

Project Manual

Customer: LEISTRITZ Extrusionstechnik GmbH

Ref.No.: JB107858-300

Project no.: 1401237

Date of issue 21.07.2014

Revision 1.2

Table of contents

Chapter 1:	Certificate + Reports
Chapter 2:	Data Sheets
Chapter 3:	Feeder
Chapter 4:	Attaching Parts Feeder
Chapter 5:	Operating
Chapter 6:	Controller
Chapter 7:	Mechanical Drawings
Chapter 8:	Electrical Drawings
Chapter 9:	Spare Parts
Chapter 10:	Address List

Installation, commissioning and programming of the equipment should only be undertaken by qualified personnel.

Zertifikate + Protokolle

- CE Konformitätserklärung
- Endprüfungsprotokoll
- Werkstoff - Liste (Abnahmeprüfzeugnis 3.1)
- Materialzertifikate
- FDA-Zertifikat

Einbauerklärung
Declaration of Incorporation
Déclaration d'Incorporation

Wir erklären hiermit, dass die unvollständige Maschine:
We declare herewith, that the partly completed machinery:
Nous déclarons ci-après que la quasi-machine:

K-PH-ML-D5-KT35

⊕ II 3D / 2D T140°C X

Projektnummer / *Project number* / *Numéro de projet*: **1401237**
 Ident Nr. / *Ident no.* / *Numéro Ident*: **M-352970**

konform ist mit den Bestimmungen der unten genannten EG-Richtlinien. Folgende EG-Richtlinien und harmonisierte Normen wurden angewendet:

is in conformity with the provisions of the below listed EC-Directives. The following EC-Directives and harmonized standards have been applied:

est conforme aux dispositions des Directives CE suivantes. Les Directives CE suivants et les normes harmonisées ont été appliquées:

EG-Richtlinien / <i>EC-Directives</i> / <i>Directives CE</i>	Normen / <i>Standards</i> / <i>Normes</i>
2006/42/EG: Maschinenrichtlinie 2006/42/EC: <i>Machinery Directive</i> 2006/42/CE: <i>Directive pour les Machines</i>	EN ISO 12100-1:2003 EN ISO 12100-2:2003 EN ISO 13850:2008 EN ISO 13857:2008 EN ISO 14121-1:2007 EN 60204-1:2006 EN 1037-1995 + A1:2008 EN 349:1993 + A1:2008 EN 62079 :2001

Die Inbetriebnahme dieser unvollständigen Maschine ist solange untersagt, bis festgestellt wurde, dass die Maschine, in die sie eingebaut werden soll, den Bestimmungen der EG-Richtlinien, den harmonisierten Normen oder den entsprechenden nationalen Normen entsprechen.

The partly completed machinery is not allowed to be put into service until the machinery, into which it is to be incorporated, has been found and declared to be in conformity with the provisions of the EC-Directives, the harmonized standards or the national standards.

Il est interdit de mettre la quasi-machine en service avant que la machine dans laquelle elle sera incorporée ait été considérée conforme aux dispositions des Directives CE, aux normes harmonisées ou aux normes nationales.

Einzelstaatlichen Stellen werden auf begründetes Verlangen die speziellen technischen Unterlagen zur unvollständigen Maschine in elektronischer Form übermittelt.

In response to a reasoned request by the national authorities, relevant technical information on the partly completed machinery will be transmitted electronically.

À la suite d'une demande dûment motivée des autorités nationales, les informations pertinentes concernant la quasi-machine sont transmis électroniquement.

Die speziellen technischen Unterlagen sind gemäss Anhang VII Teil B der Maschinenrichtlinie erstellt worden.

Dokumentationsverantwortlicher ist:

The relevant technical documentation is compiled in accordance with part B of Annex VII of the Machinery Directive. Responsible for documentation is:

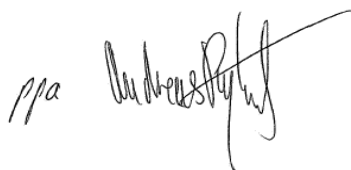
La documentation technique pertinente est constituée conformément à L'annexe VII, partie B de la Directive pour les Machines. Le responsable de la documentation est:

Andreas Rykart, Engineering Manager, Coperion K-Tron (Schweiz) GmbH, Lenzhardweg 43/45, CH 5702 Niederlenz

Niederlenz, 13.03.2014

Andreas Rykart
 Engineering / *Engineering*

Gerhard Wirz
 Geschäftsführer / *Managing director*




Konformitätserklärung
Declaration of Conformity
Déclaration de Conformité

Wir erklären hiermit, dass das Dosiersystem:
We declare herewith, that the feeding system:
Nous déclarons ci-après que l'installation de dosage:

K-PH-ML-D5-KT35

 **II 3D / 2D T140°C X**

Projektnummer / *Project number* / *Numéro de projet*: **1401237**
 Ident Nr. / *Ident no.* / *Numéro Ident*: **M-352970**

konform ist mit den Bestimmungen der unten genannten EG-Richtlinien. Folgende EG-Richtlinien und harmonisierte Normen wurden angewendet:
is in conformity with the provisions of the below listed EC-Directives. The following EC-Directives and harmonized standards have been applied:
est conforme aux dispositions des Directives CE suivantes. Les Directives CE suivants et les normes harmonisées ont été appliquées:

Anwendung / Execute / Emploi	EG-Richtlinien/EC-Directives/Directives CE	Normen / Standards / Normes
Nein No Non	2006/95/EG: Niederspannungs-Richtlinie 2006/95/EC: Low Voltage Directive 2006/95/EG: Directive Basse Tension	EN 61010-1:2001
Ja Yes Oui	2004/108/EG: EMV-Richtlinie 2004/108/EC: EMC-Directive 2004/108/CE: Compatibilité Électromagnétique	EN 61000-6-2:2005 EN 61000-6-4:2007
Ja Yes Oui	94/9/EG: Geräte und Schutzsysteme zur bestimmungsmässigen Verwendung in explosionsgefährdeten Bereichen 94/9/EC: Equipment and protective systems intended for use in potentially explosive atmospheres 94/9/CE: Appareils et les systèmes de protection destinés à être utilisés en atmosphères explosibles	EN 61241-0:2006 EN 61241-1:2004 EN 60079-0:2006 EN 13463-1:2009 EN 13463-5:2003 EN 1127-1:2007
Nein No Non	97/23/EG: Druckgeräte-Richtlinie 97/23/EC: Pressure Equipment Directive 97/23/CE: Équipements sous pression	AD 2000

Die technische Dokumentation ist vollständig vorhanden. Dokumentationsverantwortlicher ist:
The technical documentation is complete. Responsible for documentation is:
La documentation technique est complète. Le responsable de la documentation est:

Andreas Rykart, Engineering Manager, Coperion K-Tron (Schweiz) GmbH, Lenzhardweg 43/45, CH 5702 Niederlenz

K-Tron hinterlegt die technische Dokumentation bei benannter Stelle:
 K-Tron deposits the technical documentation with the notified body:
 K-Tron dépose le dossier technique chez l'organisme notifié:
 SEV (electrosuisse), Ident.No.: 1258

Niederlenz, 13.03.2014

Andreas Rykart
 Engineering / *Engineering*

Gerhard Wirz
 Geschäftsführer / *Managing director*




Bestimmungsgemässe Verwendung zu Konformitätserklärung

Intended use to declaration of conformity

Utilisation prévue pour la déclaration de conformité

Projektnummer / Project number / Numéro de projet: 1401237

Ident Nr. / Ident no. / No de ident: M-352970

K-PH-ML-D5-KT35

 **II 3D / 2D T140°C X**

Zeichnungs Nr. / Drawing number / Numéro de dessin: 1401237500A

Bestimmungsgemässe Verwendung:

Intended use:

Utilisation prévue:

Die Ausrüstung wird für die kontinuierliche oder diskontinuierliche Dosierung, Durchflussbestimmung oder Förderung von leicht- bis schwerfliessenden Schüttgütern eingesetzt.

This equipment is used for continuous or discontinuous feeding, metering or conveying of good to bad flowing bulk material.

L'équipement est utilisé pour le dosage, le transporte pneumatique en continu ou discontinu ou pour mesurer le débit de matières avec un bon à mauvais écoulement.

Aufstellungsumgebung der Anlage:

Surrounding area of the equipment:

Zone de processus externe de l'appareil:

Das System ist ausgeführt für den Betrieb in nicht-gas-explosionsgefährdeten Bereichen. Geräte ohne Kategorie für Gas sind zur Verwendung in Bereichen bestimmt, in denen eine gas-explosionsfähige Gasatmosphäre nicht in solchen Mengen zur erwarten sind, dass spezielle Vorkehrungen bei der Konstruktion, der Installation und dem Einsatz erforderlich sind. Aufstellungsumgebung ohne gas-explosionsgefährdete Atmosphäre (Schüttgutprozessraum siehe unten).

The system is built for use in non-gas-explosive hazardous areas. Non classified equipment for gas The system is built for a non classified area. The use in a hazardous surrounding area is not allowed ! Surrounding area of the equipment without gas-explosive atmosphere (internal process area see below).

L'appareil est conçu pour fonctionner avec des atmosphères non-explosibles. Les appareils sans catégorie gaz sont conçus pour pouvoir fonctionner dans les endroits dans lesquels des atmosphères explosibles seront dans des quantités telles qu'elles ne nécessiteront pas des constructions, installations et mesures spéciales pour l'utilisation. Zone de processus externe de l'appareil sans atmosphères explosibles (voir plus bas pour la zone de processus interne).

Das System ist ausgeführt als ein Gerät der Gruppe II, Gerätekategorie 3D zur Verwendung mit brennbarem Staub mit einer minimalen Zündenergie >1mJ. Geräte der Kategorie 3D sind zur Verwendung in Bereichen (Zone 22) bestimmt, in denen bei Normalbetrieb nicht damit zu rechnen ist, dass eine explosionsfähige Atmosphäre in Form einer Wolke brennbaren Staubes in Luft auftritt, wenn sie aber dennoch auftritt, dann nur kurzzeitig. Die Kategorie 3D gilt für die Aufstellungsumgebung des Gerätes (Schüttgutprozessraum siehe unten).

The system is built as equipment of the group II, equipment category 3D for use with combustible dusts with a minimum ignition energy >1mJ. Equipment of category 3D is intended for use in areas (zone 22) in which an 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. The category 3D applies for the surrounding area of the equipment (internal process area) see below).

L'appareil est conçu comme appareil du groupe II catégorie 3D, pour pouvoir fonctionner en présence de poussières combustibles avec une énergie minimale d'inflammation >1mJ. Les appareils de la catégorie 3D sont conçus pour pouvoir fonctionner dans les endroits (Zone 22), dans lesquels des atmosphères explosibles dues au mélange d'air et de poussières seront peu probables et, si elle surviennent, ne subsisteront que brièvement. La catégorie 3D s'applique à la zone de processus externe de l'appareil (voir plus bas pour la zone de processus interne).

Schüttgutprozessraum:**Internal process area of the equipment:****Zone de processus interne de l'appareil:**

Der Schüttgutprozessraum ist ausgeführt für den Betrieb in nicht-gas-explosionsgefährdeten Bereichen. Geräte ohne Kategorie für Gas sind zur Verwendung in Bereichen bestimmt, in denen eine gas-explosionsfähige Gasatmosphäre nicht in solchen Mengen zu erwarten sind, dass spezielle Vorkehrungen bei der Konstruktion, der Installation und dem Einsatz erforderlich sind. Schüttgutprozessraum ohne gas-explosionsgefährdete Atmosphäre.

The internal process area is built for use in non-gas-explosive hazardous areas. Non classified equipment for gas The system is built for a non classified area. The use in a hazardous surrounding area is not allowed ! Internal process area without gas-explosive atmosphere.

L'intérieur de l'appareil, défini comme zone de processus, est conçu pour fonctionner avec des atmosphères non-explosibles. Les appareils sans catégorie gaz sont conçus pour pouvoir fonctionner dans les endroits dans lesquels des atmosphères explosibles seront dans des quantités telles qu'elles ne nécessiteront pas des constructions, installations et mesures spéciales pour l'utilisation. Zone de processus interne de l'appareil sans atmosphères explosibles.

Der Schüttgutprozessraum ist ausgeführt als ein Gerät der Gruppe II, Gerätekategorie 2D zur Verwendung mit brennbarem Staub mit einer minimalen Zündenergie >1mJ. Geräte der Kategorie 2D sind zur Verwendung in Bereichen (Zone 21) bestimmt, in denen damit zu rechnen ist, dass eine explosionsfähige Atmosphäre in Form einer Wolke brennbaren Staubes in Luft im normalen Betrieb gelegentlich auftritt. Die Kategorie 2D gilt für den Schüttgutprozessraum des Gerätes.

The internal process area is built as equipment of the group II, equipment category 2D for use with combustible dusts with a minimum ignition energy >1mJ. Equipment of category 2D is intended for use in areas (zone 21) in which an explosive atmosphere in the form of a cloud of combustible dust in air is likely to occur, occasionally, in normal operation. The category 2D applies for the internal process area.

L'intérieur de l'appareil, défini comme zone de processus, est conçu comme appareil du groupe II catégorie 2D, pour pouvoir fonctionner en présence de poussières combustibles avec une énergie minimale d'inflammation >1mJ. Les appareils de la catégorie 2D sont conçus pour pouvoir fonctionner dans les endroits (Zone 21), dans lesquels existent occasionnellement des atmosphères explosibles dues au mélange d'air et de poussières. La catégorie 2D s'applique à la zone de processus interne de l'appareil.

Allgemeine Daten:**General data:****Données générales:**

Umgebungstemperatur / Ambient temperature / Température ambiante: Tamb = 0...40°C

Schüttguttemperatur / Bulk material temperature / Température de matériel: Tprod = 0...50°C

Sicherheitshinweise:**Safety note:****Conseils de sécurité:**

Motor Drehzahlbereich: 20 - 2000 U/Min.

Motor speed range: 20 - 2000 RPM.

Beschreibung / Typ Description / Type Description / Type	Kennzeichnung Richtlinie 94/9/EG Marking Directive 94/9/EG Marquage Directive 94/9/EG	EG Konformitätserklärung EG Declaration of Conformity EG Déclaration de Conformité	K-Tron Artikel-Nr. K-Tron Item No. K-Tron No. d'article
Feeder (Equipment): K-Tron K-PH-ML-D5-KT35	Ex II 3D / 2D T140°C X; ; Tamb=0...40°C Tprod=0...50°C; Year: 2014; K-Tron 1090009905	K-Tron doc. No.: 1000000202 / 13.03.2014 Project No.: 1401237 / M-352970	1401237 / M-352970
Sub-assembly feeder (drive-unit): K-Tron K-PH-M_-KT35/KS60	"Ex II 2GD Ex c IIC T120°C (T4), Tamb.=0...50°C" K-Tron 1090029901 A	Part of feeder	Part of feeder
Controller: K-Tron Control Module KCM SS	Ex II 3D Ex tc IIIC T65°C , Ta = -20°C...+40°C K-Tron 1190021904 A	K-Tron doc. No.: 119021906 A	0000028839
Motor DC 0.450kW: Baldor 3327 P K-Tron 0000015733	Ex II 3D IP6x T86°C, Tamb.=-20°C...+50°C SEV 06 ATEX 0127 X	Baldor	0000015733
Speed pick-up (PU): Jaquet FTG 1088... Ex	Ex II 3D IP67 T155°C, Tamb.=-40°C...+100°C	Jaquet Ex II 3G + 3D, 2003-02-24	0123-30092
Scale: K-Tron D5 XPC3	Ex II 3D Ex tD A22 IP55 T55°C, Tamb.=-20...+50°C K-Tron 0490018926 B	K-Tron doc. No.: 0490000209 C	0000005232

Freigabe - Protokoll

Release – Report

Auftragsnummer / Order number:

140 12 37

***Coperion K-Tron (Schweiz) GmbH bestätigt, dass die Qualität der gelieferten Anlage geprüft ist und die Vorgaben gemäss Bestellung sowie die allgemeingültigen Normen eingehalten sind.
Die Ausführung entspricht den festgelegten Kundenanforderungen.***

***Coperion K-Tron (Switzerland) LLC confirms that the quality of the delivered equipment has been inspected and the specifications according to the order and the general standards has been considered.
The design represents the agreed upon customer requirements.***

Bemerkungen / Remarks:

.....
.....
.....
.....

Abteilung / Department

Datum / Date:

Visum / Visa:

Montage / Assembly

3.6.14

[Signature]

Endprüfung / Inspection

3.6.14

[Signature]

Verkauf / Sales

4.6.14

[Signature]

Engineering / Proj. Manager
(Pharma / Food / ATEX only)

4.6.14

[Signature]

Montageleitung / Manager Assembly

11.6.14

[Signature]

Kunde: Customer:	<i>leistriz</i>	Projekt Nr.: Project No.:	<i>1401237</i>	K-Tron MO No.:	
Tag No.:		Kunden Ref.Nr.: Customer PO No.:			

**Geräte und Schutzsysteme in explosionsgefährdeten Bereichen (94/9/EG) (Endprüfung Kundenauftrag)
Equipment and protective systems in potentially explosive atmospheres (94/9/EC) (final insp. cust. proj.)**

Prüfpunkte mechanisch	Checkpoints mechanic	Geprüft / Checked	Trifft nicht zu / N/A
Ex-Zahnriemen in Getriebe montiert	Ex- pulleys in gear assembled		X
Horiz. -RW: RW-Flügel / Trogwand ≥ 1 mm (überall Mindest - Abstand ≥ 1 mm)	Horiz. Agitator: Agitator blad / Troughwall ≥ 1 mm Min. clearance ≥ 1 mm	X	
Vert. -RW: RW-Flügel / Trichterwand ≥ 5 mm (überall Mindest - Abstand ≥ 5 mm)	Vert. Agitator: Agitator blad / hopperwall ≥ 5 mm Min. clearance ≥ 5 mm		X
Schnecken: Konzentrität überprüfen Mind. Abstand ≥ 1 mm	Screws: concentricity checked Min. clearance ≥ 1 mm	X	
Dichtungen, Faltenbalg, Manschetten, Flex etc. montiert nach Vorgaben gemäss Begleitpapieren (Zeichnung, Stückliste etc.) (Dichtheit nur bei Staub erforderlich)	Seals, bellows, sleeves, flex connections etc. assembled as defined in production documents (drawings, bill of material etc.) (tightness for dust only)	X	
Maschinen-Komponenten komplett geerdet nach Montageanweisung 17.05-0006	Machine components completely grounded according to assembly instruction 17.05-0006	X	
Ex-Anlage als solche gekennzeichnet mit Schild	Ex - machines as such marked by label	X	

Bemerkungen / remarks:	Mech.	Endprüfung / Final inspection	
		Name / Visa	Datum / Date
		<i>[Signature]</i>	<i>3.6.14</i>

Prüfpunkte elektrisch	Checkpoints electrical	Geprüft Checked	Trifft nicht zu N/A
Limiten der Umfangsgeschwindigkeiten (Schnecken, Rührwerke, Band) eingestellt / überprüft (siehe "bestimmungsgemässen Gebrauch" als Teil der Konformitätserklärung)	Limits of circumferential speed (screws, agitators, band) adjusted / checked (see "intended use as per declaration of conformity")		X
Kabel, Stecker (Ex-Typ) montiert (Schirm)	Cables, plugs (Ex-type) assembled (shield)	X	
Komponenten in Ex-Ausführung montiert.	Explosion proved components assembled	X	
Systeme bzw. Komponenten eingestellt nach Herstellerangaben.	Systems resp. Components set according to Manufacturer description	X	

Bemerkungen / remarks:	Electr.	Endprüfung / Final inspection	
		Name / Visa	Datum / Date
		<i>[Signature]</i>	<i>03.06.14</i>



Coperion K-Tron (Schweiz)
GmbH
Lenzhardweg 43/45
CH-5702 Niederlenz

ENDPRÜFUNG- PROTOKOLL / FINAL INSPECTION CERTIFICATE

Werkzeugnis gemäss EN10204-2.2
Test report according to EN10204-2.2

Kunde: Customer:		Projekt Nr.: Project No.:		K-Tron MO No.:	
Tag No.:				Kunden Ref.Nr.: Customer PO No.:	

Prüfprotokoll für Projektdokumentation Inspection protocol for project manual			
Prüfpunkte	Checkpoints	Geprüft / Checked	Trifft nicht zu / N/A
Vorbereitung	Preparation		
Projektänderungen eingearbeitet	Project changes incorporated		
Sprachen kontrolliert	Languages checked		
Anzahl Handbücher	Number of hardcopies		
Erstellung	Creation		
Spezifische Prüfungen berücksichtigt	Specific tests considered		
Zertifikate berücksichtigt	Certificates considered		
Dokumentationsstruktur überprüft	Documentation structure checked		
Richtige Anleitungen für Anbauteile	Correct manuals for attaching parts used		
Richtige Anleitungen eingefügt (ATEX)	Correct manuals used (ATEX)		
Anleitungen in richtiger Sprache verwendet	Manuals in correct language used		
Letzte Zeichnungsrevision eingefügt	Last mechanical drawing revision used		
MDS berücksichtigt	MDS considered		
Programmierblätter berücksichtigt	Programming sheets considered		
PDF Druckvorlage überprüft	PDF Print file checked		
Zeugnisse / Prüfungen	Test reports / Inspections		
FDA Bescheinigungen überprüft	FDA approval checked		
Spezifische Prüfnachweise eingefügt	Specific test reports included		
Listen mit produktberührenden Teilen ergänzt	List with parts in contact with product completed		
Atex Dokumentationen verwendet	Atex manuals used		
Atex für Anbauteile kontrolliert	Atex conformity of attaching parts checked		
Abschlussarbeiten	Final works		
Dokumentennummern überprüft	Document numbers checked		
Letzte Schemarevision eingefügt	Last electrical drawing revision used		
Gedruckte Dokumentation kontrolliert	Printed documentation checked		
Connectivity Verzeichnis auf CD gebrannt	Connectivity folder burned on CD		
Dokumentation vom Projektleiter kontrolliert	Documentation checked from project engineer		
CD (s) gebrannt	CD (s) burned		

Bemerkung / remark:	Dokumentation Documentation	Endprüfung / Final inspection	
		Name / Visa	Datum / Date



Coperion K-Tron (Schweiz)
GmbH
Lenzhardweg 43/45
CH-5702 Niederlenz

ENDPRÜFUNG- PROTOKOLL / FINAL INSPECTION CERTIFICATE

Werkzeugnis gemäss EN10204-2.2
Test report according to EN10204-2.2

Kunde: Customer:	<i>Leudrik</i>	Projekt Nr.: Project No.:	<i>140237</i>	K-Tron MO No.:	
Tag No.:				Kunden Ref.Nr.: Customer PO No.:	

Elektrisches Prüfprotokoll (Endprüfung Kundenauftrag) Electrical inspection protocol (final test customer project)

Prüfpunkte elektrisch	Checkpoints electrical	Geprüft / Checked	Trifft nicht zu / N/A
Projekt-Spez. (Anforderungen) überprüft	Project Specification (requirements) checked	X	
Schemata (inkl. Revisionen) erstellt	El. Drawing (incl. revision) established	X	
Disposition überprüft	Arrangement drawing checked	X	
Spannung nach Schemata überprüft	Voltage as per el. drawing checked	X	
Programmierungen ausgeführt / überprüft	Programing executed / checked	X	
Batterie überprüft und eingeschaltet	Batteries checked and connected	X	
K-Link Protokoll eingestellt / überprüft	K-Link protocol adjusted / checked		X
Wandler eingestellt / überprüft	Converters adjusted / checked		X
Wago Module programmiert / überprüft	Wago Module programmed / checked		X
Hilscher Box konfiguriert / überprüft	Hilscher Box configured / checked		X
Profibuskarte / Modbus plus überprüft	Profibus Board / Modbus plus checked		X
Ethernetkarten – Treiber installiert	Ethernet board – driver installed	X	
Düsensteuerung eingestellt / überprüft	Nozzle adjusted / checked		X
Frequenzumformer eingestellt / überprüft	Frequency transformer adjusted / checked		X
Leistungsteil eingestellt	Power supply adjusted	X	
Pick-up, Zähnezah (Indikator) eingestellt	Pick-up (indicator) adjusted	X	
Drehzahl (UPM) eingestellt / überprüft	Speed (RPM) adjusted / checked	X	
Drehrichtung Schnecke / Band überprüft	Correct rotation screw / belt checked	X	
Getriebe (High / Low) überprüft	Gear (High / Low) checked	X	
Vol. / Grav. Regelverhalten überprüft	Vol. / grav. Control mode checked	X	
Verdrahtung nach Schema ausgeführt /	Wiring as per electrical drwg executed / checked	X	
Regel-System (Typ, Ausführung) überprüft	Control System (type, execution) checked	X	
Schnittstelle, Sprache eingestellt	Interface, language adjusted	X	
Alle Funktionen nach Schema überprüft	All functionalities checked as per El. drwg	X	
Bezeichnungs- / Warnschilder montiert	Ident. - / Warning - Labels installed	X	
Jet - Filter elektr. überprüft	Jet - Filter electr. checked		X
Nachfüll-System elektr. überprüft	Refill - System electr. checked		X
Abscheider / Einzelfördergerät elektr. überprüft	Receiver / Loader electr. checked		X
Sackschütte elektr. überprüft	Big Bag Dump Station electr. checked		X
Vordosierer elektr. überprüft	Pre-feeder electr. checked		X
Bandüberwachung überprüft	Belt monitoring checked		X
Pendelweg Vibrator eingestellt / überprüft	Vibratory feeder amplitude adjusted / checked		X
Gewichtstest durchgeführt	Weighing - test executed	X	
Ersatzteile / lose Teile überprüft	Spare - / loose parts checked		X
Vorauslieferung (papiermässig) überprüft	Advanced delivery checked	X	

Bemerkungen / remarks:	Endprüfung / Final inspection	
	Name / Visa	Datum / Date
	<i>[Signature]</i>	<i>03.06.14</i>



Coperion K-Tron (Schweiz)
GmbH
Lenzhardweg 43/45
CH-5702 Niederlenz

ENDPRÜFUNG- PROTOKOLL / FINAL INSPECTION CERTIFICATE

Werkzeugnis gemäss EN10204-2.2
Test report according to EN10204-2.2

Kunde: Customer:	<i>Leistrutz</i>	Projekt Nr.: Project No.:	<i>140.1237</i>	K-Tron MO No.:	
Tag No.:				Kunden Ref.Nr.:	
				Customer PO No.:	

Mechanisches Prüfprotokoll (Endprüfung Kundenauftrag) Mechanical inspection protocol (final test customer project)			
Prüfpunkte mechanisch	Checkpoints mechanic	Geprüft / Checked	Trifft nicht zu / N/A
Projekt-Spez. (Anforderungen) überprüft	Project Specification (requirements) checked	X	
Masch. Dimensionen n. Massbild überprüft	Dimension as per arrangmnt. drwg checked	X	
Spezial Anforderungen eruiert / überprüft	Special requirements determined / checked	X	
Dosierer (Typ, Ausführung) überprüft	Feeders (type, execution) checked	X	
Rahmen (Typ, Ausführung) überprüft	Frames (type, execution) checked	X	
Waagen (Typ, Ausführung) überprüft	Scales (type, execution) checked	X	
Messdosen (Typ, Ausführung) überprüft	Load cells (type, execution) checked		X
Trichter (Grösse, Ausführung) überprüft	Hoppers (size, execution) checked	X	
Motoren (Typ, Ausführung) überprüft	Motors (type, execution) checked	X	
Getriebe (Typ, Ausführung) überprüft	Gears (type, execution) checked	X	
Rührwerke (Typ, Ausführung) überprüft	Agitators (type, execution) checked	X	
Schutzvorrichtungen montiert / überprüft	Safety devices assembled / checked	X	
Pick-up mechanisch eingestellt	Pick-up mechanically adjusted	X	
Sicherungen der Getriebe-Aufhängung montiert	Safety devices of gear-suspension assembl.		X
Erdungen montiert	Groundings assembled	X	
Auslaufrohre montiert	Outlet tubes assembled	X	
Schnecken Rundlauf überprüft (streift nicht)	Screws concentric run checked (no scratching)	X	
Lackierung (Ausführung, Schäden) überprüft	Painting (execution, defects) checked	X	
Alle mechanischen Funktionen überprüft	All mech. functionalities checked	X	
Maschinen – Schilder montiert	Ident. Labels installed	X	
Warnschilder montiert	Warning labels installed	X	
Jet - Filter mech. überprüft	Jet - Filter mech. checked		X
Nachfüll-System mech. überprüft	Refill - System mech. checked		X
Abscheider / Einzelfördergerät mech. überprüft	Receiver / Loader mech. checked		X
Sackschütte mech. überprüft	Big Bag Dump Station mech. checked		X
Vordosierer mech. überprüft	Pre-feeder mech. checked		X
Druck- / Dichtheitstests durchgeführt	Pressure- / leakage tests executed		X
Oberfl. - Rauheitstests durchgeführt	Surface roughness tests executed	X	
Lärmmessung durchgeführt	Noise level test executed		X
Farbschichtdicke gemessen	Painting thickness checked		X
PMI Test durchgeführt	PMI test executed		X
Farbeindringprüfung durchgeführt	Dye penetration test executed		X
Ersatzteile / lose Teile überprüft	Spare parts / loose parts checked	X	

Bemerkungen / remarks:	Mech.	Endprüfung / Final inspection	
		Name / Visa	Datum / Date
		<i>L. Schmid</i>	<i>3.6.14</i>

Abnahmeprüfzeugnis EN 10204-3.1 / Inspection Certificate EN 10204-3.1

Kunde/ Customer:	Novartis Pharma-Singapore	Kunden Nr. / Customer No.:	JB107858-300
Projekt Nr. / Project No.:	1401237	Tag-No.:	
Prod. Line / Prod. line		M-No.:	352970
Masch. Typ / Equipment type:	K-PH-ML-D5-KT35	Coperion K-Tron (Schweiz) GmbH Lenzhardweg 43/45 CH-5702 Niederlenz	

K-Tron (Schweiz) AG bescheinigt, dass die gelieferten Erzeugnisse den Vereinbarungen bei der Bestellung entsprechen. Darüber hinaus wird bescheinigt, dass bei der Herstellung die vorgeschriebenen Prüfungen nach den bestehenden Prüfvorgaben an den zu liefernden Erzeugnissen durchgeführt und die erforderlichen Freigaben erteilt wurden. Im vorgegebenen Rahmen ist die Rückverfolgbarkeit gewährleistet.

K-Tron (Switzerland) Ltd. confirms, that the delivered products conform to the requirements of the order. In addition, we confirm that during production of the products were subjected to the prescribed tests according to current test instructions on the delivered products and the necessary releases were granted. Traceability is guaranteed within assigned scope.

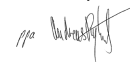
Liste der produktberührenden Teile / List of parts in contact with product - EN 10204-3.1

Teileidentifikation Part identification				Oberflächen Surfaces			Werkstoff Identifikation Material identification					
Teile Nr. Item no.	Teilebezeichnung Item description	Zeichnung Nr. Drawing no.	Pos.Nr. Pos.no.	Produktberührende Fläche [cm² ±20%] Surface in contact with product [cm² ±20%]	Sollwert Oberflächenrauheit [µm] setpoint surface roughness [µm]	Messprotokoll (sheet...) Test protocol (sheet...)	Werkstoff Ident.No.: EN 10 088 Material ident. no.: EN 10088	Werkstoff Ident. No.: ASTM Material ident.no.: ASTM	Werkstoff - Bezeichn./ Werkst.-Bez. EN 10088 Material -description/ Mat.-descript. EN 10088	Abnahmeprüfzeugnis EN 10204-3.1 (sheet...) Inspection Certificate EN 10204-3.1 (sheet...)	PMI - Prüfung PMI - Test	Bemerkungen Remarks
0000010181	RW-TRICHTER / AGITATOR HOPPER	1401237100	10	1600	Ra≤0.4 / 0.8µm	1	1.4404	--	--	2 - 4	N/A	
0000010287	TRICHTER 20L / HOPPER 20L	1401237100	52	3871	Ra≤0.4 / 0.8µm	5	1.4404	--	--	6 - 10	N/A	
9513-38043	RUEHRER / AGITATOR	1401237100	44	371	Ra≤0.4 / 0.8µm	11	1.4404	--	--	12 - 13	N/A	
0000008368	CC-SCHNECKEN PAAR / SCREW PAIR	1401237100	11	730	Ra≤0.4 / 0.8µm	14	1.4404	--	--	15	N/A	
0000010324	SIEB / MESH	1401237100	78	26	Ra≤0.4 / 0.8µm	16	1.4404	--	--	17	N/A	
0000024702	SIEB / MESH	1401237100	78	23	Ra≤0.4 / 0.8µm	18	1.4404	--	--	19	N/A	
0000027721	SCHNECKENROHREINSATZ / DISCHARGE TUBE INSERT	1401237100	76	270	Ra≤0.4 / 0.8µm	20	1.4404	--	--	21	N/A	
0000014016	FILTERSACKHALTER / FILTER BAG HOLDER	1401237100	6	637	Ra≤0.4 / 0.8µm	22	1.4435	--	--	76 - 79	N/A	
0000006962	AUSLAUFSTUECK / OUTLET	1401237100	1	583	Ra≤0.4 / 0.8µm	25	1.4404	--	--	26 - 27	N/A	
0000010367	STUTZEN ZU FRONTPLATTE UNTEN / NOZZLE FRONT PLATE BELOW	1401237100	12	8	Ra≤0.4 / 0.8µm	28	1.4404	--	--	29 - 30	N/A	
9522-35745	RÜHRWERKWELLE T35	1401237100	82	7	Ra≤0.4 / 0.8µm	31	1.4404	--	--	32	N/A	
9522-35750	SCHNECKENTRAGWELLE T35 RECHTS	1401237100	83	6	Ra≤0.4 / 0.8µm	33	1.4057	--	--	34 - 35	N/A	
9522-35747	SCHNECKENTRAGWELLE T35 LINKS	1401237100	84	6	Ra≤0.4 / 0.8µm	36	1.4057	--	--	37 - 38	N/A	
0000009000	DICHTUNGSBUCHSE	1401237100	85	10	Ra≤0.4 / 0.8µm	39	1.4404	--	--	40 - 41	N/A	
9324-70044	DICHTUNG ZU RW-TRICHTER / FLAT SEAL TROUGH	1401237100	46	261	N/A	N/A	N/A	N/A	SILICONE	42 - 44	N/A	
9585-30137	BRILLENDICHTUNG / SCREW SEAL	1401237100	65	71	N/A	N/A	N/A	N/A	SILICONE	45	N/A	
9585-30767	FALTENBALG DN200 / BELLOW DN200	1401237100	54	972	N/A	N/A	N/A	N/A	VMQ	46	N/A	
9324-40875	O-RING ID38X2.5MM	1401237100	67	3	N/A	N/A	N/A	N/A	PTFE (DL6020)	47	N/A	
9324-40760	O-RING D=9.25X1.78 SIL 70SH K	1401237100	64	0.6	N/A	N/A	N/A	N/A	SILICONE	48	N/A	
0000027410	FILTERSACK / FILTER BAG	1401237100	7	1692	N/A	N/A	N/A	N/A	TETRALEX	49	N/A	
9324-40900	KLEMMRINGDICHTUNG / CLAMP-RING SEAL	1401237100	5	79	N/A	N/A	N/A	N/A	VMQ	50 - 52	N/A	
9585-30787	FALTENBALG DN100 / BELLOW DN100	1401237100	3	383	N/A	N/A	N/A	N/A	VMQ	53	N/A	
0000008503	NT-DICHTLIPPE / NT-LIP SEAL	1401237100	69	6	N/A	N/A	N/A	N/A	PTFE (DL6020)	54 - 55	N/A	
9324-40880	O-RING ID60X3	1401237100	9	19	N/A	N/A	N/A	N/A	SILICONE	56 - 57	N/A	
9324-40859	O-RING 12X5	1401237100	68	6	N/A	N/A	N/A	N/A	SILICONE	58 - 59	N/A	
0000027492	FLACHDICHTUNG 2x46.2x76.2	1401237100	79	13	N/A	N/A	N/A	N/A	SILICONE	60	N/A	
--	GETRIEBE OEL / GEAR OIL	--	--	--	N/A	N/A	N/A	N/A	CASSIDA FLUIDS 150	61 - 67	N/A	
--	FETT / GREASE	--	--	--	N/A	N/A	N/A	N/A	CASSIDA GREASE RLS	68 - 75	N/A	

Bemerkungen:
Remarks:

K-Tron (Schweiz) GmbH
K-Tron (Switzerland) LLC

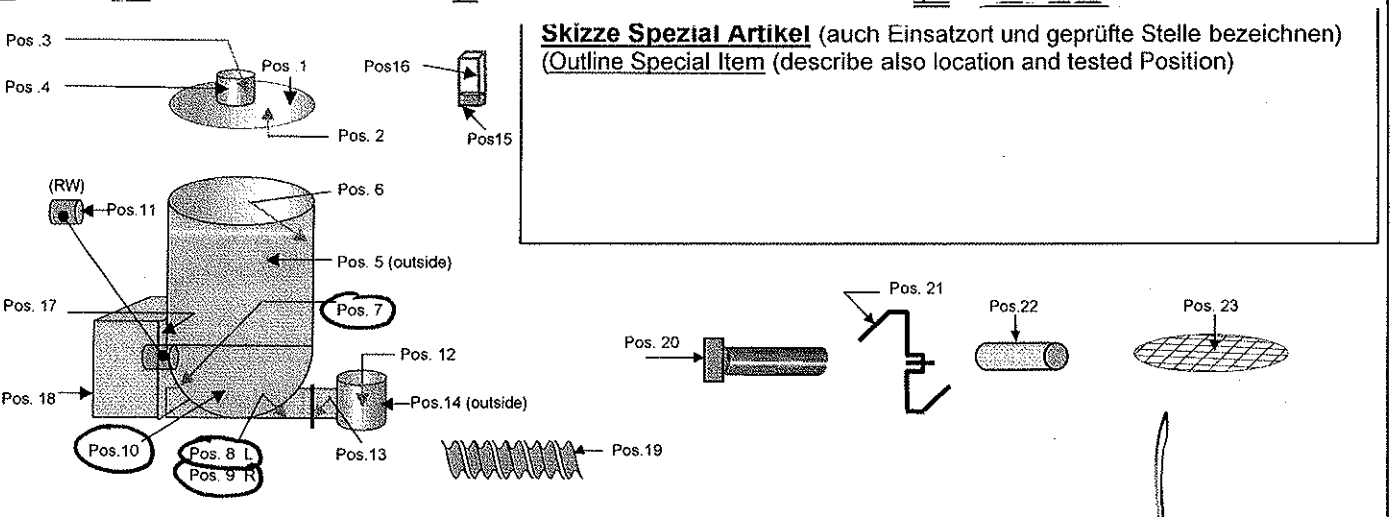
Leiter ENG. / Responsible ENG.
Andreas Rykart



Ausgabe Edition	Erstellt / Geändert Created / Changed	Name	Datum Date
A	Erstellt	M. Keller	13.03.2014
B	Geändert / Changed	A.Witte	12.06.2014
C	Geändert / Changed	A.Witte	21.07.2014

CO - Nr./ Kundenauftrag Nr.: (CO -No. / Order No.)	CO -	<input checked="" type="checkbox"/> mit Material Zertifikat (with material certificate)
MO - Nr. / Dosierer Nr.: (MO - No. / Feeder No.)	MO -	<input type="checkbox"/> mit Prüfprotokoll (Masse) (with test protocol (dimensions))
Artikel Nummer: (item number)	0000010181	<input type="checkbox"/> mit WPS (with WPS)
Artikelbeschreibung: (item description)	RW-Trichter-KT35-PA	Bemerkung: (remarks)
Prüfmittel: (test equipment)	Oberflächenmessgerät, Mitutoyo, No.: 01-33-001 oder / or Oberflächenmessgerät, Perthometer M1, Mahr, No.: 01-33-003	

Messstreifen: (Test strin)	Bemerkungen: (remarks)	Messstreifen: (Test strip)
<p>Pos. 8 { Bohrung links }</p> <p>Perthometer M1 Objekt Name # Lt 5.600 mm Ls Norm GS 2.5 µm Lc 0.800 mm Ra 0.285 µm Rz 1.96 µm Rmax 2.57 µm</p> <p>Pos. 9 { Bohrung Rechte }</p> <p>Perthometer M1 Objekt Name # Lt 5.600 mm Ls Norm GS 2.5 µm Lc 0.800 mm Ra 0.315 µm Rz 2.24 µm Rmax 3.13 µm</p>	<p>Innen Pos. 7</p> <p>Perthometer M1 Objekt Name # Lt 5.600 mm Ls Norm GS 2.5 µm Lc 0.800 mm Ra 0.308 µm Rz 2.57 µm Rmax 4.11 µm</p> <p>Innen Pos. 7</p> <p>Perthometer M1 Objekt Name # Lt 5.600 mm Ls Norm GS 2.5 µm Lc 0.800 mm Ra 0.262 µm Rz 2.18 µm Rmax 2.74 µm</p>	<p>Aussen Pos. 10</p> <p>Perthometer M1 Objekt Name # Lt 5.600 mm Ls Norm GS 2.5 µm Lc 0.800 mm Ra 0.383 µm Rz 2.54 µm Rmax 3.09 µm</p> <p>Aussen Pos. 10</p> <p>Perthometer M1 Objekt Name # Lt 5.600 mm Ls Norm GS 2.5 µm Lc 0.800 mm Ra 0.522 µm Rz 5.40 µm Rmax 7.06 µm</p>



Geprüft / Name / tested / name: Fischer	Datum / Date: 19. 05. 2014	Visum / Sign.:
---	--------------------------------------	---------------------------

FRANCE

CERTIFICAT DE RECEPTION 3.1.B
ABNAHMEPRUEFZEUGNIS 3.1.B
INSPECTION CERTIFICATE 3.1.B

Usine Producteur
Hersteller
Manufacturer
UGINE
F 73403 UGINE CEDEX
Tél: 04.78.88.20.30
Fax: 04.78.88.20.81

EN 10204.3/1.B

Produit
Erzeugnisform
Produkt
4435 BARRE A CHAUD RONDE TOL. K13 BN2 TUV

Client usine - Installate - Besteller und/oder Empfänger - Empfänger für/for Empfänger
N. de commande client - Kundenbestellnummer - Purchaser order number
105031663/LC

États et applications techniques - Normen und Prüfbedingungen - Quality and Specifications
AD-W 2 WNR 1.4435

UGIMA 4435
DIN 17440/96 + BASLER NORM BN2
État de Réception - Lieferzustand - As delivered (1)

Inspection de Référence - Probenverfahrenbehandlung - Treatment of test samples (1)

ADOUCI CONFORME A EN 10088-3

Identification du produit
Firegrade Bezeichnung Product Identification
N. de série usine N. de poste N. de Coulée
Werkbest.-Nummer Post Nr. Schmelz Nr.
Works order number plant No. Heat No.

18	19	20	21	22
3NU01 000	127041	4 ROND	120,000	2082 KG

No. Pré-inspection Inspektion Nr.	Diamètre nominal Nennmaß	État Zustand	Traction - Zugversuch - Tensile Test				Dureté Härte	Type Form	Résistance - Keylochgezeitigkeit - Notch Toughness			
			Limite d'élasticité Streckgrenze Yield Strength	Résistance à la traction Zugfestigkeit Tensile strength	Élongation Dehnung Elongation	Élongation à la rupture Bruchdehnung Elongation at break			Valours individuelles Einzelnwerte Individual Values	Moyenne Mittelwerte Average	Dureté Härte Hardness	
0160	190	RT	225	490	35	690	ISOV L	20	J	85,0	38	37
(4)	250		290	530	62					235-240-242		
(5)	255		295	530	63					245-250-247		
	260		300	530	63					242-254-251		
	265		300	530	63					250-258-252		
39 A	40		41	42	43	44	45	46	47	48	49	50
	État		C	SI	MN	NI	CR	MO	N	TI	S	
	Min		0,03	1,0	2,0	12,5	17,0	2,5	0,100	0,0500	0,025	
	Max		0,03	0,4	1,5	12,5	17,0	2,5	0,032	0,0014	0,020	
3A	31		32	33	34	35						
	État		P									
	Min		0,045									
	Max		0,027									

% FERRITE : 0,31
AUF GEGENZEICHNUNG WIRD VERZICHTET
INTERKRISTALLINE KORROSION BESTAENDIG NACH DIN 50914 / 9.1/10L/11T. GEPRUEFT
INNERE FEHLERFREIHEIT DURCH PROZESS-KONTROLLE GARANTIERT
ANNO + TRUI00 : APPROVAL BY TUEV SÜDHEISS
INFRACRYSTAL, CORROSION RESISTANT ACC. TO EUROHORN 114 / ANTIMIXING TESTED

Geprüft
4. März 2002

P-Nr: 164191	Meag
Pos Nr: 1	Zert/Tot: 3
Art Nr: 00000 10181	
920937/025382	

(1) L Long
Lang - Long
Tubes
Quec traverses

(2) A l'état de référence
Zum Bezug Zustand
At reference condition

(3) TE - Tempé à l'eau - Wasserbad - Wasserbad
TH - Tempé à l'huile - Ölbad - Öl Quench
A - Hypertempé - Lösungsgelüht - Solution annealed

(4) A l'état de réception
In state of delivery

(5) A l'état de livraison
In state of delivery

61 - Revenu - Anlassen - Tempered
62 - Recuit - Geglüht - Annealed
7SA - Recuit max - Weichgeglüht - Max annealed

66
67
68
69
70
71
72
73
74
75
76
77
78
79
80

Contrôles de marque, d'aspect et de dimensions: satisfaisants
Bezeichnung, Beschlingung und Ausmessung: ohne Beanstandung
Marking, inspection and measurement: without objection

Nous certifions que les produits énumérés ci-dessus sont conformes aux prescriptions de la commande
Wir bestätigen hiermit dass die obangewandten Erzeugnisse den Bestellungen entsprechen
We certify hereby that the above mentioned products are consistent with the order prescriptions

Ugine, le 10-09-01
L'Agent Réceptionnaire de l'usine
Der Werkverantwortliche
The Work Inspector
CR6
C. Bioteau

Larrondo LOIU (VIZCAYA) España
P.O. Box 1.323/48080 Bilbao
Tel. 34-(4) 4 71 13 00
Fax. 34-(4) 4 53 16 36





Quality Management System Approved CERTIN SGI 6000360

ACEROS INOXIDABLES

OLARRA

HANS KOHLER AG.
CLARIDENSTRASSE 20
POSTFACH 2521 - CH 8022 ZURICH - SUIZA

Trade Mark - Zeichen des Lieferwerkes
Anagrama del suministrador 
Works Inspector Stamp - Werkssachverständiger
Sello del Inspector 

Certificate type - APZ Nach Certificado tipo **EN 10204/3.1** Certificate n° - Prüf-Nr Certificado n° **80077** Date - Datum - Fecha **26 - 05 - 2011**

Our order N° Werks - Nr **458624** Heat Schmelze **315200** Your order N° Bestell - Nr **1013888-L**
N° de Referencia Colada Pedido N°

Steel Grade Werkstoff **X-2-CRNIMO-17-12-2 / 1.4404 MECAMAX** According to Entsprechend **EN 10.272-2007.**
Calidad Corresponde

Shape and Size - Gegenstand Perfil y dimensión **RUND 70 mm** Tolerance - Toleranz Tolerancia **h 9 / DIN 671 / EN 10278** Bundles Bunde **2** Bars Stäbe **Barras** Weight Gewicht **1237 Kg**
Peso

Requirements - Anforderungen - Exigencias
EN 10.088-3.2005. ASTM A 479 / A 479M-10a. ASME SA 479 / SA 479M-10. ASTM A 182 / A 182M-10. ASME SA 182 / SA 182M-10. NACE MR-0175/ISO 15156-3 2003. TRB-100 /AD-2000-W2 /ADW-10. ASTM A 276-10. ASME SA 276-2010. TP.316-TP.316L.
Conformity letter/Zustimmungsschreiben TUVBADEN28.01.1969
Waiving of Countersing/Gegenzeichnungsverzicht:01.03.1977
PED 97/23/EC, Annex I, Parag.4.3/DGR 97/23/EG
Anhang I Bsatz 4.3 Certificate/Zertifikat Nr. 348/2008/MUC
P-Nr: 164191 Meag
Pos Nr: 2 Zert/Tot: 3
Art Nr: 0000010181
920937/025382

Melting process / Erschmelzungsart / Proceso de Fusión **E.A.F. / A.O.D.** Heat treatment / Wärmebehandlung / Tratamiento térmico **1060C 4H/Std WATER/WASSER/AGUA**

Solution annealed/Abgeschreckt/Hipertemple-Centerless grinded/Geschliffen/Rectificado-

Test results - Ergebnis der Prüfungen - Resultados de los ensayos

Dimension of Specimen Abmessungen des Probestabes Medida de las probetas	Rp0,2% N/mm2 MPA	Rp 1% N/mm2 MPA	Rm N/mm2 MPA	A %L 5D	A %L 4D	Z %	Hardness Härte HBw	Impact test / Kersbschlag / Resiliencia ISO V Jules		
RD. 10,00 mm.	Min.	200	235	500	40			100		
	Max.			700			215			
Temperature °C 20	Spec. N° Probe Nr. Pro N°	1	291	333	573	52	55	74	163	235/234/238

	C	Si	Mn	P	S	Cr	Mo	Ni	N	Co
Min.						16,50	2,00	10,00		
Max.	0,030	1,00	2,00	0,045	0,030	18,50	2,50	13,00	0,1000	
	0,020	0,44	1,61	0,033	0,029	16,70	2,03	10,00	0,0360	0,20

Visual and dimensional inspection Besichtigung und Ausmessung **O.K.** Radioactivity inspection Radioaktivitätskontrolle **O.K.** Antimixing test Spektrosk Verwechslungspr **O.K.** Grain Size Korngröße Tamaño de grano

Remarks - Bemerkungen - Observaciones
IC test acc./IK prüfung nach ASTM A 262 E.02. OK
IC test acc./IK prüfung nach EN ISO 3651-2/98 Met.A. OK
US test acc./US prüfung nach EN 10308. OK
No weld repair.
US test acc./US prüfung nach ASTM A 388. OK

Zeugnisse & Zertifikate

WA-/Bestell-Nr.: 017017 Freigabe PM
Projekt-/Artikel-Nr.: 9540-41138 Datum/Vlsum: 27.1.2012
Datum / Vlsum Einkauf: 27.01.12 / JW

EDV / EDP
Acc. EN 10.204
Alfredo Molina
Certification
Mng.
Works Inspector
Der Werkssachverständige
Inspector de fábrica



Rg 410 900 013420
9517-70011

18/04 2005 08 12 FAX +41564818240

WERNER (SCHWEIZ) AG

KOENIG/SCHNID

002/002

ACEHINOX S.A. FABRICA DEL CAMPO DE CIDRALTAR PALMONAR (LOS BARRIOS) TEND (31-36-51930) FAX (31-36-61911) P.O. BOX-83 11370 LOS BARRIOS (CAOIZ)		40038654 +41564818240 Abnahmeprüfzeugnis B Inspection Certificate B Prüf-Nr. Inspection No. 568016 102 / 1 ACCORDING TO NACH EN 10204 J.1.0. "Zustimmungsschreiben des TÜV Baden vom 21. Februar 1983" Letter of approval from the TÜV Baden dated 21-2-83 "Laut Schreiben des TÜV Baden e.V. vom 28 Juni 1989 wird auf die Gegenzeichnung verzichtet." TÜV Baden renounce to the countersignature according to their letter date 26-6-89									
Besteller - Customer KOENIG SUITZA		Auftrags Nr. - order No. AB 65442 Bestellung Nr. - your Order No. YN-2493/5522050									
Prüfgangensart - Article BAND (COIL)		Werkstoff Nr und Lieferzustand - Material No. And Condition of Delivery 1.4404/1.4401 2B									
Werkstoff-Normbez-Standort - Grade of Material X2 CrNiMo 17-12-2 / X5 CrNiMo 17-12-2		Werkstoff - Work Grade ACX- 340									
Anforderungen - Technical requirements EN 10628-7/TRB 100/AD-2000-MERKBLATT W2/W10		Erstschmelzverfahren - Steelmaking Process A + A00 Verfahren - A00 Prozedur A									
Zeichen des Lieferwerks - Brand of the manufacturer 		Stempel des Sachverständigen - Inspector's stamp 									
Pos Nr Item No. 1	Stückzahl Quantity 1	Abmessung - Dimensions mm 2.00 x 1.250.00	Schmelze Nr. Heat No 6B23								
<table border="1"> <tr> <td>P-Nr: 164191</td> <td>Meag</td> </tr> <tr> <td>Pos Nr: 3</td> <td>Zert/Tot: 3</td> </tr> <tr> <td>Art Nr: 0000010181</td> <td></td> </tr> <tr> <td>920937 / 025382</td> <td></td> </tr> </table>				P-Nr: 164191	Meag	Pos Nr: 3	Zert/Tot: 3	Art Nr: 0000010181		920937 / 025382	
P-Nr: 164191	Meag										
Pos Nr: 3	Zert/Tot: 3										
Art Nr: 0000010181											
920937 / 025382											
Chemische Analyse - Chemical Composition											
Schmelze Nr Heat No 6B23	C	CR	MI	MO	N	NI	P	S	SI		
Anforderungen Requirements	0,030	16,500 18,500	2,000	2,000 2,500	0,110	10,000 13,000	0,045	0,018	1,000		
6B23	0,029 ✓	16,902 ✓	1,217 ✓	2,161 ✓	0,043 ✓	10,271 ✓	0,030 ✓	0,002 ✓	0,106 ✓		
Mechanische Eigenschaften - Mechanical Properties Pt. Temp At Temp 20 °C											
Probe Nr Test No 026B23	Prob.-Lage Pos. of Test C T	Abmessungen des Probestücks Dim. of specimen Breite x Dicke Width x Thickness mm 20,000 2,00	Rm N/mm² 530,00 680,00	Rp 0,2 N/mm² 240,00	Rd 1,0 N/mm² 270,00	A80 % 40,00	A80 % 57,31				
Bearbeitung und Messkontrollen wurden durchgeführt O.K. Surface and dimensional controlled O.K. Der Werkstoff ist beständig gegen intergranuläre Korrosion gemäss EN ISO 3461-2 The material is resistant to intergranular corrosion test according to EN ISO 3461-2 Spektroskopische Identifizierung: O.K. Spectroscopical identity test: O.K. Wärmebehandlung: Glühen bei 1060-1100 °C Heat treatment:											
WERKSACHVERSTÄNDIGER Werk Inspector J. Vaquero Zeugnis ist per EDV erstellt und ohne Unterschrift gültig gemäss E-Norm 10204											
best bearbeitet: UND ABGELEBEN MIT 1/1 Auftrags 3011/2001 9495 615176 Pos. 2											
Palmonar 11. APRIL 2005											

Zeugnisse & Zertifikate

lager P23

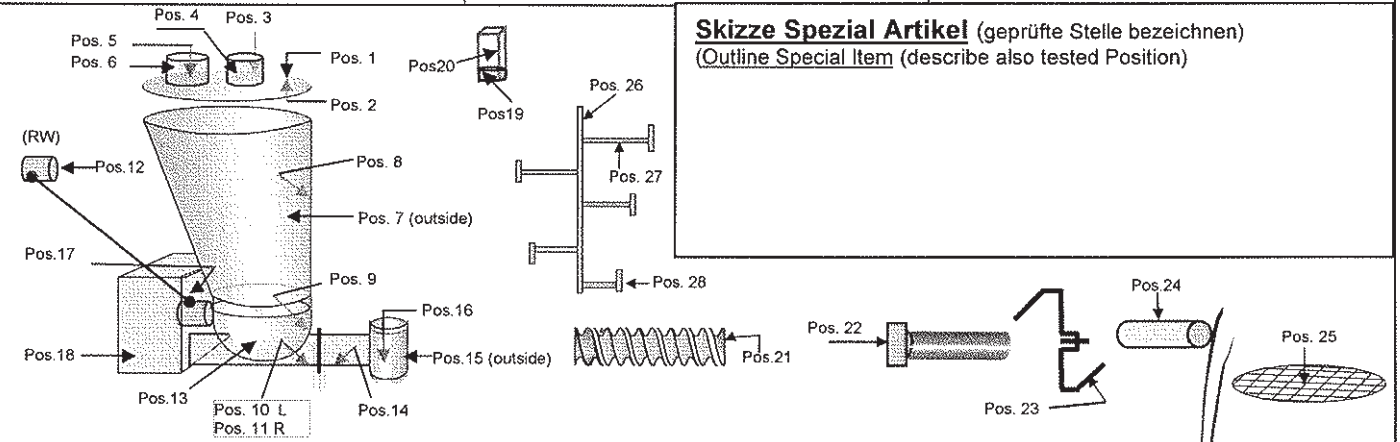
15. Mai 2006



WA-/Bestell-Nr.: 013420 Projekt-/Artikel-Nr.: 9517-70011 Datum / Visum Einkauf: 18.7.07	Freigabe PM Datum/Visum: 18.7.07 Certificat 4
---	---

CO - Nr./ Kundenauftrag Nr.: (CO -No. / Order No.)	CO -	<input checked="" type="checkbox"/> mit Material Zertifikat (with material certificate) <input type="checkbox"/> mit Prüfprotokoll (Masse) (with test protocol (dimensions)) <input type="checkbox"/> mit WPS (with WPS)
MO - Nr. / Dosierer Nr.: (MO - No. / Feeder No:)	MO -	
Artikel Nummer: (item number)	0000010287	
Artikelbeschreibung: (item description)	Trichter - 2.2 D - 20 L - FH	
Prüfmittel: (test equipment)		Oberflächenmessgerät, Mitutoyo, No.: 01-33-001 oder / or Oberflächenmessgerät, Perthometer M1, Mahr, No.: 01-33-003

Messstreifen: (Test strip)	Bemerkungen: (remarks)	Messstreifen: (Test strip)
<p>Innen</p> <p>Perthometer M1</p> <p>Objekt Name # Lt 5.600 mm Ls Norm GS 2.5 µm Lc 0.800 mm Ra 0.150 µm Rz 1.09 µm Rmax 1.77 µm</p> <p>Innen</p> <p>Perthometer M1</p> <p>Objekt Name # Lt 5.600 mm Ls Norm GS 2.5 µm Lc 0.800 mm Ra 0.129 µm Rz 0.75 µm Rmax 0.88 µm</p>		<p>Aussen</p> <p>Perthometer M1</p> <p>Objekt Name # Lt 5.600 mm Ls Norm GS 2.5 µm Lc 0.800 mm Ra 0.173 µm Rz 1.34 µm Rmax 1.80 µm</p> <p>Aussen</p> <p>Perthometer M1</p> <p>Objekt Name # Lt 5.600 mm Ls Norm GS 2.5 µm Lc 0.800 mm Ra 0.144 µm Rz 0.86 µm Rmax 0.99 µm</p>



Geprüft / Name / tested / name: Fischer	Datum / Date: 09. 05. 2014	Visum / Sign.:
---	--------------------------------------	---------------------------

49168



**INSPECTION CERTIFICATE
EN 10204 3.1**

Number: 542521 Page: 1 / 3	Rev: 00
Created on: Date: 07.03.2012	Modified on: 07.03.2012

ACERALAVA
Poligono Industrial Saracho
Spain

TL: +34 946719300
FAX: +34 946725062
E-MAIL: qualityaceralava@tubacex.es

CUSTOMER DESCRIPTION

CLIENT SOLD TO AMODIL SUPPLIES LTD. FOREST PARK CLEOBURY MORTIMER (NR.KIDDERMINSTER) DY14 9BD UNITED KINGDOM	CLIENT SHIP TO AMODIL SUPPLIES LTD. FOREST PARK CLEOBURY MORTIMER (NR.KIDDERMINSTER) DY14 9BD UNITED KINGDOM
---	---

CLIENT ORDER: AC1613
SALES ORDER: 109114

MATERIAL: STAINLESS STEEL ROUND BAR
RANDOM LENGTHS: 3.000/5.500 MM
GRADE: F316, F316L, S31600, S31603, 316, 316L, 1.4401_M, 1.4404_M, Z3CND171102
STANDARD: ASME SECT. II PART. A SA479/SA479M-2007 ED.
ASTM A182-09A
ASTM A276-08A
ASTM A479-08
EN 10088-1: 2005
EN 10088-3:1995
EN 10272:2007
NACE MR0175/ISO 15156-3:2009
QAD 39 REV.12
EN 10222-5:1999
TOLERANCES: ASTM A182-09A
EN 10088-3:1995
DIMENSIONS: 320 MM RD
PRODUCTION TYPE: FORGING

CERTIFIED
TRUE COPY OF
ORIGINAL CERTIFICATE
MANCHESTER ALLOYS & METALS LTD

Sales Item	Client Item	Delivery No	Lot No.	Heat No	Pieces	Weight	Un Lgth
10		8120009489	200062985	45110	1	2.430 KG	3000-5500 MM

LOT No	BAR No
200062985	21

RAW MATERIAL	
Heat Nr:	Supplier
45110	ACERALAVA (SPAIN)
Method	Electric furnace+AOD

CHEMICAL COMPOSITION (%)				*L: Ladle C:Products								
	Heat	Seq	C	Mn	Si	P	S	Ni	Cr	Mo	Al	Cu
L	45110	1	0,019	1,42	0,460	0,028	0,0240	10,10	16,75	2,14	0,007	0,31

P-Nr: P164247	Cust:
Pos Nr: 2	Zert/Tot: 1/2
Art Nr: 000010287 A	



We hereby certify that the material herein described has been manufactured, sampled, tested, and inspected in accordance with above standards and specifications and satisfies order's requirements. This certificate is issued by a computerized system and it is valid without original signature. In case the owner of this certificate would release a copy of it, he must attest its conformity to the issued, assuming the responsibility for any unlawful or TUBACEX not allowed use. Any forgery or falsification of this certificate shall be locally prosecuted.

