at 10 MOhm				250 Vdc			
UINS gemessen an				293 Vdc		6.86E-03	OK
1.50	1.50	MOhm	DC	250 V	0.00%	7.70E-03	OK
9.00	9.01				0.11%	1.30E-03	OK
50.00	49.9				-0.20%	2.76E-03	OK
Isolationsprüfung							
Insulation resistance							
UINS measured at 10 MOhm				500 Vdc			
UINS gemessen an				573 Vdc		3.69E-03	OK
1.50	1.50	MOhm	DC	500 V	0.00%	7.70E-03	OK
9.00	9.02				0.22%	1.30E-03	OK
50.00	49.8				-0.40%	2.76E-03	OK
Isolationsprüfung							
Insulation resistance							
UINS measured at 10 MOhm				1000 Vdc			
UINS gemessen an				1211 Vdc		1.87E-03	OK
10.00	10.0	MOhm	DC	1000 V	0.00%	1.15E-02	OK
50.00	50.4				0.80%	2.74E-03	OK

Auftragsnummer: **1266**
Order number:Zertifikat Nr.:
Certificate nr.:**7088b**

Angelegter Wert Nominal value	Anzeige Prüfung Indicated UUT	Dim.	Frequency	Bereich Range	Abweichung Deviation	Messunsicherheit Measurement uncertainty	Test
Ableitstromprüfung							
Leakage current							
1.00	1.01	mA	50 Hz		1.00%	1.25E-02	OK
1.50	1.51				0.67%	8.41E-03	OK
2.00	2.01				0.50%	6.35E-03	OK
2.50	2.51				0.40%	5.11E-03	OK
5.00	5.01				0.20%	2.62E-03	OK
Spannungsmessung							
Voltage							
115.0	117	V	DC		1.74%	9.87E-03	OK
230.0	232				0.87%	4.98E-03	OK
400.0	403				0.75%	2.87E-03	OK
990.0	997				0.71%	1.16E-03	OK
115.0	115	V	50 Hz		0.00%	1.01E-02	OK
230.0	230				0.00%	5.06E-03	OK
400.0	400				0.00%	2.96E-03	OK
990.0	989				-0.10%	1.31E-03	OK
Frequenzmessung							
Frequency							
50.0	50.0	Hz			0.00%	2.31E-03	OK
60.0	60.0				0.00%	1.92E-03	OK
400.0	400				0.00%	2.89E-03	OK

Analytical Reference Materials International

Provisional Certificate of Analysis

Certified Reference Material



Grade: 1¼Cr ½Mo / UNS K11572

Part Number (Q.A. NO.): IARM 35JN

Certificate Date: 10/18/2010

Certificate No.: 35JN-10182010-IARM-P

Revision Date: 03/10/2011

Interpretation of Data

1. Certified values listed below reflect analysis results submitted by qualified analytical laboratories using a combination of methods and instrumentation that emulate actual methods and instrumental techniques currently utilized in the analytical community and are reported as % wt. unless otherwise noted.
2. Any data reported and enclosed by a **parentheses ()** is a "best estimate" and is **NOT CERTIFIED**. This data could not be quantified sufficiently for certification. It was however, reported by enough laboratories to be considered as potentially present in the matrix of the material being examined.
3. The "Inter-laboratory Analysis Program" (ILAP) utilized in the establishment of the data are an ongoing program with permanent membership. Certain elements may be selected by a consensus of the members for more extensive testing. Therefore the data in **brackets []** indicates further testing is in process.
4. The "±Estimated Uncertainty" is enclosed by a **parentheses ()** below the individual element's concentration and is based on a Confidence Interval at 95%. Included in this estimated uncertainty, are the combined effects of method imprecision, material inhomogeneity, and any bias between methods.

Important: A "User Registration Card" accompanies all shipments. This card should be completed immediately upon receipt of materials with the appropriate user information. This is the only way in which ARMI can guarantee customer updates or possible data modifications!

<u>Aluminum</u> [0.029] [(0.001)]	<u>Antimony</u> [0.0018] [(0.0005)]	<u>Arsenic</u> [0.004] [(0.001)]	<u>Boron</u> [0.0003] [(0.0001)]	<u>Carbon</u> [0.129] [(0.003)]	<u>Calcium</u> [0.0006] [(0.0002)]	<u>Cobalt</u> [0.006] [(0.001)]	<u>Chromium</u> [1.18] [(0.02)]
<u>Copper</u> [0.087] [(0.002)]	<u>Manganese</u> [0.55] [(0.01)]	<u>Molybdenum</u> [0.45] [(0.01)]	<u>Nitrogen</u> [0.009] [(0.0005)]	<u>Niobium</u> [0.002] [(0.001)]	<u>Nickel</u> [0.086] [(0.002)]	<u>Oxygen</u> [(0.001)]	<u>Phosphorus</u> [0.006] [(0.001)]
<u>Lead</u> [(0.001)]	<u>Sulfur</u> [0.025] [(0.002)]	<u>Silicon</u> [0.60] [(0.01)]	<u>Tin</u> [0.005] [(0.001)]	<u>Titanium</u> [0.0020] [(0.0001)]	<u>Vanadium</u> [0.004] [(0.0004)]	<u>Tungsten</u> [(0.003)]	<u>Zirconium</u>

The laboratories participating in the "Inter-Laboratory Analysis Program" (ILAP) and certification of this material are as follows:

Anderson Laboratories, Inc. - Greendale, WI
Ellwood National Steel - Irvine, PA
Jorgensen Forge Corp. - Seattle, WA
Laboratory Testing, Inc. - Hatfield, PA
NSL Analytical Services - Cleveland, OH
Special Metals IncoTest - Hereford, UK

Colorado Metallurgical Services - Denver, CO
Essar Steel Algoma, Inc. - Sault Ste. Marie, ON
Kalco Metals, Inc - Wheatland, PA
Latrobe Specialty Steel Co. - Latrobe, PA
Outokumpu Stainless OY - Tornio Finland
Stork-MMA Laboratories - Newtown, PA

Traceability: All members of the "Inter-Laboratory Analysis Program" (ILAP) listed above validate test methods and instrument performance utilizing SRMs produced by the National Institute of Standards and Technology, (NIST) as well as other CRMs and RMs produced by recognized Certifying Bodies from around the world. The specific SRMs, CRMs, and RMs applicable to the material covered by this certificate are: NIST 1263, IARM 30C, 40B, 143B, EURO 077-1, NR 2D, MBH 15255, IARM 35B, LECO 501-503, 501-644, NIST 16F, 362, 364, 367, 368, C1152, C1153, C1154, 1161, 1162, 1163, 1164, 1165, 1166, 1167, 1168, 1169, 1261, 1261A, 1262, 1263A, 1264, 1265, 1754, 1761, 1762, 1763, 1764, 1765, 1766, 1767, BAS 401/1, 402/1, 403/1, 404/1, 405/1, 406/1, 407/2, 408/1, 409/1, 410/2, JSS ST01, ST02, ST03, ST04, ST05, ST06, JSS 168-4, 169-4, 170-4, 171-4, 172-4, 173-4, 174-4, 175-4, 190-1, 191-1, 192-1, 193-1, 194-1, 195-1, CZECH 184A, BS 12, 12B, 13, 13B, 14B, 156, 4142SE, CA-1, CA-2, CA-3, CA-4, CA1A, CA2A, CA3A, XAAS, XCCV, XCCS, MBH 12X353, LECO 501-506, 501-510, 502-416, NIST 293, 361, 363, LECO 501-644, NIST 898, 1263A, 1264A, 1761, BS 14B, ALPHA AR660, AR869, AR960, LECO 502-193, 762-747, IARM 35A, ALPHA AR872, NIST 1763, 1765, IARM 35B, LECO 501-510, 502-257, IST 1263A, 1766, 1767, BCS SS 401, SS 401/2, SS 404/2, SS 406/1, SS 407/2, SS 408/2, SS 409/2, SS 454/1, SS 459/1, SS 460/1, EURONORM 096/1, 097-1, LECO 501-502, 501-503, 502-256, NIST 361, 362, 363, 364, IARM 31C, 35C, 35F, 35G, LECO 501-504, 501-644, CKD 169, 170, BS CA-3, 14A, 50B, 64B, 68B, BCS 351, 408, 410, 451, 453, 454/1, 462/1, 483, IH R5657, LECO 501-551, 502-102, NIST 1217, 1225, 1763, IARM 35E, 35F, BS 4942, ALPHA AR660, AR872, IARM 35D

A specific line of traceability is established to NIST and other Certifying Bodies for those elements that are noted as "Certified Values" on the Certificates of Analyses referenced above.

See Reverse Side for Statistical Data and Additional Information Regarding this Material.

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The following data and accompanying statements represent all pertinent information reported in the ILAP as it applies to the chemical characterization of this material as of 03/10/2011.

35JN	Al	As	B	C	Co	Cr	Cu	Mn	Mo	N	Nb	Ni	O	P	Pb
1	0.030	0.0033	0.00016	0.12	0.007	1.191	0.091	0.55	0.46	0.0078	0.001	0.086	0.00050	0.0045	0.001
2	0.030	0.0061	0.0003	0.130	0.007	1.144	0.086	0.539	0.452	0.0090	0.0019	0.085	0.00109	0.0068	0.0017
3	0.0280	0.0051	0.0002	0.132	0.0063	1.172	0.088	0.557	0.439	0.008	0.0026	0.088	0.00048	0.0052	0.0017
4	0.0280	0.0035	0.0004	0.1327	0.0054	1.2522	0.0877	0.557	0.450	0.00944	0.0016	0.0855	0.0014	0.0072	0.0001
5	0.0305	0.0025	0.0005	0.1224	0.0052	1.181	0.08045	0.5494	0.4373	0.00939	0.0022	0.0797	0.0010	0.0064	0.0001
6	0.028	0.0023	0.0004	0.125	0.005	1.23	0.080	0.5665	0.4725	0.00852	0.0023	0.089		0.005	
7	0.0259	0.0031	0.0002	0.128	0.0065	1.155	0.084	0.555	0.488	0.008		0.085		0.0056	
8	0.029		0.0002	0.1279	0.0077	1.159	0.0872	0.538	0.442	0.0087		0.088		0.0055	
9	0.0293			0.128	0.006	1.2122	0.0899	0.5543	0.442	0.0090		0.0926		0.0070	
10	0.0283			0.1262	0.0065	1.145	0.0908	0.53	0.4474	0.0071		0.080		0.006	
11	0.0273			0.129		1.165	0.088	0.554	0.4738	0.0096		0.089		0.0053	
12	0.0279			0.136		1.1652	0.090	0.5577	0.469	0.0097		0.0857		0.0076	
13	0.0306			0.1353		1.1786	0.0832	0.5505	0.443	0.0092				0.0078	
14				0.1285			0.0868		0.4496						
15									0.4476						
Mean	0.0287	0.0037	0.0003	0.1286	0.0063	1.1808	0.0866	0.5506	0.4542	0.0087	0.0019	0.0881	0.0009	0.0061	0.0009
STDV.	0.0014	0.0014	0.0001	0.0045	0.0009	0.0329	0.0038	0.0098	0.0151	0.0008	0.0006	0.0037	0.0004	0.0011	0.0008
Certified	0.029	0.004	0.0003	0.129	0.006	1.18	0.087	0.55	0.45	0.009	0.002	0.086	(0.001)	0.006	(0.001)
95% C.I.	0.001	0.001	0.0001	0.003	0.001	0.02	0.002	0.01	0.01	0.0005	0.001	0.002		0.001	
Methods	I,O	X,H,I,O	I,O	C,O	X,I,O	X,I,O	X,I,O	X,I,O	X,I,O	F,O	X,O	X,I,O	F	X,I,O	H,O

Legend: W = Classical, C = Combustion, F = Fusion, A = AA or GFAA, I = ICP or DCP, D = DC Arc, O = AES, X = XRF, G = GDAES or GDMS, H = Hollow Cathode AES

35JN	S	Si	Sn	Ti	V	W	Bi	Ca	H	Mg	Sb	Se	Ta	Zn	Zr
1	0.024	0.581	0.0047	0.0019	0.003	0.0046	<0.0001	0.00043	<0.0001	0.0001	0.0019	<0.00005	<0.001	0.0018	<0.001
2	0.0248	0.598	0.007	0.0022	0.0034	0.0018	0.0004	0.0008		<0.0001	0.0015	0.0005	0.0036	0.0006	0.0033
3	0.0224	0.612	0.0054	0.002	0.0037	0.0005	0.00002	0.0002		0.0001	0.0018	0.00005	<0.0001	0.0015	<0.0001
4	0.0224	0.5984	0.0054	0.0022	0.0025	0.0029	0.0001	0.001		0.0001	0.0010		0.003	0.0011	0.0146
5	0.0290	0.6085	0.0041	0.0020	0.0044	0.0025		0.0005		0.0005	0.0024		<0.0001	0.0014	0.0015
6	0.0277	0.61	0.0046	0.0023	0.0046			0.0007			0.0022				0.0011
7	0.0228	0.591	0.0072	0.0018	0.0037			0.0005							<0.0001
8	0.0235	0.590	0.0074	0.0019	0.0032										
9	0.0269	0.5938	0.003		0.004										
10	0.0292	0.5993	0.0053		0.0033										
11	0.0253	0.615	0.0041		0.0038										
12	0.0257	0.608	0.0061												
13		0.6035													
14		0.6126													
Mean	0.0253	0.6012	0.0054	0.0020	0.0036	0.0025	0.0002	0.0006	#DIV/0!	0.0002	0.0018	0.0003	0.0033	0.0013	0.0051
STDV.	0.0024	0.0101	0.0014	0.0002	0.0006	0.0015	0.0002	0.0003	#DIV/0!	0.0002	0.0005	0.0003	0.0004	0.0005	0.0064
Certified	0.025	0.60	0.005	0.0020	0.004	(0.003)		0.0006			0.0018			(0.001)	
95% C.I.	0.002	0.01	0.001	0.0001	0.0004			0.0002			0.0005				
Methods	C,O	X,I,O	X,I,O	X,O	X,I,O	X,I,O		I,O			X,H,O			X,H,I,O	

Legend: W = Classical, C = Combustion, F = Fusion, A = AA or GFAA, I = ICP or DCP, D = DC Arc, O = AES, X = XRF, G = GDAES or GDMS, H = Hollow Cathode AES

The International Standards Organization (ISO) definitions, expressed in ISO Guide 30-1992 list the following:

Certifying Body: Any technically competent body (organization or firm, public or private) that issues a reference material certificate, which provides the information, detailed in ISO Guide 31. The only generally accepted certifying body in the United States for primary standards - Standard Reference Materials (SRM) is the U. S. Department of Commerce, National Institute of Standards & Technology, (NIST), Gaithersburg, MD. All other certifying bodies in the United States produce Reference Materials (RM) or Certified Reference Materials (CRM).

Reference Material (RM): Material or substance one or more of whose property values are sufficiently homogeneous and well established to be used for the calibration of an apparatus, the assessment of a measurement method, or for assigning values to materials.

Certified Reference Material (CRM): Reference material, accompanied by a certificate, one or more of whose property values are certified by a procedure, which establishes its traceability to an accurate realization of the unit in which the property values are expressed, and for which each certified value is accompanied by an uncertainty at a stated level of confidence.

Inter-Laboratory Analysis Program (ILAP): Although ASTM Standard E691-87 applies to inter-laboratory studies to "Determine the Precision of a Single Test Method", it is also a well thought out and logical plan for conducting an inter-laboratory program involving multiple techniques. Therefore, the planning, conducting, analyzing, protocol, and treatment of data resulting from this inter-laboratory program were performed utilizing the guidelines established in ASTM E691-87.

Methods of Analysis: In view of the fact, that the "Inter-Laboratory Analysis Program" entails a wide variety of materials, no single analytical method would provide optimum data results. Therefore, the methods utilized were a combination of ASTM Standard Methods for classical wet chemistry, ICP, AA, Optical Emission, and X-Ray spectrometric methods. The determinations for Carbon, Sulfur, Nitrogen, and Oxygen are the result of combustion and OE instrument procedures.

Expiration of Certification: The certification of this IARM is valid indefinitely, within the uncertainty specified, provided the IARM is handled and stored in accordance with the instructions stated on this certificate. The certification is nullified if the IARM is damaged, contaminated, otherwise modified, or used in a manner for which it was not intended.

Instructions for Use: The test surface is the side opposite to the labeled surface, which includes the IARM number. The entire thickness of the unit is certified. However, the user is cautioned not to measure disks less than 2 mm thick when using X-ray fluorescence spectrometry. Each packaged disk has been prepared by finishing the test surface using a lathe. The user must determine the correct surface preparation procedure for each analytical technique. The user is cautioned to use care when either resurfacing the disk or performing additional polishing as these processes may contaminate the surface. When not in use, the material should be stored in a cool, dry location. This material was tested using both the solid disks and chips prepared from the disks. The certified values are considered representative of the overall average composition of the material. **Chips are not intended for Nitrogen, or Oxygen analysis.**

Selection of Materials: A "batch" or "series" is defined as a single bar of one continuous length and heat. The majority of materials are in wrought condition; other methods of manufacture are utilized as a less desirable resort. ILAP samples are taken by removing a section, a minimum of, every one-twelfth of total length from the entire bar. A portion of the section is converted to chips and thin (pin) disk for analysis by classical wet chemistry, ICP, AA, and combustion procedures, and the balance remains as a thick disk for OES and X-Ray analysis. This systematic sampling procedure results in the homogeneity being reflected as a product of the overall statistics and certified data. This method of homogeneity testing is in accordance with ISO Guide 34, regarding the systematic selection and testing of a representative number of units for the assessment of homogeneity.



William D. Britt, President, & General Manager
Analytical Reference Materials International Corporation

Certificate No.: 35JN-10182010-IARM-P
Certificate Date: 10/18/2010
Revision Date/No.: 03/10/2011

Apparail 405

Mitutoyo

Mitutoyo Corporation

20-1, Sakado 1-chome, Takatsu-ku,
Kawasaki, Kanagawa, 213-8533, Japan
Phone (044) 813-8230

ONE YEAR WARRANTY

Product Name Mitutoyo Sufitest SJ-301 Code No.

Serial No. 400197 Date Purchased

Mitutoyo Corporation conducts quality assurance under ISO 9000 certified quality system. This product conforms to the MITUTOYO inspection standard, and the standard (s) used for the calibration is /are traceable to the national(international) standard (s).

In the event that this product should fail within one (1) year from the original date of purchase through normal use conforming to the User's Manual provided with the product and Warning Label(s) on the product, we will repair or replace at our option, free of charge, upon its prepaid return to Mitutoyo with this WARRANTY card.

*Purchaser is requested to fill the blank above and retain the warranty card at hand. Return card only when requesting Warranty Service.

Y. Yamamoto
Quality Assurance Office
Y. Yamamoto Manager

This warranty shall not apply if the product and consumables have been subject to fair wear and tear, abuse through misuse or improper use/handling/storage/maintenance/service/repair or through adaptation/modification by the original purchase or any third party without prior written consent of Mitutoyo or as a result of damage by an actual disaster or circumstances beyond the control of Mitutoyo.

To obtain service under this warranty the product must be returned to the store/dealer you purchased from along with the warranty card. Any postage, insurance, or shipping charges incurred in returning the product for service are the responsibility of the purchaser.

*This warranty is not transferable and is only valid within the country of the original purchase

*You may have additional rights under the laws of country of original purchase that do not allow the exclusion of implied warranties or the exclusion or limitation of certain damages if these laws apply, Mitutoyo's limitations and exclusions may not apply to you.

Quality Assurance under the ISO 9000 Registered Quality System

The latest status of the ISO9000 registration is posted on our website
<http://www.mitutoyo.co.jp>

Mitutoyo Sufitest SJ-301

DATE 13-05-2014
HEURE 09:13:00

NORME JIS2001
PROFIL R
FILTRE GAUSS
EVA-L 4.0mm
N 5
λc 0.8mm
λs 2.5μm
C. INCLIN. TOUS
VITESSE - M 0.5mm/s
PLAGE AUTO

PRE/POST ESC
DRIVE ON
STAND

R-PROFIL

EVA-L 4.0mm
λc 0.8mmX5

Ra 2.94μm

Mitutoyo

WA140 ⑫

保証書

商品名

コード番号

製造番号

お買い上げ日

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- ◆お買い上げ後の移送、輸送、落下などによる故障または損傷
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- ◆消耗品の消耗による故障または損傷
- ◆火災、地震、水害、落雷、その他の天災地変、公害、煙害、ガス害(硫化ガスなど)による故障または損傷
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<http://www.mitutoyo.co.jp>

ATEX

Informations complémentaires pour machines Eex Conditions spéciales « X »	Zusatz - Sicherheitshinweise EEx- Maschinen Besondere Bedingungen « X »	Additional information for EEx-Machines Special conditions « X »
Machines à fragmenter Ligne ConiWitt / TurboWitt	Zerkleinerungs- und Siebmaschinen ConiWitt / TurboWitt Reihe	Sizing & sieving mills ConiWitt / TurboWitt - Line

Indications de sécurité :

L'installation ne peut être qu'utilisée dans les conditions admises, décrites dans le manuel d'utilisation standard.

Une utilisation non conforme de l'installation ou une mise en service de l'installation sans respecter le mode d'emploi peut entraîner une annulation de garantie du fabricant.

Les modifications et corrections de l'installation qui influencent la protection antidéflagrante ne sont pas permises.

- La protection de l'installation contre une surpression, coups de bélier (à cause d'une explosion) et une augmentation de température non admise et une mauvaise direction de rotation est à prévoir du côté de l'utilisateur. Sauf information contraire dans le mode d'emploi, l'installation n'est pas conçue pour retenir une explosion.
- La détérioration de l'installation par l'utilisateur doit être prise en considération et être exclue d'une manière efficace.

Sicherheitshinweise :

Verwenden Sie das Betriebsmittel nur für den zugelassenen Einsatzzweck, wie beschrieben in der Standardbetriebsanleitung.

Fehlerhafter oder unzulässiger Einsatz sowie das Nichtbeachten der Hinweise dieser Sicherheitshinweise schliesst eine Gewährleistung seitens FREWITT SA aus.

Umbauten sowie Veränderungen am Betriebsmittel, die den Explosionsschutz beeinträchtigen, sind nicht gestattet.

- Die Absicherung der Maschine gegen Überdruck, Druckstoss (durch eine Explosion), unzulässige Temperaturerhöhung und falsche Drehrichtung ist betreiberseitig zu gewährleisten. Wenn nicht Gegenteiliges in der Gebrauchsanweisung beschrieben ist, ist die Maschine nicht druckstossfest ausgeführt.
- Der absichtliche Missbrauch der Maschine durch den Betreiber muss in Betracht gezogen und auf eine wirksame Weise ausgeschlossen werden.

Safety Indications :

Do only use the machine in the allowed conditions and purposes, as described in the standard operating instructions of the machine.

In case of a non-conform use of the machine, as well as a start-up of the machine without consulting the instruction manual excludes further guarantee of the machine by FREWITT SA.

Modifications and adaptations on the machine that modified the explosion protection are not allowed.

- Protection against a not allowed Pressure level, pressure wave (due to an explosion), temperature and a wrong rotation direction has to be implemented by the user. Except contrary information in the instruction manual, the machine is NOT pressure shock resistant.
- Furthermore, avoiding the abuse of the machine is also duty of the user.

Conditions spéciales «X»:

Basées sur les justifications thermiques, les conditions suivantes ont été fixées :

- La température ambiante pendant le fonctionnement de l'installation est limitée de Temp $\geq -20^{\circ}\text{C}$ à $\leq +28^{\circ}\text{C}$ avec filtre et de $\geq -20^{\circ}\text{C}$ à $\leq +30^{\circ}\text{C}$ sans filtre.

L'installation est conçue sans tenir compte des dangers induits par la matière à fragmenter.

L'utilisateur doit par sa propre responsabilité écarter tout risque d'explosion pour garantir l'utilisation correcte de l'installation

L'utilisateur final doit contrôler l'absence de contact mécanique entre les parties fixes et mobiles de l'outillage lors de chaque opération de montage/démontage

L'utilisateur final doit contrôler l'intégrité de l'outillage de broyage lors de chaque opération de montage/démontage

L'installation est, selon son équipement, utilisable dans les zones à dangers d'explosion pour les **zones 0 ou 20**. (voir plaquette signalétique).

Toutes les pièces mécaniques, directement en contact avec le produit, sont approuvées pour les **zones 0 et 20** (voir plaquette signalétique).

Besondere Bedingungen «X»:

Aufgrund des internen Prüfberichtes wurden die folgenden Bedingungen definiert.

- Die Umgebungstemperatur im Betrieb ist begrenzt von $\geq -20^{\circ}\text{C}$ bis $\leq +28^{\circ}\text{C}$ mit Filter und von $\geq -20^{\circ}\text{C}$ bis $\leq +30^{\circ}\text{C}$ ohne Filter.

Das Betriebsmittel ist ohne Berücksichtigung allfälliger Gefährdungen der zu verarbeiteten Feststoffe konzipiert worden.

Der Betreiber muss in eigener Verantwortung dafür Sorge tragen, dass Explosionsrisiken ausgeschlossen werden, die ein ordnungsgemässes Betreiben der Anlage verhindern.

Bei jeder Montage/Demontage der Einheit muss der Endbediener sicherstellen, dass zwischen den unbeweglichen und beweglichen Teilen der Werkzeuge kein mechanischer Kontakt besteht

Bei jeder Montage/Demontage der Einheit muss der Endbediener sicherstellen, dass die Zerkleinerungswerkzeuge einwandfrei funktionieren

Das Betriebsmittel ist je nach Ausführung für den Einsatz in explosionsgefährdeten Zonen der **Zonen 0 oder 20** zugelassen (siehe Typenschild).

Alle mechanischen Teilen, die direkt mit den zu verarbeiteten Stoffen in Kontakt kommen, sind für die **Zonen 0 und 20** geeignet (siehe Typenschild).

Special conditions « X »:

In accordance to the internal thermal tests, the next conditions are allowed:

- The ambient temperature Tamb is limited from Tamb $\geq -20^{\circ}\text{C}$ to $\leq +28^{\circ}\text{C}$ with filters and from $\geq -20^{\circ}\text{C}$ to $\leq +30^{\circ}\text{C}$ without filters.

The machine is been developed without consideration of all kinds of danger due to the used solids in the machine.

The user of the machine has to take care avoid any explosion risk to guarantee the proper functioning of the machine.

Each time the unit is assembled/dismantled, the end user must make sure that there is no mechanical contact between the stationary and moving parts of the tools.

Each time the unit is assembled/dismantled, the end user must make sure that the crushing tools are intact.

The machine is depending on the execution allowed to be used in a hazardous environment in the **zone 0 or 20** (see name plate).

All the mechanical parts, direct in contact with the treated material, are all allowed for the **zone 0 and 20** (see name plate).

Indications et recommandations techniques pour l'utilisation conforme à l'installation

Les caractéristiques des produits utilisés sur l'installation doivent correspondre aux exigences selon la « Table 1 : Caractéristiques spécifiques des produits »

Caractéristiques thermiques	Valeur « Poussière »	Valeur « Gaz »
Température d'allumage minimale pour les gaz		T4
Température d'allumage minimale d'une couche de poussière	> 232 °C	
Température d'allumage minimale d'un nuage de poussière	> 235 °C	
Energie d'allumage minimale	>1 mJ	>1 mJ

Table 1 : caractéristiques spécifiques des produits

Angaben und sicherheitstechnische Limitierungen zur bestimmungsgemässen Verwendung :

Die Eigenschaften der verwendeten Feststoffe müssen Kennzahlen gemäss « Table 1: Produktspezifischen Daten » erfüllen.

Brenneigenschaften	Kennzahl « Staub »	Kennzahl « Gas »
Minimale Zündtemperatur für Gase		T4
Mindestzündtemperatur einer Staubschicht	> 232 °C	
Mindestzündtemperatur einer Staubwolke	> 235 °C	
Mindest Zündenergie	>1 mJ	>1 mJ

Table 1 :Produktspezifischen Daten

Dedicated use: Indications and safety limitations

The properties of the solids used on the machine have to correspond with « Table 1: Product specific Information ».

Fire characteristics	Value « Dust »	Value « Gas »
Minimum ignition temperature for gas		T4
Minimum striking temperature of a dust film	> 232 °C	
Minimum ignition temperature of a dust cloud	> 235 °C	
Minimum ignition energy	>1 mJ	>1 mJ

Table 1: product specific Information

- Uniquement les solvants ou les produits contenant des solvants du groupe de gaz IIA, IIB peuvent être utilisés sur l'installation. **Pour les machines en exécution IIC - les solvants du groupe IIC (seulement à l'extérieur de la machine) peuvent être utilisés.**
- L'obstruction du treillis par le produit peut engendrer une augmentation de la température du produit et provoquer une explosion. L'obstruction du treillis par le produit est une situation qui n'est pas permise. Le passage du produit doit être continuellement garanti par l'utilisateur.
- Les produits utilisés dans l'installation ne doivent pas être sensibles aux chocs mécaniques. Les particules étrangères dans le produit ne sont pas admises.

- Es dürfen nur organische Lösungsmittel oder lösungsmittelhaltige Feststoffe verwendet werden, die der Gasgruppe IIA oder IIB entsprechen. **Für die Maschinen in IIC-Ausführung dürfen entsprechende Lösungsmittel nur ausserhalb der Maschine verwendet werden.**
- Verstopfungen im oder am Sieb können zu Temperaturerhöhungen führen und eine Explosion auslösen. Das Verstopfen im oder am Sieb ist unter allen Umständen zu vermeiden. Vom Betreiber ist der kontinuierliche Durchsatz sicher zu stellen.
- Es dürfen ausschliesslich schlagunempfindliche und fremdkörperfreie Feststoffen verarbeitet werden.

- It is only allowed to use solvents or solvent-contained solids that correspond to the gas-group IIA or IIB. **For machines in IIC execution - only solvents group IIC (only outside the machine) can be used.**
- Obstruction of the screen by the solids may increase the temperature and cause an explosion. The obstruction of the screen is not allowed. The conditions to avoid obstruction have to be assured by the user.
- The products used in the installation should not be sensitive to mechanical shocks. Foreign particles in the product are not allowed.

- Si dans le cas où l'évaluation des risques d'explosion finale, rédigée par l'utilisateur, ne couvre pas entièrement l'analyse de risques de l'installation, un cahier des charges de la part de l'utilisateur doit être transmis pour permettre une nouvelle appréciation des risques.
- Führt die Bewertung der Betreiber zu dem Ergebnis, dass das Risiko oberhalb des tolerierbaren Risikos liegt, so muss ein detailliertes Pflichtenheft abgegeben werden, woraus anschließend mittels einer erneuten Risikobeurteilung weitere Schutzmassnahmen berücksichtigt werden.
- Adequate precautions has to be taken if the risk assessment results in the fact that the risk is higher than the tolerable risk. In this case, a user specifications has to be transmitted to Frewitt.. Afterwards a new risk assessment has to be realised.

Faire attention aux points suivants pendant le montage, la mise en service et le fonctionnement de l'installation :

- Indications de sécurité de ce mode d'emploi.
- les indices et conditions de fonctionnement de la plaque signalétique.
- Les indications supplémentaires sur l'installation.
- Les certificats Atex , les certificats de conformité et les certificats des pièces détachées et leur contenu concernant les conditions spéciales de fonctionnement.
- Les différents modes d'emploi, instructions de montage et d'utilisation et prescriptions de sécurité des éléments installés sur l'installation.
- Les endommagements, les corrections et les modifications sans permission excluent une garantie de la part du fabricant.
- On ne peut dans aucun cas, dû a une source de chaleur extérieure, constater une augmentation de la température de la surface de l'installation pendant le fonctionnement de l'installation.
- Les normes de sécurité, de montage et de mise en service nationale, ainsi que les règles de la technique sont également à appliquer.

Bei Errichtung und Betrieb ist Folgendes unbedingt zu beachten:

- Die Sicherheitshinweise in der Betriebsanleitung
- Die Kennwerte und Betriebsbedingungen gemäss der Typen- und Datenschilder
- Die zusätzlichen Hinweisschilder auf dem Betriebsmittel
- Die EG - Baumusterprüfbescheinigung (nach ATEX 94/9/EG), der Konformitätsnachweis bzw. die Konformitäts- oder Teilbescheinigungen (nach bisheriger Zulassung) und die darin enthaltenen besonderen Bedingungen (falls vorhanden)
- Sämtliche Bedienungsanleitungen, Montage-, Anwendungs- und Sicherheitsvorschriften der im Betriebsmittel „Zerkleinerungsmaschine ConiWitt / TurboWitt“ eingebauten Geräte.
- Bei der Installation ist speziell zu beachten, dass das Betriebsmittel „Zerkleinerungsmaschine ConiWitt / TurboWitt“ nicht zusätzlich aufgewärmt wird. Die zulässigen Oberflächentemperaturen dürfen auf keinen Fall überschritten werden
- Die nationalen Sicherheits-, Montage- und Errichtungsvorschriften sowie die allgemein anerkannten und gültigen Regeln der Technik

Pay attention to the next points during the assembly, start-up and during running of the machine:

- Safety indications in the instruction manual
- The conditions of installation and connections according to the label
- additional indications on the machine
- The-Atex-certificates , conformity-certificates and the individual certificates of the parts and there explanations concerning special conditions
- Different instruction manuals, assembly and user instructions of the elements installed on the ConiWitt / TurboWitt sieving machine.
- Damage, adaptations and modifications without permission excludes further guarantee of the machine by Frewitt.
- It is not allowed to increase the temperature of the surface of the machine due to external sources during the functioning of the ConiWitt / TurboWitt sieving machine.
- National Safety norms, national assembly and start-up formalities, as well as technical rules are also applicable.

En cas de non-respect des instructions, ou en cas d'endommagement, de modifications non-conformes de l'installation, la certification selon ATEX 94/9/CE n'est plus valide.

Werden die genannten Hinweise nicht beachtet oder weist das Betriebsmittel Beschädigungen auf oder wurden zusätzliche nicht bewilligte Einbauten angebracht, wird der Zertifizierung nach ATEX 94/9/EG automatisch ungültig.

In case of non respect of the indications, damage occurred to the installation, or non conform modifications have been realised, the ATEX 94/9/EC certification is not valid anymore.

Informations complémentaires pour machines Eex
Conditions spéciales « X »

Zusatz - Sicherheitshinweise EEx- Maschinen
Besondere Bedingungen « X »

Additional information for EEx-Machines
Special conditions « X »

Extracteur ProFi-Sword

Austragshilfe ProFi-Sword

Discharge help ProFi-Sword

Indications de sécurité :

Sicherheitshinweise :

Safety Indications :

L'installation ne peut être qu'utilisée dans les conditions admises, décrites dans le manuel d'utilisation standard.

Verwenden Sie das Betriebsmittel nur für den zugelassenen Einsatzzweck, wie beschrieben in der Standard Betriebsanleitung.

Do only use the machine in the allowed conditions and purposes, as described in the standard operating instructions of the machine.

Une utilisation non conforme de l'installation ou une mise en service de l'installation sans respecter le mode d'emploi peut entraîner une annulation de garantie du fabricant.

Fehlerhafter oder unzulässiger Einsatz sowie das Nichtbeachten der Hinweise dieser Sicherheitshinweise schließt eine Gewährleistung des Herstellers.

In case of a non-conform use of the machine, as well as a start-up of the machine without consulting the instruction manual excludes further guarantee of the manufacturer

Les modifications et corrections de l'installation qui influencent la protection antidéflagrante ne sont pas permises.

Umbauten sowie Veränderungen am Betriebsmittel, die den Explosionsschutz beeinträchtigen, sind nicht gestattet.

Modifications and adaptations on the machine that modified the explosion protection are not allowed.

- La protection de l'installation contre une surpression, coups de bélier (à cause d'une explosion) et une augmentation de température non admise est à prévoir du côté de l'utilisateur. L'installation n'est pas conçue pour retenir une explosion.
- La détérioration de l'installation par l'utilisateur doit être prise en considération et être exclue d'une manière efficace.

- Die Absicherung der Maschine gegen unzulässigen Druck, Druckstoss, Temperatur und falsche Drehrichtung ist Anlagenseitig zu gewährleisten. Die Maschine ist nicht Druckstossfest gebaut.
- Weiterhin muss ein absichtlicher Missbrauch vom Betreiber in Betracht gezogen werden.

- Protection against a not allowed Pressure level, pressure wave (due to an explosion), temperature and a wrong rotation direction has to be implemented by the user. The machine does NOT resist to an explosion.
- Furthermore, avoiding the abuse of the machine is also duty of the user.

Conditions spéciales «X» :

Basées sur les justifications thermiques, les conditions suivantes ont été fixées :

- La température ambiante pendant le fonctionnement de l'installation est limitée de Temp $\geq -20^{\circ}\text{C}$ à $\leq +40^{\circ}\text{C}$

L'installation est conçue sans tenir compte des dangers induits par la matière à fragmenter.

L'utilisateur doit par sa propre responsabilité écarter tout risque d'explosion pour garantir l'utilisation correcte de l'installation

L'installation est, selon son équipement, utilisable dans les zones à dangers d'explosion pour les **zones 1 ou 21**. (voir plaquette signalétique)

Toutes les pièces mécaniques, directement en contact avec le produit, sont approuvées pour les **zones 1 et 21**.

Besondere Bedingungen «X»:

Aufgrund des internen Prüfberichtes wurden die folgenden besonderen Bedingungen definiert.

- Die Umgebungstemperatur im Betrieb ist begrenzt von -20°C bis $+40^{\circ}\text{C}$

Das Betriebsmittel ist konzipiert ohne Berücksichtigung allfälliger Gefährdungen der zu verarbeiteten Feststoffe

Der Betreiber muss in eigener Verantwortung dafür sorgen, dass allfällige Gefährdungen der Feststoffe im Explosionsschutzdokument berücksichtigt werden.

Das Betriebsmittel ist je nach Ausführung für den Einsatz in den **Zonen 1 oder 21** zugelassen (siehe Typenschild)

Alle mechanischen Teilen, die direkt mit den zu verarbeiteten Stoffen in Kontakt kommen, sind für die **Zonen 1 und 21** geeignet.

Special conditions « X » :

In accordance to the internal thermal tests, the next conditions are allowed :

- The environment temperature Tamb is limited : - Tamb $\geq -20^{\circ}\text{C}$ till $\leq +40^{\circ}\text{C}$.

The machine is been developed without consideration of all kinds of danger due to the used solids in the machine.

The user of the machine has to take care of the explosion risk assessment to guarantee the proper functioning of the machine.

The machine is depending on the execution allowed to be used in a hazardous environment in the **zone 1 or 21** (see label on machine)

All the mechanical parts, direct in contact with the treated material, are all allowed for the **zone 1 and 21**.

Indications et recommandations techniques pour l'utilisation conforme à l'installation

Les caractéristiques des produits utilisés sur l'installation doivent correspondre aux exigences selon la « Tabelle 1 : Caractéristiques spécifiques des produits »

Angaben und Sicherheits-technische Limitierungen zur bestimmungsgemässer Verwendung :

Die Eigenschaften der verwendeten Feststoffe müssen Kennzahlen gemäss « Tabelle 1: Produktspezifischen Daten » erfüllen.

Dedicated use: Indications and safety limitations

The properties of the solids used on the machine has to correspond with« Table 1: product specific Information ».

Caractéristiques thermiques	Valeur « Pous-sière »	Valeur « Gaz »
Température d'allumage minimale pour les gaz		T4
Température d'allumage minimale d'une couche de poussière	> 200°C	
Température d'allumage minimale d'un nuage de poussière	> 187°C	
Energie d'allumage minimale	>1 mJ	>1 mJ

Tabelle 1 : caractéristiques spécifiques des produits

Brenneigenschaften	Kennzahl « Staub »	Kennzahl « Gas »
Minimale Zündtemperatur für Gase		T4
Mindestzündtemperatur einer Staubschicht	> 200°C	
Mindestzündtemperatur einer Staubwolke	> 187°C	
Mindestzündenergie	>1 mJ	>1 mJ

Tabelle 1 :Produktspezifischen Daten

Fire characteristics	Value « Dust »	Value « Gas »
Minimum ignition temperature for gas		T4
Minimum striking temperature of a dust film	> 200°C	
Minimum ignition temperature of a dust cloud	> 187°C	
Minimum ignition energy	>1 mJ	>1 mJ

Table 1: product specific Information

- Uniquement les solvants ou les produits contenant des solvants du groupe de gaz IIA et IIB peuvent être utilisés sur l'installation.

- Es dürfen nur Organische Lösungsmittel oder Lösungsmittelhaltenden Feststoffen verwendet werden, die die Gasgruppe IIA oder IIB entsprechen.

- It is only allowed to use solvents or solvent-contained solids that correspond to the gas-group IIA or IIB.

Faire attention aux points suivants pendant le montage, la mise en service et le fonctionnement de l'installation :

- Indications de sécurité de ce mode d'emploi.
- les indices et conditions de fonctionnement de la plaquette signalétique.
- Les indications supplémentaires sur l'installation.
- Les certificats Atex , les certificats de conformité et les certificats des pièces détachées et leur contenu concernant les conditions spéciales de fonctionnement.
- Les différents modes d'emploi, instructions de montage et d'utilisation et prescriptions de sécurité des éléments installés sur l'installation.
- Les endommagements, les corrections et les modifications sans permission excluent une garantie de la part du fabricant. Durant le fonctionnement de l'installation, il faut exclure toute augmentation de la température de la surface due à une source de chaleur externe.
- Les normes de sécurité, de montage et de mise en service nationale, ainsi que les règles de la technique sont également à appliquer.

Bei Errichtung und Betrieb ist Folgendes unbedingt zu beachten :

- Die Sicherheitshinweise in der Betriebsanleitung
- Die Kennwerte und Betriebsbedingungen gemäß der Typen- und Datenschilder
- Die zusätzlichen Hinweisschilder auf dem Betriebsmittel
- Die EG - Baumusterprüfbescheinigung (nach ATEX 94/9/EG), der Konformitätsnachweis bzw. die Konformitäts- oder Teilbescheinigungen (nach bisheriger Zulassung) und die darin enthaltenen besonderen Bedingungen (falls vorhanden)
- Sämtliche Bedienungsanleitungen, Montage-, Anwendungs- und Sicherheitsvorschriften der im Betriebsmittel eingebauten Geräte. Bei der Installation ist speziell zu beachten, dass das Betriebsmittel nicht zusätzlich aufgewärmt wird. Die zulässigen Oberflächentemperaturen dürfen auf keinen Fall überschritten werden
- Die nationalen Sicherheits-, Montage- und Errichtungsvorschriften sowie die allgemein anerkannten und gültigen Regeln der Technik.

Pay attention to the next points during the assembly, start-up and during running of the machine :

- Safety indications in the instruction manual
- The conditions of installation and connections according to the label
- additional indications on the machine
- The-Atex-certificates , conformity-certificates and the individual certificates of the parts and there explanations concerning special conditions
- Different instruction manuals, assembly and user instructions , safety instructions of the elements installed on the machine.
- Damage, adaptations and modifications without permission excludes further guarantee of the machine by Frewitt. It is not allowed to increase the temperature of the surface of the machine due to external sources during the functioning of the machine.
- National Safety norms, national assembly and start-up formalities, as well as technical rules are also applicable.

Calibration avant la première mise en service :

Le ProFi-Sword ne peut en aucun cas être branché directement au réseau électrique. L'utilisation d'un appareil de limitation de courant au démarrage est nécessaire comme par exemple un démarreur progressif.
 La puissance de démarrage doit être limitée à 0,75kW

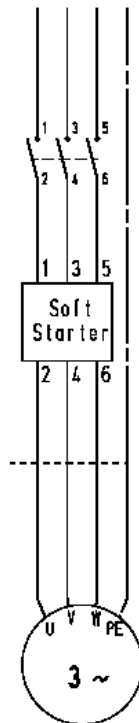
Kalibrieren vor der ersten Inbetriebnahme:

Der ProFi-Sword darf keinesfalls direkt an das elektrische Stromnetz angeschlossen werden. Es ist notwendig, ein Anlauf-Stromreduktionsgerät, wie z.B. einen Progressiv-Starter zu benutzen.

Die Startleistung muss auf 0,75kW begrenzt werden.

Calibration before the first application:

Never connect the ProFi-Sword directly to the electric network. It is necessary to use a starting current reduction e.g. a progressive starter. Starting power has to be limited at 0,75kW.



En cas de non-respect des instructions, ou en cas de dommages, de modifications non-conformes de l'installation, la certification selon ATEX 94/9/CE n'est plus valide.

Werden die genannten Hinweise nicht beachtet oder weist das Betriebsmittel Beschädigungen auf oder wurden zusätzliche nicht bewilligte Einbauten angebracht, wird der Explosionsschutz nach ATEX 94/9/EG automatisch aufgehoben.

In case of non respect of the indications, damage occurred to the installation, or non conform modifications have been realised, the ATEX 94/9/EC certification is not valid anymore.

Mesures de protection particulières pour la chambre de broyage en zone ATEX

Selon les Informations complémentaires pour machines EEx Conditions spéciales « X », l'obstruction du treillis par le produit est une situation qui n'est pas permise. Le passage du produit doit être continuellement garanti par l'utilisateur. L'obstruction du treillis par le produit peut engendrer une augmentation de la température du produit et provoquer de cette manière une explosion.

Des mesures particulières doivent être prises par l'utilisateur, en fonction de la catégorie de la chambre de broyage (voir plaquette signalétique de l'appareil) :

Besondere Schutzmassnahmen für die Zermahlkammer in ATEX Zone

Gemäss den Zusatz - und Sicherheits-hinweise für EEx- Maschinen, besondere Bedingungen « X », ist das Verstopfen des Siebes durch das Produkt unter allen Umständen zu vermeiden. Der kontinuierliche Durchsatz ist vom Benutzer sicher zu stellen. Verstopfungen des Siebes können zu Temperaturerhöhungen des Produktes führen und eine Explosion auslösen.

Besondere Massnahmen müssen vom Benutzer gemäss der Kategorie der Zermahlkammer ergriffen werden (siehe Typenschild der Maschine):

Particular protection measures for milling chamber in ATEX zone

According to the additional information for EEx-Machines Special conditions « X », the obstruction of the screen is not allowed. The conditions to avoid obstruction have to be assured by the user. Obstruction of the screen by the product may increase the temperature and cause an explosion.

Particular measures must be taken by the user, according to the category of the milling chamber (see name plate on the machine):

		Validation du processus Validation des Prozesses Validation of the process	Surveillance / suppression de la source d'allumage Zündquellen-Überwachung / Abschaffung Monitoring / Suppression of the source of ignition	Surveillance constante de l'écoulement Stetige Durchflussüberwachung Continuously throughput monitoring	Observation périodique de l'écoulement Periodische Durchfluss-Beobachtung Periodic observation of the throughput	Surveillance du temps de vidange Überwachung der Entleerungszeit Monitoring of the emptying time
Catégorie 1 Kategorie 1 Category 1 (Zone 0 / 20)	Mesures / Maßnahmen / Measures ou / oder / or		X	X		
	Mesures / Maßnahmen / Measures ou / oder / or		X		X	
	Mesures / Maßnahmen / Measures		X			X
Catégorie 2 Kategorie 2 Category 2 (Zone 1 / 21)	Mesure / Maßnahme / Measure ou / oder / or		X			
	Mesure / Maßnahme / Measure ou / oder / or			X		
	Mesure / Maßnahme / Measure ou / oder / or				X	
	Mesure / Maßnahme / Measure					X
Catégorie 3 Kategorie 3 Category 3 (Zone 2 / 22)	Mesure / Maßnahme / Measure	X				

Exemple de mise en place de ces mesures :

Beispiel der Einführung dieser Massnahmen :

Example of the introduction of these measures:

Measures	Massnahmen	Measures	Critères	Kriterien	Criteria	Application	Anwendung	Application
Validation du processus	<ul style="list-style-type: none"> Le passage du produit peut être garanti par un test de validation du processus 	<ul style="list-style-type: none"> Le passage du produit peut être garanti par un test de validation du processus 	<ul style="list-style-type: none"> En fonctionnement normal, le produit passe correctement à travers le tamis et aucune obstruction n'est constatée 	<ul style="list-style-type: none"> En fonctionnement normal, le produit passe correctement à travers le tamis et aucune obstruction n'est constatée 	<ul style="list-style-type: none"> En fonctionnement normal, le produit passe correctement à travers le tamis et aucune obstruction n'est constatée 	<ul style="list-style-type: none"> Catégorie 3 	<ul style="list-style-type: none"> Catégorie 3 	<ul style="list-style-type: none"> Catégorie 3
Surveillance de la source d'allumage au moyen de sondes de températures	<ul style="list-style-type: none"> Intégration d'une sonde de température en contact avec le tamis pour surveiller la température du produit dans la chambre de broyage 	<ul style="list-style-type: none"> Intégration d'une sonde de température en contact avec le tamis pour surveiller la température du produit dans la chambre de broyage 	<ul style="list-style-type: none"> La machine est déclenchée si la température dépasse la valeur limite. Cette option doit être installée par Frewitt 	<ul style="list-style-type: none"> La machine est déclenchée si la température dépasse la valeur limite. Cette option doit être installée par Frewitt 	<ul style="list-style-type: none"> La machine est déclenchée si la température dépasse la valeur limite. Cette option doit être installée par Frewitt 	<ul style="list-style-type: none"> Catégorie 1 Catégorie 2 	<ul style="list-style-type: none"> Catégorie 1 Catégorie 2 	<ul style="list-style-type: none"> Catégorie 1 Catégorie 2
Surveillance constante de l'écoulement	<ul style="list-style-type: none"> Pour machine intégrée dans une installation de dosage, surveillance de l'évolution du poids 	<ul style="list-style-type: none"> Pour machine intégrée dans une installation de dosage, surveillance de l'évolution du poids 	<ul style="list-style-type: none"> La machine est déclenchée automatiquement si aucun produit ne s'écoule de la machine 	<ul style="list-style-type: none"> La machine est déclenchée automatiquement si aucun produit ne s'écoule de la machine 	<ul style="list-style-type: none"> La machine est déclenchée automatiquement si aucun produit ne s'écoule de la machine 	<ul style="list-style-type: none"> Catégorie 1 Catégorie 2 	<ul style="list-style-type: none"> Catégorie 1 Catégorie 2 	<ul style="list-style-type: none"> Catégorie 1 Catégorie 2
Observation périodique de l'écoulement	<ul style="list-style-type: none"> Observation visuelle de l'écoulement du produit (verre de regard, système ouvert, etc...) Prise d'échantillon de produit à intervalle périodique à la sortie de la machine. 	<ul style="list-style-type: none"> Observation visuelle de l'écoulement du produit (verre de regard, système ouvert, etc...) Prise d'échantillon de produit à intervalle périodique à la sortie de la machine. 	<ul style="list-style-type: none"> La machine est déclenchée manuellement si aucun produit ne s'écoule de la machine 	<ul style="list-style-type: none"> La machine est déclenchée manuellement si aucun produit ne s'écoule de la machine 	<ul style="list-style-type: none"> La machine est déclenchée manuellement si aucun produit ne s'écoule de la machine 	<ul style="list-style-type: none"> Catégorie 1 Catégorie 2 	<ul style="list-style-type: none"> Catégorie 1 Catégorie 2 	<ul style="list-style-type: none"> Catégorie 1 Catégorie 2
Surveillance du temps de vidange (uniquement pour petit batch)	<ul style="list-style-type: none"> En fonctionnement normal, le temps de vidange d'un batch est validé par un test 	<ul style="list-style-type: none"> En fonctionnement normal, le temps de vidange d'un batch est validé par un test 	<ul style="list-style-type: none"> La machine est automatiquement déclenchée après 120% du temps de vidange en fonctionnement normal 	<ul style="list-style-type: none"> La machine est automatiquement déclenchée après 120% du temps de vidange en fonctionnement normal 	<ul style="list-style-type: none"> La machine est automatiquement déclenchée après 120% du temps de vidange en fonctionnement normal 	<ul style="list-style-type: none"> Uniquement pour un temps de vidange en fonctionnement normal ne dépassant pas 20 minutes Catégorie 1 Catégorie 2 	<ul style="list-style-type: none"> Uniquement pour un temps de vidange en fonctionnement normal ne dépassant pas 20 minutes Catégorie 1 Catégorie 2 	<ul style="list-style-type: none"> Uniquement pour un temps de vidange en fonctionnement normal ne dépassant pas 20 minutes Catégorie 1 Catégorie 2
Validierung des Prozesses	<ul style="list-style-type: none"> Der Durchfluss des Produktes kann durch einen Test der Bewertung des Vorgangs garantiert werden 	<ul style="list-style-type: none"> Der Durchfluss des Produktes kann durch einen Test der Bewertung des Vorgangs garantiert werden 	<ul style="list-style-type: none"> Bei Normalfunktion fliesst das Produkt korrekt durch das Sieb, und keine Obstruktion wird festgestellt 	<ul style="list-style-type: none"> Bei Normalfunktion fliesst das Produkt korrekt durch das Sieb, und keine Obstruktion wird festgestellt 	<ul style="list-style-type: none"> Bei Normalfunktion fliesst das Produkt korrekt durch das Sieb, und keine Obstruktion wird festgestellt 	<ul style="list-style-type: none"> Kategorie 3 	<ul style="list-style-type: none"> Kategorie 3 	<ul style="list-style-type: none"> Kategorie 3
Zündquellenüberwachung	<ul style="list-style-type: none"> Integration einer Temperatursonde in Kontakt mit dem Sieb, um die Temperatur des Produktes in der Zermahlkammer zu überwachen 	<ul style="list-style-type: none"> Integration einer Temperatursonde in Kontakt mit dem Sieb, um die Temperatur des Produktes in der Zermahlkammer zu überwachen 	<ul style="list-style-type: none"> Die Maschine wird angehalten, sobald die Temperatur den Grenzwert überschreitet. Diese Option muss durch Frewitt installiert werden 	<ul style="list-style-type: none"> Die Maschine wird angehalten, sobald die Temperatur den Grenzwert überschreitet. Diese Option muss durch Frewitt installiert werden 	<ul style="list-style-type: none"> Die Maschine wird angehalten, sobald die Temperatur den Grenzwert überschreitet. Diese Option muss durch Frewitt installiert werden 	<ul style="list-style-type: none"> Kategorie 1 Kategorie 2 	<ul style="list-style-type: none"> Kategorie 1 Kategorie 2 	<ul style="list-style-type: none"> Kategorie 1 Kategorie 2
Stetige Durchflussüberwachung	<ul style="list-style-type: none"> Für eine Maschine, die in einer Dosiervorrichtung integriert ist, Überwachung der Entwicklung des Gewichtes 	<ul style="list-style-type: none"> Für eine Maschine, die in einer Dosiervorrichtung integriert ist, Überwachung der Entwicklung des Gewichtes 	<ul style="list-style-type: none"> Die Maschine wird automatisch angehalten, wenn kein Produkt von der Maschine ausläuft 	<ul style="list-style-type: none"> Die Maschine wird automatisch angehalten, wenn kein Produkt von der Maschine ausläuft 	<ul style="list-style-type: none"> Die Maschine wird automatisch angehalten, wenn kein Produkt von der Maschine ausläuft 	<ul style="list-style-type: none"> Kategorie 1 Kategorie 2 	<ul style="list-style-type: none"> Kategorie 1 Kategorie 2 	<ul style="list-style-type: none"> Kategorie 1 Kategorie 2
Periodische Durchfluss-Beobachtung	<ul style="list-style-type: none"> Visuelle Beobachtung des Durchflusses des Produktes (Schauglas, offenes System usw...) Regelmässige Probenentnahme des Produktes am Maschinenausgang 	<ul style="list-style-type: none"> Visuelle Beobachtung des Durchflusses des Produktes (Schauglas, offenes System usw...) Regelmässige Probenentnahme des Produktes am Maschinenausgang 	<ul style="list-style-type: none"> Die Maschine wird manuell angehalten, wenn kein Produkt von der Maschine ausläuft 	<ul style="list-style-type: none"> Die Maschine wird manuell angehalten, wenn kein Produkt von der Maschine ausläuft 	<ul style="list-style-type: none"> Die Maschine wird manuell angehalten, wenn kein Produkt von der Maschine ausläuft 	<ul style="list-style-type: none"> Kategorie 1 Kategorie 2 	<ul style="list-style-type: none"> Kategorie 1 Kategorie 2 	<ul style="list-style-type: none"> Kategorie 1 Kategorie 2
Überwachung der Entleerungszeit (nur für kleinen Batch)	<ul style="list-style-type: none"> Bei Normalfunktion wird die Entleerungszeit eines Batches durch einen Test festgelegt 	<ul style="list-style-type: none"> Bei Normalfunktion wird die Entleerungszeit eines Batches durch einen Test festgelegt 	<ul style="list-style-type: none"> Die Maschine wird automatisch nach 120% der Entleerungszeit bei Normalfunktion angehalten 	<ul style="list-style-type: none"> Die Maschine wird automatisch nach 120% der Entleerungszeit bei Normalfunktion angehalten 	<ul style="list-style-type: none"> Die Maschine wird automatisch nach 120% der Entleerungszeit bei Normalfunktion angehalten 	<ul style="list-style-type: none"> Nur für eine Entleerungszeit bei Normalfunktion, die nicht 20 Minuten überschreitet Kategorie 1 Kategorie 2 	<ul style="list-style-type: none"> Nur für eine Entleerungszeit bei Normalfunktion, die nicht 20 Minuten überschreitet Kategorie 1 Kategorie 2 	<ul style="list-style-type: none"> Nur für eine Entleerungszeit bei Normalfunktion, die nicht 20 Minuten überschreitet Kategorie 1 Kategorie 2
Validation of the process	<ul style="list-style-type: none"> The passage of the product can be guaranteed by a validation test of the process 	<ul style="list-style-type: none"> The passage of the product can be guaranteed by a validation test of the process 	<ul style="list-style-type: none"> Under normal operation, the product passes correctly through the sieve and no obstruction is noted 	<ul style="list-style-type: none"> Under normal operation, the product passes correctly through the sieve and no obstruction is noted 	<ul style="list-style-type: none"> Under normal operation, the product passes correctly through the sieve and no obstruction is noted 	<ul style="list-style-type: none"> Category 3 	<ul style="list-style-type: none"> Category 3 	<ul style="list-style-type: none"> Category 3
Monitoring of the source of ignition	<ul style="list-style-type: none"> Integration of a temperature sensor in contact with the sieve to supervise the temperature of the product in the milling chamber 	<ul style="list-style-type: none"> Integration of a temperature sensor in contact with the sieve to supervise the temperature of the product in the milling chamber 	<ul style="list-style-type: none"> The machine is stopped if the temperature exceeds the limiting value. This option must be installed by Frewitt 	<ul style="list-style-type: none"> The machine is stopped if the temperature exceeds the limiting value. This option must be installed by Frewitt 	<ul style="list-style-type: none"> The machine is stopped if the temperature exceeds the limiting value. This option must be installed by Frewitt 	<ul style="list-style-type: none"> Category 1 Category 2 	<ul style="list-style-type: none"> Category 1 Category 2 	<ul style="list-style-type: none"> Category 1 Category 2
Continuously throughput monitoring	<ul style="list-style-type: none"> For machine integrated in an dosing installation, monitoring of the evolution of the weight 	<ul style="list-style-type: none"> For machine integrated in an dosing installation, monitoring of the evolution of the weight 	<ul style="list-style-type: none"> The machine is stopped automatically if no product runs out of the machine 	<ul style="list-style-type: none"> The machine is stopped automatically if no product runs out of the machine 	<ul style="list-style-type: none"> The machine is stopped automatically if no product runs out of the machine 	<ul style="list-style-type: none"> Category 1 Category 2 	<ul style="list-style-type: none"> Category 1 Category 2 	<ul style="list-style-type: none"> Category 1 Category 2
Periodic observation of the throughput	<ul style="list-style-type: none"> Visual observation of the product flow (Sight glass, opened system, etc...) Sampling of product at periodic interval on the outlet side of the machine. 	<ul style="list-style-type: none"> Visual observation of the product flow (Sight glass, opened system, etc...) Sampling of product at periodic interval on the outlet side of the machine. 	<ul style="list-style-type: none"> The machine is stopped manually if no product runs out of the machine 	<ul style="list-style-type: none"> The machine is stopped manually if no product runs out of the machine 	<ul style="list-style-type: none"> The machine is stopped manually if no product runs out of the machine 	<ul style="list-style-type: none"> Category 1 Category 2 	<ul style="list-style-type: none"> Category 1 Category 2 	<ul style="list-style-type: none"> Category 1 Category 2
Monitoring of the emptying time (only for small batches)	<ul style="list-style-type: none"> Under normal operation, the emptying time of a batch is validated by a test 	<ul style="list-style-type: none"> Under normal operation, the emptying time of a batch is validated by a test 	<ul style="list-style-type: none"> The machine is automatically stopped after 120% of the emptying time under normal operation 	<ul style="list-style-type: none"> The machine is automatically stopped after 120% of the emptying time under normal operation 	<ul style="list-style-type: none"> The machine is automatically stopped after 120% of the emptying time under normal operation 	<ul style="list-style-type: none"> Only for an emptying time under normal operation not exceeding 20 minutes Category 1 Category 2 	<ul style="list-style-type: none"> Only for an emptying time under normal operation not exceeding 20 minutes Category 1 Category 2 	<ul style="list-style-type: none"> Only for an emptying time under normal operation not exceeding 20 minutes Category 1 Category 2



Notification of recognition of the quality assurance production

Annex IV

- (1)
- (2) Equipment or protective systems intended for use in potentially explosive atmospheres - **Directive 94/9/EC**
- (3) Conformity certificate number: **SEV 09 ATEX 4137**
- (4) Equipment: **Machines in the type of protection Liquid Immersion "k", Control of Ignition Source "b", Constructional Safety "c", Increased Safety "e", Flameproof Enclosures "d" and Resistent Equipment**
- A list of the EC-Type Examination Certificates covered by this notification is held by the notified body.
- (5) Applicant: **Frewitt Fabrique de machines SA
Route du Coteau 7, CH-1763 Granges-Paccot**
- (6) Manufacturer: **Frewitt Fabrique de machines SA
Route du Coteau 7, CH-1763 Granges-Paccot**
- (7) Electrosuisse SEV, notified body number 1258 for Annex IV in accordance with article 9 of the council Directive 94/9/EC, notifies to the manufacturer that he has a production quality system which complies with Annex IV of the Directive.
- (8) This notification is based on audit report no. 09-IK-0183.03 dated 2012-11-15.
- (9) The results of a regular repeat evaluation of the quality assurance system form part of this notice.
- (10) This notification is valid until 2015-11-27 and can be withdrawn if the manufacturer no longer satisfies the requirements of Annex IV.
- (11) According to article 10 (1) of the Directive 94/9/EC the notified body assessing the examination phase must be indicated by showing the notified body number 1258 of Electrosuisse SEV beside the CE mark.

 **Electrosuisse
Notified Body ATEX**

Martin Plüss
Product Certification



Fehraltorf, 2012-11-27

SEV 09 ATEX 4137 / page 1 of 1



(1) **EC-Type Examination Certificate**

(2) Equipment or protective system intended for use in potentially explosive atmospheres - **Directive 94/9/EC**

(3) Examination Certificate Number

SEV 06 ATEX 0124 X

(4) Equipment: type ConiWitt-*** comminuting and screening machine resp.
type HammerWitt-LAB hammer mill resp.
type TurboWitt-*** screen mill

(5) Manufacturer: FREWITT Fabrique de machines SA

(6) Address: Route du Coteau 7, CH-1763 Granges-Paccot

(7) The equipment and any acceptable variation thereto is specified in the schedule to this certificate and the documents therein referred to.

(8) Electrosuisse SEV as notified body No. 1258 in accordance with article 9 of the Council Directive of the European Communities of 23 March 1994 (94/9/EC), certifies that this equipment has been found to comply with the essential health and safety requirements relating to the design and construction of equipment or protective systems intended for use in potentially explosive atmospheres given in Annex II to the Directive.

The results of the examination are recorded in confidential report No. 06-IK-0150.01 incl. extension no. 01.

(9) Compliance with the essential health and safety requirements has been assured by compliance with:

EN 1127-1:1997

EN13463-1:2001

EN 13463-5:2003

EN 13463-6:2005

EN 13463-8:2003

EN 14460:2006

(10) If the sign «X» is placed after the certificate number, it indicates that the equipment or protective system is subject to special conditions for safe use specified in the schedule to this certificate.

(11) This examination certificate relates only to design and construction of the specified equipment in accordance to the directive 94/9/EC. Further requirements of this directive apply to the manufacturing process and the placing on the market of the equipment.

(12) The marking of the equipment shall include the following:

 **see Appendix page 3: (19) Marking**

Electrosuisse SEV
Certification Body ATEX

Fehrltorf, 2009-11-03
Replaces certificate dated
2009-09-02
(Corrections)

Martin Plüss
Product Certification

Page 1/3

Appendix

(13)

(14)

EC-Type Examination Certificate SEV 06 ATEX 0124 X

(15) Description of the equipment

The FREWITT type ConiWitt-*** comminuting and screening machine resp. type HammerWitt-LAB hammer mill resp. type TurboWitt-*** screen mill serves for the industrial processing of substances for the pharmaceutical, chemical and foodstuffs industry. The high-speed rotor resp. screen is driven by means of a variable-speed, separately certified, drive. The control and monitoring functions are combined in a mounted control cabinet.

The machine is a group consisting of electrical and non-electrical subunits. As all electrical units are separately certified and non-electrical units of other manufacturers have been subject to the necessary conformity assessment procedures, a re-test according to the standards for electrical equipment as well as the non-electrical types of protection used only for the devices of other manufacturers could be dispensed with.

Ratings

Nominal power	ConiWitt-150	$P_N = 4.0$ kW	HammerWitt-LAB	$P_N = 4.0$ kW
	ConiWitt-200	$P_N = 4.0$ kW	TurboWitt-C20	$P_N = 4.0$ kW
	ConiWitt-250	$P_N = 5.5$ kW	TurboWitt-C25	$P_N = 5.5$ kW

(16) Test Report

06-IK-0150.01 incl. extension no. 01

(17) Special conditions for safe use

The manual supplementary "additional safety instructions EEx machine special conditions << X >>" of the manufacturer have to be considered!

(18) Fundamental essential health and safety requirements

Fulfilled by the standards applied

Appendix

EC-Type Examination Certificate SEV 06 ATEX 0124 X

(19) Marking

The marking of the equipment shall include the following:

For type ConiWitt-*** resp. type TurboWitt-***:

	II 1/2G II 2G II 1/2D	Ex ckb * IIB resp. IIB/IIC T157°C Ex ckb * IIB resp. IIB/IIC T4 Ex ckb * IP 6* T157°C	or and/or
	resp. 	II 2G resp. 2/3G resp. 3G II 2D resp. 2/3D resp. 3D	Ex ck * IIB resp. IIB/IIC T4 Ex ck * IP 6* T125°C	and/or

For type HammerWitt-LAB:

	II 1/2G resp. 2G resp. 2/3G resp. 3G II 1/2D resp. 2D resp. 2/3D resp. 3D	Ex cb * IIB resp. IIB/IIC T4 Ex cb * IP 6* T125°C	and/or
---	--	--	--------

(* = supplement depending on the integrated appliances with separate conformity assessment procedure)

Electrosuisse SEV
Certification Body ATEX

Martin Plüss
Product Certification



Fehraltorf, 2009-11-03
Replaces certificate dated
2009-09-02
(Corrections)



(1) **EC-Type Examination Certificate**

(2) Equipment or protective system intended for use in potentially explosive atmospheres - **Directive 94/9/EC**

(3) Examination Certificate Number

SEV 04 ATEX 0106 X

(4) Equipment: Filling machines type ProFi-Sword, ProFi-Dos 150/200, ProFi-Lun 300, ProFi-Liner 350/450/600, ProFi-Vent, ProFi-Bant 200/300, ProFi-Charge

(5) Manufacturer: FREWITT Fabrique de machines SA

(6) Address: Route du Coteau 7, CH-1763 Granges-Paccot

(7) The equipment and any acceptable variation thereto is specified in the schedule to this certificate and the documents therein referred to.

(8) SEV as notified body No. 1258 in accordance with article 9 of the Council Directive of the European Communities of 23 March 1994 (94/9/EC), certifies that this equipment has been found to comply with the essential health and safety requirements relating to the design and construction of equipment or protective systems intended for use in potentially explosive atmospheres given in Annex II to the Directive.

The results of the examination are recorded in confidential report No. 03-IK-0416.02 incl. Extension n° 1 and 2.

(9) Compliance with the essential health and safety requirements has been assured by compliance with:

EN 1127-1:2007

EN 13463-1:2009

EN 13463-5:2003

EN 13463-6:2005

(10) If the sign «X» is placed after the certificate number, it indicates that the equipment or protective system is subject to special conditions for safe use specified in the schedule to this certificate.

(11) This examination certificate relates only to design and construction of the specified equipment in accordance to the directive 94/9/EC. Further requirements of this directive apply to the manufacturing process and the placing on the market of the equipment.

(12) The marking of the equipment shall include the following:

see Appendix page 2: (19) Marking

Electrosuisse

Certification Body ATEX

Martin Plüss
Product Certification

Fehrltorf, 2009-05-07
replaces examination dated
2006-01-11.

Extension 1: new issued standards.

Appendix

(13)

(14)

EC-Type Examination Certificate SEV 04 ATEX 0106 X

(15) Description of the equipment

The ProFilling type ProFi-Sword, ProFi-Dos 150/200, ProFi-Lun 300, ProFi-Liner 350/450/600, ProFi-Vent, ProFi-Bant 200/300, ProFi-Charge filling machines are used for the industrial handling of powdered substances for the pharmaceutical, chemical, and food industries. The control and monitoring functions are concentrated in a separate switch cabinet.

(16)

Test Report

03-IK-0416.02 incl. Extension n° 1 and 2

(17)

Special requirements

The manual supplementary "additional safety instructions EEx machine special conditions << X >>" of the manufacturer have to be considered!

(18)

Fundamental essential health and safety requirements

Fulfilled by the standards applied


(19)

Marking


The marking of the equipment shall include the following:

	II 2G	* c * IIB T#	and / or
	II 2D	* c * T#°C	respectively
	II 1/2D	* c * T#°C	

only for ProFi-Sword:

	II 1/2G	* cb * T#	and / or
	II 1/2D	* cb * T#°C	

only for ProFi-Dos, ProFi-Vent:

	II 1/2G	* c * T#	and / or
	II 1/2D	* c * T#°C	

(* = supplement depending on the integrated appliances with separate conformity assessment procedure)

(# = the applicable temperature (class) is determined by the temperature of the medium (see manual!))

Electrosuisse

Certification Body ATEX

Fehrltorf, 2009-05-07

replaces examination dated

2006-01-11.

Extension 1: new issued standards.

Martin Plüss
Product Certification





(1) **EG-Baumusterprüfbescheinigung**

(2) Geräte und Schutzsysteme zur bestimmungsgemässen Verwendung in explosionsgefährdeten Bereichen - **Richtlinie 94/9/EG**

(3) Prüfbescheinigungsnummer: **SEV 06 ATEX 0133**

(4) Gerät: Steuerung Typ MA bzw. ES

(5) Hersteller: Frewitt Fabrique de machines SA

(6) Anschrift: Route du Coteau 7, CH-1763 Granges-Paccot

(7) Die Bauart dieses Gerätes sowie die verschiedenen zulässigen Ausführungen sind in der Anlage zu dieser Prüfbescheinigung festgelegt.

(8) Electrosuisse SEV, benannte Stelle Nr. 1258 nach Artikel 9 der Richtlinie des Rates der Europäischen Gemeinschaften vom 23. März 1994 (94/9/EG), bescheinigt die Erfüllung der grundlegenden Sicherheits- und Gesundheitsanforderungen für die Konzeption und den Bau von Geräten und Schutzsystemen zur bestimmungsgemässen Verwendung in explosionsgefährdeten Bereichen gemäss Anhang II der Richtlinien.

Die Ergebnisse der Prüfung sind im vertraulichen Prüfbericht 06-IK-0149.01 inkl. Erweiterung 1 und 2 festgehalten.

(9) Die grundlegenden Sicherheits- und Gesundheitsanforderungen werden erfüllt durch Übereinstimmung mit:

EN 1127-1:11

EN 60079-0:12

EN 60079-31:09

(10) Falls das Zeichen «X» hinter der Bescheinigungsnummer steht, wird auf besondere Bedingungen für die sichere Anwendung des Gerätes in der Anlage zu dieser Bescheinigung hingewiesen.

(11) Diese Baumusterprüfbescheinigung bezieht sich nur auf Konzeption und Bau des festgelegten Gerätes gemäss Richtlinie 94/9/EG. Weitere Anforderungen dieser Richtlinie gelten für die Herstellung und das Inverkehrbringen des Gerätes.

(12) Die Kennzeichnung des Gerätes muss die folgenden Angaben enthalten:

siehe Anlage Seite 2: (19) Kennzeichnung

 **Electrosuisse**
Benannte Stelle ATEX

Martin Plüss
Zertifizierung Produkte



Fehraltorf, 30.09.2013

SEV 06 ATEX 0133 / Seite 1 von 2

(13) **Anlage**(14) **EG-Baumusterprüfbescheinigung**(15) Beschreibung des Gerätes

Die Steuerung FREWITT Typ MA bzw. ES wird in den durch die Seriennummer bestimmten Ausführungsvarianten für gas- und/oder staubexplosionsgefährdete Bereiche in den Zündschutzarten „Druckfeste Kapselung“ und/oder „Schutz durch Gehäuse“ entsprechend den Anforderungen der Kategorien 2 oder 3 zur ausschliesslichen Verwendung in den Geräten zum Mahlen und Behandeln von Pulvern gefertigt.

Die geprüften Geräte sind Baugruppen, bestehend aus Komponenten, die ein Konformitätsbewertungsverfahren gemäss Artikel 8 der Richtlinie 94/9/EG durchlaufen haben sowie aus Teilen ohne Anforderungen an den Explosionsschutz.

Für jede Ausführungsvariante der Baugruppe wird ein thermischer Nachweis erstellt.

Installations- und Gebrauchsart: stationär
 IP Schutzgrad: IP54 bzw. IP65
 Umgebungstemperaturbereich (°C): -20 °C bis 40 °C

(16) Prüfbericht 06-IK-0149.01 inkl. Erweiterung 1 und 2(17) Besondere Bedingungen
keine(18) Grundlegende Sicherheits- und Gesundheitsanforderungen
Durch die angewandten Normen erfüllt.

(19) Kennzeichnung

⊕	II 2G	Ex d* IIB T6 Gb	und / oder bzw.
	II 2D	Ex tb IIIC T85°C Db	
⊕	II 3G	Ex d* IIB T6 Gb	und / oder
	II 3D	Ex tb IIIC T85°C Db	

(* = Ergänzung je nach eingebauten Geräten mit gesonderten Konformitätsbewertungsverfahren)

 **Electrosuisse**
Benannte Stelle ATEX

Martin Plüss
Zertifizierung Produkte




Fehraltorf, 30.09.2013

SEV 06 ATEX 0133 / Seite 2 von 2

Ex Declaration

regarding the use of permanent magnets in potential explosive atmospheres in zones 0,1,2
and 20,21,22

We,

Goudsmit Magnetic Systems B.V.
Petunialaan 19
5582 HA Waalre
The Netherlands

hereby declare, that products:


Product description: Cleanflow Magnet

do not fall within the scope of application specified in directive 94/9/EC. A risk assessment has substantiated that permanent magnets do not have any internal potential sources of ignition. They can be used for their intended purpose in potentially explosive gas atmospheres in zones 0, 1 and 2, as well as in potentially explosive dust atmospheres in zones 20, 21 and 22.

Waalre, The Netherlands, 23-7-2012

on behalf of Goudsmit:

Signature manufacturer:



.....

Ad Jacobs,
Chief Technical Officer

OUTER ELEMENTS

LIFTING TOWER

(SEE ADITIONAL BINDER)

BALANCE

(METTLER-TOLEDO)

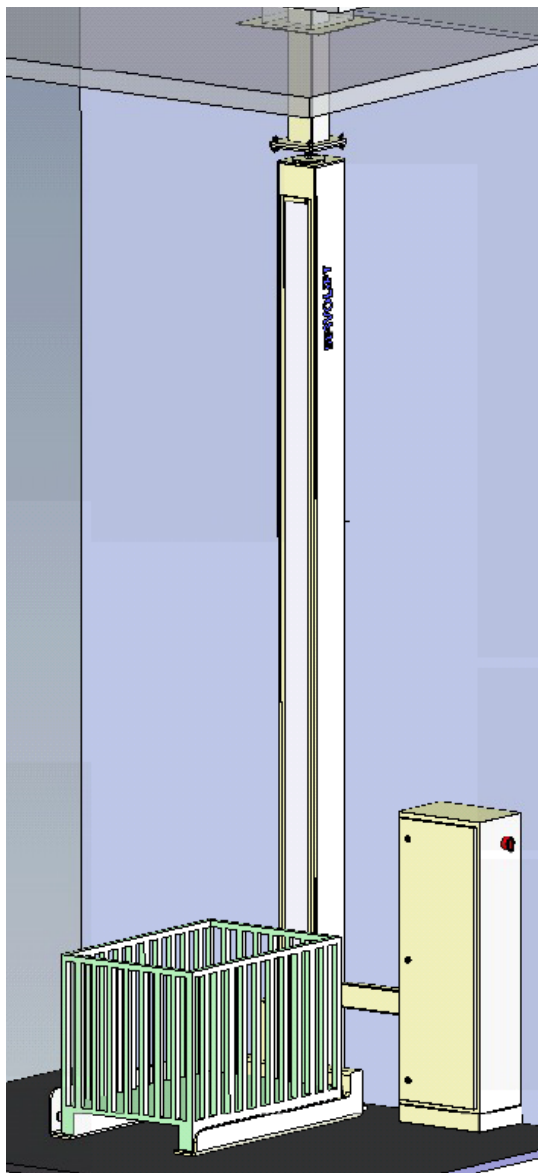
13.1- Pallet Lifter Servolift

Désignation [Document N°]
Operating Instructions Lifter <HS> Servolift 13249 [173186 - 1.1]
Technical Description Servolift Lifter <HS> 13249 <PRO-14-0012> [172329 - 1.1]
Plans and Lists Servolift Lifter <HS> 13249 [173187 - 1.1]
Drawings Servolift Lifter <HS> 13249 [173188 - 1.1]
Technical Data and msds Servolift Lifter <HS> 13249 [173189 - 1.1]
EC Declaration of incorporation Servolift Lifter <HS> 13249 [173190 - 1.1]
ATEX Declaration of Conformity Servolift Lifter <HS> 13249 [173191 - 1.1]
Declaration of Compliance- Test Certificate Servolift Lifter <HS> 13249 [173192 - 1.1]

SERVOLIFT

Operating Instructions: Lifter (HS) 13249

- Original Instructions -



Manufacturer:

Servolift GmbH
Albert-Einstein-Strasse 9
77656 Offenburg
Deutschland

Tel.: +49 (0) 781-6100-0
Fax: +49 (0) 781-6100-99
email: sl@servolift.de
24h- +49 (0) 700 7 3 7 8 6 5 4 3 8
service +49 (0) 700 SERVOLIFT

Customer:

Frewitt Fabrique de machines SA
Route du Coteau 7
1763 Granges-Paccot
Schweiz

SERVOLIFT

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SERVOLIFT

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Product Information and Safety Data Bulletin of grease	SORAJA FM 372
Technical Information and Safety Data Bulletin of anchors	HILTI

14. Electric documentation

Electric Scheme with Parts List.....	13249
EASY-program (printed)	13249_1.e60

15. Certificates

Declaration of Compliance with the Order acc. DIN EN 10204-2.1
Proof Load Test Certificate
Declaration of Incorporation for Partly Completed Machinery acc. to EU Directive 2006/42/EG
Declaration of Conformity for Explosion Protection Guidelines

SERVOLIFT

1. Description of Product

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SERVOLIFT

1.1. Intended Use of the Machine

The machine is used to be loaded with a special pallet, to be raised to a higher level. The pallet is discharged from a work platform.

The lifter is controlled from two different remote installed operator panels.

It is only allowed to use the described pallets with a maximum weight of 600 kg in all.

The machine not designed for other use as above listed – this applies as misuse of the machine.



INFORMATION

The machine is intended to be used in a room! It is NOT suited for being operated under open air. By installation of explosion proofed components, the machine is intended to be used within explosion hazardous atmosphere, classed: ATEX zone 22

Especially we point out, that it is forbidden to:

- Lift and transport personnel.
- Climb up the unit.
- Stay under the load.
- Be present within the direct working area during operation of the machine.
- Lift up loads with other parts than the provided load suspension devices.
- Put the unit into operation, if any fault is notified.
- Modify the unit without the expressly written confirmation of the manufacturer.
- By pass or remove any of the installed interlocks and safety installations.
- Use other loads than shown below.
- Use damaged loads, especially at the load suspension points.



DANGER

Operation of the machine.

Vital wounds, death and or damage to machinery.

- The machine must only be operated / used according to its intended use
- It is imperative that all safety precautions be observed, in this operation instruction and at the machine

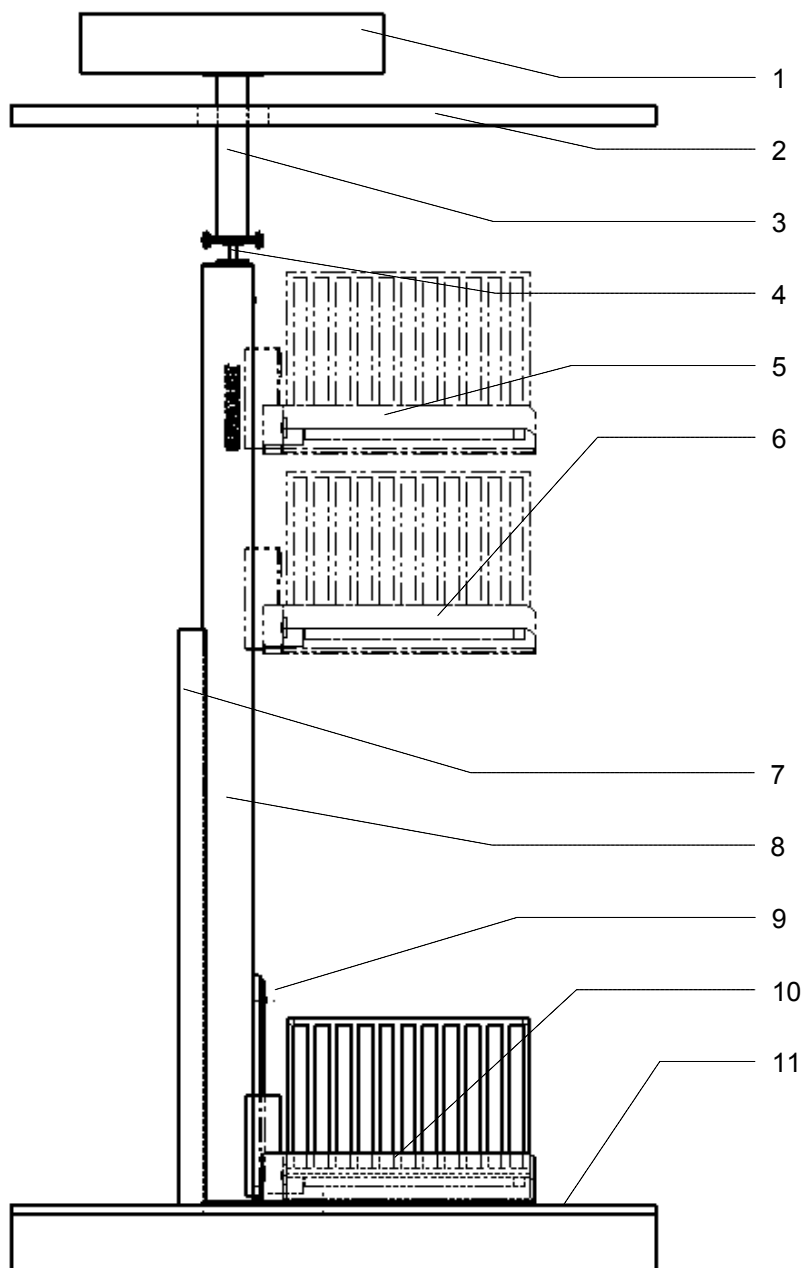


INFORMATION

This manual does not contain all safety information. Depending on local regulations and legal provisions at site, further safety measures might be necessary. Indication to health hazard caused by the product itself or by a customer specific working procedure is not subject of this manual.

SERVOLIFT

1.2. Design



- | | |
|--|---|
| 1) blanket | 8) column with internal guide and lift system |
| 2) cleanroom ceiling | 9) control cabinet with hydraulic and electric components |
| 3) column bracing | 10) supporting arm in min.-height |
| 4) column ceiling pin | 11) floor with finished surfaces |
| 5) supporting arm in max.-height | |
| 6) supporting arm in intermediate height | |
| 7) cover sheet | |

For more details and dimensions refer to general arrangement and/or layout drawing at the attachment of this manual.

SERVOLIFT

1.3. Functional characteristic

The machine consists of a column with guide and lift system, floor fixing plate, top fixing device and the lifting platform. After erection, it is fixed to floor.

Lifting is powered by a hydraulic cylinder with chain system. On the side of the column a height stop is attached that allows an exact height positioning when lowering onto upper discharge position. Lowering below the height stop is done after pneumatic retraction of the height stop latch.

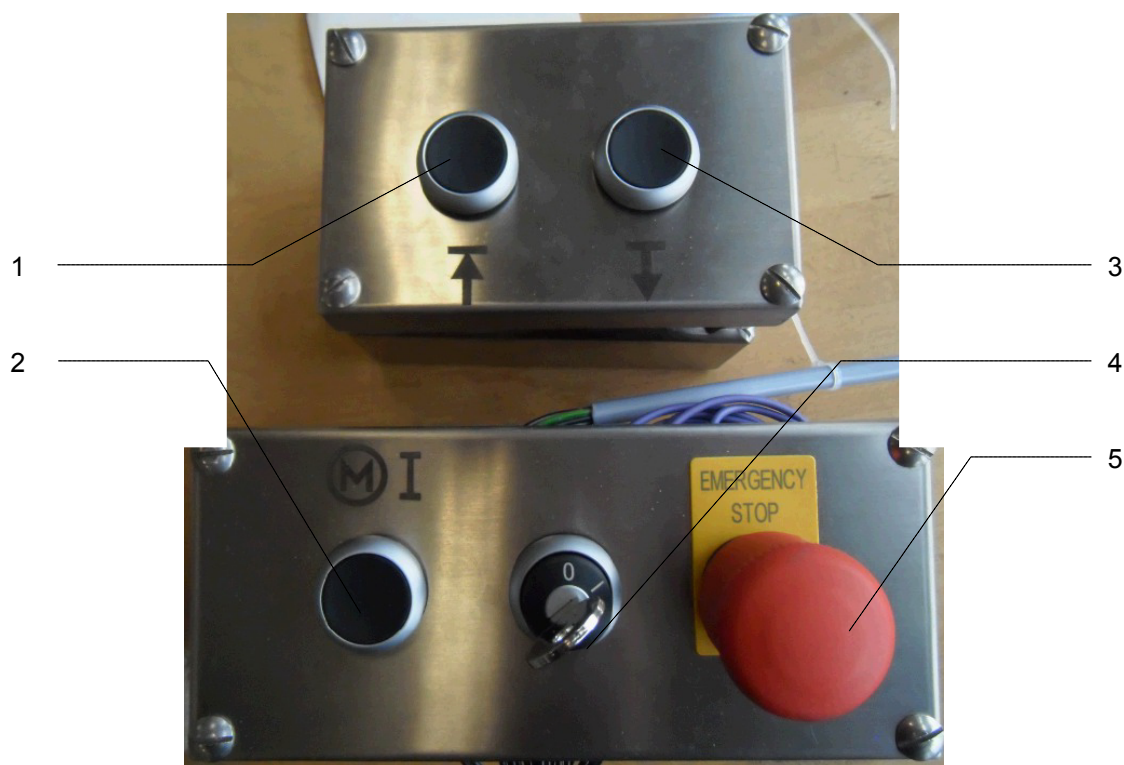
The pallet is carried by a supporting arm with two L-shaped arms as stand for the pallet.

The hydraulic power pack, the valves and the terminal box for connection of the electric elements are installed in a cabinet at the rear side of the column. Manually actuated operating elements are installed on the topside of the cabinet.

Operation is executed via push buttons on the separated operation panel.

1.4. Operating elements

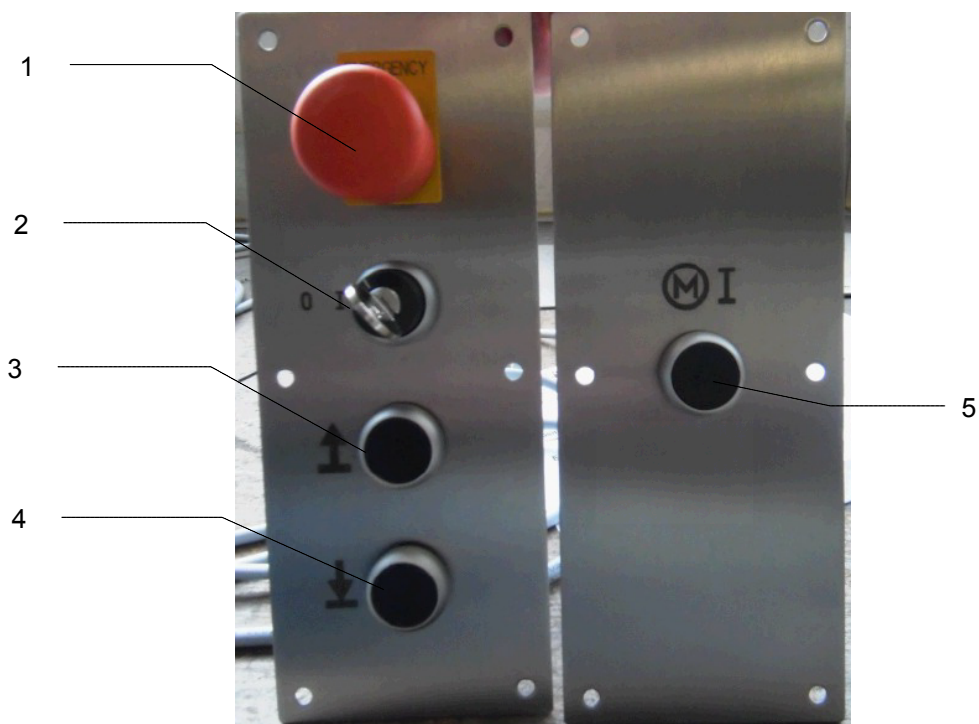
1.4.1. Mezzanine panels 1 & 2



- 1) push button, LIFT
- 2) push button, MOTOR ON
- 3) push button, LOWER
- 4) key switch, CONTROL OFF / ON
- 5) button, EMERGENCY STOP

SERVOLIFT

1.4.2. Base floor plate panels



- 1) button, EMERGENCY STOP
- 2) key switch, CONTROL OFF / ON
- 3) push button, LIFT
- 4) push button, LOWER
- 5) push button MOTOR ON

SERVOLIFT

1.5. Operation sequence

Start condition:

Mains and compressed air supply are connected to lifter.
Main switch is activated
Supporting arm is lowered minimum height.
No pallet is loaded to arm.

1.5.1. Sequence (operation first from base floor panel, then panel 1 at mezzanine):

1. Operator puts a loaded pallet into the supporting arm
2. turns key switch at base floor panel ON
3. lifts to mezzanine height
4. switches the control OFF, removes the key and inserts it into upper panel 1
5. switches the control ON
6. lifts to max.-height (pushes the button MOTOR ON and simultaneously LIFT)
7. empties the pallet
8. lowers the supporting arm to a mezzanine height (pushes the button MOTOR ON and simultaneously LOWER)
9. switches the control OFF, removes the key and inserts it into base floor panel
10. switches control ON
11. lowers the arm to minimum height
12. removes the empty pallet by a hand pallet jack
13. starts next sequence

starts next sequence

SERVOLIFT

1.6. Technical Data

Load

Load	pallet or wire mesh crate 1200mm s 800 mm, approx. 900 high
Safe working load	600 kg
Pallet to be presentet	by hand pallet jack

Dimension and Execution

Column height	4721 mm
Min. height (to top of platform)	35 mm
Max. height (to top of platform)	3771 mm
Reach (middle of column – middle of pallet)	875 mm
Height of mezzanine ceiling	5400 mm
Installation height of top fixing	5660 (+/- 50 mm)
Erection	stationary with floor and top fixing <ul style="list-style-type: none"> - floor fixing by chemical anchors HILTI HVZ dynamic M12 - floor must be even and horizontal the maximum slope to be 0,5% - top fixing by chemical anchors HILTI HAS M12 - floor fixing to be on concrete, quality C20/25, that is min. 200 mm thick
Compressed air supply	6-7bar, from column flying PVC hose ND 6, 10 m long to mezzanine junction box
Electric supply	400 V, 50 Hz, 3Ph+PE, 2 kW, from column flying lead 10 m long to mezzanine junction box.

SERVOLIFT

explosion protection rate	ATEX-category II3D (zone 22): Explosive atmosphere in the form of a cloud of combustible dust in air is not likely to occur in normal operation but, if it does occur, will persist for a short period only. motor protection rate II3D IP55 T125°C
Wiring	electric installation acc. EN 60204, with single core labelling according to the colour codes of Singapore
Sound level	< 78 dB(A)
Stroke	3736 mm
Total width	approx. 1600 mm
Total length	approx. 1775 mm
Ingress protection	IP 54
Lift speed	depending on load – approx. 10 cm/s
Time to lift	approx. 40 seconds
Cabinet	W x H x D 500 mm x 1550 mm x 335 mm (height incl. pedestal 100 mm) lateral the column with between installed duct
Oil tank	nom. 7 L
Hydraulic oil	received FDA or USDA H1 -approval
Pump size	4,3cm ³ /rev. (6,2 L/min.)
Lift cylinder	Ø50mm / stroke= 1868mm
Total load	approx. 1400 kg (incl. load)

SERVOLIFT

Stainless steel design

Exterior parts	<ul style="list-style-type: none"> - 1.4301 (AISI 304) - 1.4306 (AISI 304L) - 1.4541 (AISI 321)
Mechanical treated parts (bearing flanges, handles, distance blocks)	<ul style="list-style-type: none"> - 1.4104 (AISI 430F) - 1.4057 (AISI 431)
Interior parts	<ul style="list-style-type: none"> - St37-2 (S235JR) - St52-3 (S355JO)
Surfaces	<p>Pharma-Design:</p> <ul style="list-style-type: none"> - faces, attached parts, mechanical treated stainless steel parts polished, $R_a \leq 1,5 \mu\text{m}$ - flat weld seams polished, other weld seams brushed

Assembly groups

Lift gear	<ul style="list-style-type: none"> - column with internal guide system - hydraulic lift cylinder with pilot operated check valve as safety element - chain pulley - two chains of same dimension, whereas one chain is used as lift chain and one chain as safety chain
Supporting arm	<ul style="list-style-type: none"> - L- shaped profile as stand for palette - lateral glide pieces - rear stop with sensor "pallet in position" - stop dogs at front of stands to prevent slipping of the pallet
Hydraulic cabinet	<p>Stainless steel cabinet:</p> <ul style="list-style-type: none"> - remote from the column - connected to column by fixed duct - hydraulic power pack with valves - electric cabinet installed into hydraulic cabinet - electric control (only one point power supply at 400V will be provided to the cabinet)

SERVOLIFT

Control

- Control
 - installed into cabinet
 - motor protection switch
 - hydraulic-/ pneumatic control
 - operation at base floor: two plates with installed push buttons
 - operation from mezzanine floor: elements installed into two panels

Operating elements

- main switch at cabinet
- base floor plate panel 1 (250x100mm):
E-STOP
key switch CONTROL OFF / ON
LIFT
LOWER
- base floor plate panel 2 (250x100mm):
MOTOR ON
- mezzanine panel 1 (200x90x90mm):
MOTOR ON
key switch CONTROL OFF / ON
E-STOP
- mezzanine panel 2 (140x90x90mm]:
LIFT
LOWER

Sensors

- pallet in position
- mezzanine height

Interface (input signal)

Machine 13249 receives a signal from Frewitt:
«E-STOP Frewitt».
(contact "CLOSED", which opens if Frewitt-machine is put out of operation by E-STOP.)

Interface (output signal)

Machine 13249 sends a signal to Frewitt:
«E-STOP 13249».
(contact "CLOSED", which opens if machine 13249 is put out of operation by E-STOP)

SERVOLIFT

Safety

Safety installation

- pilot operated check valve to hold lift position in case of line rupture
- lift capacity limited by pressure limiting valve
- safety chain carries load in case of lift chain rupture
- stroke mechanically limited

Interlocks

- LIFT / LOWER only possible with pallet in place
- panel to be used must be activated by key switch
- LOWER operated from upper panel only possible to intermediate height
- two hand control acc. DIN EN 574 from both panels
- further interlocks are not installed
-

SERVOLIFT

2. General Safety Advise

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2.	General Safety Advise	1
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2.2.	Explanation of the Used Safety Signs.....	3
2.3.	Basic Safety Measures	5
2.4.	Basic Safety Measures during Maintenance and Servicing	6
2.5.	Demands on Operators.....	6

SERVOLIFT

2.1. User's Duty of Care



DANGER

This manual does NOT refer to health hazards caused by the used product to be blended or by customer's specific working process!

Warnings on this matter and appropriate safety precautions belongs to users UNDIVIDED RESPONSIBILITY!

The machine has been designed under careful selection of the harmonized standards which have to be kept, as well as further technical specifications. Therefore it agrees with the state of art and guarantees a maximum of safety.

This safety can only be achieved during normal operation, if all recommended measures are met. It belongs to the user's duty of care, to plan these steps and to check the execution.

Especially, the user has to ensure, that:

- the machine is only employed for its intended use.
- the machine is only operated in perfect and working state and especially the safety installations are checked periodically for their functioning.
- the necessary personnel protective equipment for the operating, maintaining and repair staff is at hand and used by the corresponding people.
- the owner's manual is always complete and in a readable condition and available at the machine's site.
- only sufficiently qualified and authorized personnel operate, maintain and repair the machine.
- this personnel is periodically instructed regarding all appropriate questions of operational safety and environmental protection and that they know the owner's manual and especially the included safety advice.
- all installed safety and warning labels will not be removed and are always readable.
- the machine is not operated with not installed covers and lids.

SERVOLIFT

2.2. Explanation of the Used Safety Signs

Following safety signs are used in the present owner's manual. These signs should call above all the readers attention to the text opposite the safety sign.



DANGER

Danger indicates a hazardous situation which, if not avoided, will result in death or serious injury.



WARNING

Warning indicates a hazardous situation which, if not avoided, could result in death or serious injury.



CAUTION

Caution, used with a safety alert symbol, indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.



INFORMATION

This sign indicates information which is used for a better understanding among other things of the machines function.



**SEPARATE
INSTRUCTION**

This sign points to (attached or separately delivered) additional manuals or guides for operating and servicing of OEM (original equipment manufacturer) parts which have to be read and followed attentively! Safety instructions referring to this must be respected absolutely!

SERVOLIFT

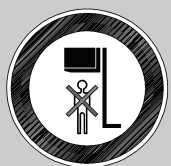
2.2.1. Explanation of the machine etched safety signs



**OVERHEAD LOAD
WARNING**

Warning of raised loads.

Those machines are labeled, which are exclusively destined for stay under the raised load only by the operator, e.g. to open the discharge valve or to install a discharge nozzle. At this time the load must be mechanically set on the height stop. The max. lift capacity is indicated below the pictogram.



**STAY UNDER THE
LOAD PROHIBITED**

This sign strictly prohibits any stay under the raised load. Those machines are labeled which are not equipped by a height stop device and a stay under the load is not exclusively intended.

The max. lift capacity is indicated below the pictogram..



**MAN RIDING
PROHIBITED**

This sign strictly prohibits any man riding on the load suspension device.

Those machines are labeled which offers evidently the possibility of riding the supporting arm, e.g. platforms, forks etc..

SERVOLIFT

2.3. Basic Safety Measures

- The legal rules for prevention of accidents must be followed.
- Lifting personnel and climbing up the machinery is forbidden.
- It is only allowed to lift up the described containers.
- If other equipment should be lifted, the written approval of the manufacturer is necessary.
- Prior lifting, a safe pick up and a firm installation of the equipment is to be checked
- Do not exceed the allowed maximum load.
- Keep a careful watch on the load during all movements.
- Do not stand under the load if not set on mechanical block stop
- Do not do any work on the electric installation with alive electric.
- Any work on the electric installation is only allowed to licensed electricians.
- The owner's manual must be always accessible to the operating staff. One copy must be stored at the machine. (e.g. power cabinet)
- When putting machine out of service, it has to be locked against unauthorized used by the lockable main switch.
- Prior to each start of production the machine has to be checked for visible faults. Make sure, that it is only used in perfect shape. Discovered faults have to be reported to the superior.
- Prior to each start of production, material and objects which are not necessary for production have to be removed from the working area.
- Do not by-pass any interlock or safety installation.
- Never put machine into operation with opened and not installed covers
- Transport, installation, connection, commissioning and maintenance must only to be carried out by skilled experts

SERVOLIFT

2.4. Basic Safety Measures during Maintenance and Servicing

The provided inspection and maintenance interval must be kept!

Respect maintenance and repair manuals of individual components attached to this manual

- Prior to the execution of maintenance and servicing, the access to the working area of the machinery has to be closed against non-authorized staff. Attach or install information sign, which indicates the maintenance or repair work!
- Prior to the execution of maintenance and servicing the electric main switch has to be locked by a padlock. Key is to be in hands of the person, who carries out the maintenance and servicing.
- For the exchange of heavy machine parts, only suitable and perfect load suspension devices and sling units must be used!
- Polluting lubricant-, coolant- and cleaning agents -, must be disposed correctly!
- Hydraulic and pneumatic system must be depressurized for maintenance.



WARNING

Possible contamination.

Consider corresponding MSDSs if handling greases and oils!

2.5. Demands on Operators

- Operation of the unit is only allowed to trained persons above an age of 18 years. The operator must be "expressly" instructed by the user.
- Only authorized personnel are allowed to be present at the working area of the machine.
- The operator must have read and understood the manual and knows the shown safety information.
- Works on the electric and electronic components are only allowed to licensed expert persons. Maintenance and repair work on hydraulic and pneumatic components must only be done by special trained persons.



DANGER

Necessary diligence.

People might be hurt seriously and the machine may be damaged or destroyed by operating errors.



3. Transport

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3.	Transport	1
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3.3.	Admissible Devices for Transport	4
3.4.	Hang up the machine	5
3.5.	Removal of eyebolts.....	6

- Original Instructions -

SERVOLIFT

3.1. General



WARNING

Transport.

Vital wounds, death and or damage to machinery.

- Following regulations must be kept

- Transport work is only allowed to qualified personnel, taking the safety regulations into account.
- It is only allowed to lift up the machine at the designed supporting spots or possibilities respectively.
- To transport the machine, use only appropriate load suspension devices and hanging equipment. At selection, consider the crate or packing list indicated load.
- Read also chapter "Safety Advice"!
- Loose or bulky parts have to be removed before transport or must be fastened against independent movement.
- Loose hanging out cable and hoses have to be tied up safe. On this occasion pay attention that these are not bent.
- The hydraulic power pack (tank) must be emptied and the electric motor must be supported within the cabinet if the machine is NOT transported vertically!
- Leave machine parts as long as possible on transport pallets.

SERVOLIFT

3.2. Transport to Installation Site

Leave machine parts as long as possible on transport pallets and move them with an fork lifter or pallet truck.



WARNING

Suspended machine may swing.

Vital wounds, death and or damage to machinery.

- Hang up the machine as shown with appropriate load suspension device
- Manoeuvre slowly and gently
- The location of the central suspension point must coincide with the centre of gravity and must not be moved.



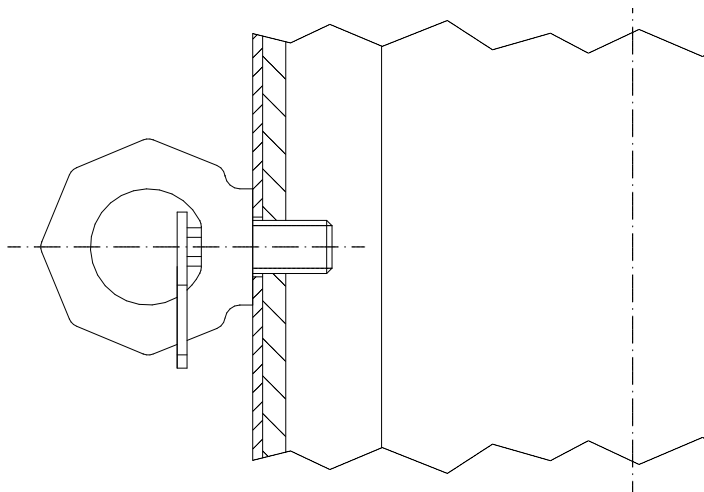
INFORMATION

If no suitable holes or attachment points for slings are available, the machine parts are hung with suitable cable loops. Make sure that no parts are crushed or torn.

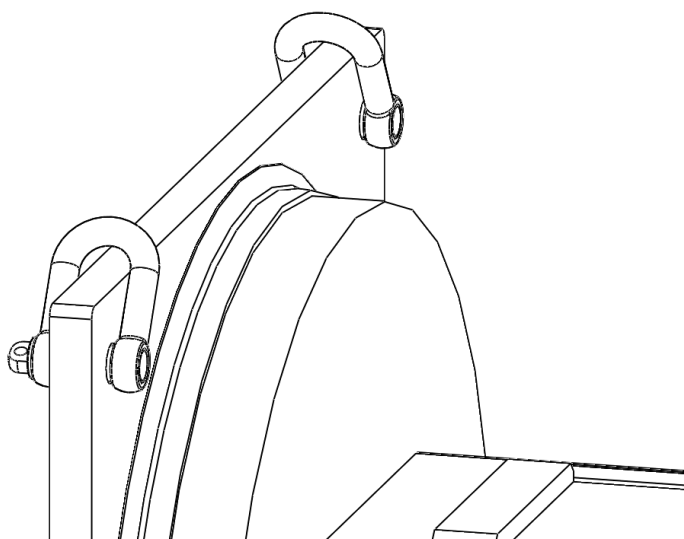
SERVOLIFT

3.3. Admissible Devices for Transport

- eye bolt at right or left side face of column



- shackle in the holes of the base plate



INFORMATION

Max. allowed load at 45° pulling direction:
M16 = 500 kg
M20 = 830 kg



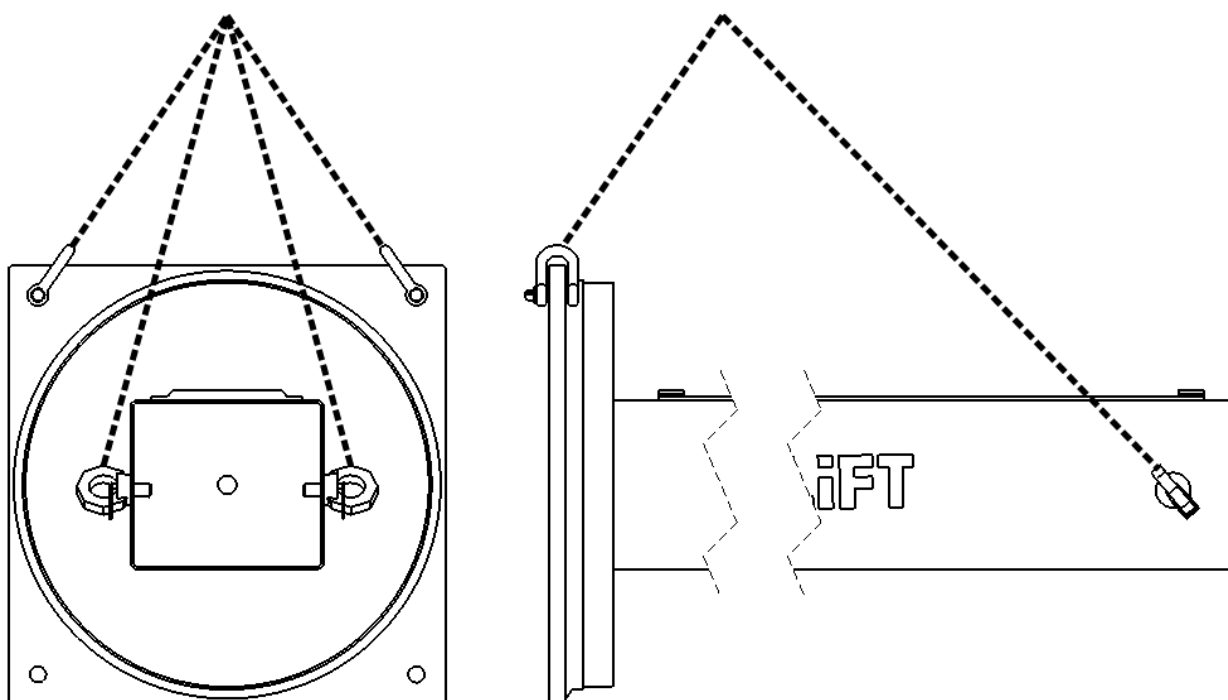
INFORMATION

Orientate eyebolts into pulling direction.
Max. allowed load at 90° pulling direction:
Do not hook up the unit at any part of the supporting arm system!

SERVOLIFT

3.4. Hang up the machine

To hang up the machine, use only the above described load suspension devices and mounted it like the picture below



INFORMATION

Do not hook up the unit at any part of the supporting arm system!

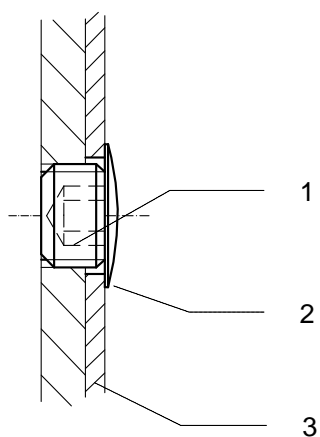
SERVOLIFT

3.5. Removal of eyebolts



INFORMATION

Eye bolts at the right and left side of the unit must be removed before operation of the unit! Close threaded holes as shown below.



- 1 Hex socket set screw,
flat with outer surface
- 2 Plastic cap pressed into socket set
screw
- 3 Outer surface of column

SERVOLIFT

4. Installation

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4.2.	Conditions of Surroundings for Installation.....	3
4.3.	Assembly and Erection	4

- Original Instructions -

SERVOLIFT

4.1. General



DANGER

Installation of the machine.

Vital wounds, death and or damage to machinery.

- Following regulations must be kept

- Installation work- assembly and connection of the machine is only allowed to qualified staff by keeping the safety advice.
- Prior to installation, the device has to be checked for transport damage. The manufacturer has to be informed immediately about possible damages.
- Use only the delivered fixing material as dowels and bolts.
- Pay attention especially to the tightening torque of the fixing screws of the load suspension device.



INFORMATION

Attention: The chemical anchors are subject of approval certificates by building authorities, that means that during installation of the anchors records are to be kept, confirming the actual concrete strength and the installation in accordance with regulations by the construction supervisor or one of his representatives. The corresponding records have to be kept available 5 years at minimum by the contractor.

- Let the hook up and the bracing at the machine as long at the machine till it is perfectly anchored.
- Do not stress the machine, before the anchors have reached their full load carrying ability.
- Refer also to chapter "Safety advice"



DANGER

Respect exactly curing time of chemical anchors.

Vital wounds, death and or damage to machinery.

- Avoid any stress or displacement during curing time
- Remove the load suspension device after curing time

SERVOLIFT

4.2. Conditions of Surroundings for Installation

- For installation within an explosion proof area the user has to be informed in time, to arrange any necessary steps. (e.g. interruption of production, to confer a welding permit, as well as the allowance to run non x-p rated machines and tools).

This is valid analogous for the installation of machines within clean rooms used in the pharmaceutical industry.

- The load carrying ability the quality of the floor must be guaranteed (even, resistant concrete floor with minimum thickness of 190mm to allow an anchoring depth of 110 mm)
- The area shown at the top view must be free of obstacles.
- The place for installation is prepared in that way, that the machine can be installed on smooth ground (possible pitch) and erected exactly vertical.
- Electricity is available near the machine's supply (column tip).
- Cranes or lifting equipment (e.g. fork lift truck) or fixing spots for a pulley bock above the area of installation.
- The unit is intended to be installed in a room. It is not suited for being operated under open air.

SERVOLIFT

4.3. Assembly and Erection

If the machine has been delivered on a pallet or in a crate, the single parts and accessories have to be removed to have free access to the column.

The column has to be hooked up at the above described point(s) (refer also to chapter "transport" item 2) and erected at the intended place.

- Mark emplacement of the machine onto the floor, depending on ambient equipment. (see attached general arrangement drawing)
- Erect the column exactly vertical at the place of installation (e.g. by help of sheet metal stripes under the floor plate). Take care, that it is not hollow between the base plate and the floor.
- Check vertical position of column.
- Drill and install the 7pcs floor anchors (chemical anchors HILTI HAS-TZ M12x95 with dynamic set, see information in the separate instruction) directly through the holes of the floor plate.
- Drill and install the top fixing device at the concrete ceiling and fasten the fixing pin and ceiling cover plate.
- Now lift the load suspension device horizontal in front to the guide system. (a forklift truck with pallet has proved to be a good remedy to lift and position the load suspension device for installation).
- Guide coverband through frontcase as indicated on installation drawing
- Connect the electric control lines from supporting arm to guide system according to attached electric scheme.
- Join the supporting arm to the lift guide and installed the fixing screws according to assembly drawing with the needed torque.
- Install the control cabinet beside the column on the floor and embarrassed the supply lines (electric & pneumatic) to the corresponding connection point.
- Check and prepare installation position of the energy supply at the ceiling. Be aware that lines will not be twisted or lengthened during later slew movement of the column.
- Install the four pcs operation panels (floor level and mezzanine level) at the required position and embarrassed the control lines into the control cabinet.
- Install the cover sheet and the cable cover.
- Seal the rim of the plate to the floor with silicone rubber.

SERVOLIFT

5. Commissioning

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5.4. First function run	3

- Original Instructions -

SERVOLIFT

5.1. General



DANGER

It's only allowed to instructed and authorized expert to hook up of the supply lines.

Vital wounds and or death by electrocution.

- By installation of supply lines, disconnect electrical connections on side.

5.2. Installation of supply lines

- Connect the control lines from the three operation panels according to the attached electric scheme.
- Install the E-Stop interfaces between machine and customer control unit.
- Install main supply cable to the site mains corresponding to electric scheme. Use the strain relief.
- Connect pneumatic maintenance unit to compressed air supply.



INFORMATION

Refer to enclosed pneumatic and electric schemes.

SERVOLIFT

5.3. Basic adjustments

- Remove all crating material and transport fasteners from unit, especially the supporting piece from the electric motor of the power pack.
- Check whether the electric- and control cables have been connected and safe installed.
- Open the door of the rear cabinet behind the column.
- Check the manometer of the pneumatic maintenance unit, whether pressure is adjusted to 6 bars, but not higher than 8 bar.
- Open the filling cap of the hydraulic oil tank and fill in the provided oil (approx. 6 lt.) e.g. by help of a funnel. (See chapter "Change of oil")
- If the tank has been filled up by the manufacturer, the blanking plug is to be replaced with the delivered ventilated tank filler cap!

The oil level has to be checked with load suspension device at minimum level. It has to be at upper mark of oil level gauge.

- Turn main switch ON and start motor (MOTOR ON) of hydraulic pump short- lived to verify its sense of rotation.



INFORMATION

The motor and thus the pump must not be run without oil. A so called "dry run" destroys the pump. Prior the first operation of the machine, the sense of rotation of the pump motor has to be checked (refer to red arrow).

- Install and clamp coverband on top of column's front slot
- Clamp through frontcase guided coverband below frontcase between two flat steel bars.
- During first operation and lowering the coverband can be strengthened and installed to the base of the column.

5.4. First function run

During test run, height positions may be adjusted if necessary see chapter "Adjustment".

Follow step by step the sequence of operation described in chapter "Operation". Pay attention to speeds, pressures and eventual collisions. Adjustments on hydraulic system must be done carefully and very slightly.

SERVOLIFT

6. Operation

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SERVOLIFT

6.1. Generals



DANGER

Operating of the machine.

Vital wounds and or death to by power-driven movement.

- Don't stay at reach of efficacy
- To watch out the load and movement of the machine

By faults / troubles switch the machine off and locked against not allowed use until the defect has been rectified

6.2. Working place of operator

During working with the machine, only the operator himself is allowed to be present within the active range of the machine.

The usual working place of the operator to put a pallet into the supporting arm is in front of them. The pallet will be moved and positioned by help of a hand pallette truck.

Only for insertion and removal of the palette, the operator is allowed to be present within the working area of the machine. It is not foreseen, that personnel is present within the area with any machine movement.

To operate the machine the operator can activate the functions optional from base floor panel or mezzanine panel.

The two panels have a key switch to locked against dual operate. If the operator works at base floor level the key switch disable the control elements at mezzanine level.

Do not stay within the working area while machine is running.



**STAY UNDER THE
LOAD PROHIBITED**

This sign strictly prohibits any stay under the raised load.
The max. lift capacity is indicated below the pictogram..

It is not planned, that further persons are present within the operating area or under the raised load of during operation or movement of the lifter.

SERVOLIFT

6.2.1. Sequence of operation

Start position:

- machine set up and connected,
- main switch turned on,
- compressed air available,
- machine in base position:
 - supporting arm in min.-height
 - No pallet is loaded to arm.



INFORMATION

All hydraulic functions (LIFT /LOWER) operated by floor or mezzanine panel are only possible with additional pressed button MOTOR ON.

All functions are available in a so called dead man's control. The function stops immediately after the release of button.

6.2.2. Operation first from floor panel, then panel 1 at mezzanine

#	action	reaction
•	Maneuver a loaded pallet into the supporting arm.	Pallet in position.
•	Turn the key switch at base floor panel ON.	The control elements at mezzanine are deactivated.
•	Push and hold the LIFT button until the movement stops.	The supporting arm lifts up to max.-height and stops at the end stops.
•	Turn the key switch at base floor panel OFF, remove the key and insert into upper panel 1.	The control elements at floor base are deactivated.
•	Unload the pallet.	Pallet is empty.
•	Push and hold the LOWER button until the movement stops.	The supporting arm lower down to mezzanine height and stops.
•	Turn the key switch at mezzanine panel OFF, remove the key and insert into base floor panel and turn the switch ON.	The control elements at mezzanine are deactivated.
•	Push and hold the LOWER button until the movement stops.	The supporting arm lower down at min.-height and stops at the end stops.
•	Remove the pallet	Supporting arm is emptied
•	Start next sequence or switch off main switch	



DANGER

Prevention from not allowed use.

Vital wounds and or death by operating error.

- Main switch must be switched OFF and locked by a padlock.

SERVOLIFT

- Original Instructions -

SERVOLIFT

7. Troubleshooting

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SERVOLIFT

7.1. Basically



ATTENTION

If any defect or malfunction is noted before, during or after the operation of the machine, usually experts have to be consulted.

The operator has to inform his supervisor. He is not allowed to remedy the fault, e.g. defects at the electric installation, on his own.

In case of faults, the machine has to be switched off and locked against further use, till the defect has been repaired by the competent expert.

7.1.1. List of possible faults

Kind of fault	Reason	Steps to repair
no operation possible	<ul style="list-style-type: none"> main switch OFF or main power failure emergence stop activated not enough or no compressed air 	<ul style="list-style-type: none"> check main switch position resp. mains supply relock emergence stop check or adjust compressed air unit
electric motor of power pack is not running	<ul style="list-style-type: none"> motor protection relay is active oil temperature > 70°C 	<ul style="list-style-type: none"> in case of motor protection switch release, experts have to be consulted switch main switch of for 2min, after repeated fault – consult an expert
supporting arm is not lifted up	<ul style="list-style-type: none"> max. load is exceeded pressure limiting valve is adjusted too low 	<ul style="list-style-type: none"> check weight adjust pressure limiting valve to necessary value
supporting arm is not lifted up to max. height	not enough oil in oil tank	fill in oil with supporting arm at lowest position and evacuate cylinder according to instructions
supporting arm is lifted elastically	cylinder contains air	evacuate cylinder and find out, why air had been come into cylinder
after loss of electric mains platform can not be lowered from mezzanine by upper panel	loss of electric mains, loss of signal	release key from upper operating panel, activate base panel and lower platform back to floor level

7.1.2. List of installed interlocks

- LIFT / LOWER only possible with pallet in place
- panel to be used must be activated by key switch
- LOWER operated from upper panel only possible to intermediate height
- two hand control acc. DIN EN 574 from both panels

SERVOLIFT

- further interlocks are not installed

- Original Anleitung -

SERVOLIFT

8. Maintenance and Adjustment

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8.1. General



INFORMATION

The information regarding an annual service by a competent expert person is given.



DANGER

Maintenance work.

Vital wounds, death and or damage to machinery.

- Following regulations must be kept
- All working steps must be executed in rotation

- The area for maintenance has to be protected spaciouly.
- Mark the machine by a sign that it is out of operation for maintenance.
- Switch off all terminals and lock them against non intended switch on (by a padlock).
- Switch the control off at the key switch. Hand both keys (padlock and key of key switch) to the person in charge with the maintenance work.
- Release the pneumatic maintenance unit from pressure.
- Use exclusively the spare parts listed at our lists, or parts which are confirmed by us in writing.
- Refer also to the chapter "Safety advises"



INFORMATION

We recommend abrasive and solvent free cleaning agents, which correspond to the company's internal validation regulations.



INFORMATION

Never open electric components with alive electric within explosive atmosphere.
Completion of repairs on Pressure-proof encapsulated components are strictly forbidden! Defective parts or components must be changed completely!
Be aware that electrical power supply lines running to the electric cabinet are still alive after having switched off the main switch at the machine

SERVOLIFT

8.2. Maintenance and care

Daily or if required respectively:

- release water from pneumatic maintenance unit.
- check oil level and tightness of hydraulic components (put the supporting arm in min.-height),
- visual control of front case with load suspension device for cracks or deformation,
- check state and readability of the operating elements, clean if necessary,
- clean the machine,
- check coverband for bends and wave lines.

Every ½ year:

- check the fixing of the load suspension device,
- visual check of the floor- and ceiling fixing,
- check complete unit for visual damage as deformation and cracks,
- check oil level at hydraulic power pack. If oil level needs to be to be filled up, check the device and its supply pipes and hoses for any leaks.

every year: (check by a competent person)

- remove all covers,
- all carrying parts have to be checked visually for corrosion, cracks and loose fixings,
- check hydraulic oil and change if necessary. Even if the unit is used rarely, the oil must be changed every two years at the latest,
- grease U-tracks inside column with common machine grease. On this occasion check tightness of lift cylinder. Bear in mind that all cylinder rods are coated with a thin film of oil which might summarize during the course of time,
- oil lift chains. (Delivered hydraulic oil may be used!),
- tighten the floor and ceiling anchors with recommended torque by torque wrench,
- check fixing screws of supporting arm by a torque wrench,
- check function of the height stop device and the adjust height position,
- Check the length of suspension and safety chain. The elongation is maximum allowed. 3%.
- testing according to DIN EN 60204: (protective) ground wired resistance, insulation resistance, residual voltage and also a function check

SERVOLIFT

every six (6) years

- The hydraulic hoses have to be exchanged every six years.
- Empty and open oil tank
- Clean tank inside
- Replace suction filter
- Exchange hydraulic oil



INFORMATION

Checking intervals for functioning and rate of wear of the machine is to be done corresponding to load factor, frequency of use and environment conditions on site. In case of "heavy duty" working conditions, intervals must be shortened adequately.

8.2.1. Lubricants

Application:	Type:	Used product	Quantity:
Hydraulic system	CLPHC 46, ISO-VG 46	FOODMAX AW46	approx. 6 L
Lift chain	chain oil, acid-free, non resinifying (food grade if needed)	FOODMAX AW46	thinly and evenly
Guides, rails, hinges	Multipurpose grease, acid-free and non resinifying (food grade if needed)	Molyduval Soraja FM 372	thinly and evenly



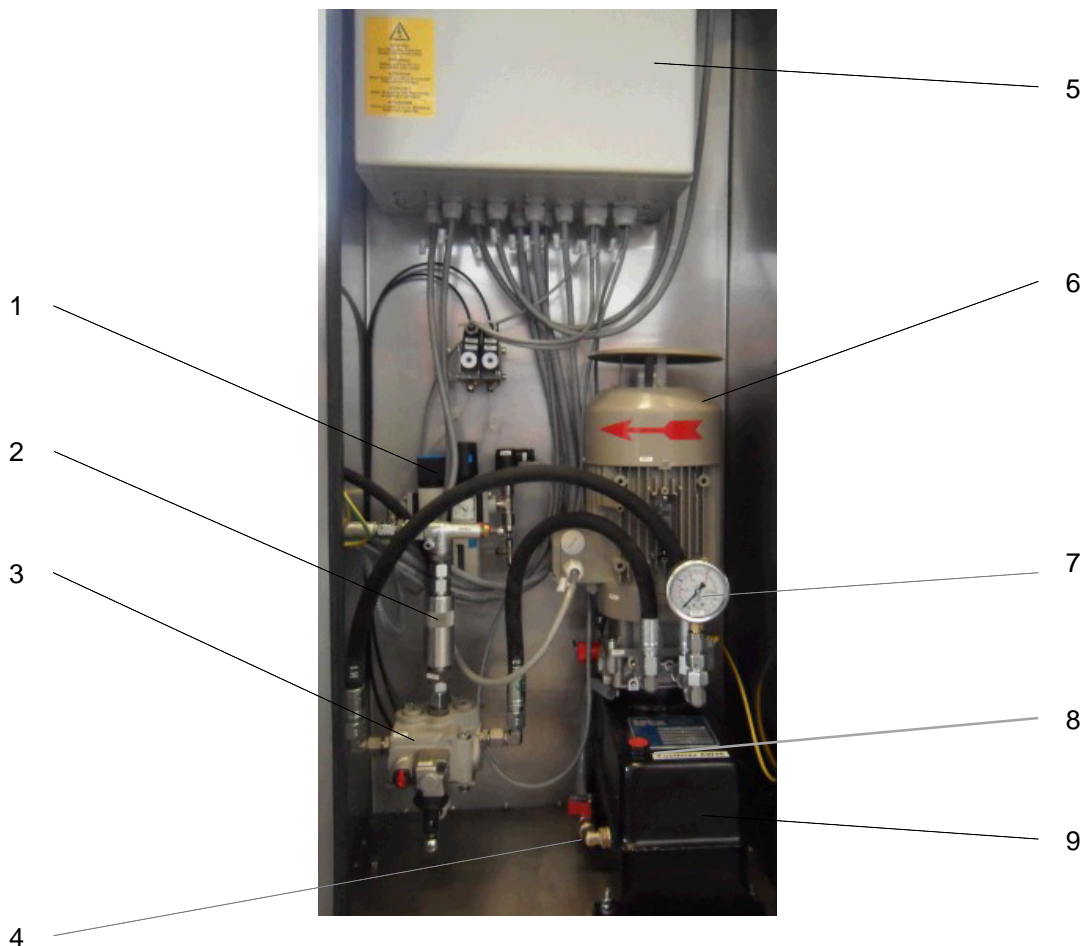
INFORMATION

The factory provided oil is a foodgrade hydraulic oil with viscosity class 46 acc. DIN 51519. This oil is conforming DAB and USDA H1 and is suitable for use in food industries with incidental food contact. All ingredients correspond to USDA respectively to FDA-direction.

SERVOLIFT

8.3. Hydraulic equipment

8.3.1. Hydraulic power pack



- 1 pneumatic maintenance unit P 0.1
- 2 flow control valve H 1.3
- 3 main control block with pressure limiting valve H 6.0 / H 6.1
- 4 drain cock with hose
- 5 electric terminal box
- 6 electric pump motor
- 7 manometer H 0.2
- 8 filler cap with dip stick
- 9 tank with internal pump H5.0

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8.3.2. Change of oil



ATTENTION

Leaking / spill oil.

Environment polluting.

- At first cover the working area with appropriate measures
- Immediately remove of leaking oil
- Disposed waste oil according to the valid regulations

The change of oil has to be carried out as follows:

- lower load suspension device down to minimum height
- switch the machine OFF at the main switch
- open rear access door.
- place a flat recipient of 8 – 10 L of capacity near rear the cabinet
- open the filling nozzle of the tank.
- Put drain hose into recipient and open drain cock or use an oil pump to empty the tank. Close drain cock and clean drain hose.
- fill in new oil (appr. 6 L); Oil level must be approximately 20 mm below top rim of the tank.
- switch machine ON, lift supporting arm to maximum height and lower back to minimum height and check oil level again.
- correct oil level if necessary.
- **remove spilled or wasted oil**
- close access door

SERVOLIFT

8.4. Adjustment Works



INFORMATION

Pressures, speeds and end stops have been adjusted by the manufacturer, corresponding to customers operating conditions as far as known during manufacturing. Any changes of necessary adjustments have to be done CAREFULLY and step by step, respecting max. pressures and speeds.

For adjusted pressures and speeds refer to the MACHINE BOOK belonging to this machine.

8.4.1. Adjusting of hydraulic pressure.

1. Lift supporting arm to maximum till it stops by itself. Check pressure at manometer H 0.2 with actuated lever LIFT and running motor.
2. Release lock nut at pressure limiting valve by a wrench (size 13mm).
3. Adjust new rate with Allen key (4mm) with running motor and actuated valve 1.10 "LIFT" (clockwise "+", counter clockwise "-")
4. Tighten lock nut by holding the socket set screw.



- 1) main control block H 6.0
- 2) pressure limiting valve H 6.1
- 3) pneumatic actuated lever

8.4.2. Lower- speed

This speed can be adjusted at flow control valve H1.3 (refer to hydraulic scheme resp. see picture "hydraulic power pack"). The adjustment has to be done with maximum load. Prior to adjustment the little set screw at the side of the silver colored bushing has to be loosened (Allen key size 2,5 mm). The adjustment is done by turning the bushing while machine is lowering under load.

SERVOLIFT

8.4.3. Pneumatic maintenance unit

Necessary pressure for the machine is to be adjusted at the maintenance unit as follows:

- lift up the upper blue cap till it is released noticeably
- now the pressure can be adjusted to the requested value by turning the cap (clockwise "+" or counter clockwise "-")
- lock the adjustment by pressing down the cap till it is caught

To release the water from the sight glass, the nozzle at the bottom has to be turned counter- clockwise (seen from below) with pressurized unit.

Replace the filter element as follows:

Close shut- off valve: system will be depressurized.

Turn filter bowl counter- clockwise, take out used filter element and put in the new one.

Remount filter bowl.

Readjust pressure if necessary.

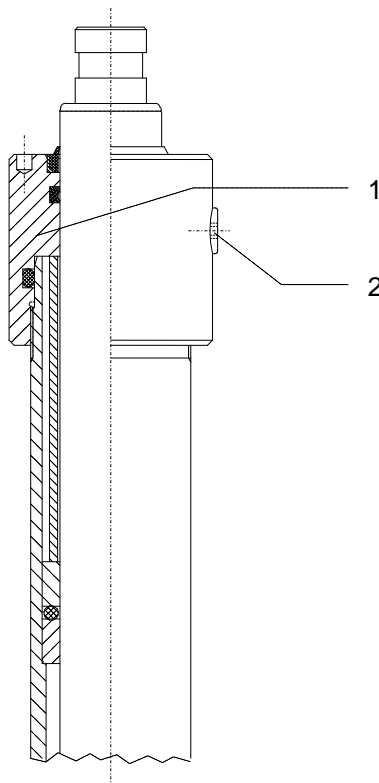


- 1 shut off valve („open-position“)
- 2 manometer
- 3 water release
- 4 pressure adjustment by pulling up an turning the cap (right "+", left "-")
- 5 pressure switch (10S2.2)
- 6 filter bowl (filter and water separator inside)

SERVOLIFT

8.4.4. Evacuation of lift cylinder

If the lift movement is springy and irregular, air is contained in the lift cylinder, which now must be evacuated.



- 1) cylinder head
- 2) vent screw, accessible from front side of column

- Lift supporting arm and though the lift cylinder to maximum lift height.
- Open vent screw (only 1/4- 1/2 turn) by an Allen Key (5mm)
- Activate "LIFT" function
- Check the out coming oil till it is free of bubbles.
- Repeat this process two times to evacuate complete air from cylinder.
- Close vent screw carefully and wipe of the oil.
- Check oil level with supporting arm at minimum height.

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9. Cleaning

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- Original Instructions -

SERVOLIFT

The machine has to be cleaned periodically according to operational use or to production based requirements. Normally no danger of pollution from the machine itself is expected, as well as no or minor pollution are taken up from the environment, e.g. by cooling fans.

During the intended maintenance intervals, the machine has to be cleaned only just for prevention from operational malfunctions caused by accumulation of dirt-, dust- and production residuals. This has to be limited to external cleaning, removal of oil leakage and coming out lubricates, condensate and particles of out blowing compressed air, as well as exchange of installed filter.

Production based cleaning (e.g. during change of product) has to be performed according to customer's instructions (method, scope and period of repetition) and if necessary recorded.



INFORMATION

The machine has been factory cleaned by an agent commonly used in machine engineering industry. Before start up within food or pharmaceutical industry, the machine has to be re-treated completely by a permitted cleaning agent.

9.1. Principle

Switch machine off at main switch, remove mobile unit from mains (pull off plug).

Do not use:

- abrasive cleanser
- aggressive detergents (acid or alkaline)
- polish or abrasive polishing paste
- abrasive clothes or scrub sponges

9.1.1. External Cleaning

Stainless steel surfaces:

- remove dust by soft cotton cloth, do not use compressed air
- use neutral cleaning agents with soft sponge or similar.
- rinse with soft water, dry with cotton cloth/ fleece.
- if necessary remove greasy dirt with alcohol (e.g. isopropyl)

Painted surfaces:

- as above, please note additionally data sheets of used cleaning detergent!
- pay attention, if alcoholic or solvent solutions are used.



INFORMATION

Do not clean machine by hose or flush water, do not use solvents or hot water or steam and high pressure cleaners! Prevent water and cleaning detergents from internal the hoist, cabinet, over terminal boxes and motors or further electric, pneumatic or hydraulic components!

Avoid direct contact of seals and rubber parts during sprinkling (w/o pressure) with cleaning detergents. Applied plastics and seal materials usually are resistant against alcoholic-, low acid- and alkaline solutions.

These are not resistant against chlorinated hydrocarbon, concentrated acids and alkaline solutions, polycyclical aromatic hydrocarbons, oils and fuels. (exception according to execution or requirement)

SERVOLIFT

9.1.2. Internal cleaning:

- remove dust by soft cotton cloth and/ or clean housing by vacuum cleaner.
(do not use compressed air to blow out housings)
- remove greasy dirt with alcohol (e.g. isopropyl).
- take up spilled oil by absorptive clothes.
- do not use water or watery solutions.

9.2. Product contact parts

- These parts are usually manufactured by high quality material, thus deviating from a.m. principles regarding cleaning and disinfection, other cleaning agents and procedures can be used, which correspond to company's internal and product specific validation requirements

Supplier has to be informed at order about possibly used detergents and methods or procedures to determine appropriate materials. Based on our experience no objections are raised against detergents and disinfection solutions used within the pharmaceutical industry.

- In case of doubt contact our service department, describing detergent and machine part intended to be cleaned



ATTENTION

Environment polluting cleaning and disinfection agents must be disposed according to national regulations. Consider corresponding safety data sheets.



10. Disposal

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SERVOLIFT

10.1. General

The machine consists of various components and parts, which have to be disposed or recycled according to local or legal provisions.



INFORMATION

Clean machine carefully from all product residuals.

After complete emptying of the hydraulic system and removal of the machine from place of installation, disassemble it and sort parts into the following groups:

- steel scrap
- aluminium
- plastic
- electronic parts and cables
- hydraulic oil and grease



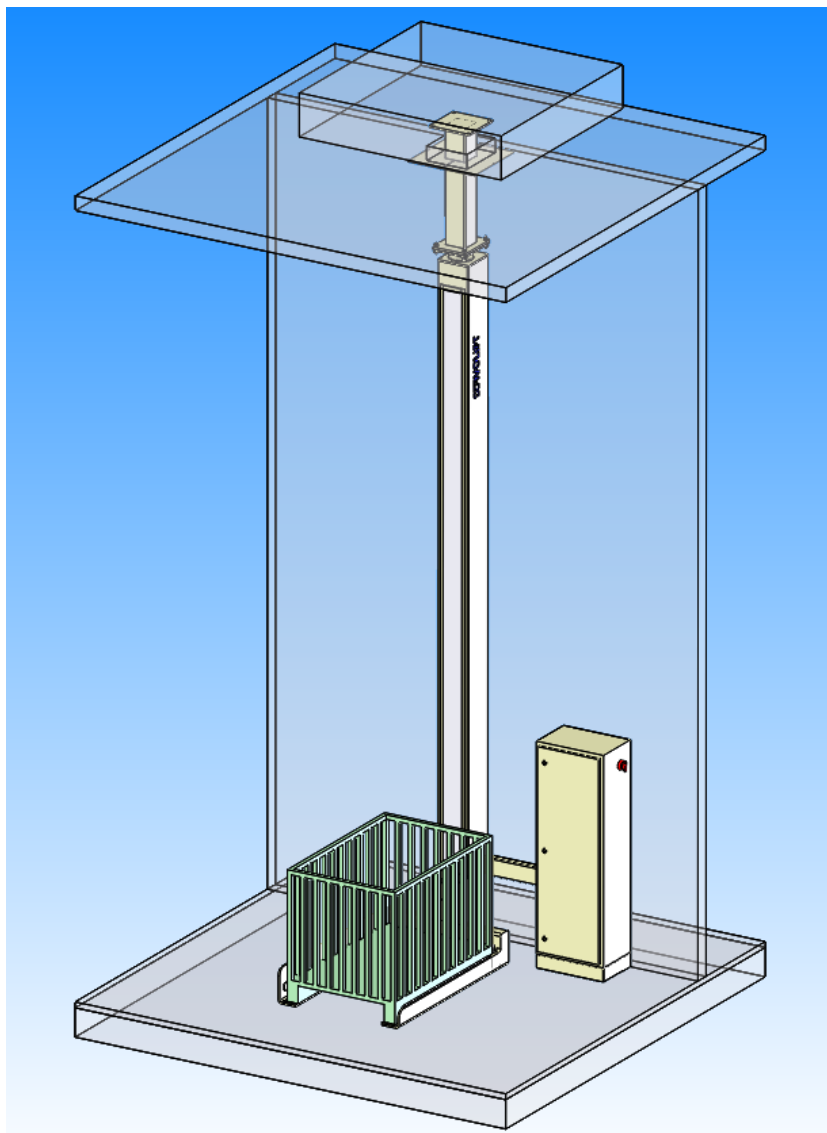
ATTENTION

Please note, that especially hydraulic cylinders and the pipe and hose system will still contain oil even with emptied hydraulic tank. Environment polluting lubricants and cleaning agents have to be disposed properly according to effective regulations.

SERVOLIFT

Technical Description

Type of Machine:	Pallet Lifter	Servolift Project No.	13249
Customer: Frewitt SA, Granges-Paccot - Switzerland		Customer Reference	CDF-14-0202
Date of Version:	11. February 2014	Version:	1



Customer	Name / Signature	Position	Date
Reviewed by:	Sig:		
Reviewed by:	Sig:		
Approved by:	Sig:		

SERVOLIFT

Technical Description			
Type of Machine:	Pallet Lifter	Servolift Project No.	13249
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1. Introduction

1.1. Description

This document (FS/FDS) is the main document during the life cycle of the machine. It is used to describe the function and scope of delivery of the system. This specification has been prepared by Servolift GmbH.

1.2. Objective of Document

Objective of the document is the detailed function specification of the single machine functions and description of the scope of delivery of the order.

Review and approval is performed by the cover page listed persons.