ACERALAVA
ACERIA DE ALAVA, S.A.
Director de Calidad

[Signature]
Andoni Jugo Orrantia

S/STEEL 316

1168



**INSPECTION CERTIFICATE
EN 10204 3.1**

Number: 542521 Page: 2 / 3	Rev: 00
Created on: Date: 07.03.2012	Modified on: 07.03.2012

Heat	Seq	Sn	V	Nb	B	Co	Ca	Ta	N
L 45110	1	0,008	0,062	0,043	0,0025	0,055	0,0022	0,020	0,0640

SURFACE FINISH
ROUND MACHINED BARS

INGOT REDUCTION

Item	Reduction
10	2,70

HEAT TREATMENT
SOLUTION ANNEALED AT 1060 °C , 6 H , WATER

TENSILE TEST

Lot No.	Sample T	Rp0.2	Rp1.0	Rm	A2"	A5	Z	Sam Cond
	°C	N/mm2	N/mm2	N/mm2	%	%	%	
200062985	1 20	267	301	557	57	55	51	S
	1 20	271	306	564	57	55	55	S

HARDNESS TEST

Lot No.	Sample HB1	HB2	Sam Cond
200062985	1 152	154	S

IMPACT TEST

Lot No.	Sample T	Ecv 1	Ecv 2	Ecv 3	Ecv AVG	Type	Sam Cond
	°C	J	J	J	J		
200062985	1 20	127	135	130	131	T	S
	1 20	129	118	126	124	T	S

GRAIN SIZE

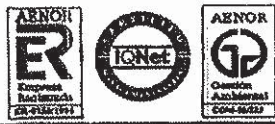
Lot No.	Sample G1	G2
200062985	1 1	1

METALURGICAL TESTS
INTERGRANULAR CORROSION TEST ACC. TO ASTM A262 PRACT. "E": SATISFACTORY

NON-DESTRUCTIVE TESTS
ULTRASONIC TESTED ACCORDING TO: CLASS FBH-6; STANDARD ASTM A-388/SA388/A-745 QL2 SATISFACTORY
STEEL GRADE ASSESSMENT BY SPECTROSCOPIQUE: WITHOUT OBJECTIONS

Pos Nr: P164247	Cust:
Pos Nr: 2	Zert/Tot: 1/2
Art Nr: 0000010287 A	

REMARKS
100% DIMENSIONAL CHECKING: SATISFACTORY
100% VISUAL INSPECTION: SATISFACTORY



We hereby certify that the material herein described has been manufactured, sampled, tested, and inspected in accordance with above standards and specifications and customer order's requirements. This certificate is issued by a computerized system and it is valid without original signature. In case the owner of the certificate would release a copy of it, he must attend its authenticity to the issuer, accepting the responsibility for any unlawful or TUBACEX, not allowed use. Any forgery or falsification of this certificate shall legally prosecuted.

ACERALAVA
ACERALAVA
ACERIA DE ALAVA S.A.
Director de Calidad

AS
Andoni Juge Orrantia



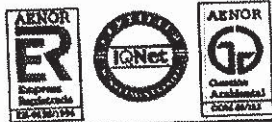
INSPECTION CERTIFICATE
EN 10204 3.1

Number: 542521 Page: 3 / 3	Rev: 00
Created on: Date: 07.03.2012	Modified on: 07.03.2012

REMARKS

STAMP OF THE INSPECTION REPRESENTATIVE: AC1
 MATERIAL MANUFACTURED TO AN ISO 9001 CERTIFIED QUALITY SYSTEM (QUALITY MANUAL REVISION 10, DATED ON APRIL 2009)
 THIS MATERIAL AND THE ELEMENTS USED ALONG MANUFACTURING ARE MERCURY FREE
 NO WELDING WAS PERFORMED ON THE MATERIAL
 MATERIAL MANUFACTURER APPROVED WITH CERTIFICATE NR. 05/2001/MUC BY TUV SUDDEUTSCHLAND BAU UND BETRIEB GMBH (NOTIFIED BODY 0036) TO ISSUE CERTIFICATES OF SPECIFIC PRODUCT CONTROL IN ACCORDANCE WITH PRESSURE EQUIPMENT DIRECTIVE 97/23/EC ANNEX 1 POINT 4.3
 RADIATION CONTAMINATION TEST: OK

P-Nr: P164247	Cust:
Pos Nr: 2	Zert/Tot: 1/2
Art Nr: 00000 102 87 A	



We hereby certify that the material herein described has been manufactured, sampled, tested, and inspected in accordance with above standards and specifications and satisfies order's requirements. This certificate is issued by a computerized system and it is valid without original signature. In case the owner of the certificate would release as a copy of it, he must attend its conformity to the issued, ensuring the original certificate is not allowed use. Any forgery or falsification of this certificate is not allowed.

ACERALAVA
ACERALAVA
ACERIA DE ALAVA.S.A.
 Director de Calidad

 Andoni Jugo Orrantia

Acciai Speciali Terni S.p.A. con Unico Socio

Viale B. Bern. 218 - 05100 Terni - Italia

12281007

AZIENDA CON SISTEMA DI GESTIONE CERTIFICATO DA ISO SECONDO ISO 9001

AD2000W2/W10

SPECIFICA: EN 10088-2 EN 10028-7

IDENTIFICAZIONE: EN 10088-4

ASTM A 240 ASME SA 240

CERTIFICATO DI COLLAUDO EN 10204/3.1

1374562

PAG. 1/ 1

INSPECTION CERTIFICATE
CERTIFICATE DE RECEPTION
ABNAHMEPRÜFZEUGNIS B*

01/00605171

CLIENTE:
CUSTOMER:
CLIENT:
BESTELLER:

SAUTER EDELSTAHL AG

Allmendstrasse 26
CH-8320 Fehraltorf

ORDINE CLIENTE N°:
CUSTOMER ORDER N°:
COMMANDE DU CLIENT N°:
BESTELLUNG N°:

ORDINE INTERNO N°:
INTERNAL ORDER N°:
COMMANDE INT. N°:
WERKS N°:

AVV. DI SPECIE N°:
SHOPPING NOTICE N°:
AVIS D'EXPECITION N°:
VERSANDZUGANG N°:

PRODOTTO: STAINLESS STEEL COILS

PRODOTTO:
PRODUCT:
PRODUKT:
PRÜFGEGENSTAND:

N° ROTOLO COIL N° N° BOBINE BAND N°	N° COLATA HEAT N° N° COULÉE SCHMELZE N°	COMPOSIZIONE CHIMICA / CHEMICAL COMPOSITION / COMPOSITION CHIMIQUE / CHEMISCHE ZUSAMMENSETZUNG												
		% C	% Mn	% Si	% P	% S	% Cr	% Ni	% Mo	% N	% Ti	Ø ₁	%	%
544123	0437564	.021	.830	.320	.026	.001	16.65	10.23	2.05	.047		.190		
568323	0438067	.028	.850	.500	.027	.001	16.83	10.23	2.02	.050		.230		

TIPO D'ACCIAIO:
STEEL TYPE:
TYPE D'ACIER:
MARKENBEZEICHNUNG:

1.4404
1.4401
316L
316

TIMBRO DEL PRODUTTORE:
PRODUCER TRADE MARK:
MARQUE DU PRODUCTEUR:
ZEICHEN DES LIEFERWERKS:

Acciai Speciali Terni S.p.A.
con Unico Socio

TIMBRO DEL RESPONSABILE INCARICATO:
INSPECTOR STAMP:
MARQUE DU RESPONSABLE CHARGE:
STEMPEL DES WERKSACHVERSTÄNDIGEN:



VERWECHSLUNGSPRÜFUNG, OBERFLÄCHEN - UND MASSKONTROLLE : OHNE BEANSTANDUNG

THE MATERIAL MEETS THE HARDNESS REQUIREMENTS OF NACE MR0175

80 CENTRO DI FINITURA P.F. TERNI COMPLIES WITH P.E.D. 97/23/EC

TRATT. TERMICO - RICOTTURA IN SOLUZIONE: 1050°C
HEAT TREATMENT - ANNEALING: AIR - WATER SPRAY - WATER COOLING
THERMTRATT - THERMTRATT - WYFTRITTREMP: AIR - EAU ATOMISÉE - EAU
WÄRMERHANDLUNG - ABSCHRECKEN: "GLUFT" - SPRÜHWASSER - WASSER

PROCESSO DI ELABORAZIONE E - AOD - CC
STEELMAKING PROCESS
PROCÉDE D'ÉLABORATION
ERHSCHMELZUNGSART

IL MATERIALE È RESISTENTE ALLA CORROSIONE INTERCRISTALLINA SECONDO:
THE MATERIAL IS RESISTANT TO INTERCRYSTALLINE CORROSION IN ACCORDANCE WITH:
LE MATÉRIEL EST RÉSISTANT À LA CORROSION INTERCristalline SELON
DIE ÜBERGENANNTE SCHMELZE IST BESTÄNDIG GEGEN INTERKRISTALLINE KORROSION ÜBERHAUPT.

EN ISO 3651-2

N° COLLO PACKAGE N° N° COILS BAND N°	N° ROTOLO COIL N° N° BOBINE BAND N°	DIMENSIONI DIMENSIONS ABMESSUNGEN mm	N° PEZZI PIECES N° N° PIÉCES STÜCKE	FINITURA FINISH Finition AUSFÜHRUNG	PESO WEIGHT POIDS GEWICHT Kg	C S	D S	TRAZIONE / TENSILE / TRACTION / ZUGVERBUCH						DUREZZA HARDNESS DURETE HÄRTE		FLECCIA BEND PLIAGE FALTVERSUCH α = 180°	GRANO GRAN KORNE		
								R _p 0.2%		R _p 1%		R _m		A %				HV B	H
								N/mm ²	M/mm ²	N/mm ²	M/mm ²	Lo = 2"	Lo = 80	Lo = AS	%				
CARATTERISTICHE RICHIESTE - REQUIRED CHARACTERISTICS - CHARACTERISTIQUES REQUISES - ANFORDERUNGEN								≥ 240	≥ 270	530-680	≥ 40	≥ 40	≤	≤					
C08016	544123	1.50X1500.0	1	2B		T	T	256	290	589	58.3	58.8	76.0						
C08016						C	T	262	293	592	57.5	58.0	78.0						
C24564	568323	1.50X1500.0	1	2B		T	T	263	299	594	58.3	58.8	73.0						
C24564						C	T	260	295	590	58.5	59.0	75.0						

MOD. 014 - 2005/180

- * Secondo accordo con il TÜV Bayern (Febbraio 1985) la firma del Technische Überwachungs Organisation può essere evitata al verso della lettera del 8 Agosto 1985.
- * In accordance with TÜV Bayern (February 1985) the signature of the Technische Überwachungs Organisation can be avoided in force of the letter of the TÜV Bayern on August 8 1985.
- * D'accord avec TÜV / Bayern (Février 1985) la signature du Technische Überwachungs Organisation peut être évitée sur la base de la lettre TÜV / Bayern datée 8 Août 1985.
- * Im Einverständnis mit dem TÜV / Bayern (Februar 1985) Auf eine Unterschrift durch die zuständige Technische Überwachungs Organisation kann auf Grund des Schreibens des TÜV Bayern vom 8-8-1985 verzichtet werden.

Certificati che i prodotti sopra elencati sono conformi alle specifiche dell'ordine.
We certify that the products listed above comply with order requirements.
Nous certifions que les produits ci-dessus énumérés sont conformes aux prescriptions de la commande.
Wir bescheinigen, dass die Lieferungen den Vereinbarungen der Bestellanträge entsprechen.

COMPLIES WITH EN 2000/53/EC

Acciai Speciali Terni S.p.A.
con Unico Socio
FIRMA DEL RESPONSABILE INCARICATO
INSPECTOR SIGNATURE
SIGNATURE DU RESPONSABLE CHARGE
UNTERSCHRIFT DES WERKSACHVERSTÄNDIGEN

Certificato emesso automaticamente

1) Sampling - Location - Ort
T = Top - Tête - Kopf
C = Bottom - Pied - Fuß

2) Size - Direction - Richtung
T = Transversale - Transversal - Transvers - Quer
L = Longitudinale - Longitudinal - Längs

MARCATURE:
MARKING:
MARQUAGE:
KENNZEICHNUNG

Wtr. - Type
Height - Col N°
Thickness - Finish

TERNA 09-10-2013

L. ROTUNDO
ist unter "Besteller" unser Name eingetragen.

Datum/Visum
SAUTER EDELSTAHL AG

P-Nr: P169247	Cust:
Pos.Nr: 1	Zert/Int: 2/2
Art.Nr: 0000010287	

Certificat 9

3016758000T5



0432

Acciai Speciali Terni SpA con unico socio V.le B.Brin, 218 05100 Terni Italy

13

0432-CPD-11 9444-1/1

EN 10088-4:2009

Corrosion resistant cold rolled
strip steel

Intended uses: Building construction or civil engineering.

Tolerances on dimensions and shape:
EN ISO 9445-2

Elongation
Tensile Strength
Yield Strength
Impact Strength
Weldability
Durability

Steel 1.4404/1.4401
EN 10088-4

Regulated substances: no performance determinate

Shipping Notice 00055656

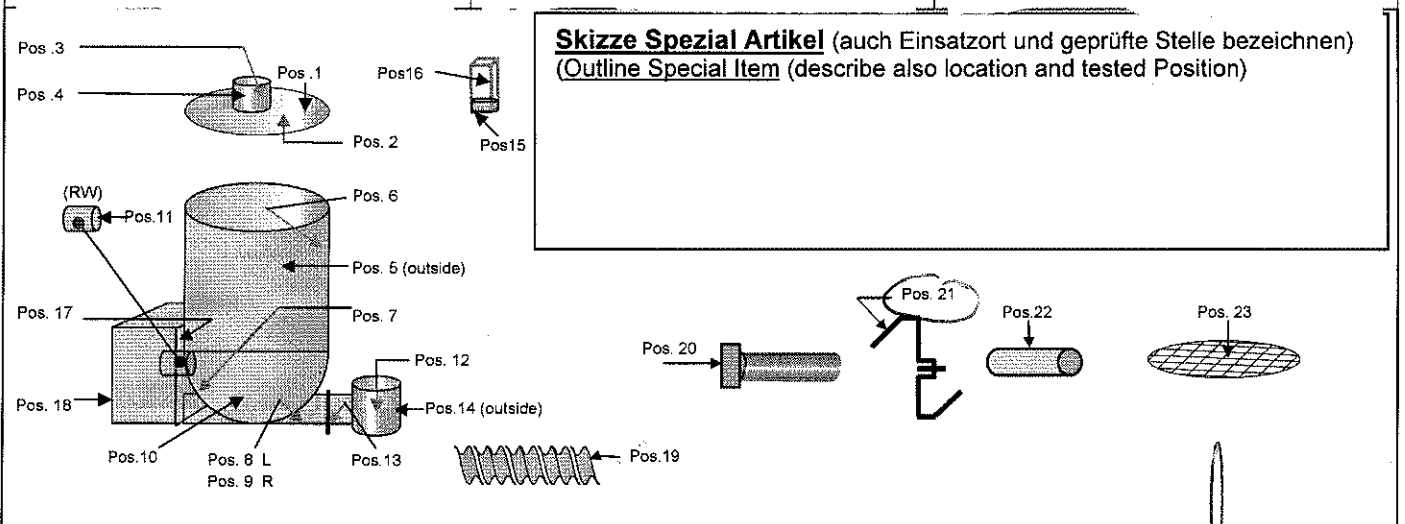
Inspection Certificate 01374562

Internal Order 8G1301540004

P-Nr:	P164247	Cust:	
Pos Nr:	1	Zert/Tot:	2/2
Art Nr:	0000010287 A		

CO - Nr./ Kundenauftrag Nr.: (CO -No. / Order No.)	CO -	<input checked="" type="checkbox"/> mit Material Zertifikat (with material certificate) <input type="checkbox"/> mit Prüfprotokoll (Masse) (with test protocol (dimensions)) <input type="checkbox"/> mit WPS (with WPS)
MO - Nr. / Dosierer Nr.: (MO - No. / Feeder No.)	MO -	
Artikel Nummer: (item number)	9513-38043	
Artikelbeschreibung: (item description)	Ruehrwerk - 2BL-7H	Bemerkung: (remarks)
Prüfmittel: (test equipment)	Oberflächenmessgerät, Mitutoyo, No.: 01-33-001 oder / or Oberflächenmessgerät, Perthometer M1, Mahr, No.: 01-33-003	

Messstreifen: (Test strin)	Bemerkungen: (remarks)	Messstreifen: (Test strin)
Pos 21 (NR. 1) Perthometer M1 Objekt Name # Lt 5.600 mm Ls Norm GS 2.5 µm Lc 0.800 mm Ra 0.210 µm Rz 1.35 µm Rmax 1.86 µm	Pos. 21 (NR. 3) Perthometer M1 Objekt Name # Lt 5.600 mm Ls Norm GS 2.5 µm Lc 0.800 mm Ra 0.247 µm Rz 1.36 µm Rmax 1.56 µm	Pos 21 (NR. 5) Perthometer M1 Objekt Name # Lt 5.600 mm Ls Norm GS 2.5 µm Lc 0.800 mm Ra 0.281 µm Rz 2.15 µm Rmax 3.27 µm
Pos. 21 (NR. 2) Perthometer M1 Objekt Name # Lt 5.600 mm Ls Norm GS 2.5 µm Lc 0.800 mm Ra 0.228 µm Rz 1.49 µm Rmax 2.17 µm	Pos 21 (NR. 4) Perthometer M1 Objekt Name # Lt 5.600 mm Ls Norm GS 2.5 µm Lc 0.800 mm Ra 0.221 µm Rz 1.40 µm Rmax 1.64 µm	Pos. 21 (NR. 6) Perthometer M1 Objekt Name # Lt 5.600 mm Ls Norm GS 2.5 µm Lc 0.800 mm Ra 0.284 µm Rz 1.90 µm Rmax 2.40 µm



Geprüft / Name / tested / name: Fischer	Datum / Date: 09. 08 2013	Visum / Sign.:
---	-------------------------------------	---------------------------

47038430 0204KG 4KF

ThyssenKrupp Nirosta Ein Unternehmen von ThyssenKrupp Stainless	Herstellerwerk / Manufacturer's works / Usine productrice ThyssenKrupp Nirosta		Art der Prüfbescheinigung / Type of inspection document / Type du document ABNAHMEPRUEFZEUGNIS INSPECTION CERTIFICATE CERTIFICAT DE RECEPTION nach / according to / suivant EN 10204-3.1		Bescheinigungs-Nr. / Document number / Numéro de document 1000133955 /						
	Oberschlesienstrasse 16, 47807 Krefeld		Besteller/Empfänger / Customer/Consignee / Acheteur/Destataire		Seite / Page / Page: 1 / 1						
SAUTER EDELSTAHL AG Allmendstrasse 26 CH-8320 Fehraltorf			Kundenbestellnr. / Customer's order number / Numéro de la commande du client 101545			Werkseuftrag-Nr. / Manufacturer's works order no / N° de la commande de l'usine productrice 900372242 / 001					
Lieferbedingungen / Terms of delivery / Conditions de livraison EN 10088-2 EN 10028-7 AD 2000 W2 Richtlinie 97/23/EG AD 2000 W10 TR9 100 ASTM A 240/A 240M ASME SA 240 Sec. II Part A Ed. 07			Stahlsorte und Gütegruppe / Steel grade and quality / Nuance de l'acier NIROSTA 4404 / 4401 TYPE 316 L / 316			Lieferanzugs-Nr. / Delivery Note No / Avis d'expédition N° 87091825 / 010					
Erzeugnis / Product / Produit BAND/COIL/ROULEAU		Maße des Erzeugnisses (Dicke / Breite / Länge) Product dimensions (Thickness / Width / Length) Dimensions du produit (Epaisseur / Largeur / Longueur)		Hersteller Steelmaking proc. Mode d'élabor.	Ausführung Finish Fini						
Kundenmaterial-Nr. Customer's material number N° de matière du client		4,0 mm x 1000,0 mm		AOD	IIIc / 2B						
Paket-Nr. Picking-No. N° Palette	Stückzahl No of pieces N° de pièces	Ist-Gewicht Actual weight Masse effective	Ident.-Nr. Erzeugnis Ident.-No of product Ident.-N° du produit	Schmelzenr. Cast number Id. de la coulée	Proben-Id. Sample Id. Empl. du prélèvement	Proben-Id. Sample Id. Empl. du prélèvement					
9884964	1	6670 KG	6731	512970	1002137176	1002137897					
Chemische Zusammensetzung / Chemical composition / Composition chimique											
Schmelzenr. / Cast no.	% C	% Si	% Mn	% P	% S	% Cr	% Mo	% Ni	% N		
512970	0,020	0,40	0,85	0,031	0,0010	16,60	2,02	10,01	0,052		
Prüflinien/Inspection lot Lot de contrôle Proben-Id./Lage Sample Id./Position Ident./empl. du prélèvement	QUER										
	Rp0,2% N/mm²	Rp1% N/mm²	Rm N/mm²	A5 %	A2 ^o %	HRB					
1002137176	323	358	597	58,9	58,9	84,0					
1002137897	376	404	658	48,3	48,3	88,0					
Beständig gegen Intermet. Korros./Resistant to intermet. corros./Résistant à la corros. Intermet.							EN ISO 3651-2 I.O.				
ASTM A 262 2a PRACTICE E I.O.											
Maße-Oberfläche/Dimensions-Surface/Dimensions-Surface							I.O.				
Verwechslungsprüfung (Spektralanalyse)/Test of identity (spectrum analysis)/Contrôle d'identification (analyse spectrale).							I.O.				
WAERMEBEHANDLUNG : 1050 GRAD C / LUFT TRAITEMENT TERMIQUE : 1050 GRAD C / AIR HEAT - TREATMENT : 1050 DEGREE / AIR											
Aus Gründen der Rückverfolgbarkeit ist unter "Besteller" unser Name eingetragen. Datum / Visum SAUTER EDELSTAHL AG							Geprüft 19. Nov. 2009				
Aussteller der Bescheinigung / Originator of the document / Auteur du document ThyssenKrupp Nirosta GmbH Dieses Zeugnis wurde maschinell erstellt Werk Krefeld Abnahme			Butzen Abnahmebeauftragter Inspector / Expert Tel. 02151-832447 Fax: 02151-834106		Stempel des (der) Abnahmebeauftragten Receiving agent's stamp Ponçon de l'agent réceptionnaire 		Datum der Ausstellung und Bestätigung Date of issue and validation 21.08.2009				

Certificat 12

P-Nr: 152745 K-Tron
 Pos Nr: 1 Zert/Tot: 112
 Art Nr: 9513-38043 a

ROLDAN, S.A. - Rostfreier Stahl

ABNAHMEPRÜFZEUGNIS

WERK

Santo Tomás de las Ollas, S/N
Apdo. de Correos 11
PONFERRADA (LEÓN)
TEL.: +34 987 44 61 00
FAX: +34 987 44 61 01
E-MAIL: rdn_fabrics@acmgrou.com



HAUPTVERWALTUNG

Santiago de Compostela, 100-3°
28035 MADRID (ESPAÑA)
TEL.: +34 913 98 52 57
FAX: +34 913 98 51 93
E-MAIL: roldan@acmgrou.com

3.1

EN 10204



ATTEST NR.	2008/003718	DATUM	6/02/2008	BLATT	1	LIEFERSCHHEIN NR.	2008/055387
WERKSTOFF	ROLDAMAX-264		EN10.088:3 { 1.4404. }				
KUNDE	SCHNOLZ + BICKENBACH AG						
ABMESSUNGEN	28,00 mm.						
LÄNGE	3.025 mm.		TOLERANZ		ISO h8		
PRÜFGEGENSTAND	Stabstahl rund, geschliffen, geschliffen, poliert.						
ANFORDERUNGEN	EN10.088:3			KUNDEBESTELLUNG			
ZUGVERSUCH	EN 10002-1			VN-3498/L15140			
ENTSPRECHEND	EN 10.272		AUSGABE AD-2000 W2 AD-2000 W10				
INTERKRISTALLINE KORROSION	EN ISO 3651-2 SATISFACTORY			WITHOUT OBJECTIONS			
BESICHTIGUNG UND MASSKONTROLLE	WITHOUT OBJECTIONS			Spektrometrical Identity Test: O.K.			
KERBSCHLAGVERSUCH, PROBEFORM	EN 10.045-1						

BESTELL N°	VORGANGS NR.	MARKE / KISTE	SCHWELZE NR.	PROBE	GEWICHT	ERSCHMELZUNGSART	ZEICHEN DES ABNAHMEBEAUFTRAGTER
LE58449 1	LE58449. 1 1	49001 / JG13453	86N7	86N7	513	EAf + AOD +CC HERSTELLERZEICHEN KENNZEICHNUNG HEAT NUMBER GRADE (RDN 264)	R3 ABNAHMEBEAUFTRAGTER JOAQUIN DIEQUEZ GONZALEZ QUALITY CONTROL REPRESENTATIVE <small>Responsible for the test results and their interpretation</small>

MECHANISCHE EIGENSCHAFTEN																
SCHWELZE	PROBE	ABMESSUNGEN DER PROBESTABE	BEMERK T°.	Rm	Rp 0,2%	Rp 1%	Z %	A %	Agt %	KERBSCHLAGZÄHKWERT 100-V (J)		HÄRTE HB	DAUERHAFTIGKEITVERFUCH	DEHNGRENZE	ZUGFESTIGKEIT	
				N/mm2	N/mm2	N/mm2	%	%		20°C	-195°C					mm ²
86N7	86N7	25,00	20°C	612	333	375	69	50				159				
ANFORDERUNGEN				EN ISO 377	500	200	235		40		100	40				215

CHEMISCHE ZUSAMMENSETZUNG %												
SCHWELZE	C	P	S	Si	Mn	Cr	Ni	Mo	Ti	N	Cu	
86N7	0,0300	0,0240	0,0270	0,3230	1,3560	16,8570	10,5330	2,2430	0,0020	0,0470	0,2950	
ANFORDERUNGEN	0,0300	0,0450	0,0300	1,0000	2,0000	16,5000	10,0000	2,0000				0,1100

BEMERKUNGEN

SB58800

PRÜFUNGEN	ANFORDERUNGEN	TRD100 TRB100, AD-2000-W2-W10, DGR197/21/SC (PED)
WÄRMEBEHANDLUNG	1.050 °C AND WATERCOOLED	

P Nr: 152745 K-Tron
 Pos Nr: 2 Zert/lot: 2/2
 Art Nr: 95713-38043 9



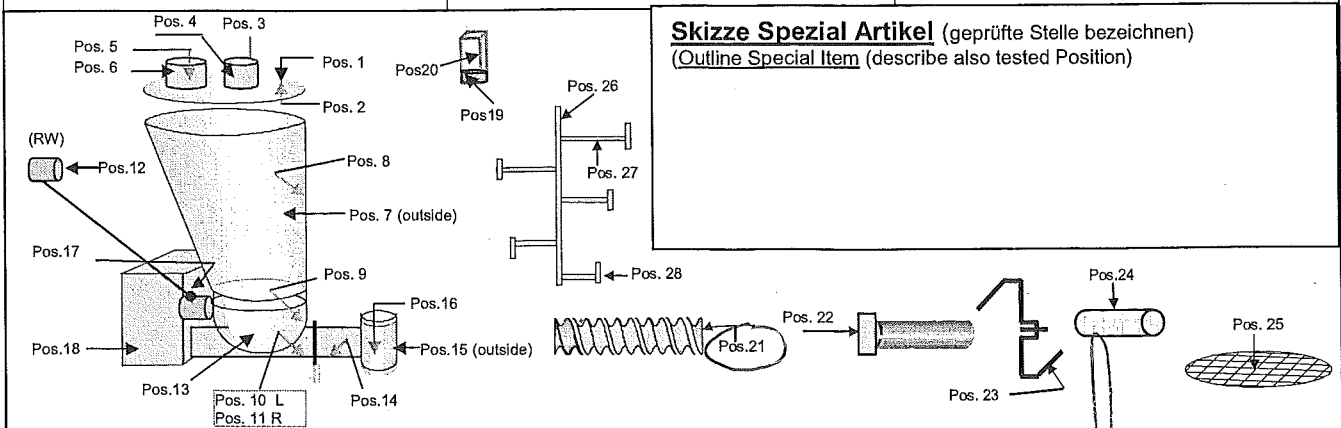
RAUHEITSTEST – PROTOKOLL

(roughness test protocol)

CO - Nr./ Kundenauftrag Nr.: (CO -No. / Order No.)	CO -	<input checked="" type="checkbox"/> mit Material Zertifikat (with material certificate)
MO - Nr. / Dosierer Nr.: (MO - No. / Feeder No.)	MO -	<input type="checkbox"/> mit Prüfprotokoll (Masse) (with test protocol (dimensions))
Artikel Nummer: (item number)	0000008368	<input type="checkbox"/> mit WPS (with WPS)
Artikelbeschreibung: (item description)	CC-Schnecke D36+50	Bemerkung: (remarks)

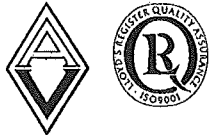
Prüfmittel: Oberflächenmessgerät, Mitutoyo, No.: 01-33-001 oder / or
(test equipment) Oberflächenmessgerät, Perthometer M1, Mahr, No.: 01-33-003

Messstreifen: (Test strip)	Bemerkungen: (remarks)	Messstreifen: (Test strip)
Pos. 21 (links) Perthometer M1 Objekt Name # Lt 5.600 mm Ls Norm GS 2.5 µm Lc 0.800 mm Ra 0.250 µm Rz 1.45 µm Rma 2.17 µm		Pos. (21 Rechts) Perthometer M1 Objekt Name # Lt 5.600 mm Ls Norm GS 2.5 µm Lc 0.800 mm Ra 0.241 µm Rz 1.45 µm Rmax 1.85 µm



Geprüft / Name / tested / name: Fischer	Datum / Date: 24. 04. 2012	Visum / Sign.:
---	--------------------------------------	---------------------------

Acciaierie Valbruna S.p.A.



CERTIFICATO DI COLLAUDO ABNAHMEPRUEFZEUGNIS INSPECTION CERTIFICATE CERTIFICAT DE RECEPTION EN 10204 (2005) , 3.1

36100 VICENZA (Italia) - Viale della scienza, 25 z.l.
Stab.: 39100 BOLZANO (Italia) - Via A. Volta, 4

Cliente / Besteller/Purchaser/Client
VALBRUNA AG
NEUENBURGSTRASSE 54 POSTFACH 212
3282-BARGEN BEI AARBERG - CH --CH

Produttore: ACCIAIERIE VALBRUNA S.P.A.
Hersteller/Item/Usine productrice

Avviso di Spedizione: D-VI08029366
Lieteleranzelge/Packing list/B.L.

Ordine nr: 804004704 STOCK
Bestell/Your order/Commande

Certificato nr: MEST690492/2008/
Prüfung/Test/Essai

Conferma ordine nr: EI08007638
Werks/Our Order/Ref. nr.

Marchio di Fabbrica:
Zeichen des Lieterwerkes
Trade mark
Sigle de l'usine productrice



Oggetto Prove: - Abgeschreckt Geschliffen Ausf. -C-
Prüfgegenstand/Item inspected/Finissage

Tipo di Elaborazione: E+AOD
Erschmelzungsart/Melting process/Mode d'elaboration

Punzone del Collaudatore:
Stempel des Werksachverständigen
Inspector's stamp/Poinçon de l'assesseur



Specifiche:

Anforderungen / Requirements / Exigences

VAL AD-W2 2007 1.4401/1.4404 A
AD 2000-M. W 2 2006 1.4404 A 1
ASME SA182 2007 S31600 A 2
ASME SA479 2007 S31603 A 5
ASTM A276 2008 S31600 A
ASTM A479 2006A S31603 A
EN 10088-3 2005 1.4401 A
EN 10272 2000 1.4404 A

AD 2000-M. W 10 2003 .
AISI 316
ASME SA182 2007 S31603 A 3
ASTM A182 2008A S31600 A 6
ASTM A276 2008 S31603 A
DIN 17440 96 1.4401 A
EN 10088-3 2005 1.4404 A
NACE MR0175* 2003 S31600 8

AD 2000-M. W 2 2006 1.4401 A (0)
AISI 316L
ASME SA479 2007 S31600 A (4)
ASTM A182 2008A S31603 A (7)
ASTM A479 2006A S31600 A
DIN 17440 96 1.4404 A
EN 10272 2000 1.4401 A
NACE MR0175* 2003 S31603 (9)

- (0) ACCORDING TO EN 10272,2000
- (2) SEC.II PT.A 2007 EDITION
- (3) SEC.II PT.A 2007 EDITION
- (4) SEC.II PT.A 2007 EDITION
- (6) Chemical analysis only and mechanical properties.
- (8) * ISO 15156-3

- 1ACCORDING TO EN 10272,2000
- 2Chemical analysis only and mechanical properties.
- 3Chemical analysis only and mechanical properties.
- 5SEC.II PT.A 2007 EDITION
- 7Chemical analysis only and mechanical properties.
- 9* ISO 15156-3

Qualità: 1.4404MV
Werkstoff/Grade/Nuance

Marca: MVAPML MAXIVAL
Markenbezeichnung/Brand/Nuance

Punzonatura: 1.4404MV
Kenzeichnung/Marking/Marquage

Pos. nr. Pos. nr. Item nr. Nr. de poste	Oggetto Gegenstand Product description Descrip. du produit	Dimensioni - mm Abmessungen Dimension Dimension	Tolleranza Tolleranz. Allowance Tolerance	Lunghezza - mm Länge Length Longueur	Colata Schmelze Heat Coulée	Pezzi Stückzahl Pieces Pièces	Peso - KG Gewicht Weight Poids	Lotto nr. Losnr. Lot nr. Lot nr.
0020	Rund	38,000	h8	3200 / 3215	422724		869,0	812701620

Sono state soddisfatte tutte le condizioni richieste
Die gestellten Anforderungen sind il. Anlage erfüllt
The material has been furnished in accordance with the requirements
Le matériel a été trouvé conforme aux exigences

Controllo antimescolanza: OK
Verwechslungsprüfung: spectralanalytisch durchgeführt
Antimixing testing performed: OK
Contrôle antimeilage fait: r.a.s.

Controllo visivo e dimensionale: soddisfa le esigenze:
Besichtigung und Ausmessung: ohne Beanstandung
Visual inspection and dimensional checks:satisfactory
Contrôle visuel et dimensionnel: satisfaisant

TEST	Provetta/Probstab Specimen/Eprouvette Larg diam. Specs. Breite Diam. Dicke Width Diam. Thickness Larg. diam. épais mm	°C	Posiz. Saggio Probenort Location Emplacement 1)	Snervamento Streckgrenze Yield Stress Limite élastique Rp 0,2% N/mm2		Snervamento Streckgrenze Yield Stress Limite élastique Rp 1% N/mm2		Resistenza Zugfestigkeit Tensile strength Resistance à traction Rm N/mm2		Allungamento Bruchdehnung Elongation Allongement A5 % E 4d %		Strizione Erschöpfung Reduction of area Suction Z % RA %		Resilienza Kerbscharbeit Impact Value Resilience KV J			Durezza Härte Hardness Dureté HB	
				min	max	205	240	515	690	40	40	-	50	100	-	215		
A	10	20	L	382	410	674	43	47	72	72	220	221	227	188				

Korngroesse nach ASTM E112 : 6

1)L=longitudinale/längs, Q=transversale/quer, T=Tangenziale/tangential

Analisi chimica

Chemische Zusammensetzung/Chemical Analysis/Analyse chimique

Colata /Heat Schmelze/Coulée	min - max 0,030	1,00	2,00	16,50 18,00	2,00 2,50	10,00 13,00	0,045	0,030	0,100	-	-	-	-	-	-
	C %	Si %	Mn %	Cr %	Mo %	Ni %	P %	S %	N %						
422724	0,027	0,51	1,54	17,20	2,00	10,12	0,029	0,030	0,063						

I.Korrosion nach EN ISO 3651-2A Sensibilisierung : T1 : OK

Corrosion test per EN ISO 3651-2A sensitized T1 : OK

Temperatureregelt warmumgeformt

Im Einvernehmen mit TUV BAYERN (Juli 1972).

Gegenzeichnungsverzicht durch TUV BAYERN (21.05.1979).

Melted and manufactured in Italy No welding or weld repair Material free from Mercury or radio-activity contamination
The Quality Management System is Certified acc. Pressure Equipment Directive [97/23/EC] Annex 1,s.,4,3 by TUEV and LLOYD'S

GEPRÜFT UND FREIGEgeben

Mat. Zert.-Nr.: 8014940/422724

Best.- / Ref.-Nr.: F.M.-1108-5479

Datum: 10. November 2011

Visum:

Vicenza, 10/11/08

Il collaudatore di stabilimento / der Werksachverständige / Works Inspector / L'agent d'usine

VCO008
(Mod. MCER)

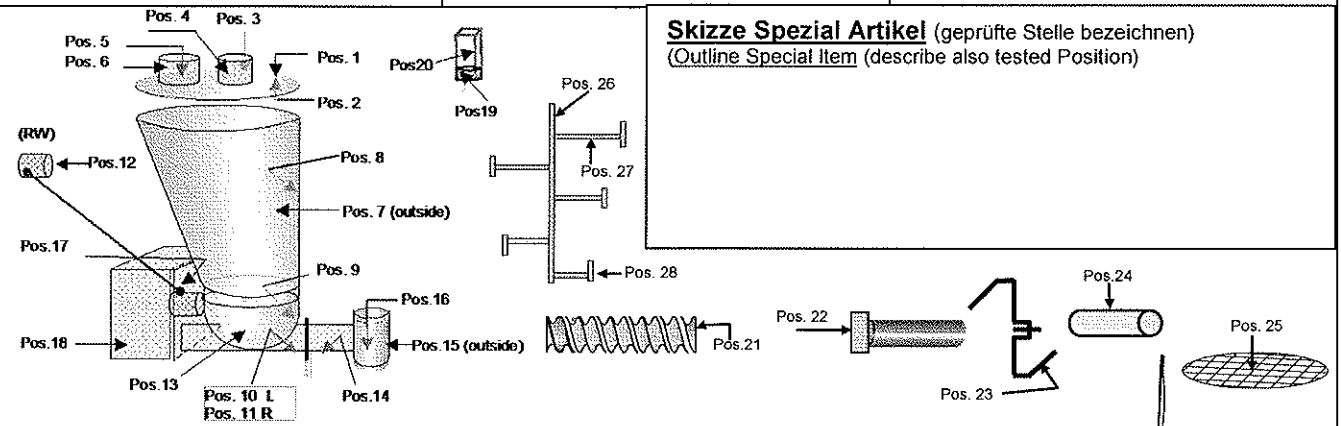
M. Rizzotto

Pagina - 1 di 1

CO - Nr./ Kundenauftrag Nr.: (CO -No. / Order No.)	CO -	<input checked="" type="checkbox"/> mit Material Zertifikat (with material certificate)
MO - Nr. / Dosierer Nr.: (MO - No. / Feeder No.)	MO -	
Artikel Nummer: (item number)	0000010324	<input type="checkbox"/> mit WPS (with WPS)
Artikelbeschreibung: (item description)	Gittersieb-4x4-KT35-PH	Bemerkung: (remarks)

Prüfmittel: Oberflächenmessgerät, Mitutoyo, No.: 01-33-001 oder / or
(test equipment) Oberflächenmessgerät, Perthometer M1, Mahr, No.: 01-33-003

<p>Messstreifen: (Test strip)</p> <p>Perthometer M1 Objekt Name # Lt 5.600 mm Ls Norm GS 2.5 µm Lc 0.800 mm Ra 0.085 µm Rz 0.44 µm Rmax 0.65 µm</p>	<p>Bemerkungen: (remarks)</p>	<p>Messstreifen: (Test strip)</p> <p>Perthometer M1 Objekt Name # Lt 5.600 mm Ls Norm GS 2.5 µm Lc 0.800 mm Ra 0.076 µm Rz 0.45 µm Rmax 0.65 µm</p>
--	--	--



Geprüft / Name / tested / name: Fischer	Datum / Date: 31. 03. 2014	Visum / Sign.:
---	--------------------------------------	---------------------------



SAUTER EDELSTAHL AG

Type Inspection Certificate 3.1 AD-2000 EN10204

Number

10114100406

Issued On

13/02/2014

- QMS approved acc AD-2000 W0 with Cert 01 202 VQ-08 5131 by TUV Rheinland (0035), cert. PED 97/23/EC Annex I §4.3 by TUV Rheinland (0035)
- Material acc. AD2000 W2 - W10
- Material conforming to NACE MR0175/ISO103 - ISO 15156-1/ISO 15156-3

Delivery Nn

8301403937

Quality Control

Pages

Of

13/02/2014

Q.M.D./Q.M. L. Solazzi

Delivery note nr

1001005736

Plant Of Gazoldo

Material

50801855

Description

CXF02C 2,00X1500 4404/316L SR 8/15 FINITURA "2B"

Norm/Grade

EN10028-7, EN10088-4, ASTM A240, ASME SA240, ASTM A480, ASME SA480

Quality/Qualità

X2C: NiMo17-12-2, WNR1.4404, A316L / AISI316, X5CrNiMo17-12-2, WNR1.4401, A316

Order Nr

1141008068/10

Client Order

1/00020249

Client Date

8/03/2014

Item	Identification Nr	Heat	Quantity
1	14YT000269	0439030	

Dimensional tolerances/

EN9445-2

Steel Processing/

Electric arc furnace VOD/AOD, continuous casting, heat treatment/annealing at 1050°C, forced air cooling

Mark Testers/

- Organization inspection: CO3

- ASME norms acc. Sec. II Part A Ed. 2010 Add. 11

Terms of Delivery/

Identification Nr	Chemical Type	Mark	C (%)	Si (%)	Mn (%)	P (%)	S (%)	Cr (%)	Ni (%)	Mo (%)	N (%)
14YT000269	Product	14H2000729	.021	.316	.958	.0400	.0005	16.934	10.534	2.061	.0412

Identification Nr	Test position	Test direction	Mark	Rm [N/mm ²]	Rp 0.2 [N/mm ²]	RP 1 [N/mm ²]	A80 (%)	A50 (%)	HRB
14YT000269	B	T	14H2000729	581	258	297	60.0	63.7	77

P-Nr: 164009	K-Tron
Pos Nr: 1	Zert/Tot: NA
Art Nr: 0000010324/13	

Test Position/Posizione Prova

Test Direction/Direzione Prova

B=Coil End

T=Transverse Direction

Remarks about tensile test:

- Renounced of counter signature agreed by TUV Rheinland (01/03/2012)

Other controls:

- Dimensions within tolerances, spectrometric/ identify test OK
- Corrosion Test EN ISO3651-2 Method A and ASTM A262 OK

Remarks:

- We certify that products listed above comply with order requirements
- Document validated acc. EN10204 par. 5
- Durability: NPD
- Regulated Substances: NPD
- Intended Uses: Building Constructions or Civil Engineering

- DoP available at <http://www.marcegaglia.com/brochure/quality/dop.html>
- surface finish 2B



Mod. 1083 Rev. 0

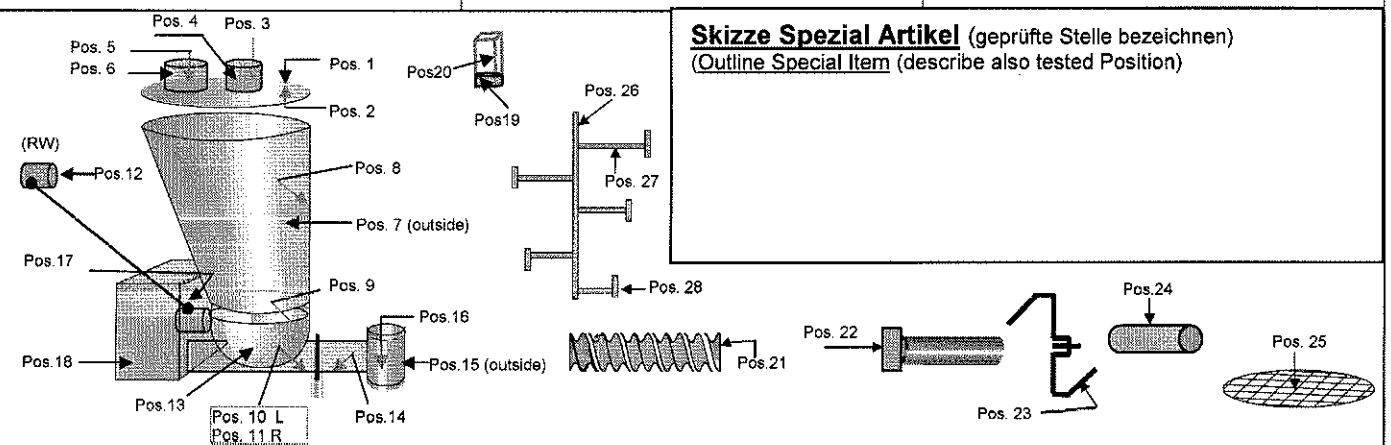


RAUHEITSTEST – PROTOKOLL

(roughness test protocol)



CO - Nr./ Kundenauftrag Nr.: (CO -No. / Order No.)	CO -	<input checked="" type="checkbox"/> mit Material Zertifikat (with material certificate)
MO - Nr. / Dosierer Nr.: (MO - No. / Feeder No.)	MO -	<input type="checkbox"/> mit Prüfprotokoll (Masse) (with test protocol (dimensions))
Artikel Nummer: (item number)	0000024702	<input type="checkbox"/> mit WPS (with WPS)
Artikelbeschreibung: (item description)	Gittersieb 7,5 x 7,5 PH	Bemerkung: (remarks)
Prüfmittel: (test equipment)	Oberflächenmessgerät, Mitutoyo, No.: 01-33-001 oder / or Oberflächenmessgerät, Perthometer M1, Mahr, No.: 01-33-003	

Messstreifen: (Test strip)	Bemerkungen: (remarks)	Messstreifen: (Test strip)
<p>NR. 1</p> <p>Perthometer M1 Objekt Name # Lt 5.600 mm Ls Norm GS 2.5 µm Lc 0.800 mm Ra 0.091 µm Rz 0.62 µm Rmax 1.13 µm</p> <p>NR. 2</p> <p>Perthometer M1 Objekt Name # Lt 5.600 mm Ls Norm GS 2.5 µm Lc 0.800 mm Ra 0.030 µm Rz 0.20 µm Rmax 0.25 µm</p>		<p>NR. 3</p> <p>Perthometer M1 Objekt Name # Lt 5.600 mm Ls Norm GS 2.5 µm Lc 0.800 mm Ra 0.070 µm Rz 0.32 µm Rmax 0.40 µm</p>



Geprüft / Name / tested / name: Fischer	Datum / Date: 14. 02. 2013	Visum / Sign.:
---	--------------------------------------	-----------------------

INSPECTION CERTIFICATE 3.1 DIN EN 10204 3.1

Delivery address, Empfänger, Lieu de livraison NOTZ METALL AG		NOTZ METALL AG										
BERNSTRASSE 18 2555 BRUEGG BEI BIEL SWITZERLAND		BERNSTRASSE 18 2501 BIEL SWITZERLAND										
Requirements, Anforderungen, Exigences AD 2000 W2, W10 & EN 10028-7 ASTM A240/A240M-11 ASME 2010 SEC. II PART A SA-240		Our Order No. / Unser Auftrag Nr. / Notre commande n° 0300164788	Your order, Ihre Bestellung, Votre commande 317976									
Product, Erzeugnisform, Produit SHEET, STAINLESS STEEL		Mark of Manufacturer / Zeichen des Lieferwerkes / Signe du producteur OUTO KUMPU	Process / Erzeugnisart / Mode de fabrication AOD									
Grade, Werkstoff, Nuance 1.4404 TYPE 316L		Tolerances / Toleranzen, Tolérancias EN ISO 9445-2										
Marking, Kernzeichnung, Marquage 1.4404 2B		Inspector's stamp / Zeichen d. Sachverst. / Poisson de l'expert 										
Line Reihe / Ligne	Item Position / Poste	Charge-test No. / Schmelz-Probé Nr. / Coulée n°	Size, Abmessungen, Dimensions	Quantity / Stückzahl / Nombre	Weight, Gewicht, Poids	Finish / Ausführung / Fini / EN/ASTM						
1	6	98384 7	2,0 X 1000 X 2000 MM	35	1082 KG	2B						
2	7	10410 5	2,5 X 1500 X 3000 MM	11	958 KG	2B						
3	11	10956 6	2,0 X 1500 X 3000 MM	14	976 KG	2B						
Charge no. / Schmelz Nr. / Coulée n°	Chemical composition, Chemische Zusammensetzung, Composition chimiques											
	C %	Si %	Mn %	P %	S %	Cr %	Ni %	MO %	N %			
98384	0,019	0,43	1,78	0,030	0,002	17,1	10,1	2,05	0,037			
10410	0,024	0,46	1,77	0,035	0,001	16,9	10,1	2,03	0,054			
10956	0,023	0,46	1,78	0,029	0,001	17,0	10,0	2,06	0,037			
Line Reihe / Ligne	Mechanical properties, Mechanische Eigenschaften, Caractéristiques mécaniques								APPROVED ACC. TO AD2000-W0 WITH VERIFICATION OF THE UNIFORMITY OVER THE STRIP LENGTH. CERTIFIED ACC TO PED 97/23/EC BY CERTIFICATION BODY FOR PRESSURE EQUIPMENT OF THE TÜV NORD SYSTEMS REG.-NO. 0045			
	Location / Ort / Lieu	Rp0.2 MPa	Rp1.0 MPa	Rm MPa	A5 %	A50 %	%	Hardness / Härte, Dureté / HB30				
1	E	314	346	591	62	53		170				
2	E	313	348	620	63	56		171				
3	E	311	342	595	62	53		170				
Identity test, Verwechslungsprüfung, Contrôle d'identification		SIZES, Abmessungen, Dimensions		OK		A = Beginning / Anfang / Début						
Surface, Oberfläche, Surface		Test of intergran. corros. / Prüfung auf Interkrist. Korros. / Test de corros. Interkrist.		OK		E = End / Ende / Fin						
EN ISO 3651-2 A: OK		NACE MR0103-2007 AND MR0175-2003		OK								
ISO 15156-1 / 15156-3		WARMBEHANDLUNG: 1070 C		OK								
EN 10088-2/1.4404												
						We certify that the above mentioned products comply with the terms of the order contract. Wir bestätigen, dass die Lieferung den Vereinbarungen der Bestellung entspricht. Nous certifions que les produits énumérés ci-dessus sont conformes aux prescriptions de la commande.						
						This test certificate is made by controlled ADP-system and is valid without signature. Dieses Zeugnis wurde von einem überprüften Datenverarbeitungssystem erstellt und ist ohne Unterschrift gültig. Ce certificat a été établi par un système informatique contrôlé et est valide sans signature.						
						Outokumpu Stainless Oy  Authorized Inspector / Werkstoffprüfer / Inspecteur autorisé TERO TAULAVUORI						
						FIN-95490 Tornio, Finland Tel. +358 16 4521, Fax +358 16 452 350, www.outokumpu.com Domicile: Tornio, Finland. Business Identity Code 0823315-9						

P-Nr: 45917-K-Ton
 Pos Nr: 1
 Art Nr: 00000 24702
 Seite: 1

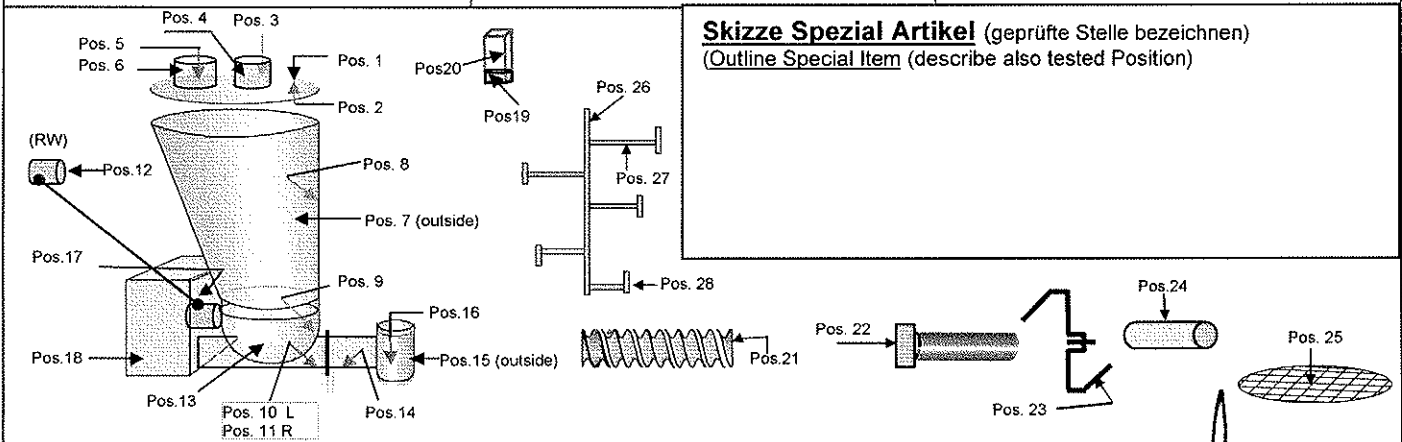
MatZert

 Mat.Zertifikat Nr.: Z668
 Mat: 1.4404 finish 2B - 2.5 mm
 Seite 1/1

CO - Nr./ Kundenauftrag Nr.: (CO -No. / Order No.)	CO -	<input checked="" type="checkbox"/> mit Material Zertifikat (with material certificate)
MO - Nr. / Dosierer Nr.: (MO - No. / Feeder No.)	MO -	<input type="checkbox"/> mit Prüfprotokoll (Masse) (with test protocol (dimensions))
Artikel Nummer: (item number)	00000 2772 A	<input type="checkbox"/> mit WPS (with WPS)
Artikelbeschreibung: (item description)	Einsatz - 76.2 x 46.2 - PH	Bemerkung: (remarks)

Prüfmittel: Oberflächenmessgerät, Mitutoyo, No.: 01-33-001 oder / or
(test equipment) Oberflächenmessgerät, Perthometer M1, Mahr, No.: 01-33-003

Messstreifen: (Test strip)	Bemerkungen: (remarks)	Messstreifen: (Test strip)
<p>Innen</p> <p>Perthometer M1</p> <p>Objekt Name # Lt 5.600 mm Ls Norm GS 2.5 µm Lc 0.800 mm Ra 0.106 µm Rz 0.91 µm Rmax 1.57 µm</p> <p>Innen</p> <p>Perthometer M1</p> <p>Objekt Name # Lt 5.600 mm Ls Norm GS 2.5 µm Lc 0.800 mm Ra 0.160 µm Rz 1.27 µm Rmax 2.14 µm</p>		<p>Russen</p> <p>Perthometer M1</p> <p>Objekt Name # Lt 5.600 mm Ls Norm GS 2.5 µm Lc 0.800 mm Ra 0.087 µm Rz 0.80 µm Rmax 1.11 µm</p>



Geprüft / Name / tested / name: Fischer	Datum / Date: 09. 05. 2014	Visum / Sign.:
---	--------------------------------------	---------------------------



22

1005194

ACEROS INOXIDABLES

OLARRA



IBERO STAHL GMBH.
PILGERSTRASSE 27
45473 MUELHEIM/RUHR - ALEMANIA

Trade Mark - Zeichen des Lieferwerkes
Anagrama del suministrador



Works Inspector Stamp - Werkssachverständiger
Sello del Inspector

3

Certificate type - APZNach
Certificado tipo EN 10.204/3.1 Certificate n° - Prüf-Nr
Certificado n° 642.932 Date - Datum - Fecha
27 DE AGOSTO 2009

Our order N°
Werks - Nr 400.957 Heat
Schmelze Colada 978155 Your order N°
N° de Referencia Bestell - Nr
Pedido N° 45478

Steel Grade
Werkstoff X-2-CRNI-MO-17-12-2 / 1.4404 MECAMAX According to
Calidad Corresponding EN 10.272 2.007

Shape and Size - Gegenstand
Perfil y dimensión RUND 80,00 MM Tolerance - Toleranz
Tolerancia h. 9 Bundles
Bunde 2 Bars
Bultos Stäbe
Barras Weight
Gewicht 1.118
Peso

Requirements - Anforderungen - Exigencias

TRB-100/AD-2000-W2-ADW-10
ASTM A479/A479M-08
EN 10.088-3.2005
ASME SA 479/SA 479M-07
According to TP.316/316L.
NACE MR 0175-03.

Rissgeprüft.
EN 10.278-99
PED97/23/EC, Annex I, Parag.4.3, Approved Cert. N° 348/2008/MUC

Melting process / Erschmelzungsart / Proceso de Fusión
E.A.F. / A.O.D.

Heat treatment / Wärmebehandlung / Tratamiento térmico
1.060°, 4 HORAS Water / Wasser / Agua

Solution annealed / Abgeschreckt / Hipertemple >> Centerless grinded / Geschliffen / Rectificado

Test results - Ergebnis der Prüfungen - Resultados de los ensayos

Dimension of Specimen Abmessungen des Probestabes Medida de las probetas	Rp 0.2% N/mm2 MPA	Rp 1% N/mm2 MPA	RM N/mm2 MPA	A %L 5D	A %L 4D	Z %	Hardness Härte Dureza HBW	Impact Test / Kerbschlag / Resiliencia ISO V Jules
RED. 10,00 MM.	200	235	500	40				100
			700				215	
Temperature °C 20C	Spec. N° 1	267	304	566	54	74	156	236/233/238

	C	Si	Mn	P	S	Cr	Mo	Ni	Ti	Cu	Co	N		
Min.						16,50	2,00	10,00						
Max.	0,030	1,00	2,00	0,045	0,030	18,50	2,50	13,00						
	0,021	0,38	1,59	0,030	0,028	16,70	2,03	10,00			0,140	0,0375		

Visual and dimensional inspection
Besichtigung und Ausmessung
Control visual y dimensional O.K.

Radioactivity inspection
Radioaktivitätskontrolle
Control de Radioactividad O.K.

Antimixing test
Spektr. Verwechslungspr.
Antimezcla O.K.

Grain Size
Korngröße
Tamaño de grano

Remarks - Bemerkungen - Observaciones

Korrosion Prüfung , Essai de Corrosion , Corrosion test ,
Ensayo de Corrosion A/EN ISO 3651-2/98 OK.
Spektr. Verwechslungspr. Durchgeführt. Anti-Mixing test OK
Zustimmungsschreiben des Tuv Baden . Vom 28.1.1969
Laut Schreiben des Tuv Baden E.V.
Vom 1. März 1977 Wird auf die Gegenzeichnung Verzichtet.

EDV / EDP
Acc. EN 10.204
Alfredo Molina
Certification
Mng.

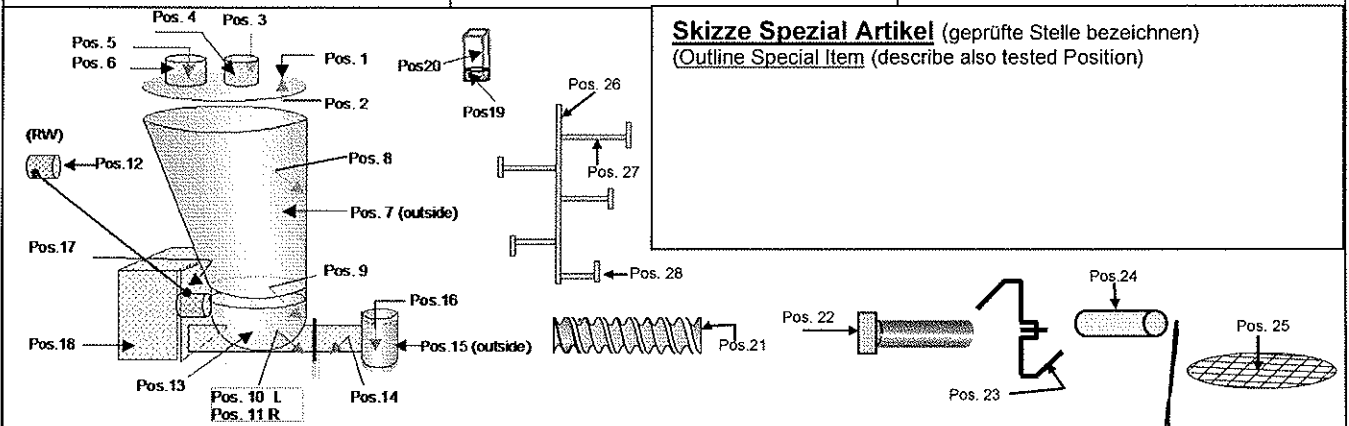
Works Inspector
Der Werkssachverständige
Inspector de fábrica

P-Nr: 12355	K-TITEL
Pos Nr:	Zert/Tot:
Art Nr: 0000 27721	

Certificat 21

CO - Nr./ Kundenauftrag Nr.: (CO -No. / Order No.)	CO -	<input checked="" type="checkbox"/> mit Material Zertifikat (with material certificate)
MO - Nr. / Dosierer Nr.: (MO - No. / Feeder No.:	MO -	
Artikel Nummer: (item number)	0000014016	<input type="checkbox"/> mit WPS (with WPS)
Artikelbeschreibung: (item description)	Filtersackhalter DU-100	Bemerkung: (remarks)
Prüfmittel: (test equipment)	Oberflächenmessgerät, Mitutoyo, No.: 01-33-001 oder / or Oberflächenmessgerät, Perthometer M1, Mahr, No.: 01-33-003	

<p>Messstreifen: (Test strip)</p> <p style="text-align: center; font-size: 24px;">NR. 1</p> <p style="text-align: center;">Perthometer M1</p> <p>Objekt Name #</p> <table style="width: 100%;"> <tr><td>Lt</td><td>5.600</td><td>mm</td></tr> <tr><td>Ls Norm GS</td><td>2.5</td><td>µm</td></tr> <tr><td>Lc</td><td>0.800</td><td>mm</td></tr> <tr><td>Ra</td><td>0.266</td><td>µm</td></tr> <tr><td>Rz</td><td>1.84</td><td>µm</td></tr> <tr><td>Rmax</td><td>2.00</td><td>µm</td></tr> </table>	Lt	5.600	mm	Ls Norm GS	2.5	µm	Lc	0.800	mm	Ra	0.266	µm	Rz	1.84	µm	Rmax	2.00	µm	<p>Bemerkungen: (remarks)</p> <p style="font-size: 24px;">Filtersackhalter NR. 1+2</p>	<p>Messstreifen: (Test strip)</p> <p style="text-align: center; font-size: 24px;">NR. 2</p> <p style="text-align: center;">Perthometer M1</p> <p>Objekt Name #</p> <table style="width: 100%;"> <tr><td>Lt</td><td>5.600</td><td>mm</td></tr> <tr><td>Ls Norm GS</td><td>2.5</td><td>µm</td></tr> <tr><td>Lc</td><td>0.800</td><td>mm</td></tr> <tr><td>Ra</td><td>0.290</td><td>µm</td></tr> <tr><td>Rz</td><td>1.98</td><td>µm</td></tr> <tr><td>Rmax</td><td>2.33</td><td>µm</td></tr> </table>	Lt	5.600	mm	Ls Norm GS	2.5	µm	Lc	0.800	mm	Ra	0.290	µm	Rz	1.98	µm	Rmax	2.33	µm
Lt	5.600	mm																																				
Ls Norm GS	2.5	µm																																				
Lc	0.800	mm																																				
Ra	0.266	µm																																				
Rz	1.84	µm																																				
Rmax	2.00	µm																																				
Lt	5.600	mm																																				
Ls Norm GS	2.5	µm																																				
Lc	0.800	mm																																				
Ra	0.290	µm																																				
Rz	1.98	µm																																				
Rmax	2.33	µm																																				



Geprüft / Name / tested / name: Fischer	Datum / Date: 16.04.2014	Visum / Sign.:
---	------------------------------------	---------------------------

Filtersackhalter
DN 100

WAZ 3.1
186

SIDERINOX

Siderinox S.p.a. Frazione Caselle 20021 Morimondo (MI) Italia
 Ufficio Commerciale: Tel. 02 9498151 - Fax 02 949815250/251
 Ufficio Amministrativo: Tel. 02 9498161 - Fax 02 949816350
 Ufficio Spedizioni: Tel. 02 949816222 - Fax 02 949816350
 Ufficio Acquisti: Tel. 02 949816345 - Fax 02 949816350
 Casella e-mail: ex@siderinox.it Sito web: www.siderinox.it

Capitale Sociale Euro 3.300.000 I.V.
 Cod. Fiscale e Reg. Imp. MI N. 01825510157
 R.E.A. Milano N. 878116
 Centro Meccanografico n. MI074282
 Partita IVA 01825510157

AZIENDA CON SISTEMA DI GESTIONE
 PER LA QUALITÀ CERTIFICATO DA DNV
 = UNI EN ISO 9001:2008 =

ABNAHMEPRÜFZEUGNIS EN 10204				3.1	N° 282404	vom 03.01.2012	
Besteller NOTZ METALL AG							
DDT n. 9 vom 03.01.2012		SIDERINOX Auftragsnummer n. 2522 del 30.11.2011			Kundenbestellnummer n. 318184 del 30.11.2011		

MATERIALBESCHREIBUNG

Produktbeschreibung Edelstahlrundrohr Ø 104 x 2 mm AISI 304/304L aussen geschliffen DIN 11850			
Abmessung 104 x 2 mm	Stahlsorte W. 1.4301/W. 1.4307 / AISI 304/AISI 304L	Menge (m) 96	Gewicht (kg) 490
Produktionsvorschrift DIN 11850	Walzen Kaltgewalzt	Toleranzfeld DIN 11850 \ DIN 11850	Schweissfaktor V=1
Stempelung			
Schweissverfahren			Ausführung der Oberfläche

CHEMISCHE ZUSAMMENSETZUNG

Schmelze	% C	% Mn	% P	% S	% Si	% Cr	% Ni	% Mo	% Ti
	0,000 - 0,030	0,000 - 2,000	0,000 - 0,045	0,000 - 0,015	0,000 - 1,000	17,500 - 19,500	8,000 - 10,000	0,000 - 0,000	0,000 - 0,000
95940	0,019	1,770	0,030	0,007	0,350	18,200	8,000		

Die chemischen Werte beziehen sich auf das Zeugnis des Stahlwerks gemäss EN 10088 / 10028-7 / ASTM A240

PRÜFERGEBNISSE

Los	Prüf Klasse	(D) *	(P) **	ZUGVERSUCH nach Nmm ² =MPa				HARTE
				Dehngrenze		Zugfestigkeit	Dehnung	HRB
				Rp 0.2%	Rp 1%	Rm	A %	
				195 -	230 -	500 - 740	40 -	
T11091872	PK1	L	M	218	279	565	48	

* (D) Richtung: (L) Längsnahtgeschweiss, (T) Quer - ** (P) Stelle, (S) Schweissung, (M) Material

Sichtkontrolle	OK	Ringaufdornversuch	OK	Dichtheitsprüfung	OK
Abmessungskontrolle	OK	EN 10234	OK	SEP 1825	OK
Verwechslungsprüfung	OK	EN 10233	OK	SEP 1914	OK
	OK	N.P.	N.P.	Prüfung auf Interkristalline Korrosion EN ISO 3651-2	N. P.

HIERMIT BESTÄTIGEN WIR, DASS DIE GELIEFERTE WARE DEM BESTELLTEN MATERIAL ENTSpricht

Bemerkungen

UNGÜLTIG

Dir. PED 97/23/EC Anlage 1, Punkt 4.3, Absatz 3
 AQUAP ab Nr. 7293-06-TU bis Nr. 7298-06-TU

Qualifizierungen:
 WPS/WPAR: EN 288 - EN ISO 15614-11 - ASME IX
 WLD: EN 1418 - ASME IX Bediener
 NDT: EN 473 - ASNT Bediener

Cert. Coll. - Rev. 2 - 03/11

Dokument ausgestellt von dem
 Abnahmebeauftragten

D. Riccio
 D. Riccio

Dokument ausgestellt von dem
 Werkverleiher

W. Amodéo
 W. Amodéo

NOTE METAL SA
CH-2501 Bienne

Material Certificate

JUI MING METAL INDUSTRIAL CO., LTD.
NO. 35, SHI-HAI RD., SEC. 2, PEITOU, CHANGHUA, TAIWAN, R.O.C.
TEL: 886-4-8888396 FAX: 886-4-8888379

ORIGINAL



Messrs. : HH Components ApS
PO# 98

EN10204 3.1B

Material: ASTM A276(316L)

QTY	Part Name	SIZE	DATE	HEAT NO.	CHEMICAL COMPOSITION							
					C	Si	Mn	P	S	Ni	Cr	Mo
					max	max	max	max	max	10	16	2
	BLANK	DN80	2008.03.11	QL1185	0.03	1.00	2.00	0.045	0.030	14	18	3
	BLANK	DN100	2008.03.11	QL1185	0.025	0.410	0.720	0.038	0.002	10.560	17.160	2.130
	BLANK	DN125	2008.03.11	QL1185	0.026	0.430	0.750	0.039	0.002	10.320	17.250	2.110
	BLANK	DN150	2008.03.11	QL1185	0.026	0.430	0.750	0.039	0.002	10.320	17.250	2.110
	BLANK	DN200	2008.03.11	QL1185	0.026	0.430	0.750	0.039	0.002	10.320	17.250	2.110

QTY	Part Name	SIZE	DATE	HEAT NO.	MECHANICAL FEATURES					
					Yield Strength	Tensile Strength	Hardness	Elongation	Impact test	SURFACE INSPECTION
					Limite elastique Rp 0.2%-N/mm2	resist rupture N/mm2	Durete HB	Allongement %	Resilience 20°C-J	
	BLANK	DN80	2008.03.11	QL1185	MIN 170	MIN 485	MAX	MIN 40		
	BLANK	DN100	2008.03.11	QL1185	184	501		50		OK
	BLANK	DN125	2008.03.11	QL1185	184	501		50		OK
	BLANK	DN150	2008.03.11	QL1185	190	510		51		OK
	BLANK	DN200	2008.03.11	QL1185	190	510		51		OK

We hereby certify that material described herein has been manufactured and tested with satisfactory results in accordance with the requirement of above material code and purchase specification.

We hereby certify that material described above has been detected and has no radiation contamination.

SUPERVISOR :

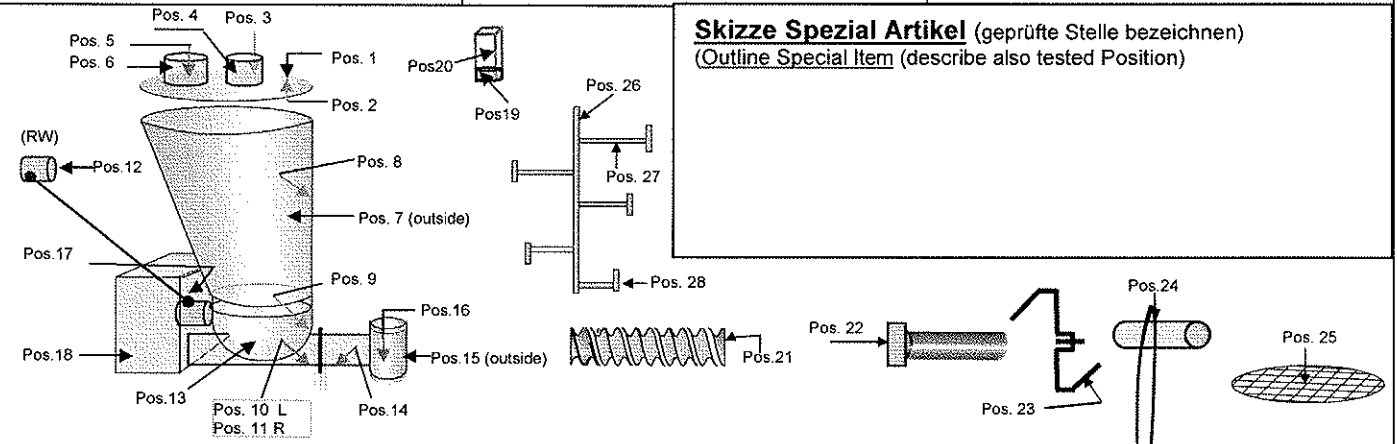
INSPECTOR :

UNGÜLTIG

164000
2
1/2


CO - Nr./ Kundenauftrag Nr.: (CO -No. / Order No.)	CO -	<input checked="" type="checkbox"/> mit Material Zertifikat (with material certificate) <input type="checkbox"/> mit Prüfprotokoll (Masse) (with test protocol (dimensions)) <input type="checkbox"/> mit WPS (with WPS)
MO - Nr. / Dosierer Nr.: (MO - No. / Feeder No.)	MO -	
Artikel Nummer: (item number)	000006962	
Artikelbeschreibung: (item description)	Auslaufstueck- KT35-7H	Bemerkung: (remarks)
Prüfmittel: (test equipment)	Oberflächenmessgerät, Mitutoyo, No.: 01-33-001 oder / or Oberflächenmessgerät, Perthometer M1, Mahr, No.: 01-33-003	


Messstreifen: (Test strip)	Bemerkungen: (remarks)	Messstreifen: (Test strip)
<p>Innen</p> <p>Perthometer M1</p> <p>Objekt Name # Lt 5.600 mm Ls Norm GS 2.5 µm Lc 0.800 mm Ra 0.091 µm Rz 0.53 µm Rmax 0.68 µm</p> <p>Innen</p> <p>Perthometer M1</p> <p>Objekt Name # Lt 5.600 mm Ls Norm GS 2.5 µm Lc 0.800 mm Ra 0.108 µm Rz 0.78 µm Rmax 1.30 µm</p>		<p>Aussen</p> <p>Perthometer M1</p> <p>Objekt Name # Lt 5.600 mm Ls Norm GS 2.5 µm Lc 0.800 mm Ra 0.261 µm Rz 1.75 µm Rmax 2.03 µm</p> <p>Aussen</p> <p>Perthometer M1</p> <p>Objekt Name # Lt 5.600 mm Ls Norm GS 2.5 µm Lc 0.800 mm Ra 0.382 µm Rz 2.19 µm Rmax 2.68 µm</p>



Geprüft / Name / tested / name: Fischer	Datum / Date: 09. 05. 2014	Visum / Sign.:
---	--------------------------------------	---------------------------

HANS KOHLER AG.
CLARIDENSTRASSE 20
POSTFACH 2521 - CH 8022 ZURICH - SUIZA

Trade Mark - Zeichen des Lieferwerkes
Anagrama del suministrador 

Works Inspector Stamp - Werkssachverständiger
Sello del Inspector 

Certificate type - APZ Nach
Certificado tipo **EN 10204/3.1** Certificate n° - Prüf-Nr
Certificado n° **75935** Date - Datum - Fecha
18 - 04 - 2011

Our order N°
Werks - Nr **460458** Heat
Schmelze **309161** Your order N°
Bestell - Nr **1014503-L**
N° de Referencia Colada Pedido N°

Steel Grade
Werkstoff **X-2-CRNIMO-17-12-2 / 1.4404 MECAMAX** According to
Entsprechend **EN 10.272-2007.**
Calidad Corresponde

Shape and Size - Gegenstad
Perfil y dimensión **RUND 100 mm** Tolerance - Toleranz
Tolerancia **h 9 / DIN 671 / EN 10278** Bundles
Bunde **2** Bars
Stäbe
Bultos Barras Weight
Gewicht **1181 Kg**
Peso

Requirements - Anforderungen - Exigencias

EN 10.088-3.2005.
ASTM A 479 / A 479M-10a.
ASME SA 479 / SA 479M-10.
ASTM A 182 / A 182M-10.
ASME SA 182 / SA 182M-10.
NACE MR-0175/ISO 15156-3 2003.
TRB-100 /AD-2000-W2 /ADW-10.
ASTM A 276-10.
ASME SA 276-2010.
TP.316-TP.316L.

Conformity letter/Zustimmungsschreiben TUVBADEN 28.01.1969
Waiving of Countersing/Gegenzeichnungserzicht: 01.03.1977
PED 97/23/EC, Annex I, Parag.4.3/DGR 97/23/EG
Anhang I Bsatz 4.3 Certificate/Zertifikat Nr. 348/2008/MUC

Melting process / Erschmelzungsart / Proceso de Fusión **E.A.F. / A.O.D.** Heat treatment / Wärmebehandlung / Tratamiento térmico
1060C 4H/Std WATER/WASSER/AGUA

Solution annealed/Abgeschreckt/Hipertemple-Centerless grinded/Geschliffen/Rectificado-

Test results - Ergebnis der Prüfungen - Resultados de los ensayos

Dimension of Specimen Abmessungen des Probestabes Medida de las probetas	Rp0,2% N/mm2 MPA	Rp 1% N/mm2 MPA	Rm N/mm2 MPA	A %L 5I	A %L 4I	Z %	Hardness Härte HBw	Impact test / Kersbschlag / Resiliencia ISO V Jules		
D. 10,00 mm.	Min.	200	235	500	40			100		
	Max.			700			215			
Temperature °C 20	Spec. N° Probe Nr. Pro N°	1	286	322	568	50	53	73	159	236/235/232

	C	Si	Mn	P	S	Cr	Mo	Ni	N	Co
Min.						16,50	2,00	10,00		
Max.	0,030	1,00	2,00	0,045	0,030	18,50	2,50	13,00	0,1000	
	0,020	0,38	1,63	0,031	0,028	16,55	2,00	10,05	0,0295	0,18

Visual and dimensional inspection
Besichtigung und Ausmessung **O.K.** Radioactivity inspection
Radioaktivitätskontrolle **O.K.** Antimixing test
Spektrosk Verwechslungspr **O.K.** Grain Size
Korngrösse
Control visual y dimensional Control de Radioactividad Antimezcla Tamaño de grano

Remarks - Bemerkungen - Observaciones

IC test acc./IK prüfung nach ASTM A 262 E.02. OK
IC test acc./IK prüfung nach EN ISO 3651-2/98 Met.A. OK
US test acc./US prüfung nach EN 10308. OK
No weld repair.
US test acc./US prüfung nach ASTM A 388. OK

P-Nr: 13383	K-Tron
Pos Nr:	Zert/Tot:
Art Nr: 00006366	

EDV / EDP
Acc. EN 10.204
Alfredo Molina
Certification
Mng.

Works Inspector
Der Werkssachverständige
Inspector de fábrica



Reinoso Standort

ISO 9001 - ISO/TS 16949

KUNDE:(PROZESSNUMMER: 1304896
AUFTRAGSN°.: 4501160266/1710017-L	AUFTRAGSN°.: 185292-1	CHARGEN°.: 98864
ARTIKELNUMMER: 73900016	DARSTELLUNG: 94001	WALZDATUM: 21.11.2007

PRODUKT IM AUFTRAG			
1.4404/1.4401 VIMAC AISI 316/316L RUNDE STANGES GESCHAEHLT ABGESCHRECKT 120 +0/+1 mm			
AUFTRAG TOLERANZ 4.000/5.000 mm NORMALE			
EXPEDITIONS DATEN	ZUSTELLUNG: 80204065	GEWICHT (KG): 2.600	BÜNDEL: 2 BARREN: 6

NORMEN UND VORSCHRIFTEN
ASTM A276 - 2002 ; EN 10272 - 10.2000 ; TRD100 - 01.08.1990 ; DIN 17440 - .09.1996
EN 10278 - 01.10.1999 ; AD2000W2 - 01.10.2000 ; ASTM A479-A479M - 2003
AD2000W10 - 01.10.2000 ; EN 10222-5 - 01.12.1999 ; EN 10088-3 - 01.04.1995
ASME SA182-SA182M - 2001 ; ASME SA479-SA479M - 2001 ; ASTM A182-A182M - . . .2000
NACE MR0175 2002 01.01.2002 ; SIDENOR SID-EU-02 0 21.03.2005
EN DIRECTIVA 97/23/CE:97 - 29.05.1997
EN 10204 :1991/A1:1995 JUNIO 1995 3.1B (3.1 - EN 10204:2004)

CHEMISCHE ZUSAMMENSETZUNG GUSS										U: % CHARGEN°.: 98864
	C	Mn	Si	P	S	Cr	Ni	Mo	Co	N
Min.					0,015	16,500	10,000	2,000		
Max.	0,030	2,000	1,000	0,045	0,030	18,000	13,000	2,500	0,2000	0,1000
Rep.	0,018	1,440	0,475	0,026	0,026	16,700	10,060	2,060	0,2000	0,0780

PRÜFUNGEN REINHETSGRAD
Norm (ASTM E45- .1997) ; A:<3 ; B:<3 ; C:<3 ; D:<3 ; A(d):2 ; A(g):1,5 ; B(d):1 ; B(g):0,5 C(d):0 ; C(g):0 ; D(d):1 ; D(g):0,5

TECHNISCHE LIEFERBEDINGUNGEN
Entnahme Probestück: 1/4 der Dimension oder Randbereich ; Temperatur von: (1): Abgeschreckt 1.050 °C Abkühlung: (1): Wasser

TECHNISCHE LIEFERBEDINGUNGEN
Richtung Probestück Zugprobe (laengst): laengst ; Rm (515/690 MPA): 570 MPA Re(1) (Rp(0,2%) >= 205 MPA): Rp(0,2%) 257 MPA ; Re(2) ((1%) >= 235 MPA): (1%) 302 MPA A ((5d) >= 45 %): (5d) 56,7 % ; Z (>= 50 %): 78,2 % Richtung Probestück Kerbschlagzähig (laengst): laengst Typ Probestück Kerbschlagzähigkeit (ISO V): ISO V ; Temperatur Kerbschlagzähigkeitsprobe (20 °C): 20 °C K(1) (>= 100 J): 275 J ; K(2): 276 J ; K(3): 279 J ; Norm (EN ISO 6506-1:99-01.09.1999) Härte (<= 215 HB): 164 HB

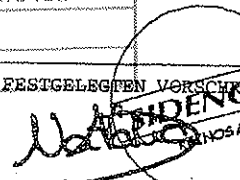

Richtung Probestück Zugprobe: laengst ; Rm: 576 MPA ; Re(1): Rp(0,2%) 262 MPA ; Re(2): (1%) 307 MPA A: (5d) 56,5 % ; Z: 78 % ; Richtung Probestück Kerbschlagzähig: laengst Typ Probestück Kerbschlagzähigkeit: ISO V ; Temperatur Kerbschlagzähigkeitsprobe: 20 °C ; K(1): 280 J K(2): 273 J ; K(3): 274 J ; Norm: EN ISO 6506-1:99 - 01.09.1999 EN ISO 6506-1:99-01.09.1999 10 Härte: 166 HB
--

Richtung Probestück Zugprobe: laengst ; Rm: 573 MPA ; Re(1): Rp(0,2%) 260 MPA ; Re(2): (1%) 306 MPA A: (5d) 56,6 % ; Z: 78,2 % ; Richtung Probestück Kerbschlagzähig: laengst Typ Probestück Kerbschlagzähigkeit: ISO V ; Temperatur Kerbschlagzähigkeitsprobe: 20 °C ; K(1): 276 J K(2): 279 J ; K(3): 280 J ; Norm: EN ISO 6506-1:99 - 01.09.1999 EN ISO 6506-1:99-01.09.1999 10 Härte: 165 HB
--

Richtung Probestück Zugprobe: laengst ; Rm: 568 MPA ; Re(1): Rp(0,2%) 255 MPA ; Re(2): (1%) 301 MPA A: (5d) 56,8 % ; Z: 78,3 % ; Richtung Probestück Kerbschlagzähig: laengst Typ Probestück Kerbschlagzähigkeit: ISO V ; Temperatur Kerbschlagzähigkeitsprobe: 20 °C ; K(1): 279 J K(2): 277 J ; K(3): 274 J ; Norm: EN ISO 6506-1:99 - 01.09.1999 EN ISO 6506-1:99-01.09.1999 10 Härte: 164 HB
--

P-Nr: 74355	K-Tron
Pos Nr:	Zert/Tot:
Art Nr: 0200 6562	

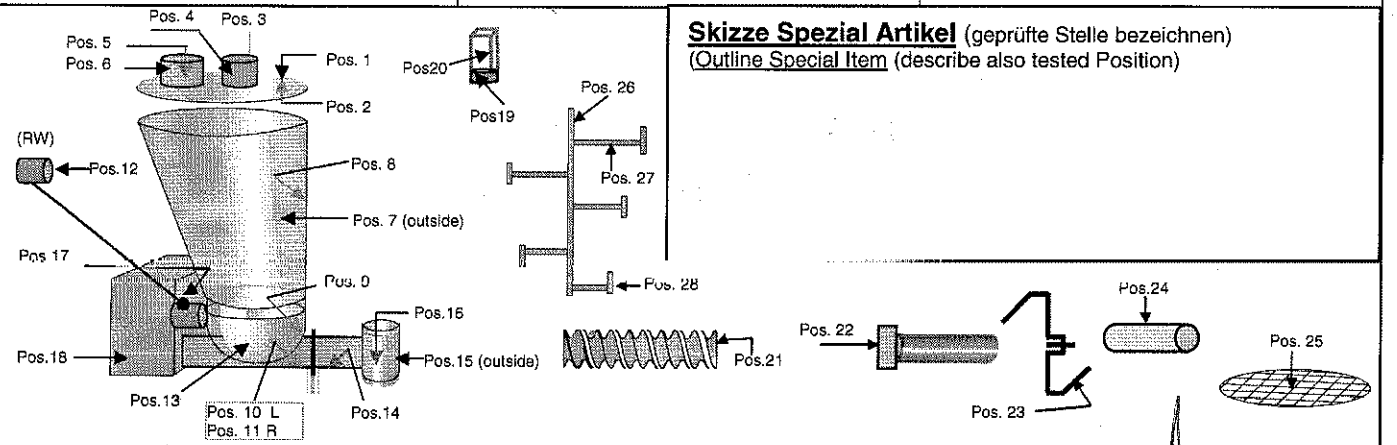
ABTEILUNG TECHNIK & QUALITÄT VERSICHERT, DASS DAS PRODUKT DEN IM AUFTRAG FESTGELEGTE VORSCHRIFTEN ENTSPRICHT
 VERANTWORTLICHER: NATALIA MANTILLA DIAZ
 DATUM: 22.11.2007
 REF.: 6000943360000

UNTERSCHRIFT: 
 Stempel des Werksinspektor 

Seite 1 von 2

CO - Nr./ Kundenauftrag Nr.: (CO -No. / Order No.)	CO -	<input checked="" type="checkbox"/> mit Material Zertifikat (with material certificate) <input type="checkbox"/> mit Prüfprotokoll (Masse) (with test protocol (dimensions)) <input type="checkbox"/> mit WPS (with WPS)
MO - Nr. / Dosierer Nr.: (MO - No. / Feeder No.)	MO -	
Artikel Nummer: (item number)	00000 10367	
Artikelbeschreibung: (item description)	Nozzle - Fr. o.d 120 P	Bemerkung: (remarks)
Prüfmittel: (test equipment)	Oberflächenmessgerät, Mitutoyo, No.: 01-33-001 oder / or Oberflächenmessgerät, Perthometer M1, Mahr, No.: 01-33-003	

<p>Messstreifen: (Test strip)</p> <p>Innen</p> <p>Perthometer M1 Objekt Name # Lt 5.600 mm Ls Norm GS 2.5 µm Lc 0.800 mm Ra 0.200 µm Rz 1.38 µm Rmax 1.79 µm</p>	<p>Bemerkungen: (remarks)</p>	<p>Messstreifen: (Test strip)</p> <p>Russen</p> <p>Perthometer M1 Objekt Name # Lt 5.600 mm Ls Norm GS 2.5 µm Lc 0.800 mm Ra 0.228 µm Rz 2.53 µm Rmax 3.22 µm</p>
---	--	--



Skizze Spezial Artikel (geprüfte Stelle bezeichnen)
(Outline Special Item (describe also tested Position))

Geprüft / Name / tested / name: Fischo	Datum / Date: 03. 06. 2013	Visum / Sign.:
--	--------------------------------------	---------------------------



COGNE ACCIAI SPECIALI S.p.a.

11100 AOSTA - VIA PARAVERA, 16
 TEL +39.0165.3021 - FAX +39.0165.302296
 CAP. SOC. 143.550.000 EUR INT. VERS.
 C.F. 02187360967
 VAT: IT00571320076 - R.E.A. n. AO-50474

Unternehmen mit Management-Systeme von ISO
 zugelassen und zertifiziert gemäß ISO 9001,
 ISO/TS 16949 e ISO 14001.

ABNAHMEPRUEFZEUGNIS 3.1 (EN 10204:2004)
 (A03) BESCHEINIGUNGS-NR 2013000223
 PAGE 1/2

(A06) BESTELLER : Schmolz + Bickenbach
 (A07) KUNDENBESTELLNr: 21037913
 (A01) HERSTELLERWERK : AOSTA, VIA PARAVERA 16 - ITALIA
 (A05) AUSSTELLER : QUALITATSTELLE
 (A08) WERKSAUFTRAGSNR : 25158662 /10 (A04) ZEICHEN DES HERSTELLERWERKES : COGNE
 DIE ZERTIFIZIERTE PRODUKTE SIND IN ÜBEREINSTIMMUNG MIT DER BESTELLUNG

INTERNE VORSCHRIFT :	STOCKBARREW2	ANFORDERUNGEN :	AD2000
(B01) ERZEUGNIS :	2281	SPE Grobgeschaelt RUND TOLERANZ :	+ 1,500 - 0,0000
(B03) OBERFLAECHE NENDE .. :	1X		
(B04) LIEFERZUSTAND :	RS LOESUNGSGEGLUEHT		
(B11) MASSE (MM) :	125,000	(B12) LANGE (MM) :	04000 /06000
(B02) STAHLSORTE .. :	AISI 316/316L EN1.4401/4404	MARKENBEZEICHNUNG :	F316L IMCO
(B08) SCHMELZE-NR. :	270159	(B07) LOS-NR. :	620990
(B06) KENNZEICHNUNG :	1.4404	KURZZEICH. F. SCHMELZE-NR	099

DAS MATERIAL ENTSPRICHT DEN BESTELLVORSCHRIFTEN UND DEN ANFORDERUNGEN NACH AD2000-MERKBLATT W0/W2.
 BEZUGSNORMEN: EN 10088-3(05), EN 10272(07), ASTM A276(08)/ASME SA(10), ASTM A479(11)/ASME SA(10), ASTM A193(08) B8M CLASSE 1D,
 ISO15156-3/NACE MR0175(09), NACE MR0103(07).

DIE GENANNTE NUR FÜR CHEMISCHE ANALYSE UND MECHANISCHEN EINGESCHAFTEN: ASTM A182(10)/ASME SA182(10).

DIE GENANNTE NUR FÜR CHEMISCHE ANALYSE: EN 10222-5(07), ASTM A484(08), ASTM A403(10), ASTM A314(08),
 AMS-QQ-S-763B

ASTM A484 GILT NICHT FÜR DURCHMESSER-UND LÄNGENTOLERANZEN.

GEMAESS NORSOK M-630 MDS S01

ERSCHMELZUNG IM ELEKTRO-OFEN + AOD + STRANGGUS

WARMGEWALZ

UNTERSETZUNG 4,3

P-Nr:	150640	K-Tron
Pos Nr:	1	Zert/Tot: 1
Art Nr:	0000010367	
		Seite:

(C71) CHEM. ZUSAMMENSETZ - SCHMELZE ANALYSE NACH ASTM E1019-A751-E1086-E415-A580

Kontrollennummer - Masse : 020000475810 -

81.500 KG

ELEMENTE	C	Si	Mn	P	S	N	Cr	Mo	Ni	Cu
ERREICHT	0,019	0,38	1,78	0,030	0,027	0,077	16,83	2,09	10,09	0,28
ELEMENTE	Co									
ERREICHT	0,09									

HARTEPRUEFUNG IM LIEFERZUSTAND

Kontrollennummer - Masse : 020000476259 -

18.216 KG

VORSCHRIFT

ENISO6506

HARTEPRUEFUNG

HB

PRUEFBEDINGUNG : 10/3000

ERREICHT

175

KERBSCHAGZAEHIGKEIT IM LIEFERZUSTAND

Kontrollennummer - Masse : 020000476259 -

18.216 KG

VORSCHRIFT

EN ISO 148-1-KV2
 KV

(C02) PROBENRICHTUNG: L

(C40) PROBENFORM

(C03) PRUEFTEMPERATUR °C

20

MASSEINHEIT

J

ERREICHT

254

254

252

248

250

248

246

249

252

251

252

252



COGNE ACCIAI SPECIALI S.p.a.

11100 AOSTA - VIA PARAVERA, 16
TEL +39.0165.3021 - FAX +39.0165.302296
CAP. SOC. 143.550.000 EUR INT. VERS.
C.F. 02187360967
VAT: IT00571320076 - R.E.A. n. AD-50474

Unternehmen mit Management-Systeme von IGQ
zugelassen und zertifiziert gemäß ISO 9001,
ISO/TS 16949 e ISO 14001.

ABNAHMEPRUEFZEUGNIS 3.1 (EN 10204:2004)
(A03) BESCHEINIGUNGS-NR 2013000223
PAGE 2/2

ZUGVERSUCH IM LIEFERZUSTAND

Kontrollennummer - Masse :020000476259 - 18.216 KG
VORSCHRIFT EN-ISO6892-1

(C02) PROBENRICHTUNG: L

MASSEINHEIT	RM MPA	RP02 MPA	A5 %	Z %	RP1 MPA
ERREICHT	599	285	5.0 D	65,3	329
	600	293	55,6	63,8	334
	571	288	57,8	65,4	334
	602	288	56,6	65,8	333
			55,1		

ZUGVERSUCH

Kontrollennummer - Masse :020000476259 - 18.216 KG
VORSCHRIFT ASTMA370-E8-0.5"SPEC

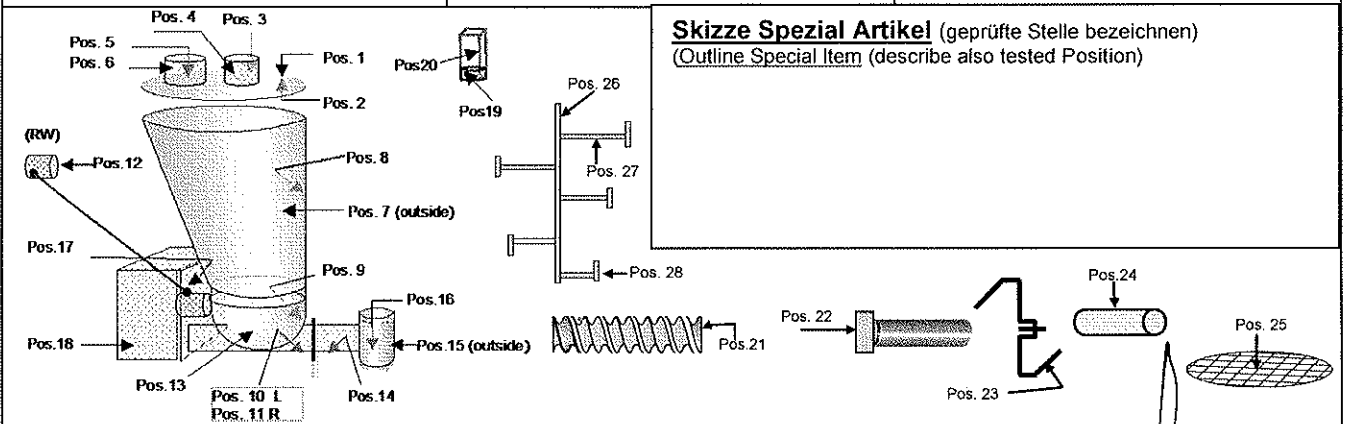
(C02) PROBENRICHTUNG: L

MASSEINHEIT	TS KSI	YS KSI	RA %	EL %
ERREICHT	86	43	65,3	4,0 D
	85	42	64,6	59,7
	86	42	64,5	60,6
	86	42	64,5	61,0
			64,5	58,7

IK-BESTAENDIGKEIT GEPRUEFT NACH ASTM A262/02a PRACTICE.E. EN ISO 3651-2: KONFORM.
SICHTPRUEFUNG UND MASSKONTROLLE GEMAESS EN10221 KLASSE C UND EN 10060: BESTANDEN.
US-PRUEFUNG GEMAESS EN10308 KLASSE 3, entspricht ASTM A388 FBH 8 (DURCH.<=400) oder EN10228-4 Klass 3, entspricht ASTM A388 FBH11 (DURCH.>400): BESTANDEN.
DAS MATERIAL WURDE NICHT REPARATURGESCHWEISST.
VERWECHSLUNGSPRUEFUNG nach portable spektroskopischer Prüfmethode: DURCHGEFUEHRT.
FREI VON VERUNREINIGUNGEN DURCH RADIOAKTIVITAET.
DIESES PRODUKT ERFUELLT DIE ANFORDERUNGEN DER EU-RICHTLINIEN: 2011/65 - 2000/53 2002/95(RoHS) 2003/11 - 2005/618 UND PED 97/23/EG.
DAS MATERIAL IST FREI VON QUECKSILBER-VERBINDUNGEN UND/ODER RADIUMKONTAMINATION ZUM ZEITPUNKT DER VERSCHIFFUNG UND WURDE OHNE VERWENDUNG VON OZON ABBAUENDEN STOFFEN DER KLASSE I UND II HERGESTELLT.
KENNZEICHNUNG: HERSTELLERZEICHEN, WERKSTOFF-NR, SCHELZEN-NR, PROBE/LOS-NR,STEMPEL DES WERKSSACHVERSTAENDIGEN.
DIESES DOKUMENT WIRD AUSGESTELLT MIT GENEHMIGUNG DES TUEV BAYERN (11.1972); AUF EINE GEGENZEICHNUNG KANN VERZICHTET WERDEN (SIEHE SCHREIBEN DES TUEV BAYERN VOM 17.01.80).
DAS QUALITAETS-MANAGEMENT-SYSTEM IST ZERTIFIZIERT DURCH IGQ UND ERFUELLT DIE ANFORDERUNGEN NACH EN ISO 9001:2008 UND ISO TS 16949:2009 (LETZTGENANNTES GILT NUR FUER WARMGEWALZTE, GESCHAELTE, GESCHLIFFENE STAEBE UND ATOMISIERTE PULVER).
ALLE NORMEN IN DER LETZTEN REVISION.
DAS MATERIAL ERFUELLT DIE ANFORDERUNGEN UND DIE NORME ASTM A182 WERKSTOFF F316L NUR FUER CHEMISCHE ANALYSE UND MECHANISCHE EINGENSCHAFTEN
(Z02) ZEICHEN DES SACHVERSTAENDIGEN LF

CO - Nr./ Kundenauftrag Nr.: (CO -No. / Order No.)	CO -	<input checked="" type="checkbox"/> mit Material Zertifikat (with material certificate) <input type="checkbox"/> mit Prüfprotokoll (Masse) (with test protocol (dimensions)) <input type="checkbox"/> mit WPS (with WPS)
MO - Nr. / Dosierer Nr.: (MO - No. / Feeder No.)	MO -	
Artikel Nummer: (item number)	9522 - 35745	
Artikelbeschreibung: (item description)	Ruehrwerkswelle T35 PH	Bemerkung: (remarks)
Prüfmittel: (test equipment)	Oberflächenmessgerät, Mitutoyo, No.: 01-33-001 oder / or Oberflächenmessgerät, Perthometer M1, Mahr, No.: 01-33-003	

<p>Messstreifen: (Test strip)</p> <p>(1) (RA.04)</p> <p>Perthometer M1 Objekt Name # Lt 5.600 mm Ls Norm GS 2.5 µm Lc 0.800 mm Ra 0.355 µm Rz 3.06 µm Rmax 3.64 µm</p> <p>(2) (RA.04)</p> <p>Perthometer M1 Objekt Name # Lt 5.600 mm Ls Norm GS 2.5 µm Lc 0.800 mm Ra 0.353 µm Rz 2.79 µm Rmax 3.47 µm</p>	<p>Bemerkungen: (remarks)</p>	<p>Messstreifen: (Test strip)</p> <p>(1) (RA.08)</p> <p>Perthometer M1 Objekt Name # Lt 5.600 mm Ls Norm GS 2.5 µm Lc 0.800 mm Ra 0.494 µm Rz 3.89 µm Rmax 4.64 µm</p> <p>(2) (RA.08)</p> <p>Perthometer M1 Objekt Name # Lt 5.600 mm Ls Norm GS 2.5 µm Lc 0.800 mm Ra 0.495 µm Rz 3.94 µm Rmax 4.62 µm</p>
--	--	--




Skizze Spezial Artikel (geprüfte Stelle bezeichnen)
(Outline Special Item (describe also tested Position))

Geprüft / Name / tested / name: Fischer	Datum / Date: 31. 03. 2014	Visum / Sign.:
---	--------------------------------------	--------------------

Besteller/Empfänger

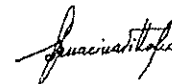
SCHMOLZ + BICKENBACH
STAHLCENTER AG
POSTFACH 238
9501 WIL CH

Seite 20

Art der Pruefbescheinigung	Abnahmepruefzeugnis 3.1 Nach EN 10204:2004									
	Bescheinigungsnummer	A104008153								
	Lieferscheinnummer	4009217	21/10/10							
	Aussteller der Bescheinigung	Labor Trafileria Corti								
	Werksauftragsnummer	4000015221	07/10/10							
	KundenBestellnummer	L 21028408	06/10/10							
	Unsere Artikelnummer	4404R032-801								
	Ihre Artikelnummer									
Erzeugnisform	1.4404+SL mm. 32,000 h8 Rund Staebe 6,0 m.									
Gewicht	0,468 ton.									
Identifizierung des Erzeugnisses	Los-Nummer	0910000327								
	Schmelzen-Nummer	39483								
Stahlbezeichnung	En 10088-3:2005									
Lieferzustand	+AT (abgeschreckt)									
Oberflaechenuekteklasse	Nicht vorgeschrieben									
Pruefung	Nicht vorgeschrieben									
Chemische Zusammensetzung	C	SI	Mn	P	S	Cr	NI	Mo	N	Ca
	%	%	%	%	%	%	%	%	%	%
	0,0270	0,300	1,700	0,0350	0,0280	16,900	10,370	2,08000	0,0470	0,0028
Mechanische Eigenschaften	Rm	Rp 0,2	A5	Hardness						
	N/mm2	N/mm2	%	HB						
	591	260	56,80	146						
Zusaetzhche Anforderungen	Prueftemperatur 20 C°									
	 SB72445									

Wir bestaetigen hiermit dass die obengenannten Erzeugnisse den Bestellaufschriften entsprechen

Laborbeauftragter



21/10/2010

P-Nr:	163996	K-Tron
Pos Nr:	1	Zert/Tot:
Art Nr:	9522-35745	
		Seite:

Certificat 32

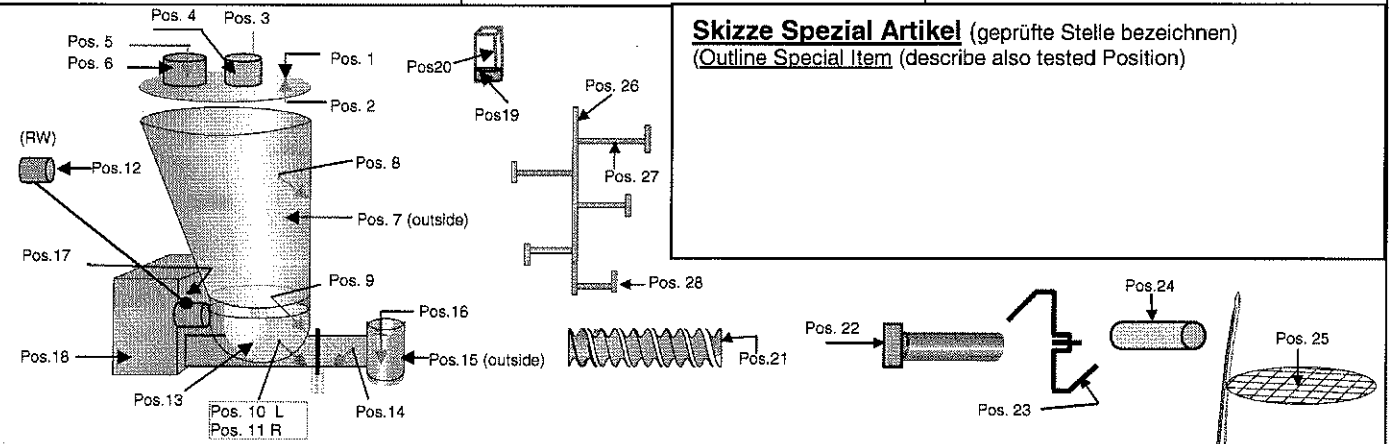


RAUHEITSTEST – PROTOKOLL

(roughness test protocol)

CO - Nr./ Kundenauftrag Nr.: (CO -No. / Order No.)	CO -	<input checked="" type="checkbox"/> mit Material Zertifikat (with material certificate)
MO - Nr. / Dosierer Nr.: (MO - No. / Feeder No:)	MO -	<input type="checkbox"/> mit Prüfprotokoll (Masse) (with test protocol (dimensions))
Artikel Nummer: (item number)	9522-35750	<input type="checkbox"/> mit WPS (with WPS)
Artikelbeschreibung: (item description)	Schneckenfräse T35	Bemerkung: (remarks)
Prüfmittel: (test equipment)	Oberflächenmessgerät, Mitutoyo, No.: 01-33-001 oder / or Oberflächenmessgerät, Perthometer M1, Mahr, No.: 01-33-003	

Messstreifen: (Test strip)	Bemerkungen: (remarks)	Messstreifen: (Test strip)
<p>Perthometer M1</p> <p>Objekt Name # Lt 5.600 mm Ls Norm GS 2.5 µm Lc 0.800 mm Ra 0.464 µm Rz 2.19 µm Rmax 5.42 µm</p>		<p>Perthometer M1</p> <p>Objekt Name # Lt 5.600 mm Ls Norm GS 2.5 µm Lc 0.800 mm Ra 0.386 µm Rz 2.36 µm Rmax 5.01 µm</p>



Skizze Spezial Artikel (geprüfte Stelle bezeichnen)
(Outline Special Item (describe also tested Position))

Geprüft / Name / tested / name: Fischer	Datum / Date: 01.07.2013	Visum / Sign.:
---	------------------------------------	---------------------------

3



Usine productrice Hersteller Manufacturer	Ugine Avenue Paul Girod 73403 Ugine Frankreich	ABNAHMEPRUEFZEUGNIS 3.1 CERTIFICAT DE RECEPTION 3.1 INSPECTION CERTIFICATE 3.1 ----- EN 10204 / 3.1	UGITECH Providing special steel solutions
---	--	---	--

Numéro / Nummer / Number 81048591 000010	Ordre de fab. / Auftrag / Prod. Order A1146GJ76000	N° coulée / Schmelzen Nr / Heat N° 142305	N° lot MM / Chargen / Batch 1146GJ7600
---	---	--	---

Certification - Werkzeugnis - Certificate AD 2000-MERKBLATT W0/TRD100 Pressure Equipment Directive 97/23/EC ISO 9001 ISO/TS 16949 ISO 14001	ISO 9100 ISO 9120	Marque d'usine Herstellerzeichen Supplier's Mark	UGITECH
		Poinçon de l'expert Prüfstemp Inspector's stamp	IQ

Produit Erzeugnisform Product	UGI 4057 STAB GESCHLIFFEN POLIERT VERGÜTET QT800 H9RUND 40,000MM LONG. 3,000M +100,00 OMM -0,000MM UGI 4057 BARRE RECTIFIÉE POLIE TRAITÉE(Q) QT800 H9ROND(E) 40,000MM LONG. 3,000M +100,000MM -0,00 UGI 4057 STAB GESCHLIFFEN POLIERT VERGÜTET QT800 H9RUND 40,000MM LONG. 3,000M +100,000MM -0,000 UGI 4057 BAR GROUND POLISHED QUENCHED AND TEMPERED QT800 H9ROUND 40,000MM LONG. 3,000M +100,000
-------------------------------------	--

Client et/ou destinataire - Besteller und/oder Empfänger - Purchaser and/or Consigner 12051 SCHMOLZ + BICKENBACH	N° de commande client - Kundenbestellnummer - Purchase order number 2549001740
---	---

Norme de référence / Besugsnorm / Standard for reference EN 10088-3 ED 2005 1.4057	<table border="1"> <tr> <td>P-Nr: 152051</td> <td>K-Tron</td> </tr> <tr> <td>Pos Nr: 1</td> <td>Zert/Tot: 1</td> </tr> <tr> <td>Art Nr: 9522-35750</td> <td></td> </tr> <tr> <td></td> <td>Seite:</td> </tr> </table>	P-Nr: 152051	K-Tron	Pos Nr: 1	Zert/Tot: 1	Art Nr: 9522-35750			Seite:	<p style="font-size: 48px; opacity: 0.5;">KOPIE</p>
P-Nr: 152051	K-Tron									
Pos Nr: 1	Zert/Tot: 1									
Art Nr: 9522-35750										
	Seite:									

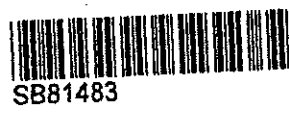
Spécification client / Kundenspezifikation / Customer's specification

Nombre Stueckzahl Pieces Nbr	18	Profil Profile Shape	RO	Dimension Ausmessung Dimension	40,000 MM 21-1	Longueur Laenge Length	3,000 21-2	Poids Gewicht Weigh	886 KG
------------------------------------	----	----------------------------	----	--------------------------------------	----------------	------------------------------	------------	---------------------------	--------

Mode d'élaboration Erchmel zungsart Melting process EAF + AOD + CC	N° prélèvement Probenummer Test number 2JTX	Demandé / Vorschrift / Required	42 % C	43 % SI	44 % MN	45 % NI	46 % CR	47 % S	48 % P	49
		Min	0,1200			1,5000	15,0000			
		Max	0,2200	1,0000	1,5000	2,5000	17,0000	0,0300	0,0400	
		coulée/ Schmelzen / Heat	0,1810	0,3830	0,8830	1,9050	15,7310	0,0090	0,0218	
		Produit / Erzeugnisform/ Product								

Demandé / Vorschrift / Required	50	51	52	53	54	55	70	71	72	73	74	75
Min												
Max												
coulée/ Schmelzen / Heat												
Produit / Erzeugnisform/ Product												

Demandé / Vorschrift / Required	76	77	78	79	80	81	82	83	84	85	86	87
Min												
Max												
coulée/ Schmelzen / Heat												
Produit / Erzeugnisform/ Product												



SB81483


Hiermit erklären wir, dass das zitierte Produkt mit den Anforderungendes Vertrags konform ist und den Anforderungen sowie den geltenden Normen und Vorschriften nach den durchgeführten Kontrollen und Prüfungen REACH-Verordnung. In jeder Hinsicht entspricht, vorbehaltlich gelistete Ausnahmen oder Bedenken von dieser Konformitätserklärung; Dieses Dokument ist durch eine digitale Unterschrift gültig. Produkt hergestellt gemäß

We declare that the mentioned product is in compliance with the requirements of the contract and that, after checks and tests, it meets in all respects the specified requirements and applicable standards and regulations, except reservations or exceptions as listed in this declaration of conformity; Document validated by electronic signature. Material manufactured in the REACH regulation respect.