1.3. Reference Documents

Drawing	Lifter for Pallets	13249-00-001
	Force Scheme	13249-Static-LS1C

2. Document History – Change Control

The following list registers the execution of changes for this document

Version	Date	Editor	Reason for Change / Details of Change
1	10. February 2014	SCH	original – initial version

SERVOLIFT

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Type of Machine:	Pallet Lifter	Servolift Project No.	13249
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3. Description of Product

The **Lifter for Pallets** is used to be loaded with a special pallet, to be raised to a higher level. The pallet is discharged from a work platform.

The lifter is controlled from two different remote installed operator panels

It is only allowed to use the described pallets with a maximum weight of 600 kg in all.

The machine not designed for other use as above listed – this applies as misuse of the machine.

3.1. Overview of the System

The Lifter is stationary non slewable and bolted to the floor by compound anchors.

The lift function is powered by an electro-hydraulic power pack which is placed with the control valves in the cabinet. This is installed remote and lateral the unit and by a cable duct between.

Lifting and lowering is powered by a hydraulic lift cylinder and a chain system.

The pallet is carried by a supporting arm with two L-shaped arms as stand for the pallet.

Operation is executed via push buttons

3.2. Scope of Delivery

- (1x) Lifter for pallets 13249
- (1x) Cabinet and cable duct
- (1x) Cover stripes column - wall
- (1x) Top fixing
- (1x) Ceiling cover plate
- (1x) Plate with following installed elements: E-STOP, key switch CONTROL OFF /ON, LIFT, LOWER
- (1x) Plate with following installed elements: MOTOR ON
- (1x) Operator panel at mezzanine 140x90x90 including push buttons LIFT / LOWER
- (1x) Operator panel at mezzanine 200x90x90 including MOTOR ON, key switch CONTROL OFF/ ON,
and E-STOP
- (1x) Atex-Certificate
- (1x) Documentation in English language (1-fold hardware and 1 pc CD-Rom)
- (1x) Packaging
- (1x) FAT at Servolift site

SERVOLIFT

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4. Technical Data

4.1. Load

Load	pallet or wire mesh crate 1200mm s 800 mm, approx. 900 high
Safe working load	600 kg
Pallet to be presentet	by hand pallet jack

4.2. Dimension and Execution

Column height	4721 mm
Min. height (to top of platform)	35 mm
Max. height (to top of platform)	3771 mm
Reach (middle of column – middle of pallet)	875 mm
Height of mezzanine ceiling	5400 mm
Installation height of top fixing	5660 (+/- 50 mm)
Erection	stationary with floor and top fixing <ul style="list-style-type: none"> - floor fixing by chemical anchors HILTI HVZ dynamic M12 - floor must be even and horizontal the maximum slope to be 0,5% - top fixing by chemical anchors HILTI HAS M12 - floor fixing to be on concrete, quality C20/25, that is min. 200 mm thick
Compressed air supply	6-7bar, from column flying PVC hose ND 6, 10 m long to mezzanine junction box
Electric supply	400 V, 50 Hz, 3Ph+PE, 2 kW, from column flying lead 10 m long to mezzanine junction box.

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explosion protection rate	ATEX-category II3D (zone 22): Explosive atmosphere in the form of a cloud of combustible dust in air is not likely to occur in normal operation but, if it does occur, will persist for a short period only. motor protection rate II3D IP55 T125°C
Wiring	electric installation acc. EN 60204, with single core labelling according to the colour codes of Singapore
Sound level	< 78 dB(A)
Stroke	3736 mm
Total width	approx. 1600 mm
Total length	approx. 1775 mm
Ingress protection	IP 54
Lift speed	depending on load – approx. 10 cm/s
Time to lift	approx. 40 seconds
Cabinet	W x H x D 500 mm x 1550 mm x 335 mm (height incl. pedestal 100 mm) lateral the column with between installed duct
Oil tank	nom. 7 L
Hydraulic oil	received FDA or USDA H1 -approval
Pump size	4,3cm ³ /rev. (6,02 L/min.)
Lift cylinder	Ø50mm / stroke= 1868mm
Total load	approx. 1400 kg (incl. load)

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4.3. Stainless steel design

Exterior parts	<ul style="list-style-type: none"> - 1.4301 (AISI 304) - 1.4306 (AISI 304L) - 1.4541 (AISI 321)
Mechanical treated parts (bearing flanges, handles, distance blocks)	<ul style="list-style-type: none"> - 1.4104 (AISI 430F) - 1.4057 (AISI 431)
Interior parts	<ul style="list-style-type: none"> - St37-2 (S235JR) - St52-3 (S355JO)
Surfaces	Pharma-Design: <ul style="list-style-type: none"> - faces, attached parts, mechanical treated stainless steel parts polished, $R_a \leq 1,5 \mu\text{m}$ - flat weld seams polished, other weld seams brushed

4.4. Assembly groups

Lift gear	<ul style="list-style-type: none"> - column with internal guide system - hydraulic lift cylinder with pilot operated check valve as safety element - chain pulley - two chains of same dimension, whereas one chain is used as lift chain and one chain as safety chain
Supporting arm	<ul style="list-style-type: none"> - L- shaped profile as stand for palette - lateral glide pieces - rear stop with sensor "pallet in position" - stop dogs at front of stands to prevent slipping of the pallet
Hydraulic cabinet	Stainless steel cabinet: <ul style="list-style-type: none"> - remote from the column - connected to column by fixed duct - hydraulic power pack with valves - electric cabinet installed into hydraulic cabinet - electric control (only one point power supply at 400V will be provided to the cabinet)

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4.5. Control

Control

- installed into cabinet
- motor protection switch
- hydraulic-/ pneumatic control
- operation at base floor: two plates with installed push buttons
- operation from mezzanine floor: elements installed into two panels

Operating elements

- main switch at cabinet
- base floor plate panel 1 (250x100mm):
E-STOP
key switch CONTROL OFF / ON
LIFT
LOWER
- base floor plate panel 2 (250x100mm):
MOTOR ON
- mezzanine panel 1 (200x90x90mm):
MOTOR ON
key switch CONTROL OFF / ON
E-STOP
- mezzanine panel 2 (140x90x90mm]:
LIFT
LOWER

Sensors

- pallet in position
- mezzanine height

Interface (input signal)

Machine 13249 receives a signal from Frewitt: «E-STOP Frewitt».
(contact "CLOSED", which opens if Frewitt-machine is put out of operation by E-STOP.)

Interface (output signal)

Machine 13249 sends a signal to Frewitt: «E-STOP 13249».
(contact "CLOSED", which opens if machine 13249 is put out of operation by E-STOP)

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4.6. Safety

Safety installation

- pilot operated check valve to hold lift position in case of line rupture
- lift capacity limited by pressure limiting valve
- safety chain carries load in case of lift chain rupture
- stroke mechanically limited

Interlocks

- LIFT / LOWER only possible with pallet in place
- panel to be used must be activated by key switch
- LOWER operated from upper panel only possible to intermediate height
- two hand control acc. DIN EN 574 from both panels
- further interlocks are not installed

5. Sequence of operation

5.1. Start position

Mains and compressed air supply are connected to lifter.
Main switch is activated
Supporting arm is lowered minimum height.
No pallet is loaded to arm.

5.2. Sequence (operation first from base floor panel, then panel 1 at mezzanine):

1. Operator puts a loaded pallet into the supporting arm
2. turns key switch at base floor panel ON
3. lifts to mezzanine height
4. switches the control OFF, removes the key and inserts it into upper panel 1
5. switches the control ON
6. lifts to max.-height (pushes the button MOTOR ON and simultaneously LIFT)
7. empties the pallet
8. lowers the supporting arm to a mezzanine height (pushes the button MOTOR ON and simultaneously LOWER)
9. switches the control OFF, removes the key and inserts it into base floor panel
10. switches control ON
11. lowers the arm to minimum height
12. removes the empty pallet by a hand pallet jack
13. starts next sequence

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Customer: Frewitt SA, Granges-Paccot - Switzerland		Customer Reference	CDF-14-0202
Date of Version:	11. February 2014	Version:	1

5.3. Sequence (operation first from panel 1 at mezzanine, then base floor panel,):

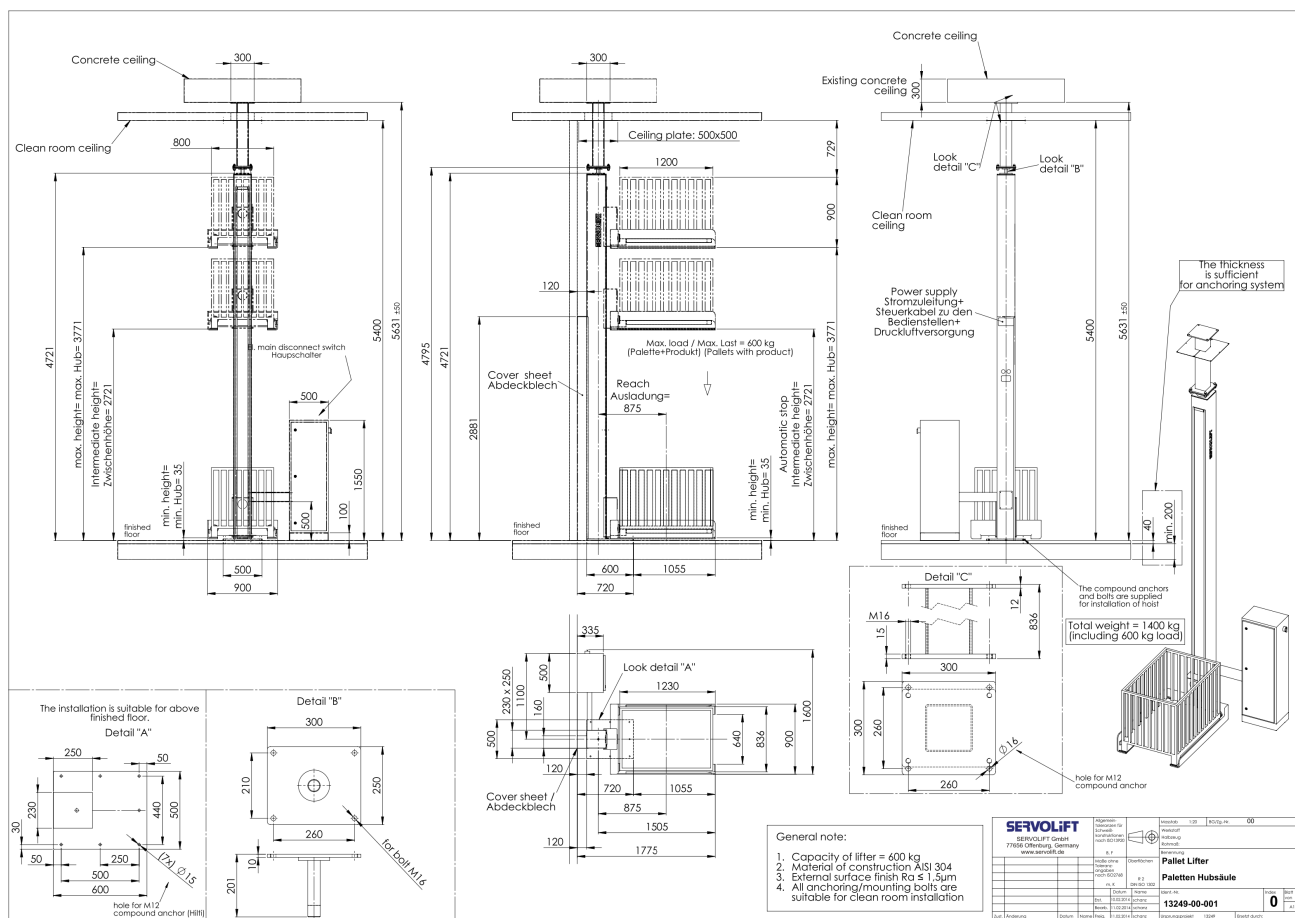
1. Operator puts a loaded pallet into the supporting arm
2. turns key switch ON at upper panel 1
3. lifts to max. height
4. empties the pallet
5. pushes the button MOTOR ON and simultaneously LOWER
6. lowers the supporting arm to a mezzanine height
7. switches the control OFF, removes the key and inserts it into base floor panel
8. switches control ON at base floor panel
9. lowers the arm to minimum height
10. removes the empty pallet by a hand pallet jack
11. starts next sequence

SERVOLIFT

Technical Description

Type of Machine:	Pallet Lifter	Servolift Project No.	13249
Customer: Frewitt SA, Granges-Paccot - Switzerland		Customer Reference	CDF-14-0202
Date of Version:	11. February 2014	Version:	1

6. Approval drawing



SERVOLIFT

Technical Description

Type of Machine:	Pallet Lifter	Servolift Project No.	13249
Customer: Frewitt SA, Granges-Paccot - Switzerland	Customer Reference	CDF-14-0202	
Date of Version:	11. February 2014	Version:	1

SERVOLIFT

Sheet 1/2

DELUMPWITT POST HOIST		Project Number: 13249-Static-LS1C	
Drawn:	B. Schanz	Date:	11.02.2014
Checked:	G. Grubski	Date:	11.02.2014
Visa:		Visa:	

DATA			
Weight container+product:	Q =	6000	N
Weight of supporting arm:	Q1 =	2000	N
Column weight:	Q2 =	6000	N
Overload factor:	C =	1,4	
Reach:	L =	875	mm
Height:	H =	5631	mm
Height:	H1 =	4721	mm
Height:	H2 =	910	mm
Ceiling plate:	L3 =	280	mm
Ceiling plate:	L4 =	300	mm
Ceiling plate:	L5 =	260	mm
Base plate:	P1 =	600	mm
Base plate:	P2 =	500	mm
Distance between dovels:	P10 =	500	mm
Distance between dovels:	P20 =	440	mm

FLOOR FIXATION			
Type of compound anchor	Hilti HVZ-M12x95		
Qty of compound anchors	n =	7	pièces
Tension force per compound anchor	Fsp1 =	18	kN
Minimum property of concrete:	B25,C20/25	25	N/mm ²
Minimum thickness of concrete floor:	Ep1 =	190	mm
Nominal distance between floor plate and concrete floor border	P3 (nom.) =	95	mm
minimal distance between floor plate and concrete floor border	P3 (mini) =	10	mm

CEILING FIXING			
Type of compound anchor	Hilti HVZ-M12x95		
Qty of compound anchors	n =	4	pièces
Tension force per compound anchor	Fsp2 =	18	kN
Minimum property of concrete:	B25,C20/25	25	N/mm ²
Minimum thickness of concrete floor:	Ep2 =	190	mm
Nominal distance between border of ceiling plate and concrete floor border	L6 (nom.) =	125	mm
minimal distance between border of ceiling plate and concrete floor border	L6 (mini) =	40	mm

Dessin non représenté à l'échelle

Darstellung nicht maßstäblich

Representation not to scale

SERVOLIFT

Technical Description

Type of Machine:	Pallet Lifter	Servolift Project No.	13249
Customer: Frewitt SA, Granges-Paccot - Switzerland		Customer Reference	CDF-14-0202
Date of Version:	11. February 2014	Version:	1

SERVOLIFT

Sheet 2/2

DELUMPWITT POST HOIST	Project Number: 13249-Static-LS1C
-----------------------	--

REMARKS CONCERNING FLOOR AND CEILING FIXING
ON PAGE 1/2

- 1) The lifting column is to be fixed directly onto concrete of floor and ceilings.
(No cast, screed or pavement!)
- 2) Please inform us if dimensions "Ep1", "Ep2", "P3(nom.)", "P3(min)", "L6(nom.)" and "L6(min)" on site falls below here mentioned values. Floor or ceiling fixing is to be modified because dovel anchoring does no longer correspond to manufacturer's specification.
- 3) Following is to be proceeded by an architecte or statical calculation engineer:
 - a) Dimensioning / verification of floor and ceiling structure, corresponding to applied loads.
 - b) Verification of stability of building's structure.

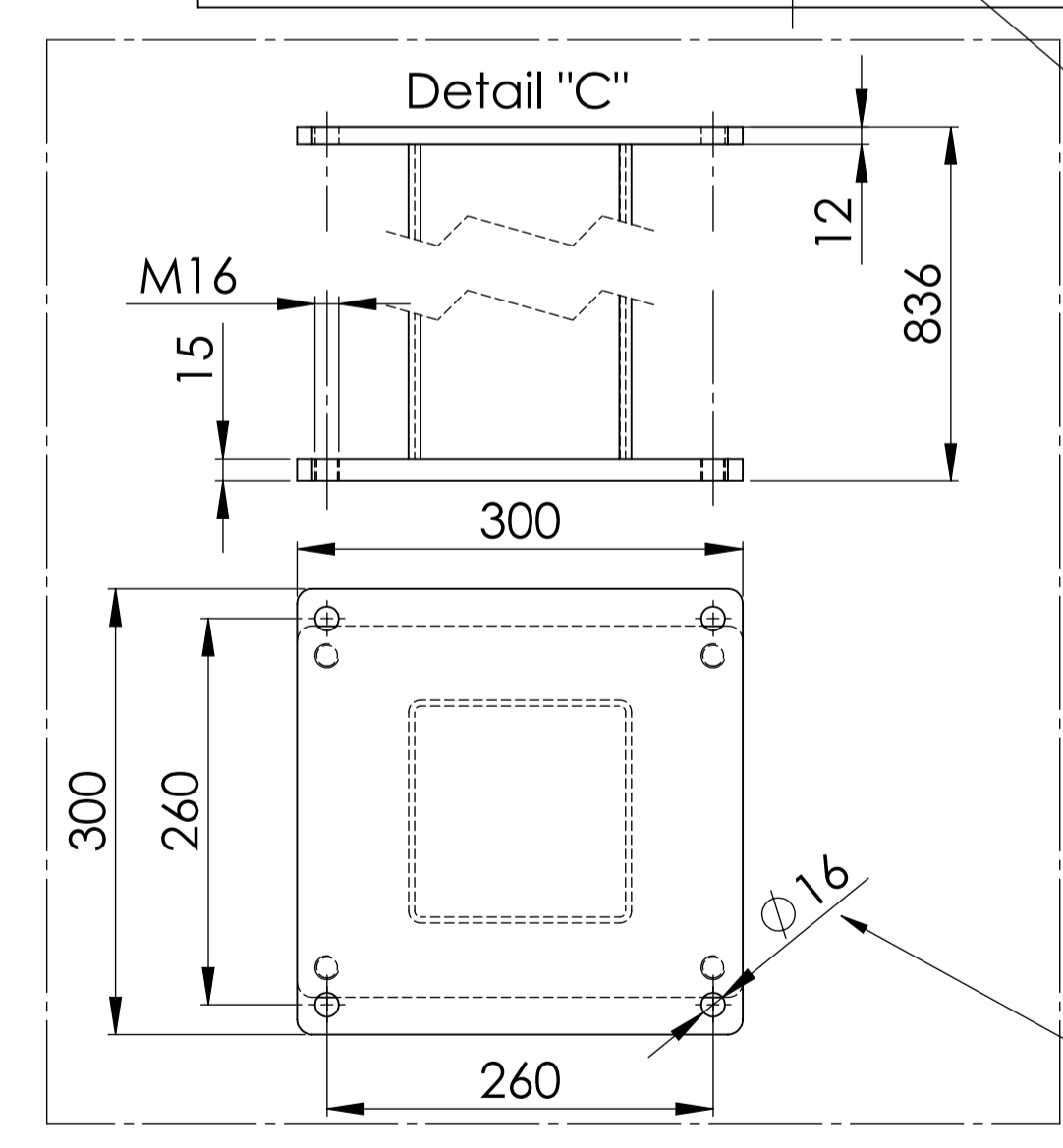
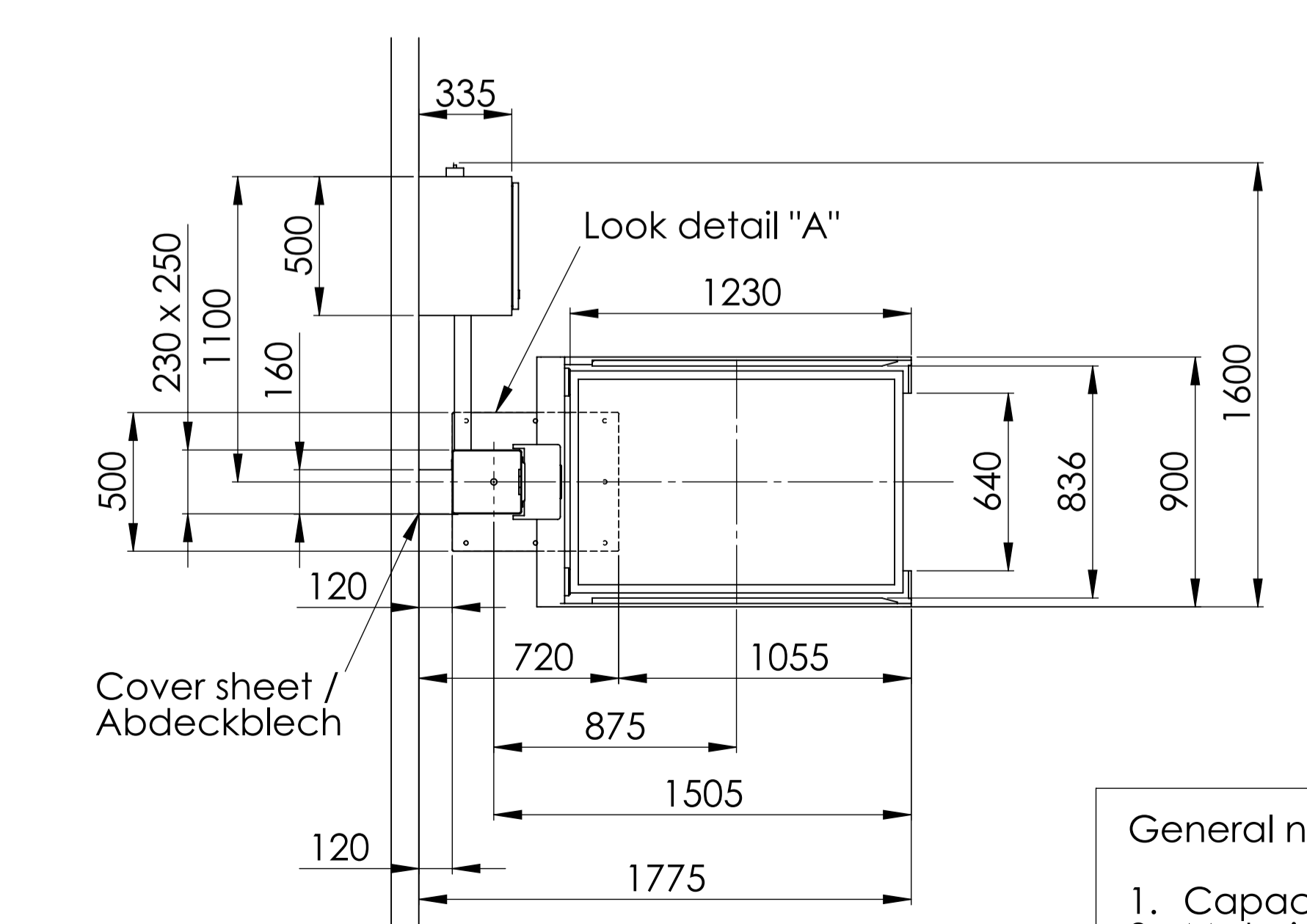
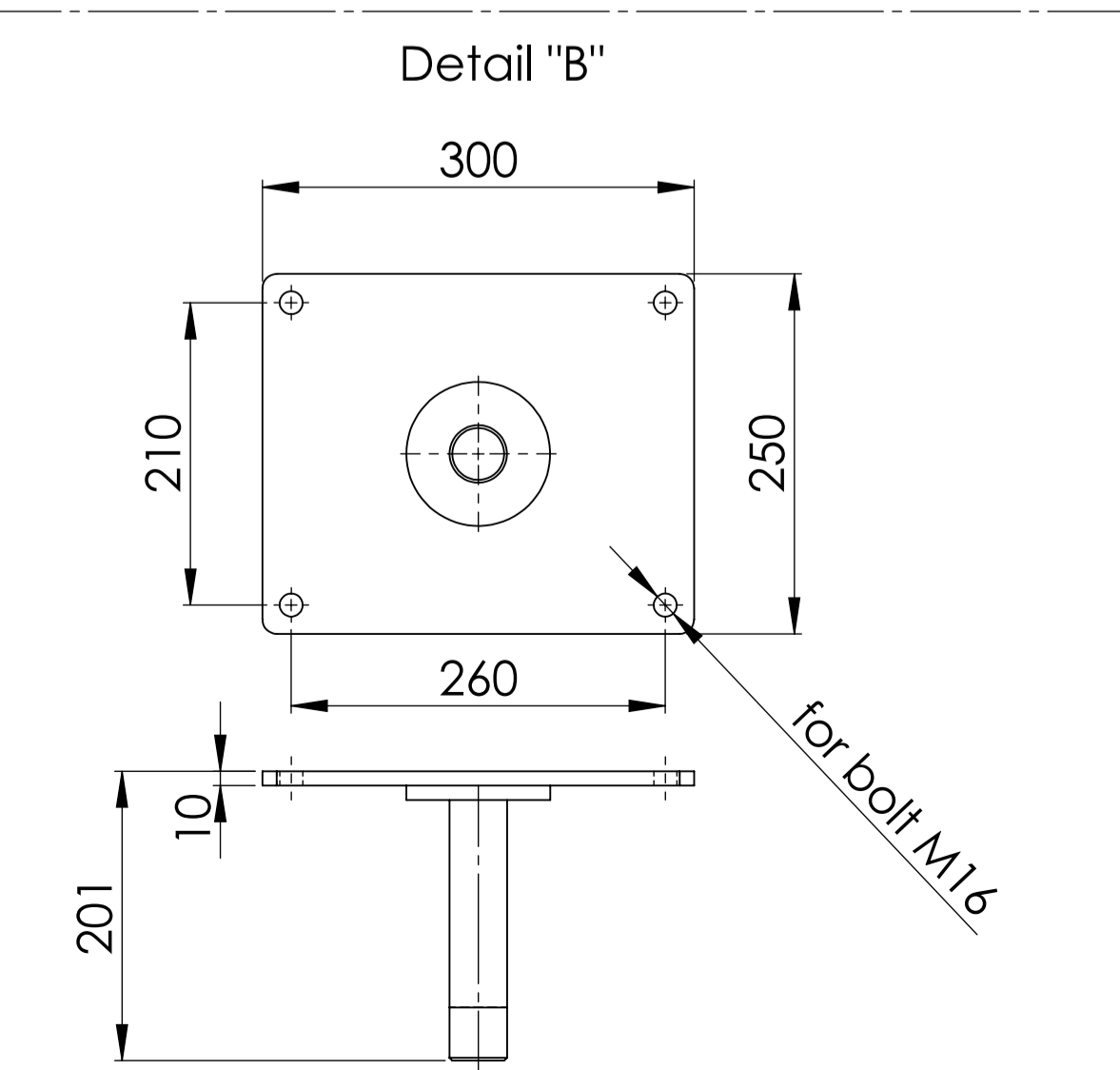
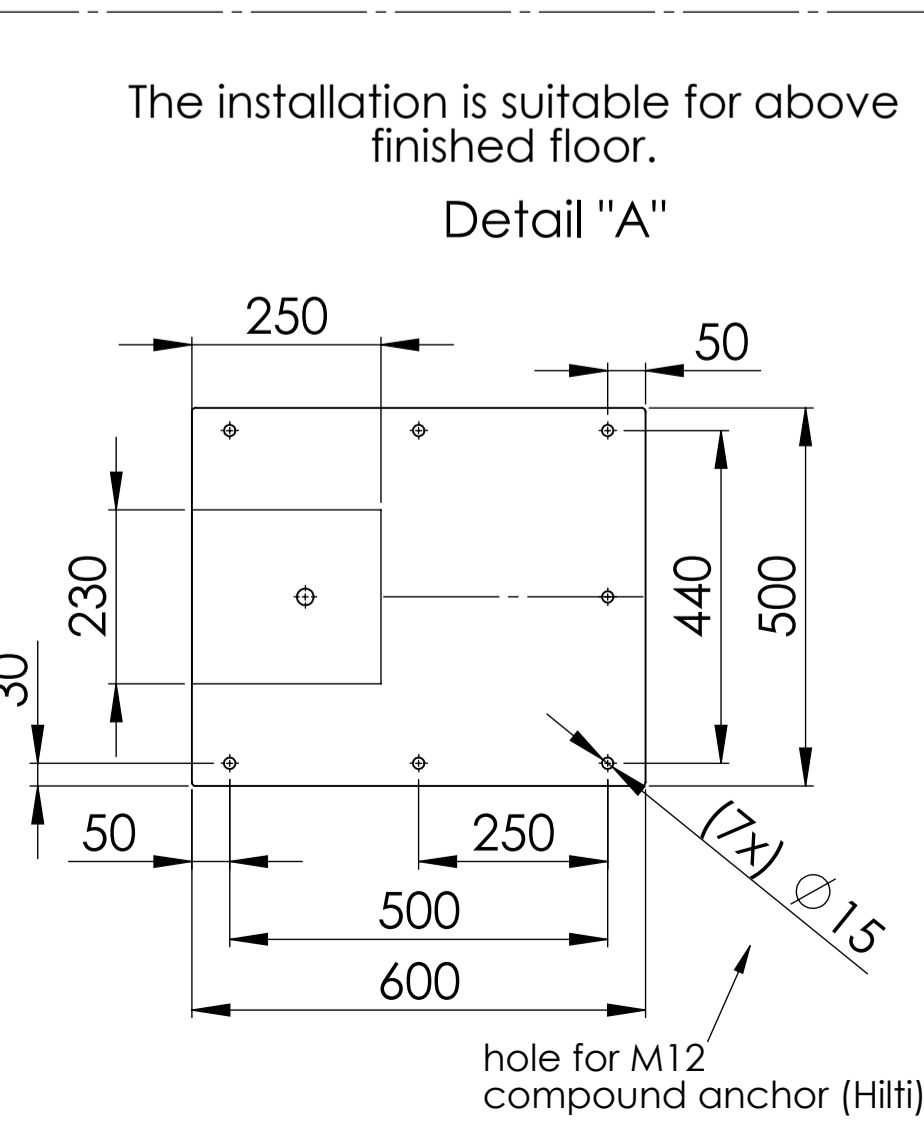
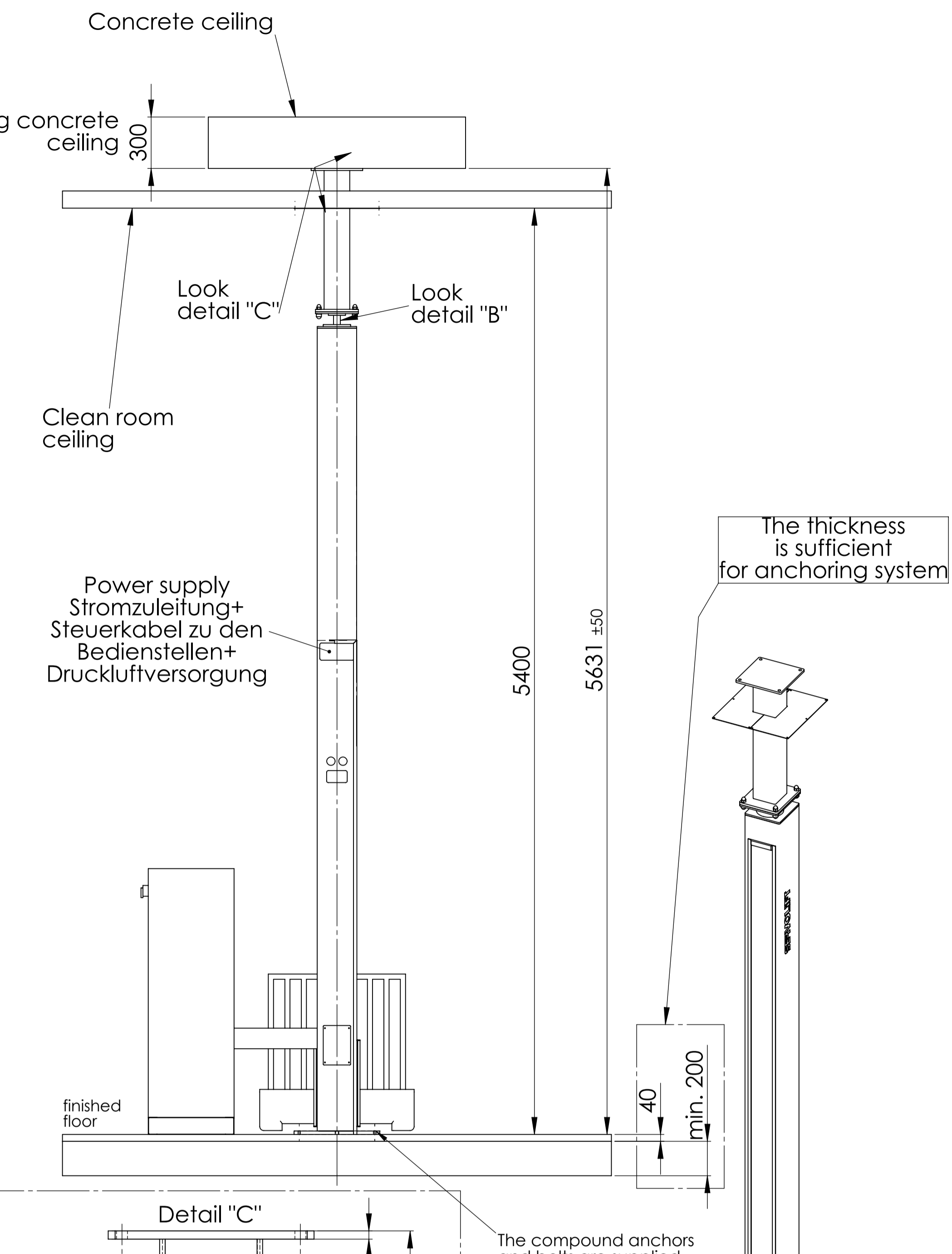
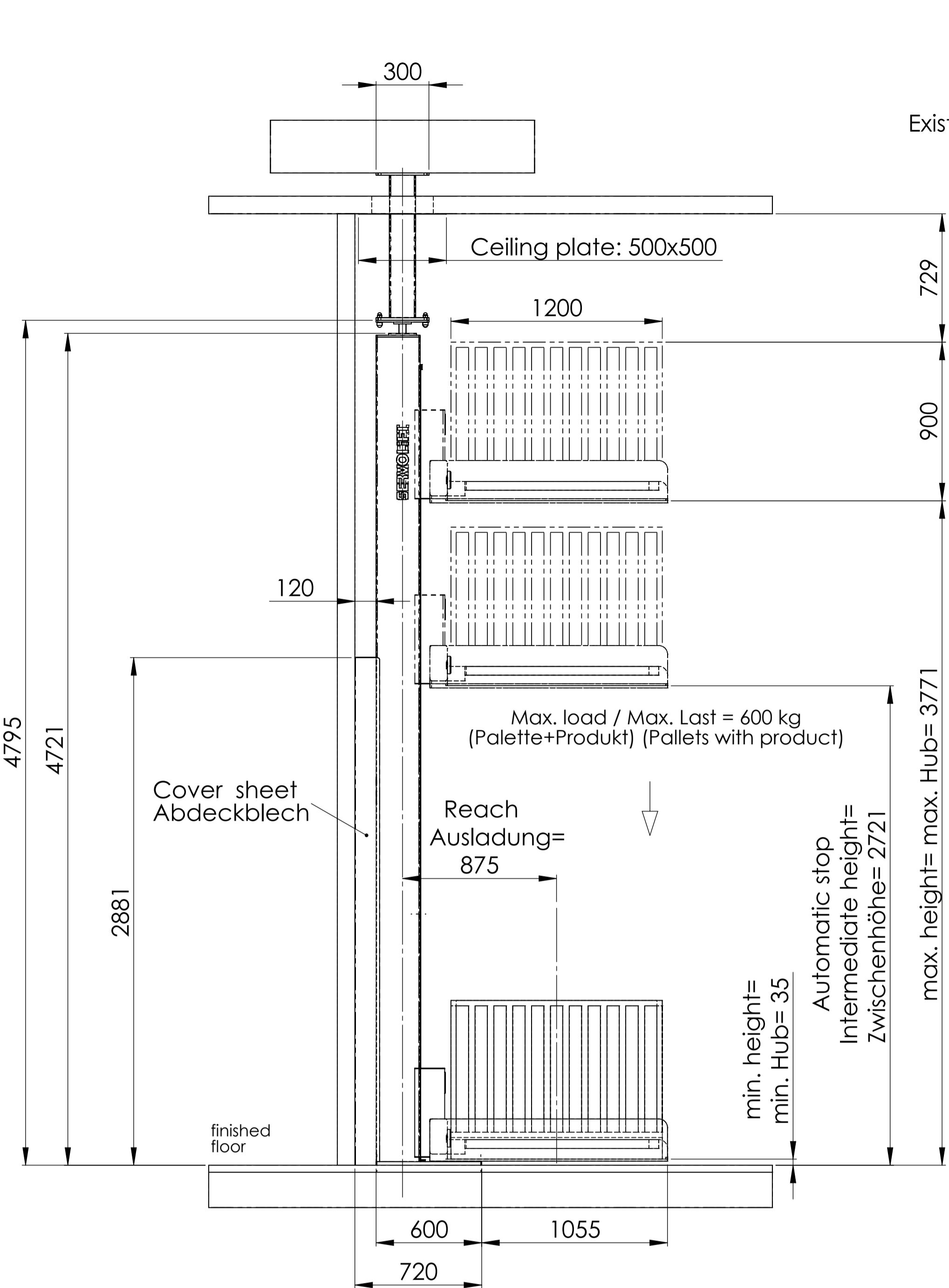
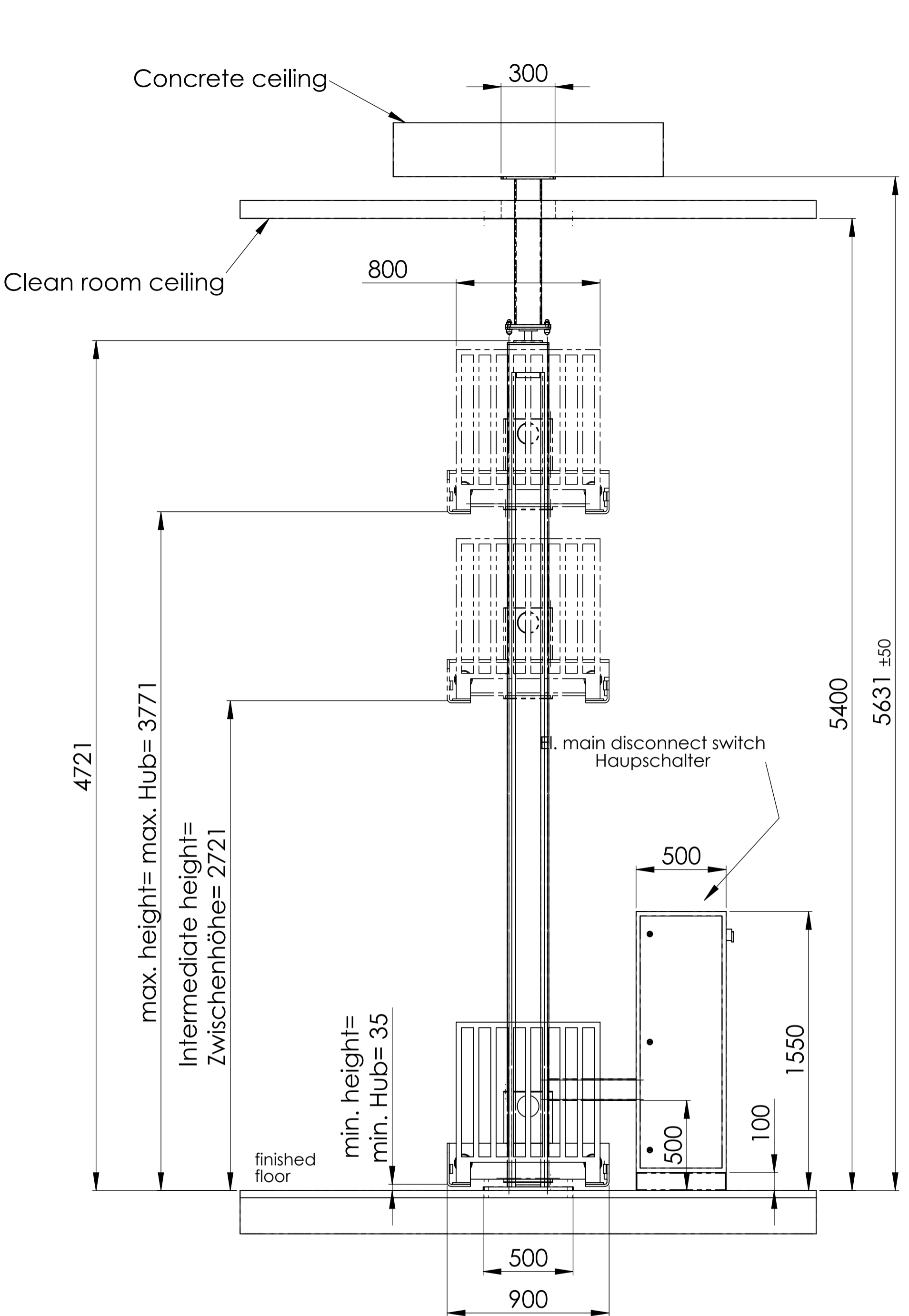
CALCULS			
Maximal Load:			
$Q_g = Q + Q_1 + Q_2$	=	14000	N
Foundation pressure:			
$P = \frac{Q_g + n \times F_{sp1}}{P_1 \times P_2}$	=	0,467	N/mm ²
Forces:			
$F = \frac{(Q + Q_1) \times C \times L}{H}$	=	1740	N
$F_1 = \frac{(Q + Q_1) \times C \times L}{H_1}$	=	2076	N
$F_2 = \frac{F_1 \times H_2}{L_3}$	=	6747	N

Dessin
non représenté
à l'échelle

Darstellung
nicht
maßstäblich

Representation
not to scale

END of document



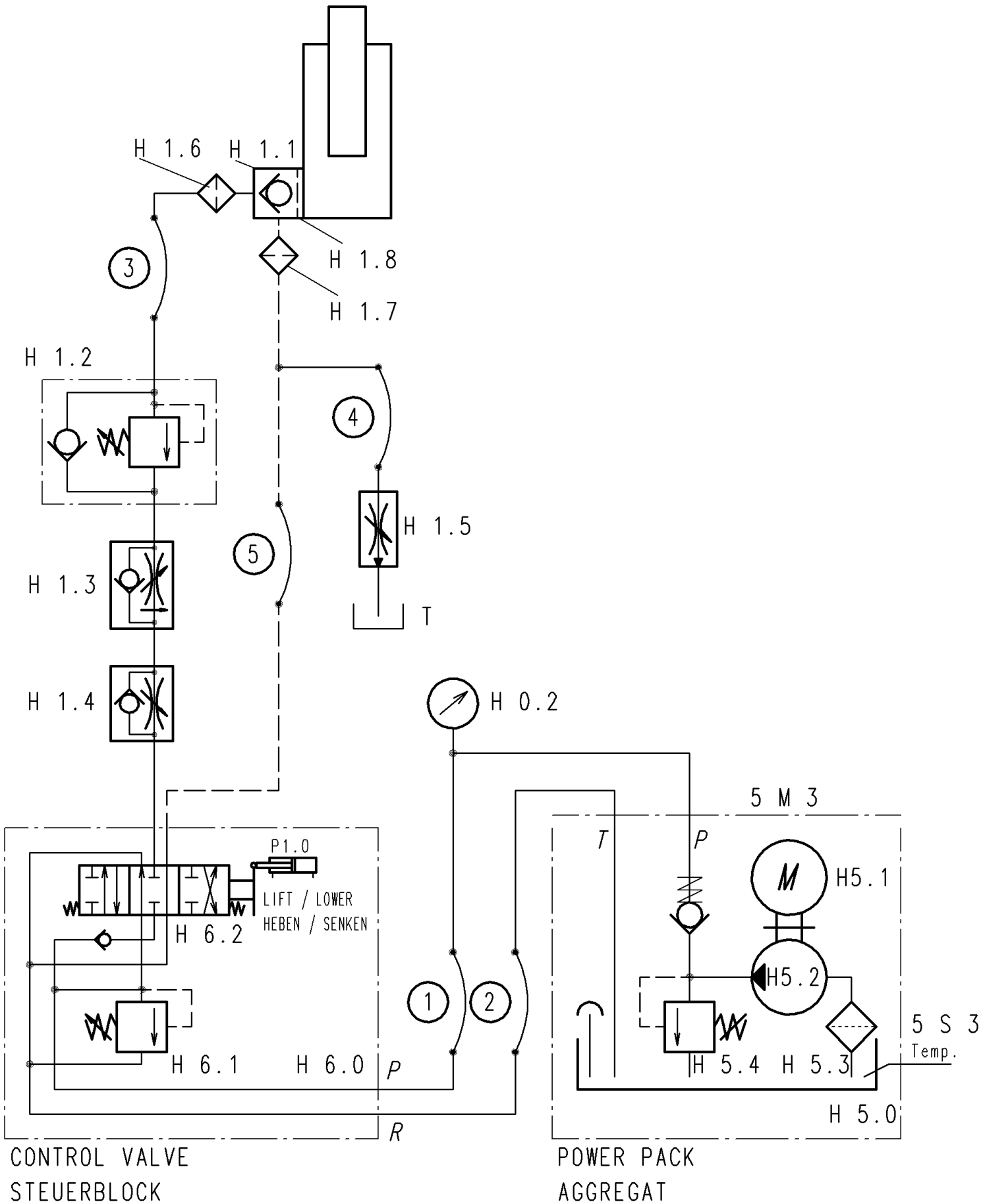
The compound anchors and bolts are supplied for installation of hoist

Total weight = 1400 kg (including 600 kg load)

- General note:
1. Capacity of lifter = 600 kg
 2. Material of construction AISI 304
 3. External surface finish $R_a \leq 1,5\mu m$
 4. All anchoring/mounting bolts are suitable for clean room installation

SERVOLIFT		Allgemeintoleranzen für Schweißkonstruktionen nach ISO13920		Mastab 1:20		BG/fg.-Nr. 00	
SERVOLIFT GmbH 77656 Offenburg, Germany www.servolift.de		B, F		Werkstoff Halbzeug Rohmaß:		Benennung	
Maße ohne Toleranzangaben nach ISO2768 m, K		Oberflächen		R 2 DIN ISO 1302		Palet Lifter Paletten Hubsäule	
Erst. 10.02.2014 schanz		Datum		Name		Ident.-Nr.	
Bearb. 11.02.2014 schanz		Freig.		11.02.2014 schanz		13249-00-001	
Zust. Änderung		Datum		Name		Index Blatt 0 von 1 A1	
Freig.		11.02.2014 schanz		Ursursprungsprojekt 13249		Ersetzt durch:	

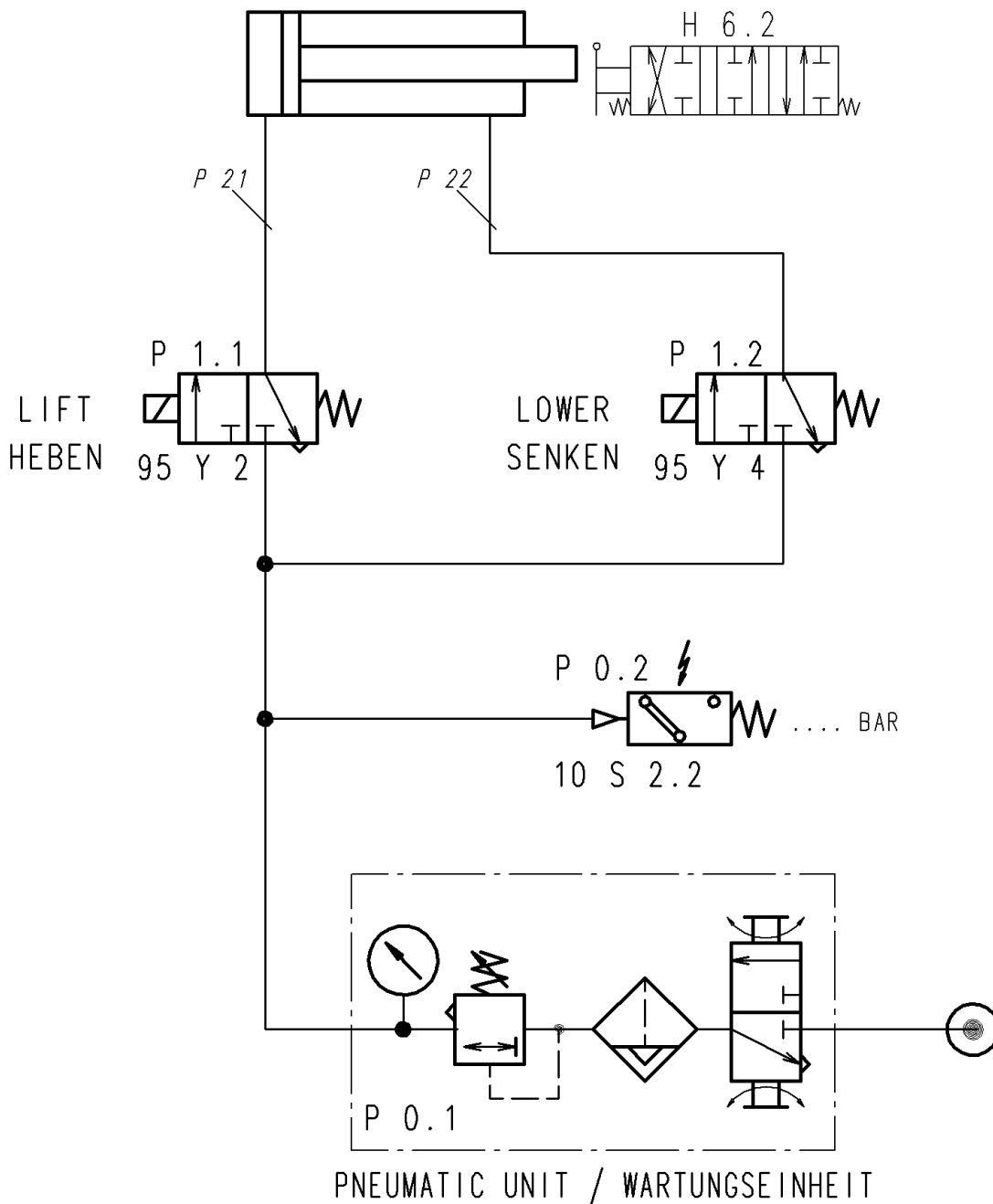
1.0 LIFT CYLINDER
HUBZYLINDER



Projekt-Nr.	Maße ohne Toleranzangaben	Oberflächenreihe R 2	Maßstab 1:1	Art.-Nr. -
		SO 2768	Werkstoff, Halbzeug	
		DIN ISO 1302	Benennung	
		Date	Hydraulic schematic Hydraulikschaltplan	
		Erst. 11.02.14	Schanz	
		Änder.		
		Bearb. 11.02.14	Schanz	
		Gep. 11.02.14	Schanz	
		SERVO LIFT GmbH Handhabungstechnik Albert-Einstein-Str.9 D-77656 Offenburg-Zunsweier Tel.0781/6100-0		Zeichnungsnummer U:97\973321\SC509JKE.ZE1
			13249-61-001	Index 0
Zusi. Änderung	Datum	Name	Ersatz für:	Ersatz durch:

vorläufig

P 1.0 LIFT / LOWER
HEBEN / SENKEN



Projekt-Nr.		Maße ohne Toleranzangaben		Oberflächenreihe R 2	Maßstab 1:1	Art.-Nr. -	
		ISO 2768		DIN ISO 1302	Werkstoff, Halbzeug		
		Date		Name	Benennung		
		Erst. 11.02.14		Schanz	Pneumatic Schematic		
		Änder.					
		Bearb. 11.02.14		Schanz			
		Gepr. 11.02.14		Schanz			
		SERVO LIFT GmbH		Zeichnungsnummer U:9807\ZEI\SCI186PO.ZEI		Index	Blatt
		Handhabungstechnik		13249-62-001		0	1/1
		Albert-Einstein-Str.9					
		D-77656 Offenburg-Zunsweier					
		Tel.0781/6100-0		Ersatz für:		Ersatz durch:	
Zust.	Änderung	Datum	Name				

vorläufig

SERVOLIFT

Albert-Einstein-Str. 9
D-77656 Offenburg
Tel.: +49 (0) 781 6100-0

13249

Customer : Frewitt
Plant designation : PALLET-LIFTER

Power supply : 230/400V (50Hz)
Input lead : 4x2,5mm²
Power : 2 KW
Fuse : 16 A
Control Voltage : 24 VDC
Manufacturing date : 2014
Ex - rating : II3D / ZONE 22

Designed / checked : 02.11.2012
Creator : LORENZ
Last Modification : 08.05.2014
Last modification by : lorenz
Version : 1
CAD - Ver. : 2.3.5

2

SERVOLIFT

Albert-Einstein-Str.9
77656 Offenburg
Phone +49 (0) 781-6100-0
Email: sl@servolift.de

Designed / checked

date 02.11.2012
Ed. by LORENZ

Modification

date 08.05.2014
Ed. by lorenz
ver.: 1

project: PALLET-LIFTER

project no.: 13249

description
COVER SHEET

Frewitt

SINGAPUR

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page 1

of 2

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/2	TABLE OF CONTENTS : /1 - =KP/107		08.05.2014	lorenz
=DOK/1	MODIFICATION INDEX		14.02.2014	lorenz
=DOK/2	DESIGN DESCRIPTION		08.05.2014	lorenz
=DOK/2.a	DIMENSIONING FOR DIN VDE 0100-430/1991:		20.09.2012	voegele
=DOK/3	OVERVIEW		07.05.2014	lorenz
=DOK/3.a	OVERVIEW		14.02.2014	lorenz
=DOK/4	CABLE ARRANGEMENT		14.02.2014	lorenz
=DOK/6	CABLE OVERVIEW		11.03.2014	lorenz
=DOK/7	ENCLOSURE		14.02.2014	lorenz
=DOK/8	MOUNTING PANEL		07.05.2014	lorenz
=DOK/9	CONTROL PANEL		07.05.2014	lorenz
=DOK/10	CONTROL PANEL		08.05.2014	lorenz
=EP+HS/1	POWER SUPPLY		08.05.2014	lorenz
=EP+HS/2	SUPPLY 24V		08.05.2014	lorenz
=EP+HS/5	MOTOR HYDRAULIC PUMP		08.05.2014	lorenz
=EP+HS/10	E-STOP MODULE		07.05.2014	lorenz
=EP+HS/11	TWO-HAND MODULE		14.02.2014	lorenz
=EP+HS/12	TWO-HAND MODULE		14.02.2014	lorenz
=EP+HS/14	SIGNAL EXCHANGE		11.03.2014	lorenz
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=EP+HS/21	CIRCUIT DIAGRAM INPUTS, DIGITAL		14.02.2014	lorenz
=EP+HS/23	CIRCUIT DIAGRAM INPUTS, DIGITAL		14.02.2014	lorenz
=EP+HS/95	CIRCUIT DIAGRAM VALVES		14.02.2014	lorenz
=EP+HS/100	OVERVIEW SPARE TERMINALS		14.02.2014	lorenz
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=KP/102.a	X14		11.03.2014	lorenz
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=KP/104	X31		14.02.2014	lorenz
=KP/105	X32		14.02.2014	lorenz
=KP/106	X33		14.02.2014	lorenz
=KP/107	X41		14.02.2014	lorenz

=DOK/1

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Modification

 date 08.05.2014
 Ed. by lorenz
 ver.: 1

project: PALLET-LIFTER

project no.: 13249

description

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 =KP/107

Frewitt

SINGAPUR

=

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page 2



of 2

DESIGN REFERENCE

WIRING WIDTH

MAIN CIRCUIT : 400V AC - MIN. 1,5MM²
 CONTROL CIRCUIT : 24V DC - MIN. 0,5MM²
 CONTROL CIRCUIT : 230V AC - MIN. 1,5MM²

SPECIFIC REFERENCE

CABLE ENTRY : BELOW
 CUSTOMER SPECIFICATIONS : 
 CONDUCTOR MARKING : 
 LANGUAGE : ENGLISH

THE INSTALLATION OF THE MACHINE IS ACCORDING TO VDE 0100, VDE 0113.

WIRING COLOURS

MAIN CIRCUIT : L1: BROWN / L2: BLACK / L3: GREY
 NEUTRAL CONDUCTOR : LIGHT BLUE
 PROTECTIVE WIRE : GREEN-YELLOW
 CONTROL CIRCUIT 230V AC : BROWN
 GROUND 230V AC : BLUE
 CONTROL CIRCUIT 24V DC : VIOLETT
 GROUND 24V DC : VIOLET/WHITE
 EXTERNAL VOLTAGE : ORANGE
 ANALOGUE SIGNAL : WHITE
 PT 100 : WHITE
 INTRINSICALLY SAFE (EX I) : BLUE


CUSTOMER SPECIFICATIONS

WIRING COLOURS

CONTROL CIRCUIT 24V DC : VIOLETT
 GROUND 24V DC : VIOLET/WHITE
 MAIN CIRCUIT : L1: BROWN /
 L2: BLACK /
 L3: GREY

1

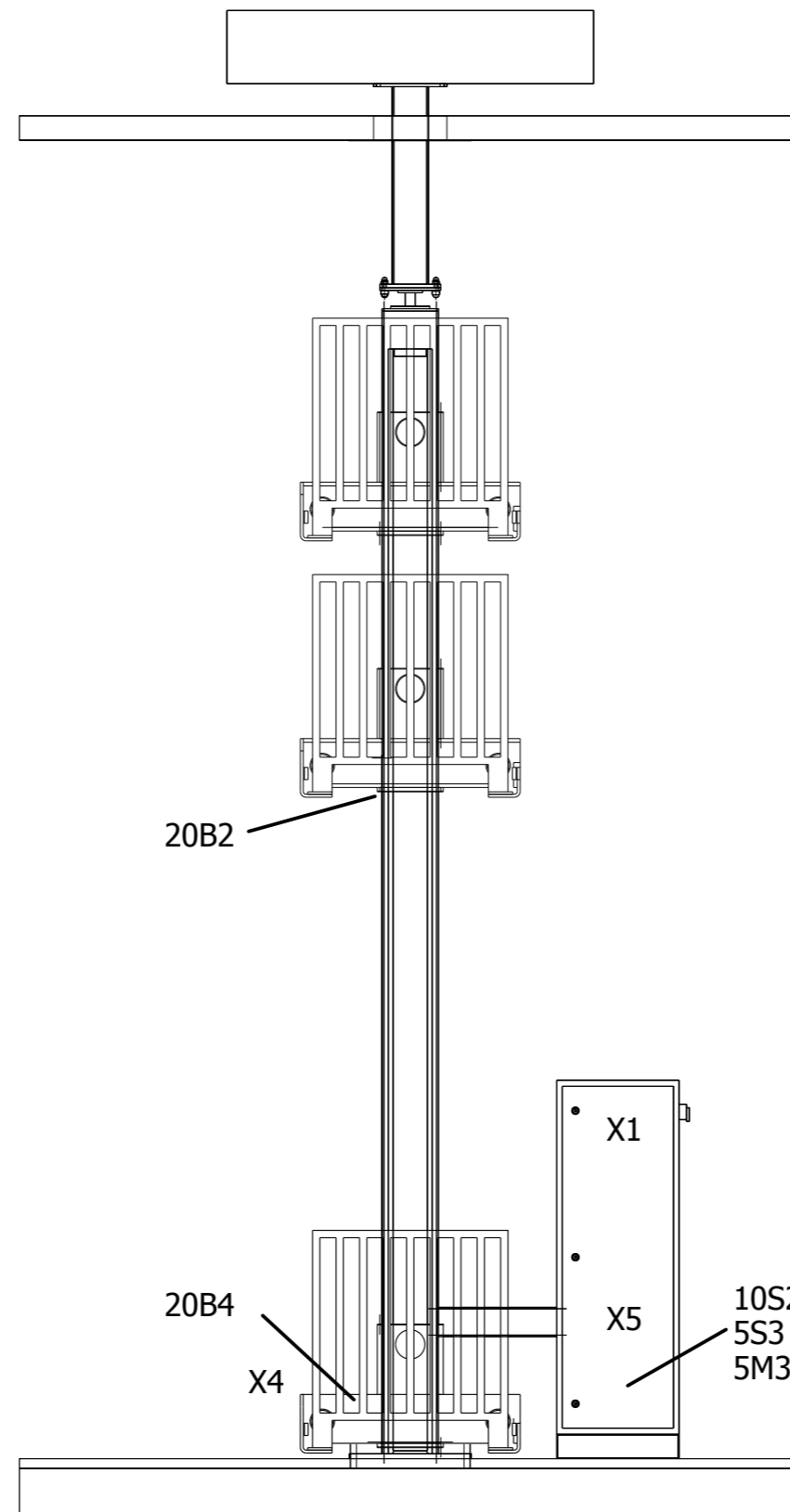
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 Albert-Einstein-Str.9 77656 Offenburg Phone +49 (0) 781-6100-0 Email: sl@servolift.de	Designed / checked	Modification	project: PALLET-LIFTER	description DESIGN DESCRIPTION	Frewitt	= DOK	DOCUMENTATION	
	date 02.11.2012	date 08.05.2014	project no.: 13249				+	
	Ed. by LORENZ	Ed. by lorenz						page 2
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DIMENSIONING FOR DIN VDE 0100-430/1991:

CURRENT CARRYING CAPACITY OF CABLES AND WIRES WITH COPPER UND PVC-INSULATION
AT FIXED LAYING IN AND AT BUILDINGS; CONTINUOUS OPERATION;
WORKING TEMPERATURE: 70°C; AMBIENT TEMPERATURE: 25°C

1		2	3	4	5	6	7	8	9	10	11	12	13	
INSTALLATION METHOD		A1		A2		B1		B2		C		E		
NUMBER OF CONDUCTED WIRES		2	3	2	3	2	3	2	3	2	3	2	3	
NOMINAL WIDTH IN MM ²		CURRENT CARRYING CAPACITY "I Z" IN A; NOMINAL CURRENT "I N" IN A												
COPPER	1,5	I Z	16,5	14,5	16,5	14,0	18,5	16,5	17,5	16,0	21	18,5	23	19,5
		I N	16	13	16	13	16	16	16	16	20	16	20	16
	2,5	I Z	21	19	19,5	18,5	25	22	24	21	29	25	32	27
		I N	20	16	16	16	25	20	20	20	25	25	32	25
	4	I Z	28	25	27	24	34	30	32	29	38	35	42	36
		I N	35	35	35	20	32	25	32	25	35	35	40	35
	6	I Z	36	33	34	31	43	38	40	36	49	43	54	46
		I N	25	32	32	25	40	35	40	35	40	40	50	40
	10	I Z	49	45	46	41	60	53	55	50	67	63	74	64
		I N	40	40	40	40	50	50	50	50	63	63	63	63
	16	I Z	65	59	60	55	81	72	73	66	90	81	100	85
		I N	63	50	50	50	80	63	63	63	80	80	100	80
	25	I Z	85	77	80	72	107	94	95	85	119	102	126	107
		I N	80	63	80	6	100	80	80	80	100	100	125	100
	35	I Z	105	94	98	88	133	117	118	105	146	126	157	134
		I N	100	80	80	80	100	100	100	100	125	125	125	125
	50	I Z	126	114	117	105	160	142	141	125	178	153	191	162
		I N	125	100	100	100	160	125	125	125	160	125	160	160



X3.3 21S10
21S12

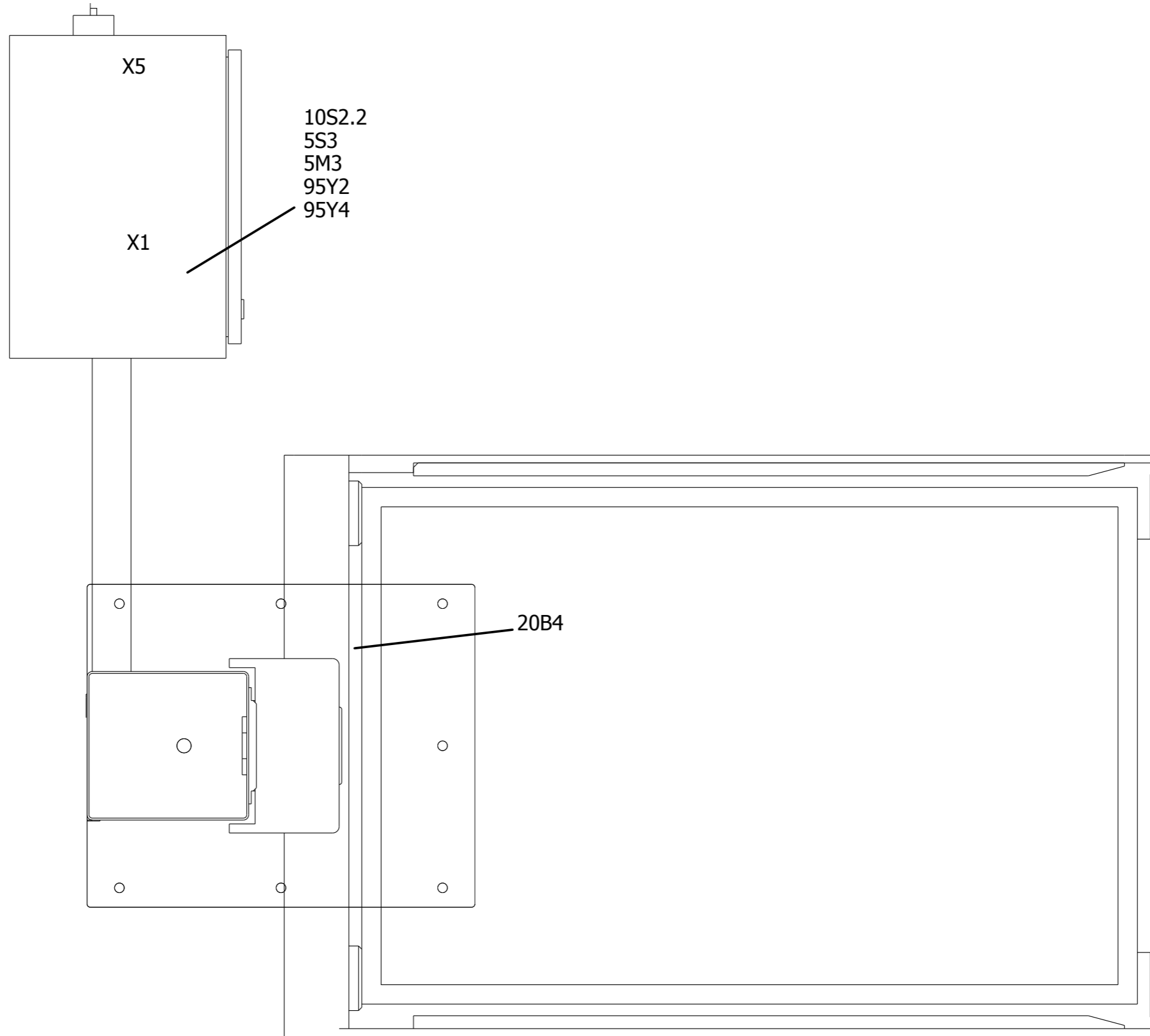
X3.1 10S2
12S7
14S6

11S7

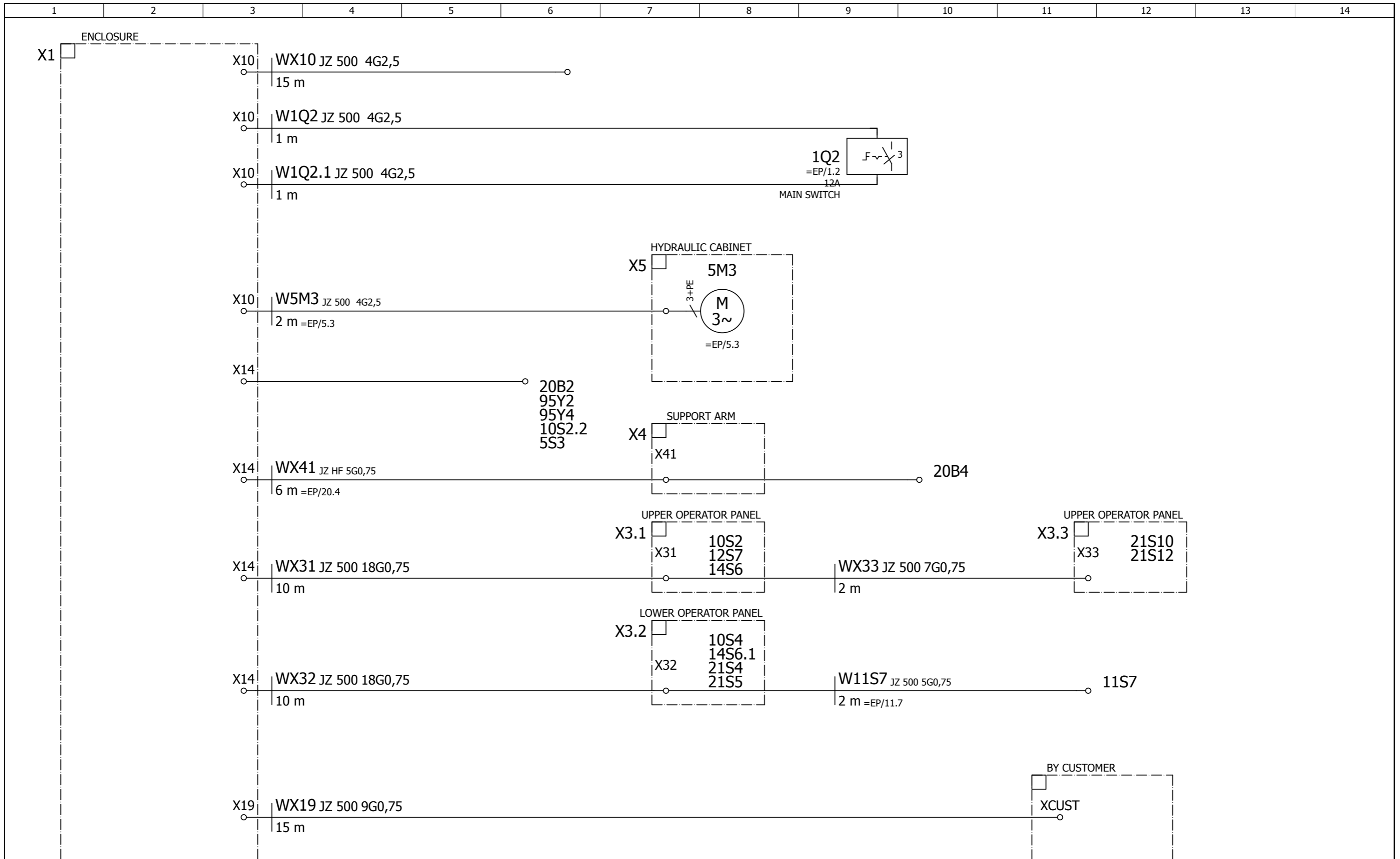
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21S4
21S5
14S6.1

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3.a

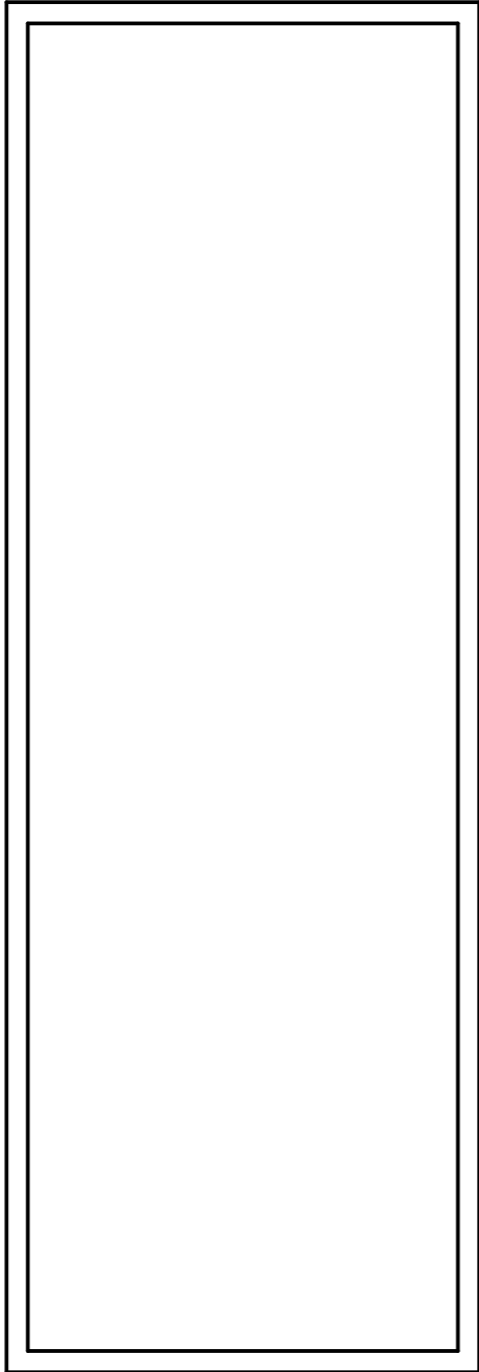


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	date 02.11.2012	date 08.05.2014	project no.: 13249		SINGAPUR	+ _____
	Ed. by LORENZ	Ed. by lorenz				page 3.a
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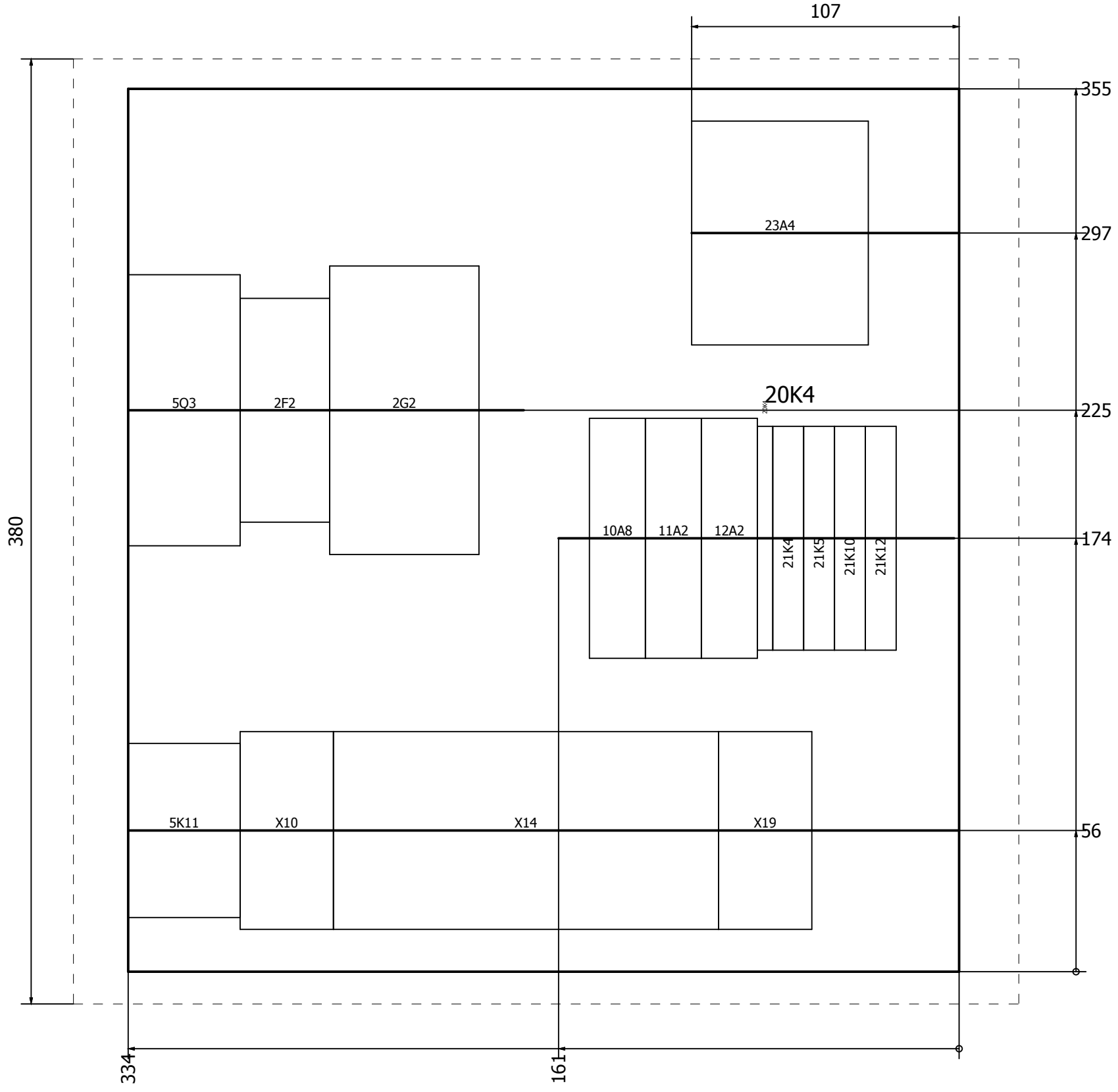
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1Q2

X1



9

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Frewitt
SINGAPUR

description
MOUNTING PANEL

project: **PALLET-LIFTER**
project no.: **13249**

Modification
date 08.05.2014
Ed. by lorenz
ver.: 1

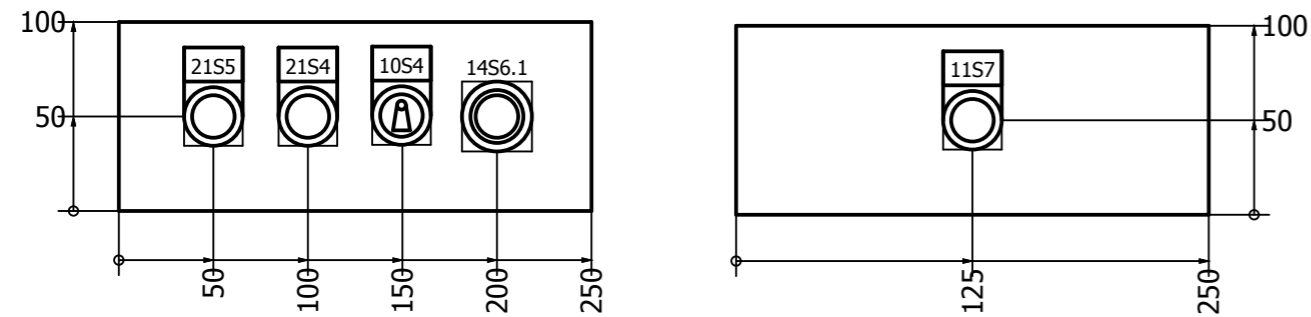
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SERVOLIFT
Albert-Einstein-Str.9
77656 Offenburg
Phone +49 (0) 781-6100-0
Email: sl@servolift.de

7

BMK	FUNCTION
14S6.1	EMERGENCY STOP
21S4	BUTTON: LIFT
21S5	BUTTON: LOWER
10S4	CONTROL OFF/ ON
11S7	MOTOR ON

X3.2

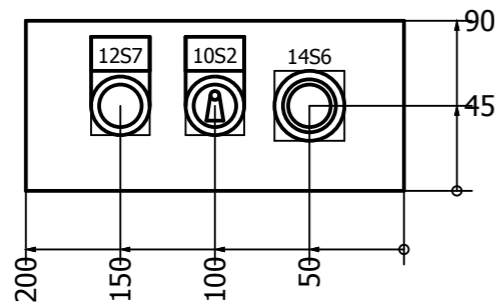


LOWER OPERATOR PANEL

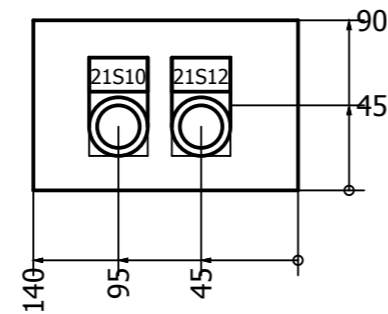
SERVOLIFT Albert-Einstein-Str.9 77656 Offenburg Phone +49 (0) 781-6100-0 Email: sl@servolift.de	Designed / checked	Modification	project: PALLET-LIFTER	description CONTROL PANEL	Frewitt	= DOK DOCUMENTATION
	date 02.11.2012	date 08.05.2014	project no.: 13249			+ _____
	Ed. by LORENZ	Ed. by lorenz			SINGAPUR	page 9
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BMK	FUNCTION
12S7	MOTOR ON
21S10	BUTTON: LIFT
21S12	BUTTON: LOWER
14S6	EMERGENCY STOP
10S2	CONTROL OFF/ ON

X3.1



X3.3



UPPER OPERATOR PANEL

SERVOLIFT Albert-Einstein-Str.9 77656 Offenburg Phone +49 (0) 781-6100-0 Email: sl@servolift.de	Designed / checked	Modification	project: PALLET-LIFTER	description CONTROL PANEL	Frewitt	= DOK DOCUMENTATION
	date 02.11.2012	date 08.05.2014	project no.: 13249		SINGAPUR	+ _____
	Ed. by LORENZ	Ed. by lorenz				page 10
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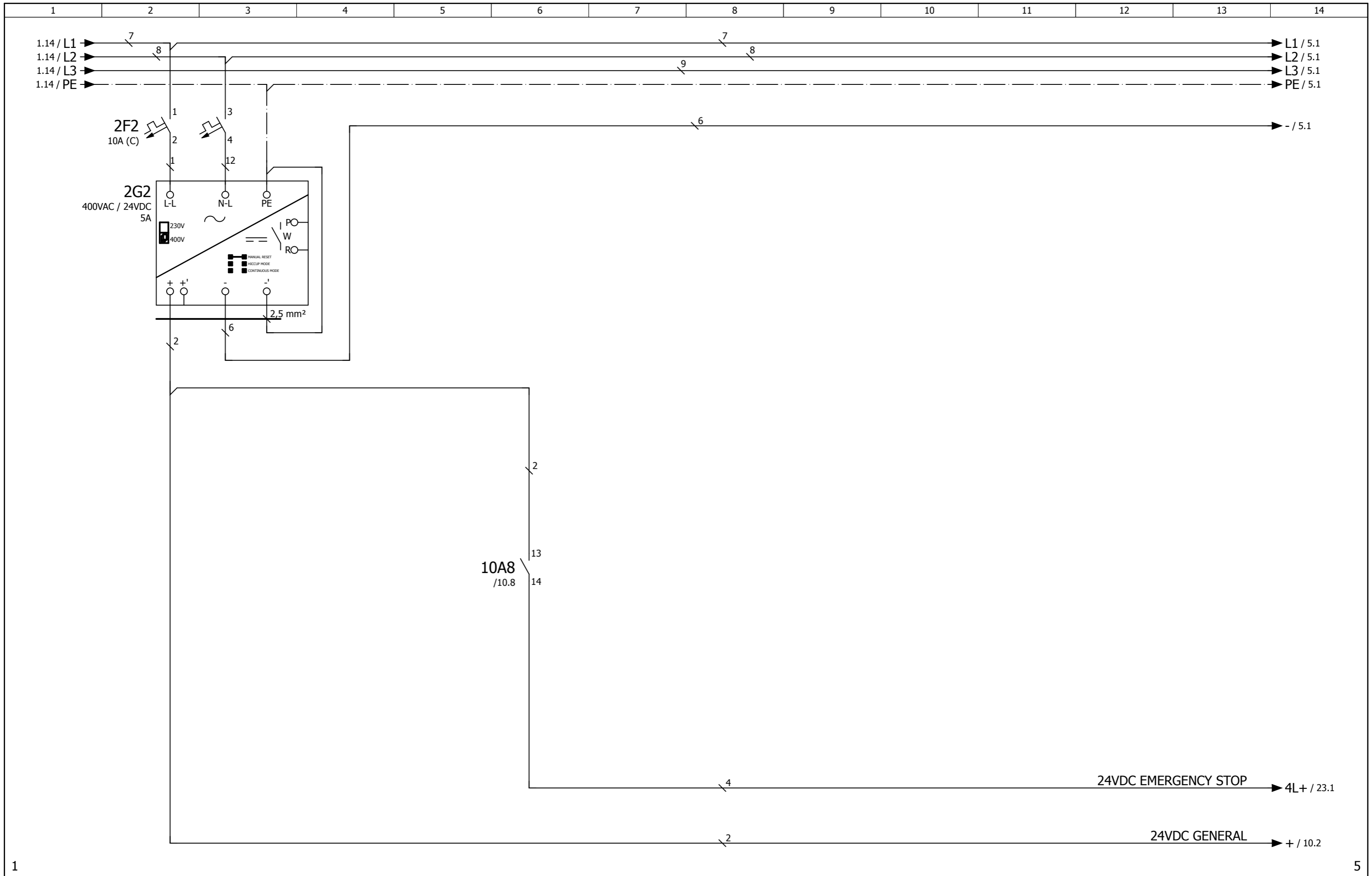


L1: BROWN /
 L2: BLACK /
 L3: GREY

=DOK/10

2

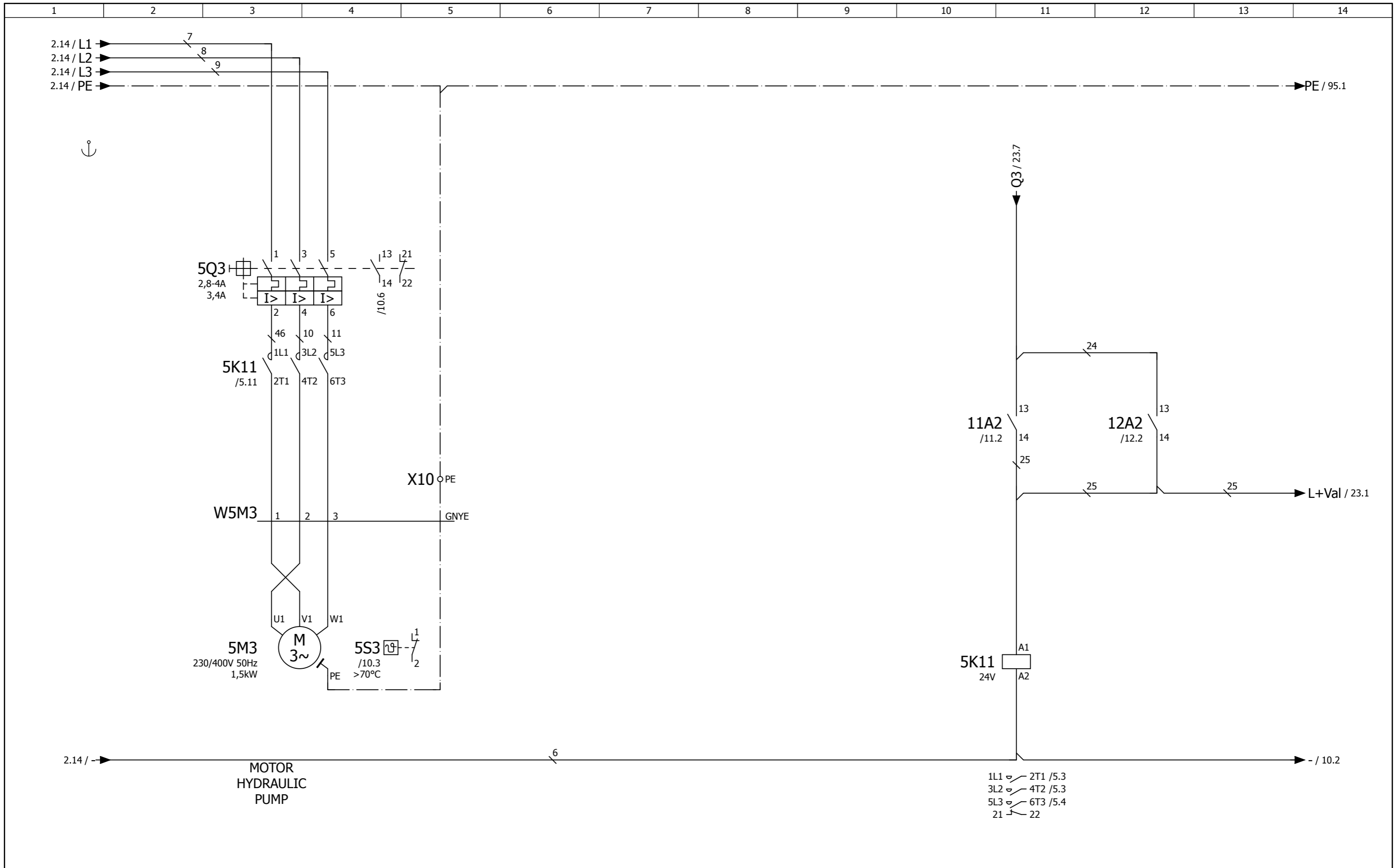
SERVOLIFT Albert-Einstein-Str.9 77656 Offenburg Phone +49 (0) 781-6100-0 Email: sl@servolift.de	Designed / checked	Modification	project: PALLET-LIFTER	description POWER SUPPLY	Frewitt	= EP	CIRCUIT DIAGRAM
	date 02.11.2012	date 08.05.2014				+ HS	LIFTING COLUMN
	Ed. by LORENZ	Ed. by lorenz					page 1
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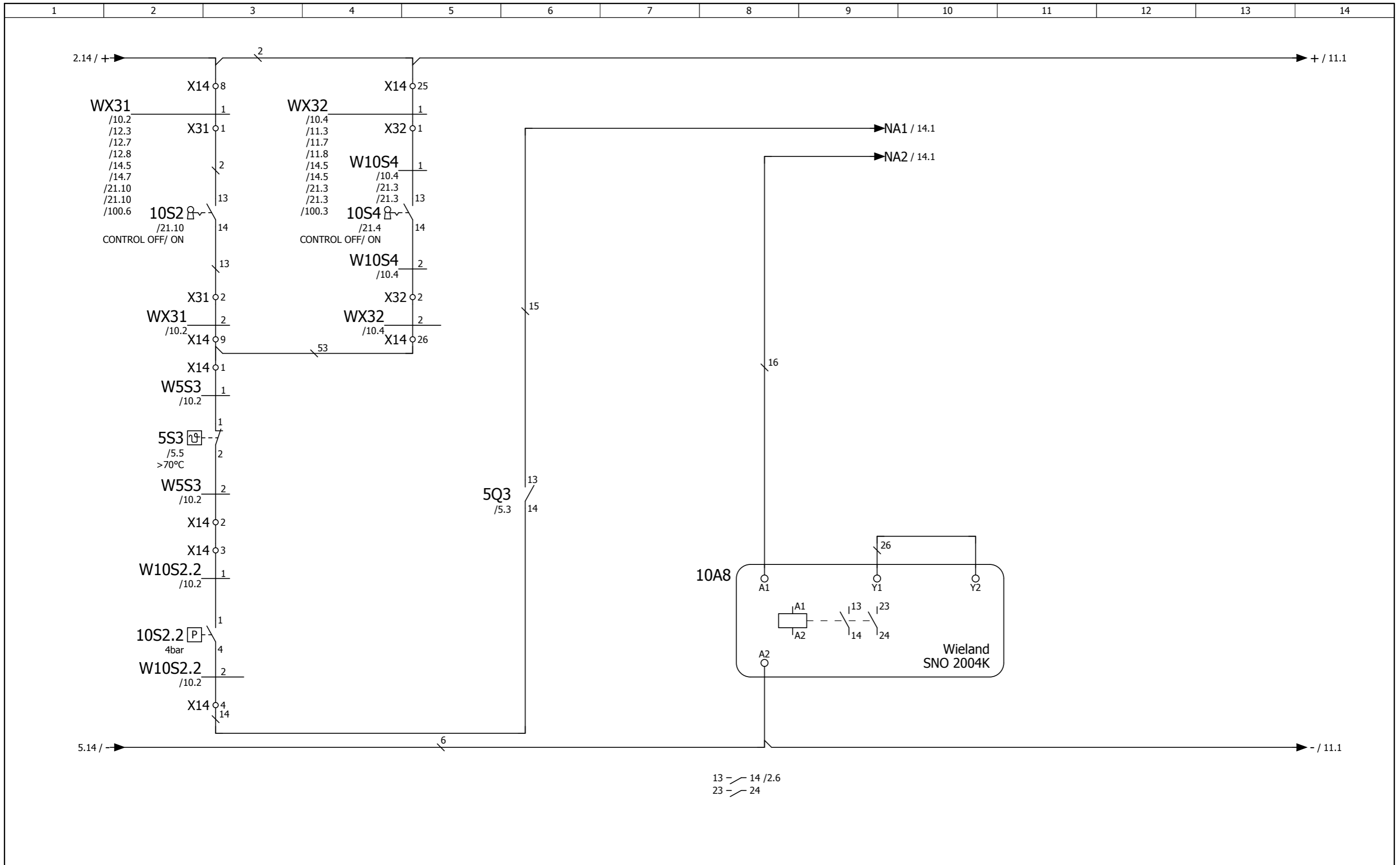


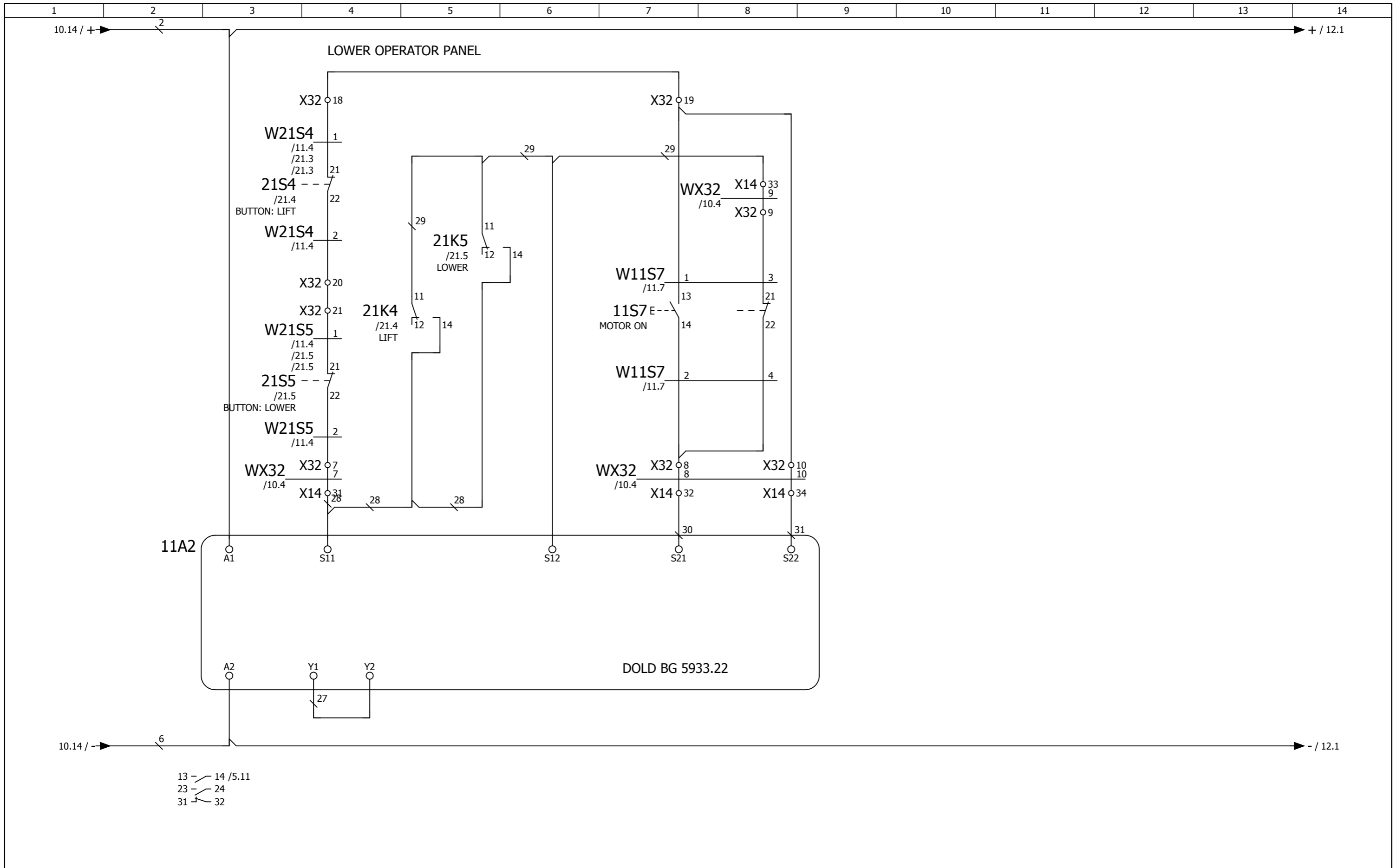
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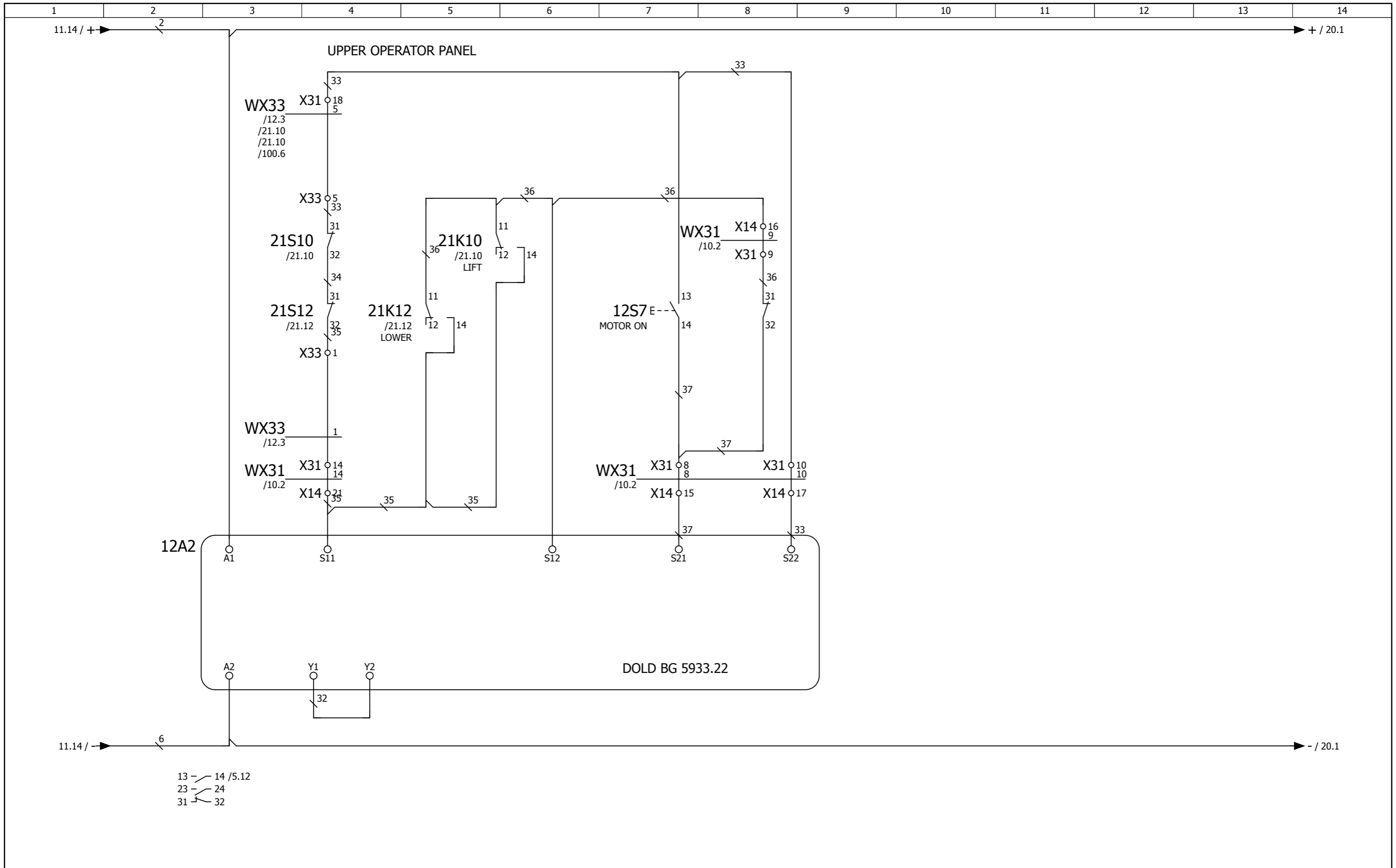
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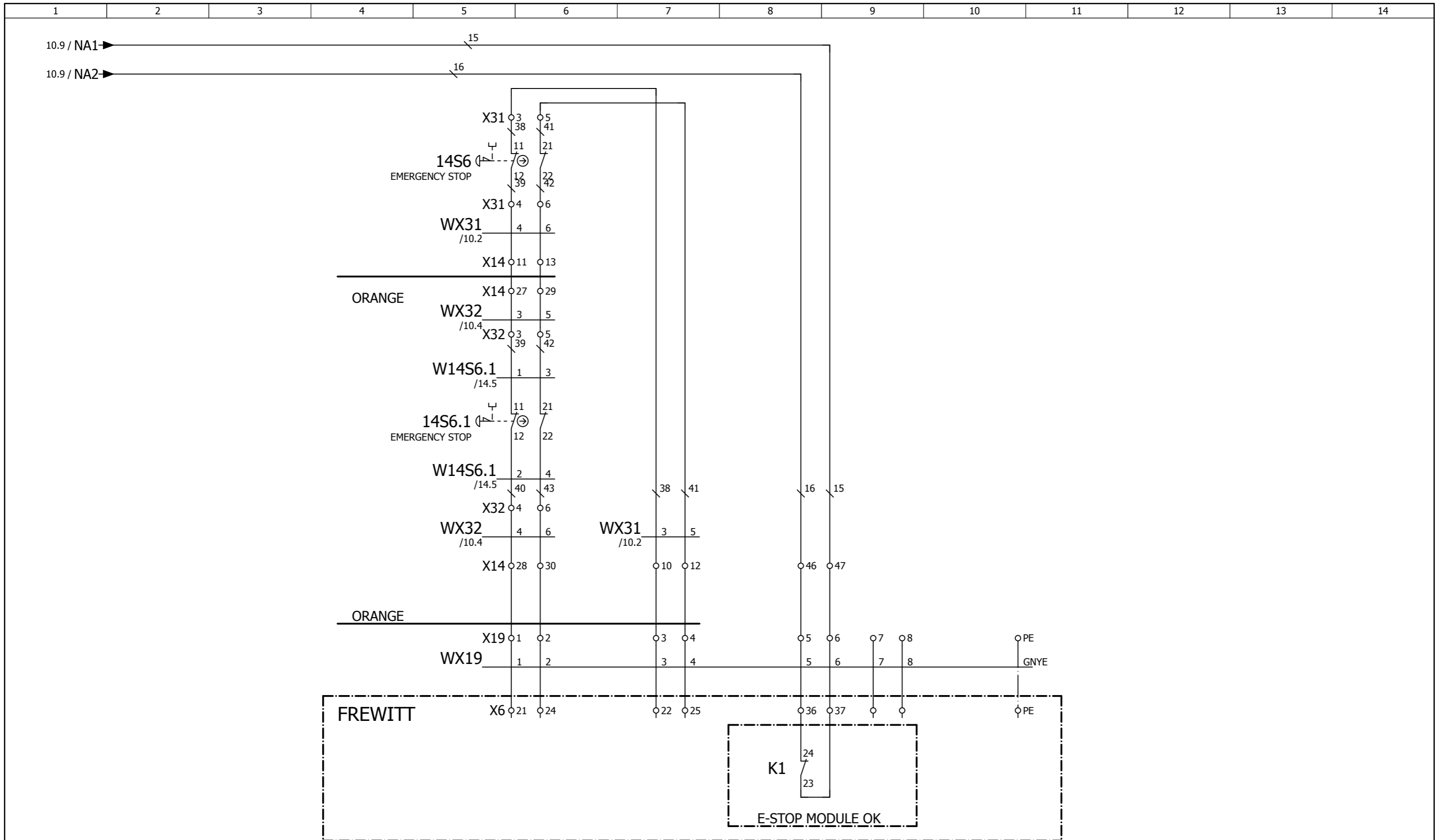
SERVOLIFT Albert-Einstein-Str.9 77656 Offenburg Phone +49 (0) 781-6100-0 Email: sl@servolift.de	Designed / checked	Modification	project: PALLET-LIFTER	description: SUPPLY 24V	Frewitt	= EP	CIRCUIT DIAGRAM
	date 02.11.2012	date 08.05.2014	project no.: 13249			+ HS	LIFTING COLUMN
	Ed. by LORENZ	Ed. by lorenz					page 2
		ver.: 1			SINGAPUR		of 100

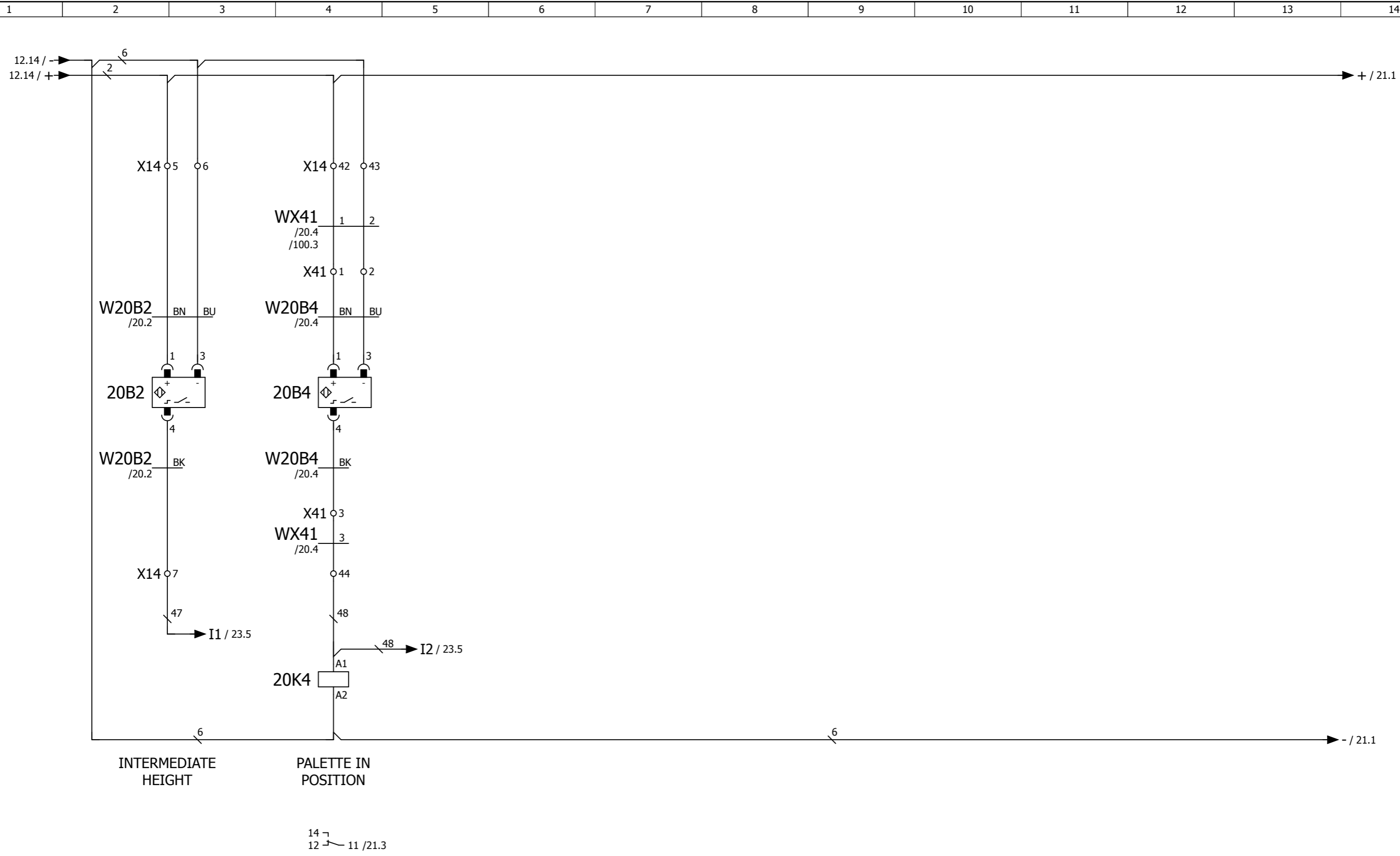


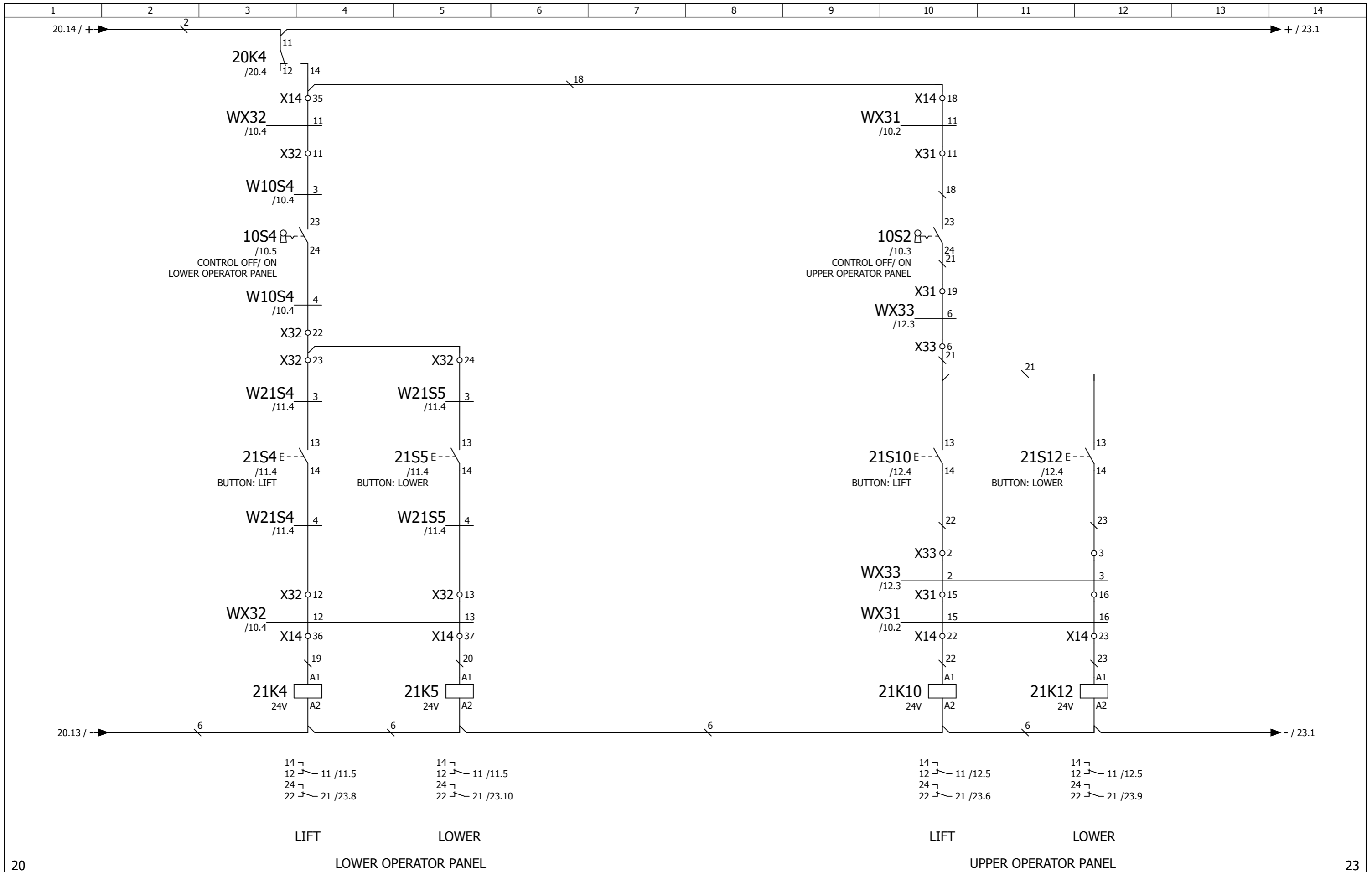






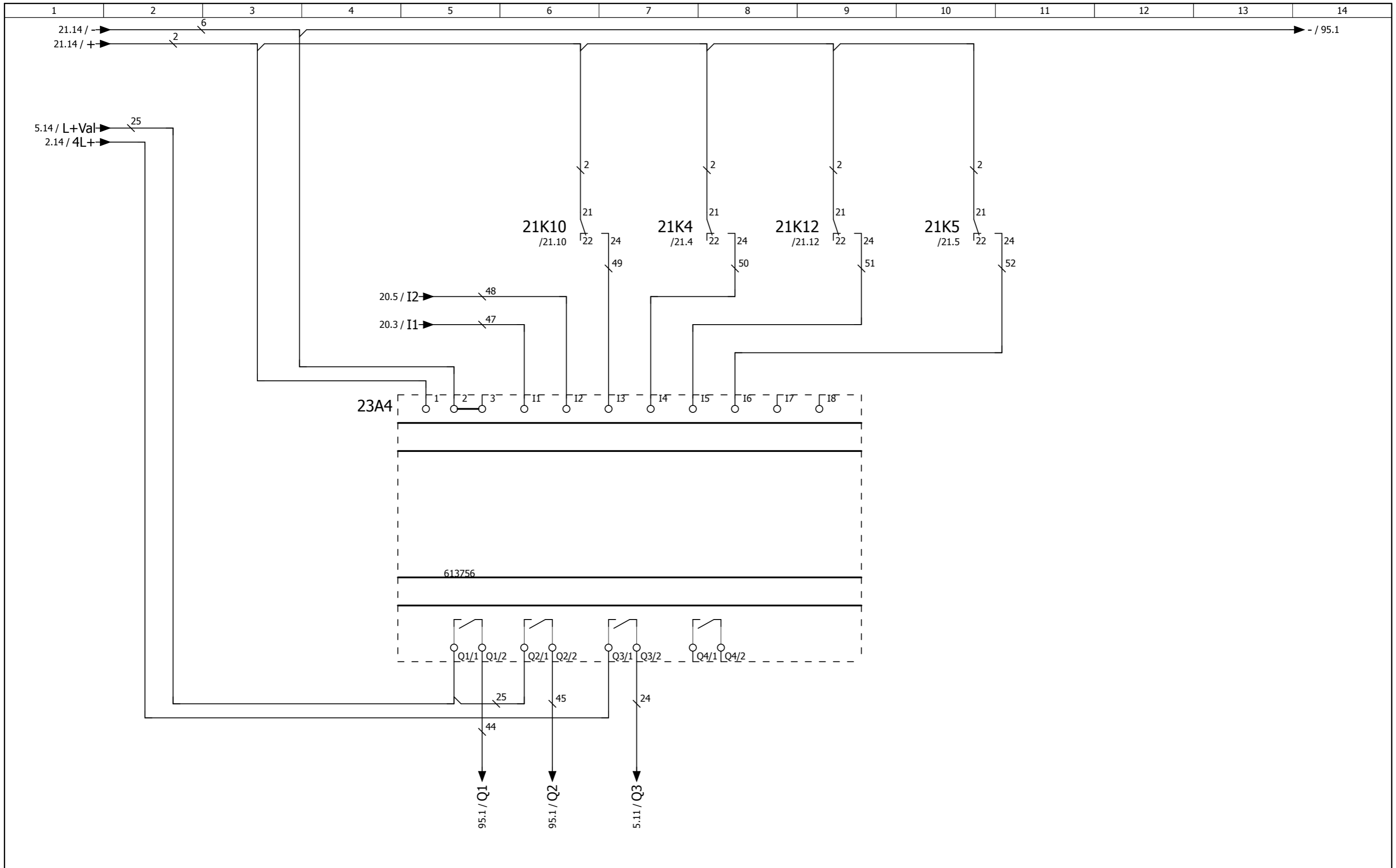


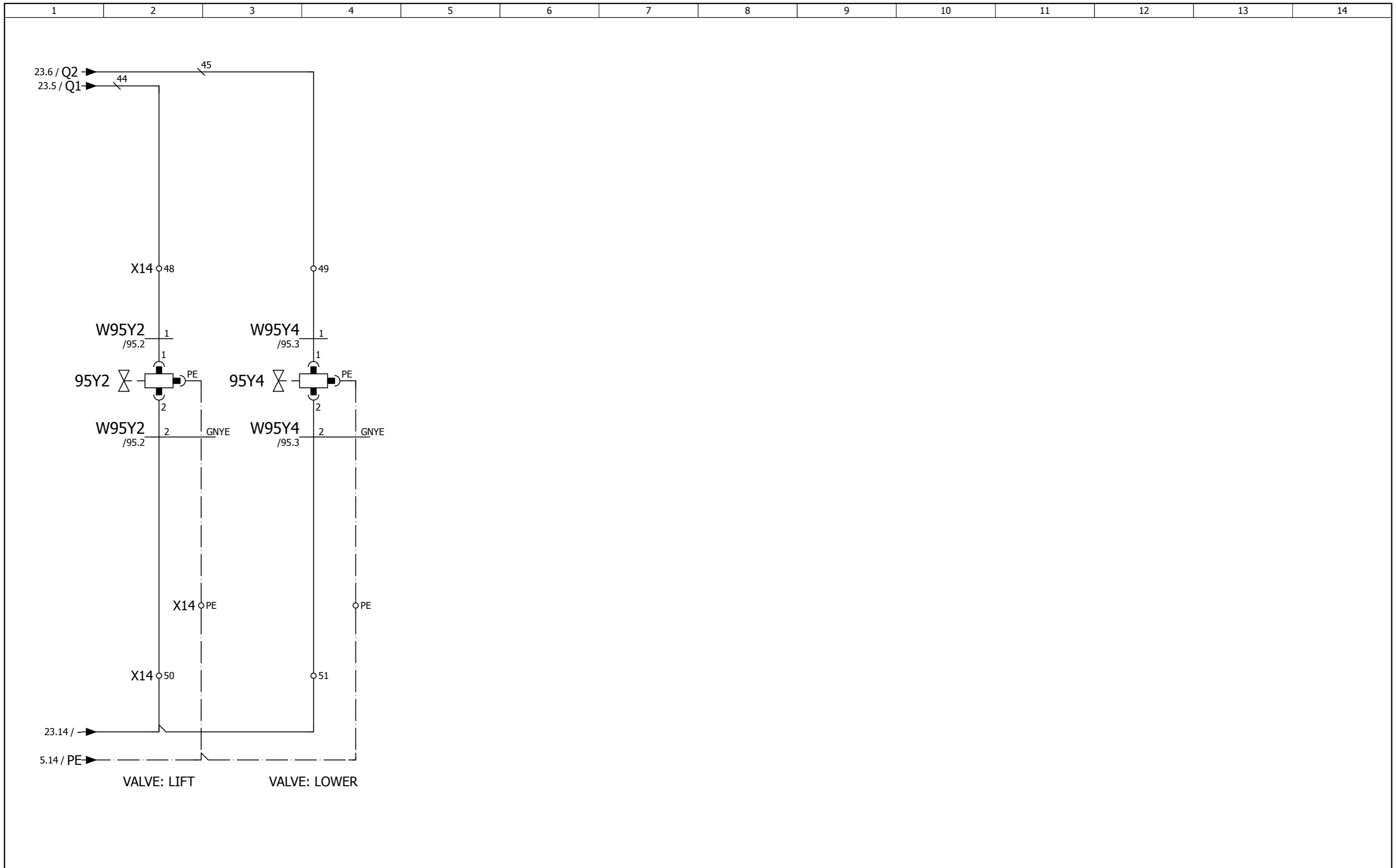




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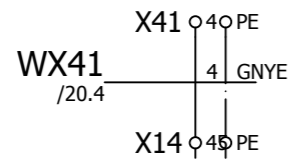
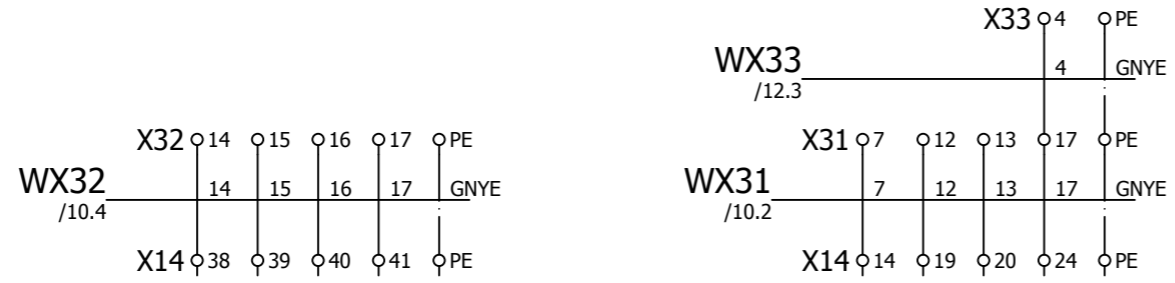
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23	H1.10	H1.10	100
SERVOLIFT Albert-Einstein-Str.9 77656 Offenburg Phone +49 (0) 781-6100-0 Email: sl@servolift.de	Designed / checked	Modification	project: PALLET-LIFTER
	date 02.11.2012	date 08.05.2014	description CIRCUI DIAGRAM VALVES
	Ed. by LORENZ	Ed. by lorenz	Frewitt
		ver.: 1	project no.: 13249
			SINGAPUR
			= EP CIRCUI DIAGRAM
			+ HS LIFTING COLUMN
			page 95
			of 100

1 2 3 4 5 6 7 8 9 10 11 12 13 14



Terminal diagram

Cable name		Cable type		Wire number		Target design.		Connection		Terminal number		Jumpers		Target design.		Connection	
W1Q2.1	JZ 500	4G2,5 mm ²		1		L1				1				1Q2		1	
W5M3	JZ 500	4G2,5 mm ²		2		L2				2				1Q2		3	
WX10	JZ 500	4G2,5 mm ²		3		L3				3				1Q2		5	
						PE				PE							
						X10				PE							
						X10				PE							
						PE				PE							
						X10				PE							
						PE				PE							
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Terminal diagram


		Cable name		Cable type		Wire number		Target design.		Connection		Terminal number		Jumpers		Target design.		Connection		Cable name		Cable type	
								X14		28		1		.		X6		21		WX19		9G0,75 mm ²	
								X14		30		2		.		X6		24					
								X14		10		3		.		X6		22					
								X14		12		4		.		X6		25					
								X14		46		5		.		X6		36					
								X14		47		6		.		X6		37					
												PE		.		X6		PE					
												7		.		X6							
												8		.		X6							
												PE		.		X6		PE					

Terminal diagram

		Cable name		Cable type		Wire number		Target design.		Connection		Terminal number		Jumpers		Target design.		Connection		Cable name		Cable type		Page/ path			
		WX33		JZ 500		7G0,75 mm ²														WX31		JZ 500		18G0,75 mm ²			

Terminal diagram

		Cable name		Cable type		Wire number		Strip designation		Cable name		Cable type	
Target design.	Connection	Terminal number	Jumpers	Target design.	Connection	Cable name	Cable type	Page/ path					
W21S4	JZ 500	5G0,75 mm ²		10S4	13	1		X14	25	WX32	JZ 500	18G0,75 mm ²	=EP/10.5
W11S7	JZ 500	5G0,75 mm ²		10S4	14	2		X14	26				=EP/10.5
W21S5	JZ 500	5G0,75 mm ²		14S6.1	11	3		X14	27				=EP/14.5
W14S6.1	JZ HF	5G0,75 mm ²		14S6.1	12	4		X14	28				=EP/14.5
W10S4	JZ 500	5G0,75 mm ²		14S6.1	21	5		X14	29				=EP/14.6
				14S6.1	22	6		X14	30				=EP/14.6
				21S5	22	7		X14	31				=EP/11.4
				11S7	14	8		X14	32				=EP/11.7
				11S7	22	9		X14	33				=EP/11.8
				11S7	21	10		X14	34				=EP/11.8
				10S4	23	11		X14	35				=EP/21.4
				21S4	14	12		X14	36				=EP/21.4
				21S5	14	13		X14	37				=EP/21.5
						14		X14	38				=EP/100.4
						15		X14	39				=EP/100.4
						16		X14	40				=EP/100.4
						17		X14	41				=EP/100.4
				21S4	21	18							=EP/11.4
				11S7	13	19							=EP/11.7
				21S4	22	20							=EP/11.4
				21S5	21	21							=EP/11.4
				10S4	24	22							=EP/21.4
				21S4	13	23							=EP/21.4
				21S5	13	24							=EP/21.5
						PE		X14	PE				=EP/100.5

 <p>Albert-Einstein-Str.9 77656 Offenburg Phone +49 (0) 781-6100-0 Email: sl@servolift.de</p>	Designed / checked date 02.11.2012 Ed. by LORENZ	Modification date 08.05.2014 Ed. by lorenz ver.: 1	project: PALLET-LIFTER project no.: 13249	description X32	Frewitt SINGAPUR	= KP +	TERMINAL DIAGRAM
							page 105 of 107

SPARE PARTS LIST

13249

Project no.

1033505

Parts-# Servolift	Qty	Description	Manufacturer	location
106325	4,7 m	cover band 140 mm width, with sealed rim	Forbo Siegling GmbH	column
111489	1 pcs	cover ø 160 mm 1.4571	Hommel GmbH	column
104923	2 pcs	cover element M 10 for socket cap screw in countersinking, GPN 340, grey	Pöppelmann GmbH & Co.	column
130664	1 pcs	tension spring Z 155I 2,5x22,5x93	Gutekunst & Co. Federnfabriken	column
103214	4 pcs	cover element M 16 for hexagon head screw GPN 1000, SW24, grey	ITK Kienzler GmbH & Co.KG	top bearing
101272	1 pcs	Spherical ball bearing 40x80x18 CS 208 NPPB	Sturm Präzision GmbH	top bearing
103212	7 pcs	plastic cap for hexagon head screw M12 19 A/F .grey	Inden GmbH	bottom group
133792	10 l	hydraulic oil, tecoil Foodmax AW46 (food grade quality)	George Handels GmbH	control cabinet
103212	4 pcs	plastic cap for hexagon head screw M12 19 A/F .grey	Inden GmbH	top bearing
110160	3,7 m	sealing profile for control cabinet EPDM	Dirak GmbH & Co. KG	cabinett door
101347	3 pcs	hinge black 224-9001	Dirak GmbH & Co. KG	control cabinet
101350	1 pcs	square socket key 7 mm black PA, black	Dirak GmbH & Co. KG	control cabinet
101349	3 pcs	lock, assembled 7mm/26mm with H26/L45	Dirak GmbH & Co. KG	control cabinet
101072	1 pcs	hinged joint M8 130 ST-BLK/KU SXN03	springfix GmbH	control cabinet
8012821	1 pcs	E-Motor EX Zone 22, 1,5/1,75kW, 90L	Siemens AG	power pack
8003730	1 pcs	tank 7 ltr. with pump 4,3 ccm/rev.	Hydr-App. SpA	power pack
101785	4 pcs	rubber bumper 30x20 - M8, 55 Shore A bolt / thread, NR		power pack
125204	1 pcs	coupling for hydraulic power pack type MC2/MC4 for shaft Ø 24	Lotz Hydraulik GmbH	power pack
111636	1 pcs	temperatur switch, IP65 TS-70/X/12	Hydac/Flutec	power pack
112433	1 pcs	seal set for lift cylinder Ø50, plunger type	Servolift	lift cylinder
100629	2 pcs	slide bearing, cyl. ISO 3547-3220 DU (32x36x20) steel back	Glacier Garlock	idler pulley
108012	2 pcs	bushing GFM-3236-16	Igus GmbH	idler pulley
128355	2 pcs	lift chain, type flyer 3/4"-4x4 with end plates		lifting system
103212	2 pcs	plastic cap for hexagon head screw M12 19 A/F .grey	Inden GmbH	column
100625	2 pcs	slide bearing, cyl. ISO 3547-2515 DU (25x28x15) steel back	Glacier Garlock	lift sled
103884	2 pcs	cover DP 1500 d=38,0 2763 black	Heymann Manufacturing GmbH	support arm
123138	2 pcs	slide bar for cover band 140 PE electrically conductable	Servolift	frontcase
111489	1 pcs	cover ø 160 mm 1.4571	Hommel GmbH	support arm
124558	4 pcs	shim ring 26x31x0,5	Servolift	
124559	4 pcs	shim ring 26x31x1	Servolift	
134728	4 pcs	idler pulley standard 0 HMTR 24x61,8x24 2RS	Knapp Wälzlagertechnik GmbH	

HYDRAULIC PARTS LIST 13249

Project no. 1033505

Project:		Name	Date	Revision	Dwg. no.	
Pallet Lifter		Schanz	07.05.2014	0	13249-61-001	
Pos. Nr.	Qty	Description	Manufacturer		Parts-# Servolift	location
10	H 1.0	1 pcs lift cylinder	Servolift		127586	column
20	H 1.1	1 pcs check valve with hydr. release RH 1, G1/4", 15 l/min	HAWE Hydraulik SE		101190	control cabinet
30	H 1.2	1 pcs hydr. pressure limiting valve G3/8" MVCS46 E, Bypass, R=500bar	HAWE Hydraulik SE		101192	control cabinet
40	H 1.3	1 pcs flow control valve VCD-RU 3/8"	Oil Control GmbH		110982	control cabinet
70	H 1.6	1 pcs sieve and filter element HFE 1/4 F in housing	HAWE Hydraulik SE		122971	lift cylinder
80	H 1.7	1 pcs sieve and filter element HFE 1/4 F in housing	HAWE Hydraulik SE		122971	lift cylinder
90	H 1.8	1 pcs filtration element for screwing in in HFC 1/4 F 3 elements, 100µm	HAWE Hydraulik SE		122907	lift cylinder
100	H 5.0	1 pcs power pack by order	Servolift		128285	control cabinet
110	H 6.0	1 pcs control-block	Servolift		128309	control cabinet
120	H 0.2	1 pcs pressure gauge NG63/DIN - 160 bar bottom fitting	Welte Cardan-Service GmbH		103252	control cabinet

Pneumatik-Stückliste

13249

Projekt-Nr.