Ugine le 30.11.2011
L'agent Réceptionnaire de l'usine
Der Werksachverständige
The work inspector

66-1

66-2 040000527630 Page 1/2 63

productrice Hersteller Manufacturer	Ugine Avenue Paul Girod 73403 Ugine Frankreich	ABNAHMEPRUEFZEUGNIS 3.1 CERTIFICAT DE RECEPTION 3.1 INSPECTION CERTIFICATE 3.1 ----- EN 10204 / 3.1	UGITECH Providing special steel solutions	
---	--	---	--	---

3
2

Número / Nummer / Number 81048591 000010	Ordre de fab. / Auftrag / Prod. Order A1146GJ76000	N° coulée / Schmelzen Nr / Heat N° 142305	N° lot MM / Chargen / Batch 1146GJ7600
---	---	--	---

24	90	T°C	Limite d'élasticité Streckgrenze Yield Strength		RM Zugfestigkeit Tensile	Allongement Bruchdehnung Elongation		Striction Einschnürung Red area	Dureté-Haerte-Hardness			
			0,2%	1%		A5D	A4D		HB	HV	HRB	HRC
13	Min Max Min Max	°C 20 20	Mpa 600	Mpa	Mpa 800 950	% 14	%	%				
N° prélèvement Probenummer Test number	2JTX 120 L 1	20	735		911	17						

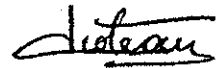
A l'état de Référence / treatment on test sample / Probestreifenbehandlung	14	25	26A	26B	27	28	89	29	30	88	100	37
---	----	----	-----	-----	----	----	----	----	----	----	-----	----

Taux de corroyage Forging ratio Verschmiedungsgrad	Résilience-Kerbschlagzähigkeit-Notch Toughness								
	Type Form Type	T°C	Sens Richtung Direction	Min	Valeurs individuelles Einzelwerte Individual values		Moyenne Mittelwerte Average	Expansion latérale Seitliche Breitung Lateral Expansion	
31,8	31	33	32	95			35	36	91
A l'état de livraison / Lieferzustand / As delivered	13	KISOV	20	L	J 25	J 27-32-50	J 36	J 36	
Vergütet QT800						--	--		
A l'état de Référence / treatment on test sample / Probestreifenbehandlung	14								

INNERE FEHLERFREIHEIT DURCH PROZESS-KONTROLLE GARANTIERT

SCHMOLZ + BICKENBACH

Quantité livrée / delivered quantity / gelieferte Quantität	92	93	94
---	----	----	----

Hiermit erklären wir, dass das zitierte Produkt mit den Anforderungen des Vertrags konform ist und den Anforderungen sowie den geltenden Normen und Vorschriften nach den durchgeführten Kontrollen und Prüfungen REACH-Verordnung in jeder Hinsicht entspricht, vorbehaltlich gelisteter Ausnahmen oder Bedenken von dieser Konformitätserklärung; Dieses Dokument ist durch eine digitale Unterschrift gültig. Produkt hergestellt gemäß	66-1	Ugine le 30.11.2011 L'agent Réceptionnaire de l'usine
We declare that the mentioned product is in compliance with the requirements of the contract and that, after checks and tests, it meets in all respects the specified requirements and applicable standards and regulations, except reservations or exceptions as listed in this declaration of conformity; Document validated by electronic signature. Material manufactured in the REACH regulation respect.	66-2	Der Werksachverständige The work inspector 

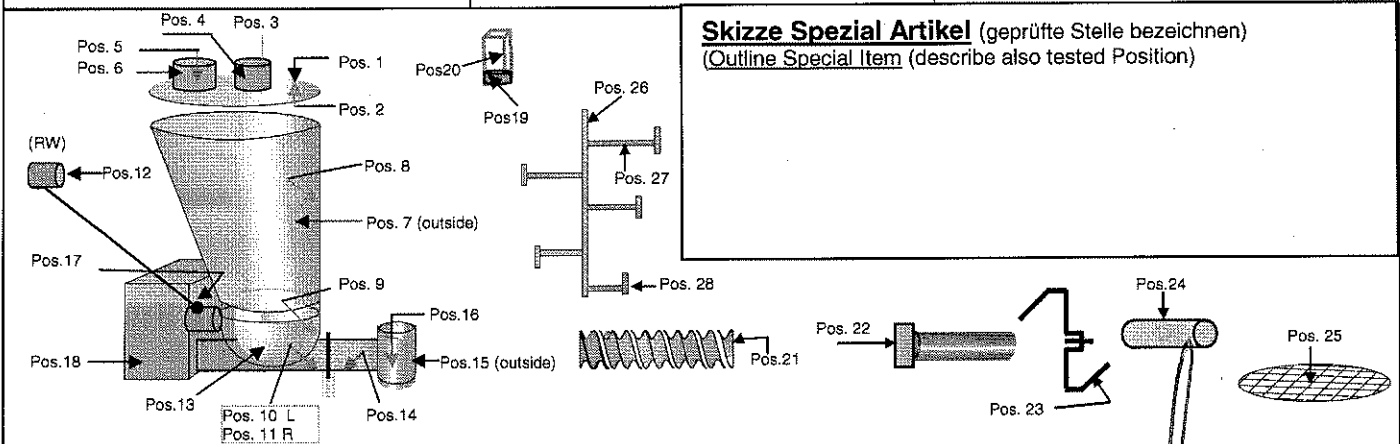


RAUHEITSTEST – PROTOKOLL

(roughness test protocol)

CO - Nr./ Kundenauftrag Nr.: (CO -No. / Order No.)	CO -	<input checked="" type="checkbox"/> mit Material Zertifikat (with material certificate)
MO - Nr. / Dosierer Nr.: (MO - No. / Feeder No:)	MO -	<input type="checkbox"/> mit Prüfprotokoll (Masse) (with test protocol (dimensions))
Artikel Nummer: (item number)	9522 - 35747	<input type="checkbox"/> mit WPS (with WPS)
Artikelbeschreibung: (item description)	Welle - SCREW-D36	Bemerkung: (remarks)
Prüfmittel: (test equipment)	Oberflächenmessgerät, Mitutoyo, No.: 01-33-001 oder / or Oberflächenmessgerät, Perthometer M1, Mahr, No.: 01-33-003	

Messstreifen: (Test strip)	Bemerkungen: (remarks)	Messstreifen: (Test strip)
<p>NR. 1</p> <p>Perthometer M1</p> <p>Objekt Name #</p> <p>Lt 5.600 mm Ls Norm GS 2.5 µm Lc 0.800 mm Ra 0.128 µm Rz 1.52 µm Rmax 3.63 µm</p> <p>NR. 2</p> <p>Perthometer M1</p> <p>Objekt Name #</p> <p>Lt 5.600 mm Ls Norm GS 2.5 µm Lc 0.800 mm Ra 0.121 µm Rz 1.00 µm Rmax 1.14 µm</p>	<p>Tragwelle NR 1 - NR, 4</p>	<p>NR. 3</p> <p>Perthometer M1</p> <p>Objekt Name #</p> <p>Lt 5.600 mm Ls Norm GS 2.5 µm Lc 0.800 mm Ra 0.109 µm Rz 0.86 µm Rmax 1.05 µm</p> <p>NR. 4</p> <p>Perthometer M1</p> <p>Objekt Name #</p> <p>Lt 5.600 mm Ls Norm GS 2.5 µm Lc 0.800 mm Ra 0.128 µm Rz 0.93 µm Rmax 1.11 µm</p>



Geprüft / Name / tested / name: Fischer	Datum / Date: 05.08.2013	Visum / Sign.:
---	------------------------------------	---------------------------

3
2



UGITECH
Providing special steel solutions

Usine productrice Hersteller Manufacturer	Ugine Avenue Paul Girod 73403 Ugine Frankreich	ABNAHMEPRUEFZEUGNIS 3.1 CERTIFICAT DE RECEPTION 3.1 INSPECTION CERTIFICATE 3.1 ----- EN 10204 / 3.1	
---	---	---	--

Numéro / Nummer / Number 81048591 000010	Ordre de fab. / Auftrag / Prod. Order A1146GJ76000	N° coulée / Schmelzen Nr / Heat N° 142305	N° lot MM / Chargen / Batch 1146GJ7600
---	---	--	---

24	80	T°C	Limite d'élasticité Streckgrenze Yield Strength		RM Zugfestigkeit Tensile	Allongement Bruchdehnung Elongation		Striction Einschnürung Red area	Dureté-Haerte-Hardness				
			0.2%	1%		A5D	A4D		HB	HV	HRB	HRC	
	13	°C	Mpa	Mpa	Mpa	%	%	%					
		20	600		800	14							
		20			950								
N° prélèvement Probenummer Test number	2JTX 1	120 L	735		911	17							
398													

A l'état de Référence / treatment on test sample / Probestreifenbehandlung													
---	--	--	--	--	--	--	--	--	--	--	--	--	--

14	75	26A	26B	27	28	89	29	30	88	100	37	Résilience-Kerbschlagzähigkeit-Notch Toughness					
												Type Form Type	T°C	Sens Richtung Direction	Min	Valeurs individuelles Einzelwerte Individual values	Moyenne Mittelwerte Average
Taux de corroyage Forging ratio Verschmiedungsgrad		31,8															
	101																
A l'état de livraison / Lieferzustand / As delivered Vergütet QT800	13	KISOV	20	L	J 25	J 27-32-50	J 36										
A l'état de Référence / treatment on test sample / Probestreifenbehandlung	14																

INNERE FEHLERFREIHEIT DURCH PROZESS-KONTROLLE GARANTIERT

SCHMOLZ + BICKENBACH

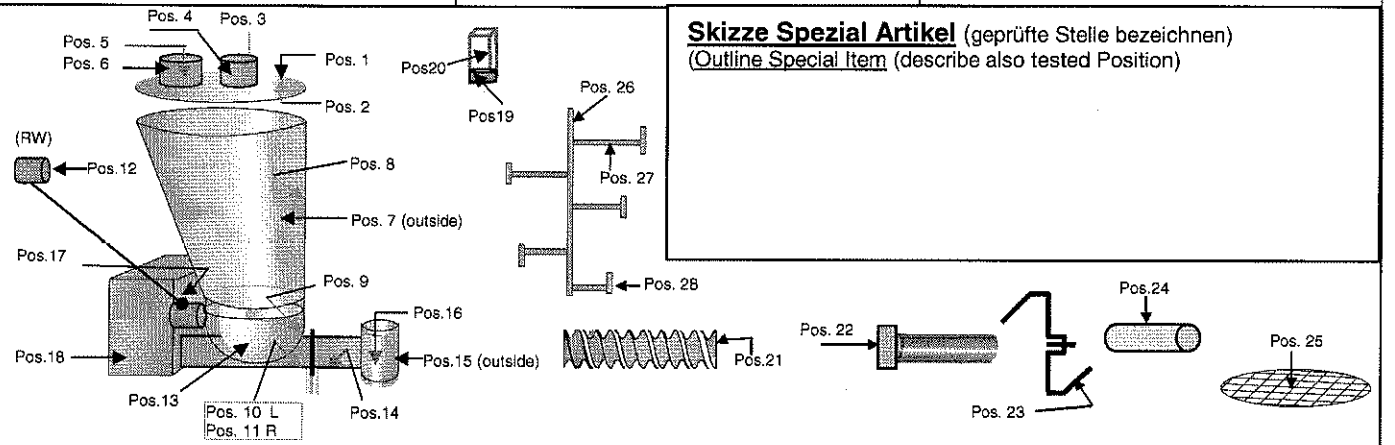
Quantité livrée / delivered quantity / gelieferte Quantität		
---	--	--

<p>Hiermit erklären wir, dass das zitierte Produkt mit den Anforderungen des Vertrags konform ist und den Anforderungen sowie den geltenden Normen und Vorschriften nach den durchgeführten Kontrollen und Prüfungen REACH-Verordnung, in jeder Hinsicht entspricht, vorbehaltlich gelisteter Ausnahmen oder Bedenken von dieser Konformitätsklärung; Dieses Dokument ist durch eine digitale Unterschrift gültig. Produkt hergestellt gemäß</p>	<p>Ugine le 30.11.2011 L'agent Réceptionnaire de l'usine</p>
<p>We declare that the mentioned product is in compliance with the requirements of the contract and that, after checks and tests, it meets all respects the specified requirements and applicable standards and regulations, except reservations or exceptions as listed in this declaration of conformity; Document validated by electronic signature. Material manufactured in the REACH regulation respect.</p>	<p>Der Werksechverständige The work Inspector</p> <p><i>J. Jean</i></p>

CO - Nr./ Kundenauftrag Nr.: (CO -No. / Order No.)	CO -	<input checked="" type="checkbox"/> mit Material Zertifikat (with material certificate)
MO - Nr. / Dosierer Nr.: (MO - No. / Feeder No.)	MO -	<input type="checkbox"/> mit Prüfprotokoll (Masse) (with test protocol (dimensions))
Artikel Nummer: (item number)	0000000000	<input type="checkbox"/> mit WPS (with WPS)
Artikelbeschreibung: (item description)	DICHTUNGSBUCHSE 73.5	Bemerkung: (remarks)

Prüfmittel: (test equipment) Oberflächenmessgerät, Mitutoyo, No.: 01-33-001 oder / or Oberflächenmessgerät, Perthometer M1, Mahr, No.: 01-33-003

Messstreifen: (Test strip)	Bemerkungen: (remarks)	Messstreifen: (Test strip)
<p>Perthometer M1</p> <p>Objekt Name #</p> <p>Lt 5.600 mm</p> <p>Ls Norm GS 2.5 µm</p> <p>Lc 0.800 mm</p> <p>Ra 0.088 µm</p> <p>Rz 0.52 µm</p> <p>Rmax 0.68 µm</p> <p>Perthometer M1</p> <p>Objekt Name #</p> <p>Lt 5.600 mm</p> <p>Ls Norm GS 2.5 µm</p> <p>Lc 0.800 mm</p> <p>Ra 0.076 µm</p> <p>Rz 0.47 µm</p> <p>Rmax 0.62 µm</p>		<p>Perthometer M1</p> <p>Objekt Name #</p> <p>Lt 5.600 mm</p> <p>Ls Norm GS 2.5 µm</p> <p>Lc 0.800 mm</p> <p>Ra 0.061 µm</p> <p>Rz 0.47 µm</p> <p>Rmax 0.60 µm</p> <p>Perthometer M1</p> <p>Objekt Name #</p> <p>Lt 5.600 mm</p> <p>Ls Norm GS 2.5 µm</p> <p>Lc 0.800 mm</p> <p>Ra 0.092 µm</p> <p>Rz 0.64 µm</p> <p>Rmax 0.89 µm</p>



Skizze Spezial Artikel (geprüfte Stelle bezeichnen)
(Outline Special Item (describe also tested Position))

Geprüft / Name / tested / name: <i>Pöschel / Bachmann</i>	Datum / Date: <i>17.5.13</i>	Visum / Sign.: <i>P. Bachmann</i>
---	--	---

Made in Germany

ABNAHMEPRÜFZEUGNIS
INSPECTION CERTIFICATE ACCORDING TO EN 10204
CERTIFICAT DE RECEPTION

Hersteller
Manufactureur
Producteur
D-57012_SIEGEN
1310036
Uns. Auftr.-Nr.
Order-No.
Nbre Com. No.
Besteller
Customer
Client
Schmolz + Bickenbach Stahlcenter AG
Bestell-Nr.
Order-No.
Commande No.
L21032193

Schmolz + Bickenbach Stahlcenter AG
Postfach 238
CH-9501-Wil

DEUTSCHE EDELSTAHLWERKE
Providing special steel solutions



ISO / IEC
17025

ISO 9001
ISO / TS 16949
EN 9100
ISO 14001
DGR 97/23/EG
PED 97/23/IEU

1.4004 / X 2 CrNiMo 17-12-2
Acidur 4404
NIROCUJ 4404
AISI 316 L
316 S 11

Strangguss
Continuous casting
Coulée Continue
Elektrostahl
Electric-arc-furnace steel
Acier électrique

Blankstahl in Stäben
Abgeschreckt
warmgewalzt, geschleift, geschliffen

Anforderungen
Requirements
Prescriptions
de contrôle
EN 10088
ASTM A 276
ASTM A 182/A 182M
BS 970 PART 3
AD 2000-MERKEL W 2 02/08
ASTM A 479/A479M
MR0175/ISO 15156-3
AD W10
DIN EN 10272

Gewicht / Masse
Weight / Masse
944

Stempel Abnahmebeauftragter
Inspector's stamp
WA

% C	0,017	% SI	0,61	% MN	1,34	% P	0,035	% S	0,022	% CR	2,030	% MO	11,17	% NI	0,44	% CU	0,0330	% N	0,009	% NB	0,009
-----	-------	------	------	------	------	-----	-------	-----	-------	------	-------	------	-------	------	------	------	--------	-----	-------	------	-------

Abmessung / Dimensions
Dimensions / Dimensions
30,00 + 0,000/-0,039 RD

Stückzahl / Nombre
Quantity / Nombre
RD

Temp
°C
20

Joule
246

Joule
232

Joule
249

Temp
°C
20

Joule
254

DIN EN 10045-1
KV
180HB

DIN EN 10045-1
KV

Härteprüfung
Hardness
Dureté



SB80958

Härte HRC =< 22
IK TEST NACH ASTM A 262 VERF. E : OHNE BEANSTANDUNG
IG CORROSION TEST ACC. TO ASTM A 262 PRACT. E : SATISFACTORY.
DER WERKSTOFF IST INTERKRIST. BESTAEND. NACH: DIN EN ISO 3651-2
MAT. IS RESIST. TO INTERCR. CORR. PURS. TO: DIN EN ISO 3651-2
L'ACIER EST RESIST. A LA CORR. INTERGR. S.: DIN EN ISO 3651-2
MASS UND OBERFLAECHEKONTROLLE: KEINE BEANSTANDUNG


Das Zeugnis wurde maschinell erstellt und ist gemäß EN 10204 ohne Unterschrift rechtsverbindlich.
This certificate was generated by data system, acc. to EN 10204, it need not to be signed for validity.
Ce certificat a été établi sur système informatique et est valable selon EN 10204 sans signature.

Tel: 0271/808-2540
Fax: 0271/808-2521
Email: axel.schmidt@dew-stahl.com

Datum: 08.11.2011
Schmidt
(Abnahmebeauftragter/
Inspector)

P-Nr: 14718	K-Ton
Pos Nr: 1	Zer/ton
Art Nr: 000000000	

P-Nr: 193938 K-Tron
 Pos Nr: 1 Zert/Tot:
 Art Nr: 0000000000
 Seite: 2

Made in Germany		 DEUTSCHE EDELSTAHLWERKE Providing special steel solutions	Prüf-Nr. 93764 / Seite Page / Page 2 / 2
ABNAHMEPRÜFZEUGNIS INSPECTION CERTIFICATE ACCORDING TO EN 10204 CERTIFICAT DE RECEPTION 3.1			Bestell Nr. Order-No. L21032193
Besteller Customer Schmolz + Bickenbach Stahlcenter AG Client		Uns. Auftr.-Nr. Order-No. 1310036/001 Notre Com. No.	Problem-Nr. Test N. Etrouv.N. 944727
Hersteller Manufactureur DEUTSCHE EDELSTAHLWERKE GMBH Producteur D-57012 SIEGEN		DIMENSIONS AND SURFACE INSPECTION: SATISFACTORY DIMENSIONS ET SURFACE CONTRÔLE: SATISFAISANTS 100% US-Prüfung nach EN 10308, Tab 1, Typ 1A, vollständige Prüfung, Tab.3, OK.3: ohne Beanstandung. 100% Risgeprüft EN 10221, Kl.C: ohne Beanstandung 100% US-Test acc. to EN 10308,Tab.1, Type 1A, complete test volume,Tab.3, QC3: without Indication. 100% Surface crack test acc. to EN 10221, Cl.C: without indication PRÜFUNG AUF WERKSTOFFIDENTITÄT DURCHGEF.: OB TESTS TO VERIFY BATCH AND QUALITY:WITHOUT INDICATION CONTRÔLE D'IDENTITÉ EFFECTUE: PAS D'OBJECTION DAS MATERIAL IST FREI VON RADIOAKTIVITÄT. THE PRODUCT IS FREE FROM RADIOACTIVE. LE MATÉRIEL N'EST PAS RADIOACTIF.	
Das Zeugnis wurde maschinell erstellt und ist gemäß EN 10204 ohne Unterschrift rechtsverbindlich. This certificate was generated by data system, acc. to EN 10204, it need not to be signed for validity. Ce certificat a été établi sur système informatique et est valable selon EN 10204 sans signature.		Tel: 0271/808-2540 Fax: 0271/808-2521 Email: axel.schmidt@dew-stahl.com	Datum: 08.11.2011 Schmidt (Abnahmebeauftragter/ Inspector)



D. J. Finley 3/22/2013
REGIONAL MANAGER

LIM® 6050

Liquid Silicone Rubber

Product Description LIM6050-D2 liquid silicone rubber is a 2-component product formulated for use in liquid injection molding to high performance elastomeric parts. It is clear, but easily pigmentable with Momentive Performance Materials masterbatch colors.

The combination of excellent tear strength and very high tensile strength makes this product suitable for a wide variety of applications. Mechanical parts such as connector inserts, seals, flexible mounts, and valve parts can be made readily from LIM6050 liquid silicone rubber.

Other possible applications include sports goggles and masks, health care equipment, camera parts, and coating metal rolls.

LIM6050-D2 offers convenient 1:1 mix ratio, high tear strength, and easy release from molds. Cure time is rapid, generally 10 to 40 seconds (@ 149-205°C) depending upon part size, configuration, and molding temperature.

Key Performance Properties

- High clarity for excellent visibility
- Excellent tear strength
- Convenient 1:1 mix ratio for use with automatic equipment
- Rapid cure time: 10 to 40 seconds depending upon part size, configuration, and molding temperature
- Wide range of molding temperatures: 150C (302F) to 205C (400F)
- Excellent release from metal molds

Typical Product Data Uncured Properties

Property	LIM6050A Base	LIM6050B Curing Agent
Color	Clear, Colorless	Clear, Colorless
Specific Gravity, gm/cc	1.12	1.12
Application Rate, gm/min	80	80
Mixed A & B		LIM6050 A& B
Cure rate (Monsanto Rheometer, MDR2000 @ 177C (350F))		

Torque, max. in-lbs.	20	
T-02 seconds	6	
Peak rate, in./lb/min.	164	
T-90, seconds	13	
Cured Properties	As Molded 30 sec/177C (350F)	Postbaked 1 hr/204C (400F)
Hardness, Shore A durometer	50	53
Tensile Strength, psi (MPa)	1250 (8.6)	1300 (9.0)
Elongation, %	575	530
Tensile Modulus, 100% psi (MPa)	310 (2.1)	320 (2.2)
Tear Strength, ppi (KN/M)	250 (43.9)	250 (43.9)
Compression Set, % (22 hrs. @ 177C/(350F))	35	25
Bashore, %	60	58
After Heat Aging 168 hr @ 177C/350F		
Hardness, Shore A change	+4 pts.	+2 pts.
Tensile change	+12%	-4%
Elongation, change	4%	-7%
Tear Strength, change	-7%	-7%
Bashore change	0 pts.	+ 2 pts.
Electrical		
Dielectric Strength, V/mil	510	-
Dielectric Constant @ 1000 Hz	3.12	
Dissipation Factor @ 1000 Hz	0.0001	
Volume Resistivity Ohm-cm	6.1E + 14	

Specifications Typical product data values should not be used as specifications. Assistance and specifications are available by contacting Momentive Performance Materials at 800/255-8886.

LIM6050 may be safely used as a food contact surface of articles intended for repeated use in producing, or holding food, in accordance with the following prescribed conditions:

- 1) Articles are manufactured in accordance with Good Manufacturing Practice
- 2) It is thoroughly cleansed prior to its first use

See 21CFR177 2600 for details of the extraction limitations and other requirements.

LIM6050 is designed, manufactured and sold for industrial use only. Prior to use for any application other than an industrial use, the user has sole responsibility for determining the suitability of these products for any such application. This silicone rubber product is not designed for permanent implantation into the human body.

Momentive Performance Materials has on file data from representative

samples of LIM6050 which indicate that, when properly compounded and cured, these compounds meet extractive limitations prescribed by FDA for use in rubber articles in repeated contact with dry, aqueous, acid and alcoholic foods. Tests according BGA and EC recommendations indicate compliance with extractive limitations for aqueous, acid and alcoholic foods and beverages. Extractives have been evaluated at reflux temperatures but not under autoclave conditions. The user should be cautioned, however, to evaluate the product under his/her specific conditions to use.

LIM6050 has met the requirements of USP Class VI testing. Compliance is based on a single batch which is considered representative of production. It is the responsibility of the end-user to verify compliance of the final fabricated product. Questions on the above testing should be directed to the Product Regulatory Department of Momentive Performance Materials.

Handling and Safety	Material Safety Data Sheets are available upon request from Momentive Performance Materials. Similar information for solvents and other chemicals used with Momentive Performance Materials products should be obtained from your suppliers. When solvents are used, proper safety precautions must be observed.
Storage and Warranty Period	The warranty period is 6 months from date of shipment from Momentive Performance Materials if stored in the original unopened container at 26C (80F).
Availability	Products may be ordered from Momentive Performance Materials, Waterford, N.Y. 12188, or the Momentive Performance Materials sales office nearest you.
Government Requirement	Prior to considering use of a Momentive Performance Materials' product in fulfilling any government requirement, please contact the Government and Trade Compliance office at 413-448-4624.

@LIM is a registered trademark of Momentive Performance Materials.

CDS4873

LEGAL DISCLAIMER

THE MATERIALS, PRODUCTS AND SERVICES OF MOMENTIVE PERFORMANCE MATERIALS, THEIR SUBSIDIARIES OR AFFILIATES (THE "SUPPLIER"), ARE SOLD SUBJECT TO THE SUPPLIER'S STANDARD CONDITIONS OF SALE, WHICH ARE INCLUDED IN APPLICABLE SALES AGREEMENTS, PRINTED ON THE BACK OF ACKNOWLEDGMENTS AND INVOICES, OR AVAILABLE UPON REQUEST. ALTHOUGH THE INFORMATION, RECOMMENDATIONS OR ADVICE CONTAINED HEREIN IS GIVEN IN GOOD FAITH, SUPPLIER MAKES NO WARRANTY OR GUARANTEE, EXPRESS OR IMPLIED, (I) THAT THE RESULTS DESCRIBED HEREIN WILL BE OBTAINED UNDER END-USE CONDITIONS, OR (II) AS TO THE EFFECTIVENESS OR SAFETY OF ANY DESIGN INCORPORATING SUPPLIER'S MATERIALS, PRODUCTS, SERVICES, RECOMMENDATIONS OR ADVICE. NOTHING IN THIS OR ANY OTHER DOCUMENT SHALL ALTER, VARY, SUPERSEDE OR OPERATE AS A WAIVER OF ANY OF THE SUPPLIER'S STANDARD CONDITIONS OF SALE.

Each user bears the full responsibility for making its own determination as to the suitability of Supplier's materials, products, services, recommendations or advice for its own particular purpose. Each user must identify and perform tests and analyses sufficient to assure it that its finished parts will be safe and suitable for use under end-use conditions. Because actual use of products by the user is beyond the control of Supplier, such use is within the exclusive responsibility of the user, and Supplier cannot be held responsible for any loss incurred through incorrect or faulty use of the products. Further, no statement contained herein concerning a possible or suggested use of any material, product, service or design is intended or should be construed to grant any license under any patent or other intellectual property right of Supplier or any of its subsidiaries or affiliated companies, or as a recommendation for the use of such material, product, service or design in the infringement of any patent or other intellectual property right.

K-Tron (Schweiz) AG
Herr Michel Ucar
Maschinenfabrik
Lenzhardweg 43/45
5702 Niederlenz

Datum: 09.11.2012
Unser Zeichen: Beatrice Adler
Ihr Zeichen: Herr Michel Ucar
Betrifft: Bestellung Nr. P142344

Werkzeugnis EN 10204-2.1

T35Silikon weiss Brillendichtungen

20 20003.D005 = 64 x 34 x 8.5 mm 200.00 Stk
Zn. Nr. 4-9585-30137 B
Ihre Artikel Nr. 9585-30137

Der verwendete Werkstoff ist konform mit FDA Titel 21, § 177.2600.

Wir bestätigen, dass die von Ihnen bestellten Dichtungen aus oben beschriebenem Material hergestellt wurden.

Mit freundlichen Grüßen

Franz Gysi AG

Dieses Dokument ist auch ohne Unterschrift gültig!

DECLARATION OF CONFORMITY

In accordance with
EN ISO /IEC 17050

Declaration subject:

Material description:

VMQ (FH4BES)

The material described above meets the requirements stipulated in the following guidelines / standards:

In compliance with EC 1935/2004

In compliance with EC 2023/2006

In compliance with FDA CFR 21 § 177.2600

In compliance with BfR-Empfehlung XV

P- Nr. P 156010	Gröflin AG
Pos. Nr.	Zert/ Tot: 1
Art. Nr. 3008.30767	
Art. Nr.	
Art. Nr.	
Art. Nr.	

Gröflin AG



Frenkendorf, 23. April 2014
(Place and date)

Heinz Gröflin

FDA / EG1935/2004 DL 6020

Confirmation

The following NT K+D AG gasketing materials based on modified PTFE, color white, is in full compliance with the FDA 177.1550 Perfluorocarbon regulation and the EG1935/2004 regulation.

DL 6020

NT K+D AG

Hombrechtikon, October 2013

9324-40875

NT
K+D AG

Kunststoff & Dichtungstechnik

NT K+D AG

Fabrikweg 10 / P.O. Box 267
CH-8634 Hombrechtikon

Telefon +41 (0)55 254 54 54
Fax +41 (0)55 254 54 55
E-Mail info@ntkd.ch
Internet www.ntkd.com

Certificat 47

9324-40760

S708F

Compound	Silicone 70 Sh Red
Elastomer	Silicone rubber
Case Hardening Temperature	-55°C / +200°C
Color	Red
License / Certificate	FDA CFR 21 177.2600 Animal Derivated Ingredient Free EC 1935/2004



Description
S708F is a silicone rubber developed for food processing industry. S708F has been formulated using only those ingredients determined by the United States Federal Food and Drug Administration (FDA) to be in accordance with Code of Federal Regulations Title 21 (CFR21), Section 177.2600. It has also been developed and approved according to EC1935/2004.

PROPERTIES	NORM	UNIT	VALUE
Hardness	ISO7619	IRHD	71
Tensile Strength	ISO37	Mpa	13
Ultimate Elongation	ISO37	%	379
Compression Set 22h 175°C	ISO815	%	30
Heat Ageing 24h 230°C	ISO188		
Hardness Change	ISO7619	Point	+7
Tensile Strength Change	ISO37	Mpa	- 4
Ultimate Elongation Change	ISO37	%	-23
ASTM oil No.1 70h 175°C	ISO 1817		
Tensile strength change	ISO37	%	- 19
Ultimate Elongation Change	ISO37	%	- 19
Volume Change		%	+ 7

The above information corresponds to our current knowledge and is offered solely to provide possible suggestions for your own experimentations. It is not intended to substitute any testing you may need to conduct to determine suitability of our products for your end use. NT K+D AG makes no warranties and assumes no liability in connection with any use of the above information.

* RESPONSIBLE INNOVATIVE EXCELLENT QUALITY DEPENDABLE SERVICE

Konformitätserklärung

Hiermit erklären wir, dass die unten aufgeführten Produkte aufgrund ihrer Konzeption und Bauart sowie in der von uns in Verkehr gebrachten Ausführung den einschlägigen grundlegenden Sicherheits- und Gesundheitsanforderungen der EG-Richtlinien entsprechen, gemäss den Werksvorschriften hergestellt und nach den für die jeweiligen Produkte relevanten Normen und Richtlinien geprüft werden.

Von der Fertigungsplanung bis zur Auslieferung werden unsere Produkte unter Einhaltung von Sicherheitsstandards ständig Qualitätskontrollen unterzogen und müssen deshalb zur Erhaltung ihrer Charakteristiken mit gegebener Vorsicht behandelt werden.

Die aufgelisteten Produkte erfüllen die allgemeinen Anforderungen laut EG-GMP-Leitlinien für Ausrüstungen und sind mit ihren codierten Bestandteilen FDA-konform gemäss 21 CFR.

Produkte:

Produktbezeichnung	Produktgattung	Artikelnummer
Øi105-239-T6288-PTFE-Membr.	Filtersack	218939

Verwendete Bestandteile mit CFR-Code:

Bezeichnung	Anwendung	21 CFR-Code
206560 Medium Polyester mit ePTFE-Membrane	Filtermedium	175.300 / 177.1550
209393 Dichtmasse Silikon	Klebstoff	175.300 / 177.2600

Weitere Bestandteile ohne CFR-Code:

Bezeichnung	Anwendung	Bemerkung
105415 Faden Polyester & Baumwolle	Nähgarn	
106622 Faden Polyester	Nähgarn	

Bemerkungen:

Berücksichtigte Normen, Richtlinien und Dokumenta

Bezeichnung	Norm, Richtlinie, Dokumentation	Bemerkungen
Qualitätsmanagementssystem	ISO 9001-2008	

Die Konformität unserer Produkte gegenüber weiteren spezifischen Anforderungen kann nur mittels vom Anwender definierten Anforderungskriterien verifiziert und bestätigt werden.

Bei einer nicht mit uns abgestimmten Änderung dieser Produkte, verliert diese Erklärung ihre Gültigkeit.

Niederlenz, 12.03.2013

Stempel / Visum

UNIFIL AG
 Filtertechnik
 Industriestrasse 1, CH-5702 Niederlenz
 Telefon 062 885 01 00, Fax 062 885 01 01

KE - FDA - Øi105-239-T6288-PTFE-Membr. - 218939



TRE Engineering GmbH
Aussergrütstrasse 2
CH-6319 Allenwinden

Tel. 041 727 27 70
Fax 041 727 27 71
E-Mail office@tregmbh.ch
www.tregmbh.ch

KONFORMITÄTSBESCHEINIGUNG

Für die durch unser Werk verwendeten Werkstoffe, geben wir nachstehende Erklärung ab :

Edelstähle

Wir verwenden nur genormte Edelstähle, welche den Anforderungen der Lebensmittelindustrie entsprechen.

Dichtungsmaterialien für Spannring-Verbindungen und Rohrverschraubung mit Nutmuttern

Die in der Lebensmittelindustrie gebräuchlichsten Werkstoffe für Dichtungen sind :

- NBR
- EPDM
- VMQ
- FKM
- PTFE

Wir bestätigen, dass die nachgenannten Artikel in der Rohstoffauswahl den FDA-Richtlinien, FDA § 177.2600, entsprechen :

- Dichtungen NBR,
- Dichtungen EPDM,
- Dichtungen VMQ,
- Dichtungen FKM,
- Dichtungen PTFE,
- Dichtungen ummantelt PTFE-FKM

alle sechs in Abmessungen von DN 6 bis DN 300 und 1/2" bis 12".

Diese Artikel entsprechen in der Rohstoffauswahl sowohl den FDA-Richtlinien 21 CFR 177.1550, als auch den BGA-Empfehlungen, 160igste Mitteilung, Empfehlung LI vom 1. März 1983.


TRE ENGINEERING GmbH

Januar 2009

K-Tron Nr.: 9324-40900



TRE Engineering GmbH
Aussergrütstrasse 2
CH-6319 Allenwinden

Tel. 041 727 27 70
Fax 041 727 27 71
E-Mail office@tregmbh.ch
www.tregmbh.ch

CERTIFICATE OF CONFORMITY

For the materials listed below our producer is giving the following confirmation :

Stainless steels.

We are only using stainless steel grades which are corresponding with the requirements of the food industry and are strictly produced according to the existing standards.

Materials for joints in Clamping connections and screwed pipe connection with nut

Materials for joints which are commonly being used in the food industry are :

- NBR
- EPDM
- VMQ
- FKM
- PTFE

We are confirming that the articles listed below comply regarding the raw material selection exactly with FDA-regulations § 177.2600 :

- gaskets NBR,
- gaskets EPDM,
- gaskets VMQ,
- gaskets FKM,
- gaskets PTFE,
- gaskets enveloped PTFE-FKM

all six in sizes from DN 6 to DN 300 and 1/2" to 12".

The selected raw materials for these articles are complying with the FDA-regulations 21, CFR 177.1550, as well as with the BGA recommendations, 160ieth communication, recommendation LI of March 1st 1983.

January 2009


TRE ENGINEERING GmbH

K-Tron Nr.: 9324-40900

Werkstoff-Datenblatt

Clampdichtungen VMQ DIN-DN 10 bis 200, ISO-DN 8 bis 200, DN1" bis 8,6"

Werkstoffmischung, Compound	SE80670F
Kurzbezeichnung ISO 1629 bzw. ASTM 1418	VMQ (MVQ)
Chemische Werkstoffbezeichnung	Silikon-Kautschuk
Farbe	Transparent
Vernetzung	Peroxid
FDA-Konformität	21CFR §177.2600
Temperaturbereich	-40 °C bis +200 °C

Werkstoffeigenschaften:

1. Physikalische Eigenschaften

1.1 Härte, ASTM D2240	70° ±5° Shore A
1.2 Dichte, ASTM D1817	1,195 g/cm ³
1.3 Zugfestigkeit, ASTM D412	> 6 N/mm ²
1.4 Reißdehnung, ASTM D412	> 150 %
1.5 Druckverformungsrest, ASTM D395B (22 Std., 175 °C)	< 25 %

2. Verhalten in warmer Luft, ASTM D573 (70 Std., 225 °C)

2.1 Härteänderung	+ 10°
2.2 Zugfestigkeitsänderung	- 25 %
2.3 Reißdehnungsänderung	- 30 %

3. Verhalten in Öl, ASTM D471 Öl Nr.1, (70 Std., 150 °C)

3.1 Härteänderung	+ 15°
3.2 Zugfestigkeitsänderung	- 20 %
3.3 Reißdehnungsänderung	- 20 %
3.4 Volumenänderung	+ 10 %

Allgemeine Anwendungshinweise:

Alterungsbeständigkeit	1
Ozonbeständigkeit	1
Benzinbeständigkeit	5
Öl- und Fettbeständigkeit	1
Säurebeständigkeit	5
Alkalienbeständigkeit	5
Heißwasserbeständigkeit	5
Dampfbeständigkeit	4
Gasundurchlässigkeit	2
Abriebfestigkeit	5
Elektrischer Widerstand	1

Haftungsausschluß:

Alle Angaben in diesem Datenblatt basieren auf den uns zur Zeit vorliegenden Daten und Erfahrungen. Die Angaben sind unverbindlich und schließen jede Haftung für Schäden aus. Sie befreien den Anwender nicht von eigenen einsatzspezifischen Prüfungen.

K-Tron Nr.: 9324-40900

DECLARATION OF CONFORMITY

In accordance with
EN ISO /IEC 17050

Declaration subject:

Material description:

VMQ (FH4BES)

The material described above meets the requirements stipulated in the following guidelines / standards:

In compliance with EC 1935/2004

In compliance with EC 2023/2006

In compliance with FDA CFR 21 § 177.2600

In compliance with BfR-Empfehlung XV

P- Nr.P148362	Gröflin AG
Pos. Nr.	Zert/ Tot: 1
Art. Nr.3008.30787	
Art. Nr.	
Art. Nr.	
Art. Nr.	

Gröflin AG



Frenkendorf, 23. April 2014
(Place and date)

Heinz Gröflin



Fabrikweg 10 Tel. +41 (0)55 254 54 54
CH-8634 Hombrechtikon Fax +41 (0)55 254 54 55

Werksbescheinigung nach EN 10204-2.1**7118127****Attestation de conformité selon EN 10204-2.1**

564002

26.03.2012 DW

Certificate of compliance EN 10204-2.1

u. Auftrags Nr., Datum 2107531
o. Order No., Date: 16.03.12
N. no. de commande, date:

K-Tron (Schweiz) GmbH
Lenzhardweg 43/45
5702 Niederlenz AG

I. Auftrags Nr. P132500 vom 15.03.2012
Y. order No.: Herr Roman Scholz
V. no. de command

DLS53036.02210 Anzahl, Quantity, Quantité **Stk.** **50**

NT-Dichtlippen DL6020-FDA weiss ø 36 x 22 x 1.0 mm FDA, CFR 21 § 177.1550

NT-Lip seals DL6020-FDA white ø 36 x 22 x 1.0 mm FDA, CFR 21 § 177.1550

K-Tron Nr.: 0000008503

NT-Joint à lèvres DL6020-FDA blanc ø 36 x 22 x 1.0 mm FDA, CFR 21 § 177.1550

02830.0178S70R Anzahl, Quantity, Quantité **Stk.** **20**

O-Ring Silikon 70 Sh A rot ø 28,30 x 1,78 mm

O-Ring silicone 70 Sh A rouge ø 28,30 x 1,78 mm

01712.0262S70R Anzahl, Quantity, Quantité **Stk.** **200**

O-Ring Silikon 70Sh A rot, FDA ø 17,12 x 2,62 mm FDA, CFR 21 § 177.2600

O-Ring silicone 70 Sh A red, FDA ø 17,12 x 2,62 mm FDA, CFR 21 § 177.2600

K-Tron Nr.: 9324-40831

O-Ring silicone 70 Sh A rouge, FDA ø 17,12 x 2,62 mm FDA, CFR 21 § 177.2600

DLS53036.02010 Anzahl, Quantity, Quantité **Stk.** **50**

NT-Dichtlippen DL6020-FDA weiss ø 36 x 20 x 1.0 mm FDA, CFR 21 § 177.1550

NT-Lip seals DL6020-FDA white ø 36 x 20 x 1.0 mm FDA, CFR 21 § 177.1550

K-Tron Nr.: 9324-40914

NT-Joint à lèvres DL6020-FDA blanc ø 36 x 20 x 1.0 mm FDA, CFR 21 § 177.1550



NT [REDACTED]

Fabrikweg 10 Tel. +41 (0)55 254 54 54
CH-8634 Hombrechtikon Fax +41 (0)55 254 54 55

K+D AG Kunststoff & Dichtungstechnik

7118127

Seite, page, page 2

Wir bestätigen, dass die Lieferung den Vereinbarungen bei der Bestellannahme entspricht.

Nous confirmons que la marchandise livrée est conforme au texte de votre commande.

We confirm that the delivered products are in strict accordance with the purchase order specification.

NT K+D AG

Daniela Weber

Qualitätsverantwortlicher

Responsable de Qualité

Quality responsible

**NT****K+D AG**

Kunststoff & Dichtungstechnik

Fabrikweg 10 Tel. +41 (0)55 254 54 54
CH-8634 Hombrechtikon Fax +41 (0)55 254 54 55**Werksbescheinigung nach EN 10204-2.1****Attestation de conformité selon EN 10204-2.1****Certificate of compliance EN 10204-2.1****7127223**

564002

02.05.2013 PW

u. Auftrags Nr., Datum 2115872
o. Order No., Date: 23.04.13
N. no. de commande, date:K-Tron (Schweiz) GmbH
Lenzhardweg 43/45
5702 Niederlenz AGI. Auftrags Nr. P149963 v.22.04.2013
Y. order No.: Herr Michel Ucar
V. no. de command**DLS53078.06210** Anzahl, Quantity, Quantité **Stk.** **5**

NT-Dichtlippen DL6020-FDA weiss ø 78 x 62 x 1.0 mm

NT-Lip seals, DL6020-FDA white ø 78 x 62 x 1.0 mm

NT-Joint à lèvres DL6020-FDA blanc ø 78 x 62 x 1.0 mm

03460.0262S70R Anzahl, Quantity, Quantité **Stk.** **50**

O-Ring Silikon 70 Sh A rot FDA ø 34,60 x 2,62 mm FDA, CFR 21 § 177.2600

O-Ring silicone 70 Sh A red ø 34,60 x 2,62 mm FDA, CFR 21 § 177.2600

O-Ring silicone 70 Sh A rouge ø 34,60 x 2,62 mm FDA, CFR 21 § 177.2600

06000.0300S70R Anzahl, Quantity, Quantité **Stk.** **20**

O-Ring Silikon 70 Sh A rot FDA ø 60,00 x 3,00 mm FDA, CFR 21 § 177.2600

O-Ring silicone 70 Sh A red, FDA ø 60,00 x 3,00 mm FDA, CFR 21 § 177.2600

O-Ring silicone 70 Sh A rouge, FDA ø 60,00 x 3,00 mm FDA, CFR 21 § 177.2600

9324-40880**F00360S0026030** Anzahl, Quantity, Quantité **Stk.** **30**

Fl.Dicht.Silikon transp. 60 Sh ø 36 x 26 x 3 mm FDA, CFR 21 § 177.2600 0000008969

ø 36 x 26 x 3 mm FDA, CFR 21 § 177.2600

Joint silicone transp. 60 Sh ø 36 x 26 x 3 mm FDA, CFR 21 § 177.2600



NT

Fabrikweg 10 Tel. +41 (0)55 254 54 54
CH-8634 Hombrechtikon Fax +41 (0)55 254 54 55

K+D AG Kunststoff & Dichtungstechnik

7127223

Seite, page, page 2

Wir bestätigen, dass die Lieferung den Vereinbarungen bei der Bestellannahme entspricht.

Nous confirmons que la marchandise livrée est conforme au texte de votre commande.

We confirm that the delivered products are in strict accordance with the purchase order specification.

NT K+D AG

Peter Weber

Qualitätsverantwortlicher

Responsable de Qualité

Quality responsible

**NT****K+D AG**

Kunststoff & Dichtungstechnik

Fabrikweg 10 Tel. +41 (0)55 254 54 54
CH-8634 Hombrechtikon Fax +41 (0)55 254 54 55**Werksbescheinigung nach EN 10204-2.1****Attestation de conformité selon EN 10204-2.1****Certificate of compliance EN 10204-2.1****7127687**

564002

24.05.2013 PW

u. Auftrags Nr., Datum 2116113
o. Order No., Date: 03.05.13
N. no. de commande, date:K-Tron (Schweiz) GmbH
Lenzhardweg 43/45
5702 Niederlenz AGI. Auftrags Nr. P150571 v. 03.05.2013
Y. order No.: Herr Michel Ucar
V. no. de command**06634.0262S70R** Anzahl, Quantity, Quantité **Stk.** **40**

O-Ring Silikon 70 Sh A rot FDA ø 66,34 x 2,62 mm FDA, CFR 21 § 177.2600

O-Ring silicone 70 Sh A red FDA ø 66,34 x 2,62 mm FDA, CFR 21 § 177.2600

O-Ring silicone 70 Sh A rouge FDA ø 66,34 x 2,62 mm FDA, CFR 21 § 177.2600

01200.0150S70R Anzahl, Quantity, Quantité **Stk.** **200**

O-Ring Silikon 70 Sh A rot FDA ø 12,00 x 1,50 mm FDA, CFR 21 § 177.2600

O-Ring silicone 70 Sh A red FDA ø 12,00 x 1,50 mm FDA, CFR 21 § 177.2600

O-Ring silicone 70 Sh A rouge FDA ø 12,00 x 1,50 mm FDA, CFR 21 § 177.2600

9324-40859**07400.0300S70R** Anzahl, Quantity, Quantité **Stk.** **30**

O-Ring Silikon 70 Sh A rot, FDA ø 74,00 x 3,00 mm FDA, CFR 21 § 177.2600

O-Ring silicone 70 Sh A red, FDA ø 74,00 x 3,00 mm FDA, CFR 21 § 177.2600

O-Ring silicone 70 Sh A rouge, FDA ø 74,00 x 3,00 mm FDA, CFR 21 § 177.2600

DLS53036.02010 Anzahl, Quantity, Quantité **Stk.** **100**

NT-Dichtlippen DL6020-FDA weiss ø 36 x 20 x 1.0 mm FDA, CFR 21 § 177.1550

NT-Lip seals DL6020-FDA white ø 36 x 20 x 1.0 mm FDA, CFR 21 § 177.1550

NT-Joint à lèvres DL6020-FDA blanc ø 36 x 20 x 1.0 mm FDA, CFR 21 § 177.1550



NT

Fabrikweg 10 Tel. +41 (0)55 254 54 54
CH-8634 Hombrechtikon Fax +41 (0)55 254 54 55

K+D AG Kunststoff & Dichtungstechnik

7127687

Seite, page, page 2

Wir bestätigen, dass die Lieferung den Vereinbarungen bei der Bestellannahme entspricht.

Nous confirmons que la marchandise livrée est conforme au texte de votre commande.

We confirm that the delivered products are in strict accordance with the purchase order specification.

NT K+D AG

Peter Weber

Qualitätsverantwortlicher

Responsable de Qualité

Quality responsible

Konformitätsbescheinigung *Declaration of Conformity*

Vollsilicon/Solid Silicone

LEP 301 (30 Shore A)

LEP 401 (40 Shore A)

LEP 501 (50 Shore A)

LEP 601 (60 Shore A)


LEP 701 (70 Shore A)

Farben: transparent, rotbraun, schwarz, blau, weiß, gelb
Colour: transparent, red brown, black, blue, white, yellow

Für die oben aufgeführten MagniQ LEP Qualitäten bescheinigen wir,
dass die verwendeten Rohstoffe den Vorgaben der FDA § 177.2600 und
der Richtlinie des BfR Silicone XV entsprechen.

*We certify for the above mentioned MagniQ LEP qualities that they are
manufactured from materials which are listed according to FDA §
177.2600 and BfR guideline Silicone XV.*

Ludger Brümmer
- Quality Manager -



Bremen, 14. Jan. 2008

K-Tron Nr.:
0000027492

Product Information

CASSIDA FLUID GL Series

Synthetic gear lubricants for use in food manufacturing equipment

CASSIDA FLUID GL 150, 220, 320, 460 and 680 are high performance, anti-wear gear oils specially developed for the lubrication of enclosed gears in food and beverage processing machinery.

They are based on a careful blend of synthetic fluids and selected additives chosen for their ability to meet the stringent requirements of the food industry.

Certified by NSF for ISO 21469 and registered by NSF (Class H1) for use where there is potential for incidental food contact. These products meet the guidelines (1998) of, and were previously authorized by, the US Department of Agriculture Food Safety and Inspection Service (USDA FSIS) for H1 use (lubricant with incidental food contact) and listed in Miscellaneous Publication No 1419 "List of Proprietary Substances and Nonfood Compounds". Product contain only substances permitted under US 21 CFR 178.3570, 178.3620 and 182 for use in lubricants with incidental food contact.

Applications

- ◆ Lubrication of enclosed gearboxes used in the food industry.
- ◆ Also intended for use in equipment manufacturing food packaging.

Performance Features

- ◆ Resists the formation of harmful products of oxidation even at elevated temperatures.
- ◆ Base oil has an ability to provide superior lubrication under all operating conditions.
- ◆ Excellent EP properties make CASSIDA FLUID GL suitable for steel-on-steel and worm and phosphor-bronze wheel applications.
- ◆ Neutral odour and taste
- ◆ High viscosity index resulting in minimum variation of viscosity with change in temperature.

Seal and Paint Compatibility

Compatible with the elastomers, gaskets, seals and paints normally used in food machinery lubrication systems.

Specifications and Certificates

- ◆ NSF H1 registered
- ◆ NSF ISO 21469 certified
- ◆ Kosher certified
- ◆ Halal certified
- ◆ DIN 51506 VBL (GL 150, 220), VCL (GL 150)
- ◆ ISO/DP 6743/6 L-CKD
- ◆ DIN 51517 CLP

Approvals & Recommendations

This is an ongoing process; please contact your local partner for any updates.

Synthetic lubricants

- ◆ Does not contain natural products derived from animals or genetically modified organisms (GMO).
- ◆ Does not contain any allergenic or intolerance inducing substances as specified in Annex IIIa of EC directive 203/98/EC
- ◆ Suitable for use where vegetarian and 'nut-free' food is prepared.
- ◆ Biostatic; does not promote the growth of bacteria or fungal organisms.

"Incidental Food contact"

Registered by NSF (Class H1) and meets the USDA H1 guidelines (1998) for lubricants for use where there is a potential for incidental food contact.

Made only from substances permitted under the US FDA Title 21 CFR 178.3570, 178.3620 and/or those generally regarded as safe (US 21 CFR 182) for use in food grade lubricants.

To comply with the requirements of US 21 CFR 178.3570, contact with food should be avoided where possible. In the case of incidental food contact, the concentration of this product in the food must not exceed 10 parts per million (10mg/kg of foodstuff).

In locations and/or applications where local legislation does not specify maximum concentration limits, it is recommended that this same 10 ppm limit be observed, as up to this concentration CASSIDA FLUID GL will not impart undesirable taste, odour or colour to food, nor will cause adverse health effects.

Consistent with good manufacturing practice, use only the amount necessary to achieve correct lubrication and take appropriate corrective action should excessive incidental contact with food be detected.

Product Information

CASSIDA FLUID GL Series

Health & Safety

Based on information available, CASSIDA FLUID GL is unlikely to present any significant health or safety hazard when properly used in the recommended application and good standards of industrial and personal hygiene are maintained. As for all oils, prolonged or repeated contact with the skin should be avoided.

For further information refer to the appropriate Material Safety Data Sheet.

Oil condition during use

It is recommended that the condition of the oil and the equipment be regularly checked to ensure safe operation.

Protect the environment

Take used lubricants and empty packs to an authorised collection point. Do not discharge into drains, soil or water.

Handling and storage

All food grade lubricants, such as CASSIDA FLUID GL, should be stored separately, out of direct sunlight or other heat sources, from other lubricants, chemical substances and foodstuffs.

Store between 0°C and 40°C. Provided that the product has been stored under these conditions we recommend that the product be used within 5 years from the date of manufacture.

Accept for use new CASSIDA FLUID GL only if the manufacturer's seal is intact.

Before opening the packs ensure the area around the closure is clean. It is recommended that it be cleaned with CASSIDA FLUID FL 5 and/or potable water and then dried with a clean cloth before opening.

Record the date the seal was broken. To prevent product contamination, always close the package after use. Upon opening a pack, the product must be used within 2 years (or within 5 years of date of manufacture, whichever is the sooner).

Typical characteristics

CASSIDA FLUID GL			150	220	320	460	680
Property		Test Method					
NSF Registration Number			144689	144690	144691	144692	144693
Colour			Colourless, pale yellow				
Density at 15 °C	kg/m ³	ISO 12185	845	847	852	855	858
Flashpoint	°C	ISO 2592	268	276	278	270	286
Pourpoint	°C	ISO 3016	-54	-48	-45	-45	-39
Kin. Visc. at 40 °C	mm ² /s	ISO 3104	150	220	320	460	680
Kin. Visc. at 100 °C	mm ² /s	ISO 3104	18.9	25.0	33.4	43.8	58.6
Viscosity index		ISO 2909	143	143	147	148	152
FZG-Test A/8.3/90 Failure Load Stage		ISO 14635-1	>12				

These characteristics are typical for current production. Variations in these characteristics may occur.

Produced according to FLT Quality Standards, in facilities where HACCP audit and Good Manufacturing Practice have been implemented and form part of the quality and hygiene management systems ISO 9001 and ISO 21469.

As far as we know these information reflect the current state of knowledge and our research. They cannot, however, be taken as an assurance about the properties nor as a guarantee of the suitability of the product for the individual case in point. Before using our products the purchaser must, therefore, check their suitability and be satisfied that the output will be satisfactory. Our products are continually being up-dated. We reserve the right, therefore, to alter the information of this product information at any time and without prior announcement.

We are specialized in developing products for extreme tribological problems in cooperation with end users.
FUCHS LUBRITECH provides service and individual advice. Please contact us!
E-Mail: cassida.lubricants@fuchs-lubritech.de



1. Identification of the substance/mixture and of the company/undertaking

Product identifier

Name of product CASSIDA FLUID GL 150

Manufacturer/distributor

FUCHS LUBRITECH GMBH
Werner-Heisenberg-Straße 1, D-67661 Kaiserslautern/ Germany
Phone +49 (0) 6301 3206 - 0, Fax +49 (0) 6301 3206 - 940
E-Mail reach@fuchs-lubritech.de
Internet www.fuchs-lubritech.com

Advice

Product Safety Management
Phone +49 (0) 6301 3206 - 0
Fax +49 (0) 6301 3206 - 940

Emergency advice

+49 (0)171 / 4632154

Recommended intended purpose(s)

Lubrication oil

2. Hazards identification

Labelling according to 67/548/EEC or 1999/45/EC

Remarks for labelling

The product does not require a hazard warning label in accordance with EC directives/German regulations on dangerous substances. Although this product does not require a hazard warning label, we recommend that the safety advice should be observed. Classification done on the basis of calculation methods of substance directive (67/548 / EEC).

Information pertaining to special dangers for human and environment

none at appropriate handling and storage

3. Composition/information on ingredients

Description

Blend of polyolefins and additives
Product contains only substances permitted under US 21CFR 178.3570, 178.3620 and 182 for use in lubricants with incidental food contact.

Additional advice

none at appropriate handling and storage

4. First aid measures

General information

Remove contaminated soaked clothing immediately, don't leave to dry.

In case of inhalation

Not applicable: No harmful steam concentration due to low volatility

In case of skin contact

In case of contact with skin wash off with soap and water.
Don't use organic solvents
Consult a doctor if skin irritation persists.

In case of eye contact

In case of contact with eyes rinse with plenty of water carefully. In the event of persistent symptoms seek medical treatment.

In case of ingestion

Call doctor in case of indisposition
Do not induce vomiting.

Physician's information / possible symptoms

No symptoms known so far.

Physician's information / possible dangers

Aspiration hazard when vomiting after swallow up

Treatment (Advice to doctor)

Treat symptoms.



5. Firefighting measures

Suitable extinguishing media

Foam
Dry powder
Carbon dioxide
sand
water mist

Extinguishing media which must not be used for safety reasons

Full water jet

Special hazards arising from the substance or mixture

Fire gas of organic material has to be classified as harmful to the respiratory system.

Special protective equipment for fire-fighters

Use breathing apparatus with independent air supply.

Additional information

Apply foam in large quantities because some of it is destroyed by the product.
Collect contaminated firefighting water separately, must not be discharged into the drains.

6. Accidental release measures

Personal precautions

Ensure adequate ventilation.
Avoid contact with skin and eyes
High risk of slipping due to leakage/spillage of product.

Environmental precautions

Do not discharge into the drains/surface waters/groundwater.
Prevent spread over a wide area (e.g. by containment or oil barriers).
Do not discharge into the subsoil/soil.

Methods for cleaning up

Send in suitable containers for recovery or disposal.
Take up with absorbent material (e.g. general-purpose binder).

Additional Information

Informations for disposal see chapter 13.

7. Handling and storage

Advice on safe handling

Care for thoroughly room ventilation, if necessary use in well ventilated area with local exhaust ventilation at workplace.
Take the usual precautions when handling with chemicals.

Advice on protection against fire and explosion

The product is combustible.
Pay attention to general rules of internal fire prevention.

Requirements for storage rooms and vessels

Prevent penetration into the ground.
Use steel containers.
Use polyethylene containers.

Advice on storage compatibility

Do not store together with oxidising and self-inflammable materials.

Further information on storage conditions

Keep container tightly closed, store at cool and aired place, open and handle carefully.
Protect from heat and direct solar radiation.
Store in a dry place.
Do not keep at temperatures below 0°C.
Recommended storage temperature: room temperature.

Storage group 10

Fire class B

Information on storage stability

Storage stability 12 months maximum.



8. Exposure controls/personal protection

Additional advice on system design

Do not inhale aerosols caused by spraying application

Additional advice

This product as such does not contain any relevant ingredients with to be observed limited values
As basis for this information served the valid references.

Respiratory protection

Not required at determined application

Hand protection

As the product is a preparation of several substances, the resistance of the materials used for gloves cannot be predetermined; it is therefore necessary to check this before using the product.

The break through time depends on the mechanical stress imposed and must therefore be checked individually.

PVC gloves

nitrile gloves

Neoprene gloves

Eye protection

safety goggles

Skin protection

Usual working clothes for chemical industries

General protective measures

Avoid contact with eyes and skin

Do not inhale gases/vapours/aerosols.

Hygiene measures

Cloths contaminated with product should not be kept in trouser pockets.

Follow general rules of industrial hygiene for safe handling of chemical products

At work do not eat, drink and smoke.

Remove soaked clothing immediately.

Keep away from food and drink.

Wash hands before breaks and after work.

9. Physical and chemical properties

Form

liquid

Colour

colourless

Odour

characteristic

Important health, safety and environmental information

	Value	Temperature	at	Method	Remark
pH value in delivery state					not applicable
boiling range	> 280 °C				
flowing point	-54 °C			DIN/ISO 3016	
Flash point	ca. 268 °C			DIN/ISO 2592	
Autoignition	> 320 °C				
Lower explosion limit	1 Vol-%				
Upper explosion limit	10 Vol-%				
Vapour pressure	< 0,5 Pa	20 °C			
Density	0,842 g/cm ³	20 °C		DIN 51757	
Solubility in water					more or less insoluble
Partition coefficient (log p_{OW})	> 6				
Viscosity kinematic	148 mm ² /s	40 °C			



10. Stability and reactivity

Conditions to avoid

Heating, unshielded flame, ignition source, electrostatic charge

Materials to avoid

none at appropriate handling and storage
Reactions with strong oxidising agents.

Hazardous decomposition products

none at appropriate handling and storage

Thermal decomposition

Remark No decomposition if used as directed.

11. Toxicological information

Acute toxicity/Irritability/Sensitization

	Value/Validation	Species	Method	Remark
LD50 acute oral				not determined
Irritability skin				frequent and/or persistent contact may cause skin irritation
Irritability eye	may have irritating effect			if splash reaches eye
Skin sensitization	No sensitizing effect known			

Experiences made from practice

Frequent persistent contact with the skin may cause skin irritation.
no harmful effects at appropriate handling and determined usage

Additional information

No toxicological data available.
The product was classified on the basis of the calculation procedure of the directive 67/548/EEC (conventional method).

12. Ecological information

Data on elimination (persistence and degradability)

	Elimination rate	Method of analysis	Method	Validation
Biological degradability				not determined

Mobility and bioaccumulative potential

The product has not been tested. Because of the product's consistency and low solubility in water bioavailability is not likely.

Ecotoxicological effects

	Value	Species	Method	Validation
Fish				not determined

Behaviour in sewage plant

Product gets duly not into waste water before it is not treated according to the local regulations.
Das Produkt bildet auf der Wasseroberfläche einen dünnen Ölfilm. Wird von Schwebeteilchen adsorbiert. Abscheidung durch Sedimentation.

General regulation

Ecological data are not available.
Do not allow uncontrolled leakage of product into the environment.

13. Disposal considerations

Recommendations for the product

Disposal according to local authority prescriptions

Recommendations for packaging

Totally emptied packaging may be taken for recycling.
Dispose one-trip container according to local authority prescriptions

Recommended cleansing agent

white spirit



General information

Ultimately responsible for correct classification is the waste producer, as the EWC names different codes for different origins of same waste

14. Transport information

Land and inland navigation transport ADR/RID

No dangerous goods as defined by these transport regulations

Marine transport IMDG

No hazardous goods as defined by prescriptions

Air transport ICAO/IATA-DGR

No hazardous goods as defined by prescriptions

15. Regulatory information

VOC standard

VOC content 0 %

National regulations

Water hazard class 1 Mixture-WGK according to VwVwS (GER) preliminary

16. Other information

Training advice

Use information in this MSDS

Recommendend uses and restrictions

usage only according to instructions for use and observance of warning notes

Produkt ist zur Verwendung in Lebensmittelbetrieben freigegeben.

National and local regulations concerning chemicals shall be observed.

Further information

All the raw materials in this product are listed under HSNO (New Zealand) or are exempt from listing.

Substantial changes to the former version are marked by "!" on the left margin of the paper.

All the raw materials in this product are listed in TSCA.

All the raw materials in this product are listed in AICS.

Refer to product information paper.

The information contained herein is based on the state of our knowledge. It characterizes the product with regard to the appropriate safety precautions. It does not represent a guarantee of the properties of the product.

Sources of key data used

Material Safety Data Sheets of raw materials

Product Information

CASSIDA GREASE RLS Series

Synthetic regular load grease for food & beverage processing equipment

CASSIDA GREASE RLS 00, 0, 1 and 2 are specially developed for the grease lubrication of machinery in the food and beverage processing and packaging industry.

They are based on an aluminium complex thickener, synthetic fluids and selected additives chosen for their ability to meet the stringent requirements of the food & beverage industry.

Certified by NSF for ISO 21469 and registered by NSF (Class H1) for use where there is potential for incidental food contact. Products contain only substances permitted under US 21 CFR 178.3570, 178.3620 and 182 for use in lubricants with incidental food contact.

Applications

CASSIDA GREASES RLS 00 / RLS 0

- ◆ Lightly loaded grease lubricated gear boxes
- ◆ Automatic, centralised lubrication systems

CASSIDA GREASES RLS 1 / RLS 2

- ◆ Rolling element and plain bearings
- ◆ Joints and linkages open to the atmosphere
- ◆ Automatic, centralised lubrication systems
- ◆ CASSIDA GREASE RLS 1 is recommended for Lincoln centralised lubrication systems

Performance Features

CASSIDA GREASES RLS are noted for their long life

- ◆ Good water resistance ensures lasting protection even in the presence of large amounts of water
- ◆ Good oxidation and mechanical stability. Resists the formation of deposits caused by oxidation at high operating temperatures and maintain consistency, reducing leakage
- ◆ Effective corrosion protection. Ensures components/bearings do not fail due to corrosion
- ◆ Good adhesive properties reduce losses thereby reducing grease consumption
- ◆ Neutral odour and taste

Seal & Paint Compatibility

Compatible with the elastomers, gaskets, seals and paints normally used in food machinery lubrication systems.

Approvals & Recommendations

This is an ongoing process; please contact your local partner for any updates.

Operating temperatures

- RLS 00: -45 °C to +100 °C (peak up to +120 °C)
- RLS 0: -40 °C to +100 °C (peak up to +120 °C)
- RLS 1: -40 °C to +120 °C (peak up to +140 °C)
- RLS 2: -35 °C to +120 °C (peak up to +140 °C)

Specifications & Certificates

- ◆ NSF H1 registered
- ◆ NSF ISO 21469 certified
- ◆ Kosher certified
- ◆ Halal certified

Synthetic lubricant

- ◆ Does not contain natural products derived from animals or genetically modified organisms (GMO)
- ◆ Does not contain any allergenic or intolerance-inducing substances as specified in Annex IIIa of EC directive 2003/89/EC
- ◆ Suitable for use where vegetarian and 'nut-free' food is prepared
- ◆ Biostatic; does not promote the growth of bacteria or fungal organisms

"Incidental Food contact"

Registered by NSF (Class H1) and meets the USDA H1 guidelines (1998) for lubricants for use where there is a potential for incidental food contact.

Certified by NSF for ISO 21469, Safety of machinery, Lubricants with incidental product contact, Hygiene requirements.

Made only from substances permitted under the US FDA Title 21 CFR 178.3570, 178.3620 and/or those generally regarded as safe (US 21 CFR 182) for use in food grade lubricants.

To comply with the requirements of US 21 CFR 178.3570, contact with food should be avoided where possible. In the case of incidental food contact, the concentration of this product in the food must not exceed 10 parts per million (10mg/kg of foodstuff).

In locations and/or applications where local legislation does not specify maximum concentration limits, it is recommended that this same 10 ppm limit be observed, as up to this concentration CASSIDA GREASE RLS will not impart undesirable taste, odour or colour to food, nor will cause adverse health effects.

Consistent with good manufacturing practice, use only the amount necessary to achieve correct lubrication and take appropriate corrective action should excessive incidental contact with food be detected.

Product Information

CASSIDA GREASE RLS Series

Protect the environment

Take used lubricants and empty packs to an authorised collection point. Do not discharge into drains, soil or water.

Health & Safety

Based on information available, CASSIDA GREASE RLS is unlikely to present any significant health or safety hazard when properly used in the recommended application and good standards of industrial and personal hygiene are maintained. As for all greases, prolonged or repeated contact with the skin should be avoided. For further information refer to the appropriate Material Safety Data Sheet.

Handling & storage

All food grade lubricants should be stored separately from other lubricants, chemical substances and foodstuffs and out of direct sunlight or other heat sources. Store between 0°C and 40°C. Provided that the product has been stored under these conditions we recommend that the product be used within 3 years from the date of manufacture.

Accept for use new CASSIDA GREASE RLS only if the manufacturer's seal is intact.

Before opening the packs ensure the area around the closure is clean. It is recommended that it be cleaned with potable water and then dried with a clean cloth before opening.

Record the date the seal was broken. To prevent product contamination, always close the package after use. Upon opening a pack, the product must be used within 2 years (or within 3 years of date of manufacture, whichever is the sooner).

Typical characteristics

CASSIDA GREASE RLS		00	0	1	2
Property	Test method				
NSF Registration No.		144705	144704	144706	144707
Appearance		White semi-fluid		White smooth paste	
Type of thickener		Aluminium complex			
Worked penetration at 25°C $1/_{10}$ mm	ISO 2137	400 - 430	355 - 385	310 - 340	265 - 295
NLGI number	DIN 51818	00	0	1	2
Kin. Visc. (base oil) at 40°C mm ² /s	ISO 3104	100	150	150	150
Kin. Visc. (base oil) at 100°C mm ² /s	ISO 3104	13.4	18.0	18.0	18.0
Dropping Point °C	ISO 2176	>200	>240	>240	> 240
Classification DIN	DIN 51502	GP HC 00 G-40	GP HC 0 G-40	KP HC 1 K-40	KP HC 2 K-30
Classification ISO	ISO 6743-9	L-XEBA 00	L-XDBEA 0	L-XDCEA 1	L-XCCEA 2

These characteristics are typical for current production. Variations in these characteristics may occur.

Produced according to FLT Quality Standards, in facilities where HACCP audit and Good Manufacturing Practice have been implemented and form part of the quality and hygiene management systems ISO 9001 and ISO 21469.

As far as we know these information reflect the current state of knowledge and our research. They cannot, however, be taken as an assurance about the properties nor as a guarantee of the suitability of the product for the individual case in point. Before using our products the purchaser must, therefore, check their suitability and be satisfied that the output will be satisfactory. Our products are continually being up-dated. We reserve the right, therefore, to alter the information of this product information at any time and without prior announcement.

We are specialized in developing products for extreme tribological problems in cooperation with end users.
FUCHS LUBRITECH provides service and individual advice. Please contact us!
E-Mail: cassida.lubricants@fuchs-lubritech.de

2011-06-10/ES

PI-No.: 2 - 7537

FUCHS LUBRITECH GMBH

Werner-Heisenberg-Straße 1
67661 Kaiserslautern/Germany
Tel. +49 (0) 6301 3206-0
Fax +49 (0) 6301 3206-940

Internet: www.fuchs-lubritech.com





! 1. Identification of the substance/mixture and of the company/undertaking

Product identifier

Name of product CASSIDA GREASE RLS 2 SPRAY

Manufacturer/distributor

FUCHS LUBRITECH GMBH
Werner-Heisenberg-Straße 1, D-67661 Kaiserslautern/ Germany
Phone +49 (0) 6301 3206 - 0, Fax +49 (0) 6301 3206 - 940
E-Mail reach@fuchs-lubritech.de
Internet www.fuchs-lubritech.com

Advice

Product Safety Management
Phone +49 (0) 6301 3206 - 0
Fax +49 (0) 6301 3206 - 940

Emergency advice

+49 (0)171 / 4632154

Recommended intended purpose(s)

Aerosol
Lubricating fluid

2. Hazards identification

Classification according to 67/548/EEC or 1999/45/EC

F+; R12
R66

R-phrases

12 Extremely flammable.
66 Repeated exposure may cause skin dryness or cracking.

Labelling according to 67/548/EEC or 1999/45/EC

Remarks for labelling

The product is classified and labelled in accordance with EC directives/German regulations on dangerous substances.
Classification done on the basis of calculation methods of substance directive (67/548 / EEC).

F+ Extremely flammable



R-phrases

12 Extremely flammable.
66 Repeated exposure may cause skin dryness or cracking.

S-phrases

16 Keep away from sources of ignition - No smoking.
23 Do not breathe spray.
51 Use only in well-ventilated areas.

Hazardous ingredients for labeling

butane, propane

Special rules for supplemental label elements for certain mixtures

Pressurized container: protect from sunlight and do not expose to temperatures exceeding 50°C. Do not pierce or burn, even after use.
Do not spray on a naked flame or any incandescent material.
Keep away sources of ignition - don't smoke
If possible work in the open air or in well-ventilated rooms.

Information pertaining to special dangers for human and environment

Application may cause development of explosive / inflammable vapour-air-mixtures



3. Composition/information on ingredients

Description

propellant: propane / butane
Wirkstoff: Polyolefine, organische Lösemittel und Additive

Hazardous ingredients

CAS No	EC No	Name	[% weight]	Classification according to 67/548/EEC
74-98-6	200-827-9	propane	10 - 65	F+ R12
106-97-8	203-448-7	butane	10 - 65	F+ R12
64742-48-9	265-150-3	Mixture of hydrocarbons, de-aromatized	5 - 24,9	Xn; R10-65-66-67
80939-62-4		Aminphosphat-Gemisch	0,1 - 0,24	Xi, N,R36/38-51/53

REACH

CAS No	Name	REACH registration number
74-98-6	propane	Exempt
106-97-8	butane	Exempt

Additional advice

no

4. First aid measures

General information

Remove contaminated soaked clothing immediately, don't leave to dry.

In case of inhalation

Ensure of fresh air.
In the event of symptoms refer for medical treatment.

In case of skin contact

In case of contact with skin wash off immediately with soap and water.
Don't use organic solvents
Consult a doctor if skin irritation persists.

In case of eye contact

In case of contact with eyes rinse with plenty of water carefully. In the event of persistent symptoms seek medical treatment.

In case of ingestion

Do not induce vomiting.
If swallowed seek medical advice immediately and show the doctor packing or label.

Physician's information / possible symptoms

Coughing
Headache

Physician's information / possible dangers

Aspiration hazard when vomiting after swallow up

Treatment (Advice to doctor)

Treat symptoms.

5. Firefighting measures

Suitable extinguishing media

Foam
Dry fire-extinguishing substance
Carbon dioxide
Water spray jet

Extinguishing media which must not be used for safety reasons

Full water jet

Special hazards arising from the substance or mixture

Fire gas of organic material has to be classified as harmful to the respiratory system.

Special protective equipment for fire-fighters

Use breathing apparatus with independent air supply.

Additional information

Cool endangered containers with water spray jet.
Explosion risk in case of longer heating
Collect contaminated firefighting water separately, must not be discharged into the drains.



6. Accidental release measures

Personal precautions

Ensure adequate ventilation.
Keep away sources of ignition.
Avoid contact with skin and eyes

Environmental precautions

Do not discharge into the drains/surface waters/groundwater.
active agent: Prevent spread over a wide area (e.g. by containment or oil barriers).
Suppress gases/vapours/mists with water spray jet

Methods for cleaning up

Suck off by room ventilation.
Send in suitable containers for recovery or disposal.
Take up with absorbent material (e.g. general-purpose binder).

Additional Information

Informations for disposal see chapter 13.

7. Handling and storage

Advice on safe handling

Care for thoroughly room ventilation, if necessary use in well ventilated area with local exhaust ventilation at workplace.

Advice on protection against fire and explosion

Keep away from sources of ignition - No smoking
The product is extremely flammable.
Vapours can form an explosive mixture with air.
Bursting hazard with fire expansion and injury danger near fire

Requirements for storage rooms and vessels

Keep in closed original container.
Don't store in staircases and passage-ways

Advice on storage compatibility

Do not store together with oxidising and self-inflammable materials.

Further information on storage conditions

Store only in closed original container at cool and aired place.
Protect from heat and direct solar radiation.
Keep container dry.
Keep in a cool place, heat causes increase in pressure and risk of bursting.
Do not keep at temperatures below 0°C.
Do not keep at temperatures above 30°C.

Storage group 2B

Fire class B

8. Exposure controls/personal protection

Additional advice on system design

Do not inhale aerosols caused by spraying application

Additional advice

As basis for this information served the valid references.

Respiratory protection

Not required at determined application

Hand protection

The choice of a suitable material for gloves depends not only on the material itself, but also on further quality characteristics.
As the product is a preparation of several substances, the resistance of the materials used for gloves cannot be predetermined; it is therefore necessary to check this before using the product.
Wear gloves of PVC at prolonged or intensive skin contact
nitrile gloves
Neoprene gloves

Eye protection

tightly fitting goggles, in case of splashing

Skin protection

Usual working clothes for chemical industries

General protective measures

Avoid contact with eyes and skin
Do not inhale aerosols



Hygiene measures

Cloths contaminated with product should not be kept in trouser pockets.
At work do not eat, drink, smoke or take drugs.
Follow general rules of industrial hygiene for safe handling of chemical products
Remove soiled or soaked clothing immediately.
Work in rooms with good ventilation.
Keep away from food and drink.
Use barrier skin cream.

9. Physical and chemical properties

Form aerosol	Colour white	Odour solvent-like
------------------------	------------------------	------------------------------

Important health, safety and environmental information

	Value	Temperature	at	Method	Remark
pH value in delivery state					not applicable
boiling range	not applicable				Aerosols
Flash point	< 0 °C				Active agent + solved propellant pro rata
Vapour pressure	2400 - 3000 hPa	20 °C			Aerosol can pressure
Density	0,900 g/cm3	15 °C			Active agent + solved propellant pro rata
Solubility in water					more or less insoluble

Explosive properties

In and after use danger of production of inflammable compounds
Danger of bursting when heating over 50 °C

Additional information

Vapours are heavier than air.
flammable liquid

10. Stability and reactivity

Conditions to avoid

Because of the high vapour pressure, containers are liable to burst if temperature rises.
Heating, unshielded flame, ignition source, electrostatic charge

Materials to avoid

Reactions with strong oxidising agents.

Hazardous decomposition products

none at appropriate handling and storage

Thermal decomposition

Remark No decomposition if used as directed.

11. Toxicological information

Acute toxicity/Irritability/Sensitization

	Value/Validation	Species	Method	Remark
LD50 acute oral				not determined
Irritability skin				frequent and/or persistent contact may cause skin irritation
Irritability eye	may have irritating effect			if splash reaches eye
Skin sensitization	No sensitizing effect known			

Experiences made from practice

Possible sensitization in case of persons suffering from hypersensitivity.
Frequent contact specially if dried out may cause skin and eye irritations.

Additional information

No toxicological data available.



Safety Data Sheet according to Regulation (EC) No. 1907/2006 (REACH)

Printed 11.08.2011
Revision 09.08.2011 (GB) Version 1.1

CASSIDA GREASE RLS 2 SPRAY
A01-07547

The product was classified on the basis of the calculation procedure of the directive 67/548/EEC (conventional method).

12. Ecological information

Data on elimination (persistence and degradability)

Elimination rate	Method of analysis	Method	Validation
			not determined

Biological degradability

Mobility and bioaccumulative potential

The product has not been tested. Because of the product's consistency and low solubility in water bioavailability is not likely. preparation is water insoluble and does not formate emulsion

Ecotoxicological effects

Value	Species	Method	Validation
			not determined

Fish

Behaviour in sewage plant

Product gets duly not into waste water before it is not treated according to the local regulations.

General regulation

Ecological dates are not available.
Do not allow uncontrolled leakage of product into the environment.

13. Disposal considerations

Recommendations for the product

Disposal according to local authority prescriptions

Recommendations for packaging

Totally emptied packaging may be taken for recycling.
Aerosolsden mit REStdruck sind in Behältern mit Entlüftungseinrichtung nach GGVSE zu sammeln und zu transportieren.
Dispose one-trip container according to local authority prescriptions

General information

Ultimately responsible for correct classification is the waste producer, as the EWC names different codes for different origins of same waste

! 14. Transport information

! Land and inland navigation transport ADR/RID

UN 1950 AEROSOLS, 2.1, (D), Classification code: 5F
Minor quantities are not considered

Marine transport IMDG

UN 1950 AEROSOLS, 2.1
Labelling: AEROSOLS UN 1950

! Air transport ICAO/IATA-DGR

UN 1950 Aerosols, flammable, 2.1
UN-4G/Y fibreboard boxes required

! 15. Regulatory information

! VOC standard

VOC content 68,5 %

National regulations

Other regulations, restrictions and prohibition regulations

Take note of: TRG 300 "Aerosole" (GER)

Water hazard class

2 Mixture-WGK according to VwVwS (GER)
preliminary

Decree for case of interference/ remarks

Annex I, No. 11



! 16. Other information

Training advice

Use information in this MSDS

Recommendend uses and restrictions

usage only according to instructions for use and observance of warning notes
National and local regulations concerning chemicals shall be observed.

! Further information

All the raw materials in this product are listed under HSNO (New Zealand) or are exempt from listing.

Substantial changes to the former version are marked by "!" on the left margin of the paper.

All the raw materials in this product are listed in TSCA.

All the raw materials in this product are listed in AICS.

Refer to product information paper.

The information contained herein is based on the state of our knowledge. It characterizes the product with regard to the appropriate safety precautions. It does not represent a guarantee of the properties of the product.

Sources of key data used

Material Safety Data Sheets of raw materials

Wording of the R/H-phrases specified in chapter 3 (not the classification of the mixture!)

R 10 Flammable.

R 12 Extremely flammable.

R 36/38 Irritating to eyes and skin.

R 51/53 Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

R 65 Harmful: may cause lung damage if swallowed.

R 66 Repeated exposure may cause skin dryness or cracking.

R 67 Vapours may cause drowsiness and dizziness.

P-Nr.: 164008	Coperion K-Tron
Pos Nr.:	Zert. / Tot.:
Art Nr.: 0000014016	

Abnahmeprüfzeugnis

EN 10204-3.1

Prüf-Nr.: 104421

**BUTTING**

Seite 1 von 3

Besteller:
Neumo GmbH & Co. KG
Postfach 11 63

D - 75434 Knittlingen
DEUTSCHLAND

Bestell-Nr.: RA071125WE-Pharmatube S/ECO
BUTTING-Auftrags-Nr.: 75744916/03
BA-Nr.: 2244552

Anforderungen: AD2000-W2/W10/BN2/EN10217-7 TC2

DIN 11866-H30/DR-Klasse 3/
Bestellbed.

Ausnutzung der zul. Berechnungsspannung: 100 %

PRÜFGEGENSTAND: längsnahtgeschweißte Edelstahlrohre

Verwendungszweck: NEUMO Pharma Tube S

Abmessung: 104,0x2,00mm **Menge:** 54 Rohre = 328,86m

hergestellt unter **Auftrags-Nr.:** 71744552/00 von Band


aus **Werkstoff Nr.:** 1.4435/TP316L


mit Abnahmeprüfzeugnis nach EN 10204-3.1.B

geliefert von	aus Schmelzen-Nr.	Rohr-Nr.
ALZ	728099	280; 292; 302; 309; 319; 325; 327-334; 336-340; 342-343; 345-352; 354-361; 363; 366; 368-370; 372-376

Ergebnis der Schmelzeanalyse gemäß Abnahmeprüfzeugnis des Stahlwerkes:

geliefert von	Schmelzen-Nr.	C%	Si%	Mn%	P%	S%	Cr%	Ni%	N%	Ti%	Mo%
ALZ	728099	0,017	0,4	1,35	0,03	0,001	17,26	12,6	0,035	0,000	2,51

KENNZEICHNUNG:  75/44916/03-104,0x2,00-1.4435/TP316L-CH.728099
EN10217-7 TC2-WG-DIN 11866-H30-NEUMO-PHARMA TUBE S

Stempel des Abnahmebeauftragten: 

MATERIALKONTROLLEN

Kontrolle der Materialkennzeichnung: o.B.

Kontrolle auf Materialverwechslung: (Spektroskop) o.B.

Oberflächenkontrolle: innen 100% in Gegenlicht o.B.
außen 100% o.B.

Oberflächenbeschaffenheit entspricht: DIN EN 10217-7 WG

Ausführungsart entspricht: DIN EN 10217-7 WG

Wärmebehandlung/Glühen: 1040-1090°C, Abkühlung in Wasser

Die Anforderungen an den Hersteller nach AD-Merkblatt W0/HPQ und TRD 100/201 sind erfüllt. (Schreiben des TÜV Hannover/Sachsen-Anhalt e.V. vom 26.10.2000). Auf eine Gegenzeichnung wird verzichtet.



H. Butting GmbH & Co. KG
29379 Wittigden-Kriesebeck

Dieses Zeugnis wurde maschinell erstellt und gilt ohne Unterschrift.

Qualitätsstelle
Andreas Kian
Dir. Abnahmebeauftragter:
☎ (0049)6834 50-337

Kriesebeck den 21.02.2009 /7156

P-Nr.: 164008	Coperion K-Tron
Pos Nr.:	Zert. / Tot.:
Art Nr.: 0000014016	

Abnahmeprüfzeugnis

EN 10204-3.1
Prüf-Nr.: 104421



BUTTING

Seite 2 von 3

ERGEBNISSE DER PRÜFUNGEN:

Zerstörende Prüfungen

Mechanische Prüfungen

Zugversuch(ε)

Prüfen-Nr.	Schweißnaht	Profilanlage	Abmessung	Rp0.2(N/mm ²)	Rp1.0(N/mm ²)	Rm(N/mm ²)	AS %	Temp. C
5	728099	G1	20.17x2.02	333	362	590	48.2	20
142	728099	G1	19.99x2.03	313	362	598	49.3	20
223	728099	G1	20.24x2.05	317	363	598	50.4	20
317	728099	G1	20.19x2.07	323	362	597	49.2	20

G = Grundwerkstoff; S = Schweißnaht; U = Übergangzone; WEZ = Wärmebehandlung; J = Länge; q = quer

Technologische Prüfungen

Schmelztemp.
728099

Aufweitprobe gem. DIN EN ISO 8493

o.B.

Korrosionsfest

IK-TE DIN EN ISO 3651-2A

beständig

Metallographische Untersuchungen

Delta-Ferrit Bestimmung

<0,5%

Rauheitsmessung

<0,8 µm

Zerstörungsfreie Prüfungen

Wirbelstrom-Prüfung

100% durchgeführt Ergebnis: o.B.

Dichtheitskontrolle:

100% durchgeführt o.B.

durch Wirbelstromprüfung nach SEP 1925 / E426

Maßkontrolle:

entspricht DIN 11866 / Tab.2 - Reihe A

Die Anforderungen an den Hersteller nach AD-Merkblatt W0/H0 und TRD 100/201 sind erfüllt. (Schreiben des TÜV-Hauptver/Sachsen-Anhalt e.V. vom 26.10.2000). Auf seine Gegenzusage wird verzichtet.



Zertifiziert nach
ISO 9001



DAF PL 3330.00
DIN EN ISO/IEC 17025

H. Butting GmbH & Co. KG
29379 Willtrien-Knesebeck

Dieses Zeugnis wurde maschinell erstellt und gilt ohne Unterschrift

Qualitätsstelle

Andreas Klan

Der Abnahmebeauftragte

(0049)5834 50-337

Knesebeck, den 21.02.2000, 7:150

P-Nr.: 164008	Coperion K-Tron
Pos Nr.:	Zert. / Tot.:
Art Nr.: 0000014016	

Abnahmeprüfzeugnis

EN 10204-3.1

Prüf-Nr.: 104421



BUTTING

Seite 3 von 3

Bemerkungen: o.B. = ohne Beanstandung

Außenfläche der Rohre mit Korn 400 geschliffen.

Überprüft nach AD2000-Merkblatt W0 und zertifiziert nach Richtlinie 97/23/EG, Anhang 1, Ziffer 4.3 durch die TÜV CERT-Zertifizierungsstelle für Druckgeräte der TÜV Nord-Gruppe;

Benannte Stelle, Kern-Nr. 0045 mit Zertifikat-Nr. 07 202 4211/20002/1/H

Das zur Anwendung gekommene Schweißverfahren gem. Druckgeräterichtlinie 97/23/EG; AD2000 HP2/1 / EN 288-3 und die Schweißerqualifikation gem. EN 1418 sind zertifiziert durch die TÜV CERT-Zertifizierungsstelle für Druckgeräte der TÜV Nord-Gruppe, Benannte Stelle, Kern-Nr. 0045

Die Anforderungen sind erfüllt.

Die Anforderungen an den Hersteller nach AD-Merkblatt W0/W00 und TRD 100/201 sind erfüllt. (Schweißerei der TÜV Hannover/Sachsen-Anhalt e.V. vom 26.10.2000). Auf eine Gegenzeichnung wird verzichtet.



Zertifiziert nach
ISO 9001



DAP-PL-3430-00
DIN EN ISO/IEC 17026
Dargestellt durch Herrli AG, CH-4100 Kerzers
www.herrli.com

H. Butting GmbH & Co. KG
28379 Wülfingen-Knesebeck

Dieses Zeugnis wurde maschinell erstellt und gilt ohne Unterschrift.

Knesebeck den 21.02.2009 / 156

Qualitätsstelle:

Andreas Klau

Der Abnahmebeauftragte:

☎ (0049) 5934 50-337

Chapter 2:

Data Sheets

- Machine Data Sheet
- Programming Sheet
- Data Sheets

Project No.

Customer

Reps. / MA's	KD, Karl-Heinz Klein
Sales	Karl-Heinz Klein
Elec. Engineering	L. Hausammann
Mech. Engineering	Matthias Keller
Assembly testing	M. Stutz
Manuals	M. Germanier

Project - Summary

User Interface **Software**

Number of Feeders **Ex Standard**

Density Unit **MO**

Flow Unit

Factory Inspection:

Remarks

Project No.	1401237	Feeder No.	M01
Tag No.	0	Dim. Dwg.	1401237500
Bulk material	Pharma-Pulver (Wirkstoff)		
Max. Bulk density [kg/l]	.55	Min. Bulk density [kg/l]	.50
Hazardous areas	Outside Zone 22 / Inside Zone 21		
Min. Feed rate [kg/h]	12.00		
Max. Feed rate [kg/h]	90.00		
User Interface	KCM		

Screw feeder		0660-21095
Type	K-PH-ML-D5-KT35	Ident No. M352970
Motor / Drive	Baldor 0.450kW 200V DC 2.50A 2000RPM IP65	
Gear red. i tot	15.579:1 (C)	
Agitator drive 1	0	
Agitator drive 2	0	
Feeding tools	TCC (Twin Concave Coarse 35mm)	
Outlet	35mm	
Hopper / Tank	20 L	

Tests	
Programming sheets	Yes
Final inspection certificate	Yes
Weight test certificate	Yes
Pressure/Tightness test	No
Surface finish test	No
Special Tests	0

Weighing System	
Type	LWF D5
Load cell	WMOD-120 KSFT
Load Cell Serial Number	11315778-V
	# 1

Feeder Control	
Type	KCM
Remarks	0

Customer LEISTRITZ EXTRUSIONSTECH. GMBH
 Project No. 1401237 Machine: M01
 Feeder Control KCM

Gross scale capacity: 120.000 kg
 Tare value: 83.525 kg
 Net weight range: 35.6521 kg
 Span: 1.0000
 Load cell WMOD-120 KSFT
 Load Cell Serial Number 11315778-V
 Load cell Software S9700-20080-V

Test results

(Values in % are related on the gross scale capacity)

	Main Scale	Tolerance	Result
Friction deviation:	2.12097 g = 0.0018 %	0.0050 %	Ok
Max. deviation linearity test:	0.00455 kg = 0.0038 %	0.0300 %	Ok
Zero point dev. linearity test:	-0.00315 kg = -0.0026 %	+/- 0.0250 %	Ok
Deviation while motor running:	2.17448 g = 0.0018 %	0.0500 %	Ok
Span deviation (related on 1.0):	0.0047 %	+/-5.0000 %	Ok

Linearity test results

(Values in % are related on the gross scale capacity)

Calib mass	Weight Increments		Weight Decrements	
	Actual Value	Deviation	Actual Value	Deviation
0.000 kg	0.00096 kg	0.0000 %	-0.00219 kg	-0.0026 %
2.000 kg	2.00144 kg	0.0012 %	1.99765 kg	-0.0020 %
4.000 kg	4.00140 kg	0.0012 %	3.99735 kg	-0.0022 %
6.000 kg	6.00134 kg	0.0011 %	5.99706 kg	-0.0024 %
8.000 kg	8.00161 kg	0.0013 %	7.99864 kg	-0.0011 %
10.000 kg	10.0014 kg	0.0011 %	9.99942 kg	-0.0005 %
12.000 kg	12.0009 kg	0.000785987	12.0009 kg	0.000785987

Date: 03.06.2014 14:33

Tested by: M.Stutz



K - Tron (Schweiz) AG
 Industrie Lenzhard
 CH - 5702 Niederlenz

English ▼

PROGRAMMING KCM-LWF

Customer: LEISTRITZ EXTRUSIONSTECH. G

Comm No: 1401237

Feeder:	M01	Tag No.:	M352970
Date:	03.06.2014	Programming date:	

Menu/Address		progr.	progr.
SETPOINT		0.00	
PRODUCT CHANGE			
REFILL		Disable	
REFILL MAX		1.50	
REFILL MIN		0.5	
INIT FF		360.00	
GEARSWITCH		High	
CALIBRATION			
CALIBRATION			
INIT FF		360.00	
SPAN		1.00	
CAL CORRELA.		0.00	
CAL CORR LIM		80.00	
CAL DC		10.00	
CALIB TIME		30.00	
FEEDFACTOR			
REFILL ARRAY		On	
MF@8%DC		8.00	
MF@12%DC		12.00	
MF@17%DC		17.00	
MF@23%DC		23.00	
MF@33%DC		33.00	
MF@50%DC		50.00	
MF@70%DC		70.00	
MF@100%DC		360.00	
INIT FF			
ALARMS			
ALARM LIMITS			
MASSFLOW ERR+		10.00	
MASSFLOW ERR-		10.00	
DRIVE CMD HI		99.00	
DRIVE CMD LO		0.00	
FF DEV LIM		0.00	
MAX REF TIME		30.00	
NW. LOW LIMIT		0.00	
ALARM SETUP			
ALARM DELAY		30.00	
STARTUP DELAY		60.00	
STOP CLRS.ALARM		No	
ALRMODE 1		Immed.Stop	
ALRMODE 2		Immed.Stop	
ALRMODE 3		Immed.Stop	
ALRMODE 4		Immed.Stop	
ALRMODE 5		Timed	
ALRMODE 6		Immed.Stop	



K - Tron (Schweiz) AG
 Industrie Lenzhard
 CH - 5702 Niederlenz

English ▼

PROGRAMMING KCM-LWF

Customer: LEISTRITZ EXTRUSIONSTECH. G

Comm No: 1401237

Feeder:	M01	Tag No.:	M352970
Date:	03.06.2014	Programming date:	

Menu/Address		progr.	progr.
ALRMODE 7		Immed.Stop	
ALRMODE 8		Immed.Stop	
ALRMODE 9		Immed.Stop	
ALRMODE 10		Immed.Stop	
ALRMODE 11		Immed.Stop	
ALRMODE 12		Immed.Stop	
ALRMODE 13		Immed.Stop	
ALRMODE 14		Immed.Stop	
ALRMODE 15		Immed.Stop	
ALRMODE 16		Immed.Stop	
ALRMODE 17		Immed.Stop	
ALRMODE 18		Immed.Stop	
ALRMODE 19		Immed.Stop	
ALRMODE 20		Immed.Stop	
ALRMODE 21		Immed.Stop	
ALRMODE 22		Immed.Stop	
ALRMODE 23		Immed.Stop	
ALRMODE 24		Immed.Stop	
ALRMODE 25		Immed.Stop	
ALRMODE 26		Immed.Stop	
ALRMODE 27		Immed.Stop	
ALRMODE 28		Immed.Stop	
ALRMODE 29		Immed.Stop	
ALRMODE 30		Immed.Stop	
ALRMODE 31		Immed.Stop	
ALRMODE 32		Immed.Stop	
ALRMODE 33		Immed.Stop	
ALRMODE 34		Immed.Stop	
ALRMODE 35		Immed.Stop	
ALRMODE 36		Immed.Stop	
ALRMODE 37		Immed.Stop	
ALRMODE 38		Immed.Stop	
ALRMODE 39		Immed.Stop	
ALRMODE 40		Immed.Stop	
ALRMODE 41		Immed.Stop	
ALRMODE 42		Immed.Stop	
ALRMODE 43		Immediate	
ALRMODE 44		Timed Stop	
ALRMODE 45		Timed Stop	
ALRMODE 46		Timed Stop	
ALRMODE 47		Timed Stop	
ALRMODE 48		Timed Stop	
ALRMODE 49		Ignore	
ALRMODE 50		Immed.Stop	
ALRMODE 51		Timed Stop	
ALRMODE 52		Immed.Stop	
ALRMODE 53		Timed Stop	
ALRMODE 54		Timed Stop	
ALRMODE 55		Timed Stop	
ALRMODE 56		Timed Stop	
ALRMODE 57		Timed Stop	
ALRMODE 58		Immediate	
ALRMODE 59		Immed.Stop	



K - Tron (Schweiz) AG
 Industrie Lenzhard
 CH - 5702 Niederlenz

English ▼

PROGRAMMING KCM-LWF

Customer: **LEISTRITZ EXTRUSIONSTECH. G**

Comm No: **1401237**

Feeder:	M01	Tag No.:	M352970
Date:	03.06.2014	Programming date:	

Menu/Address	progr.	progr.
ALRMODE 60		Immed.Stop
ALRMODE 61		Immed.Stop
ALRMODE 62		Timed
ALRMODE 63		Immediate
ALRMODE 64		Immed.Stop
REFILL		
REFILL		Disable
REFILL MAX		1.50
REFILL MIN		0.50
POST REF DELAY		10.00
REFILLMODE		Auto
FLT CLEAR TM		1000.00
TUNING		
DISPLAY FILTER		30.00
CTRL GAIN		30.00
ADAPTIVE TUNE		On
ADAPTIVE GAIN		100.00
SAMPLE TIME		1040.00
SFT CUTOFF		0.24
PERT VALUE		0.19
SETP CHG LIM		10.00
SPEED MODULAT.		Off
SCALE		
SCALE		
TARE		83.5245
SPAN		1.0000
NET WEIGHT		0.0016
GROSS WT		83.5261
SCALE RANGE		120.0000
SFT		
SFT REQUIRED		1.00
SFT ADDRESSED 1		On
SFT WEIGHT 1		0.0000
SFT TYPE 1		120
SFT# 1		S9700-20080-V
SFT SN# 1		11315778
SFT ADDRESSED 2		Off
SFT WEIGHT 2		0.0000
SFT TYPE 2		0
SFT# 2		0.00
SFT SN# 2		0
SFT ADDRESSED 3		Off
SFT WEIGHT 3		0.0000
SFT TYPE 3		0
SFT# 3		0.00
SFT SN# 3		0



K - Tron (Schweiz) AG
 Industrie Lenzhard
 CH - 5702 Niederlenz

English ▼

PROGRAMMING KCM-LWF

Customer: LEISTRITZ EXTRUSIONSTECH. G

Comm No: 1401237

Feeder:	M01	Tag No.:	M352970
Date:	03.06.2014	Programming date:	

Menu/Address		progr.	progr.
MACHINE SETUP			
GENERAL			
SETPOINT MODE		Local	
MAX SETPT.		90.0000	
UNITS		0.0000	
FDR ADDR		1	
APPLICATION		LWF	
ICON		SuspScrew	
MOTOR			
GEAR REDUC.		15.580	
GEAR REDUC.LO		5.00	
PICKUP TEETH		120	
ACTUAL POWER		#NV	
MAX MOT POWER		450	
MAX MOT SPEED		2000	
MAX MOT VOLTAGE		200	
DC CEILING		110	
VIBRATORY			
KV DEVICE		2	
VIB SPAN		1	
SERVICE SETUP			



K - Tron (Schweiz) AG
 Industrie Lenzhard
 CH - 5702 Niederlenz

English ▼

PROGRAMMING KCM-LWF

Customer: LEISTRITZ EXTRUSIONSTECH. G

Comm No: 1401237

Feeder:	M01	Tag No.:	M352970
Date:	03.06.2014	Programming date:	

Menu/Address		progr.	progr.
I/O SETUP			
DIGITAL INPUT			
FUNCTION 1		Start	
FUNCTION 2		Stop	
FUNCTION 3		ALS Input	
FUNCTION 4		None	
FUNCTION 5		Start	
FUNCTION 6		Stop	
FUNCTION 7		None	
FUNCTION 8		None	
FUNCTION 9		None	
FUNCTION 10		None	
FUNCTION 11		None	
FUNCTION 12		None	
FUNCTION 13		None	
FUNCTION 14		None	
FUNCTION 15		None	
FUNCTION 16		None	
POLARITY 1		Normal	
POLARITY 2		Normal	
POLARITY 3		Normal	
POLARITY 4		Normal	
POLARITY 5		Normal	
POLARITY 6		Normal	
POLARITY 7		Normal	
POLARITY 8		Normal	
POLARITY 9		Normal	
POLARITY 10		Normal	
POLARITY 11		Normal	
POLARITY 12		Normal	
POLARITY 13		Normal	
POLARITY 14		Normal	
POLARITY 15		Normal	
POLARITY 16		Normal	
DIGITAL OUTPUT			
FUNCTION 1		Run	
FUNCTION 2		Alr Relay	
FUNCTION 3		ALS Out	
FUNCTION 4		Drive ena	
FUNCTION 5		Drive ena	
FUNCTION 6		Refill	
FUNCTION 7		Alr Relay	
FUNCTION 8		None	
FUNCTION 9		None	
FUNCTION 10		None	
FUNCTION 11		None	
FUNCTION 12		None	
FUNCTION 13		None	
FUNCTION 14		None	
FUNCTION 15		None	
FUNCTION 16		None	



K - Tron (Schweiz) AG
 Industrie Lenzhard
 CH - 5702 Niederlenz

English ▼

PROGRAMMING KCM-LWF

Customer: **LEISTRITZ EXTRUSIONSTECH. G**

Comm No: **1401237**

Feeder:	M01	Tag No.:	M352970
Date:	03.06.2014	Programming date:	

Menu/Address	progr.	progr.
SETPOINT INPUT		
SOURCE	CPU Analog	
AIN MIN	20.000	
AIN MAX	100.000	
DEADBAND	0.000	
ANALOG OUTPUT		
FUNCTION CPU	Massflow	
AOUTMIN CPU	20	
AOUTMAX CPU	100	
DEADBAND CPU	0	
FUNCTION Ext1	None	
AOUTMIN Ext1	0	
AOUTMAX Ext1	100	
DEADBAND Ext1	0	
FUNCTION Ext2	None	
AOUTMIN Ext2	0	
AOUTMAX Ext2	100	
DEADBAND Ext2	0	
FUNCTION Ext3	None	
AOUTMIN Ext3	0	
AOUTMAX Ext3	100	
DEADBAND Ext3	0	
MODBUS I/O		
ADDR. 80	None	
ADDR. 81	None	
ADDR. 82	None	
ADDR. 83	None	
DETAILS		
TYPE SEL 80	Anlg In	
I/O POINT 1 80	None	
I/O POINT 2 80	None	
I/O POINT 3 80	None	
I/O POINT 4 80	None	
I/O POINT 5 80	None	
I/O POINT 6 80	None	
I/O POINT 7 80	None	
I/O POINT 8 80	None	
LOADER		
LOADER FUNCTION	None	
MAX LOAD TIME	30	
SHUTDOWN TIME	5	
DISCHARGE TIME	10	
VALVE CLOSE TIME	5	



K - Tron (Schweiz) AG
 Industrie Lenzhard
 CH - 5702 Niederlenz

English ▼

PROGRAMMING KCM-LWF

Customer: **LEISTRITZ EXTRUSIONSTECH. G**

Comm No: **1401237**

Feeder:	M01	Tag No.:	M352970
Date:	03.06.2014	Programming date:	

Menu/Address	progr.	progr.
HCU LOADER		
COMMAND	None	
LDR CYCLE	0	
LDR TIME	0	
STATUS	0	
PARAM NAME	----	
PARAM VALUE	0	
SYSTEM		
COMMUNICATION		
HOST PROT	ProfinetIO	
HOST FILE	Small	
KPORT1	KSU	
BAUD RATE	19200	
KPORT2	KSU	
BAUD RATE	38400	
CONFIG MODE	KMB	
BAUD RATE	19200	
SW VERSIONS		
SW #	20207	
CPUHWREV	-0000025151-C	
SFT#	S9700-20080-V	
#NV		
PARAMETER BACKUP		
PASSWORD		
ACTION		
SP		
SP ACCESS	RD/WR	
TOTAL KEY	Clr.Only	
VOL & ALR CLR	Ena	
FDR BEING VIEWED	Hide	
PRODUCT CHANGE	RD/WR	
CALIBRATION	RD/WR	
ALARMS	RD/WR	
TUNING	RD/WR	
REFILL	RD/WR	
SCALE	RD/WR	
MACHINE SETUP	RD/WR	
I/O SETUP	RD/WR	
LOADER	Hide	
HCU LOADER	RD/WR	
SYSTEM	RD/WR	
SP	RD/WR	



K - Tron (Schweiz) AG
 Industrie Lenzhard
 CH - 5702 Niederlenz

English ▼

PROGRAMMING KCM-LWF

Customer: LEISTRITZ EXTRUSIONSTECH. G

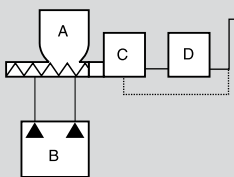
Comm No: 1401237

Feeder:	M01	Tag No.:	M352970
Date:	03.06.2014	Programming date:	

Menu/Address		progr.	progr.																								
<p>Legende: Programming before start up / muss programmiert werden vor Inbetriebnahme / Programming avant mise en Service.</p> <table border="0"> <tr> <td>1) Max setpoint / Max Sollwert / Consigne maximum</td> <td>according needs:>0</td> <td></td> <td></td> </tr> <tr> <td>2) Tare / Tara / Tare</td> <td>Execute taring of scale and compare value with the "Weight Test Certificate"</td> <td></td> <td></td> </tr> <tr> <td>3) Span / Steilheit / Correction</td> <td>see "Weight Test Certificate"</td> <td></td> <td></td> </tr> <tr> <td>4) Scale range / Kapazitaet / Portée balance</td> <td>see "Weight Test Certificate"</td> <td></td> <td></td> </tr> <tr> <td>5) SFT required / Anzahl Messdosen / Nbre SFT</td> <td>see "Weight Test Certificate"</td> <td></td> <td></td> </tr> <tr> <td>6) Fd. Fact. Init / Start Faktor / Facteur de dosage Initial</td> <td>Execute FF calibration</td> <td></td> <td></td> </tr> </table>				1) Max setpoint / Max Sollwert / Consigne maximum	according needs:>0			2) Tare / Tara / Tare	Execute taring of scale and compare value with the "Weight Test Certificate"			3) Span / Steilheit / Correction	see "Weight Test Certificate"			4) Scale range / Kapazitaet / Portée balance	see "Weight Test Certificate"			5) SFT required / Anzahl Messdosen / Nbre SFT	see "Weight Test Certificate"			6) Fd. Fact. Init / Start Faktor / Facteur de dosage Initial	Execute FF calibration		
1) Max setpoint / Max Sollwert / Consigne maximum	according needs:>0																										
2) Tare / Tara / Tare	Execute taring of scale and compare value with the "Weight Test Certificate"																										
3) Span / Steilheit / Correction	see "Weight Test Certificate"																										
4) Scale range / Kapazitaet / Portée balance	see "Weight Test Certificate"																										
5) SFT required / Anzahl Messdosen / Nbre SFT	see "Weight Test Certificate"																										
6) Fd. Fact. Init / Start Faktor / Facteur de dosage Initial	Execute FF calibration																										

Coperion K-Tron Product Specification Twin Screw Loss-in-Weight Pharma Feeder

K-PH-ML-D5-KT35



Ext. communication to Host System

- A Feeder
- B Weighing System
- C Control Module
- D Operator Interface

Each COPERION K-TRON weigh feeder consists of the components A, B, C and D.

Component A is specified here.

Application

Gravimetric feeding of free flowing to very poorly flowing powders (e.g. lumpy, moist or bridge building materials) as well as fibers, especially in pharma applications. The weigh bridge is a sanitary version and therefore suitable where quick and easy cleaning is essential.

Design

Modular twin-shaft feeder mounted on a weigh bridge. A great variety of feeder screws allows accommodation of various bulk materials. All parts in contact with the material being fed, are stainless steel. The modular components are held together by V-clamps. The horizontal agitator gently moves bulk material to the large throat and then into the discharge screws. It is removable without tools. The horizontal agitator speed totals 17% of the screw speed. This equipment conforms to CE standards regarding EMC and safety.

Controller: (see separate data sheets)

The SmartConnex® control system allows individual or multi-component control. Each feeder has its own control module. Connection between feeders, operator interface and smart I/O is via an industrial network. A variety of protocols is available for connection to the plant's host system.

Hazardous Location Options: (see sheet I-000002)

- NEC Class II, Div. 2, Groups F & G / Class II, Div. 1, Groups F & G
- Class I, Div. 2, Groups C & D / Class I, Div. 1, Groups C & D
- ATEX 3D/3D, 3D/2D (outside/inside)

Feeder Screws and Feed Rates

Actual feeder screws will be determined by the material being fed. Speed range (rpm) and the type of gear are determined by the feed rate. Feeder screws are easily interchangeable.

Pitch	Type of drive	Twin concave screws		Twin auger screws		Speed range	Gearbox type
		dm ³ /h	ft ³ /h	dm ³ /h	ft ³ /h		
coarse	⊖	20 - 1450	0.7 - 51.2	21 - 1506	0.7 - 53.2	RPM	A
		10 - 695	0.4 - 24.5	10 - 721	0.4 - 25.5	7 - 558	B
		4 - 300	0.14 - 11	4 - 312	0.14 - 11	4 - 267	C
	⊕	129 - 1772	4.6 - 62.6	134 - 1840	4.7 - 65	50 - 682	A
		62 - 849	2.2 - 30	64 - 882	2.3 - 31	24 - 327	B
		27 - 367	1 - 13	28 - 381	1 - 13.5	10 - 141	C
fine	⊖	7 - 502	0.3 - 17.7	7.4 - 530	0.3 - 18.7	RPM	A
		3.3 - 240	0.11 - 8.5	3.5 - 254	0.12 - 9	7 - 558	B
		1.4 - 104	0.05 - 3.7	1.5 - 110	0.05 - 3.9	4 - 267	C
	⊕	45 - 613	1.6 - 21.6	47 - 647	1.7 - 22.8	50 - 682	A
		21 - 294	0.74 - 10	23 - 310	0.8 - 10.9	24 - 327	B
		9.2 - 127	0.33 - 4.5	9.8 - 134	0.35 - 4.7	10 - 141	C



Max. feed rates are based on a max. motor speed of 2000 RPM with DC-motor. The feed rate indications are approximate values. The gravimetric feed rate can be calculated from the bulk density.

Configuration

Description	Data	Remarks	Weight kg (lb)
Vertical agitator (option)	3x400/230V 0.18/0.25kW	4D(80dm ³ ,2.83ft ³) 6D(110dm ³ ,3.9ft ³)	25 (55) 36 (79)
Cover		4D 6D	2 (4) 3 (7)
Base hopper		see table below	
Horizontal agitator			0.3 (0.7)
Trough	5 dm ³ (0.18 ft ³)		2 (4)
Housing			7 (15)
Gear box			6 (13)
Motor drive	200 V = 0.45 kW IP 55 400/230 V ~ 0.55 kW IP 55	standard: 0.45kW	12 (26)
Screws			0.8 (2)
Outlet	Horiz. outlet Vertical outlet Pressure compensation		4 (9)
Stand			3 (7)
Weigh bridge	60 kg 120 kg 200 kg	Gross weight feeder capacity	

Materials:

Material contact parts: Stainless steel
 DIN 1.4404, 1.4435 (AISI 316L)

Seals: Food-Quality
 Painting: Light grey RAL 7035

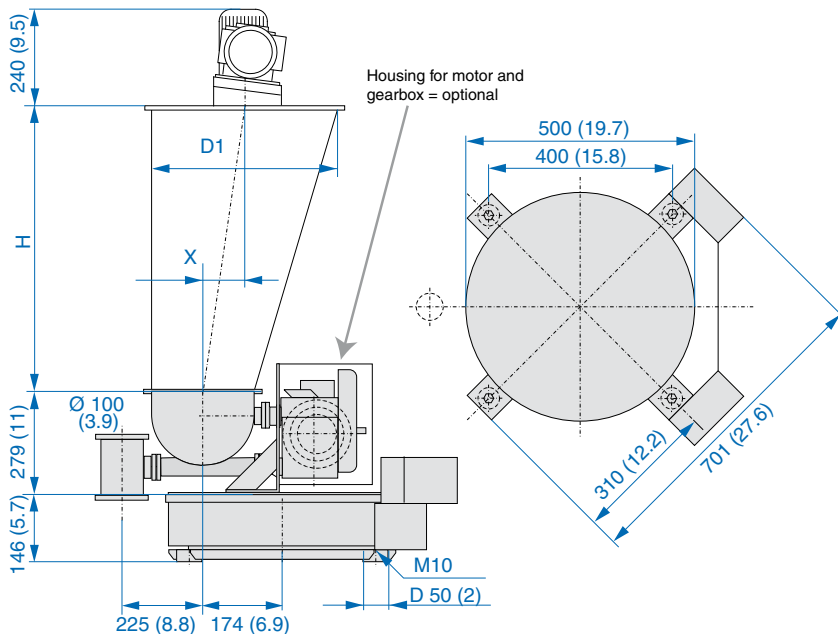
Weighing Range:

Gross weighbridge capacity (60, 120 or 200 kg) less total feeder weight.

Temperature-Limits:

Ambient: 0 to 40.5 °C / 32 to 105 °F
 Material: standard: -20 to 55 °C / -4 to 130 °F
 -20 to 150 °C / -4 to 300 °F

Dimensions [mm(in)]



Asymmetrical Hoppers

Volume dm ³ (ft ³)	H mm (in)	D1 mm (in)	Weight kg (lb)
50 (1.8)	615 (24.2)	400 (15.7)	7 (15.4)
80 (2.8)	869 (34.2)	400 (15.7)	11 (24.2)
110 (3.9)	922 (36.3)	600 (23.6)	17 (37.4)

Symmetrical Hoppers

Volume dm ³ (ft ³)	H mm (in)	D1 mm (in)	Weight kg (lb)
10 (0.35)	283 (11)	220 (8.7)	3 (6.6)
20 (0.71)	566 (22.3)	220 (8.7)	6 (13.2)
80 (2.8)	727 (28.6)	400 (15.7)	11 (24.6)

Caution: these measurements are for general reference only. Please consult dimensional drawing for exact measurements

Chapter 3:

Feeder

- K-PH-ML-D5-KT35 ATEX

0990005602

OPERATING AND MAINTENANCE INSTRUCTIONS

K-PH-ML-D5-KT35



Read this document prior to operating the device.
This document contains all safety and warning notes.
Original operating instructions

0990005602-EN Rev. 1.1.0

Service

If you need assistance, please call your local service centre or

Coperion K-TRON Schweiz GmbH Tel. 0041 (0) 62 / 885 71 71
Lenzhardweg 43/45 Fax 0041 (0) 62 / 885 71 80
CH-5702 Niederlenz

Coperion K-Tron Pitman, Inc. Tel. 001 (0) 856 / 589 0500
590 Woodbury Glassboro Road Fax 001 (0) 856 / 589 81 13
Sewell, New Jersey 08080 USA

Coperion K-TRON Salina Tel. 001 (0) 785 / 825 16 11
606 N. Front St. Fax 001 (0) 785 / 825 8759
Salina, KS 67402-0017

Web: www.coperionktron.com

Before you call...

- ⇒ Do you have alarm displays? Are you able to eliminate the causes?
- ⇒ Have you modified part of the system, product or operating mode?
- ⇒ Have you tried to remedy the fault in accordance with the operating instructions?
- ⇒ Note the project or order number You will find these on the machine or in the system manual.
 - Example: 0403214

Using the manual:

- ⇒ This arrow identifies an individual action.
- 1. Numbers identify a sequence of actions which have to be executed step-by-step.
- ▲ This symbol identifies a general safety note.



Reference to another manual.



Important information.



This symbol indicates that tools are required for the following task.



Specifies where information or a situation must be checked.

If an error or omission is found, please contact:

documentation@coperionktron.com

Doc. No.: 0990005602-EN

Date: 2014/Feb/07

Original: 0990005602-EN

Coperion K-Tron assumes no responsibility for damages resulting from misuse of any equipment or negligence on the part of operating personnel. Further, you may kindly refer to the purchase order, confirmation or other document that contains the express Coperion K-Tron warranty disclaimer limiting or excluding certain warranties with respect to the company's equipment. Except as otherwise expressly provided by Coperion K-Tron in any such document, COPERION K-TRON MAKES NO WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, NOR ANY OTHER WARRANTY, EXPRESS OR IMPLIED, WITH RESPECT TO THE EQUIPMENT.

Table of contents

1	Safety notes	7
1.1	Safety symbols definitions	7
1.1.1	Electrical Hazard Icon	8
1.1.2	Ground Icon	8
1.1.3	No Hands Icon	8
1.1.4	Power Icon	8
1.1.5	EX-protection	8
1.2	Responsibilities of the owner	9
1.3	Proper use	9
1.4	Organizational measures	10
1.5	Safety-conscious work	10
1.6	Safety devices	10
1.7	High voltage	11
1.8	Additional equipment	11
1.9	Customer service and repairs	11
1.10	Shut-down procedure	11
2	Assembly and function	12
2.1	Function	12
2.2	Structure	12
2.3	Feed screw types and applications	13
2.3.1	Twin screw sizes and throughput	14
2.4	Gearing reduction	14
2.5	Safety devices and warnings	15
2.5.1	Safety devices	15
2.5.2	Warnings	16
3	Technical Data	17
4	Installation	18
4.1	Unpacking	19
4.2	Notes on transportation	19
4.3	Mounting the feeder	20
4.4	Oil ventilation plug	20
4.5	Connecting the feeder	21
4.6	Taking the feeder into operation	22
4.7	Notes on storage	22
5	Operation	23
5.1	Notes on operation	23
5.2	Switching on/off	23

6	Cleaning	24
6.1	Switching off machine before maintenance	24
6.2	Cleaning advises	24
6.2.1	Cleaning the outside	25
6.2.2	Cleaning the inside	25
6.2.3	Preparation for cleaning	25
6.2.4	Dismantle feeder	25
6.2.5	Cleaning with parts removal	25
6.2.6	Check after assembly	26
6.3	Replacing the filter	27
6.3.1	Filter dismantle	27
6.3.2	Filter cleaning	27
6.3.3	Filter assembly	27
6.4	Replacing the vertical agitator	28
6.4.1	Vertical agitator dismantle	28
6.4.2	Vertical agitator cleaning	28
6.4.3	Vertical agitator assembly	28
6.5	Replacing the hopper	29
6.5.1	Hopper dismantle	29
6.5.2	Hopper cleaning	29
6.5.3	Hopper assembly	29
6.6	Replacing the outlet tube	30
6.6.1	Outlet tube dismantle	30
6.6.2	Outlet tube cleaning	30
6.6.3	Outlet tube assembly	30
6.7	Replacing the feed screws	31
6.7.1	Feed screws dismantle	31
6.7.2	Feed screws cleaning	31
6.7.3	Feed screws assembly	32
6.8	Replacing the horizontal agitator	33
6.8.1	Agitator dismantle	33
6.8.2	Agitator cleaning	33
6.8.3	Agitator assembly	34
6.9	Replacing the agitator hopper	35
6.9.1	Agitator hopper dismantle	35
6.9.2	Agitator hopper cleaning	36
6.9.3	Agitator hopper assembly	36
7	Maintenance	37
7.1	Maintenance Intervals	37
7.2	Replacing seals	38
7.2.1	Removing seals	38
7.2.2	Dismantle screw seal	38
7.2.3	Dismantle agitator seal	38
7.2.4	Structure screw seal	38
7.2.5	Structure agitator seal bushing	39
7.2.6	Assembly seals	39
7.2.7	Assembly screw seals	39

7.2.8	Assembly agitator seals	40
7.3	Replacing the drive motor	41
7.3.1	Removing the motor	41
7.3.2	Installing the motor	42
7.3.3	Check the motor	42
7.4	Replacing the tachometer	43
7.4.1	Removing the tachometer	43
7.4.2	Installing the tachometer	44
7.5	Lubrication	45
7.5.1	Oil level inspection	45
7.5.2	Oil change	45
8	Troubleshooting	46
8.1	Troubleshooting table	46
9	Explosion-proof feeders	47
9.1	Safety notes	47
9.1.1	General	47
9.1.2	Operation of the device in accordance with ATEX	47
9.1.3	Standards and directives	47
9.2	Area of use in an explosive atmosphere)	48
9.2.1	Explosion proof marking	48
9.2.2	Zones and device categories (gas)	48
9.2.3	Zones and device categories (dust)	48
9.2.4	Dust deposits and glow temperature	49
9.3	Device categories within and outside the feeder	50
9.4	Protection through housing (IP degree of protection)	50

1 Safety notes



In case of feeders which are used in hazardous areas also observe the safety notes and information for explosion-proof feeders (see Section 9).