1033505

Projekt	Bearbeiter	Datum	Revision	Zeichn.-Nr.	
Pallet Lifter	Schanz	07.05.2014	0	13249-62-001	
Pos. Nr.	Menge	Bezeichnung/Typ	Hersteller	Art.-Nr. Servolift	Einbauort
10	P 1.0	1 Stck Pneum. Rund-Zyl. ISO 6432 Ø 20 - Hub 50 mm doppw.	Festo KG	103078	Schaltschrank
20	P 1.1	1 Stck 3/2-Pneum. Ventil G1/8" MFH-3-1/8-EX (Ex-II2GD) Magnet/Feder (Sperr Nullst.) geschlossen	Festo KG	128171	Schaltschrank
30		1 Stck Magnetspule 24V DC, Ex-geschützt (Ex-II3GD) Typ MSFG-24-EX, mit Steckerfahnen	Festo KG	128092	P 1.1
31		1 Stck Ventilstecker Typ MSSD-F-M16 (20x28mm) für MSFG-24-EX	Festo KG	129839	P 1.1
40	P 1.2	1 Stck 3/2-Pneum. Ventil G1/8" MFH-3-1/8-EX (Ex-II2GD) Magnet/Feder (Sperr Nullst.) geschlossen	Festo KG	128171	Schaltschrank
50		1 Stck Magnetspule 24V DC, Ex-geschützt (Ex-II3GD) Typ MSFG-24-EX, mit Steckerfahnen	Festo KG	128092	P 1.2
51		1 Stck Ventilstecker Typ MSSD-F-M16 (20x28mm) für MSFG-24-EX	Festo KG	129839	P 1.2
60	P 0.2	1 Stck Pneum. Druckschalter (P/E-Wandler) G 1/4" Schließer, 1-10bar, IP65, 230V/2A	Suco	107325	Schaltschrank
70		1 Stck Pneum. Wartungsgeräte Kombination EX MSB4-AGB:C4:J1-WP-EX4 EXII2GD	Festo KG	8014571	Schaltschrank

Hydr.-Schlauch-Stückliste 13249

Projekt-Nr. 1033505

Projekt	Bearbeiter	Datum	Revision	Zeichn.-Nr.	
Pallet Lifter	Schanz	07.05.2014	0	13249-61-001	

Pos. Nr.	Menge	Bezeichnung/Typ	Hersteller	Art.-Nr. Servolift	Einbauort
10 1	1	Stck HD-Schlauch SC1 DN 12x 750mm EN 857 DKO-L M18x1,5 beidseitig Schlauch-Länge 750 mm	Welte Cardan-Service GmbH	132563	Schaltschrank
20 2	1	Stck HD-Schlauch SC1 DN 12x 500mm EN 857 DKO-L M18x1,5 beidseitig Schlauch-Länge 500 mm	Welte Cardan-Service GmbH	132561	Schaltschrank
30 3	1	Stck HD-Schlauch SC1 DN 10x 850mm EN 857 DKO-L M16x1,5 beidseitig Schlauch-Länge 850 mm	Welte Cardan-Service GmbH	132569	Schaltschrank
40 4	1	Stck HD-Schlauch SC1 DN 8x 900mm EN 857 DKO-L M14x1,5 beidseitig Schlauch-Länge 900 mm	Hansa-Flex Hydraulik GmbH	132554	Schaltschrank

ELECTRIC PARTS LIST**13249****Project no.****1033505**

Lifter
 Frewitt Fabrique, Granges-Paccot, Swiss
 Version 1 / 19.02.2014
 Name: Lorenz/Lg

Pos.	Qty	Unit	Component/ Marking	Description	Manufacturer	Parts-#	
10	1	pcs.	10A8	safety relay, 24V DC, 2 NC SNO2004K AC/DC 24V 50-60Hz	Wieland Electric GmbH	614723	
20	1	pcs.	11A2	two hand safety relay, BG 5933.22 24V DC, 2 NO/1 NC, cat.4	Dold E. & Soehne KG	614205	
30	1	pcs.	12A2	two hand safety relay, BG 5933.22 24V DC, 2 NO/1 NC, cat.4	Dold E. & Soehne KG	614205	
40	1	pcs.	23A4	control relay, 24V DC, 8In/4Out, relay without display, EASY 412-DC-RCX	Eaton	613756	
50	1	pcs.	20B2	proximity switch, flat housing, 3G/3D NO, 2m cable	Pepperl+Fuchs GmbH	6902442	II 3D Ex tD A22 IP67 T80°C X II 3G Ex nA IIC T6 X
60	1	pcs.	20B4	proximity switch M18 NO, DC, 8b, plugable, 3G/3D	Pepperl+Fuchs GmbH	614408	II 3D IP67 T88°C X II 3G EEx nA IIC T6 X
70	1	pcs.	2F2	miniature circuit breaker, 10A, 2 poles C-5-10xIN	Siemens AG	614037	
80	1	pcs.	2G2	primary switch mode power supply REP 2-2405 230/400/500VAC/24VDC; 5A	Riedel Michael	615198	
90	1	pcs.	5K11	motor contactor 4KW 3NO, 1NC, 24V DC, with diode	Siemens AG	615120	
100	1	pcs.	20K4	coupling relay, TERMSERIES TRZ 24VDC 1CO 24V DC, 6A, 1CO, dimension 6,2mm	Weidmüller GmbH & Co. KG	615265	
110	1	pcs.	21K4	coupling relay, TERMSERIES TRZ 24VDC 2CO 24V DC, 8A, 2CO, dimension 12,8mm	Weidmüller GmbH & Co. KG	615272	
120	1	pcs.	21K5	coupling relay, TERMSERIES TRZ 24VDC 2CO 24V DC, 8A, 2CO, dimension 12,8mm	Weidmüller GmbH & Co. KG	615272	
130	1	pcs.	21K10	coupling relay, TERMSERIES TRZ 24VDC 2CO 24V DC, 8A, 2CO, dimension 12,8mm	Weidmüller GmbH & Co. KG	615272	
140	1	pcs.	21K12	coupling relay, TERMSERIES TRZ 24VDC 2CO 24V DC, 8A, 2CO, dimension 12,8mm	Weidmüller GmbH & Co. KG	615272	
150	1	pcs.	5M3	3x230/400V 50Hz/3x460V 60Hz, V18, IP55, FI Ø140	Siemens AG	8012821	II 3D Ex tD A22 IP55 T125°C
160	1	pcs.	1Q2	safety switches, 16A, 3 poles, EX red/yellow	Stahl R. Schaltgeräte GmbH	613572	II 2G EEx ed IIC T6 PTB 02 ATEX 1033 II 2D IP65 T80°C LIEC 02 ATEX 6241
170	1	pcs.	5Q3	motor protective circuit breaker, S00 2,8-4A, without aux. switch	Siemens AG	615105	
180	1	pcs.		aux. contacts for motor-protective circuit-breaker 1NO/1NC	Siemens AG	615113	

ELECTRIC PARTS LIST**13249****Project no.****1033505**

Lifter

Frewitt Fabrique, Granges-Paccot, Swiss

Version 1 / 19.02.2014

Name: Lorenz/Lg

Pos.	Qty	Unit	Component/ Marking	Description	Manufacturer	Parts-#	
190	1	pcs.	5S3	temperatur switch, IP65 TS-70/X/12	Hydac/Flutec	111636	IP65
200	1	pcs.	10S2	key operated actuator, 2NO, key removable in 0 M22-WRS-A1	Eaton	613455	
210	1	pcs.		fixing adapter, M22-A for contact elements M22-K	Eaton	613381	
220	2	pcs.		contact element, NO, M22-K10 for RMQ-Titan, front fixing	Eaton	613379	
230	1	pcs.	10S2.2	pressure switch, 0-10 bar IP65, 230V/2A	Suco	107325	
240	1	pcs.	10S4	key operated actuator, 2NO, key removable in 0 M22-WRS-A1	Eaton	613455	
250	1	pcs.		limit switch, LS-Titan, 31mm 2NO, IP66, type LS-20	Eaton	614522	
260	1	pcs.		position switch fixing adapter group RMQ-Titan, type M22-LS	Eaton	614130	
290	1	pcs.	11S7	push button M22D-S black	Eaton	613446	
292	1	pcs.		limit switch, LS-Titan, 31mm 1NC/1NO, IP66, type LS-11	Eaton	614129	
294	1	pcs.		position switch fixing adapter group RMQ-Titan, type M22-LS	Eaton	614130	
300	1	pcs.	12S7	push button M22D-S black	Eaton	613446	
310	1	pcs.		fixing adapter, M22-A for contact elements M22-K	Eaton	613381	
320	1	pcs.		contact element, NO, M22-K10 for RMQ-Titan, front fixing	Eaton	613379	
330	1	pcs.		contact element, NC, M22-K01	Eaton	613380	
340	1	pcs.	14S6	emergency stop button M22-PV	Eaton	613438	
350	1	pcs.		fixing adapter, M22-A for contact elements M22-K	Eaton	613381	
360	2	pcs.		contact element, NC, M22-K01	Eaton	613380	
380	1	pcs.		emergency stop plate M22-XCK-GB99 "Emergency Stop"	Eaton	613441	

ELECTRIC PARTS LIST**13249****Project no.****1033505**

Lifter

Frewitt Fabrique, Granges-Paccot, Swiss

Version 1 / 19.02.2014

Name: Lorenz/Lg

Pos.	Qty	Unit	Component/ Marking	Description	Manufacturer	Parts-#	
390	1	pcs.	14S6.1	limit switch, LS-Titan, plastic version 31mm, 2NC, IP66, LS-02	Eaton	614181	
400	1	pcs.		emergency stop button M22-PV	Eaton	613438	
410	1	pcs.		position switch fixing adapter group RMQ-Titan, type M22-LS	Eaton	614130	
420	1	pcs.		emergency stop plate M22-XCK-GB99 "Emergency Stop"	Eaton	613441	
430	1	pcs.	21S4	limit switch, LS-Titan, 31mm 1NC/1NO, IP66, type LS-11	Eaton	614129	
440	1	pcs.		push button M22D-S black	Eaton	613446	
450	1	pcs.		position switch fixing adapter group RMQ-Titan, type M22-LS	Eaton	614130	
460	1	pcs.	21S5	limit switch, LS-Titan, 31mm 1NC/1NO, IP66, type LS-11	Eaton	614129	
470	1	pcs.		push button M22D-S black	Eaton	613446	
480	1	pcs.		position switch fixing adapter group RMQ-Titan, type M22-LS	Eaton	614130	
490	1	pcs.	21S10	push button M22D-S black	Eaton	613446	
500	1	pcs.		fixing adapter, M22-A for contact elements M22-K	Eaton	613381	
510	1	pcs.		contact element, NO, M22-K10 for RMQ-Titan, front fixing	Eaton	613379	
520	1	pcs.		contact element, NC, M22-K01	Eaton	613380	
530	1	pcs.	21S12	push button M22D-S black	Eaton	613446	
540	1	pcs.		fixing adapter, M22-A for contact elements M22-K	Eaton	613381	
550	1	pcs.		contact element, NO, M22-K10 for RMQ-Titan, front fixing	Eaton	613379	
560	1	pcs.		contact element, NC, M22-K01	Eaton	613380	
570	1	pcs.	95Y2	solenoid coil Ex-protect zone 2+22 MSFG-24-EX	Festo KG	128092	II 3GD EEx nA II 130°C X IP65

ELECTRIC PARTS LIST**13249****Project no.****1033505**

Lifter

Frewitt Fabrique, Granges-Paccot, Swiss

Version 1 / 19.02.2014

Name: Lorenz/Lg

Pos.	Qty	Unit	Component/ Marking	Description	Manufacturer	Parts-#	
580	1	pcs.	95Y4	solenoid coil Ex-protect zone 2+22 MSFG-24-EX	Festo KG	128092	II 3GD EEx nA II 130°C X IP65
590	1	M	W1Q2	flexible control cable 4x 2,5qmm, JZ-500	Helukabel GmbH	602707	
600	1	M	W1Q2.1	flexible control cable 4x 2,5qmm, JZ-500	Helukabel GmbH	602707	
610	2	M	W5M3	flexible control cable 4x 2,5qmm, JZ-500	Helukabel GmbH	602707	
620	2	M	W5S3	flexible control cable, number coded 2x 1qmm, OZ-500	Helukabel GmbH	602691	
630	2	M	W10S2.2	flexible control cable, number coded 2x 1qmm, OZ-500	Helukabel GmbH	602691	
640	1	M	W10S4	flexible control cable 5x 0,75qmm, JZ-500	Helukabel GmbH	602693	
650	1	M	W11S7	flexible control cable 5x 0,75qmm, JZ-500	Helukabel GmbH	602693	
660	1	M	W14S6.1	high-flexible control cable 5x 0,75qmm, JZ-HF	Helukabel GmbH	602721	
670	1	pcs.	W20B2	cable socket, straight, M8 10m, 4-pole, PVC cable	Pepperl+Fuchs GmbH	614916	
690	1	pcs.		non pre-wired cable socket for prox.switch, M8 3 poles, without LED, Slimline	Murrelektronik GmbH	615024	
700	1	pcs.	W20B4	elbow connector plug for proximity switch, M12 with cable 5m, 4 cores	Pepperl+Fuchs GmbH	611749	
710	1	pcs.		interlock protection for M12 connector V1-CLIP, category 3G/3D	Pepperl+Fuchs GmbH	614404	
720	1	M	W21S4	flexible control cable 5x 0,75qmm, JZ-500	Helukabel GmbH	602693	
730	1	M	W21S5	flexible control cable 5x 0,75qmm, JZ-500	Helukabel GmbH	602693	
740	1	pcs.	W95Y2	plug for valves (20x28mm) for MSFG-24-EX type MSSD-F-M16	Festo KG	129839	
750	1	pcs.	W95Y4	plug for valves (20x28mm) for MSFG-24-EX type MSSD-F-M16	Festo KG	129839	
760	15	M	WX10	flexible control cable 4x 2,5qmm, JZ-500	Helukabel GmbH	602707	
770	15	M	WX19	flexible control cable 9x 0,75qmm, JZ-500	Helukabel GmbH	614044	

ELECTRIC PARTS LIST**13249****Project no.****1033505**

Lifter

Frewitt Fabrique, Granges-Paccot, Swiss

Version 1 / 19.02.2014

Name: Lorenz/Lg

Pos.	Qty	Unit	Component/ Marking	Description	Manufacturer	Parts-#	
780	12	M	WX31	flexible control cable 18x 0,75qmm, JZ-500	Helukabel GmbH	602698	
790	12	M	WX32	flexible control cable 18x 0,75qmm, JZ-500	Helukabel GmbH	602698	
800	2	M	WX33	flexible control cable 7x 0,75qmm, JZ-500	Helukabel GmbH	602694	
810	6	M	WX41	high-flexible control cable 5x 0,75qmm, JZ-HF	Helukabel GmbH	602721	
820	1	pcs.	X1	compact enclosure AE 1380.500 380x380x210, RAL 7035	Rittal	602061	
870	3	pcs.	X10	double desk spring-cage terminal, 2 connections 0,08-2,5qmm; ZDK 2,5/1,5	Weidmüller	614498	
880	2	pcs.	X10	double desk earth spring-cage terminal, 2 connect. 0,08-2,5qmm; ZDK 2,5/1,5PE	Weidmüller	614702	
890	1	pcs.	X10	WAD 5 cover, neutral WAD 5 NEUTRAL; 33,5x5mm	Weidmüller	614481	
900	2	pcs.	X10	modular terminal, accessories, rail support ZEW35, width:6mm	Weidmüller	614443	
910	26	pcs.	X14	double desk spring-cage terminal, 2 connections 0,08-2,5qmm; ZDK 2,5/1,5	Weidmüller	614498	
920	2	pcs.	X14	double desk earth spring-cage terminal, 2 connect. 0,08-2,5qmm; ZDK 2,5/1,5PE	Weidmüller	614702	
930	1	pcs.	X14	WAD 5 cover, neutral WAD 5 NEUTRAL; 33,5x5mm	Weidmüller	614481	
940	2	pcs.	X14	modular terminal, accessories, rail support ZEW35, width:6mm	Weidmüller	614443	
950	4	pcs.	X19	double desk spring-cage terminal, 2 connections 0,08-2,5qmm; ZDK 2,5/1,5	Weidmüller	614498	
960	2	pcs.	X19	modular terminal, accessories, rail support ZEW35, width:6mm	Weidmüller	614443	
970	1	pcs.	X19	double desk earth spring-cage terminal, 2 connect. 0,08-2,5qmm; ZDK 2,5/1,5PE	Weidmüller	614702	
980	1	pcs.	X3.1	terminal box,inox 1.4301 - V2A,without mount.plate 90x200x90mm, Mod. APD 9 20, IP66	IRINOX	614621	
982	4	pcs.		sloted head screw M4x20 DIN 84-4.8, galv.		100188	
990	1	pcs.	X3.2	terminal box 75x160x55	Rose Elektrotechnik GmbH&Co KG	602187	

ELECTRIC PARTS LIST**13249****Project no.****1033505**

Lifter

Frewitt Fabrique, Granges-Paccot, Swiss

Version 1 / 19.02.2014

Name: Lorenz/Lg

Pos.	Qty	Unit	Component/ Marking	Description	Manufacturer	Parts-#	
1000	1	pcs.	X3.3	90x140x90mm, Mod. APD 9 14, IP66	IRINOX	614620	
1002	4	pcs.		slotted head screw M4x20 DIN 84-4.8, galv.		100188	
1010	1	pcs.	X31	connector markers ZGB 15, 15x7mm, Polyamid, white	Weidmüller	615191	
1020	1	pcs.	X31	end bracket ZEW 15	Weidmüller	614563	
1030	19	pcs.	X31	spring-cage terminal for TS 15 0,13-2,5qmm, ZDUA 2,5-2	Weidmüller	614477	
1040	1	pcs.	X31	ground spring-cage terminal for TS 15 0,13-2,5qmm, ZPEA 2,5-2	Weidmüller	614480	
1050	1	pcs.	X32	connector markers ZGB 15, 15x7mm, Polyamid, white	Weidmüller	615191	
1060	1	pcs.	X32	end bracket ZEW 15	Weidmüller	614563	
1070	24	pcs.	X32	spring-cage terminal for TS 15 0,13-2,5qmm, ZDUA 2,5-2	Weidmüller	614477	
1080	1	pcs.	X32	ground spring-cage terminal for TS 15 0,13-2,5qmm, ZPEA 2,5-2	Weidmüller	614480	
1090	1	pcs.	X33	connector markers ZGB 15, 15x7mm, Polyamid, white	Weidmüller	615191	
1100	1	pcs.	X33	end bracket ZEW 15	Weidmüller	614563	
1110	6	pcs.	X33	spring-cage terminal for TS 15 0,13-2,5qmm, ZDUA 2,5-2	Weidmüller	614477	
1120	1	pcs.	X33	ground spring-cage terminal for TS 15 0,13-2,5qmm, ZPEA 2,5-2	Weidmüller	614480	
1130	1	pcs.	X4	terminal box 75x80x55 polyester	Rose Elektrotechnik GmbH&Co KG	602186	
1140	1	pcs.	X41	connector markers ZGB 15, 15x7mm, Polyamid, white	Weidmüller	615191	
1150	1	pcs.	X41	end bracket ZEW 15	Weidmüller	614563	
1160	4	pcs.	X41	spring-cage terminal for TS 15 0,13-2,5qmm, ZDUA 2,5-2	Weidmüller	614477	
1170	1	pcs.	X41	ground spring-cage terminal for TS 15 0,13-2,5qmm, ZPEA 2,5-2	Weidmüller	614480	

ELECTRIC PARTS LIST**13249****Project no.****1033505**

Lifter

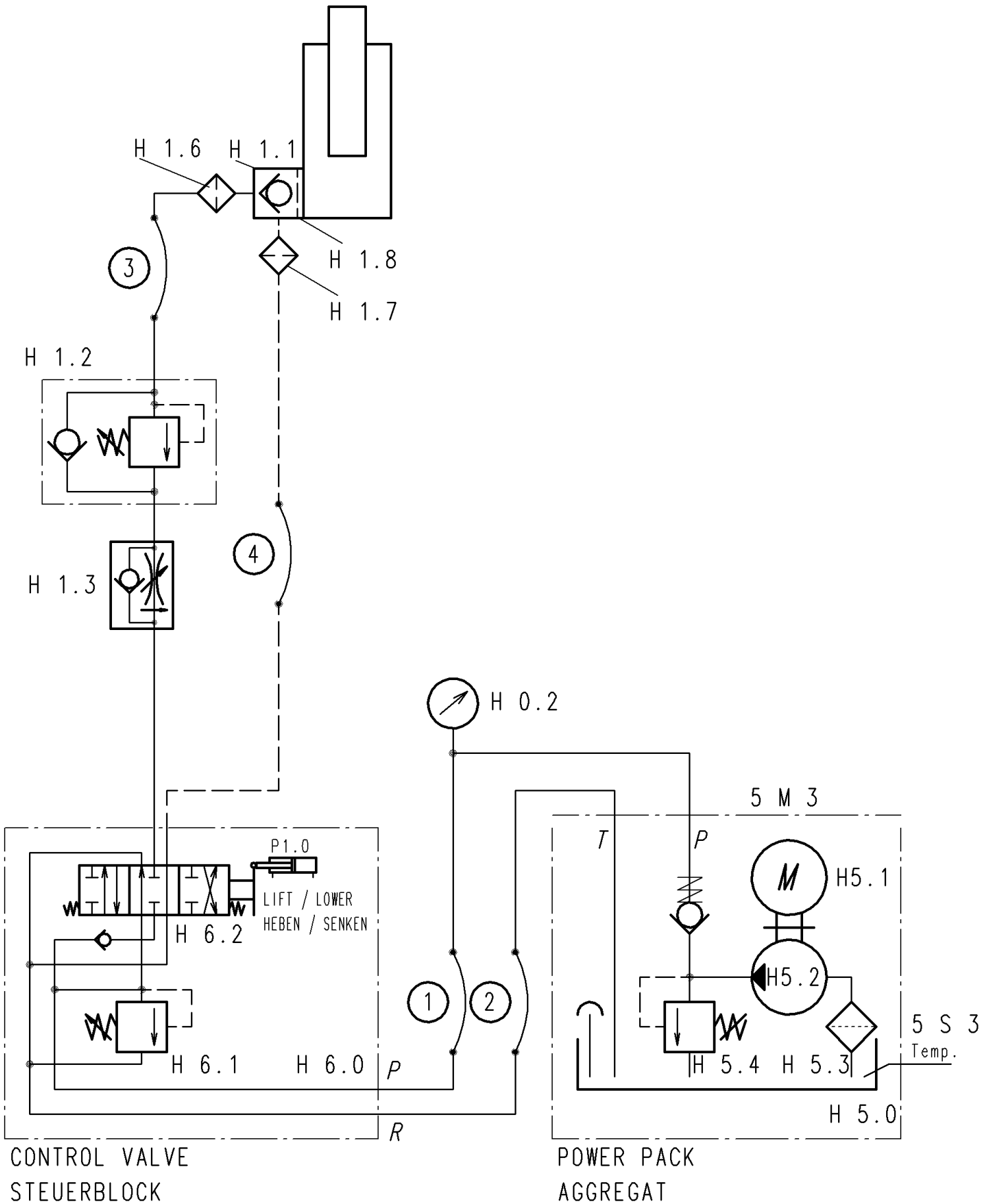
Frewitt Fabrique, Granges-Paccot, Swiss

Version 1 / 19.02.2014

Name: Lorenz/Lg

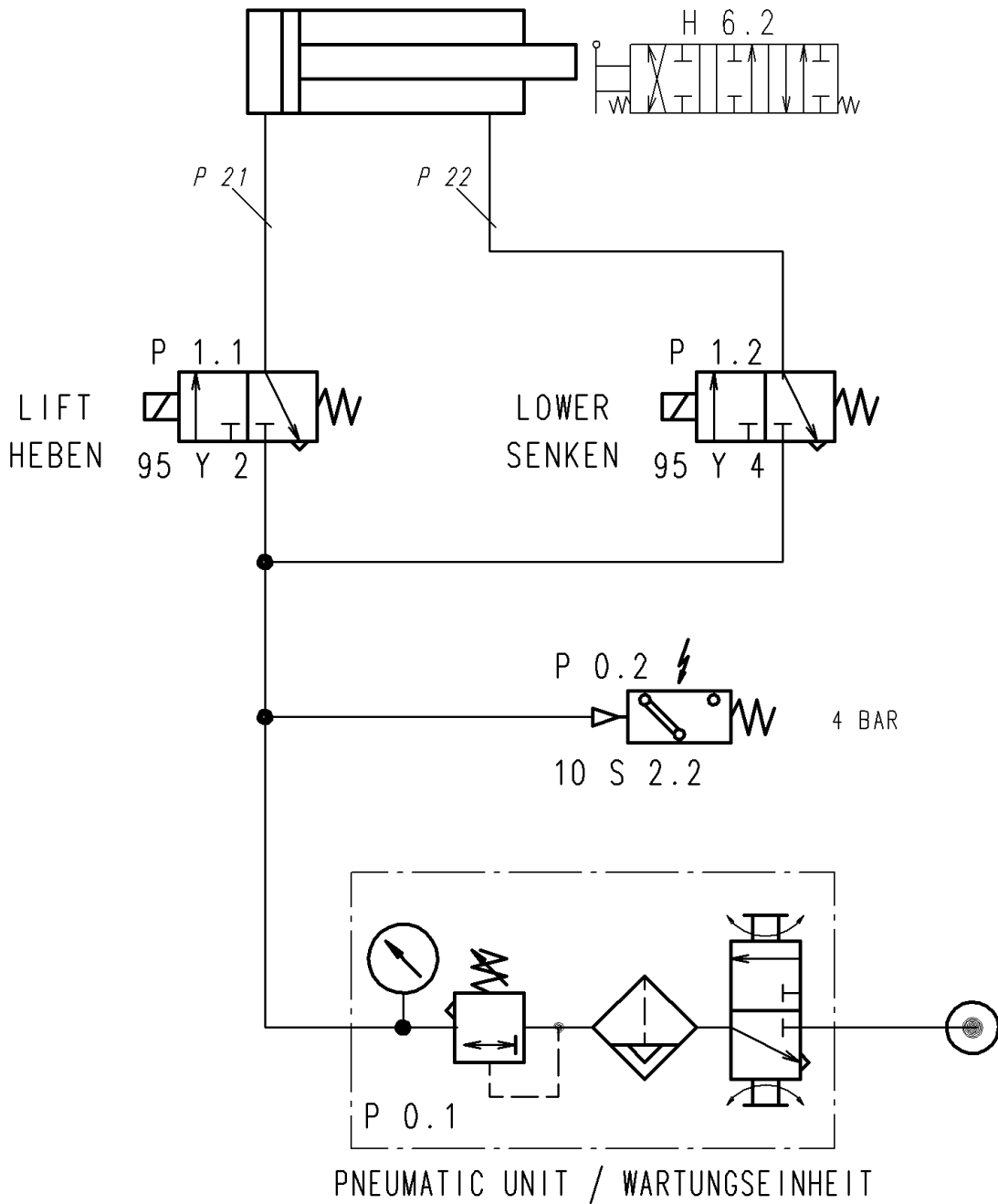
Pos.	Qty	Unit	Component/ Marking	Description	Manufacturer	Parts-#	
1180	1	pcs.	X5	HYDRAULIC CABINET		-	
1190	1	pcs.		cable strap with title area	T&B	102750	

1.0 LIFT CYLINDER
HUBZYLINDER

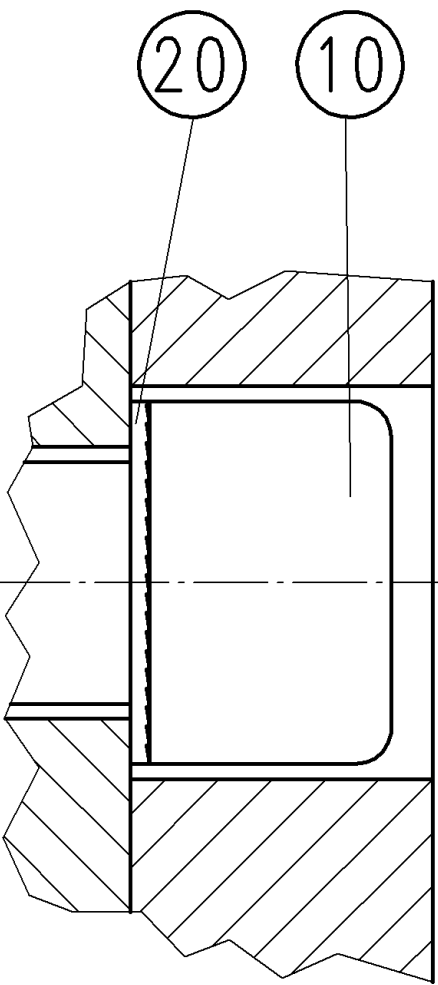


Projekt-Nr.		Maße ohne Toleranzangaben		Oberflächenreihe		Maßstab 1:1		Art.-Nr. -	
		ISO 2768		R 2		Werkstoff, Halbzeug			
		Datum		Name		Benennung			
		Erst. 11.02.14		Schanz		Hydraulic schematic			
		Änder.				Hydraulikschaltplan			
		Bearb. 07.05.14		Schanz					
		Gepr. 07.05.14		Schanz					
		SERVO LIFT GmbH				Zeichnungsnummer U:97\973321\SC509JKE.ZE1		Index	Blatt
		Handhabungstechnik				13249-61-001		0	1/1
		Albert-Einstein-Str.9							
		D-77656 Offenburg-Zunsweier							
		Tel.0781/6100-0				Ersatz für:		Ersatz durch:	
Zusi. Änderung		Datum		Name					

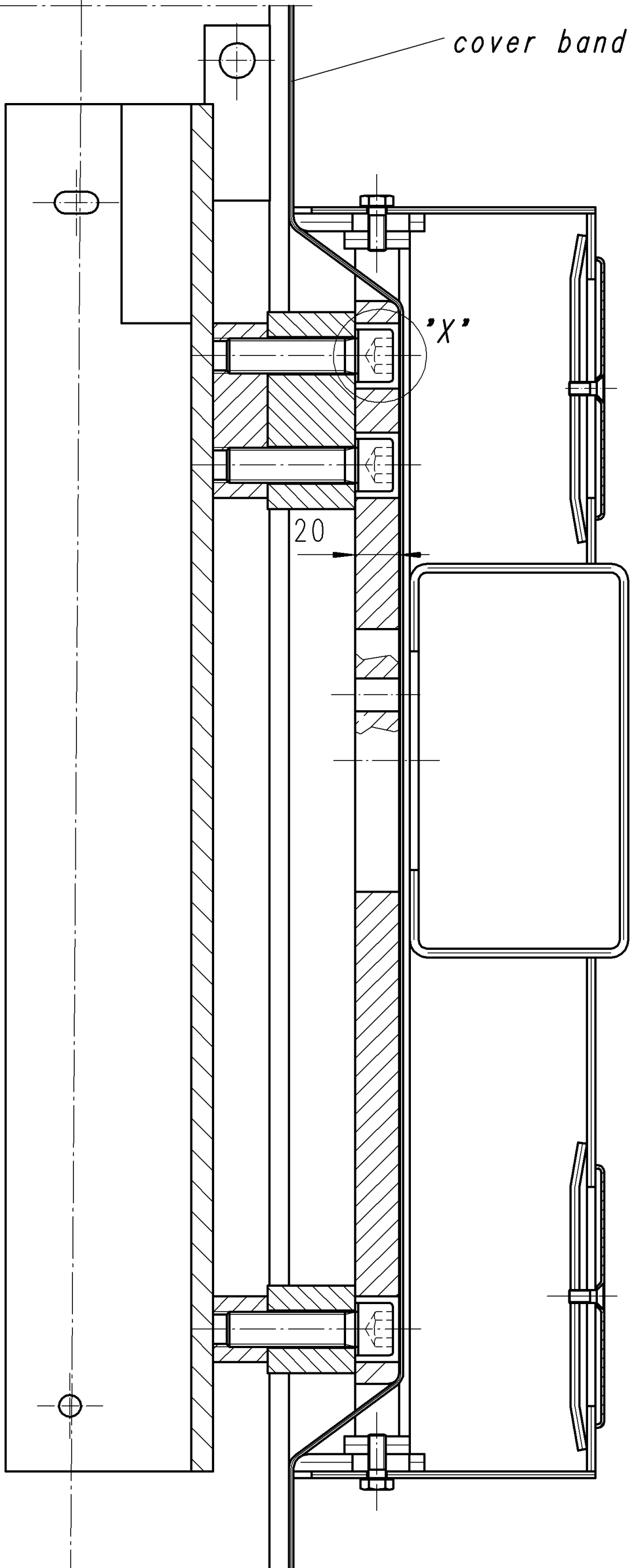
P 1.0 LIFT / LOWER
HEBEN / SENKEN



Projekt-Nr.		Maße ohne Toleranzangaben		Oberflächenreihe R 2		Maßstab 1:1		Art.-Nr. -		
		ISO 2768		DIN ISO 1302		Werkstoff, Halbzeug				
			Datum	Name		Benennung				
			Erst.	11.02.14	Schanz		Pneumatic Schematic			
			Änder.							
			Bearb.	07.05.14	Schanz					
			Gepr.	07.05.14	Schanz					
		SERVO LIFT GmbH		Zeichnungsnummer U:9807\ZE1\SC1186PO.ZE1		Index		Blatt		
		Handhabungstechnik		13249-62-001		0		1/1		
		Albert-Einstein-Str.9								
		D-77656 Offenburg-Zunsweier								
		Tel.0781/6100-0								
Zust. Änderung		Datum		Name		Ersatz für:		Ersatz durch:		



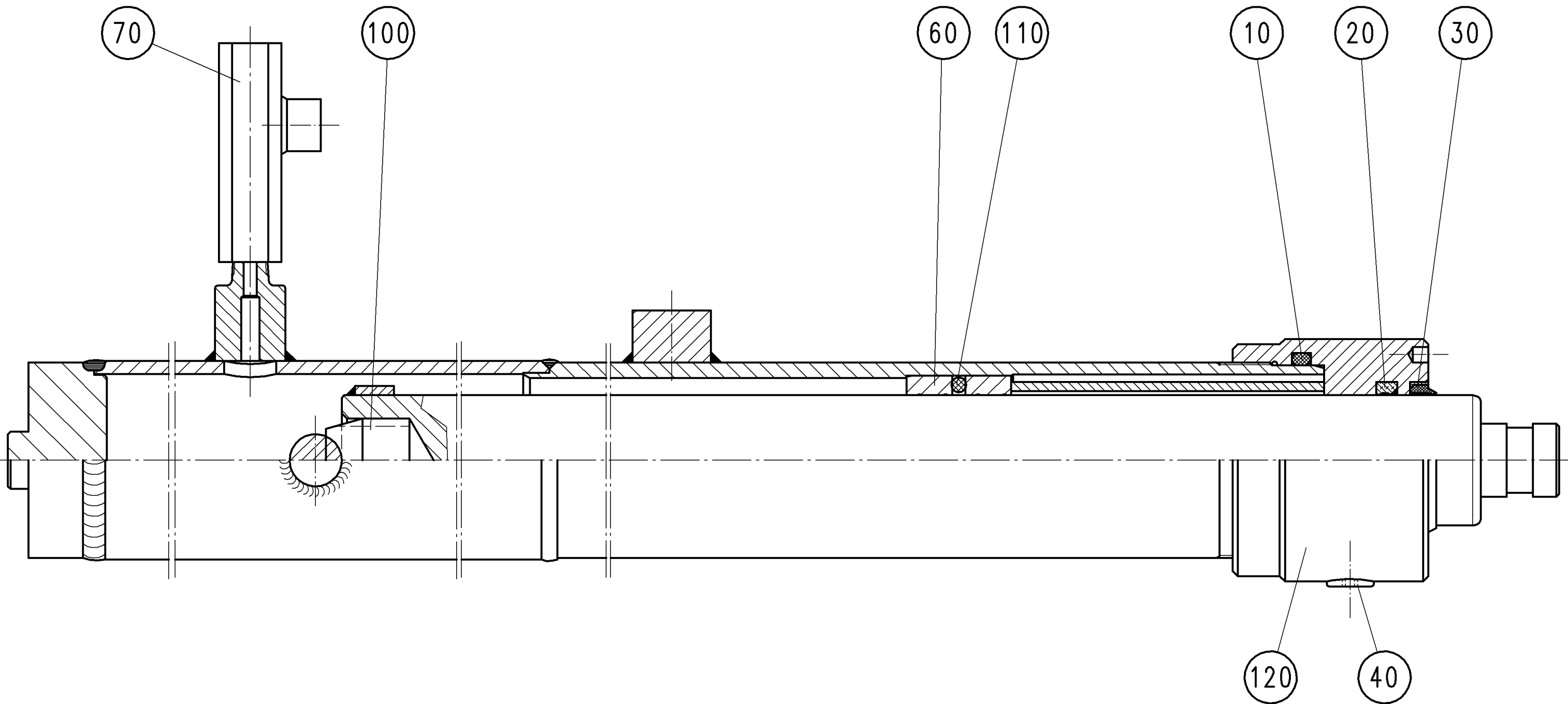
view "X"
M 2:1



10 : thread and screw head
lubricated with Klüberpaste UH 84-201

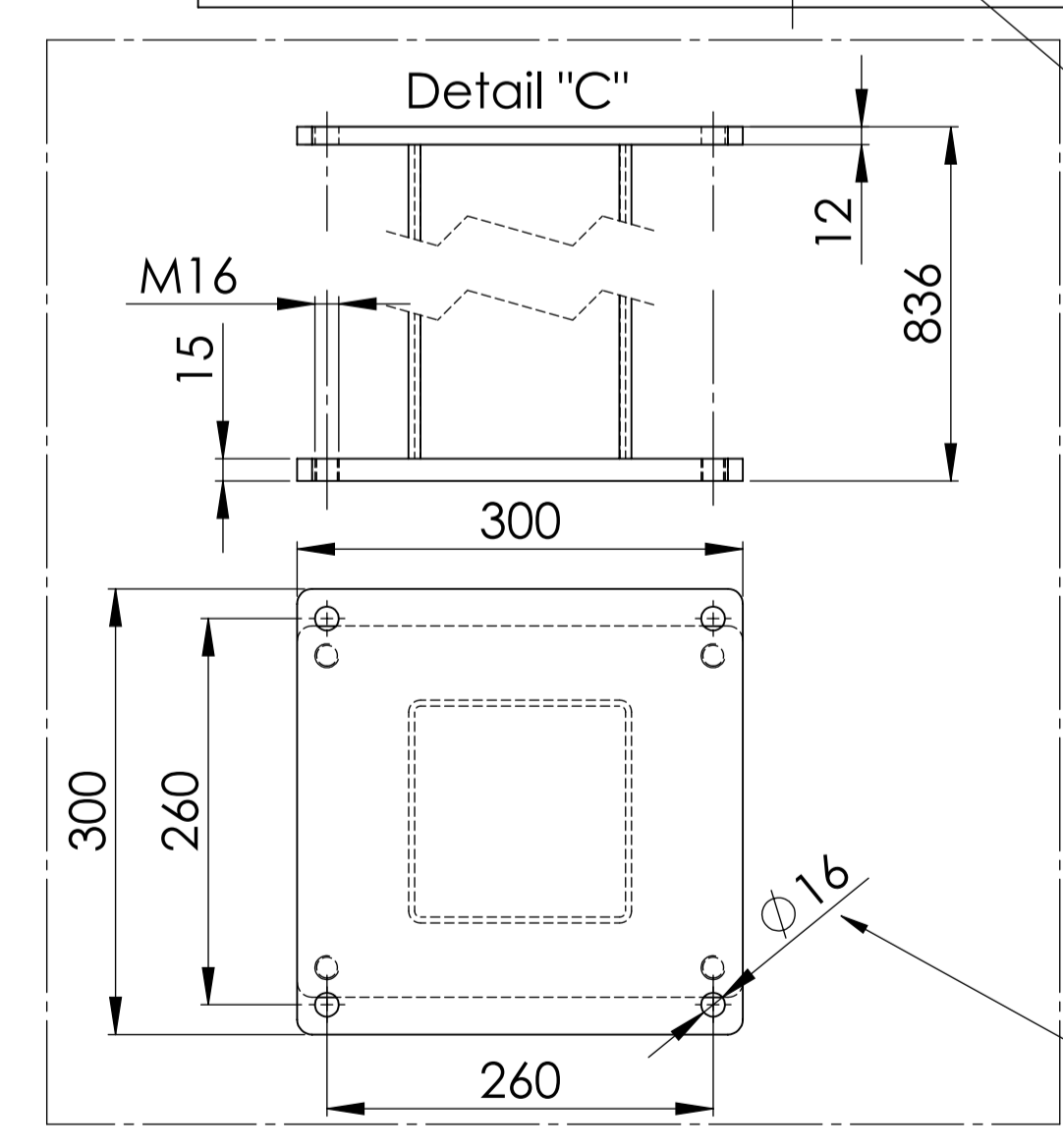
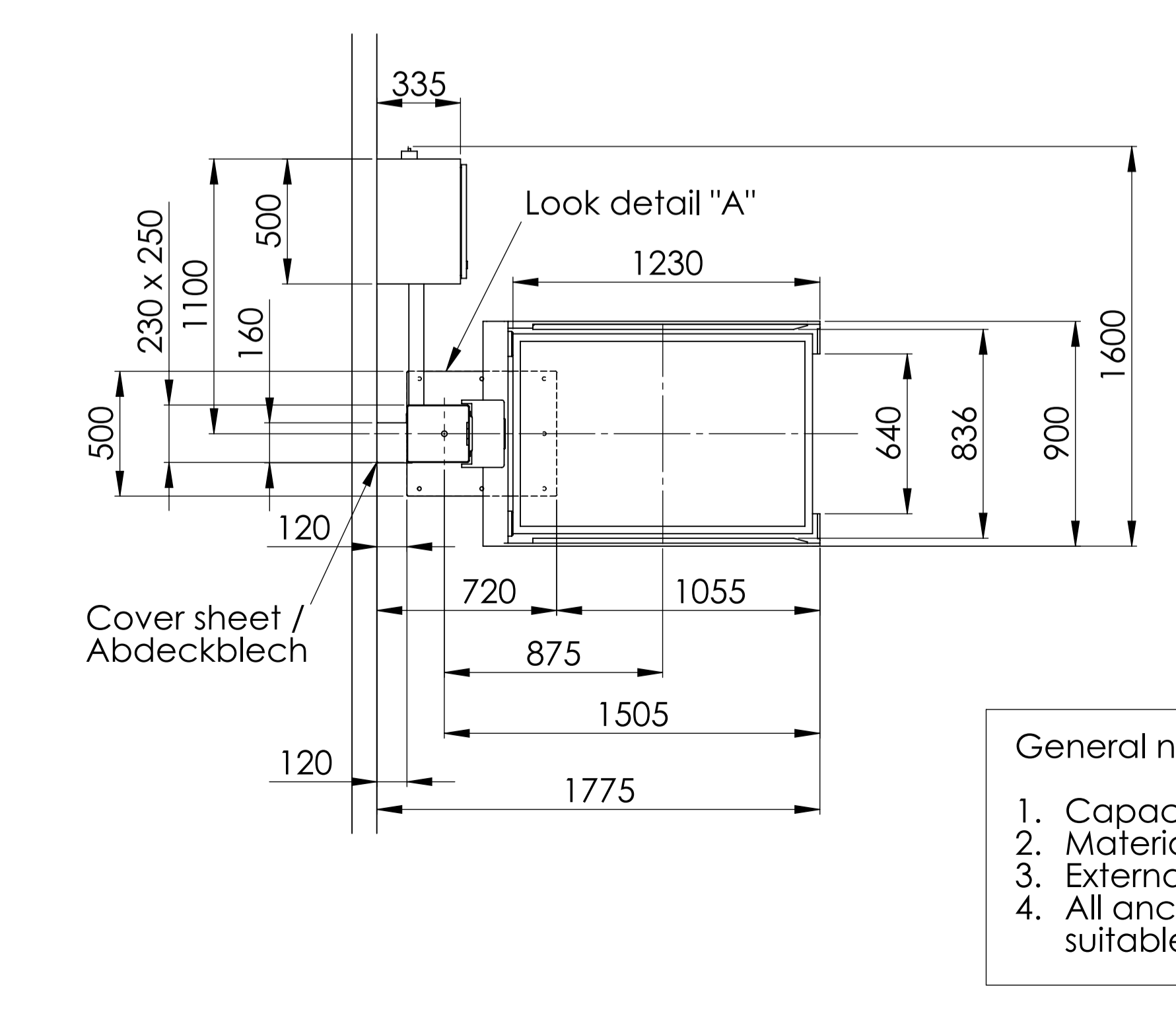
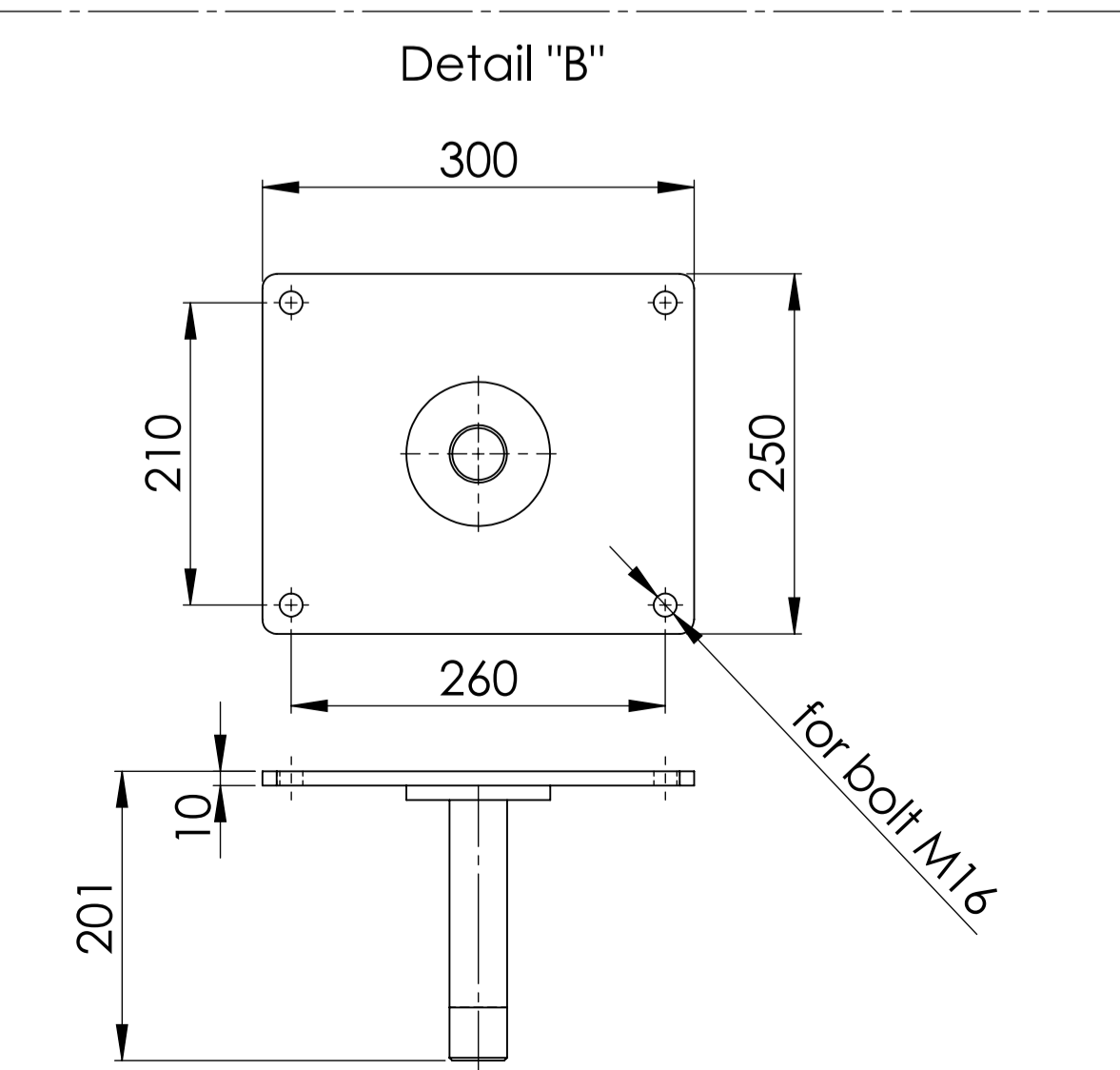
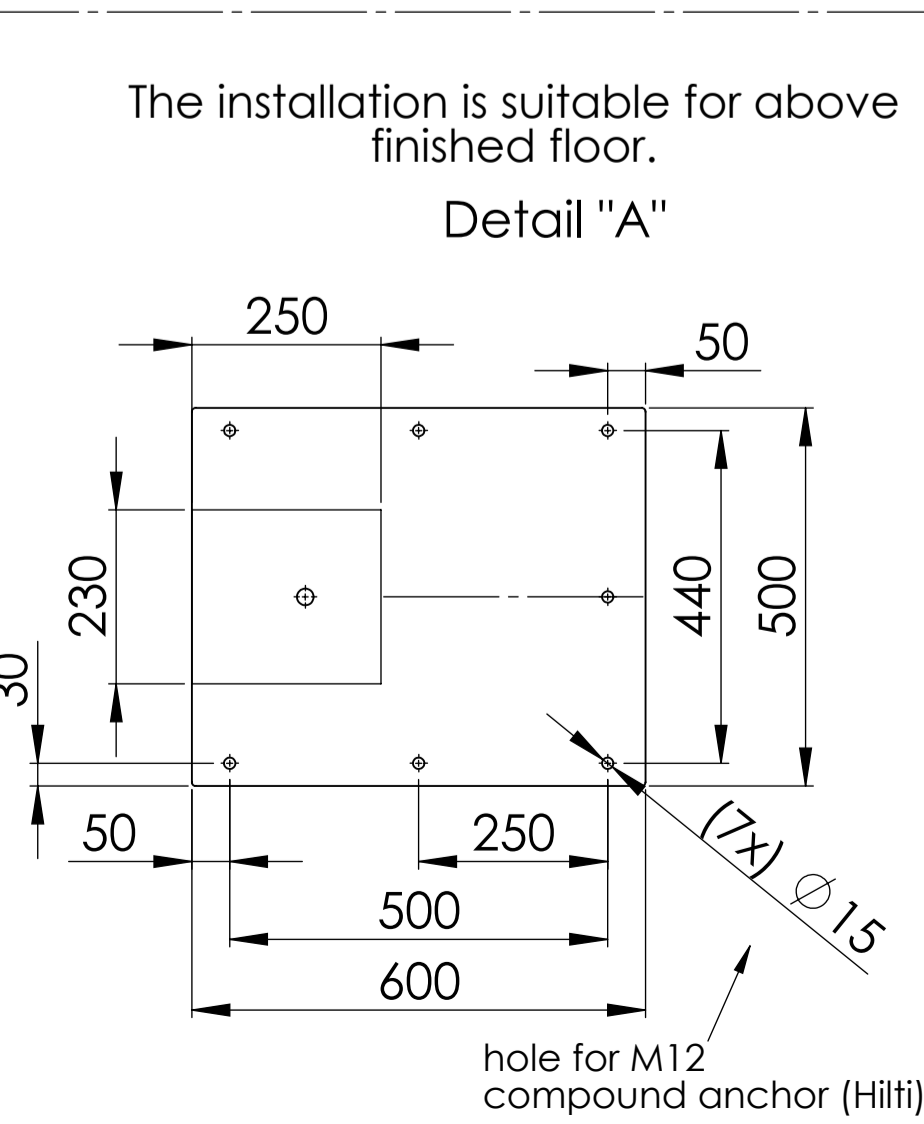
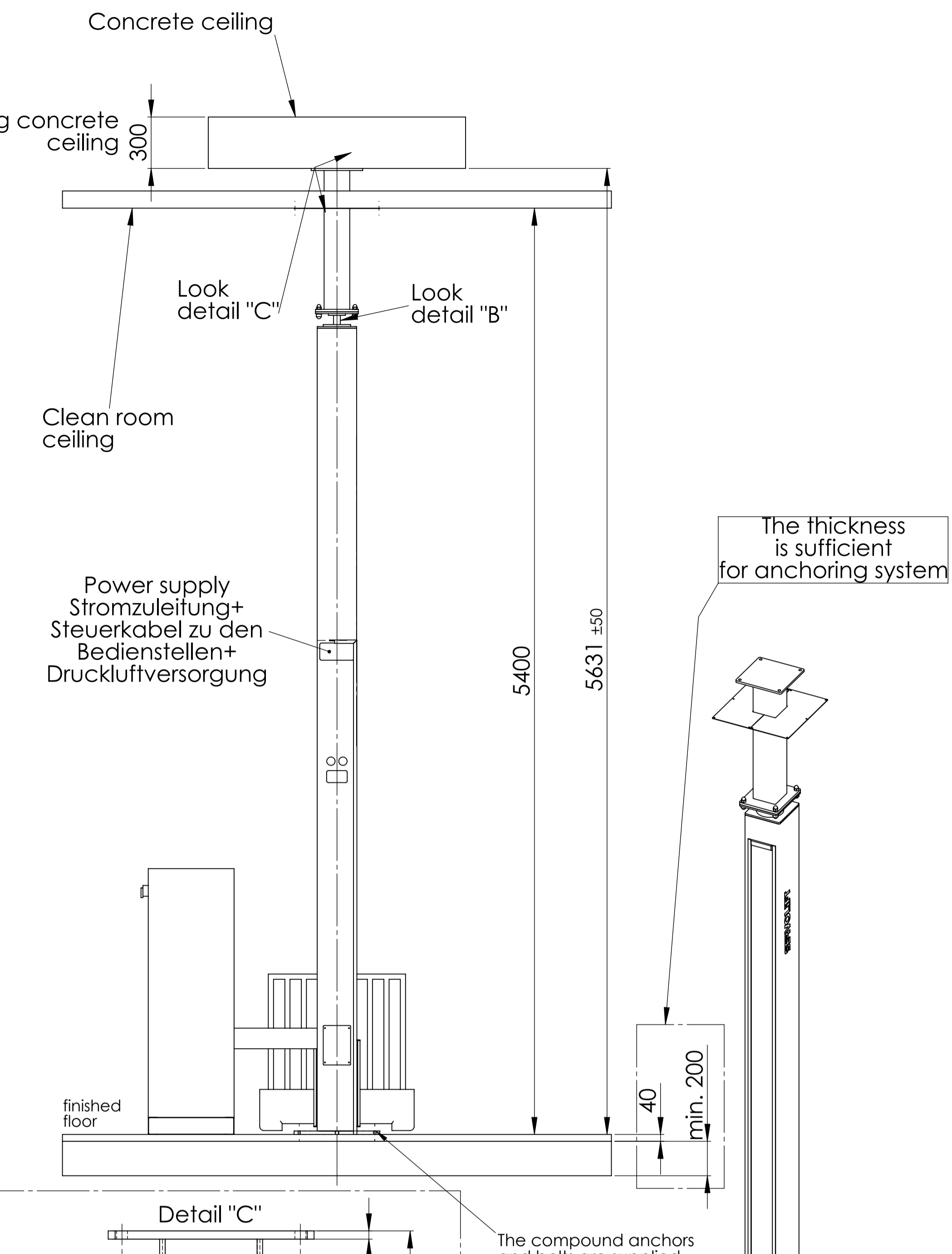
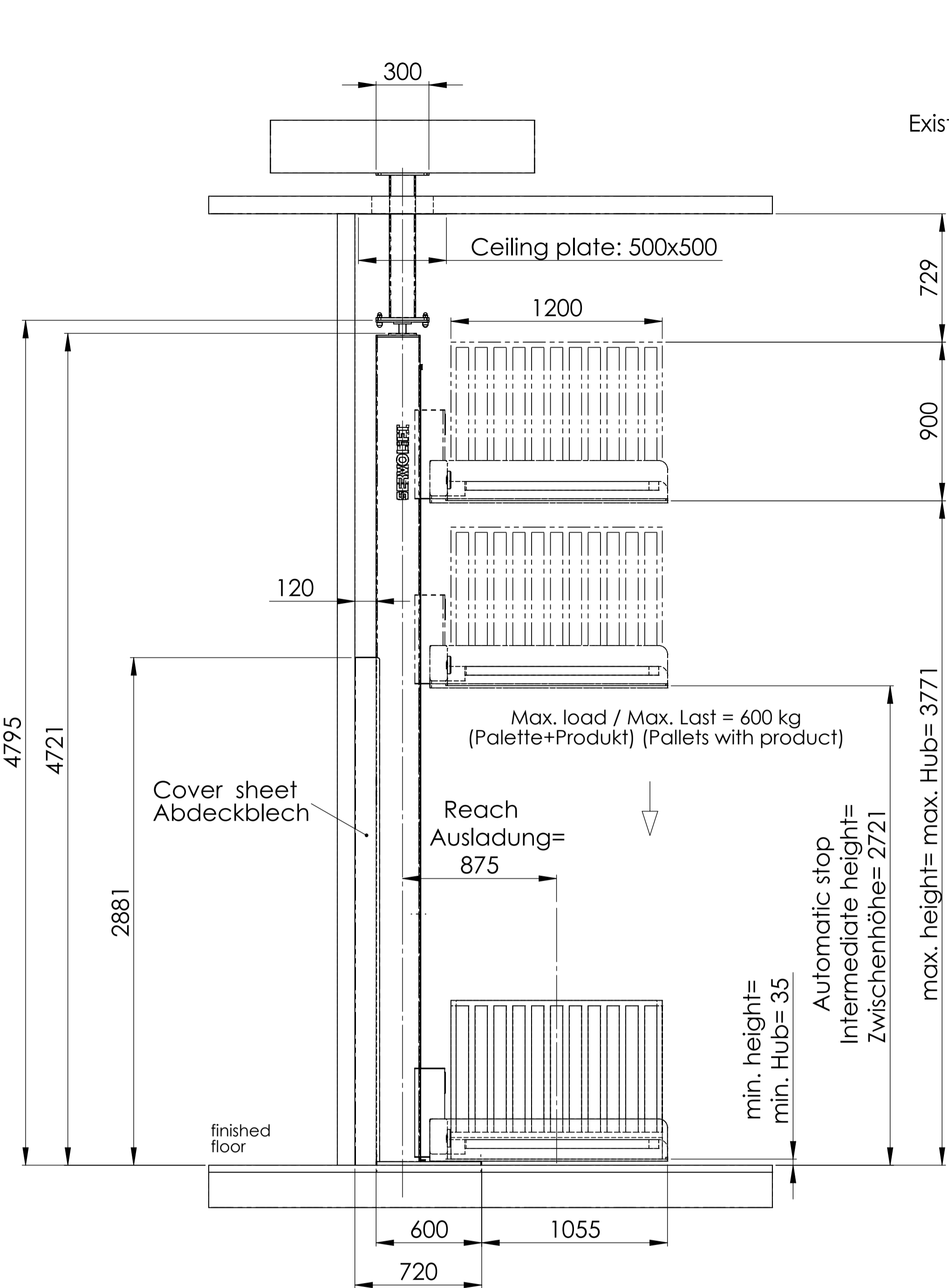
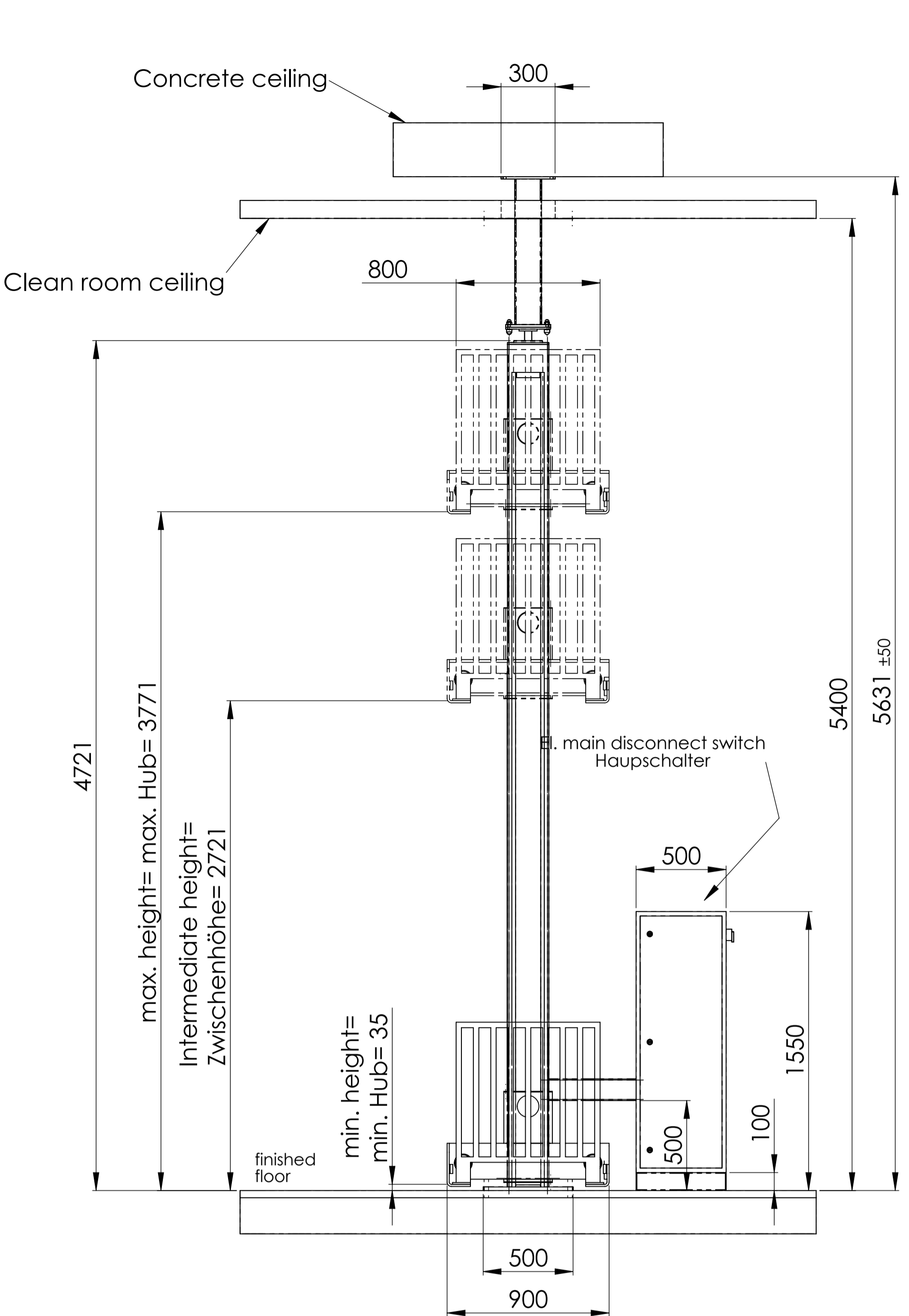
Pos.	PCS.	DISCRIPTION	ART. #	SPECIFICATION	Tightening torque
10	4	cylinder head screw	100320	ISO 4762 - M 16x60 - 8.8	Ma = 226 Nm
20	4	lock washer	111815	Schnorr S 16	

Projekt-Nr.		Maße ohne Toleranzangaben		Oberflächenreihe		Maßstab		Art.-Nr.	
		ISO 2768		R 2		1:2		132640	
Zust. Änderung		Datum		Name		Werkstoff, Holzzeug			
		Erstl. Datum		Name		Benennung			
		08.06.11		luckerM		Assembly of Support Arm			
		Änder. Datum		Name		to Lift Slide. - 200x230, Std			
		20.07.11		luckerM		Zeichnungsnummer: STANDARD\00\TUF861\VV.ZE1		Index	
		Bearb. Datum		Name		00-39-001/1		0	
		20.07.11		luckerM		Ersatz durch:			
		Gepr. Datum		Name					
		20.07.11		luckerM					
		SERVO LIFT GmbH							
		Handhabungstechnik							
		Albert-Einstein-Str. 9							
		D-77656 Ofenbunrg-Zunswelner							
		Tel. 0781/6100-0							



POS.	PCS.	DESCRIPTION	DRAWING-NO.	ART.-NO.	SPECIFICATION
10	1	O-Ring		101645	O-Ring 72.2x5.7
20	1	ROD SEAL		100790	S39-50-60-8
30	1	ROD WIPER		100805	50-60-7-10 AS
40	1	SCREW PLUG		100507	R1/8"
60	2	GUIDE BUSHING	00-41-217	112400	Rohr $\phi 65 \times \phi 50 - 17,5$ lg. -Rg7-DIN 1705
70	1	CHECK VALVE		101190	RH1
	1	LINE RUPTURE VALVE		110258	LB 1 C - 10
100	1	RUBBER BUMPER		112325	80-32 - EFFBE-Urelast 90 Shore A
110	1	O-RING		100813	52,2x5,7
120	1	CYLINDER HEAD $\phi 50$	00-41-202	101618	Rd 95-75 lg. -DIN 1691-GGG25
	1	SEAL SET		112433	POS.: 10, 20, 30, 100, 110

Projekt-Nr.		Maße ohne Toleranzangaben mittel ISO 2768	Oberflächenreihe R 2 DIN ISO 1302	Maßstab 1:1,5 Werkstoff, Halbzeug	Art.-Nr. 125039
		Datum	Name	Benennung	
		Erst.	02.05.02	schmitt	
		Änder.			
		Bearb.	07.12.04	Pielawa	
		Gepr.	04.04.05	luckerm	
		SERVO LIFT GmbH Handhabungstechnik Albert-Einstein-Str.9 D-77656 Offenburg-Zunsweier Tel.0781/6100-0		Zeichnungsnummer U:0205\ZE1\ST&NDF4G.ZE1	Index Blatt 2/3
a	Sivas Aufbereitung	31.08.2004	Stichling	00-41-201V a	
Zust.	Änderung	Datum	Name	Ersatz für: DO-41-201	Ersatz durch:



The compound anchors and bolts are supplied for installation of hoist

Total weight = 1400 kg (including 600 kg load)

General note:

- Capacity of lifter = 600 kg
- Material of construction AISI 304
- External surface finish $R_a \leq 1,5 \mu m$
- All anchoring/mounting bolts are suitable for clean room installation

SERVOLIFT		Allgemeintoleranzen für Schweißkonstruktionen nach ISO13920		Mastab 1:20		BG/fg-Nr. 00	
SERVOLIFT GmbH 77656 Offenburg, Germany www.servolift.de		B, F		Werkstoff Halbzeug Rohmaß:		Benennung Pallet Lifter	
Maße ohne Toleranzangaben nach ISO2768 m, K		Oberflächenreife R 2 DIN ISO 1302		Paletten Hubsäule		Ident.-Nr.	
Erst. 10.02.2014 schanz		Datum Name		13249-00-001		Index Blatt 0 von 1 A1	
Bearb. 11.02.2014 schanz		Freig. 17.03.2014 grubski		Ursursungsprojekt 13249		Ersetzt durch:	

MOLYDUVAL

Soraja FM 372



Special Grease for Food Industry

Virtually odourless and tasteless lubrication grease. It is made with a white mineral oil and an aluminium complex soap thickener. Extreme care is taken throughout the manufacture to protect its purity. If any incidental contact with food occurs, the grease will not affect the colour, odour, or taste of the product.

Contains an FDA approved oxidation inhibitor which gives high stability against chemical changes. It also contains rust inhibitor protecting bearings and metal surfaces subjected to wet conditions, humidity, water washing, steam. It also protects during periods of machine idleness. It resists water washout and provides a sealing of the bearing against entrance of water, or fruit and vegetable juices. Because it is compatible with beverages and food juices, it maintains his consistency. And because it is shear-stable, it also maintain its consistency when it is severely worked in the bearing.

Properties

- * free from mineral oil
- * very good corrosion protection
- * suitable for centralized lubrication systems
- * excellent tackiness
- * good resistant against cold and hot water, even sea water
- * excellent wear protection
- * food grade - all components conform to USDA H1 or the FDA regulations for Lubricants in incidental food contact
- * very good water resistance
- * withstands many alcohols and acids
- * good resistant against washing off
- * good resistant against cold and hot water, even sea water

Applications

- * for anti-friction and sleeve bearings at high temperatures, in ovens, ventilators, engines
- * for bearings in refrigeration equipment
- * for chains in food industry, for packing and filling machines
- * for bearings at funnels and weirs
- * for slide bars in butcheries or slaughterhouses
- * as corrosion preservative
- * for gear boxes in food industry
- * for anti-friction and sleeve bearings in fish production
- * for hooks, sleeve elements, rolls, joints, clutches
- * for slow running bearings, especially heavy loaded bearings

Technical Datas

Color		white
Consistency Class NLGI		2
Name		KPF2K-20
Base Fluid		White Oil
Name		ISO-L-XBCEB2
Density 15°C	kg/m ³	1000
Water Resistance Static	Grade	0
Water Resistance Static	Grade	1-90
Temperature Range	°C	-20 -> +120
Temperature Range kurzzeitig bis	°C	140
Corrosion Protection Kupfer	Grade	1b

For further information, please see our website www.molyduval.com or consult your local representative.

The technical data in this information sheet represents our present knowledge and is based on our general experience. It is intended to give information of possible applications to a reader with technical experience. It constitutes neither an assurance of product properties nor does it release the user from the obligation of performing preliminary tests with the selected product to ensure that the product is safe, effective and fully satisfactory for the intended end use. It does also not form part of any sales contract as guaranteed properties of the delivered material.

MOLYDUVAL

Soraja FM 372

Technical Datas

Oxidation Resistance	kPa	< 35
Dropping Point	°C	265
Lubricating Ability 02-SKF-R2F 120°C		pass
Wear Protection VKA Schweißkraft	N	6000
Wear Protection VKA Verschleißtiefe 40kg/107C/1200U/1h	mm	0,7

The indicated service temperatures are guide values depending on the lubricants composition and on the application. They may vary in case of special influences or ongoing use.

For further information, please see our website www.molyduval.com or consult your local representative.

The technical data in this information sheet represents our present knowledge and is based on our general experience. It is intended to give information of possible applications to a reader with technical experience. It constitutes neither an assurance of product properties nor does it release the user from the obligation of performing preliminary tests with the selected product to ensure that the product is safe, effective and fully satisfactory for the intended end use. It does also not form part of any sales contract as guaranteed properties of the delivered material.

EC-Safety Data Sheet conforming to 1907/2006/EG, Article 31

MOLYDUVAL Soraja FM 372

Date 13.12.2012 Page 1

1. Commercial Product Name and Company/Manufacturer

1.1 Trade Name:	Soraja FM 372
1.2 Product Application	for gear boxes in food industry for anti-friction and sleeve bearings at high temperatures, in ovens, ventilators, engines for bearings in refrigeration equipment for chains in food industry, for packing and filling machines for bearings at funnels and we
1.3 Producer / Distributor:	MOLYDUVAL GmbH * Halskestr.6 * D-40880 Ratingen * H.Wunsch
1.4 Emergency Phone	+49 (2102) 9757-00

2. Hazards Identification

2.1 Classification	No health hazards known. Product may be used fro lubrication of food processing equipment.
2.2 Information pertaining to particular dangers for man	Is improbable, that the product leads to eye irritations, to a provoking the skin, to an endangerment of the respiratory organs, to a provoking of the lungs or that swallowing leads to effects injurious to health.
2.3 Information pertaining to particular dangers for environment:	Although no environmental damages and bioaccumulations were expected, withdrawing should be avoided into the environment. Into drains to arrive do not leave

3. Composition - Information on Ingredients

3.1 Composition - Information on Ingredients	Mixture from paraffinic white oil and thickener. All components conform to the FDA regulations FDA 21 CFR 178.3570 and/or the german DAB.
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4. First Aid Measures

4.1 General Instructions	Remove victim from danger zone, without exposing yourself to any personal risk. Remove wetted clothing and shoes and clean items before using them again.
4.2 After Inhalation	Not applicable.
4.3 After Skin Contact	Wash with soap and much water.
4.4 After Eye Contact	Flush eyes with copious amounts of water for 15 minutes holding lid away from eye.
4.5 After Ingestion	Consult a physician
4.6 Symptoms and effects	no
4.7 Instructions for attending physician	Prolonged or repeated exposure may cause skin discomfort.

5. Fire-Fighting Measures

5.1 Extinguishing media - Usable	Water Spray, Powder, Alcohol Foam, Sand, CO2
5.2 Extinguishing media - Not usable	Waterjet
5.3 Special personal protection	No
5.4 Further information	Water may cause splattering.

6. Accidental Release Measures

6.1 Special Personal Protection	Use oil-proofed clothing
6.2 Special Environmental Protection	Do not expose to environment or in effluent water.
6.3 Absorbing Materials	Sabbia
6.4 Cleaning Methods	Take up mechanically.

7. Handling and Storage

7.1 Handling	Open and handle with the general caution when handling lubricants.
7.2 Storage	Keep container closed. Store in a cool, well ventilated place away from incompatible materials. Do not handle or store near an open flame, heat or other sources of ignition. Protect material from direct sunlight. Do not pressurize, cut, heat, or weld containers. Storage Class VCI: 11 Flammable Solids

8. Exposure Controls / Personal Protection

8.2 Eye Protection:	None required
8.3 Skin Protection:	None required
8.4 Respiratory Protection:	None required
8.5 Technical Protection	None required

9. Physical and Chemical Properties

9.1 Appearance Form	pasty
9.2 Color	light
9.3 Appearance	like grease
9.4 Odour	without
9.6 Boiling Point / Boiling Range	n.b.
9.7 Melting Point / Melting Range	n.b.
9.8 Flash Point	n.b.

EC-Safety Data Sheet conforming to 1907/2006/EG, Article 31

MOLYDUVAL Soraja FM 372

Date 13.12.2012 Page 2

9.9 Autogenous Ignition Temperature	n.b.
9.10 Upper Explosion Limit	-
9.11 Lower Explosion Limit	-
9.13 Specific Gravity, 20°C	0,96 g/cm ³
9.14 Water Solubility	N
9.15 Viscosity, 40°C	n.b.
9.17 VOC-Content	n.b.

10. Stability und Reactivity

10.1 Stability	This product is stable in normal-use temperatures and will not react violently with water
10.2 Conditions to be avoided	No
10.3 Substances to be avoided	No

11. Toxicological Information

11.1 Toxicological Tests	No health hazards known. Product may be used fro lubrication of food processing equipment.
11.2 At Eye Contact	No hazard.
11.3 At Skin Contact	No hazard.
11.4 At Inhalation	no data available
11.5 At Ingestion	May cause sickness and vomiting.

12. Ecological Information

12.1 Ecological Information	Ecotoxicological data have not been determined specifically for this product. The information provided is based on the knowledge of the components. Product is not readily biodegradable. The main constituents are expected to be inherently biodegradable, but some components that may persist in the environment.
-----------------------------	---

13. Disposal Considerations

13.1 Disposal Considerations	May not be disposed together with domestic rubbish. Disposal in compliance with federal, state, and local laws. EAK Waste Product Code : 130899 Ölabfälle, nicht anders spezifiziert
------------------------------	--

14. Transport Information

14.1 UN-No	No
14.2 Land Transport ADR/GGVS RID/GGVE	No
14.3 Sea Transport ADNR/IMDG/GGVSee	No
14.4 Air Transport IATA/ICAO	No
14.5 Other	No transport regulations.

15. Regulatory Information

15.1 Limits for Disposal at Places of Employment	No MAK Values defined
15.2 Characterisation symbols	No Precautionary Labels.

16. Further Information

16.1 Further Information	Although the information on this safetysheet is based on the by us known and reliable considered information, we can neither accept any responsibility for the use of it. Please contact us if more infos are needed.
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EC-Safety Data Sheet conforming to 1907/2006/EG, Article 31

MOLYDUVAL Soraja FM 372

Date 13.12.2012 Page 1

1. Commercial Product Name and Company/Manufacturer

1.1 Trade Name:	Soraja FM 372
1.2 Product Application	for gear boxes in food industry for anti-friction and sleeve bearings at high temperatures, in ovens, ventilators, engines for bearings in refrigeration equipment for chains in food industry, for packing and filling machines for bearings at funnels and we
1.3 Producer / Distributor:	MOLYDUVAL GmbH * Halskestr.6 * D-40880 Ratingen * H.Wunsch
1.4 Emergency Phone	+49 (2102) 9757-00

2. Hazards Identification

2.1 Classification	No health hazards known. Product may be used fro lubrication of food processing equipment.
2.2 Information pertaining to particular dangers for man	Is improbable, that the product leads to eye irritations, to a provoking the skin, to an endangerment of the respiratory organs, to a provoking of the lungs or that swallowing leads to effects injurious to health.
2.3 Information pertaining to particular dangers for environment:	Although no environmental damages and bioaccumulations were expected, withdrawing should be avoided into the environment. Into drains to arrive do not leave

3. Composition - Information on Ingredients

3.1 Composition - Information on Ingredients	Mixture from paraffinic white oil and thickener. All components conform to the FDA regulations FDA 21 CFR 178.3570 and/or the german DAB.
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4. First Aid Measures

4.1 General Instructions	Remove victim from danger zone, without exposing yourself to any personal risk. Remove wetted clothing and shoes and clean items before using them again.
4.2 After Inhalation	Not applicable.
4.3 After Skin Contact	Wash with soap and much water.
4.4 After Eye Contact	Flush eyes with copious amounts of water for 15 minutes holding lid away from eye.
4.5 After Ingestion	Consult a physician
4.6 Symptoms and effects	no
4.7 Instructions for attending physician	Prolonged or repeated exposure may cause skin discomfort.

5. Fire-Fighting Measures

5.1 Extinguishing media - Usable	Water Spray, Powder, Alcohol Foam, Sand, CO2
5.2 Extinguishing media - Not usable	Waterjet
5.3 Special personal protection	No
5.4 Further information	Water may cause splattering.

6. Accidental Release Measures

6.1 Special Personal Protection	Use oil-proofed clothing
6.2 Special Environmental Protection	Do not expose to environment or in effluent water.
6.3 Absorbing Materials	Sabbia
6.4 Cleaning Methods	Take up mechanically.

7. Handling and Storage

7.1 Handling	Open and handle with the general caution when handling lubricants.
7.2 Storage	Keep container closed. Store in a cool, well ventilated place away from incompatible materials. Do not handle or store near an open flame, heat or other sources of ignition. Protect material from direct sunlight. Do not pressurize, cut, heat, or weld containers. Storage Class VCI: 11 Flammable Solids

8. Exposure Controls / Personal Protection

8.2 Eye Protection:	None required
8.3 Skin Protection:	None required
8.4 Respiratory Protection:	None required
8.5 Technical Protection	None required

9. Physical and Chemical Properties

9.1 Appearance Form	pasty
9.2 Color	light
9.3 Appearance	like grease
9.4 Odour	without
9.6 Boiling Point / Boiling Range	n.b.
9.7 Melting Point / Melting Range	n.b.
9.8 Flash Point	n.b.

EC-Safety Data Sheet conforming to 1907/2006/EG, Article 31

MOLYDUVAL Soraja FM 372

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9.9 Autogenous Ignition Temperature	n.b.
9.10 Upper Explosion Limit	-
9.11 Lower Explosion Limit	-
9.13 Specific Gravity, 20°C	0,96 g/cm ³
9.14 Water Solubility	N
9.15 Viscosity, 40°C	n.b.
9.17 VOC-Content	n.b.

10. Stability und Reactivity

10.1 Stability	This product is stable in normal-use temperatures and will not react violently with water
10.2 Conditions to be avoided	No
10.3 Substances to be avoided	No

11. Toxicological Information

11.1 Toxicological Tests	No health hazards known. Product may be used fro lubrication of food processing equipment.
11.2 At Eye Contact	No hazard.
11.3 At Skin Contact	No hazard.
11.4 At Inhalation	no data available
11.5 At Ingestion	May cause sickness and vomiting.

12. Ecological Information

12.1 Ecological Information	Ecotoxicological data have not been determined specifically for this product. The information provided is based on the knowledge of the components. Product is not readily biodegradable. The main constituents are expected to be inherently biodegradable, but some components that may persist in the environment.
-----------------------------	---

13. Disposal Considerations

13.1 Disposal Considerations	May not be disposed together with domestic rubbish. Disposal in compliance with federal, state, and local laws. EAK Waste Product Code : 130899 Ölabfälle, nicht anders spezifiziert
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14. Transport Information

14.1 UN-No	No
14.2 Land Transport ADR/GGVS RID/GGVE	No
14.3 Sea Transport ADNR/IMDG/GGVSee	No
14.4 Air Transport IATA/ICAO	No
14.5 Other	No transport regulations.

15. Regulatory Information

15.1 Limits for Disposal at Places of Employment	No MAK Values defined
15.2 Characterisation symbols	No Precautionary Labels.

16. Further Information

16.1 Further Information	Although the information on this safetysheet is based on the by us known and reliable considered information, we can neither accept any responsibility for the use of it. Please contact us if more infos are needed.
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March 11, 2004

Thomas Hanemann
MOLYDUVAL VAN LAAR GMBH
HALSKESTR. 6
RATINGEN, NRW 40880
GERMANY

RE: Soraja FM 372
Category Code: H1
NSF Registration No. 132323

Dear Thomas Hanemann:

NSF has processed the application for Registration of **Soraja FM 372** to the *NSF Registration Guidelines for Proprietary Substances and Nonfood Compounds* (2004), which are available at www.nsf.org/usda. The NSF Nonfood Compounds Registration Program is a continuation of the USDA product approval and listing program, which is based on meeting regulatory requirements including FDA 21 CFR for appropriate use, ingredient and labeling.

This product is acceptable as a lubricant with incidental food contact (H1) for use in and around food processing areas. Such compounds may be used on food processing equipment as a protective anti-rust film, as a release agent on gaskets or seals of tank closures, and as a lubricant for machine parts and equipment in locations in which there is a potential exposure of the lubricated part to food. The amount used should be the minimum required to accomplish the desired technical effect on the equipment. If used as an anti-rust film, the compound must be removed from the equipment surface by washing or wiping, as required to leave the surface effectively free of any substance which could be transferred to food being processed.

NSF Registration of this product is current when the NSF Registration Number, Category Code, and Registration Mark appear on the NSF-approved product label, and the registered product name is included in the current NSF White Book Listing of Nonfood Compounds at the NSF website (<http://www.nsf.org/usda>). The NSF Registration Mark can be downloaded from the NSF website, at http://www.nsf.org/mark/download_marks.html.

NSF Listing of all registered Nonfood compounds by NSF International is not an endorsement of those compounds, or of any performance or efficacy claims made by the manufacturer.

Registration status may be verified at any time via the NSF web site, at <http://www.nsf.org/usda>. Changes in formulation or label, without the prior written consent of NSF, will void registration, and will supersede the on-line listing.

Sincerely,



Carmen Grindatti
NSF Nonfood Compounds Registration Program

Company No: N11182



Foodmax AW

Range of multipurpose lubricating oils for the food industry

Description

Foodmax AW is formulated using specially selected highly refined base stocks in combination with the latest additive technology. The product is non toxic and suitable for use in applications where incidental contact with food or raw materials during the production is possible or likely. Thanks to its great performance characteristics and carefully chosen additives, Foodmax AW oils can be used in most applications in the manufacturing process in the food production and processing industry.

The Foodmax AW is available in a wide range and is both NSF and InS approved.

Applications

General lubrication

The Foodmax AW lubricants can be used for all kinds of general lubrication. For example for bearings, slides, chains and small mechanisms, which need a medium pressure oil that provides a clean and non contaminating lubrication. The application is easily done either automatic or by dropping, spraying or manually.

Air tool lubrication

Foodmax AW 22 (ISO VG 22) is perfectly suitable for airline and air tool lubrication. It will protect the pipes from corrosion as well as all the elements and valves of the pneumatic network. The use of Foodmax AW 22 will provide a trouble free operation. The de-emulsifying characteristics of Foodmax AW 22 provide easy draining of the moisture that is present in compressed air. Foodmax AW 22 is recommended for air lubrication whenever there is a chance that the air will be in contact with food; for example in case of spraying of food additives.

Hydraulic oil

Thanks to its excellent anti wear properties the AW range is used as hydraulic fluid for both power and motion transfer in machinery operated close to food production processes:

- High viscosity index, high temperature behaviour is excellent. Foodmax AW shows rather flat viscosity-temperature curves, which results in a smooth operation in both high and low temperature lubrication
- Low pour point which allows operation at temperatures below < 0 °C and increased performance in start-up operations
- High shear stability
- Outstanding anti foam properties
- Excellent demulsifying capacity

Conveyor lubrication

In the beverage industry very often a mixture of soap and water is used to lubricate stainless steel conveyors in combination with glass bottles. The soap mixture will give a messy workplace and will stain labels. Foodmax AW 22 has proven to do an excellent job here. Usually a very small amount is sprayed on the conveyor (almost dry lubrication). Foodmax AW 22 has been approved by DROPSA, beverage equipment supplier for use on the conveyors.

All performance data on this Technical Data Sheet are indicative only and can vary during production



Dielectric oil

Foodmax AW fluids possess excellent isolating and dielectric properties. Foodmax AW 68 is amongst others being used as dielectric oil in underwater pumps that are used in drinking water.

Anticorrosive agent

Foodmax AW can be used as light anticorrosive protector of metal surfaces which might be in contact with food products. Examples are wires for canned meat sealing, conveyor or slides in manufacturing equipment and handling food packaging. Foodmax AW can also be used to clean and polish stainless steel.

Typical performance data

	AW 22	AW 32	AW 46	AW 68	AW 100
Density @ 20 °C, g/ml	0,842	0,864	0,850	0,865	0,870
Viscosity @ 40 °C, cSt	22	32	46	68	100
Viscosity Index	105	105	105	105	100
Pour point, °C	-24	-24	-21	-21	- 21
Flash point, °C	165	170	180	200	215
Acidity index, mg KOH/gr	0,8	0,8	0,8	0,8	0,8
Aniline point, °C	105	105	105	105	105
Copper corrosion, 3h/100 °C	1 a	1 a	1 a	1 a	1 a
Steel corrosion, distilled water	Pass	Pass	Pass	Pass	Pass
De-emulsifying index	40/37/3 (30')	40/37/3 (30')	40/37/3 (30')	40/37/3 (30')	40/37/3 (30')

George Handels-GmbH, Waldstr. 10, D-76879 Bornheim
Tel.: 0049-6348/98240, info@tecoil.de – www.tecoil.de

All performance data on this Technical Data Sheet are indicative only and can vary during production

SAFETY DATA SHEET

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Revised edition no : 5

Date : 14 / 6 / 2012

Supersedes : 14 / 12 / 2011

Foodmax AW

FOODMAX AW

SECTION 1 Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier

Identification of the product : Oily liquid.
Trade name : Foodmax AW
Format : Commission Regulation (EU) No 453/2010 of 20 May 2010 amending Regulation (EC) No 1907/2006 of the European Parliament and of the Council on the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH).

1.2. Relevant identified uses of the substance or mixture and uses advised against

Use : Food grade hydraulic and lubricating fluid.

1.3. Details of the supplier of the safety data sheet

Company identification : George Handels-GmbH
 Waldstr. 10
 D-76879 Bornheim
 Tel: +49 (0)6348 98240
 Fax: +49 (0)6348 982440
 info@tecoil.de
 +49 (0)6348 98240

1.4. Emergency telephone number

Emergency phone nr : +31 (0)316 740850

SECTION 2 Hazards identification

2.1. Hazard classification

Classification EC 67/548 or EC 1999/45

Hazard Class and Category Code Regulation EC 1272/2008 (CLP)

: Not classified as dangerous product (Directive 1999/45/EC).
Not regulated.

2.2. Label elements

Labelling EC 67/548 or EC 1999/45

• **Symbol(s)** : None.

Labelling Regulation EC 1272/2008 (CLP)

• **Hazard pictograms code** : ---

• **Precautionary statements**

2.3. Other hazards

None under normal conditions.

SECTION 3 Composition/information on ingredients

Substance / Preparation : Preparation.

Components : This product is not hazardous but contains hazardous components.

Substance name	Contents	CAS No	EC No	Annex No	REACH	Classification
Amine phosphates	: 0.1 0.5 %	----	----	----	----	Xi, R36/38 N, R51-53
N-phenyl benzolamine derivatives	: 0.1 0.5 %	----	----	----	----	N, R51-53

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Foodmax AW		FOODMAX AW

SECTION 4 First aid measures

4.1. Description of first aid measures

First aid measures

- Inhalation : Assure fresh air breathing.
- Skin contact : Remove affected clothing and wash all exposed skin area with mild soap and water, followed by warm water rinse.
- Eye contact : Rinse immediately with plenty of water. Obtain medical attention if pain, blinking or redness persist.
- Ingestion : Rinse mouth. Do not induce vomiting. Seek medical advice.

4.2. Most important symptoms and effects, both acute and delayed

None known.

4.3. Indication of any immediate medical attention and special treatment needed

After adequate first aid, no further treatment is required unless symptoms reappear.

SECTION 5 Fire-fighting measures

5.1. Extinguishing media

Alcohol foam.

Extinguishing media

- Suitable extinguishing media : Carbon dioxide.
Dry powder.
Foam.
- Unsuitable extinguishing media : Do not use extinguishing media containing water.

5.2. Special hazards arising from the substance or mixture

Specific hazards : When exposed to heat, may decompose liberating hazardous gases.

5.3. Advice for fire-fighters

- Protection against fire : Do not enter fire area without proper protective equipment, including respiratory protection.
- Prevention : No naked lights. No smoking.
- Special procedures : Exercise caution when fighting any chemical fire.
Avoid (reject) fire-fighting water to enter environment.
- Surrounding fires : Use water spray or fog for cooling exposed containers.

SECTION 6 Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Personal precautions : Spill should be handled by trained cleaning personnel properly equipped with respiratory and eye protection.
Spill area may be slippery.

6.2. Environmental precautions

Environmental precautions : Harmful to aquatic organisms. Prevent entry to sewers and public waters. Notify authorities if product enters sewers or public waters.

6.3. Methods and material for containment and cleaning up

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Foodmax AW		FOODMAX AW

SECTION 6 Accidental release measures (continued)

Clean up methods : Soak up spills with inert solids, such as clay or diatomaceous earth as soon as possible. Dilute residues and flush. Recover the cleaning water for later disposal. On water, recover/skim from surface and pour out in disposal container.

6.4. Reference to other sections

See Headings 7 and 8.

SECTION 7 Handling and storage

7.1. Precautions for safe handling

General : Ventilate confined spaces before entering.
Handling : Handle in accordance with good industrial hygiene and safety procedures. Ensure prompt removal from eyes, skin and clothing. Wash hands and other exposed areas with mild soap and water before eat, drink or smoke and when leaving work.
Precautions in handling and storage : Avoid all unnecessary exposure.

7.2. Conditions for safe storage, including any incompatibilities

Storage : Store in tightly closed, properly ventilated containers away from heat, sparks, open flame. Keep container closed when not in use.

7.3. Specific end use(s)

SECTION 8 Exposure controls/personal protection

8.1. Control parameters

Personal protection
- **Respiratory protection** : No special respiratory protection equipment is recommended under normal conditions of use with adequate ventilation.
- **Skin protection** : No special clothing/skin protection equipment is recommended under normal conditions of use.
- **Eye protection** : Eye protection should only be necessary where liquid could be splashed or sprayed.
- **Hand protection** : In case of repeated or prolonged contact wear gloves.
- **Ingestion** : When using, do not eat, drink or smoke.
Industrial hygiene : Provide good ventilation in process area to prevent formation of vapour.

8.2. Occupational Exposure Limits

Not established.

SECTION 9 Physical and chemical properties

9.1. Information on basic physical and chemical properties

• Appearance

Appearance : Not established.
Physical state at 20 °C : Liquid.
Colour : Colourless.

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SECTION 9 Physical and chemical properties (continued)

• Odour

Odour : Odourless.

• Initial boiling point - boiling range

Boiling point [°C] : >250

• Flash point

Flash point [°C] : >165

• Relative density

Density @ 20°C g/ml : 0.842-0.890

• Solubility

Solubility in water : Insoluble.

• Viscosity

Viscosity (Cst @ 40 °C) : Depending on grade

SECTION 10 Stability and reactivity
--

10.1. Reactivity

Stability and reactivity : Not established.

10.2. Chemical stability

Not established.

10.3. Possibility of hazardous reactionsHazardous reactions :
None under normal conditions.Hazardous properties :
This product contains hazardous components for the environment.**10.4. Conditions to avoid**

Conditions to avoid : Strong oxidizers.

10.5. Incompatible materials

Materials to avoid : Not established.

10.6. Hazardous decomposition productsHazardous decomposition products : Thermal decomposition (>200 C) and combustion may produce Carbon oxides, phosphorus and nitrogen derivatives, as well as other toxic vapour and gases
Not established.

SECTION 11 Toxicological information

11.1. Information on toxicological effects

Toxicity information

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SECTION 11 Toxicological information (continued)

Rat oral LD50 [mg/kg] : Not established.

SECTION 12 Ecological information
--

12.1. Toxicity

No known toxicological effects from this product.

LC50-96 Hour - fish [mg/l] : Not established.

12.2. Persistence - degradability

Persistence - degradability : Not established.

12.3. Bioaccumulative potential

Bioaccumulative potential : Not established.

12.4. Mobility in soil

Not established.

12.5. Results of PBT and vPvB assessment

Not established.

12.6. Other adverse effects

Not established.

Ecological effects information : No specific risk for the environment.
No data available.

SECTION 13 Disposal considerations

13.1. Waste treatment methods

General : Dispose of this material and its container at hazardous or special waste collection point. Avoid release to the environment. Dispose of this material and its container at hazardous or special waste collection point. Dispose in a safe manner in accordance with local/national regulations.

SECTION 14 Transport information

14.1. UN Number

General information : Not classified.

14.2. Proper shipping name

Shipping name : (product name)

14.3. Transport Hazard Classification

Not established.

14.4. Packing group**14.5. Environmental hazards**

In case of spillage and/or leakage : Clean up even minor leaks or spills if possible without unnecessary risk.
Not established.

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Foodmax AW		FOODMAX AW

SECTION 14 Transport information (continued)

14.6. Special precautions for user

- Personal precautions** : The driver shall not attempt to deal with any fire of the load.
- Emergency action in case of accident** : Stop the engine. No naked lights. No smoking. Mark roads and warns other road users. Keep public away from danger area. NOTIFY POLICE AND FIRE BRIGADE IMMEDIATELY.
- Additional information** : None
None.

SECTION 15 Regulatory information

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture

Ensure all national/local regulations are observed.

EUROPEAN COMMUNITIES

Regulation (EC) No 1907/2006 of the European Parliament and of the Council of 18 December 2006.

Directive 2006/121/EC of the European Parliament and of the Council of 18 December 2006.

EC Labelling

15.2. Chemical Safety Assessment

Not established.

SECTION 16 Other information

- Text of R-Phrases in § 3** :
R51/53 : Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
- Further information** : None
None.

End of document



March 27, 2006

RE: Foodmax AW 46
Category Code: H1
NSF Registration No. 138238

Dear Mr. Perry Peters:

NSF has processed the application for Registration of **Foodmax AW 46** to the NSF Registration Guidelines for Proprietary Substances and Nonfood Compounds (2004), which are available at <http://www.nsf.org>. The NSF Nonfood Compounds Registration Program is a continuation of the USDA product approval and listing program, which is based on meeting regulatory requirements including FDA 21 CFR for appropriate use, ingredient and labeling.

This product is acceptable as a lubricant with incidental food contact (H1) for use in and around food processing areas. Such compounds may be used on food processing equipment as a protective anti-rust film, as a release agent on gaskets or seals of tank closures, and as a lubricant for machine parts and equipment in locations in which there is a potential exposure of the lubricated part to food. The amount used should be the minimum required to accomplish the desired technical effect on the equipment. If used as an anti-rust film, the compound must be removed from the equipment surface by washing or wiping, as required to leave the surface effectively free of any substance which could be transferred to food being processed.

NSF Registration of this product is current when the NSF Registration Number, Category Code, and Registration Mark appear on the NSF-approved product label, and the registered product name is included in the current NSF White Book Listing of Nonfood Compounds at the NSF website (<http://www.nsf.org>). The NSF Registration Mark can be downloaded from the NSF website, at http://www.nsf.org/business/about_NSF/nsf_marks_download.asp.

NSF Listing of all registered Nonfood compounds by NSF International is not an endorsement of those compounds, or of any performance or efficacy claims made by the manufacturer.

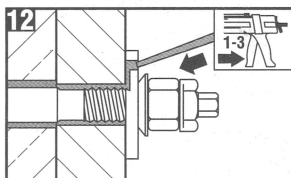
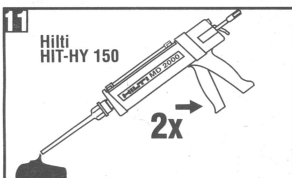
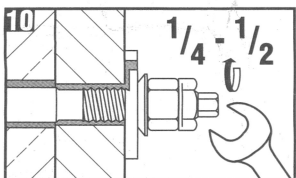
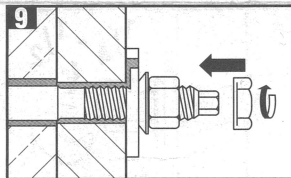
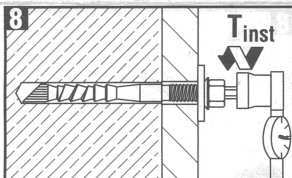
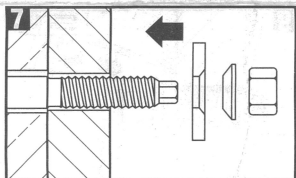
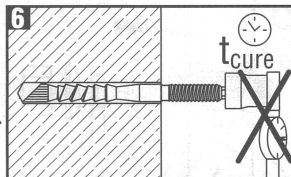
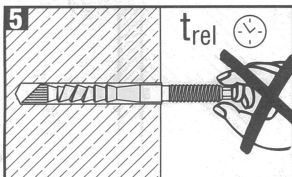
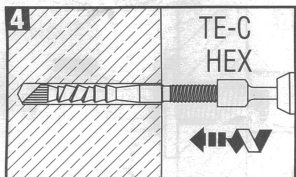
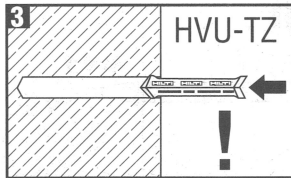
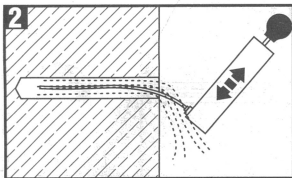
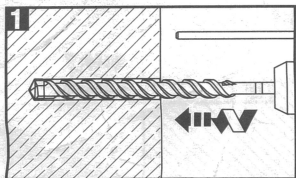
Registration status may be verified at any time via the NSF web site, at <http://www.nsf.org>. Changes in formulation or label, without the prior written consent of NSF, will void registration, and will supersede the on-line listing.

Sincerely,



A handwritten signature in black ink, appearing to read 'Carmen Grindatti'.

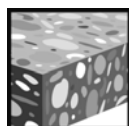
Carmen Grindatti
NSF Nonfood Compounds Registration Program

Company No: 3L800



HVZ Adhesive anchor

Mortar system	Benefits
 <p>Hilti HVU-TZ foil capsule</p>  <p>HAS-TZ HAS-RTZ HAS-HCRTZ rod</p>	<ul style="list-style-type: none"> - suitable for cracked and non-cracked concrete C 20/25 to C 50/60 - high loading capacity - suitable for dry and water saturated concrete



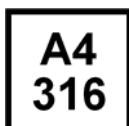
Concrete



Tensile zone



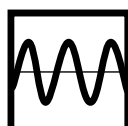
Fire resistance



Corrosion resistance



High corrosion resistance



Fatigue



Shock



European Technical Approval



CE conformity



Hilti anchor design software

Approvals / certificates

Description	Authority / Laboratory	No. / date of issue
European technical approval ^{a)}	DIBt, Berlin	ETA-03/0032 / 2008-09-29
Approval for shockproof fastenings in civil defence installations	Bundesamt für Zivilschutz, Bern	BZS D 09-602 / 2009-10-28
Approval for dynamic loads	DIBt, Berlin	Z-21.3-1692 / 2007-11-04
Fire test report ZTV-Tunnel	IBMB, Braunschweig	UB 3357/0550-2 / 2001-06-26
Fire test report	IBMB, Brunswick	UB 3357/0550-1 / 2001-04-17
Assessment report (fire)	warringtonfire	WF 166402 / 2007-10-26

a) All data given in this section according ETA-03/0032, issue 2008-09-29.

Basic loading data (for a single anchor)

All data in this section applies to

For details see Simplified design method

- Correct setting (See setting instruction)
- No edge distance and spacing influence
- Steel failure
- Base material thickness, as specified in the table
- Embedment depth, as specified in the table
- One anchor material, as specified in the tables
- Concrete C 20/25, $f_{ck,cube} = 25 \text{ N/mm}^2$
- Temperate range I
(min. base material temperature -40°C , max. long term/short term base material temperature: $+50^\circ\text{C}/80^\circ\text{C}$)
- Installation temperature range 0°C to $+40^\circ\text{C}$

Embedment depth and base material thickness for the basic loading data.

Mean ultimate resistance, characteristic resistance, design resistance, recommended loads.

Anchor size	M10x75	M12x95	M16x105	M16x125	M20x170
Embedment depth [mm]	75	95	105	125	170
Base material thickness [mm]	150	190	210	250	340

Mean ultimate resistance ^{a)}: concrete C 20/25 – $f_{ck,cube} = 25 \text{ N/mm}^2$, anchor HVZ

Data according ETA-03/0032, issue 2008-09-29							
Anchor size			M10x75	M12x95	M16x105	M16x125	M20x170
Non cracked concrete							
Tensile $N_{Ru,m}$	HVZ	[kN]	36,8	53,3	72,4	94,1	149,2
Shear $V_{Ru,m}$	HVZ	[kN]	18,9	28,4	53,6	53,6	92,4
Cracked concrete							
Tensile $N_{Ru,m}$	HVZ	[kN]	31,2	44,4	51,6	67,1	106,4
Shear $V_{Ru,m}$	HVZ	[kN]	18,9	28,4	53,6	53,6	92,4

Characteristic resistance: concrete C 20/25 – $f_{ck,cube} = 25 \text{ N/mm}^2$, anchor HVZ

Data according ETA-03/0032, issue 2008-09-29							
Anchor size			M10x75	M12x95	M16x105	M16x125	M20x170
Non cracked concrete							
Tensile N_{Rk}	HVZ	[kN]	32,8	40,0	54,3	70,6	111,9
Shear V_{Rk}	HVZ	[kN]	18,0	27,0	51,0	51,0	88,0
Cracked concrete							
Tensile N_{Rk}	HVZ	[kN]	23,4	33,3	38,7	50,3	79,8
Shear V_{Rk}	HVZ	[kN]	18,0	27,0	51,0	51,0	88,0

Design resistance: concrete C 20/25 – $f_{ck,cube} = 25 \text{ N/mm}^2$, anchor HVZ

Data according ETA-03/0032, issue 2008-09-29							
Anchor size			M10x75	M12x95	M16x105	M16x125	M20x170
Non cracked concrete							
Tensile N_{Rd}	HVZ	[kN]	21,9	26,7	36,2	47,1	74,6
Shear V_{Rd}	HVZ	[kN]	14,4	21,6	40,8	40,8	70,4
Cracked concrete							
Tensile N_{Rd}	HVZ	[kN]	15,6	22,2	25,8	33,5	53,2
Shear V_{Rd}	HVZ	[kN]	14,4	21,6	40,8	40,8	70,4

Recommended loads ^{a)}: concrete C 20/25 – $f_{ck,cube} = 25 \text{ N/mm}^2$, anchor HVZ

Data according ETA-03/0032, issue 2008-09-29							
Anchor size			M10x75	M12x95	M16x105	M16x125	M20x170
Non cracked concrete							
Tensile N_{rec}	HVZ	[kN]	15,6	19,0	25,9	33,6	53,3
Shear V_{rec}	HVZ	[kN]	10,3	15,4	29,1	29,1	50,3
Cracked concrete							
Tensile N_{rec}	HVZ	[kN]	11,1	15,9	18,4	24,0	38,0
Shear V_{rec}	HVZ	[kN]	10,3	15,4	29,1	29,1	50,3

a) With overall partial safety factor for action $\gamma = 1,4$. The partial safety factors for action depend on the type of loading and shall be taken from national regulations. According ETAG 001, annex C, the partial safety factor is $\gamma_G = 1,35$ for permanent actions and $\gamma_Q = 1,5$ for variable actions.

Service temperature range

Hilti HVZ adhesive anchor with anchor rod HAS-TZ may be applied in the temperature ranges given below. An elevated base material temperature may lead to a reduction of the design bond resistance.

Temperature range	Base material temperature	Maximum long term base material temperature	Maximum short term base material temperature
Temperature range I	-40 °C to +80 °C	+50 °C	+80 °C

Max short term base material temperature

Short-term elevated base material temperatures are those that occur over brief intervals, e.g. as a result of diurnal cycling.

Max long term base material temperature

Long-term elevated base material temperatures are roughly constant over significant periods of time.

Materials

Mechanical properties of HAS-TZ

			Data according ETA-03/0032, issue 2008-09-29				
Anchor size			M10x75	M12x95	M16x105	M16x125	M20x170
Nominal tensile strength f_{uk}	HAS-(R) (HCR)TZ	[N/mm ²]	800				
Yield strength f_{yk}	HAS-(R) (HCR)TZ	[N/mm ²]	640				
Stressed cross-section A_s	tension	[mm ²]	44,2	63,6	113	113	227
	shear	[mm ²]	50,3	73,9	141	141	245
Moment of resistance W	HAS-(R) (HCR)TZ	[mm ³]	50,3	89,6	236	236	541

Material quality

Part	Material
HAS-TZ	carbon steel strength class 8.8 EN 20898-1
HAS-R-TZ	stainless steel 1.4401 and 1.4571 EN 10088
HAS-HCR-TZ	high corrosion resistance steel 1.4529 and 1.4547 EN 10088

Anchor dimensions

Anchor size		M10x75	M12x95	M16x105	M16x125	M20x170
Anchor embedment depth	[mm]	75	95	105	125	170

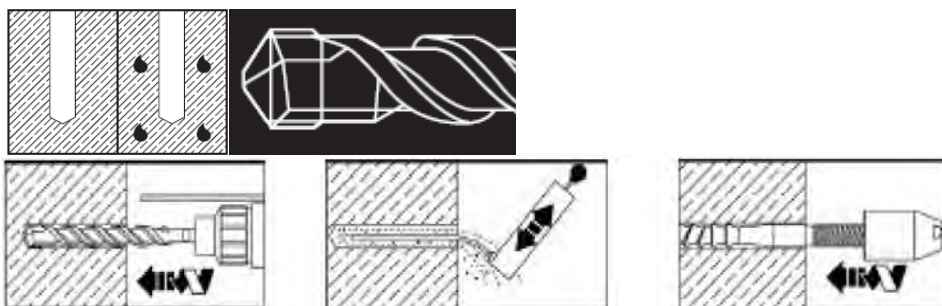
Setting

installation equipment

Anchor size	M10x75	M12x95	M16x105	M16x125	M20x170
Rotary hammer	TE 2 – TE 16				TE 40 – TE 70
Tools	Setting tools				

Setting instruction

Dry and water-saturated concrete, hammer drilling



For detailed information on installation see instruction for use given with the package of the product.

For technical data for anchors in diamond drilled holes please contact the Hilti Technical advisory service.

Curing time for general conditions

Data according ETA-04/0084, issue 2007-01-03	
Temperature of the base material	Curing time before anchor can be fully loaded t_{cure}
$\geq 20\text{ °C}$	20 min
10 °C to 20 °C	30 min
0 °C to 10 °C	60 min

These data are valid for dry concrete only. In wet concrete the curing time must be doubled.

Setting details

			Data according ETA-03/0032, issue 2008-09-29				
Anchor size			M10x75	M12x95	M16x105	M16x125	M20x170
Nominal diameter of drill bit	d_0	[mm]	12	14	18	18	25
Diameter of element	d	[mm]	10	12	16	16	20
Effective anchorage depth	h_{ef}	[mm]	75	95	105	125	170
Drill hole depth	h_0	[mm]	90	110	125	145	195
Minimum base material thickness	$h_{min}^{a)}$	[mm]	150	190	210	250	340
Diameter of clearance hole in the fixture	d_f	[mm]	12	14	18	18	22
Cracked concrete							
Minimum spacing	s_{min}	[mm]	50	60	70	70	80
Minimum edge distance	c_{min}	[mm]	50	60	70	70	80
Non cracked concrete							
Minimum spacing	s_{min}	[mm]	50	60	70	70	80
Minimum edge distance	c_{min}	[mm]	50	70	85	85	80
Critical spacing for splitting failure	$s_{cr,sp}$	[mm]	$2 c_{cr,sp}$				
Critical edge distance for splitting failure	$c_{cr,sp}$	[mm]	$1,5 h_{ef}$				
Critical spacing for concrete cone failure	$s_{cr,N}$		$2 c_{cr,N}$				
Critical edge distance for concrete cone failure	$c_{cr,N}^{b)}$		$1,5 h_{ef}$				
Torque moment ^{c)}	T_{max}	[Nm]	40	50	90	90	150

For spacing (edge distance) smaller than critical spacing (critical edge distance) the design loads have to be reduced.

- h : base material thickness ($h \geq h_{min}$)
- The critical edge distance for concrete cone failure depends on the embedment depth h_{ef} and the design bond resistance. The simplified formula given in this table is on the save side.
- This is the maximum recommended torque moment to avoid splitting failure during installation for anchors with minimum spacing and/or edge distance.

Simplified design method

Simplified version of the design method according ETAG 001, Annex C. Design resistance according data given in ETA-03/0032, issue 2007-01-03.

- Influence of concrete strength
- Influence of edge distance
- Influence of spacing
- Valid for a group of two anchors. (The method may also be applied for anchor groups with more than two anchors or more than one edge distance. The influencing factors must then be considered for each edge distance and spacing. The calculated design loads are then on the save side: They will be lower than the exact values according ETAG 001, Annex C. To avoid this, it is recommended to use the anchor design software PROFIS anchor)

The design method is based on the following simplification:

- No different loads are acting on individual anchors (no eccentricity)

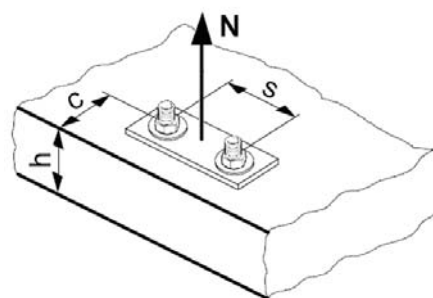
The values are valid for one anchor.

For more complex fastening applications please use the anchor design software PROFIS Anchor.

Tension loading

The design tensile resistance is the lower value of

- Steel resistance: $N_{Rd,s}$
- Combined pull-out and concrete cone resistance: $N_{Rd,p} = N_{Rd,p}^0 \cdot f_{B,p} \cdot f_{h,p}$
- Concrete cone resistance: $N_{Rd,c} = N_{Rd,c}^0 \cdot f_B \cdot f_{1,N} \cdot f_{2,N} \cdot f_{3,N} \cdot f_{h,N} \cdot f_{re,N}$
- Concrete splitting resistance (only non-cracked concrete): $N_{Rd,sp} = N_{Rd,c}^0 \cdot f_B \cdot f_{1,sp} \cdot f_{2,sp} \cdot f_{3,sp} \cdot f_{h,sp} \cdot f_{re,N}$



Basic design tensile resistance

Design steel resistance $N_{Rd,s}$

		Data according ETA-03/0032, issue 2008-09-29				
Anchor size		M10x75	M12x95	M16x105	M16x125	M20x170
$N_{Rd,s}$	HAS-TZ HAS-R-TZ HAS-HCR-TZ [kN]	23,3	34,0	60,0	60,0	121,3

Design combined pull-out and concrete cone resistance $N_{Rd,p} = N_{Rd,p}^0 \cdot f_{B,p} \cdot f_{h,p}$

		Data according ETA-03/0032, issue 2008-09-29				
Anchor size		M10x75	M12x95	M16x105	M16x125	M20x170
Embedment depth h_{ef} [mm]		75	95	105	125	170
Non cracked concrete						
$N_{Rd,p}^0$	Temperature range I [kN]	21,9	26,7	36,2	47,1	74,6
Cracked concrete						
$N_{Rd,p}^0$	Temperature range I [kN]	15,6	22,2	25,8	33,5	53,2

1 Identification of substance:

- **Product details:**
- **Trade name:** Hilti HVU-TZ M10 - M20
- **Container size** 11 g - 117 g
- **Application of the substance / the preparation** Adhesive anchor capsule for anchor fastening in concrete
- **Manufacturer/Supplier:**
Hilti Deutschland GmbH
Hiltistrasse 2
86916 Kaufering
Tel.: 08191-90-0
Fax: 08191 90 1122
- **Informing department:** see section 16
- **Emergency information:**
Hilti Deutschland GmbH
Tel: 0049 8191 90-0
Fax: 0049 8191 90 1122
Schweizerisches Toxikologisches Informationszentrum - 24 h Service
Tel.: 0041 / 1 251 51 51 (international)

2 Composition/information on ingredients

- **Chemical characterization**
- **Description:**
2-component foil capsule contains:
Urethane methacrylate resin, inorganic filler
Dibenzoyl peroxide, phlegmatized
Mixture of the substances listed below with harmless additions.

· Dangerous components:			
27813-02-1	methacrylic acid, monoester with propane-1,2-diol	Xi; R 36-43	2,5 - 10%
94-36-0	dibenzoyl peroxide	Xi, E, O; R 3-7-36-43	<2,5%

- **Additional information** For the wording of the listed risk phrases refer to section 16.

3 Hazards identification

- **Hazard designation:**



Xi Irritant

- **Information pertaining to particular dangers for man and environment**
The product has to be labelled due to the calculation procedure of the "General Classification guideline for preparations of the EU" in the latest valid version.
R 36 Irritating to eyes.
R 43 May cause sensitisation by skin contact.
- **Classification system**
The classification is in line with current EC lists. It is expanded, however, by information from technical literature and by information furnished by supplier companies.

4 First aid measures

- **General information** Instantly remove any clothing soiled by the product.
- **After inhalation**
Move to fresh air in case of accidental inhalation of fumes from overheating or combustion. Move to fresh air in case of accidental inhalation of vapours. Consult a doctor after significant exposure.
- **After skin contact** Instantly wash with water and soap and rinse thoroughly. If skin irritation persists, call a physician.
- **After eye contact** Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician.
- **After swallowing**
Rinse out mouth and then drink plenty of water.
Seek medical treatment.
- **Information for doctor**
- **The following symptoms may occur:** Allergic reactions

5 Fire fighting measures

- **Suitable extinguishing agents** Water spray, carbon dioxide (CO₂), carbon dioxide blanket, foam, or dry powder.
- **Special hazards caused by the material, its products of combustion or resulting gases:**
Can be released in case of fire
Carbon monoxide (CO)
Carbon dioxide (CO₂)
Nitrogen oxides (NO_x)

(Contd. on page 2)

Trade name: **Hilti HVU-TZ M10 - M20**

(Contd. of page 1)

- Under certain fire conditions, traces of other toxic gases cannot be excluded.
- **Protective equipment:** In the event of fire, wear self contained breathing apparatus

6 Accidental release measures

- **Person-related safety precautions:**
 - Wear protective clothing.
 - Keep away from ignition sources
 - Use personal protective equipment. Ensure adequate ventilation. Remove all sources of ignition.
- **Measures for environmental protection:** keep dangerous ingredients away from soil, drains or water.
- **Measures for cleaning/collecting:**
 - Collect mechanically.
 - Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust).
 - Dispose of the material collected according to regulations.

7 Handling and storage

- **Handling**
 - **Information for safe handling:**
 - Observe the capsule expiration date: See date printed on the sales packaging (box).
 - The usual precautionary measures for handling chemicals must be observed.
 - Keep away from heat and direct sunlight.
 - **Information about protection against explosions and fires:** Keep ignition sources away - Do not smoke.
 - **Storage**
 - **Requirements to be met by storerooms and containers:** Store in a cool (+5°C to +25°C), dry and dark place only in the original packaging.
 - **Information about storage in one common storage facility:** Store away from foodstuffs.
 - **Further information about storage conditions:** Protect from heat and direct sunlight.
 - **Storage class**
 - As per VCI (1991) storage classification concept.
- 10

8 Exposure controls and personal protection

- **Additional information about design of technical systems:** Breathing apparatus with filter
- **Components with limit values that require monitoring at the workplace:**
 - The product does not contain any relevant quantities of materials with critical values that have to be monitored at the workplace.
- **Additional information:** The lists that were valid during the compilation were used as basis.
- **Personal protective equipment**
- **General protective and hygienic measures**
 - Do not eat or drink while working.
 - Use skin protection cream for preventive skin protection.
 - Be sure to clean skin thoroughly after work and before breaks.
 - Keep away from foodstuffs, beverages and food.
 - Wash hands during breaks and at the end of the work.
 - Avoid contact with the eyes and skin.
- **Breathing equipment:** Not required.
- **Protection of hands:**
 - Protective gloves
 - Avoid direct contact with the chemical/ the product/ the preparation by organizational measures.
 - Use gloves of stable material (e.g. Nitrile) - if necessary tricoted to improve the wearability.
- **Material of gloves** Nitrile rubber, NBR
- **Penetration time of glove material**
 - The exact break trough time has to be found out by the manufacturer of the protective gloves and has to be observed.
- **For the permanent contact gloves made of the following materials are suitable:** Nitrile rubber, NBR
- **Not suitable are gloves made of the following materials:**
 - Leather gloves
 - Strong gloves
- **Eye protection:** Tightly sealed safety glasses.
- **Body protection:** Protective work clothing.

9 Physical and chemical properties:

· General Information

Form:	foil capsule
Colour:	resin: yellowish liquid hardener: white powder
Odour:	Ester-like

(Contd. on page 3)

Printing date 05.03.2009

Revision: 05.03.2009

Trade name: **Hilti HVU-TZ M10 - M20**

(Contd. of page 2)

· Change in condition Melting point/Melting range: Not determined Boiling point/Boiling range: Not determined	
· Flash point:	109°C (DIN 53213)
· Ignition temperature:	
· Decomposition temperature:	Peroxid: +55 °C (SADT)
· Self-inflammability:	Product is not selfigniting.
· Danger of explosion:	Product is not explosive.
· Vapour pressure at 20°C:	<0,1 (HPMA) hPa
· Density	resin: 1,1 g/cm ³ hardener: 1,23 g/cm ³
· Solubility in / Miscibility with Water:	Not miscible or difficult to mix
· pH-value:	not applicable
· Viscosity: dynamic at 23°C:	> 300 mPa.s (DIN 53788)
· Solvent content: Organic solvents: Water:	0 % 0 %

10 Stability and reactivity

- **Thermal decomposition / conditions to be avoided:** No decomposition if used according to specifications.
- **Dangerous reactions** No dangerous reactions known
- **Dangerous products of decomposition:** none, if stored and handled correctly.

11 Toxicological information

- **Acute toxicity:**
- **Primary irritant effect:**
- **on the skin:** No irritant effect.
- **on the eye:** Irritant effect.
- **Sensitization:** Sensitization possible by skin contact.
- **Additional toxicological information:**
The product shows the following dangers according to the calculation method of the General EC Classification Guidelines for Preparations as issued in the latest version:
Irritant

12 Ecological information:

- **Additional ecological information:**
- **According to recipe contains the following heavy metals and compounds according to EC guideline NO. 76/464 EC: ---**
- **General notes:**
The product does not contain organically bounded halogens (AOX-free).
Water hazard class 1 (German Regulation) (Self-assessment): slightly hazardous for water.

13 Disposal considerations

- **Product:**
- **Recommendation**
For disposal, local regulations issued by the authorities must be observed.
Uncured product take for example to a suitable incineration plant.
After curing, the product can be disposed of with household waste.

European waste catalogue

20 01 28	paint, inks, adhesives and resins other than those mentioned in 20 01 27
08 04 10	waste adhesives and sealants other than those mentioned in 08 04 09

- **Uncleaned packagings:**
- **Recommendation:**
Non contaminated packagings can be used for recycling.

(Contd. on page 4)

-DE-

Printing date 05.03.2009

Revision: 05.03.2009

Trade name: **Hilti HVU-TZ M10 - M20**

Disposal must be made according to official regulations.

(Contd. of page 3)

14 Transport information

- **Land transport ADR/RID (cross-border)**
- **ADR/RID-GGVS/E Class:** -
- **Remarks:** Not classified as dangerous goods in terms of the ADR
- **Maritime transport IMDG:**
- **IMDG Class:** -
- **Marine pollutant:** No
- **Remarks:** Not classified as dangerous goods as per above regulation.
- **Air transport ICAO-TI and IATA-DGR:**
- **ICAO/IATA Class:** -
- **Remarks:** Not classified as dangerous goods as per above regulation.

· **Transport/Additional information:** Not dangerous according to the above specifications.

15 Regulatory information

- **Designation according to EC guidelines:** The product has been labelled in accordance with EC Directives / relevant national laws.
- **Code letter and hazard designation of product:**



Xi Irritant

- **Hazard-determining components of labelling:**
methacrylic acid, monoester with propane-1,2-diol
dibenzoyl peroxide
- **Risk phrases:**
36 Irritating to eyes.
43 May cause sensitisation by skin contact.
- **Safety phrases:**
3 Keep in a cool place.
24/25 Avoid contact with skin and eyes.
26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
28 After contact with skin, wash immediately with plenty of soap and water.
36/37/39 Wear suitable protective clothing, gloves and eye/face protection.
- **National regulations**
Council Directive 89/391/EEC of 12 June 1989 on the introduction of measures to encourage improvements in the safety and health of workers at work. Article 12 Training of workers
- **Information about limitation of use:** Employment restrictions concerning young persons must be observed.

16 Other information:

These data are based on our present knowledge. However, they shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

- **Relevant R-phrases**
3 Extreme risk of explosion by shock, friction, fire or other sources of ignition.
36 Irritating to eyes.
43 May cause sensitisation by skin contact.
7 May cause fire.

- **Department issuing data specification sheet:**

Hilti Entwicklungsgesellschaft mbH
Hiltistrasse 6
D-86916 Kaufering
Tel.: +49 8191 906310
Fax: +49 8191 906826
e-mail: monika.moench@hilti.com

- **Contact:** Monika Mönch
- *** Data compared to the previous version altered.**

SERVOLIFT

Declaration of Incorporation for partly completed Machinery (Directive 2006/42/EG)

This is to declare, that the following indicated machinery/ part of machinery, is intended for installation into a machinery or combined with a further machine to a machinery as defined by the European Machinery Directive 2006/42/EC in the version of its last alternation. Therefore the machinery/ part of machinery agrees to the following guidelines possibly only in parts.

The declaration will become invalid, if the machinery is modified in any way, which is not approved by us:

This declaration is only valid for directed use of the machinery by instructed personal.

Name / Type of machinery:	Pallet Lifter / HS
Serial No.:	13249
Year of construction:	2014
Applied EC guidelines:	- EC guidelines of European Machinery Directive 2006/42/EC - Low Voltage Directive 2006/95/EEC - EMC correct installation 2004/108/EEC

in case of **explosion proofed** machines refer to and note enclosed
- Declaration of Conformity of EX-proofed guidelines

Used EN and ISO standards:	DIN EN ISO 12100; 2011; DIN EN 60204-1; 2006 DIN EN ISO 13849-1
-----------------------------------	--

Applied essential health and safety requirements acc. annex I of a.m. directive	compl. or when applicable: No.1.1, 1.2, 1.3, 1.4, 1.5, 1.6, 1.7, as well as No. 2 et seq., 4 et seq.
---	--

Requirements to put into operation

Herewith we state, that the start up is prohibited, until the machinery or installation into which the machinery or part of machinery is installed, in all (that means inclusive the machinery / part of machinery for which this confirmation is issued) corresponds to the directive 2006/42/EC and the Declaration of Conformity is issued according to appendix IIA of this directive.


Attorney for technical documentation: SERVOLIFT GmbH

Servolift GmbH
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D- 77656 Offenburg

Telefon : +49 (0) 781/61 00-0
Fax : +49 (0) 781/61 00-400
E-Mail : sl@servolift.de
web : www.servolift.de

Offenburg, May 09. 2014
Place / Date

Jürgen Rieber, Managing Director
Name



Signature

Datei: 13249_EG-kon-IIB-engl.doc
Erstellt: Macke
Datum: 07.12.2005

Version: 5
Geprüft: G. Macke
Datum: 04.11.2008

QM- Dokumente/Aufzeichnungen
Freigegeben: Hasenpusch
Datum: 08.12.2005

1 / 1

SERVOLIFT

Appendix to EC declaration of conformity (as defined by the EC Guidelines for Machinery 2006/42/EG, Appendix IIA)



or

Appendix to EC- manufacturer's declaration (as defined by the EC Guidelines for Machinery 2006/42/EG, Appendix IIB)

Declaration of Conformity

for Explosion protection guidelines

Herewith we confirm, that the following product:

Name / Type of machinery: Pallet Lifter / HS
Machine number: 13249
Year of construction: 2014
category: II3D
Marking according to ATEX:  II3D IP55 T125°C
Marking of non-electrical equipment:  c b T4 (max. 130 °C)

correspond to the following EC-guidelines:

- Explosion protection guideline 94/9/EC
 The documentation has been given to TÜV Product-Service, München (registration No. 0123) for archiving under registration No. EX9 03 02 47371 001
 Place of archiving: TÜV Product-Service, Gottlieb Daimler Straße 7, D-70794 Filderstadt
- EC Low voltage guideline for electrical equipment installed within non potential explosive area.

The following standards are fully or partly used (where applicable):

- EN 1127-1:2007, EN 60079-14:2008, EN 13463-1:2009, EN 13463-5:2003, EN 60204-1:2006

Commissioning is not allowed until machine is proved to correspond to the guideline 2006/42/EG.


We hereby confirm, that the installation of the electrical equipment is carried out according to the instructions of the manufacturer and of the standard EN 60079-14:2008

SERVOLIFT GmbH
 Albert-Einstein-Str. 9
 D- 77656 Offenburg

Phone : +49 (0) 781/61 00-0
 Fax : +49 (0) 781/61 00-99
 E-mail : sl@servolift.de web: www.servolift.de

Offenburg, May 09. 2014
 Place / Date

Jürgen Rieber, Managing Director
 Name



Signature

Datei:	13249_Ex-Konformitätserklärung- engl.doc	Version:	1	QM- Überwachung und Messung	
Erstellt:	G. Macke	Gepprüft:	J. Rieber	Freigegeben:	J. Rieber
Datum:	09.05.2014	Datum:	09.05.2014	Datum:	09.05.2014



10088704 - TE201413249 1
13249_2.1 Werksbescheinigung

SERVOLIFT

Declaration of Compliance with the order (acc. DIN EN 10204- 2.1)		
Name of Project: Pallet Lifter	Date :	08.05.2014
Client: Frewitt Fabrique, Granges-Paccot, Schweiz	Version :	1
		Servolift GmbH Project No. 13249

We herewith confirm that the above mentioned project and related delivered products and components correspond to the scope of our offer and to the requirements of your order:

Non product contact materials are made of AISI 304 or higher quality.

Hydraulic oil and grease:

The shop provided lubricants are suitable for use in food industries with incidental food contact. These have received FDA and USDA H1 approval.

Servolift GmbH
Albert-Einstein-Str. 9
D- 77656 Offenburg

Phone : +49 (0) 781/61 00-0
Fax : +49 (0) 781/61 00-99
E-Mail : sl@servolift.de
web : www.servolift.de

Offenburg, 08. 05. 2014
Place / Date

Manuel Armbruster
Name (printed)
Quality Assurance

SERVOLIFT
Qualitätssicherung

Signature

Datei:	13249_Declaration_of_compliance_2.1.doc	Version:	0	QM-Formular Werksbescheinigung 2.1
Erstellt:	M. Junker	Geprüft:	G.Macke	Freigegeben: M.Junker
Datum:	17.05.2005	Datum:	20.05.2005	Datum: 30.05.2005



10088733 - TE201413249 1
13249_Load_Test_Certificate

SERVOLIFT

Load Test Certificate		
Name of Project: Pallet Lifter	Date :	08.May 2014
Client: Frewitt Fabrique, Granges-Paccot, Switzerland	Version :	1
		Servolift GmbH Project No. 13249

This certificate is issued to confirm that the Servolift machine listed below has been factory tested in accordance with the Machine Directive 2006/42/EG stated values.

Nominal working load : 600 kg

Dynamic Load Test Test load (+ 10%) =660 kg

Static Load Test Test load (+ 25%) = 750.kg

We confirm:

- that the unit has been adjusted according to the dynamic load for a safe operation
- that no permanent deformation nor patent defect has been noted after static load test

Servolift GmbH
Albert-Einstein-Str. 9
D- 77656 Offenburg

Phone : +49 (0) 781/61 00-0
Fax : +49 (0) 781/61 00-99
E-Mail : sl@servolift.de
web : www.servolift.de

SERVOLIFT
Qualitätssicherung

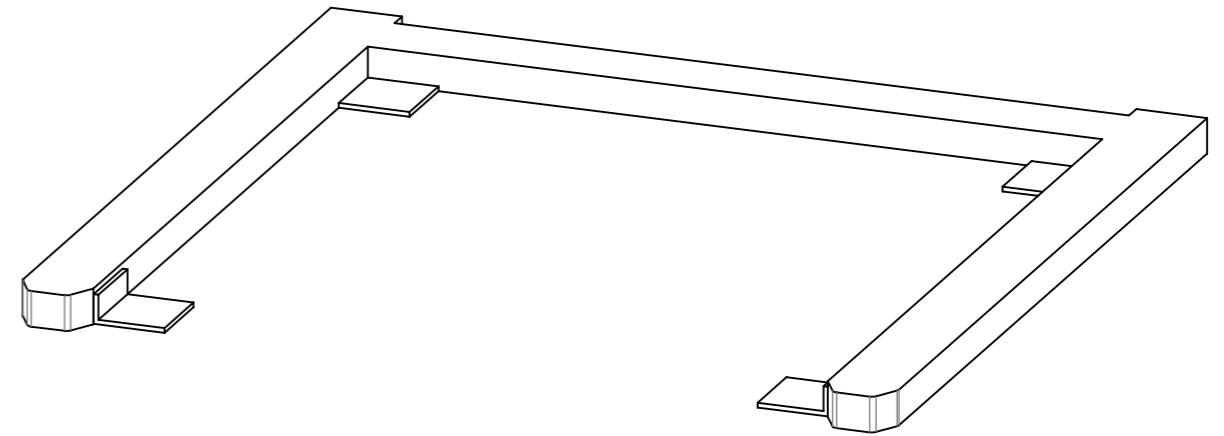
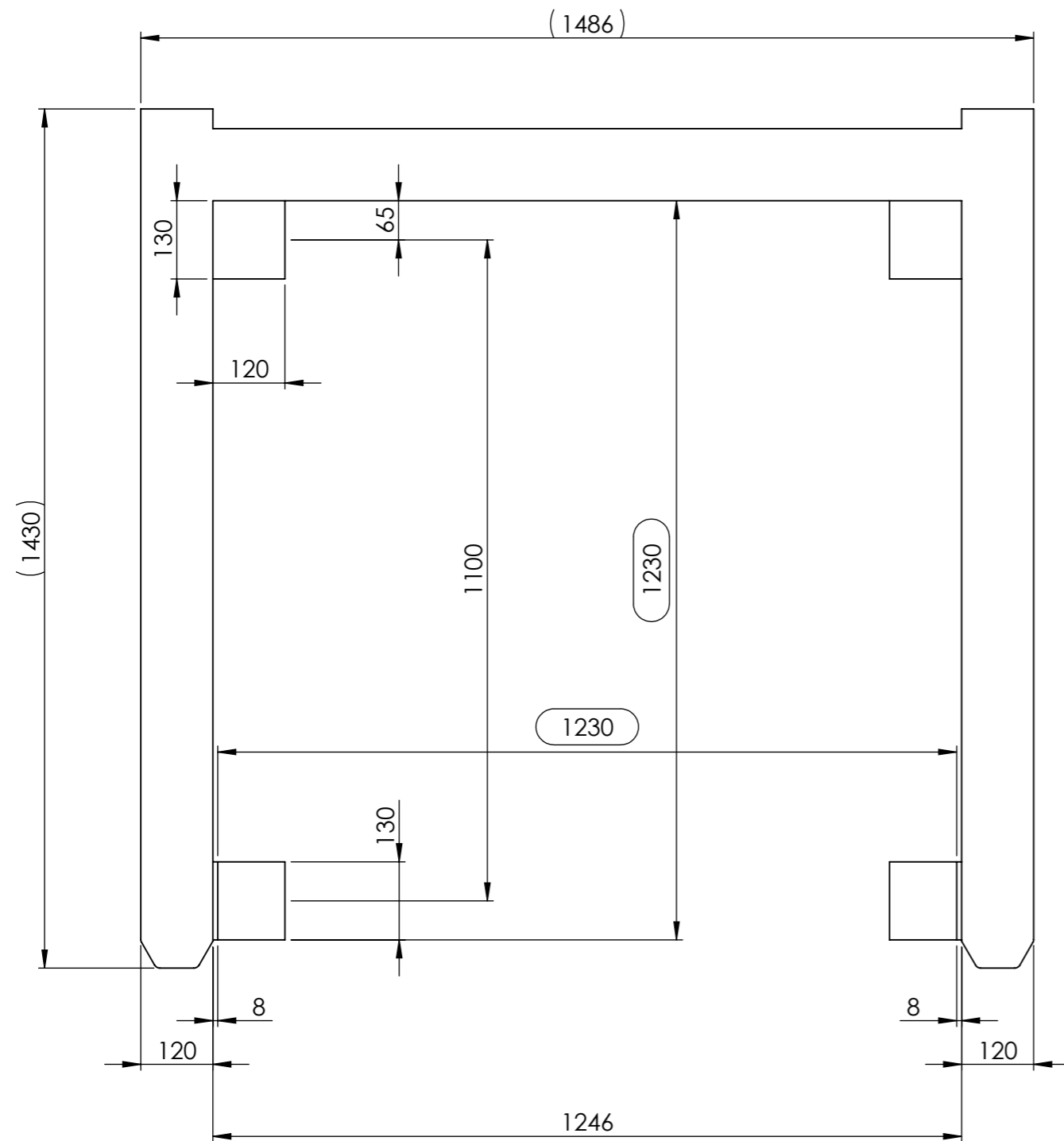
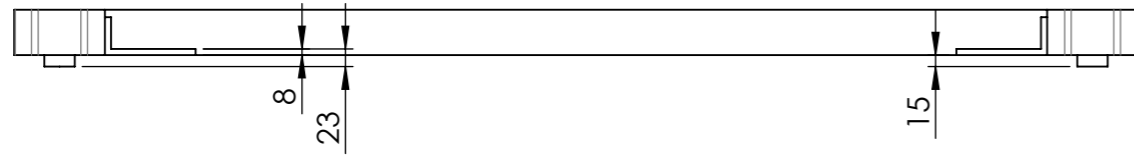
Offenburg, 08. Mai 2014
Place / Date

Lucien DeCesaris
Name (printed)
Quality Assurance


Signature

Datei:	13249_Load_Test_Certificate.doc	Version:	1	Freigegeben:	J. Rieber
Erstellt:	G.Macke	Geprüft:	H. Jekal	Datum:	21.Nov.2013
Datum:	19. Nov. 2013	Datum:	20.Nov. 2013		

BALANCE
METTLER-TOLEDO



Numéro de série :
- PTA459-F1500 S/N

Dimensions without tolerance [mm]	above	6	30	120	400	1000	MATERIAL :					
	up to	6	30	120	400	1000	Scale	Similar	Designed	27/02/2014	obi	
Machining: ISO 2768-m		±0.10	±0.20	±0.30	±0.50	±0.80	%	473518	Controlled	12/03/2014	edgu	
Welding Assembly: ISO 2768-c		±0.30	±0.50	±0.80	±1.20	±2.00	Weight [kg]		Revised	12/03/2014	edgu	
Balance							⊕	240.668	Atex			
							A3					
<small>Any and all information received by you from us shall be held and kept confidential and shall not be disclosed by you to any third party except with prior written consent of FREWITT SA.</small>									<small>Frewitt SA: Milling and Handling of Powders P.O.B. 615, CH-1701 Fribourg, SWITZERLAND tel: +41 26 460 74 00 / fax: +41 26 460 74 01 info@frewitt.com / www.frewitt.com</small>		Page	Ver.
							473792		1/1		A	



METTLER TOLEDO

Werkszertifikat / Manufacturer Certificate

Produktionsdatum / Production Date: 27.03.2014
Produkttyp / Product Typ: PTA459-F1500
Seriennummer / Serial Number: 3415506
Hergestellt von / Produced by: Mettler-Toledo(Albstadt) GmbH

Qualität und die damit verbundene Zufriedenheit unserer Kunden sind von entscheidender Bedeutung für unseren nachhaltigen Geschäftserfolg. Das von Ihnen erworbene Produkt wurde von dem oben angeführten Mitarbeiter entsprechend den relevanten Richtlinien und Gesetzen hergestellt und geprüft. Auf Basis der Testergebnisse bescheinigen wir hiermit die Übereinstimmung des Produktes mit Ihrem Auftrag und der technischen Spezifikation.

Mettler-Toledo (Albstadt) GmbH ist zertifiziert nach DIN EN ISO 9001 und DIN EN ISO 14001. Sollten Sie einen Grund zur Beanstandung haben, wenden Sie sich bitte mit Angabe der Seriennummer an Ihre zuständige Service-Organisation.

Quality and the resulting customer satisfaction are key factors for the prevailing success of our company. The product you have purchased was manufactured and tested by the employee mentioned above according to the relevant laws and guidelines. Based on the test results we certify that the product complies with the technical specifications of your order.

Mettler-Toledo (Albstadt) GmbH is both DIN EN ISO 9001 and DIN EN ISO 14001 certified. In case of complaints please contact your local service organisation and state to the serial number.



Christoph Dermond
General Manager



METTLER TOLEDO

Werkszertifikat / Manufacturer Certificate

Produktionsdatum / Production Date:	27.03.2014
Produkttyp / Product Typ:	IND690xx-Panel
Seriennummer / Serial Number:	3415503
Hergestellt von / Produced by:	Mettler-Toledo(Albstadt) GmbH

Qualität und die damit verbundene Zufriedenheit unserer Kunden sind von entscheidender Bedeutung für unseren nachhaltigen Geschäftserfolg. Das von Ihnen erworbene Produkt wurde von dem oben angeführten Mitarbeiter entsprechend den relevanten Richtlinien und Gesetzen hergestellt und geprüft. Auf Basis der Testergebnisse bescheinigen wir hiermit die Übereinstimmung des Produktes mit Ihrem Auftrag und der technischen Spezifikation.

Mettler-Toledo (Albstadt) GmbH ist zertifiziert nach DIN EN ISO 9001 und DIN EN ISO 14001. Sollten Sie einen Grund zur Beanstandung haben, wenden Sie sich bitte mit Angabe der Seriennummer an Ihre zuständige Service-Organisation.

Quality and the resulting customer satisfaction are key factors for the prevailing success of our company. The product you have purchased was manufactured and tested by the employee mentioned above according to the relevant laws and guidelines. Based on the test results we certify that the product complies with the technical specifications of your order.

Mettler-Toledo (Albstadt) GmbH is both DIN EN ISO 9001 and DIN EN ISO 14001 certified. In case of complaints please contact your local service organisation and state to the serial number.



Christoph Dermond
General Manager



METTLER TOLEDO

Werkszertifikat / Manufacturer Certificate

Produktionsdatum / Production Date:	27.03.2014
Produkttyp / Product Typ:	IND690xx-Panel
Seriennummer / Serial Number:	3415504
Hergestellt von / Produced by:	Mettler-Toledo(Albstadt) GmbH

Qualität und die damit verbundene Zufriedenheit unserer Kunden sind von entscheidender Bedeutung für unseren nachhaltigen Geschäftserfolg. Das von Ihnen erworbene Produkt wurde von dem oben angeführten Mitarbeiter entsprechend den relevanten Richtlinien und Gesetzen hergestellt und geprüft. Auf Basis der Testergebnisse bescheinigen wir hiermit die Übereinstimmung des Produktes mit Ihrem Auftrag und der technischen Spezifikation.

Mettler-Toledo (Albstadt) GmbH ist zertifiziert nach DIN EN ISO 9001 und DIN EN ISO 14001. Sollten Sie einen Grund zur Beanstandung haben, wenden Sie sich bitte mit Angabe der Seriennummer an Ihre zuständige Service-Organisation.

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Christoph Dermond
General Manager



We Mettler-Toledo (Albstadt) GmbH, Unter dem Malesfelsen 34, D-72458 Albstadt,
Declare under our sole responsibility that the product,
 erklären, in alleiniger Verantwortung, dass dieses Produkt,
 déclarons sous notre seule responsabilité que le produit,
 declaramos, bajo nuestra sola responsabilidad, que el producto,
 dichiariamo sotto nostra unica responsabilità, che il prodotto,

PTA... Linie

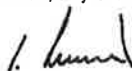
S/N: > 3000000,

to which this declaration relates, is in conformity with the following standard(s) or other normative document(s).

auf das sich diese Erklärung bezieht, mit der/den folgenden Norm(en) oder Richtlinie(n) übereinstimmt.
 auquel se réfère cette déclaration est conforme à la (aux) norme(s) ou au(x) document(s) normatif(s).
 al que se refiere esta declaración es conforme a la(s) norma(s) u otro(s) documento(s) normativo(s).
 a cui si riferisce questa dichiarazione è conforme alla/e sequente/i norma/e o documento/i normativo/i.

Guideline	Certificate	Applicable Standards:	*Technical status in accordance with:
ATEX (94/9/ EC) Version Analog	BVS 08 ATEX E063 ¹⁾ System Solution Type Analog Ex2 KEMA 03 ATEX 1070 ²⁾ Load Cell Model 0745A Load frame lift BVS 10 ATEX H/B 026 ³⁾ Load frame standard BVS 08 ATEX H/B 131 ³⁾	EN 60079-0 (2006) * EN 60079-15 (2005) * EN 61241-0 (2006) * EN 61241-1 (2004) * EN 13463-1	EN 60079-0 (2009) EN 60079-15 (2010) EN 60079-31 (2009)
ATEX (94/9/ EC) Version IDNet	BVS 06 ATEX E098 ¹⁾ System Solution Type Point KEMA 03 ATEX 1070 ²⁾ Load Cell Model 0745A Load frame lift BVS 10 ATEX H/B 026 ³⁾ Load frame standard BVS 08 ATEX H/B 131 ³⁾	EN 60079-15 (2003) * IEC61241-0 (2004) * EN 61241-1 (2004) * EN 13463-1	EN 60079-0 (2009) EN 60079-15 (2010) EN 60079-31 (2009)
EMC Directive: (2004/108/EC)		EN 61000-6-2 EN 61000-6-3	
RoHS 2011/65/EC		EN 50581 (2012)	
Non automatic weighing instrument directive (2009/23/EC)		EN 45501	
			[Year] [Code] 

Albstadt, July 2013



Christoph Dermond, General Manager

Certificate / Acknowledgement issued by:
 1), 3) DEKRA EXAM GmbH, Dinnendahlstrasse 9
 D-44809 Bochum, NB: 0158
 2) DEKRA Certification B.V. Utrechtseweg 310,
 Postbus 5185 NL-6802 ED Arnhem, NB: 0344

Important notice for verified weighing instruments in EC countries

Wichtiger Vermerk für geeichte Waagen in EU-Ländern
 Nota importante concernant les instruments de pesage vérifiés dans les pays de la CE
 Información importante para instrumentos de pesada verificados en países de la UE
 Avvertenza importante per gli strumenti di pesatura testati nei paesi della Comunità Europea



Weighing Instruments verified at the place of manufacture bear the preceding mark on the packing label and a green "M" sticker on the descriptive plate. They may be set to work immediately.

Werkgezeichnete Waagen tragen vorstehendes Kennzeichen auf dem Packetkett und einen grünen „M“-Aufkleber auf dem Eichschild. Sie können sofort in Betrieb genommen werden.

Les instruments de pesage vérifiés sur le site de production portent la marque précédente sur l'emballage et un autocollant vert "M" sur la plaque signalétique. Ils sont immédiatement opérationnels.

Los instrumentos de pesada verificados en el lugar de fabricación llevan la marca de la izquierda en la etiqueta de embalaje y un adhesivo verde "M" en la placa descriptiva. Se pueden poner en funcionamiento inmediatamente.

Gli strumenti di pesatura testati nella sede di produzione recano un'etichetta con questo marchio sulla confezione e un adesivo verde con una "M" sulla targhetta descrittiva. Possono essere messi subito in funzione.



Weighing Instruments which are verified in two steps have no green "M" on the descriptive plate, bear the aforementioned identification on the packing label. The second step of the verification must be carried out by the Mettler-Toledo service approved or by the W&M authorities. Please contact your Mettler-Toledo organization.

Waagen, die in zwei Schritten geeicht werden, und kein grünes „M“ auf dem Eichschild haben, tragen vorstehendes Kennzeichen auf dem Packetkett. Der zweite Schritt der Eichung ist durch den behördlich anerkannten Mettler-Toledo Service oder durch den Eichbeamten durchzuführen. Bitte nehmen Sie mit dem Mettler-Toledo Kundendienst Kontakt auf.

Les instruments de pesage vérifiés en deux étapes n'ont pas d'autocollant vert "M" sur la plaque signalétique et leurs emballages ne portent pas la marque distinctive précédente. La seconde étape de la vérification doit être exécutée par le service agréé Mettler-Toledo ou par les autorités compétentes pour les poids et mesures. Veuillez contacter votre interlocuteur Mettler-Toledo.

Los instrumentos de pesada que se verifican en dos etapas no tienen una "M" verde en la placa descriptiva y llevan la marca de la izquierda en la etiqueta del embalaje. La segunda etapa de la verificación ha de realizarla el servicio autorizado Mettler Toledo o las autoridades responsables de pesos y mediciones. Póngase en contacto con la empresa Mettler-Toledo.

Gli strumenti di pesatura che vengono sottoposti a due serie di test sono privi della "M" verde sulla targhetta descrittiva e recano questo marchio di identificazione sull'etichetta della confezione. La seconda serie di test deve essere effettuata da un centro autorizzato Mettler Toledo o dalle autorità per i pesi e le misure. Si prega di contattare la filiale Mettler Toledo.

The first step of the verification has been carried out in the manufacturing company. It comprises all tests according EN45501-8.2.2. In regard to scales with analogue connection to the weighing-platform, a weighing test according to EN 45501-3.5.3.3 must be carried out additionally. This test is not necessary if the terminal bears the serial-number of the weighing-platform.

If national regulations in individual countries limit the period of validity of the certification, the operator of such a scale is himself responsible for its timely re-certification.

Der erste Schritt der Eichung wurde im Herstellerwerk durchgeführt. Er umfasst alle Prüfungen gemäß EN 45501-8.2.2. Bei Waagen mit analogem Wägebüchsenanschluss muss zusätzlich die Richtigkeit gemäß EN 45501-3.5.3.3 geprüft werden. Diese Prüfung ist nicht notwendig, wenn das Terminal die Serien-Nr. der Wägebüchse trägt. Sofern gemäß den nationalen Vorschriften in den einzelnen Staaten die Gültigkeitsdauer der Eichung beschränkt ist, ist der Betreiber einer solchen Waage für die rechtzeitige Nacheichung selbst verantwortlich.

La première étape de la vérification a été exécutée dans l'usine de fabrication. Celle-ci inclut l'ensemble des tests conformément à EN45501-8.2.2.

Si les réglementations nationales des différents pays limitent la période de validité de la vérification, l'exploitant d'une telle balance est lui-même responsable de la faire révéifier en temps utile.

La primera etapa de la verificación se ha efectuado en la planta de fabricación, incluye todas las pruebas según EN45501-8.2.2.

Si las normativas nacionales de los países limitan el periodo de validez de la certificación, el operador de dicha báscula es responsable de gestionar dicha certificación.

La prima serie di test è stata eseguita presso lo stabilimento e comprende tutti i test previsti da EN45501-8.2.2.

Qualora la legislazione locale dei singoli paesi limiti il periodo di validità della certificazione, l'operatore della bilancia dovrà provvedere tempestivamente al rinnovo della stessa.


METTLER TOLEDO
**Declaration of Conformity
Konformitätserklärung
Déclaration de conformité
Declaración de Conformidad
Dichiarazione di conformità**

22020918C

We Mettler-Toledo (Albstadt) GmbH, Unter dem Malesfelsen 34, D-72458 Albstadt,

Declare under our sole responsibility that the product,



erklären, in alleiniger Verantwortung, dass dieses Produkt,
déclarons sous notre seule responsabilité que le produit,
declaramos, bajo nuestra sola responsabilidad, que el producto,
dichiariamo sotto nostra unica responsabilità, che il prodotto,

IND690xx ... Linie

S/N: > 3000000,

to which this declaration relates, is in conformity with the following standard(s) or other normative document(s).

auf das sich diese Erklärung bezieht, mit der/den folgenden Norm(en) oder Richtlinie(n) übereinstimmt.
auquel se réfère cette déclaration est conforme à la (aux) norme(s) ou au(x) document(s) normalif(s).
al que se refiere esta declaración es conforme a la(s) norma(s) u otro(s) documento(s) normativo(s).
a cui si riferisce questa dichiarazione è conforme alla/e seguente/i norma/e o documento/i normativo/i.

	Applicable Standards:
ATEX (94/9/ EEC)	EN 60079- 0 (2012) EN 60079-11 (2012) EN 60079-15 (2010) EN 60079- 31(2009)
Low Voltage Directive (2006/95/ EEC)	EN 60950 EN 50178
EMC Directive (2004/108/EEC)	EN 61000-6-2 EN 61000-6-3
Non automatic weighing instrument directive (2009/23/EEC) ¹⁾	EN 45501 ¹⁾
	 <div style="display: inline-block; border: 1px solid black; padding: 2px;"> [Year] ¹⁾ [Code]  </div>

1) applies only to certified non-automatic weighing instruments in connection with approved load cells
gilt nur für geeichte Waagen in Verbindung mit zugelassenen Wägezellen
valable uniquement pour les balances vérifiées en liaison avec des cellules de charge homologuées
solo aplicable a balanzas verificadas en combinación con células de carga aprobadas
la dichiarazione vale solo per le bilance omologate in collegamento con celle di carico approvate

Albstadt, November 2013



Christoph Dermond, General Manager

Important notice for verified weighing instruments in EC countries

Wichtiger Vermerk für geeichte Waagen in EU-Ländern

Note importante concernant les instruments de pesage vérifiés dans les pays de la CE

Información importante para instrumentos de pesada verificados en países de la UE

Avvertenza importante per gli strumenti di pesatura testati nei paesi della Comunità Europea



Weighing instruments verified at the place of manufacture bear the preceding mark on the packing label and a green "M" sticker on the descriptive plate. They may be set to work immediately.

Werksgestellte Waagen tragen vorstehendes Kennzeichen auf dem Packetikett und einen grünen „M“-Aufkleber auf dem Eichschild. Sie können sofort in Betrieb genommen werden.

Les instruments de pesage vérifiés sur le site de production portent la marque précédente sur l'emballage et un autocollant vert "M" sur la plaque signalétique. Ils sont immédiatement opérationnels.

Los instrumentos de pesada verificados en el lugar de fabricación llevan la marca de la izquierda en la etiqueta de embalaje y un adhesivo verde "M" en la placa descriptiva. Se pueden poner en funcionamiento inmediatamente.

Gli strumenti di pesatura testati nella sede di produzione recano un'etichetta con questo marchio sulla confezione e un adesivo verde con una "M" sulla targhetta descrittiva. Possono essere messi subito in funzione.



Weighing instruments which are verified in two steps have no green "M" on the descriptive plate, bear the aforementioned identification on the packing label. The second step of the verification must be carried out by the Mettler-Toledo service approved or by the W&M authorities. Please contact your Mettler-Toledo organization.

Waagen, die in zwei Schritten geeicht werden, und kein grünes „M“ auf dem Eichschild haben, tragen vorstehendes Kennzeichen auf dem Packetikett. Der zweite Schritt der Eichung ist durch den behördlich anerkannten Mettler-Toledo Service oder durch den Eichbeamten durchzuführen. Bitte nehmen Sie mit dem Mettler-Toledo Kundendienst Kontakt auf.

Les instruments de pesage vérifiés en deux étapes n'ont pas d'autocollant vert "M" sur la plaque signalétique et leurs emballages ne portent pas la marque distinctive précédente. La seconde étape de la vérification doit être exécutée par le service agréé Mettler-Toledo ou par les autorités compétentes pour les poids et mesures. Veuillez contacter votre interlocuteur Mettler-Toledo.

Los instrumentos de pesada que se verifican en dos etapas no tienen una "M" verde en la placa descriptiva y llevan la marca de la izquierda en la etiqueta del embalaje. La segunda etapa de la verificación ha de realizarla el servicio autorizado Mettler Toledo o las autoridades responsables de pesos y mediciones. Póngase en contacto con la empresa Mettler-Toledo.

Gli strumenti di pesatura che vengono sottoposti a due serie di test sono privi della "M" verde sulla targhetta descrittiva e recano questo marchio di identificazione sull'etichetta della confezione. La seconda serie di test deve essere effettuata da un centro autorizzato Mettler Toledo o dalle autorità per i pesi e le misure. Si prega di contattare la filiale Mettler Toledo.

The first step of the verification has been carried out in the manufacturing company. It comprises all tests according EN45501-8.2.2. In regard to scales with analogue connection to the weighing-platform, a weighing test according to EN 45501-3.5.3.3 must be carried out additionally. This test is not necessary if the terminal bears the serial-number of the weighing-platform.

If national regulations in individual countries limit the period of validity of the certification, the operator of such a scale is himself responsible for its timely re-certification.

Der erste Schritt der Eichung wurde im Herstellerwerk durchgeführt. Er umfasst alle Prüfungen gemäß EN 45501-8.2.2. Bei Waagen mit analogem Wägebüchchenanschluss muss zusätzlich die Richtigkeit gemäß EN 45501-3.5.3.3 geprüft werden. Diese Prüfung ist nicht notwendig, wenn das Terminal die Serien-Nr. der Wägebüchche trägt.

Solfern gemäß den nationalen Vorschriften in den einzelnen Staaten die Gültigkeitsdauer der Eichung beschränkt ist, ist der Betreiber einer solchen Waage für die rechtzeitige Nach Eichung selbst verantwortlich.

La première étape de la vérification a été exécutée dans l'usine de fabrication. Celle-ci inclut l'ensemble des tests conformément à EN45501-8.2.2.

Si les réglementations nationales des différents pays limitent la période de validité de la vérification, l'exploitant d'une telle balance est lui-même responsable de la faire révéifier en temps utile.

La primera etapa de la verificación se ha efectuado en la planta de fabricación. Incluye todas las pruebas según EN45501-8.2.2.

Si las normativas nacionales de los países limitan el período de validez de la certificación, el operador de dicha báscula es responsable de gestionar dicha certificación.

La prima serie di test è stata eseguita presso la stabilimento e comprende tutti i test previsti da EN45501-8.2.2.

Qualora la legislazione locale dei singoli paesi limiti il periodo di validità della certificazione, l'operatore della bilancia dovrà provvedere tempestivamente al rinnovo della stessa.

IND690xx Weighing Terminal

TÜV 06 ATEX 552902 X		
EC-Type Examination Certificate	06 July 2006	Original, 3 pages
EG-Baumusterprüfbescheinigung	06 Juli 2006	Original, 3 Seiten
Attestation de vérification de type CE	06 Juillet 2006	Original, 3 pages
Certificado de inspecciones de tipo de construcción CE	06 Julio 2006	Original, 3 páginas
Certificato di approvazione CE	06 Luglio 2006	Originale, 3 pagine

Amendment 1 to TÜV 06 ATEX 552902 X		Contens / Changes	
Supplement 1	17 May 2010	Display, special condition for save use, marking	Original, 1 page
Ergänzung 1	17 Mai 2010	Anzeige, besondere Bedingungen für sicheren Betrieb, Kennzeichnung	Original, 1 Seite
Supplément 1	17 Mai 2010	Affichage, conditions speziales pour sûr l'usage, marquage	Original, 1 page
Suplemento 1	17 Mayo 2010	Pantella, condición especial para el uso seguro, marcación	Original, 1 página
Supplemento 1	17 Maggio 2010	Indicatioe, condizione speciale per il uso sicuro, marcatura	Originale, 1 pagina

Amendment 2 to TÜV 06 ATEX 552902 X		Contens / Changes	
Supplement 2	05 November 2013	New standards, special condition for use, marking	Original, 2 pages
Ergänzung 2	05 November 2013	Neue Normen, besondere Bedingungen, Kennzeichnung	Original, 2 Seiten
Supplément 2	05 Novembre 2013	Nouvelles conditions standards, état spécial pour l'usage, marquant	Original, 2 pages
Suplemento 2	05 Noviembre 2013	Nuevas condiciones estándar, condición especial para el uso, etiquetando	Original, 2 páginas
Supplemento 2	05 Novembre 2013	Nuove condizioni standard, stato speciale per uso, identificante	Originale, 2 pagine

TÜV NORD**(1) Konformitätsaussage**

(2) Geräte und Schutzsysteme zur bestimmungsgemäßen Verwendung in explosionsgefährdeten Bereichen, **Richtlinie 94/9/EG**

(3) **Konformitätsaussage Nummer: TÜV 06 ATEX 552902 X**

(4) für das Gerät: Terminal Typ IND690xx-Desk
und Typ IND690xx-Panel

(5) des Herstellers: Mettler-Toledo (Albstadt) GmbH

(6) Anschrift: Unter dem Malesfelsen 34
D-72458 Albstadt

Auftragsnummer: 8000552902

Ausstellungsdatum: 06.07.2006

(7) Die Bauart dieses Gerätes sowie die verschiedenen zulässigen Ausführungen sind in der Anlage zu dieser Konformitätsaussage festgelegt.

(8) Die TÜV NORD CERT GmbH bescheinigt die Erfüllung der grundlegenden Sicherheits- und Gesundheitsanforderungen für die Konzeption und den Bau von Geräten und Schutzsystemen zur bestimmungsgemäßen Verwendung in explosionsgefährdeten Bereichen. Die Ergebnisse der Prüfung sind in dem vertraulichen Prüfbericht Nr. 06 YEX 552902 festgelegt.

(9) Die grundlegenden Sicherheits- und Gesundheitsanforderungen werden erfüllt durch Übereinstimmung mit:

EN 60079-15:2003

EN 50 281-1-1:1998+A1

EN 1127:1997

(10) Falls das Zeichen "X" hinter der Bescheinigungsnummer steht, wird auf besondere Bedingungen für die sichere Anwendung des Gerätes in der Anlage zu dieser Bescheinigung hingewiesen.

(11) Diese Konformitätsaussage bezieht sich nur auf Konzeption und Prüfung des festgelegten Gerätes gemäß Richtlinie 94/9/EG. Weitere Anforderungen dieser Richtlinie gelten für die Herstellung und das Inverkehrbringen dieses Gerätes. Diese Anforderungen werden nicht durch diese Bescheinigung abgedeckt.

(12) Die Kennzeichnung des Gerätes muss die folgenden Angaben enthalten:

Ex II 3 G EEx nA L [L] IIC T4 bzw. II 3 D T70°C IP69K

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Der Leiter der Zertifizierungsstelle

Schwedt

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(13) ANLAGE**(14) Konformitätsaussage Nr. TÜV 06 ATEX 552902 X****(15) Beschreibung des Gerätes**

Die Terminals Typ IND690xx-Desk und Typ IND690xx-Panel dienen zur Anzeige und Auswertung von Gewichtswerten der angeschlossenen Wägebrücken. Zusammen mit angeschlossenen externen Geräten kann das Wägeterminal Typ IND690xx-Desk und Typ IND690xx-Panel für verschiedene Steueraufgaben genutzt werden.

Anschließbar über verschraubbare Stecker bzw. durch Kabelverschraubungen und interne Verbindungen sind folgende Geräte:

- eine alphanumerische Tastatur (gespeist über einen energiebegrenzten Stromkreis)
- bis zu drei Wägebrücken (digital IDNet oder analog)
- über optional eingebaute Datenschnittstellen (z. B. Serielle Interfaces, Netzwerk-Interfaces, Digitale I/O-Interfaces); Geräte gemäß der Installationsanleitung des Herstellers

Das Terminal Typ IND690xx-Desk ist als Tischgerät oder mit einer zugehörigen Wandkonsole als Wandgerät ausgeführt. Mit Hilfe der Zubehörteile Adapter, Stativ und Sockel kann das IND690xx Desk auch auf den Boden gestellt oder auf dem Boden bzw. an einem Bock festgeschraubt werden. Die Installationsanleitung des Herstellers ist zu beachten.

Das Terminal Typ IND690xx-Panel ist als Einbaugerät ausgeführt.

Die Terminals Typ IND690xx-Desk und Typ IND690xx-Panel dürfen in explosionsgefährdeten Bereichen, in denen Betriebsmittel der Kategorie 3 erforderlich sind, errichtet werden.

Der zulässige Umgebungstemperaturbereich ist $-10^{\circ}\text{C} \dots +40^{\circ}\text{C}$.

Elektrische Daten

Versorgungsstromkreis $U_n = 100 \dots 240 \text{ V AC}, +10\%/-15\%, 50/60\text{Hz}, \text{ca. } 70 \text{ VA}$
(Anschlussleitung)

Ausgang IDNet-Schnittstelle ...	Versorgungsspannung Wägezelle	max. 20 V DC
	Spannung Schnittstellenstromkreis CL	max. 27 V DC
	Stromstärke Schnittstellenstromkreis CL	max. 30 mA

5V-Versorgungsstromkreis..... energiebegrenzter Stromkreis EEx nL IIC

$U_o = 5 \text{ V DC}$

zulässige Stromentnahme im Bemessungsbetrieb:

$I_{n, \text{max}} = 100 \dots 300 \text{ mA}$

Die Installationsanleitung des Herstellers ist zu beachten

höchstzulässige äußere Kapazität: $C_o = 200 \text{ } \mu\text{F}$

höchstzulässige äußere Induktivität: $L_o = 60 \text{ } \mu\text{H}$

z. B. zur Versorgung der externen Tastatur Typ MF2 gemäß der Konformitätsaussage TÜV 00 ATEX 1629

Die höchstzulässige äußere Kapazität ist die Summe aller an dem energiebegrenzten 5V-Versorgungsstromkreis angeschlossenen Stromkreise.

Die höchstzulässige äußere Induktivität darf in jedem 5V-Stromkreis, der als energiebegrenzt betrachtet wird, angeschlossen werden.

Die elektrischen Daten für alle übrigen Anschlüsse (nicht energiebegrenzte Stromkreise) sind den Angaben des Herstellers in der Betriebsanleitung zu entnehmen.



Anlage Konformitätsaussage Nr. TÜV 06 ATEX 552902 X

(16) Die Prüfungsunterlagen sind im Prüfbericht Nr. 06 YEX 552902 aufgelistet.

(17) Besondere Bedingungen

1. Das Terminal Typ IND690xx-Panel so zu installieren, dass eine Schutzart von mindestens IP 54 gemäß EN 60529 erreicht wird.
2. Die Angaben bezüglich des energiebegrenzten Stromkreises sind dieser Bescheinigung zu entnehmen.
3. Das Verbinden und Trennen der Anschlüsse für die nicht energiebegrenzten Stromkreise unter Spannung ist nur bei der Installation oder für Reparaturzwecke zulässig.
4. Die angeschlossenen Geräte dürfen in explosionsgefährdeten Bereichen der Zone 2 und Zone 22 betrieben werden, wenn sie für die am Einsatzort vorliegenden Bedingungen geeignet sind.

(18) Grundlegende Sicherheits- und Gesundheitsanforderungen

keine zusätzlichen

Translation

(1) **Statement of Conformity****TÜV NORD**

- (2) Equipment and protective systems intended for use in potentially explosive atmospheres, **Directive 94/9/EC**



- (3) **Statement of Conformity Number: TÜV 06 ATEX 552902 X**

- (4) for the equipment: Terminal type IND690xx-Desk
and type IND690xx-Panel
- (5) of the manufacturer: Mettler-Toledo (Albstadt) GmbH

- (6) Address: Unter dem Malesfelsen 34
D-72458 Albstadt

Order number: 8000552902

Date of issue: 2006-07-06

- (7) This equipment or protective system and any acceptable variation thereto are specified in the schedule to this statement of conformity and the documents therein referred to.
- (8) The TÜV NORD CERT GmbH certifies that this equipment or protective system has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of equipment and protective systems intended for use in potentially explosive atmospheres given in Annex II to the Directive. The examination and test results are recorded in the confidential report No. 06 YEX 552902.
- (9) Compliance with the Essential Health and Safety Requirements has been assured by compliance with:
- EN 60079-15:2003 EN 50 281-1-1:1998+A1 EN 1127:1997
- (10) If the sign "X" is placed after the certificate number, it indicates that the equipment or protective system is subject to special conditions for safe use specified in the schedule to this certificate.
- (11) This statement of conformity relates only to the design, examination and tests of the specified equipment in accordance to the Directive 94/9/EC. Further requirements of the Directive apply to the manufacturing process and supply of this equipment. These are not covered by this certificate.
- (12) The marking of the equipment or protective system must include the following:

II 3 G EEx nA L [L] IIC T4 resp. II 3 D T70°C IP69K

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The head of the certification body

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(13) **SCHEDULE**(14) **Statement of Conformity No. TÜV 06 ATEX 552902 X**

(15) Description of equipment

The terminals type IND690xx-Desk and type IND690xx-Panel are used for displaying and analysis of weighing values of connected weighing bridges. In combination with connected external devices the terminals type IND690xx-Desk and type IND690xx-Panel can be used for different control tasks.

Connectable by means of plugs fixed by screw connection resp. per cable threads and internal connections are the following devices:

- an alphanumeric keyboard (energised by an energy limited circuit)
- up to three weighing bridges (digital IDNet or analogue)
- by optional build-in data interfaces (e. g. serial interfaces, network interfaces, digital I/O interfaces); devices according to the installation guidelines of the manufacturer:

The terminal type IND690xx-Desk is executed as a tabletop unit or, with a belonging wall mounting bracket, as a wall unit. By means of the belonging accessories adapter, stand and socket, the IND690xx Desk can be placed on the floor or screwed to the floor resp. to a bench. The installation guidelines of the manufacturer have to be observed.

The terminal type IND690xx-Panel is executed as a built-in unit.

The terminals type IND690xx-Desk and type IND690xx-Panel may be installed in explosion hazardous areas where apparatus of category 3 are required.

The permissible ambient temperature range is $-10^{\circ}\text{C} \dots +40^{\circ}\text{C}$

Electrical data

Supply circuit $U_n = 100 \dots 240 \text{ V a. c.}, +10\%/-15\%, 50/60\text{Hz}, \text{ approx. } 70 \text{ VA}$
(connecting cable)

Output IDNet interface	Supply voltage weighing cell	max.	20 V d. c.
	Voltage interface circuit CL	max.	27 V d. c.
	Current interface circuit CL	max.	30 mA

5V-supply circuit..... energy limited circuit EEx n L IIC

$U_o = 5 \text{ V d. c.}$

permissible current drain at rated operation:

$I_{n, \text{max}} = 100 \dots 300 \text{ mA}$

The installation guidelines of the manufacturer have to be observed.

max. permissible external capacitance: $C_o = 200 \mu\text{F}$

max. permissible external inductance: $L_o = 60 \mu\text{H}$

e. g. for supply of the external keyboard type MF2 according to the Statement of Conformity TÜV 00 ATEX 1629

The max. permissible external capacitance is the sum of all circuits which are connected to the energy limited 5V-supply circuit.

The max. permissible external inductance may be connected to each energy limited 5V-supply circuit.

The electrical data of all other connections (non energy limited circuits) have to be taken from the manufacturer's data in the installation guidelines.



Schedule Statement of Conformity No. TÜV 06 ATEX 552902 X

(16) The test documents are listed in the test report No. 06 YEX 552902.

(17) Special conditions for safe use

1. The terminal type IND690xx-Panel has to be installed in that way that a degree of protection of min. IP 54 according to EN 60529 is reached.
2. The specifications regarding the energy limited circuit have to be taken from this certificate.
3. The connection and disconnection of the connections of the non energy limited circuits under voltage, as well, is only permitted during installation and for repair purposes.
4. The connected devices may be operated in explosion hazardous areas of zone 2 resp. zone 22 if they are capable for the conditions at the place of installation.

(18) Essential Health and Safety Requirements

no additional ones



1. ERGÄNZUNG

zur Bescheinigungsnummer: **TÜV 06 ATEX 552902 X**
 Gerät: Terminal Typ IND690xx-Desk und IND690xx-Panel
 Hersteller: Mettler-Toledo (Albstadt) GmbH
 Anschrift: Unter dem Malesfelsen 34
 72458 Albstadt
 Auftragsnummer: 8000555737
 Ausstellungsdatum: 17.05.2010

Die Terminals Typ IND690xx-Desk und Typ IND690xx-Panel dürfen künftig auch entsprechend den im Prüfbericht aufgeführten Unterlagen gefertigt werden.

Die Änderungen betreffen den Einbau des Display-Modul Typ GUT170X40J-9301 des Herstellers Noritake sowie die „Besonderen Bedingungen“ und die Kennzeichnung.

Diese lautet:

II 3 G Ex nA nL [nL] IIC T4 bzw.
 II 3 D Ex tD A22 T70°C IP69K

Die elektrischen Daten sowie alle weiteren Angaben gelten unverändert für diese Ergänzung.

Das Gerät entsprechend dieser Ergänzung erfüllt die Anforderungen der folgenden Normen:

EN 60079-0:2006 EN 60 079-15:2005 EN 61241-0:2006
 EN 61241-1:2004 EN 1127-1:2007

(16) Die Prüfungsunterlagen sind im Prüfbericht Nr. 10 204 555737 aufgelistet.

(17) Besondere Bedingungen

1. Das Terminal Typ IND690xx-Panel in einem geeigneten Gehäuse entsprechend EN 60079-15 bzw. EN61241-1 so zu installieren, dass eine Schutzart von mindestens IP 54 bzw. IP 6X für Anwendungen mit leitfähigem Staub gemäß EN 60529 erreicht wird.
2. Die Angaben bezüglich des energiebegrenzten Stromkreises sind dieser Bescheinigung zu entnehmen.
3. Das Verbinden und Trennen der Anschlüsse für die nicht energiebegrenzten Stromkreise unter Spannung ist nur bei der Installation oder für Reparaturzwecke zulässig.
4. Die angeschlossenen Geräte dürfen in explosionsgefährdeten Bereichen der Zone 2 und Zone 22 betrieben werden, wenn sie für die am Einsatzort vorliegenden Bedingungen geeignet sind.
5. Es ist zu beachten, dass die Oberflächentemperatur von 70 °C ohne Staubauflage gemessen wurde.
6. Bezüglich der Gefahren durch elektrostatische Entladungen ist die Betriebsanleitung des Herstellers zu beachten.

(18) Grundlegende Sicherheits- und Gesundheitsanforderungen

keine zusätzlichen

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Der Leiter der Zertifizierungsstelle

Schwedt



Translation

1. SUPPLEMENT

to Certificate No.	TÜV 06 ATEX 552902 X
Equipment:	Terminals type IND690xx-Desk and type IND690xx-Panel
Manufacturer:	Mettler-Toledo (Albstadt) GmbH
Address:	Unter dem Malesfelsen 34 72458 Albstadt, Germany
Order number:	8000555737
Date of issue:	2010-05-17

In the future, the terminal type IND690xx-Desk and type IND690xx-Panel may also be manufactured according to the documents listed in the test report.

The changes refer to the installation of the display module type GUT170X40J-9301 of the manufacturer Noritake as well as the "Special conditions for safe use and the marking.

This reads:

II 3 G Ex nA nL [nL] IIC T4 resp.
II 3 D Ex tD A22 T70°C IP69K

The electrical data and all other data apply unchanged for this supplement.

The equipment incl. of this supplement meets the requirements of these standards:

EN 60079-0:2006	EN 60 079-15:2005	EN 61241-0:2006
EN 61241-1:2004	EN 1127-1:2007	

(16) The test documents are listed in the test report No. 10 204 555737.

(17) Special conditions for safe use

1. The terminal type IND690xx-Panel has to be installed in a suitable housing corresponding to EN 60079-15 resp. EN 61241-1 in that way that a degree of protection of min. IP 54 resp. IP 6X for use with conductive dust according to EN 60529 is reached.
2. The specifications regarding the energy limited circuit have to be taken from this certificate.
3. The connection and disconnection of the connections of the non energy limited circuits under voltage, as well, is only permitted during installation and for repair purposes.
4. The connected devices may be operated in explosion hazardous areas of zone 2 resp. zone 22 if they are capable for the conditions at the place of installation.
5. It has to be observed, that the surface temperature of 70 °C was measured without dust layer.
6. Regarding the hazards by electrostatic discharges, the manual of the manufacturer has to be observed.

(18) Essential Health and Safety Requirements

no additional ones

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The head of the certification body

Schwedt

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2. ERGÄNZUNG

zur Bescheinigungsnummer: TÜV 06 ATEX 552902 X
 Gerät: Terminal Typ IND690xx-Desk und IND690xx-Panel
 Hersteller: Mettler-Toledo (Albstadt) GmbH
 Anschrift: Unter dem Malesfelsen 34
 72458 Albstadt
 Auftragsnummer: 8000425797
 Ausstellungsdatum: 05.11.2013

Für die Geräte Terminal Typ IND690xx-Desk und IND690xx-Panel gelten künftig die folgenden Angaben:

Elektrische Daten

5V-Versorgungstromkreis..... in Zündschutzart Eigensicherheit Ex ic IIC
 $U_o = 5,1 \text{ V}$
 $P_o = 7 \text{ W}$ (statischer Wert)
 höchstzulässige äußere Kapazität: $C_o = 200 \text{ } \mu\text{F}$
 höchstzulässige äußere Induktivität: $L_o = 60 \text{ } \mu\text{H}$

Die höchstzulässige äußere Kapazität ist die Summe aller an dem eigensicheren 5V-Versorgungstromkreis angeschlossenen Stromkreise.

Die höchstzulässige äußere Induktivität darf in jedem eigensicheren 5V-Versorgungstromkreis angeschlossen werden.

Für die zulässige Stromentnahme im Bemessungsbetrieb ist die Installationsanleitung des Herstellers ist zu beachten

Die elektrischen Daten für alle übrigen Anschlüsse (nicht eigensichere Stromkreise) sind den Angaben des Herstellers in der Betriebsanleitung zu entnehmen.

Die Kennzeichnung lautet künftig:

II 3 G Ex nA ic [ic] IIC T4 Gc

II 3 D Ex tc T70 °C IIIB Dc

Alle weiteren Angaben gelten unverändert.

Das Gerät incl. dieser Ergänzung erfüllt die Anforderungen der folgenden Normen:

EN 60079-0:2012
 EN 60079-31:2009

EN 60079-11:2012

EN 60079-15:2010

(16) Die Prüfungsunterlagen sind im Prüfbericht Nr. 13 214 129090 aufgelistet.



2. Ergänzung zur Bescheinigungsnummer TÜV 06 ATEX 552902 X

(17) Besondere Bedingungen

1. Entsprechend EN 60079-15, Abschnitt 6.3.1 gilt für den Einsatz in explosionsgefährdeten Bereichen durch Gas der Zone 2 für das Gerät „IND690xx-Panel“ Folgendes:
 - a) Das Gerät ist an einem gemäß der IEC 60079-0 geprüften Gehäuse so zu installieren, dass die Anforderungen der Schutzart IP54 erfüllt sind.
 - oder
 - b) Das Gerät ist an einem gemäß der IEC 60079-0 geprüften Gehäuse zu errichten, dass die Anforderungen der Schutzart IP4X erfüllt ist. Das Gehäuse darf dann ausschließlich in Bereichen installiert werden, die ihrerseits einen geeigneten Schutz gegen das Eindringen von Fremdkörpern oder Flüssigkeiten bieten.
2. Das Gerät „IND690xx-Panel“ ist für den Einsatz in explosionsgefährdeten Bereichen durch Staub der Zone 22 an einem gemäß der IEC 60079-0 geprüften Gehäuse so zu installieren, dass die Anforderungen der Schutzart IP5X erfüllt sind (EN 60079-31, Tabelle 1).
3. Die Geräte „Terminal Typ IND690xx-Desk und IND690xx-Panel“ dürfen für den Einsatz in explosionsgefährdeten Bereichen durch Gas der Zone 2 in einem Bereich mit einem Verschmutzungsgrad von nicht größer als 2 eingesetzt werden (EN 60079-15, Abschnitt 13). Der Versorgungsstromkreis muss entsprechend der Überspannungskategorie II nach IEC 60664-1 begrenzt sein (EN 60079-11, Abschnitt F.3.2).
4. Die Angaben bezüglich des eigensicheren Stromkreises sind dieser Bescheinigung zu entnehmen.
5. Das Verbinden und Trennen der Anschlüsse für die nicht eigensicheren Stromkreise unter Spannung ist nur zulässig, wenn keine explosionsfähige Atmosphäre vorhanden sein kann.
6. Die angeschlossenen Geräte dürfen in explosionsgefährdeten Bereichen der Zone 2 und Zone 22 betrieben werden, wenn sie für die am Einsatzort vorliegenden Bedingungen geeignet sind.
7. Die Geräte „Terminal Typ IND690xx-Desk und IND690xx-Panel“ dürfen nur in Räumen oder an Stellen betrieben werden, in denen erwartungsgemäß keine starken elektrischen Feldstärken (Vermeidung elektrostatischer Aufladung) auftreten können.
8. Geräte mit beschädigten Dichtungen dürfen in explosionsgefährdeten Bereichen nicht betrieben werden.

(18) Grundlegende Sicherheits- und Gesundheitsanforderungen

keine zusätzlichen

TÜV NORD CERT GmbH, Langemarckstraße 20, 45141 Essen, benannt durch die Zentralstelle der Länder für Sicherheitstechnik (ZLS), Ident. Nr. 0044, Rechtsnachfolger der TÜV NORD CERT GmbH & Co. KG Ident. Nr. 0032

Der Leiter der benannten Stelle

Schwedt

Geschäftsstelle Hannover, Am TÜV 1, 30519 Hannover, Tel.: +49 (0) 511 986-1455, Fax: +49 (0) 511 986-1590



Translation

2. SUPPLEMENT

to Certificate No.	TÜV 06 ATEX 552902 X
Equipment:	Terminal type IND690xx-Desk and IND690xx-Panel
Manufacturer:	Mettler-Toledo (Albstadt) GmbH
Address:	Unter dem Malesfelsen 34 72458 Albstadt
Order number:	8000425797
Date of issue:	2013-11-05

In the future, for the apparatus terminal type IND690xx-Desk and IND690xx-Panel, the following details are valid:

Electrical data

5V-supply circuit..... in type of protection intrinsic safety Ex ic IIC
 $U_o = 5.1 \text{ V}$
 $P_o = 7 \text{ W}$ (static value)
 max. permissible external capacitance: $C_o = 200 \text{ } \mu\text{F}$
 max. permissible external inductance: $L_o = 60 \text{ } \mu\text{H}$

The max. permissible external capacitance is the sum of all circuits which are connected to the intrinsically safe 5V-supply circuit.

The max. permissible external inductance may be connected to each intrinsically safe 5V supply circuit.

The electrical data of all other connections (non intrinsically safe circuits) have to be taken from the manufacturer's data in the installation guidelines.

In the future, the marking reads:

II 3 G Ex nA ic [ic] IIC T4 Gc

II 3 D Ex tc T70 °C IIIB Dc

All other details apply unchanged.

The equipment incl. of this supplement meets the requirements of these standards:

EN 60079-0:2012
 EN 60079-31:2009

EN 60079-11:2012

EN 60079-15:2010

(16) The test documents are listed in the test report No. 13 214 129090.



2. Supplement to Certificate No. TÜV 06 ATEX 552902 X

(17) Special conditions for safe use

1. According to EN 60079-15, section 6.3.1, for the operation in explosion hazardous areas caused by gas of zone 2 for the apparatus „IND690xx-Panel“, the following is valid:
 - a) The apparatus has to be mounted at a housing tested according to IEC 60079-0, so that the requirements of degree of protection IP54 are adhered to.
 - or
 - b) The apparatus has to be mounted at a housing tested according to IEC 60079-0, so that the requirements of degree of protection IP4X are adhered to. Then, the apparatus may exclusively be mounted in locations providing adequate protection against the entry of solid foreign objects or liquids.
2. For the operation in explosion hazardous areas caused by dust of zone 22, the apparatus „IND690xx-Panel“ has to be mounted at a housing tested according to IEC 60079-0, so that the requirements of degree of protection IP5X are adhered to (EN 60079-31, table 1).
3. For the operation in explosion hazardous areas caused by gas of zone 2, the apparatus „Terminal type IND690xx-Desk and IND690xx-Panel“ are allowed to be operated in an area of not more than pollution degree 2 (EN 60079-15, section 13). The supply circuit has to be limited to overvoltage category II as defined in IEC 60664-1 (EN 60079-11, section F.3.2).
4. The specifications regarding the intrinsically safe circuit have to be taken from the certificate.
5. The connection and disconnection of the connections of the non intrinsically safe circuits under voltage is only permitted, if no explosion hazardous atmosphere can be available.
6. The connected devices are allowed to be operated in explosion hazardous areas of zone 2 or zone 22, if they are suitable for the conditions available at the place of operation.
7. The apparatus „Terminal IND690xx-Desk and IND690xx-Panel“ are only allowed to be operated in rooms or locations, where from experience no intense electric field strength can occur (avoidance of electrostatic charge).
8. Apparatus with damaged sealings are not allowed to be operated in explosion hazardous areas.

(18) Essential Health and Safety Requirements

no additional ones

TÜV NORD CERT GmbH, Langemarckstraße 20, 45141 Essen, notified by the central office of the countries for safety engineering (ZLS), Ident. Nr. 0044, legal successor of the TÜV NORD CERT GmbH & Co. KG Ident. Nr. 0032

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Subject to technical changes

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Anhang zur Installationsanleitung

Dokumentation 22012802

Anhang zur Dokumentation 22012802 Kapitel 5 "Technische Daten"

Aufgrund unseres Nachtrags zur IND690xx Zulassung (Konformitätsaussage Nummer: TÜV 06 ATEX 552902 X) wurde die, in der Installationsanleitung, angegeben Gerätekategorie aktualisiert.

Bisherige Gerätekategorie:

II 3 G Ex nA nL [nL] IIC T4
II 3 D Ex tD A22 T70°C IP69k

Gültige Gerätekategorie ab 15.11.2013

II 3G Ex nA ic [ic] IIC T4 Gc
-10°C ≤ Ta ≤ +40°C

II 3D Ex tc T70°C IIIB Dc
IP6x

Diese Aktualisierungen wurden aufgrund Normänderungen notwendig und vollzogen. Nach folgenden europäischen Normen wurde das IND690xx geprüft:

EN60950
EN 60079-0:2012
EN 60079-11:2012
EN 60079-15:2010
EN 60079-31:2009

Des Weiteren müssen folgende Werte beim Anschließen von externen Geräten an IDNet, SICS, RS232 sowie PS/2 Schnittstellen beachtet werden:

Elektrische Daten

5V-Versorgungstromkreis..... in Zündschutzart Eigensicherheit Ex ic IIC

$$U_o = 5,1 \text{ V}$$

$$P_o = 7 \text{ W (statischer Wert)}$$

$$\text{höchstzulässige äußere Kapazität: } C_o = 200 \text{ } \mu\text{F}$$

$$\text{höchstzulässige äußere Induktivität: } L_o = 60 \text{ } \mu\text{H}$$

Die höchstzulässige äußere Kapazität ist die Summe aller an dem eigensicheren 5V-Versorgungstromkreis angeschlossenen Stromkreise.

Die höchstzulässige äußere Induktivität darf in jedem eigensicheren 5V-Versorgungstromkreis angeschlossen werden.

Für die zulässige Stromentnahme im Bemessungsbetrieb ist die Installationsanleitung des Herstellers ist zu beachten

Die elektrischen Daten für alle übrigen Anschlüsse (nicht eigensichere Stromkreise) sind den Angaben des Herstellers in der Betriebsanleitung zu entnehmen.

IND690xx		Externes Gerät bei Anschluss an IDNet, SICS, RS232 sowie PS/2 Schnittstelle
U_o	\leq	U_i or U_{max}
P_o	\leq	P_i or P_{max}
C_o	\geq	C_i + C Kabel
L_o	\geq	L_i + L Kabel

Bemerkungen:

- Die PS/2 Schnittstelle ist eigensicher (5V).
- Die Werkseinstellung der RS232 sowie SICS Schnittstelle ist eigensicher (5V).
- Den 5V Pin der IDNet Schnittstelle darf nicht verwendet werden. Für die Mettler Toledo Wägebrücken werden nur die 12V sowie die 30V verwendet.
- Bei Verwendung der eigensicheren 5V Spannung muss die Norm EN60079-14 beachtet werden.

Appendix for Installation manual

Documentation 22012803

Appendix for Documentation 22012802 Chapter 5 "Technical Data"

Due to the 2. Supplement of the IND690xx certificate (Certificate No.: TÜV 06 ATEX 552902 X) there is a update needed in respect of the type of protection.

Previous type of protection:

II 3 G Ex nA nL [nL] IIC T4
II 3 D Ex tD A22 T70°C IP69k

Valid type of protection as from 15.11.2013:

II 3G Ex nA ic [ic] IIC T4 Gc
-10°C ≤ Ta ≤ +40°C

II 3D Ex tc T70°C IIIB Dc
IP6x

This updates were necessary and completed due to changes in the latest European standards. The IND690xx was tested according the below mentioned European Standards:

EN60950
EN 60079-0:2012
EN 60079-11:2012
EN 60079-15:2010
EN 60079-31:2009

Furthermore following values has to be considered as soon as you are going to use an external device on IDNet, SICS, RS232 and PS/2 interface(s).

Electrical data

5V-supply circuit..... in type of protection intrinsic safety Ex ic IIC

$$U_o = 5.1 \text{ V}$$

$$P_o = 7 \text{ W (static value)}$$

$$\text{max. permissible external capacitance: } C_o = 200 \text{ } \mu\text{F}$$

$$\text{max. permissible external inductance: } L_o = 60 \text{ } \mu\text{H}$$

The max. permissible external capacitance is the sum of all circuits which are connected to the intrinsically safe 5V-supply circuit.

The max. permissible external inductance may be connected to each intrinsically safe 5V supply circuit.

The electrical data of all other connections (non intrinsically safe circuits) have to be taken from the manufacturer's data in the installation guidelines.

IND690xx		External device connected to an IDNet, SICS, RS232 and PS/2 interface
U_o	\leq	U_i or U_{max}
P_o	\leq	P_i or P_{max}
C_o	\geq	$C_i + C_{\text{cable}}$
L_o	\geq	$L_i + L_{\text{cable}}$

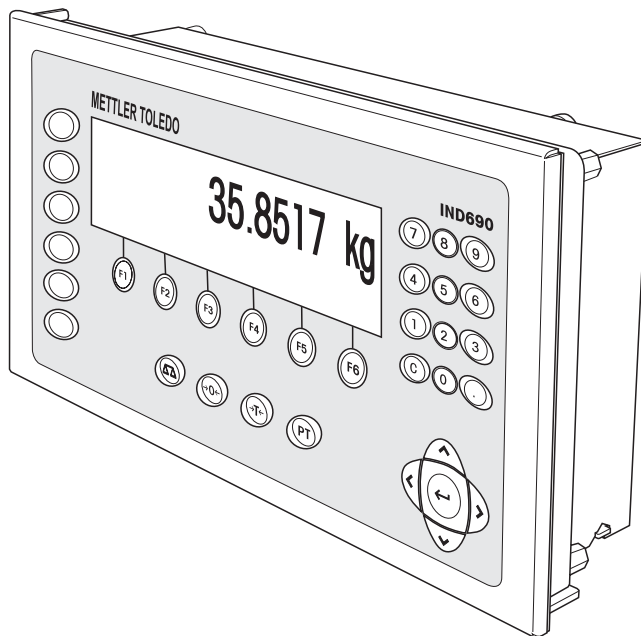
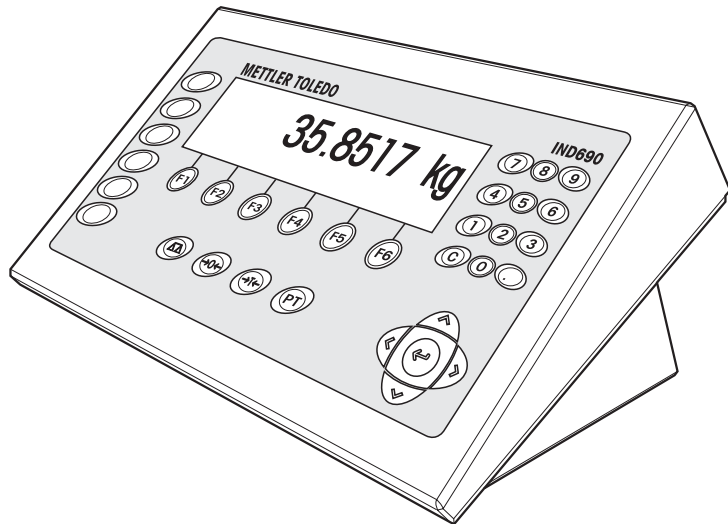
Notes:

- The PS/2 interface is intrinsically safe (5V).
- Factory setting of the RS232 and SICS interface is intrinsically safe (5V).
- The 5V Pin of the IDNet Interface must not be used. All Mettler Toledo weighing platforms are using either 12 V or 30V.
- In case of using the intrinsically safe 5V voltage please consider the latest European standard EN 60079-14.

Operating instructions

METTLER TOLEDO MultiRange IND690-Base weighing terminals

METTLER TOLEDO



www.mt.com/support

ServiceXXL

Tailored Services

Congratulations on choosing the quality and precision of METTLER TOLEDO. Proper use according to these instructions and regular calibration and maintenance by our factory-trained service team ensure dependable and accurate operation, protecting your investment. Contact us about a ServiceXXL agreement tailored to your needs and budget.

We invite you to register your product at www.mt.com/productregistration so we can contact you about enhancements, updates and important notifications concerning your METTLER TOLEDO product.

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1 Safety instructions

1.1 Safety instructions for IND690xx



The explosion-protected IND690xx weighing terminal fulfills Device category 3 and is approved for operation in Zone 2 (gases) and Zone 22 (dusts) hazardous areas.

There is an increased risk of injury and damage when the IND690xx weighing terminal is used in a potentially explosive atmosphere.

Special care must be taken when working in such hazardous areas. The code of practice is oriented to the "Safe Distribution" concept drawn up by METTLER TOLEDO.

- Competence**
- ▲ The IND690xx weighing terminal, accompanying weighing platforms and accessories may only be installed, maintained and repaired by authorised METTLER TOLEDO service personnel.
 - ▲ The mains connection may only be connected or disconnected by the owner's electrician.
- Ex approval**
- ▲ For the exact specification please refer to the statement of conformity.
 - ▲ In order to avoid electrostatic charging the IND690xx may only be installed in rooms or areas at which strong electric field strengths cannot occur from experience.
 - ▲ No modifications may be made to the terminal and no repair work may be performed on the modules. Any weighing platform or system modules that are used must comply with the specifications contained in the installation instructions. Non-compliant equipment jeopardizes the safety of the system, cancels the Ex approval and renders any warranty or product liability claims null and void.
 - ▲ The cable glands must be tightened so that a strain relief of ≥ 20 N per mm cable diameter is ensured.
 - ▲ When connecting external devices, always observe the maximum permissible connected loads, see installation information. It must be ensured that no voltages are fed into the IND690xx than it itself provides. The interface parameters have to fulfill the standard.
 - ▲ Peripheral devices without an Ex approval may only be operating in non-hazardous areas. It must be ensured that no voltages are fed into the IND690xx than it itself provides. In addition the maximum permissible connected loads have to be observed, see Page installation information. The interface parameters have to fulfill the standard.
 - ▲ The safety of a weighing system including the IND690xx weighing terminal is only guaranteed when the weighing system is operated, installed and maintained in accordance with the respective instructions.

- ▲ Also comply with the following:
 - the instructions for the system modules
 - the regulations and standards in the respective country
 - the statutory requirement for electrical equipment installed in hazardous areas in the respective country, e.g. EN 60079-14 and EN 6124-14
 - all instructions related to safety issued by the owner
- ▲ Before initial start-up and following service work, check the explosion-protected weighing system for the proper condition of all safety-related parts.

Operation

- ▲ Prevent the build-up of static electricity. Therefore:
 - only operate the IND690xx in rooms or areas at which strong electric field strengths cannot occur from experience,
 - always wear suitable working clothes when operating or performing service work on the system,
 - do not rub or wipe off the keyboard surface with a dry cloth or glove.
- ▲ Do not use protective hoods.
- ▲ Prevent damage to the weighing terminal. Hairline cracks in the keyboard membrane are also considered damage.
- ▲ If the IND690xx weighing terminal, accompanying weighing platforms or accessories are damaged:
 - Switch off weighing terminal.
 - Separate the weighing terminal from the mains in accordance with the applicable regulations.
 - Secure the weighing terminal against accidental start-up.

Leakages

- ▲ The IND690xx panel unit does not comply with any freedom-from-leaks rating. Therefore the installer is responsible for compliance with the freedom from leaks rating, e.g. at control cabinet installation. The respective national standards furthermore have to be observed. At least a freedom-from-leaks rating IP54 is required in hazardous areas, in case of conductive dust IP6X.

1.2 Safety instructions for IND690-24V



- ▲ Never operate the IND690-24V weighing terminal in hazardous areas; there are special scales in our product line for this purpose.
- ▲ The IND690-24V weighing terminal may only be connected to a power supply (storage battery or mains) having a 24 VDC SELV power circuit in accordance with EN 60950.
- ▲ Short-circuit danger!
Ensure that the power supply is connected properly:
brown lead +24 V
blue lead 0 V or negative pole
- ▲ The safety of the unit is endangered if it is not operated in accordance with these operating instructions.
- ▲ Only authorized personnel may open the IND690-24V weighing terminal.

Competence

- ▲ The IND690-24V weighing terminal, accompanying weighing platforms and accessories may only be installed, maintained and repaired by authorised METTLER TOLEDO service personnel.

Leakages

- ▲ The IND690-24V panel unit does not comply with any freedom-from-leaks rating. Therefore the installer is responsible for compliance with the freedom from leaks rating, e.g. at control cabinet installation. The respective national standards furthermore have to be observed.

1.3 Safety instructions for IND690



- ▲ Do not operate the IND690 weighing terminal in hazardous areas. We have special suitable scales in our range of products for hazardous areas.
- ▲ Ensure that the power socket outlet for the IND690 weighing terminal is earthed and easily accessible, so that it can be de-energised rapidly in emergencies.
- ▲ Ensure that the supply voltage at the installation site lies within in the range of 100 V to 240 V.
- ▲ The safety of the device cannot be ensured if it is not operated in accordance with these operating instructions.
- ▲ Only authorised personnel may open the IND690 weighing terminal.

Competence

- ▲ The IND690 weighing terminal, accompanying weighing platforms and accessories may only be installed, maintained and repaired by authorised METTLER TOLEDO service personnel.

Leakages

- ▲ The IND690 panel unit does not comply with any freedom-from-leaks rating. Therefore the installer is responsible for compliance with the freedom from leaks rating, e.g. at control cabinet installation. The respective national standards furthermore have to be observed.

2 Introduction and commissioning

2.1 Documentation

The weighing terminal comes supplied with a CD containing all the documentation on the IND690 weighing system.

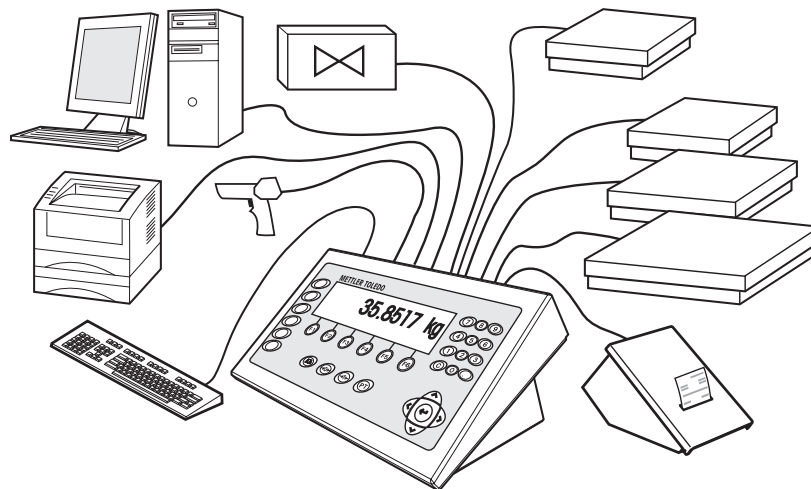
These installation instructions describe operation of the IND690 with the basic software Base-690 and all possible interfaces.

If your weighing terminal is equipped with application software (Batch-690, Com-690, Control-690, Count-690, Fill-690, Form-690, FormXP-690, Sum-690) you'll find the application specific information in the corresponding operating instructions.

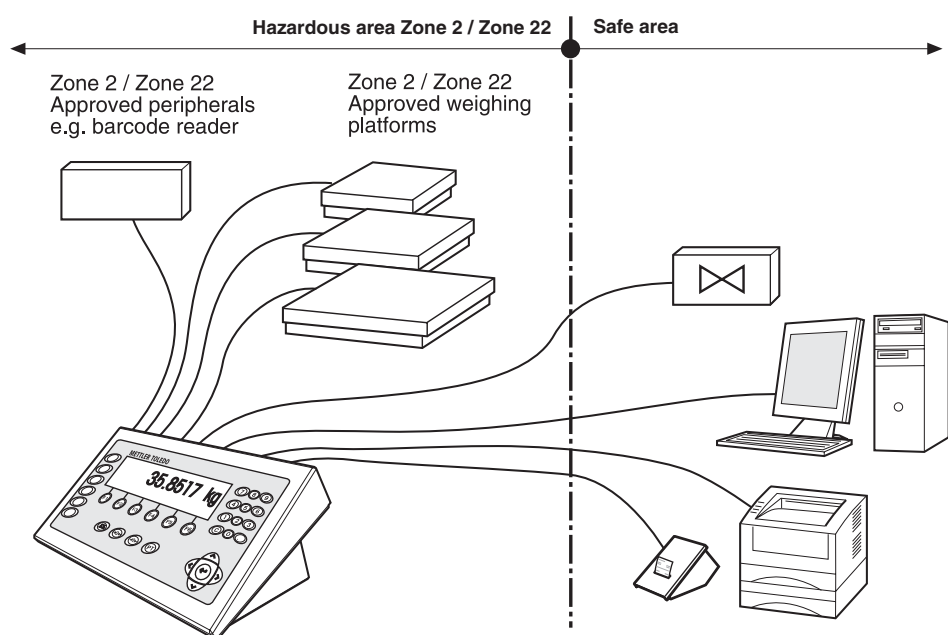
2.2 Applications

With the weighing terminals the following applications are possible:

IND690
IND690-24V



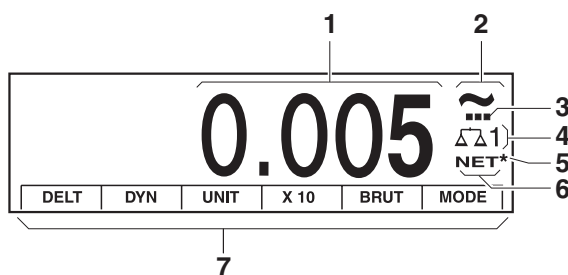
IND690xx



- Multi-scale operation with up to 4 weighing platforms with IND690 resp. up to 3 weighing platforms with IND690xx and IND690-24V, including weighing platforms with an analog signal output.
- Up to 9 data interfaces
 - for printing,
 - for data exchange with a computer,
 - for connecting a barcode reader,
 - for control, e.g. of valves or flaps,
 - for connecting reference scales,
 - for connecting an external keypad.

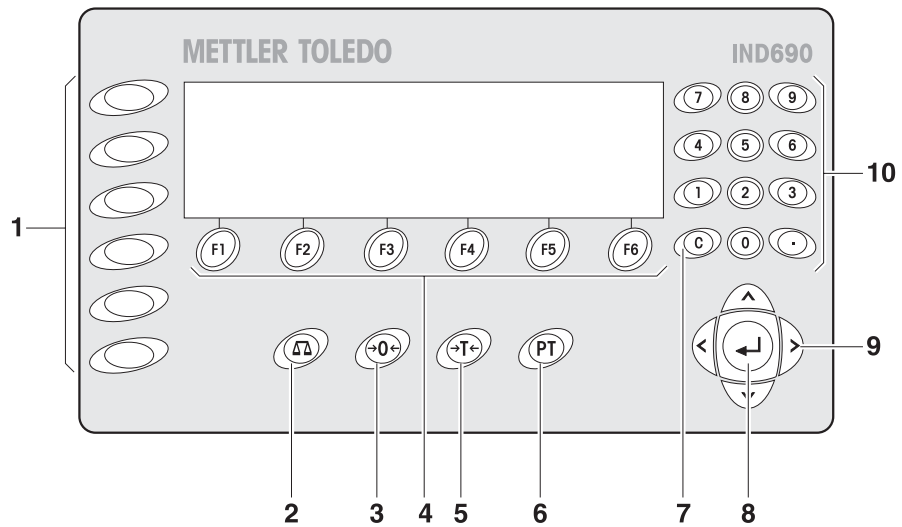
2.3 IND690 weighing terminals

2.3.1 Display



- 1 Weight display BIG WEIGHT[®] with sign and decimal point
- 2 Stability monitor: lights up until the weighing platform has levelled out, then the weight unit appears here
- 3 Range display for multi-range weighing platforms
- 4 Number of the weighing platform: shows the weighing platform just selected
- 5 Symbol * for identifying weight values in the second unit or in a higher resolution
- 6 NET symbol for marking net weight values
- 7 Assignment of the function keys

2.3.2 Keypad



- 1 CODE A ... CODE F keys – enter identification data
- 2 SCALE key – select scale
- 3 ZERO-SET key – set scale to zero, test scale
- 4 Function keys F1 ... F6 – the current assignment is shown in the display above the key
- 5 TARA key – tare scale
- 6 TARE SPECIFICATION key – enter known tare values numerically
- 7 CLEAR key – clear entries and values
- 8 ENTER key – accept and transfer data
- 9 Cursor keys
- 10 Numeric keypad with decimal point

2.4 Cleaning



DANGER OF SHOCK

→ Do not open the weighing terminal to clean.

CAUTION

→ Make sure that unused connection sockets are covered with protective caps to protect the socket contacts from moisture and dirt.

Cleaning

→ Wipe off the weighing terminal with a commercially available glass or plastic cleaner.

3 Basic functions

3.1 Switching on and off

Switch on from the standby mode

→ Press any key.

The display shows a weight value based on the last tare value and zero point.

Note

We recommend leaving the device switched on when it is operated in humid areas or is subjected to high temperature fluctuations. This ensures that condensate does not form on the device inside.

Switch off

→ Press function key OFF.

The display goes out and the IND690 weighing terminal is in the standby mode. The zero point and tare value remain saved.

Note

If the function key OFF does not appear in the current assignment, press the cursor key < or > several times if necessary until OFF is displayed.

Switch on with restart

1. Relieve weighing platform.
2. Press function key OFF and hold down until METTLER TOLEDO IND690 (factory setting) or text you have specified appears in display. Then weight value appears.

The weighing platform is restarted.

Note

The text which appears during switch-on with a restart is saved in the text memory 20, see page 37.

3.2 Charge indicator in storage battery operation (IND690-24V only)

If the supply voltage drops below 22.5 V, a continuous whistle sound is emitted for approx. 10 to 30 minutes.


If the supply voltage drops below 21 V, the IND690-24V weighing terminal switches off automatically.

→ If the whistle sound is emitted, complete the current weighing process and charge or replace the storage battery.

3.3 Setting to zero

Setting to zero corrects the influence of minor dirt on the load plate.


In the case of excessive dirt which cannot be compensated by setting to zero, the display shows OUT OF RANGE.

- Manual zero set**
1. Relieve weighing platform.
 2. Press .
- The display shows 0.000 kg.

Automatic zero set On certified weighing platforms the zero point of the weighing platform is automatically corrected when the weighing platform is relieved.
The automatic zero set can be switched off in the master mode on noncertified weighing platforms.

3.4 Taring

3.4.1 Manual taring

1. Place empty container on scale.
 2. Press .
- The tare weight is saved and the weight display set to zero.
The display shows the NET symbol.

Notes

- When the weighing platform is relieved, the saved tare weight is displayed with a negative sign.
- The weighing platform only saves **one** tare value.

3.4.2 Automatic taring

Condition

AUTOTARA ON must be set in the master mode, see page 48.

- Place empty container on scale.
The container weight is automatically saved and the weight display set to zero.
The display shows the NET symbol.

Note

The saved tare weight is automatically deleted with the load is removed from the weighing platform.

3.4.3 Specify tare weight

Enter numerically

1. Press **PT**.
2. Enter tare weight (container weight) and confirm with **←**.
When weighing platform is relieved, the entered tare weight is displayed with a negative sign.

Note

The weight unit for entering the tare weight can be selected with the cursor keys **<** or **>**.

Correct entry

→ Clear the entry character by character with **C** and repeat correctly.

Copy tare constant

The IND690 has 999 tare memories for frequently used tare weights programmed in the master mode.

1. Enter memory number: 1... 999.

2. Press **PT**.

The memory number, the saved tare weight and the designation appear briefly in the display. The next to appear is the weight display with the net weight referred to the called-up tare weight and the symbol NET.

3.4.4 Recall currently saved tare weight

The saved tare weight can be recalled at any time.

→ Enter INFO, **PT** sequence.

The saved tare weight is displayed.

3.4.5 Clear tare weight

→ Relieve weighing platform and tare.

– or –

→ Specify tare weight 0.

– or –

→ Enter **PT**, **C** sequence.

Note

If AUTO CLEAR TARE ON is selected in the master mode, the saved tare weight is automatically deleted with the load is removed from the weighing platform.

3.5 Weighing

Weighing without taring

- Lay weighing sample on weighing platform.
Gross weight (total weight) is displayed.


Weighing with taring

1. Place the empty container on the weighing platform and tare.
The display shows the net weight and the NET symbol.

Weighing with tare specification

1. Place filled container on weighing platform.
The display shows the gross weight (total weight).
2. Specify tare weight or recall tare memory.
The display shows the net weight (container content) and the NET symbol.

Note

If the MinWeight function is activated in the master mode, weight values that fall below the defined minimum weight are identified with the blinking symbol .


3.6 Working with several weighing platforms

Up to 4 weighing platforms can be connected to the IND690, and up to 3 weighing platforms can be connected to the IND690xx and IND690-24V.

Depending on the setting in master mode, only the currently active scale appears in the display (serial Multi-scale mode) or all scales are operated at the same time (parallel multi-scale mode). A constantly updated sum scale is also available in parallel multi-scale mode.

3.6.1 Switch over weighing platform

The weighing platform currently selected is shown on the terminal.

- Press .

The next weighing platform is selected.

– or –

- Enter number of weighing platform and press .

The desired weighing platform is selected.

3.6.2 Displaying several scales simultaneously

Condition

PARALLEL SCALE is selected in the master mode.

→ Press the cursor key < or > as often as necessary until all scales are shown in the display.

Notes

- When all scales are displayed, only the function keys UNIT and GROSS are still active. These function keys then act on all connected scales.
- The sum scale can only be operated non-verifyably. It is therefore identified by the symbol Σ .
- The calculation mode and resolution of the sum scale can be configured in master mode, see Section 5.5.5.

4 Additional functions

The assignment of the 6 function keys of the IND690 weighing terminal differs depending on the weighing task. The current assignment is shown above the function keys. The cursor keys < or > can then be used to switch to other function key assignments.

Independent of the application software, the IND690-Base has the following additional functions:

DELT	DYN	UNIT	X 10	GROSS	MODE
Weighing with the DeltaTrac, see 4.1	Dynamic weighing, see 4.2	Change weight unit, see 4.3	Increase resolution, see 4.4. This key is not assigned when the control mode is continually switched on.	Display gross weight, see 4.5	Activate master mode, see Chapter 5

MUL-T	ADD-T	ITARE	SETP	OFF	INFO
Multiplicative tare function, see 4.7	Additive tare function, see 4.8	Sandwich tare, see 4.9	Set dynamic set points, see 4.6. This key is not assigned if no set points are defined.	Switching off terminal	Calling up information

Without additional application software, the IND690-Base still provides the following function keys for totalizing:

PLUS	MAN	CANC	SUM	TARG	ITEM
Totalizing is described in Section 4.10					

4.1 Weighing with the DeltaTrac

The DeltaTrac is an analog display which makes it easier to read the weighing results.

In the master mode you can select how the DeltaTrac is displayed for the various weighing tasks FILLING, CLASSIFYING or CHECKWEIGHING.

Notes

- With the DeltaTrac signals you can also control lamps, flaps or valves, see page 65.
- With the AnalogOut-690 interface the net value can be output as an analog current or voltage signal, see page 68.

Application FILLING

For weighing-in to a target weight with tolerance monitoring.

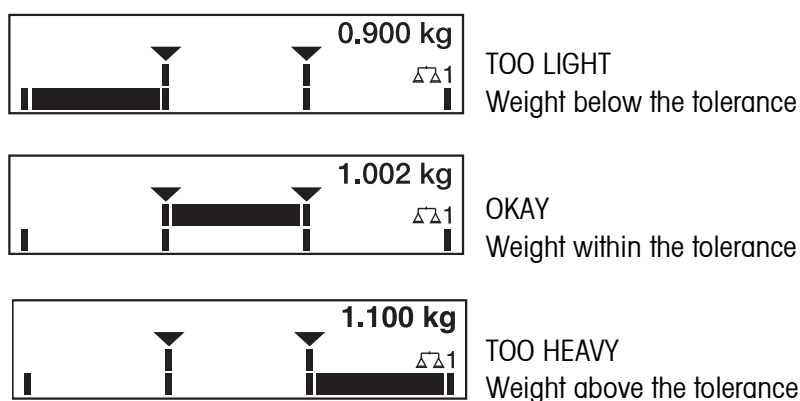
Example: Target weight = 1.000 kg, tolerance = +/-1 %



Application CLASSIFYING

To evaluate test samples as OKAY, TOO LIGHT or TOO HEAVY, based on a target weight and specified +/- tolerances.

Example: Target weight = 1.000 kg, tolerance = +/-1 %



Application CHECKWEIGHING

For determining the difference between the target and actual weight.

Example: Target weight = 1.000 kg, tolerance = +/-1 %

▼▼▼	0.900 kg
DELTA	-0.100 kg ▲▲1

Weight below the tolerance
Difference: -0.100 kg

▼▼▼	1.002 kg
DELTA	+0.002 kg ▲▲1

Weight within the tolerance
Difference: +0.002 kg

▼▼▼	1.100 kg
DELTA	+0.100 kg ▲▲1

Weight above the tolerance
Difference: +0.100 kg

4.1.1 Preset DeltaTrac target values

Enter numerically

1. Press DELT key.
2. Enter target weight and confirm with \leftarrow .
3. Enter the lower tolerance TOL (-) as a % of the target weight and confirm with \leftarrow .
4. Enter the upper tolerance TOL (+) as a % of the target weight and confirm with \leftarrow .

Notes

- The weight unit for entering the DeltaTrac target values can be selected with the cursor keys < or >.
- The terminal suggests symmetrical tolerances TOL. (+) and TOL. (-). However, different tolerances are also permissible.

Correct entry

→ With \textcircled{C} the entry is corrected character by character.

Copy constants

The IND690 weighing terminal has 999 DeltaTrac memories for frequently used target values and tolerances, which are programmed in the master mode.

1. Enter number of DeltaTrac memory: 1 ... 999.
2. Press DELT key.

Reference sample

1. Press DELT key.
2. Lay sample on weighing platform and confirm with $\textcircled{\Delta}$.
3. Only for FILLING and CLASSIFYING: Enter tolerance and confirm with \leftarrow .
4. Remove sample from weighing platform.

Limits	Minimum target value	10 Digit, can be adjusted in master mode, see page 38
	Maximum target value	configured maximum load
	Minimum tolerance	1 Digit
	Maximum tolerance	100 %

Note

If the limits are not observed, a message appears in the display, e.g. MIN-DEL = ..., for too small a target value.

Clear DeltaTrac target value → Press DELT **C** key sequence.
DELTA CLEARED appears briefly in the display, then the weight is shown.

4.2 Dynamic weighing

With the dynamic weighing function you can weigh restless weighing samples, e.g. live animals. To do this, specify the number of weighing cycles for which the mean weight value is to be taken.

1. Set container on the weighing platform.
2. Tare weighing platform.
3. Place weighing sample in container.
4. Press DYN key and enter number of weighing cycles.
Possible values: 1 ... 255.
5. Start dynamic weighing with ←.
6. After cycle time has expired, center line of display shows:
RESULT x.xxxx kg.
This display is retained until the next weighing is started or until it is cleared.

Delete result → Press **C**.

Notes

- Dynamic weighing results are automatically printed when AUTO PRINT is set in the master mode, see page 41.
- During dynamic weighing it is not possible to display the weight value BIG WEIGHT DISPLAY, which fills the entire display.
- Dynamic weighing can also be started with the interface command AW016..., see page 116.

4.3 Change weight unit

If an additional, second weight unit is configured in the master mode, it is possible to switch back and forth between the two weight units.

→ Press UNIT key.
The weight value is shown in the second unit.

Note

Possible second weight units are: mg, g, kg, lb, oz, ozt, dwf.

4.4 Working in a higher resolution

Depending on the setting of the master mode block CONTROL MODE (see page 41), the weight value can be displayed in a higher resolution continuously or when called. Weight values in a higher resolution are marked with a *.

Displaying weight values in higher resolution

→ Press X 10 key.

The weight value is displayed in at least a 10x higher resolution.

The higher resolution is displayed until the X 10 key is pressed again.

Note

With certified weighing platforms, the weight value only appears in a higher resolution as long as the X 10 key is pressed.

4.5 Display gross weight

The gross weight can only be displayed when a tare weight has been saved.

→ Press GROSS key and hold down.

The gross weight is displayed.

4.6 Specifying dynamic set points

Conditions

- 4 I/O-690 interface or 8-690 relay box connected.
- SETPOINT MODE ON is selected and a dynamic switching point is allocated to at least one output in the mastermode.

Use If the specified set point values are exceeded or dropped below, digital outputs are set, e.g. for controlling lamps, flaps, valves etc.


Dynamic set points can be set for each weighing procedure individually.

The set points are retained until they are overwritten with a new value or deleted.

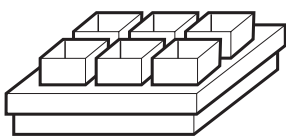
Specifying set points

1. Press the SETP key; the entry prompt for the first dynamic set point appears.
2. Enter the desired weight value and confirm with ↵.
3. If additional dynamic set points are configured, the entry prompt appears for the next dynamic set point.
4. Enter the desired weight value and confirm with ↵.
5. Repeat the procedure until all set points have been entered.

Deleting set points

→ Press the SETP key and delete the value with the .

4.7 Multiplicative tare function



The multiplicative tare function is particularly suitable when pallets with identical containers are filled. If the number of containers and tare of the individual container are known, the weighing terminal calculates the total tare.

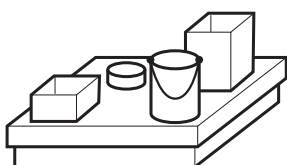
1. Press MUL-T key.
2. Enter known tare weight of individual container and confirm with \leftarrow .
3. Enter number of containers and confirm with \leftarrow .

When the weighing platform is relieved, the total tare value is shown in the display with a negative sign.

Note

The weight unit for entering the tare weight can be selected with the cursor keys < and >.

4.8 Additive tare function



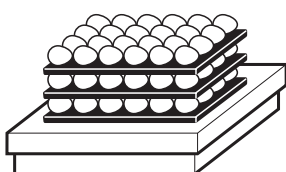
With the additive tare function you can subtract the tare of additional containers with a known tare weight for related weighings, e.g. if containers with different weights are filled on one pallet.

1. Place container on scale and press ADD-T key.
2. Enter known tare weight and confirm with \leftarrow .
The total net weight appears in the weight display.

Note

The weight unit for entering the tare weight can be selected with the cursor keys < or >.

4.9 Sandwich tare



With the sandwich tare function you can detect additional tare weights for related weighings without losing the total gross and total net.

Example

In production or shipping boxes are laid between individual layers in the transport container. The weight of these boxes can be subtracted with this function.

1. Press ITARE key.
2. Place sandwich tare, e.g. box, on scale and confirm with \leftarrow .
The net weight is retained.

4.10 Totalizing

Totalizing is only possible at the IND690-Base without additional software.
The following function keys are available for totalizing:

PLUS	MAN	CANC	SUM	TARG	ITEM
Totalize the items	Totalize manual weight values	Remove the last item from the total	Display and print out the total	Enter the target value for the total	Enter a start and end value for the item counter

4.10.1 Course

- Place an item on the scale.
If the weight exceeds the minimum deflection specified in mastermode, the "+" sign flashes behind the concurrent total.

NO.: 0001 SUM: 1,000 kg+	1,000 kg
---	-----------------

- Press PLUS key.
The item is added to the total and transferred to the printer/PC.
- Totalize further items.
The item counter (NO.) and the transaction number are both increased by 1.

4.10.2 Printing the total and finalising

- Press the SUM key.
The total is displayed and printed out.
- In order to continue with totalizing, press the ← key.
– or –
→ To clear the sum, press the **C** key.
The item counter is reset to the start value.

4.10.3 Manual entry

In order to add known weights to the total proceed as follows:

- Unload the scale and press the MAN key.
- Enter the weight and use the ← key to add to the total.

4.10.4 Totalizing to a target value

If a target value is entered, the TARGET REACHED message is displayed when this weight value is reached.

1. Press the TARG key.
2. Enter the target weight and confirm with \leftarrow .
3. Totalize the items.
4. When the TARGET REACHED message is displayed, finalize the total.

4.10.5 Totalizing with an item counter

The start and end value of the item counter can be specified between 1 and 9999.

1. Press the ITEM key.
2. Enter the start value and confirm with \leftarrow .
3. Enter the end value and confirm with \leftarrow .
4. Totalize the items.
5. When the TARGET REACHED message is displayed, finalize the total.

4.10.6 Cancelling an item

The last added item can be removed from the total.

→ Press the CANC key.

The last item is removed from the total, the item counter is reduced by 1.

4.11 Display ID code and test weighing platform

Each time the weighing platform configuration is changed the ID code counter is increased by 1. On certified weighing platforms the displayed ID code must match the ID code on the ID code sticker, otherwise the calibration is no longer valid.

Display ID code

→ Press $\rightarrow 0 \leftarrow$ and hold until IDENTCODE = ... appears in the display.

Test weighing platform

→ Press $\rightarrow 0 \leftarrow$ again.

The connected weighing platform is checked. The display shows CHECK SCALE and then SCALE IS OK after completing the test.

Note

If weighing platform is defective, display shows SCALE ERROR.

4.12 Identifications

The weighing terminal is equipped with 6 identification data memories for storing identification data Code A ... Code F.

The memories have a name, e.g. Article No., and a content which identifies the current weighing, e.g. 1234567.

The memories are named in the master mode, and the names can be noted on the keyboard. When the CODE keys are pressed, the name appears in the display.

Identification data Code A ... Code F can be entered or recalled for each weighing and are printed immediately.

4.12.1 Enter identification

An identification may contain a maximum of 30 characters.

Enter numerical identification

1. Press one of the keys CODE A ... CODE F.
2. Enter identification data Code A ... Code F via the numeric keypad and confirm with ↵.

Enter alphanumeric identification

1. Press one of the keys CODE A ... CODE F.
The functions keys are given the following assignment:

ABCDE	FGHIJ	KLMNO	PQRST	UVWXY	Z/(-)
Selection of letters A to E	Selection of letters F to J	Selection of letters K to O	Selection of letters P to T	Selection of letters U to Y	Selection of letter Z or a special character

2. Select desired group of letters, e.g. press KLMNO key.
3. Select desired letter.
The display changes again to the above selection.
4. Repeat entry in steps 2 and 3 for additional characters.

Notes

- Letters and numbers can be combined as desired.
- It is possible to switch between upper case and lower case with the cursor keys ^ and v. The following special characters are then also available with the lower case letters: *, \$, %, &.

Recall fixed text memory

The IND690 weighing terminal is equipped with 999 memories for fixed texts which can be programmed in the master mode and used as identifications.

1. Enter memory number: 1 ... 999.
2. Press a key CODE A ... CODE F.
The saved fixed text is now assigned to the selected identification Code A ... Code F.

Other entry possibilities Identifications can also be entered with a barcode or RFID reader, see section 4.15, or with an external keypad, see section 4.16.

4.12.2 Clear identifications

→ Press desired key CODE A ... CODE F and clear memory content with .

4.13 Recall information

On the weighing terminal memory contents and system information can be recalled.

1. Press INFO key.

Then the following function key assignment appears:


DELT	TARE	TEXT	ALIBI	DATE	VERS
Display DeltaTrac values	Display tare weight	Display fixed texts and name of keys CODE A ... CODE F	Recall content of alibi memory, see section 4.18. This selection only appears when Alibi-Memory-690 is installed.	Display date and time	Display version numbers of installed software modules

W&M	ERROR	COM	AB	DNGLE	
Display checksum of the software relevant to calibration. The correct checksum is documented in the calibration approval.	Fault / Event memory display	Calling up the settings of the interfaces	Display designation and contents of application blocks including sub-blocks To access directly first enter the number of the desired application block.	Display of production date, number and type of the hardware dongle	

2. Select desired information.

The information is displayed for the set DISPLAY DURATION, then the weighing terminal changes to the weighing mode again.

Notes

- When several values are displayed, the IND690-Base automatically changes to the next value after the set DISPLAY DURATION.
- With  it is possible to switch to the next value or back to the weighing mode.
- When the GA46 printer is connected, the version numbers of the installed software modules are automatically printed.
- After COM has been pressed, the settings of all 9 interfaces are displayed consecutively, for example
COM1: RS232
MODE: DEFAULT
SETTING: 9600, N, 8, 1
STATUS: ACTIVE

4.13.1 Recall memory

1. Press INFO key.
2. Enter number of memory and press DELT, TARA or TEXT key depending on desired memory.

Recall name of CODE A ... CODE F keys

1. Press INFO key.
2. Press one of the keys CODE A ... CODE F.
The display shows the current Code.

4.13.2 Calling up information on the installed interface modules

Information on the installed interface modules can be called up with the following key combinations:

INFO 50	Type and software version of the installed WLAN module
INFO 51	Status of the WLAN module
INFO 60	Type and software version of the installed Bluetooth module
INFO 61	Status of the Bluetooth module

4.13.3 Recall application-specific information

See operating instructions of the relevant application software.

4.14 Print or transfer data

If a printer or computer is connected, weighing results can be printed out or transferred to the computer.

In the master mode you can set the following for this purpose:

- Data to be printed or transferred,
- Manual or automatic data transfer,
- Key which triggers printing or data transfer.

Factory setting

- Manual triggering with ↵.
- The content of the display is transferred or printed.

4.15 Enter values with barcode or RFID reader

If you have connected a barcode or RFID reader to the weighing terminal, you can make all required entries, such as identifications or target specifications, easily with the barcode or RFID reader.

4.15.1 Read in any desired entries with the barcode or RFID reader

Example Read in identification Code A

1. Press CODE A key; the weighing terminal expects the entry of Code A.
2. Enter identification Code A with the barcode or RFID reader.
The identification read in appears in the display.
3. Confirm barcode entry with ↵.

4.15.2 Read in a frequently used entry directly with the barcode or RFID reader

If your working procedure repeatedly requires the same entry, you can configure the barcode or RFID reader in the master mode (see page 63) so that no additional keys need to be pressed on the weighing terminal.

Example Barcodes are automatically read in as Code A









If the working procedure requires the entry of Code A:

- Enter identification Code A with barcode reader.
The information read in appears in the display and is automatically processed by the weighing terminal as Code A.

4.16 Working with external keypad

If the weighing terminal is equipped with the interface PS2-690, an external keyboard can be connected so that alphanumerical values can be entered conveniently.

In addition to the alpha and numerical keys, the following additional scale functions can also be operated with the external AK-MFII keypad.

Function for IND690-Base	External keypad	Function for IND690-Base	External keypad
Function key F1	F1	CODE A key	Shift F1
Function key F2	F2	CODE B key	Shift F2
Function key F3	F3	CODE C key	Shift F3
Function key F4	F4	CODE D key	Shift F4
Function key F5	F5	CODE E key	Shift F5
Function key F6	F6	CODE F key	Shift F6
 key	F9	 key	Shift F9
 key	F10	 key	Shift F10
 key	F11	 key	Shift F11
 key	F12	 key	Shift F12

Note

The language of your external keyboard can be set in the master mode block LAYOUT EXT. KEYBOARD, see page 68.

4.17 Working with a second display

An ID1 Plus, ID3s, ID7 or another IND690 weighing terminal can be connected to the IND690 weighing terminal as a second display.

Conditions

- Interface CL 20mA-690 installed in passive operating mode (factory setting).
- AUTO-DIR setting selected in master mode (see page 56).
- Weighing terminal is connected as second display with cable 00 504 511.

Operation possibilities on second display

The following functions are also possible on the second display:

- Set to zero
- Taring

IND690 as second display

With IND690 as a second display, the weight value fills the entire display (BIG WEIGHT DISPLAY ON).

4.18 Recall data from Alibi memory

With the AlibiMemory-690 memory module you can fulfill your recording obligations in certified operation without having to archive paper.

AlibiMemory-690 automatically assigns every weighing operation a consecutive data record number that also appears on the printout, saves the net and tare value, the date and the time and also the scale number, tare source, MinWeigh and, if necessary, additional ID codes.

Immediately after the following actions, entries are made in the alibi memory:

- Interface commands "S" and "SX"
- Interface command "SR" as soon as a stable weight value has been determined
- Pressing ←
- Automatic transfer key printout when a certain weight value is reached (AutoPrint)

The AlibiMemory-690 operates according to the principle of a ring memory: When the capacity limit of 675500 data records is reached, the oldest data record is deleted and overwritten with data from the latest weighing.

By entering suitable search criteria you can quickly access the data of a very specific weighing.

4.18.1 Initiate

→ Press INFO, ALIBI key sequence.

The function keys change to the following assignment:

FIND	>>...		PRINT	-> Num	END
Enter search criteria	Search for next matching data record starting with oldest		Print displayed data record	Search for data record with known data record number	Exit Info Alibi and return to normal mode

4.18.2 Fast search with entry of data record number

1. Press ->Num key.
2. Enter number of data record to be searched for and confirm with ←. AlibiMemory-690 now searches for the desired data record.

Notes

- The search may take up to 10 seconds.
- If no data record with the entered number is found, the message NO MATCHING DATA RECORD appears.

4.18.3 Search with other search criteria

→ Press FIND key.

The function keys are given the following assignment:

DATE	TIME	NET	TARE	START	END
Enter date as search criterion	Enter time as search criterion	Enter net value as search criterion	Enter tare value as search criterion	Start search with entered search criteria	Terminate search

All offered search criteria can be combined with each other. The entered search criteria are shown in the display in clear text. This enables you to search for a find a specific weighing.

Enter date

→ Press DATE key and enter complete date in DD.MM.YY form.

Enter time

→ Press TIME key and enter desired time in one of following formats.

Format HH all weighings between HH.00.00 and HH.59.59 are found
 Format HH.MM all weighings between HH.MM.00 and HH.MM.59 are found
 Format HH.MM.SS only the weighing at the time HH.MM.SS is found

Enter net/fare value

1. Press NET or TARE key.
2. Enter weight value and confirm with \leftarrow .
The function key assignment changes back again for selection of the search criteria.

Note

The weight unit for entering the weight values can be selected with the cursor keys < or >.

Start search

- Press START key.
AlibiMemory-690 searches for the oldest data record which meets the entered search criteria.

Notes

- The search may take up to 10 seconds.
- If no data record with the entered values is found, the message NO MATCHING DATE RECORD appears.
- If no search criterion has been entered, the oldest data record is displayed.

4.18.4 Displaying data records

Found data records are shown in the display on 2 pages. You can change between the two pages with the cursor keys < or >.

Example 1st page

D/Z:	02.04.98	09:25:51	1/2
NUM:	000987		
NET:	25.000 KG		ΔΔ 1
TARE:	100,346 KG	PT	

Example 2nd page

ARTICLE NO.	2/2
A: 123456789	
ORDER NO.	
B: 55555	

Scroll forward/back The key >>... enables you to scroll within the found data records.

Notes

- When, during scrolling with the key >>... all entries of the AlibiMemory-690 have been searched through, the message END OF FILE appears.
- If a weight value has fallen below the set minimum weight, the weight value is also shown in the alibi memory with the symbol \leftarrow .

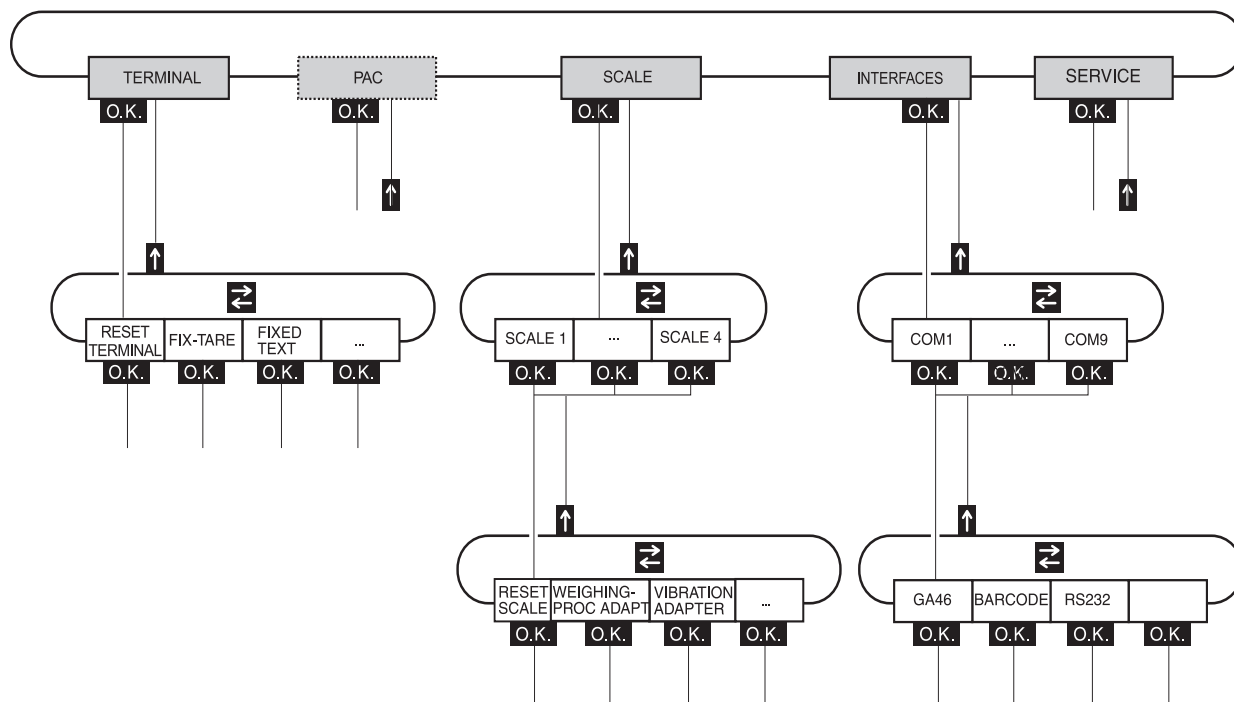
4.18.5 Printing records

1. Press the PRINT key.
2. Press the PRINT key in the next window.
3. Enter the number of the first record to be printed.
4. Enter the number of records to be printed.
5. Enter the output port (COM1 ... COM9).
The selected records are printed at the specified interface.

5 Settings in the master mode

5.1 Overview of the master mode

In the master mode you adapt the IND690-Base weighing terminal to meet your needs. Depending on the configuration, the master mode is divided into 4 or 5 master mode blocks, which are in turn divided into further blocks.



TERMINAL For system settings, such as entering the date and time or loading permanent texts, see section 5.3.

PAC To set application-specific parameters, see operating instructions of the respective application software.
APPLICATION is displayed instead at the IND690-Base, see Section 5.4.

SCALE To select one of the connected weighing platforms. For each selected weighing platform the parameters are then set which concern the weight value, e.g. stability detector, unit, etc., see section 5.5.1.

INTERFACES To select an interface. The communication parameters are then set for each interface, see section 5.6.

SERVICE For configuring the weighing platform(s).
On IDNet weighing platforms only for METTLER TOLEDO service technicians.
On weighing platforms with an analog signal output, see service manual A/D converter Point ME-22004256.

5.2 Operating the master mode

5.2.1 Enter the master mode

1. Press MODE key.
If the current function keys assignment does not contain MODE, press the cursor keys < or > as often as necessary until the MODE key appears.
2. Enter personal code if configured.
The display shows the first master mode block TERMINAL.

5.2.2 Assignment of function keys in the master mode

Assignment on the top level

On the top level of the master mode the function keys are assigned as follows:

←	→		↑	END	OK
Change to previous block within a level	Change to next block within a level		Exit level and return to higher-level block	Exit the master mode and return to normal mode	Recall lower-level block or confirm selection

→ Select the function by pressing the function key.

Example → Press the END key to exit the master mode and return to the normal mode.

When the function keys are otherwise allocated

→ Press the cursor keys < or > repeatedly until the function key assignment shown above appears.

Assignment in input masks

In input masks for several parameters, the function keys are assigned as follows:

↓↑	<	>	F▶	EDIT	↑
Select parameters	Setting parameters		Select function of function key F5: EDIT, STD, ADD, INS, etc.	Possible assignments: ADD INS EDIT DEL PRINT STD EDIT GOTO	Accept settings and return to higher-level block

5.2.3 Master mode operation with the navigation keys

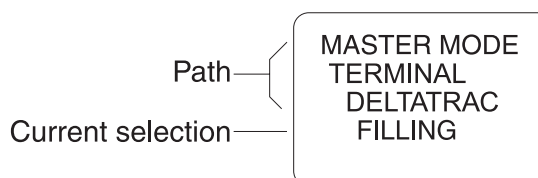
Instead of the function keys, it is also possible to use the navigation keys to operate the master mode.

Function key	Navigation key
F1 (←)	<
F2 (→)	>
F4 (↑)	^
F6 (OK)	↵

5.2.4 Orientation in the master mode

For improved orientation the display shows the last steps in the path of the current master mode block.

Example The upper 3 lines of the display show the following path for selecting the DeltaTrac application FILLING:



5.2.5 Entries in the master mode

The following basic rules apply to entries made in the master mode:

- Confirm (alpha)numeric entries with ↵.
- Alphanumeric entries with the IND690: see page 24.
- To accept the displayed value: Press ↵.

5.2.6 Emergency entrance into the master mode

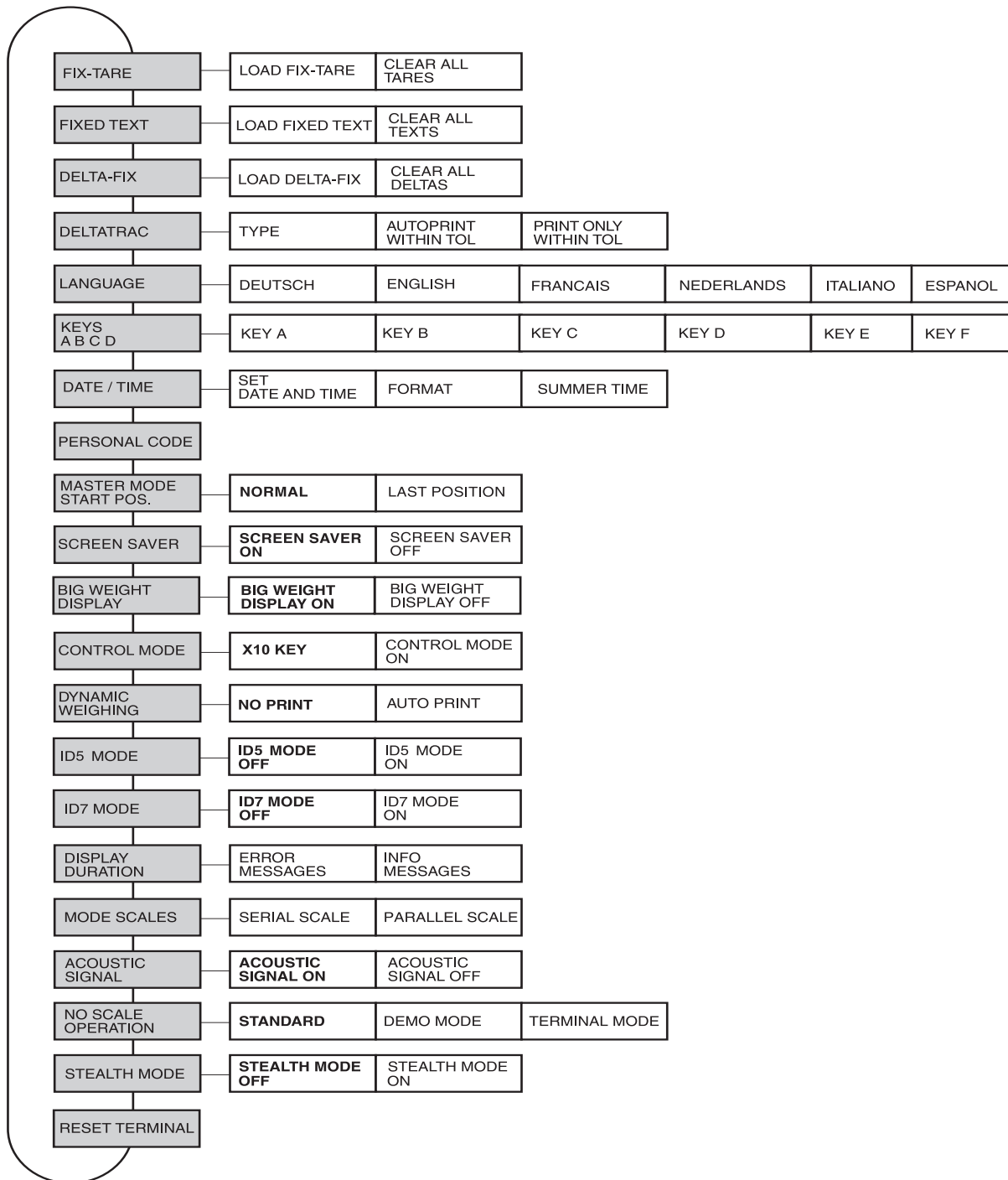
If a personal code has been assigned for entering the master mode and you have forgotten your code, you can still enter the master mode:

→ Enter the character sequence C, L, E, A, R as your personal code.

5.3 TERMINAL master mode block

5.3.1 Overview of the TERMINAL master mode block

In the TERMINAL master mode block you enter the following system settings:



- Legend**
- Blocks highlighted in **grey** are described in detail in the following.
 - Factory settings are printed in **bold print**.

5.3.2 Settings in the master mode block TERMINAL

FIXED TARE	Store tare values in the tare memory as a safeguard against power failure
LOAD FIXED TARE	<ol style="list-style-type: none"> 1. Select memory number with GOTO: 1 ... 999. 2. With ↓↑, change to WEIGHT, press EDIT and enter the tare weight in the unit displayed. 3. With ↓↑, change to TEXT, press EDIT and enter the designation of the tare memory, max. 30 characters. 4. To load additional tare weight constants, press ↓↑ and repeat steps 1 to 3.
DELETE ALL TARES	Delete all tare memories.
Notes	<ul style="list-style-type: none"> • With the cursor keys < or > you can scroll through the existing tare memories. • When entering the tare weight, it is possible to change the weight unit with the cursor keys < or >.

FIXED TEXT	Store texts in the text memory as a safeguard against power failure
	These texts can for example be assigned as identifications or can be additionally output when printing.
LOAD FIXED TEXTS	<ol style="list-style-type: none"> 1. Select memory number with GOTO: 1 ... 999. 2. With ↓↑, change to TEXT, press EDIT and enter the designation of the text memory, max. 30 characters. 3. To load additional fixed texts, press ↓↑ and repeat steps 1 and 2.
DELETE ALL TEXTS	Delete all text memories.
Notes	<ul style="list-style-type: none"> • With the cursor keys < or > you can scroll through the existing text memories. • Fixed text No. 20 is displayed when switching on with a restart, see Page 11.

FIXED DELTA	Store target weight/tolerance combinations in DeltaTrac memories as a safeguard against power failure
LOAD FIXED DELTA	<ol style="list-style-type: none"> 1. Select memory number with GOTO: 1 ... 999. 2. With ↓↑, change to TARGET, press EDIT and enter the target weight in the unit displayed. 3. With ↓↑, change to TOL.(–), press EDIT and enter the lower tolerance in the unit displayed. 4. With ↓↑, change to TOL.(+), press EDIT and enter the upper tolerance in the unit displayed. 5. To load additional DeltaTrac constants, press ↓↑ and repeat steps 1 to 4.
DELETE ALL DELTA	Delete all DeltaTrac memories.
Notes	<ul style="list-style-type: none"> • With the cursor keys < or > you can scroll through the existing DeltaTrac memories. • When entering the target weight and tolerances, it is possible to change the weight unit with the cursor keys < or >. • The terminal suggests symmetrical tolerances TOL. (+) and TOL. (–). However, different tolerances are also permissible.

DELTATRAC	Set DeltaTrac application
TYPE	Select DeltaTrac application
FILLING	Weigh in target weight within a tolerance range (factory setting)
CLASSIFYING	Evaluate the test samples as good, too light or too heavy based on the target weight and tolerance
CHECKWEIGHING	Determine difference between target and actual weight
AUTO PRINT WITHIN TOL	Automatic printout when actual weight lies within the specified tolerance
PRINT ONLY WITHIN TOL	Printout only when actual value lies within the specified tolerance
MIN. DELTA	Specify minimum target weight, adjustable from 10 ... 100 d, factory setting: 40 d

LANGUAGE	Select dialog language
	Possible settings: German, English, French, Dutch, Italian, Spanish

KEYS A B C D E F	Name identification keys CODE A ... CODE F
KEY A (B, C, D, E, F)	Identification data CODE A (CODE B, CODE C, CODE D, CODE E, CODE F)
TEXT	Naming the ID key
LENGTH	Max. 30 characters possible, factory setting: 20 characters
REQUEST FOR INPUT	Set request for input for the selected key Possible settings:
	OFF CODE A (CODE B, CODE C, CODE D, CODE E, CODE F) does not have to be entered
	RENEW A new identification must be entered for every weighing
	REUSE An identification can be used for several weighings

DATE / TIME	Enter date and time
SET DATE AND TIME	
DATE	Enter date in the displayed format
TIME	Enter time in the displayed format
FORMAT	
DATE	Select date format Possible settings: DD.MM.YY (factory setting), MM.DD.YY, YY.MM.DD, DD.MM.YYYY, MM.DD.YYYY, YYYY.MM.DD
SEP	Select separating character in date format Possible settings: "." (factory setting), ":", "/", "-"
TIME	Select time format Possible settings: HH:MM:SS 24 h (factory setting), HH:MM:SS 12 h, HH:MM 24 h, HH:MM 12 h
SEP	Select separating character in time format Possible settings: ":" (factory setting), "."

DATE / TIME	Enter date and time
SUMMER TIME	
SUMMER TIME OFF	No automatic changeover to summer time
SUMMER TIME ON	Configure automatic changeover to summer time Other settings, factory settings in brackets: START WEEKDAY (Sunday) WEEK (4) MONTH (MARCH) TIME (2:00) END WEEKDAY (Sunday) WEEK (4) MONTH (October) TIME (03:00:00)

PERSONAL CODE	Load or delete code for entering the master mode
CODE	Enter code with a maximum of 8 alphanumeric characters.
Comment	<ul style="list-style-type: none"> • If no code is entered, access to the master mode is unrestricted. • The personal code can be entered as ASCII characters (default), hexadecimal code (activation using the IDENT E key) or decimal code (activation with the IDENT F key).

MASTER MODE START POS.	Select start position for entering the master mode
NORMAL	Selection of the master mode blocks always begins with the TERMINAL block (factory setting).
LAST POSITION	When entering the master mode, the last block edited is displayed immediately.

SCREEN SAVER	Switch screen saver on or off
WAITING TIME	Enter time until screen saver is activated. Possible values: 1 ... 60 minutes
Comment	To hold all display elements at the same luminosity, we recommend not switching off the screen saver.

BIG WEIGHT DISPLAY	Switch full-display indication of the weight on or off
	Factory setting: BIG WEIGHT DISPLAY ON

CONTROL MODE	Adjust control mode
X10 KEY	Activation of control mode with X10 key (factory setting).
CONTROL MODE ON	This setting is only possible with non-certified scales. The weighing terminal always operates with the higher resolution.

DYNAMIC WEIGHING	Set printing during dynamic weighing
NO PRINT	Results during dynamic weighing are not automatically printed out (factory setting).
AUTO PRINT	Each result during dynamic weighing is automatically printed. Dynamic weights are marked with "Result:" on the printout.

ID5 MODE ID7 MODE	Deactivating or activating downward compatibility with ID5 or ID7
	If ID5 MODE ON or if ID7 MODE ON is selected, the IND690 is operated with downward compatibility to the ID5 or ID7. This also applies to the other application pacs. For details please contact the METTLER TOLEDO customer service. Factory setting: ID5 MODE OFF, ID7 MODE OFF

DISPLAY DURATION	Set display duration for messages
ERROR MESSAGES	Set display duration for error messages; factory setting: 2 seconds
INFO MESSAGES	Set display duration for informational messages; factory setting: 3 seconds
STATUS MESSAGES	Set the display duration for status messages, factory setting: 3 seconds

MODE SCALES	Select between serial and parallel operating mode for the connected scales
SCALES SERIAL	Serial operation of the connected scales: Only the weight value of the current scale is displayed.
SCALES PARALLEL SUM SCALE	Parallel operation of the connected scales: All weight values of the connected scales are displayed simultaneously. A sum scale can be defined in parallel scale operation. 1. SUM SCALE: Select ACTIVATED. 2. With \uparrow , change to SCALE 1 and select YES with < or > if this scale is to be the sum scale. 3. Repeat the procedure for SCALE 2 - SCALE 4. Factory setting: SUM SCALE DEACTIVATED

ACOUSTIC SIGNAL	Signal tone On/Off
	Factory setting: SIGNAL ON

OPERATION WITHOUT SCALE	Set the behaviour when the weighing terminal is operated without a scale
	IND690 searches for connected weighing platforms while booting. If no scale is found, the following behaviour patterns are possible.
STANDARD	If no scale is found, the booting process stops and the message NO SCALES DETECTED is displayed (factory setting). To continue the booting process press the SCALE key. During operation a virtual scale is shown whose weight value can be changed and which otherwise behaves like a "real" scale.
DEMO	If no scale is found, the message NO SCALES DETECTED is displayed briefly. During operation a virtual scale is shown whose weight value can be changed and which otherwise behaves like a "real" scale.
TERMINAL	If no scale is found, the message NO SCALES DETECTED is displayed briefly. A scale is not displayed during operation, the message TERMINAL is shown. All the scale-specific functions, keys and application blocks are deactivated.

STEALTH MODE	Switch the scale on/off without weight display
	Under certain circumstances, such as high quality goods or top secret recipes, working without a weight display may be desirable. The DeltaTrac is then the only filling aid.
DELTATRAC	Select the display behaviour of the DeltaTrac optical weighing aid
STANDARD	"Normal" DeltaTrac, high resolution in the range of the target weight
LINEAR	The optical weighing aid behaves linearly to the weighed-in weight
STANDARD-I	The display behaviour of the DeltaTrac is inversely to that of the "normal" DeltaTrac
Comment	STEALTH MODE can only be activated at non-certifiable scales.

RESET TERMINAL	Reset all terminal functions to the factory setting
	DELTATRAC Filling Autoprint within tol: no Print only within tol: no Min.Delta = 40 d DATE/TIME Format = DD.MM.YY / HH:MM:SS 24h Summertime: off MASTER MODE START POS. Normal SCREENSAVER ON BIG WEIGHT DISPLAY On DYNAMIC WEIGHING No printout CONTROL MODE X 10 key ID5 MODE Off ID7 MODE Off DISPLAY DURATION 2 / 3 seconds MODE SCALES Serial ACOUSTIC SIGNAL on OPERATION WITHOUT SCALE Standard STEALTH MODE Off
Comment	The memories are not affected by this.

5.4 APPLICATION master mode block

This block is only displayed at the IND690-Base.

TOTALIZING	Adapting the totalizing function
	If TOTALIZING ON is selected, the following setting options are displayed.
FUNCTION KEYS	Displaying/hiding the function keys permitted for totalizing
TARG	Display/hide the TARG key
MAN	Display/hide the MAN key
CANC	Display/hide the CANC (cancel) key
ITEM	Display/hide the ITEM (item counter) key
MINIMUM DEFLECTION	Entry of the minimum deflection that has to be exceeded so that the next item can be totalized. Possible settings: 1 ... 999 d Factory setting: 10 d
TRANSACTION NUMBER	The transaction number is increased by 1 at every totalization. When the transaction number has reached 999 999, it begins again at 000 001. Nonetheless the transaction number in this block can be set to a specific value.
SCQ FUNCTION	Recording of the mean value standard deviation, minimum and maximum Factory setting: SCQ FUNCTION OFF
RESET APPLICATION	Reset the TOTALIZING function to the factory setting

5.5 SCALE master mode block

The weighing platform is selected in the first block: SCALE 1 ... SCALE 4 and SCALE Σ for IND690 or SCALE 1 ... SCALE 3 and SCALE Σ for IND690xx and IND690-24V.

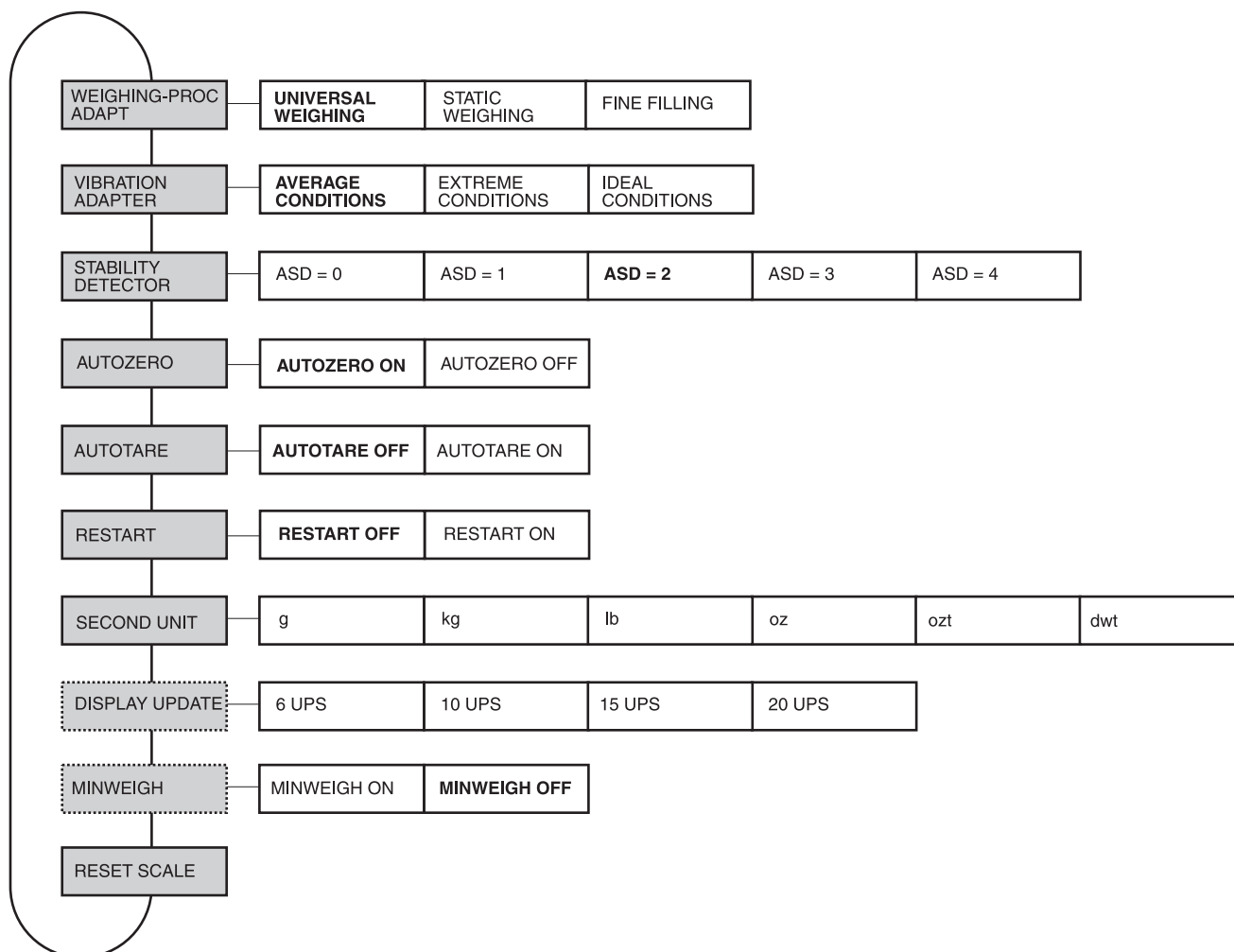
The SCALE master mode block depends on the connected weighing platform.

METTLER TOLEDO industrial scales	see Section 5.5.1
METTLER TOLEDO SICS scales	see Section 5.5.2
LabTec X-/XP-/XS scales	see Section 5.5.3
WM/WMH scales	see Section 5.5.4
Sum scale	see Section 5.5.5

5.5.1 SCALE master mode block for METTLER TOLEDO industrial scales

Overview

In the SCALE master mode block the following settings for the weight can be carried out:



- Legend**
- Blocks highlighted in **grey** are described in detail in the following.
 - Factory settings are printed in **bold print**.
 - Blocks which only appear under certain conditions have a **dotted outline**.

Settings

WEIGHING-PROC ADAPT	Adapt weighing platform to weighing sample
UNIVERSAL WEIGHING	For solid bodies, coarse filling or checkweighing (factory setting).
STATIC WEIGHING	For solid bodies and weighing under extreme conditions, e.g. strong vibrations or weighing animals.
FINE FILLING	For liquid or powdered weighing samples.

VIBRATION ADAPTER	Adapt weighing platform to the vibration influences of the environment
AVERAGE CONDITIONS	Factory setting.
EXTREME CONDITIONS	The weighing platform operates more slowly, however is less sensitive, e.g. suitable with building vibrations and vibrations at the weighing location.
IDEAL CONDITIONS	The weighing platform operates very quickly, however is very sensitive, e.g. suitable with very calm and stable weighing location.

STABILITY DETECTOR	Adapt automatic stability detector
	<p>Possible settings:</p> <p>ASD = 0 Stability detector switched off (only possible with non-certified weighing platforms)</p> <p>ASD = 1 fast display good reproducibility</p> <p>ASD = 2 ▲ ▼ (factory setting)</p> <p>ASD = 3 ▲ ▼</p> <p>ASD = 4 slow display very good reproducibility</p>


AUTOZERO	Switch automatic zero-point correction on or off
	<p>The automatic zero-point correction corrects the weight of minor dirt with the weighing platform unloaded.</p> <p>Factory setting: AUTOZERO ON</p>
Comment	On certified weighing platforms the zero-point correction is always switched on.

AUTOTARE	Configuring automatic taring
AUTO SET TARE	Activate/deactivate automatic taring
OFF	No automatic taring, factory setting
ON	Taring when the weight threshold is exceeded
AUTO CLEAR TARE	Activate/deactivate automatic clearing of the tare
OFF	No automatic clearing of the tare weight, factory setting
ON	Delete the tare automatically when the weight drops below the weight threshold
THRESHOLD	Entry of the weight threshold at which taring or tare clearing is carried out. Possible settings: 1 d ... 99 d, factory setting: 10 d

RESTART	Switch restart function on or off
	When RESTART ON is set, the zero point and tare value remain stored after the power supply is interrupted. When the weighing platform is switched on again, the terminal shows the current weight. Factory setting: RESTART OFF

SECOND UNIT	Select second weight unit																					
	Possible units: g, kg, lb, oz, ozt, dwt																					
	<table border="1"> <thead> <tr> <th>Unit</th> <th>Abbreviation</th> <th>Conversion to g</th> </tr> </thead> <tbody> <tr> <td>Kilogram</td> <td>kg</td> <td>= 1000 g</td> </tr> <tr> <td>Pound</td> <td>lb</td> <td>≈ 453.59237 g</td> </tr> <tr> <td>Ounce</td> <td>oz</td> <td>≈ 28.349523125 g</td> </tr> <tr> <td>Troy Ounce</td> <td>ozt</td> <td>≈ 31.1034768 g</td> </tr> <tr> <td>Pennyweight</td> <td>dwt</td> <td>≈ 1.555173843 g</td> </tr> <tr> <td>Gram</td> <td>g</td> <td>= 1 g</td> </tr> </tbody> </table>	Unit	Abbreviation	Conversion to g	Kilogram	kg	= 1000 g	Pound	lb	≈ 453.59237 g	Ounce	oz	≈ 28.349523125 g	Troy Ounce	ozt	≈ 31.1034768 g	Pennyweight	dwt	≈ 1.555173843 g	Gram	g	= 1 g
Unit	Abbreviation	Conversion to g																				
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Troy Ounce	ozt	≈ 31.1034768 g																				
Pennyweight	dwt	≈ 1.555173843 g																				
Gram	g	= 1 g																				
Comment	On certified weighing platforms only the units permitted by certification appear.																					

DISPLAY UPDATE	Set display speed of the weight display
	Select number of updates per second (UPS). Possible values: 6, 10, 15, 20 UPS
Comments	<ul style="list-style-type: none"> This block only appears when the DISPLAY UPDATE function is supported by the connected weighing platform. The possible settings are dependent on the connected weighing platform.

MINWEIGH	Configure minimum weighing-in quantity
MINWEIGH ON	In this setting, the blinking symbol  appears in the display when the weight on the scale falls below the stored minimum weight.
TYPE	<p>Determining the minimum weight:</p> <p>CALCULATED The minimum,5 weight is calculated:</p> <p>U_0 Measurement uncertainty when the load approaches 0.</p> <p>TOL Required tolerance</p> <p>SF Safety factor</p> <p>MINWEIGH Calculated value based on the parameters entered above</p> <p>DIRECT Enter MINWEIGH value directly</p>
MINWEIGH OFF	No monitoring of the minimum weighing-in quantity (factory setting)
Comment	MINWEIGH is only available if monitoring of the minimum weighing-in quantity is activated in service mode.

RESET SCALE	Reset weighing platform to factory setting
	WEIGHING-PROC ADAPT universal weighing
	VIBRATION ADAPTER average conditions
	STABILITY DETECTOR ASD = 2
	AUTOZERO on
	AUTOTARE off
	RESTART off
	MINWEIGH off

5.5.2 SCALE master mode block at SICS scales

Only the following settings for the weight value can be carried out at METTLER TOLEDO SICS scales:

SCALE	Settings for the weighing value at SICS scales
AUTOTARE	For details see Section 5.5.1
SECOND UNIT	
MINWEIGH	

5.5.3 SCALE master mode block at LabTec X-/XP-/XS scales

The following settings for the weight value can be carried out at METTLER TOLEDO LabTec X-/XP-/XS scales:

SCALE	Settings for the weighing value at LabTec X-/XP-/XS scales
WEIGHING MODE	For details see below
CONDITIONS	
MEASURED VALUE ENABLE	
TEST WEIGHT	
TEST CALIBRATION	
AUTOZERO	For details see Section 5.5.1
AUTOTARE	
RESTART	
SECOND UNIT	
DISPLAY UPDATE	
MINWEIGH	Display update is set fixed to 10 UPS

WEIGHING MODE	Adapt the weighing platform to the weighing sample
UNIVERSAL	For all the common weighing processes
FILLING	For liquid or powdered weighing sample
SENSOR MODE	Supplies a weighing signal that is filtered to different degrees depending on the setting of the ambient conditions. The filter behaves linearly (not adaptatively) with regard to time and is suitable for continuous measured value processing
CHECK WEIGHING	The scale only reacts to larger weight changes, the weighing result is very stable

CONDITIONS	Adapt the weighing platform to the conditions
STANDARD	Normal conditions, factory setting
RESTLESS	The scale operates slower, but is less sensitive. Suitable, for example, for building oscillations and vibrations at the weighing location
VERY RESTLESS	The scale operates very slowly, but is even less sensitive. Suitable, for example, for strong building oscillations and extreme vibrations at the weighing location
CALM	The scale operates very fast, but is very sensitive. Suitable, for example, for a very calm and stable weighing location

MEASURED VALUE ENABLE	Adapt the reproducibility	
VERY FAST	Rapid display	good reproducibility
FAST	▲	▼
RELIABLE + FAST	▲	▼ (factory setting)
RELIABLE	▲	▼
VERY RELIABLE	Slow display	excellent reproducibility

TEST WEIGHT	Test weight used to check the calibration
SET EXT CALIBRATION WEIGHT	Enter the weight value of the external calibration weight

TEST CALIBRATION	Settings used to check the calibration
CALIBRATION WEIGHT	
INTERNAL	Checking with the internal calibration weight
EXTERNAL	Checking with external calibration weights as entered under TEST WEIGHT External calibration weights are not possible at certified scales
Comment	For the course and starting refer to the LabTec X-/XP-/XS scales documentation

5.5.4 SCALE master mode block at WM/WMH scales

The following settings can be carried out at METTLER TOLEDO WM/WMH scales:

SCALE	Settings at WM/WMH scales
DIRECT TALK	For details, see the next page
REMOTE TALK	
TEST WEIGHT	For details see Section 5.5.3
TEST CALIBRATION	
AUTOZERO	For details see Section 5.5.1
AUTOTARE	
RESTART	
SECOND UNIT	
DISPLAY UPDATE	Display Update can be configured using "Direct talk"
MINWEIGH	

DIRECT TALK	Direct communication between IND690 and WM/WMH scale
	<p>When DIRECT TALK is activated, commands can be entered and sent to the WM/WMH scale by using the SEND function key.</p> <p>In weighing mode the following information is displayed: SEND sent command RCVD answer received from the WM/WMH scale</p> <p>The possible commands are described in the WM/WMH operating instructions.</p>

REMOTE TALK	Configuration at the PC, display at the IND690
	<p>When REMOTE TALK is activated, commands to the WM/WMH scale have to be processed on a PC.</p> <p>In weighing mode the following information is displayed: SENT sent command RECD answer received from the WM/WMH scale</p> <p>Start command: RTS_x, whereby x is the scale number End command: RTE</p> <p>The possible commands are described in the WM/WMH operating instructions.</p>

5.5.5 SCALE master mode block Σ

SCALE Σ	Setting a sum scale
SCALE RESOLUTION	Select the scale resolution of the sum scale
METROLOGICAL	The sum scale resolution corresponds to the coarsest scale involved or the coarsest weighing range respectively
MATHEMATICAL	The weight values are totalized mathematically correctly
CALCULATION	Calculation basis for the total
NORMAL	The displayed weight values are added
HIGHRES	The high-resolution weight values are added

5.6 INTERFACE master mode block

Select the interface connection

- Select the interface connection in the first block:
COM1 ... COM9.

Select interface type

- Specify the interface type for the selected interface connection COM1 ... COM9.

COM1 ... COM9	
NOT ASSIGNED	If the selected interface connection is not assigned.
GA46	For connecting the printer GA46/GA46-W. The data is exchanged via an RS232 interface. The other setting possibilities are described in the operating and installation instructions GA46.
BARCODE RFID	For connecting a barcode or RFID reader. The data is exchanged via an RS232 interface. For additional settings, see Section 5.6.2.
RS232	This requires an RS232 interface to be connected at the selected interface connection. For additional settings, see Section 5.6.1.
IDNET SCALE	Only for COM2 ... COM5 (IND690) or for COM2 ... COM4 (IND690xx, IND690-24V) This requires an interface IDNet-690 to be installed at the selected interface connection. For additional settings in the master mode block SCALE, see Section 5.5.
ANALOG SCALE	Only for COM2 ... COM5 (IND690) or for COM2 ... COM4 (IND690xx, IND690-24V) This requires an interface AnalogScale-690 to be installed at the selected interface connection. For additional settings in the master mode block SCALE, see Section 5.5.
SICS SCALE	Only for COM2 ... COM5 (IND690) or for COM2 ... COM4 (IND690xx, IND690-24V) This requires an interface SICS-Scale-690 to be installed at the selected interface connection. When SICS SCALE is selected, the following default settings are set: SICS mode, 9600 baud, 8 data bits, 1 stop bit, no parity. For additional settings, see Section 5.6.1.
ALIBI MEMORY	Only for COM2 ... COM9. This requires an AlibiMemory-690 to be installed at the selected interface connection. For additional settings, see Section 5.6.3.
CL20MA	Only for COM2 ... COM9. This requires an interface CL20mA-690 to be installed at the selected interface connection. For additional settings, see Section 5.6.1.

COM1 ... COM9	
RS422 RS485	Only for COM2 ... COM9. This requires an interface RS485/422-690 to be installed at the selected interface connection. For additional settings, see Section 5.6.1.
4 I/O	Only for COM5/COM6. This requires an interface 4 I/O-690 with a relay box 4-690 to be installed at the selected interface connection. For additional settings, see Section 5.6.4.
RELAY BOX 8	Only for COM2 ... COM9. This requires an interface RS485/422-690 with a relay box 8-690 to be installed at the selected interface connection. For additional settings, see Section 5.6.4.
ARM100	Only for COM2 ... COM9. This requires an interface RS485/422-690 with ARM100 to be installed at the selected interface connection. For additional settings, see Section 5.6.4.
ANALOG OUTPUT	Only for COM5/COM6. This requires an interface AnalogOut-690 to be installed at the selected interface connection. For additional settings, see Section 5.6.6.
ETHERNET	Only for COM2 ... COM9. This requires an interface Ethernet-690 to be installed at the selected interface connection. For additional settings, see Section 5.6.7.
PROFIBUS-DP	Only for COM2 ... COM9. This requires an interface ProfibusDP-690 to be installed at the selected interface connection. For additional settings, see Section 5.6.8.
WLAN	Only for COM2 ... COM9. This requires an interface WLAN-690 to be installed at the selected interface connection. For additional settings, see Section 5.6.9.
BLUETOOTH	Only for COM2 ... COM9. This requires an interface Bluetooth-690 to be installed at the selected interface connection. For additional settings, see Section 5.6.10.
BT-BLD DISPLAY	Only for COM2 ... COM9. For direct connection of the "BLD Display" as a second display. This requires an interface Bluetooth-690 to be installed at the selected interface connection. For additional settings, see Section 5.6.10.

COM1 ... COM9	
BT-P42	<p>Only for COM2 ... COM9. For direct connection of the "BT-P42" printer. This requires an interface Bluetooth-690 to be installed at the selected interface connection.</p> <p>For additional settings, see Section 5.6.10.</p>
BT-BARCODE	<p>Only for COM2 ... COM9. For connection of a Bluetooth barcode reader. This requires an interface Bluetooth-690 to be installed at the selected interface connection.</p> <p>For additional settings, see Section 5.6.10.</p>
BT-SICS SCALE	<p>Only for COM2 ... COM5 (IND690) or for COM2 ... COM4 (IND690xx, IND690-24V) This requires an interface Bluetooth-690 to be installed at the selected interface connection.</p> <p>When SICS SCALE is selected, the following default settings are set: SICS mode, 9600 baud, 8 data bits, 1 stop bit, no parity.</p> <p>For additional settings, see Section 5.6.10.</p>
USB	<p>Only for COM2 ... COM9.</p> <p>This requires an interface USB-690 to be installed at the selected interface connection.</p> <p>For additional settings, see Section 5.6.1.</p>
KEYBOARD PS2	<p>For connecting an external keyboard.</p> <p>Only for COM9.</p> <p>This requires an interface PS2-690 to be installed at COM9.</p> <p>For additional settings, see Section 5.6.5.</p>

5.6.1 Settings in the master mode blocks RS232, RS422, RS485, CL20mA, USB

RS232, RS422, RS485, CL20mA, USB	
OPERATING MODE	This selection only appears with the RS485 master mode block.
1:1 CONNECTION	Weighing terminal and peripheral are directly connected.
BUS SLAVE	For operating the weighing terminal in a bus system. The following parameters are set automatically for the dialog: No handshake, no continuous transmission, no transfer string, fixed string framing $C_{R}L_F$. The PC is the master, the terminals act as slaves and only transmit when requested to do so by the master. The master must also wait until after sending out a command until the slave's answer is received. Each terminal must be assigned a unique address. Additional setting: ENTER TERMINAL ADDRESS. Possible addresses: 1 ... 31
COMMUNICATION	Set communication parameters (factory settings are shown in bold print). All parameters are shown on a display page and can be set there; for function key assignment, see page 59.
BITS PER CHARACTER	Possible settings: 7 bits, 8 bits
STOPBITS	Possible settings: 1 stop bit , 2 stop bits
PARITY	Possible settings: Parity even, parity odd, parity space, parity mark, no parity
BAUDRATE	Possible settings: 150, 300, 600, 1200, 2400, 4800, 9600 , 19200, 38400, 57600 baud
MODE	Set operating mode. This selection does not appear when interface RS485/422-690 is operated in the BUS SLAVE operating mode.
STANDARD SETTING	Set operating mode to factory setting: MMR dialog mode, no handshake, no auto transmission (no continuous transmission), transfer string: Standard, string framing: $C_{R}L_F$
DIALOG MODE	For dialog between weighing terminal and computer. For other settings see next section.
PRINT MODE	To print weighing data, e.g. on a form printer. For other settings see page 58.

Set dialog mode

DIALOG MODE	Set dialog between weighing terminal and computer
<p>MMR</p> <p>HANDSHAKE</p> <p>AUTOMATIC CONTINUOUS TRANSMISSION</p> <p>TRANSFER STRING</p> <p>STRING FRAMING</p>	<p>For information on dialog mode with the MMR command set, see page 78. All parameters are shown on a display page and can be set there.</p> <p>Possible settings:</p> <ul style="list-style-type: none"> • NO HANDSHAKE • CL HANDSHAKE – for additional information on the CL handshake, see page 128. • XON-XOFF PROTOCOL. <p>This block does not appear with the RS485/422-690 interface.</p> <p>Possible settings:</p> <ul style="list-style-type: none"> • NO AUTO TRANSMISSION. • AUTO SIR – after each measuring cycle a stabilized or dynamic weight is transmitted. • AUTO DIR – weight values are transmitted as with AUTO SIR and additionally, the special characters in the display are transmitted for a second display. Fixed communications parameters: 9600 baud, 7 data bits, 2 stop bits, parity even • AUTO SR – after each weight change which is greater than the set value, a motionless weight value and then a dynamic weight value are sent <p>This block does not appear with the RS485/422-690 interface.</p> <p>Possible settings:</p> <ul style="list-style-type: none"> • STANDARD – gross, net, tare • OPTION 082/083 – gross, net, tare in GNT form, see operating instructions, Option 082. • USER-DEFINED – enter numbers of the application blocks which are to be transmitted or printed out. <p>Possible settings (factory settings are printed in bold print):</p> <ul style="list-style-type: none"> • CR Yes/No • LF Yes/No • <STX>---<ETX> Yes/No • BLOCK CHECK CHAR Yes/No
<p>SICS</p> <p>STANDARD</p> <p>HANDSHAKE</p> <p>AUTOREPEAT</p>	<p>Dialog mode with Standard Interface Command Set (SICS), see page 91.</p> <p>Standard setting: no handshake, no auto transmission.</p> <p>Possible settings as MMR, see above.</p> <p>Possible settings as MMR, see above.</p> <p>AUTO-DIR not possible with SICS.</p>

DIALOG MODE	Set dialog between weighing terminal and computer
<p>TOLEDO CONTINUOUS</p> <p>TRANSFER RATE</p> <p>CHECKSUM ON</p> <p>CHECKSUM OFF</p> <p>WEIGHT FORMAT</p>	<p>For the continuous transmission of net and tare values to METTLER TOLEDO devices, e.g. to a second display. For a description, see page 89. This block does not appear with the RS485/422-690 interface.</p> <p>Set the data transfer rate Possible settings: 25%, 33%, 50%, 100% Factory setting: 100%</p> <p>Checksum byte active, factory setting</p> <p>Checksum byte inactive, the transfer format is shortened by 1 character.</p> <p>Possible settings:</p> <ul style="list-style-type: none"> • Leading zeroes (factory setting) • Leading blanks
<p>TOLEDO SHORT CONTINUOUS</p> <p>TRANSFER RATE</p> <p>CHECKSUM ON</p> <p>CHECKSUM OFF</p> <p>WEIGHT FORMAT</p>	<p>For the continuous transmission of net values to METTLER TOLEDO devices, e.g. to a second display. For a description, see page 89. This block does not appear with the RS485/422-690 interface.</p> <p>Set the data transfer rate Possible settings: 25%, 33%, 50%, 100% Factory setting: 100%</p> <p>Checksum byte active, factory setting</p> <p>Checksum byte inactive, the transfer format is shortened by 1 character.</p> <p>Possible settings:</p> <ul style="list-style-type: none"> • Leading zeroes (factory setting) • Leading blanks
<p>PE SEND CONTINUOUS</p>	<p>For connecting a PE balance as a reference balance, only with IND690-Count and Interface CL20mA-690.</p>
<p>SECOND DISPLAY</p>	<p>Used to connect an IND4xx terminal as a second display</p>

Set print mode

PRINT MODE	Configure printout on an external printer
HANDSHAKE	Possible settings: <ul style="list-style-type: none"> • NO HANDSHAKE • XON-XOFF PROTOCOL
LINE LENGTH	Enter number of characters per line. Possible settings: 1 ... 240 characters Factory setting: 40 characters
LINE FRAMING	Enter ASCII character for line framing. Possible settings: ASCII 0 ... 255 Factory setting: ASCII 013 010 (C _R L _F)
REPORT TYPE	Assignment of one of two possible printout formats to the configured printer. Possible settings: <ul style="list-style-type: none"> • REPORT TYPE A e.g. for barcode printer • REPORT TYPE B e.g. for A4 printer
CONFIGURATION PRINTOUTS TRANSFER KEY CODE A KEY ... CODE F KEY DYNAMIC KEY PAC KEYS	Configuration of the printouts assigned to the individual keys. For each offered key, the current configuration can be printed out with the key sequence CHANGE CONFIGURATION, F▶ (possibly several times) and PRINT. Configuration options: <ul style="list-style-type: none"> • CHANGE CONFIGURATION See next section • DEFAULT SETTING Key-specific, if existent • DELETE ALL All blocks of the data string are deleted • PAPER FEED Adjustment range: 0 ... 9 lines • REPORT ON/OFF Switch key printout on/off • # OF COPIES Setting range: 1 ... 9 copies Factory setting: 1 copy Only for the transfer key : <ul style="list-style-type: none"> • PRINT INTERLOCK Prevents the same article from being weighed several times • ZERO LIMIT The weighing platform has to be unloaded at least under the zero limit before a new article can be weighed Setting range: 1 ... 99 d Factory setting: 10 d • MIN. DEFLECTION The weighing platform has to be deflected by at least the minimum deflection before the new article is weighed Setting range: 1 ... 99 d Factory setting: 30 d

PRINT MODE	Configure printout on an external printer
AUTOMATIC PRINTOUT	Switch automatic printout for transfer key on/off. When AUTO PRINTOUT ON is selected, a printout for the transfer key is automatically created for each weight change > x digits. Possible settings: 1 ... 255 digits (factory setting: 30 digits)
DECIMAL FORMAT DOT (.) COMMA (,)	Decimal display Decimal point (factory setting) Decimal comma
PRINT LIST COMPLETE LIST LIST AB LIST SCALE LIST INTERFACES LIST KEY CONFIGURATIONS	Print settings Print a complete list of all the parameters Print only application blocks Print only the scale parameters Print only the interface parameters Print only the key configurations

Change configuration

Function keys The function keys are assigned in CHANGE CONFIGURATION as follows:

	<	>	F▶	ADD	↑
	Display previous entry	Display next entry	Select function of function key F5: ADD, INS etc.	ADD INS EDIT DEL PRINT	Return to next highest level; changes are not saved

The printout can be edited with function key F5:

ADD	Adds a new entry at the end of the printout.
INS	Inserts a new entry in front of the displayed entry.
EDIT	Changes into the EDIT mode for the displayed entry to edit the entry.
DEL	Deletes the displayed entry.
PRINT	Creates a key printout.

EDIT mode

Function keys The following function keys are available in the EDIT mode:

<->	<	>	F▶	SAVE	↑
Select parameters	Set parameters, scroll back	Set parameters, scroll forward	Select function of function key F5: SAVE, EDIT	Confirm changes and return to higher level	Cancel EDIT mode and return to higher level; changes are not saved

Display page The setting of the parameters of an entry appears in a clear layout on a display page (example):

TRANSFER KEY	[EDIT]	(2/7)
TYPE: AB		STYLE: <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
CRLF: YES	FILL: NO	PAD: 01
DATA:		011-013

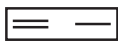
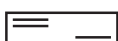

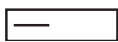
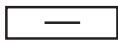
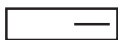
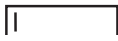
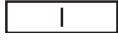

First display line Information for orientation in an entry

- Key name
- Mode: EDIT, INS or ADD
- Number of the display entry and total number of entries for the current printout.

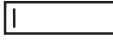


TYPE parameter Selection possibilities:

AB	Output content of an application block with or without designation
TEXT	Print out any desired text
CHRn	Insert n of any desired ASCII characters in the line, e.g. for tables; selection of character via DATA parameter
LINE	Blank line or separator line with any desired alphanumeric characters
DB	Accesses a database field. When a field is printed out, all entries of the field are listed. The option DB is only available when the software application supports access to a database. The offered database fields are application-specific.



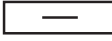
STYLE parameter STYLE determines in which format the designation and content of the application block are printed; adjustment possibilities:

TYPE	STYLE
AB DB	 Designation and content in grouped style
	 Designation and content in two lines, grouped style
	 Designation and content separated with extra blank spaces
	 Content alone, left-justified
	 Content alone, centred
	 Content alone, right-justified
TEXT	 Left-justified
	 Centred
	 Right-justified

CRLF parameter Force line feed; the CRLF parameter is only available for:

-  Text, left-justified
-  Content alone, left-justified
-  Designation and content separated with extra blank spaces
- Type CHRn


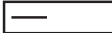
FILL parameter Show content with leading blank spaces up to maximum available length; the FILL parameter is only available for:

-  Designation and content separated with extra blank spaces
-  Content alone, left-justified
-  Content alone, centred

PAD parameter Show designation and content separated with x blank spaces

Possible settings: 0 ... 63 extra blank spaces.

The PAD parameter is only available for:

-  Designation and content separated with extra blank spaces
-  Content alone, left-justified

DATA/FIELD parameter Depending on the TYPE selected, DATA or FIELD is available.

TYPE	DATA/ FIELD	ENTRY
LINE	DATA	1 alphanumeric character Entry also possible as ASCII code, see below
AB	DATA	Number of application blocks to be output: xxx The application block can be further specified with the following keys: AB_EXT: _ For selecting read-only memories: xxx_yyy SUB-BLK: . For selecting a sub-block: xxx.z or xxx_yyy.z RANGE: - For entering a range: xxx-xxx or xxx_yyy-yyy
CHRn	DATA	1 alphanumeric character Entry also possible as ASCII code, see below
TEXT	DATA	Alphanumeric characters
DB	FIELD	Select database field

Entry of DATA parameter

To enter data or select database fields, the EDIT mode must be active.

1. Press **F▶** key, repeat if necessary until the assignment of the F5 key changes to EDIT.
2. Press the EDIT key; an input mask appears.
3. Enter data in the format and with the keys offered.
4. Complete entry with **↵**.

Enter ASCII code for LINE and CHRn parameters

1. Open the entry mask with the EDIT key.
2. Press IDENT F and enter the ASCII code numerically.
3. Complete the numeric entry with IDENT F.
4. Complete entry with **↵**.

5.6.2 Set barcode or RFID reader

BARCODE, RFID	Set barcode or RFID reader
TYPE DL900/DL910/ DLL6000/LS3603/ GRYPHON BT100/ HERON-G D130/ FIRESCAN D131 ... OTHER	Select barcode or RFID reader. When one of the barcode or RFID readers is selected, the communication and mode parameters for the selected barcode or RFID reader are automatically set. For other barcode or RFID readers: Settings in the sub-blocks COMMUNICATION and MODE as for the blocks RS232/RS422/RS485/CL20mA/USB, see page 5.6.1. The PRINT MODE setting is not possible when using barcode or RFID readers!
DESTINATION BLOCK 000/00	Enter the number of the application block and of the subsequent block with which the barcode or RFID entry is to be described. When a target block is selected, barcode or RFID information can be read directly into this block without having to press a key beforehand, see page 27.
AUTOMATIC ENTRY	If AUTOMATIC ENTRY ON is selected, the received barcode or RFID code is shown in the display and is then accepted as the entry automatically. The display duration can be set in the TERMINAL master mode block, see page 41.
DISPLAY DATA UNTIL TIMEOUT UNTIL KEYPRESS	Only for RFID The read-in data are displayed for the duration of the set display duration. The read-in data are displayed until a key is pressed.

5.6.3 Setting AlibiMemory

ALIBI MEMORY	Configure contents of the entries of the alibi memory
ENTRY LENGTH 15 CHARACTERS 35 CHARACTERS 45 CHARACTERS 55 CHARACTERS 55 CHARACTERS 55 CHARACTERS 55 CHARACTERS 55 CHARACTERS	Use ↓↑ to select from various entries, the contents are shown in the display. Gross, tare, date/time, scale number, MinWeigh, tare source; 15 characters Factory setting Same as 1, additionally ID code A (20 characters) Same as 1, additionally ID code A (30 characters) Same as 1, additionally ID code A (20 characters) + ID code B (20 characters) Same as 1, additionally ID code A (20 characters) + ID code C (20 characters) Same as 1, additionally ID code A (20 characters) + ID code D (20 characters) Same as 1, additionally ID code A (20 characters) + ID code E (20 characters) Same as 1, additionally ID code A (20 characters) + ID code F (20 characters)
Note	If an alibi memory had already been initialised and the format is changed, all previous entries (in the old format) are deleted. For safety, a corresponding notice appears before initialisation.

5.6.4 Configure inputs/outputs

4 I/O / RELAY BOX 8 / ARM100	
INPUT	Operate inputs internally or externally.
INTERNALLY	<p>Factory setting. Additional settings:</p> <p>CONFIGURE INPUTS Select the desired setting for every input. Factory setting for IND690-Base: Input 1 not in use Input 2 zero setting Input 3 taring Input 4 entry (ENTER key) Input 5 ... 8 not in use Possible settings: see page 127</p> <p>Additional settings, only for 4 I/O:</p> <p>ON/OFF HIGH ACTIVE Factory setting, the weighing terminal is switched off when ON/OFF = 1. After the digital input has been activated, the display goes out, and the content of the text read-only memory 021, factory setting appears in the upper left corner: POWER OFF.</p> <p>ON/OFF LOW ACTIVE The weighing terminal is switched off when ON/OFF = 0.</p> <p>ON TIME Delayed switch-on: After the On signal has been activated, the weighing terminal still remains switched off for the configured period. Possible settings: 0 to 9 seconds</p> <p>Off TIME Delayed switch-off: After the Off signal has been activated, the weighing terminal still remains switched on for the configured period. Possible settings: 0 ... 9 seconds</p> <p>Note: The input ON/OFF has priority over the keyboard, i.e. the weighing terminal can only be switched on again in the POWER OFF state via the ON/OFF input! In addition, entry into the master mode is permitted via the F6 key to be able to correct incorrect settings.</p>
EXTERNALLY	<p>Inputs are independent of the weighing functions. Read status of the inputs with the AR707 command, see page 121.</p>

**SETPOINT MODE ON –
defining set points**

After SETPOINT MODE ON is selected, the following input mask appears for the setpoints 1 ... 4 (Example):

SP1:	F↑	A012	W1	1.2345 KG
SP2:	F↓	A013	W2	0.5678 KG
SP3:	D↑	A012	ALL	
SP4:	D↓	A011	ALL	

4 parameters can be set for each set point:

a) Type of set point

- F↑ fixed set point, ascending
- F↓ fixed set point, descending
- D↑ dynamic set point, ascending
- D↓ dynamic set point, descending

Fixed set point Set point value is specified in the master mode and cannot be changed in the weighing mode.

Dynamic set point Set point value is specified in the weighing mode, see page 20.

Ascending Digital output is set when the value of the application block concerned is greater than or equal to the set point value.

Decending Digital output is set when the value of the application block concerned is less than or equal to the set point value.

b) Application block

Weight value to which the set point refers. All application blocks with a valid weight unit (kg, g, lb, oz, ozt, dwt, pc) are possible.

Factory setting: Application block 012, net weight

c) Scale

W1 ... W4 or ALL for all scales

d) Set point value

With dynamic set points the weight value is entered in the normal mode, see page 20.

Configuring switching points 5 – 8


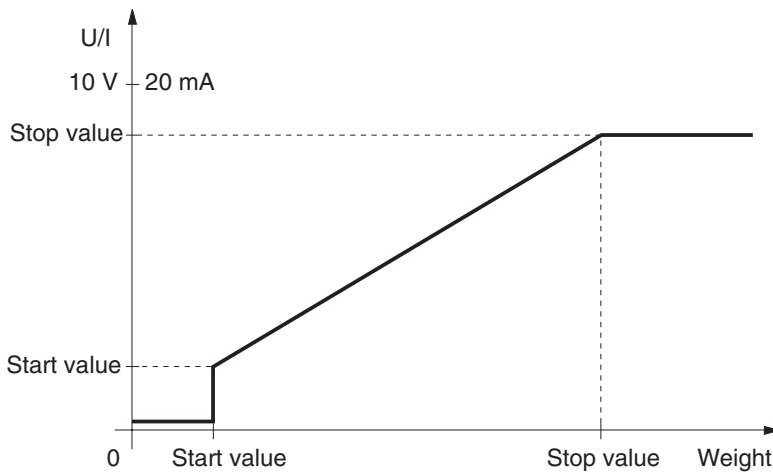
→ With F4 >>, change to the input mask for switching points 5 – 8.

5.6.5 Configuring external keyboard

KEYBOARD PS2	Select keyboard layout of connected external keyboard
	Possible setting: English-USA, English-UK, German, French, Dutch, Italian, Spanish, Finnish, Russian

5.6.6 Configuring AnalogOut-690

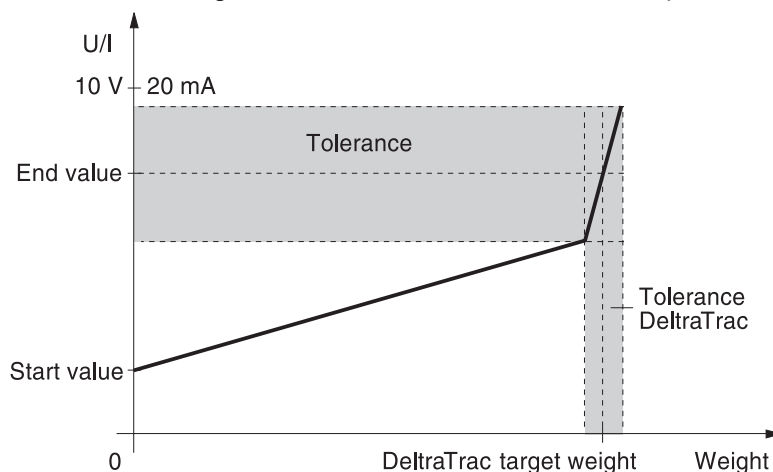
The functionality of AnalogOut-690 is dependent on the version of your weighing terminal.

ANALOG OUTPUT	
SCALE	Select weighing platform from which the weight values are to be output at the interface AnalogOut-690. This block only appears when several weighing platforms are connected. Factory setting: All weighing platforms
ALL SCALES	Weight values can be output by all connected weighing platforms at the AnalogOut-690 interface. The assignment of a weighing platform to the AnalogOut-690 interface can be changed with  or the command AW010...
SCALE 1 ... SCALE 4	Only weight signals of the selected weighing platform can be output via the AnalogOut-690 interface
START-STOP MODE	<p>When the selected weight value or the selected number of pieces is within the specified en start and stop values, a current/voltage signal in the specified range will be output at the AnalogOut-690 interface.</p>  <p>For additional settings, see page 70.</p>

ANALOG OUTPUT**DELTATRAC MODE**

In this operating mode the net weight value on the AnalogOut-690 interface is output in the factory setting, provided DeltaTrac is active.

If no DeltaTrac target value is entered, 0 V / 0 mA are output.

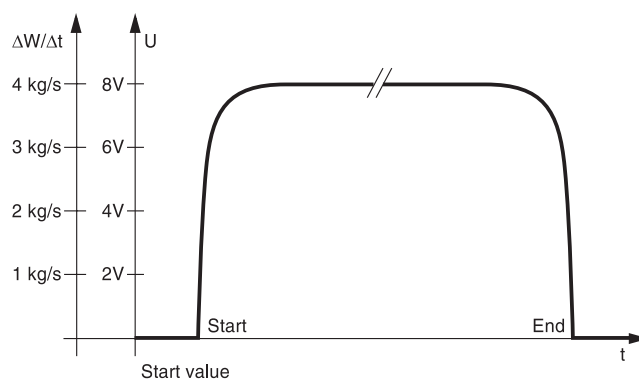


For additional settings, see page 70.

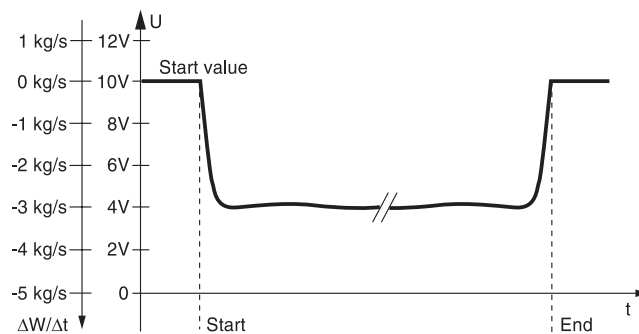
 ΔW - ΔT MODE

In this operating mode flows are measured via the weight change per time in the supply or catch container.