Installation, commissioning and programming of the specified equipment should only be undertaken by qualified personnel.

1.1 Safety symbols definitions



▲ The safety alert symbol is used to alert to the potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.

CAUTION

▲ CAUTION indicates a potentially hazardous situation which, if not avoided, may result in property damage.

▲ CAUTION

▲ CAUTION with safety alert indicates a potentially hazardous situation which, if not avoided, could lead to light bodily injuries.

▲ WARNING

▲ WARNING indicates a potentially hazardous situation which, if not avoided, could lead to heavy bodily injury or to death.

▲ DANGER

▲ DANGER indicates a extremely hazardous situation which, if not avoided, could lead to heavy bodily injury or to death.

1.1.1 Electrical Hazard Icon



This sign indicates an electrical hazard.

1.1.2 Ground Icon



This sign indicates that a ground/PE connection is required.

1.1.3 No Hands Icon



Do not place hands or other body parts into moving parts or machine.

1.1.4 Power Icon



Power off and disconnect air supply before working on the equipment.

1.1.5 EX-protection



Important information to explosion protection.

1.2 Responsibilities of the owner



- ▲ Ensure that only qualified and trained personnel work with the feeder.
 - ▲ Establish personnel responsibilities for operation and maintenance.
 - ▲ Ensure that the personnel has read and understood the operating instructions to all installation components, particularly this chapter "Safety notes".
 - ▲ Strictly follow the operating and maintenance instructions.
 - ▲ The plant owner must replace immediately damaged or missing components.
 - ▲ The operator has to avoid the entry of foreign substances reaching the feeder (metal parts, stones) by appropriate methods.
 - ▲ The plant owner is responsible for compliance with legally prescribed accident prevention and safety regulations.
-

1.3 Proper use



Feeder provides precise volumetric and gravimetric feeding of free flowing material and liquids

- ▲ Use feeders only as stationary equipment.
 - ▲ Only operate the feeder in conjunction with the appropriate control and drive equipment from Coperion K-Tron (Switzerland) LLC.
 - ▲ Only operate the feeder in accordance with the specified technical data.
 - ▲ When processing dangerous materials, also comply with the safety notes which govern the handling of such materials.
 - ▲ Any modifications and changes on safety devices are prohibited
 - ▲ Do not use the equipment in a manner not intended by the manufacturer.
 - ▲ Never use feeder to process materials which may cause a chemical reaction with the materials of the feeding units.
 - ▲ Not suitable for mixing or crushing bulk material.
-

1.4 Organizational measures



- ▲ Always keep the operating instructions near the feeder, within easy reach. Ensure that they are always complete and legible.
 - ▲ Observe the safety notes for the connected control devices.
 - ▲ In addition to the operating instructions, always comply with generally prescribed safety regulations governing accident prevention and environmental safety.
-

1.5 Safety-conscious work



- ▲ Read the operating instructions, in particular these safety notes, and follow these instructions.
 - ▲ Ensure that only authorized personnel enter the working and danger area of the feeder.
 - ▲ Any changes (including changes in the operational behavior) which affect safety must be immediately reported to the responsible member of the staff.
 - ▲ Always keep safety in mind while working.
 - ▲ Before working on the feeder always switch the feeding equipment off at the main power switch.
-

1.6 Safety devices



- ▲ Operating the feeder without safety devices
 - is dangerous for the health and life of the operator or third persons
 - can damage the feeding units or other material
 - ▲ Never alter the mechanical safety devices or the electrical control system for the safety devices. Increased risk of accident.
 - ▲ Only operate the feeder if all safety devices are installed and fully functional.
 - ▲ Check that all safety devices operate properly every day.
 - ▲ Never open or remove covers or hoods while the equipment is in operation.
 - ▲ Never operate the feeder when the housing is open.
 - ▲ Do not modify the electrical safety devices, for example fuses. Increased risk of accident.
 - ▲ Only use the specified fuse types when replacing fuses.
 - ▲ Replace damaged cable joints and connections immediately.
-

1.7 High voltage

 **DANGER**

- ▲ Only qualified electricians may work on the electrical equipment of the feeder.
- ▲ High voltage occurs at the motor connections.
- ▲ After switching off the main power supply there are still some internal electrical components of the motor drive carrying high voltage which discharges slowly.
- ▲ Protect electrical parts of the feeder against humidity.

1.8 Additional equipment



- ▲ Modifications to the feeding equipment are prohibited.
- ▲ The operator is responsible for complying with all safety regulations related to interact with any additional equipment, e.g. refilling units.

1.9 Customer service and repairs



- ▲ Have repairs to the feeder carried out by
 - by the responsible Coperion K-Tron (Switzerland) LLC customer service (customer service address is found on the project manual – or –
 - by specialized personnel trained by Coperion K-Tron (Switzerland) LLC.
- ▲ Only use original Coperion K-Tron (Switzerland) LLC parts.

1.10 Shut-down procedure

 **CAUTION**

- ▲ The operator is responsible for the proper removal and disposal of the feeding equipment from service.

2 Assembly and function

2.1 Function

Method of operation

The feeder is part of a feeding equipment. The minimum configuration of the equipment consists of a feeder, scale, controller and motor control unit.

The feed material (Bulk material) is transported from the refill system to the hopper onto the feed screws. A motor drives the feed screws and the horizontal agitator (screw filler). The feed screws transport the bulk material outwards in a constant flow. The feed rate is controlled by the controller via the speed of the motor and the gearing reduction.

- A vertical agitator with separate motor drive prevents bridging in the hopper.

Field of application

Feeding of bulk materials which flow easily to heavily. Different feed screws are available. The feeding tools can be exchanged rapidly

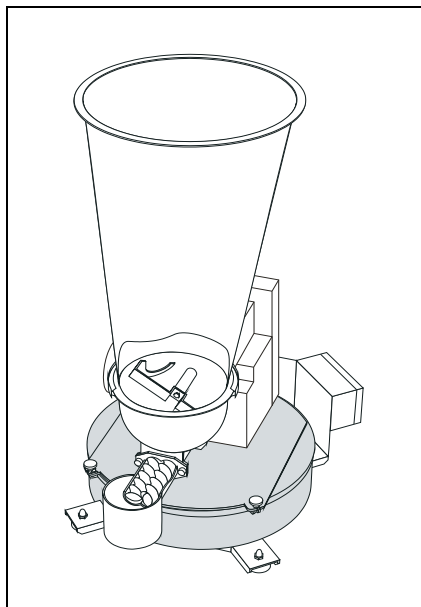


Fig. 2.1 Feeder

2.2 Structure

- (1) Hopper lid
- (2) Seal
- (3) Hopper
- (4) Gearbox for agitator and feed screw
- (5) Agitator hopper
- (6) Outlet tube
- (7) Feeding screws
- (8) Horizontal agitator
- (9) V-clamp
- (10) Motor
- (11) V-clamp
- (12) Motor vertical agitator
- (13) Vertical agitator
- (14) D5-Scale

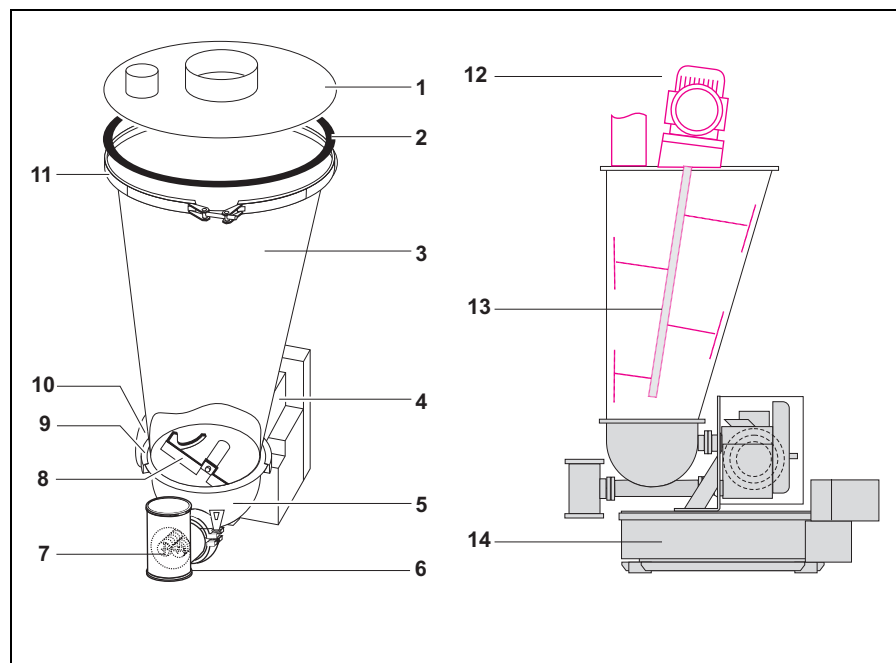
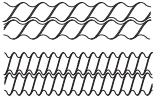
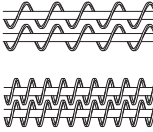
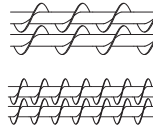
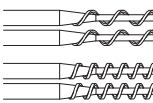


Fig. 2.2 Overall view

2.3 Feed screw types and applications

Screw Type	Shape	Code	Application
Twin concave coarse Twin concave fine		TCC TCF	Floodable and mildly cohesive powder. Low friction when compresses.
Twin spiral coarse Twin spiral fine		TSC TSF	Free flowing and non- free flowing powders, hygroscopic materials, flakes. Used only in special cases.
Twin auger coarse Twin auger fine		TAC TAF	Free flowing and compacting, sticky powders. Hygroscopic materials, flakes.
Double spiral coarse Double spiral fine		DSC DSF	Very free flowing, free flowing, dusty. hygroscopic Flakes, Pellets, Granules.

i

- Twin and double screws are used in pairs.
- Extended length screws and ones with outboard support bearings are available.
- Nominal twin screw diameters are roughly the model size. e.g. T35 has 35 mm diameter screw sets.
- Double screw flights do not intermesh, twin screws flights intermesh.

1. Concave screw
2. On concave screws measure two flights see pitch on (Section 2.3.1)

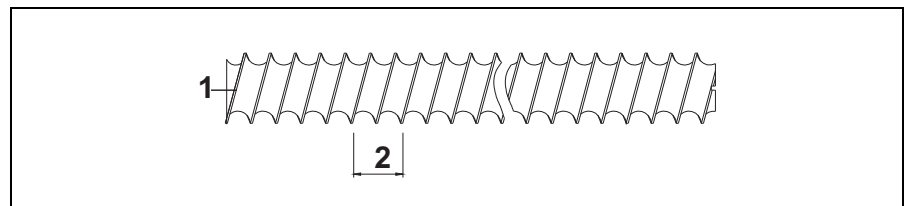


Fig. 2.3 Screw dimensions

2.3.1 Twin screw sizes and throughput

i Capacity is nominal. The properties of the bulk material being fed may result in a different capacity than that shown.

Screw type	Nominal Dia mm	Capacity dm ³ /u	Pitch mm/inch
T35 double concave coarse	35	0.043	50 / 1.96
T35 double concave fine	35	0.019	25 / 0.98
T35 double auger coarse	35	0.067	50 / 1.96
T35 double auger fine	35	0.030	25 / 0.98
T35 double spiral coarse	35	0.039	40 / 1.57
T35 double spiral fine	35	0.022	20 / 0.79
T35 twin spiral coarse	35	0.003	40 / 1.57
T35 twin spiral fine	35	0.019	20 / 0.79

2.4 Gearing reduction

The feeders gearing reduction is controlled by changing gear box.

Feeder Type	Gear	Gearing reduction (at a motor speed of 2000 RPM)
K-PH..KT35	A	3,228 : 1 to 619 U/min
	B	6,7368 : 1 to 296 U/min
	C	15,5789 : 1 to 128 U/min
	D	1,9646 : 1 to 1020 U/min

2.5 Safety devices and warnings



- ▲ Operate the feeding device only with the installed safety devices.
- ▲ Replace damaged or missing safety devices on the feeder.

2.5.1 Safety devices

Following devices are compellingly defined as safety devices:

- Filter bag on the hopper ventilation nozzle (7)
- Connected refilling unit with bellow (1)
- Hopper lid (6)
- Hopper (2)
- Agitator hopper (3)
- Outlet tube (4)

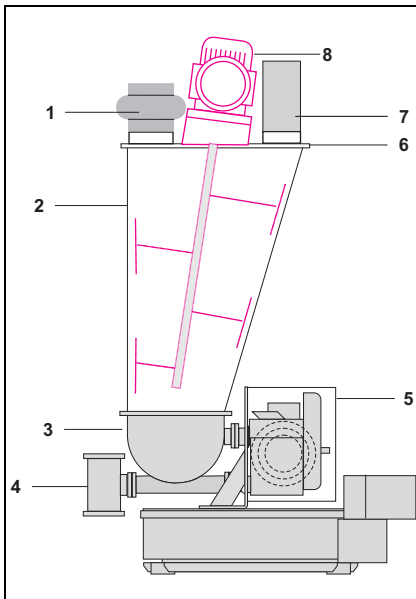


Fig. 2.4 Safety devices

2.5.2 Warnings



The warning shown in is applied to the following positions:

- At the agitator hopper (see [Fig. 2.4/3](#))
- At the outlet tube (see [Fig. 2.4/4](#))
- At the hopper (see [Fig. 2.4/2](#))



- ▲ Do not reach into the rotating screws or agitator.



The warning shown in is applied to the following positions :

- At the vertical agitator (see [Fig. 2.4/8](#))
- At the drive unit cover (see [Fig. 2.4/5](#))





When carrying out maintenance or cleaning work on the switched-off feeder there is a danger of injury through unintentional switching-on.

- ▲ Switch off the feeding system before carrying out maintenance work on the feeder and secure it against unintentional restarting (see section [7.1](#)).

3 Technical Data



In case of feeders which are used in hazardous areas also observe the safety notes and information for explosion-proof feeders (see Section 9).

Manufacturer	Coperion K-Tron (Switzerland) LLC
Name	K-PH-ML-D5-KT35
Marking	  for detailed marking see declaration of conformity
Operating temperature range	see identification plate, see declaration of conformity
Temperature range of conveyed product	see declaration of conformity
Gear box filling	Type Shell Cassida GL 150 or comparable Content: 0,65 l
Lubrication	Grease for seals, o-rings and shafts Shell Cassida GL
Noise	<70 dB (A)
Operating temperature range	0° to 40° C (32° to 104° F) see declaration of conformity
Temperature range of conveyed product	-20° to 55° C (-4° to 130° F) see declaration of conformity
Cleaning Agents	Material contact parts Metal and seals : Water, ISOPROPANOL Filter bag : Water, detergent (no surfactant)

4 Installation



- ▲ Only have the feeder connected and commissioned by authorized personnel.
 - ▲ The feeder weighs over 25kg (55lbs). To lift the feeder use more than one person or with a crane or similar hoisting equipment.
-



- ▲ Only use explosion-proof feeders in hazardous areas.
 - ▲ Only install the feeders in environment that complies with the technical data (see chapter 3) and appropriate safety notes (see chapter 1) and which are used in hazardous areas (see chapter 9).
-

4.1 Unpacking

CAUTION

- ▲ Transport the feeder only with a crane or similar hoisting equipment.
- ▲ In order to avoid damage to the feeder only use bands with sufficient lifting capacity for the crane (for the weight of the feeder see the mechanical drawings).
- ▲ Only fasten the bands at the marked point (see Section 4.1).
- ▲ The transport bands must be sufficiently long to avoid too much strain to the band. The angle should be less than 60°.
- ▲ Remove the v-clamps and transport guard only after the feeder has been secured. The Feeder can overturn otherwise.

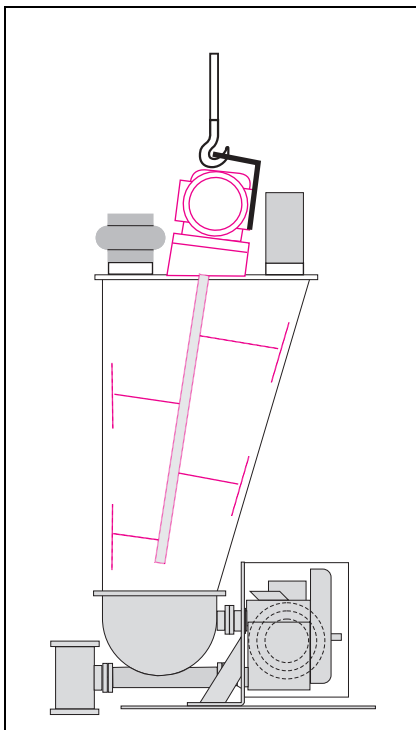


Fig. 4.1 Fastening

1. Only use bands with sufficient lifting capacity for the crane or similar hoisting equipment.
2. Fasten the bands at the marked point.
3. Ensure that the v-clamps are secured.
4. Remove the feeder carefully from the packaging.
5. Check whether the supplied goods are complete and check them for transport damage.
6. Report any damage immediately to Coperion K-Tron (Switzerland) LLC.

4.2 Notes on transportation

CAUTION

- ▲ For transportation or while working on the feeder the platform scale and load cell have to be protected against damage by using safety guards or completely separate them from the feeder.
- ▲ For transportation remove the feeder from the platform scale.
- ▲ Ensure that the v-clamps are secured.

4.3 Mounting the feeder

CAUTION

- ▲ Do not throw, hit or drop the scale.
- ▲ Do not drop any objects on to the scale.
- ▲ Do not turn the scale upside down more than 5 minutes. The possibly fitted oil shock absorber will leak and become unusable.
- ▲ Only hold and lift the scale at the bottom and handle carefully.

1. Select a level and vibration-free installation location (max. inclination for gravimetric feeder: 5 ‰ or 0.3°). Allow sufficient space for maintenance, calibration and inspection work.
2. Clean the installation location.



For information on the dimensions for feeders see the dimensional drawings in the project manual.

3. Securely mount the scale on to the mounting surface.
 4. Gently place feeder on to the scale and secure with the knurled screws.
- ⇒ Mount the hopper (if not already mounted) (see chapter 6.5).

4.4 Oil ventilation plug

CAUTION

- ▲ If the plastic screw plug is not replaced with the ventilation screw, the overpressure created during operation will push the gear seals out.

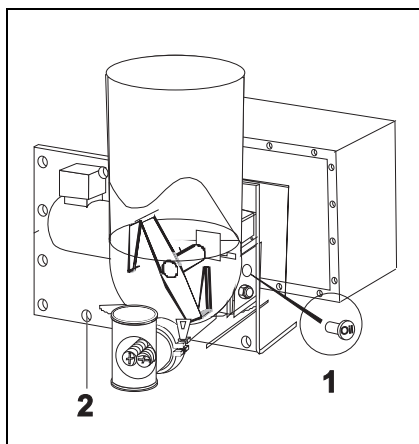


Fig. 4.2 Replace ventilation screw

1. Remove the gearing and motor cover (2, optional).
2. Remove the plastic screw plug (1).
3. Insert the supplied ventilation screw (marked "Oil").

4.5 Connecting the feeder

⚠ DANGER

Improper connection of the feeder can cause danger to life through electric shock.

- ▲ The feeder may only be connected by qualified electricians.
- ▲ Observe the local regulations.

1. Connect the feeder in accordance with the electrical wiring diagram.
2. Ground the feeder carefully.



Connect the ground connection to a low-impedance equipotential bonding ($\leq 0.1 \Omega$), see the grounding information on the feeder.



Provide a lockable main switch to disconnect the main power supply from the feeder.



Carefully follow all wiring and shielding procedures as indicated on the provided wiring diagrams and operating instructions of the controls.

4.6 Taking the feeder into operation



- ▲ Do not place any bulk materials into the feeder until correct screw rotation has been verified and the feed screws are securely locked on the drive shafts. Feed screws may become disengaged if the motor rotation is incorrect.

1. Before the first activation ensure that the agitator hopper and feed screw are free of objects such as screws, packaging rests, etc.
2. Switch on the feeder with the connected controls (see operating instructions).
3. Check the parameter according to the manual.



For more information see controller operating and programming instructions.



When the feeder is running the screws turn counterclockwise.

4.7 Notes on storage

1. Empty the feeder prior to shipment or storage and attach the MSDS data sheet describing the product last fed in the machine.
2. Dismantle the feeder from the scale.
3. Only transport the feeder with a crane or equivalent lifting gear (see Section 4.1).

5 Operation

5.1 Notes on operation



Risk of injury at the rotating agitator and at the rotating screws.

- ▲ Only operate the feeder with a hopper or a corresponding protective grating.
- ▲ Only operate the feeder with the outlet tube.
- ▲ Only switch on the feeder when the motor and gear drive covers are mounted.
- ▲ Do not reach into the hopper, agitator hopper or screw while the feeder is running.
- ▲ Do not bring hair, clothing and tools into the feeder.
- ▲ Never use the feeder to process materials which may cause a chemical reaction with the materials of the feeder, for example feed materials containing the following substances:
 - Acid
 - Iodine
 - Chromium
 - Bromium
- ▲ When feeding dangerous materials observe the safety notes applying for handling these materials.



Avoid vibrations and do not touch the feeder during operation with scales.

5.2 Switching on/off

- ⇒ Before switching on ensure that the agitator hopper and feed screw are free of objects such as screws, packaging rests, etc.
- ⇒ Switch on/off the feeder with the connected controls.



For more information see controller operating and programming instructions.

6 Cleaning

DANGER

When carrying out maintenance work on the switched-off feeder there is a danger on injury through unintentional switching-on.

- ▲ Switch off the feeding system before carrying out maintenance work on the feeder and secure it against unintentional restarting (Chap 6.1).

CAUTION

Aggressive and toxic cleaning agents damage the feeder and the represent an increased accident risk.

- ▲ Do not clean the feeder with corrosive cleaning agents.
- ▲ Use only safe cleaning agents and disinfectants in feeders used for foods.
- ▲ Ensure that no cleaning agent residues are left on the components which come into contact with the feed material, e.g. on hopper connections, discharge tube and disk.
- ▲ Clean in the area of the drive motor only with slight air stream.
- ▲ Do not clean the equipment with high-pressure devices.
- ▲ Avoid cleaning solutions with a ph greater than 8.5.
- ▲ Do not allow moisture to come in contact with electrical components.
- ▲ Wipe all surfaces dry before use.

6.1 Switching off machine before maintenance



1. Switch off the machine at the main switch.
2. Secure the main switch with a lock.
3. Attach a danger sign to the main switch or perform a lock-out, tag-out procedure.
4. Turn off compressed air for all the pneumatic devices.

6.2 Cleaning advises



- ⇒ Empty the feeder for cleaning.
- ⇒ Clean only with light air stream.
- ⇒ In case of external soiling, clean all the components of the feeder with a damp cloth and use normal industrial cleaners.
- ⇒ Clean with a vacuum cleaner or with a smooth brush.
- ⇒ Eliminate dust accumulation > 5 mm through cleaning.

6.2.1 Cleaning the outside

CAUTION

- ▲ By using from ISOPROPANOL or others cleaning agents follow the adequate safety instructions from the safety data sheet.

⇒ In case of external soiling, clean all the components of the feeder with a damp cloth and use normal industrial cleaners.

6.2.2 Cleaning the inside

CAUTION

Danger through sharp-edged agitator blades!

While disassembling without protecting gloves the agitator can cause cut wounds to the hands.

- s Always wear protecting gloves while working with the agitator.
- ▲ Heavy load. Lift the agitator only with a crane or similar hoisting equipment.
- ▲ Risk by overturn. Secure the feeder against overturn.

6.2.3 Preparation for cleaning

1. Empty the feeder.
2. Switch off the machine (see Section 7.1).

6.2.4 Dismantle feeder

In order to clean the feeder more thoroughly or in general wet cleaning, remove the following parts:

- ⇒ Filter (see section 6.3.1)
- ⇒ Hopper lid and vertical agitator (see section 6.4.1)
- ⇒ Hopper (see section 6.5.1)
- ⇒ Outlet tube (see section 6.6.1)
- ⇒ Feed screw (see Section 6.7.1)
- ⇒ Agitator (see section 6.8.1)
- ⇒ Agitator hopper (see section 6.9.1)

6.2.5 Cleaning with parts removal

After cleaning assemble the parts in following order:

- ⇒ Agitator hopper (see section 6.9.3)
- ⇒ Agitator (see section 6.8.3)
- ⇒ Feed screw (see Section 6.7.3)
- ⇒ Outlet tube (see section 6.6.3)
- ⇒ Hopper (see section 6.5.3)
- ⇒ Hopper lid and vertical agitator (see section 6.4.3)
- ⇒ Filter (see section 6.3.3)

6.2.6 Check after assembly

In order to check the correct installation let the feeder run without bulk material.



- ▲ Do not reach into the rotating feed screws or agitator.

6.3 Replacing the filter



▲ Cleaning agents with surfactant destroys the coating from the filter.

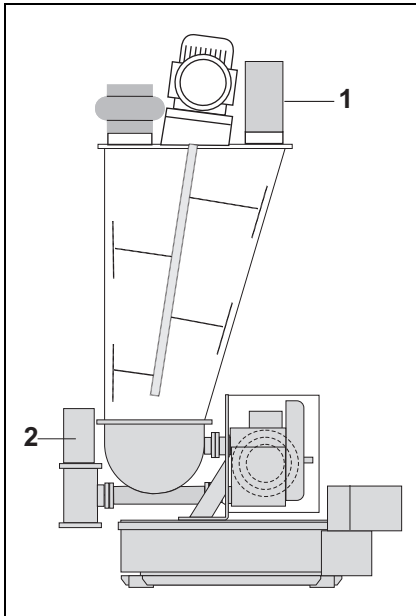


Fig. 6.1 Filter cleaning

6.3.1 Filter dismantle

The filters are consisting of a filter bag holder and the filter bag.

1. Dismantle the filter (1) from the hopper lid by loosening the clamping ring.
2. Dismantle the filter (2) from the outlet tube by loosening the clamping ring.

6.3.2 Filter cleaning

⇒ Specific cleaning agents or procedures are request by the vendor.

Cleaning with Water and detergent no surfactant):

Only put the filter bag together with filter bag holder in the washer. It is for a better flush of the filter bag.

After cleaning dry the parts.

6.3.3 Filter assembly

1. Check the parts before fitting for damage or wear and replace as necessary.
2. Mount the filter (1) on the hopper lid and fastening it with the clamping ring.
3. Mount the filter (2) on the outlet tube and fastening it with the clamping ring.

6.4 Replacing the vertical agitator



Danger through sharp-edged agitator blades!

While disassembling without protecting gloves the agitator can cause cut wounds to the hands.

- s Always wear protecting gloves while working with the agitator.
- ▲ Heavy load. Lift the agitator only with a crane or similar hoisting equipment.



13mm Allen wrench

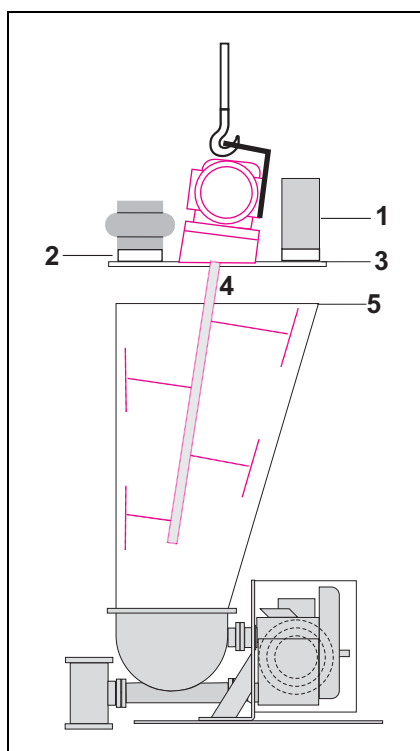


Fig. 6.2 Agitator replacement

6.4.1 Vertical agitator dismantle

1. Disconnect all the wires and air supplies.
2. Dismantle filter (1) and bellow (2) from hopper lid (3) (see section 6.3.1).
3. Loosening v-clamp at hopper lid.
4. Use the crane to lift the hopper lid together with the agitator.
 - By lack of space is it possible to lift the complete feeder or to lift the hopper together with the vertical agitator. Check for clamped connection from the v-clamp.
5. Remove seal (5).

6.4.2 Vertical agitator cleaning

⇒ Specific cleaning agents or procedures are request by the vendor.

Cleaning with Water and Isopropanol :

filter bag holder (1), Bellow (2), Hopper lid (3), agitator (4), seal (5).

Cleaning filter (see section 6.3.2)

After cleaning dry the parts.

6.4.3 Vertical agitator assembly

1. Check the parts before fitting for damage or wear and replace as necessary.
2. Put the seal on the hopper edge.
3. Lift the hopper lid (3) together with the agitator into the operating position.
4. Fastening v-clamp.
5. Mount the bellow (2) and filter (1) (see section 6.3.3).

6.5 Replacing the hopper

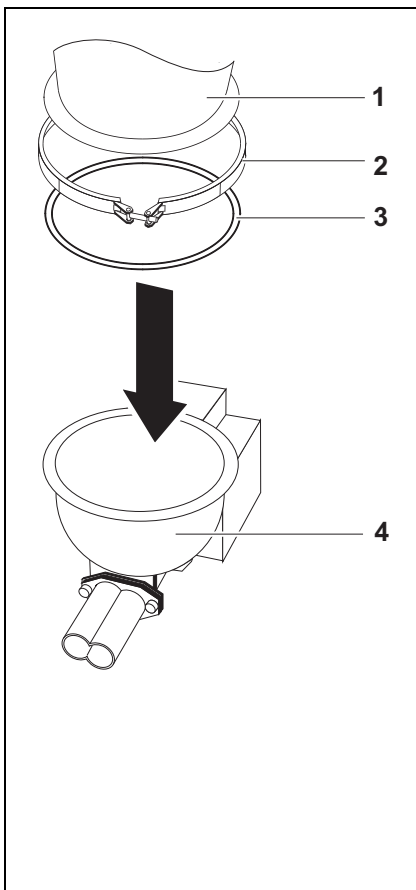


The v-clamp only forms the connection between the hopper and the agitator hopper.

- ▲ Before replacing the hopper dismantle the vertical agitator.
- ▲ Secure the hopper for overturn.



- The seal (3) between the agitator hopper (4) and the hopper (1) can continue to be used when the hopper is replaced.
- Secure the hopper for overturn before loosening or fastening the v-clamp.



6.5.1 Hopper dismantle

1. Disconnect all the wires and air supplies.
2. Remove hopper lid and vertical agitator (see chapter 6.4.1).
3. Loosen and remove the v-clamp (2) and secure the hopper for overturn.
4. Remove the hopper (1) and seal (3).

6.5.2 Hopper cleaning

⇒ Specific cleaning agents or procedures are request by the vendor.

Cleaning with Water and Isopropanol:
Hopper (1), seal (3).

After cleaning dry the parts.

6.5.3 Hopper assembly

1. Check the parts before fitting for damage or wear and replace as necessary.
2. Put the seal (3) on the hopper edge.
3. The seal (3) has on one side 3 pins. This pins must in the corresponding holes on the hopper edge(4).
4. Lift the hopper (1) up and fastening it with v-clamp (2).
5. Lift the hopper lid (3) together with the agitator into the operating position (see section 6.4.3).

Fig. 6.3 Replacing the hopper

6.6 Replacing the outlet tube

6.6.1 Outlet tube dismantle

1. Loosen and remove the clamping ring (2).
2. Dismantle filter (1) and bellow (3) (see section 6.3.1).
3. Loosen clamping ring (5).
4. Remove outlet tube (4). Don't lose the centering pin (7) and the o-ring (6).

6.6.2 Outlet tube cleaning

⇒ Specific cleaning agents or procedures are request by the vendor.

Cleaning with Water and Isopropanol :

outlet tube (4), bellow (3), filter bag holder

Clean bellow (3) and filter bag holder. Clean the outlet tube (4) the interior with a bottle brush. Take care that none product residuals.

Cleaning filter (see section 6.3.2).

After cleaning dry the parts.

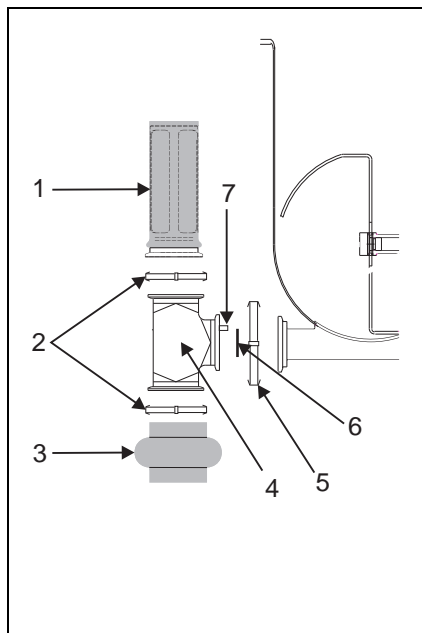


Fig. 6.4 Outlet tube replacement

6.6.3 Outlet tube assembly

1. Check the parts before fitting for damage or wear and replace as necessary.
2. Put o-ring (6) to the channel from outlet tube (4).
3. Ensure that the centering pin (7) is in the hole from outlet tube (4).
4. Stuck the outlet tube (4) to the agitator hopper and attend the centering pin.
5. Fastening the outlet tube (4) with clamping ring (5).
6. Assemble filter (1) and bellow (3) and fastening with clamping ring (2) (see section 6.3.3).

6.7 Replacing the feed screws

Observe the following points when replacing the feed screws:

- ⇒ Ensure that the hopper and agitator hopper are empty.
- ⇒ Remove the twin screws simultaneously and clean the screw bearing shaft.
- ⇒ Do not damage the screw bearing shaft and the o-rings (1) during installation and removal.

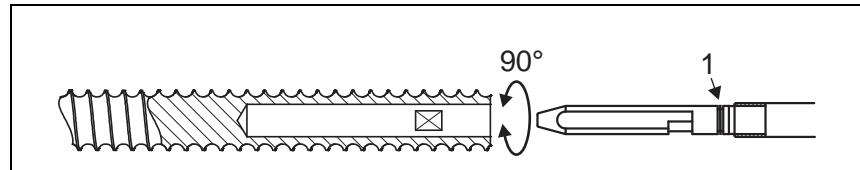


Fig. 6.5 Connection of feed screw

Bayonet connection

In order to loosen/lock the screw turn it by approx. 90° on the bearing shaft.



- 4mm Screwdriver

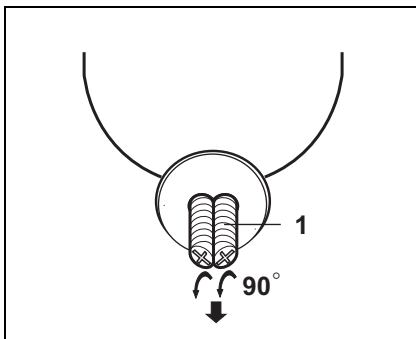


Fig. 6.6 Removing the screws

6.7.1 Feed screws dismantle

1. Remove the outlet tube (see Section 6.6.1).
2. Loosen the screws by turning them 90° counterclockwise and remove the feed screws (1).

6.7.2 Feed screws cleaning

- ⇒ Specific cleaning agents or procedures are request by the vendor.

Cleaning with Water and Isopropanol:

feed screws (1)

Clean the feed screw housing with a bottle brush. Take care that none product or grease residuals.

After cleaning dry the parts.

6.7.3 Feed screws assembly

CAUTION

- ▲ When installing the screws do not damage the O-ring at the screw bearing shaft.
- ▲ Do not use a hammer to have the screws latched in.

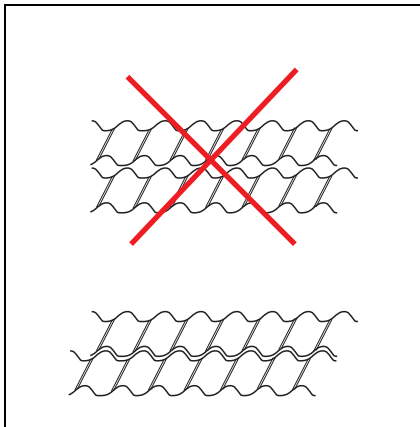


Fig. 6.7 Positioning the screws

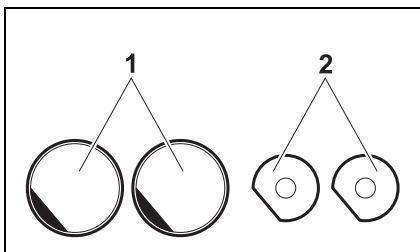


Fig. 6.8 Aligning the screw hole to the bearing shaft

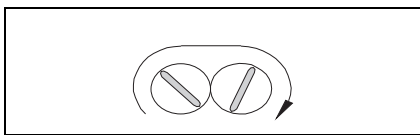


Fig. 6.9 Installing the screws

1. Check the parts before fitting for damage or wear and replace as necessary.
2. Ensure that there are no feed material residues in the feed screw housing or at the screw bearing shaft.
3. Before installing the feed screws check the screw bearing shaft for scratches or sharp edges and eliminate these.
4. Turn the twin screws so that the helices of the one screw move in the gaps of the helices of the other screw (see Fig. 6.7).
5. Before the assembly apply a light grease lubricant to the bearing shafts and o-rings(Shell Cassida).
6. Slide the screws onto the bearing shaft so that the carrier surface in the screw holes show in the same direction as the leading-in surface of the bearing shaft.
7. Place the screws on the bearing shaft and rotate them by 90° clockwise.
8. Pull the screw carefully in order to check whether the bayonet connection has latched in.
9. Assemble the outlet tube (see section 6.6.3).

6.8 Replacing the horizontal agitator



Danger through sharp-edged agitator blades!

While disassembling without protecting gloves the agitator can cause cut wounds to the hands.

s Always wear protecting gloves while working with the agitator.



Feeding different bulk materials may require an agitator with four blades or special agitator models which can be supplied for special applications.



- 10mm wrench

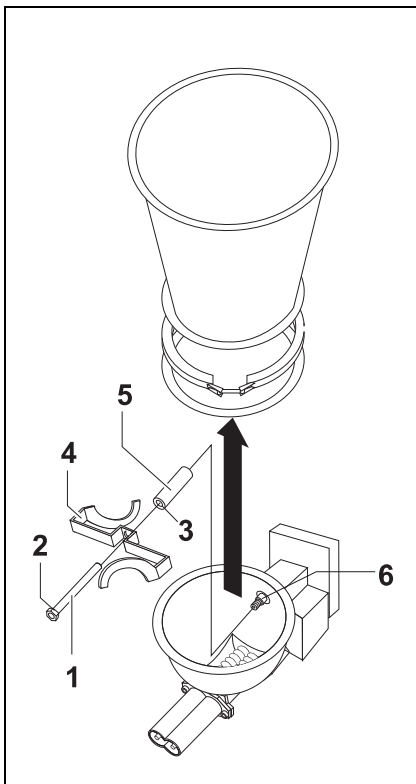


Fig. 6.10 Removing agitator

6.8.1 Agitator dismantle

1. Dismantle filter (see Section 6.3.1).
2. Dismantle hopper lid and vertical agitator (see Section 6.4.1).
3. Remove the hopper (see Section 6.5.1).
4. Turn the agitator (4) counterclockwise, to loosen the agitator retainer (1).
5. Remove the agitator retainer (1), agitator (4) and the distance tube (5).

6.8.2 Agitator cleaning

⇒ Specific cleaning agents or procedures are request by the vendor.

Cleaning with Water and Isopropanol:

agitator retainer(1), agitator (4), distance tube (5), o-ring (2), o-ring (3)

Remove o-ring (2) from agitator retainer(1) and o-ring (3). Clean the inner thread of the agitator retainer (1). Clean the inner thread of the distance tube (5) with a bottle brush. Clean the thread of the shaft to the agitator (6). Clean the agitator (4) and o-rings. Take care that none product or grease residuals.

After cleaning dry the parts.

6.8.3 Agitator assembly

1. Check the parts before fitting for damage or wear and replace as necessary.
2. Assemble o-ring (2) at the agitator retainer (1) and o-ring (3) at the distance tube.
3. Apply a light grease lubricant to the agitator shaft and o-rings (Shell Cassida).
4. Slide the distance tube (5) onto the agitator shaft (6).
5. Stuck agitator (4) with the asymmetric hole on the distance tube (5).
6. Slide the agitator retainer (1) through the agitator (4) and the distance tube (5) and screw it on clockwise. Turn the agitator (6) clockwise and firmly tighten it by hand.
7. Assemble hopper (see section [6.5.3](#)).
8. Assemble hopper lid and vertical agitator (see section [6.4.3](#)).
9. Assemble filter (see section [6.3.3](#)).

6.9 Replacing the agitator hopper



Danger through sharp-edged agitator blades!

While disassembling without protecting gloves the agitator can cause cut wounds to the hands.

s Always wear protecting gloves while working with the agitator.



- 10mm wrench

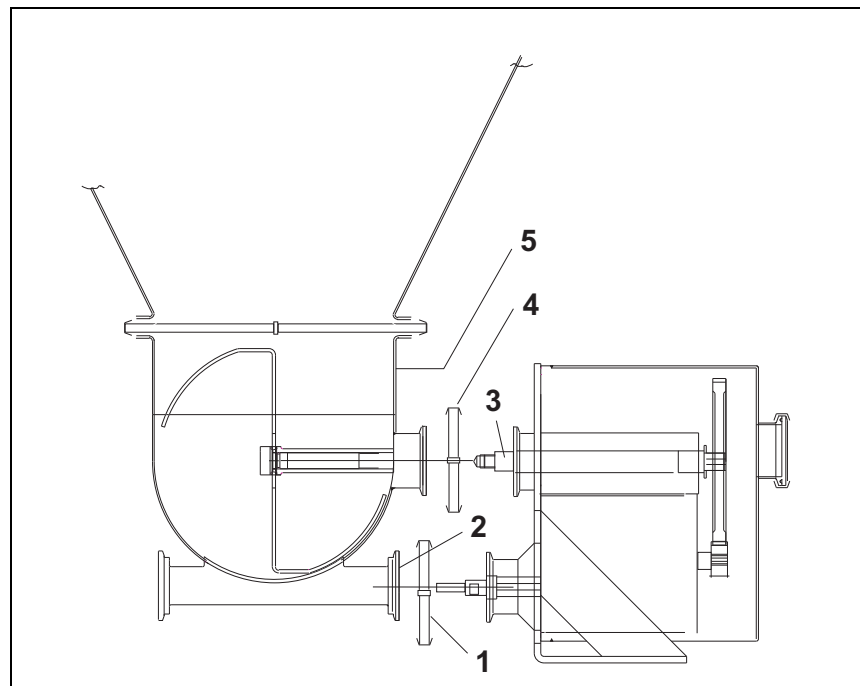


Fig. 6.11 Replacing the agitator hopper

6.9.1 Agitator hopper dismantle

1. Dismantle filter (see Section 6.3.1).
2. Dismantle hopper lid and vertical agitator (see Section 6.4.1).
3. Remove the hopper (see Section 6.5.1).
4. Remove outlet tube (see section 6.6.1).
5. Remove feed screws (see section 6.7.1).
6. Remove agitator (see section 6.8.1).
7. Loosen clamping ring (1, 4) and remove agitator hopper (5).

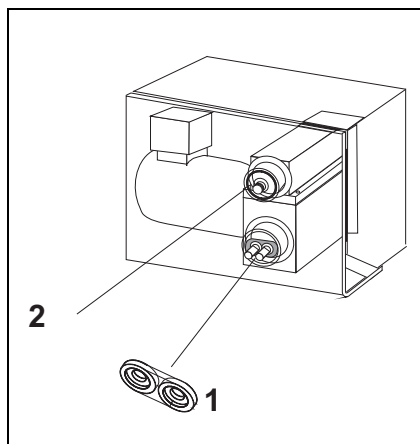


Fig. 6.12 Screw seal

6.9.2 Agitator hopper cleaning

⇒ Specific cleaning agents or procedures are request by the vendor.

Cleaning with Water and Isopropanol:

agitator hopper(1), screw seal (1), o-ring (2)

Remove screw seal (1) and o-ring (2). Check for damage or wear and clean it. Clean agitator hopper.

After cleaning dry the parts.

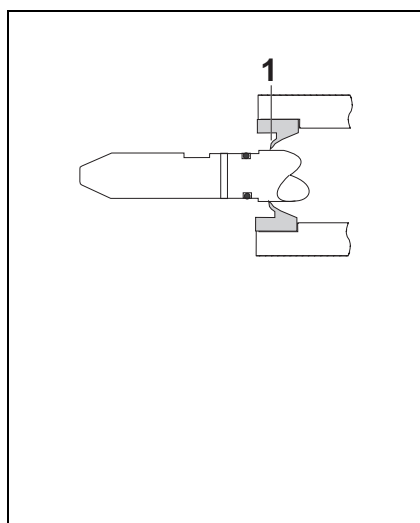


Fig. 6.13 Mounting direction

6.9.3 Agitator hopper assembly

1. Check the parts before fitting for damage or wear and replace as necessary.
2. Insert screw seal (1) and o-ring (2) (see [Fig. 6.12](#)).
3. Check direction (see [Fig. 6.13](#)).
4. Position the agitator hopper ([Fig. 6.11/ 3](#)) at the drive unit.
5. Fastening clamping ring ([Fig. 6.11/ 1, 2](#)).
6. Assemble agitator (see section [6.8.3](#)).
7. Assemble feed screws (see section [6.7.3](#)).
8. Assemble outlet tube (see section [6.6.3](#)).
9. Assemble hopper (see section [6.5.3](#)).
10. Assemble hopper lid with vertical agitator (see section [6.4.3](#)).
11. Assemble filter (see section [6.3.3](#)).

7 Maintenance

WARNING

When carrying out maintenance work on the switched-off feeder there is a danger on injury through unintentional switching-on.

- ▲ Switch off the feeding system before carrying out maintenance work on the feeder and secure it against unintentional restarting (see section 6.1).

CAUTION

- ▲ Only qualified and trained personnel may carry out maintenance work on the feeding equipment.
- ▲ Only qualified electricians may work on the electrical equipment.



Close adherence to the inspection and maintenance intervals is absolutely necessary to ensure safe working conditions and explosion protection!

7.1 Maintenance Intervals

Element	Checkpoints when in operation	Interval
Mechanical	Eliminate dust accumulation > 5 mm through cleaning	weekly
	Seals (leakage inspection)	As required (feed product dependent)
	Oil level	3 Months
	Oil change	10000 Hours or 2 Years
	Bearings inspection	2 Years
	Bearing change	25000-30000 Hours
	shaft sealing ring inspection	3 Months
	shaft sealing ring change	25000-30000 Hours
	Bellows	As required
	Filters	As required
Electrical	Motor brushes	As required (see motor specs.)

7.2 Replacing seals



Based upon its nature and function a shaft sealing ring has a normal wear. The life time depends on the operational conditions. It is advisable to include the seals check in the periodical maintenance and inspection of the installation.



- Screwdriver, size 4, flat

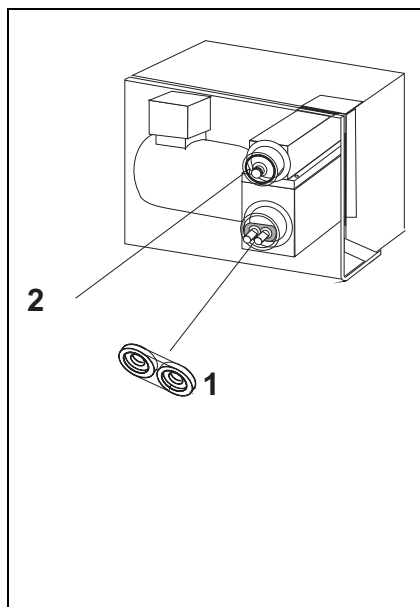


Fig. 7.1 Seals

7.2.1 Removing seals

- ⇒ Switch off the machine (see Section 7.1).
- ⇒ Remove filter, vertical agitator, hopper, agitator, outlet tube, screws and agitator hopper (see Section 6).

7.2.2 Dismantle screw seal

- ⇒ Remove the seal (1) using a screw driver. Do not damage the gearbox in the surrounding of the seal and screw bearing shaft when removing the seal.

7.2.3 Dismantle agitator seal

- ⇒ Remove agitator seal bushing (2) from gear box. Do not damage the gearbox in the surrounding of the seal and agitator bearing shaft when removing the seal.
- ⇒ Disassemble agitator seal bushing (2) according the assembly (see Fig. 7.3).

1. O-Ring 7 x 1,5
2. Screw seal
3. Seal bushing
4. O-Ring 38 x 2
5. Locking ring 40 x 23 x 3
6. Spacer
7. Screw shaft seal

7.2.4 Structure screw seal

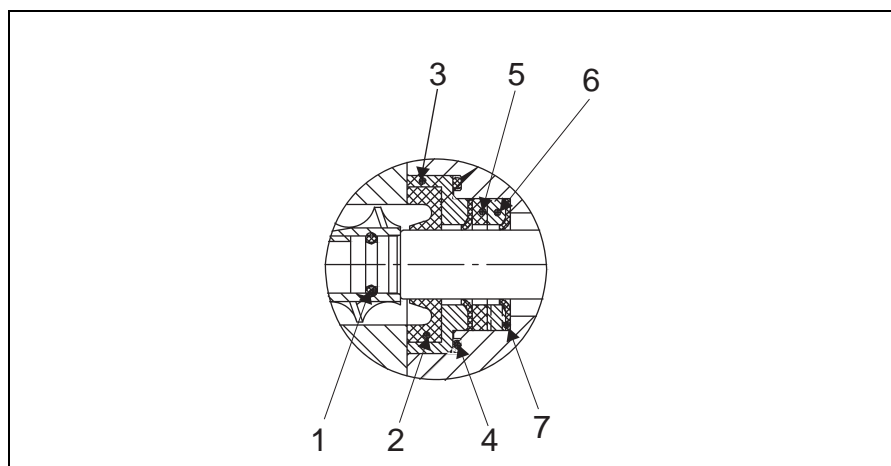


Fig. 7.2 Assembly screw seal

7.2.5 Structure agitator seal bushing

1. O-Ring 38 x 2,5
2. O-Ring 40 x 3
3. Agitator seal bushing
4. NT-Lipseal
5. Ring for air purge
6. Endring
7. Support bushing
8. Snapping

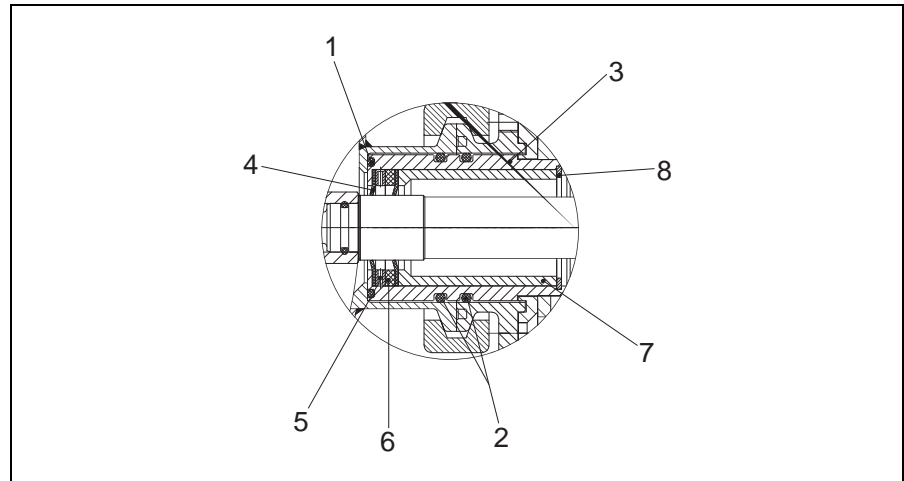


Fig. 7.3 Assembly agitator seal bushing

7.2.6 Assembly seals



Check the parts before fitting for damage or wear and replace as necessary.

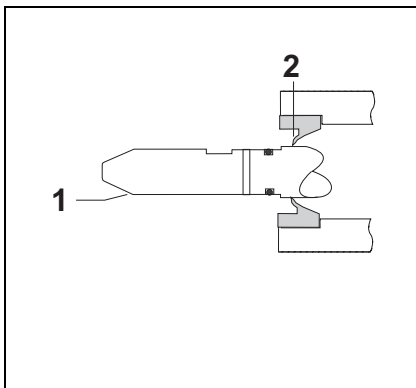


Fig. 7.4 mounting direction

7.2.7 Assembly screw seals

1. Clean the seal environment.
2. In order to ensure that the seal is not damaged when being slid over the screw bearing shaft lubricate the seal lips (2) lightly with suitable grease.
3. Slide the seals according the assembly (see [Fig. 7.2](#)) onto the screw bearing shafts. The sealing lips (2) point towards the agitator hopper. If the sealing lips are pointing to the wrong direction the sealing is not guaranteed.
4. Press the seals carefully in until they sit tight.

7.2.8 Assembly agitator seals

1. Clean the seal environment.
2. In order to ensure that the seal is not damaged when being slid over the screw bearing shaft lubricate the seal lips (2) lightly with suitable grease.
3. Assemble agitator seal bushing according the assembly (see [Fig. 7.3](#)). Press the seals carefully into the bushing until they sit tight. The sealing lips (2) point towards the agitator hopper. If the sealing lips are pointing to the wrong direction the sealing is not guaranteed.
4. Press the agitator seal bushing carefully onto the agitator bearing shaft.
5. Assemble agitator hopper, feed screws, outlet tube, agitator, hopper, hopper lid with vertical agitator and filter (see section [6](#)).

7.3 Replacing the drive motor



Improper connection of the feeder can cause danger to life through electric shock.

- ▲ The feeder may only be connected by qualified electricians.
- ▲ Observe the local regulations.



- 13-mm wrench
- 2.5-mm Allen key

7.3.1 Removing the motor



1. Switch off the machine (see Section [7.1](#)).
2. Disconnect the motor connections at the motor terminal box.

3. Dismantle drive unit cover.
4. Use an 13-mm wrench to loosen the 4 screws at the motor while a second person secures the motor.
5. Remove the motor from the drive housing.

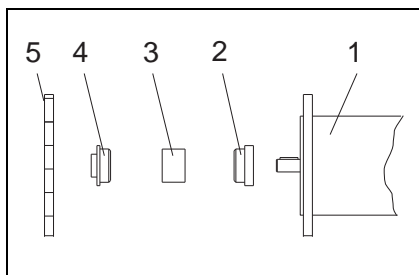


Fig. 7.5 Installing the motor

7.3.2 Installing the motor

1. Adjust the motor coupling sprocket (2) by using a 2.5-mm Allen key so that the coupling (3) fits between coupling sprockets (4) and (2) leaving 1 mm gap.
2. Slide the motor (1) to its place. Guide the coupling so that it latches in into its counterpart in the coupling sleeve (3).
3. Insert the mounting bolts and tighten them.
4. Connect the motor.

7.3.3 Check the motor



- ▲ Do not place any bulk materials into the feeder until correct screw rotation has been verified and the feed screws are securely locked on the drive shafts. Feed screws may become disengaged if the motor rotation is incorrect.

1. Switch on the feeder with the connected controls (see operating instructions).



For more information see controller operating and programming instructions.

2. Check direction of rotation.



When the feeder is running the screws turn counterclockwise.

When the direction is wrong then the polarity from the motor must be changed

7.4 Replacing the tachometer

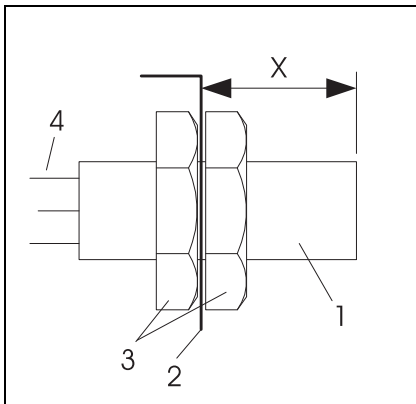


- 3mm Screwdriver
- Test equipment for tachometer
- Gauge
- Feeler gauge (0,2 mm/0.0078")



The gearwheel of the tachometer generator is mounted at one end of the coupling. (see [Fig. 7.5 /5](#)).

7.4.1 Removing the tachometer



1. Switch off the machine (see Section [7.1](#)).
2. Screw off the cable cover of the tachometer and disconnect the cable (4) from the tachometer generator.
3. Remove the tachometer (1) with bracket (2) from the gearbox.
4. Measure Distance X from the surface of the tachometer to the bracket and note it.
5. Loosen the nuts (3) and remove the tachometer from the bracket.