Example 1: Weighing in with a flow rate of 4 kg/sec.



Example 2: Subtractive weighing with a flow rate of 3 kg/sec. starting value of the analog voltage signal: 10 V.



In both cases a change in the flow rate of 1 kg/sec. results in a change in the analog voltage signal of 2 V.

For additional settings, see page 71.

ANALOG OUTPUT	
DIRECTION	Configure the behaviour of the analog output.
ALL	The analog signal is sent irrespective of the preceding sign.
POSITIVE	The analog signal is only output at positive weight values. In the case of an underload or negative weight values the signal remains at "0" or the start value.
NEGATIVE	The analog signal is only output at negative weight values. In the case of positive weight values the signal remains at "0" or the start value. This setting is ideal for subtractive weighing from a container.

Parameter for Start-Stop mode

AB	Application block number for the weight value to be output at the AnalogOut-690 interface. Factory setting: Application block 012, net weight
VALUE	Starting value of the analog output signal Factory setting: 0 V Possible settings: 0 V – 10 V or 0 mA – 20 mA Stop value of the analog output signal Factory setting: 10 V Possible settings: 0 V – 10 V or 0 mA – 20 mA
WEIGHT	Weight value at which the analog output is to start. Factory setting: 0 g or 0 kg Weight value from which the maximum value of the analog signal is to be output. Factory setting: Maximum load of weighing platform

Parameter for DeltaTrac mode

AB	Application block number for the weight value to be output at the AnalogOut-690 interface. Factory setting: Application block 012, net weight
V/mA AT ZERO	Starting value of the analog output signal Factory setting: 0 V Possible settings: 0 V – 10 V or 0 mA – 20 mA
V/mA AT TARGET	Stop value of the analog output signal Factory setting: 10 V Possible settings: 0 V – 10 V or 0 mA – 20 mA
TOLERANCE	+/- deviation from stop value of analog signal when the target weight tolerance is reached Factory setting: Tolerance = 0 V

Parameters for the ΔW - ΔT MODE

AB	Application block number for the weight value to be output at the AnalogOut-690 interface. Factory setting: Application block 012, net weight
ΔW - ΔT	Value for the change in the analog output signal in the case of a weight change of one unit per second.
START VALUE	Starting value of the analog output signal Factory setting: 0 V Possible settings: 0 V – 10 V or 0 mA – 20 mA

5.6.7 Configuring Ethernet-690

The weighing terminal can only be operated on a network with a valid IP address, subnet mask and gateway address (if the weighing terminal is to route connections to another partial network). Ask your system administrator for these addresses.

ETHERNET	Configuring Ethernet-690
COMMUNICATION	For adaptation of the communication parameters between weighing terminal and the Ethernet module, see page 55.
MODE	For adaptation of the communication mode, see page 55.
IP ADDRESS	IP address entry
SUBNET MASK	Net mask entry
GATEWAY	Gateway address entry

Note

Additional information on the configuration of the Ethernet-690 network card and information on troubleshooting can be downloaded from the website of the manufacturer: www.WuT.de.

Checking Ethernet-690**Condition**

You require a PC with Windows on which the protocol TCP/IP is installed. The PC must be operated in the same network segment as the weighing terminal with Ethernet-690.

Conducting test

With DOS entry window

1. Open DOS entry window.
2. Enter **TELNET xxx.xxx.xxx.xxx 8000** (xxx.xxx.xxx.xxx = IP address) and confirm with ↵.

The PC reports the following in a Telnet window

```
*****
* Com-Server Highspeed *
*****
```

The message means that the Ethernet-690 network card is operable. The PC and the weighing terminal can communicate with each other via interface commands, see chapter 6.

3. Close Telnet window.

With browser

1. Start browser, e.g. Internet Explorer.
2. Enter **xxx.xxx.xxx.xxx** (xxx.xxx.xxx.xxx = IP address) and confirm with ↵.

The PC reports a login window.

3. Enter password (factory setting: no password).
The configuration menu of the Ethernet-690 network card appears.

5.6.8 Configuring ProfibusDP-690

PROFIBUS-DP	Configuring ProfibusDP-690
NODE ADDRESS	Select desired node address in range 001 to 126. Factory setting: 3
OPERATING MODE	Set type and word length of user data parameter VALUE.
16-BIT-INTEGER / 2 WORDS	Consistent over valid module pair in GSD file 2 words 16-BIT-INTEGER 2(+2)W AI 16-BIT-INTEGER 2(+2)W AO
16-BIT-INTEGER / 4 WORDS	2 words 16-BIT-INTEGER 2(+2)W AI (use 2x) 16-BIT-INTEGER 2(+2)W AO (use 2x)
32-BIT-FLOATING- POINT	4 words 32-BIT-FLOATING-POINT 4W AI 32-BIT-FLOATING-POINT 4W AO
S/P MODE	Set type and use of setpoint.
UNIVERSAL	Each setpoint can be set and read independently of others.
CHECKWEIGHING	As soon as setpoints 1 and 2 are set, DeltaTrac CHECKWEIGHING will be activated with SP1 = setpoint and SP2 = tolerance (in %, in 16-bit integer mode with 2 decimal places). In read table current state BELOW (SP1), GOOD (SP2) or ABOVE (SP3) can be read off.

PROFIBUS-DP	Configuring ProfibusDP-690												
FILLING	<p>As soon as setpoints 1 and 2 are set, DeltaTrac CHECKWEIGHING will be activated with SP1 = setpoint and SP2 = tolerance (in %, in 16-bit integer mode with 2 decimal places). In addition, SP3 and SP4 can also be loaded as any desired setpoints.</p> <p>In read table current state GOOD (SP1), ABOVE (SP2), SP3 REACHED (SP3) or SP4 REACHED (SP4) can be read off.</p>												
I/P MODE	<p>Set request for identification data in Input mode.</p> <p>After setting the user data command INPUT MODE in the write table, the selected request for input is automatically carried out and the entries are saved in the application blocks 094 to 099.</p> <p>The user data response INPUT MODE RUNNING remains set while the input mode is active.</p>												
A	Code A is requested.												
A+B	Code B and Code A are always requested.												
A+B+C	Code C, Code B and Code A are always requested.												
A+B+C+D	Code D, Code C, Code B and Code A are always requested.												
A+B+C+D+E	Code E, Code D, Code C, Code B and Code A are always requested.												
A+B+C+D+E+F	Code F, Code E, Code D, Code C, Code B and Code A are always requested.												
BYTE ORDER	Order of the bytes within a data word												
NORMAL	Usual byte order (factory setting)												
SWAPPED	The upper and lower byte of each data word are swapped												
SIGN	Location of the sign in the 16-bit integer values Is only displayed if MODE = 16-BIT-INTEGERS/WORDS has been selected												
SEPARATE BIT 16	<p>The sign is transferred separately in Bit 16 (factory setting)</p> <p>Examples</p> <table> <tbody> <tr> <td>+2</td> <td>0002</td> <td>0000 0000 0000 0010</td> </tr> <tr> <td>+1</td> <td>0001</td> <td>0000 0000 0000 0001</td> </tr> <tr> <td>-1</td> <td>8001</td> <td>1000 0000 0000 0010</td> </tr> <tr> <td>-2</td> <td>8002</td> <td>1000 0000 0000 0010</td> </tr> </tbody> </table>	+2	0002	0000 0000 0000 0010	+1	0001	0000 0000 0000 0001	-1	8001	1000 0000 0000 0010	-2	8002	1000 0000 0000 0010
+2	0002	0000 0000 0000 0010											
+1	0001	0000 0000 0000 0001											
-1	8001	1000 0000 0000 0010											
-2	8002	1000 0000 0000 0010											
INTEGRATED IN INTEGER	<p>The sign is transferred integrated in the integer</p> <p>Examples</p> <table> <tbody> <tr> <td>+2</td> <td>0002</td> <td>0000 0000 0000 0010</td> </tr> <tr> <td>+1</td> <td>0001</td> <td>0000 0000 0000 0001</td> </tr> <tr> <td>-1</td> <td>FFFF</td> <td>1111 1111 1111 1111</td> </tr> <tr> <td>-2</td> <td>FFFE</td> <td>1111 1111 1111 1110</td> </tr> </tbody> </table>	+2	0002	0000 0000 0000 0010	+1	0001	0000 0000 0000 0001	-1	FFFF	1111 1111 1111 1111	-2	FFFE	1111 1111 1111 1110
+2	0002	0000 0000 0000 0010											
+1	0001	0000 0000 0000 0001											
-1	FFFF	1111 1111 1111 1111											
-2	FFFE	1111 1111 1111 1110											

PROFIBUS-DP	Configuring ProfibusDP-690																																																
<p>EXP. AB AREA</p>	<p>Input of up to three expanded application blocks for constants which can be accessed when writing applications blocks.</p> <p>Example</p> <p>Input enables access to</p> <p>021 application blocks 021_001 to 021_999</p> <p>046 application blocks 046_001 to 046_999</p> <p>071 application blocks 071_001 to 071_999</p>																																																
<p>CONFIGURE INPUTS</p>	<p>Select the desired setting for every input.</p> <p>Factory setting for the IND690-Base:</p> <p>Input 1 not in use</p> <p>Input 2 zero setting</p> <p>Input 3 taring</p> <p>Input 4 entry (↵ key)</p> <p>Input 5 ... 8 not in use</p> <p>Further settings: see page 129</p>																																																
<p>CONFIGURE OUTPUTS</p>	<p>Select the desired setting for every output.</p> <p>Factory setting for the IND690-Base:</p> <p>Output 1 Delta low</p> <p>Output 2 Delta ok</p> <p>Output 3 Delta high</p> <p>Output 4 Stable</p> <p>Output 5 ... 8 Setpoint 1 ... 4</p> <p>Further settings: see page 129</p>																																																
<p>TEST MODE</p>	<p>Activation of the information display. In line 3 and 4 write and read tables are displayed as follows:</p> <div style="border: 1px solid black; padding: 10px; margin: 10px 0;"> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 15%;"></td> <td style="width: 15%; text-align: center;">3</td> <td style="width: 15%; text-align: center;">4</td> <td style="width: 15%; text-align: center;">5</td> <td style="width: 15%; text-align: center;">6</td> <td style="width: 15%;"></td> </tr> <tr> <td></td> <td style="text-align: center;"> </td> <td style="text-align: center;"> </td> <td style="text-align: center;"> </td> <td style="text-align: center;"> </td> <td></td> </tr> <tr> <td></td> <td style="text-align: center;">└─</td> <td style="text-align: center;">└─</td> <td style="text-align: center;">└─</td> <td style="text-align: center;">└─</td> <td></td> </tr> <tr> <td></td> <td style="text-align: center;">TEST MODE</td> <td></td> <td></td> <td style="text-align: right;">0.999 kg</td> <td></td> </tr> <tr> <td></td> <td style="text-align: center;">└─ Id</td> <td style="text-align: center;">└─ Val</td> <td style="text-align: center;">5432109876543210</td> <td style="text-align: center;">I/Os</td> <td></td> </tr> <tr> <td style="text-align: right;">2 ─</td> <td style="text-align: center;">00</td> <td style="text-align: center;">0000</td> <td style="text-align: center;">0000000010000000</td> <td style="text-align: center;">00 00</td> <td></td> </tr> <tr> <td style="text-align: right;">1 ─</td> <td style="text-align: center;">00</td> <td style="text-align: center;">03E7</td> <td style="text-align: center;">0100000000000000</td> <td style="text-align: center;">08 00</td> <td></td> </tr> <tr> <td></td> <td colspan="4" style="text-align: center; border-top: 1px solid black;">CANCEL</td> <td></td> </tr> </table> </div> <p>1 Read table</p> <p>2 Write table</p> <p>3 Operating mode (internal)</p> <p>4 Value (hexadecimal)</p> <p>5 Command/response bits</p> <p>6 Inputs/outputs (hexadecimal)</p>		3	4	5	6									└─	└─	└─	└─			TEST MODE			0.999 kg			└─ Id	└─ Val	5432109876543210	I/Os		2 ─	00	0000	0000000010000000	00 00		1 ─	00	03E7	0100000000000000	08 00			CANCEL				
	3	4	5	6																																													
	└─	└─	└─	└─																																													
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	CANCEL																																																

5.6.9 Configuring WLAN-690

The weighing terminal can only be operated in a wireless network with a valid IP address, subnet mask etc. Ask your system administrator for these parameters.

WLAN	Configuring WLAN-690
INFO	Displays the type and software version of the WLAN module. Same function as the key sequence "INFO 50" in the operating mode.
STATUS	Displays the current status of the WLAN module: Radio channel used, data rate of connection, transmission and reception quality, MAC address of the currently connected access point. Same function as the key sequence "INFO 51" in the operating mode.
COMMUNICATION	For adaptation of the communication parameters between weighing terminal and the WLAN module, see page 55.
MODE	For adaptation of the communication mode, see page 55.
IP ADDRESS	IP address entry
PORT NUMBER	Port number entry
GATEWAY	Gateway address entry
SUBNET MASK	Net mask entry
SSID	Entry of wireless-network name (ServiceSetIdentifier).
WEP-KEY	WEP key entry, with 5 characters (64 bit key) or 13 characters (128 bit key).
WPA-PSK	WPA-PSK key entry, with 16 characters (128 bit key). Note: It may take up to 50 seconds to proceed the key.
AUTHORIZATION	Activating/deactivating the authorization in accordance with the setting at the AccessPoint. If the authorization is activated at the AccessPoint, the authorization also has to be activated at the IND690.
PORT TYPE	Set WLAN architecture: Ad hoc or infrastructure
AUTO CONNECT	Input of the IP address and port number of a partner to which establishing of a connection is tried cyclically – if a connection does not exist.
Comment	SSID, WEP-key and WPA_PSK-key can be entered in different ways: ASCII characters direct entry Hexadecimal code start entry with IDENT E Decimal code start entry with IDENT F

5.6.10 Configuring Bluetooth-690/BT-BLD Display/BT-P42/BT-SICS

BLUETOOTH/BT-BLD/ BT-P42/BT-SICS	Configure Bluetooth-690/BT-BLD Display/BT-P42/BT-SICS
INFO	Displays the type, software version and manufacturer of the Bluetooth module. Same function as the key sequence "INFO 60" in the operating mode.
STATUS	Displays the current status of the Bluetooth module: own Bluetooth address, own Bluetooth name, user service/COM port and name of the Bluetooth module to which there is currently a connection. Same function as the key sequence "INFO 61" in the operating mode.
MODE	Adaptation of the communication mode, see Page 55.
PASSKEY	Switching the passkey interrogation on/off and entering the passkey, if switched on. Enter the passkey "Mettler-Toledo" at the BT-BLD display and the BT-P42. All the communication parameters are then set automatically for the connected device
CONNECT	All reachable Bluetooth modules are displayed. The connection to one of these modules can then be made or an existing connection can be broken.
Comment	Passkey can be entered in different ways: ASCII characters direct entry Hexadecimal code start entry with IDENT E Decimal code start entry with IDENT F

6 Interface description

6.1 General

To exchange data with a computer, the weighing terminal is equipped with an RS232 interface. Up to 8 additional interfaces are available as an option.

The interfaces operate independently of each other, can be used simultaneously and can be adjusted individually, see section 5.6.

To operate the serial interfaces in the **dialog mode**, one of the following METTLER TOLEDO command sets must be selected in the master mode:

- MMR command set, see section 6.2.
- METTLER TOLEDO Continuous mode, see section 6.3.
- METTLER TOLEDO SICS command set, see section 6.4.

Note

In order to avoid data loss, do not operate the interfaces in unsolicited mode. In particular if the handshake is deactivated, ensure that the host waits for a response after every command before a new command is sent.

6.2 MMR command set

6.2.1 Syntax and formats of communication

Commands and responses for transmitting weights have the following formats:

Command format when transmitting weight formats

Identification	_	Weight value	_	Unit	Framing
Character sequence for specification of command (1 ... 4 characters)		1 ... 8 digits, number of digits variable		1 ... 3 characters, number of characters variable	Definable in master mode, factory setting: C _R L _F

Response format when transmitting weight formats

Identification	_	Weight value	_	Unit	Framing
Character sequence for specification of response (2 ... 3 characters)		10 digits, right-justified, filled out with blank spaces		3 characters, left-justified, filled out with blank spaces	definable in master mode, factory setting: C _R L _F

Example

Command Tare specification

T _ 1 3 . 2 9 5 _ k g

Response Tare specification

T B H _ _ _ _ _ 1 3 . 2 9 5 _ k g _

Data formats

- The following symbols are used in the following command description:

Weight value 10 characters with sign and decimal point, right-justified (with preceding blank spaces)

Unit 3 characters, left-justified (with following blank spaces)

Text_n maximum of n characters, left-justified

- The string framing is mandatory, however it is **not** contained in the following command description!
- Enter commands as ASCII characters. The following ASCII characters are available: 20 hex/32 deci ... 7F hex/127 deci, see page 126.

BUS SLAVE operating mode (RS485)

In the BUS SLAVE operating mode each command and each response begins with a code for the terminal address.

Terminal address 1 ... 9 Code "1" ... "9" (31H ... 39H)

Terminal address 10 ... 31 Code "a" ... "v" (61H ... 76H)

Example

Command to terminal 3: 3 S

Response from terminal 3: 3 S _ _ _ _ _ 1 2 . 7 6 5 _ k g _

6.2.2 Command overview

Command	Meaning	Page
RO / R1	Switch keypad on/off	80
KD / KE	Switch individual key on/off	80
Z	Set weight display to zero after weighing platform stabilization	80
U_...	Change over terminal to a different weight unit	80
T	Tare	81
T_...	Specify tare weight	81
DY_...	Specify DeltaTrac target value	82
S	Transmit in case of weighing platform stabilization	82
SI	Transmit independent of weighing platform stabilization	82
SIR	Transmit repeatedly independent of weighing platform stabilization	83
SR	Transmit stabilized weight values repeatedly depending on a weight change	83
SR_...	Transmit repeatedly depending on weighing platform stabilization with specification of an excursion value	83
SX	Transmit data record after weighing platform stabilization	84
SXI	Transmit data record independent of weighing platform stabilization	84
SXIR	Transmit data record repeatedly independent of weighing platform stabilization	84
ARNo.	Read information of application block	85
AWNo_...	Write to application block	85
D_...	Write to display	85
P_...	Print alphanumeric characters or barcodes on the GA46	86
DS	Trigger acoustic signal	86
ID	Interrogate terminal identification	86
W_...	Actuating digital outputs	87

6.2.3 Command description


Switch keypad on or off

Command	<input type="text" value="R,0"/> Switch on keypad <input type="text" value="R,1"/> Switch off keypad
Response	<input type="text" value="R,B"/> Keypad switched on or off
Comments	<ul style="list-style-type: none"> • Factory setting: Keypad switched on. • When the keypad is switched off, the terminal cannot be operated manually.

Switch individual key on or off

Command	<input type="text" value="K,E,_,x,x"/> Switch on key with key number xx <input type="text" value="K,D,_,x,x"/> Switch off key with key number xx
Response	<input type="text" value="K,B"/> Key switched on or off
Comments	<ul style="list-style-type: none"> • Factory setting: Keys switched on. • See table in the Appendix for key numbers.

Set zero

Command	<input type="text" value="Z"/> Set gross weight display to zero after weighing platform stabilization, effect as when  is pressed.
Response	<input type="text" value="Z,B"/> Weighing platform set to zero <input type="text" value="Z,-"/> Command cannot be executed: Zero-set range dropped below <input type="text" value="Z,+"/> Command cannot be executed: Zero-set range exceeded
Comments	<ul style="list-style-type: none"> • Setting to zero is not possible when the weighing platform stabilizes in the zero-set range. • With some weighing platform types setting to zero deletes a saved tare weight. This is indicated with the message TA, see section 6.2.4.

Changing over to different weight unit

Command	<input type="text" value="U,_,Unit"/> Change over weight display to different weight unit <input type="text" value="U"/> Change over weight display to first weight unit
Response	<input type="text" value="U,B"/> Weight display changed over to different weight unit
Comment	Possible units: g, kg, lb, ozt, oz, dwt

Specify DeltaTrac target value

Command	<code>D | Y | _ | Target weight (weight value) | _ | Unit | _ | Lower tolerance | _ | Unit | _ |</code> <code>Upper tolerance | _ | Unit</code> Specify DeltaTrac target value <code>D | Y</code> Delete DeltaTrac target value
Response	<code>D | B</code> DeltaTrac target value loaded/deleted
Comments	<ul style="list-style-type: none"> Observe limit values, see page 18 Also possible: <code>A | W | 0 | 2 | 0 | . . .</code>, see page 116
Example	Command: <code>D | Y | _ | 4 | . | 5 | _ | k | g | _ | 5 | _ | % | _ | 4 | _ | %</code> Response: <code>D | B</code>

Transmit content of display

Command	<code>S</code> Transmit a stabilized weight when weighing platform is stabilized. <code>S | I</code> Transmit a stabilized or dynamic weight independent of weighing platform stabilization.
Response	<code>S | _ | _ | Weight value | _ | Unit</code> Stabilized weight value transmitted <code>S | D | _ | Weight value | _ | Unit</code> Dynamic weight value transmitted <code>S | I</code> Invalid weight <code>S | I | -</code> Weighing platform in underload range <code>S | I | +</code> Weighing platform in overload range

Transmit content of display repeatedly

Command	<p><code>S,I,R</code> Transmit stabilized or dynamic weight values after each measuring cycle independent of weighing platform stabilization.</p> <p><code>S,R</code> Transmit the next stabilized weight value after a weight change (e.g. different item) and one dynamic and the next stabilized weight value after each deflection > 30 d.</p> <p><code>S,R, _ Deflection weight (weight value) _ Unit</code> Transmit the next stabilized weight value and, depending on the specified deflection, a dynamic weight value after a weight change greater than the specified deflection value.</p>
Response	<p><code>S, _ _ Weight value _ Unit</code> Transmit stabilized weight value repeatedly</p> <p><code>S,D _ _ Weight value _ Unit</code> Transmit dynamic weight value repeatedly</p>
Comment	Stop command with <code>S</code> , <code>S,I</code> command or by interrupting the interface
Example	<p>Command: <code>S,R _ _ 1,4,0 _ k,g</code></p> <p>Responses: <code>S, _ _ _ _ _ 2,0,0 . 0,0 _ k,g</code> 1st item</p> <p><code>S,D _ _ _ _ _ 3,4,5 . 8,5 _ k,g</code></p> <p><code>S, _ _ _ _ _ 4,1,0 . 5,0 _ k,g</code> 2nd item</p>

Transmit data record

Command	<p><code>S,X</code> Transmit a data record with stabilized weight values after weighing platform stabilization. Effect as if <code>↵</code> is pressed.</p> <p><code>S,X,I</code> Transmit a data record with stabilized or dynamic weight values independent of weighing platform stabilization.</p> <p><code>S,X,I,R</code> Transmit data records with stabilized or dynamic weight values repeatedly independent of weighing platform stabilization.</p>
Response	<p><code>S,X,_,_ Application block _ _ Application block ... ]</code> | | <code>A No. _ Data record</code> Data record with stabilized weight values transmitted</p> <p><code>S,X,D _ Application block _ _ Application block ... ]</code> | | <code>A No. _ Data record</code> Data record with dynamic weight values transmitted</p> <p><code>S,X,I</code> Invalid value <code>S,X,I -</code> Weighing platform in underload range <code>S,X,I +</code> Weighing platform in overload range</p>
Comments	<ul style="list-style-type: none"> • Number of application block: three-digit with leading zeros. • The content of the corresponding application block is contained in data record, see chapter 7. Standard data record consists of 3 blocks: <p><code>S,X,_,_ A,0,1,1 _ Gross weight (weight value) _ Unit _ _</code> <code>A,0,1,2 _ Net weight (weight value) _ Unit _ _</code> <code>A,0,1,3 _ Tare weight (weight value) _ Unit</code></p> <p>The continuous transmission of data records started with the <code>S,X,I,R</code> command can be stopped with the <code>S,X</code> or <code>S,X,I</code> command.</p>
Example	<p>Command: <code>S,X,I</code></p> <p>Response: Standard data record</p> <p><code>S,X,D _ A,0,1,1 _ _ _ _ _ 2,3 . 6,5,0 _ k,g _ _</code> <code>_ _ A,0,1,2 _ _ _ _ _ 2,1 . 6,5,0 _ k,g _ _</code> <code>_ _ A,0,1,3 _ _ _ _ _ 2 . 0,0,0 _ k,g _ _</code></p>

Read application block

Command	<input type="text" value="A"/> <input type="text" value="R"/> <input type="text" value="No."/> <input type="text" value=""/>	Read content of application block
Response	<input type="text" value="A"/> <input type="text" value="B"/> <input type="text" value=""/> <input type="text" value="Information"/>	Content of application block transmitted
Comments	<ul style="list-style-type: none"> • Transmitted information is dependent on application block, see chapter 7. • Number of application block must be entered as 3 digits with preceding zeros. 	

Write to application block

Command	<input type="text" value="A"/> <input type="text" value="W"/> <input type="text" value="No."/> <input type="text" value=""/> <input type="text" value="Information"/>	Write to application block
	<input type="text" value="A"/> <input type="text" value="W"/> <input type="text" value="No."/> <input type="text" value=""/>	Reset application block
	<input type="text" value="A"/> <input type="text" value="W"/> <input type="text" value="No."/> <input type="text" value=""/> <input type="text" value=""/>	Delete application block
Response	<input type="text" value="A"/> <input type="text" value="B"/>	Written to application block
Comments	<ul style="list-style-type: none"> • Information to be entered is dependent on target block, see chapter 7. • Deleting and resetting have same effect. 	

Write to display

Command	<input type="text" value="D"/> <input type="text" value=""/> <input type="text" value="Text_20"/>	Write to display
	<input type="text" value="D"/> <input type="text" value=""/>	Switch display to dark
	<input type="text" value="D"/>	Set display to normal status
Response	<input type="text" value="D"/> <input type="text" value="B"/>	Written to display
Comments	<ul style="list-style-type: none"> • Character stock: ASCII characters 20 hex/32 deci ... 7F hex/127 deci, see page 126. • Watch upper and lower case. 	

Alphanumeric printout on GA46 printer

Command	<p><code>P _ Text_48</code> Print text as per setting</p> <p><code>P _ \$! 1 Text_48</code> Print text in small type</p> <p><code>P _ \$! 2 Text_48</code> Print text in normal type</p> <p><code>P _ \$! 3 Text_48</code> Print text in large type</p> <p><code>P _ \$! A Text_48</code> Print text in small type and bold print</p> <p><code>P _ \$! B Text_48</code> Print text in normal type and bold print</p> <p><code>P _ \$! C Text_48</code> Print text in large type and bold print</p> <p><code>P _</code> Print blank line</p>
Response	<code>P | B</code> Alphanumeric characters printed
Comments	<ul style="list-style-type: none"> • Character stock: ASCII characters 20 hex/32 deci ... 7F hex/127 deci, see page 126. • Text is printed in last selected type size. • Watch upper and lower case.

Barcode printout on GA46 printer

Command	<p><code>P _ \$ # 1 Text_20, barcode-specific</code> Print Code 39</p> <p><code>P _ \$ # 2 Text_8, barcode-specific</code> Print EAN 8</p> <p><code>P _ \$ # 3 Text_13, barcode-specific</code> Print EAN 13</p> <p><code>P _ \$ # 4 Text_20, barcode-specific</code> Print EAN 128</p> <p><code>P _ \$ # 5 Text_20, barcode-specific</code> Print Code 2 of 5</p> <p><code>P _ \$ # 6 Text_20, barcode-specific</code> Print Code 2 of 5 interleaved</p> <p><code>P _ \$ # 7 Text_20, barcode-specific</code> Print Code 128</p> <p><code>P _ \$ # 8 Text_20, barcode-specific</code> Print EAN 128</p> <p><code>P _</code> Print blank line</p>
Response	<code>P | B</code> Barcode printed
Comments	<ul style="list-style-type: none"> • Character stock: ASCII characters 20 hex/32 deci ... 7F hex/127 deci, see page 126. • With Code 39, 3 barcodes can be printed next to each other. Separating characters: \$\$ or H_T (ASCII character 09 hex/9 deci). Arrangement of barcodes: Barcode 2, Barcode 1, Barcode 3.

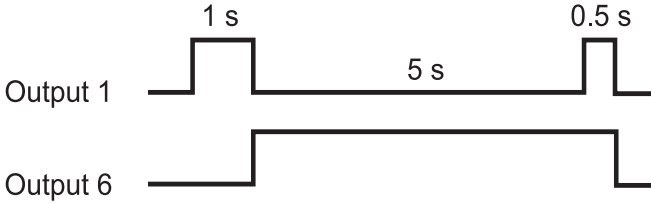
Acoustic signal

Command	<code>D | S</code> Generate short acoustic signal (beep tone) in terminal
Response	<code>D | B</code> Acoustic signal generated in terminal

Identification

Command	<code>I | D</code> Interrogate identification of terminal
Response	<code>I | D | 7 _ |</code> Program number of Pac

Actuating digital outputs

<p>Command</p>	<p><code>W _ Status</code> Switch individual digital outputs on or off</p> <p><code>W _ Status 1 _ Time 1 _ Status 2 _ Time 2 _ ... Status 4 _ Time 4 _ Status 5</code> Trigger time sequence of status changes of digital outputs</p> <p><code>W , W _</code> Reset all outputs to logical 0</p> <p>Status: Each output is assigned a value. The total of the values of those outputs which are to be closed is indicated as the "Status".</p> <table> <tr><td>Digital output 1</td><td>1</td></tr> <tr><td>Digital output 2</td><td>2</td></tr> <tr><td>Digital output 3</td><td>4</td></tr> <tr><td>Digital output 4</td><td>8</td></tr> <tr><td>Digital output 5</td><td>16</td></tr> <tr><td>Digital output 6</td><td>32</td></tr> <tr><td>Digital output 7</td><td>64</td></tr> <tr><td>Digital output 8</td><td>128</td></tr> <tr><td>All outputs open</td><td>0</td></tr> <tr><td>All outputs closed</td><td>255</td></tr> </table> <p>Time: 1 ... 99999 ms</p>	Digital output 1	1	Digital output 2	2	Digital output 3	4	Digital output 4	8	Digital output 5	16	Digital output 6	32	Digital output 7	64	Digital output 8	128	All outputs open	0	All outputs closed	255
Digital output 1	1																				
Digital output 2	2																				
Digital output 3	4																				
Digital output 4	8																				
Digital output 5	16																				
Digital output 6	32																				
Digital output 7	64																				
Digital output 8	128																				
All outputs open	0																				
All outputs closed	255																				
<p>Response</p>	<p><code>W , B</code> Digital outputs set</p>																				
<p>Comments</p>	<ul style="list-style-type: none"> • Max. 5 statuses "Status" and 4 intervals "Time" are possible. After sequence has been run, digital outputs freeze in last status "Status". • A break in the port has no effect on the outputs. • If terminal receives a new W command before time sequence has been run, ongoing sequence will be aborted immediately. • If limits for "Status" and "Time" are not adhered to, error message EL appears on 4 I/O-690 interface or 8-690 relay box. 																				
<p>Examples</p>	<p>Command: <code>W _ 5</code> Digital outputs 1 and 3 are closed, all others opened</p> <p>Command: <code>W _ 1 _ 1,0,0,0 _ 3,2 _ 5,0,0,0 _ 3,3 _ 5,0,0 _ 0</code> triggers following sequence:</p>  <p>The diagram shows two digital signals over time. The top signal, labeled 'Output 1', starts low, goes high for a duration of 1 s, then returns to low for a duration of 5 s, and finally goes high for a duration of 0.5 s before returning to low. The bottom signal, labeled 'Output 6', starts low, goes high for a duration of 5 s, and then returns to low.</p>																				

6.2.4 Terminal messages – only with RS232, RS422, CL20mA and USB

In the dialog mode the weighing terminal transmits an acknowledgement to the computer each time a key is pressed.

When this pressing of a key is replaced with an interface command, the acknowledgement only differs in the second character in the response format which is part of the command:

Function	Key	Acknowledgement
Set zero		Z, A
Tare		T, A ... (see command T)
Specify tare weight		T, A, H ... (see command T_ ...)
Change over unit		U, A, _ Unit
Transmit data record in case of weighing platform stabilization		S, T, _ _ ... (see command SX)
Switch over weighing platform		S, A, _ _ n n = weighing platform 1 ... 3
Dynamic weighing		A, A, 0, 1, 6 _ Weight value _ Unit
Identification A ... F	A ... F	K, x _ Identification x = A, B, C, D, E, F 20 characters, right-justified
Function keys	F1 ... F6	K, F _ x x = I, J, K, L, M, N

6.2.5 Fault messages

Fault messages always consist of 2 characters and a string frame.

The string frame can be defined in the master mode (section 5.6.2).

E, T

Transmission error

The terminal transmits a transmission error for errors in the received bit sequence, e.g. parity errors, missing stop bit.

E, S

Syntax error

The terminal transmits a syntax error when the received characters cannot be processed, e.g. command does not exist.

E, L

Logic error

The terminal transmits a logic error when a command cannot be executed, e.g. when an attempt is made to write to a write-protected application block.

6.3 METTLER TOLEDO continuous mode

These operating modes are suitable for continuous data transmission in real time from the weighing terminal to METTLER TOLEDO devices, e.g. to a second display. The data are even transmitted when the weighing platform is moving or the gross weight = 0.

Commands can also be sent to the weighing terminal, permitting remote control of certain keys on the terminal.

There are 2 different continuous modes:

- Continuous mode – net and tare values are continuously transmitted.
- Short continuous mode – only net values are continuously transmitted.

6.3.1 Data output from IND690

Output format

Weight values are always transmitted in the following format:

STX	SB1	SB2	SB3	DF1	DF2	CR	CHK
-----	-----	-----	-----	-----	-----	----	-----

STX	ASCII characters 02 hex/2 deci, character for "start of text" is required by some printers
SB...	For status bytes, see below
DF1	Data field with 6 digits for the weight value transmitted without a decimal point and unit When counting is active in the IND690-Count: 6 digits for the quantity, no leading zeroes
DF2	Data field with 6 digits for the tare weight; is not transmitted in the short continuous mode When counting is active in the IND690-Count: 6 zeroes, not transferred in Short Continuous mode
CR	Carriage return (ASCII character 0D hex/13 deci)
CHK	Checksum (2-part complement of binary sum of 7 lower bits of all previously transmitted characters, including STX and CR)

Status byte SB1

Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0	1	Rounding / Increment		Decimal position		

Bit 4	Bit 3	Rounding/ Increment
0	1	1
1	0	2
1	1	5

Bit 2	Bit 1	Bit 0	Decimal position
0	0	0	XXXX00
0	0	1	XXXXX0
0	1	0	XXXXXX
0	1	1	XXXXX.X
1	0	0	XXXX.XX
1	0	1	XXX.XXX
1	1	0	XX.XXXX
1	1	1	X.XXXXX

Status byte SB2

Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0	1	0 lb	0 Stabiliza- tion	0 Normal status	0 Positive sign	0 Gross value
		1 kg	1 Movement	1 Underload/ overload	1 Negative sign	1 Net value

Status byte SB3

Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0	1	0	0 Basic state 1 Print request	Weight value		

Bit 2	Bit 1	Bit 0	Weight value
0	0	0	kg / lb (SB2 Bit 4)
0	0	1	g
0	1	0	†
0	1	1	oz
1	0	0	oz†
1	0	1	dwt
1	1	0	ton
1	1	1	free unit

6.3.2 Commands to IND690

Individual command characters can be transmitted to the IND690 in the text format. One function each on the terminal is assigned to these command characters. After a command character is received, the following functions are executed:

Com- mand	Function	Note
C	Delete tare	for every application software
P	Print or send transfer string	
T	Taring	
Z	Setting to zero	
Tx.xxx	Specify tare value	
Sxxxx	Specify reference quantity	only for IND690-Count
Sx.xxx	Specify reference weight	
Ax.xxx	Specify reference piece weight	

6.4 METTLER TOLEDO SICS command set

6.4.1 Communication syntax and formats

Command format when transmitting weight values

Identification	_	Weight value	_	Unit	Framing
String of characters for specification of command (1 ... 4 characters)		1 ... 10 characters		1 ... 3 characters, number of characters variable	C _R L _F

Response format when transmitting weight values

Identification	_	Status	_	Weight value	_	Unit	Framing
String of characters for specification of response (1 ... 2 char.)		1 char.		10 char., right-justified, filled in with blank char.		3 char., left-justified, filled in with blank char.	C _R L _F

Example

Tare specification command `T A _ 1 3 . 2 9 5 _ k g`

Tare specification response `T A _ A _ _ _ _ _ 1 3 . 2 9 5 _ k g _`

Data formats

- The following symbols are used in the command description:

<u>Weight value</u>	10 numbers with sign and decimal point, right-justified (with preceding blank spaces)
<u>Unit</u>	3 characters, left-justified (with following blank spaces)
<u>"Text_n"</u>	maximum of n characters, left-justified

- The string framing is mandatory, however it is **not** listed in the following command description!
- Enter commands as upper-case letters.
- Text to be entered must always be placed in quotation marks.

6.4.2 Command overview

Command	Meaning	Page
Level 0		
I0	Transmit list of all available SICS commands	93
I1	Transmit SICS level and SICS versions	93
I2	Transmit scale data (terminal, platform)	93
I3	Transmit scale software version (program number)	94
I4	Transmit serial number	94
S, SI, SIR	Transmit display contents	94
Z	Set to zero	95
ZI	Set to zero immediately	95
@	Reset	95
Level 1		
D	Write display	95
DW	Weight display	95
K	Keyboard monitoring	96
SR	Transmit stable weight values repeatedly depending on a weight change	97
T	Taring	97
TI	Tare immediately	98
TA	Specify tare weight	98
TAC	Delete tare weight	99
Level 2		
SX, SXI, SXIR	Transmit data record	99
R0, R1	Switch keyboard on or off	100
U	Change over to different weight unit	100
DS	Acoustic signal	100
Level 3		
AR	Read application block	100
AW	Write application block	101
DY	Specify DeltaTrack target value	101
P	Print text or barcode	102
W	Actuating digital outputs	103

6.4.3 Command description

Transmit SICS commands

Command	<code>I,0</code> Transmit SICS commands
Response	<pre> I,0 B 0 "I0" I,0 B 0 "I1" ... I,0 B 1 "D" ... I,0 B 2 "SX" ... I,0 B 3 "AR" ... </pre>

Transmit SICS levels and SICS versions

Command	<code>I,1</code> Transmit SICS levels and SICS versions
Response	<pre> I,1 A "x1" "x2" "x3" "x4" "x5" </pre> <p>x1 = 0123 Scale with SICS levels 0, 1, 2 and 3 x2 Version or implemented SICS0 commands x3 Version or implemented SICS1 commands x4 Version or implemented SICS2 commands x5 Version or implemented SICS3 commands</p> <pre> I,1 I Command understood, cannot be executed at this time </pre>
Comments	<ul style="list-style-type: none"> • On the SICS level only fully implemented levels are executed. • With the SICS version all levels are specified.

Transmit scale data

Command	<code>I,2</code> Transmit data from weighing terminal and weighing platform(s)
Response	<code>I,2 A "text"</code>
Example	<code>I,2 A "IND690-Count IZ05 15.000 kg IZ10 32.000 kg"</code>

Transmit scale software version

Command	<code>I,3</code> Transmit software version from weighing terminal and weighing platform(s)
Response	<code>I,3 _ A _ "text "</code>
Example	<code>I,3 _ A _ "IP63-0-0100I IZ05-0-030I IZ10-0-0221"</code>

Transmit serial number

Command	<code>I,4</code> Transmit serial number of weighing terminal
Response	<code>I,4 _ A _ "text "</code>
Example	<code>I,4 _ A _ "1234567"</code>
Comment	The response to I4 appears automatically following switch-on and after the Reset command (@).

Transmit display contents

Command	<p><code>S</code> Transmit a stable weight value when the weighing platform is at a standstill.</p> <p><code>S,I</code> Transmit a stable or a dynamic weight value, regardless of whether the weighing platform is at a standstill.</p> <p><code>S,I,R</code> Transmit a stable or a dynamic weight value after each measuring cycle, regardless of whether the weighing platform is at a standstill.</p>
Response	<p><code>S _ S _ Weight value _ Unit</code> Stable weight value transmitted</p> <p><code>S _ D _ Weight value _ Unit</code> Dynamic weight value transmitted</p> <p><code>S _ I</code> Invalid value</p> <p><code>S _ -</code> Weighing platform in underload range</p> <p><code>S _ +</code> Weighing platform in overload range</p>
Comment	Stop <code>S,I,R</code> command with <code>S</code> , <code>S,I</code> , <code>S,R</code> , @ command or disconnect port.

Set to zero

Command	<code>Z</code> <code>Z I</code>	Set gross weight display to zero after weighing platform comes to a standstill, effect as when $\rightarrow 0 \leftarrow$ is pressed Set the gross weight display immediately to zero independently of a standstill
Response	<code>Z _ A</code> <code>Z _ I</code> <code>Z _ -</code> <code>Z _ +</code>	Weighing platform set to zero Command cannot be executed: e.g. standstill not achieved or another command is currently being executed Command cannot be executed: Zero-set range dropped below Command cannot be executed: Zero-set range exceeded

Reset

Command	<code>@</code>	Reset weighing terminal to the state maintained after Power On
Response	<code>I, 4 _ A _ "text"</code>	Serial number
Comments	<ul style="list-style-type: none"> All running applications and functions are cancelled. The tare memory is reset to zero. 	

Write display

Command	<code>D _ "Text_20"</code> <code>D _ ""</code>	Write display Darken display
Response	<code>D _ A</code> <code>D _ A</code> <code>D _ I</code> <code>D _ L</code>	Display written; the complete text appears left-justified in the display, marked with a symbol, e.g. with * Display written; the end of the text appears left-justified in the display with the beginning cut off, marked with a symbol, e.g. with * Command cannot be executed Command understood, parameters defective
Comment	A symbol in the display, e.g. *, indicates that an invalid weight value is displayed.	

Weight display

Command	<code>D, W</code>	Switch over main display into the weight mode
Response	<code>D, W _ A</code> <code>D, W _ I</code>	The main display shows the current weight value Command understood, but cannot be executed

Keyboard monitoring

Command	<p>$\boxed{K}_{-} \boxed{-} \boxed{1}$ When a key is pressed, execute the function, but do not transmit anything (factory setting)</p> <p>$\boxed{K}_{-} \boxed{-} \boxed{1}$ When a key is pressed, do not execute the function and do not transmit anything</p> <p>$\boxed{K}_{-} \boxed{-} \boxed{3}$ When a key is pressed, do not execute the function, but transmit the key code $\boxed{K}_{-} \boxed{-} \boxed{C}_{-} \boxed{-} \boxed{x}$ or, when the key is pressed longer, transmit $\boxed{K}_{-} \boxed{-} \boxed{R}_{-} \boxed{-} \boxed{x}$ and $\boxed{K}_{-} \boxed{-} \boxed{C}_{-} \boxed{-} \boxed{x}$</p> <p>$\boxed{K}_{-} \boxed{-} \boxed{4}$ When a key is pressed, execute the function and transmit the function code $\boxed{K}_{-} \boxed{-} \boxed{A}_{-} \boxed{-} \boxed{x}$</p> <p>If the function cannot be executed immediately, the function code for the start of the function $\boxed{K}_{-} \boxed{-} \boxed{B}_{-} \boxed{-} \boxed{x}$ or $\boxed{K}_{-} \boxed{-} \boxed{A}_{-} \boxed{-} \boxed{x}$ for the end of the function is transmitted.</p>
Response	<p>$\boxed{K}_{-} \boxed{-} \boxed{A}$ Command understood or function successfully executed</p> <p>$\boxed{K}_{-} \boxed{-} \boxed{I}$ Command understood, but currently cannot be executed, e.g. no keyboard present</p> <p>$\boxed{K}_{-} \boxed{-} \boxed{L}$ Command understood, parameters defective</p> <p>Key codes</p> <p>$\boxed{K}_{-} \boxed{-} \boxed{R}_{-} \boxed{-} \boxed{x}$ Key x was pressed briefly and released again immediately</p> <p>$\boxed{K}_{-} \boxed{-} \boxed{C}_{-} \boxed{-} \boxed{x}$ Key x was pressed for approx. 2 sec.</p> <p>See table in the Appendix for key codes</p>
Comments	<ul style="list-style-type: none"> • The factory setting is active after switch-on, after the Reset command and after exiting the master mode. • Only one K command is ever active at one time.

Tare immediately

Command	<code>T, I</code> Tare weighing platform immediately.
Response	<code>T, I, S, Tare weight (weight value), Unit</code> Weighing platform tared, stable tare value <code>T, I, D, Tare weight (weight value), Unit</code> Weighing platform tared, dynamic tare value <code>T, I, I</code> Taring not carried out <code>T, I, L</code> Command cannot be executed <code>T, I, -</code> Command cannot be executed: Tare range dropped below <code>T, I, +</code> Command cannot be executed: Tare range exceeded
Comments	<ul style="list-style-type: none"> Each taring command overwrites the contents of the tare memory with the new tare weight. Following a dynamic tare value, a stable weight value can be specified. However, this value is not exact.

Specify tare weight

Command	<code>T, A, Tare weight (weight value), Unit</code> Specify tare weight: The contents of the tare memory are overwritten with the specified tare weight and the net weight is displayed. Effect as when the key sequence <code>PT</code> , 0 ... 9, <code>←</code> is pressed.
Response	<code>T, A, A, Tare weight (weight value), Unit</code> Weighing platform tared with the specified value <code>T, A, I</code> Command not carried out <code>T, A, L</code> Command understood, parameters defective <code>T, -</code> Command cannot be executed: Tare range dropped below <code>T, +</code> Command cannot be executed: Tare range exceeded
Comments	<ul style="list-style-type: none"> The contents of the tare memory are overwritten with the specified tare value. On non-certified weighing systems the tare weight is automatically rounded off to the current increment. On certified weighing systems: Tare range with MultiRange only in first increment range.
Example	Command: <code>T, A, 1, 2, ., 6, 5, 0, k, g</code> Response: <code>T, A, A, _ _ _ _ 1, 2, ., 6, 5, 0, k, g, _</code>

Delete tare weight

Command	<code>T A C</code>	Delete tare weight.
Response	<code>T A C _ A</code> <code>T A C _ I</code>	Weighing platform tared with the specified weight Command not carried out

Transmit data record

Command	<p><code>S X</code> After the weighing platform comes to a standstill, transmit a data record with stable weight values. Effect as when \leftarrow is pressed.</p> <p><code>S X I</code> Transmit a data record with stable or dynamic weight values, regardless of whether the weighing platform is at a standstill.</p> <p><code>S X I R</code> Repeatedly transmit a data record with stable or dynamic weight values, regardless of whether the weighing platform is at a standstill.</p>
Response	<p><code>S X _ S _ Application block _ _ Application block [ ... ]</code> | | <code>A No. _ Data record</code> Data record with stable weight values transmitted</p> <p><code>S X _ D _ Application block _ _ Application block [ ... ]</code> | | <code>A No. _ Data record</code> Data record with dynamic weight values transmitted</p> <p><code>S X _ I</code> Command cannot be executed <code>S X _ -</code> Weighing platform in underload range <code>S X _ +</code> Weighing platform in overload range</p>
Comments	<ul style="list-style-type: none"> • Number of application blocks: three-place with preceding zeros. • The contents of the corresponding application block is contained in the data record, see chapter 7. The standard data record consists of 3 blocks: <pre> S X _ S _ A 0 1 1 _ Gross weight (weight value) _ Unit _ _ A 0 1 2 _ Net weight (weight value) _ Unit _ _ A 0 1 3 _ Tare weight (weight value) _ Unit </pre> The continuous transmission of data records started with the <code>S X I R</code> command can be stopped with the commands <code>S X</code> or <code>S X I</code>.
Example	<p>Command: <code>S X I</code></p> <p>Response: Default data record</p> <pre> S X _ D _ A 0 1 1 _ _ _ _ _ 2 3 . 6 5 0 _ k g _ _ _ A 0 1 2 _ _ _ _ _ 2 1 . 6 5 0 _ k g _ _ _ A 0 1 3 _ _ _ _ _ 2 . 0 0 0 _ k g _ </pre>

Switch keyboard on or off

Command	<code>R, 0</code> Switch on keyboard <code>R, 1</code> Switch off keyboard
Response	<code>R, 0 _ _ A</code> Keyboard switched on <code>R, 1 _ _ A</code> Keyboard switched off
Comments	<ul style="list-style-type: none"> • Factory setting: Keyboard switched on. • When the keyboard is switched off, the terminal cannot be manually operated.

Changing over to different weight unit

Command	<code>U _ Unit</code> Change over weight display to different weight unit <code>U</code> Change over weight display to the first weight unit
Response	<code>U _ _ A</code> Weight display switched over to another weight unit <code>U _ _ I</code> Impermissible weight unit
Comment	Possible units: g, kg, lb, ozt, oz, dwt

Acoustic signal

Command	<code>D, S</code> Generate short acoustic signal (beep) in the terminal
Response	<code>D, S _ _ A</code> Acoustic signal generated in the terminal

Read application block

Command	<code>A, R _ _ No.</code> Read contents of the application block
Response	<code>A, R _ _ A _ Information</code> Contents of the application block transmitted
Comments	<ul style="list-style-type: none"> • The transmitted information is dependent on the application block, see chapter 7. • The number of the application block must be entered as a three-place number with preceding zeros.

Write application block

Command	<input type="text" value="A,W,_,No.,_,Information"/> Write application block <input type="text" value="A,W,_,No."/> Reset application block <input type="text" value="A,W,_,No.,_"/> Delete application block
Response	<input type="text" value="A,W,_,A"/> Application block written <input type="text" value="A,W,_,I"/> Application block not present <input type="text" value="A,W,_,L"/> Application block cannot be written
Comments	<ul style="list-style-type: none"> The information to be entered is dependent on the target block, see chapter 7. Deleting and resetting have the same effect.

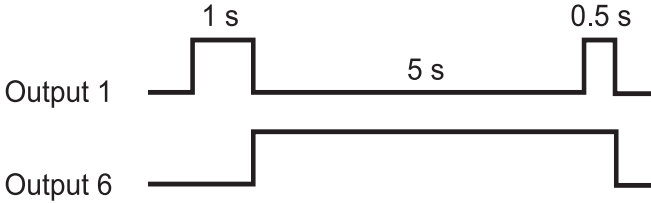
Specify DeltaTrac target value

Command	<input type="text" value="D,Y,_,Target weight (weight value),_,Unit,_,Lower tolerance,_,Unit,_,Upper tolerance,_,Unit"/> Specify DeltaTrac target value <input type="text" value="D,Y"/> Delete DeltaTrac target value
Response	<input type="text" value="D,Y,_,A"/> DeltaTrac target value loaded/deleted
Comments	<ul style="list-style-type: none"> Observe limit values, see page 18 Also possible: <input type="text" value="A,W,_,0,2,0,..."/> , see page 116
Example	Command: <input type="text" value="D,Y,_,4,.,5,_,k,g,_,5,_,%"/> Response: <input type="text" value="D,Y,_,A"/>

Print text or barcode with GA46 printer

Command	<table border="0"> <tr> <td><code>P _ Text_48</code></td> <td>Print text as per setting</td> </tr> <tr> <td><code>P _ \$! 1 Text_48</code></td> <td>Print text in small print</td> </tr> <tr> <td><code>P _ \$! 2 Text_48</code></td> <td>Print text in normal print</td> </tr> <tr> <td><code>P _ \$! 3 Text_48</code></td> <td>Print text in large print</td> </tr> <tr> <td><code>P _ \$! A Text_48</code></td> <td>Print text in small type and bold print</td> </tr> <tr> <td><code>P _ \$! B Text_48</code></td> <td>Print text in normal type and bold print</td> </tr> <tr> <td><code>P _ \$! C Text_48</code></td> <td>Print text in large type and bold print</td> </tr> <tr> <td><code>P _ \$ # 1 Text_20, barcode-specific</code></td> <td>Print code 39</td> </tr> <tr> <td><code>P _ \$ # 2 Text_8, barcode-specific</code></td> <td>Print EAN 8</td> </tr> <tr> <td><code>P _ \$ # 3 Text_13, barcode-specific</code></td> <td>Print EAN 13</td> </tr> <tr> <td><code>P _ \$ # 4 Text_20, barcode-specific</code></td> <td>Print code 128</td> </tr> <tr> <td><code>P _ \$ # 5 Text_20, barcode-specific</code></td> <td>Print code 2 of 5</td> </tr> <tr> <td><code>P _ \$ # 6 Text_20, barcode-specific</code></td> <td>Print code 2 of 5 interleaved</td> </tr> <tr> <td><code>P _ \$ # 7 Text_20, barcode-specific</code></td> <td>Print code 128</td> </tr> <tr> <td><code>P _ \$ # 8 Text_20, barcode-specific</code></td> <td>Print EAN 128</td> </tr> <tr> <td><code>P _</code></td> <td>Print blank line</td> </tr> </table>	<code>P _ Text_48</code>	Print text as per setting	<code>P _ \$! 1 Text_48</code>	Print text in small print	<code>P _ \$! 2 Text_48</code>	Print text in normal print	<code>P _ \$! 3 Text_48</code>	Print text in large print	<code>P _ \$! A Text_48</code>	Print text in small type and bold print	<code>P _ \$! B Text_48</code>	Print text in normal type and bold print	<code>P _ \$! C Text_48</code>	Print text in large type and bold print	<code>P _ \$ # 1 Text_20, barcode-specific</code>	Print code 39	<code>P _ \$ # 2 Text_8, barcode-specific</code>	Print EAN 8	<code>P _ \$ # 3 Text_13, barcode-specific</code>	Print EAN 13	<code>P _ \$ # 4 Text_20, barcode-specific</code>	Print code 128	<code>P _ \$ # 5 Text_20, barcode-specific</code>	Print code 2 of 5	<code>P _ \$ # 6 Text_20, barcode-specific</code>	Print code 2 of 5 interleaved	<code>P _ \$ # 7 Text_20, barcode-specific</code>	Print code 128	<code>P _ \$ # 8 Text_20, barcode-specific</code>	Print EAN 128	<code>P _</code>	Print blank line
<code>P _ Text_48</code>	Print text as per setting																																
<code>P _ \$! 1 Text_48</code>	Print text in small print																																
<code>P _ \$! 2 Text_48</code>	Print text in normal print																																
<code>P _ \$! 3 Text_48</code>	Print text in large print																																
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<code>P _ \$! B Text_48</code>	Print text in normal type and bold print																																
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<code>P _ \$ # 5 Text_20, barcode-specific</code>	Print code 2 of 5																																
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<code>P _ \$ # 7 Text_20, barcode-specific</code>	Print code 128																																
<code>P _ \$ # 8 Text_20, barcode-specific</code>	Print EAN 128																																
<code>P _</code>	Print blank line																																
Response	<table border="0"> <tr> <td><code>P _ A</code></td> <td>Alphanumeric characters printed</td> </tr> <tr> <td><code>P _ L</code></td> <td>no GA46 present</td> </tr> </table>	<code>P _ A</code>	Alphanumeric characters printed	<code>P _ L</code>	no GA46 present																												
<code>P _ A</code>	Alphanumeric characters printed																																
<code>P _ L</code>	no GA46 present																																
Comments	<ul style="list-style-type: none"> • Character stock: ASCII character 20 hex/32 dec ... 7F hex/127 dec, see page 126. • Printing is carried out in the font size last selected. • Watch upper and lower case. 																																

Actuating digital outputs

<p>Command</p>	<p><code>W _ Status</code> Switch individual digital outputs on or off</p> <p><code>W _ Status 1 _ Time 1 _ Status 2 _ Time 2 _ ... Status 4 _ Time 4 _ Status 5</code> Trigger time sequence of status changes of digital outputs</p> <p><code>W , W _</code> Reset all outputs to logical 0</p> <p>Status: Each output is assigned a value. The total of the values of those outputs which are to be closed is indicated as the "Status".</p> <table> <tr><td>Digital output 1</td><td>1</td></tr> <tr><td>Digital output 2</td><td>2</td></tr> <tr><td>Digital output 3</td><td>4</td></tr> <tr><td>Digital output 4</td><td>8</td></tr> <tr><td>Digital output 5</td><td>16</td></tr> <tr><td>Digital output 6</td><td>32</td></tr> <tr><td>Digital output 7</td><td>64</td></tr> <tr><td>Digital output 8</td><td>128</td></tr> <tr><td>All outputs open</td><td>0</td></tr> <tr><td>All outputs closed</td><td>255</td></tr> </table> <p>Time: 1 ... 99999 ms</p>	Digital output 1	1	Digital output 2	2	Digital output 3	4	Digital output 4	8	Digital output 5	16	Digital output 6	32	Digital output 7	64	Digital output 8	128	All outputs open	0	All outputs closed	255
Digital output 1	1																				
Digital output 2	2																				
Digital output 3	4																				
Digital output 4	8																				
Digital output 5	16																				
Digital output 6	32																				
Digital output 7	64																				
Digital output 8	128																				
All outputs open	0																				
All outputs closed	255																				
<p>Response</p>	<p><code>W _ A</code> Digital outputs set</p>																				
<p>Comments</p>	<ul style="list-style-type: none"> • Max. 5 statuses "Status" and 4 intervals "Time" are possible. After sequence has been run, digital outputs freeze in last status "Status". • A break in the port has no effect on the outputs. • If terminal receives a new W command before time sequence has been run, ongoing sequence will be aborted immediately. • If the limits for "Status" and "Time" are not adhered to when operating the interface types 4 I/O or relay box 8, the fault message EL appears. 																				
<p>Examples</p>	<p>Command: <code>W _ 5</code> Digital outputs 1 and 3 are closed, all others opened</p> <p>Command: <code>W _ 1 _ 1,0,0,0 _ 3,2 _ 5,0,0,0 _ 3,3 _ 5,0,0 _ 0</code> triggers following sequence:</p>  <p>The diagram shows two digital signals over time. The top signal, labeled 'Output 1', starts low, goes high for a duration of 1 s, then returns to low for a duration of 5 s, and finally goes high again for a duration of 0.5 s before returning to low. The bottom signal, labeled 'Output 6', starts low, goes high for a duration of 5 s, and then returns to low.</p>																				

6.4.4 Error messages

Error messages always consist of 2 characters and a string limit.
The string limit can be defined in the master mode (section 5.6.1).

E, T

Transmission error

The terminal transmits a transmission error for errors in the received bit sequence, e.g. parity error, missing stop bit.

E, S

Syntax error

The terminal transmits a syntax error when it cannot process the received characters, e.g. command not present.

E, L

Logic error

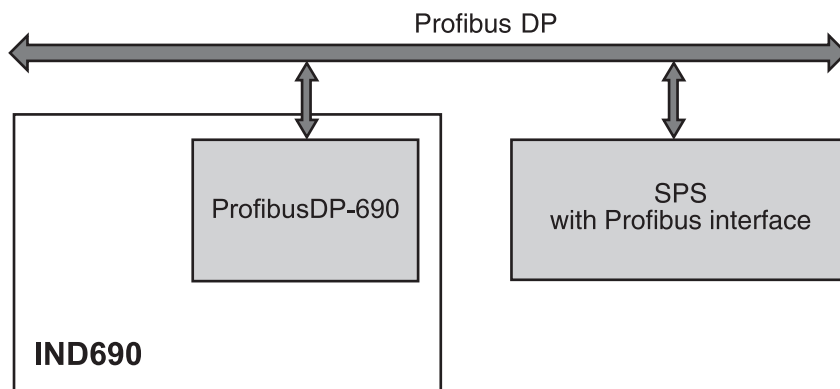
The terminal transmits a logic error, when a command cannot be executed, e.g. when an attempt is made to write a non-writable application block.

6.5 Profibus DP communication with a PLC

6.5.1 Overview

The ProfibusDP-690 is designed for operation as a slave on the Profibus DP. This provides the following possibilities with a master PLC also connected to the Profibus DP:

- Access to the weight values of the weighing platform connected to the weighing terminal
- Operation of the weighing platforms connected to the weighing terminal (zero-set, taring, setting specified tare values, etc.)
- Triggering key presses, transmitting data strings or display of texts



6.5.2 Data formats

All user data are transmitted in a compressed, up to 4-word long format.

Write table Format for transmitting user data from the PLC to the ProfibusDP-690.

Read table Format for the transmission of user data from ProfibusDP-690 to the PLC.

Structure of the write and read table

The write and read table are similarly structured and contain the following sections:

- Value (16-bit integer or 32-bit floating point) for the transmission of weight values, application block numbers, etc.
- Commands or the corresponding responses with a total of 16 bits
- Control of 16 digital I/Os

6.5.3 Handshake

As certain commands can not always be executed immediately by the scale, e.g. taring with a restless weighing platform, 3 handshake bits of the PLC allow clear monitoring of the success of its commands:

1. The PLC starts a command by setting the corresponding command bit and also toggles COMMAND VALID in the write table. All other command bits are 0.
2. The weighing terminal responds with the current data of the read table. If it was possible to completely process the command, the COMMAND EXECUTED bit is toggled. Otherwise COMMAND EXECUTED remains unchanged.
3. The PLC recognises whether it can transmit the next command or must repeat the last one from COMMAND EXECUTED and transmits the write table to the weighing terminal.
4. The weighing terminal recognises from the status change of the COMMAND VALID bit that it should carry out the next command. In addition, the weighing terminal also detects whether the last command has been executed or is still running. If the PLC attempts to start new commands before the previous one has been confirmed by the weighing terminal with a status change of COMMAND VALID, the weighing terminal ignores this new command.

6.5.4 Commands and responses

All commands available to the PLC and the corresponding responses are shown in the following two tables.

Data direction PLC -> IND690 Write table

Data direction IND690 -> PLC Read table

Write table

16-Bit Integer 2 Words	Word 0			Word 1		
16-Bit Integer 4 Words	Word 0			Word 1	Word 2	Word 3
32-Bit Floating Point		Word 0	Word 1	Word 2	Word 3	
Bit	Value 16-Bit	Value 32-Bit Floating Point		Command	16 Digital I/O	AB data
0				Command valid Toggle-bit for all commands	Setting of IND690 outputs or Displaying or evaluating inputs of external I/O module	Data for writing an application block Tolerance specifica- tions are handled in % if the sign is set to 1.
1		Mantissa		Bits 1/2/3: Selection of read-table value, read/write AB 0/0/0 = Display 1/0/0 = Net 0/0/1 = Key No. 1/0/1 = Read AB 0/1/0 = Gross 1/1/0 = Tare 0/1/1 = Write AB 1/1/1 = Not in use		
2						
3						
4						
5						
6						
7		Mantissa		Taring		
8				Delete tare		
9				Set to zero		
10				ENTER key		
11				Input mode		
12				Switch keyboard on/off		
13		Exponent		Bits 13/14/15: Selection of weighing platform 0/0/0 = None 1/1/0 = Scale 3 1/0/0 = Scale 1 0/0/1 = Scale 4 0/1/0 = Scale 2 1/0/1 = Sum scale		
14						
15	Sign				Sign	Sign

Read table

16-Bit Integer 2 words	Word 0			Word 1		
16-Bit Integer 4 words	Word 0			Word 1	Word 2	Word 3
32-Bit Floating Point		Word 0	Word 1	Word 2	Word 3	
Bit	Value 16-Bit	Value 32-Bit Floating Point		Command	16 Digital I/O	Not in Use
0				Command executed Toggle-bit for all commands	Showing or reading of IND690 inputs or Displaying or setting outputs of external I/O module	
1		Mantissa		Error command		
2				Movement		
3				Net		
4				Error scale (overload/underload...)		
5		Mantissa		Key(s) was/were pressed		
6				Input mode active		
7				Setpoint 1 reached		
8				Setpoint 2 reached		
9		Exponent		Setpoint 3 reached		
10				Setpoint 4 reached		
11				1 = keyboard blocked, 0 = keyboard unblocked		
12				Second unit 0 = first unit, 1 = second unit		
13		Sign		Bits 13/14/15: Current weighing platform 0/0/0 = None 1/1/0 = Scale 3 1/0/0 = Scale 1 0/0/1 = Scale 4 0/1/0 = Scale 2 1/0/1 = Sum scale		
14						
15	Sign	Sign				

Notes on commands

If the command requires parameters, they will be transmitted either as an integer value or as a floating point value depending on the operating mode set.

Exception: The commands READ/WRITE APPLICATION BLOCK and PRESS KEY always expect integer values as parameters.

Read commands

- The read commands Display value, Net, Gross, Tare, Key and Application block overwrite the cyclically transmitted display values with the required data. The data are transmitted as 16-bit integers or 32-bit floating points. As soon as the COMMAND EXECUTED bit is toggled, these values must be evaluated immediately by the PLC, as in the next cycle the value in the read table is overwritten again with the current weight value.
- The response to the READ KEY NUMBER command (write table bits 1/2/3 = 0/0/1) is transmitted in the Word 0 (16-bit integer) or in Word 1 (32-bit floating point). The low byte contains the keyboard code, the high byte the function key code. The weighing terminal can store a maximum of 10 keys for being called via the READ KEY NUMBER command. If they are not called, the oldest key actuations are overwritten.
After reading out the last stored key, the KEY WAS PRESSED bit is reset. The key memory is cleared after the device is switched on and after the master mode is exited.

Key numbers

Number	Function key
00	Standard keys of IND690-Base
02	Extended tare keys of ID690-Base
51	Standard keys of Pac
52	Extended keys of Pac
...	Only when the Pac is equipped with more than one function key page, i.e. more than 6 function keys

Reading and writing application blocks

- When writing an application block, the desired data are simultaneously transferred with Word 3. For this reason, writing application blocks is only possible in 16-bit integer/4-word mode.
- Only application blocks with the formats "numeric" or "weight value" can be read or written. When writing, certain tolerance (sub-)blocks (e.g. with DeltaTrac) can be intentionally written with the format "percent" by setting the sign to "1".
- If a non-existent block or an alphanumeric block is selected, the IND690 responds with ERROR COMMAND.
The requested data are supplied in the 16-bit integer mode in the same format as the weight value, and in the 32-bit floating point mode floating point values are always transmitted.

The **application block number** in the write table must be entered as a value (Word 0 in 16-bit integer mode, Word 1 in 32-bit floating point mode) in the following format for the READ APPLICATION BLOCK and WRITE APPLICATION BLOCK commands:

"Basic" application block

	Sub-block no.				Exp.		Application block number													
	Bit	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0			
Example	S	S	S	S	E	E	A	A	A	A	A	A	A	A	A	A	A			
AB 10	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0			
AB 20, sub-block 2	0	0	1	0	0	0	0	0	0	0	0	1	0	1	0	0	0			

Expanded application block

Condition

One or more expanded application blocks are selected in master mode.

Example

Application block 21 is selected as the 1st expanded application block, application block 46 is selected as the 2nd expanded application block.

	Sub-block no.				Exp.		Index of the expanded AB													
	Bit	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0			
Example	S	S	S	S	E	E	A	A	A	A	A	A	A	A	A	A	A			
AB 21_007	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	1	1			
AB 46_005, SB 1	0	0	0	1	1	0	0	0	0	0	0	0	0	1	0	1	0			

Input of tolerances in %

If the sign (bit 15) in Word 3 is set to 1, tolerance specifications can be written accurately down to one decimal place in %.

This rule applies in the same way for Word 0 (16-bit integer) and Word 1 (32-bit floating point) when reading.

Example	Decimal	Binary															
		15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
100.0 %	-1000	1	0	0	0	0	0	1	1	1	1	1	0	1	0	0	0
1 %	-10	1	0	0	1	1	0	0	0	0	0	0	0	1	0	1	0
0.1 %	-1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1

Write commands

- The write command PRESS KEY requires the low byte keyboard code and the high byte function key code as parameters.
- The function key code is based on the active function keys and must be correctly specified for each PRESS KEY command. A function key change can also automatically be forced by changing the function key code, e.g. from REF 10 (3301 hex) to X10 (0004 hex).
- The setpoints loaded via the WRITE SETPOINT X commands (e.g. Setpoint 1: write table bits 4/5/6 = 0/0/1) are deleted after switch-on and each time the master mode is run. The Tolerance parameter in the setpoint modes Checking and Filling must be specified in the 16-bit integer mode with 2 decimal places, e.g. 1025 for 10.25 %.

6.5.5 Digital I/Os

The operating mode of an I/O interface (4 I/O-690 or a relay box 8-690) installed on the IND690 is dependent on where the I/Os are located (directly on the IND690 or externally on the Profibus) and on the parameters CONTROL INPUTS, CONTROL OUTPUTS.

	Outputs	Inputs
No I/Os on IND690	The weighing terminal controls external outputs via the read table.	The weighing terminal reads external inputs from the write table and executes predefined actions.
I/Os on IND690 (4 I/O-690 or 8-690 relay box), inputs and outputs configured to CONTROL INTERNAL	The weighing terminal controls internal outputs and displays these in the read table.	The weighing terminal reads internal inputs and executes predefined actions; the PLC has no access.
I/Os on IND690 (4 I/O-690 or 8-690 relay box), inputs and outputs configured to CONTROL EXTERNAL	The PLC controls the outputs of the weighing terminal via the write table.	The weighing terminal reads internal inputs and displays these in the read table.

6.5.6 Messages in display

The following messages may appear briefly in the display:

Message	Meaning
PROFIBUS NOT ACTIVE!	<ul style="list-style-type: none"> • Initialisation processes are still running on Profibus DP. • The weighing terminal is not yet connected to the Profibus DP.
PROFIBUS ACTIVE	<ul style="list-style-type: none"> • Readiness restored, e.g. after switch-on, exiting master mode or following a bus interruption.
PROFIBUS – ERROR BCC RX PROFIBUS – ERROR BCC TX	<ul style="list-style-type: none"> • Weighing terminal or field bus module have detected a BCC error.
PROFIBUS – ERROR DATA RX PROFIBUS – ERROR DATA TX	<ul style="list-style-type: none"> • Communication error weighing terminal <--> Field bus module: e.g. not ETX, Uart error, etc.
PROFIBUS – TIMEOUT IND690	<ul style="list-style-type: none"> • Communication error weighing terminal <--> Field bus module: The weighing terminal does not respond within the defined time.
PROFIBUS – ERROR CONF.	<ul style="list-style-type: none"> • The field bus module has not received the configuration data properly.

6.5.7 GSD file

The GSD file required for communication with the ProfibusDP-690 is available from METTLER TOLEDO Service or can be downloaded from the Profibus GSD Library at <http://www.profibus.com>.

6.5.8 Profibus DP-690 demo kit

For a demonstration and test of all commands with a normal PC, ask METTLER TOLEDO Customer Service for the ProfibusDP-690 demo kit.

7 Application blocks

Application blocks are internal information memories in which weighing data, calculated quantities, configuration data or character sequences entered with the keypad are stored. The content of the application blocks can be read out or written to with a computer.

When the GA46 printer is connected, the assignment of the application blocks can be printed out, see operating instructions for the GA46 printer.

7.1 Syntax and formats

The syntax and formats are dependent on the command set selected in the dialog mode, see page 56.

7.1.1 Read application block

Read

A	R	No.
---	---	-----

A	R	_	No.
---	---	---	-----

MMR command set

SICS command set

The weighing terminal receives the command from the computer to read out the content of the "No." application block. Possible formats for "No." are:

xxx Entire application block

xxx.zz Sub-block of an application block

xxx_yyy Read-only memory

xxx_yyy.zz Sub-block of a read-only memory

This read command is **not** contained in the following description of the application blocks.

Response

A	B	_	Information
---	---	---	-------------

A	R	_	A	_	Information
---	---	---	---	---	-------------

MMR command set

SICS command set

As a response the weighing terminal transmits the content of the "No." application block to the computer.

This response is contained in the following description of the application blocks in the MMR version.

Example

Command MMR
Command SICS

A	R	0	2	1	_	0	0	1
---	---	---	---	---	---	---	---	---

A	R	_	0	2	1	_	0	0	1
---	---	---	---	---	---	---	---	---	---

Read out tare memory 1.

Response MMR
Response SICS

A	B	_	_	_	_	_	_	1	0	.	5	_	k	g	_
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

A	R	_	A	_	_	_	_	_	1	0	.	5	_	k	g	_
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

7.1.3 Data formats

- In the following description of the application blocks the following data formats are used:

<u>Weight value</u>	10 digits with sign and decimal point, right-justified (with preceding blank space)
<u>Unit</u>	3 characters, left-justified (with following blank spaces)
<u>Number_n</u>	Number, n digits, right-justified (with preceding blank spaces)
<u>Text_n</u>	maximum of n characters If the SICS command set is used, "Text" must always be placed in inverted commas.

- Conclude commands and responses with the string frame $C_R L_F$
(ASCII characters $C_R = 0D$ hex/13 deci, $L_F = 0A$ hex/10 deci).
The string frame is **not** contained in the following description.

7.1.4 Read and write application blocks with the SICS command set

In the following description, the application blocks are shown in the syntax for the MMR command set. When used with the SICS command set, please observe the following SICS conventions, also see sections 7.1.1 to 7.1.3 :

- A blank space must be entered between AR or AW and the application block number: E.g. `A | R | _ | No.`
- The command identification is repeated in the response and a blank space and the character A added:
`A | R | _ | A | _ | Information` application block transmitted and
`A | W | _ | A` application block written.
- Texts entered or transmitted are always in inverted commas.

Example Read application block for CODE A

Command: `A | R | _ | 0 | 9 | 4`

Response: `A | R | _ | A | _ | "Article"`

Write application block for CODE A

Command: `A | W | _ | 0 | 9 | 4 | _ | "Article"`

Response: `A | W | _ | A |]`

7.2 List of the application blocks

No.	Content	Format
001	Terminal type	Response: <input type="text" value="A,B _ Mettler-Toledo_IND690"/>
002	Program number	Response: <input type="text" value="A,B _ IP60-0-0xxxx _"/>
004	Serial number	Response: <input type="text" value="A,B _ Identification (Text_20) _ _"/> <input type="text" value="SN Terminal (Number_7) _ _"/> <input type="text" value="SN Scale 1 (Number_14) _ _"/> <input type="text" value="SN Scale 2 (Number_14) _ _"/> <input type="text" value="SN Scale 3 (Number_14) _ _"/> <input type="text" value="SN Scale 4 (Number_14) _ _"/> <input type="text" value="SN Mainboard (Number_24)"/> Write: <input type="text" value="A,W 0,0,4 _ Identification (Text_20)"/>
005	Keyboard	Response: <input type="text" value="A,B _ Keyboard"/> Write: <input type="text" value="A,W 0,0,5 _ \$ \$ Text"/> Note: Only possible as long as input active on IND690. The text is then written into the input field
006	Electronic finger	Response: <input type="text" value="A,B _ Keys _ _ key number"/> Write: <input type="text" value="A,W 0,0,6 _ \$ \$ 2,4"/> Note: See table in the Appendix for key numbers
007 007.01 007.02	Current gross weight (2nd weight unit)	Response: <input type="text" value="A,B _ Weight value _ Unit"/> <input type="text" value="A,B _ Weight value"/> <input type="text" value="A,B _ Unit"/>
008 008.01 008.02	Current net weight (2nd weight unit)	Response: <input type="text" value="A,B _ Weight value _ Unit"/> <input type="text" value="A,B _ Weight value"/> <input type="text" value="A,B _ Unit"/>
009 009.01 009.02	Current tare weight (2nd weight unit)	Response: <input type="text" value="A,B _ Weight value _ Unit"/> <input type="text" value="A,B _ Weight value"/> <input type="text" value="A,B _ Unit"/> Write: <input type="text" value="A,W 0,0,9 _ Weight value _ Unit"/>
010	Current weighing platform	Response: <input type="text" value="A,B _ Number_2"/> Write: <input type="text" value="A,W 0,1,0 _ Number_2"/> Switch over weighing platform
011 011.01 011.02	Current gross weight (1st weight unit)	Response: <input type="text" value="A,B _ Weight value _ Unit"/> <input type="text" value="A,B _ Weight value"/> <input type="text" value="A,B _ Unit"/>
012 012-01 012-02	Current net weight (1st weight unit)	Response: <input type="text" value="A,B _ Weight value _ Unit"/> <input type="text" value="A,B _ Weight value"/> <input type="text" value="A,B _ Unit"/>

No.	Content	Format
013 013.01 013.02	Current tare weight (1st weight unit)	Response: <input type="text" value="A, B _ Weight value _ Unit"/> <input type="text" value="A, B _ Weight value"/> <input type="text" value="A, B _ Unit"/> Write: <input type="text" value="A, W 0, 1, 3 _ Weight value _ Unit"/>
014	Content of display	Response: <input type="text" value="A, B _ Display"/> Display = Text_20 or weight value
015	Date	Response: <input type="text" value="A, B _ Date"/> Write: <input type="text" value="A, W 0, 1, 5 _ Date"/> Comment: The date is sent in the format selected in the master mode.
016	Dynamic weighing	Response: <input type="text" value="A, B _ Weight value _ Unit"/> Write: <input type="text" value="A, W 0, 1, 6 _ No. of cycles"/> Start weighing cycle Comment: No. of cycles = 1 ... 255
018	Difference target/ actual weight	Response: <input type="text" value="A, B _ Weight value _ Unit"/>
019	Date and time	Response: <input type="text" value="A, B _ Date _ Time"/> Write: <input type="text" value="A, W 0, 1, 9 _ Date \$ \$ Time"/> Comment: Date and time are sent in the format selected in the master mode.
020	Current DeltaTrac	Response: <input type="text" value="A, B _ Target weight (weight value) _ Unit _ _"/> <input type="text" value="lower tolerance (weight value) _ Unit _ _"/> <input type="text" value="upper tolerance (weight value) _ Unit"/> Write: <input type="text" value="A, W 0, x, x _ Target weight (weight value) _ Unit \$ \$"/> <input type="text" value="lower tolerance (weight value) _ Unit \$ \$"/> <input type="text" value="upper tolerance (weight value) _ Unit"/> Comment: xx = 20
021_001 ... 021_999	Tare memory 1 ... 999	Response: <input type="text" value="A, B _ Weight value _ Unit _ _ Name (Text_30)"/> Write: <input type="text" value="A, W 0, x, x, _ x, x, x _ Weight value _ Unit \$ \$"/> <input type="text" value="Name (Text_30)"/> Comment: xx_xxx = 21_001 ... 21_999
021 ... 045	Tare memory 1 ... 25	Response: equal to 021_001 Write: equal to 020_001 Comment: xx_xxx = 21 ... 45 The contents of the tare memories 1 ... 25 are identical to the contents of the tare memories 021_001 ... 021_025.
046_001 ... 046_999	DeltaTrac memory 1 ... 999	Response: equal to 020 Write: equal to 020 Comment: xx = 46_001 ... 46_999

No.	Content	Format																																																																							
046 ... 070	DeltaTrac memory 1 ... 25	Response: equal to 020 Write: equal to 020 Comment: xx = 46 ... 70 The contents of the DeltaTrac memories 1 ... 25 are identical to the contents of the DeltaTrac memories 046_001 ... 046_025.																																																																							
071_001 ... 071_999	Text memory 1 ... 999	Response: <table border="1"><tr><td>A</td><td>B</td><td>_</td><td>Text_30</td></tr></table> Write: <table border="1"><tr><td>A</td><td>W</td><td>0</td><td>x</td><td>x</td><td>_</td><td>x</td><td>x</td><td>x</td><td>_</td><td>Text_30</td></tr></table> Comment: xx = 71_001 ... 71_999	A	B	_	Text_30	A	W	0	x	x	_	x	x	x	_	Text_30																																																								
A	B	_	Text_30																																																																						
A	W	0	x	x	_	x	x	x	_	Text_30																																																															
071 ... 090	Text memory 1 ... 20	Response: equal to 071_001 Write: equal to 071_001 Comment: xx_xxx = 71 ... 90 The contents of the text memories 1 ... 20 are identical to the contents of the text memories 071_001 ... 071_020.																																																																							
091	Barcode EAN 28, EAN 128	Response: <table border="1"><tr><td>A</td><td>B</td><td>_</td><td>EAN 28</td><td>_</td><td>_</td><td>EAN 128 01</td><td>_</td><td>_</td><td>EAN 128 310</td><td>_</td><td>_</td><td>_</td></tr><tr><td colspan="13" style="text-align: center;"> EAN 128 330 </td></tr></table> <u>EAN 28:</u> <table border="1"><tr><td>2</td><td>8</td><td>Article</td><td>Check digit</td><td>Weight</td></tr></table> Article: 4-digit article No. from memory Code A Check digit: 1-digit, calculated by IND690-Base for the weight Weight: 5-digit positive weight value with 3 decimal places between 00.000 kg - 99.999 kg <u>EAN 128 01:</u> <table border="1"><tr><td>0</td><td>1</td><td>Article</td></tr></table> or <table border="1"><tr><td>0</td><td>1</td><td>Article</td><td>Check digit</td></tr></table> or <table border="1"><tr><td>0</td><td>1</td><td>0</td><td>Article</td><td>Check digit</td></tr></table> or <table border="1"><tr><td>0</td><td>1</td><td>0</td><td>Article</td></tr></table> Article: Article No. from memory Code A, max. 14 digits Check digit: 1-digit, calculated by IND690-Base Length: total of max. 16 digits <u>EAN 128 310:</u> <table border="1"><tr><td>0</td><td>1</td><td>9</td><td>Article</td><td>Check digit</td><td>3</td><td>1</td><td>0</td><td>x</td><td>Weight</td></tr></table> or <table border="1"><tr><td>0</td><td>1</td><td>9</td><td>Article</td><td>3</td><td>1</td><td>0</td><td>x</td><td>Weight</td></tr></table> Article: Article No. from memory Code A max. 12 or 13 digits Check digit: 1-digit calculated by IND690-Base x: 0 ... 6, decimal places of weight value Weight: 6-digit net weight value <u>EAN 128 330:</u> <table border="1"><tr><td>3</td><td>3</td><td>0</td><td>x</td><td>Weight</td></tr></table> x: 0 ... 6, decimal places of weight value Weight: 6-digit gross weight value	A	B	_	EAN 28	_	_	EAN 128 01	_	_	EAN 128 310	_	_	_	EAN 128 330													2	8	Article	Check digit	Weight	0	1	Article	0	1	Article	Check digit	0	1	0	Article	Check digit	0	1	0	Article	0	1	9	Article	Check digit	3	1	0	x	Weight	0	1	9	Article	3	1	0	x	Weight	3	3	0	x	Weight
A	B	_	EAN 28	_	_	EAN 128 01	_	_	EAN 128 310	_	_	_																																																													
EAN 128 330																																																																									
2	8	Article	Check digit	Weight																																																																					
0	1	Article																																																																							
0	1	Article	Check digit																																																																						
0	1	0	Article	Check digit																																																																					
0	1	0	Article																																																																						
0	1	9	Article	Check digit	3	1	0	x	Weight																																																																
0	1	9	Article	3	1	0	x	Weight																																																																	
3	3	0	x	Weight																																																																					

No.	Content	Format
092	Barcode EAN 29	Response: <input type="text" value="A,B _ 2,9 Article Check digit Weight"/> Comment: Article: 4-digit article no. from memory Code A Check digit: 1-digit no., calculated from IND690-Base for the weight Weight: 5-digit positive weight value with 3 places to right of point between 00.000 kg ... 99.999 kg
093	Barcode EAN 29 A	Response: <input type="text" value="A,B _ 2,9 Article Weight"/> Comment: Article: 5-digit article no. from memory Code A Weight: 5-digit positive weight value with 3 places to right of point between 00.000 kg ... 99.999 kg
094 ... 099	Identification data Code A ... Code F	Response: <input type="text" value="A,B _ Name (text_20) _ _ Identification (text_30)"/> Write: <input type="text" value="A,W 0,x,x _ Name (text_20) \$ \$ Identification (text_30)"/> Comment: xx = 94 ... 99
101 ... 109	Status COM1 ... COM9	Response: <input type="text" value="A,B _ HW (Text_21 _ _ Mode (Text_21 _ _) Status (Text_21 _ _) Settings (Text_31)"/> Write*: <input type="text" value="A,W 1,0,x _ Transmit buffer COMx"/> Note: x = 1 ... 9 The information entered is sent directly via the selected interface. The max. data length of a transmit buffer is 246 characters.
110	Scales ID	Response: <input type="text" value="A,B _ Scale No. Scale 1 (Number_2) _ _ Scale No. Scale 2 (Number_2) _ _ Scale No. Scale 3 (Number_2) _ _ Scale No. Scale 4 (Number_2) _ _ Scale No. Sum scale (Number_2)"/> Note: This block only contains data if the setting PARALLEL SCALES is selected under the SCALES MODE. When a sum scale is configured, the scale number 05 is output in the last sub-block. If no sum scale is configured, the last sub-block is empty.
111_001 ... 111_005	Gross weight, scales 1 ... 4, sum scale	Response: <input type="text" value="A,B _ Weight value _ Unit"/> Note: This block only contains data if the setting PARALLEL SCALES is selected under the SCALES MODE.
112_001 ... 112_005	Net weight, scales 1 ... 4, sum scale	Response: <input type="text" value="A,B _ Weight value _ Unit"/> Note: This block only contains data if the setting PARALLEL SCALES is selected under the SCALES MODE.
113_001 ... 113_005	Tare weight, scales 1 ... 4, sum scale	Response: <input type="text" value="A,B _ Weight value _ Unit"/> Write: <input type="text" value="A,W 1,1,3 _ 0,0,x Weight value _ Unit"/> Note: x = 1 ... 5 This block only contains data if the setting PARALLEL SCALES is selected under the SCALES MODE.
115	Status terminal	Response: <input type="text" value="A,B _ Status"/>

No.	Content	Format
206	Item counter	Response: <input type="text" value="A, B _ Item (Number 4)"/>
207	Transaction number	Response: <input type="text" value="A, B _ Transaction number (Number 6)"/>
208	Last process	Response: <input type="text" value="A, B _ Process (Number 1)"/> Remark: Last process carried out 1 = Totalizing 2 = Manual input 4 = Cancelled
211 211.01 211.02	Sum gross	Response: <input type="text" value="A, B _ Weight value _ Unit"/> <input type="text" value="A, B _ Weight value"/> <input type="text" value="A, B _ Unit"/>
212 212.01 212.02	Sum net	Response: <input type="text" value="A, B _ Weight value _ Unit"/> <input type="text" value="A, B _ Weight value"/> <input type="text" value="A, B _ Unit"/>
213 213.1 213.2	Sum tare	Response: <input type="text" value="A, B _ Weight value _ Unit"/> <input type="text" value="A, B _ Weight value"/> <input type="text" value="A, B _ Unit"/>
214 214.01 214.02	Last gross	Response: <input type="text" value="A, B _ Weight value _ Unit"/> <input type="text" value="A, B _ Weight value"/> <input type="text" value="A, B _ Unit"/>
215 215.01 215.02	Last net	Response: <input type="text" value="A, B _ Weight value _ Unit"/> <input type="text" value="A, B _ Weight value"/> <input type="text" value="A, B _ Unit"/>
216 216.01 216.02	Last tare	Response: <input type="text" value="A, B _ Weight value _ Unit"/> <input type="text" value="A, B _ Weight value"/> <input type="text" value="A, B _ Unit"/>
217	Mean value	Response: <input type="text" value="A, B _ Weight value _ Unit"/>
218	Standard deviation	Response: <input type="text" value="A, B _ Weight value _ Unit"/>
219	Minimum x_{\min}	Response: <input type="text" value="A, B _ Weight value _ Unit"/>
220	Maximum x_{\max}	Response: <input type="text" value="A, B _ Weight value _ Unit"/>
701	Description of application	Response: <input type="text" value="A, B _ ID690-Interfaces"/>
702	Program designation	Response: <input type="text" value="A, B _ IK07-0-0300"/>
706, 708, 710, 712, 714, 716, 718, 720	Dig. outputs 1 ... 8	Response: <input type="text" value="A, B _ 8-digit binary value"/> Write: <input type="text" value="A, W 7, x, x _ 8-digit binary value"/> Note: xx = 06, 08, 10, 12, 14, 16, 18, 20 8-digit binary value: Bit8, Bit7 ... Bit1 Bit8 = Output 8 ... Bit1 = Output 1

No.	Content	Format																								
707, 709, 711, 713, 715, 717, 719, 721	Dig. inputs 1 ... 8	<p>Response: <input type="text" value="A, B _ _ 8-digit binary value"/></p> <p>Note: 8-digit binary value: Bit8, Bit7 ... Bit1 Bit8 = Input 8 ... Bit1 = Input 1</p>																								
722, 723	COM5 analog output, COM6 analog output	<p>Response: Start-Stop mode</p> <table border="1"> <tr><td><input type="text" value="A, B _ _ A Application block for COM5 (Number_3) _ _ _"/></td></tr> <tr><td>Start value (weight value) <input type="text" value=" _ _ Unit _ _ _"/></td></tr> <tr><td>Stop value (weight value) <input type="text" value=" _ _ Unit _ _ _"/></td></tr> <tr><td>Start value voltage/current <input type="text" value=" _ _ Unit _ _ _"/></td></tr> <tr><td>Stop value voltage/current <input type="text" value=" _ _ Unit *"/></td></tr> </table> <p>DeltaTrac mode</p> <table border="1"> <tr><td><input type="text" value="A, B _ _ A Application block for COM5 (Number_3) _ _ _"/></td></tr> <tr><td>Start value voltage/current <input type="text" value=" _ _ Unit _ _ _"/></td></tr> <tr><td>Stop value voltage/current <input type="text" value=" _ _ Unit _ _ _"/></td></tr> <tr><td>Tolerance voltage/current <input type="text" value=" _ _ Unit *"/></td></tr> </table> <p>ΔW-ΔT mode</p> <table border="1"> <tr><td><input type="text" value="A, B _ _ A Application block for COM5 (Number_3) _ _ _"/></td></tr> <tr><td>Start value voltage/current <input type="text" value=" _ _ Unit _ _ _"/></td></tr> <tr><td>Delta voltage/current <input type="text" value=" _ _ Weight unit/sec *"/></td></tr> </table> <p>Write: Start-Stop mode</p> <table border="1"> <tr><td><input type="text" value="A, W 7, x, x _ _ A Application block for COM5 (Number_3) \$ \$"/></td></tr> <tr><td>Start value (weight value) <input type="text" value=" _ _ Unit \$ \$"/></td></tr> <tr><td>Stop value (weight value) <input type="text" value=" _ _ Unit \$ \$"/></td></tr> <tr><td>Start value voltage/current <input type="text" value=" _ _ Unit \$ \$"/></td></tr> <tr><td>Stop value voltage/current <input type="text" value=" _ _ Unit *"/></td></tr> </table> <p>DeltaTrac mode</p> <table border="1"> <tr><td><input type="text" value="A, W 7, x, x _ _ A Application block for COM5 (Number_3) \$ \$"/></td></tr> <tr><td>Start value voltage/current <input type="text" value=" _ _ Unit \$ \$"/></td></tr> <tr><td>Stop value voltage/current <input type="text" value=" _ _ Unit \$ \$"/></td></tr> <tr><td>Tolerance voltage/current <input type="text" value=" _ _ Unit *"/></td></tr> </table> <p>ΔW-ΔT mode</p> <table border="1"> <tr><td><input type="text" value="A, W 7, x, x _ _ A Application block for COM5 (Number_3) \$ \$"/></td></tr> <tr><td>Start value voltage/current <input type="text" value=" _ _ Unit \$ \$"/></td></tr> <tr><td>Delta voltage/current <input type="text" value=" _ _ Weight unit/s *"/></td></tr> </table> <p>Note: xx = 22: COM5 xx = 23: COM6</p>	<input type="text" value="A, B _ _ A Application block for COM5 (Number_3) _ _ _"/>	Start value (weight value) <input type="text" value=" _ _ Unit _ _ _"/>	Stop value (weight value) <input type="text" value=" _ _ Unit _ _ _"/>	Start value voltage/current <input type="text" value=" _ _ Unit _ _ _"/>	Stop value voltage/current <input type="text" value=" _ _ Unit *"/>	<input type="text" value="A, B _ _ A Application block for COM5 (Number_3) _ _ _"/>	Start value voltage/current <input type="text" value=" _ _ Unit _ _ _"/>	Stop value voltage/current <input type="text" value=" _ _ Unit _ _ _"/>	Tolerance voltage/current <input type="text" value=" _ _ Unit *"/>	<input type="text" value="A, B _ _ A Application block for COM5 (Number_3) _ _ _"/>	Start value voltage/current <input type="text" value=" _ _ Unit _ _ _"/>	Delta voltage/current <input type="text" value=" _ _ Weight unit/sec *"/>	<input type="text" value="A, W 7, x, x _ _ A Application block for COM5 (Number_3) \$ \$"/>	Start value (weight value) <input type="text" value=" _ _ Unit \$ \$"/>	Stop value (weight value) <input type="text" value=" _ _ Unit \$ \$"/>	Start value voltage/current <input type="text" value=" _ _ Unit \$ \$"/>	Stop value voltage/current <input type="text" value=" _ _ Unit *"/>	<input type="text" value="A, W 7, x, x _ _ A Application block for COM5 (Number_3) \$ \$"/>	Start value voltage/current <input type="text" value=" _ _ Unit \$ \$"/>	Stop value voltage/current <input type="text" value=" _ _ Unit \$ \$"/>	Tolerance voltage/current <input type="text" value=" _ _ Unit *"/>	<input type="text" value="A, W 7, x, x _ _ A Application block for COM5 (Number_3) \$ \$"/>	Start value voltage/current <input type="text" value=" _ _ Unit \$ \$"/>	Delta voltage/current <input type="text" value=" _ _ Weight unit/s *"/>
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Delta voltage/current <input type="text" value=" _ _ Weight unit/s *"/>																										
724 ... 731	Set point 1	<p>Response: <input type="text" value="A, B _ _ Set point (Text_2) _ _ _"/></p> <table border="1"> <tr><td><input type="text" value="A, x, x, x, _ _ , y, y, y, . , z, z _ _ _"/></td></tr> <tr><td>Scale (Text_3) <input type="text" value=" _ _ _"/></td></tr> <tr><td>Set point value (weight value) <input type="text" value=" _ _ _"/></td></tr> </table> <p>Write: <input type="text" value="A, W 7, 2, x _ _ Set point type (Text_2) \$, \$"/></p> <table border="1"> <tr><td><input type="text" value="A, x, x, x, _ _ , y, y, y, . , z, z \$, \$"/></td></tr> <tr><td>Scale (Text_3) <input type="text" value=" \$, \$"/></td></tr> <tr><td>Set point value (weight value) <input type="text" value=" _ _ _"/></td></tr> </table> <p>Note: xx = 24 ... 31 Set point type: F\uparrow, F\downarrow, D\uparrow, D\downarrow Scale: W1, W2, W3, ALL</p>	<input type="text" value="A, x, x, x, _ _ , y, y, y, . , z, z _ _ _"/>	Scale (Text_3) <input type="text" value=" _ _ _"/>	Set point value (weight value) <input type="text" value=" _ _ _"/>	<input type="text" value="A, x, x, x, _ _ , y, y, y, . , z, z \$, \$"/>	Scale (Text_3) <input type="text" value=" \$, \$"/>	Set point value (weight value) <input type="text" value=" _ _ _"/>																		
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Scale (Text_3) <input type="text" value=" \$, \$"/>																										
Set point value (weight value) <input type="text" value=" _ _ _"/>																										


8 What to do if ...?

Error / Display	Possible causes	Remedy
Display is dark	<ul style="list-style-type: none"> • No mains voltage • Terminal switched off • Power cord not connected • Brief malfunction • Switch-off time too short in storage battery operation at the IND690-24V • Storage battery level too low at the IND690-24V • Operating-mode selector switch for storage battery operation/mains operation set incorrectly at the IND690-24V 	<ul style="list-style-type: none"> → Check mains → Switch on terminal → Plug in power plug → Switch terminal off and on again → Switch off power for 10 seconds → Charge storage battery → Set operating-mode selector switch to desired operating mode
Underload	<ul style="list-style-type: none"> • Load plate not in place • Preload not applied • Weighing range dropped below 	<ul style="list-style-type: none"> → Apply load plate → Apply preload → Set zero
Overload	<ul style="list-style-type: none"> • Weighing range exceeded • Weighing platform locked 	<ul style="list-style-type: none"> → Relieve weighing platform → Release lock
Weight display unstable	<ul style="list-style-type: none"> • Agitated set-up location • Draft • Contact between load plate and/or weighing sample and surroundings • Power malfunction 	<ul style="list-style-type: none"> → Adjust vibration adapter → Avoid drafts → Eliminate contact → Check mains
Wrong weight display	<ul style="list-style-type: none"> • Wrong setting to zero of weighing platform • Wrong tare weight • Contact between load plate and/or weighing sample and surroundings • Weighing platform tilted • Wrong weighing platform selected 	<ul style="list-style-type: none"> → Relieve weighing platform, set to zero and repeat weighing → Delete tare or enter right tare value → Eliminate contact → Level weighing platform → Select right weighing platform
A whistle sound is emitted in the IND690-24V	<ul style="list-style-type: none"> • Storage battery level too low 	<ul style="list-style-type: none"> → Charge storage battery or switch over to 24 VDC mains operation
WRONG CODE	<ul style="list-style-type: none"> • Wrong personal code 	<ul style="list-style-type: none"> → Enter right personal code

Error / Display	Possible causes	Remedy
SCALE NO. ERROR	<ul style="list-style-type: none"> • Error in weighing cell 	<ul style="list-style-type: none"> → Repeat test → If the message appears again: contact METTLER TOLEDO Customer Service
OUT OF RANGE	<ul style="list-style-type: none"> • Zero set range exceeded • Gross weight negative • Taring range exceeded • Entered value outside permissible range 	<ul style="list-style-type: none"> → Relieve weighing platform → Relieve weighing platform and set to zero → Relieve weighing platform and set to zero → Enter permissible value
NOT ALLOWED	<ul style="list-style-type: none"> • Weighing platform does not exist • Print with negative weight value 	<ul style="list-style-type: none"> → Connect weighing platform → Relieve weighing platform, set to zero and repeat weighing
NOT EXISTENT	<ul style="list-style-type: none"> • Recalled memory not assigned 	<ul style="list-style-type: none"> → Recall other memory
NO DATA TRANSFER	<ul style="list-style-type: none"> • Weighing platform does not transmit data to the terminal 	<ul style="list-style-type: none"> → Switch terminal off and on again → If the message appears again: contact METTLER TOLEDO Customer Service
INTERF. COM X – BREAK	<ul style="list-style-type: none"> • Break in receiving cable of specified interface 	<ul style="list-style-type: none"> → Check cable and connectors → Check external devices (on/off)
TRANSMIT BUFFER FULL	<ul style="list-style-type: none"> • No transmission • Too many key messages and baud rate too low 	<ul style="list-style-type: none"> → Check handshake → Increase baud rate
KEY BUFFER FULL	<ul style="list-style-type: none"> • Data string currently being edited contains too many blocks 	<ul style="list-style-type: none"> → Remove blocks from data string
ERROR BARCODE	<ul style="list-style-type: none"> • The specified application block contains no data • Wrong sub-block selected, e.g. sub-block 0 	<ul style="list-style-type: none"> → Select application block which contains data → Select permissible sub-block
NO BLOCK	<ul style="list-style-type: none"> • Entered application block does not exist 	<ul style="list-style-type: none"> → Enter different application block
BUFFER IS FULL	<ul style="list-style-type: none"> • Data string of transfer key contains more than 10 application blocks 	<ul style="list-style-type: none"> → Change configuration of transfer key
DISPLAY MODE	<ul style="list-style-type: none"> • Weighing cell defective 	<ul style="list-style-type: none"> → Contact METTLER TOLEDO Customer Service

Error / Display	Possible causes	Remedy
NO ANALOG OUTPUT	<ul style="list-style-type: none">• Resolution or maximum load of the selected weighing bridge was changed	→ Reconfigure Interface AnalogOut-690 in master mode
SCALE NUMBER DOUBLED	<ul style="list-style-type: none">• 2 weighing platforms with same scale number connected	→ Contact METTLER TOLEDO Customer Service

9 Technical data and accessories

Weighing functions	
Tare compensation	At the press of a button or automatically, up to maximum load (subtractive)
Tare target value	<ul style="list-style-type: none"> • For single-range scales over entire weighing range (subtractive) • For multi-range scales depending on national calibration regulations • 999 stored tare memories, protected against power failure
Tare indicator	NET lights up with saved tare weight
DeltaTrac	<ul style="list-style-type: none"> • Analog display of dynamic measured values • With optical marks for target value and tolerances • Asymmetric tolerances possible • 3 selectable applications • 999 DeltaTrac memories, protected against power failure
Setting to zero	Automatic or manual
Gross changeover	Display of weight value can be changed over to gross weight at press of a button
Unit changeover	Unit can be changed over to weight units kg, g, lb, oz, ozt, dwt in dependence on national calibration regulations at press of a button
Stabilization detector	4-step, with motion indicator
Weighing process adapter	3-step adjustment to weighing sample
Vibration adapter	3-step adjustment to ambient conditions
MinWeigh	<ul style="list-style-type: none"> • Weight values below the minimum weighing-in quantity are identified with  • Minimum weighing-in quantity fixed or calculated
Identification data	<ul style="list-style-type: none"> • 6 memories for 30 alphanumeric characters, can be recalled with keys A to F • Each memory can be assigned a fixed name which can be written in the marking field next to the corresponding key • 999 memories for frequently used identification data
Info function	Displays of current weighing data, identification data and memories at the press of a button
Date and time	<ul style="list-style-type: none"> • For printout or output via the data interface • Quartz-controlled, 12 or 24-hour display, automatic calendar function, Europe, USA or free format, safe against power failure • Automatic summer time switchover







10 Appendix

10.1 ASCII table

hex	deci	ASCII US	hex	deci	ASCII US	hex	deci	ASCII US	hex	deci	ASCII US	hex	deci	ASCII US
00	0	NUL	34	52	4	68	104	h	9C	156	€	D0	208	⌚
01	1	SOH	35	53	5	69	105	i	9D	157	¥	D1	209	⌘
02	2	STX	36	54	6	6A	106	j	9E	158	ℳ	D2	210	⌚
03	3	ETX	37	55	7	6B	107	k	9F	159	f	D3	211	⌚
04	4	EOT	38	56	8	6C	108	l	A0	160	á	D4	212	⌚
05	5	ENQ	39	57	9	6D	109	m	A1	161	í	D5	213	⌚
06	6	ACK	3A	58	:	6E	110	n	A2	162	ó	D6	214	⌚
07	7	BEL	3B	59	;	6F	111	o	A3	163	ú	D7	215	⌚
08	8	BS	3C	60	<	70	112	p	A4	164	ñ	D8	216	⌚
09	9	HT	3D	61	=	71	113	q	A5	165	Ñ	D9	217	⌚
0A	10	LF	3E	62	>	72	114	r	A6	166	ª	DA	218	⌚
0B	11	VT	3F	63	?	73	115	s	A7	167	º	DB	219	■
0C	12	FF	40	64	@	74	116	t	A8	168	¿	DC	220	■
0D	13	CR	41	65	A	75	117	u	A9	169	¡	DD	221	■
0E	14	SO	42	66	B	76	118	v	AA	170	¬	DE	222	■
0F	15	SI	43	67	C	77	119	w	AB	171	□	DF	223	■
10	16	DLE	44	68	D	78	120	x	AC	172	□	E0	224	α
11	17	DC1	45	69	E	79	121	y	AD	173	¡	E1	225	β
12	18	DC2	46	70	F	7A	122	z	AE	174	«	E2	226	Γ
13	19	DC3	47	71	G	7B	123	{	AF	175	»	E3	227	Π
14	20	DC4	48	72	H	7C	124	|	B0	176	⋮	E4	228	Σ
15	21	NAK	49	73	I	7D	125	}	B1	177	⋮	E5	229	σ
16	22	SYN	4A	74	J	7E	126	~	B2	178	■	E6	230	μ
17	23	ETB	4B	75	K	7F	127	⏪	B3	179	|	E7	231	τ
18	24	CAN	4C	76	L	80	128	reserved	B4	180	¡	E8	232	φ
19	25	EM	4D	77	M	81	129	ü	B5	181	¡	E9	233	θ
1A	26	SUB	4E	78	N	82	130	é	B6	182	¡	EA	234	Ω
1B	27	ESC	4F	79	O	83	131	ê	B7	183	π	EB	235	ø
1C	28	FS	50	80	P	84	132	ä	B8	184	π	EC	236	∞
1D	29	GS	51	81	Q	85	133	à	B9	185	¡	ED	237	∅
1E	30	RS	52	82	R	86	134	å	BA	186	||	EE	238	ε
1F	31	US	53	83	S	87	135	ç	BB	187	π	EF	239	∩
20	32	SP	54	84	T	88	136	ê	BC	188	⌚	F0	240	≡
21	33	!	55	85	U	89	137	ë	BD	189	⌚	F1	241	±
22	34	"	56	86	V	8A	138	è	BE	190	⌚	F2	242	≥
23	35	#	57	87	W	8B	139	ï	BF	191	⌚	F3	243	≤
24	36	\$	58	88	X	8C	140	î	C0	192	⌚	F4	244	|
25	37	%	59	89	Y	8D	141	ï	C1	193	⌚	F5	245	⌚
26	38	&	5A	90	Z	8E	142	Ä	C2	194	⌚	F6	246	÷
27	39	'	5B	91	[	8F	143	Å	C3	195	⌚	F7	247	≈
28	40	(	5C	92	\	90	144	É	C4	196	—	F8	248	°
29	41	)	5D	93	]	91	145	æ	C5	197	+	F9	249	•
2A	42	*	5E	94	^	92	146	Æ	C6	198	⌚	FA	250	·
2B	43	+	5F	95	_	93	147	ô	C7	199	⌚	FB	251	√
2C	44	,	60	96	`	94	148	ö	C8	200	⌚	FC	252	ˆ
2D	45	-	61	97	a	95	149	ò	C9	201	⌚	FD	253	ˆ
2E	46	.	62	98	b	96	150	ù	CA	202	⌚	FE	254	ˆ
2F	47	/	63	99	c	97	151	û	CB	203	⌚	FF	255	ˆ
30	48	0	64	100	d	98	152	ÿ	CC	204	⌚			
31	49	1	65	101	e	99	153	Û	CD	205	=			
32	50	2	66	102	f	9A	154	Ü	CE	206	⌚			
33	51	3	67	103	g	9B	155	ç	CF	207	⌚			

10.2 Key codes

All keys of the IND690 are assigned to numbers so that the keys may be addressed via interfaces.

Key	Number	Key	Number
Key 0	0	Key 	19
Key 1	1	Key 	20
...	...	Key 	21
Key 9	9	Key 	22
Decimal point key	10	Key 	23
Function key F1	11	Key 	24
Function key F2	12	CODE A key	25
Function key F3	13	CODE B key	26
Function key F4	14	CODE C key	27
Function key F5	15	CODE D key	28
Function key F6	16	CODE E key	29
		CODE F key	30
		Cursor key <	31
		Cursor key >	32
		Cursor key ^	33
		Cursor key v	34

10.3 Notes on CL handshake

With the CL handshake 3 types of interface control are possible:

Handshake in receiving direction, in transmitting direction and in both directions.

After switch-on and after each interruption, the IND690 attempts to establish the handshake in both directions.

CL handshake in receiving direction

This type of CL handshake is suitable for data transmission from the IND690 to the computer.

1. The weighing terminal transmits SYN after switch-on.
2. The computer transmits the character ACK after switch-on or after receiving SYN.
3. The weighing terminal then sends the response to a command or to a key actuation after each ACK.

CL handshake in transmission direction






This type of CL handshake is suitable for data transmission from the computer to the IND690.

1. The weighing terminal transmits SYN after switch-on.
2. The computer transmits the character SYN after switch-on or after receiving SYN.
3. The weighing terminal acknowledges the receipt of SYN again with SYN and signals its readiness to receive with ACK.
4. Then the computer can transmit a command after each ACK.

CL handshake in both directions

1. The weighing terminal transmits SYN after switch-on.
2. The computer transmits the character SYN after switch-on or after receiving SYN.
3. The weighing terminal acknowledges the receipt of SYN again with SYN and signals its readiness to receive with ACK.
4. The computer signals its readiness to receive with ACK.
5. During operation the weighing terminal receives data and transmits ACK when it is ready to receive data again.
The computer receives data and transmits ACK when it is ready to receive data again.

10.4 Selection possibilities for the assignment of the digital inputs and outputs

Digital inputs	Assignment	Function
	ON/OFF	switch terminal on or off
	ZERO SET	like 
	TARE SET	like 
	ENTER	like 
	CLEAR	like 
	SCALE	like 
	SCALE 1 ... SCALE 5	switch over to Scale 1 ... 5
	KBD LOCK	lock/unlock keyboard
	F1 ... F6	like key F1 ... F6
	NOT USED	no function stored
Digital outputs	Assignment	Function
	DELTA BELOW	DeltaTrac below tolerance
	DELTA GOOD	DeltaTrac within tolerance
	DELTA ABOVE	DeltaTrac above tolerance
	STABLE	scale stationary, no movement
	SETPOINT 1 ... SETPOINT 8	Setpoint 1 ... 8 reached or exceeded
	SCALE 1 ... SCALE 5	current scale is Scale 1 ... 5
	GA46 P O	Out of paper GA46
	CMD	toggles after a command triggered via an input has been executed
	RESULT	result of the command execution 0 = correct, 1 = incorrect
	NET	net weight is displayed
	NOT USED	no function stored

10.5 Disposal



In conformance with the European Directive 2002/96 EC on Waste Electrical and Electronic Equipment (WEEE) this device may not be disposed of with domestic waste. This also applies to countries outside the EU, per their specific requirements.

→ Please dispose of this product in accordance with local regulations at the collecting point specified for electrical and electronic equipment.

If you have any questions, please contact the responsible authority or the distributor from which you purchased this device.

Should this device be passed on to other parties (for private or professional use), the content of this regulation must also be related.

Thank you for your contribution to environmental protection.

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Quick Guide

METTLER TOLEDO MultiRange

METTLER TOLEDO

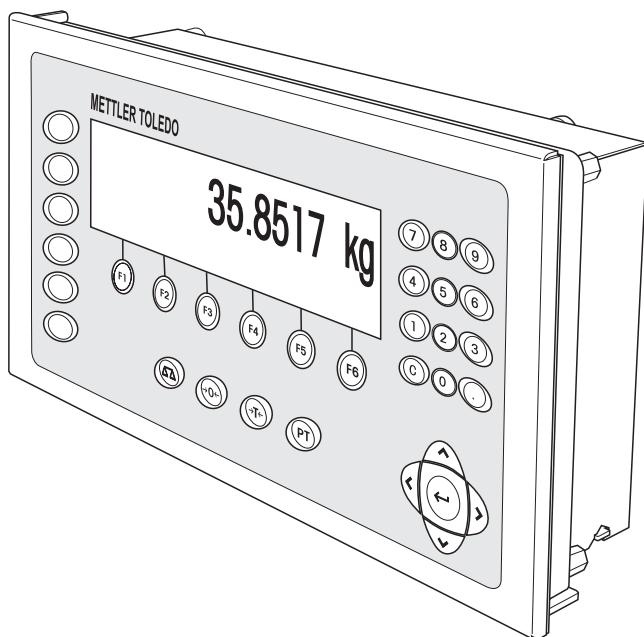
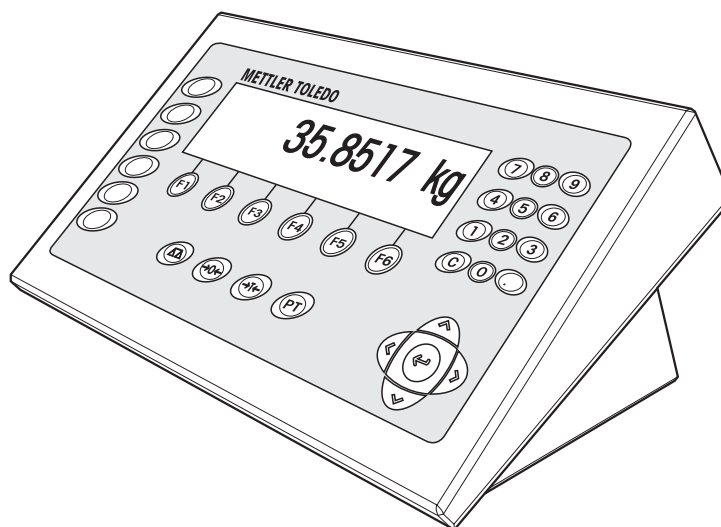
IND690 / IND690xx / IND690-24V weighing terminals

Wägeterminals IND690 / IND690xx / IND690-24V

Terminaux de pesage IND690 / IND690xx / IND690-24V

Terminales de pesada IND690 / IND690xx / IND690-24V

Terminali di pesata IND690 / IND690xx / IND690-24V



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1 Safety instructions

1.1 Safety instructions for IND690xx



The explosion-protected IND690xx weighing terminal fulfills Device category 3 and is approved for operation in Zone 2 (gases) and Zone 22 (dusts) hazardous areas.

There is an increased risk of injury and damage when the IND690xx weighing terminal is used in a potentially explosive atmosphere.

Special care must be taken when working in such hazardous areas. The code of practice is oriented to the "Safe Distribution" concept drawn up by METTLER TOLEDO.

- Competence**
- ▲ The IND690xx weighing terminal, accompanying weighing platforms and accessories may only be installed, maintained and repaired by authorized METTLER TOLEDO service personnel.
 - ▲ The mains connection may only be connected or disconnected by the owner's electrician.
- Ex approval**
- ▲ For the exact specification please refer to the statement of conformity.
 - ▲ In order to avoid electrostatic charging the IND690xx may only be installed in rooms or areas at which strong electric field strengths cannot occur from experience.
 - ▲ No modifications may be made to the terminal and no repair work may be performed on the modules. Any weighing platform or system modules that are used must comply with the specifications contained in the installation instructions. Non-compliant equipment jeopardizes the safety of the system, cancels the Ex approval and renders any warranty or product liability claims null and void.
 - ▲ The cable glands must be tightened so that a strain relief of ≥ 20 N per mm cable diameter is ensured.
 - ▲ When connecting external devices, always observe the maximum permissible connected loads, see installation information. It must be ensured that no voltages are fed into the IND690xx than it itself provides. The interface parameters have to fulfill the standard.
 - ▲ Peripheral devices without an Ex approval may only be operating in non-hazardous areas. It must be ensured that no voltages are fed into the IND690xx than it itself provides. In addition the maximum permissible connected loads have to be observed, see installation information. The interface parameters have to fulfill the standard.
 - ▲ The safety of a weighing system including the IND690xxx weighing terminal is only guaranteed when the weighing system is operated, installed and maintained in accordance with the respective instructions.

- ▲ Also comply with the following:
 - the instructions for the system modules
 - the regulations and standards in the respective country
 - the statutory requirement for electrical equipment installed in hazardous areas in the respective country, e.g. EN 60079-14 and EN 61241-14
 - all instructions related to safety issued by the owner
- ▲ Before initial start-up and following service work, check the explosion-protected weighing system for the proper condition of all safety-related parts.

Operation

- ▲ Prevent the build-up of static electricity. Therefore:
 - only operate the IND690xx in rooms or areas at which strong electric field strengths cannot occur from experience,
 - always wear suitable working clothes when operating or performing service work on the system,
 - do not rub or wipe off the keyboard surface with a dry cloth or glove.
- ▲ Do not use protective hoods.
- ▲ Prevent damage to the weighing terminal. Hairline cracks in the keyboard membrane are also considered damage.
- ▲ If the IND690xx weighing terminal, accompanying weighing platforms or accessories are damaged:
 - Switch off weighing terminal.
 - Separate the weighing terminal from the mains in accordance with the applicable regulations.
 - Secure the weighing terminal against accidental start-up.

Leakages

- ▲ The IND690xx panel unit does not comply with any freedom-from-leaks rating. Therefore the installer is responsible for compliance with the freedom from leaks rating, e.g. at control cabinet installation. At least a freedom-from-leaks rating IP54 is required in hazardous areas, in case of conductive dust IP6X. The respective national standards furthermore have to be observed.

1.2 Safety instructions for IND690-24V



- ▲ Never operate the IND690-24V weighing terminal in hazardous areas; there are special scales in our product line for this purpose.
- ▲ The IND690-24V weighing terminal may only be connected to a power supply (storage battery or mains) having a 24 VDC SELV power circuit in accordance with EN 60950.
- ▲ Short-circuit danger!
Ensure that the power supply is connected properly:
brown lead +24 V
blue lead 0 V or negative pole
- ▲ The safety of the unit is endangered if it is not operated in accordance with these operating instructions.
- ▲ Only authorized personnel may open the IND690-24V weighing terminal.

Competence ▲ The IND690-24V weighing terminal, accompanying weighing platforms and accessories may only be installed, maintained and repaired by authorized METTLER TOLEDO service personnel.

Leakages ▲ The IND690-24V panel unit does not comply with any freedom-from-leaks rating. Therefore the installer is responsible for compliance with the freedom from leaks rating, e.g. at control cabinet installation. The respective national standards furthermore have to be observed.

1.3 Safety instructions for IND690



- ▲ Do not operate the IND690 weighing terminal in hazardous areas. We have special suitable scales in our range of products for hazardous areas.
- ▲ Ensure that the power socket outlet for the IND690 weighing terminal is earthed and easily accessible, so that it can be de-energized rapidly in emergencies.
- ▲ Ensure that the supply voltage at the installation site lies within in the range of 100 V to 240 V.
- ▲ The safety of the device cannot be ensured if it is not operated in accordance with these operating instructions.
- ▲ Only authorized personnel may open the IND690 weighing terminal.

Competence ▲ The IND690 weighing terminal, accompanying weighing platforms and accessories may only be installed, maintained and repaired by authorized METTLER TOLEDO service personnel.

Leakages ▲ The IND690 panel unit does not comply with any freedom-from-leaks rating. Therefore the installer is responsible for compliance with the freedom from leaks rating, e.g. at control cabinet installation. The respective national standards furthermore have to be observed.

2 Documentation

The weighing terminal comes supplied with the instructions and a CD containing all the documentation on the weighing system IND690.

Quick Guide These instructions describe the first steps with the weighing terminal following installation.

Operation instructions **IND690-Base**

Further instructions on working with the weighing terminal with the basic software and the interface settings can be found in the operating instructions IND690-Base.

IND690-Batch, IND690-Com, IND690-Control, IND690-Count, IND690-Fill, IND690-Form, IND690-FormXP, IND690-Sum

These operating instructions contain all information about how to operate and adjust the respective software application.

Example: Weighing terminal IND690-Count

The operating instructions for **IND690-Base** contain the following information:

- Basic functions (e.g. weighing, taring, ...)
- Additional functions (e.g. printing, DeltaTrac, dynamic weighing ...)
- Terminal settings (e.g. date/time, language ...)
- Scale settings (e.g. second unit, weighing process adapter, ...)
- Interface settings

The operating instructions for **IND690-Count** contain the following information:

- Counting mode
- Settings for counting

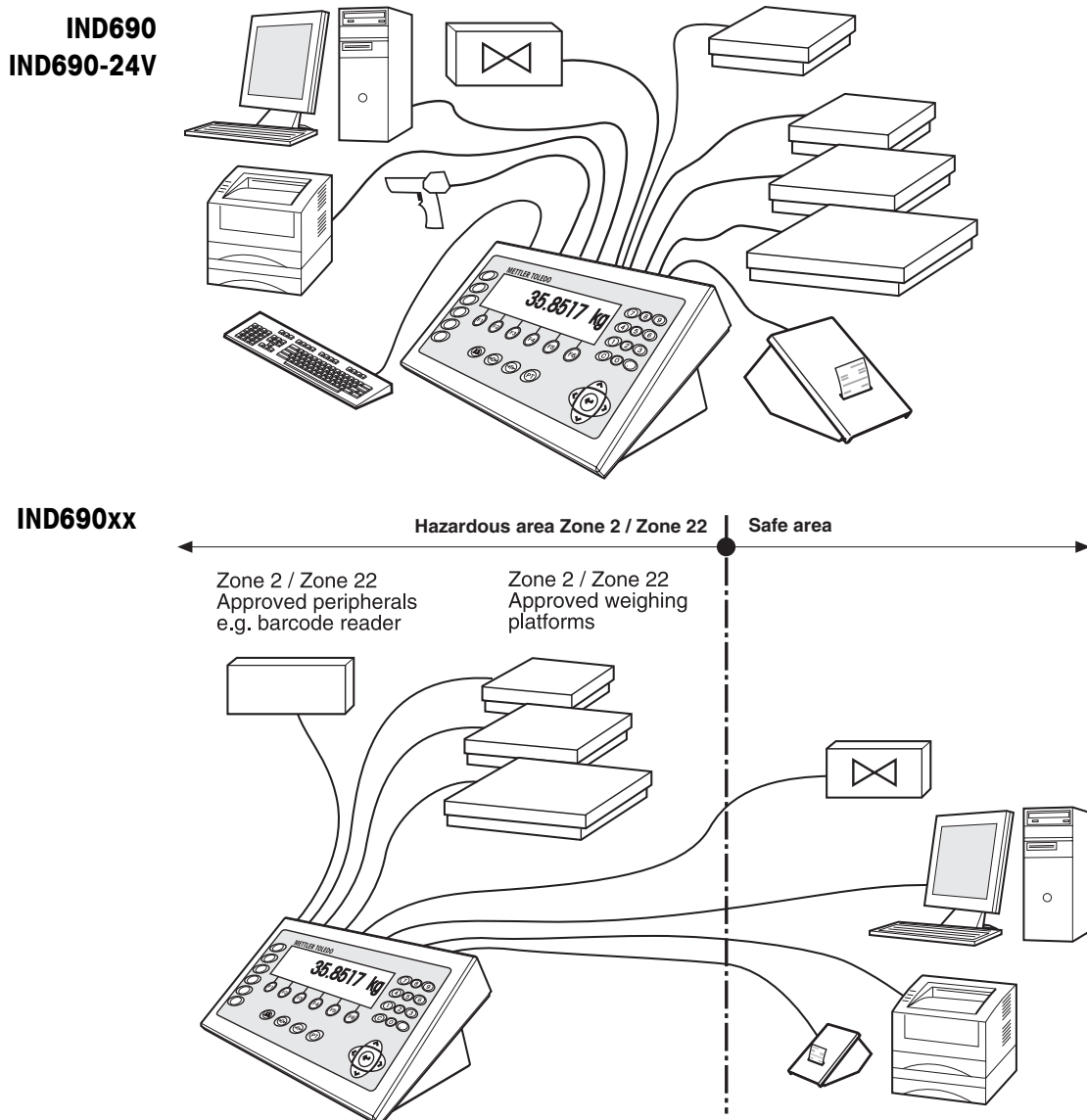
Installation information

Information about installation and/or retrofitting your terminal and the technical data of the hardware components can be found in the installation information IND690 / IND690xx / IND690-24V.

3 The weighing terminals

3.1 Applications

With the weighing terminals the following applications are possible:



- Multi-scale operation with up to 4 weighing platforms with IND690 and up to 3 weighing platforms with IND690xx and IND690-24V, including weighing platforms with an analog signal output.
- Up to 9 data interfaces
 - for printing,
 - for data exchange with a computer,
 - for connecting a barcode reader,
 - for control, e.g. of valves or flaps,
 - for connecting reference scales.
 - for connecting an external keypad

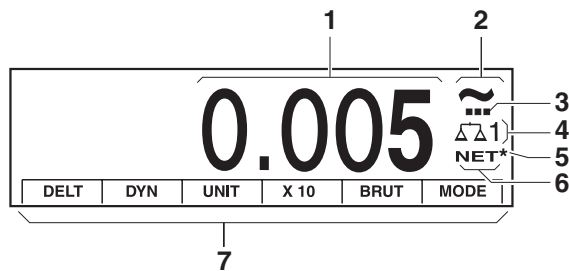
3.2 Installation

The weighing terminal is normally set up and installed by the METTLER TOLEDO Customer Service.

In the case of the IND690xx, the mains connection has to be made by one of the operator's skilled electricians.

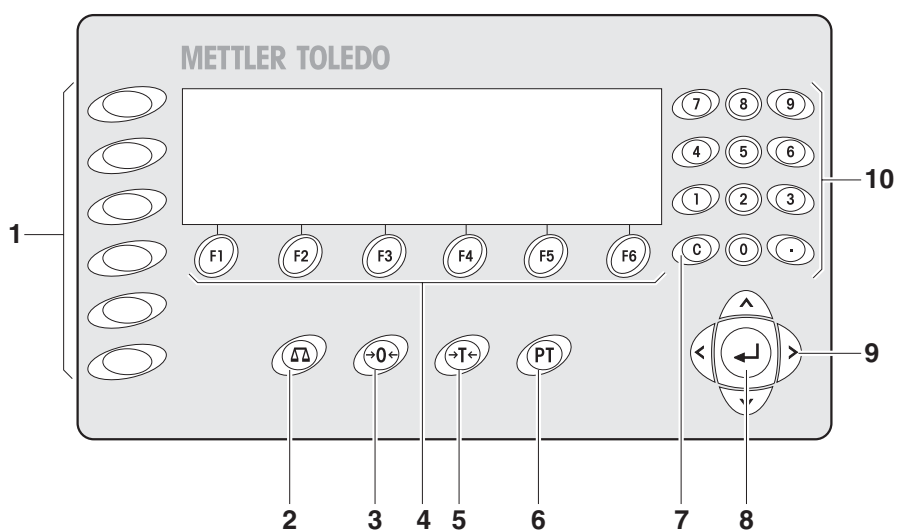
3.3 Overview

3.3.1 Display



- 1** Weight display BIG WEIGHT® with sign and decimal point
- 2** Stability monitor: lights up until the weighing platform has levelled out, then the weight unit appears here
- 3** Range display for multi-range weighing platforms
- 4** Number of the weighing platform: shows the weighing platform just selected
- 5** NET symbol for marking net weight values
- 6** Assignment of the function keys
The function keys are multiple assigned. With the cursor keys < or > you can switch between the different assignments.

3.3.2 Keyboard



- 1 CODE A ... CODE F keys – enter identification data
- 2 SCALE key – select scale
- 3 ZERO SET key – set scale to zero, test scale
- 4 Function keys F1 ... F6 – the current assignment is shown in the display above the key
- 5 TARE key – tare scale
- 6 TARE SPECIFICATION key – enter known tare values numerically
- 7 CLEAR key – clear entries and values
- 8 ENTER key – accept and transfer data
- 9 Cursor keys
- 10 Numeric keypad with decimal point

4 Operation

4.1 Switching on and off

Switching on from the standby mode

- Press any key.
The display shows a weight value based on the last tare value and zero point.

Switch off

- Press function key OFF.
The display goes out and the weighing terminal is in the standby mode. The zero point and tare value remain saved.

Note

If the function key OFF does not appear in the current assignment, press the cursor keys < or > several times if necessary until OFF is displayed.

Switching on with restart

1. Relieve weighing platform.
2. Press function key OFF and hold down until METTLER TOLEDO IND690 (factory setting) or text you have specified appears in display.
Then weight value appears.

The weighing platform is restarted.

4.2 Charge indicator in storage battery operation (IND690-24V only)

If the supply voltage drops below 22.5 V, a continuous whistle sound is emitted for approx. 10 to 30 minutes.

If the supply voltage drops below 21 V, the IND690-24V weighing terminal switches off automatically.


- If the whistle sound is emitted, complete the current weighing process and charge or replace the storage battery.

4.3 Setting to zero

Setting to zero corrects the influence of minor dirt on the load plate.

In the case of excessive dirt which cannot be compensated by setting to zero, the display shows OUT OF RANGE.

Manual zero set

1. Relieve weighing platform.
2. Press .
The display shows 0.000 kg.

Automatic zero set

On certified weighing platforms the zero point of the weighing platform is automatically corrected when the weighing platform is relieved.

The automatic zero set can be switched off in the master mode on noncertified weighing platforms.

4.4 Taring

4.4.1 Manual taring

1. Place empty container on scale.
2. Press $\rightarrow T \leftarrow$.
The tare weight is saved and the weight display set to zero.
The display shows the NET symbol.

Notes

- When the weighing platform is relieved, the saved tare weight is displayed with a negative sign.
- The weighing platform only saves **one** tare value.

4.4.2 Specifying tare weight

1. Press PT .
2. Enter tare weight (container weight) and confirm with \leftarrow .
When weighing platform is relieved, the entered tare weight is displayed with a negative sign.

Note

The weight unit for entering the tare weight can be selected with the cursor keys < or >.

4.4.3 Clearing tare weight

- Relieve weighing platform and tare.
- or –
- Specify tare weight 0.
- or –
- Enter PT , C sequence.

4.5 Weighing

Weighing without taring → Lay weighing sample on weighing platform.
Gross weight (total weight) is displayed.

Weighing with taring

1. Place the empty container on the weighing platform and tare.
2. Pour in weighing sample.
The display shows the net weight and the NET symbol.

Weighing with tare specification

1. Place filled container on weighing platform.
The display shows the gross weight (total weight).
2. Specify tare weight or recall tare memory.
The display shows the net weight (container content) and the NET symbol.


4.6 Working with several weighing platforms

Up to 4 weighing platforms can be connected to the IND690, and up to 3 weighing platforms can be connected to the IND690xx and IND690-24V.

Depending on the setting in master mode, only the currently active scale appears in the display (serial Multi-scale mode) or all scales are operated at the same time (parallel multi-scale mode). A constantly updated sum scale is also available in parallel multi-scale mode.


4.6.1 Switching over weighing platform

The weighing platform currently selected is shown on the terminal.

→ Press .

The next weighing platform is selected.

– or –

→ Enter number of weighing platform and press .

The desired weighing platform is selected.

4.6.2 Displaying several scales simultaneously

Condition

PARALLEL SCALE is selected in the master mode.

→ Press the cursor keys < or > as often as necessary until all scales are shown in the display.

5 Cleaning



DANGER OF SHOCK

→ Do not open the weighing terminals to clean.

CAUTION

→ Make sure that unused connection sockets are covered with protective caps to protect the socket contacts from moisture and dirt.

→ Do not use high-pressure cleaners.

Cleaning

→ Wipe off the weighing terminals with a commercially available glass or plastic cleaner.

IND690 Terminal

WM / WMH Weighing Module



Operation of WM weighing modules
and WMH weighing platforms
with an IND690 industrial terminal

METTLER TOLEDO

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1 Introduction

With the WM / WMH product line, METTLER TOLEDO offers weighing technology for the automation industry that is optimal with regard to speed, ruggedness, precision, and direct integration. The WM / WMH high-performance sensors (weighing modules) can be optimally connected to the IND690 industrial terminal with extended functionality as from Software Version 2.0, as well as to a computer (PC) or process control system (PLC). The DIRECT TALK and REMOTE TALK functionalities allow direct communication with a connected weighing module. The direct communication allows freely chosen commands to be sent directly to the weighing module, which makes configuration of the weighing module simple. With DIRECT TALK, the weighing module can be completely configured by the IND690, without connection of a PC.

2 Configuration

2.1 System structure

Operation of a weighing module on an IND690 requires a ConModule and a power supply from the system side (or power supply unit (PSU) for Ex Zone 1 weighing modules), because the IND690 cannot directly supply the weighing module with the necessary operating voltage. For the connection, an RS232 (point-point) or RS422 (for large distances) is available. Corresponding cables are available. The IND690 supports up to four scales with the METTLER TOLEDO Standard Interface Command Set (MT-SICS). The corresponding interface cards are built into the IND690.

The terminal can also be connected directly to a PC via the terminal interface COM1 (RS232) (interface configuration, see 3.3, page 6).

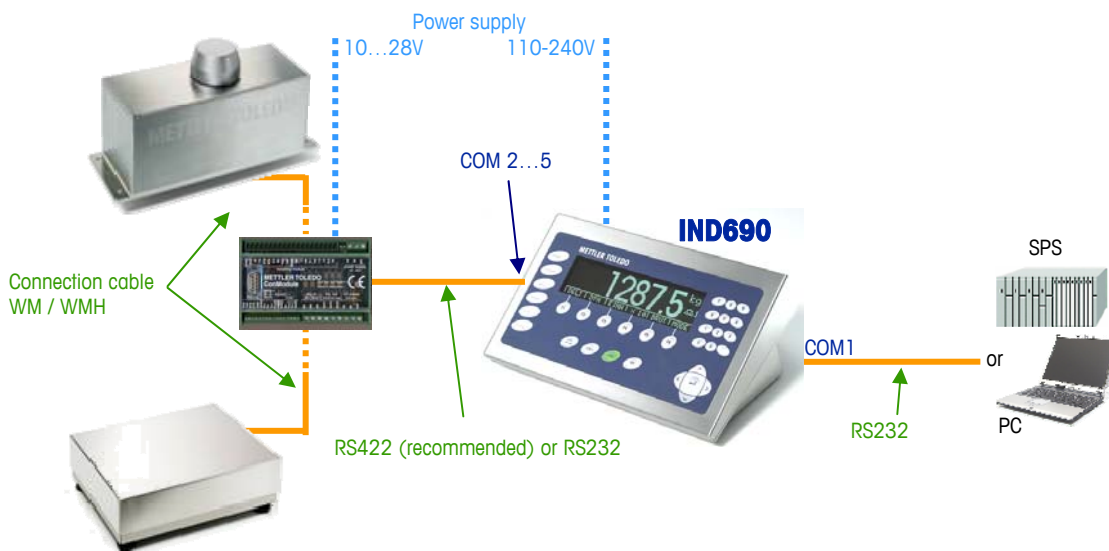


Figure 1: System structure IND690 weighing module

2.2 Connection diagram

As described in sections 2.2.1 and 2.2.2, an IND690 is connected to the weighing module via a ConModule (see [4]). Depending on the distance between the terminal and the ConModule or weighing module, an RS232 or RS422 connection can be used. Provided that the specification is met, and the correct baud rate is used, the RS422 allows a length of up to 1200 meters.

The voltage supply to the weighing module is from a separate supply on the ConModule.

The article numbers for typical configurations are listed in section 4.1 on page 9.

Recommendation: So that the RS232 remains available as service interface, METTLER TOLEDO recommends using the RS422 as connection between the IND690 and the ConModule.

2.2.1 Connection diagram for an RS232 connection

Terminal ConModule	1	2	3	4	5	6
Signal ConModule	RXD:	TxD	RTS	CTS	GND	Shield
Cable	See 4.1, page 9					
Color	White	Green	Yellow	Brown	Gray	Braid
Pin on plug IND690	2	3	8	4	6	1
Signal IND690	TxD	RxD	CTS	RTS	GND	Shield
Interface IND690	RS232-690 configuration: SICS-SCALE					

2.2.2 Connection diagram for an RS422 connection

Terminal ConModule	7	8	9	10	11
Signal ConModule	Rx+	Rx-	Tx+	Tx-	Shield
Cable	See 4.1, page 9				
Color	Green	Yellow	Gray	Pink	Braid
Pin on plug IND690	3	4	6	5	Plug
Signal IND690	TxD+	TxD-	RxD+	RxD-	Shield
Interface IND690	RS232-690 configuration: SICS-SCALE Interface module: switch 1 and 6: ON and 2-5: OFF (see [2])				

3 Functionality

For the WM and WMH weighing modules in conjunction with the IND690, many functions are available. In each case, the full update rate is maintained.

The functionalities described below are not all the functionalities that are available. The complete description of the functionality, and an overview of the available applications such as, for example, IND690 Count, is contained in the IND690 Operating Instructions [3] .

3.1 Direct Talk

3.1.1 Description

With the DIRECT TALK configuration, individual commands can be sent to a weighing module as an ASCII character string. The terminal adds the end-of-line (<cr><lf>) automatically. The commands are input either directly via the terminal, or via a PC keyboard that is connected to the terminal (interface card).

The responses are displayed on the terminal; multiline responses are possible. The function keys F1 / F2 can be used to page through a multiline response (up to 40 lines).

3.1.2 Terminal setting

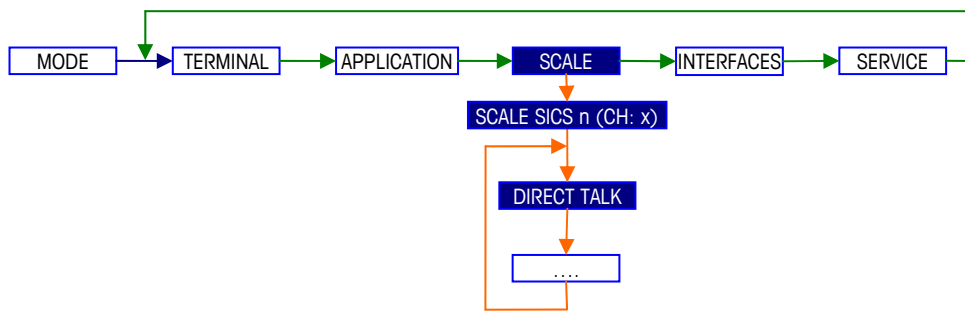


Figure 2: IND690 – DIRECT TALK menu

3.1.3 Display information items

COMx x = port number of the weighing module
 SEND Command that was sent to the weighing module
 RECD Response received from the weighing module



Figure 3: DIRECT TALK display

3.1.4 Key designations

F1 / F2	< >	Up / down for multiline responses	
F3	NEW	Input new command to be sent	| The command is input via the display or | an external PC keyboard
F4	EDIT	Edit last command	
F5	ENDE	Quit DIRECT TALK; the terminal is re-started	
F6	SEND	Send the command to the weighing module	
< >		Page through long responses right / left	
^ v		Switch display keyboard between upper case, lower case, and special characters	

3.2 Remote Talk

3.2.1 Description

REMOTE TALK mode enables a direct connection to be set up between a computer (for example the WM_Terminal or Microsoft ® HyperTerminal) and a weighing module via the IND690. Only one connection is possible. To change between several weighing modules, the connection must always be stopped. The IND690 is then re-started.

The communication is displayed on the terminal with the end-of-line (<cr><lf>) suppressed. The communication commands (see [1]) comprise the command set of the respective weighing module. The communication supports the full update rate (depending on the specific weighing module that is connected).

3.2.2 Display information items

COMx x = port number of the weighing module
 SEND The command that was sent to the weighing module
 RECD Response received from the weighing module

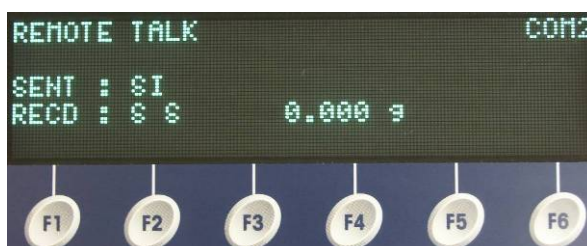


Figure 4: REMOTE TALK display

3.2.3 Command set

Command	RTS_ScaleID	Start REMOTE TALK ScaleID matches the ID of the scale (according to the display) [1...4]
Responses	RTS_A	Command executed successfully
	RTS_L	Command understood, but cannot be executed
	RTS_I	Invalid command, incorrect scale type connected

As soon as REMOTE TALK mode is activated, any interface command described in [1] can be sent to the weighing module.

Command	RTE	Stop REMOTE TALK The terminal is then re-started
Responses	RTE_A	REMOTE TALK was successfully stopped
	RTE_L	REMOTE TALK cannot be stopped
	RTE_I	REMOTE TALK is not switched on

3.3 MT-SICS commands of the IND690

The COM1 interface of the terminal serves to exchange data with a computer or SPS. In DIALOG MODE, the MT-SICS command set can be activated (MASTERMODE - INTERFACES - COMx - RS232 - MODE - DIALOG MODE - SICS). This makes it possible to communicate with the terminal by using MT_SICS commands. When doing so, it is important to note that the MT-SICS commands are not transmitted unchanged 1:1 by the terminal (as in REMOTE TALK), but interpreted. The command is sent to the scale that is currently active in the display.

The complete list of the compatible MT-SICS commands is contained in the Operating Instructions: IND690 Base (see [3], Chapter 6.4).

3.4 Restart

3.4.1 Description

The Restart functionality of the IND690 allows the original status to be recreated after a loss of voltage on the weighing module. With the RESTART ON configuration, the tare and zero values are permanently stored in the terminal. After a voltage interruption, the IND690 writes the respective values back into the weighing module.

3.4.2 Terminal setting

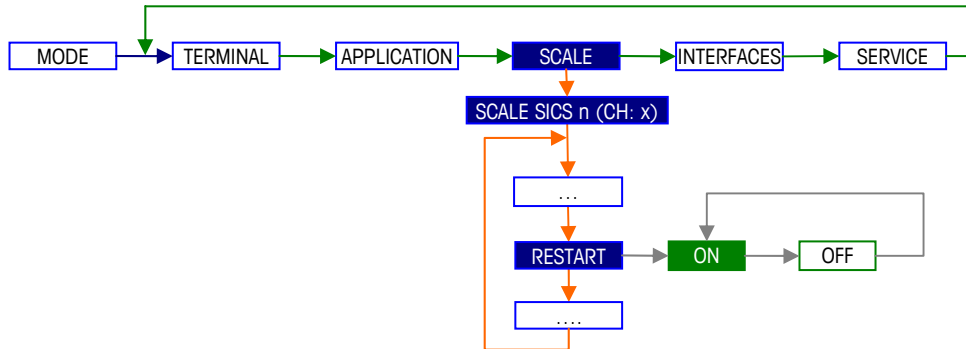


Figure 5: IND690 restart menu

3.5 Control mode x10

3.5.1 Description

Control mode x10 allows an additional display position – a so-called auxiliary numerical increment – on the WMH / WMH Ex weighing modules. This corresponds to the command MOD 1 or MOD 0 which is described in the MT-SICS Manual (see [1]).

With Control Mode switched on, the weight value is marked on the terminal with an asterisk (*).

Important: When Control Mode is switched off, all user modes are also switched off! With Increased Display Resolution or Open Zero, this mode must be re-set (see [1]).

3.5.2 Terminal setting

Setting is done with function key F4 in Master Mode.

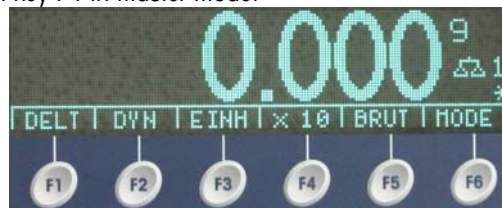


Figure 6: Control mode display

3.6 Totaling scale (scales in parallel)

3.6.1 Description

In the PARALLEL SCALE - Totaling Scale operating mode (see [3], Chapter 3.6.2), totaling of the weight values of up to four weighing modules is possible. When this operating mode is activated, the respective weighing modules that are used in the totaling are selected. The SCALES key can be used to switch between the measurement values of the individual weighing modules and the total. Instead of the number of the weighing cell, the display shows a total sign (Σ).

3.6.2 Terminal setting

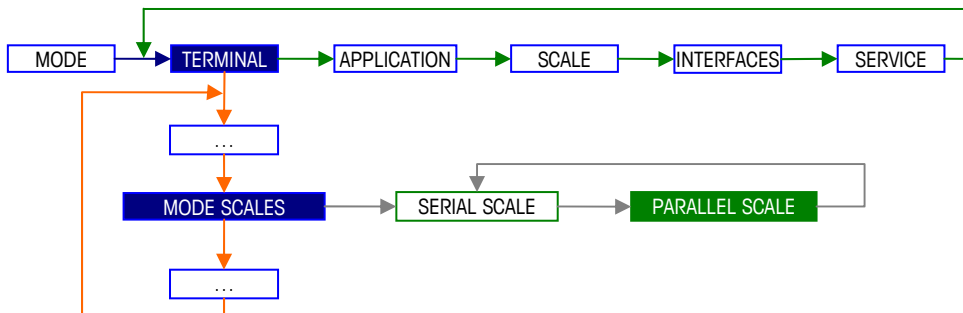


Figure 7: IND690 – SCALES IN PARALLEL - totaling scale

3.7 Menu item Scale

Under the menu item SCALE, several functions are available that depend on the scale that is connected. For the weighing modules, the functions that are listed below are possible. Further information is contained in the Operating Instructions (see [3]).

3.7.1 Terminal setting

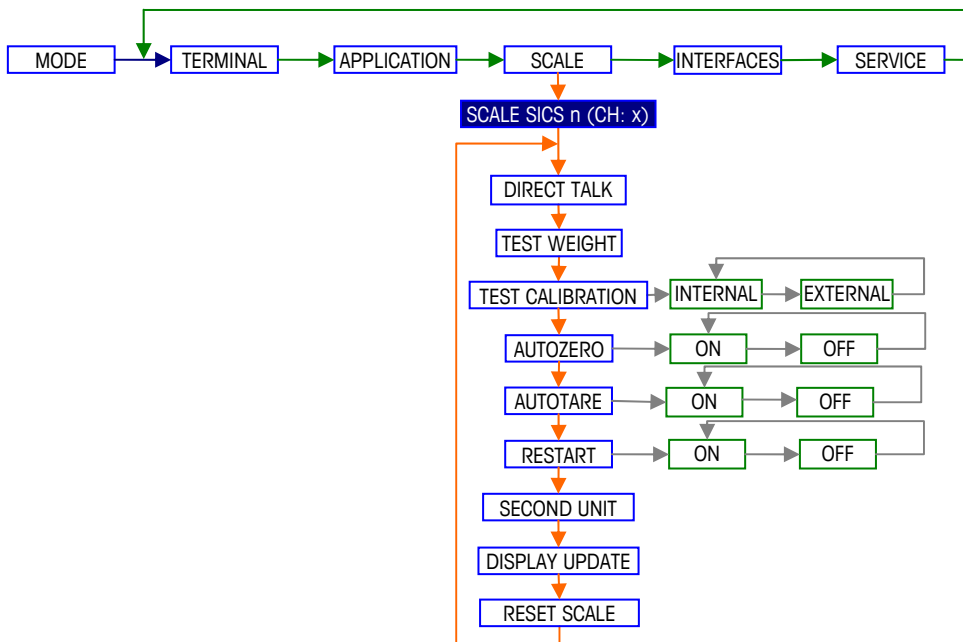


Figure 8: Overview IND690 - menu item SCALE

4 Annex

4.1 Typical configurations

4.1.1 Connection of the WM / WMH weighing module via a ConModule

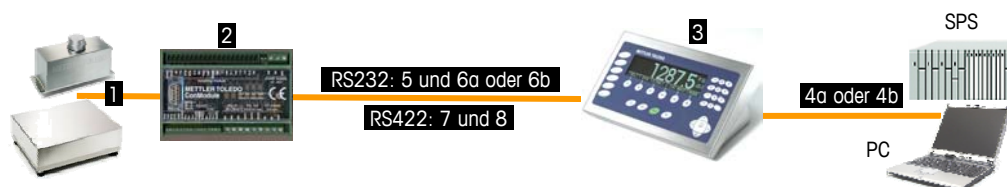


Figure 9: Typical configuration via a ConModule

No.	Article number	Designation
1	See [5]	WM or WMH weighing modules
		WM / WMH cable, 19-pin plug, straight or angled
2	42102811	ConModule (DIN rail) or ConBox (42102800)
3	22011901	IND690 terminal
4a	00504374	RS232 cable, 9-pin (female), 3 m for connection to a PC
4b	00503756	Plug (8-pin) and own cable for connection to an SPS/PLC
Connection via RS232		
5	22011953	RS232 interface card for installation in the IND690 terminal
6a	22006795	RS232 cable, 9-pin (male) for SICS balances via the service connector
6b	00503756	Plug (8-pin) and own cable for connection to the ConModule
Connection via RS422 (recommended)		
7	22011956	RS422 interface card for installation in the IND690 terminal
8	00204933	Cable (3 m) for RS422 with open end

4.1.2 Connection of a WM Ex / WMH Ex weighing module via a PSU



Figure 10: Typical configuration via a PSU

No.	Article number	Designation
1	See [5]	WM Ex or WMH Ex weighing modules
		Terminal box and Ex cable (blue)
2	22008525	Power supply unit (PSU) with RS232 interface
3	22011901	IND690 terminal
4a	00504374	RS232 cable, 9-pin, 3 m for connection to a PC
4b	00503756	Plug (8-pin) and own cable for connection to an SPS/PLC
5	22011953	RS232 interface card for installation in the IND690 terminal
6	22003832	PSU – IND690 connection cable (4 m)

4.1.3 Direct connection of a WX weighing module

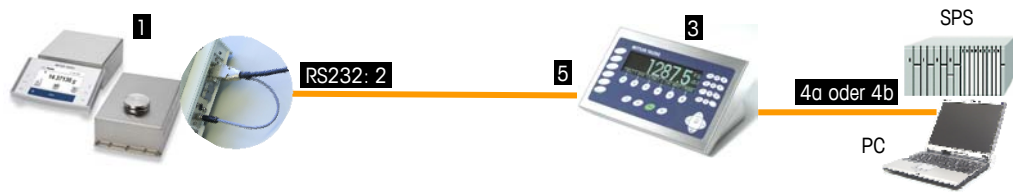


Figure 11: Typical configuration for WXT / WXS

No.	Article number	Designation
1	See [5]	WXT / WXS weighing module
2	22015128	RS232 cable, 9-pin (male) for SICS balances including power supply
3	22011901	IND690 terminal
4a	00504374	RS232 cable, 9-pin (female), 3 m for connection to a PC
4b	00503756	Plug (8-pin) and own cable for connection to an SPS/PLC
5	22011953	RS232 interface card for installation in the IND690 terminal Important: The voltage must be changed from 5V (factory) to 12V (BR2 bridge unpick and BR3 close).



4.2 Referenced documents

- [1] Reference Manual, Standard Interface Command Set for WM and WMH Weighing Modules MT-SICS (42101959)
- [2] Installation Information, Weighing Terminals IND690 / IND690xx / IND690-24V (22012803)
- [3] Operating Instructions, IND690 Base (22012808)
- [4] ConModule, Installation and Operating Instructions (42102823)
- [5] Weighing Components Catalog (44099884)

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www.mt.com

For more information

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Subject to technical changes
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Printed in Switzerland 42908990A

TESTS PROTOCOL

Qualité

Selon le système de management de la qualité ISO 9001:2008 et 14001:2004 établi dans l'entreprise Frewitt, nous attestons que l'installation à été construite, testée et contrôlée selon les règles de l'art pour assurer la qualité de l'installation et la conformité à la commande.

Qualität

Gemäss des Qualitätsmanagement-System ISO 9001:2008 und 14001:2004, welches für die Firma Frewitt erstellt wurde, bestätigen wir, dass die Anlage regelrecht konstruiert, getestet und kontrolliert wurde, um die Qualität der Anlage und die Übereinstimmung mit dem Auftrag zu gewährleisten.

Qualité

According to the system of management of quality ISO 9001:2008 and 14001:2004 established in the company Frewitt, we confirm that the installation has been built, tested and controlled according to the rules of practice to ensure the quality of the installation and its conformity to the order.



N° d'enregistrements

Registrier Nr:

Record Numbers

ISO 9001 : 02-103-118

ISO 14001 : 02-103-523

Résponsable Qualité

Fabienne Reynaud

Frewitt atteste que la vérification des connexions directes de la mise à terre a été réalisée selon les normes :

Frewitt bescheinigt, dass die Überprüfung der Erdung nach durchgeführt wurde:

Frewitt certify that the verification of direct connections to the grounding was performed according to:

EN 60204-1 / DIN VDE 0133 / IEC 204-1

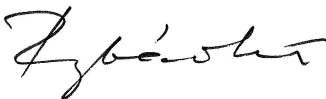
Cette vérification a été réalisée avec l'appareil :

Diese Prüfung erfolgte mit dem Gerät:

This test was conducted with the device:

PROFITEST 204

Frewitt Fabrique de Machines SA



R. Rybarikova

*Documentalis
Dokumentalist
Documentalist*

SERVOLIFT

Abnahmeprotokoll

erstellt: Armbruster Manuel
 Tel.: 0781 / 6100-102
 Fax.: 0781 / 6100-802
 e-mail: Armbruster@servolift.de

Kunde: Frewitt Fabrique, Granges-Paccot, Schweiz **MV:** Schanz

Maschine Nr.: 13249 Paletten-Hubsäule **PL:** Schanz

Teilnehmer: Kunde: Gumy Edouard **Teilnehmer: Servolift:** Armbruster Manuel

Grossrieder Y. Knobel Nicolas

Die Anlage wurde abgenommen:

Nach Pflichtenheft	<input type="checkbox"/>	ohne Beanstandung	<input type="checkbox"/>
Nach Freigabezeichnung	<input checked="" type="checkbox"/>	mit nachstehender Beanstandung	<input checked="" type="checkbox"/>
		mit nachstehenden Kundenwünschen	<input type="checkbox"/>

Bemerkungen / Beanstandungen	Verantw	erledigt
1. Im Schaltschrank müssen die Adern L1 in Braun, L2 in Schwarz und L3 in Grau geändert werden, siehe auch vorgegebener Farbcode für Singapur. E-Plan anpassen/revidieren, L1 L2 L3 einfügen!	ES/DL	
2. Hauptanschluss Luft auf Festanschluss Aussen 8mm, Innen 6mm, männlich umbauen	SCH/ FO	
3. Verpackung muss für Luftfracht ausgelegt werden!	GK/ NK	
4. Dokumentation an TB Version 2 und gekennzeichnete Punkte im Dokumentations-Ordner anpassen	GM	
5. In Dokumentation unter Punkt 7.1. aufnehmen: Steht die Anlage über der Zwischenhöhe und der Strom wird unterbrochen, dann erkennt die Anlage nach erneutem Anschalten nicht, dass diese über der Zwischenhöhe steht. Verfahren/Steuern ist nur mit dem unteren Panel möglich.	GM	
6. In Dokumentation Bild von ATEX Pneumatikeinheit einfügen und die Druckluftüberwachung mit anzeigen und angeben.	GM	
7. Dokumentation Punkt10 ist Disposal nicht Cleaning, siehe Inhaltsverzeichnis, anpassen.	GM	
8. In Dokumentation fehlt die Einbauerklärung und ATEX 3D-Zertifikat. Problematik kein CE verkauft, Anlage entspricht nicht CE. Klärung offen.	NK/ GM	
9. Protokoll zur Bestätigung, dass die Anlage mit Last geprüft wurde.	GM	
10. Liefertermin spätestens 21.05. Wareneingang bei Frewitt	NK	

Zunsweier, den 08.05.2014
 Ort / Datum

Armbruster M.
 SL: Name (Druckschrift)

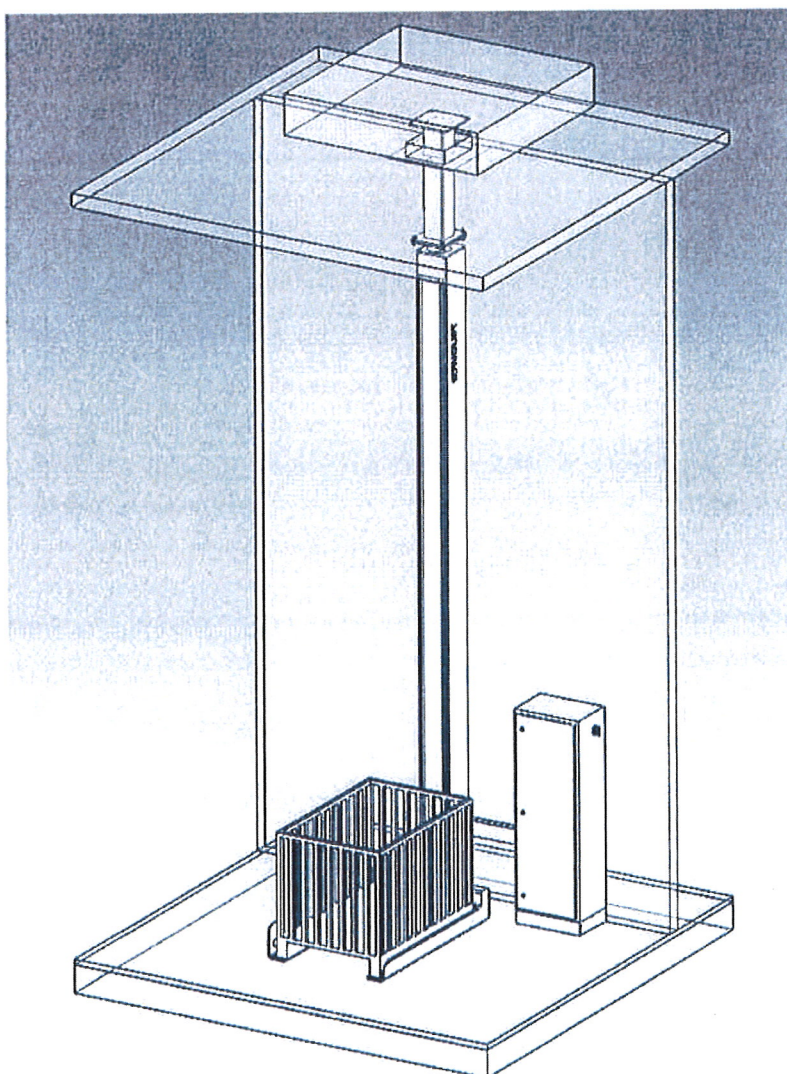
Unterschrift


Grossrieder Yves
 Kunde: Name (Druckschrift)

Unterschrift

SERVOLIFT

Technical Description			
Type of Machine:	Pallet Lifter	Servolift Project No.	13249
Customer: Frewitt SA, Granges-Paccot - Switzerland		Customer Reference	CDF-14-0202
Date of Version:	08. May 2014	Version:	2



Customer	Name / Signature	Position	Date
Reviewed by:	Sig: 	Project manager	08.05.2014
Reviewed by:	Sig:		
Approved by:	Sig:		

SERVOLIFT

Technical Description			
Type of Machine:	Pallet Lifter	Servolift Project No.	13249
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Date of Version:	08. May 2014	Version:	2

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SERVOLIFT

Technical Description			
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Customer: Frewitt SA, Granges-Paccot - Switzerland		Customer Reference	CDF-14-0202
Date of Version:	08. May 2014	Version:	2

1. Introduction

1.1. Description

This document (FS/FDS) is the main document during the life cycle of the machine. It is used to describe the function and scope of delivery of the system. This specification has been prepared by Servolift GmbH.

1.2. Objective of Document

Objective of the document is the detailed function specification of the single machine functions and description of the scope of delivery of the order.

Review and approval is performed by the cover page listed persons.

1.3. Reference Documents

Drawing	Lifter for Pallets	13249-00-001
	Force Scheme	13249-Static-LS1C

2. Document History – Change Control

The following list registers the execution of changes for this document

Version	Date	Editor	Reason for Change / Details of Change
1	10. February 2014	SCH	original – initial version
2	08. May 2014	SCH	Sequence 5.3 deleted

SERVOLIFT

Technical Description			
Type of Machine:	Pallet Lifter	Servolift Project No.	13249
Customer: Frewitt SA, Granges-Paccot - Switzerland		Customer Reference	CDF-14-0202
Date of Version:	08. May 2014	Version:	2

3. Description of Product

The **Lifter for Pallets** is used to be loaded with a special pallet, to be raised to a higher level. The pallet is discharged from a work platform.

The lifter is controlled from two different remote installed operator panels

It is only allowed to use the described pallets with a maximum weight of 600 kg in all.

The machine not designed for other use as above listed – this applies as misuse of the machine.

3.1. Overview of the System

The Lifter is stationary non slewable and bolted to the floor by compound anchors.

The lift function is powered by an electro-hydraulic power pack which is placed with the control valves in the cabinet. This is installed remote and lateral the unit and by a cable duct between.

Lifting and lowering is powered by a hydraulic lift cylinder and a chain system.

The pallet is carried by a supporting arm with two L-shaped arms as stand for the pallet.

Operation is executed via push buttons

3.2. Scope of Delivery

- (1x) Lifter for pallets 13249
- (1x) Cabinet and cable duct
- (1x) Cover stripes column - wall
- (1x) Top fixing
- (1x) Ceiling cover plate
- (1x) Plate with following installed elements: E-STOP, key switch CONTROL OFF /ON, LIFT, LOWER
- (1x) Plate with following installed elements: MOTOR ON
- (1x) Operator panel at mezzanine 140x90x90 including push buttons LIFT / LOWER
- (1x) Operator panel at mezzanine 200x90x90 including MOTOR ON, key switch CONTROL OFF/ ON, and E-STOP
- (1x) Atex-Certificate
- (1x) Documentation in English language (1-fold hardware and 1 pc CD-Rom)
- (1x) Packaging
- (1x) FAT at Servolift site

SERVOLIFT

Technical Description			
Type of Machine:	Pallet Lifter	Servolift Project No.	13249
Customer: Frewitt SA, Granges-Paccot - Switzerland		Customer Reference	CDF-14-0202
Date of Version:	08. May 2014	Version:	2

4. Technical Data

4.1. Load

Load	pallet or wire mesh crate 1200mm s 800 mm, approx. 900 high
Safe working load	600 kg
Pallet to be presentet	by hand pallet jack

4.2. Dimension and Execution

Column height	4721 mm
Min. height (to top of platform)	35 mm
Max. height (to top of platform)	3771 mm
Reach (middle of column – middle of pallet)	875 mm
Height of mezzanine ceiling	5400 mm
Installation height of top fixing	5660 (+/- 50 mm)
Erection	stationary with floor and top fixing <ul style="list-style-type: none"> - floor fixing by chemical anchors HILTI HVZ dynamic M12 - floor must be even and horizontal the maximum slope to be 0,5% - top fixing by chemical anchors HILTI HAS M12 - floor fixing to be on concrete, quality C20/25, that is min. 200 mm thick
Compressed air supply	6-7bar, from column flying PVC hose ND 6, 10 m long to mezzanine junction box
Electric supply	400 V, 50 Hz, 3Ph+PE, 2 kW, from column flying lead 10 m long to mezzanine junction box.

SERVOLIFT

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explosion protection rate	ATEX-category II3D (zone 22): Explosive atmosphere in the form of a cloud of combustible dust in air is not likely to occur in normal operation but, if it does occur, will persist for a short period only. motor protection rate II3D IP55 T125°C
Wiring	electric installation acc. EN 60204, with single core labelling according to the colour codes of Singapore
Sound level	< 78 dB(A)
Stroke	3736 mm
Total width	approx. 1600 mm
Total length	approx. 1775 mm
Ingress protection	IP 54
Lift speed	depending on load – approx. 10 cm/s
Time to lift	approx. 40 seconds
Cabinet	W x H x D 500 mm x 1550 mm x 335 mm (height incl. pedestal 100 mm) lateral the column with between installed duct
Oil tank	nom. 7 L
Hydraulic oil	received FDA or USDA H1 -approval
Pump size	4,3cm ³ /rev. (6,02 L/min.)
Lift cylinder	Ø50mm / stroke= 1868mm
Total load	approx. 1400 kg (incl. load)

SERVOLIFT

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4.3. Stainless steel design

Exterior parts	<ul style="list-style-type: none"> - 1.4301 (AISI 304) - 1.4306 (AISI 304L) - 1.4541 (AISI 321)
Mechanical treated parts (bearing flanges, handles, distance blocks)	<ul style="list-style-type: none"> - 1.4104 (AISI 430F) - 1.4057 (AISI 431)
Interior parts	<ul style="list-style-type: none"> - St37-2 (S235JR) - St52-3 (S355JO)
Surfaces	Pharma-Design: <ul style="list-style-type: none"> - faces, attached parts, mechanical treated stainless steel parts polished, $R_a \leq 1,5 \mu\text{m}$ - flat weld seams polished, other weld seams brushed

4.4. Assembly groups

Lift gear	<ul style="list-style-type: none"> - column with internal guide system - hydraulic lift cylinder with pilot operated check valve as safety element - chain pulley - two chains of same dimension, whereas one chain is used as lift chain and one chain as safety chain
Supporting arm	<ul style="list-style-type: none"> - L- shaped profile as stand for palette - lateral glide pieces - rear stop with sensor "pallet in position" - stop dogs at front of stands to prevent slipping of the pallet
Hydraulic cabinet	Stainless steel cabinet: <ul style="list-style-type: none"> - remote from the column - connected to column by fixed duct - hydraulic power pack with valves - electric cabinet installed into hydraulic cabinet - electric control (only one point power supply at 400V will be provided to the cabinet)

SERVOLIFT

Technical Description			
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Date of Version:	08. May 2014	Version:	2

4.5. Control

Control	<ul style="list-style-type: none"> - installed into cabinet - motor protection switch - hydraulic-/ pneumatic control - operation at base floor: two plates with installed push buttons - operation from mezzanine floor: elements installed into two panels
Operating elements	<ul style="list-style-type: none"> - main switch at cabinet - base floor plate panel 1 (250x100mm): E-STOP key switch CONTROL OFF / ON LIFT LOWER - base floor plate panel 2 (250x100mm): MOTOR ON - mezzanine panel 1 (200x90x90mm): MOTOR ON key switch CONTROL OFF / ON E-STOP - mezzanine panel 2 (140x90x90mm): LIFT LOWER
Sensors	<ul style="list-style-type: none"> - pallet in position - mezzanine height
Interface (input signal)	<p>Machine 13249 receives a signal from Frewitt: «E-STOP Frewitt». (contact "CLOSED", which opens if Frewitt-machine is put out of operation by E-STOP.)</p>
Interface (output signal)	<p>Machine 13249 sends a signal to Frewitt: «E-STOP 13249». (contact "CLOSED", which opens if machine 13249 is put out of operation by E-STOP)</p>

SERVOLIFT

Technical Description			
Type of Machine:	Pallet Lifter	Servolift Project No.	13249
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4.6. Safety

Safety installation

- pilot operated check valve to hold lift position in case of line rupture
- lift capacity limited by pressure limiting valve
- safety chain carries load in case of lift chain rupture
- stroke mechanically limited

Interlocks

- LIFT / LOWER only possible with pallet in place
- panel to be used must be activated by key switch
- LOWER operated from upper panel only possible to intermediate height
- two hand control acc. DIN EN 574 from both panels
- further interlocks are not installed

5. Sequence of operation

5.1. Start position

Mains and compressed air supply are connected to lifter.
Main switch is activated
Supporting arm is lowered minimum height.
No pallet is loaded to arm.

5.2. Sequence:

1. Operator puts a loaded pallet into the supporting arm ✓
2. turns key switch at base floor panel ON ✓
3. lifts to mezzanine height ✓
4. switches the control OFF, removes the key and inserts it into upper panel 1
5. switches the control ON ✓
6. lifts to max.-height (pushes the button MOTOR ON and simultaneously LIFT) ✓
7. empties the pallet ✓
8. lowers the supporting arm to a mezzanine height (pushes the button MOTOR ON and simultaneously LOWER) ✓
9. switches the control OFF, removes the key and inserts it into base floor panel ✓
10. switches control ON ✓
11. lowers the arm to minimum height ✓
12. removes the empty pallet by a hand pallet jack ✓
13. starts next sequence ✓

Frewitt Edoarda Gummy
P.05.2014

SERVOLIFT

Technical Description

Type of Machine:	Pallet Lifter	Servolift Project No.	13249
Customer: Frewitt SA, Granges-Paccot - Switzerland		Customer Reference	CDF-14-0202
Date of Version:	08. May 2014	Version:	2

SERVOLIFT

Sheet 1/2

DELUMPWITT POST HOIST				Project Number:		13249-Static-LS1C	
Drawn	B. Schanz	Date	11.02.2014	Checked:	G. Grubski	Date	11.02.2014
Visa:				Visa:			

DATA			
Weight container-product:	Q =	6000	N
Weight of supporting arm:	Q1 =	2000	N
Column weight:	Q2 =	6000	N
Overload factor:	C =	1.4	
Reach:	L =	875	mm
Height:	H =	5631	mm
Height:	H1 =	4721	mm
Height:	H2 =	910	mm
Ceiling plate:	L3 =	280	mm
Ceiling plate:	L4 =	300	mm
Ceiling plate:	L5 =	260	mm
Base plate:	P1 =	600	mm
Base plate:	P2 =	500	mm
Distance between dovels:	P10 =	500	mm
Distance between dovels:	P20 =	440	mm

FLOOR FIXATION			
Type of compound anchor	Hilti HVZ-M12x95		
Qty of compound anchors	n =	7	pièces
Tension force per compound anchor	Fsp1 =	18	kN
Minimum property of concrete:	B25, C20/25	25	N/mm ²
Minimum thickness of concrete floor	Ep1 =	180	mm
Nominal distance between floor plate and concrete floor border	P3 (nom.) =	95	mm
minimal distance between floor plate and concrete floor border	P3 (mini) =	10	mm

CEILING FIXING			
Type of compound anchor	Hilti HVZ-M12x95		
Qty of compound anchors	n =	4	pièces
Tension force per compound anchor	Fsp2 =	18	kN
Minimum property of concrete:	B25, C20/25	25	N/mm ²
Minimum thickness of concrete floor	Ep2 =	100	mm
Nominal distance between border of ceiling plate and concrete floor border	L6 (nom.) =	125	mm
minimal distance between border of ceiling plate and concrete floor border	L6 (mini) =	40	mm

Coupe A-A
Schallt A-A
section A-A

Dessin non représenté à l'échelle	Darstellung nicht maßstäblich	Representation not to scale
-----------------------------------	-------------------------------	-----------------------------

SERVOLIFT

Technical Description

Type of Machine:	Pallet Lifter	Servolift Project No.	13249
Customer: Frewitt SA, Granges-Paccot - Switzerland		Customer Reference	CDF-14-0202
Date of Version:	08. May 2014	Version:	2

SERVOLIFT

Sheet 2/2

DELUMPPWITT POST HOIST	Project Number:	13249-Static-LS1C
------------------------	-----------------	-------------------


REMARKS CONCERNING FLOOR AND CEILING FIXING ON PAGE 1/2

- 1) The lifting column is to be fixed directly onto concrete of floor and ceilings. (No cast, screed or pavement!)
- 2) Please inform us if dimensions "Ep1", "Ep2", "P3(nom.)", "P3(mixt)", "L6(nom.)" and "L6(mixt)" on site falls below here mentioned values. Floor or ceiling fixing is to be modified because dovel anchoring does no longer correspond to manufacturer's specification.
- 3) Following is to be proceeded by an architect or structural calculation engineer:
 - a) Dimensioning / verification of floor and ceiling structure, corresponding to applied loads.
 - b) Verification of stability of building's structure.

CALCULS			
<u>Maximal Load:</u>			
$Qg = Q + Q1 + Q2$	=	14000	N
<u>Foundation pressure:</u>			
$P = \frac{Qg + n \times Fsp1}{P1 \times P2}$	=	0,467	N/mm²
<u>Forces:</u>			
$F = \frac{(Q + Q1) \times C \times L}{H}$	=	1740	N
$F1 = \frac{(Q + Q1) \times C \times L}{H1}$	=	2076	N
$F2 = \frac{F1 \times H2}{L3}$	=	6747	N

Dessin non représenté à l'échelle	Darstellung nicht maßstäblich	Representation not to scale
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END of document

	MANAGEMENT MANUAL	Document: 172203-2-en.doc			
		Version: 01	Established: 24 Apr 14	by: edgu	Page: 1 de 6
Formular Factory Acceptance Test		Process: P4 – Réalisation 20 – Offre – Commande – Location I			

Manufacturer

FREWITT Maschinenfabrik AG
Rte du Coteau 7
CH - 1763 Granges-Paccot

Customer

Novartis Pharmaceutical
10, Tuas Bay Lane
69115 Singapore

Type 1 DelumpWitt FREWITT (ConiWitt-250 / ProFi-Sword)

Installation number ProFi-Sword 14001243013 / ConiWitt-250 14001219097





Project number PRO-14-0012


Order CDC-14-0112 / 3000949997

Novartis Equipment Tag SG.TBP.202.M.5234


Pre-Approval:

This FAT test Protocol of the equipment was created, reviewed and accepted by:


Name	Signature Reason	Function/ Department	Signature	Date
Edouard Gummy	Author	Frewitt Technical Project Manager		9.05.2014
Karsten Kutnar	Reviewer	Frewitt Electrical Project Manager		9.05.2014
Ho Sook Hwa	Reviewer	NSPM Qualification Coordinator		12 MAY 14
f. LOKE MAY LAM Christina Chen	Approver	NSPM Process Engineer		12 MAY 14
Shivabalan Kanesan	Approver	NSPM Automation Engineer		12 May 14
Panicker Shreekumar	Approver	NSPM Technical Project Manager		12 May 14
Yap Yee Boon	Approver	NSPM Project QA		14 May 14

	MANAGEMENT MANUAL	Document: 172203-2-en		
		Version: 01	Established: 24 Apr 14	by: edgu	Page: 2 de 6
Formular Factory Acceptance Test		Process: P4 – Réalisation 20 – Offre – Commande – Location I		



Position	Number	Designation	Released		
			Yes	No	
1	1	DelumpWitt FREWITT Execution ATEX execution Protection Part in contact with the product other part Construction	Milling chamber: ATEX II 1G/1D cb Ex T ¹⁵⁷ °C IP65 <i>130°C</i> Outside: ATEX II 3D ATEX II 3D c Ex tD T ¹²⁵ °C IP65 <i>130°C</i> Stainless steel AISI-316, Ra ≤ 0,4 µm, Sieve AISI-316 Seals made of silicone, EPDM, Novafon and PTFE AISI-304, Ra ≤ 1.4 µm (grain 220) According to GMP guidelines	<input checked="" type="checkbox"/>	<input type="checkbox"/>
1.1		Inlet hopper With inlet cone	hopper with cover, vibrator, safety magnet on the door. Suction connection DN100 Jacob. 2 Filters on side of the hopper. DN250 chute bag clamped on side of the hopper.	<input checked="" type="checkbox"/>	<input type="checkbox"/>
1.2		Inlet cone	The inlet cone serves as a connecting piece, crushing assistance as well as a security unit between the crusher module and customer's dispensing device for hardened and lumpy powdery solid blocks. The inlet cone is provided with stators enabling the pre-crushing process of large blocks.	<input checked="" type="checkbox"/>	<input type="checkbox"/>
1.3	1	Crusher module § Machine cone equipped with flange for fixation of vibrator § Inlet flange specific to be connected to the outlet of the inlet cone § Outlet transition funnel fitted with a cone for connection to the sizing unit Tools § Upper sword for the primary crushing § Lower crown for the secondary crushing Drive unit § Motor with <i>0,75 kW</i> with frequency converter for stepless speed adjustment of rotor speed. With Motor protection		<input checked="" type="checkbox"/>	<input type="checkbox"/>


	MANAGEMENT MANUAL	Document: 172203-2-en			
		Version: 01	Established: 24 Apr 14	by: edgu	Page: 3 de 6
Formular Factory Acceptance Test		Process:	P4 – Réalisation 20 – Offre – Commande – Location I		

1.4	1	Grinding unit		<input checked="" type="checkbox"/>	<input type="checkbox"/>
		Basic equipment			
		<ul style="list-style-type: none"> § Inlet milling head with special TriClamp flange § Safety device inlet magnetic safety switch ELOBAU at inlet to stop the machine if the crusher module is not mounted § Outlet milling head with TriClamp flange DN 300 (ISO 2852) § Bearing rotor drive housing cast in one piece preventing any risk of leakage and product contamination § Connection channel between machine head and control box 			
		Tools			
		<ul style="list-style-type: none"> § 1xConical Rasp 3mm 436242 ✓ § Rotor with 2 arms <i>type C</i> 			
		Drive unit <i>Speed 100 - 700 rpm</i>			
		<ul style="list-style-type: none"> § Motor with 5 kW with frequency converter for stepless speed adjustment of rotor speed § With Motor protection 			
		Manual lifting and swivelling system			
		<ul style="list-style-type: none"> § The grinding unit is mounted on the manual lifting and swivelling system allowing its easily disconnection without using external lift device (for example to change the tools) with the crusher module. 			
1.5	1	Outlet funnel	Tri-Clamp connection DN300 ISO2852. Compensator antistatic for manual docking.	<input checked="" type="checkbox"/>	<input type="checkbox"/>
1.6	1	Outlet funnel For Cleaning	Tri-Clamp connection DN300 outlet DN50 with two wash nozzles.	<input checked="" type="checkbox"/>	<input type="checkbox"/>
1.7	1	Inlet flange for Cleaning	Tri-Clamp connection DN250 with one wash nozzles.	<input checked="" type="checkbox"/>	<input type="checkbox"/>
1.8	1	Connection Electrical connection	3x400V, 3P+N+PE, 50 Hz	<input checked="" type="checkbox"/>	<input type="checkbox"/>
1.8	1	Control Control panel	for the above system, for controlling the actuators, solenoid valves, limit switches, etc. The installation is equipped with a PLC (Siemens S7 – 300) with all the necessary switching and control devices.	<input checked="" type="checkbox"/>	<input type="checkbox"/>

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Formular Factory Acceptance Test		Process:	P4 – Réalisation 20 – Offre – Commande – Location I		


- | | | | | | |
|---|---|---|--|-------------------------------------|--------------------------|
| 1.9 | 1 | Gas control system | installed in the control cabinet:
- Electo-pneumatic solenoid valve
- Filter unit
- Pressure reducing valve for gas flow control. | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 2 | 1 | Tubular steel support frame | Tubular steel support frame square tube dimensions as per Layout 473599 | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 3 | 1 | Scale | Mettler weight scale with terminal | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 4 | 1 | Hoist | Servolift lifting hoist for DelumpWitt | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| <u>Documentation for Delumpwitt:</u> | | | | | |
| 5 | 1 | Manual in English | (2x paper / 1x on CD) | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 6 | 1 | Surface quality with certificate | | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 7 | 1 | FAT IQ/OQ Support protocol for Delumpwitt | • FAT IQ / OQ – Protocol on CD-Rom | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 8 | 1 | Sets of material certificates (3.1) for Delumpwitt | For the part in contact with the product | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 9 | 1 | Factory Calibration certificates (3.1) for Delumpwitt | (for critical instrument, if any) | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 10 | 1 | Certificate of Conformance for magnetic strength performance | Technical datasheet | <input checked="" type="checkbox"/> | <input type="checkbox"/> |

Name	Signature Reason	Department / Function	Date	Signature
Grassieder Yves	Executed By Frewitt	Project manager	20.05.14	 XLR
CHRISTINA CHEN	Reviewed By NSPM	PROCESS ENGINEER	22 MAY 14	

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Formular Factory Acceptance Test		Process:	P4 – Réalisation 20 – Offre – Commande – Location I		

Deficiencies to be remedied:

21.05.2014

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Formular Factory Acceptance Test		Process: P4 – Réalisation 20 – Offre – Commande – Location I			

Date of delivery:

Machines: Week 24

Accessories: 4



Documentation: 1

Issued by:

FREWITT Fabrique de machines SA
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Final Approval

The Signers confirm the FAT, for the rightness of the included data with their signature. All ascertained critical deviations are adequate documented.

Name	Signature Reason	Function/ Department	Signature	Date
Edouard Gummy	Reviewer	Frewitt Technical Project Manager		22.05.2014
Ho Sook Hwa	Reviewer	NSPM Qualification Coordinator		
Christina Chen	Approver	NSPM Process Engineer		22 MAY 14
Shivabalan Kanesan	Approver	NSPM Automation Engineer		
Panicker Shreekumar	Approver	NSPM Technical Project Manager		
Yap Yee Boon	Approver	NSPM Project QA		

QUALIFICATION AND VALIDATION



FAT IQ Test Protocol

SG.TBP.202.M.5234

Delumpwitt

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QUALIFICATION IQ
DELUMPWITT (CRUSHER/GRINDING)
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FREWITT 

Project Name :	Novartis Singapore, DelumpWitt
Client :	NOVARTIS SINGAPORE PHARMACEUTICAL
Location :	SG-Singapore
Customer Order # :	3000949997
Supplier :	Frewitt Fabrique de Machines S.A.
Object :	DelumpWitt (Crusher/Grinding)
Serial # :	14001235183 - Installation 14001243013 - Crusher Profi-Sword 14001219097 - Grinding CW-250

Document Name :	Qualification IQ DelumpWitt (Crusher/Grinding) 14001235183 - Installation 14001243013 - Crusher Profi-Sword 14001219097 - Grinding CW-250
Document Reference :	172424-2-en
Document Version # :	02

Pre-Approval:

This FAT-IQ test Protocol of the equipment was created, reviewed and accepted by:

Name	Signature Reason	Function/ Department	Signature	Date
Karsten Kutnar	Author	Frewitt Project Manager		9.05.2014
Edouard Gummy	Reviwer	Frewitt Technical Project Manager		9.05.2014
Ho Sook Hwa	Reviewer	NSPM Qualification Coordinator		12 MAY 14
f. LOKE MAY LAM Christina Chen	Approver	NSPM Process Engineer		12 MAY 14
Shivabalan Kanesan	Approver	NSPM Automation Engineer		12 May 14
Panicker Shreekumar	Approver	NSPM Technical Project Manager		12 May 14
Yap Yee Boon	Approver	NSPM Project QA		14 May 14

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Table of Name and Abbreviated Signatures of All Personnel executing the FAT Qualification ^{IQ} ^{EE} ^{Chemist} ^{19 May 14}

NAME	DEPARTMENT	SIGNATURE	INITIAL
CHRISTINA CHEN	NOVARTIS	<i>Chemist</i>	CTF
Shivabalan Kanesan	NOVARTIS	<i>[Signature]</i>	SH1
Chorib Saei Koushki	RAVASSA	<i>[Signature]</i>	Jc
Grossrieder Yves	Frewitt	<i>[Signature]</i>	YAR
		NA <i>Chemist</i> 22 MAY 14	

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QUALIFICATION IQ
DELUMPWITT (CRUSHER/GRINDING)
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2. General tests

Test No.	Test Description	Expected Result / Acceptance Criteria	Actual Results	Fulfilled (Y/N)	Deviation No.	Executed by : (Initial, Date)
2.1	Visible transport-related damage	No visible signs of impacts	NO VISIBLE SIGNS OF IMPACT	Y	NA	CYF 19 MAY 14
2.2	User access to machine	There must be enough space around the machine to allow access to the control panel, accessories and tooling systems for normal operation of the machine. For units installed as permanent fixtures, there must also be enough room around the machine to allow maintenance work to be carried out	THERE IS SUFFICIENT SPACE FOR ACCESS TO MACHINE AND FOR MAINTENANCE	Y	NA	CYF 19 MAY 14
2.3	Machine dimensions	As per approved GA/ drawing	Verified GA drawing Attachment # 1	N	01	CYF 19 MAY 14
2.4	Metallic material in contact with product (Verify as per part list for each item)	Stainless steel AISI-316 / AISI-316L material certificate/ test report as per EN 10204-2.2 included in manual. Surface finish meets requirement $Ra \leq 0.8 \mu m$	Stainless steel AISI-316 / AISI-316L Material Certificate/test report as per EN 10204-2.2; <input checked="" type="radio"/> Yes / No) Manual Reference: DELUMPWITT OPERATING INSTRUCTIONS CHAPTER 11 Surface finish meets requirement $Ra \leq 0.8 \mu m$ <input checked="" type="radio"/> Yes / No) Manual Reference: DELUMPWITT OPERATING INSTRUCTIONS CHAPTER 11	REFER TO ATTACHMENT 2 Y Y	NA	CYF 19 MAY 14
2.5	Non-metallic material in contact with product (Verify as per	Meets FDA requirements. Test report as per EN 10204-2.2 included in manual.	FDA Certificate as per EN 10204-2.2; <input checked="" type="radio"/> Yes / No)	REFER TO ATTACHMENT 2 Y	NA	CYF 19 MAY 14

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	part list for each item)	FDA certificates included in manual.	Manual Reference: DELUMPWITT OPERATING INSTRUMENT EE CH 19 MAY 14 INSTRUCTIONS CHAPTER 11			
2.6	Lubricant Certification	All lubricants used are documented and certified to meet the appropriate standards (for Instance per USDA Class H1) Recommendation Lubricant certificates included in manual	ALL LUBRICANTS USED ARE AS PER USDA CLASS H1 Lubricant Certificate Manual Reference: DELUMPWITT EE OPERATING MANUAL CH 19 MAY 14 INSTRUCTIONS CHAPTER 11	Y	NA	CYF 19 MAY 14
2.7	Verify the Equipment Tags and Markings as per Novartis Tags.	Main Equipment Tags and Markings as per Novartis Tags are correct.	MAIN EQUIPMENT TAGS AND MARKINGS AS PER NOVARTIS TAGS REFER TO ATTACHMENT 6	Y	NA	CYF 19 MAY 14

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QUALIFICATION IQ
DELUMPWITT (CRUSHER/GRINDING)
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FREWITT 

3. Feeding hopper with inlet cone

Test No.	Test Description	Expected Result / Acceptance Criteria	Actual Results	Fulfilled (Y/N)	Deviation No.	Executed by : (Initial, Date)
3.1	Feeding hopper with inlet cone	Product contact parts - Stainless steel 1.4404/1.4435, Ra ≤ 0.4 µm Seals made of EPDM, Silicone Other parts - Stainless steel 1.4301 Ra ≤ 1.4 µm (Certificates to be attached)	MATERIAL AS PER EXPECTED. REFER TO TEST 2.4 POS 100 CHECKED Manual Reference: DELUMPWITT OPERATING INSTRUCTIONS CHAPTER 11	Y	NA	CYF 19 MAY 14
3.2	Inlet cone (stator)	Inlet flange with inner Ø 900 mm and outer Ø 980 mm, pitch circle Ø 950 mm, borehole 24 x 12 mm. Outlet flange specific for connection to pre-crusher unit. (Certificates to be attached)	REFER TO TEST 2.4 POS 2+101 CHECKED FOR MATERIALS Manual Reference: DELUMPWITT OPERATING INSTRUCTIONS CHAPTER 11	Y	NA	He 19th May 14

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4. Crusher unit (ProFi-Sword)

Test No.	Test Description	Expected Result / Acceptance Criteria	Actual Results	Fulfilled (Y/N)	Deviation No.	Executed by : (Initial, Date)
4.1	Crusher unit	Product contact parts - Stainless steel 1.4404/1.4435, Ra ≤ 0.4 µm Seals made of FEP-O-SEAL, PTFE, FKM, Gylon, Novaflon Non contact parts - Stainless steel 1.4404 Ra ≤ 1.4 µm	REFER TO TEST 2-4 POS 102 CHECKED FOR MATERIALS Surface finish Manual Reference: DELUMPWITT OPERATING INSTRUCTIONS CHAPTER 11	Y	NA	CYF 20 MAY 14
4.2	Inlet connection to pre-crusher	Stainless steel 1.4404/1.4435 Flange with inner Ø 630 mm ; outer Ø 710 mm, pitch circle Ø 680 mm, borehole 16 x 12 mm. Seal O-Ring in FEP-O-SEAL.	REFER TO TEST 2.4 POS 102-104 CHECKED FOR MATERIALS Manual Reference: DELUMPWITT OPERATING INSTRUCTIONS CHAPTER 11	Y	NA	HH 19 th May 14
4.3	Outlet funnel (fitted with a cone for connection to the grinding unit)	Stainless steel 1.4404/1.4435. Seal O-Ring in FEP-O-SEAL. Tri-Clamp DN 300 connection to grinding unit	REFER TO TEST 2.4 POS 102-104 CHECKED FOR MATERIALS Manual Reference: DELUMPWITT OPERATING INSTRUCTIONS CHAPTER 11	Y	NA	CYF 20 MAY 14

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DELUMPWITT (CRUSHER/GRINDING)
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5. Grinding unit (ConiWitt-250)

Test No.	Test Description	Expected Result / Acceptance Criteria	Actual Results	Fulfilled (Y/N)	Deviation No.	Executed by : (Initial, Date)
5.1	Grinding unit -Materials of construction of Product contact parts, seals and Non-product contact parts	Product contact parts - Stainless steel 1.4404/1.4435, Ra ≤ 0.4 µm Seals made of PTFE, EPDM, MVQ, Fluoroloy Non contact parts - Stainless steel 1.4404 Ra ≤ 1.4 µm	REFER TO TEST 2.4 POS 103 CHECKED FOR MATERIALS. Surface finish Manual Reference:	Y	NA	CYF 20 MAY 19

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 INSTRUCTIONS CHAPTER 11

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6. Tools

Test No.	Test Description	Expected Result / Acceptance Criteria	Actual Results	Fulfilled (Y/N)	Deviation No.	Executed by : (Initial, Date)
6.1	Rotor CW-250 - Mounting in an installation	Rotor with 2 arms ; square profile for dry milling	ROTOR CW-250 MOUNTING IN INSTALLATION	Y	NA	 19th May 14
6.2	Cutters (upper / intermediate) Mounting in an installation	Cutters mounted	CUTTERS MOUNTED	Y	NA	 19th May 14
6.3	Conical rasp 3mm Mounting in an installation	Stainless steel AISI-316L	3MM CONICAL RASP INSTALLED Manual Reference: DELUMPWITT OPERATING INSTRUCTIONS CHAPTER 11	Y	NA	 19th May 14

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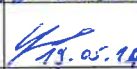


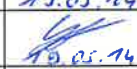


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QUALIFICATION IQ
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7. Lifting tower

Test No.	Test Description	Expected Result / Acceptance Criteria	Actual Results	Fulfilled (Y/N)	Deviation No.	Executed by : (Initial, Date)
7.1	Material of construction	Construction stainless steel 1.4301	1.4301 1.4306 * 1.4541	N	02	 19.05.14
7.2	Function	lifting tower: up and down movements	UP and down movements ok	Y	NA	 19.05.14
7.3	Speed	approx. 8 – 12 cm /sec.	10 cm/sec	Y	NA	 19.05.14
7.4	Max. applicable load	600 kg	600 kg	Y	NA	 19.05.14
7.5	Total height of the tower	approx. 5'000 mm	4715 mm	Y	NA	 19.05.14
7.6	Construction	for ATEX zoning II 3D (ATEX Zone 22)	ATEX Zone 3D (Zone 22)	Y	NA	 19.05.14
7.7	Drive	electro-hydraulic	electro-hydraulic	Y	NA	 19.05.14
7.8	Motor	2.2 kW	1.5 kW	N	03	 19.05.14
7.9	Electrical connection	230/400 V, 50 Hz, 3Ph + N + E	400V 50Hz 3Ph + PE	N	04	 19.05.14

* Mechanical treated parts 1.4504 (AISI 430F)
 1.4057 (AISI 431)
 Extension parts 1.4301 (AISI 304)
 1.4306 (AISI 304L)
 1.4541 (AISI 321)
 Interior parts St 37-2 (S235JR)
 St 52-3 (S35570)

YGR
 20.05.2014

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8. Motorisation

Test No.	Test Description	Expected Result / Acceptance Criteria	Actual Results	Fulfilled (Y/N)	Deviation No.	Executed by : (Initial, Date)
Motor of Grinding unit						
8.1	Motor	6P LSPX132M 5.0kW with PTC probe	LSPX 132M 5.0 kW PTC	Y	NA	 19th May 14
8.2	Frequency converter (mounted in electrical panel) for stepless rotor speed adjustment	between 100 – max. 700 rpm *	MIN SPEED = 100 rpm MAX SPEED = 700 rpm	Y	NA	CYF 20 MAY 14
Motor of Crusher unit						
8.3	Motor	4P LSPX80L 0.70kW	LSPX80L 0.75 kW	N	05	 19th May 14
8.4	Reduction	(439572) Lenze GKR05-2NHAK-7C 439572	LENZE GKR05-2N NAK-7C	N	06	 19th May 14

* (FOR I) REFER TO DELUMPWITT OPERATING INSTRUCTIONS CHAPTER 11, DOC NO: 17389-4 FOR CALIBRATION CERTIFICATE OF TACHOMETER 20 MAY 14.

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QUALIFICATION IQ
DELUMPWITT (CRUSHER/GRINDING)
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9. Energies connections

Test No.	Test Description	Expected Result / Acceptance Criteria	Actual Results	Fulfilled (Y/N)	Deviation No.	Executed by : (Initial, Date)
9.1	Electrical connections	As per circuit diagram.	Attachment no: <u>3</u>	N	08	SH1 19MAY14
9.2	Pneumatic connections	As per pneumatic diagram.	Attachment no: <u>7</u>	N	07	CYF 19MAY14

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10. Documentation

Manual contents

Test No.	Test Description	Expected Result / Acceptance Criteria	Actual Results	Fulfilled (Y/N)	Deviation No.	Executed by : (Initial, Date)
Check that the following documents are present:						
10.1	Index	Document present	DOCUMENT PRESENT	Y	NA	CYF 20 MAY 14
10.2	General	Document present	PRESENT	Y	NA	CYF 20 MAY 14
10.3	Safety	Document present	PRESENT	Y	NA	CYF 20 MAY 14
10.4	Start-up	Document present	PRESENT	Y	NA	CYF 20 MAY 14
10.5	Operating instructions	Document present	PRESENT	Y	NA	CYF 20 MAY 14
10.6	Cleaning	Document present	PRESENT	Y	NA	CYF 20 MAY 14
10.7	Maintenance and support	Document present	PRESENT	Y	NA	CYF 20 MAY 14
10.8	Spare parts	Document present	PRESENT	Y	NA	CYF 20 MAY 14
10.9	Tools	Document present	PRESENT	Y	NA	CYF 20 MAY 14
10.10	Electrical / drive / pneumatic	Document present	PRESENT	Y	NA	CYF 20 MAY 14
10.11	Certificates	Document present	PRESENT	Y	NA	CYF 20 MAY 14
10.12	ATEX certificates	Document present	PRESENT	Y	NA	CYF 20 MAY 14
10.13	Lifting Tower documentation	Document present	PRESENT	Y	NA	CYF 20 MAY 14
10.14	Qualification IQ / OQ	Document present	PRESENT	Y	NA	CYF 20 MAY 14

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QUALIFICATION IQ
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11. Software and Hardware Installation

Test No.	Test Description	Expected Result / Acceptance Criteria	Actual Results	Fulfilled (Y/N)	Deviation No.	Executed by : (Initial, Date)
11.1	Software installation and version verification (PLC & HMI)	Latest revision of software installed	Development Software: HMI: WinCC Flexible Advanced 2008 SP3 PLC: Step 7 vs. S Application Software: HMI: 14-0012 v1.0 PLC: 14-0012 v1.0 Refer to Att 4	Y	NA	SHI 19May14
11.2	Hardware installation and verification	Latest revision of software installed Hardware Protocol Error SHI 19May14	Latest revision of software installed Hardware Attachment#: Refer to Wiring Diagram SHI 19May14	Y	NA	SHI 19May14
11.3	Software and hardware configuration and verification	Latest revision of software installed	Latest revision of software installed Attachment#: 4 SHI 19May14	Y	NA	SHI 19May14
11.4	Verify that the infrastructure for NSPM domain connection is ready	Ethernet Card / IP Address Configuration Computer Name Logon Functionality	10.132.10.194 WSO044 Phsgtb-WSO044 EE SHI 19May14 Simatic Logon Refer Att 5	Y	NA	SHI 19May14

Professional Milling and Handling of Powders

Professional Milling and Handling of Powders

Frewitt SA
Route du Coteau 7
CH-1763 Granges-Paccot
Switzerland

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CH-1701 Fribourg
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No. TVA 489 197
IBAN EUR: CH90 0483 5036 3818 0200 0
IBAN CHF: CH27 0483 5036 3818 0100 0
Credit Suisse CH-3001 Bern/Swift CRESCH ZZ30 R



QUALIFICATION IQ
DELUMPWITT (CRUSHER/GRINDING)
15 / 19

15

12. Additional tests

Test No.	Test Description	Expected Result / Acceptance Criteria	Actual Results	Fulfilled (Y/N)	Deviation No.	Executed by : (Initial, Date)
12.1	Verify Insertable Sieve ie mesh sieve size, material test and identifiable screen tag.	Sieve mesh size meets URS/FDS requirements	SIEVE MESH SIZE MEET URS/FDS REQUIREMENT REFER TO DELUMPWITT OPERATING INSTRUCTIONS CHAPTER II	Y	NA	CYF 10 MAY 14
12.2	Verification of instruments and components with tags as per P&ID	Instruments and tags correspond to P&ID	INSTRUMENTS NOT AS PER PID AND PART LIST Attachment#: 6	N	09	CYF 19 MAY 14
12.3	I/O loop checks	I/O loop checks performed	Refer to wiring diagram Attachment#: 3	Y	NA	SHI 19 MAY 14
12.4	I/O loop checks	I/O loop checks performed	NA	NA	NA	Repeat Test (12.3)
12.5	EMI/CE certification	EMI/CE certificate present	CE CERTIFICATE PRESENT	Y	NA	CYF 20 MAY 14
12.6	Magnetic separator	Material Construction, Certificate of conformance for magnetic strength performance	Material Certificate Manual Reference: * DELUMPWITT OPERATING INSTRUCTIONS CHAPTER II Certificate of Conformance Δ DELUMPWITT OPERATING INSTRUCTIONS CHAPTER 10	Y	NA	CYF 20 MAY 14

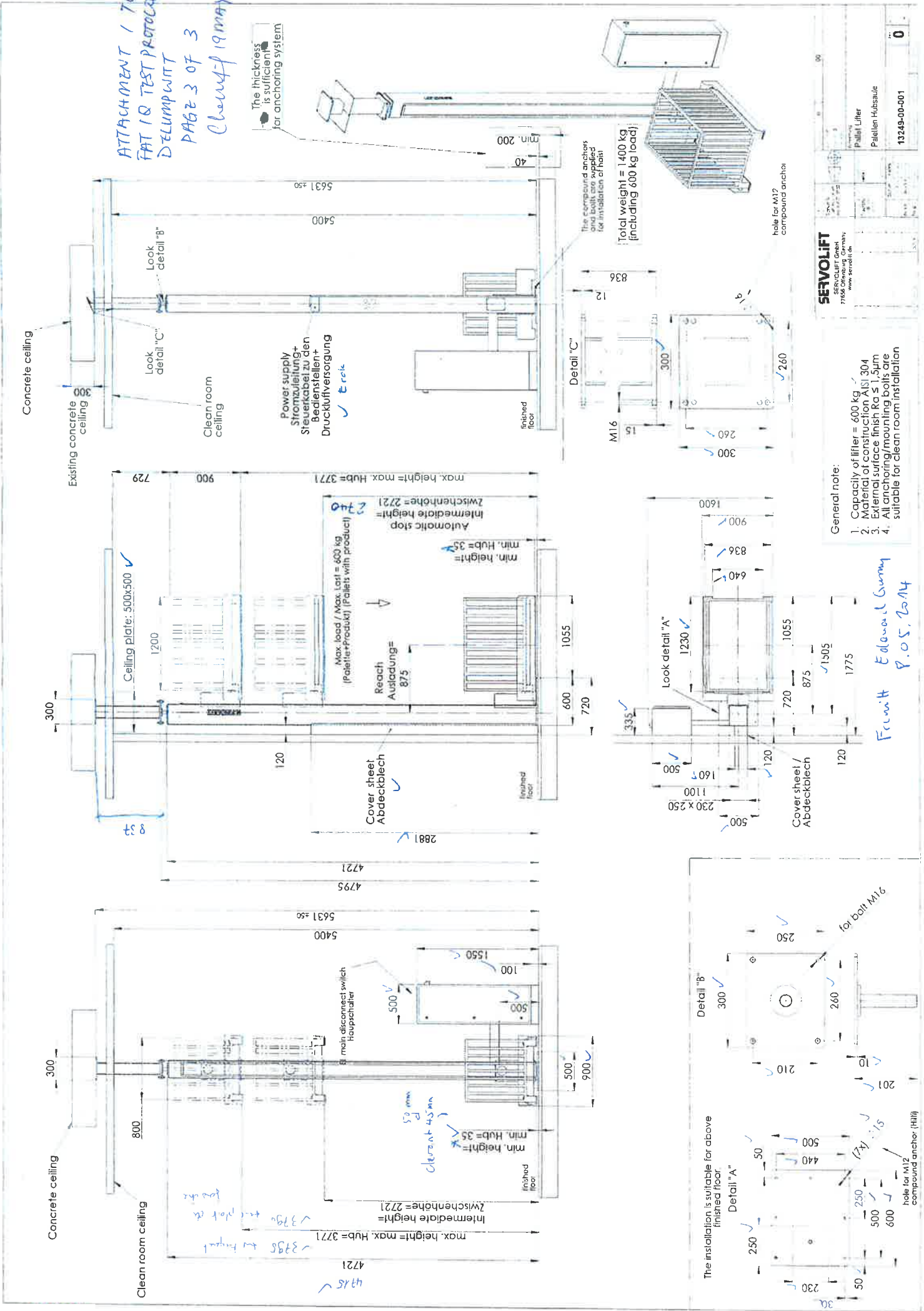
* (FOR I) REFER TO TEST 2.4 POS 104-100 FOR CHECKED MATERIALS. CHECKED 20 MAY 14

Δ (FOR I) DATASHEET AVAILABLE FOR MAGNETIC STRENGTH. ACTUAL STRENGTH WILL BE TESTED ON SITE CHECKED 20 MAY 14

Professional Milling and Handling of Powders

- | | | | |
|--|---|---|---|
| <ul style="list-style-type: none"> ■ Frewitt SA Route du Coteau 7 CH-1763 Granges-Paccot Switzerland | <ul style="list-style-type: none"> ■ Postal address: Box 615 CH-1701 Fribourg Switzerland | <ul style="list-style-type: none"> ■ info@frewitt.com www.frewitt.com P + 41(0)26 460 74 00 F + 41(0)26 460 74 59 | <ul style="list-style-type: none"> ■ No. TVA 489 197 IBAN EUR: CH90 0483 5036 3818 0200 0 IBAN CHF: CH27 0483 5036 3818 0100 0 Credit Suisse CH-3001 Bern/Swift CRESCH ZZ30 R |
|--|---|---|---|

ATTACHMENT 1 TO
FAT IQ TEST PROTOCOL
DELUMPWITT
PAGE 3 OF 3
Client: 19 May 14



SERVOLIFT
SERVOLIFT GmbH
77686
www.servolift.de

General note:
1. Capacity of lifter = 600 kg
2. Material of construction AISI 304
3. External surface finish Ra ≤ 1.5µm
4. All anchoring/mounting bolts are suitable for clean room installation

Fremt Edvard Gummy
P.O.S. 2014



CERTIFICAT MATIERES EN 10204-3.1
MATERIALZERTIFIKAT / MATERIALS CERTIFICATE
Crusher and Grinding Installat or
DelumpWitt PRO-14-0012

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Pos. 105 **465091** Dessin / Zeichnung / Drawing : **465091-CMA**

Measure N° Mass Nr. Measure Nr.	Matière Material	Al	Sb	Sn	Cd	Pd	Ag	Mo	Nb	Zr	Bi	Pb	Se	W	Zn	Cu	Ni	Co	Fe	Mn	Cr	V	Ti
1	316/316L	0.00	0.00	0.00	0.00	0.00	0.00	2.15	0.00	0.01	0.01	0.02	0.01	0.00	0.03	0.08	10.74	0.15	68.63	1.35	16.73	0.08	0.00
2	316/316L	0.00	0.00	0.02	0.00	0.00	0.00	2.11	0.03	0.00	0.01	0.01	0.00	0.07	0.00	0.46	10.16	0.20	68.09	1.68	17.10	0.05	0.02

Pos. 500-504 Dessin / Zeichnung / Drawing : **473649-CMA**

Measure/Pos. N° Mass/Pos. Nr. Measure/Pos. Nr.	Matière Material	Article Artikel	Certificat FDA N° FDA Zertifikat Nr. FDA certificate No.
500	Silicone	453974	56867
501	Silicone	438974	15186
502	Silicone	406571	17348
503	Tetratex®	474448	172897
504	Silicone		56867

Pos.101-Inlet cone-473842

Pos. 101 **473842** Dessin / Zeichnung / Drawing : **473842-CMA**

Measure N° Mass Nr. Measure Nr.	Matière Material	Al	Sb	Sn	Cd	Pd	Ag	Mo	Nb	Zr	Bi	Pb	Se	W	Zn	Cu	Ni	Co	Fe	Mn	Cr	V	Ti
1	316/316L	0.00	0.01	0.02	0.00	0.00	0.00	2.12	0.01	0.01	0.01	0.02	0.00	0.04	0.00	0.37	10.29	0.45	68.72	1.15	16.70	0.09	0.00
2	316/316L	0.00	0.01	0.02	0.00	0.00	0.01	2.09	0.01	0.00	0.00	0.01	0.00	0.08	0.00	0.30	10.13	0.33	69.14	1.03	16.76	0.07	0.00
3	316/316L	0.00	0.01	0.02	0.00	0.01	0.00	2.01	0.02	0.01	0.01	0.02	0.00	0.03	0.03	0.49	11.09	0.48	67.29	1.16	17.25	0.10	0.00
4	316/316L	0.00	0.01	0.02	0.01	0.00	0.00	2.15	0.03	0.01	0.01	0.01	0.00	0.00	0.03	0.41	11.26	0.37	67.36	1.23	16.99	0.11	0.00
5	316/316L	0.00	0.00	0.02	0.00	0.00	0.00	2.18	0.01	0.01	0.01	0.01	0.00	0.07	0.01	0.44	10.73	0.58	68.66	1.26	16.91	0.09	0.00

Pos.102-Crusher-473841

Pos. 1 **464795** Dessin / Zeichnung / Drawing : **473841-CMA**

Measure N° Mass Nr. Measure Nr.	Matière Material	Al	Sb	Sn	Cd	Pd	Ag	Mo	Nb	Zr	Bi	Pb	Se	W	Zn	Cu	Ni	Co	Fe	Mn	Cr	V	Ti
1	316/316L	0.00	0.00	0.01	0.00	0.00	0.00	2.23	0.02	0.00	0.02	0.01	0.00	0.07	0.01	0.47	10.76	0.44	67.53	1.49	16.85	0.10	0.00

Pos. 2 **454215** Dessin / Zeichnung / Drawing : **473841-CMA**

Measure N° Mass Nr. Measure Nr.	Matière Material	Al	Sb	Sn	Cd	Pd	Ag	Mo	Nb	Zr	Bi	Pb	Se	W	Zn	Cu	Ni	Co	Fe	Mn	Cr	V	Ti
1	316/316L	0.00	0.01	0.01	0.01	0.00	0.00	2.20	0.02	0.01	0.01	0.03	0.01	0.00	0.00	0.34	10.16	0.28	68.59	1.35	16.88	0.09	0.01

Pos. 3 **464796** Dessin / Zeichnung / Drawing : **473841-CMA**

Measure N° Mass Nr. Measure Nr.	Matière Material	Al	Sb	Sn	Cd	Pd	Ag	Mo	Nb	Zr	Bi	Pb	Se	W	Zn	Cu	Ni	Co	Fe	Mn	Cr	V	Ti
1	316/316L	0.00	0.01	0.01	0.01	0.00	0.00	2.33	0.02	0.00	0.00	0.01	0.01	0.00	0.00	0.42	12.12	0.33	68.21	1.38	16.58	0.08	0.00

Pos.100 **454424** Dessin / Zeichnung / Drawing : **454424-CMA**

Pos. 100 **459448** Dessin / Zeichnung / Drawing : **459448-CMA**

Measure N° Mass Nr. Measure Nr.	Matière Material	Al	Sb	Sn	Cd	Pd	Ag	Mo	Nb	Zr	Bi	Pb	Se	W	Zn	Cu	Ni	Co	Fe	Mn	Cr	V	Ti
1	316Ti	0.00	0.00	0.00	0.01	0.00	0.00	2.19	0.03	0.01	0.01	0.01	0.00	0.00	0.00	0.21	10.83	0.00	68.11	1.01	17.36	0.06	0.16

Pos. 500 Dessin / Zeichnung / Drawing : **459448-CMA**

Measure/Pos. N° Mass/Pos. Nr. Measure/Pos. Nr.	Matière Material	Article Artikel	Certificat FDA N° FDA Zertifikat Nr. FDA certificate No.
500	Gulon	459448	127378

Pos. 500-501 Dessin / Zeichnung / Drawing : **454424-CMA**

Measure/Pos. N° Mass/Pos. Nr. Measure/Pos. Nr.	Matière Material	Article Artikel	Certificat FDA N° FDA Zertifikat Nr. FDA certificate No.
500	FKM	454357	311900
501	PEP-O-SEAL	431768	165314

Pos. 101 **454299** Dessin / Zeichnung / Drawing : **454299-CMA**

Measure N° Mass Nr. Measure Nr.	Matière Material	Al	Sb	Sn	Cd	Pd	Ag	Mo	Nb	Zr	Bi	Pb	Se	W	Zn	Cu	Ni	Co	Fe	Mn	Cr	V	Ti
1	316/316L	0.00	0.00	0.00	0.00	0.00	0.00	2.07	0.01	0.01	0.00	0.03	0.00	0.03	0.02	0.35	10.53	0.30	68.84	0.99	16.75	0.07	0.00
2	316/316L	0.00	0.00	0.01	0.00	0.00	0.01	2.10	0.01	0.01	0.01	0.01	0.00	0.03	0.02	0.43	10.73	0.00	68.20	1.50	16.85	0.07	0.02
3	316/316L	0.00	0.00	0.02	0.00	0.00	0.00	1.98	0.02	0.01	0.01	0.02	0.00	0.01	0.01	0.36	10.39	0.50	69.10	1.16	16.84	0.09	0.00
4	316/316L	0.00	0.00	0.02	0.00	0.00	0.00	2.08	0.01	0.00	0.01	0.03	0.00	0.00	0.01	0.25	9.91	0.39	69.05	1.35	16.80	0.08	0.00
5	316/316L	0.00	0.01	0.01	0.00	0.00	0.00	2.06	0.01	0.01	0.01	0.02	0.00	0.04	0.01	0.33	9.96	0.08	69.91	0.97	16.44	0.11	0.02

ATTACHMENT 2 TO
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 DELUMPWITT
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CERTIFICAT MATIERES EN 10204-3.1
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Crusher and Grinding Installation
DelumpWitt PRO-14-0012

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Pos. 102 473848 Dessin / Zeichnung / Drawing : 473848-CMA

Mesure N° Mass Nr. Measure Nr.	Matière Material Material	Al	Sb	Sn	Cd	Pd	Ag	Mo	Nb	Zr	Bi	Pb	Se	W	Zn	Cu	Ni	Co	Fe	Mn	Cr	V	Ti
1	316/316L	0.00	0.00	0.01	0.00	0.00	0.00	2.69	0.00	0.00	0.01	0.01	0.00	0.03	0.02	0.18	13.19	0.15	65.13	1.83	16.72	0.03	0.00
2	316/316L	0.00	0.01	0.02	0.01	0.00	0.00	2.69	0.01	0.00	0.00	0.02	0.00	0.02	0.01	0.45	10.57	0.23	67.47	1.36	17.07	0.06	0.00
3	316/316L	0.00	0.02	0.01	0.00	0.00	0.01	2.21	0.02	0.00	0.01	0.01	0.00	0.11	0.00	0.25	10.42	0.48	68.58	1.12	16.66	0.10	0.00
4	316/316L	0.00	0.02	0.01	0.01	0.00	0.01	2.05	0.01	0.01	0.00	0.03	0.00	0.04	0.03	0.41	10.15	0.11	68.60	1.75	16.70	0.06	0.00
5	316/316L	0.00	0.01	0.01	0.00	0.00	0.00	2.46	0.01	0.01	0.02	0.00	0.00	0.07	0.01	0.27	10.99	0.61	69.54	1.38	16.55	0.11	0.00
6	316/316L	0.00	0.00	0.02	0.00	0.00	0.00	2.08	0.01	0.00	0.00	0.03	0.00	0.02	0.01	0.38	9.85	0.49	68.57	1.00	17.43	0.10	0.01
7	316/316L	0.00	0.01	0.02	0.00	0.00	0.00	3.17	0.00	0.00	0.01	0.00	0.01	0.00	0.05	0.10	13.58	0.00	65.35	1.89	15.74	0.05	0.01
8	316/316L	0.00	0.00	0.03	0.01	0.00	0.01	2.68	0.02	0.00	0.01	0.02	0.00	0.02	0.01	0.26	13.60	0.27	64.26	1.81	16.97	0.03	0.00

Pos. 103 454311 Dessin / Zeichnung / Drawing : 454311-CMA

Mesure N° Mass Nr. Measure Nr.	Matière Material Material	Al	Sb	Sn	Cd	Pd	Ag	Mo	Nb	Zr	Bi	Pb	Se	W	Zn	Cu	Ni	Co	Fe	Mn	Cr	V	Ti
1	316/316L	0.00	0.01	0.01	0.00	0.00	0.00	2.05	0.01	0.01	0.00	0.01	0.00	0.00	0.02	0.33	10.13	0.48	69.05	0.82	16.98	0.10	0.00
2	316/316L	0.00	0.00	0.00	0.00	0.00	0.00	2.12	0.00	0.00	0.02	0.00	0.00	0.12	0.01	0.20	9.86	0.22	69.68	1.51	16.79	0.07	0.01
3	316/316L	0.00	0.00	0.01	0.01	0.00	0.00	2.09	0.00	0.01	0.00	0.01	0.00	0.00	0.04	0.34	9.80	0.51	69.59	1.53	16.95	0.12	0.00
4	316/316L	0.00	0.00	0.02	0.00	0.00	0.00	2.20	0.02	0.00	0.01	0.01	0.00	0.03	0.01	0.50	10.71	0.14	67.59	1.93	16.68	0.09	0.06

Pos. 104 464798 Dessin / Zeichnung / Drawing : 464798-CMA

Mesure N° Mass Nr. Measure Nr.	Matière Material Material	Al	Sb	Sn	Cd	Pd	Ag	Mo	Nb	Zr	Bi	Pb	Se	W	Zn	Cu	Ni	Co	Fe	Mn	Cr	V	Ti
1	316/316L	0.00	0.00	0.01	0.01	0.00	0.00	1.99	0.03	0.00	0.01	0.00	0.00	0.00	0.03	0.22	9.33	0.26	69.01	1.03	17.97	0.11	0.00
2	316/316L	0.00	0.01	0.02	0.00	0.01	0.01	2.30	0.01	0.02	0.01	0.00	0.00	0.00	0.03	0.40	10.62	0.43	68.47	1.37	13.73	0.05	0.02
3	316/316L	0.00	0.00	0.01	0.00	0.00	0.00	2.38	0.00	0.00	0.01	0.02	0.00	0.05	0.00	0.29	11.43	0.14	65.45	1.53	18.65	0.03	0.01

Pos. 500 Dessin / Zeichnung / Drawing : 473841-CMA

Mesure/Pos. N° Mass/Pos. Nr. Measure/Pos Nr	Matière Material Material	Article Artikel Article	Certificat FDA N° FDA Zertifikat Nr. FDA certificate No
500	Novafion	453220	42422

Pos.103-Grinding 473746

Pos. 1 436255 Dessin / Zeichnung / Drawing : 473746-CMA

Mesure N° Mass Nr. Measure Nr	Matière Material Material	Al	Sb	Sn	Cd	Pd	Ag	Mo	Nb	Zr	Bi	Pb	Se	W	Zn	Cu	Ni	Co	Fe	Mn	Cr	V	Ti
1	316/316L	0.00	0.00	0.01	0.00	0.00	0.00	2.28	0.00	0.00	0.00	0.02	0.01	0.00	0.00	0.33	9.99	0.34	67.67	0.42	18.85	0.06	0.01

Pos.100 436059 Dessin / Zeichnung / Drawing : 436059-CMA

Pos. 500-502 Dessin / Zeichnung / Drawing : 436059-CMA

Mesure/Pos. N° Mass/Pos. Nr. Measure/Pos Nr	Matière Material Material	Article Artikel Article	Certificat FDA N° FDA Zertifikat Nr. FDA certificate No
500	EPDM	404664	165274
501	EPDM	435702	165274
501	Silicone	406205	56867

Pos. 101 436242 Dessin / Zeichnung / Drawing : 29961

Mesure N° Mass Nr. Measure Nr	Matière Material Material	Al	Sb	Sn	Cd	Pd	Ag	Mo	Nb	Zr	Bi	Pb	Se	W	Zn	Cu	Ni	Co	Fe	Mn	Cr	V	Ti
1	316/316L	0.00	0.00	0.02	0.00	0.00	0.00	2.08	0.01	0.00	0.00	0.02	0.00	0.00	0.00	0.66	10.07	0.39	68.39	1.45	16.83	0.05	0.03
2	316/316L	0.00	0.00	0.02	0.00	0.00	0.00	2.02	0.01	0.00	0.01	0.02	0.00	0.11	0.01	0.36	10.33	0.28	68.96	1.29	16.50	0.07	0.01

Pos. 102 435843 Dessin / Zeichnung / Drawing : 435843-CMA

Mesure N° Mass Nr. Measure Nr	Matière Material Material	Al	Sb	Sn	Cd	Pd	Ag	Mo	Nb	Zr	Bi	Pb	Se	W	Zn	Cu	Ni	Co	Fe	Mn	Cr	V	Ti
1	316/316L	0.00	0.00	0.02	0.01	0.00	0.00	2.07	0.02	0.01	0.00	0.03	0.00	0.00	0.00	0.37	10.51	0.14	67.90	1.62	17.11	0.13	0.08

Pos. 500 Dessin / Zeichnung / Drawing : 435843-CMA

Mesure/Pos. N° Mass/Pos. Nr. Measure/Pos Nr	Matière Material Material	Article Artikel Article	Certificat FDA N° FDA Zertifikat Nr. FDA certificate No
500	FEP-O-SEAL	419771	165314

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Pos. 103 432459 Dessin / Zeichnung / Drawing : 432459-CMA

Mesure N° Mass Nr. Measure Nr.	Matière Material Material	Al	Sb	Sn	Cd	Pd	Ag	Mo	Nb	Zr	Bi	Pb	Se	W	Zn	Cu	Ni	Co	Fe	Mn	Cr	V	Ti
1	316/316L	0.00	0.00	0.01	0.01	0.00	0.00	2.19	0.00	0.01	0.00	0.01	0.01	0.03	0.00	0.66	11.48	0.06	68.67	0.89	16.86	0.11	0.02
2	316/316L	0.00	0.00	0.02	0.00	0.00	0.01	2.60	0.05	0.01	0.00	0.01	0.00	0.00	0.01	0.37	10.65	0.28	69.06	1.52	16.85	0.06	0.00
3	316/316L	0.00	0.01	0.00	0.00	0.00	0.00	2.24	0.05	0.00	0.00	0.04	0.00	0.05	0.00	0.70	10.47	0.26	67.79	1.76	16.49	0.12	0.03
4	316/316L	0.00	0.00	0.01	0.00	0.00	0.00	2.49	0.00	0.00	0.01	0.01	0.00	0.03	0.00	0.36	10.64	0.24	67.92	0.01	18.23	0.06	0.00

Pos. 100 435025 Dessin / Zeichnung / Drawing : 435025-CMA

Mesure N° Mass Nr. Measure Nr.	Matière Material Material	Al	Sb	Sn	Cd	Pd	Ag	Mo	Nb	Zr	Bi	Pb	Se	W	Zn	Cu	Ni	Co	Fe	Mn	Cr	V	Ti
1	316/316L	0.00	0.02	0.02	0.00	0.00	0.00	2.17	0.03	0.01	0.01	0.01	0.00	0.14	0.01	0.15	11.66	0.12	65.55	1.57	18.51	0.04	0.00

Pos. 500 Dessin / Zeichnung / Drawing : 435025-CMA

Mesure/Pos. N° Mass/Pos. Nr. Measure/Pos. Nr.	Matière Material Material	Article Artikel Article	Certificat FDA N° FDA Zertifikat Nr. FDA certificate No.
500	Rulon	432410	148886

Pos. 500 Dessin / Zeichnung / Drawing : 432459-CMA

Mesure/Pos. N° Mass/Pos. Nr. Measure/Pos. Nr.	Matière Material Material	Article Artikel Article	Certificat FDA N° FDA Zertifikat Nr. FDA certificate No.
500	Ecoflon	432412	28248

Pos. 104 436011 Dessin / Zeichnung / Drawing : 436011-CMA

Mesure N° Mass Nr. Measure Nr.	Matière Material Material	Al	Sb	Sn	Cd	Pd	Ag	Mo	Nb	Zr	Bi	Pb	Se	W	Zn	Cu	Ni	Co	Fe	Mn	Cr	V	Ti
1	316/316L	0.00	0.01	0.02	0.00	0.00	0.00	2.18	0.03	0.00	0.02	0.01	0.00	0.07	0.00	0.36	9.96	0.30	68.44	0.35	18.18	0.07	0.00
2	316/316L	0.00	0.00	0.01	0.00	0.00	0.00	2.21	0.01	0.00	0.00	0.03	0.00	0.04	0.00	0.40	10.97	0.20	69.04	1.86	16.83	0.15	0.01

Pos. 104-Outlet-473713

Pos. 100 473711 Dessin / Zeichnung / Drawing : 473711-CMA

Mesure N° Mass Nr. Measure Nr.	Matière Material Material	Al	Sb	Sn	Cd	Pd	Ag	Mo	Nb	Zr	Bi	Pb	Se	W	Zn	Cu	Ni	Co	Fe	Mn	Cr	V	Ti
1	316/316L	0.00	0.02	0.02	0.00	0.00	0.00	2.24	0.02	0.00	0.02	0.00	0.00	0.04	0.03	0.46	10.34	0.36	68.54	1.04	16.79	0.08	0.00
2	316/316L	0.00	0.01	0.01	0.00	0.00	0.01	2.06	0.00	0.01	0.01	0.01	0.00	0.09	0.02	0.32	10.32	0.66	68.54	0.98	16.84	0.10	0.03
3	316/316L	0.00	0.00	0.02	0.00	0.00	0.00	2.02	0.01	0.00	0.00	0.01	0.01	0.03	0.01	0.45	10.33	0.18	68.02	1.75	17.07	0.06	0.01
4	316/316L	0.00	0.00	0.02	0.00	0.00	0.00	2.13	0.04	0.01	0.00	0.04	0.00	0.02	0.01	0.39	11.26	0.24	69.92	1.89	16.90	0.12	0.00
5	316Ti	0.00	0.00	0.02	0.00	0.01	0.00	2.04	0.01	0.01	0.01	0.01	0.00	0.04	0.01	0.33	10.67	0.52	68.24	1.01	16.68	0.09	0.32
6	316/316L	0.00	0.01	0.02	0.00	0.00	0.00	2.09	0.00	0.00	0.00	0.02	0.00	0.02	0.02	0.40	9.87	0.58	68.77	0.97	17.14	0.08	0.00
7	316/316L	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.01	0.01	0.00	0.00	0.07	0.01	0.31	9.98	0.67	68.66	1.16	17.01	0.09	0.00

Pos. 101 473712 Dessin / Zeichnung / Drawing : 473712-CMA

Mesure N° Mass Nr. Measure Nr.	Matière Material Material	Al	Sb	Sn	Cd	Pd	Ag	Mo	Nb	Zr	Bi	Pb	Se	W	Zn	Cu	Ni	Co	Fe	Mn	Cr	V	Ti
1	316/316L	0.00	0.00	0.02	0.00	0.00	0.00	2.11	0.03	0.01	0.02	0.01	0.00	0.08	0.00	0.44	10.20	0.20	68.21	1.65	16.96	0.06	0.00
2	316/316L	0.00	0.00	0.01	0.01	0.01	0.00	2.19	0.02	0.01	0.01	0.03	0.00	0.06	0.00	0.38	10.32	0.27	68.20	1.87	16.57	0.06	0.00
3	316/316L	0.00	0.00	0.01	0.00	0.00	0.00	2.25	0.03	0.01	0.01	0.01	0.00	0.00	0.00	0.22	10.38	0.46	69.85	0.79	16.89	0.09	0.02

Pos. 500 Dessin / Zeichnung / Drawing : 473713-CMA

Mesure/Pos. N° Mass/Pos. Nr. Measure/Pos. Nr.	Matière Material Material	Article Artikel Article	Certificat FDA N° FDA Zertifikat Nr. FDA certificate No.
500		437890	169108

POS.500 Dessin / Zeichnung / Drawing : 473599-CMA

Mesure/Pos. N° Mass/Pos. Nr. Measure/Pos. Nr.	Matière Material Material	Article Artikel Article	Certificat FDA N° FDA Zertifikat Nr. FDA certificate No.
500	Novallon	457663	118884

Protocole établi par (visa) H.Rey  le 30.04.2014
 Protokoll erstellt von (visa) Report established by (visa) am on

* Tetratex® ePTFE-Membran Polyester Nadel filz antistatic

ATTACHMENT 2 TO
 FAT IQ TEST PROTOCOL
 DELUMPWITT
 PAGE 4 OF 30

Cherry 19 MAY 14



CERTIFICAT D'ETAT DE SURFACES /
ZERTIFIKAT FÜR OBERFLÄCHENQUALITÄT /
SURFACE QUALITY CERTIFICATE

11

Crusher and Grinding Installation
DelumpWitt PRO-14-0012

N° Série:

Serien-Nr.

Serial Nr.

14001235183

REF 473463

Appareil de mesure / Messapparat / Measuring unit : Mitutoyo Suftest SJ-301

N° série / Serien-Nr. / Serial Nr. : 400197

N° Etalon / Massstab-Nr. / Standard Nr. : 522

Position de mesure: Intérieur Extérieur

Massnahmenposition: I = innen E = Aussen

Measure position: Inside Outside

Ref	Position mesure Massnahmenposition Measure position	Measure N° Masse Nr. Measure Nr.	Norme Norm Stand	Profil Profil Profile	Filtre Filter Filter	Eva.-L Ausw.-L Eva.-L	AC	N	Vitesse Gesch. Speed	Drive Vorschub Drive	Ra
DATA pos. 100											
Pos.1											
428715	I	1	JIS2001	R	GAUSS	4.0mm	0.8mm	5.00	0.5mm/s	STAND	0.06um
428715	I	2	JIS2001	R	GAUSS	4.0mm	0.8mm	5.00	0.5mm/s	STAND	0.08um
Pos.100											
473648	I	1	JIS2001	R	GAUSS	4.0mm	0.8mm	5.00	0.5mm/s	STAND	0.20um
473648	I	2	JIS2001	R	GAUSS	4.0mm	0.8mm	5.00	0.5mm/s	STAND	0.23um
Pos.101											
476706	I	1	JIS2001	R	GAUSS	4.0mm	0.8mm	5.00	0.5mm/s	STAND	0.08um
476706	I	2	JIS2001	R	GAUSS	4.0mm	0.8mm	5.00	0.5mm/s	STAND	0.14um
Pos.102											
473700	I	1	JIS2001	R	GAUSS	4.0mm	0.8mm	5.00	0.5mm/s	STAND	0.10um
473700	I	2	JIS2001	R	GAUSS	4.0mm	0.8mm	5.00	0.5mm/s	STAND	0.10um
Pos.103											
473688	I	1	JIS2001	R	GAUSS	4.0mm	0.8mm	5.00	0.5mm/s	STAND	0.16um
473688	I	2	JIS2001	R	GAUSS	4.0mm	0.8mm	5.00	0.5mm/s	STAND	0.25um
DATA pos. 101											
Pos.101											
473842	I	1.00	JIS2001	R	GAUSS	4.0mm	0.8mm	5.00	0.5mm/s	STAND	0.06um
473842	I	2.00	JIS2001	R	GAUSS	4.0mm	0.8mm	5.00	0.5mm/s	STAND	0.10um
DATA pos. 102											
Pos.1											
464795	E	1.00	JIS2001	R	GAUSS	4.0mm	0.8mm	5.00	0.5mm/s	STAND	0.04um
464795	E	2.00	JIS2001	R	GAUSS	4.0mm	0.8mm	5.00	0.5mm/s	STAND	0.08um
Pos.3											
464796	E	1.00	JIS2001	R	GAUSS	4.0mm	0.8mm	5.00	0.5mm/s	STAND	0.22um
464796	E	2.00	JIS2001	R	GAUSS	4.0mm	0.8mm	5.00	0.5mm/s	STAND	0.13um
Pos.101											
454299	E	1.00	JIS2001	R	GAUSS	4.0mm	0.8mm	5.00	0.5mm/s	STAND	0.33um
454299	E	2.00	JIS2001	R	GAUSS	4.0mm	0.8mm	5.00	0.5mm/s	STAND	0.24um
Pos.102											
473848	I	1.00	JIS2001	R	GAUSS	4.0mm	0.8mm	5.00	0.5mm/s	STAND	0.34um
473848	I	2.00	JIS2001	R	GAUSS	4.0mm	0.8mm	5.00	0.5mm/s	STAND	0.05um
Pos.103											
454311	E	1.00	JIS2001	R	GAUSS	4.0mm	0.8mm	5.00	0.5mm/s	STAND	0.28um
454311	E	2.00	JIS2001	R	GAUSS	4.0mm	0.8mm	5.00	0.5mm/s	STAND	0.29um
Pos.104											
464798	I	1.00	JIS2001	R	GAUSS	4.0mm	0.8mm	5.00	0.5mm/s	STAND	0.08um
464798	I	2.00	JIS2001	R	GAUSS	4.0mm	0.8mm	5.00	0.5mm/s	STAND	0.09um

ATTACHMENT 2 TO
FAT IQ TEST PROTOCOL
DELUMPWITT
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Cherry 19 MAY 14



CERTIFICAT D'ETAT DE SURFACES /
ZERTIFIKAT FÜR OBERFLÄCHENQUALITÄT /
SURFACE QUALITY CERTIFICATE

11

Crusher and Grinding Installation
DelumpWitt PRO-14-0012

DATA pos. 103

Pos.1											
436255	E	1.00	JIS2001	R	GAUSS	4.0mm	0.8mm	5.00	0.5mm/s	STAND	0.04um
436255	E	2.00	JIS2001	R	GAUSS	4.0mm	0.8mm	5.00	0.5mm/s	STAND	0.09um
Pos.102											
435843	E	1.00	JIS2001	R	GAUSS	4.0mm	0.8mm	5.00	0.5mm/s	STAND	0.13um
435843	E	2.00	JIS2001	R	GAUSS	4.0mm	0.8mm	5.00	0.5mm/s	STAND	0.17um
Pos.103											
436255	E	1.00	JIS2001	R	GAUSS	4.0mm	0.8mm	5.00	0.5mm/s	STAND	0.09um
436255	E	2.00	JIS2001	R	GAUSS	4.0mm	0.8mm	5.00	0.5mm/s	STAND	0.23um
Pos.104											
436011	I	1.00	JIS2001	R	GAUSS	4.0mm	0.8mm	5.00	0.5mm/s	STAND	0.20um
436011	I	2.00	JIS2001	R	GAUSS	4.0mm	0.8mm	5.00	0.5mm/s	STAND	0.08um

DATA pos. 104

Pos.100											
473712	I	1.00	JIS2001	R	GAUSS	4.0mm	0.8mm	5.00	0.5mm/s	STAND	0.12um
473712	I	2.00	JIS2001	R	GAUSS	4.0mm	0.8mm	5.00	0.5mm/s	STAND	0.12um
Pos.101											
473712	I	1.00	JIS2001	R	GAUSS	4.0mm	0.8mm	5.00	0.5mm/s	STAND	0.07um
473712	I	2.00	JIS2001	R	GAUSS	4.0mm	0.8mm	5.00	0.5mm/s	STAND	0.09um

Protocole établi par (visa)
Protokoll erstellt von (Visa)
Report established by (Visa)

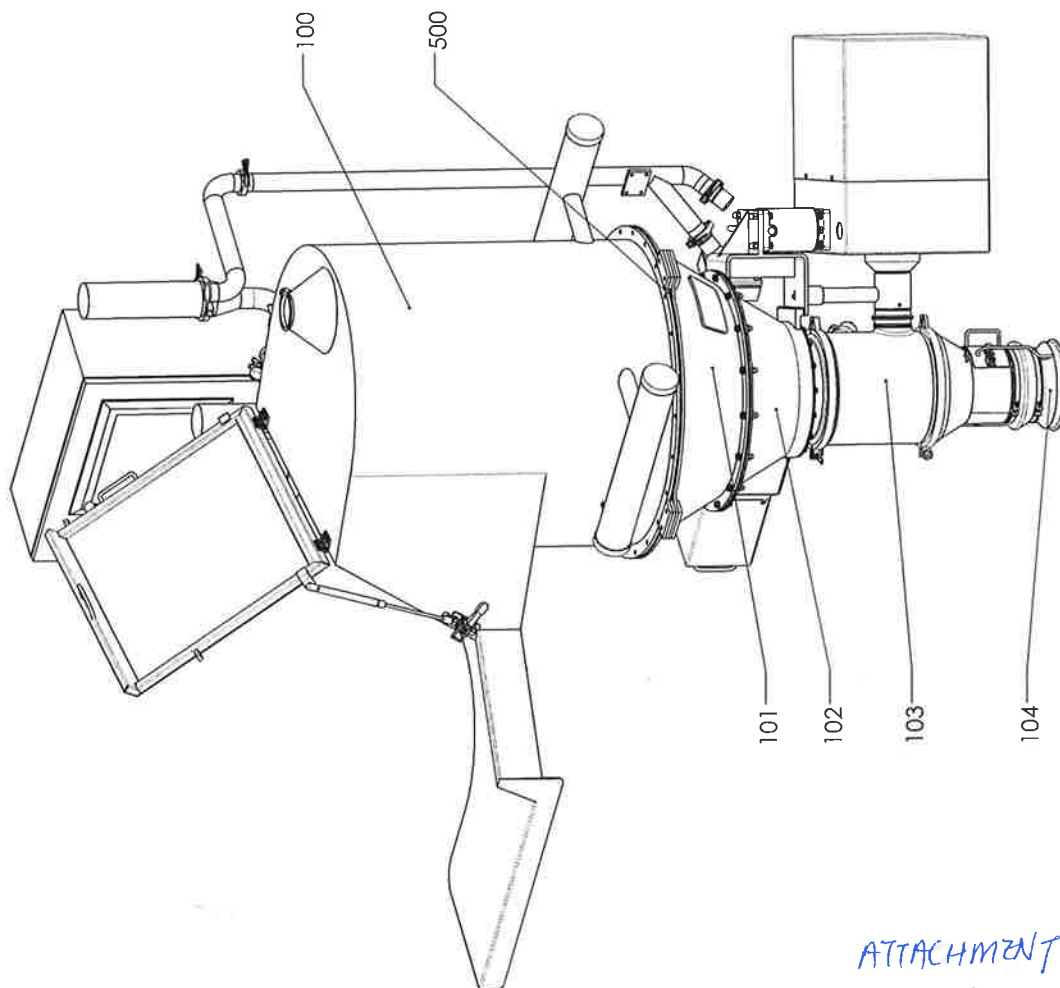
H.REY

le
am 30-04-2014
on

ATTACHMENT 2 TO
FAT IQ TEST PROTOCOL
DELUMPWITT
PAGE 26 OF 30
EE Cheryl 19 MAY 14
Cheryl 19 MAY 14

Pos.	Item number	Control drawing	Materials certificates EN-10204-3.1B FDA	Surface quality certificates
100	473649	473649-CMA	X	X
101	473842	473842-CMA	X	X
102	473841	473841-CMA	X	X
103	473746	473746-CMA	X	X
104	473713	473713-CMA	X	X
500	457663	---	X	0

X = delivered
0 = undelivered



Dimensions without tolerance [mm]		above	6	30	120	400	1000	MATERIAL : N/A
up to		6	30	120	400	1000	2000	
Machining ISO 2768-m		+0.10	+0.20	+0.30	+0.50	+0.80	+1.20	Scale
Weighting Assembly ISO 2768-e		+0.30	+0.30	+0.80	+1.20	+2.00	+3.00	%
								Similar
								464769
								Weight [kg]
								N/A
								A3
								A1EX
								Page
								1/1
								Ver
								A

PRO-14-0012 / DelumpWitt

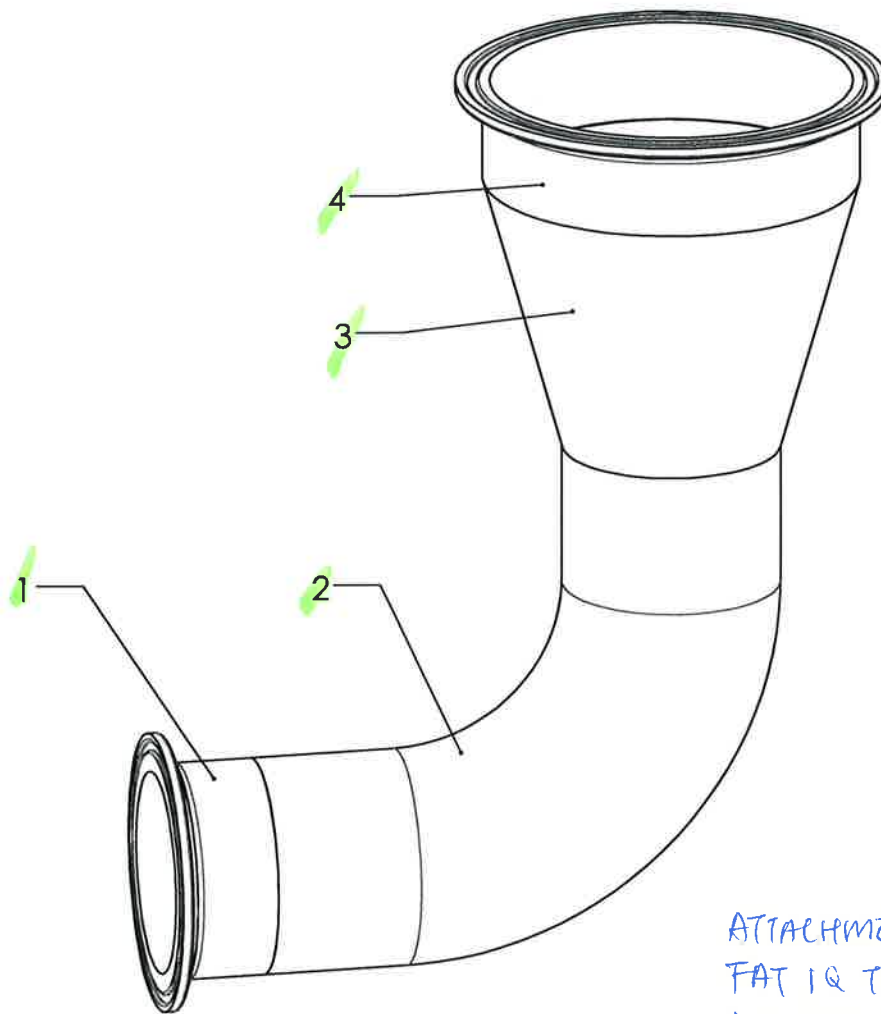
Novartis S.A. - Migros and Holding of Provent
P.O. Box 815, CH-4170 Birmensdorf, Switzerland
Tel: +41 26 460 74 00 / Fax: +41 26 460 74 01
www.novartis.com / www.provent.com



ATTACHMENT 2 OF
FAT IQ TEST PROTOCOL
DELUMPWITT
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Cherry 19 MAY 14

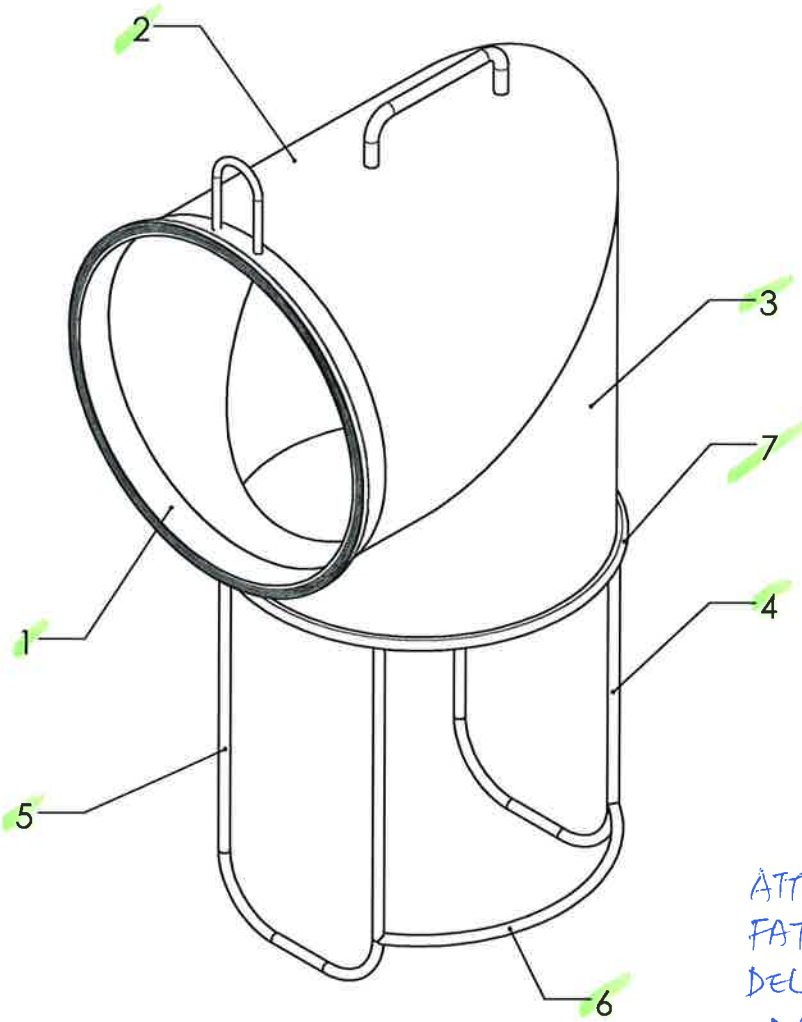
EE
Cherry 19 MAY 14



ATTACHMENT 2 TO
 FAT IQ TEST PROTOCOL
 DELUMPWITT
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 Chemyff 19 MAY 14

POS 100 - ¹⁰¹~~102~~ EE Chemyff 19 MAY 14
 POS 100 - 102

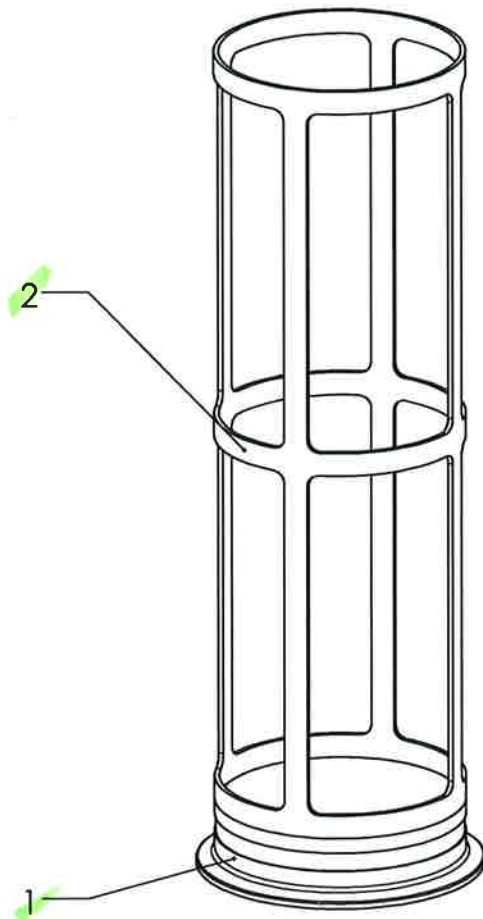
Dimensions without tolerance [mm]	above		6	30	120	400	1000	MATERIAL : N/A			
	up to	6	30	120	400	1000	2000				
Machining: ISO 2768-m		±0.10	±0.20	±0.30	±0.50	±0.80	±1.20	Scale % Similar			
Welding Assembly: ISO 2768-c		±0.30	±0.50	±0.80	±1.20	±2.00	±3.00				
Coude 90°								Designed	04/02/2014	edgu	
								Controlled	18/02/2014	edgu	
								Revised	18/02/2014	edgu	
								Atex			
Any and all information received by you from us shall be held and kept confidential and shall not be disclosed by you to any third party except with prior written consent of FREWITT SA.								Weight [kg]			
								A4	N/A		
 Frewitt SA: Milling and Handling of Powders P.O.B. 615, CH-1701 Fribourg, SWITZERLAND Tel: +41 26 460 74 00 / Fax: +41 26 460 74 01 info@frewitt.com / www.frewitt.com								473706-CMA		Page	Ver.
										1/1	A



ATTACHMENT 2 TO
 FAT IQ TEST PROTOCOL
 DELUMPWITT
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 Chevry 19/04/14

POS 100 - 103

Dimensions without tolerance [mm]	above		6	30	120	400	1000	MATERIAL : 316/316L				
	up to	6	30	120	400	1000	2000					
Machining: ISO 2768-m		±0.10	±0.20	±0.30	±0.50	±0.80	±1.20					
Welding Assembly: ISO 2768-c		±0.30	±0.50	±0.80	±1.20	±2.00	±3.00					
Tube pour sache								Scale %	Similar	Designed	03/02/2014	edgu
										Controlled	18/02/2014	edgu
								Weight [kg]	Revised	18/02/2014	edgu	
								A4	6.98	Atex		
Any and all information received by you from us shall be held and kept confidential and shall not be disclosed by you to any third party except with prior written consent of FREWITT SA.				Frewitt SA: Milling and Handling of Powders P.O.B. 615, CH-1701 Fribourg, SWITZERLAND tel: +41 26 460 74 00 / fax: +41 26 460 74 01 info@frewitt.com / www.frewitt.com				473688-CMA		Page	Ver.	
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ATTACHMENT 2 To
FAT IQ TEST PROTOCOL
DELUMPWITT

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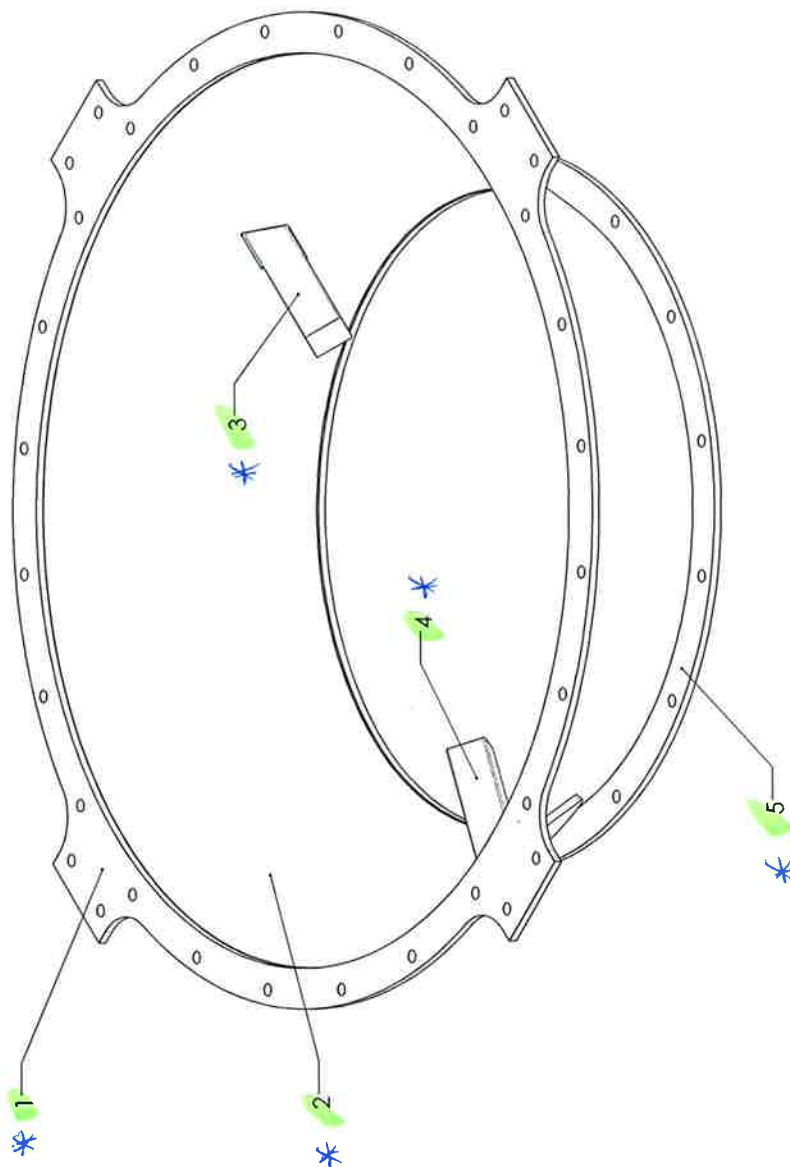
Cherry / 19 MAY 11

POS 100-104

POS 100-105

Dimensions without tolerance [mm]	above		6	30	120	400	1000	MATERIAL : 316/316L				
	up to	6	30	120	400	1000	2000	Scale	Similar	Designed	19/07/2011	thle
Machining: ISO 2768-m		±0.10	±0.20	±0.30	±0.50	±0.80	±1.20	%		Controlled	19/07/2011	thle
Welding Assembly: ISO 2768-c		±0.30	±0.50	±0.80	±1.20	±2.00	±3.00			Revised	19/07/2011	thle
Cartouche pour filtre								⊕	Weight [kg]	Atex		
								A4	N/A			
Any and all information received by you from us shall be held and kept confidential and shall not be disclosed by you to any third party except with prior written consent of FREWITT SA.				Frewitt SA: Milling and Handling of Powders P.O.B. 615, CH-1701 Fribourg, SWITZERLAND tel: +41 26 460 74 00 / fax: +41 26 460 74 01 info@frewitt.com / www.frewitt.com				465091-CMA		Page	Ver.	
										1/1	A	

Pos. 101

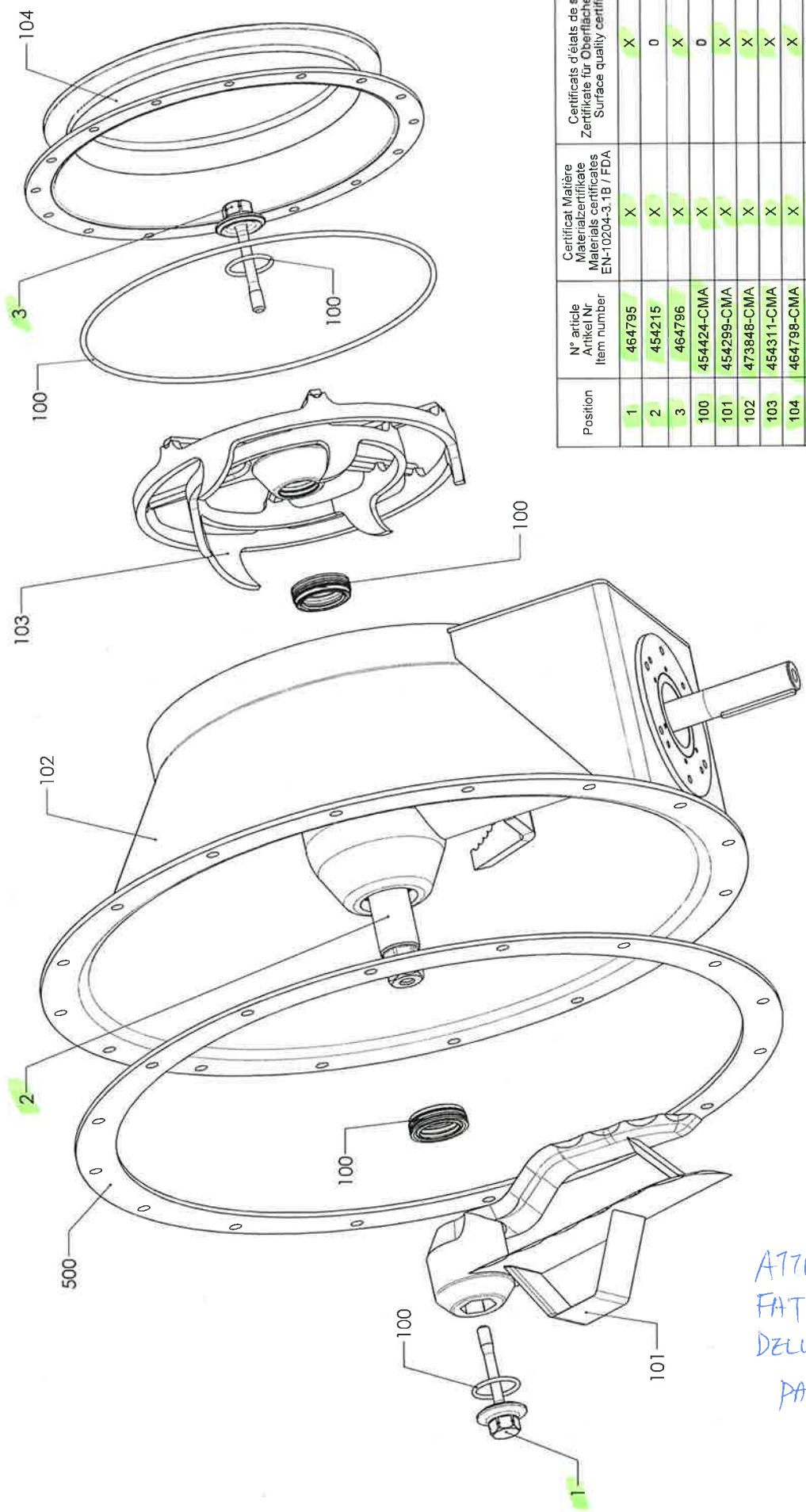


Dimensions without tolerance [mm]	6	30	120	400	1000
Machining ISO 2768-m	±0.10	±0.20	±0.30	±0.50	±1.20
Welding Assembly: ISO 2768-S	±0.30	±0.50	±0.80	±1.20	±2.00
MATERIAL :-					
Scale	Similar				
%					
Weight [kg]	35,595				
Designed	17/02/2014				
Controlled	18/02/2014				
Revised	18/02/2014				
Page	1/1				
Ver	A				
473842-CMA					
Frewitt SA, 18 Rue du Nord, 1000 Lausanne, Suisse P. 021 315 1101, F. 021 315 1102, E. info@frewitt.com info@frewitt.com | www.frewitt.com					

Trémie de concassage

* (FOR 5) MATERIAL CERTIFICATES AND SURFACE QUALITY CERTIFICATES C/F 19 MAY 14

ATTACHMENT 2 TO
 FAT IQ TEST PROTOCOL
 DELUMWITT
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 Cheryl 19 MAY 14



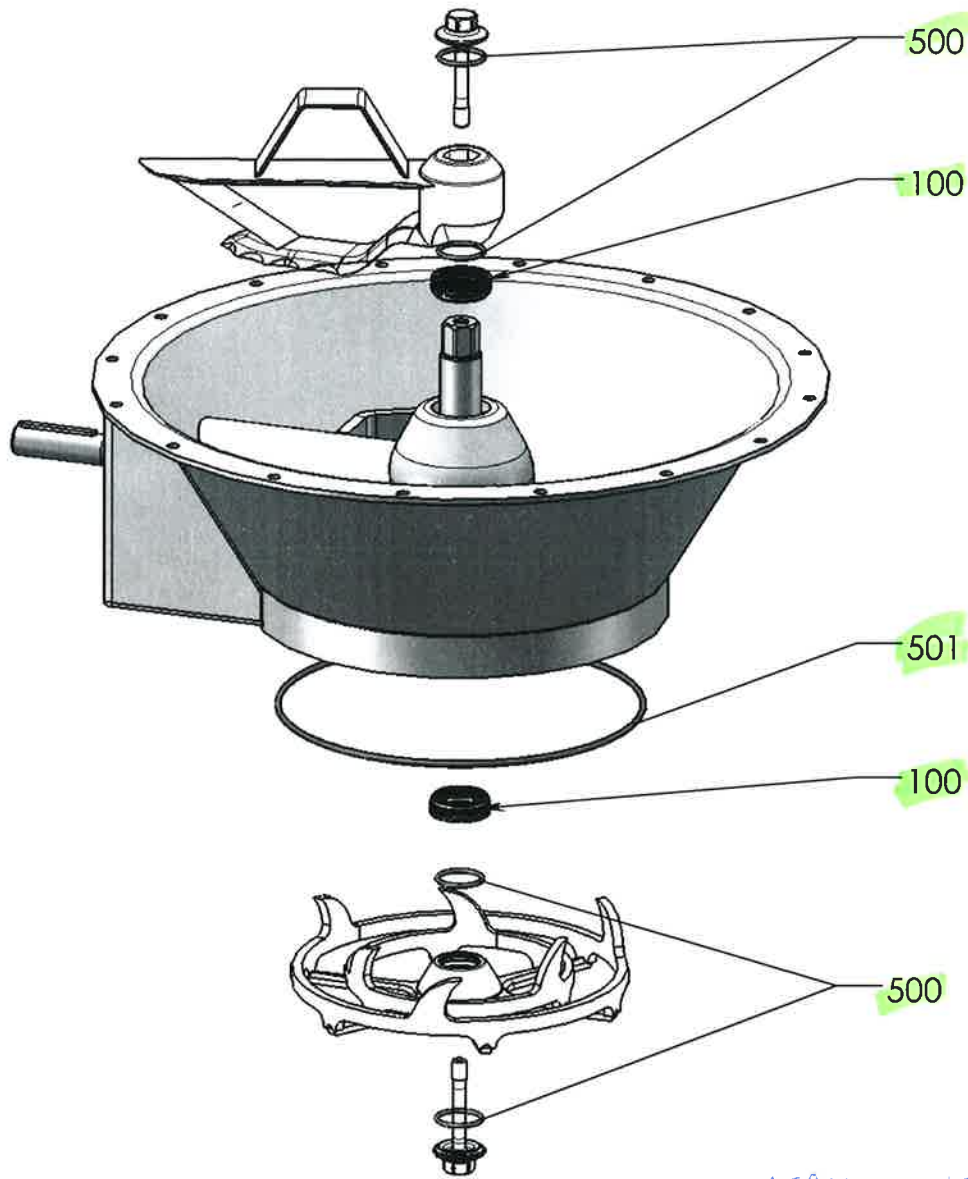
Position	N° article Artikel Nr Item number	Certificat Matière Materialcertifikate Materials certificates EN-10204-3.1B / FDA	Certificats d'états de surface Zertifikate für Oberflächen Surface quality certificates
1	464795	X	X
2	454215	X	0
3	464796	X	X
100	454424-CMA	X	0
101	454299-CMA	X	X
102	473848-CMA	X	X
103	454311-CMA	X	X
104	464798-CMA	X	X
500	453220	X	0

X = livré / geliefert / delivered
0 = non livré / ungeliefert / undelivered

pos 102

Dimensions without tolerance [mm]	above	6	30	120	400	1000	
Machining ISO 2768-m	up to	6	30	120	400	1000	
Welding Assembly-ISO 2768-c			+0.10	+0.20	+0.30	+0.80	
			+0.30	+0.50	+0.80	+1.20	
			+0.50	+1.00	+2.00	+5.00	
Scale		%		Similar		Weight [kg]	
				A3		189.81	
MATERIAL :							
Designed		18/02/20		Controlled		19/05/20	
Revised		19/05/20		Edge		edge	
Page		1/1		Ver.		B	
473841-CMA							

ATTACHMENT 2 TO
FAT IQ TEST PROTOCOL
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Chenyl/19MAY14



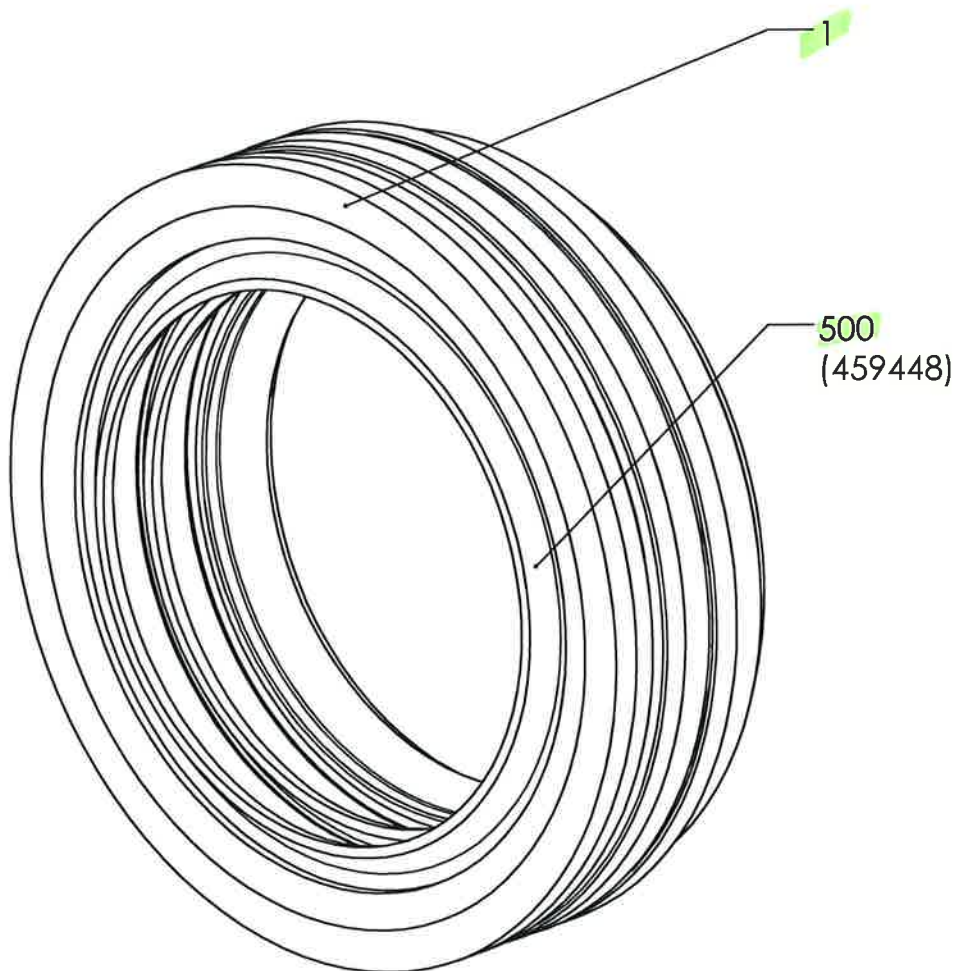
ATTACHMENT 2 TO
FAT IQ TEST PROTOCOL
DELUMPWITT
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Chuyff 19 MAY 11

Position	N° article Artikel Nr Item number
100	459448-CMA
500	454357
501	431768

Pos 102-100/11

Dimensions without tolerance [mm]	above	6	30	120	400	1000	MATERIAL : Matériau <non spécifié>				
	up to	6	30	120	400	1000					
Machining: ISO 2768-m		±0.10	±0.20	±0.30	±0.50	±0.80	±1.20				
Welding Assembly: ISO 2768-c		±0.30	±0.50	±0.80	±1.20	±2.00	±3.00				
Etanchéité							Scale %	Similar	Designed	06/05/2010	jbe
									Controlled	06/06/2011	wwi
									Revised	06/06/2011	wwi
									Atex		
		Weight [kg]									
		A4	59,99								
Any and all information received by you from us shall be held and kept confidential and shall not be disclosed by you to any third party except with prior written consent of FREWITT SA.		Frewitt SA: Milling and Handling of Powders P.O.B. 615, CH-1701 Fribourg, SWITZERLAND tel: +41 26 460 74 00 / fax: +41 26 460 74 01 info@frewitt.com / www.frewitt.com					Page		Ver.		
							1/1		B		
454424-CMA											



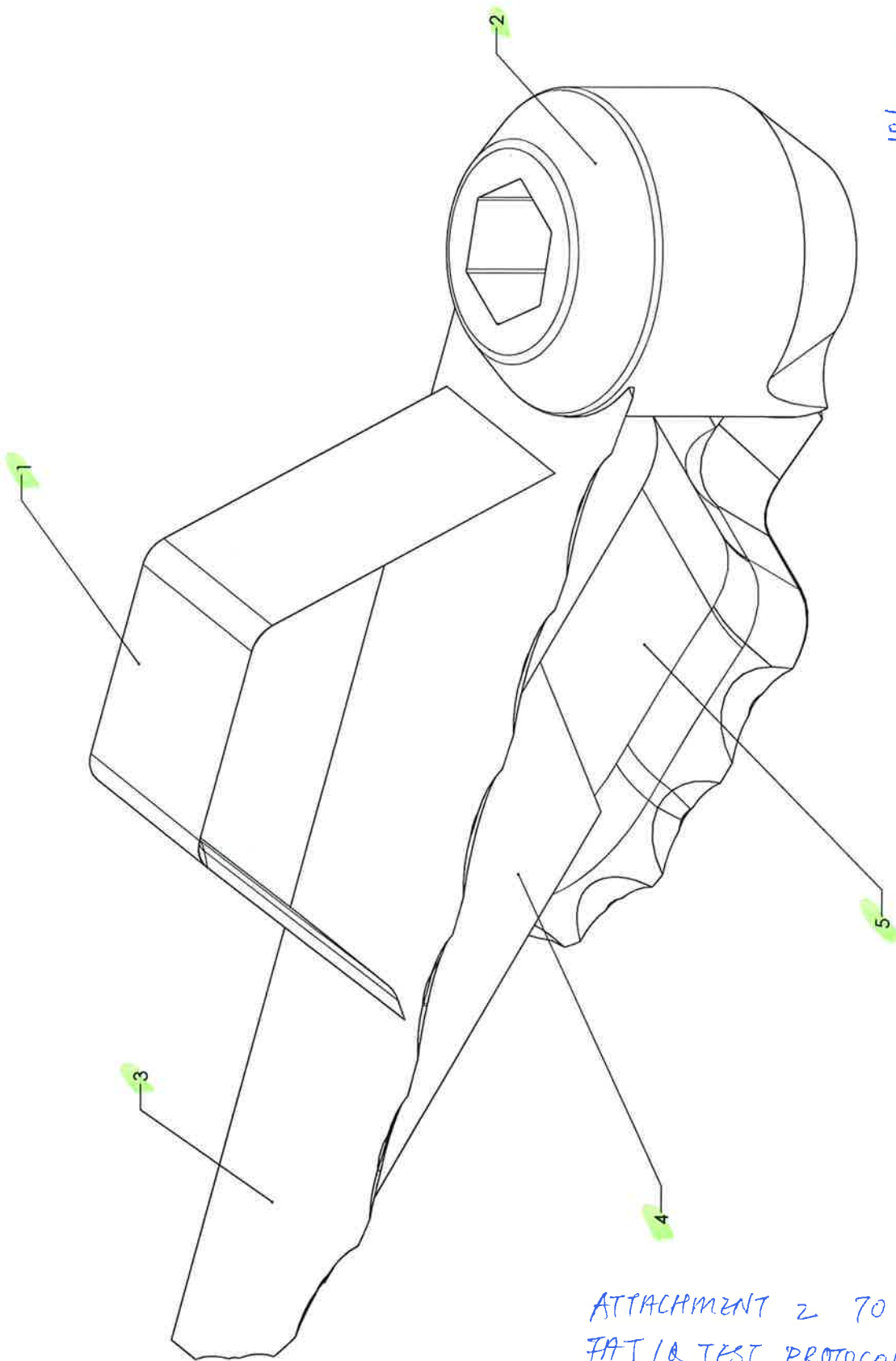
ATTACHMENT 2 TO
 FAT (R TEST PROTOCOL
 DELUMPWITT
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Chenyp 19 MAY 14

POS 100 - 100/2

Dimensions without tolerance [mm]	above up to	6	30	120	400	1000	2000	MATERIAL :					
Machining: ISO 2768-m		±0.10	±0.20	±0.30	±0.50	±0.80	±1.20	Scale %	Similar	Designed	25/08/2010	jbe	
Welding Assembly: ISO 2768-c		±0.30	±0.50	±0.80	±1.20	±2.00	±3.00			Controlled	10/05/2011	jbe	
Joint à 2 lèvres PS								Weight [kg]		Revised	10/05/2011	jbe	
								A4	0.000000	Atex			
Any and all information received by you from us shall be held and kept confidential and shall not be disclosed by you to any third party except with prior written consent of FREWITT SA.				Frewitt SA: Milling and Handling of Powders P.O.B. 615, CH-1701 Fribourg, SWITZERLAND tel: +41 26 460 74 00 / fax: +41 26 460 74 01 info@frewitt.com / www.frewitt.com				459448-CMA		Page	Ver.		
										1/1	A		

POS 102 - 102 EE Chemff 19 MAY 14



Dimensions without tolerance (mm)	above	6	30	120	400	1000
	up to	6	30	120	400	1000
Machining: ISO 2768-m		±0.10	±0.30	±0.50	±0.80	±1.20
Welding Assembly: ISO 2768-c		±0.30	±0.50	±0.80	±1.20	±2.00

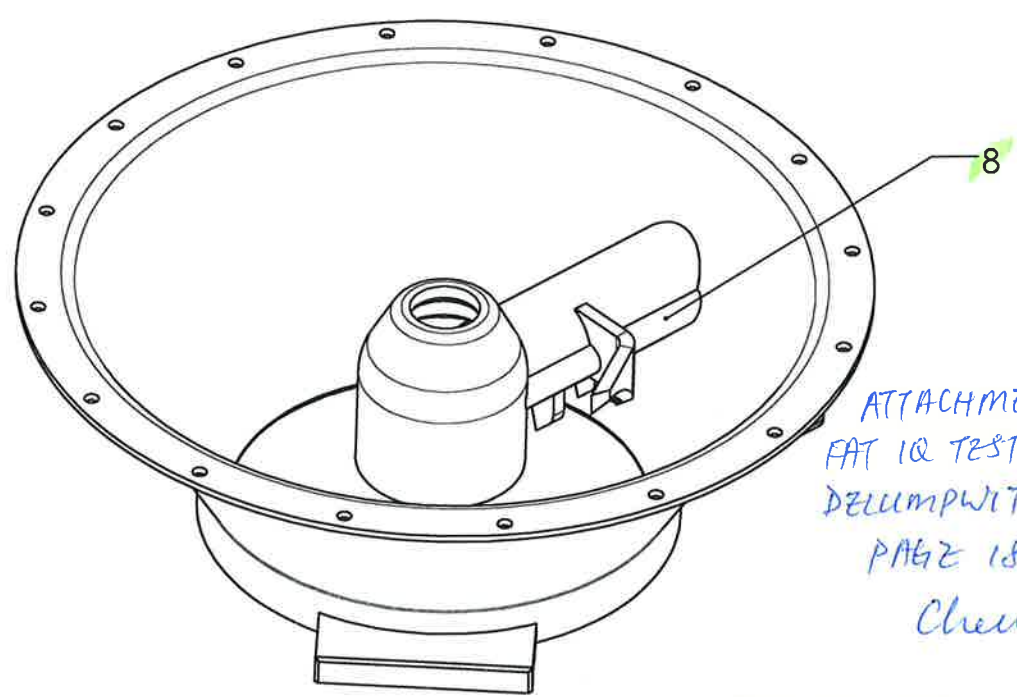
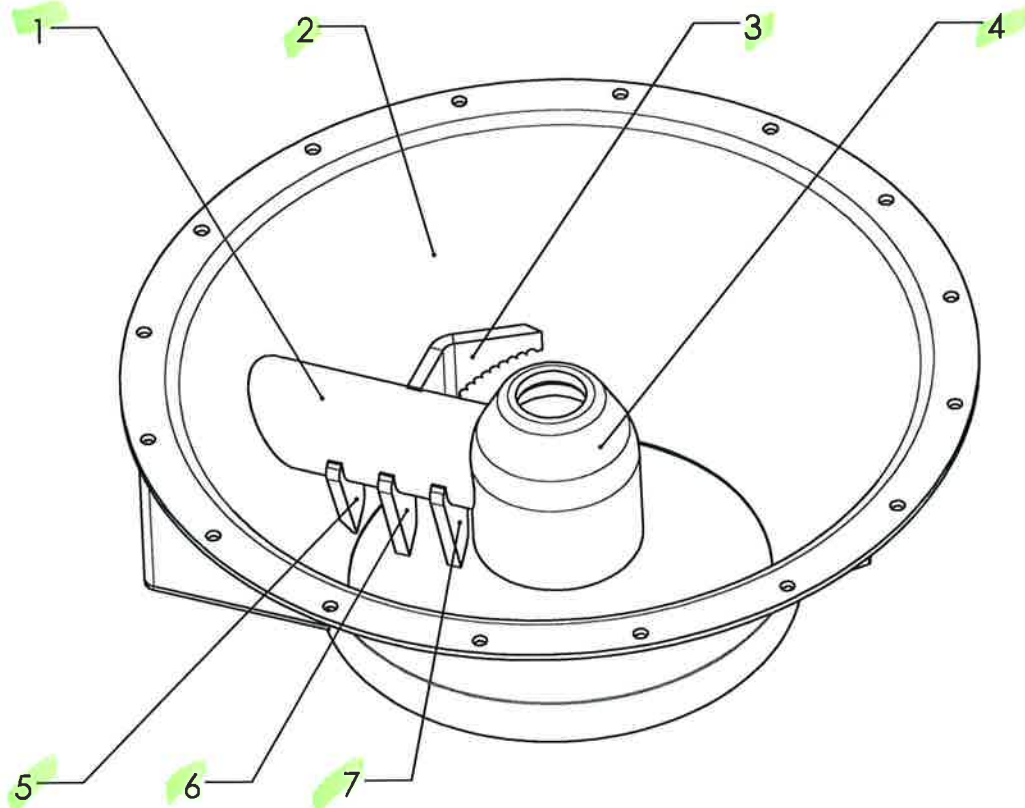
MATERIAL:	
Scale	Similar
%	
Weight (kg)	
A3	Alex
454299-CMA	
Page	Ver.
1/1	A

Couteau supérieur

PRECISION METAL FABRIQUE S.A. Using and Handling of Powdered Metals
 615, Chemin de la Vallée, 1700 Yverdon, Suisse
 Tel: +41 26 921 11 11 Fax: +41 26 921 11 12
 www.precisionmetal.ch

ATTACHMENT 2 TO
 FAT I&A TEST PROTOCOL
 DELUMPWITT
 PAGE 17 OF 30

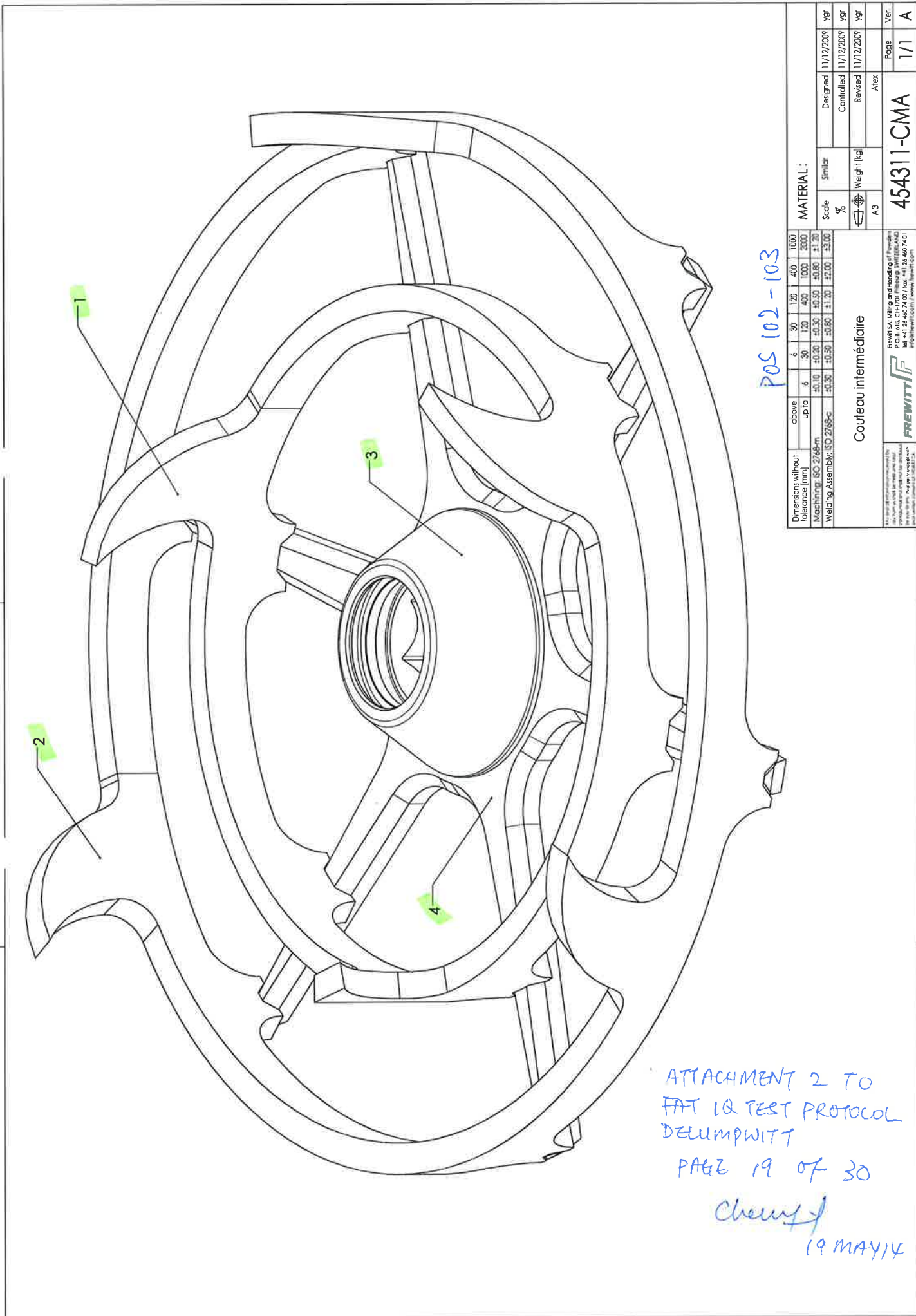
Chemff 19 MAY 14



ATTACHMENT 2 TO
 FAT IQ TEST PROTOCOL
 DELUMPWITT
 PAGE 18 OF 30
 Chrupf
 RAMAYK

POS 102-102

Dimensions without tolerance [mm]	above up to	6	30	120	400	1000	2000	MATERIAL : Matériau <non spécifié>				
Machining: ISO 2768-m		±0.10	±0.20	±0.30	±0.50	±0.80	±1.20	Scale %	Similar	Designed	18/02/2014	edgu
Welding Assembly: ISO 2768-c		±0.30	±0.50	±0.80	±1.20	±2.00	±3.00			Controlled	18/02/2014	edgu
Bâti usiné								Weight [kg]	Revised	18/02/2014	edgu	
								A4	34.907	Atex		
Any and all information received by you from us shall be held and kept confidential and shall not be disclosed by you to any third party except with prior written consent of FREWITT SA.				Frewitt SA: Milling and Handling of Powders P.O.B. 615, CH-1701 Fribourg, SWITZERLAND tel: +41 26 460 74 00 / fax: +41 26 460 74 01 info@frewitt.com / www.frewitt.com				473848-CMA		Page	Ver.	
								1/1		A		



POS 102-103

Dimensions without tolerance (mm)	above	6	30	120	400	1000
	up to	6	30	120	400	2000
Machining ISO 2768-m		+0.10	+0.20	+0.30	+0.50	+1.20
Welding Assembly ISO 2768-c		+0.30	+0.50	+0.60	+1.20	+3.00

MATERIAL:

Scale	Similar	Designed	11/12/2009	Ygr
%		Controlled	11/12/2009	Ygr
Weight (kg)		Revised	11/12/2009	Ygr
A3		Atex		

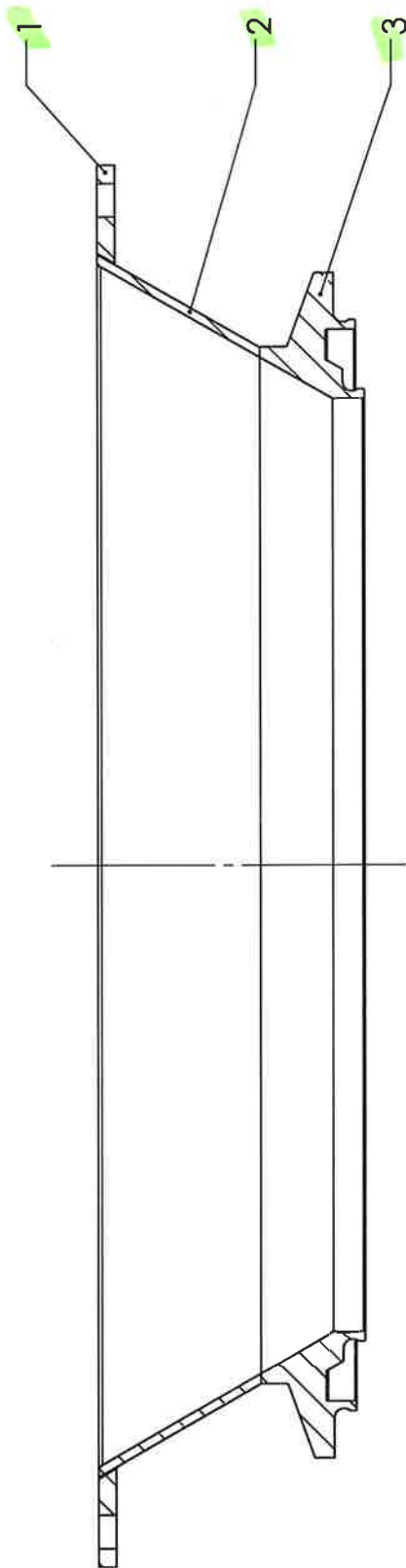
Couteau intermédiaire

Frewitt SA, Milling and Handling of Powders
 P.O. B. 687700 | Frewitt | 26460 7401
 frewitt.com | frewitt@frewitt.com | www.frewitt.com