Fig. 7.6 Removing the tachometer generator

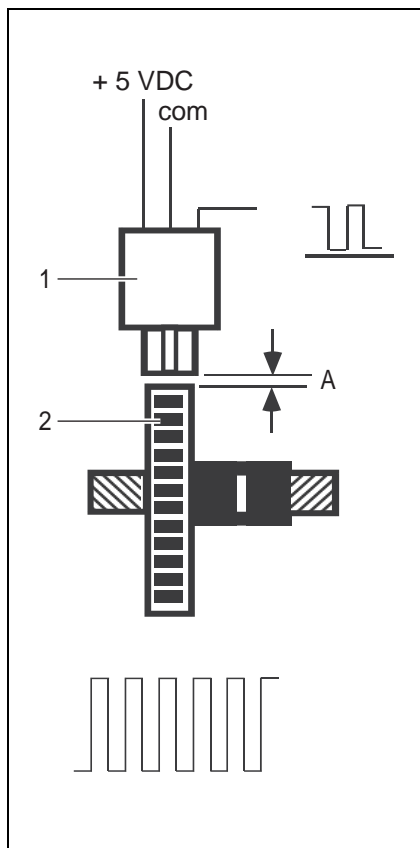


Fig. 7.7 Installing the tachometer generator

7.4.2 Installing the tachometer

1. Mount the new tachometer with the supplied accessories to the bracket.
2. Screw the nuts (see Fig. 7.6/3) so far onto the tachometer generator that the measured Distance X between the surface of the tachometer and the bracket is reached.
3. Fasten the bracket with tachometer by means of the mounting bolts (2 pieces) only loosely to the gearbox.
4. Use the feeler gauge to set gap A between the gearwheel (2) and the tachometer (1) so that the feeler gauge can still be moved slightly in the gap.
5. Tighten the mounting bolts at the bracket.
6. Remove the feeler gauge and turn the gearwheel.
The gearwheel and tachometer generator may not touch each other.
7. Connect the tachometer generator cable and mount the cover sheet.
8. Supply the tachometer generator with the test equipment with power and check whether it functions correctly while the gearwheel rotates. No pulse may be missing during one rotation of the gearwheel.
9. In order to check the correct installation let the feeder run without bulk material.



For more technical information about the tachometer see project manual.

7.5 Lubrication



- ▲ Remove any oil spillage immediately with an oil-binding agent in compliance with environmental requirements.



- ▲ Signs of changes in the oil can be seen with the naked eye. Fresh oil is clear to the eye and has a typical smell and a specific product color. Clouding or dark appearance indicate water and/or contamination. If you detect such abnormalities, the oil must be changed immediately.



For oil type and content refer to chapter 3, technical data.

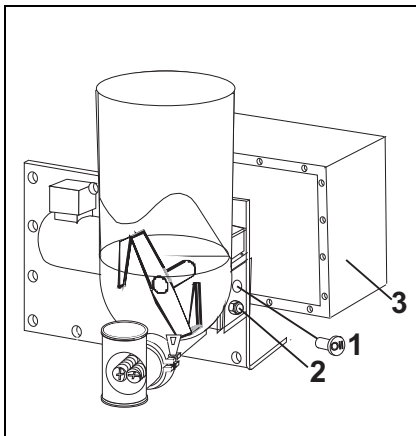


Fig. 7.8 Lubrication

7.5.1 Oil level inspection

- ⇒ Remove cover (3) for gearbox and drive.
- ⇒ Check the oil level on the gear box through the inspection plug with the oil sight glass (2) .

The oil level must be in the middle of the sight glass.

If there is not enough oil do following:

- ⇒ Unscrew slightly the oil inspection plug (2), oil must run out.
- ⇒ If there is insufficient oil, fill in oil through the ventilation hole (1) until oil runs out of the oil-level inspection hole.
- ⇒ Tighten both oil inspection and ventilation plug.

7.5.2 Oil change

1. Remove cover (3) for gearbox and drive.
2. Loosen ventilation plug (1).
3. Remove inspection plug (2) and drain off oil in a proper container.
4. Screw in slightly the oil inspection plug (2) do not tighten it.
5. Fill up oil through the ventilation hole (1) until it flows out of the inspection hole (2).
6. Tighten both oil inspection and ventilation plug.
7. Check oil level according to section 7.5.1.

8 Troubleshooting



Eliminating faults in a feeder which is running can cause serious accidents.

- ▲ Switch off the feeding system before every intervention and secure it against unintentional restarting (see section 6.1).



1. Always switch off the feeders before carrying out repairs.
2. Check the feeder.
3. Please observe the error messages which are displayed on the connected control device or host computer (see operating instructions for the relevant control device).
4. Document faults and call the local service center (customer service see project manual).

8.1 Troubleshooting table

Malfunction/Error	Possible cause	Remedy
Feeder does not transport any material	<ul style="list-style-type: none"> • No connection or no power 	⇒ Check the connections.
Screws rotates incorrectly	<ul style="list-style-type: none"> • Motor connections incorrect 	⇒ Check the connections.
Screws and/or agitator does/do not rotate	<ul style="list-style-type: none"> • Foreign bodies in feeder • Feed material piling-up in the outlet tube. • Motor does not get any power from the motor controller. 	<ul style="list-style-type: none"> ⇒ Remove the foreign bodies. ⇒ Dismantle the outlet tube and eliminate the pile-up. ⇒ Check the motor controller. ⇒ Check wiring. ⇒ Check oil level and quality.
	<ul style="list-style-type: none"> • Gear box overheated 	
Feed rate not constant	<ul style="list-style-type: none"> • Foreign bodies in feed material • Feed material forms bridging in the hopper. 	<ul style="list-style-type: none"> ⇒ Empty and clean the feeder. ⇒ Empty the feeder and check the material flow in the hopper.
Gear box leaking	<ul style="list-style-type: none"> • Internal pressure to high • Damaged sealing 	<ul style="list-style-type: none"> ⇒ Check ventilation plug. ⇒ Replace sealing (Coperion K-Tron (Switzerland) LLC).

9 Explosion-proof feeders

9.1 Safety notes

9.1.1 General



The explosion-proof feeder conforms to the design regulations for the device group II.

- ▲ The explosion-proof feeder may only be used in those zones which are specified in the declaration of conformity or in non-classified areas.
- ▲ For the maximum surface temperature of the device see the declaration of conformity.
- ▲ The plant owner has to ensure that a possible dust layer is not thicker than a maximum of 5 mm.
- ▲ The feeder may only be used in the ambient temperature range specified in the declaration of conformity.
- ▲ The plant owner has to ensure that the information on the rating plate of the individual drives have to agree with the conditions in the area of use on site.
- ▲ The plant owner has to ensure that the power supply agrees with the information on the rating plate of the individual drives.
- ▲ The plant owner has to ensure that the installation location is free of explosive media.

9.1.2 Operation of the device in accordance with ATEX



The feeder belongs to device group II.

- ▲ For the device category see marking on the feeder or declaration of conformity.

9.1.3 Standards and directives



- ▲ Observe and fulfill the following instructions, standards and directives when installing and erecting explosion-proof systems:
 - Standards 99/92/EG (ATEX 137)

9.2 Area of use in an explosive atmosphere)



- ▲ The owner is responsible for ensuring that the system is installed in the intended zone. The corresponding category is described in the declaration of conformity.

9.2.1 Explosion proof marking

The marking on the feeder shows the device category. The declaration of conformity shows the zone in which the feeder may be used.

9.2.2 Zones and device categories (gas)

Zone	Description	Devices of the category
Zone 0	Areas in which it is expected that dangerous, potentially explosive atmospheres are present continuously for an extended period or occur frequently.	1G
Zone 1	Areas in which it is to be expected that dangerous, potentially explosive atmospheres arise occasionally.	2G
Zone 2	Areas in which it is not expected that dangerous, potentially explosive atmospheres arise. If they do arise here, however, it is only seldom and briefly.	3G

9.2.3 Zones and device categories (dust)

Zone	Description	Devices of the category
Zone 20	Areas in which it is expected that dangerous, potentially explosive air/dust atmospheres are present continuously for an extended period or occur frequently.	1D
Zone 21	Areas in which it is to be expected that dangerous, potentially explosive air/dust atmospheres arise occasionally.	2D
Zone 22	Areas in which it is not to be expected that dangerous, potentially explosive air/dust atmospheres arise. If they do arise here, however, it is only seldom and briefly.	3D

9.2.4 Dust deposits and glow temperature



- ▲ Observe the requirements of the standard IEC/EN 60079-14 Chapter 5.6.3.1 with regard to reduced glow temperature at dust deposits.

In case of dust deposits of up to 5 mm:

- Glow temperature of the material at a thickness of the layer of dust 5 mm: \geq max. Surface temperature (T_{\max}) + 75 K.
- $T_{\max} = T_{5\text{ mm}} - 75\text{ °C}$

In case of dust deposits greater than 5 mm to max. 50mm:

- The difference to be observed between the glow temperature of the material and the surface temperature (T_{\max}) depends on how thick the dust layer is. The context is shown in Fig. 1 of the standard EN 60079-14 Chapter 5.3.3.2.1
- Avoid Dust deposits > 5mm (see [6 cleaning](#)).

Dust deposits > 5mm avoid or complete covered:

- not allowed

9.3 Device categories within and outside the feeder



Leaky connections can lead to dangerous explosive atmospheres.

- ▲ Ensure that seals, O-rings, bellows, packing and sheet parts are undamaged, clean and built in correctly.
- ▲ Always work carefully during mounting and maintenance.
- ▲ Replace defective parts immediately.

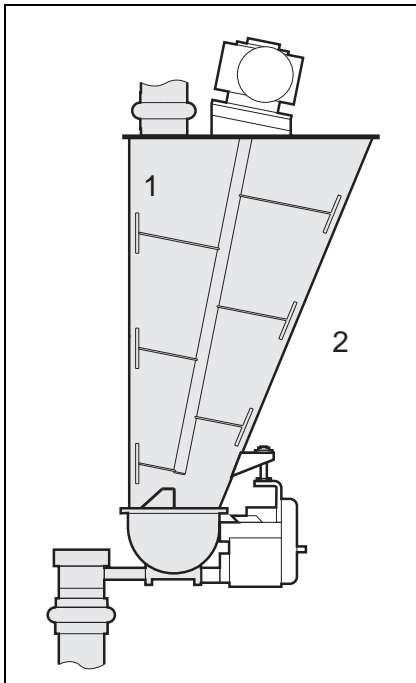


Fig. 9.1 Device categories inside/outside

The areas within the feeder (1) often have a different zone/device category assigned to them as the area outside the feeder (2).

Components at connections, such as seals, O-rings, bellows, packing and sheet parts, must separate the various device categories in side and outside securely from each other (see declaration of conformity).

9.4 Protection through housing (IP degree of protection)

Moving parts are protected by a housing having the degree of protection according to declaration of conformity.



The degree of protection of the housing according to declaration of conformity has to remain.

- ▲ Ensure that the seals always conform to the degree of protection according to declaration of conformity.
- ▲ Ensure that the drive belts, gearwheels and the interior of the housing are clean.
- ▲ Always work carefully during mounting and maintenance.
- ▲ Replace defective parts immediately.

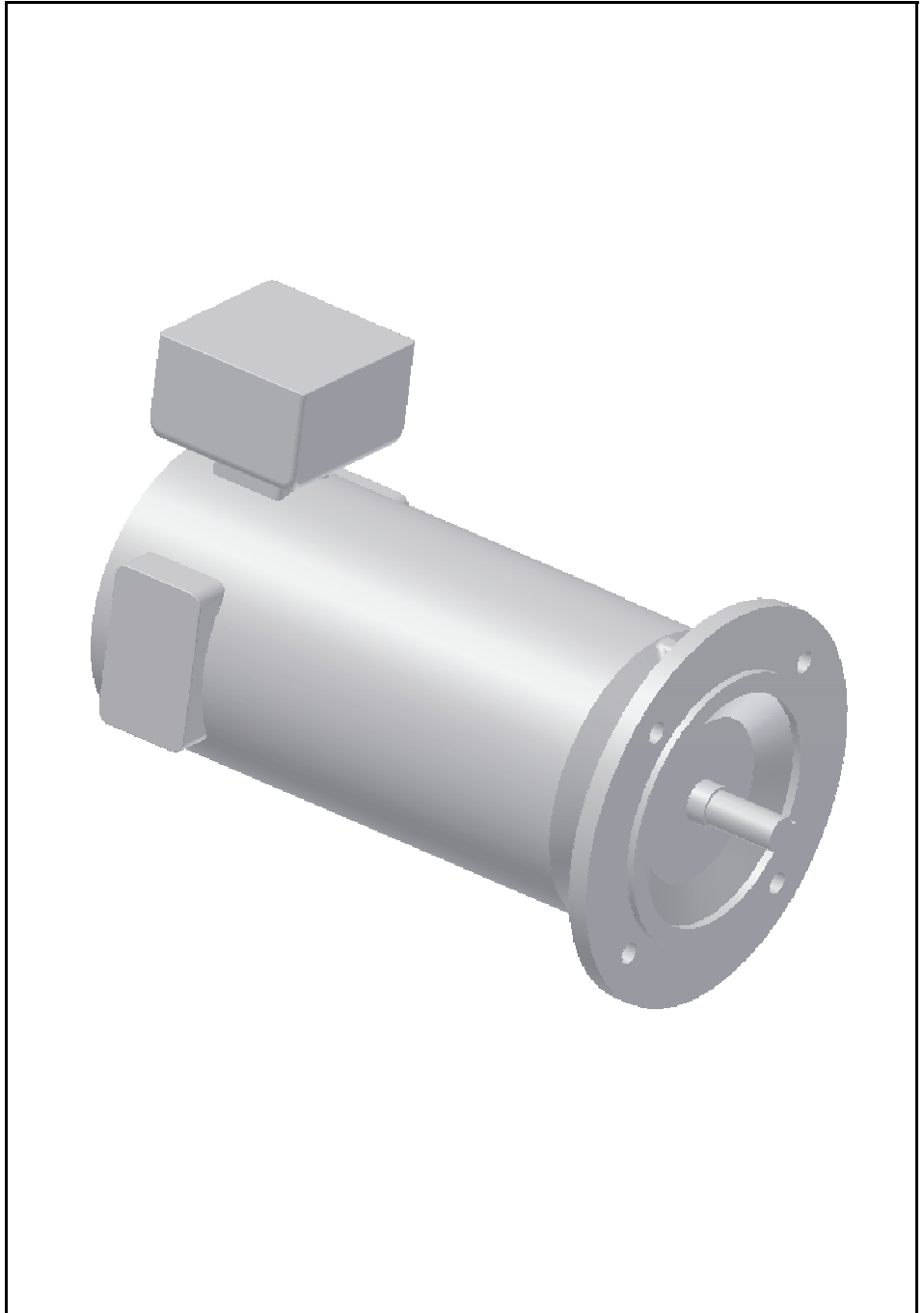
Chapter 4:

Attaching Parts Feeder

- Motor Baldor 450 W ATEX 0890024604
- Speed Pickup Jaquet 0000000237
- D5 XPC3 0990018601

OPERATING AND MAINTENANCE INSTRUCTIONS

Baldor motor ATEX 450 W



Read this document prior to operating the device.

This document contains all safety and warning notes.

Original operating instructions

0890024604-EN Rev. 1.1.0

Service

If you need assistance, please call your local service centre or

Coperion K-TRON Schweiz GmbH Tel. 0041 (0) 62 / 885 71 71
Lenzhardweg 43/45 Fax 0041 (0) 62 / 885 71 80
CH-5702 Niederlenz

Coperion K-Tron Pitman, Inc. Tel. 001 (0) 856 / 589 0500
590 Woodbury Glassboro Road Fax 001 (0) 856 / 589 81 13
Sewell, New Jersey 08080 USA

Coperion K-TRON Salina Tel. 001 (0) 785 / 825 16 11
606 N. Front St. Fax 001 (0) 785 / 825 8759
Salina, KS 67402-0017

Web: www.coperionktron.com

Before you call...

- ⇒ Do you have alarm displays? Are you able to eliminate the causes?
- ⇒ Have you modified part of the system, product or operating mode?
- ⇒ Have you tried to remedy the fault in accordance with the operating instructions?
- ⇒ Note the project or order number You will find these on the machine or in the system manual.
 - Example: 0403214

Using the manual:

- ⇒ This arrow identifies an individual action.
- 1. Numbers identify a sequence of actions which have to be executed step-by-step.
- ▲ This symbol identifies a general safety note.



Reference to another manual.



Important information.



This symbol indicates that tools are required for the following task.



Specifies where information or a situation must be checked.

If an error or omission is found, please contact:

documentation@coperionktron.com

Doc. No.: 0890024604-EN

Date: 2014/Jan/16

Original: 0890024604-EN

Coperion K-Tron assumes no responsibility for damages resulting from misuse of any equipment or negligence on the part of operating personnel. Further, you may kindly refer to the purchase order, confirmation or other document that contains the express Coperion K-Tron warranty disclaimer limiting or excluding certain warranties with respect to the company's equipment. Except as otherwise expressly provided by Coperion K-Tron in any such document, COPERION K-TRON MAKES NO WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, NOR ANY OTHER WARRANTY, EXPRESS OR IMPLIED, WITH RESPECT TO THE EQUIPMENT.

Table of contents

1	Safety notes	5
1.1	Safety symbols definitions	5
1.1.1	Ex-protection	6
1.1.2	Electrical Hazard Icon	6
1.1.3	Ground Icon	6
1.1.4	Power Icon	6
1.2	Responsibilities of the owner	7
1.3	Proper use	7
1.4	Special provisions	7
1.5	Organizational measures	8
1.6	Safety-conscious operation	8
1.7	Safety devices	8
1.8	High voltage	9
1.9	Additional equipment	9
1.10	Customer service and repairs	9
1.11	Shut-down procedure	9
2	Field of application and function	10
2.1	Field of application	10
2.1.1	Gas	10
2.1.2	Dust	10
2.1.3	Dust deposits and glow temperature	11
2.2	Description	12
2.3	Further applicable documents	12
3	Technical data	13
4	Installation	14
4.1	Unpacking	14
4.2	Setup conditions	14
4.3	Installation	14
4.4	Connect the motor	15
4.4.1	Lengths of the connecting line: 230 V AC	16
4.4.2	Connection diagram of KCM to motor	16
4.5	Commissioning	17
4.5.1	Default values for the programming of the KCM	18
4.5.2	KCM menu Mechanics, sub-menu Setting of Motor	18
4.5.3	Programming of KCM	18
5	Operation	19
5.1	Switching on / off	19

6	Maintenance	20
6.1	Maintenance intervals	20
6.2	Carbon brushes	20
6.3	Lubrication of the motor	20
7	Trouble-shooting	21
7.1	Trouble-shooting table	21
8	Appendix	22
8.1	Declaration of conformity	22

1 Safety notes



- ▲ The motor is among the products with high risk of damage, since it is meant for use in potentially explosive areas. Therefore, the duty to take care while handling this motor is all the more imperative.



The installation and commissioning of the motor may be performed only by qualified staff.

1.1 Safety symbols definitions



- ▲ DANGER indicates an extremely hazardous situation which, if not avoided, could lead to heavy bodily injury or to death.



- ▲ WARNING indicates a potentially hazardous situation which, if not avoided, could lead to heavy bodily injury or to death.



- ▲ CAUTION with safety alerts indicates a potentially hazardous situation which, if not avoided, could lead to light bodily injuries.



- ▲ CAUTION indicates a potentially hazardous situation which, if not avoided, may result in property damage.



- ▲ The safety alert is used to alert to the potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.



1.1.1 Ex-protection

Important information to explosion protection.



1.1.2 Electrical Hazard Icon

This sign indicates an electrical hazard.



1.1.3 Ground Icon

This sign indicates that a ground/PE connection is required.



1.1.4 Power Icon

Power off and disconnect air supply before working on the equipment.

1.2 Responsibilities of the owner



- ▲ Note and follow the following guideline for the installation and setup of explosion-proof systems: Directive 99/92/EC (ATEX 137).
 - ▲ Ensure that only qualified and trained personnel work with the motor.
 - ▲ Establish the responsibilities of operating and maintenance.
 - ▲ Ensure that the personnel have read and understood the operating instructions to all installation, components, particularly these safety notes.
 - ▲ Strictly follow the operating and maintenance instructions.
 - ▲ The plant owner must have damaged or missing components replaced immediately.
 - ▲ The plant owner of the motor is responsible for compliance with the legally stipulated accident and safety regulations.
-

1.3 Proper use



- ▲ Kindly operate the motor exclusively in combination with the designated KCM control system by Coperion K-Tron (Switzerland) LLC.
 - ▲ Operate the motor only according to the specified technical data.
 - ▲ Manipulation and safety-related technical modifications are forbidden.
 - ▲ Never use the motor for purposes other than those foreseen by the manufacturer.
 - ▲ Use the motor only in Zone 22 or non-classified areas.
 - ▲ Use the motor only in specified ambient temperature areas.
 - ▲ Avoid heavy layering of dust on the motor.
 - ▲ Allow only an authorised and qualified electrician to mount, connect and commission the motor.
-

1.4 Special provisions



- ▲ Kindly operate the motor exclusively in combination with the designated KCM control system by Coperion K-Tron (Switzerland) LLC.
 - ▲ The motor is designed only for indoor applications and must be protected against strong UV radiation.
 - ▲ At an ambient temperature of 50 °C and full load, the motor may be operated only at speeds greater than 1000 rpm. Otherwise, sufficient cooling is not assured. At speeds less than 1000 rpm and full load, the ambient temperature must be reduced to 40 °C.
-

1.5 Organizational measures



- ▲ Always keep the operating instructions near the motor, within easy reach. Ensure that they are always complete and legible.
 - ▲ Observe the safety notes for the connected devices.
 - ▲ In addition to the operating instructions, always comply with generally prescribed safety regulations covering accident prevention and environmental safety.
-

1.6 Safety-conscious operation



- ▲ Read the operating instructions, in particular these safety notes, and follow these instructions.
 - ▲ Ensure that only authorised personnel enter the operating range and danger zone of the motor.
 - ▲ Any changes (including changes in the operational behavior) which affect safety must be immediately reported to the responsible member of the staff.
 - ▲ Always keep safety in mind while working.
 - ▲ Before working on the motor, always switch off the system at the main power switch.
-

1.7 Safety devices



- ▲ Operating the motor without safety devices:
 - is dangerous for the health and life of the operator or a third person
 - can damage the feeding units or other material
 - ▲ Never alter the mechanical safety devices or the electrical control system of the safety devices. Increased risk of accident!
 - ▲ Operate the motor only if all the safety devices are installed and functional.
 - ▲ Check that all safety devices operate properly every day.
 - ▲ Do not open or remove any lids and covers while the motor is in operation.
 - ▲ Do not operate the motor with the housing open.
 - ▲ Do not modify the electrical safety devices, e.g. fuses. Increased risk of accident!
 - ▲ Only use the specified fuse types when replacing fuses.
 - ▲ Replace damaged cable joints and connections immediately.
-

1.8 High voltage



- ▲ Only qualified electricians may work on the electrical equipment of the motor.
 - ▲ High voltage occurs at the motor connections.
 - ▲ After switching off the main power supply there are still some internal electrical components of the motor drive carrying high voltage which discharges slowly.
 - ▲ Protect electrical parts of the motor against humidity.
-

1.9 Additional equipment



- ▲ Modifications to the motor are prohibited.
 - ▲ The operator is responsible for complying with all safety regulations related to inter-operation with any additional equipment.
-

1.10 Customer service and repairs



- ▲ Have repairs to the feeder carried out
 - by the responsible Coperion K-Tron (Switzerland) LLC customer service (customer service address is found in the Project manual)
 - or –
 - by specialized personnel trained by Coperion K-Tron (Switzerland) LLC.
 - ▲ Only use original Coperion K-Tron (Switzerland) LLC parts.
-

1.11 Shut-down procedure



- ▲ The operator is responsible for the proper removal of the motor from service.
-

2 Field of application and function

2.1 Field of application

The motor, permitted for use in areas with flammable dust, is an electrical operating resource of device category II 3D and may be used in Zone 22, provided the respective provisions are complied with.

2.1.1 Gas

Zone	Description	Use of the motor
Zone 0	Areas in which it is expected that dangerous, potentially explosive atmospheres are present continuously for an extended period or occur frequently.	Not allowed
Zone 1	Areas in which it is to be expected that dangerous, potentially explosive atmospheres arise occasionally.	Not allowed
Zone 2	Areas in which it is not expected that dangerous, potentially explosive atmospheres arise. If they do arise here, however, it is only seldom and briefly.	Not allowed

2.1.2 Dust

Zone	Description	Use of the motor
Zone 20	Areas in which it is expected that dangerous, potentially explosive air/dust atmospheres are present continuously for an extended period or occur frequently.	Not allowed
Zone 21	Areas in which it is to be expected that dangerous, potentially explosive air/dust atmospheres arise occasionally.	Not allowed
Zone 22	Areas in which it is not to be expected that dangerous, potentially explosive air/dust atmospheres arise. If they do arise here, however, it is only seldom and briefly.	Allowed

2.1.3 Dust deposits and glow temperature



- ▲ Observe the requirements of the standard IEC/EN 60079-14 Chapter 5.6.3.1 with regard to reduced glow temperature at dust deposits.

In case of dust deposits of up to 5 mm:

- Glow temperature of the material at a thickness of the layer of dust 5 mm: \geq max. Surface temperature (T_{max}) + 75 K.

$$T_{max} = T_{5mm} - 75 \text{ }^{\circ}\text{C}$$

In case of dust deposits greater than 5 mm:

- The difference to be observed between the glow temperature of the material and the surface temperature (T_{max}) depends on how thick the dust layer is. The context is shown in Fig. 1 of the standard EN 60079-14 Chapter 5.6.3.2.1.
- Avoid dust deposits > 5 mm.

Dust deposits \geq 50 mm or complete covered:

- Not allowed
-

2.2 Description



The motor is produced in the USA. The motor is always regulated and controlled and/or monitored by the standard Coperion K-Tron (Switzerland) LLC control system of type KCM. The parameters for the motor are predefined by the company Coperion K-Tron (Switzerland) LLC. They may be changed only by trained staff of Coperion K-Tron (Switzerland) LLC and in consultation with Coperion K-Tron (Switzerland) LLC.

2.3 Further applicable documents



Additional information pertaining to programming and control is given in the project manual.

3 Technical data

Specification	Data and notes
Manufacturer	Baldor Electric Company P.O. Box 2400 Forth Smith, AR 72902-2400 USA
Designation	Baldor motor ATEX 450 W
Applied standards	See declaration of conformity
Marking	  II 3D Ex tD A22 IP65 T86 °C SEV 06 ATEX 0127X
Power	0.45 kW
Voltage anchor	200 V DC (direct current)
Current anchor	2.2 A
Number of revolutions	2000 rpm
Max. surface temperature range	86°C
Operating temperature range	-20 °C to +50 °C

4 Installation

WARNING

Ambient conditions

- ▲ Only use explosion-proof equipment in hazardous areas.

CAUTION

- ▲ Allow only an authorised and qualified electrician to mount, connect and commission the motor.
- ▲ The motor must always be mechanically protected in such a way that items of clothing of persons do not get caught in the motor and/or persons do not accidentally touch revolving or moving machine parts.
- ▲ The shaft key must be sufficiently protected prior to starting the motor.
- ▲ The motor may be operated only according to the specifications on the rating plate.
- ▲ Safety and protection measures and/or safety devices may neither be bypassed nor put out of operation.

4.1 Unpacking

1. Remove the motor carefully from the packaging.
2. Check the delivery for completeness and transport damages. The motor housing must not exhibit any damage. The shaft must be freely movable. Friction may occur only due to the two carbon brushes and the bearings.
3. Report damages immediately to Coperion K-Tron (Switzerland) LLC.

4.2 Setup conditions

The motor must be set up and/or operated only in such a way that the motor cooling implemented via the motor housing is not impaired.

4.3 Installation

In order to avoid vibration of the motor, the motor must be mounted on a rigid base or a rigid support. In case the base or support is uneven, shim plates are sometimes required for levelling.

4.4 Connect the motor

 **DANGER**

- ▲ The motor may be operated in explosive areas only with Coperion K-Tron (Switzerland) LLC control systems of type KCM.
- ▲ Improper connecting of the motor can lead to risk to life from electrocution.
- ▲ The motor may only be connected by qualified electricians.
- ▲ Observe the local regulations.



- ⇒ Provide a lockable main switch to disconnect the main power supply from the feeder.
- ⇒ The lockable circuit breaker or isolating switch must be mounted in the proximity of the device and must be easily accessible to the operator.
- ⇒ The disconnecting circuit breaker must be marked as a line disconnecter.

1. Connect the motor follow the wiring diagram.
2. While connecting the motor, use connecting cable with a temperature resistance of minimum 80 °C. No warning note has been affixed to the motor, since the connection is performed exclusively by the company Coperion K-Tron (Switzerland) LLC.
3. While connecting the cable, shim washers made of steel (included in the scope of delivery) must be used for the connection to the contact parts with light metal content.
4. Earth the motor carefully. In order to ensure the potential equalisation, the motor must be integrated in a conductive housing and/or system part, which is connected with the PE cable of the mains.



Connect the ground connection to a low-impedance equipotential bonding ($\leq 0.1 \Omega$), see the grounding information on the Motor.



Carefully follow all wiring and shielding procedures as indicated on the provided wiring diagrams and operating instructions of the controls.

4.4.1 Lengths of the connecting line: 230 V AC

Motor type	Nominal voltage	Nominal current	Cable length given a wire cross-section of 1.3 mm ² or 16 AWG in metres	Cable length given a wire cross-section of 3.3 mm ² or 12 AWG in metres
Baldor 450W	200 V	2.5 A	267	300

4.4.2 Connection diagram of KCM to motor

Note:

- All the terminal strips are represented in this example.

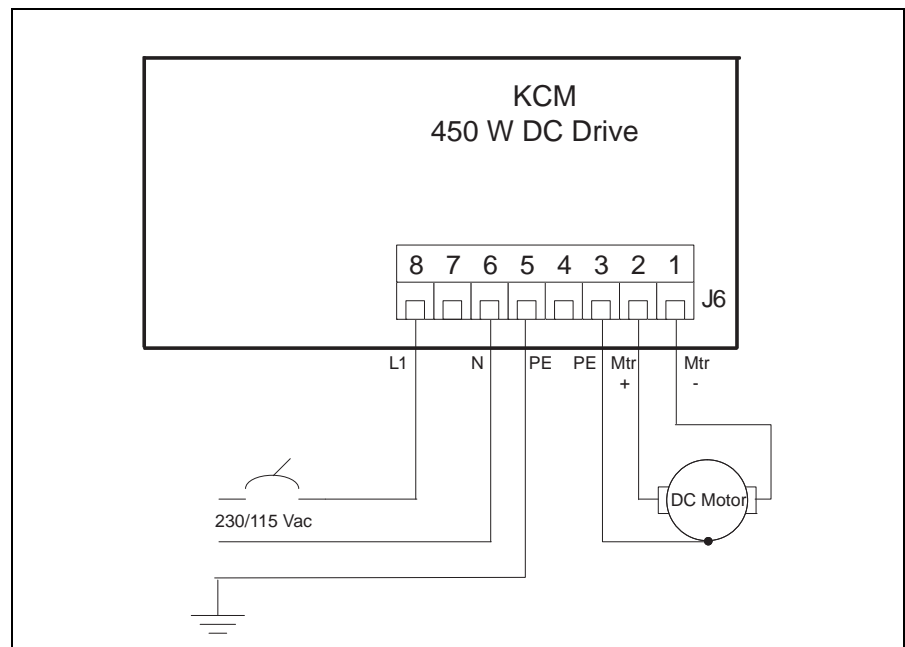


Fig. 4.1 Example of circuit for motor in the KCM

4.5 Commissioning



- ▲ The motor may be operated in explosive areas only with Coperion K-Tron (Switzerland) LLC control systems of type KCM.



Additional information pertaining to programming and control is given in the project manual.



The motor may be regulated and controlled in explosive areas only with the Coperion K-Tron (Switzerland) LLC control system of type KCM. In the process, the parameters are preset by the company Coperion K-Tron (Switzerland) LLC. The parameters may be changed by the operator only in consultation with Coperion K-Tron (Switzerland) LLC.

The operator of the explosion-proof motor has to ensure that the preset parameters are observed and not exceeded in all operating conditions.

In order to avoid damage to production machinery, the direction of rotation of the motor must be clarified and/or checked at the time of commissioning.

If the motor is directly coupled, the axes of the shafts must be faultlessly aligned. If there are fluctuations in temperature, the linear expansion of the drive unit, which could impair the motor shaft, must be taken into consideration.

If the motor is switched on with the correct rotor, the motor must ramp up as quickly as possible. The drive unit must run silently, i.e. there should be no audible vibration noise. Otherwise, the machine must be immediately switched off again. Establish the cause.

Possible causes: Too low voltage, wrongly connected motor, too high current.

It is recommended to measure the motor current at the time of commissioning and to compare it with the specification on the rating plate.

4.5.1 Default values for the programming of the KCM



Additional information pertaining to programming and control is given in the project manual.

4.5.2 KCM menu Mechanics, sub-menu Setting of Motor

Parameters	Value
PICK UP TEETH	120
MAX MOT POWER [Watt]	450 W
MAX MOT VOLTAGE	200 V
MAX MOT SPEED [RPM]	2000 rpm

4.5.3 Programming of KCM

KCM menu Mechanics, sub-menu Setting of Motor

Parameters	Definition
PICK UP TEETH	Input of the number of teeth of the pick up gear. Standard: 120
MAX MOT POWER [Watt]	This entry sets the maximal output voltage to the motor. See name plate on motor for value. Input range: 25 to 1600 W
MAX MOT VOLTAGE	This input sets the maximal supply voltage for the motor. See the rating plate on the motor for the respective value. Standard: 200 V DC (direct current)
MAX MOT SPEED[rpm]	Input of the maximum motor rpm for 100% drive command. See name plate on the motor for value.

5 Operation



- ▲ There is a risk of injury at the time of disassembly of the system. In order to avoid this risk, observe the following points:
 - Follow the operating instructions of the device in which the motor is integrated.
-

5.1 Switching on / off

⇒ Switch on / off the feeder with the connected controls.



For more information, see operating and programming instructions for the control system.

6 Maintenance

DANGER

When carrying out maintenance work on the switched-off device, there is a danger of injury through unintentional switching-on.

- ▲ Switch off the feeding system before carrying out maintenance work on the feeder and secure it against unintentional restarting.
- ▲ The motor must not be opened if flammable dust is present in the atmosphere or has accumulated on the motor housing.

6.1 Maintenance intervals

Type	Checkpoints when in operation	Interval
Cleaning	Eliminate dust accumulation > 5 mm through cleaning	Weekly
Seals	Kindly pay attention to the leakage tightness of the sealing means for the terminal box and for the shaft sealing.	2200 hours (depending upon load)
Motor brushes	Check for free movement and active length.	1500 hours (depending upon load)



- ▲ The replacement of a connecting cable on the explosion-proof motor shall be approved on a case-by-case basis in consultation with the company Coperion K-Tron (Switzerland) LLC (Switzerland) GmbH, CH-5702 Niederlenz.

6.2 Carbon brushes

The carbon brushes are to be checked at periodic intervals for their functioning (freedom of movement) and their active length.

If need be, the carbon brush dust in the motor must be blown out with the necessary protective measures. If the brushes are worn out up to 10 mm length (see spare parts catalogue), these must be replaced with original brushes by the manufacturer.

If the collector is worn or abraded, Coperion K-Tron (Switzerland) LLC must be informed about it immediately.

6.3 Lubrication of the motor

The motor possesses double sealed ball bearings. The ball bearings were lubricated ex-works. Subsequent lubrication is not required.

7 Trouble-shooting

- ⇒ Kindly also observe the error notes that are displayed on the connected control system or control computer (see operating instructions of the control devise).
- ⇒ Document faults and call the local service centre (customer service see project manual).
- ⇒ If the motor is defect, disassemble the motor and exchange with a new motor.

7.1 Trouble-shooting table

Fault	Cause	Remedy
Motor does not start up	<ul style="list-style-type: none">• No setpoint from KCM.• Safety switch is active.• Motor cable is pulled out / disconnected.• Motor is defect.	<ul style="list-style-type: none">⇒ Enter the setpoint via the control system.⇒ Check the safety switch on the feeder or connection to the KCM.⇒ Check the motor cable.⇒ Replace the motor.⇒ Check for alarm messages that lead to stopping of the machine.⇒ Check display status for <Wait>, <Disa>, <Alsh>.⇒ Check the power supply of the KCM.

8 Appendix

8.1 Declaration of conformity

Baldor ASR AG
Schützenstrasse 59
CH-8245 Feuerthalen

Baldor Electric Company
P.O. Box 2400
Fort Smith, AR 72902-2400 USA



KONFORMITÄTSERKLÄRUNG

DECLARATION OF CONFORMITY
DÉCLARATION DE CONFORMITÉ

Wir erklären hiermit, dass:
We declare herewith, that:
Nous déclarons ci-après que:

Typ / type:	Kennzeichnung / marking / marquage:
Baldor Motor 450 W DC	II 3D Ex tD A22 IP65 T86°C Tamb. = -20...+50°C SEV 06 ATEX 0127 X

konform ist / sind mit den Bestimmungen der unten genannten EG-Richtlinien. Folgende EG-Richtlinien und harmonisierte Normen wurden angewendet:
is / are in conformity with the provisions of the below listed EC-Directives. The following EC-Directives and harmonized standards have been applied:
est / sont conforme aux dispositions des Directives CE suivantes. Les Directives CE suivants et les normes harmonisées ont été appliquées:

EG-Richtlinien / EC-Directives / Directives CE	Normen / Standards / Normes
94/9/EG: Geräte und Schutzsysteme zur bestimmungsgemässen Verwendung in explosionsgefährdeten Bereichen 94/9/EC: <i>Equipment and protective systems intended for use in potentially explosive atmospheres</i> 94/9/CE: <i>Appareils et les systèmes de protection destinés à être utilisés en atmosphères explosibles</i>	EN 1127-1:2007 EN 61241-0:2006 EN 61241-1:2004
2006/95/EG: Niederspannungs-Richtlinie 2006/95/EC: <i>Low Voltage Directive</i> 2006/95/EG: <i>Directive Basse Tension</i>	EN 61010-1:2001
2004/108/EG: EMV-Richtlinie 2004/108/EC: <i>EMC-Directive</i> 2004/108/CE: <i>Compatibilité Électromagnétique</i>	EN 61000-6-2:2005 EN 61000-6-4:2007

Die technische Dokumentation ist vollständig vorhanden. Dokumentationsverantwortlicher ist Heinz Rhiner.
The technical documentation is complete. Responsible for documentation is Heinz Rhiner.
La documentation technique est complète. Le responsable de la documentation est Heinz Rhiner.

Feuerthalen, 01.04.2010

Heinz Rhiner
Area Sales Manager

Frank Schlosser
Geschäftsführer

EX-ATEX Certified
Hall Effect Single Channel Speed Sensor
FTG 1088.xx Ex and FTG 1089.xx Ex



valid for sensors with serial no. 4909 and later

Product ID

Type #	Product #	Drawing #
FTG 1088.00 Ex (DSD 1005.00 KTV Ex-atex T6-T1)	343Z-03772	4-106.026B rev.1
FTG 1088.00 Ex KTV-B (DSD 1005.00 KTV-B Ex-atex T6-T1)	343Z-05108	4-112.989 rev.1
FTG 1088.01 Ex (DSD 1005.00 PTV Ex-atex T6-T1)	343Z-03770	4-106.026B rev.1
FTG 1088.00 S4 Ex	343Z-03834	4-109.287B S4 rev.1
FTG 1089.00 Ex (DSD 1010.00 KTV Ex-atex T6-T1)	343Z-03832	4-106.026B rev.1
FTG 1089.01 Ex (DSD 1010.00 PTV Ex-atex T6-T1)	343Z-03837	4-106.026B rev.1
FTG 1089.00 S4 Ex (1.5m)	343Z-03821	4-109.287B S4 rev.1
FTG 1089.00 S4 Ex (5m)	343Z-03829	4-109.287B S4 rev.1
FTG 1089.02 Ex	343Z-05605	106026A rev. 2

General

Function

The sensors FTG 1088.xx Ex and FTG 1089.xx Ex are suitable, in conjunction with a pole wheel, for generating square wave signals proportional to rotary speeds. The sensing element consists of a magnetically biased differential hall effect semiconductor in a bridge-circuit, followed by a Schmitt-trigger. The latter has an open collector output connected to the positive pole of the power supply through a 1.8k resistor.

The FTG 1088.xx Ex have a dynamic behaviour, so that pulse generation is guaranteed down to a speed corresponding to a frequency of 5 Hz.

The FTG 1089.xx Ex have a static behaviour, so that pulse generation is guaranteed down to a speed corresponding to a frequency of 0Hz

Safety Notice

The sensors FTG 1088.xx Ex and FTG 1089.xx Ex are certified for applications in areas with explosive atmospheres. These types are to be duly used in undamaged and clean condition. Modifications of sensors are prohibited if not expressly listed in these operating instructions.

Conformity to Standards

Sensor types FTG 1088.xx Ex and FTG 1089.xx Ex are certified according to EN 50014:1997+A1+A2, EN 50020:1994, prEN 61241-0:2002 and IEC 61241-11:2002 (see main certificate):

- II 1 G EEx ia IIC T6
- II 1 D Ex iaD 20 T... °C

In addition, the sensors meet the standards EN 60079-0:2006, EN60079-11:2007, EN 61241-0:2006 and EN 61241-11:2006 (see 2. supplement):

- II 1 G Ex ia IIC T6
- II 1 D Ex iaD 20 T 125°C

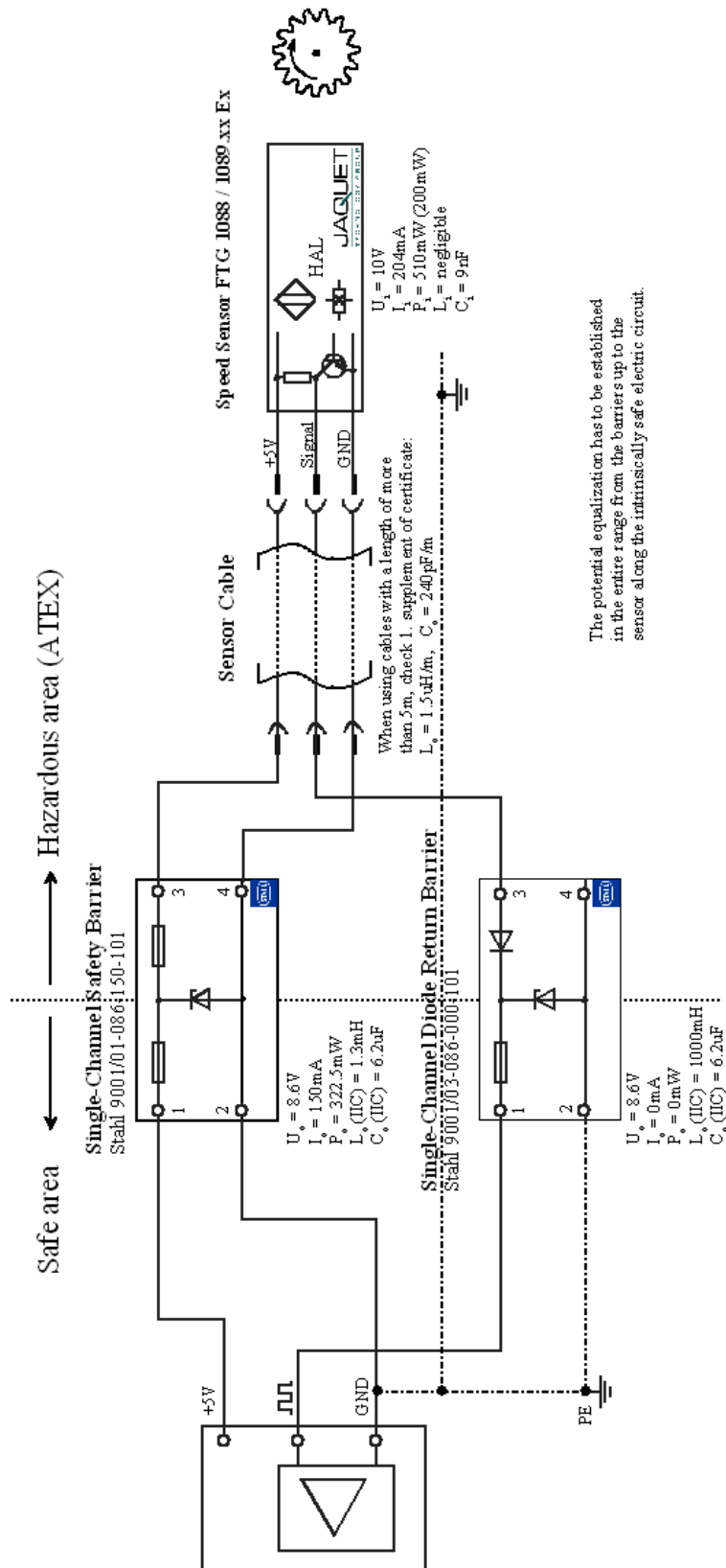
They have been designed, manufactured and tested according to the state of the art. For their application the restrictions listed in the European Certificate of Conformity ZELM 03 ATEX 0147X and its 1st and 2nd supplement must be observed. 0820

Technical data

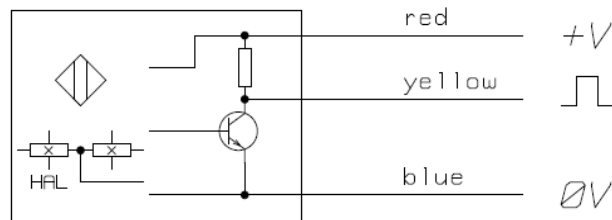
Supply voltage	5V ±10% (continuous) protected against false polarity																				
Current consumption	Max. 16 mA (without load)																				
Signal output	<ul style="list-style-type: none"> • Square wave signal • Signal levels without load $U_{High} \sim U_{power\ supply}$, $U_{Low} < 0.4\ V$ • Max. allowed sink current = 25mA (at a saturation voltage < 0.4V) • The output is connected through a pull-up resistor of 1.8 kΩ to the positive pole of the power supply. 																				
Frequency range	FTG 1088.xx Ex: 5Hz...20 kHz FTG 1089.xx Ex: 0Hz...20 kHz																				
Electromagnetic compatibility (EMC):	<p>According to 2004/108/EG, EN 61000-6-2, EN 61000-6-4:</p> <ul style="list-style-type: none"> • Electrostatic discharge into housing, cable shield and wires: up to ±4 kV peak according to IEC 61000-4-2, severity level 2 • Radiated electromagnetic field: up to 30 V/m, 50% AM, 1 kHz in the range of 1 MHz to 1000 MHz according to IEC 61000-4-3, severity level 3 • Electrical fast transients/bursts, coupled to sensor cable with a capacitive coupling clamp: up to ±4 kV peak according to IEC 61000-4-4, severity level 4 																				
Housing	<table border="1"> <thead> <tr> <th>Type #</th> <th>Housing material</th> </tr> </thead> <tbody> <tr> <td>FTG 1088.00 Ex (DSD 1005.00 KTV Ex-atex T6-T1)</td> <td>CuNi7Zn39Mn2Pb3</td> </tr> <tr> <td>FTG 1088.00 Ex KTV-B (DSD 1005.00 KTV-B Ex-atex T6-T1)</td> <td>CuNi7Zn39Mn2Pb3</td> </tr> <tr> <td>FTG 1088.01 Ex (DSD 1005.00 PTV Ex-atex T6-T1)</td> <td>CuNi7Zn39Mn2Pb3</td> </tr> <tr> <td>FTG 1088.00 S4 Ex</td> <td>X2CrNiMo</td> </tr> <tr> <td>FTG 1089.00 Ex (DSD 1010.00 KTV Ex-atex T6-T1)</td> <td>CuNi7Zn39Mn2Pb3</td> </tr> <tr> <td>FTG 1089.01 Ex (DSD 1010.00 PTV Ex-atex T6-T1)</td> <td>CuNi7Zn39Mn2Pb3</td> </tr> <tr> <td>FTG 1089.00 S4 Ex (1.5m)</td> <td>X2CrNiMo</td> </tr> <tr> <td>FTG 1089.00 S4 Ex (5m)</td> <td>X2CrNiMo</td> </tr> <tr> <td>FTG 1089.02 Ex</td> <td>CuNi7Zn39Mn2Pb3</td> </tr> </tbody> </table> <p>German silver (Argentan) CuNi7Zn39Mn2Pb3 (CW400J) EN 12164, front side sealed hermetically, sensor components potted in chemical and age proof synthetic resin. Stainless steel X2CrNiMo 18/14/3 (material number 1.4435), front side sealed hermetically, sensor components potted in chemical and age proof synthetic resin. Dimensions according to drawing.</p>	Type #	Housing material	FTG 1088.00 Ex (DSD 1005.00 KTV Ex-atex T6-T1)	CuNi7Zn39Mn2Pb3	FTG 1088.00 Ex KTV-B (DSD 1005.00 KTV-B Ex-atex T6-T1)	CuNi7Zn39Mn2Pb3	FTG 1088.01 Ex (DSD 1005.00 PTV Ex-atex T6-T1)	CuNi7Zn39Mn2Pb3	FTG 1088.00 S4 Ex	X2CrNiMo	FTG 1089.00 Ex (DSD 1010.00 KTV Ex-atex T6-T1)	CuNi7Zn39Mn2Pb3	FTG 1089.01 Ex (DSD 1010.00 PTV Ex-atex T6-T1)	CuNi7Zn39Mn2Pb3	FTG 1089.00 S4 Ex (1.5m)	X2CrNiMo	FTG 1089.00 S4 Ex (5m)	X2CrNiMo	FTG 1089.02 Ex	CuNi7Zn39Mn2Pb3
Type #	Housing material																				
FTG 1088.00 Ex (DSD 1005.00 KTV Ex-atex T6-T1)	CuNi7Zn39Mn2Pb3																				
FTG 1088.00 Ex KTV-B (DSD 1005.00 KTV-B Ex-atex T6-T1)	CuNi7Zn39Mn2Pb3																				
FTG 1088.01 Ex (DSD 1005.00 PTV Ex-atex T6-T1)	CuNi7Zn39Mn2Pb3																				
FTG 1088.00 S4 Ex	X2CrNiMo																				
FTG 1089.00 Ex (DSD 1010.00 KTV Ex-atex T6-T1)	CuNi7Zn39Mn2Pb3																				
FTG 1089.01 Ex (DSD 1010.00 PTV Ex-atex T6-T1)	CuNi7Zn39Mn2Pb3																				
FTG 1089.00 S4 Ex (1.5m)	X2CrNiMo																				
FTG 1089.00 S4 Ex (5m)	X2CrNiMo																				
FTG 1089.02 Ex	CuNi7Zn39Mn2Pb3																				
Pole wheel	<p>Toothed wheel made of a magnetically permeable material (e.g. Steel 1.0036)</p> <ul style="list-style-type: none"> • Minimum tooth width 10 mm • Side offset < 0.2 mm • Eccentricity < 0.2mm • Involute gear wheel preferred (module ≥0.5) 																				
Air gap sensor / pole wheel	<p>Air gap between pole wheel (involute gear) and sensor housing:</p> <p>FTG 1088.xx Ex:</p> <ul style="list-style-type: none"> • Module 0.5 mm: 0.1...0.4 mm • Module 1.0 mm: 0.1...1.0 mm • Module 2.0 mm (and larger): 0.1...1.3 mm <p>FTG 1089.xx Ex:</p> <ul style="list-style-type: none"> • Module 1 mm: 0.1...0.5 mm • Module 2 mm: 0.1...1.3 mm • Module 4 mm (and larger): 0.1...1.5 mm 																				
Insulation	Housing and electronics galvanically separated (500 V/50 Hz/ 1 min)																				
Protection class	IP68 (head) and IP67 (cable or litz wire outlet)																				
Vibration immunity	3 g in the range 4...100 Hz																				
Shock immunity	20 g during 11 ms, half-sine wave																				
Temperature	see Ex certificate																				

EX-Safety and Marking	<p>For these explosion proof sensors a copy of the European Certificate of Conformity ZELM 03 ATEX 0147X and its 1st and 2nd Supplement is attached.</p> <p>See also below, the Ex related information in this documentation.</p> <p>As mentioned in section "Conformity to Standards", these sensors fulfil both the "old" standards (EN 50014:1997+A1+A2, EN 50020:1994, prEN 61241-0:2002 and IEC 61241-11:2002) and the "current" standards (EN 60079-0:2006, EN60079-11:2007, EN 61241-0:2006 and EN 61241-11:2006).</p>
Connection	<p>The sensors must be connected according to the sensor drawing.</p> <p>Sensor wires are susceptible to radiated noise. Hence, the sensor wires must be laid as far as possible from large electrical machines. They must not run parallel in the vicinity of power cables. The permissible cable length is limited from a safety point of view according to the 1. Supplement of the Certificate of Conformity ZELM 03 ATEX 0147X.</p>
Installation	<p>All mechanical installations must be carried out by an expert. General safety requirements have to be met.</p> <p>For installation, the CE directives for the installation of apparatus in explosive environments must be taken into account.</p> <p>These sensors contain differential Hall probes. Therefore, the housing has to be aligned to the pole wheel according to the sensor drawing.</p> <p>Deviations in positioning may affect the functioning and decrease the noise immunity of the sensor.</p> <p>The sensor should be mounted with the middle of the face side over the middle of the pole wheel. Where the pole wheel has teeth or slots and with radial sensor location, the sensor would normally be mounted over the centre. Dependent upon the wheel width, a certain degree of axial movement is permissible. However, the middle of the sensor must be at minimum in a distance of 3mm from the edge of the pole wheel under all operating conditions.</p> <p>A solid and vibration free mounting of the sensor is important.</p> <p>Eventual sensor vibration relative to the pole wheel can induce additional output pulses.</p> <p>The sensors are insensitive to oil, grease etc and can be installed in arduous conditions. During installation, the smallest possible pole wheel to sensor gap should be set. The gap should however be set to prevent the face of the sensor ever touching the pole wheel. Within the air gap specified the amplitude of the output signals is not influenced by the air gap.</p>
Further information	
Maintenance	No maintenance required. The sensors cannot be repaired.
Transport	Product must be handled with care to prevent damage of the front face.
Storage	Product must be stored in dry conditions. The storage temperature corresponds to the operation temperature.
Disposal	Product must be disposed of properly; it must not be disposed as domestic waste.

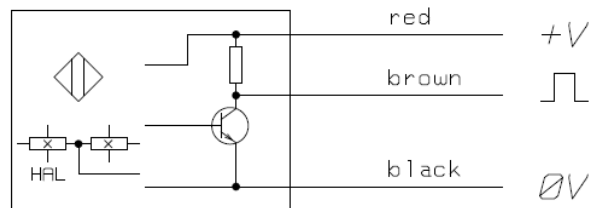
Example of connection diagram using safety barriers:



Connection diagram (Standard):



“S4“ Variants:



Type-list:

Type #	Product #	Housing length [mm]	Cable/lace type	Cable/lace length [m]	Connection	Weight [gr]
FTG 1088.00 Ex (DSD 1005.00 KTV Ex-atex T6-T1)	343Z-03772	35	Wire	0.4	Open wire	20
FTG 1088.00 KTV-B (DSD 1005.00 KTV-B Ex-atex T6-T1)	343Z-05108	35	Wire	0.130	Terminal block	
FTG 1088.01 Ex (DSD 1005.00 PTV Ex-atex T6-T1)	343Z-03770	35	Wire	0.105	Connector	23
FTG 1088.00 S4 Ex	343Z-03834	50	Cable	5	Open wire	100
FTG 1089.00 Ex (DSD 1010.00 KTV Ex-atex T6-T1)	343Z-03832	35	Wire	0.4	Open wire	20
FTG 1089.01 Ex (DSD 1010.00 PTV Ex-atex T6-T1)	343Z-03837	35	Wire	0.105	Connector	23
FTG 1089.00 S4 Ex (1.5m)	343Z-03821	50	Cable	1.5	Open wire	50
FTG 1089.00 S4 Ex (5m)	343Z-03829	50	Cable	5	Open wire	100
FTG 1089.02 Ex	343Z-05605	35	Wire	1	Open wire	25

Wire:

- Twisted Teflon insulated wires, cross section=0.22 mm² (AWG 24), outer diameter=1.5 mm, colours red, blue and yellow

Cable:

- FEP Teflon cable, 3-wire, 0.6 mm² (AWG 20), outer-Ø max. 4.7 mm, bending radius min. 70 mm, strand shielded screen (white, metal net), Jaquet Part-No. 824L-33024

Connector:

- Molex-plug, Type 03-06-2031, Jaquet Part-No. 343C-72577

Terminal block:

- Phoenix contact MSTB 2,5/ 3-ST-5,08 and IC 2,5/ 3-ST-5,08

**Baugruppen-Einbauerklärung nach Anhang II.B
(Artikel 4 Absatz 2 der Richtlinie 98/37/EG) und
Konformitätserklärung**

**Declaration of incorporation of a subassembly
(Annex II.B; Article 4(2) of Directive 98/37/EC)
and declaration of conformity**

Der Hersteller

The manufacturer

Jaquet AG, Thannerstrasse 15, CH-4009 Basel

erklärt, dass die nachfolgende Baugruppe

hereby declares that the subassembly described below

Bezeichnung:

Description:

**Hall Effect Single Channel Speed Sensor FTG 1088.xx Ex and FTG 1089.xx Ex
(DSD 1005.xx xTV Ex-atex and DSD 1010.xx xTV Ex-atex)**

Kennzeichnung / Marking:  II 1G Ex ia IIC T6 und/and oder/or  II 1D Ex iaD 20 T ... °C

Identifikations-Nummer lt. Lieferpapieren

Identification number check shipping documents

erst in Betrieb genommen werden darf, nachdem die Konformität der Anlage, in die diese eingebaut wird, mit den Bestimmungen der Richtlinie 98/37/EG und den sie umsetzenden nationalen Rechtsvorschriften erklärt wurde, mit den Bestimmungen folgender harmonisierter Normen, in der zum Unterschriftsdatum gültigen Fassung übereinstimmt:

EN 60079-0 Elektrische Betriebsmittel für gasexplosionsgefährdete Bereiche; Allgemeine Bestimmungen

EN 60079-11 Explosionsfähige Atmosphäre – Teil 11: Geräteschutz durch Eigensicherheit "i"

EN 60079-26 Elektrische Betriebsmittel für gasexplosionsgefährdete Bereiche – Teil 26: Konstruktion, Prüfung und Kennzeichnung elektrischer Betriebsmittel für Gruppe II Kategorie 1G

EN 61241-0 Elektrische Betriebsmittel zur Verwendung in Bereichen mit brennbarem Staub – Teil 0: Allgemeine Anforderungen

EN 61241-11 Elektrische Betriebsmittel zur Verwendung in Bereichen mit brennbarem Staub – Teil 11: Schutz durch Eigensicherheit "iD"

EN 61010-1 Sicherheitsbestimmungen für elektrische Mess-, Steuer-, Regel- und Laborgeräte, Teil 1: Allgemeine Anforderungen

EN 61000-6-2 Elektromagnetische Verträglichkeit (EMV), Teil 6-2: Fachgrundnormen, Störfestigkeit für Industriebereich

EN 61000-6-4 Elektromagnetische Verträglichkeit (EMV), Teil 6-4: Fachgrundnormen, Störaussendung für Industriebereich

EN 61000-4-2/3/4/5/6/8/11 Elektromagnetische Verträglichkeit (EMV): Prüf- und Messverfahren

ISO 9001 Qualitätsmanagementsysteme – Anforderungen

may not be put into service before the system into which it will be incorporated has been declared to be compliant with the provisions of Directive 98/37/EC, and with the regulations transposing it into national law; complies with the provisions of the following harmonized standards in the version valid at signature date:

EN 60079-0 Electrical apparatus for explosive gas atmospheres: General requirements

EN 60079-11 Explosive Atmospheres: Equipment protection by intrinsic safety "i"

EN 60079-26 Electrical apparatus for explosive gas atmospheres – Part 26: Construction, test and marking of group II category 1G electrical apparatus

EN 61241-0 Electrical apparatus for use in the presence of combustible dust – Part 0: General requirements

EN 61241-11 Electrical apparatus for use in the presence of combustible dust – Part 11: Protection by intrinsic safety "iD"

EN 61010-1 Safety requirements for electrical equipment for measurement, control, and laboratory use, Part 1: General requirements

EN 61000-6-2 Electromagnetic compatibility (EMC); Part 6-2: Generic standards, Immunity for industrial environments

EN 61000-6-4 Electromagnetic compatibility (EMC); Part 6-4: Generic standards, Emission standard for industrial environments

EN 61000-4-2/3/4/5/6/8/11 Electromagnetic compatibility (EMC): Testing and measurement techniques

ISO 9001 Quality management systems – Requirements

Mit den Bestimmungen folgender Europäischer Richtlinien übereinstimmt:

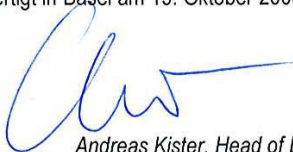
RL 94/9/EG Explosionsschutz
RL 2004/108/EG EMV

Complies with the provisions of the following European Directives:

Directive 94/9/EC Explosion protection
Directive 2004/108/EC EMC

Ausgefertigt in Basel am 19. Oktober 2009

Signed in Basel on October, 19th, 2009



Andreas Kister, Head of Engineering



Wolfgang Schnell, EX-delegate

Last change by: MT, 18.11.2011	Checked by: WS, 05.12.2011	Document status: APPROVED	Document Nr.: 117728	Document Revision: 010
www.jaquet.com	info@jaquet.com	Tel.: +41 61 306 88 22	Page 6/11	



Prüf- und Zertifizierungsstelle

ZELM Ex



(13)

SCHEDULE

(14)

EC-TYPE-EXAMINATION CERTIFICATE ZELM 03 ATEX 0147X

(15) Description of equipment

The rotation speed sensors are used for the recording of the rotation speed for the touchless scanning of rotating ferromagnetic rotating magnetic poles, gears, camshafts and the like.