FREWITT

454311-CMA	Page	1/1
	Ver.	A

ATTACHMENT 2 TO
 FAT IQ TEST PROTOCOL
 DELUMPWITT
 PAGE 19 OF 30
 Cheryl
 19 MAY 14



POS 102-104

Dimensions without tolerance [mm]		above	6	30	120	400	1000
Machining: ISO 2768-m		up to	6	30	120	400	2000
Welding Assembly: ISO 2768-c			±0.10	±0.20	±0.30	±0.50	±1.20
			±0.30	±0.50	±0.80	±1.20	±3.00
MATERIAL : 316L		Scale	Similar	Designed	05/05/2011	thle	
		%		Controlled	05/05/2011	thle	
		weight [kg]		Revised	05/05/2011	thle	
		A4	N/A	Atex			
Bride de liaison Ra 0.4		464798-CMA		Page	1/1	Ver.	A

Frewitt SA: Milling and Handling of Powders
 P.O. B. 615, CH-1701 Fribourg, SWITZERLAND
 Tel: +41 26 460 74 00 / Fax: +41 26 460 74 01
 info@frewitt.com / www.frewitt.com



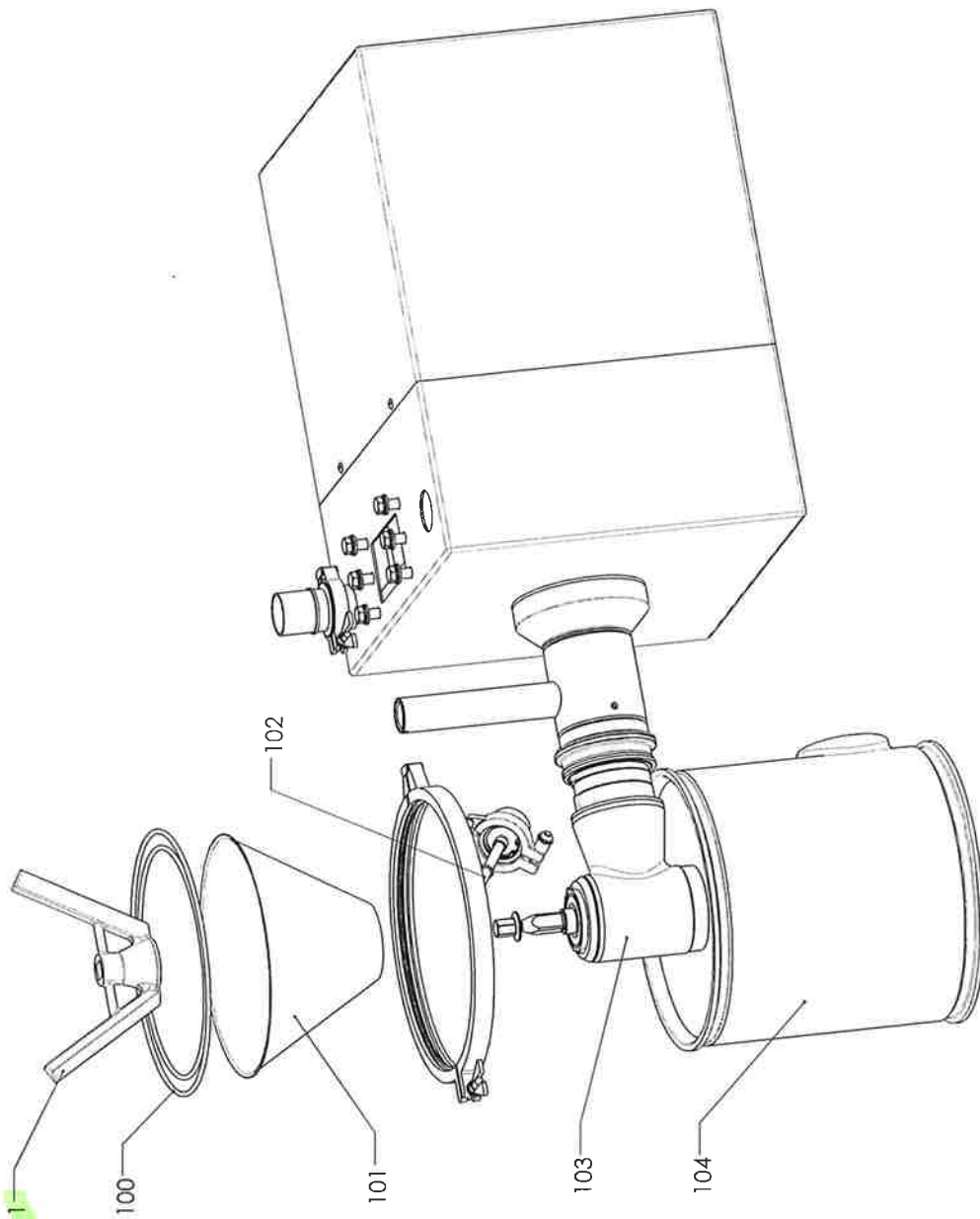
Any and all information received by you from us shall be held and kept confidential and shall not be disclosed by you to any third party except with prior written consent of FREWITT SA

ATTACHMENT 2 TO
 FAF IQ TEST PROTOCOL
 DELUMPWITT

PAGE 20 OF 30

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19 MAY 14



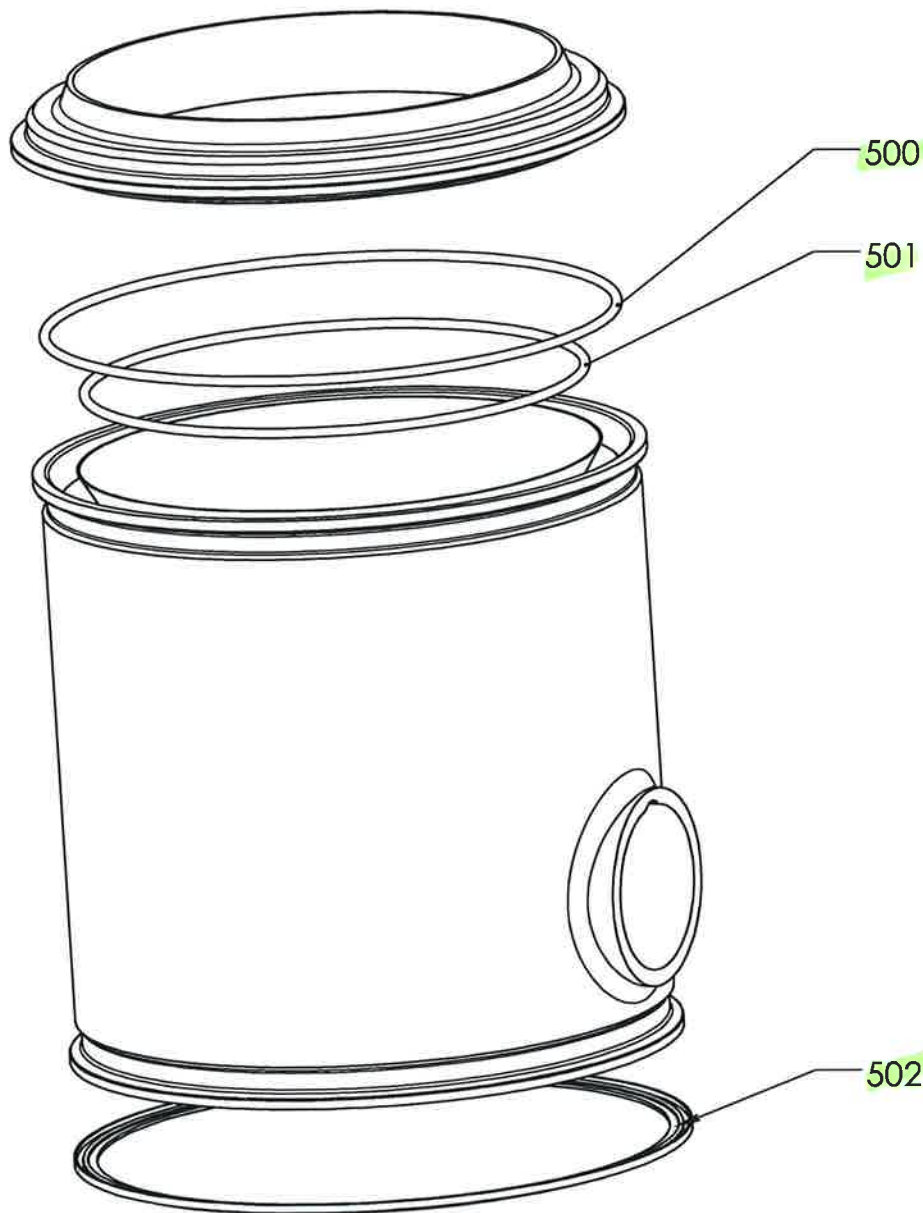
103 103

ATTACHMENT 2 TO
 FAT IQ TEST PROTOCOL
 DELUMPWITT
 PAGE 21 OF 30
 Chemist 19 MAY 14

Pos.	Item number	Control drawing	Materials certificates EN-10204-3.1B FDA	Surface quality certificates
1	436255	473746-CMA	X	X
100	436059	436059-CMA	X	0
101	436242	29961	X	0
102	435843	435843-CMA	X	X
103	432459	432459-CMA	X	X
104	436011	436011-CMA	X	X

X = delivered
 0 = undelivered

ATEX category	II GD / IIB	Machined dim.	ISO 2768-m
Voltage [V]		Welded dim.	ISO 2768-c
Frequency [Hz]		Designed	18/02/2014
		Controlled	30/04/2014
		Revised	30/04/2014
Power [kW]		Scale	%
Speed [mm-1]			A3
PRO-14-0012 / ConiWitt-250		473746-CMA	
Novartis S.A. - 4000 Basel, Switzerland P.O. Box 115, CH-4002 Malans, Switzerland Tel: +41 78 460 74 00 / Fax: +41 78 460 74 01 info@novartis.com / www.novartis.com			
		Page	1/1
		Ver.	A

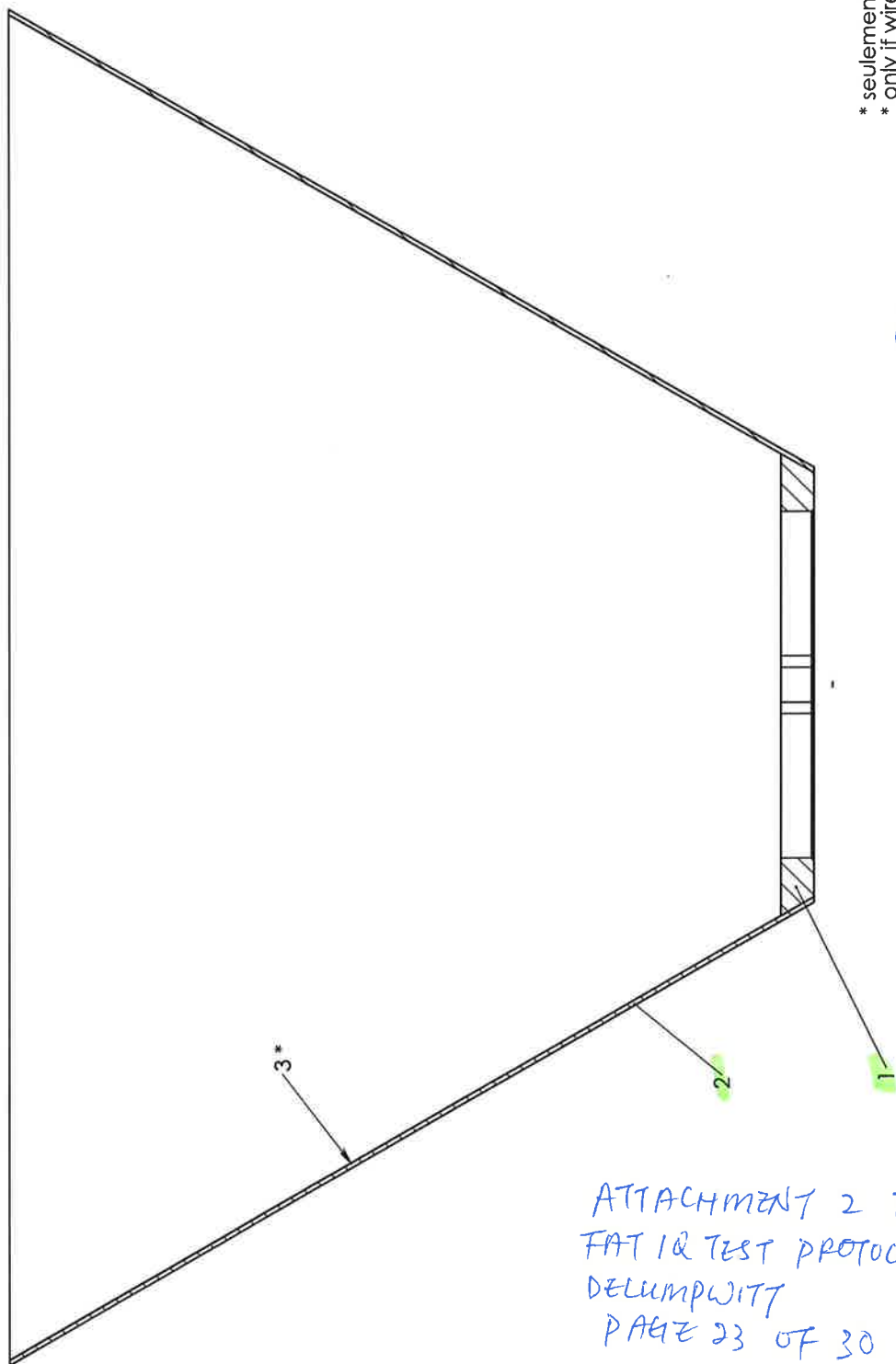


ATTACHMENT 2 TO
 FAT IQ TEST PROTOCOL
 DELUMPWITT
 PAGE 22 OF 30
 Chemff 19 MAY 14

POS 103-100

Position	Item number
500	404664
501	435702
502	406205

Dimensions without tolerance [mm]	above up to	6	30	120	400	1000	2000	MATERIAL : Matériau <non spécifié>					
Machining: ISO 2768-m		±0.10	±0.20	±0.30	±0.50	±0.80	±1.20	Scale %	Similar	Designed	17/02/2010	wwi	
Welding Assembly: ISO 2768-c		±0.30	±0.50	±0.80	±1.20	±2.00	±3.00			Controlled	23/08/2012	jbe	
Etanchéité EPDM-silicone								Weight [kg]		Revised	23/08/2012	jbe	
								A4	0.10	Atex			
Any and all information received by you from us shall be held entirely confidential and shall not be disclosed by you to any third party except with prior written consent of FREWITT SA.										Frewitt SA: Milling and Handling of Powders P.O.B. 615, CH-1701 Fribourg, SWITZERLAND tel: +41 26 460 74 00 / fax: +41 26 460 74 01 info@frewitt.com / www.frewitt.com		Page	Ver.
								436059-CMA		1/1	A		

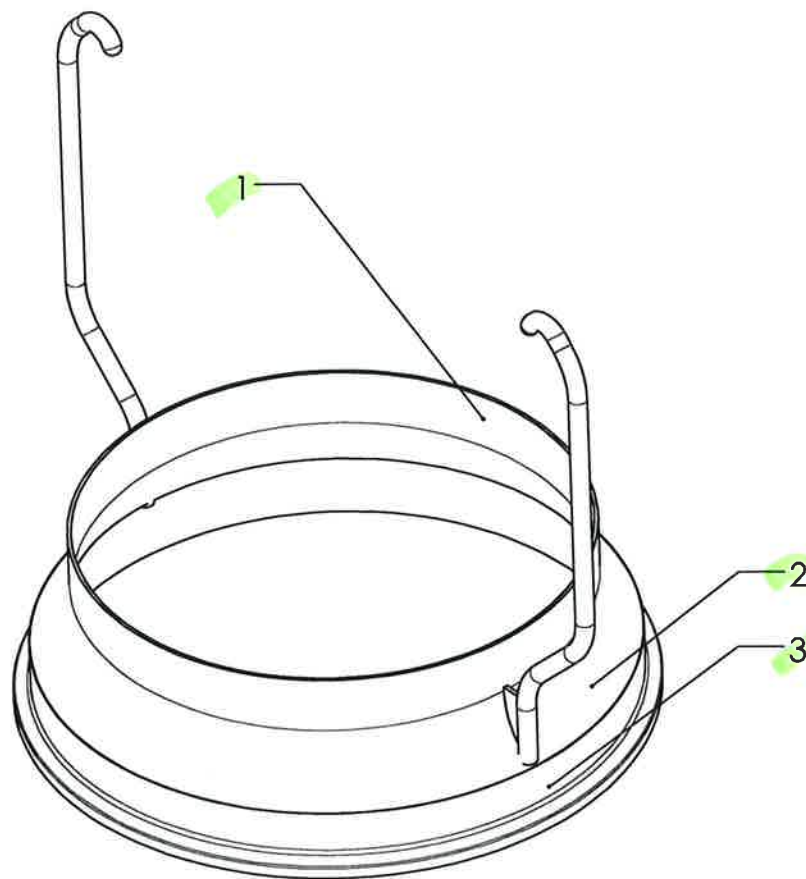


* seulement si treillis soudé à l'intérieur
 * only if wire mesh is welded inside

POS103-101


<table border="1"> <tr> <th>Pour dimensions sans tolérance</th> <th>au-dessus de jusqu'à</th> <th>6</th> <th>30</th> <th>120</th> <th>400</th> <th>1000</th> </tr> <tr> <td>Tolérance générale usinage [mm]</td> <td></td> <td>±0.10</td> <td>±0.20</td> <td>±0.30</td> <td>±0.50</td> <td>±0.80 ± 1.20</td> </tr> <tr> <td>Tolérance générale brut [mm]</td> <td></td> <td>±0.30</td> <td>±0.50</td> <td>±0.80</td> <td>±1.20</td> <td>±2.00 ±3.00</td> </tr> </table>	Pour dimensions sans tolérance	au-dessus de jusqu'à	6	30	120	400	1000	Tolérance générale usinage [mm]		±0.10	±0.20	±0.30	±0.50	±0.80 ± 1.20	Tolérance générale brut [mm]		±0.30	±0.50	±0.80	±1.20	±2.00 ±3.00	<table border="1"> <tr> <th colspan="2">MATIERE :</th> </tr> <tr> <td>Echelle %</td> <td>Similaire</td> </tr> <tr> <td>Masse [kg]</td> <td>Alex</td> </tr> <tr> <td>A3</td> <td>1,088</td> </tr> </table>	MATIERE :		Echelle %	Similaire	Masse [kg]	Alex	A3	1,088	<table border="1"> <tr> <td>04.01.07</td> <td>ama</td> </tr> <tr> <td>04.01.07</td> <td>ama</td> </tr> <tr> <td>18.08.08</td> <td>lbe</td> </tr> <tr> <td>Page</td> <td>1/1</td> </tr> <tr> <td>Rev.</td> <td>1</td> </tr> </table>	04.01.07	ama	04.01.07	ama	18.08.08	lbe	Page	1/1	Rev.	1
Pour dimensions sans tolérance	au-dessus de jusqu'à	6	30	120	400	1000																																			
Tolérance générale usinage [mm]		±0.10	±0.20	±0.30	±0.50	±0.80 ± 1.20																																			
Tolérance générale brut [mm]		±0.30	±0.50	±0.80	±1.20	±2.00 ±3.00																																			
MATIERE :																																									
Echelle %	Similaire																																								
Masse [kg]	Alex																																								
A3	1,088																																								
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Tamis / Râpe Ligne ConiWitt		29961																																							
Frewitt SA, Miling and Harding st, Fowdair P.O.B. 615, CH-701 Fribourg, SWITZERLAND Tel: +41 26 467 7400 / Fax: +41 26 467 7401 E-Mail: frewitt@frewitt.com																																									

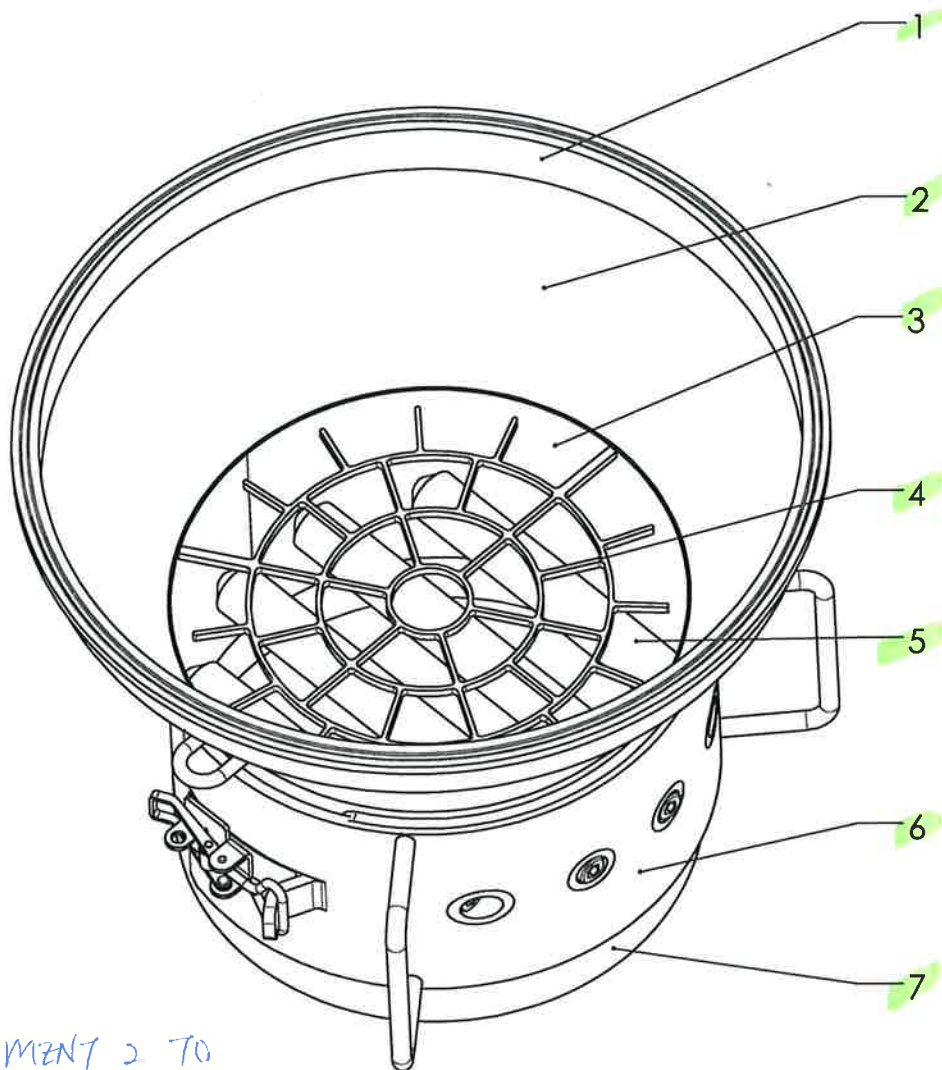
ATTACHMENT 2 TO
 FAT IQ TEST PROTOCOL
 DELUMPWITT
 PAGE 23 OF 30
 Cheryl 19 MAY 14



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 FAT IQ TEST PROTOCOL
 DELUMPWITT
 PAGE 30 OF 30
 Cheryl 19 MAY 14

POS 104 - 101

Dimensions without tolerance [mm]	above		6	30	120	400	1000	MATERIAL : 316-316L				
	up to	6	30	120	400	1000	2000					
Machining: ISO 2768-m		±0.10	±0.20	±0.30	±0.50	±0.80	±1.20	Scale	Similar	Designed	04/02/2014	edgu
Welding Assembly: ISO 2768-c		±0.30	±0.50	±0.80	±1.20	±2.00	±3.00	%		Controlled	11/04/2014	edgu
Tube de liaison container								Weight [kg]	Revised	11/04/2014	edgu	
									A4		1.42	Atex
Any and all information received by you from us shall be held and kept confidential and shall not be disclosed by you to any third party except with prior written consent of FREWITT SA.				Frewitt SA: Milling and Handling of Powders P.O.B. 615, CH-1701 Fribourg, SWITZERLAND tel: +41 26 460 74 00 / fax: +41 26 460 74 01 info@frewitt.com / www.frewitt.com				473712-CMA		Page	Ver.	
										1/1	A	




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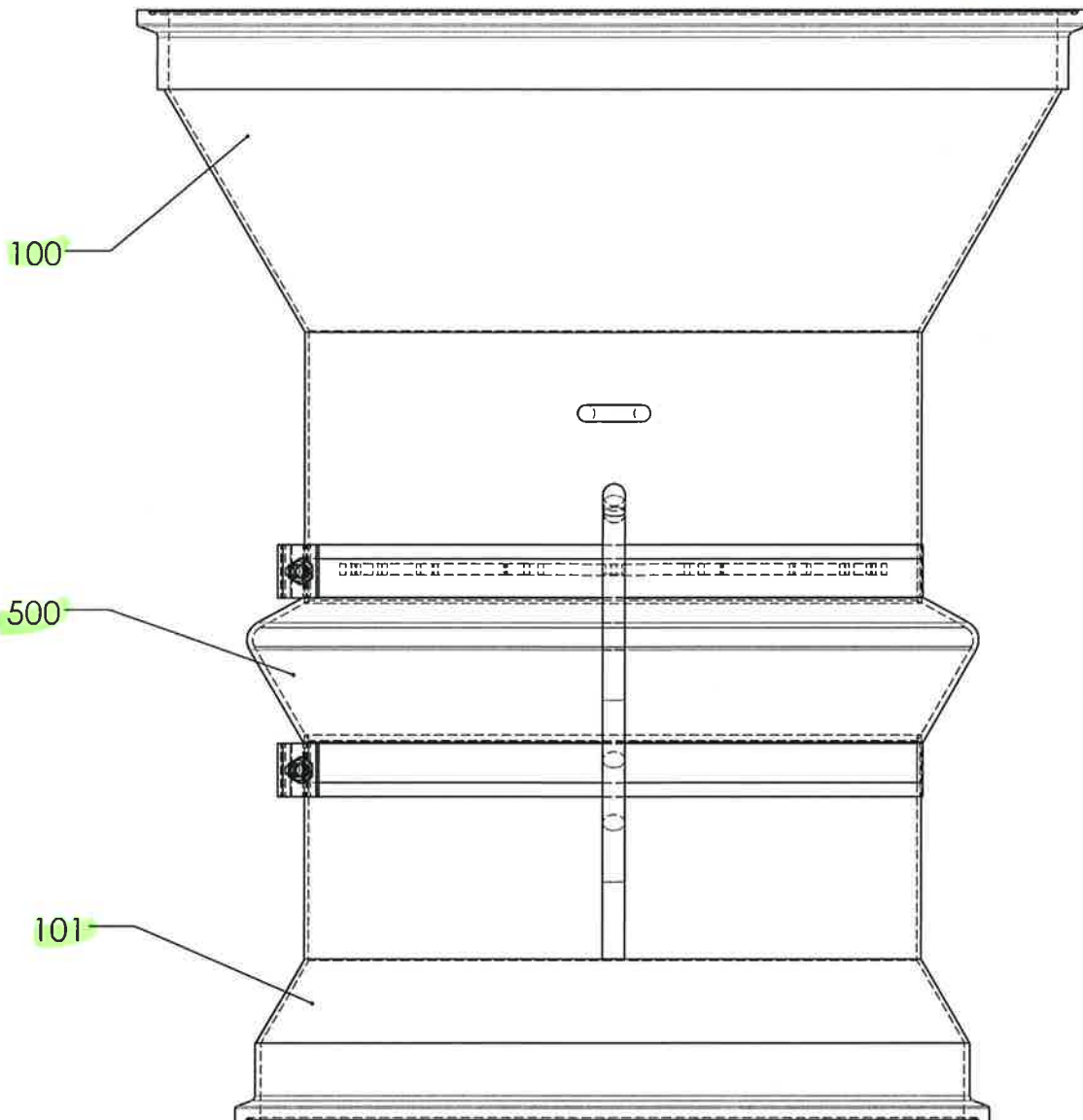
PAGE 29 OF 30

Cherry 19 MAY 14

POS 104-100

Dimensions without tolerance [mm]	above		6	30	120	400	1000	MATERIAL : 316L					
	up to	6	30	120	400	1000	2000	Scale	Similar	Designed	04/02/2014	edgu	
Machining: ISO 2768-m		±0.10	±0.20	±0.30	±0.50	±0.80	±1.20	%		Controlled	24/04/2014	edgu	
Welding Assembly: ISO 2768-c		±0.30	±0.50	±0.80	±1.20	±2.00	±3.00	Weight [kg]		Revised	24/04/2014	edgu	
Entonnoir				6				A4	2.71	Atex			
Any and all information received by you from us shall be held and kept confidential and shall not be disclosed by you to any third party except with prior written consent of FREWITT SA.				Frewitt SA: Milling and Handling of Powders P.O.B. 615, CH-1701 Fribourg, SWITZERLAND tel: +41 26 460 74 00 / fax: +41 26 460 74 01 info@frewitt.com / www.frewitt.com				473711-CMA		Page	Ver.		
										1/1	A		

ATTACHMENT 2 TO
 FAT IQ TEST PROTOCOL
 DELUMPWITT
 PAGE 28 OF 30
 Cheryl 19MAY14

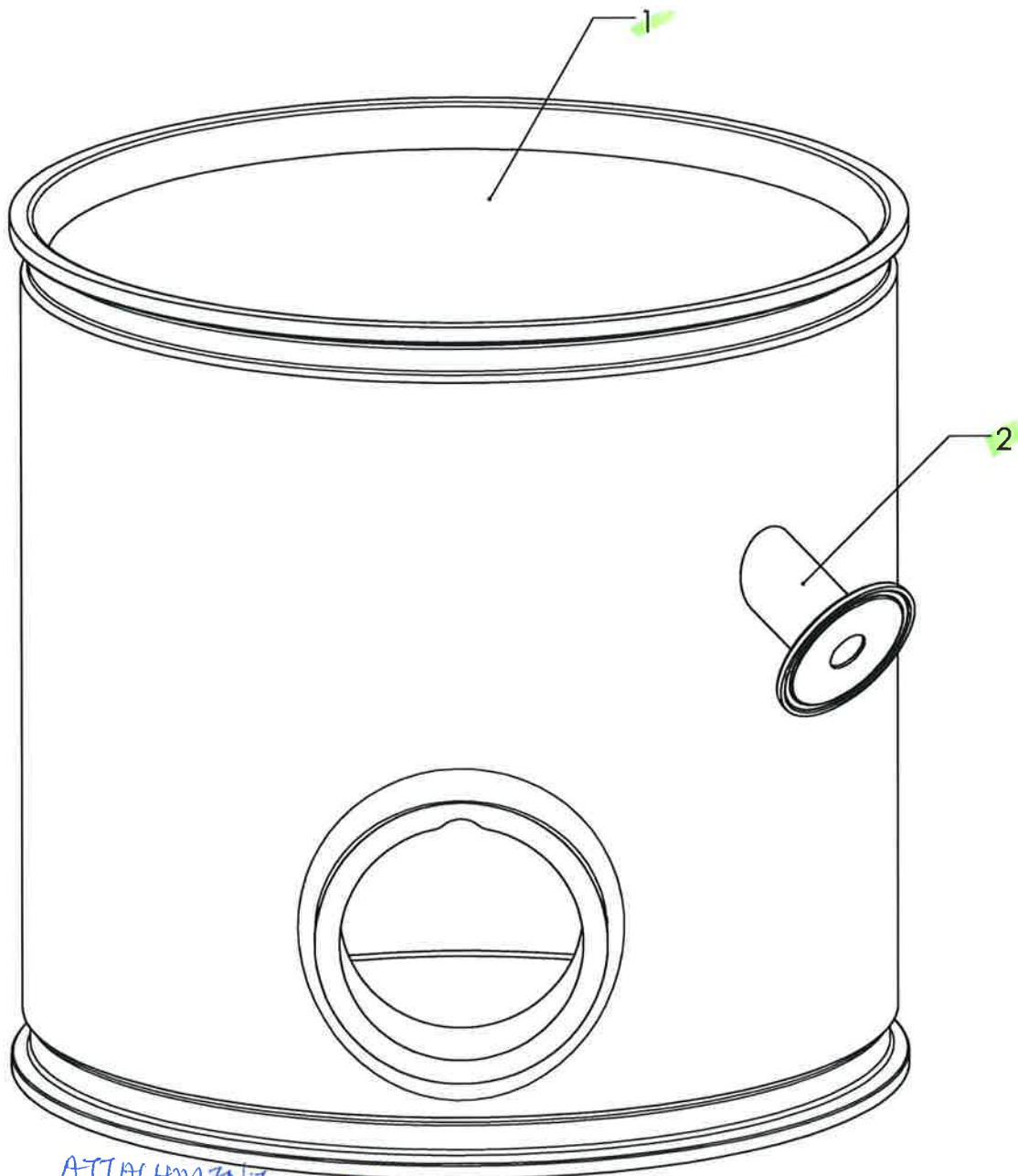


△ (FOR 1) MATERIAL CERTIFICATE C/F 19MAY14

Position	Item number
100	473711-CMA *
101	473712-CMA *
500	437890 △

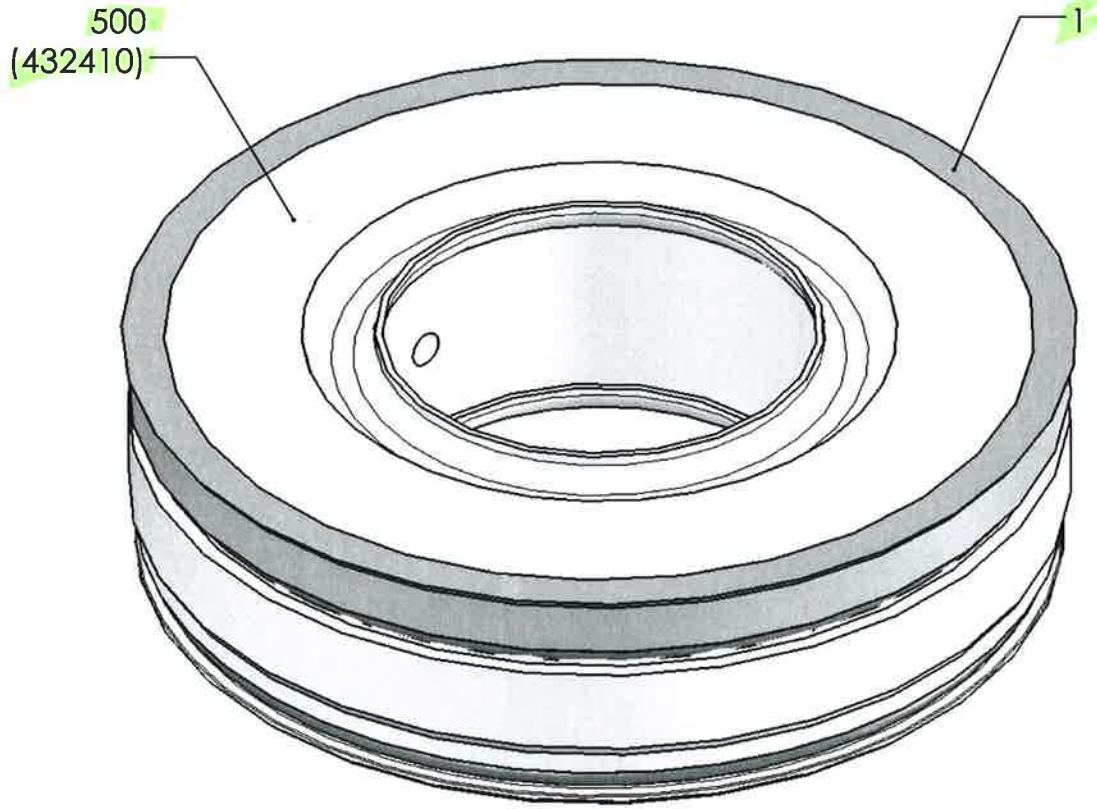
* (FOR 2) MATERIAL CERTIFICATES AND SURFACE QUALITY CERTIFICATES 105.104 C/F 19MAY14

Dimensions without tolerance [mm]	above up to	6	30	120	400	1000	MATERIAL : N/A							
Machining: ISO 2768-m		±0.10	±0.20	±0.30	±0.50	±0.80	±1.20	Scale	Similar	Designed	04/02/2014	edgu		
Welding Assembly: ISO 2768-c		±0.30	±0.50	±0.80	±1.20	±2.00	±3.00	%		Controlled	04/02/2014	edgu		
Ensemble entonnoir sortie							A4	Weight [kg]	N/A	Revised	04/02/2014	edgu		
										Atex				
Any and all information received by you from us shall be held and kept confidential and shall not be disclosed by you to any third party except with prior written consent of FREWITT SA.							FREWITT		Frewitt SA: Milling and Handling of Powders P.O.B. 615, CH-1701 Fribourg, SWITZERLAND tel: +41 26 460 74 00 / fax: +41 26 460 74 01 info@frewitt.com / www.frewitt.com		473713-CMA		Page	Ver.
											1/1	A		



ATTACHMENT 2 TO
 FAT IQ TEST ~~PROTO~~ PROTOCOL ~~EE~~ *Cherif* 19 MAY 14
 DELUMPWITT
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Cherif 19 MAY 14 Pos 103 - 104

Dimensions without tolerance [mm]	above		6	30	120	400	1000	MATERIAL :	Scale	Similar	Designed	02/09/2010	wwi
	up to	6	30	120	400	1000	2000				Controlled	02/09/2010	wwi
Machining: ISO 2768-m		±0.10	±0.20	±0.30	±0.50	±0.80	±1.20	Weight [kg]	A4	27.179352	Revised	02/09/2010	wwi
Welding Assembly: ISO 2768-c		±0.30	±0.50	±0.80	±1.20	±2.00	±3.00				Atex		
Bâti pour sonde								A4	27.179352	Atex	Page	Ver.	
											436011-CMA		1/1
Any and all information received by you from us shall be held and kept confidential and shall not be disclosed by you to any third party except with prior written consent of FREWITT SA.		FREWITT		Frewitt SA: Milling and Handling of Powders P.O.B. 615, CH-1701 Fribourg, SWITZERLAND tel: +41 26 460 74 00 / fax: +41 26 460 74 01 info@frewitt.com / www.frewitt.com									



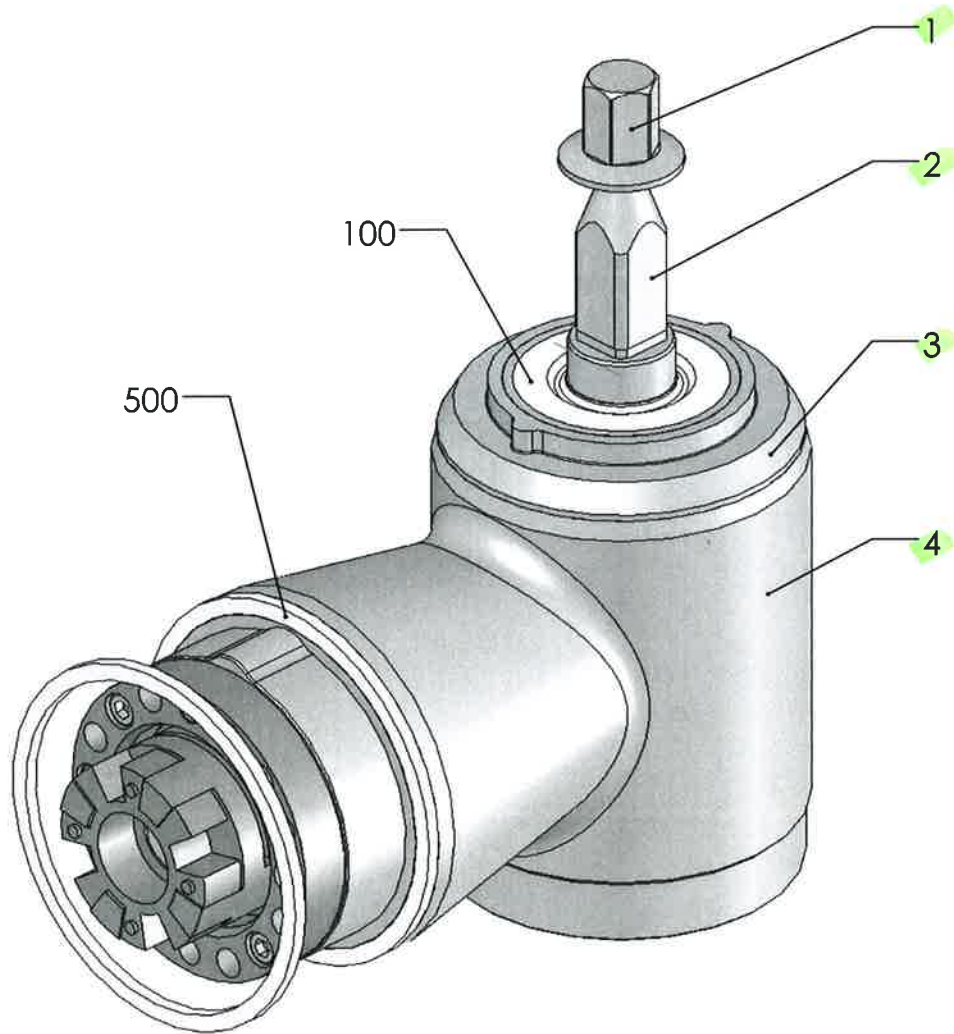
ATTACHMENT 2 TO
FAT IQ TEST PROTOCOL
DELUMPWITT

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Cheriff 19 MAY 14

3 EE Cheriff 19 MAY 14
POS 103-100/2

Dimensions without tolerance [mm]	above up to	6	30	120	400	1000	2000	MATERIAL :				
Machining: ISO 2768-m		±0.10	±0.20	±0.30	±0.50	±0.80	±1.20	Scale %	Similar	Designed	03/09/2010	wwi
Welding Assembly: ISO 2768-c		±0.30	±0.50	±0.80	±1.20	±2.00	±3.00			Controlled	10/05/2011	jbe
Joint à 2 lèvres complet								⊕	Weight [kg]	Revised	10/05/2011	jbe
								A4	0.110520	Atex		
Any and all information received by you from us shall be held as confidential and shall not be disclosed by you to any third party except with prior written consent of FREWITT SA.				Frewitt SA: Milling and Handling of Powders P.O.B. 615, CH-1701 Fribourg, SWITZERLAND tel: +41 26 460 74 00 / fax: +41 26 460 74 01 info@frewitt.com / www.frewitt.com				435025-CMA		Page	Ver.	
										1/1	A	

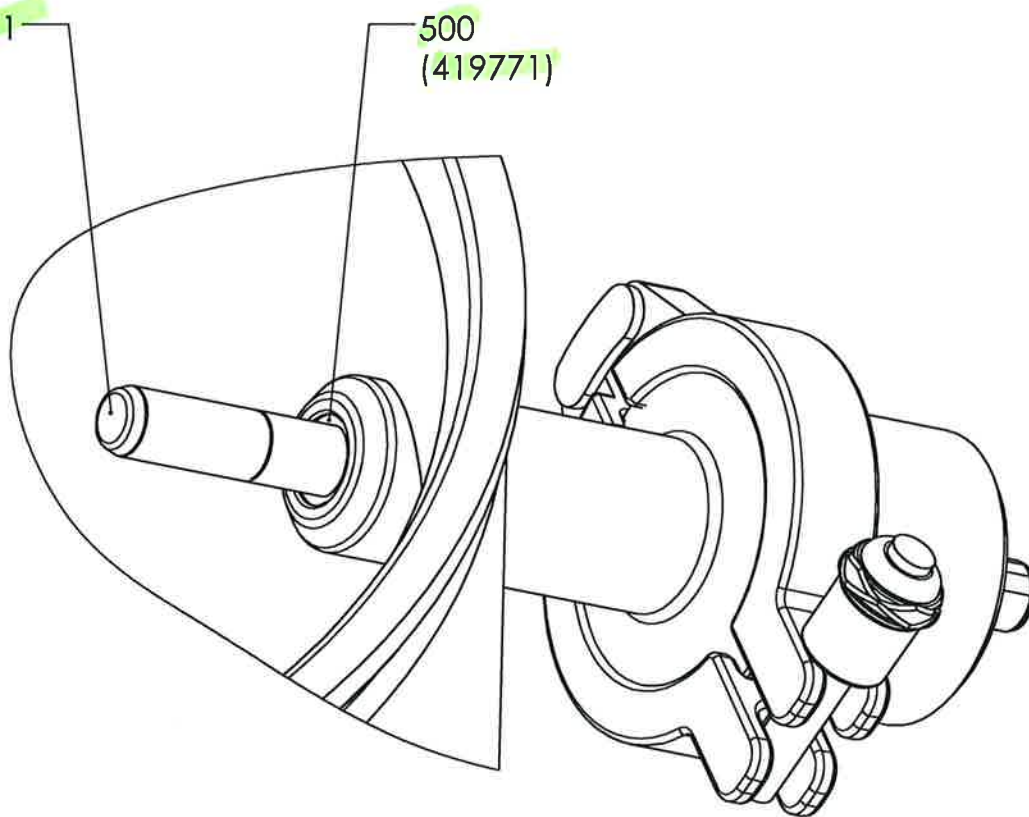


ATTACHMENT 2 TO
 FAT IQ TEST PROTOCOL
 DELUMPLWITT
 PAGE 25 OF 30
 Cheuff 19 MAY 14

Position	N° article Artikel Nr Item number
1	---
2	---
3	---
4	---
100	435025-CMA
500	432412

pos 103 - 100/1 ³ ee Cheuff 19 MAY 14

Dimensions without tolerance [mm]	above up to	6	30	120	400	1000	2000	MATERIAL : Matériau <non spécifié>					
Machining: ISO 2768-m		±0.10	±0.20	±0.30	±0.50	±0.80	±1.20	Scale %	Similar	Designed	17/02/2010	wwi	
Welding Assembly: ISO 2768-c		±0.30	±0.50	±0.80	±1.20	±2.00	±3.00			Controlled	01/06/2011	wwi	
Palier								Weight [kg]		Revised	01/06/2011	wwi	
								A4	11.977	Alex			
Any and all information received by you from us shall be held and kept confidential and shall not be disclosed by you to any third party except with prior written consent of FREWITT SA.				Frewitt SA: Milling and Handling of Powders P.O.B. 615, CH-1701 Fribourg, SWITZERLAND tel: +41 26 460 74 00 / fax: +41 26 460 74 01 info@frewitt.com / www.frewitt.com				432459-CMA		Page	Ver.		
										1/1		A	



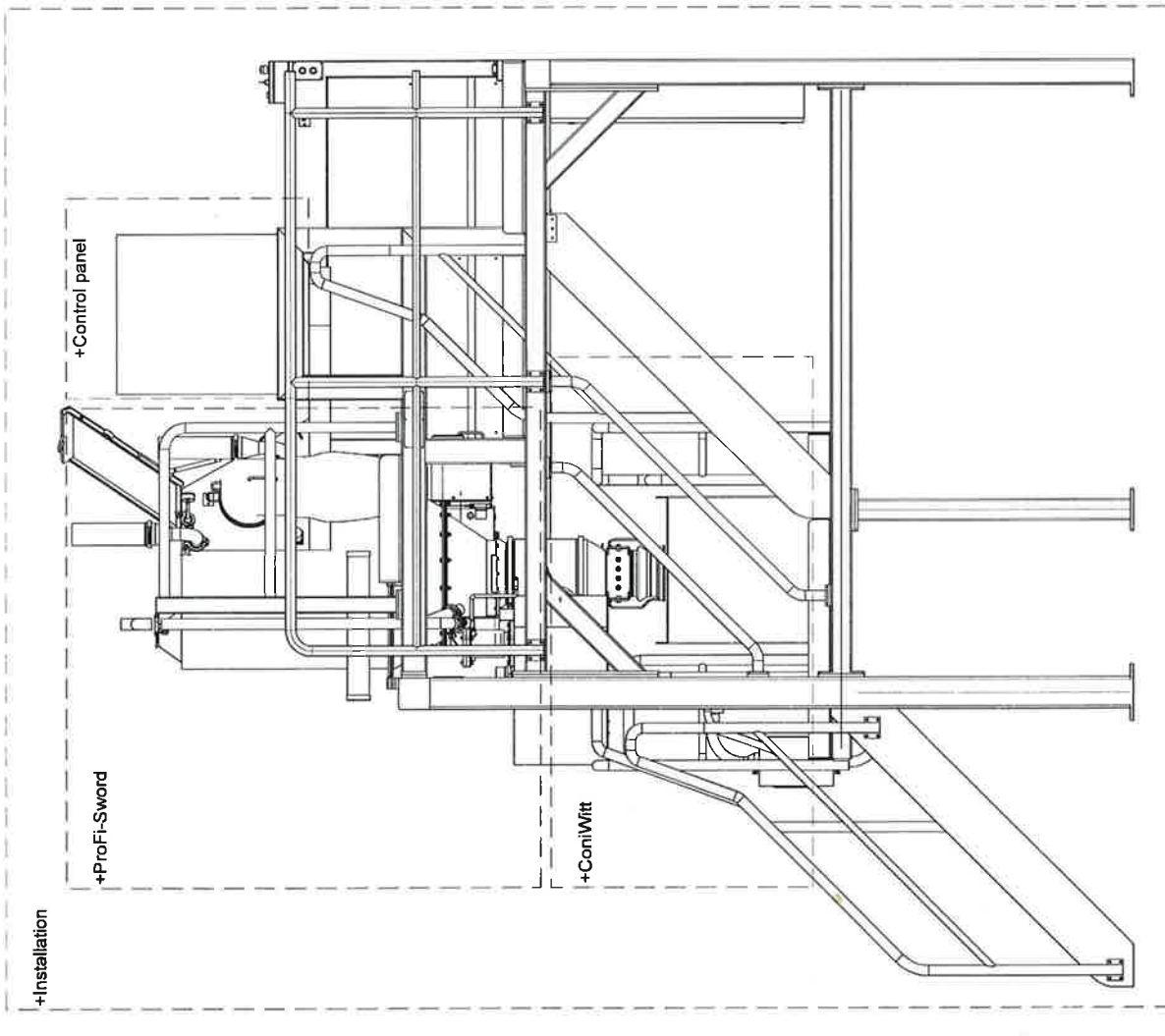
ATTACHMENT 2 TO
 FAT IQ TEST PROTOCOL
 DELUMPWITT
 PAGE 24 OF 30
 cheryf 19 MAY 14

POS 103 - 102

Dimensions without tolerance [mm]	above		6	30	120	400	1000	MATERIAL : Matériau <non spécifié>			
	up to	6	30	120	400	1000	2000				
Machining: ISO 2768-m		±0.10	±0.20	±0.30	±0.50	±0.80	±1.20	Scale			
Welding Assembly: ISO 2768-c		±0.30	±0.50	±0.80	±1.20	±2.00	±3.00	Similar			
ENSEMBLE SONDE PTC TAMIS								Designed	02/09/2010	wwi	
								%		Controlled	24/07/2013	jbe
								Revised	24/07/2013	jbe	
								Weight [kg]		Atex	
								A4	1.179		
								Page		Ver.	
Any and all information received by you from us shall be held and kept confidential and shall not be disclosed by you to any third party except with prior written consent of FREWITT SA.				Frewitt SA: Milling and Handling of Powders P.O.B. 615, CH-1701 Fribourg, SWITZERLAND Tel: +41 26 460 74 00 / Fax: +41 26 460 74 01 info@frewitt.com / www.frewitt.com				435843-CMA		1/1	A

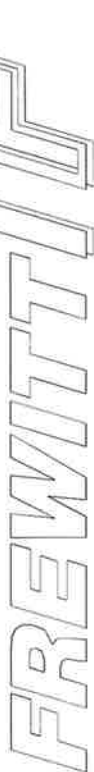
Project : PRO-14-0012

SG.TBP 202.M.5234



Type : PF - Installation
 Carrying out: 400V,50Hz,3P+N+PE
 Rated output power: 17 kW
 Rated current: 30 A

Attachment 3 to FAT IQ Delumpwitt
 Pg 1 of 26
 Test 9.1,12.3
 19/05/14

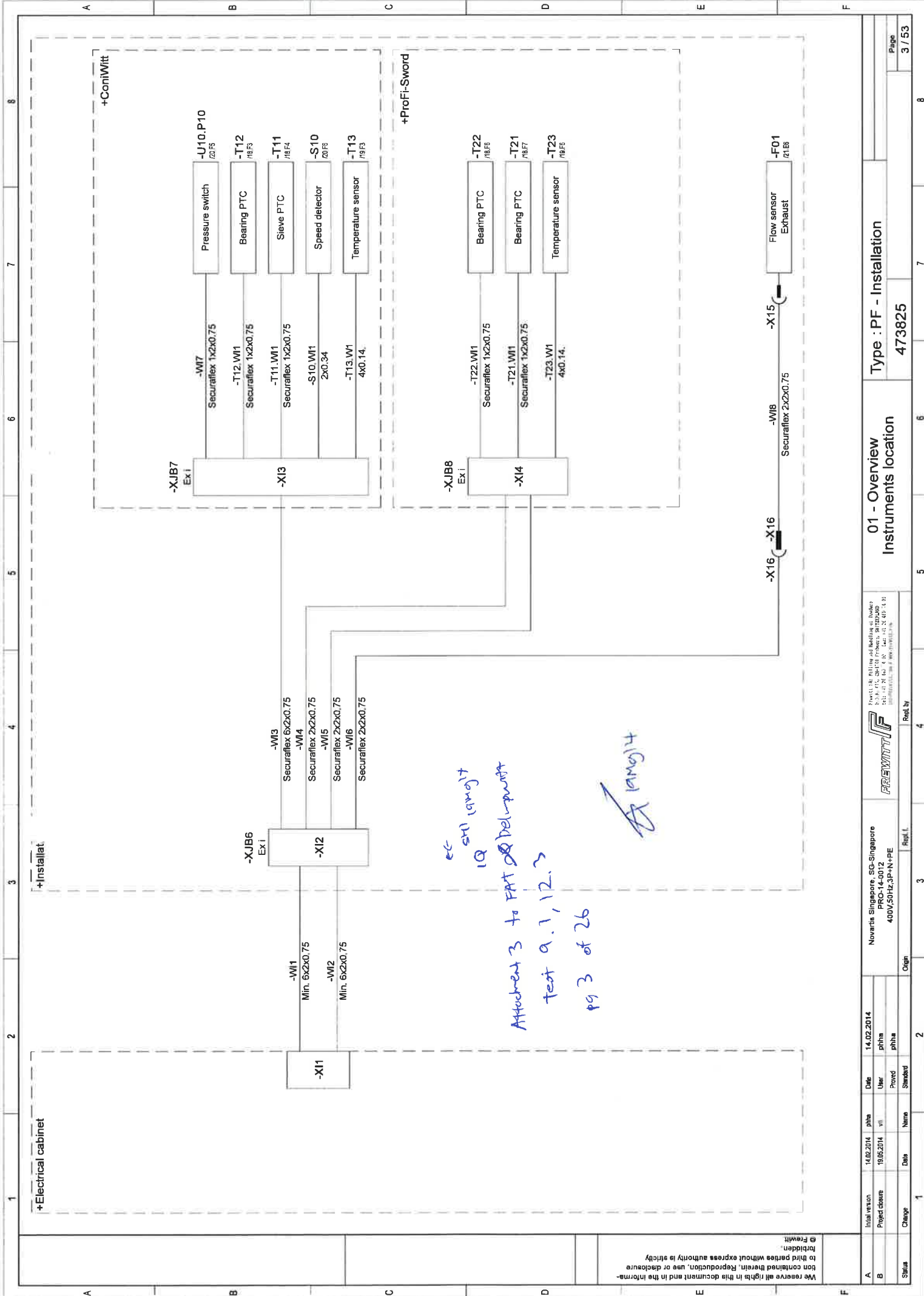


Wire colors :

Power	400VAC - L1	Brown	6mm ²
Power	400VAC - L2	Black	6mm ²
Power	400VAC - L3	Gray	6mm ²
Power	N	Light blue	6mm ²
Power	PE	Green/Yellow	6mm ²
Control voltage	24VDC	Violet	0.5 to 0.75mm ²
Control voltage	0VDC	Violet-White	0.5 to 0.75mm ²
Control voltage	Ex-i	Blue	0.75mm ²
External voltage	...	Orange	0.75mm ²
White	WH	Blue	BU
Brown	BN	Red	RD
Green	GN	Black	BK
Yellow	YE	Violet	VT
Gray	GY	Orange	OG
Pink	PK		

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A	Issue version	14.02.2014	Date	14.02.2014	Novartis Singapore, SG-Singapore			00 - Cover sheet DelumpWitt	473825	Page	1/53
	Project closure	19.05.2014	User	phha	Origin	Rept. I.					
B	Change	Date	Name	Version	Standard	Proved	phha				



Initial version		14.02.2014	phfa	Date	14.02.2014	Novartis Singapore, SG-Singapore		01 - Overview		Type : PF - Installation		Page	
Project closure		19.05.2014	phfa	User	phfa	PRO-14-0012		Instruments location		473825		3 / 53	
Change			phfa	Checked	phfa	400V,50Hz,3P+N+PE							
Status				Drawn		Repl. I.							

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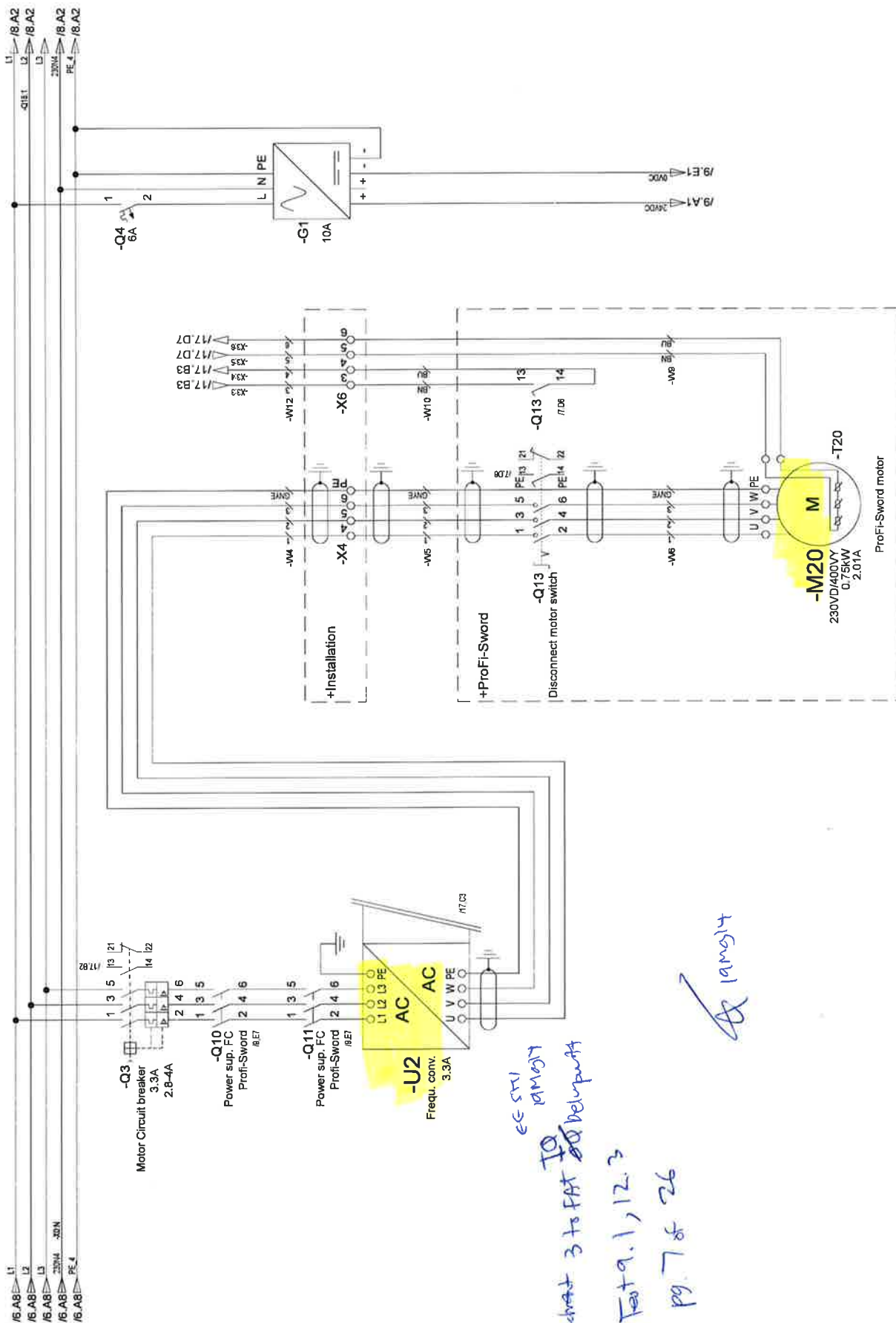


Attachment 3 to FAT IQ DelumpWitt
 Test 9.1, 12.3
 pg 4 of 26

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A	Initial version	14.02.2014	pha	Date	14.02.2014	Novartis Singapore, SG-Singapore	 Frewitt Pte. Ltd. 06-8117100 (Tel) / 06-8117101 (Fax) 06-8117102 (Fax) / 06-8117103 (Fax) 06-8117104 (Fax) / 06-8117105 (Fax) 06-8117106 (Fax) / 06-8117107 (Fax) 06-8117108 (Fax) / 06-8117109 (Fax) 06-8117110 (Fax) / 06-8117111 (Fax) 06-8117112 (Fax) / 06-8117113 (Fax) 06-8117114 (Fax) / 06-8117115 (Fax) 06-8117116 (Fax) / 06-8117117 (Fax) 06-8117118 (Fax) / 06-8117119 (Fax) 06-8117120 (Fax) / 06-8117121 (Fax) 06-8117122 (Fax) / 06-8117123 (Fax) 06-8117124 (Fax) / 06-8117125 (Fax) 06-8117126 (Fax) / 06-8117127 (Fax) 06-8117128 (Fax) / 06-8117129 (Fax) 06-8117130 (Fax) / 06-8117131 (Fax) 06-8117132 (Fax) / 06-8117133 (Fax) 06-8117134 (Fax) / 06-8117135 (Fax) 06-8117136 (Fax) / 06-8117137 (Fax) 06-8117138 (Fax) / 06-8117139 (Fax) 06-8117140 (Fax) / 06-8117141 (Fax) 06-8117142 (Fax) / 06-8117143 (Fax) 06-8117144 (Fax) / 06-8117145 (Fax) 06-8117146 (Fax) / 06-8117147 (Fax) 06-8117148 (Fax) / 06-8117149 (Fax) 06-8117150 (Fax) / 06-8117151 (Fax) 06-8117152 (Fax) / 06-8117153 (Fax) 06-8117154 (Fax) / 06-8117155 (Fax) 06-8117156 (Fax) / 06-8117157 (Fax) 06-8117158 (Fax) / 06-8117159 (Fax) 06-8117160 (Fax) / 06-8117161 (Fax) 06-8117162 (Fax) / 06-8117163 (Fax) 06-8117164 (Fax) / 06-8117165 (Fax) 06-8117166 (Fax) / 06-8117167 (Fax) 06-8117168 (Fax) / 06-8117169 (Fax) 06-8117170 (Fax) / 06-8117171 (Fax) 06-8117172 (Fax) / 06-8117173 (Fax) 06-8117174 (Fax) / 06-8117175 (Fax) 06-8117176 (Fax) / 06-8117177 (Fax) 06-8117178 (Fax) / 06-8117179 (Fax) 06-8117180 (Fax) / 06-8117181 (Fax) 06-8117182 (Fax) / 06-8117183 (Fax) 06-8117184 (Fax) / 06-8117185 (Fax) 06-8117186 (Fax) / 06-8117187 (Fax) 06-8117188 (Fax) / 06-8117189 (Fax) 06-8117190 (Fax) / 06-8117191 (Fax) 06-8117192 (Fax) / 06-8117193 (Fax) 06-8117194 (Fax) / 06-8117195 (Fax) 06-8117196 (Fax) / 06-8117197 (Fax) 06-8117198 (Fax) / 06-8117199 (Fax) 06-8117200 (Fax) / 06-8117201 (Fax)	Novartis Singapore, SG-Singapore PRO-14-0012 400V50Hz3P4WPE	Type : PF - Installation 473825	02 - Electric layout Electric layout	*Electrical cabinet	Page 4 / 53
B	Project details	19.05.2014	vi	User	pha							
C	Change	Date	Name	Standard	Origin	R.						



Crusher module

Type : PF - Installation
473825

03 - Electrical diagram
Power

Novartis Singapore, SG-Singapore
PRO-14-0012
400V,50Hz,3P+N+PE



14.02.2014
18.05.2014
19.05.2014

phba
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phba

Change	Date	Name	Standard	Origin	Repl. I.	Repl. by
A	14.02.2014	phba				
B	18.05.2014	phba				
	19.05.2014	phba				

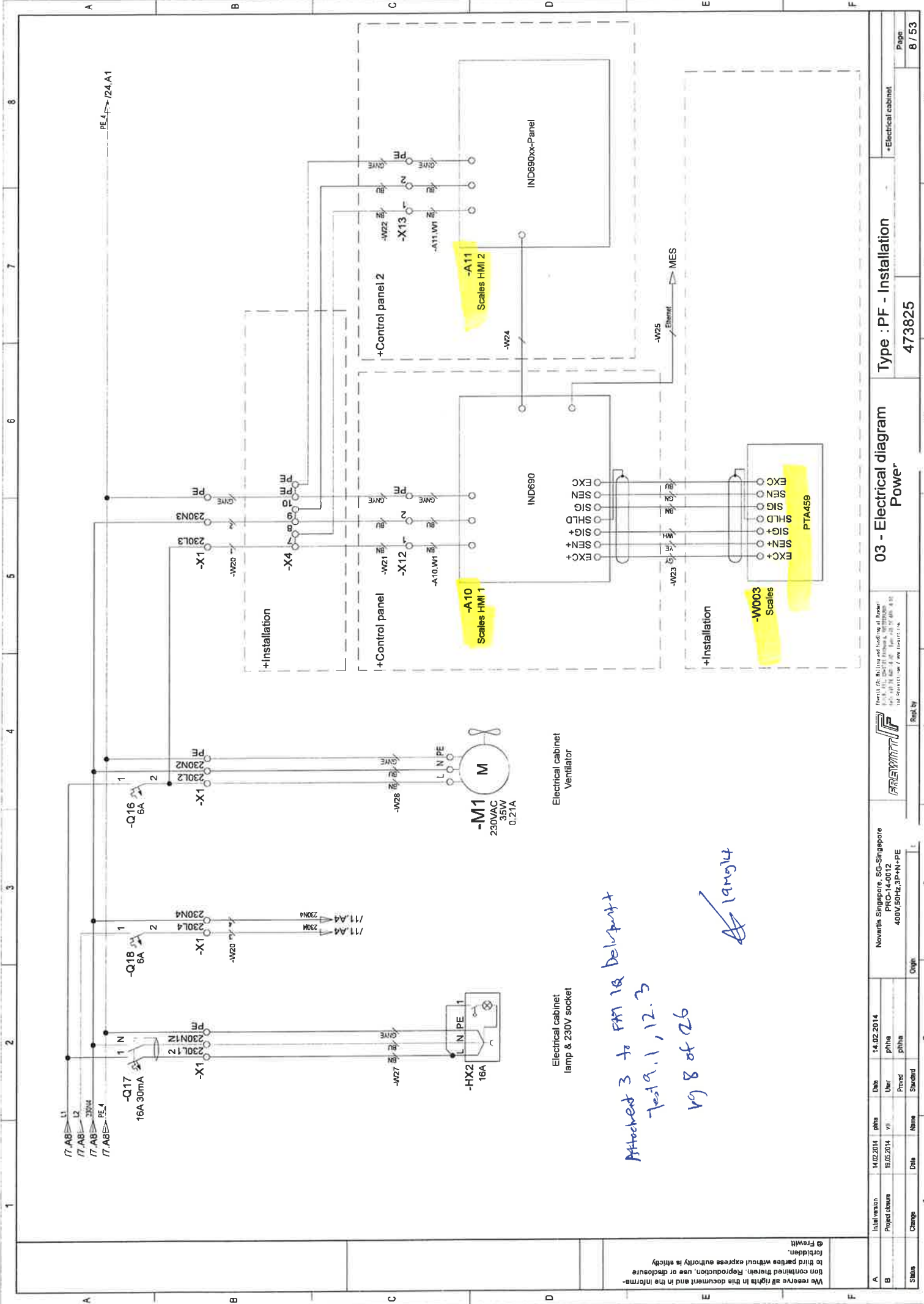
Status

Electrical cabinet
7 / 53

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Attached 3 to FAT IO
Test 9.1, 12.3
pg. 7 & 26

RAMSIT

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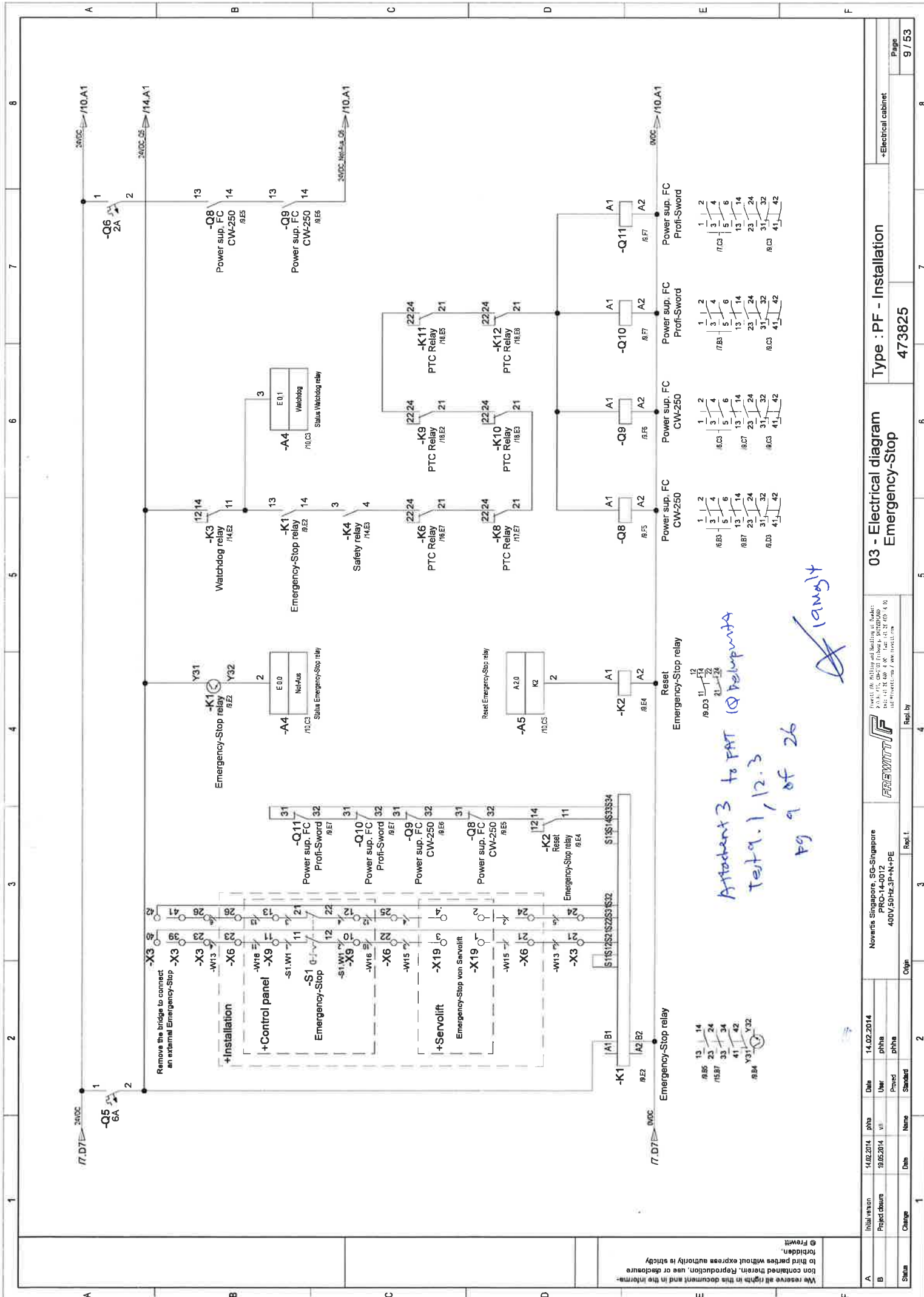


Attached 3 to PM 18 DelumpWitt
 Test 9.1, 12.3
 WJ 8 of 26
 19 Aug 14

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Initial version	14.02.2014	Date	14.02.2014	Novartis Singapore, SG-Singapore	Project	PRO-14-0012	Drawn by	1
Prepared by	18.05.2014	Date	18.05.2014	Novartis Singapore, SG-Singapore	Project	PRO-14-0012	Drawn by	2
Checked by		Date		Novartis Singapore, SG-Singapore	Project	PRO-14-0012	Drawn by	3
Approved by		Date		Novartis Singapore, SG-Singapore	Project	PRO-14-0012	Drawn by	4
Drawn by		Date		Novartis Singapore, SG-Singapore	Project	PRO-14-0012	Drawn by	5
Reviewed by		Date		Novartis Singapore, SG-Singapore	Project	PRO-14-0012	Drawn by	6
Finalized by		Date		Novartis Singapore, SG-Singapore	Project	PRO-14-0012	Drawn by	7
Released by		Date		Novartis Singapore, SG-Singapore	Project	PRO-14-0012	Drawn by	8

03 - Electrical diagram
 Power
 Type : PF - Installation
 473825



Rev	Date	By	Check	Appr	Desc
1	14.02.2014	phs	phs	phs	Initial version
2	19.05.2014	phs	phs	phs	Project closure

Change	Date	Name	Standard	Origin	Repl. I.	Repl. by
1					3	
2					4	
3					4	
4					4	
5					5	
6					6	
7					7	
8					8	

Status	Change	Date	Name	Standard	Origin	Repl. I.	Repl. by
A							
B							

Type	Part No.	Page
03 - Electrical diagram	473825	9 / 53
Emergency-Stop		
+Electrical cabinet		

Attach 3 to PAT (Pulupunta Test 9.1, 12.3 pg 9 of 26)

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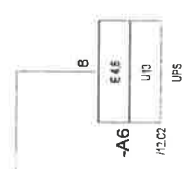
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Attachment 3 to FAT IQ DelumpWitt
 pg 10 of 26
 Slanyj4
 Test 9.1, 12.3

24VDC → I12.A1
 0VDC → I12.A1

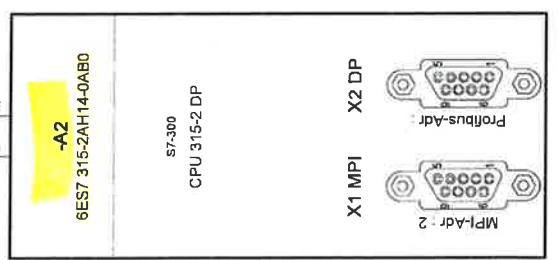
I9.A1 24VDC
 I9.C8 24VDC, No-Alarm, DI
 I9.E8 0VDC



-A1 24VDC, DI → I13.A1
 -A1 0VDC → I13.B1

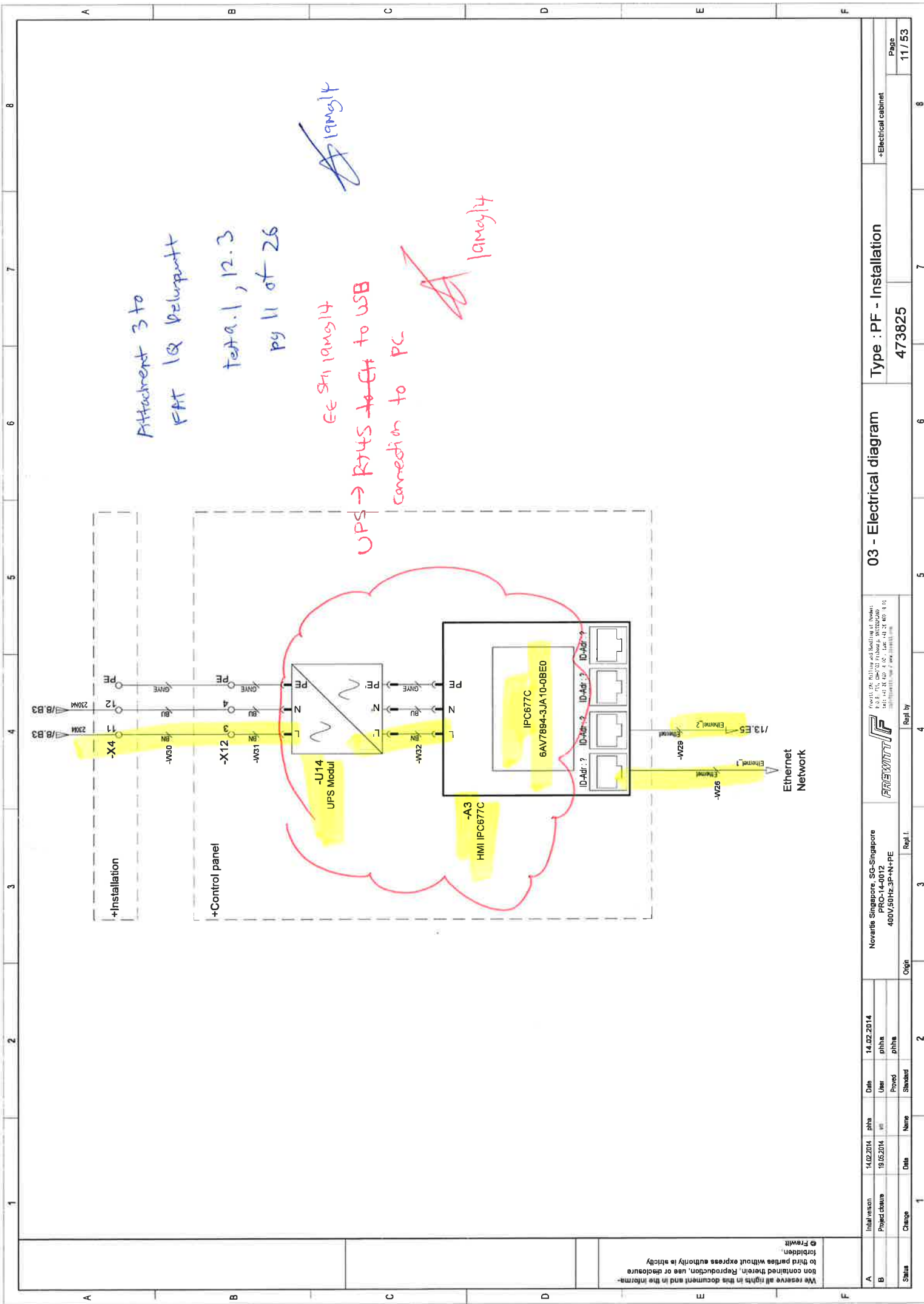
-A5	
6ES7 322-1BH01-0AA0	
1L+	1M 2L+ 2M
1L+	24V DC S7-300 SM 322
2	A2.0
3	A2.1
4	A2.2
5	A2.3
6	A2.4
7	A2.5
8	A2.6
9	A2.7
10	A2.8
11	A2.9
12	A2.10
13	A2.11
14	A2.12
15	A2.13
16	A2.14
17	A2.15
18	A2.16
19	A2.17
20	A2.18

-A4	
6ES7 321-1BH02-0AA0	
2	E0.0
3	E0.1
4	E0.2
5	E0.3
6	E0.4
7	E0.5
8	E0.6
9	E0.7
10	E0.8
11	E0.9
12	E1.0
13	E1.1
14	E1.2
15	E1.3
16	E1.4
17	E1.5
18	E1.6
19	E1.7
20	E1.8



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Novartis Singapore, SG-Singapore PRD-14-0012 400V, 50Hz, 3P+N+PE		Novartis Singapore, SG-Singapore PRD-14-0012 400V, 50Hz, 3P+N+PE		Type: PF - Installation 473825	
Date: 14.02.2014 User: phiba		Date: 14.02.2014 User: phiba		Electrical cabinet	
Project: phiba		Project: phiba		Page: 10 / 53	
Status: Change		Status: Change		Page: 10 / 53	



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Project closure		19.05.2014	phs	User	phs	PRO-14-0012		400V,50Hz,3P+N+PE		473825		11/53			
Change		Date	Name	Drawn	Checked	Repl. I.		Repl. by		473825		11/53			

0VDC → /14.E1

Attachment 3 to FAT IQ

DelumpWitt

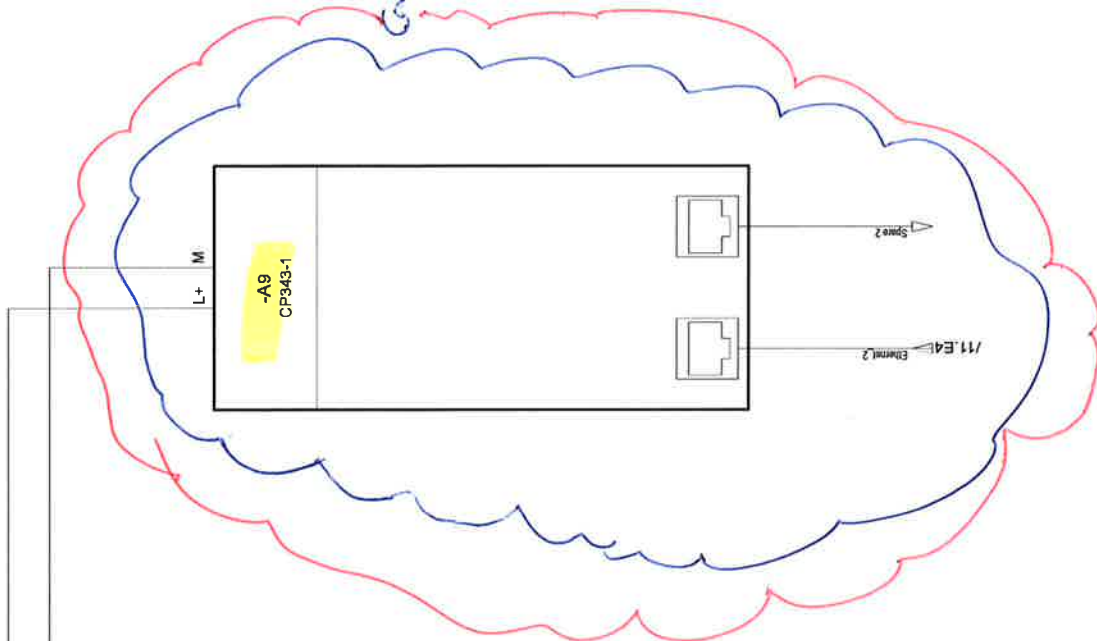
Test 9.1, 12.3

pg 13 of 26

[Signature]
19/01/14

Connection to UPS to be modified

[Signature]
19/01/14

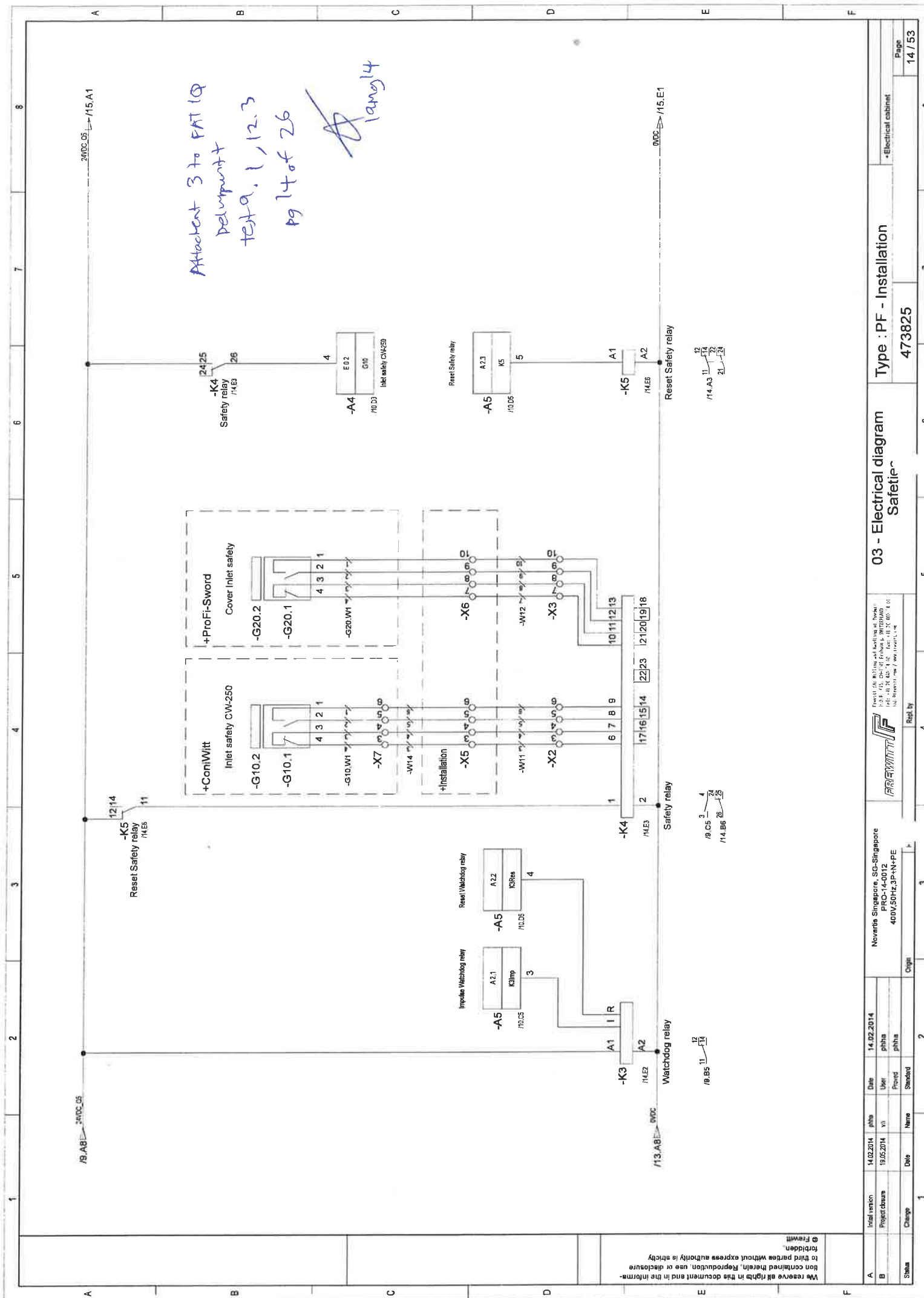


24V DC		-A8 6ES7 334-0CE01-0AA0	
Channel	U / I	Adressa	
2	MV0+		
3	MD-	PEM 136	Temperature control 1
4	MD+		
5	MV1+	PEM 138	Temperature control 2
6	M1+		
7	M1+		
8	MV2+		
9	M2-	PEM 140	Reserve
10	M2+		
11	MV3+		
12	M3-	PEM 142	Reserve
13	M3+		
14	CVO		
15	QMANA	PMW 134	Reserve
16	QIO		
17	CV1		
18	QMANA	PMW 136	Reserve
19	QI1		

/12.A8 0VDC
/10.B6 24VDC Q14
/10.B6 0VDC
/12.B8 24VDC Q15

Project: 03 - Electrical diagram Doc No: 172424-2		Type: PF - Installation 473825		Page 13 / 53	
Novartis Singapore, SG-Singapore PRO-14-0012 400V, 50Hz, 3P+N+PE		Repl. I.		Repl. by	
Date: 14.02.2014 User: phia		Date: 19.05.2014 User: phia		Date: 19.05.2014 User: phia	
Change		Date		Name	
Status		Date		Name	

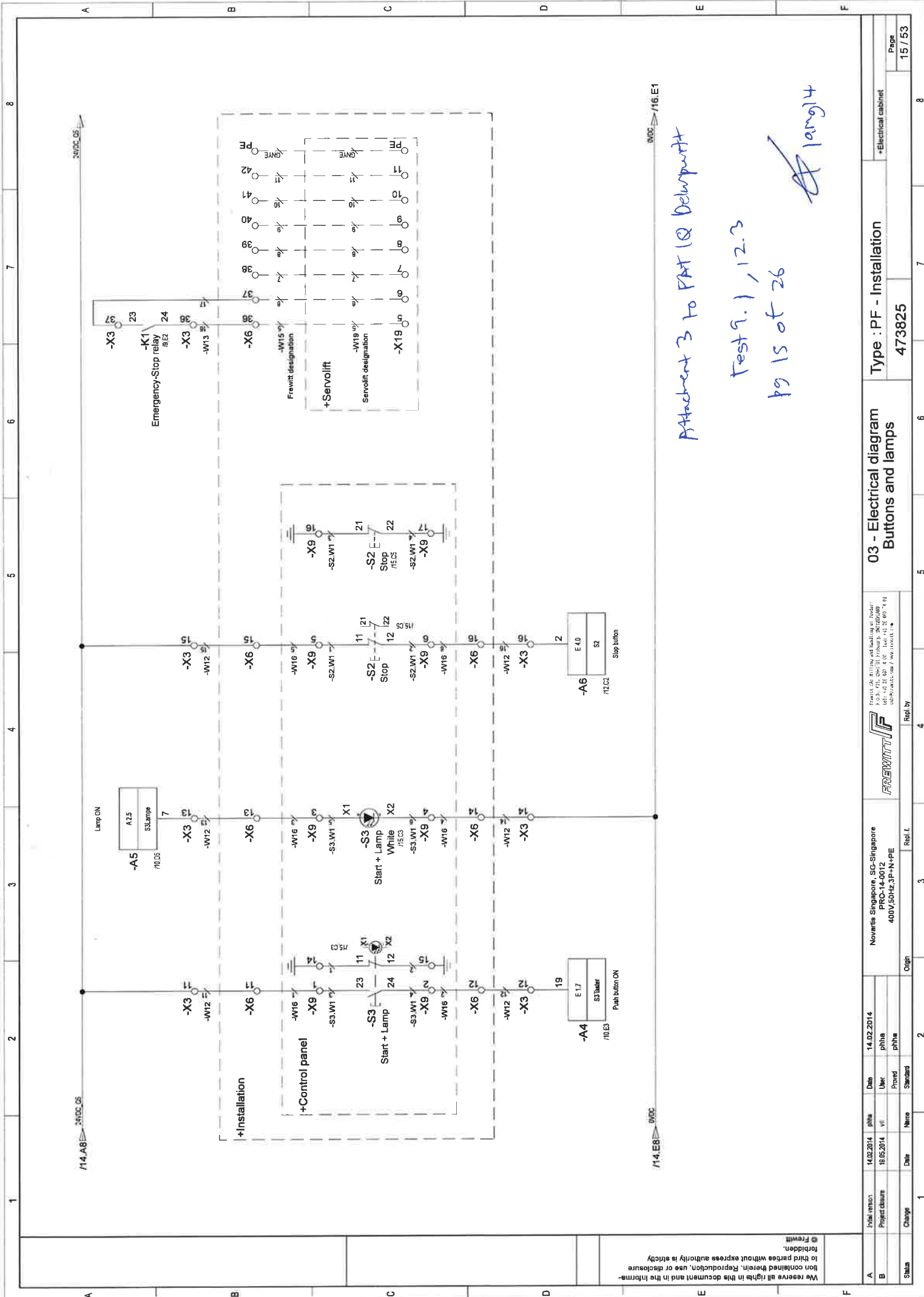
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Attachent 3 to PAT IQ
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 testa. 1, 12.3
 pg 14 of 26
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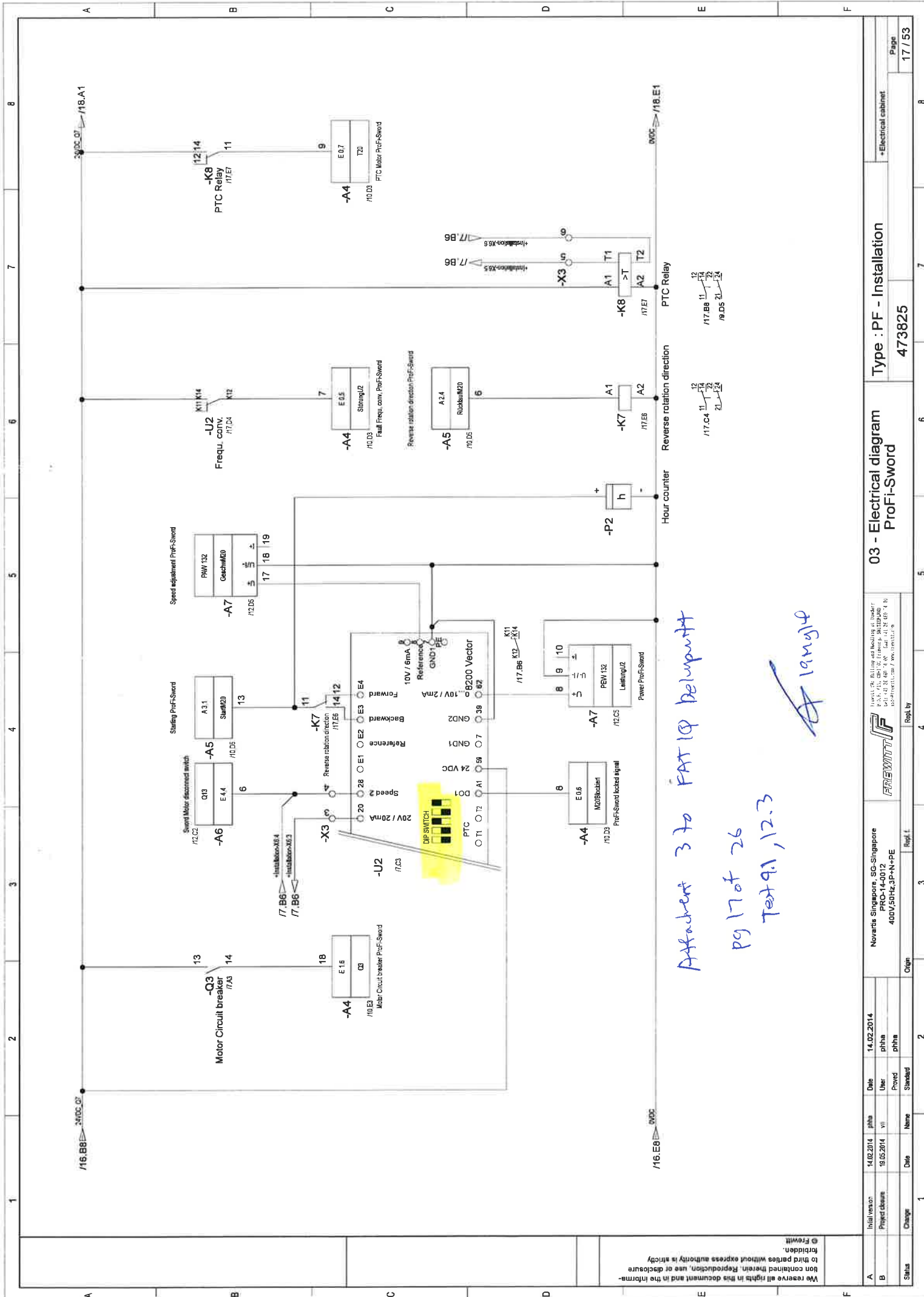
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Status	Change	Date	Name	Version	Origin
		14.02.2014	phha	14.02.2014	phha
B	Project closure	18.05.2014	vi	18.05.2014	phha
A	Initial version	14.02.2014	phha	14.02.2014	phha
Novartis Singapore, SG, Singapore PRO-14-0012 400V/50HZ/3P+N+PE					
Project 03 - Electrical diagram Safetie~ Type : PF - Installation 473825 -Electrical cabinet					
					Page 14 / 53



Attachment 3 to PAT IQ Delumpwitt
 Test 9.1, 12.3
 pg 15 of 26
 J Langt

Initial version		14.02.2014	phba	Date	14.02.2014	Novartis Singapore, SG-Singapore		03 - Electrical diagram		Type : PF - Installation		+Electrical cabinet	
Project change		18.05.2014	User	User	phba	PRO-14-0012		Buttons and lamps		473825		Page	
Change		Date	Name	Prepared	phba	400V/50HZ,3P+N+PE		Repl. by		Repl. by		15 / 53	
Status		Date	Name	Standard	phba	400V/50HZ,3P+N+PE		Origin		473825		8	



Attachment 3 to FAT IQ DelumpWitt
 pg 17 of 26
 Test 9.1, 12.3
 19 May 14

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Initial version	14.02.2014	phh	14.02.2014	phh	Novartis Singapore, SG-Singapore		Novartis Singapore, SG-Singapore PRO-14-0012 400V, 50Hz, 3P+N+PE	Repl. f. 3 Repl. by 4	Type : PF - Installation Prof-i-Sword 473825	Page 17 / 53
Project change	18.05.2014	VI	18.05.2014	VI	Novartis Singapore, SG-Singapore PRO-14-0012 400V, 50Hz, 3P+N+PE						Repl. f. 5 Repl. by 6	Type : PF - Installation Prof-i-Sword 473825	Page 17 / 53
Change		Name	Date	Name	Date	Origin	Repl. f.	Repl. by	Type	Page
Status	1		2	3	4	5	6	7	8	8

34VDC_01 /Z0.A1

18.A8 34VDC_01

Attachment 3 to FAT IQ DelimpWitt

Test 9.1, 17.3

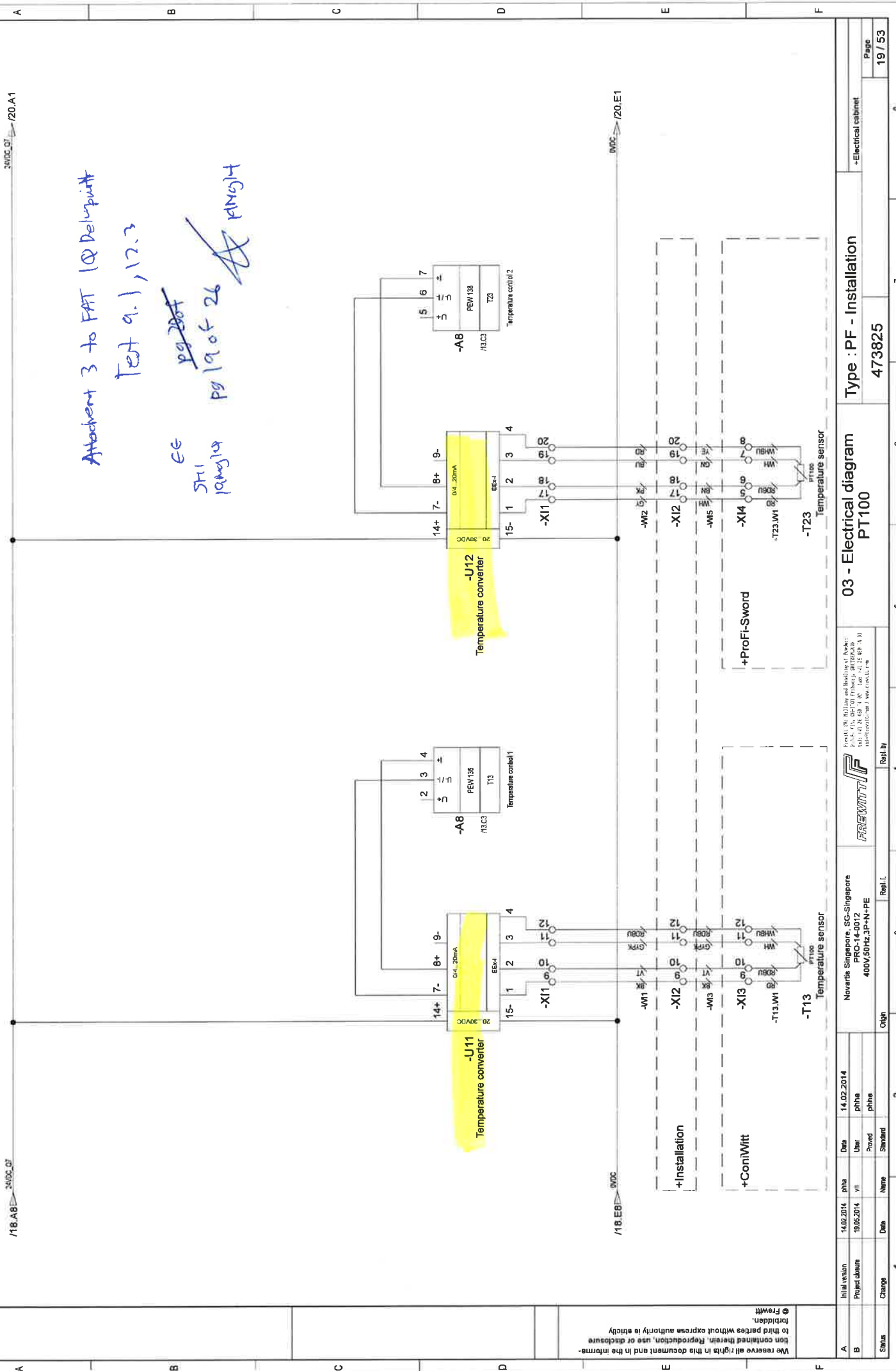
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SHI

pg 2007

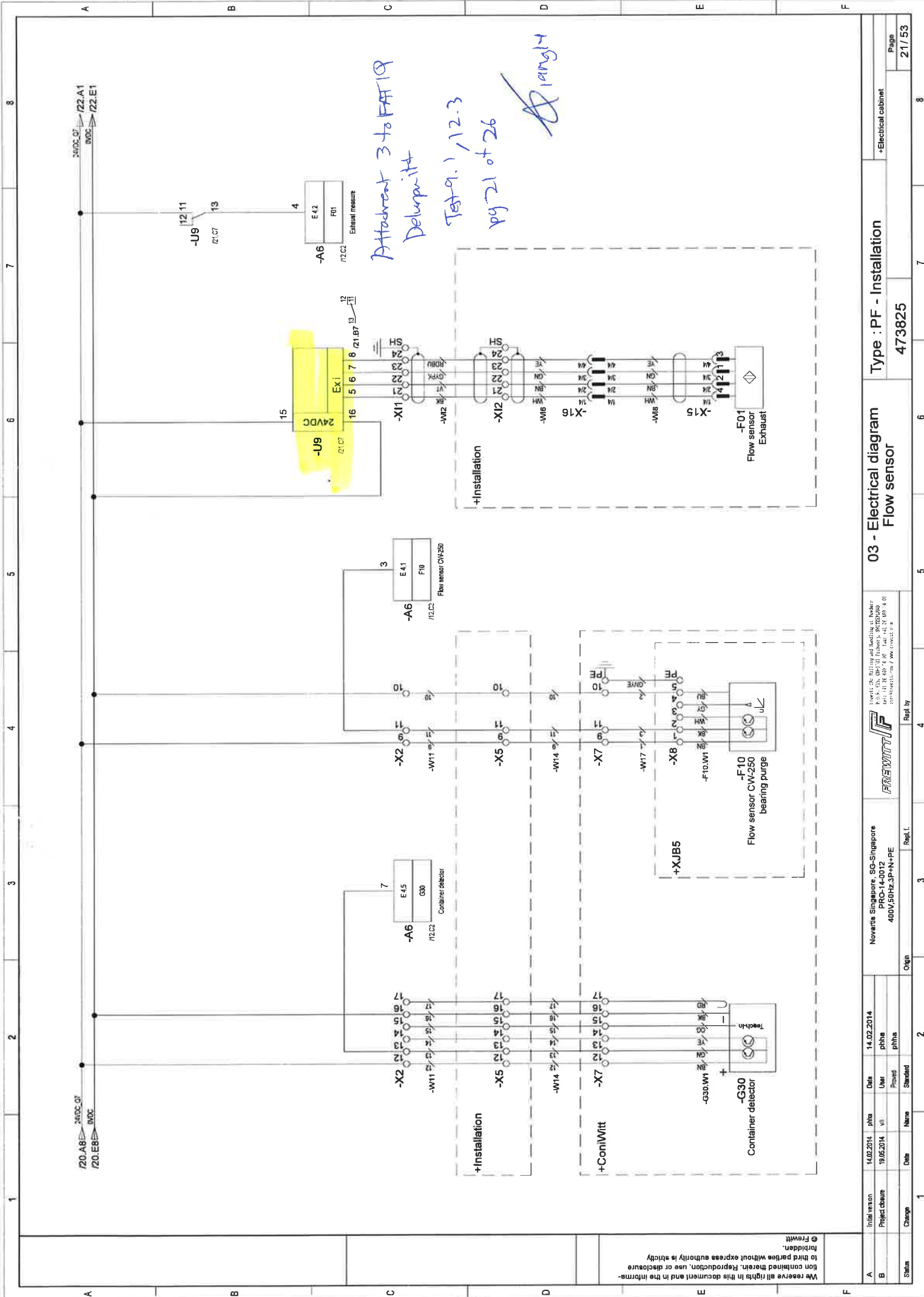
pg 19 of 26

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Initial version	14.02.2014	pha	Date	14.02.2014	Novartis Singapore, SG-Singapore		Frewitt Novartis Singapore, SG-Singapore PRO-14-0012 400V, 50HZ, 3P+N+PE	Repl. I.	Origin	3	Repl. by	4	03 - Electrical diagram PT100	Type : PF - Installation 473825	+Electrical cabinet	Page	
Project change	19.05.2014	ph	User	ph	19 / 53												
Change	Date	Name	Prep	Standard	2	2	2	2	2	2	2	2	2	2	2	2	19 / 53



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Initial version	14.02.2014	phfa	Date	14.02.2014	Novartis Singapore	400V, 50Hz, 3P+N+PE	Repl. I.	3	Origin	2	Repl. by	4	473825	Type: PF - Installation	03 - Electrical diagram	Flow sensor	Electrical cabinet	Page	21/53
Project closure	19.05.2014	phfa	User	phfa	PRO-14-0012														
Change			Date																
Status																			

Bill of material

Article Number	Description	Manufacturer	Reference	Device	Quantity
452558	Wiring plan pockets	RITTAL	TS4118.000	-A1	1
452561	Rail for shielding bracket	RITTAL	SZ2388.800	-A1	1
452562	EMC shielding bracket	RITTAL	SZ2388.100	-A1	5
452563	EMC shielding bracket	RITTAL	SZ2388.200	-A1	5
452564	Cable clamp	RITTAL	SZ2388.140	-A1	5
452565	Cable clamp	RITTAL	SZ2388.180	-A1	5
452566	Cable clamp	RITTAL	SZ2388.220	-A1	5
454680	Electrical cabinet	RITTAL	TS8806.500	-A1	1
454681	Side panels	RITTAL	TS8106.235	-A1	1
463136	Plinth front-rear	RITTAL	TS8602.800	-A1	1
463137	Plinth side	RITTAL	TS8602.050	-A1	1
463256	EMC shielding bracket	RITTAL	SZ2388.280	-A1	10
463257	Cable clamp	RITTAL	DK7097.220	-A1	5
418213	CPU	SIEMENS	6ES7 315-2AH14-0AB0 / Serial nbr : C-E2V15838	-A2	1
428608	Memory card	SIEMENS	6ES7 953-8LG20-0AA0	-A2	1
473840	Operator panel	SIEMENS	6AV7894-3JA10-0BE0	-A3	1
418216	Digital input module	SIEMENS	6ES7 321-1BH02-0AA0 / Serial nbr : C-E2TD2565	-A4	1
418220	Front connector	SIEMENS	6ES7 392-1AJ00-0AA0	-A4	1
418217	Digital output module	SIEMENS	6ES7 322-1BH01-0AA0 / Serial nbr : C-E2TB82226	-A5	1
418220	Front connector	SIEMENS	6ES7 392-1AJ00-0AA0	-A5	1
418216	Digital input module	SIEMENS	6ES7 321-1BH02-0AA0 / Serial nbr : C-E2TD2490	-A6	1
418220	Front connector	SIEMENS	6ES7 392-1AJ00-0AA0	-A6	1
418220	Front connector	SIEMENS	6ES7 392-1AJ00-0AA0	-A7	1
418221	Analog I/O module	SIEMENS	6ES7 334-0CE01-0AA0 / Serial nbr : C-E1VW1918	-A7	1
418220	Front connector	SIEMENS	6ES7 392-1AJ00-0AA0	-A8	1
418221	Analog I/O module	SIEMENS	6ES7 334-0CE01-0AA0 / Serial nbr : C-E1VW1917	-A8	1
460068	Communication processor	SIEMENS	6AG1343-1EX30-4XE0 / Serial nbr : L-BED369008	-A9	1
414554	Fuse Terminal	PHOENIX CONTACT	UK5-HESI	-F1	1
422517	Fuse	SCHURTER	0034.3112	-F1	1

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 Test a.1, 12.3
 pg 23 of 26
 [Signature]

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Initial version: 14.02.2014	Date: 14.02.2014	phib	Novartis Singapore, SG-Singapore	05 - Bill of material	Type : PF - Installation	473825	Page 47 / 53
Project release: 18.05.2014	Date: 18.05.2014	phib	PRO-14-0012				
Change	Date	Name	Origin	Repl. f.	Repl. by		
		phib	phib	3	4	5	8
		phib	phib	2	7	6	8

Bill of material

Article Number	Description	Manufacturer	Reference	Device	Quantity
456574	Flow sensor	EGE	STS 212 S P11206	-F01	1
457071	Flow sensor	FESTO	SFE3-F500-L-W18-2PB-K3	-F10	1
426509	Power supply	SIEMENS	6EP1 334-3BA00 / Serial nbr : YSU/E2128448	-G1	1
404567	Magnet	ELOBAU	304 200 00 V2	-G10	1
404568	Magnet safety switch	ELOBAU	671 271 MU0 5	-G10	1
404567	Magnet	ELOBAU	304 200 00 V2	-G20	1
428806	Magnet safety switch	ELOBAU	671 271 MU0 10	-G20	1
417815	Cable for Cabinet light	RITTAL	SZ4315.100	-HX2	1
452560	Cabinet light	RITTAL	SZ4139.190	-HX2	1
422766	Emergency-Stop relay	PILZ	PNOZ X3 / 774 318	-K1	1
456536	Relay	SIEMENS	LZS:RT4A4L24	-K2	1
452578	Watchdog relay	ABB	CM-WDS	-K3	1
456657	Safety relay	ELOBAU	462 121 E1 01 / Serial nbr : 3079760	-K4	1
456536	Relay	SIEMENS	LZS:RT4A4L24	-K5	1
454256	PTC Relay	SIEMENS	3RN10 11-1BB00	-K6	1
456536	Relay	SIEMENS	LZS:RT4A4L24	-K7	1
454256	PTC Relay	SIEMENS	3RN10 11-1BB00	-K8	1
454256	PTC Relay	SIEMENS	3RN10 11-1BB00	-K9	1
454256	PTC Relay	SIEMENS	3RN10 11-1BB00	-K10	1
454256	PTC Relay	SIEMENS	3RN10 11-1BB00	-K11	1
454256	PTC Relay	SIEMENS	3RN10 11-1BB00	-K12	1
464050	Ventilator	RITTAL	SK 3240.600	-M1	1
464051	Filter	RITTAL	SK 3240.060	-M1	1
461226	Motor	LEROY-SOMER	LSPX132M	-M10	1
473196	Motor	LEROY-SOMER	LSPX80LG	-M20	1
418219	Rail	SIEMENS	6ES7390-1AE80-0AA0	-MR1	1
463735	Hour counter	ABB	E233-12/48	-P1	1
463735	Hour counter	ABB	E233-12/48	-P2	1
456655	Main switch	SIEMENS	3LD2203-1TL53	-Q1	1

Attachment 3 to FATIQ
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 Test a. 1, 12.3
 A length

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Initial version	14.02.2014	pha	Date	14.02.2014	Novartis Singapore, SG-Singapore
Prepared by	18.05.2014	vi	User	pha	PRO-14-0012
Change		nm	Prepared	pha	400V,50HZ,3P-N+PE
Status		sh	Standard		Origin
Type : PF - Installation					473825
05 - Bill of material					473825
Page					48 / 53

Bill of material

Article Number	Description	Manufacturer	Reference	Device	Quantity
456529	Motor Circuit breaker	SIEMENS	3RV10214BA15	-Q2	1
456530	Motor Circuit breaker	SIEMENS	3RV10211EA15	-Q3	1
456538	Protection switch	SIEMENS	5SY6 106-7	-Q4	1
456538	Protection switch	SIEMENS	5SY6 106-7	-Q5	1
456537	Protection switch	SIEMENS	5SY6 102-7	-Q6	1
456537	Protection switch	SIEMENS	5SY6 102-7	-Q7	1
456533	Contact	SIEMENS	3RT10251BB44	-Q8	1
456533	Contact	SIEMENS	3RT10251BB44	-Q9	1
456534	Contact	SIEMENS	3RT10241BB44	-Q10	1
456534	Contact	SIEMENS	3RT10241BB44	-Q11	1
456715	Motor maintenance switch	SIEMENS	3LD2103-1TP51	-Q12	1
465949	Grounding module	SIEMENS	3LD9220-2B	-Q12	1
456715	Motor maintenance switch	SIEMENS	3LD2103-1TP51	-Q13	1
465949	Grounding module	SIEMENS	3LD9220-2B	-Q13	1
456538	Protection switch	SIEMENS	5SY6 106-7	-Q14	1
456537	Protection switch	SIEMENS	5SY6 102-7	-Q15	1
456538	Protection switch	SIEMENS	5SY6 106-7	-Q16	1
465089	Residual current circuit-breaker	SIEMENS	5SU1354-6KK16	-Q17	1
456538	Protection switch	SIEMENS	5SY6 106-7	-Q18	1
405190	Emergency-Stop button	STAHL	8003/123-010	-S1	1
445287	Pushbutton	STAHL	8003/123-001	-S2	1
438080	Illuminated pushbutton	STAHL	8018/3113	-S3	1
406886	Proximity Switch	PEPPERL+FUCHS	NCB 1.5-8GM25-NO	-S10	1
443351	PTC sensor	ZIEHL	KD60	-T11	1
443351	PTC sensor	ZIEHL	KD60	-T12	1
459090	PT100 sensor	JUMO	902050/40-378-1011-3-10-20-115-11-5000/000	-T13	1
443351	PTC sensor	ZIEHL	KD60	-T21	1
443351	PTC sensor	ZIEHL	KD60	-T22	1
459090	PT100 sensor	JUMO	902050/40-378-1011-3-10-20-115-11-5000/000	-T23	1

Attachment 3 to FAT 10
 DelumpWitt
 test a.1 / 12.3
 pg 25 of 26
 J Ramojit

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 © Rewitt

Initial version	14.02.2014	phs	Date	14.02.2014	Novartis Singapore, SG-Singapore
Project name	18.05.2014	vi	User	phs	PRO-14-0012
Change		Name	Prepared	phs	400V/50Hz,3P+N+PE
Status		Date	Shredded		Origin
 REWITT					Type : PF - Installation 473825
Page 49 / 53					473825

Bill of material

Article Number	Description	Manufacturer	Reference	Device	Quantity
418881	Operating module	LENZE	E82ZBC	-U1	1
453193	Frequency converter	LENZE	E82EV552K4C / Serial nbr : 0008	-U1	1
453888	Function module	LENZE	E82ZAFSC100/S	-U1	1
418881	Operating module	LENZE	E82ZBC	-U2	1
453190	Frequency converter	LENZE	E82EV751K4C / Serial nbr : 0035	-U2	1
453888	Function module	LENZE	E82ZAFSC100/S	-U2	1
425177	Safety barrier Ex-i	STAHL	9002777-093-300-001	-U3	1
425177	Safety barrier Ex-i	STAHL	9002777-093-300-001	-U4	1
425177	Safety barrier Ex-i	STAHL	9002777-093-300-001	-U5	1
425177	Safety barrier Ex-i	STAHL	9002777-093-300-001	-U6	1
411946	Ex-i Switch Amplifier	PEPPERL+FUCHS	KFD2-SR2-Ex2.W	-U7	1
417735	Ex-i fill converter	PEPPERL+FUCHS	KFD2-SR2-Ex2.W	-U8	1
438902	Flow controller	EGE	KFD2-SR2-Ex2.W	-U9	1
453536	Pneumat. preparation unit	Frewitt	SZA400 24VDC P10708 / Serial nbr : 21348	-U10	1
=>	Pressure switch	UNIVER	453536	-U10	1
=>	Solenoid valve	ASCO JOUOMATIC	405 002 112 11	-U10.P10	1
443422	Ex-i T/I converter	PEPPERL+FUCHS	PV E374A016MS	-U10.SV10	1
443422	Ex-i T/I converter	PEPPERL+FUCHS	KFD2-UT2-Ex1	-U11	1
466205	UPS module	SIEMENS	KFD2-UT2-Ex1	-U12	1
473853	UPS module	APC	6EP1933-2EC51 / Serial nbr : 06E2A1TBFMF	-U13	1
403949	Cable	HEINIGER	APC Back-Ups USV 350VA BK350	-U14	1
403949	Cable	HEINIGER	888 854 043 / TT flex C 4G2.5	-W2	1
403949	Cable	HEINIGER	888 854 043 / TT flex C 4G2.5	-W3	1
403949	Cable	HEINIGER	888 854 043 / TT flex C 4G2.5	-W5	1
411612	Cable	HEINIGER	888 854 043 / TT flex C 4G2.5	-W6	1
411612	Cable	HEINIGER	888 802 023 / TT flex CEE 2x1	-W7	1
411612	Cable	HEINIGER	888 802 023 / TT flex CEE 2x1	-W8	1
411612	Cable	HEINIGER	888 802 023 / TT flex CEE 2x1	-W9	1
411612	Cable	HEINIGER	888 802 023 / TT flex CEE 2x1	-W10	1
435708	Cable	HEINIGER	888 830 183 / TT flex 18G0.5	-W14	1

Attachment 3 to FAT 19
 Determinant
 Test 9.1 / 12.3
 Pg 26 of 26
 14/07/14

Attachment 4 to Delumpwitt FAT-IQ 172424-2
SG12.202.M.5234

Handwritten signature

Test 11.1, 11.3

NOVARTIS **DelumpWitt 5234** 19/05/2014 10:26:18 **FREWITT**

Operator: Admin **System**

Main screen **Mainte. mode**

Active Alarm Time screen 19/05/2014 10:26:18 **Store Recipe**

Alarm Archive Time PLC 19/05/2014 10:26:17 **System User**

User	Password	Group	Logoff time
Admin	*****	Administra...	30
kanessh2loc	*****	Administra...	15
M5234_Admin	*****	Administra...	15
M5234_Maint	*****	Service	15
M5234_Opera	*****	Operator	15
M5234_Superv	*****	Supervisory	5

Batch **Print Page**

Trend **Print Report**

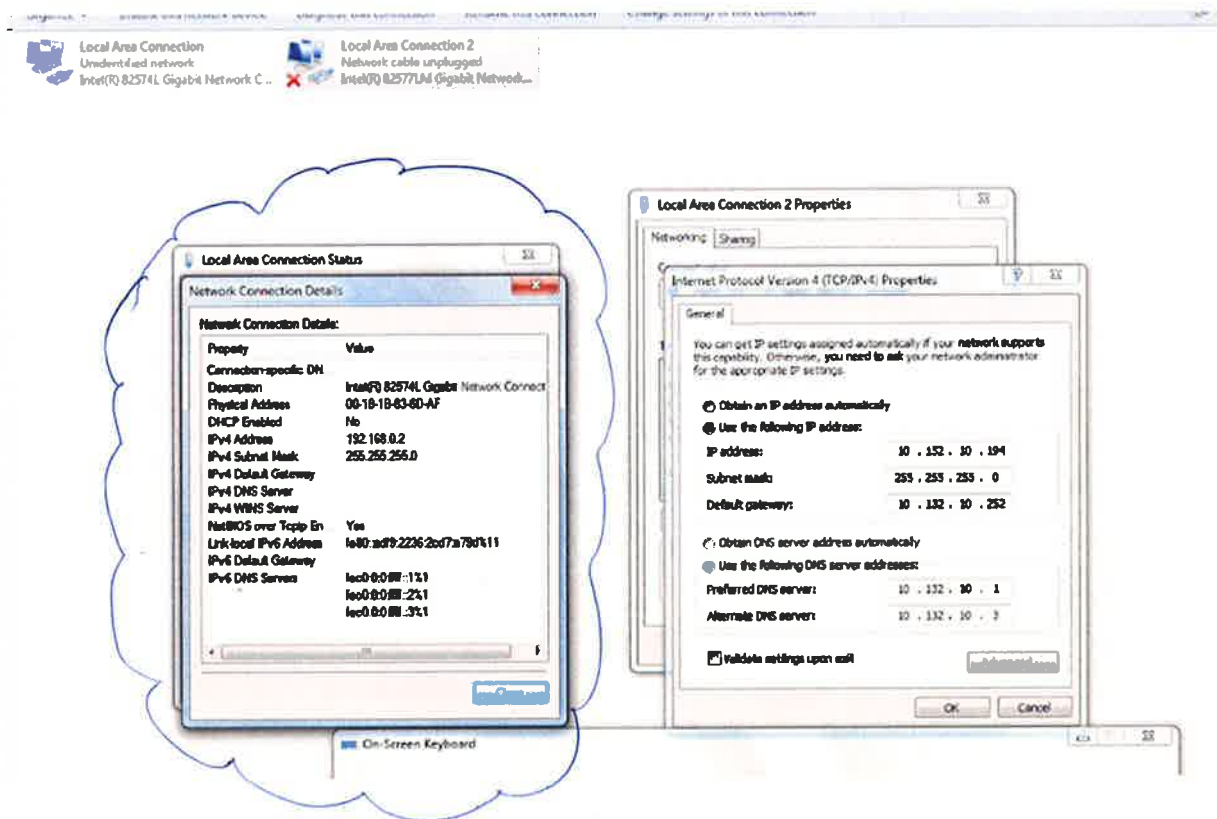
Logout Synchron. Time back to WinCE Batch end **Quit**

Softwareversion: STEP7 V5.5;
WinCC Flexible Advanced 2008 SP3
SPS:14-0012 Version 1.0
WinCC: 14-0012 Version 1.0

Attachment 4 to Delumpwitt FAT-IQ 172424-2
SG12.202.M.5234

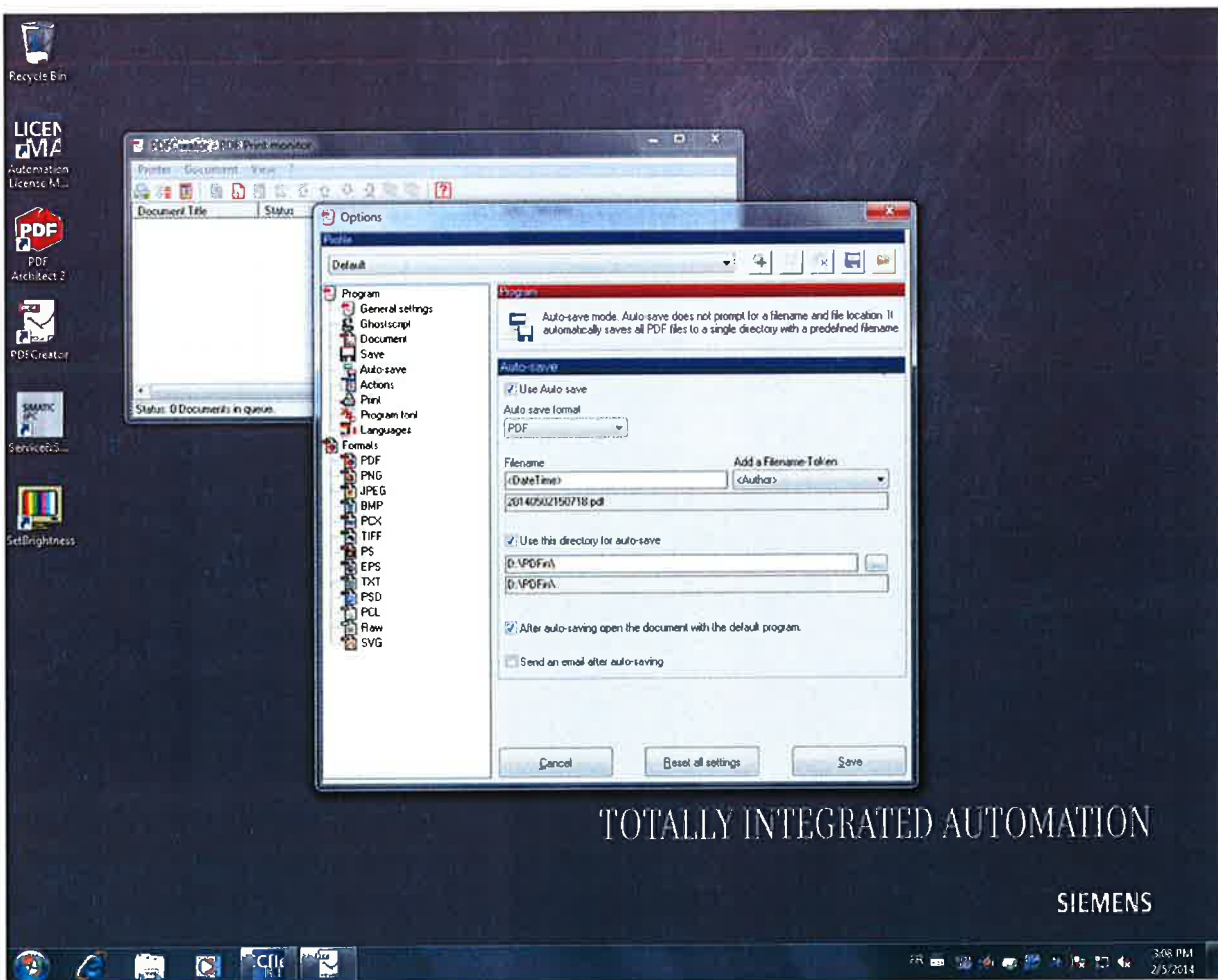
Test 11.3

PLC-HMI network connection

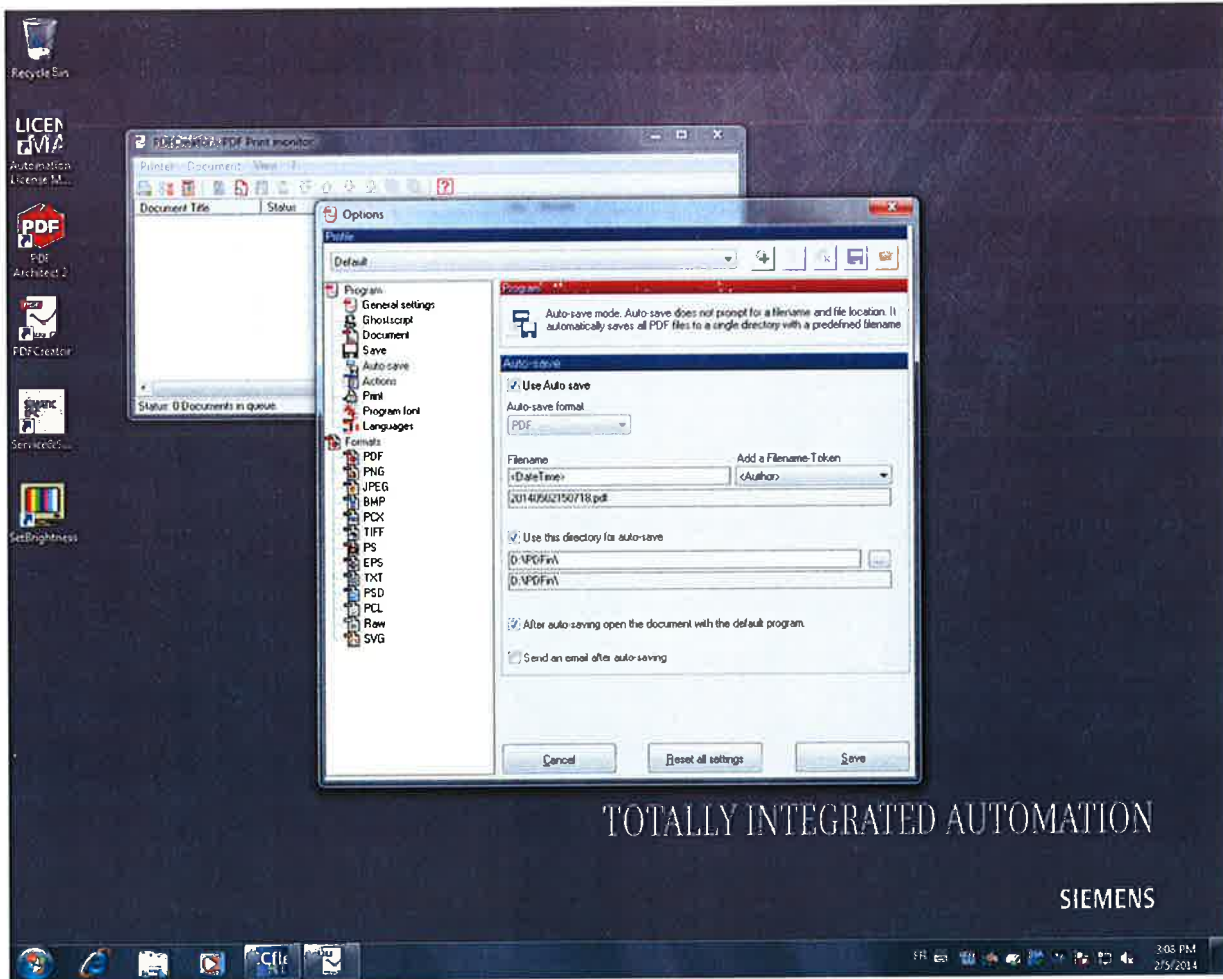


Attachment 4 to Delumpwitt FAT-IQ 172424-2
SG12.202.M.5234

PDF Printer Configuration

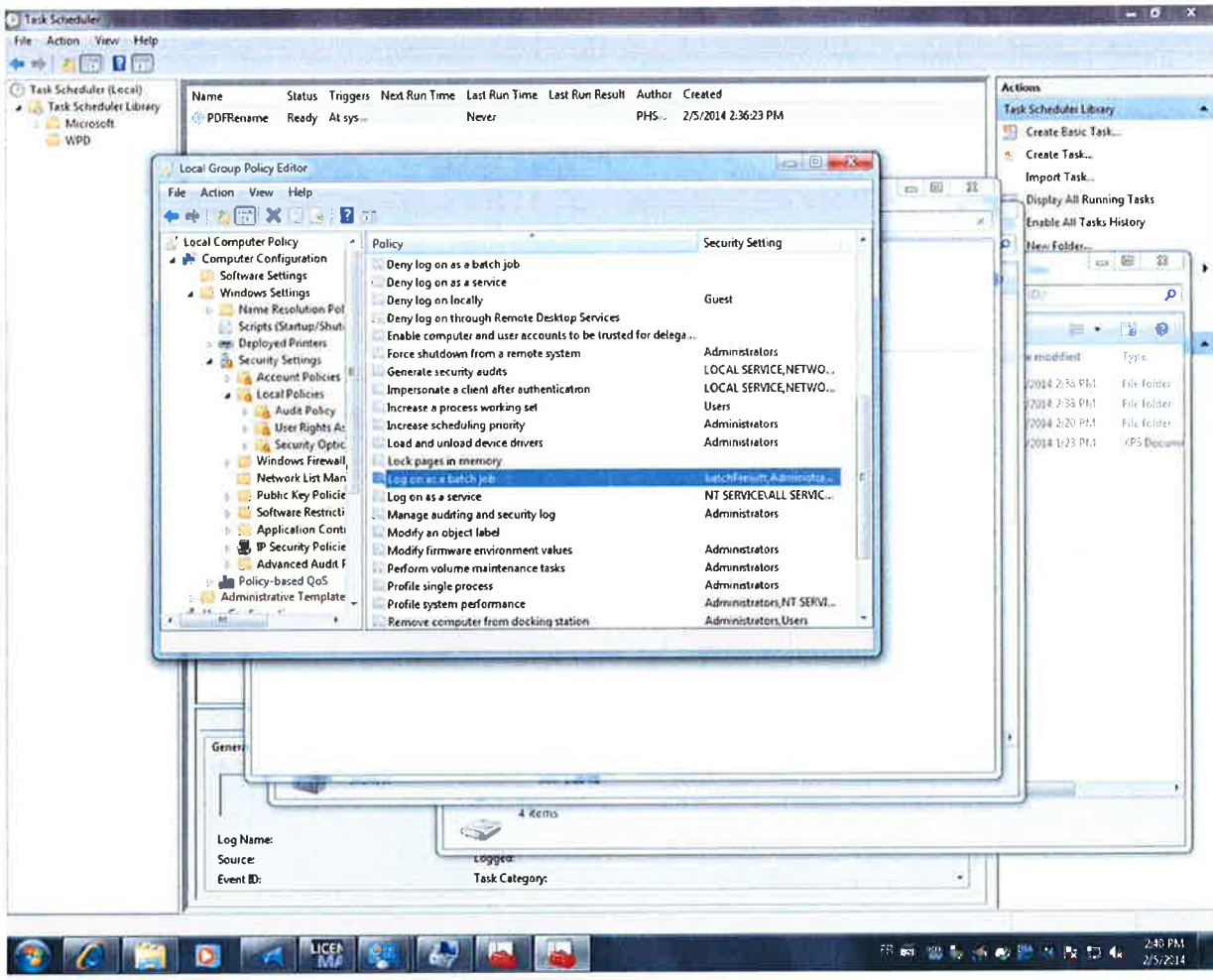


Attachment 4 to Delumpwitt FAT-IQ 172424-2
SG12.202.M.5234



Attachment 4 to Delumpwitt FAT-IQ 172424-2
SG12.202.M.5234

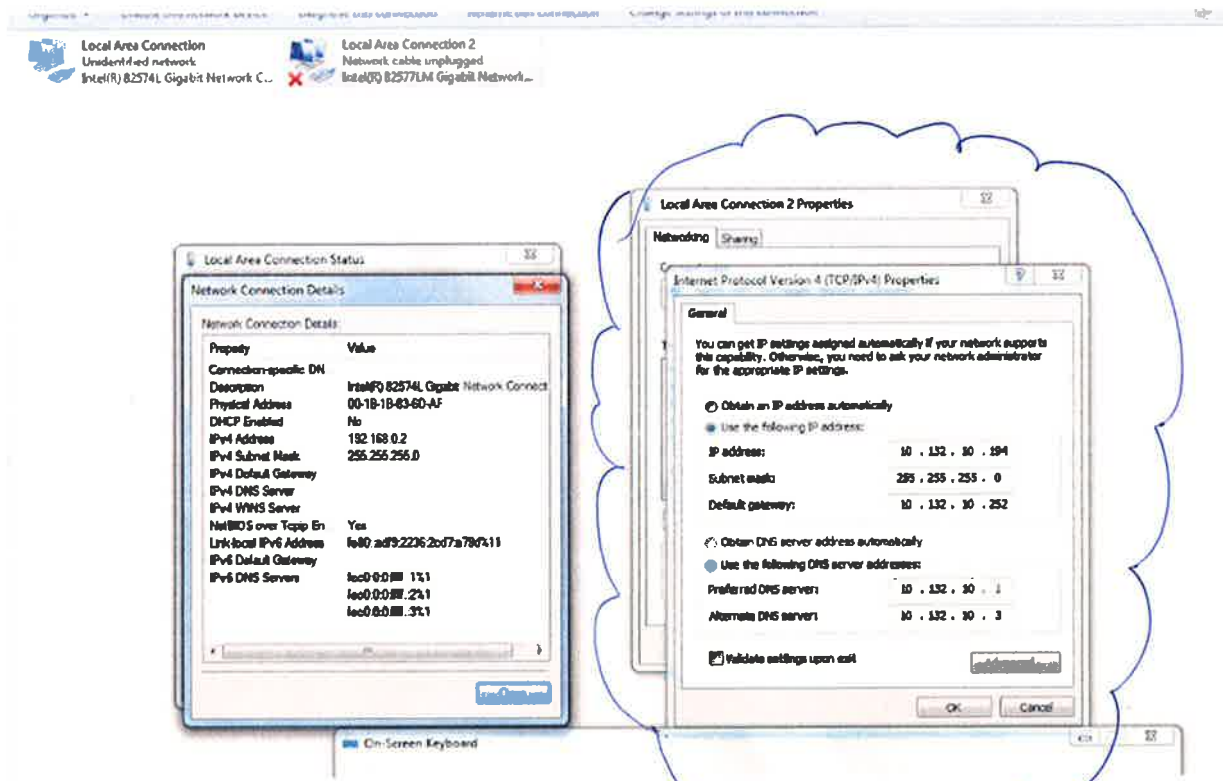
Handwritten signature
19 May 14



Attachment 5 to Delumpwitt FAT-IQ 172424-2
SG12.202.M.5234

19 May 14

Test 11.4



Network Connection for NSPM

19 May 14

Attachment 5 to Delumpwitt FAT-IQ 172424-2
SG12.202.M.5234

The screenshot shows the Windows 7 System Control Panel window. The title bar reads "Control Panel > All Control Panel Items > System". The main content area is titled "View basic information about your computer".

Windows edition
Windows 7 Ultimate
Copyright © 2009 Microsoft Corporation. All rights reserved.
Service Pack 1

System

Manufacturer:	Siemens AG
Rating:	Windows Experience Index
Processor:	Intel(R) Celeron(R) CPU P4305 @ 1.87GHz 1.87 GHz
Installed memory (RAM):	2.00 GB (1.86 GB usable)
System type:	64-bit Operating System
Pen and Touch:	Touch Input Available with 2 Touch Points

Siemens AG support

Phone number:	+49 (0)911 895 7222
Support hours:	Mo.-Fr.: 8 a.m. to 5 p.m. (CET)
Website:	Online support

Computer name, domain, and workgroup settings

Computer name:	PHSGTB-WS0044
Full computer name:	PHSGTB-WS0044
Computer description:	
Workgroup:	WORKGROUP

Windows activation

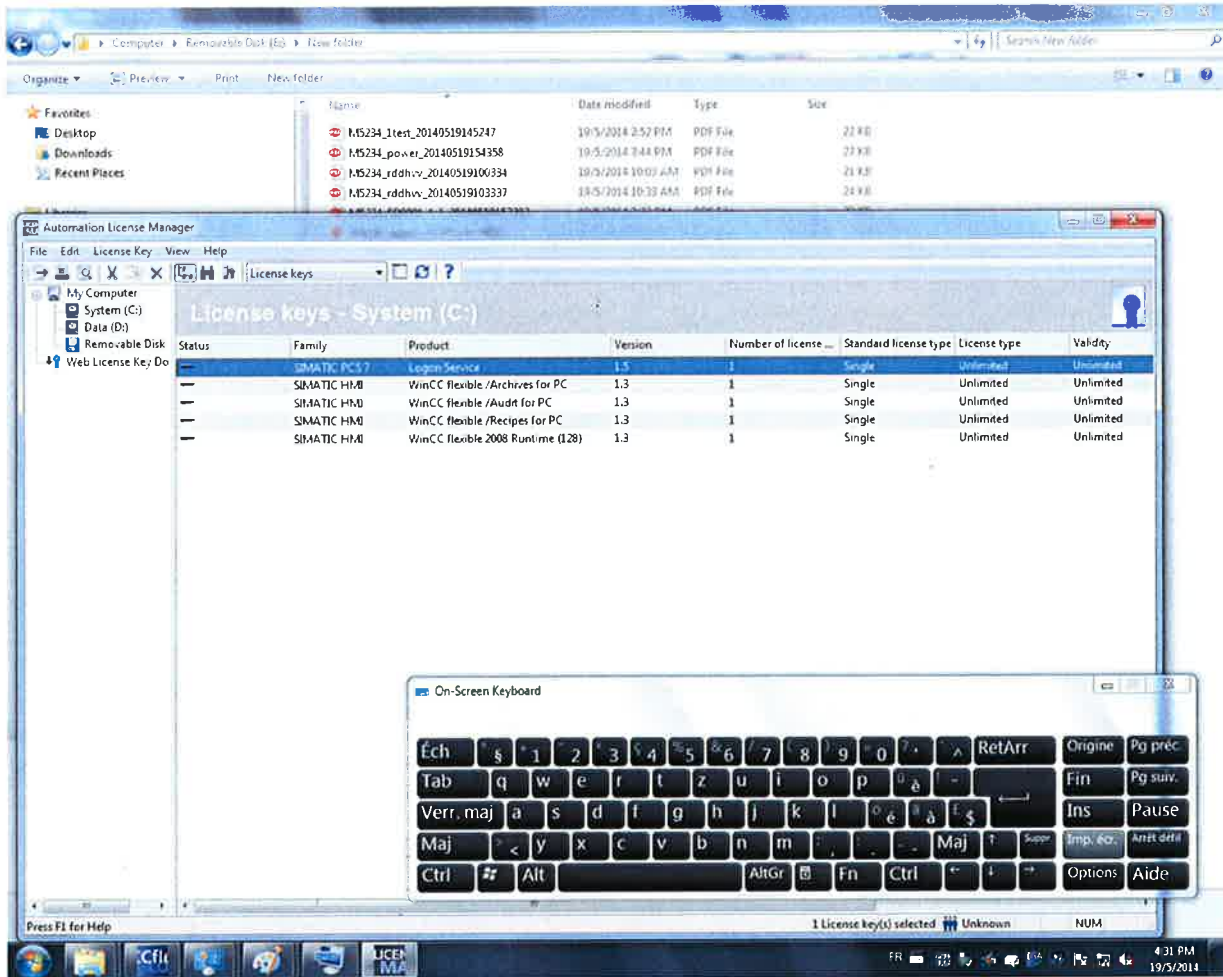
Windows is activated
Product ID: 00426-OEM-8992662-00405

See also:
[Action Center](#)
[Windows Update](#)
[Performance Information and Tools](#)

The screenshot also shows a keyboard overlay at the bottom, a "genuine Microsoft software" logo, and a taskbar with icons for Internet Explorer, Windows Explorer, and other applications.

Attachment 5 to Delumpwitt FAT-IQ 172424-2
SG12.202.M.5234

Amay14



Simatic Logon

Amay14


R & I Part list
DelumpWitt PRO-14-0012 SG.TBP.202.M.5234
10
Customer: NOVARTIS SINGAPORE

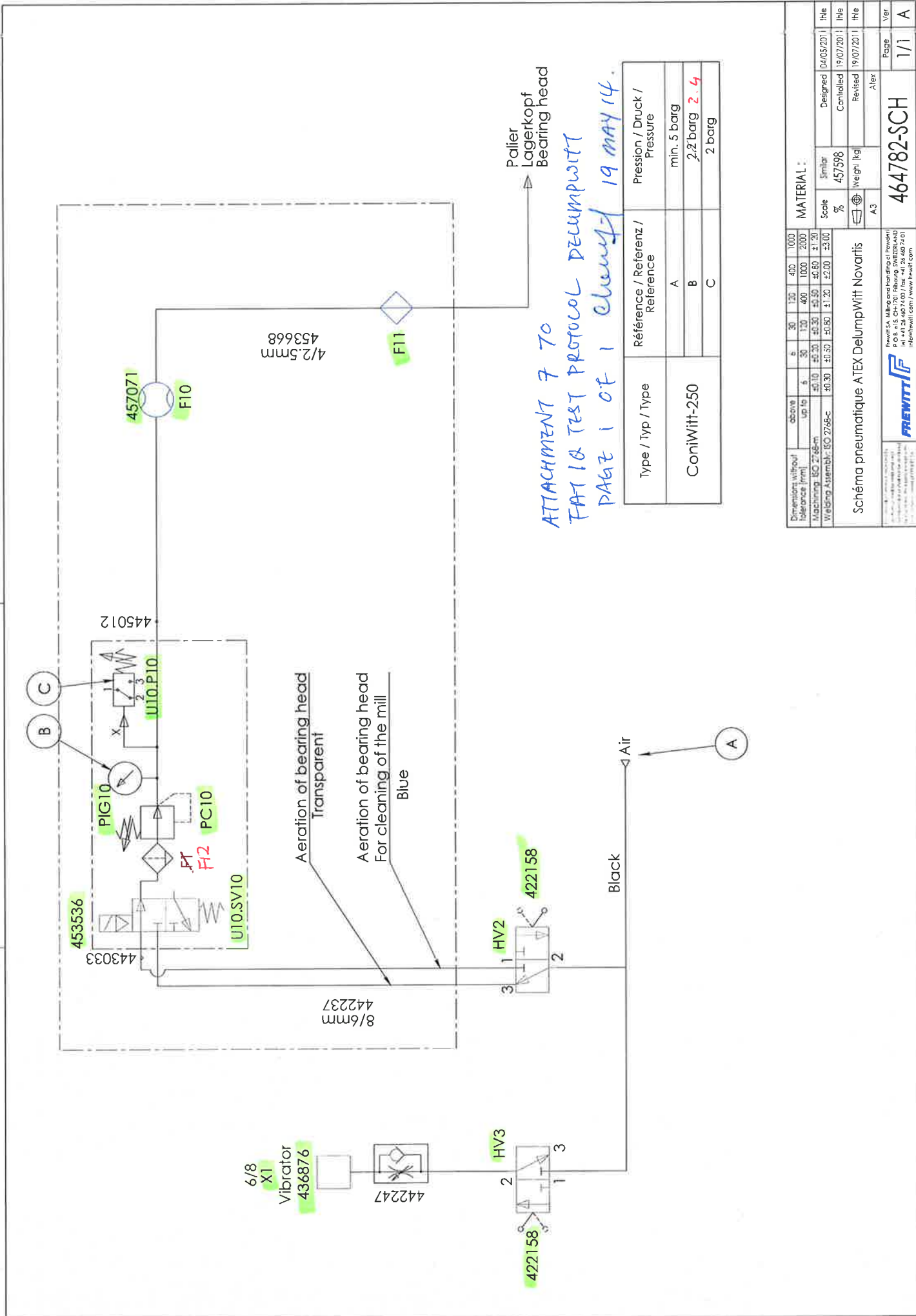
Serial-Nr. DelumpWitt 14001235184

P&ID Diagram 473871 Rev. A

R&I Article R&I Artikel R&I Article	Article N° Artikel Nr. Article ID.	Description Beschreibung Description	Fournisseur Hersteller Supplier	Quantité Menge Quantity
F10	457071	Flow sensor SFE3-F500-L-W18-2PB- KS KI ✓	FESTO	1
F01	456574	Flow sensor Exi G1/2, Exi, 1G/D, P11206, STS 212 S	BACHOFEN AG (EGE) ✓	1
F11	457102	Sterile filter for air - P-SRF N 0006 G 1/4" - Element P-SRF N 03/10	Donaldson	1
F12	(453536)	Filter F.01 HA4 G1/4	UNIVER	1
F4	465745	Filter NF 07-351-600 NFIA	FreWitt	1
F5	465745	Filter NF 07-351-600 NFIA	FreWitt	1
G10	404567	Magnet 304 200 00 ✓	ELOBAU	1
G10	404568	Magnetic safety switch 671 271 MU0 510 ✓	ELOBAU	1
G20	404567	Magnet 304 200 00 ✓	ELOBAU	1
G20	404568	Magnetic safety switch 671 271 MU0 510 ✓	ELOBAU	1
G30	473759	Proximity Switches P43-T4Y-2D-001-200EEX	Waycon	1
HV2	422158	Valve for cleaning	ASCO / NUMATICS GMBH	1
HV3	422158	Valve for Vibrator	ASCO / NUMATICS GMBH	1
M10	461226	Motor 5KW 6P Ex II2D Ex ID IP65 T125°C 400V 50Hz	LEROY-SOMER SA	1
M20	461218	Motor 8.75 4P, 230/400/50, B14, Ex II2D IP65 125°C	LEROY-SOMER SA	1
PC10	(453536)	Regulator R.01 G1/4 0.2-6 bar	TECSIS	1
PIG02	456254	Vacumeter VMA-63-V1/0-1/4-CT-183522 inox ✓	FESTO SA WIKA ✓	1
PIG10	(453536)	Manometer P1415B073001 G1/8	(UNIVER) TECSIS ✓	1
S10	406886	Proximity Switches EXI M8 NCB 1,5-8GM25-NO	PEPPERL+FUCHS	1
T10	(452856)	PTC Sensor	(LEROY-SOMER SA)	1
T11	443351	Sensor 3XPTC 60°C EN SÉRIE K401300, KD60	TRELCO AG (ZIEHL) ✓	1
T12	443351	Sensor 3XPTC 60°C EN SÉRIE K401300, KD60	TRELCO AG (ZIEHL) ✓	1
T20	(450798)	PTC Sensor	(LEROY-SOMER SA)	1
T21	443351	Sensor 3XPTC 60°C EN SÉRIE K401300, KD60	TRELCO AG (ZIEHL) ✓	1
T22	443351	Sensor 3XPTC 60°C EN SÉRIE K401300, KD60	TRELCO AG (ZIEHL) ✓	1
T13	459090	PT 100 M10, 902050/40-378-1011-3-10-20-115-11-5000/000	JUMO	1
T23	459090	PT 100 M10, 902050/40-378-1011-3-10-20-115-11-5000/000	JUMO	1
U10.P10	(453536)	Pressure Switches 40500211211	Layher	1
U10.SV10	(453536)	Solenoid valve PV G356A002VMS	ASCO JOUCOMATIC	1
B1	459229	Sachschülte	FreWitt	1
I002	459271	ProFi-Sword	FreWitt	1
I001	459286	ConiWitt-250	FreWitt	1
XC1	459332	Cleaning connection	FreWitt	1
XC2	456364	Cleaning connection	FreWitt	1
R10	436255	Rotor fs Type C	FreWitt	1
F100	436242	Raspeil Sieb 3mm Dicke 1mm	FreWitt	1
R20.1	454299	Rotor ProFi-Sword	FreWitt	1
R20.2	454311	Rotor ProFi-Sword	FreWitt	1
X1	436876	Vibrator NTP25B+C SE Inox	Netter	1
X2	470252	Magnetic separator Type Neoflux Cleanflow magnet SEC38333F	Goudsmil / FreWitt	1
W013	473792	Weighing (Typ IND590 / PTA459-F1500T)	Mettler Toledo	1

ATTACHMENT 6 TO
 FAT IQ TEST PROTOCOL
 DELUMPWITT
 PAGE 2 OF 2

Cherry 19 MAY 14



ATTACHMENT 7 TO
FAT IQ TEST PROTOCOL DELUMPWITT
PAGE 1 OF 1 changed 19 MAY 14.

Type / Typ / Type	Référence / Referenz / Reference	Pression / Druck / Pressure
ConiWitt-250	A	min. 5 barg
	B	2.2 barg 2.4
	C	2 barg

MATERIAL :		Similar	Designed	File
Scale	%	457598	04/05/2011	File
Weight	kg		19/07/2011	File
A3		Alex		Ver
		464782-SCH		Page
				1/1

Dimensions without tolerance [mm]	above	30	120	400	1000	
Machining ISO 2768-m	up to	6	30	120	400	
	up to	±0.10	±0.30	±0.50	±0.80	±1.30
Welding Assembly ISO 2768-c	up to	±0.30	±0.50	±0.80	±1.20	±2.00
	up to	±0.30	±0.50	±0.80	±1.20	±3.00

Schéma pneumatique ATEX DelumpWitt Novartis

FreWitt S.A. Milling and Handling of Powders
P.O. Box 415, CH-7013 Riehen, Switzerland
Tel: +41 29 460 94 00 / Fax: +41 29 460 94 01
info@frewitt.com / www.frewitt.com

FreWitt

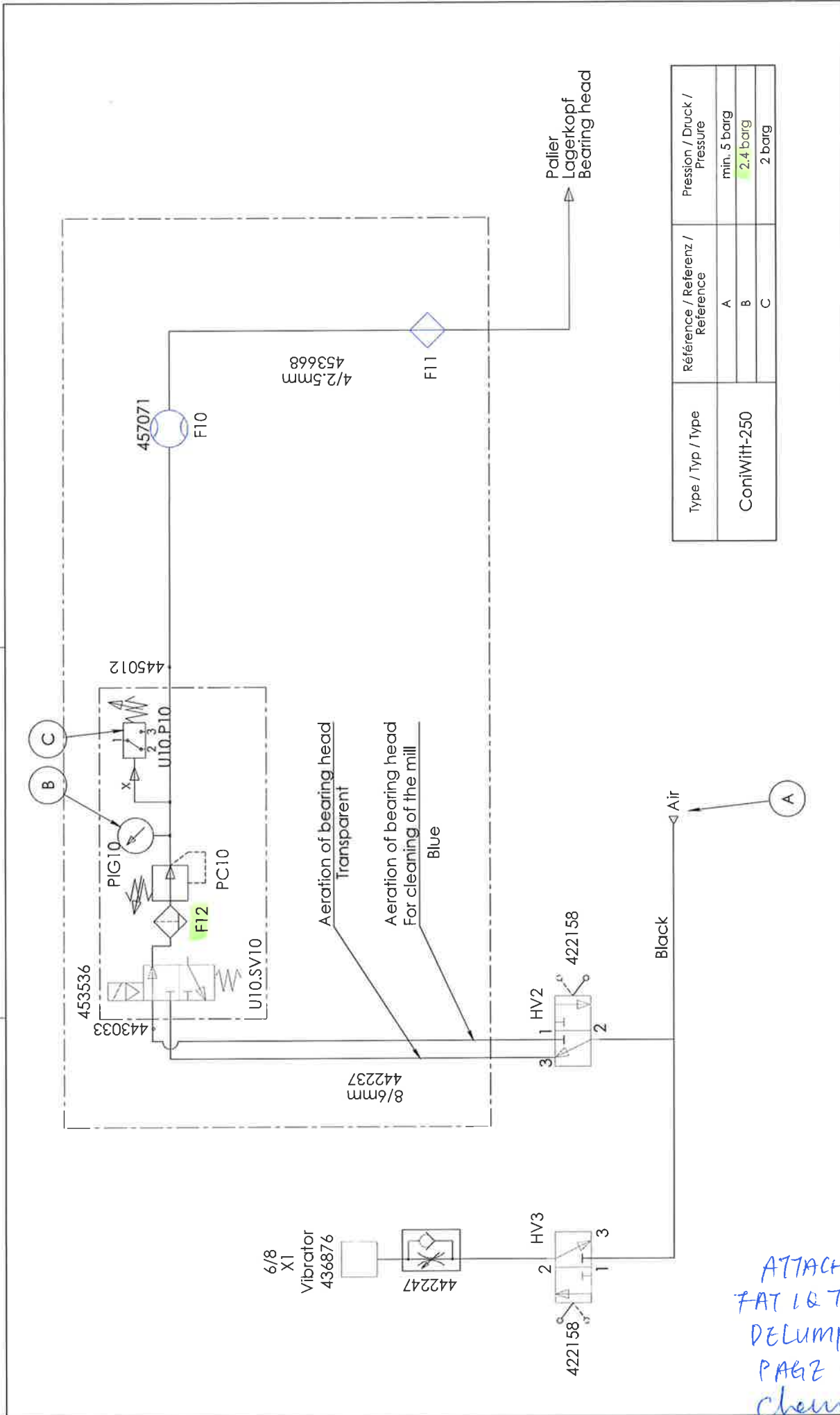

R & I Part list
DelumpWitt PRO-14-0012 SG.TBP.202.M.5234
10
Customer: NOVARTIS SINGAPORE

Serial-Nr. DelumpWitt 14001235184

P&ID Diagram 473871 Rev. B

R&I Article R&I Artikel R&I Article	Article N° Artikel Nr. Article ID.	Description Beschreibung Description	Fournisseur Hersteller Supplier	Quantité Menge Quantity
F10	457071	Flow sensor SFE3-F500-L-W18-2PB-K1	FESTO	1
F01	456574	Flow sensor Exi G1/2, Exi, 1G/D, P11206, STS 212 S	BACHOFEN AG (EGE)	1
F11	457102	Sterile filter for air – P-SRF N 0006 G 1/4 – Element P-SRF N 03/10	Donaldson	1
F12	(453536)	Filter F.01 HA4 G1/4	UNIVER	1
F4	465745	Filter NF 07-351-600 NFIA	FreWitt	1
F5	465745	Filter NF 07-351-600 NFIA	FreWitt	1
G10	404567	Magnet 304 200 00 V	ELOBAU	1
G10	404568	Magnetic safety switch 671 271 MU0 10	ELOBAU	1
G20	404567	Magnet 304 200 00 V	ELOBAU	1
G20	404568	Magnetic safety switch 671 271 MU0 10	ELOBAU	1
G30	473759	Proximity Switches P43-T4Y-2D-001-200EEX	Waycon	1
HV2	422158	Valve for cleaning	ASCO / NUMATICS GMBH	1
HV3	422158	Valve for Vibrator	ASCO / NUMATICS GMBH	1
M10	461226	Motor 5kW 6P Ex II2D Ex ID IP65 T125°C 400V 50Hz	LEROY-SOMER SA	1
M20	473196	Motor 0.75 kW 4P, 230/400/50, B14, Ex II2D IP65 125°C	LEROY-SOMER SA	1
PC10	(453536)	Regulator R.01 G1/4 0.2-6 bar	UNIVER (TECSIS)	1
PIG02	460760	Vacumeter 632.050.063 -100...0 mbar G1/4 B inox	WIKA	1
PIG10	(453536)	Manometer P1415B073001 G1/8	Tesis (UNIVER)	1
S10	406886	Proximity Switches EXI M8 NCB 1,5-8GM25-NO	PEPPERL+FUCHS	1
T10	(452856)	PTC Sensor	(LEROY-SOMER SA)	1
T11	443351	Sensor 3XPTC 60°C EN SÉRIE K401300, KD60	TRELCO AG (ZIEHL)	1
T12	443351	Sensor 3XPTC 60°C EN SÉRIE K401300, KD60	TRELCO AG (ZIEHL)	1
T20	(450798)	PTC Sensor	(LEROY-SOMER SA)	1
T21	443351	Sensor 3XPTC 60°C EN SÉRIE K401300, KD60	TRELCO AG (ZIEHL)	1
T22	443351	Sensor 3XPTC 60°C EN SÉRIE K401300, KD60	TRELCO AG (ZIEHL)	1
T13	459090	PT 100 M10, 902050/40-378-1011-3-10-20-115-11-5000/000	JUMO	1
T23	459090	PT 100 M10, 902050/40-378-1011-3-10-20-115-11-5000/000	JUMO	1
U10.P10	(453536)	Pressure Swiches 40500211211	Layher	1
U10.SV10	(453536)	Solenoid valve PV G356A002VMS	ASCO JOUCOMATIC	1
B1	459229	Sachschütte	FreWitt	1
I002	459271	ProFi-Sword	FreWitt	1
I001	459286	ConiWitt-250	FreWitt	1
XC1	459332	Cleaning connection	FreWitt	1
XC2	456364	Cleaning connection	FreWitt	1
R10	436255	Rotor Is Type C	FreWitt	1
F100	436242	Raspel Sieb 3mm Dicke 1mm	FreWitt	1
R20.1	454299	Rotor ProFi-Sword	FreWitt	1
R20.2	454311	Rotor ProFi-Sword	FreWitt	1
X1	436876	Vibrator NTP25B+C SE Inox	Netter	1
X2	470252	Magnetic separator Type Neoflux Cleanflow magnet SEC38333F	Goudsmil / Frewitt	1
W013	473792	Weighing (Typ IND590 / PTA459-F1500T)	Mettler Toledo	1

ATTACHMENT 8 TO
 FAT IQ TEST PROTOCOL
 DELUMPWITT
 PAGE 1 OF 5
 Cheryl 21 MAY 14



Type / Typ / Type	Référence / Referenz / Reference	Pression / Druck / Pressure
ConiWitt-250	A	min. 5 barg
	B	2.4 barg
	C	2 barg

Dimensions without tolerance (mm)		above	6	30	120	400	1000
Machining	ISO 2768-m	up to	30	120	400	1000	2000
Welding	Assembly-ISO 2768-c		+0.10	+0.20	+0.30	+0.50	+0.80
			+0.30	+0.50	+0.80	+1.20	+2.00

MATERIAL :	
Scale	Similar
%	457598
Weight (kg)	
A3	

Designed	04/05/2011	lble
Controlled	20/05/2014	edgu
Revised	20/05/2014	edgu

Page	Ver.
1/1	B

Schéma pneumatique ATEX DelumpWitt Novartis

FRUITWITT

FRUITWITT SA, Mining and Handling of Powder
P.O. Box 15, CH-1701 Fribourg, SWITZERLAND
www.fruitwitt.com
info@fruitwitt.com

ATTACHMENT 8 TO
FAT IQ TEST PROTOCOL
DELUMPWITT
PAGE 2 OF 5
chemp/15 MAY 15

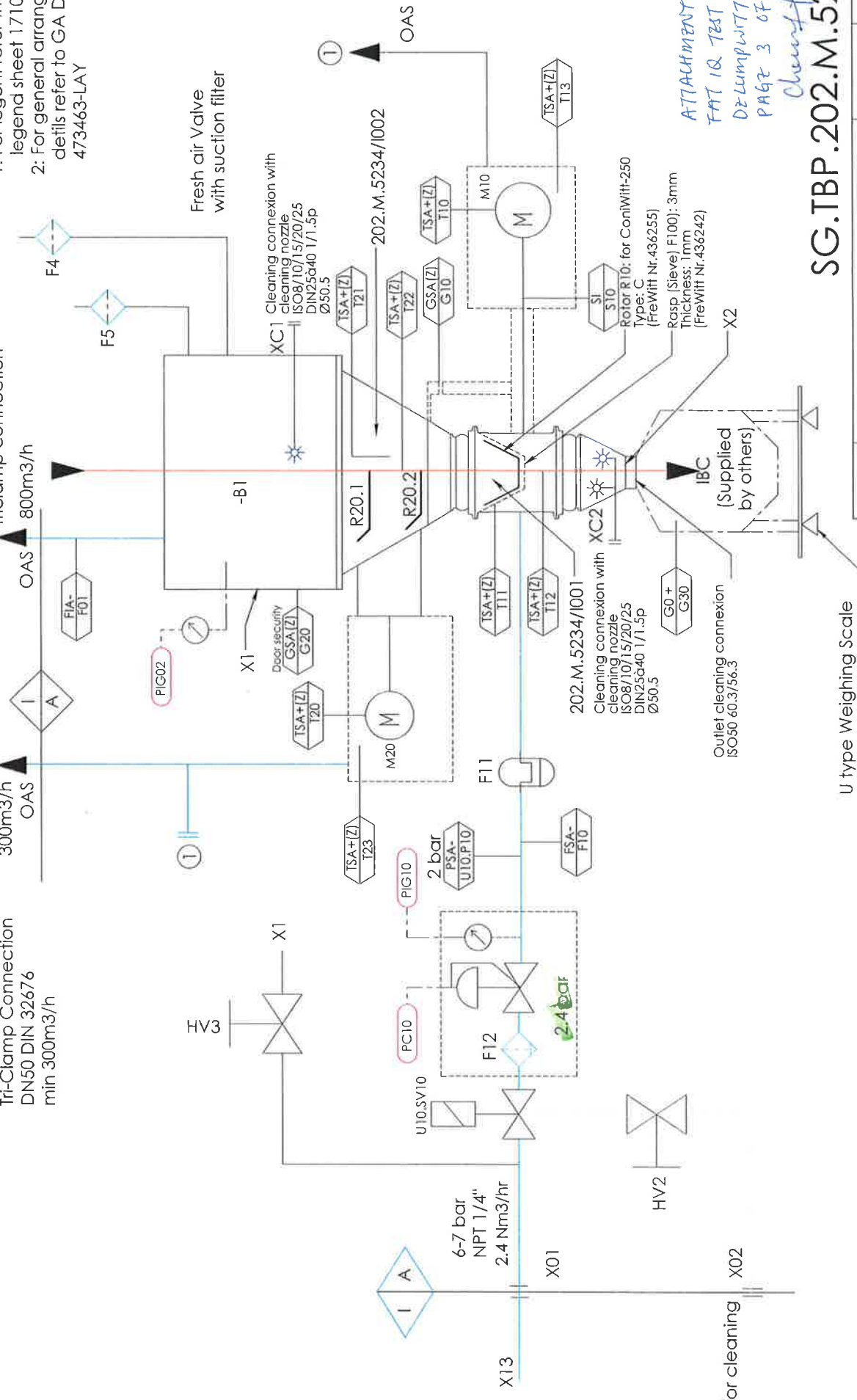
ATTACHMENT 8 TO
FAT IQ TEST PROTOCOL
DELUMPWITT
PAGE 3 OF 5
Chemical analysis

General notes:

- 1: For legend refer the legend sheet 171097
- 2: For general arrangement details refer to GA DWG 473463-LAY

X04 :Air suction Inlet funnel
Jackob Connection DN100
Triclamp connection
800m3/h

X03 :Air suction for ConiWitt
and Profi-Sword
Tri-Clamp Connection
DN50 DIN 32676
min 300m3/h



SG.TBP.202.M.5234

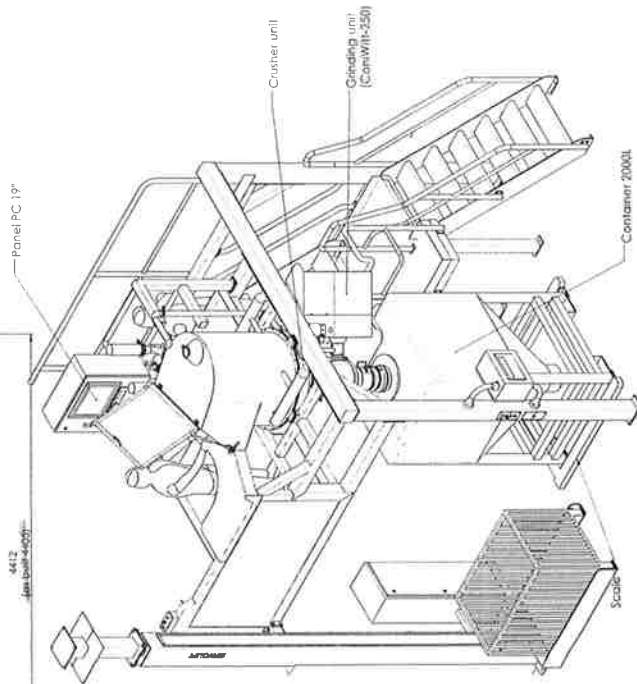
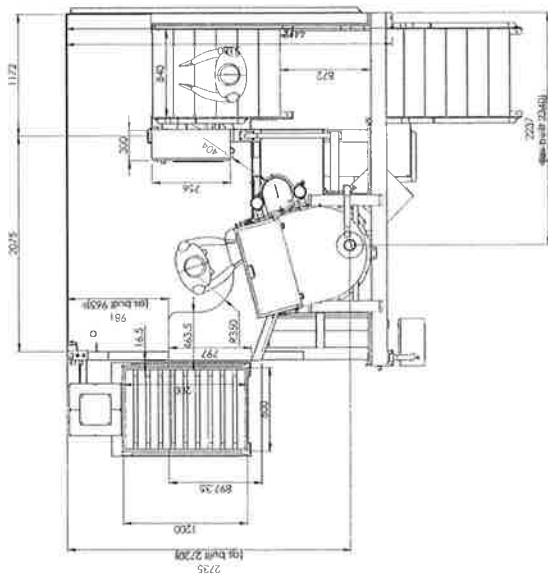
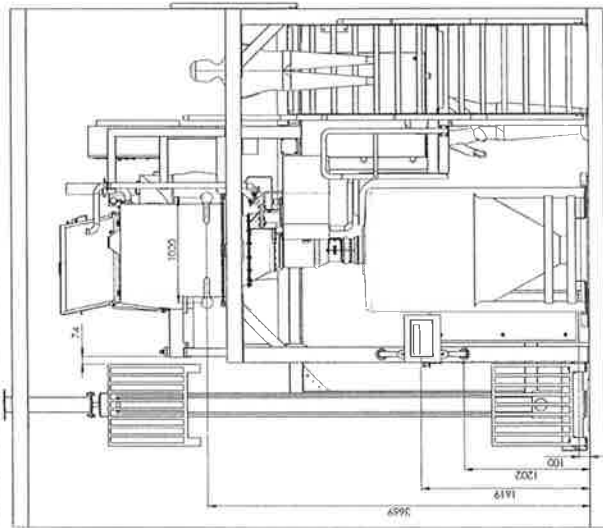
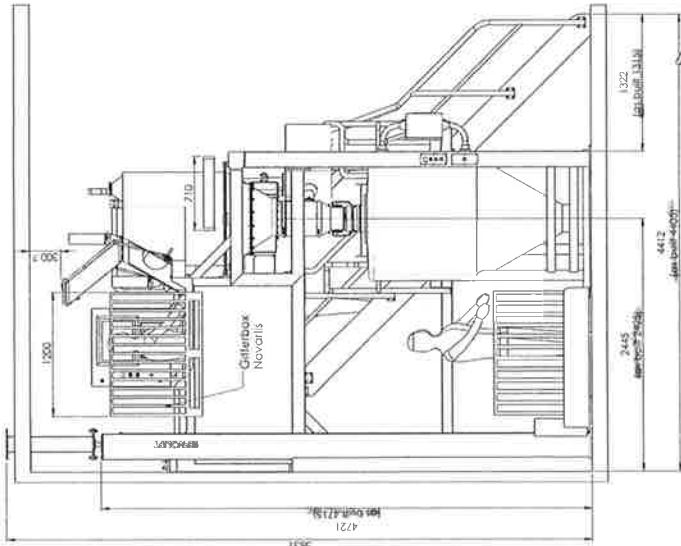
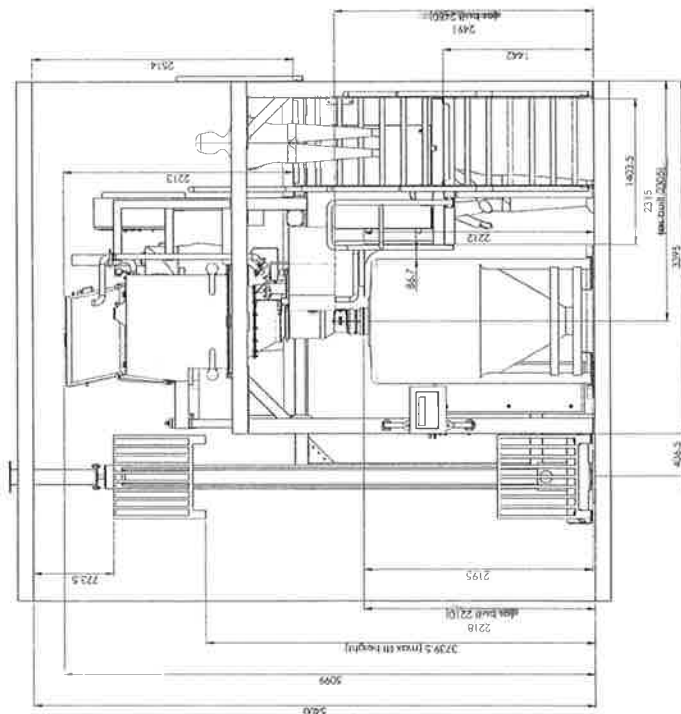
U type Weighing Scale
202.M.0914/W013

AIEX category	Int II / G / D Ex 3D	ISO 2768-m
Voltage [V]	400	ISO 2768-c
Power [kW]	75 / 1.5	Designed
Frequency [Hz]	50	19/02/2014
Speed [mm-1]	200-400	Controlled
Scale	%	20/05/2014
Scale	A3	Revised
Page	1/1	Ver
473871		B

I=Infrastructure
A=Installation
(Z)=Security

General notes:

1. Material of construction :
 - Product contact parts AISI 316/316L
 - Non-product contact parts AISI 304/304L
2. Surface finish :
 - Product contact part < Ra 0.4
 - Non-product contact parts < Ra 1.4
3. All non-metallic parts in contact with product shall be FDA approved food grade
4. Design fabrication shall comply with GMP requirement with no sharp corners, dead legs, easily drainable and crevices free



ATTACHMENT 8 70
 FAT IQ TEST PROTOCOL
 DELUMPWITT
 PAGE 4 OF 5

Change 21 MAY 15

Total installed empty weight : 3000kg
 Total operating weight : 4000kg

SG.TBP.202.M.5234

Developed by the Novartis Group
 Approved by the Novartis Group

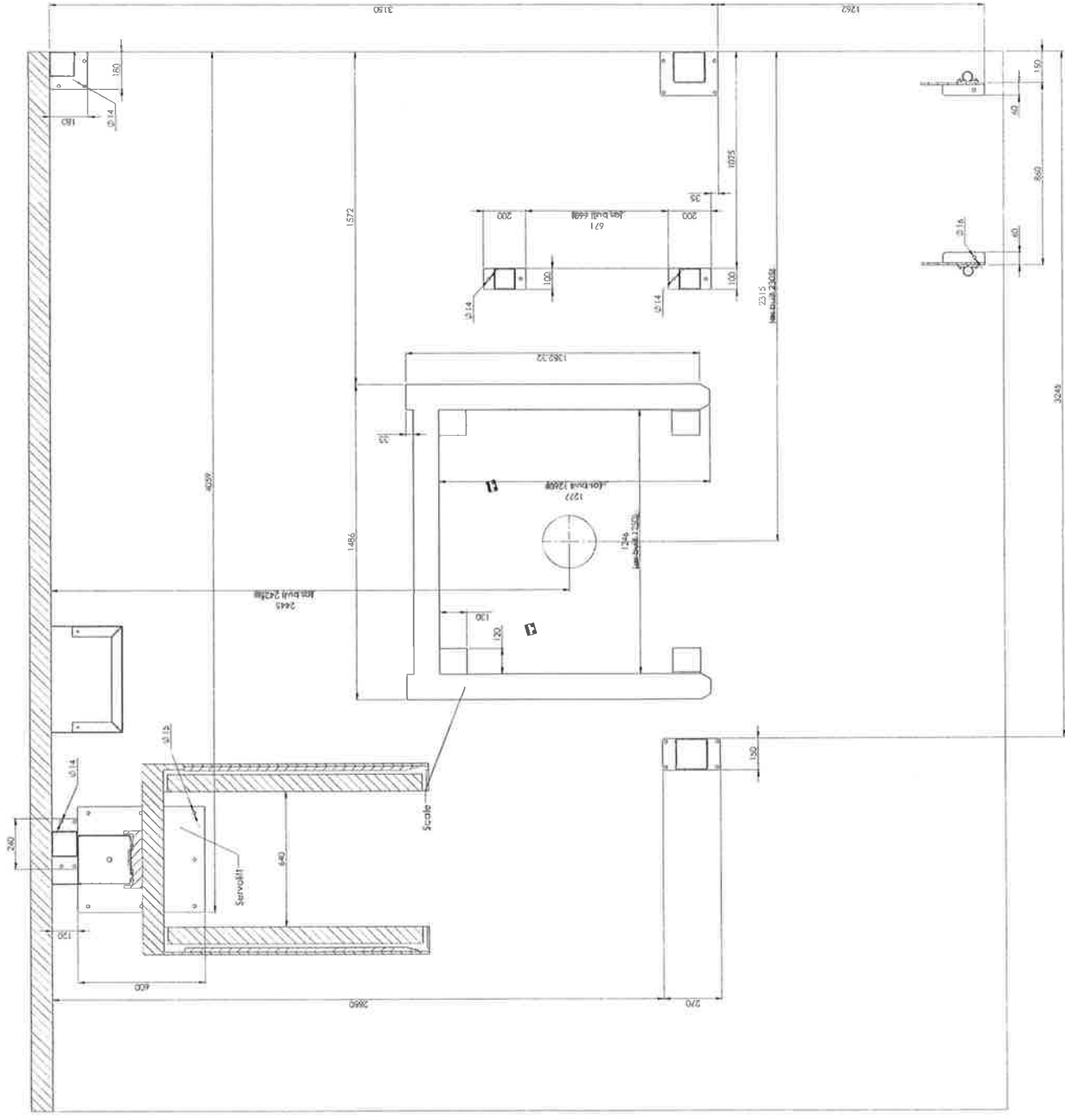
REV	DATE	BY	CHKD	APPV	DESCRIPTION
1	15/05/15				Issue for qualification
2	15/05/15				Issue for qualification
3	15/05/15				Issue for qualification
4	15/05/15				Issue for qualification
5	15/05/15				Issue for qualification
6	15/05/15				Issue for qualification
7	15/05/15				Issue for qualification
8	15/05/15				Issue for qualification
9	15/05/15				Issue for qualification
10	15/05/15				Issue for qualification
11	15/05/15				Issue for qualification
12	15/05/15				Issue for qualification
13	15/05/15				Issue for qualification
14	15/05/15				Issue for qualification
15	15/05/15				Issue for qualification
16	15/05/15				Issue for qualification
17	15/05/15				Issue for qualification
18	15/05/15				Issue for qualification
19	15/05/15				Issue for qualification
20	15/05/15				Issue for qualification
21	15/05/15				Issue for qualification
22	15/05/15				Issue for qualification
23	15/05/15				Issue for qualification
24	15/05/15				Issue for qualification
25	15/05/15				Issue for qualification
26	15/05/15				Issue for qualification
27	15/05/15				Issue for qualification
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30	15/05/15				Issue for qualification
31	15/05/15				Issue for qualification
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35	15/05/15				Issue for qualification
36	15/05/15				Issue for qualification
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68	15/05/15				Issue for qualification
69	15/05/15				Issue for qualification
70	15/05/15				Issue for qualification

ATTACHMENT 8 TO
IAT IQ TEST PROTOCOL
DELUMPHWITT
PAGE 5 OF 5

Chemistry 21 MAY 14

SG.TBP.202.M.5234

PRO-14-0017 / DelumpWitt	473463-LAY	27	5



Attachment 9 to FAT IQ DelumWitt

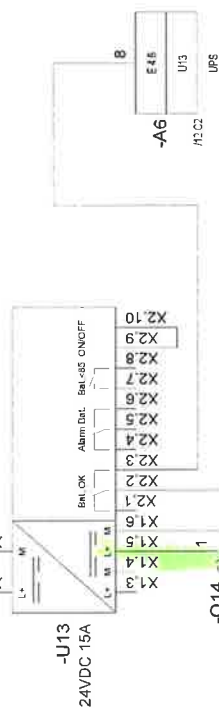
pg 1 of 3

A 220914

Revised Drawing

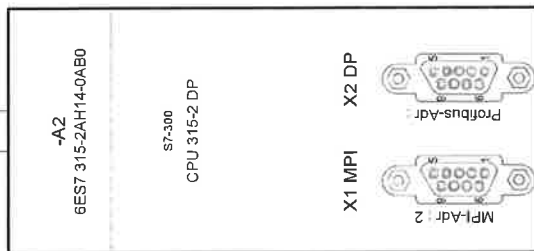
24VDC → /12.A1
0VDC → /12.A1

/9.AB1 24VDC
/9.C8 24VDC 16A/45.0A
/9.E8 0VDC



-A5 6ES7 322-1BH01-0AA0	
1L+	1M 2L+ 2M
○ 2	A20
○ 3	A21
○ 4	A22
○ 5	A23
○ 6	A24
○ 7	A25
○ 8	A26
○ 9	A27
○ 10	A28
○ 11	A29
○ 12	A30
○ 13	A31
○ 14	A32
○ 15	A33
○ 16	A34
○ 17	A35
○ 18	A36
○ 19	A37

-A4 6ES7 321-1BH02-0AA0	
○ 2	E00
○ 3	E01
○ 4	E02
○ 5	E03
○ 6	E04
○ 7	E05
○ 8	E06
○ 9	E07
○ 10	E08
○ 11	E09
○ 12	E10
○ 13	E11
○ 14	E12
○ 15	E13
○ 16	E14
○ 17	E15
○ 18	E16
○ 19	E17

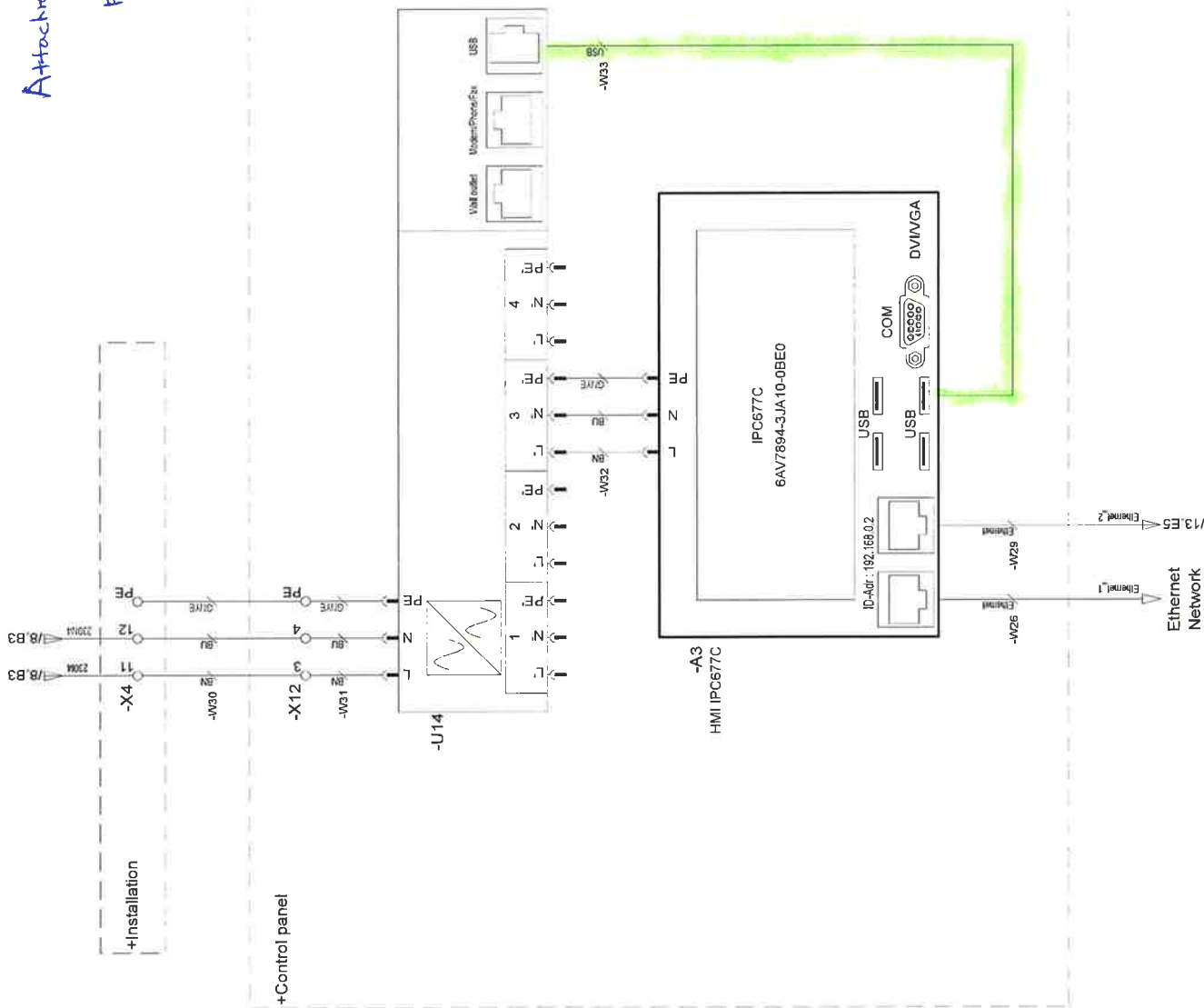


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Initial version	14.02.2014	phh	Date	14.02.2014	Novartis Singapore, SG-Singapore	03 - Electrical diagram	Type : PF - Installation	473825	+Electrical cabinet	10 / 53
Project change	19.05.2014	phh	User	phh	PRD-14-0012	PLC				
Project follow-up	22.05.2014	phh	Proved	phh	400V,50Hz,3P+N+PE					
Change			Name	Standard	Origin	Repl. I.	Repl. by			

Attachment 9 to FAT IQ DelumpWitt
Pg 2 of 3

Handwritten signature
22 May 14



Novartis Singapore, SG-Singapore
PRO-14-0012+PE
400V, 50Hz, 3P+N+PE

Change	Date	Name	Standard
Project closure	19.05.2014	vin	phtha
Project follow-up	21.05.2014	vin	phtha

14.02.2014
Date
14.02.2014
Date
14.02.2014
Date

Repl. I
Repl. I

Origin

Type : PF - Installation
473825

03 - Electrical diagram

Electrical cabinet

Page
11 / 53

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00DC → /14.E1

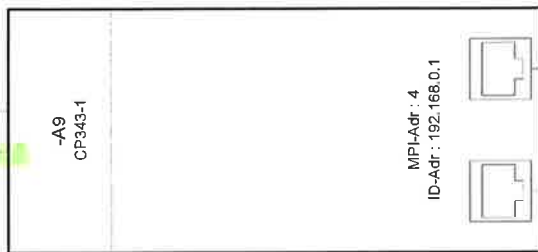
/12.A8 → 00DC

/10.B6 → 20DC_014

/10.B6 → 00DC

/12.B6 → 20DC_015

Attachment 9 to FAT 00
 Relumpwitt
 pg 3 of 3




L+ M		24V DC		-A8	
S7-300		SM 334		6ES7 334-0CE01-0AA0	
Channel	U / I	Adresse			
2	MV0+	PEW136	/18 D4 T3	Temperature control 1	
3	CH0	PEW138	/18 D7 T3	Temperature control 2	
4	MV0+				
5	MV1+				
6	M1-				
7	M1+				
8	MV2+				
9	M2-	PEW140	/23 B7 Reserve	Reserve	
10	M2+				
11	MV3+				
12	M3-	PEW142	/23 B7 Reserve	Reserve	
13	M3+				
14	QV0				
15	QMANA	PAW134	/23 D7 Reserve	Reserve	
16	QD				
17	QV1				
18	QMANA	PAW136	/23 D7 Reserve	Reserve	
19	QI1				

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Status	Change	Date	Name	Standard	Origin	Repl. by	Repl. t.	3	4	5	6	7	8
A	Initial version	14.02.2014	phba										
B	Project closure	19.05.2014	vn	User	phba								
C	Project closure	22.05.2014	vn	Provid	phba								
Novartis Singapore, SG-Singapore PRO-14-0012 400V,50Hz,3P+N+PE										Type : PF - Installation 473825		*Electrical cabinet Page 13 / 53	
03 - Electrical diagram PLC										03 - Electrical diagram PLC			



14. IQ – Conclusion

FAT IQ EXECUTED WITH 9 DEVIATIONS RAISED. ALL DEVIATIONS WERE SUCCESSFULLY CLOSED. Cheryl 22 MAY 14

[Large diagonal line across the page]

NA

Cheryl 22 MAY 14

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QUALIFICATION IQ
DELUMPWITT (CRUSHER/GRINDING)
18 / 19



15. Deviation Sheet

DEVIATION = 01.

Deviation To Test No:	2-3.
Description of Deviation ON SITE DIMENSIONS ARE NOT AS PER DOCUMENTED IN 473463-LAY	
Evaluation and Proposed Corrective Action DIMENSIONS TO BE INCLUDED AS "AS BUILT" IN REVISION B	
Resolution 473463-LAY REVISED TO REVISION B AND REPLACED IN THE DELUMPWITT OPERATING INSTRUCTIONS REFER TO ATTACHMENT 8 IN FAT IQ PROTOCOL	

Deviation Prepared By				
Name	Signature Reason	Department / Function	Date	Signature
CHRISTINA CHEN.	Author	NSPM PROCESS ENGINEER	21 MAY 14	

Deviation Accepted By				
Name	Signature Reason	Department / Function	Date	Signature
Grossrieder Urs	Approver	Frewitt Project manager	21.05.14	

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**QUALIFICATION IQ
DELUMPWITT (CRUSHER/GRINDING)
18 / 19**



15. Deviation Sheet

DEVIATION = 03

Deviation To Test No:	7.8
Description of Deviation	
The description for the pump motor for the hoist is 2.2 kW and actual result is 1.5 kW. REFER TO ATTACHMENT 1	
Evaluation and Proposed Corrective Action	
It was a typing error on the qualification document. The standard motor for the hoist is a 1.5 kW motor and the hoist was tested by servolift with a load of 600 kg.	
Resolution	
no modification	

Deviation Prepared By				
Name	Signature Reason	Department / Function	Date	Signature
Grossi edler Yves	Author	Project manager	19.05.14	

Deviation Accepted By				
Name	Signature Reason	Department / Function	Date	Signature
CHRISTINA CHEN	Approver	NSPM PROCESS ENGINEER	20 MAY 14	

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SIEMENS 3-MOT1LA7096-4AA19-Z
Digital Siemens Made in Czech Rep. UD 1404/1611874-001-001
 14.2kg P55 90L MW18 IEC/EN 60034 Th.C1.155(F) -20° C <= TAMB <= 40° C
 50 Hz 230/400 V Δ/Y 60 Hz 460 V Y
 1.5 kW 6.0/3.45 A 1.75 kW 3.30 A
 cosφ=0.81 1420/min cosφ=0.82 1720/min
 EI-71.2% II 3.0 EX I MB T125° C Dc EI-81.5%
IE1 **CCC** **CE**

ATTACHMENT 1 TO DEVIATION 03 OF
 FATIGUE TEST PROTOCOL DELUMPWITT
 PAGE 21 OF 1 Chemnitz 20 MAY 14

15

**QUALIFICATION IQ
DELUMPWITT (CRUSHER/GRINDING)
18 / 19**



15. Deviation Sheet

DEVIATION = 04

Deviation Test No:	7-9
Description of Deviation	
On the Acceptance criteria for the electrical connection for the hoist it is mention 400V 50Hz 3Ph+N+E but the N is not needed.	
Evaluation and Proposed Corrective Action	
The N on the Acceptance criteria was a typing error.	
Resolution	
no modification	

Deviation Prepared By				
Name	Signature Reason	Department / Function	Date	Signature
Grossi edna Jus	Author	Project manager	19.05.14	

Deviation Accepted By				
Name	Signature Reason	Department / Function	Date	Signature
CHRISTINA CHEN	Approver	NSPM PROCESS ENGINEER	20 MAY 14	

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QUALIFICATION IQ
DELUMPWITT (CRUSHER/GRINDING)
18 / 19



15. Deviation Sheet

DEVIATION = 05

Deviation To Test No:	8.3
Description of Deviation	
The acceptance criteria for the crusher unit motor is 4P LSPX 80L 0,70kW and the result is LSPX 80 LG 0,75kW	
Evaluation and Proposed Corrective Action	
This deviation is acceptable and as no influence on the process.	
Resolution	
no modification	

Deviation Prepared By				
Name	Signature Reason	Department / Function	Date	Signature
Grossrieder Yves	Author	Project manager	19.05.14	

Deviation Accepted By				
Name	Signature Reason	Department / Function	Date	Signature
CHRISTINA CHEN	Approver	NSPM PROCESS ENGINEER	20 MAY 14	

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18 / 19



15. Deviation Sheet

EE
Cheriff 20 MAY 14

DEVIATION: 806

Deviation To Test No:	8.4
Description of Deviation	
The acceptance criteria for the reduction for the crusher unit is 439572 Lenze Gk ROS-2NHAK-7C 439572 and there is no mention of 439572 on the reduction geo-box.	
Evaluation and Proposed Corrective Action	
This deviation is acceptable because de number 439522 is the Frewitt internal part number.	
Resolution	
no modification	

Deviation Prepared By				
Name	Signature Reason	Department / Function	Date	Signature
Gross-eder Yves	Author 	Project manager	19.05.14	

Deviation Accepted By				
Name	Signature Reason	Department / Function	Date	Signature
CHRISTINA CHEN	Approver	N/SPM PROCESS ENGINEER	20MAY14	

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QUALIFICATION IQ
DELUMPWITT (CRUSHER/GRINDING)
18 / 19



15. Deviation Sheet

DEVIATION = 07

Deviation To Test No:	9.2
Description of Deviation	
FILTER F12 IS WRONGLY MARKED AS F1 PRESSURE REQUIRED FOR REFERENCE B IS 2.4 BARG REFER TO ATTACHMENT 7 IN FAT IQ PROTOCOL.	
Evaluation and Proposed Corrective Action	
DRAWING 464782 - SCH TO BE REVISED AS PER REDLINED IN ATTACHMENT 7 IN FAT IQ PROTOCOL	
Resolution	
DRAWING 464782 - SCH REVISED TO REVISION B. AND REPLACED IN THE DELUMPWITT OPERATING INSTRUCTIONS. REFER TO ATTACHMENT 8 IN FAT IQ PROTOCOL.	

Deviation Prepared By				
Name	Signature Reason	Department / Function	Date	Signature
CHRISTINA CHEN	Author	NSPM PROCESS ENGINEER	19 MAY 14	

Deviation Accepted By				
Name	Signature Reason	Department / Function	Date	Signature
Grassmader Y. 23	Approver	Frewitt Project manager	21.05.14	

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DELUMPWITT (CRUSHER/GRINDING)
18 / 19



15. Deviation Sheet

DEVIATION = 08

Deviation To Test No:	9.1
Description of Deviation	
<p>All connections w.r.t to machine and control system are correct, except for the connection between UPS and HMI which was notified rectified ^{21 May 14} on 20 May 14.</p>	
Evaluation and Proposed Corrective Action	
<p>No impact on machine functionality. To update Wiring Diagram 473825 from Rev B to C</p>	
Resolution	
<p>Document Revised Refer to Attachment 9 in FAT IQ Protocol.</p>	

Deviation Prepared By				
Name	Signature Reason	Department / Function	Date	Signature
Shivabalan Karesa	Author	NSPM Automation	21 May 14	

Deviation Accepted By				
Name	Signature Reason	Department / Function	Date	Signature
Grossrieder Gues	Approver	Frewitt Project manager	22.05.14	

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QUALIFICATION IQ
DELUMPWITT (CRUSHER/GRINDING)
18 / 19



15. Deviation Sheet

DEVIATION: 09

Deviation To Test No:	12-2.
Description of Deviation COMPONENT AND INSTRUMENT DESCRIPTION AND SUPPLIER DO NOT MATCH AS BUILT. IN PART LIST (171097-1-EN) AND PID (473871, REV A)	
Evaluation and Proposed Corrective Action PART LIST (171097-1-EN) AND PID (473871, REV A) TO BE REVISED AS PER ATTACHED IN ATTACHMENT 6	
Resolution DOCUMENTS REVISED. REFER TO ATTACHMENT 8 IN FAT IQ PROTOCOL DOCUMENTS REPLACED IN THE DELUMPWITT OPERATING INSTRUCTIONS.	

Deviation Prepared By				
Name	Signature Reason	Department / Function	Date	Signature
CHRISTINA CHEN	Author	NSPM PROCESS ENGINEER	19 MAY 14	

Deviation Accepted By				
Name	Signature Reason	Department / Function	Date	Signature
Grossrieder Yves	Approver	Frewitt Project manager	21.05.14	

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16. Post-Approval

This FAT-IQ test Protocol of the equipment has been executed and accepted by:

Name	Signature Reason	Function/ Department	Signature	Date
Edouard Gumy	Reviewer	Frewitt Project Manager		22.05.2014
Ho Sook Hwa	Reviewer	NSPM Qualification Coordinator		
Christina Chen	Approver	NSPM Process Engineer		
Shivabalan Kanesan	Approver	NSPM Automation Engineer		
Panicker Shreekumar	Approver	NSPM Technical Project Manager		
Yap Yee Boon	Approver	NSPM Project QA		

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- | | | | |
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|--|---|---|---|



FAT OQ Test Protocol

SG.TBP.202.M.5234

Delumpwitt



Project Name :	Novartis Singapore DelumpWitt
Client :	NOVARTIS SINGAPORE PHARMACEUTICAL
Location :	SG-Singapore
Customer Order # :	3000949997
Supplier :	Frewitt Fabrique de Machines S.A.
Object :	DelumpWitt (Crusher/Grinding)
Serial # :	14001235183 – Installation 14001243013 – Crusher Profi-Sword 14001219097 – Grinding CW-250

Document Name :	Qualification OQ DelumpWitt (Crusher/Grinding) 14001235183 – Installation 14001243013 – Crusher Profi-Sword 14001219097 – Grinding CW-250
Document Reference :	172420-2-en.docx
Document Version # :	02

Pre-Approval:

This FAT-OQ test Protocol of the equipment was created, reviewed and accepted by:

Name	Signature Reason	Function/ Department	Signature	Date
Karsten Kutnar	Author	Frewitt Project Manager		9.05.2014
Edouard Gummy	Reviewer	Frewitt Technical Project Manager		9.05.2014
Ho Sook Hwa	Reviewer	NSPM Qualification Coordinator		12 MAY 14
f. LOKE MAY LAM Christina Chen	Approver	NSPM Process Engineer		12 MAY 14
Shivabalan Kanesan	Approver	NSPM Automation Engineer		12 May 14
Panicker Shreekumar	Approver	NSPM Technical Project Manager		12 May 14
Yap Yee Boon	Approver	NSPM Project QA		14 May 14



1 Introduction

1.1 Purpose

The purpose of this document is to verify the control function of the machine and the properties of the machine as per documented evidence.

1.2 Operation qualification (OQ)

With this operation qualification the functions according to the functional specification are controlled and documented.

1.3 General

The protocol "Operation qualification (OQ)" defines the procedure for implementation of the qualification.

1.4 Basis

The following references are the basis of these documents

- General standards of GMP
- General standards of safety



OQ – DelumpWitt Novartis

Project: PRO-14-0012

2 Function tests

2.1 Test of each element

Test No.	Test Description	Expected Result Acceptance Criteria	Actual Results	Fulfilled (Y/N)	Deviation No.	Executed by : (Initial, Date)
1	Check Start/Stop	The machine can be switched on and off with the "Start" and "Stop" push buttons.	Machine can be switched on/off with Start/Stop buttons.	Y	NA	SH1 19May14
2	Check E-stop	The E-stop is pushed. The machine stops and an alarm message is indicated on the HMI. A direct start is not possible. After pressing the "reset" a new start is possible.	E-stop pushed. Machine stops and an alarm message is indicated on HMI. A direct start is not possible. After reset, a new start is possible.	Y	NA	SH1 19May14
3	Review of the function of flow control	Flow Control purge bearing of the mill. The minimum flow is simulated; the machine stops and indicates an alarm text.	Minimum flow is simulated, machine stops with an alarm setting: <0.8	Y	NA	SH1 20May14
4	Review of the function of flow control	Flow Control purge bearing mill. The minimum pressure is simulated; the machine stops and indicates an alarm text.	Minimum Pressure is simulated. Machine stops with an alarm	Y	NA	SH1 20May14



OQ – DelumpWitt Novartis

Project: PRO-14-0012

Test No.	Test Description	Expected Result Acceptance Criteria	Actual Results	Fulfilled (Y/N)	Deviation No.	Executed by : (Initial, Date)
5	Check of PTC	The following temperature sensors are used. The switching is simulated. The machine stops and an alarm is displayed. 1.TSA+T11 PTC mill sieve 2.TSA+T12 PTC mill bearing 3.TSA+T21 PTC crusher bearing 4.TSA+T22 PTC crusher bearing 5. TSA+T20 PTC crusher motor 6.TSA+T10 PTC mill motor	Machine stops and an alarm is displayed for 1-6 on the HMI. Refer to attached 1	Y	NA	SHI 19Maj14
6	Parameterization exists and is documented for the mill	Parameterization exists for the mill drive(CD or Paper)	Refer to Operating Instructions 14-0012 Chpt 7	Y	NA	SHI 20Maj14
7	Check the speed setting according recipes	Speed setting of the mill is possible Recipes 1 100 r/min; Recipes 2 700 r/min;	Speed setting 100-700 possible	Y	NA	SHI 19Maj14
8	Parameterization exists and is documented for the crusher module	Parameterization exists for the crusher drive (CD or Paper)	Refer to Operating Instructions 14-0012 Chpt 7	Y	NA	SHI 20Maj14



OQ – DelumpWitt Novartis

Project: PRO-14-0012

Test No.	Test Description	Expected Result Acceptance Criteria	Actual Results	Fulfilled (Y/N)	Deviation No.	Executed by : (Initial, Date)
9	Check the speed setting of the crusher	Speed setting of crusher is possible from 10- 14 r/min An exceeding or falling under the limits is not possible.	Speed setting 10-14 rpm. possible Limits cannot be exceeded	Y	NA	SH1 19Maj14
10	Input / Review of the process parameters for each batch	Input / Review of the process parameters for each batch must be possible. A batch report is printed out and verifies the parameters, alarm messages and audit trail.	Belt h Report Contents → Parameter → Audit Trail → Batch Data → Alarms OK	Y +	NA	SH1 19Maj14
11	Drain ability check	Cleaning drainability check to be carried out	Cleaning draining can be carried out	Y	NA	SH1 19Maj14
12	Check Vibrator operation	Vibrator operation in inlet	Vibrator working ok.	X	NA	SH1 19Maj14
13	Check inlet-safety magnetic switch operation	To check the Delumpwitt does not start while ConiWitt is not in good position	Delumpwitt cannot start GZA (Z) G10/G20 Error Safety Protection	X	NA	SH1 19Maj14
14	Test function of safety switches (interlocks) door inlet funnel	To check the Delumpwitt does not start while the ConiWitt is not in good position	Delumpwitt cannot start. GZA (Z) G10/G20 Error safety Protection.	Y	NA	SH1 19Maj14
15	Test power of	Switching off power and switching on again. New login is needed, but parameters stay.	Switching off and on again directly Login required but parameters stay	Y ++	NA	SH1 19Maj14

Att 2

* Note : UTC Timestamps has been changed to -8 (GMT+8 Singapore Time).

This will be checked during SAT after connection to Novartis Domain 19Maj14

Testing of UPS Power Duration

++ This was tested after PLC is automatically powered down when Delumpwitt Panel is switched off. UPS is able to last more than 20 min, in a separate verification check to sustain the HMI, preventing it from shutting down etc. 19Maj14.



OQ – DelumpWitt Novartis

Project: PRO-14-0012


Test No.	Test Description	Expected Result Acceptance Criteria	Actual Results	Fulfilled (Y/N)	Deviation No.	Executed by : (Initial, Date)
16	Access level: Record the privileges check for each level.	Login with different access levels to check the accesses	All access levels are verified and working. Note: This was tested with local accounts. Attachment#: <u>7</u>	Y	NA	SHI 19Maj14
17	Verify the user is locked out when he enters the wrong password 3 times. Verify the user is logged off after 15 min of idle time	The user is locked out when he enters the wrong password 3 times. The user is logged off after 15 min of idle time	The user is locked out when he enters wrong password 3 times. The user is logged off after 15 min of idle time. Note: This was tested with local accounts.	Y	NA	SHI 19Maj14
18	Alarms Test	Alarms (including the description) are simulated according to alarm list defined in the FDS.	All alarms tested ok, against FDS Attachment#: <u>1, 2, 3, 4, 5, 6</u>	Y	NA	SHI 19Maj14
19	Graphic Verification against the DelumpWitt FDS	Graphics (including tag-names) is verified to be correct against the DelumpWitt FDS	Graphics verified ok against FDS Attachment#: <u>8</u>	Y	NA	SHI 19Maj14



OQ – DelumpWitt Novartis

Project: PRO-14-0012

Test No.	Test Description	Expected Result Acceptance Criteria	Actual Results	Fulfilled (Y/N)	Deviation No.	Executed by : (Initial, Date)
20	Magnetic Separator Test Note: This can be tested with gauss meter if present	Magnetic separator can function correctly.	Magnetic separator can function correctly.	Y	NA	SHI 19/04/14


Note, only functional deck was performed. without gauss meter.  19/04/14



4 OQ – Conclusion

FAT OQ DelumpWitt passed without Deviations.

- All access login w.r.t local accounts tested successfully, domain logins can only be tested during SAT at NSPM, Simatic Logon to be configured onsite.

 21 May 14

NA SPM
21 May 14



OQ – DelumpWitt Novartis

Project: PRO-14-0012

5 Deviation Sheet

Deviation To Test No:	
Description of Deviation	
Evaluation and Proposed Corrective Action	
Resolution	

N/A
STI
2/May/14

Deviation Prepared By				
Name	Signature Reason	Department / Function	Date	Signature
	Author			

Deviation Accepted By				
Name	Signature Reason	Department / Function	Date	Signature
	Approver			



OQ – DelumpWitt Novartis

Project: PRO-14-0012

6 Post-Approval

This FAT-OQ test Protocol of the equipment has been executed and accepted by:

Name	Signature Reason	Function/ Department	Signature	Date
Edouard Gummy	Reviewer	Frewitt Technical Project Manager		22.05.2014
Ho Sook Hwa	Reviewer	NSPM Qualification Coordinator		
Christina Chen	Approver	NSPM Process Engineer		
Shivabalan Kanesan	Approver	NSPM Automation Engineer		
Panicker Shreekumar	Approver	NSPM Technical Project Manager		
Yap Yee Boon	Approver	NSPM Project QA		

Attachment 1 to FAT OQ DelumpWitt
Test 5, 10, 18

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19 May 14

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EG

SHI
19 May 14

Batch report

DelumpWitt SG.TBP.202.M.5234

19/05/2014 15:33:02

Operator: Admin Batch name: SD0001-1-1
 Start batch: 19/05/2014 14:54:34 Product name: ABCD
 Batch end: 19/05/2014 15:33:01 Product number: 987654

Screening Metformin
 Speed mill LL Setpoint HL Feedback
 350 400 450 404
 Speed crusher 14.0

Screening HPC
 Speed mill LL Setpoint HL Feedback
 80 100 120 100
 Speed crusher 10.0

Event

No.	Time	Status	Date
24	15:32:56	(A)D	19/05/2014
	Stop active		
24	15:32:55	A	19/05/2014
	Stop active		
25	15:32:49	(A)D	19/05/2014
	Start active		
25	15:32:47	A	19/05/2014
	Start active		
24	15:32:44	(A)D	19/05/2014
	Stop active		
24	15:32:43	A	19/05/2014
	Stop active		
25	15:30:48	(A)D	19/05/2014
	Start active		
25	15:30:47	A	19/05/2014
	Start active		
24	15:30:42	(A)D	19/05/2014
	Stop active		
24	15:30:41	A	19/05/2014
	Stop active		
25	15:30:32	(A)D	19/05/2014
	Start active		
25	15:30:31	A	19/05/2014
	Start active		

Date : 19 May 14

Signature : 

Page : 1

Total pages : 7

Attachment 1 to FAT OQ DelumpWitt

(172420-2)

test 5,10,18

pg 2 of 7
19mgl

Batch report

DelumpWitt SG.TBP.202.M.5234

19/05/2014 15:33:02

No.	Time	Status	Date
28	15:30:28	(AD)Q	19/05/2014
	G30 Container not detected		
28	15:30:00	(A)D	19/05/2014
	G30 Container not detected		
25	15:29:55	(A)D	19/05/2014
	Start active		
25	15:29:53	A	19/05/2014
	Start active		
28	15:29:37	A	19/05/2014
	G30 Container not detected		
25	15:29:37	(A)D	19/05/2014
	Start active		
25	15:29:36	A	19/05/2014
	Start active		
23	15:29:22	(AD)Q	19/05/2014
	TIA+T23 PT100 Error temperature top		
23	15:29:17	(A)D	19/05/2014
	TIA+T23 PT100 Error temperature top		
23	15:28:42	A	19/05/2014
	TIA+T23 PT100 Error temperature top		
23	15:28:25	(AQ)D	19/05/2014
	TIA+T23 PT100 Error temperature top		
22	15:28:25	(AQ)D	19/05/2014
	TIA+T13 PT100 Error temperature bottom		
23	15:28:25	(A)Q	19/05/2014
	TIA+T23 PT100 Error temperature top		
22	15:28:25	(A)Q	19/05/2014
	TIA+T13 PT100 Error temperature bottom		
23	15:28:00	A	19/05/2014
	TIA+T23 PT100 Error temperature top		
22	15:27:36	A	19/05/2014
	TIA+T13 PT100 Error temperature bottom		
25	15:26:00	(A)D	19/05/2014
	Start active		
25	15:25:59	A	19/05/2014
	Start active		
13	15:25:11	(AQ)D	19/05/2014
	M20 Error motor crusher		
13	15:25:11	(A)Q	19/05/2014
	M20 Error motor crusher		
25	15:25:07	(A)D	19/05/2014
	Start active		
25	15:25:05	A	19/05/2014
	Start active		
25	15:25:03	(A)D	19/05/2014
	Start active		

Date : 19mgl

Signature : 

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Total pages : 7

Attachment 1 to FAT OQ DelumpWitt
Test 5,10,18 (172420-2)
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A. Langit

Batch report

DelumpWitt SG.TBP.202.M.5234

19/05/2014 15:33:02

No.	Time	Status	Date
25	15:25:02	A	19/05/2014
	Start active		
13	15:24:51	A	19/05/2014
	M20 Error motor crusher		
25	15:24:45	(A)D	19/05/2014
	Start active		
25	15:24:44	A	19/05/2014
	Start active		
14	15:24:41	(AQ)D	19/05/2014
	M10 Error motor mill		
14	15:24:41	(A)Q	19/05/2014
	M10 Error motor mill		
14	15:24:16	A	19/05/2014
	M10 Error motor mill		
25	15:24:12	(A)D	19/05/2014
	Start active		
25	15:24:10	A	19/05/2014
	Start active		
26	15:14:06	(AD)Q	19/05/2014
	Element still in manual mode		
26	15:12:47	(A)D	19/05/2014
	Element still in manual mode		
26	15:12:31	A	19/05/2014
	Element still in manual mode		
18	15:12:07	(AQ)D	19/05/2014
	M20 Motor crusher maintenance switch open		
10	15:12:07	(AQ)D	19/05/2014
	M20 Error motor protection switch crusher(Q3)		
18	15:12:07	(A)Q	19/05/2014
	M20 Motor crusher maintenance switch open		
10	15:12:07	(A)Q	19/05/2014
	M20 Error motor protection switch crusher(Q3)		
18	15:11:40	A	19/05/2014
	M20 Motor crusher maintenance switch open		
10	15:11:37	A	19/05/2014
	M20 Error motor protection switch crusher(Q3)		
11	15:11:35	(AQ)D	19/05/2014
	M10 Error motor protection switch mill(Q2)		
11	15:11:35	(A)Q	19/05/2014
	M10 Error motor protection switch mill(Q2)		
11	15:11:15	A	19/05/2014
	M10 Error motor protection switch mill(Q2)		
17	15:11:02	(AQ)D	19/05/2014
	M10 Motor mill maintenance switch open		
17	15:11:02	(A)Q	19/05/2014
	M10 Motor mill maintenance switch open		

Date : 19Mg14

Signature : 

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Total pages : 7

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Test S,10,18 (172420-2)
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Batch report

DelumpWitt SG.TBP.202.M.5234

19/05/2014 15:33:02

No.	Time	Status	Date
17	15:10:55	A	19/05/2014
	M10 Motor mill maintenance switch open		
18	15:10:48	(AQ)D	19/05/2014
	M20 Motor crusher maintenance switch open		
18	15:10:48	(A)Q	19/05/2014
	M20 Motor crusher maintenance switch open		
18	15:10:25	A	19/05/2014
	M20 Motor crusher maintenance switch open		
2	15:10:20	(AQ)D	19/05/2014
	GSA(Z) G10/G20 Error safety protection		
2	15:09:55	(A)Q	19/05/2014
	GSA(Z) G10/G20 Error safety protection		
2	15:09:40	A	19/05/2014
	GSA(Z) G10/G20 Error safety protection		
18	15:09:13	(AQ)D	19/05/2014
	M20 Motor crusher maintenance switch open		
17	15:09:13	(AQ)D	19/05/2014
	M10 Motor mill maintenance switch open		
9	15:09:13	(AQ)D	19/05/2014
	TSA+ (Z)T10 Error PTC motor mill		
8	15:09:13	(AQ)D	19/05/2014
	TSA+ (Z)T20 Error PTC motor crusher		
7	15:09:13	(AQ)D	19/05/2014
	TSA+ (Z)T22 Error PTC crusher bearing		
6	15:09:13	(AQ)D	19/05/2014
	TSA+ (Z)T21 Error PTC crusher bearing		
5	15:09:13	(AQ)D	19/05/2014
	TSA+ (Z)T12 Error PTC mill bearing		
4	15:09:13	(AQ)D	19/05/2014
	TSA+ (Z)T11 Error PTC mill sieve		
18	15:09:13	(A)Q	19/05/2014
	M20 Motor crusher maintenance switch open		
17	15:09:13	(A)Q	19/05/2014
	M10 Motor mill maintenance switch open		
9	15:09:13	(A)Q	19/05/2014
	TSA+ (Z)T10 Error PTC motor mill		
8	15:09:13	(A)Q	19/05/2014
	TSA+ (Z)T20 Error PTC motor crusher		
7	15:09:13	(A)Q	19/05/2014
	TSA+ (Z)T22 Error PTC crusher bearing		
6	15:09:13	(A)Q	19/05/2014
	TSA+ (Z)T21 Error PTC crusher bearing		
5	15:09:13	(A)Q	19/05/2014
	TSA+ (Z)T12 Error PTC mill bearing		
4	15:09:13	(A)Q	19/05/2014
	TSA+ (Z)T11 Error PTC mill sieve		

Date : 19Mg14

Signature : 

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lamglt

Batch report

DelumpWitt SG.TBP.202.M.5234

19/05/2014 15:33:02

No.	Time	Status	Date
9	15:08:27	A	19/05/2014
	TSA+ (Z)T10 Error PTC motor mill		
8	15:08:05	A	19/05/2014
	TSA+ (Z)T20 Error PTC motor crusher		
25	15:06:50	(A)D	19/05/2014
	Start active		
25	15:06:48	A	19/05/2014
	Start active		
7	15:06:46	A	19/05/2014
	TSA+ (Z)T22 Error PTC crusher bearing		
6	15:06:25	A	19/05/2014
	TSA+ (Z)T21 Error PTC crusher bearing		
5	15:05:58	A	19/05/2014
	TSA+ (Z)T12 Error PTC mill bearing		
25	15:05:18	(A)D	19/05/2014
	Start active		
25	15:05:15	A	19/05/2014
	Start active		
17	15:05:15	A	19/05/2014
	M10 Motor mill maintenance switch open		
18	15:05:12	A	19/05/2014
	M20 Motor crusher maintenance switch open		
4	15:05:08	A	19/05/2014
	TSA+ (Z)T11 Error PTC mill sieve		
24	15:03:17	(A)D	19/05/2014
	Stop active		
24	15:03:15	A	19/05/2014
	Stop active		
25	15:03:13	(A)D	19/05/2014
	Start active		
25	15:03:10	A	19/05/2014
	Start active		
3	15:02:56	(AQ)D	19/05/2014
	PSA- U10.P10 Error flow control purge bearing mill		
3	15:02:56	(A)Q	19/05/2014
	PSA- U10.P10 Error flow control purge bearing mill		
3	15:02:33	A	19/05/2014
	PSA- U10.P10 Error flow control purge bearing mill		
25	15:01:29	(A)D	19/05/2014
	Start active		
25	15:01:28	A	19/05/2014
	Start active		
3	15:01:21	(AQ)D	19/05/2014
	PSA- U10.P10 Error flow control purge bearing mill		
3	15:01:21	(A)Q	19/05/2014
	PSA- U10.P10 Error flow control purge bearing mill		

Date : *lamglt*

Signature : *[Signature]*

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Test S, 19/18
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Batch report

DelumpWitt SG.TBP.202.M.5234

19/05/2014 15:33:02

No.	Time	Status	Date
3	14:59:31	A	19/05/2014
	PSA- U10.P10 Error flow control purge bearing mill		
25	14:57:20	(A)D	19/05/2014
	Start active		
25	14:57:18	A	19/05/2014
	Start active		
18	14:56:25	(AQ)D	19/05/2014
	M20 Motor crusher maintenance switch open		
17	14:56:25	(AQ)D	19/05/2014
	M10 Motor mill maintenance switch open		
18	14:56:24	AQ	19/05/2014
	M20 Motor crusher maintenance switch open		
17	14:56:24	AQ	19/05/2014
	M10 Motor mill maintenance switch open		
1	14:56:24	(AQ)D	19/05/2014
	Safety stop E-stop		
1	14:56:24	(A)Q	19/05/2014
	Safety stop E-stop		
25	14:56:10	(A)D	19/05/2014
	Start active		
25	14:56:08	A	19/05/2014
	Start active		
1	14:55:51	A	19/05/2014
	Safety stop E-stop		
25	14:55:35	(A)D	19/05/2014
	Start active		
25	14:55:34	A	19/05/2014
	Start active		
24	14:55:26	(A)D	19/05/2014
	Stop active		
24	14:55:25	A	19/05/2014
	Stop active		
25	14:54:36	(A)D	19/05/2014
	Start active		
25	14:54:35	A	19/05/2014
	Start active		

Date : 19Mg14

Signature : 

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Attachment 1 to FAT OQ DelumpWitt (172420-2)

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19 May 14

Batch report

DelumpWitt SG.TBP.202.M.5234

19/05/2014 15:33:03

RecordID	TimeStamp	DeltaToUTC	UserID
0	19/5/2014 2:54:34 PM	-8:00	System
	ObjectID: Application Description: New log file during run of on device . Project: ' - ' Build 278, created with WinCC flexible 2008 SP3 Advanced.WinCC flexible RT 2008 SP3WinCC flexible RT 2008 SP3WinCC flexible RT 2008 SP3WinCC flexible RT 2008 SP3WinCC flexible RT 2008 SP3		
212	19/5/2014 3:30:44 PM	-8:00	Admin
	ObjectID: Tag: PAR.screening Description: Change the value of the 'PAR.screening' tag from '1' to '2' by entering '2'.		
213	19/5/2014 3:32:45 PM	-8:00	Admin
	ObjectID: Tag: PAR.screening Description: Change the value of the 'PAR.screening' tag from '2' to '1' by entering '1'.		
214	19/5/2014 3:33:01 PM	-8:00	Admin
	ObjectID: Logs: AuditTrail_1 Description: Stop Audit Trail 'D:\archiv\AuditTrail_10.csv'. No user actions will be logged.		

Date : 19 May 14

Signature : 

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Total pages : 7

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19May14

Batch report

DelumpWitt SG.TBP.202.M.5234

19/05/2014 15:43:57

Operator: M5234_Opera Batch name: power
 Start batch: 19/05/2014 15:39:41 Product name: ABCD
 Batch end: 19/05/2014 15:43:56 Product number: 987654

Screening Metformin
 Speed mill LL Setpoint HL Feedback
 350 400 450 404
 Speed crusher 14.0

Screening HPC
 Speed mill LL Setpoint HL Feedback
 80 100 120 100
 Speed crusher 10.0

Event

No.	Time	Status	Date
24	15:43:51	(A)D	19/05/2014
	Stop active		
24	15:43:50	A	19/05/2014
	Stop active		
25	15:43:44	(A)D	19/05/2014
	Start active		
25	15:43:43	A	19/05/2014
	Start active		
24	15:43:25	(A)D	19/05/2014
	Stop active		
24	15:43:24	A	19/05/2014
	Stop active		
25	15:43:11	(A)D	19/05/2014
	Start active		
25	15:43:10	A	19/05/2014
	Start active		
28	15:43:05	(AQ)D	19/05/2014
	G30 Container not detected		
28	15:43:05	(A)Q	19/05/2014
	G30 Container not detected		
25	15:43:00	(A)D	19/05/2014
	Start active		
25	15:42:59	A	19/05/2014
	Start active		

Date : 19May14

Signature : 

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Total pages : 5

Attachment 2 to FAT OQ DelumpWitt

Test 15, 18

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Batch report

DelumpWitt SG.TBP.202.M.5234

19/05/2014 15:43:57

No.	Time	Status	Date
25	15:42:36	(A)D	19/05/2014
	Start active		
28	15:42:34	A	19/05/2014
	G30 Container not detected		
25	15:42:34	A	19/05/2014
	Start active		
18	15:42:23	(AQ)D	19/05/2014
	M20 Motor crusher maintenance switch open		
29	15:42:22	(AQ)D	19/05/2014
	Power loss HMI and PLC powered by UPS		
23	15:42:22	(AQ)D	19/05/2014
	TIA+T23 PT100 Error temperature top		
22	15:42:22	(AQ)D	19/05/2014
	TIA+T13 PT100 Error temperature bottom		
18	15:42:22	AQ	19/05/2014
	M20 Motor crusher maintenance switch open		
12	15:42:22	(AQ)D	19/05/2014
	Error Watchdog		
11	15:42:22	(AQ)D	19/05/2014
	M10 Error motor protection switch mill(Q2)		
10	15:42:22	(AQ)D	19/05/2014
	M20 Error motor protection switch crusher(Q3)		
9	15:42:22	(AQ)D	19/05/2014
	TSA+ (Z)T10 Error PTC motor mill		
8	15:42:22	(AQ)D	19/05/2014
	TSA+ (Z)T20 Error PTC motor crusher		
7	15:42:22	(AQ)D	19/05/2014
	TSA+ (Z)T22 Error PTC crusher bearing		
6	15:42:22	(AQ)D	19/05/2014
	TSA+ (Z)T21 Error PTC crusher bearing		
5	15:42:22	(AQ)D	19/05/2014
	TSA+ (Z)T12 Error PTC mill bearing		
4	15:42:22	(AQ)D	19/05/2014
	TSA+ (Z)T11 Error PTC mill sieve		
2	15:42:22	(AQ)D	19/05/2014
	GSA(Z) G10/G20 Error safety protection		
1	15:42:22	(AQ)D	19/05/2014
	Safety stop E-stop		
29	15:42:22	(A)Q	19/05/2014
	Power loss HMI and PLC powered by UPS		
23	15:42:22	(A)Q	19/05/2014
	TIA+T23 PT100 Error temperature top		
22	15:42:22	(A)Q	19/05/2014
	TIA+T13 PT100 Error temperature bottom		
12	15:42:22	(A)Q	19/05/2014
	Error Watchdog		

After power failure alarm is cleared, operator can restart the batch

A 19Mg14

Date : 19Mg14

Signature : *A*

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Attachment 2 to FAT OQ DelumpWitt

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19Mg14

Batch report

DelumpWitt SG.TBP.202.M.5234

19/05/2014 15:43:57

No.	Time	Status	Date
11	15:42:22	(A)Q	19/05/2014
	M10 Error motor protection switch mill(Q2)		
10	15:42:22	(A)Q	19/05/2014
	M20 Error motor protection switch crusher(Q3)		
9	15:42:22	(A)Q	19/05/2014
	TSA+ (Z)T10 Error PTC motor mill		
8	15:42:22	(A)Q	19/05/2014
	TSA+ (Z)T20 Error PTC motor crusher		
7	15:42:22	(A)Q	19/05/2014
	TSA+ (Z)T22 Error PTC crusher bearing		
6	15:42:22	(A)Q	19/05/2014
	TSA+ (Z)T21 Error PTC crusher bearing		
5	15:42:22	(A)Q	19/05/2014
	TSA+ (Z)T12 Error PTC mill bearing		
4	15:42:22	(A)Q	19/05/2014
	TSA+ (Z)T11 Error PTC mill sieve		
2	15:42:22	(A)Q	19/05/2014
	GSA(Z) G10/G20 Error safety protection		
1	15:42:22	(A)Q	19/05/2014
	Safety stop E-stop		
24	15:41:59	(A)D	19/05/2014
	Stop active		
29	15:41:54	A	19/05/2014
	Power loss HMI and PLC powered by UPS		
24	15:41:54	A	19/05/2014
	Stop active		
23	15:41:54	A	19/05/2014
	TIA+T23 PT100 Error temperature top		
22	15:41:54	A	19/05/2014
	TIA+T13 PT100 Error temperature bottom		
12	15:41:54	A	19/05/2014
	Error Watchdog		
11	15:41:54	A	19/05/2014
	M10 Error motor protection switch mill(Q2)		
10	15:41:54	A	19/05/2014
	M20 Error motor protection switch crusher(Q3)		
9	15:41:54	A	19/05/2014
	TSA+ (Z)T10 Error PTC motor mill		
8	15:41:54	A	19/05/2014
	TSA+ (Z)T20 Error PTC motor crusher		
7	15:41:54	A	19/05/2014
	TSA+ (Z)T22 Error PTC crusher bearing		
6	15:41:54	A	19/05/2014
	TSA+ (Z)T21 Error PTC crusher bearing		
5	15:41:54	A	19/05/2014
	TSA+ (Z)T12 Error PTC mill bearing		

Date : 19Mg14

Signature : 

Page : 3

Total pages : 5

Attachment 2 to FAT OQ DelumpWitt

test 15,18

(172420-2)

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19Mg/14

Batch report

DelumpWitt SG.TBP.202.M.5234

19/05/2014 15:43:57

No.	Time	Status	Date
4	15:41:54	A	19/05/2014
	TSA+ (Z)T11 Error PTC mill sieve		
2	15:41:54	A	19/05/2014
	GSA(Z) G10/G20 Error safety protection		
1	15:41:54	A	19/05/2014
	Safety stop E-stop		
18	15:41:12	(AQ)D	19/05/2014
	M20 Motor crusher maintenance switch open		
17	15:41:12	(AQ)D	19/05/2014
	M10 Motor mill maintenance switch open		
12	15:41:12	(AQ)D	19/05/2014
	Error Watchdog		
18	15:41:12	(A)Q	19/05/2014
	M20 Motor crusher maintenance switch open		
17	15:41:12	(A)Q	19/05/2014
	M10 Motor mill maintenance switch open		
12	15:41:12	(A)Q	19/05/2014
	Error Watchdog		
17	15:40:25	A	19/05/2014
	M10 Motor mill maintenance switch open		
18	15:40:24	A	19/05/2014
	M20 Motor crusher maintenance switch open		
12	15:40:23	A	19/05/2014
	Error Watchdog		
25	15:39:42	(A)D	19/05/2014
	Start active		
25	15:39:41	A	19/05/2014
	Start active		

Date : 19Mg/14

Signature : 

Page : 4

Total pages : 5

Attachment 2 to FAT OQ DelumpWitt
Test 15, 18
pg 5 of 5
(172420-2)


Batch report

DelumpWitt SG.TBP.202.M.5234

19/05/2014 15:43:58


19 May 14

RecordID	TimeStamp	DeltaToUTC	UserID
0	19/5/2014 3:39:41 PM	-8:00	System
ObjectID: Application Description: New log file during run of on device . Project: ' . - ' Build 278, created with WinCC flexible 2008 SP3 Advanced.WinCC flexible RT 2008 SP3WinCC flexible RT 2008 SP3WinCC flexible RT 2008 SP3WinCC flexible RT 2008 SP3WinCC flexible RT 2008 SP3			
215	19/5/2014 3:42:50 PM	-8:00	M5234_Opera
ObjectID: User administration Description: User 'M5234_Opera' logged on with group 'Operator'.			
216	19/5/2014 3:43:38 PM	-8:00	M5234_Opera
ObjectID: Tag: PAR.screening Description: Change the value of the 'PAR.screening' tag from '1' to '2' by entering '2'.			
217	19/5/2014 3:43:55 PM	-8:00	M5234_Opera
ObjectID: Logs: AuditTrail_1 Description: Stop Audit Trail 'D:\archiv\AuditTrail_10.csv'. No user actions will be logged.			

} Batch can still run after Power is turned on again.

19 May 14

Date : 19 May 14

Signature : 

Page : 5
Total pages : 5

Attachment 3 to FAT OQ DelumpWitt

Pg 1 of 2

(172420-2)

Test 18

iamg14

Batch report

DelumpWitt SG.TBP.202.M.5234

19/05/2014 15:58:33

Operator: M5234_Opera Batch name: speed test
 Start batch: 19/05/2014 15:56:56 Product name: ABCD
 Batch end: 19/05/2014 15:58:33 Product number: 987654

Screening Metformin
 Speed mill LL Setpoint HL Feedback
 405 400 450 404
 Speed crusher 14.0

Screening HPC
 Speed mill LL Setpoint HL Feedback
 80 100 95 100
 Speed crusher 10.0

Event

No.	Time	Status	Date
19	15:58:30	(AQ)D	19/05/2014
		Error S10+ Exceed maximum motorspeed mill	
19	15:58:30	(A)Q	19/05/2014
		Error S10+ Exceed maximum motorspeed mill	
19	15:57:51	A	19/05/2014
		Error S10+ Exceed maximum motorspeed mill	
25	15:57:47	(A)D	19/05/2014
		Start active	
25	15:57:46	A	19/05/2014
		Start active	
20	15:57:38	(AQ)D	19/05/2014
		Error S10- Fall under minimum speed mill	
20	15:57:38	(A)Q	19/05/2014
		Error S10- Fall under minimum speed mill	
20	15:57:00	A	19/05/2014
		Error S10- Fall under minimum speed mill	
25	15:56:58	(A)D	19/05/2014
		Start active	
25	15:56:57	A	19/05/2014
		Start active	

Date : 19Mg14

Signature : *iamg14*

Page : 1

Total pages : 2

Attachment 3 to FAT OQ DelumpWitt
(172420-2)
Pg 2 of 2
test 18
19 May 14

Batch report

DelumpWitt SG.TBP.202.M.5234

19/05/2014 15:58:34

RecordID	TimeStamp	DeltaToUTC	UserID
0	19/5/2014 3:56:56 PM	-8:00	System
ObjectID: Application Description: New log file during run of on device . Project: ' . - ' Build 278, created with WinCC flexible 2008 SP3 Advanced.WinCC flexible RT 2008 SP3WinCC flexible RT 2008 SP3WinCC flexible RT 2008 SP3WinCC flexible RT 2008 SP3WinCC flexible RT 2008 SP3			
218	19/5/2014 3:57:29 PM	-8:00	M5234_Opera
ObjectID: Tag: PAR.screening Description: Change the value of the 'PAR.screening' tag from '1' to '2' by entering '2'.			
219	19/5/2014 3:58:32 PM	-8:00	M5234_Opera
ObjectID: Logs: AuditTrail_1 Description: Stop Audit Trail 'D:\archiv\AuditTrail_10.csv'. No user actions will be logged.			

Date : 19 May 14

Signature : 

Page : 2
Total pages : 2

Attachment 4 to FAT OQ DelumpWitt
test 18 (172420-2)
Pg 1 of 1
A 19/05/14

Batch report

DelumpWitt SG.TBP.202.M.5234

19/05/2014 14:52:45

Operator: Admin Batch name: 1test
 Start batch: 19/05/2014 14:37:36 Product name: ABCD
 Batch end: 19/05/2014 14:52:45 Product number: 987654

Screening Metformin
 Speed mill LL Setpoint HL Feedback
 350 400 450 404

Speed crusher 14.0

Screening HPC
 Speed mill LL Setpoint HL Feedback
 80 106 120 104

Speed crusher 10.0

Event

No.	Time	Status	Date
24	14:52:45	(A)D	19/05/2014
	Stop active		
24	14:52:42	A	19/05/2014
	Stop active		
25	14:52:35	(A)D	19/05/2014
	Start active		
25	14:52:34	A	19/05/2014
	Start active		
24	14:52:29	(A)D	19/05/2014
	Stop active		
24	14:52:28	A	19/05/2014
	Stop active		
25	14:52:05	(A)D	19/05/2014
	Start active		
25	14:52:04	A	19/05/2014
	Start active		
16	14:39:09	(AQ)D	19/05/2014
	FSA- F10 Error flow control purge bearing		
16	14:39:09	(A)Q	19/05/2014
	FSA- F10 Error flow control purge bearing		
16	14:38:23	A	19/05/2014
	FSA- F10 Error flow control purge bearing		
25	14:37:37	(A)D	19/05/2014
	Start active		

Date : 19/05/14

Signature : 

Page : 1

Total pages : 1

Attachment 5 to Delumpwitt FAT-OQ 172420-2
SG12.202.M.5234

Other alarms

No.	Time	Date	State	Text	QGR
21	17:01:46	19/05/2014	A	Missing input screening, product number, batch number, login	0
15	16:32:06	19/05/2014	A	FIA- F01 Exhaust missing	0

Alarms

Verified

[Signature] 19Mg14



2.4 Operation

The DelumpWitt is switched on with the button ON. This turns on the mill (ConiWitt) and the crusher (ProFi-Sword) simultaneously.

Turning off DelumpWitt via the button OFF.

Attachment 6 to FAT OQ DelumpWitt (172420-2)

Test 18

pg 1 of 1

[Signature] 19Mg14
19Mg14
SH1
19Mg14

2.4.1 Operator procedure

After switching on the main switch and booting the PLC and HMI the active alarms must be reset. A user must log in to start the machine.

The operator has recipes with different product numbers and names to select. With the screening the desired speed of crusher and ConiWitt, and the upper and lower limits of ConiWitt are selected. The next step is then entered on the main screen a batch number. Only then the DelumpWitt can be started.

2.4.2 Recipes

To create or modify existing recipes the following steps are needed:

On the screen "Save recipes", which is accessible only for supervisor and administrator, all recipes are created or modified. There, the product number or product name for "product" and the screenings (name, speed reference values lower or upper limit) are created and stored. The operator can simply call them on the main screen.

2.4.3 Error display

The following fault indications are displayed as pop up on each screen of the HMI

- ✓ 1 Safety stop E-stop A++1
- ✓ 2 GSA(Z) G10/G20 Error safety protection A++1
- ✓ 3 PSA- U10.P10 Error flow control purge bearing mill A++1
- ✓ 4 TSA+ (Z)T11 Error PTC mill sieve
- ✓ 5 TSA+ (Z)T12 Error PTC mill bearing } A++1
- ✓ 6 TSA+ (Z)T21 Error PTC crusher bearing
- ✓ 7 TSA+ (Z)T22 Error PTC crusher bearing
- ✓ 8 TSA+ (Z)T20 Error PTC motor crusher
- ✓ 9 TSA+ (Z)T10 Error PTC motor mill
- ✓ 10 M20 Error motor protection switch crusher(Q3) } A++1
- ✓ 11 M10 Error motor protection switch mill(Q2)
- ✓ 12 Error Watchdog A++2
- ✓ 13 M20 Error motor crusher A++1
- ✓ 14 M10 Error motor mill A++1
- ✓ 15 FIA- F01 Exhaust missing A++5
- ✓ 16 FSA- F10 Error flow control purge bearing A++4
- ✓ 17 M10 Motor mill maintenance switch open A++1
- ✓ 18 M20 Motor crusher maintenance switch open A++1
- ✓ 19 Error S10+ Exceed maximum motor speed mill A++3
- ✓ 20 Error S10- Fall under minimum speed mill A++3
- ✓ 21 Missing input screening, product number, batch number, login A++5
- ✓ 22 TIA+T13 PT100 Error temperature bottom } A++1
- ✓ 23 TIA+T23 PT100 Error temperature top
- ✓ 26 Element still in manual mode
- ✓ 27 *
- ✓ 28 G30 Container not detected A++1
- ✓ 29 Power loss HMI and PLC powered by UPS A++2

[Signature] 19Mg14

All errors result directly in switching off the DelumpWitt.

Attached 7 to FAT OQ DelumpWitt (172420-2)

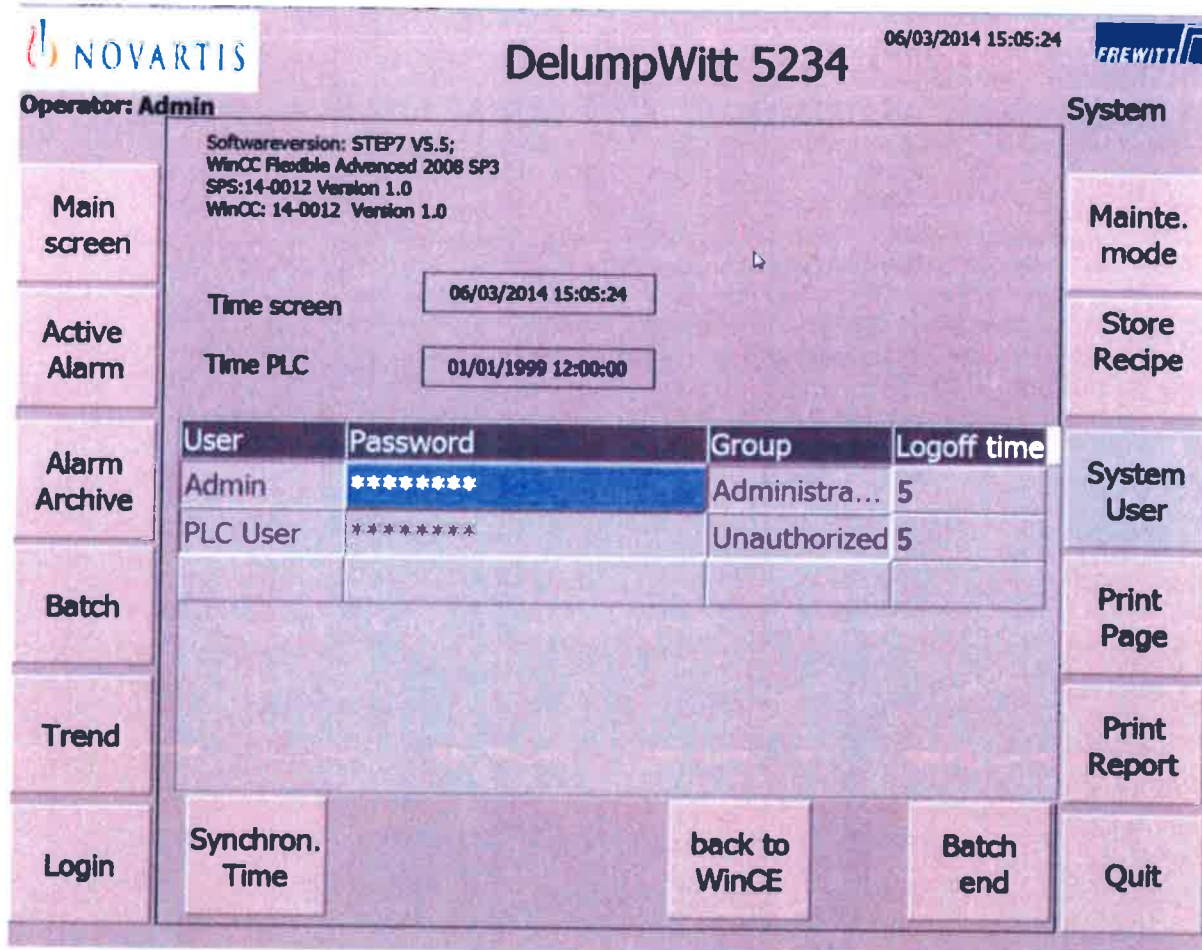
pg 1 of 2
Test 16

Aramg14

Verified *Aramg14*



2.5.8 System



This view allows:

- The HMI has a time synchronization from the network. The PLC is synchronized automatically from the HMI.
- Creating and changing user password
- To return to the operating system WinCE

On this screen, which is only accessible for the administrator the batch end button which has to be pressed each time a new PLC application is charged. All other "Batch end" buttons are new visible if a batch has been started.

The passwords can be created or modified by pressing the corresponding button and entering the desired parameter. This function is password protected.

Name	description
user	User name (Login)
Password	User's password. It has to have 8 characters
Group	Authorization of the user-level
Logoff time	Validation time (0 to 60 min, at 0 no automatic logoff)

These user's groups are used:

Rights (G▶K)	Name	Description
9	Administrator	All access rights on the HMI (Administrator)
8	Supervisor	Access to all screens except system

Attachment 7 to FAT OQ DelumpWitt (172420-2)

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Test 16

A 19mg/14



7	Service	Access to all screens except system and recipe
1	Operator	Login necessary, access to limited screens and functions
0	unauthorized	no Login, no access, only display

For the following functions the user must have at least the following rights:

Button	Rights
Recipe	Supervisory
Maintenance,	Service
Input batch datas, batch end	Operator
Trend, Alarm archive, Active Alarm, Logout, Login, Quit, Print report	all

Functions	Rights
System: back to WinCE	Administrator
Alarms: back	alle

Input of parameters (setpoints)	Rights
Main screen	Operator

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Attachment 8 to PAT OQ DelumpWitt 172420-2

Test 19

pg 7 of 13

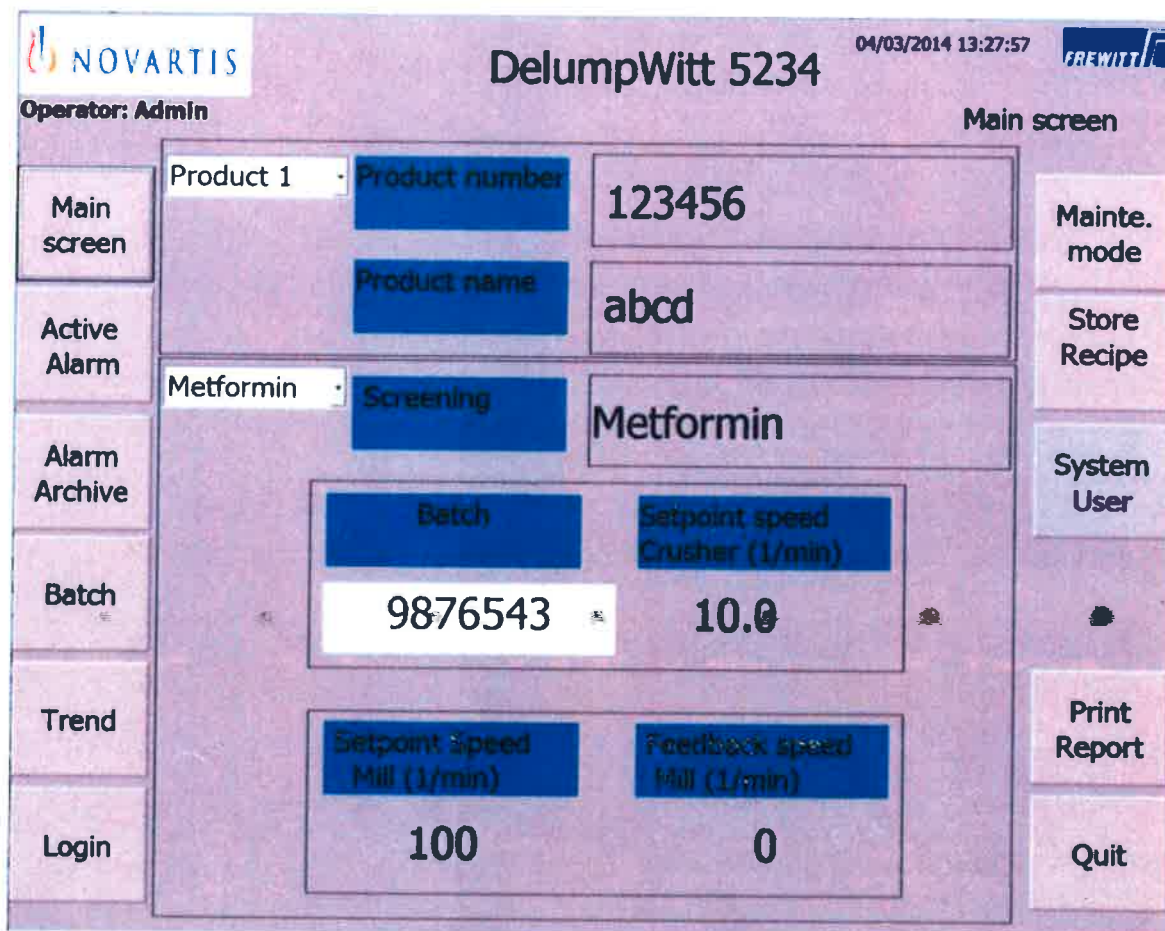
A 19/03/14



Description of application

Verified
A 19/03/14

2.5.1 Main screen



From this screen you can reach the following functional screens:

Maintenance screen	2.5.2
Recipe store	2.5.3
Trend	2.5.4
Batch	2.5.6
System	2.5.8
Active Alarm	2.5.9.1
Alarm archive	2.5.9.2

Direct functional touch buttons are:

Logout	the user is not logged any more
Login	opens the screen to fill the user's name and password for login.
Print report	the report of the actual/last batch is printed
Batch end	ends the batch and creates the batch report
Quit	reset all alarms and error messages

Attachment 8 to FAT OQ DelumpWitt 172420-2

Test 19

pg 2 of 13

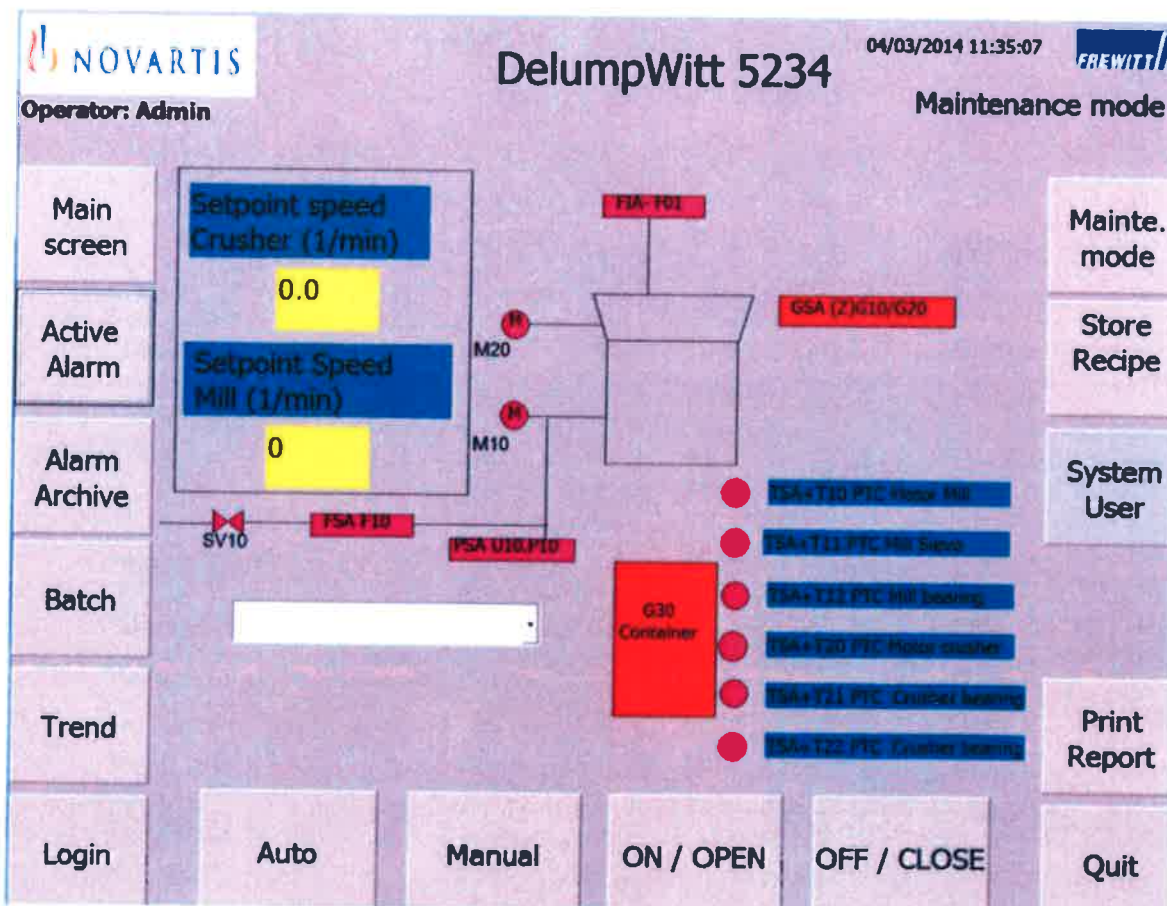
19mg14

Verified 19mg14



2.5.2 Maintenance mode

On this screen only service, supervisor and administrator has access. Here each single element (actuator) can be selected and switched on/off in manual mode. For the sensors the status is indicated.



This screen gives an overview of the machine and permits:

- All valves and motors to control manually
- To show the status of all valves and motors in automatic and manual mode
- To show the status of all pressure switches and safety switches

Elements	Man. Mode	Deactivated	Activated	fault
valve	M	Magenta	Green	Red
Motor	M	Magenta	Green	Red

Element	Deactivated (-)	Deactivated (+)	Activated (-)	Activated (+)
Safety switch	Red	Red	Green	Green
Pressure switch	Magenta	Magenta	Green	Green
Ultrasonic switch	Red	Red	Green	Green

In order to control an element in manual or automatic mode, the operator must select the item and then press the "Manual" button or "Auto". If the item is in the "M" (manual) it can be switched on/off with the buttons ON/OPEN and OFF/CLOSE.

Only the selected and displayed element (a M flashes next to the item) can be controlled in manual mode.

Attachment 8 to FAT OQ DelumpWitt 172420-2

test 19
pg 3 of 13

A 19Mogit



2.5.3 Recipe

The access to this screen is limited to the supervisor and the administrator. On this screen the recipes are created and changed. The lower and upper limits of the mill speed are fixed.

The screenshot shows the 'DelumpWitt 5234' interface with the following fields and controls:

- Product 1** (dropdown menu)
- Product number**: 123456
- Product name**: abcd
- Screening**: Metformin
- Setpoint Speed Mill (1/min)**: 100
- Setpoint Speed Crusher (1/min)**: 10
- LL Speed Mill (1/min)**: 95
- HL Speed Mill (1/min)**: 105

Buttons include 'Save Product', 'Save', and 'Save Recipe'. A sidebar on the left contains navigation options: Main screen, Active Alarm, Alarm Archive, Batch, Trend, Login. A sidebar on the right contains: Maintenance mode, Store Recipe, System User, Print Page, Print Report, Quit.

Here the screening and the production name und number datas are stored.

✓ Verified
A 19Mogit

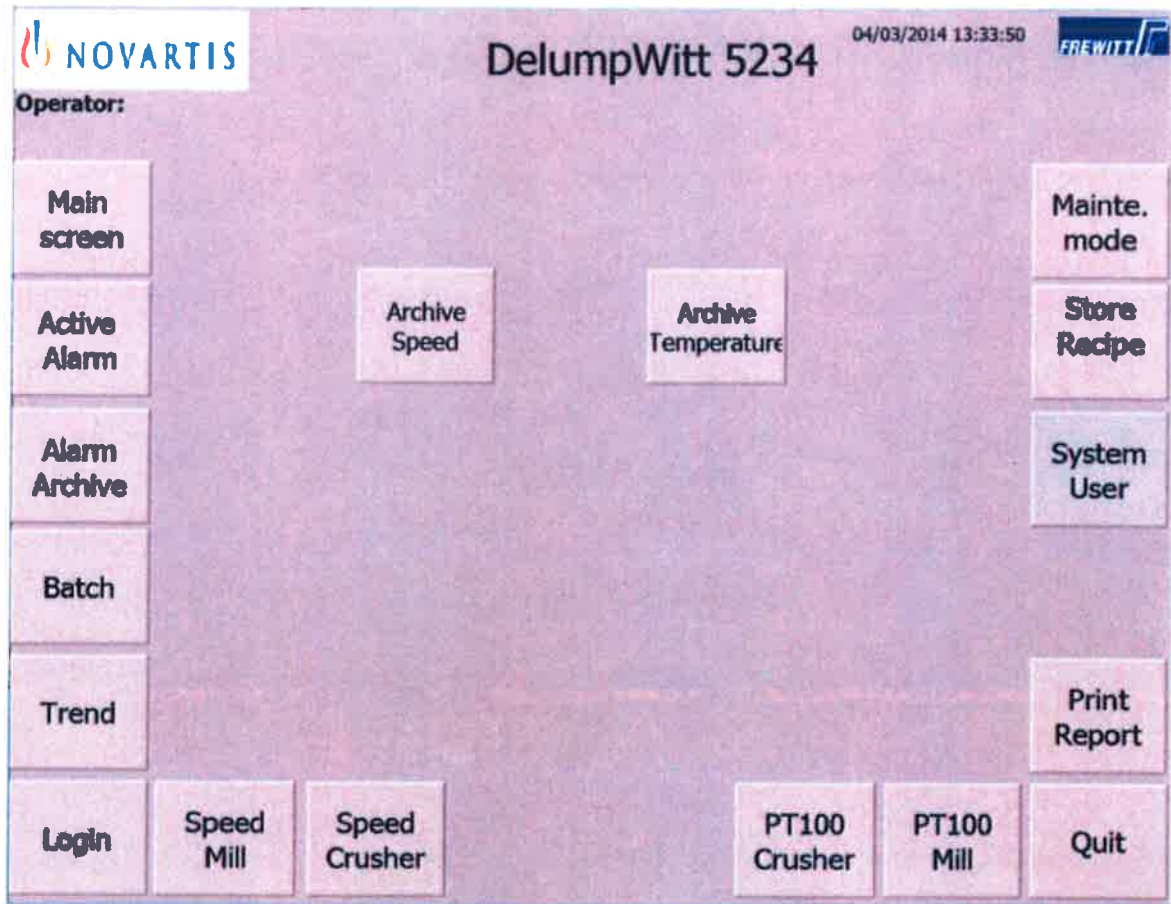
terj19
pg 4 of 13

Triangly ✓ Verified
Triangly



2.5.4 Trend

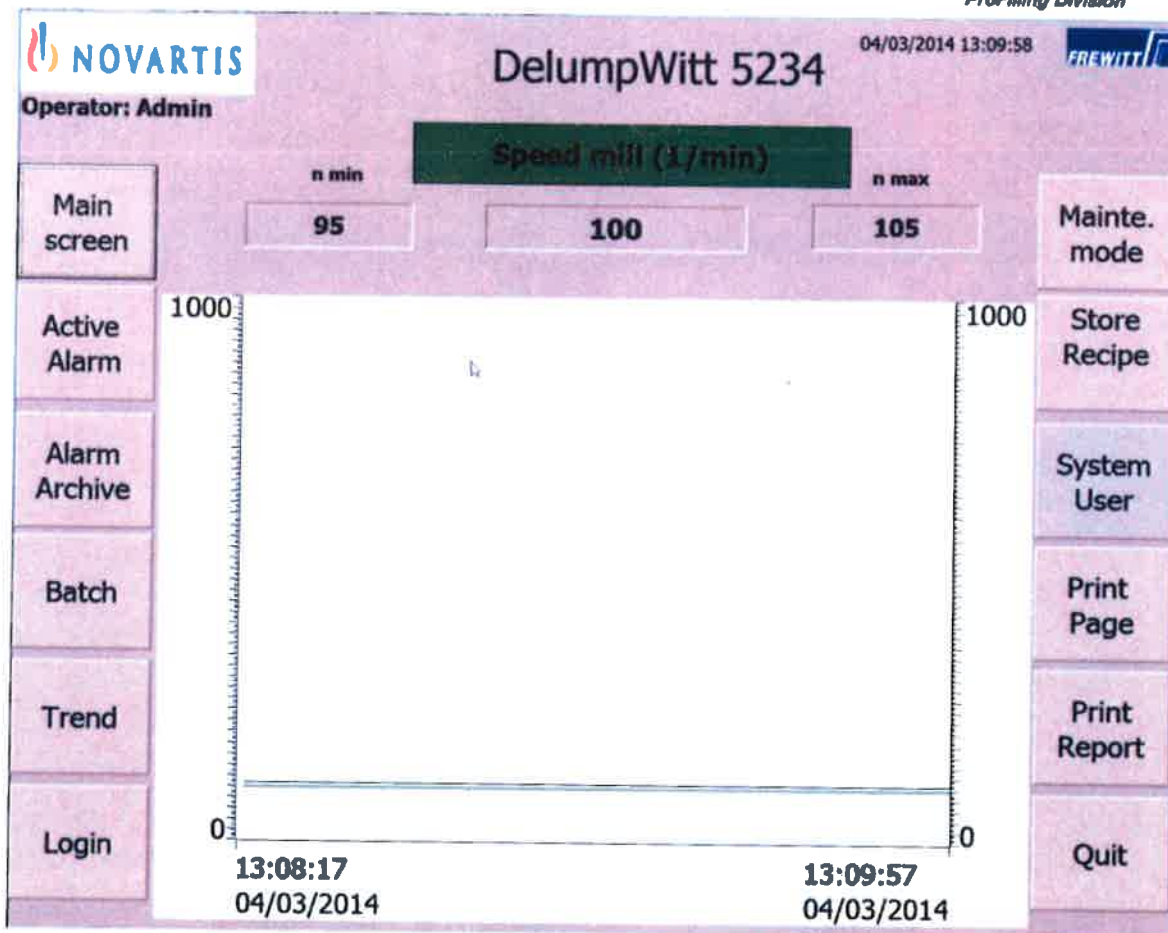
This is the screen to give access to the trending and archive curves.



Here you find access to the trends of the PT100. For the mill motor speed as well as the speed of the crusher (only set point) trends are created. Also the archives can be reached.

Attachment 8 to FAT OQ DelumpWitt 172420-2
test 19
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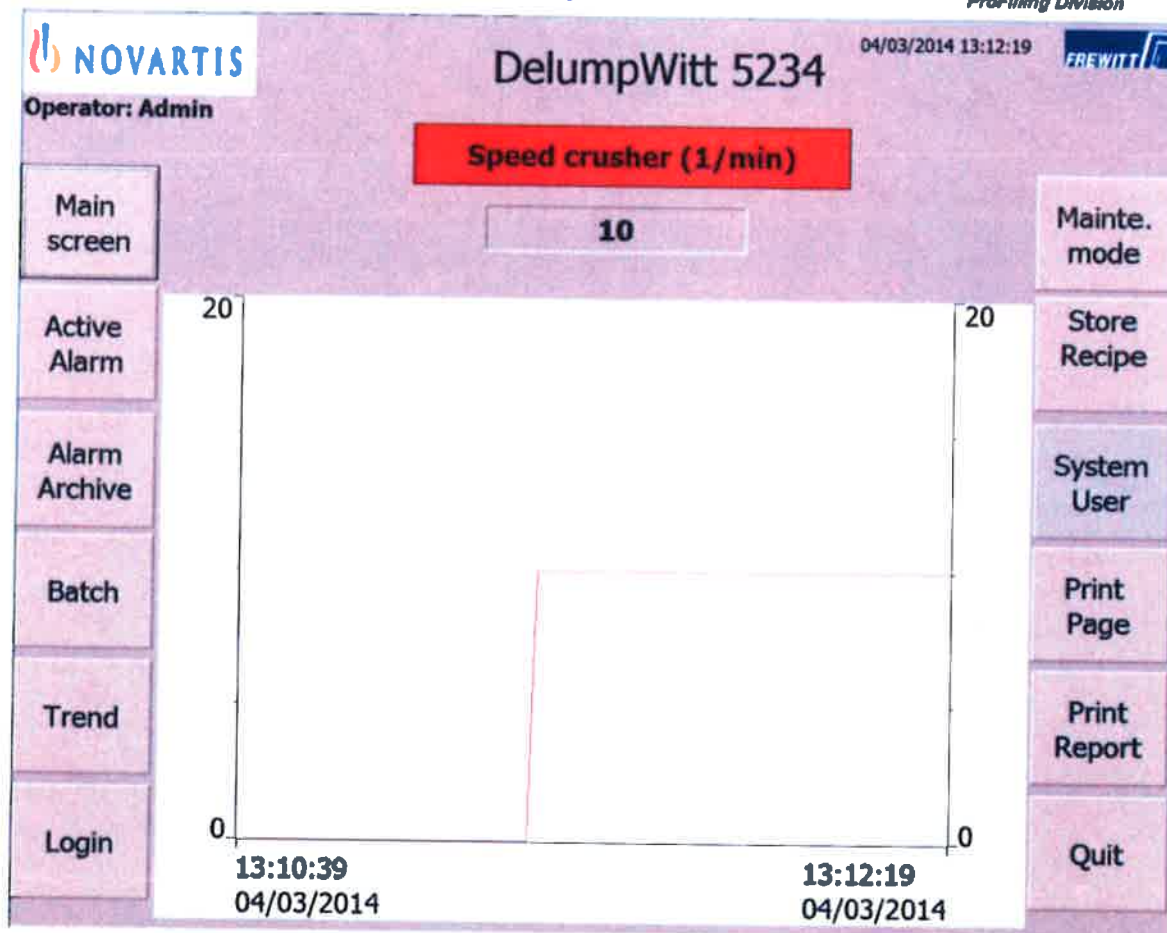
19 May 14



✓ verified
19 May 14

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19/03/14

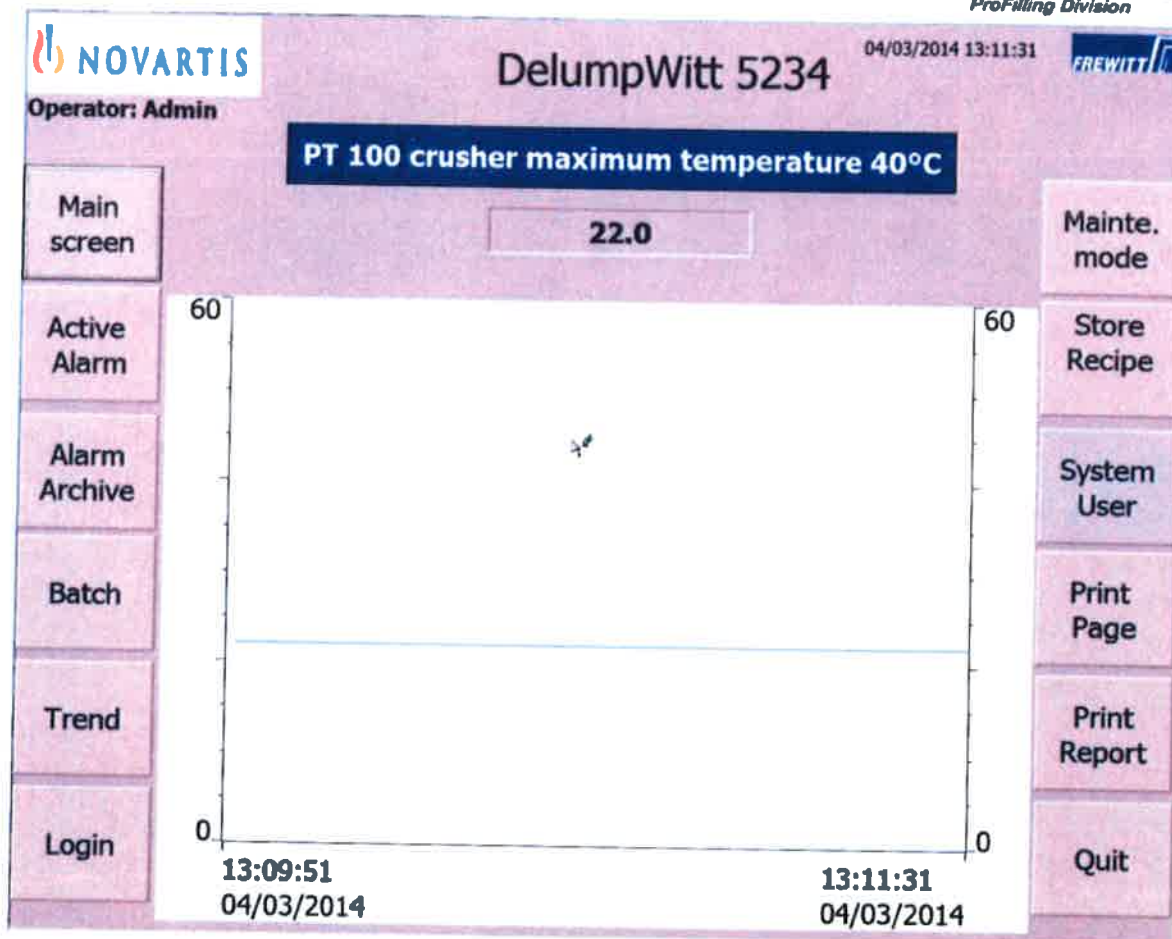


✓ Verified
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Attachment 8 to FAT OQ DelumpWitt 172420-2

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[Signature] 19 May 14

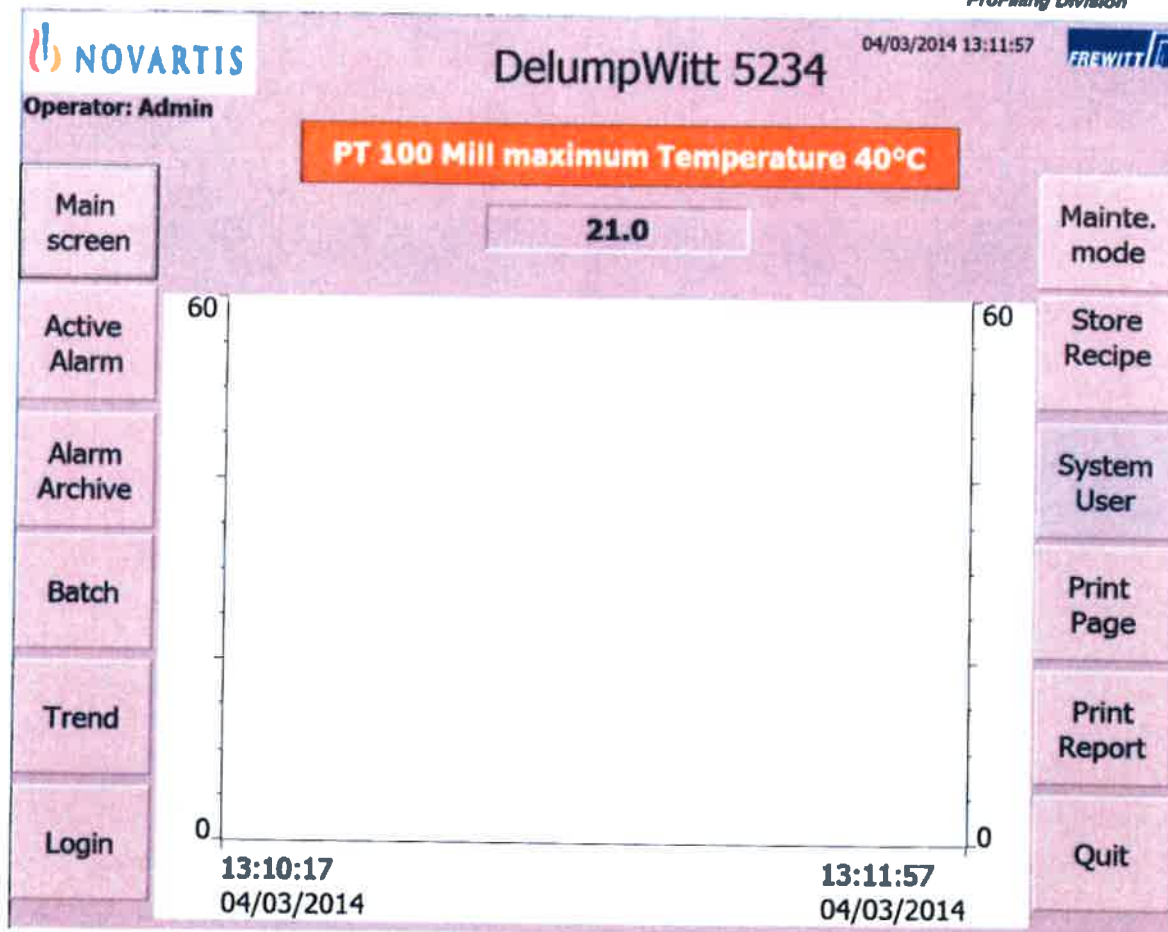


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[Signature] 19 May 14

Attachment 8 to FAT OQ DelumpWitt (172420-2)

Test 19
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[Signature]



✓ Verified

[Signature]

Attachment 8 to FAT OQ DelumpWitt (172420-2)

test 19

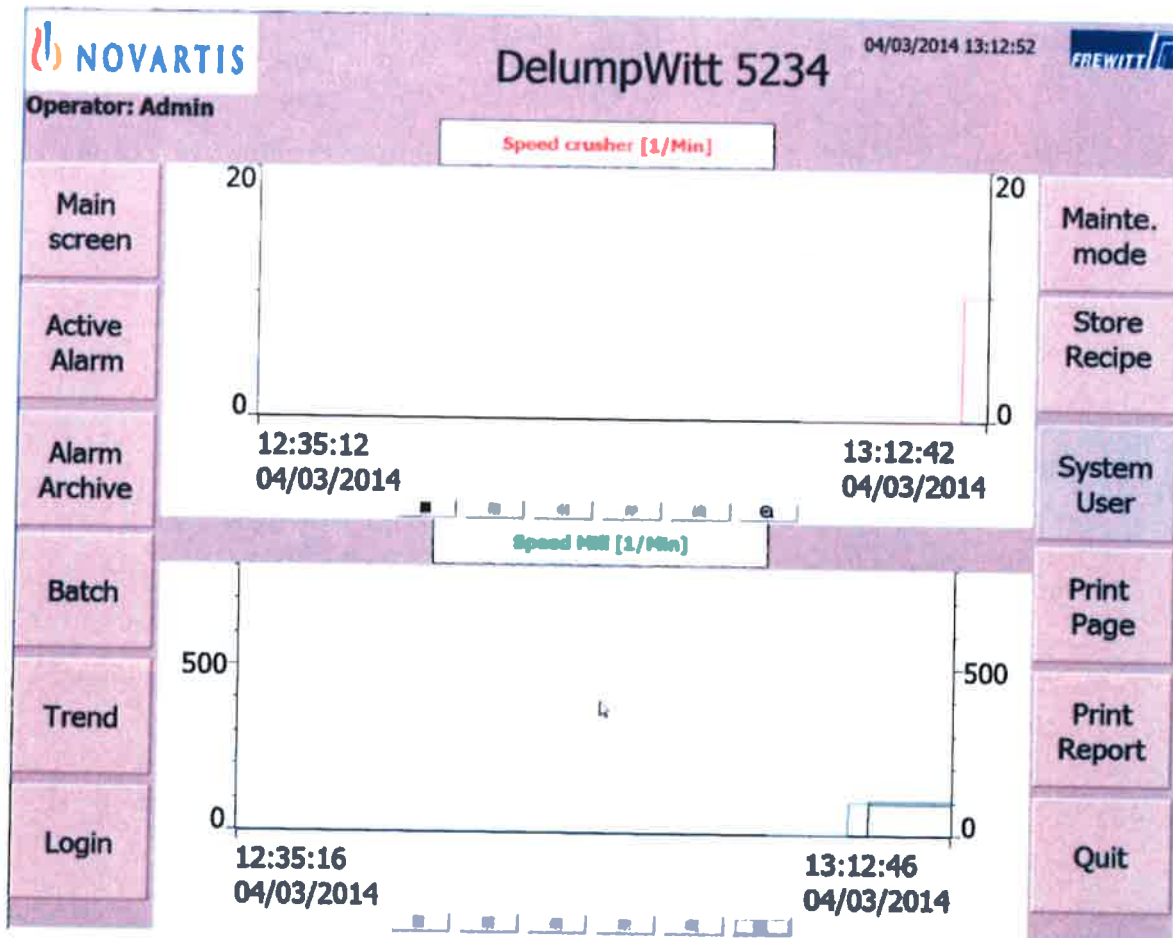
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2.5.5 Archive curve

Besides the trendings the feedbacks are also stored as trend in an archive.

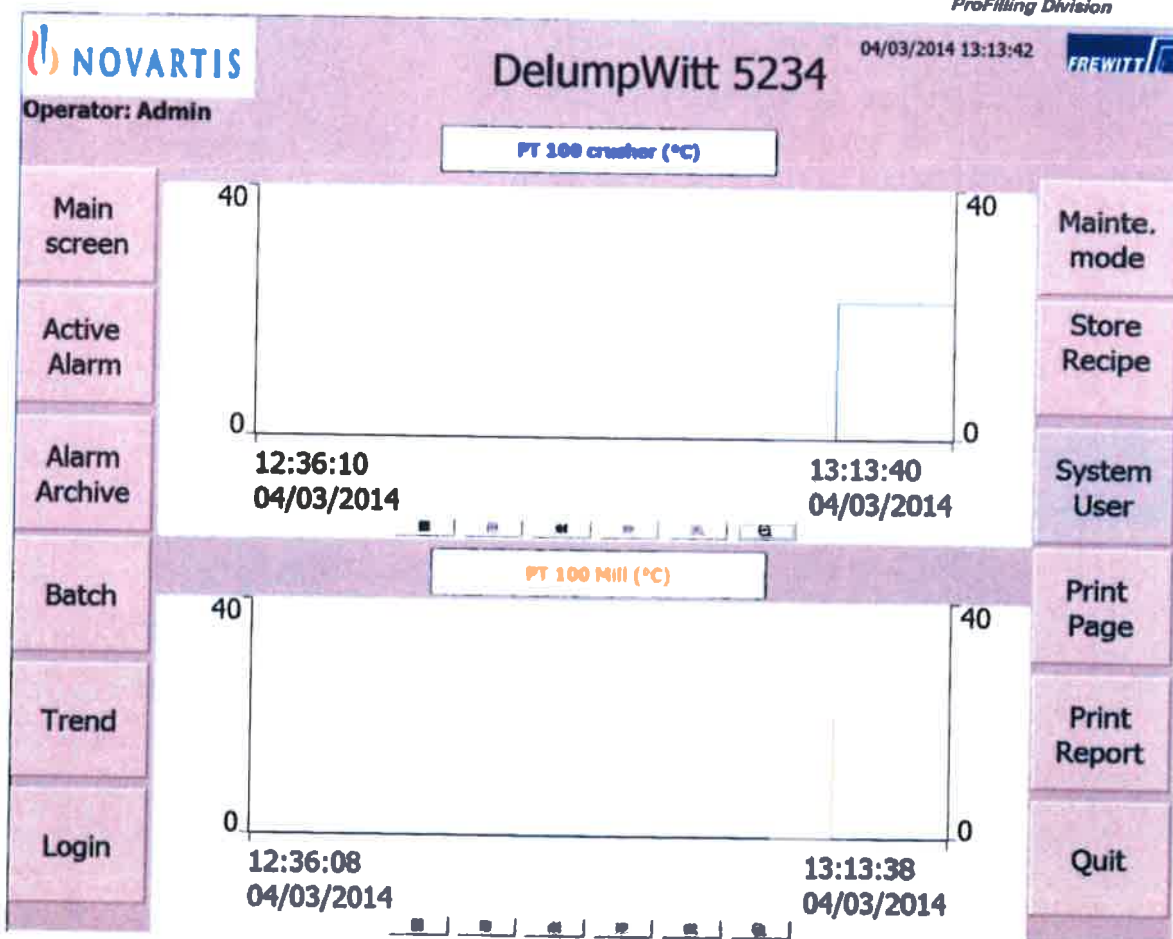


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19 May 14

Attachment 18 to OQ FAT DelumpWitt 172420-2
test 19

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A. Iamg14



✓

Ventfred

A. Iamg14

Attachment 8 to FAT OQ DelumpWitt 172420-2

Test 19

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A 19M014



2.5.6 Batch

To start the DelumpWitt the main screen has to be filled. In addition the operator has to be logged. The Batch screen indicates all datas including the start and end time of the batch. The end of the batch stops the DelumpWitt.

		DelumpWitt 5234		04/03/2014 11:34:49	
Operator: Admin			Batch		
Main screen	Batch name	9876543		Mainte. mode	
Active Alarm	Product number	123456		Store Recipe	
Alarm Archive	Product name	abcd		System User	
Batch	Screening	Metformin			
	Start batch	01/01/1999 12:00:00			
	Batch end	01/01/1999 12:00:00			
Trend				Print Report	
Login				Quit	

✓
verified
A 19M014

Attachment 8 to FAT OQ DelumpWitt 172420-2

Test 19

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A. Jangly

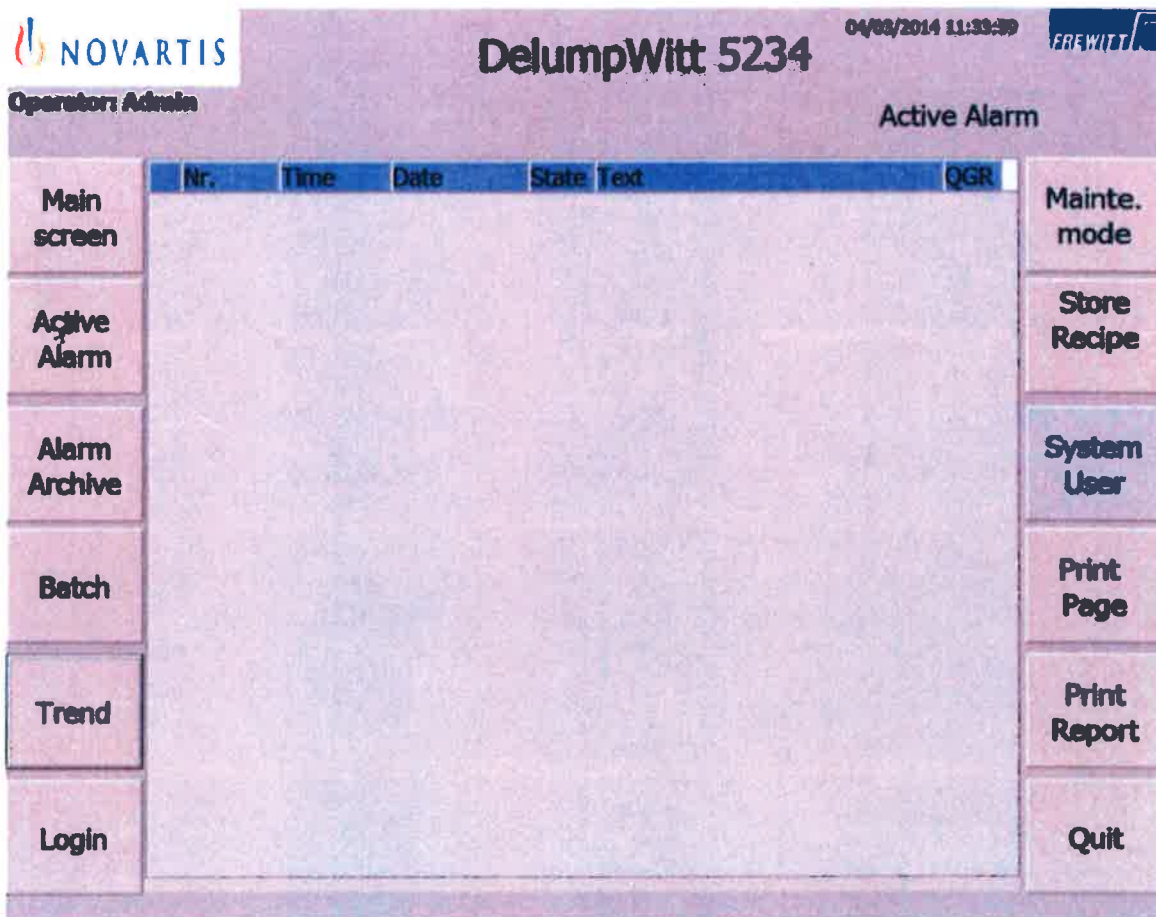


2.5.9 Alarmmessages



If an alarm is activated it is shown on the pop-up together with the message date, time and alarm number.

2.5.9.1 Active Alarm



This screen shows the active alarms

Verified A. Jangly

Attachment 8 To FAT OQ Delumpwitt 172420-2

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largit



2.5.9.2 Alarm archive

All alarms are stocked in an archive with the text, number, date, and time.

NOVARTIS **DelumpWitt 5234** 04/03/2014 11:34:33 **FREWITT**

Operator: Admin Alarm archive

Nr.	Time	Date	State	Text	QGR
1	13:46:11	20/02/2014	AD	Safety stop E-stop	0
1	13:46:04	20/02/2014	A	Safety stop E-stop	0
1	08:32:28	14/02/2014	AD	Safety stop E-stop	0
1	08:29:35	14/02/2014	A	Safety stop E-stop	0

Navigation buttons: Main screen, Active Alarm, Alarm Archive, Batch, Trend, Login, Maintenance mode, Store Recipe, System User, Print Page, Print Report, Quit.

2.5.10 Parameter Ranges

Parameter	Range
Revolution Crusher	10- 14 r/min
Revolution Mill	100- 700 r/min

Verified largit