Model key:

type	Cable type	Cable length	Remarks
FTG 1088.00 Ex FTG 1089.00 Ex	Single laces	400 mm	
FTG 1088.01 Ex FTG 1089.01 Ex	Single laces - twisted	105 mm	with connection plug
FTG 1088.00 S4 Ex FTG 1089.00 S4 Ex	3-wire shielded teflon cord	max. 5 m	

The types FTG 1088... and FTG 1089... distinguish through the inner construction and the functional behavior. These differences are however for security reasons without importance.

Electrical data

Supply- and signal circuit type of protection intrinsic safety EEx ia IIC resp. ia IIB or iaD for use according to category 1D

only for the connection to certified intrinsically safe circuits

maximum values: $U_i = 10 \text{ V}$
 $I_i = 204 \text{ mA}$
 $P_i = 510 \text{ mW resp. } 200 \text{ mW}$

Maximum effective inner capacity $C_i = 9 \text{ nF}$

The maximum effective inner inductance is negligibly small

The lower temperature boundary is for all versions and applications - 20 °C.

The temperature class resp. the maximum surface temperature, the maximum permissible ambient temperature and the maximal permissible power of the connected, certified, intrinsically safe circuit (P_i) for the different versions are to take from the tables 1 resp. 2.

Table 1

Category	P _i [mW]	maximum ambient temperature for the temperature classes in °C					
		T1	T2	T3	T4	T5	T6
2G	510	100	100	100	100	70	55
	200	100	100	100	100	85	70
1G	510	100	100	100	80	50	40
	200	100	100	100	95	65	55

Sheet 2/3

EC-type-examination Certificates without signature and stamp are not valid. The certificates may only be circulated without alteration. Extracts or alterations are subject to approval by the Prüf- und Zertifizierungsstelle ZELM Ex. This English version is based on the German text. In the case of dispute, the German text shall prevail.

Prüf- und Zertifizierungsstelle ZELM Ex • Siekgraben 56 • D-38124 Braunschweig



Prüf- und Zertifizierungsstelle

ZELM Ex



Schedule to EC-TYPE-EXAMINATION CERTIFICATE ZELM 03 ATEX 0147X

Table 2

Category	P _i [mW]	maximum ambient temperature	maximum surface temperature
1D	510	100 °C	155 °C
	200	100 °C	125 °C

(16) Report No.

ZELM Ex 0040315194

(17) Special conditions for safe use

1. The Rotation Speed Sensors may be used only in intrinsically safe electric circuits in accordance with the information in this EC-type-examination certificate. Because of possible ignition hazards, which can arise due to mistakes and/or transient currents in the potential equalization system galvanic separation is to be favored in the supply- and signal circuit. Associated apparatus without galvanic separation may be used only if the corresponding requirements are kept according to IEC 60079-14.
2. The permissible ambient temperature range is to be determined according to the determination of this EC-type-examination certificate.
3. The versions with plug adapter resp. with single laces are only intended for mounting in an appropriate enclosure, which assure an adequate protection corresponding the environmental conditions and allowed the proper electric connection. The supply cable of the corresponding version is to protect against mechanical hazards and against electrostatic charge where appropriate by correct installation.
4. The metal case of the rotation speed sensors is to be included in the local potential equalization as far as dangerous electrostatic charge for example through flowing media or mechanical friction must be reckoned on.
5. The tightness for the purposes of zone separating measures for the mounting across the boundary between different zones is not subject of this certification and must be ensured by appropriate measures of installation.
6. The instruction manual has to be considered.

(18) Essential Health and Safety Requirements

Met by standards. The rotation speed sensors correspond with the norms EN 50014 and EN 50020. For the commitment 1 D the performed draft standards were used besides since no harmonized European standards that are to be applied in connection with the type of protection "Intrinsic safety" are available in the moment.

Zertifizierungsstelle ZELM Ex

Braunschweig, June 19, 2003


Adolf Gruber



Sheet 3/3

EC-type-examination Certificates without signature and stamp are not valid. The certificates may only be circulated without alteration. Extracts or alterations are subject to approval by the Prüf- und Zertifizierungsstelle ZELM Ex. This English version is based on the German text. In the case of dispute, the German text shall prevail.

Prüf- und Zertifizierungsstelle ZELM Ex • Siekgraben 56 • D-38124 Braunschweig



Prüf- und Zertifizierungsstelle

ZELM Ex



1. Supplement

(Supplement according to EC-Directive 94/9 Annex III letter 6)
to EC-type-examination Certificate

ZELM 03 ATEX 0147 X

Equipment: **Rotation speed sensor type FTG 1088... Ex and Type FTG 1089... Ex**
Manufacturer: **JAUQUET AG**
Address: **Thannerstrasse 15, CH-4009 Basel**

Description of supplement

The 1. Supplement considers application different length of the connecting cables for different types of sensors.

Additional to the maximum values of the effective inner capacitance and inductance mentioned in the EC-Type Examination Certificate following maximal values of the capacitance and inductance are to be considered by using connecting cables with the length of more than 5 m:

$$C_i = 240 \text{ pF/m}$$

$$L_i = 1,5 \text{ µH/m}$$

The explosion protection of the equipment is not affected by these changes.

The equipment may be used in future also in consideration of this Supplement.

The type of protection, all further data as well as the special conditions remain unchanged and also apply to this 1. Supplement.

References:

The instruction manual has to be observed.

Report No.

ZELM Ex 0840617485

Essential Health and Safety Requirements

The Essential Health and Safety Requirements are still fulfilled under consideration of the Standards mentioned in the EC-type-examination Certificate.

Zertifizierungsstelle **ZELM Ex**



Braunschweig, September 26, 2006


Dipl.-Ing. Harald Zelm

Sheet 1 / 1

EC-type-examination Certificates without signature and stamp are not valid. The certificates may only be circulated without alteration. Extracts or alterations are subject to approval by the Prüf- und Zertifizierungsstelle ZELM Ex. This English version is based on the German text. In the case of dispute, the German text shall prevail.

Prüf- und Zertifizierungsstelle ZELM Ex • Siekgraben 56 • D-38124 Braunschweig

Last change by: MT, 18.11.2011	Checked by: WS, 05.12.2011	Document status: APPROVED	Document Nr.: 117728	Document Revision: 010
www.jaquet.com	info@jaquet.com	Tel.: +41 61 306 88 22	Page 10/11	

OPERATING AND MAINTENANCE INSTRUCTIONS

D5 XPC3



Read this document prior to operating the device.

This document contains all safety and warning notes.

Original operating instructions

0990018601-EN Rev. 1.0.2

Service

If you need assistance, please call your local service centre or

Coperion K-TRON Schweiz GmbH Tel. 0041 (0) 62 / 885 71 71
Lenzhardweg 43/45 Fax 0041 (0) 62 / 885 71 80
CH-5702 Niederlenz

Coperion K-Tron Pitman, Inc. Tel. 001 (0) 856 / 589 0500
590 Woodbury Glassboro Road Fax 001 (0) 856 / 589 81 13
Sewell, New Jersey 08080 USA

Coperion K-TRON Salina Tel. 001 (0) 785 / 825 16 11
606 N. Front St. Fax 001 (0) 785 / 825 8759
Salina, KS 67402-0017

Web: www.coperionktron.com

Before you call...

- ⇒ Do you have alarm displays? Are you able to eliminate the causes?
- ⇒ Have you modified part of the system, product or operating mode?
- ⇒ Have you tried to remedy the fault in accordance with the operating instructions?
- ⇒ Note the project or order number You will find these on the machine or in the system manual.
 - Example: 0403214

Using the manual:

- ⇒ This arrow identifies an individual action.
- 1. Numbers identify a sequence of actions which have to be executed step-by-step.
- ▲ This symbol identifies a general safety note.



Reference to another manual.



Important information.



This symbol indicates that tools are required for the following task.



Specifies where information or a situation must be checked.

If an error or omission is found, please contact:

documentation@coperionktron.com

Doc. No.: 0990018601-EN

Date: 2014/01/20

Original: 0990018601-EN

Coperion K-Tron assumes no responsibility for damages resulting from misuse of any equipment or negligence on the part of operating personnel. Further, you may kindly refer to the purchase order, confirmation or other document that contains the express Coperion K-Tron warranty disclaimer limiting or excluding certain warranties with respect to the company's equipment. Except as otherwise expressly provided by Coperion K-Tron in any such document, COPERION K-TRON MAKES NO WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, NOR ANY OTHER WARRANTY, EXPRESS OR IMPLIED, WITH RESPECT TO THE EQUIPMENT.

Table of contents

1	Safety notes	5
1.1	Safety symbols definitions	5
1.2	Responsibilities of the owner	6
1.3	Proper use	6
1.4	Organizational measures	6
1.5	Safety-conscious work	7
1.6	Safety devices	7
1.7	Additional equipment	7
1.8	Installation	7
1.9	Customer service and repairs	8
1.10	Shut-down procedure	8
2	Field of application and function.	9
2.1	Field of application	9
2.1.1	Zones and device categories (gas)	9
2.1.2	Zones and device categories (dust)	9
2.1.3	Dust deposits and glow temperature	10
2.2	Main features	11
2.3	Functions description	12
2.4	Assembly	13
2.5	Function	13
3	Technical data	14
3.1	Dimensioned drawing	15
4	Mounting	16
4.1	Unpacking of the scale	16
4.2	Preparing mounting	17
4.3	Connecting the scale	18
5	Dismantling and Transport	19
6	Operation	20
7	Cleaning	21
7.1	Switching off the installation	21
7.2	Notes on cleaning	21
8	Maintenance	22
8.1	Maintenance intervals	22
9	Troubleshooting	23

9.1	Troubleshooting table	23
10	Appendix	24
10.1	Declaration of conformity D5 XPC3	24

1 Safety notes



- ▲ The explosion-proof scale is a product with a higher risk of damage because it is used in hazardous rooms. It is essential to comply with the following safety notes.



Installation, commissioning and programming of the specified equipment should only be undertaken by qualified personnel.

1.1 Safety symbols definitions



DANGER

- ▲ DANGER indicates an extremely hazardous situation which, if not avoided, could lead to heavy bodily injury or to death.



WARNING

- ▲ WARNING indicates a potentially hazardous situation which, if not avoided, could lead to heavy bodily injury or to death.



CAUTION

- ▲ CAUTION with safety alert indicates a potentially hazardous situation which, if not avoided, could lead to light bodily injuries.

NOTE

- ▲ NOTE indicates a potentially hazardous situation which, if not avoided, may result in property damage.



- ▲ The safety alert symbol is used to alert to the potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.

1.2 Responsibilities of the owner



- ▲ Observe and fulfill the following instructions, standards and directives when installing and erecting explosion-proof systems: Directives 99/92/EG (ATEX 137).
 - ▲ Ensure that only qualified and trained personnel work with the scale.
 - ▲ Establish personnel responsibilities for operation and maintenance.
 - ▲ Ensure that the personnel has read and understood the technical instructions to all installation components, particularly this chapter "Safety notes".
 - ▲ Strictly follow the operating and maintenance instructions.
 - ▲ The plant owner must replace immediately damaged or missing components.
 - ▲ The plant owner is responsible for compliance with legally prescribed accident prevention and safety regulations.
-

1.3 Proper use



- ▲ Use scale only in zones 22 or in non-classified areas.
 - ▲ Use D5 scale XPC3 only as weight sensor for weighing processes.
 - ▲ Only operate the scale in conjunction with the appropriate controls from Coperion K-Tron (Switzerland) LLC.
 - ▲ Only operate the scale in accordance with the specified technical data.
 - ▲ To avoid dust deposits on the scale
 - ▲ When processing dangerous materials, also comply with the safety notes which govern the handling of such materials.
 - ▲ Any modifications and changes on safety devices are prohibited
 - ▲ Do not use the D5 scale in a manner not intended by the manufacturer.
-

1.4 Organizational measures



- ▲ Observe the safety notes for the connected devices.
 - ▲ In addition to the technical instructions, always comply with generally prescribed safety regulations governing accident prevention and environmental safety.
-

1.5 Safety-conscious work



- ▲ Read the technical instructions, in particular these safety notes, and follow these instructions.
 - ▲ Ensure that only authorized personnel enter the working and danger area of the feeder.
 - ▲ Any changes (including changes in the operational behavior) which affect safety must be immediately reported to the responsible member of the staff.
 - ▲ Always keep safety in mind while working.
 - ▲ Before working on the weighing system always switch the equipment off at the main power switch.
-

1.6 Safety devices



- ▲ Never open or remove covers or hoods while the equipment is in operation.
 - ▲ Do not modify the electrical safety devices, for example fuses. Increased risk of accident.
 - ▲ Replace damaged cable joints and connections immediately.
-

1.7 Additional equipment



- ▲ Modifications to the scale are prohibited.
 - ▲ The plant owner is responsible for complying with all safety regulations related to the operation in conjunction with other machines.
-

1.8 Installation



- ▲ Mounting, wiring and commissioning of the scale may only be carried out by qualified personnel.
 - ▲ Check whether special clothing or special tools are required to work in the hazardous area of the operator.
 - ▲ Install and wire up the D5 XPC3 only when the plant owner has confirmed in writing that the place of installation is free of explosive media and that there is no risk.
 - ▲ After completing installation and before operating for the first time, check that the D5 XPC3 is in perfect condition from a safety point of view.
-

1.9 Customer service and repairs



- ▲ Load cells can only be repaired at the Coperion K-Tron (Switzerland) LLC factory (customer service address is found on the project manual).
-

1.10 Shut-down procedure



- ▲ The plant owner is responsible for the proper removal and disposal of the Scales from service.
-

2 Field of application and function.

2.1 Field of application

The D5 XPC3 scale is used as weight sensor in process engineering for weighing processes which require explosion protection in zone 22

2.1.1 Zones and device categories (gas)

Zone	Description	application scale
Zone 0	Areas in which it is expected that dangerous, potentially explosive atmospheres are present continuously for an extended period or occur frequently.	not allowed
Zone 1	Areas in which it is to be expected that dangerous, potentially explosive atmospheres arise occasionally.	not allowed
Zone 2	Areas in which it is not expected that dangerous, potentially explosive atmospheres arise. If they do arise here, however, it is only seldom and briefly.	not allowed

2.1.2 Zones and device categories (dust)

Zone	Description	application scale
Zone 20	Areas in which it is expected that dangerous, potentially explosive air/dust atmospheres are present continuously for an extended period or occur frequently.	not allowed
Zone 21	Areas in which it is to be expected that dangerous, potentially explosive air/dust atmospheres arise occasionally.	not allowed
Zone 22	Areas in which it is not to be expected that dangerous, potentially explosive air/dust atmospheres arise. If they do arise here, however, it is only seldom and briefly.	allowed

2.1.3 Dust deposits and glow temperature



- ▲ Observe the requirements of the standard IEC/EN 60079-14 Chapter 5.6.3.1 with regard to reduced glow temperature at dust deposits.

In case of dust deposits of up to 5 mm:

- Glow temperature of the material at a thickness of the layer of dust 5 mm: \geq max. Surface temperature (T_{max}) + 75 K.
- $T_{max} = T_{5\text{ mm}} - 75\text{ °C}$

In case of dust deposits greater than 5 mm to max. 50mm:

- The difference to be observed between the glow temperature of the material and the surface temperature (T_{max}) depends on how thick the dust layer is. The context is shown in Fig. 1 of the standard EN 60079-14 Chapter 5.3.3.2.1
- Avoid Dust deposits > 5mm (see [7 cleaning](#)).

Dust deposits \geq 50 mm avoid or complete covered:

- not allowed
-

2.2 Main features

- Direct digital weight detection
- Weighing module with onboard micro controller
- Very good reproducibility and stability
- High resolution (1:4000000 on 80 ms)
- High tolerance to vibration and electrical noise
- Integrated, electronic linearisation
- Electronic temperature compensation
- Stiff and robust construction
- Interface RS 485
- Addressable interactive communication
- Integrated overload protection + 100%
- Integrated underload protection -50%
- Atex 3D (zone 22)

2.3 Functions description

The principle of the SFT is that of the dependency of the resonant frequency of an oscillating wire on the mechanical wire tension.

An unknown load changes the wire tension of the load sensor. The onboard microprocessor detects the resulting change in frequency and converts it to a digital weight signal. The serial interface transmits the linearized and temperature-compensated signal to the connected controller.

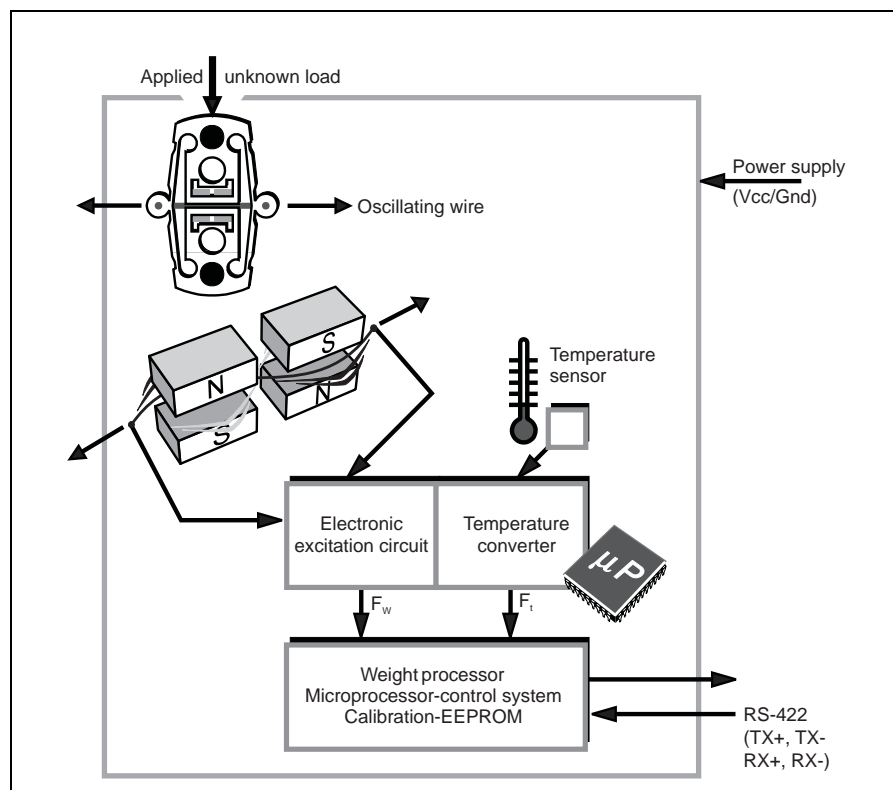


Fig. 2.1 Function description

2.4 Assembly

1. Top Cover
2. Cross
3. Weighing unit
4. Shock mounts

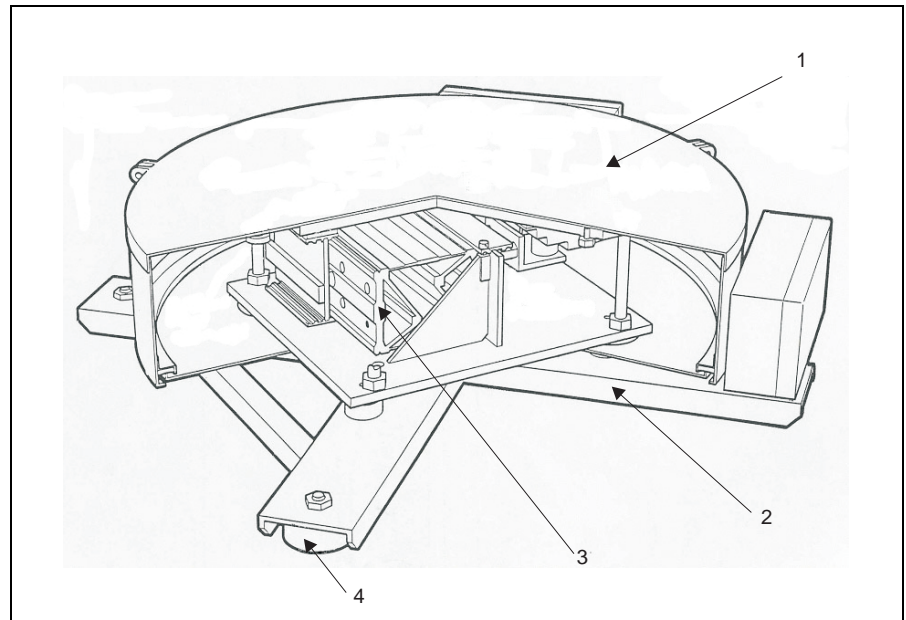


Fig. 2.2 Assembly D5 scale

2.5 Function

The weight (force) to be measured is transmitted to the load cell and reduced to the weight permitted for the load cell by the transmission mechanism.

This reduction is caused by only one lever which is lead through the lever plates. The distance ratio is defining the weighing range.

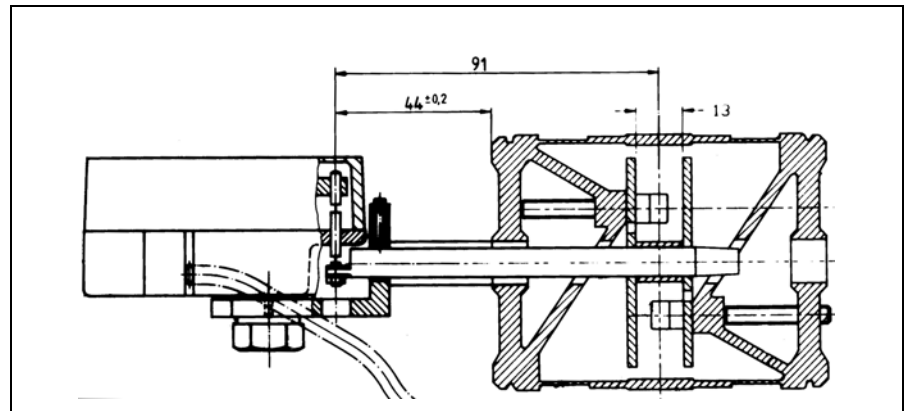




Fig. 2.3 Distance ratio a:b

3 Technical data

Manufacturer	Coperion K-Tron (Switzerland) LLC
Designation	D5 XPC3 XPC3
Marking	  II 3D Ex tD A22 IP55 T55°C
Ingress protection	IP55
Load ranges	450, 900, 1500 N
Combined error	< ±0.03 %*
Resolution	1:4'000'000 (measuring interval ≥ 80 ms)
Creep	0.02 % of max. value (30 min)
Hysteresis	0.02 %* max.
Repeatability	<=0.001% (standard deviation of 30 measurements; measuring time 2 s)
Reference temperature	23 °C
Operating temperature	-20 to +50 °C
Temperature drift per Kelvin SPAN ZERO	0.002 %* 0.003 %
Storage temperature	-25 to + 80 °C
Shock limits	+50 G in all directions without maladjustment +75 G in all directions with maladjustment
Output	RS422/RS485 (full duplex)
Transmission rate	2400 to 38400 baud
Measuring interval	Programmable from 9ms to 4500ms
Supply voltage	7.2–12.5 V DC
Current consumption	Max. 30 mA
Power consumption	Max. 270 mW
Communication distance	Max. 500 m
Weight	29kg

* All percentage specifications refer to the load capacity.
The precision specifications refer to a temperature range of -10 to +50 °C.

3.1 Dimensioned drawing

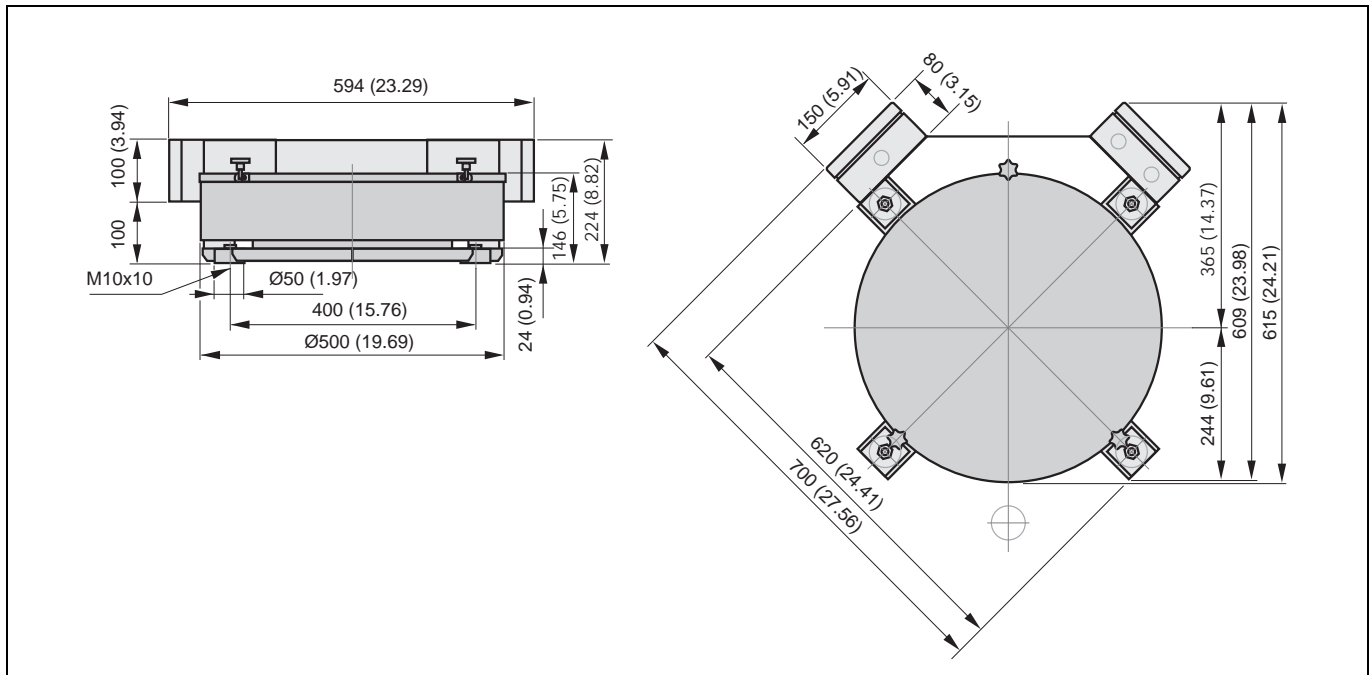


Fig. 3.1 Dimensioned drawing (All dimensions in mm (in))

4 Mounting

 **CAUTION**

- ▲ Mounting, wiring and commissioning of the scale may only be carried out by qualified electrician.
-

 **WARNING**

Ambient conditions

- ▲ Install scales only in an environment in accordance with the technical data (see Section 3).
-

4.1 Unpacking of the scale

NOTE

- ▲ The scale contains sensitive mechanical and electronic components. Do not throw, knock or drop the scale.
 - ▲ Protect the scale against impact.
 - ▲ Do not pull or move the scale by using the cable.
-

- ⇒ Only hold the Scale at the bottom and carefully lift off the packing.
- ⇒ Check delivery for completeness and transport damage.
- ⇒ Report any damage immediately to Coperion K-Tron (Switzerland) LLC.

4.2 Preparing mounting

⚠ CAUTION

- ▲ Screw down the feeding system with all four screws otherwise enganger of tipping over.

NOTE

- ▲ Keep scale away from heat

i

The D5 scale has a internal protection. A overload from 100% or a underload from 50% ar accepted

- ⇒ For mounting clean the installation location.
- ⇒ Mount the weighing system on a massive block, frame or flor and level out any irregularities. Maximum difference $\pm 5\%$.
- ⇒ Do not twist the scale while screwing down.
- ⇒ There are screw holes in the vibration shock absorbers for screwing down the scale.
- ⇒ Put the feeder carefully on the weighing system and fix it with the quick tensioning nuts.

4.3 Connecting the scale



Improper connection of the scale can cause danger to life through electric shock.

- ▲ The scale may only be connected by qualified electricians.
- ▲ Observe the local regulations.

1. Connect the scale in accordance with the electrical wiring diagram.
2. Ground the scale carefully.



Connect the ground connection to a low-impedance equipotential bonding ($\leq 0.1 \Omega$), see the grounding information on the scale.



- Carefully follow all wiring and shielding procedures as indicated on the provided wiring diagrams and operating instructions of the controls.
- Use twisted pair shielded cable with a braid and foil shield. (3x2x0,22 mm²) e.g. Type Belden 8103.

Run signal and mains/high-voltage cables in separate conduits or cable trays.

Shielding

- ⇒ Connect the cable shields to the housing ground via the cable glands on both sides. Connect the ground connection with low-impedance equipotential bonding ($\leq 0.1 \Omega$).
- ⇒ Lay the screening (1) evenly over the O-ring (2).

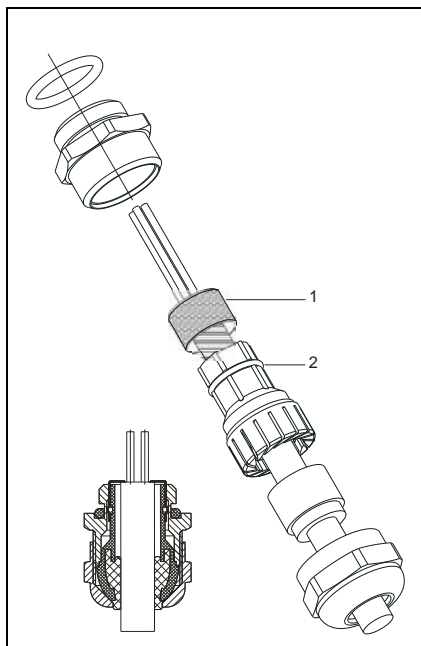


Fig. 4.1 Cable Gland shielding

5 Dismantling and Transport



- ▲ The load cell contains sensitive mechanical and electronic components. Do not throw, knock or drop the load cell. Protect the load cells against impact.
- ▲ Never open the scales, this leads to maladjustment and possible damage scale.
- ▲ Do not drop any objects on the scale.
- ▲ Dismantle the scale from the feeder before transportation.

-
- ⇒ Dismantle wiring of the scale.
 - ⇒ Disconnect the feeder from the scale.
 - ⇒ Pack the scales carefully.

6 Operation

WARNING

- ▲ Never process materials which may cause a chemical reaction with the materials of the scale, for example feed materials containing the following substances:
 - Acid
 - Iodine
 - Chromium
 - Bromine
- ▲ When feeding dangerous materials observe the safety notes applying for handling these materials.

NOTE

During operation of the scale:

- ▲ Avoid vibrations.
- ▲ Keep the scale away from heat
- ▲ Do not carry out welding operations near the weighing system.

Notes on operation



- Avoid vibrations and do not touch the feeder during operation with scales.
- The precession of the scale according to the technical data is reached at a temperature of -10...+50 C° (14 to 122°F)

⇒ Tare the weighing system.



For more information see controllers operation and programming instructions.

7 Cleaning



DANGER

When carrying out maintenance work on the switched-off device there is a danger of injury through unintentional switching-on.

- ▲ Switch off the device before carrying out maintenance work and secure it against unintentional restarting (see section 7).

NOTE

Aggressive and toxic cleaning agents damage the equipment and represent an increased accident risk.

- ▲ Follow the safety regulations for dealing with cleaning agents. After use dispose properly the cleaning agents.
- ▲ Use only cleaning agents with $5.0 < \text{pH} < 8.5$.
- ▲ Clean with non-toxic cleaning agents and disinfectants.
- ▲ Only use cleaning agents that not affect the used seal and filter materials (silicone / PTFE / Teflon / polyester fabric not included).
- ▲ Any residues of cleaning agent on parts with product contact are not allowed.
- ▲ Do not clean with high pressure cleaners, steam cleaner or compressed air.
- ▲ Not remove product adhesion with force.
- ▲ There must no moisture on electrical components.
- ▲ All parts must be dry cleaned before assembly.

7.1 Switching off the installation



1. Switch off the equipment at the main switch.
2. Secure the main switch with a lock.
3. Attach a danger sign to the main switch.
4. Turn off compressed air for all the pneumatic devices.

7.2 Notes on cleaning

- ⇒ Clean only with mild air stream.
- ⇒ In case of external soiling, clean with a damp cloth and use normal industrial cleaners
- ⇒ Use vacuum cleaner or soft brush for cleaning.
- ⇒ Remove dust layers over 5 mm.

8 Maintenance



The D5 XPC3 scale is maintenance-free.

NOTE

- ▲ Never open the scale, this leads to maladjustment and possible damage of the load cell.
- ▲ Do not carry out welding operations near the scale.
- ▲ Only qualified and trained personnel may carry out maintenance work on the scale.
- ▲ Only qualified electricians may work on the electrical equipment.

8.1 Maintenance intervals

Type	Checkpoints when in operation	Interval
Scale	Eliminate dust accumulation > 5 mm through cleaning	as required
	Static weight test for repeatability (friction)	after mounting work

⇒ After mounting work, or inspections of the weighing system, check the weighing system by means of calibrated weights.



For more information see controllers operation and programming instructions.

9 Troubleshooting



Eliminating faults on a running feeding system can cause serious accidents.

- ▲ Switch off the feeding and refill system before any intervention and secure them against unintentional restarting (see Section 7).

1. Check the scale (see Section 9.1).
2. Please observe the error messages which are displayed on the connected control device or host computer (see operating instructions for the relevant control device).
3. Document faults and call the local service center (customer service see project manual).

9.1 Troubleshooting table

Problem/Error	Possible cause	Remedy
scale delivers no weight information	<ul style="list-style-type: none"> • Wrong connection • Incorrect SFT addressing • Damaged scale 	<ul style="list-style-type: none"> ⇒ Check the connection. ⇒ Check the supply voltage. ⇒ Check the SFT programming. ⇒ Replace the scale.
Weighing is not constant	<ul style="list-style-type: none"> • Foreign objects between frame and scale • Scale overloaded • Mechanical friction caused by cables or bellows. 	<ul style="list-style-type: none"> ⇒ Remove foreign objects. ⇒ Check weight on scale. ⇒ Check the cable laying and mechanical connections to the scale.

10 Appendix

10.1 Declaration of conformity D5 XPC3



K-Tron (Schweiz) AG
 Lenzhardweg 43/45
 CH-5702 Niederlenz



KONFORMITÄTSERKLÄRUNG

DECLARATION OF CONFORMITY
 DÉCLARATION DE CONFORMITÉ

Wir erklären hiermit, dass:
 We declare herewith, that:
 Nous déclarons ci-après que:

Typ / type:	Kennzeichnung / marking / marquage:
D5 XPC3	II 3D Ex tD A22 IP55 T55°C Tamb. = -20...+50°C K-Tron 0490018926 B

konform ist / sind mit den Bestimmungen der unten genannten EG-Richtlinien. Folgende EG-Richtlinien und harmonisierte Normen wurden angewendet:
is / are in conformity with the provisions of the below listed EC-Directives. The following EC-Directives and harmonized standards have been applied:
 est / sont conforme aux dispositions des Directives CE suivantes. Les Directives CE suivants et les normes harmonisées ont été appliquées:

EG-Richtlinien / EC-Directives / Directives CE	Normen / Standards / Normes
94/9/EG: Geräte und Schutzsysteme zur bestimmungsgemässen Verwendung in explosionsgefährdeten Bereichen 94/9/EC: Equipment and protective systems intended for use in potentially explosive atmospheres 94/9/CE: Appareils et les systèmes de protection destinés à être utilisés en atmosphères explosibles	EN 1127-1:2007 EN 61241-0: 2006 EN 61241-1: 2004
2004/108/EG: EMV-Richtlinie 2004/108/EC: EMC-Directive 2004/108/CE: Compatibilité Électromagnétique	EN 61000-6-2:2005 EN 61000-6-4:2007

Die technische Dokumentation ist vollständig vorhanden. Dokumentationsverantwortlicher ist Andreas Rykart, LeiterEngineering.
The technical documentation is complete. Responsible for documentation is Andreas Rykart, Head of the Engineering Department.
 La documentation technique est complète. Le responsable de la documentation est Andreas Rykart, Directeur Engineering.

Niederlenz, 17.08.2009

Andreas Rykart
 Engineering / Engineering

Gerhard Wirz
 Geschäftsführer / Managing director

Chapter 5:

Operating

- KCM/KSU-II LWF 1090020602
- KCM LWF Prog. 0590020601

OPERATING INSTRUCTIONS

KCM LWF



Read this document prior to operating the device.
This document contains all safety and warning notes.

Original operating instructions

1090020602-EN Rev. 1.0.2

Service

If you need assistance, please call your local service centre or

Coperion K-TRON Schweiz GmbH Tel. 0041 (0) 62 / 885 71 71
Lenzhardweg 43/45 Fax 0041 (0) 62 / 885 71 80
CH-5702 Niederlenz

Coperion K-Tron Pitman, Inc. Tel. 001 (0) 856 / 589 0500
590 Woodbury Glassboro Road Fax 001 (0) 856 / 589 81 13
Sewell, New Jersey 08080 USA

Coperion K-TRON Salina Tel. 001 (0) 785 / 825 16 11
606 N. Front St. Fax 001 (0) 785 / 825 8759
Salina, KS 67402-0017

Web: www.coperionktron.com

Before you call...

- ⇒ Do you have alarm displays? Are you able to eliminate the causes?
- ⇒ Have you modified part of the system, product or operating mode?
- ⇒ Have you tried to remedy the fault in accordance with the operating instructions?
- ⇒ Note the project or order number You will find these on the machine or in the system manual.
- Example: 0403214

Using the manual:

- ⇒ This arrow identifies an individual action.
- 1. Numbers identify a sequence of actions which have to be executed step-by-step.
- ▲ This symbol identifies a general safety note.



Reference to another manual.



Important information.



This symbol indicates that tools are required for the following task.



Specifies where information or a situation must be checked.

If an error or omission is found, please contact:

documentation@coperionktron.com

Doc. No.: 1090020602-EN

Date: 2013/Dec/16

Original: 1090020602-EN

Coperion K-Tron assumes no responsibility for damages resulting from misuse of any equipment or negligence on the part of operating personnel. Further, you may kindly refer to the purchase order, confirmation or other document that contains the express Coperion K-Tron warranty disclaimer limiting or excluding certain warranties with respect to the company's equipment. Except as otherwise expressly provided by Coperion K-Tron in any such document, COPERION K-TRON MAKES NO WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, NOR ANY OTHER WARRANTY, EXPRESS OR IMPLIED, WITH RESPECT TO THE EQUIPMENT.

Table of Contents

1	Safety notes	7
1.1	Safety symbols definitions	7
1.2	Proper use	8
1.3	Organizational measures	8
1.4	Operator responsibilities	8
1.5	Safety-conscious operation	8
1.6	Safety devices	9
1.7	High voltage	9
1.8	Additional equipment	9
1.9	Removal from service	10
1.10	Customer service and repairs	10
2	Application and Design	11
2.0.1	Document notation	11
2.0.2	Additional programming information	11
2.0.3	Abbreviations and terminology	11
2.1	LWF control	13
2.1.1	Refilling	14
2.1.2	LWF with Loader control	15
2.2	Operator interface	16
2.3	Status symbols function	17
2.3.1	Keypad functions	19
3	Operation and Programming	21
3.1	Operating Levels	21
3.1.1	Operating level (HOME menu)	21
3.1.2	Special Functions	21
3.1.3	Programming level (MAIN menu)	21
3.1.4	Menu overview	22
3.2	Operating level HOME menu	23
3.2.1	HOME menu	23
3.2.2	Entering a setpoint-SP	23
3.2.3	Totalizer key function	24
3.2.4	Gravimetric and volumetric toggle control	24
3.2.5	Alarm key functions	24
3.2.6	Setting display brightness	25
3.2.7	Screen saver	25
3.3	Programming level MAIN menu	26
3.4	Security menu programming	28
3.4.1	Setting menu security	28
3.5	Language selection	28

4	Switching the Feeding System ON and OFF	29
4.0.1	Checks prior to first operation	29
4.1	Switching to 'ON'	29
4.2	Switching to "OFF"	29
5	START/STOP the Feeder	30
5.1	Checking feeder parameters	30
5.2	Status check	30
5.3	Starting the feeder	31
5.4	Stopping the feeder	31
5.5	Feeder Stopped By Message	32
5.5.1	Alarm Setup sub-menu	32
6	Operation	33
6.1	<HOME> menu parameters	33
6.2	Programming	34
6.2.1	<PRODUCT CHANGE> menu	34
6.2.2	<CALIBRATION> menu	39
6.2.3	<CALIBRATION> sub-menu	39
6.2.4	<FEEDFACTOR> sub-menu-motor driven feeders	41
6.2.5	<FEEDFACTOR> sub-menu-vibratory feeders	42
6.3	Emptying the feeder	43
7	Calibration	44
7.0.1	Calibration tasks	44
7.0.2	Span limits	44
7.0.3	Accuracy for reference equipment	44
7.1	Calibrating	45
7.1.1	Scale friction test (repeatability)	45
7.1.2	Taring	45
7.1.3	Scale calibration using static weight	46
7.1.4	Feedfactor calibration	47
7.1.5	Flow rate calibration-general	48
7.2	Flow rate calibration using Auto FF Calib function	49
7.2.1	Flowrate calibration procedure	49
7.3	Flowrate calibration using totalizer	50
7.4	Flowrate accuracy check by sampling	51
8	Alarms - What to Do	52
8.1	Stage 1- Soft alarm	52
8.2	Stage 2 - Hard alarm	52
8.3	Possible responses to the error condition	53
9	Alarm Messages- Cause and Remedy	54
9.1	System alarms	54
9.2	Display messages	61

9.3	Feeder won't start - displayed messages	61
9.4	Feeder won't run in GRAV	61
9.5	Process alarms	62
9.5.1	Massflow variances in LWF feeding	63

1 Safety notes



Installation, commissioning and programming of the specified equipment should only be undertaken by qualified personnel.

1.1 Safety symbols definitions



▲ The safety alert symbol is used to alert to the potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.

CAUTION

▲ CAUTION indicates a potentially hazardous situation which, if not avoided, may result in property damage.

▲ CAUTION

▲ CAUTION with safety alert indicates a potentially hazardous situation which, if not avoided, could lead to light bodily injuries.

▲ WARNING

▲ WARNING indicates a potentially hazardous situation which, if not avoided, could lead to heavy bodily injury or to death.

▲ DANGER

▲ DANGER indicates a extremely hazardous situation which, if not avoided, could lead to heavy bodily injury or to death.

1.2 Proper use



- ▲ Only operate in conjunction with the feeder equipment from Coperion K-Tron.
 - ▲ Only operate in accordance with the specified technical data.
 - ▲ Do not use the equipment in a manner not intended by the manufacturer.
-

1.3 Organizational measures



- ▲ Observe the safety notes for the connected feeding devices.
 - ▲ In addition to the operating instructions, always comply with generally prescribed safety regulations governing accident prevention and environmental safety.
 - ▲ Always keep the metering device operating instructions within easy reach. Ensure that they are always complete and legible.
-

1.4 Operator responsibilities



- ▲ Ensure that only qualified and trained personnel work with the equipment.
 - ▲ Establish personnel responsibilities for operation and maintenance.
 - ▲ Ensure that personnel have read and understood the operating instructions to all installation components, particularly these safety notes.
 - ▲ The operator must have damaged or missing components replaced immediately.
 - ▲ The operator is responsible for compliance with the legally prescribed accident and safety regulations.
-

1.5 Safety-conscious operation



- ▲ Any changes (including changes to operational behavior) which affect safety must be immediately reported to the responsible member of staff.
 - ▲ Perform all operations with safety in mind.
 - ▲ Do not make any internal adjustments to the KSU-II and KCM while the feeder is in operation.
-

1.6 Safety devices



- ▲ The electrical safety devices must not be altered. This increases the danger of accidents.
 - ▲ Never operate with the housing open.
 - ▲ Replace damaged cables and connections immediately.
 - ▲ Only operate the feeding equipment if all safety devices are installed and fully functional.
 - ▲ Check that the safety devices operate properly daily.
 - ▲ Never open or remove covers or hoods while the equipment is in operation.
 - ▲ If accessing internal components, allow 3 minutes to lapse prior to opening the enclosure. This ensures safe discharge of high voltage components.
-

1.7 High voltage



- ▲ High voltage of 230 Vac may be present on the line power cables.
 - ▲ Switch off the power 3 minutes before:
 - any disassembly, maintenance and repair work
 - replacing the motor.
 - ▲ Only qualified electricians may work on the equipment.
 - ▲ Protect the equipment against moisture entrance.
-

1.8 Additional equipment



- ▲ Modifications are prohibited.
 - ▲ The operator is responsible for complying with all safety regulations related to operation with the feeding equipment.
-

1.9 Removal from service



- ▲ Disconnect from the power supply before removal from service.
 - ▲ The operator is responsible for the proper removal from service.
-

1.10 Customer service and repairs



- ▲ Only be repaired by
 - your authorized Coperion K-Tron customer service centeror
 - qualified personnel, trained by Coperion K-Tron.
 - ▲ Only use original Coperion K-Tron parts for repairs.
-

2 Application and Design

2.0.1 Document notation

The following is standard through out this document.

- Parameter name shown as <PARAM NAME>
- Parameter value shown as <Param Value>
- Menu name as <MENU NAME>
- Alarm message as <Alarm Message>
- Display indication or key action result as <INDICATION>.
- Dialog box indication as <Dialog>.
- Key or button as **KEY**

2.0.2 Additional programming information

See the following documents for more detailed programming information: LWF - 0590020601

2.0.3 Abbreviations and terminology

- Config port = diagnostic serial data port from KCM
- CPU = central processing unit, microprocessor
- Drive-MDU = Common representation of all five types of drive pc boards (450 watt DC drive, 1600 watt DC drive, AC drive interface, stepper motor drive, vibratory drive)
- HCU = Hurricane pneumatic loader control
- Host Channel = serial data connection to remote host computer
- HSU = Hurricane pneumatic loader control programming interface
- HMI = human, machine interface, usually a PC utilizing a commercial SCADA software package
- Internal Channel = serial data connection to SFTs/HCU loader controls and internal motor drives
- KCM = Coperion K-Tron Control Module, feeder controller
- KCM-GD = KCM with local keypad and graphic Display
- KCM-KD = KCM with local Keypad and (4x20 characters) Display
- KCM-SD = KCM with status display only
- kgr = host communication file residing in KCM
- KSC = Coperion K-Tron Smart Commander, a PC based HMI system for use with up to 30 controllers
- KSL = Coperion K-Tron line interface for up to 8 feeders
- K-Net = KCM serial data connection to KSU-II, KSL or KSC
- K-Port 1 and K-Port 2 = data ports for a Coperion K-Tron specific interface

- KSU-II = Coperion K-Tron single unit user interface for the KCM
- LWF = loss-in-weight feeder
- pcb = printed circuit board
- SCADA = supervisory, control and data acquisition system
- Smart Connex II = second version of SmartConnex architecture
- SFT = Smart Force Transducer

2.1 LWF control

The loss-in-weight feeding concept can be used with gravimetric feeding systems. Here the feeder and the product supply are mounted on a scale.

Over short intervals the weight on the scale is determined and transmitted to the controller. The current feeding performance (massflow) results from the weight change per unit of time.

The control signal, called drive command, is determined by comparing the setpoint and calculated mass flow value and is then sent to the motor/vibratory control unit. The motor/vibratory unit's output voltage is proportional to the control signal.

To maintain accurate motor speed or displacement amplitude, which represents the desired control value, speed or displacement feedback is returned to the motor/vibratory control unit.

Note: It is possible to control various drive types both with and without feedback, although DC motors do require speed feedback

When the setpoint and massflow values differ, the controller adjusts the drive command which, in turn, alters the motor speed or vibratory tray displacement in a manner that returns the massflow value to the desired setpoint.

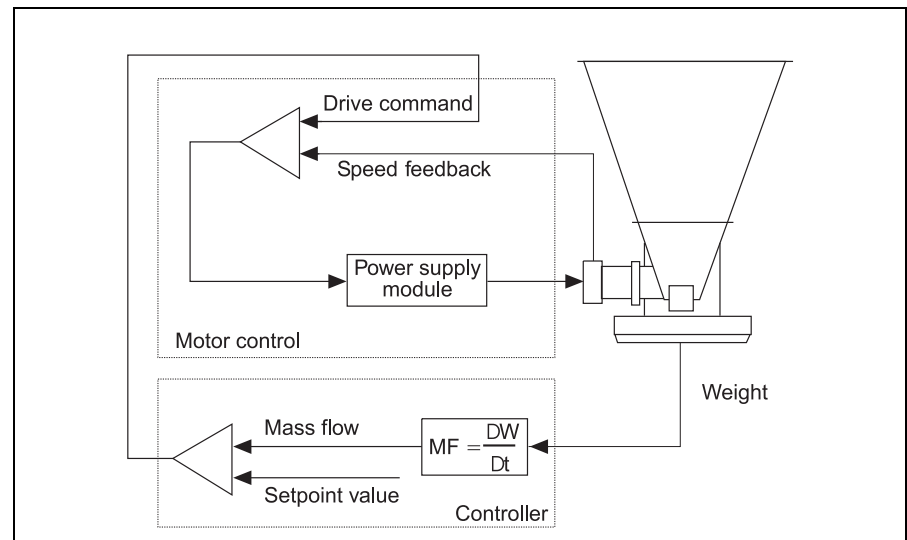


Fig. 2.1 LWF mode

2.1.1 Refilling

In LWF applications, the bulk material is continuously discharged and has to be periodically refilled. The refilling process is triggered automatically when the programmable minimum filling quantity has been reached.

The weight loss cannot be accurately measured during refilling due to the fact that bulk material is entering and leaving the feeder's hopper at the same time. That is why the controller switches to volumetric control. The KSU-II/KCM-GD will display "REFILL" on the Status line. The feeder then operates at the motor speed determined during the previous gravimetric mode.

When the programmable maximum filling quantity has been reached, the controller ends refilling and returns to the gravimetric mode.

For products where the amount of filling in the feed screw changes with the quantity in the hopper, the product-supply-dependent speed can be stored in registers during feeding (Fig. 2.2).

When the next highest filling weight is reached during refilling, the controller adapts the motor speed to the new filling weight.

Notes

- To prevent overfilling, the weight level has to be adapted to the refill device in order to switch off the refill device properly.
- In order to guarantee a sufficient filling for the feeder feed screws, the weight level entry that triggers refill must not be set too low. This applies, in particular, to fluidizing or low density products.
- Changing hopper pressure conditions that occur during refill have to be compensated.

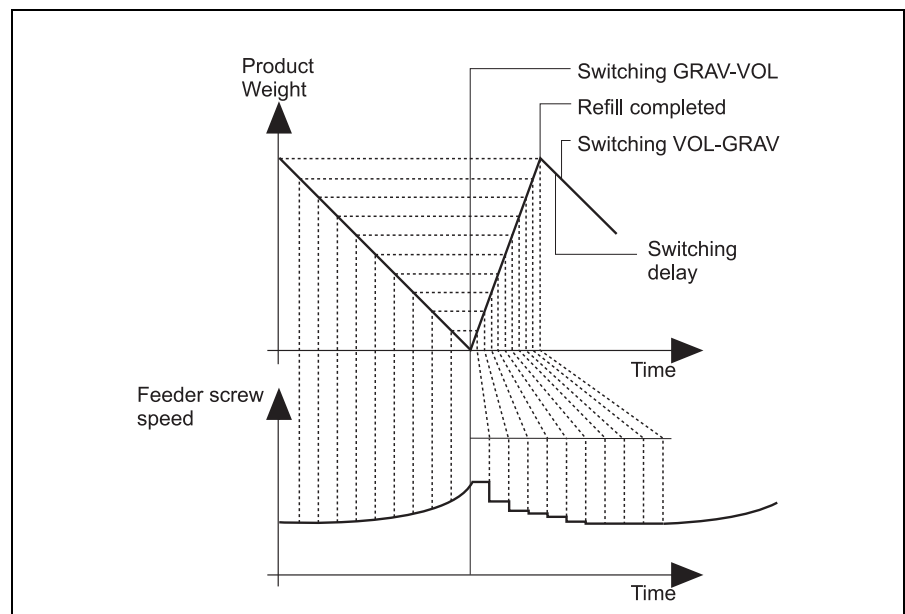


Fig. 2.2 Refilling profile versus elapsed time

2.1.2 LWF with Loader control

Example of an HCU / LSR loader control used with the KCM.

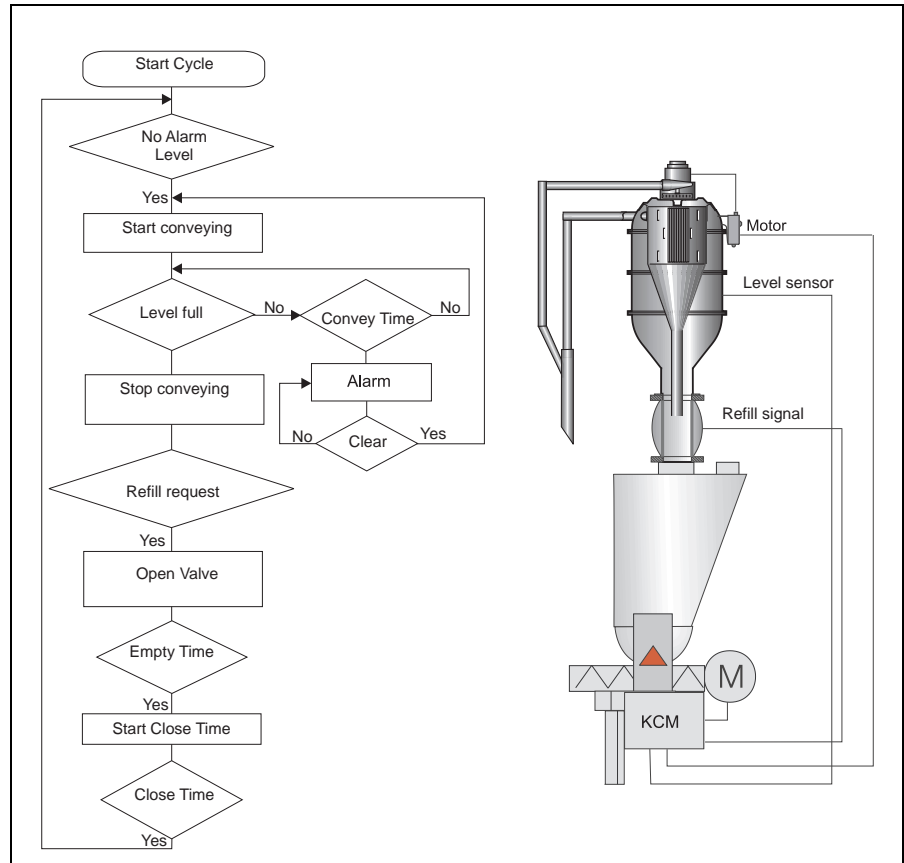


Fig. 2.3 Loader controls with KCM

2.2 Operator interface

The display shows the process data, status information and programming data.

Status area left:

Left side: Run, Stop, Pause Icon
 Under the Run/Stop Icon is the Time Hours:minutes.

Then Four color status Fields:

Top left: Run/Stop/Wait
 Bottom left: Setpoint control mode
 (Blue indicates Local setpoint control).

Top right: Special status indicators such as Calibrate, Pert, Refill etc
 Bottom right: Grav/ Vol status

Status area right:

Upper left: Feeder Type and Feeder address

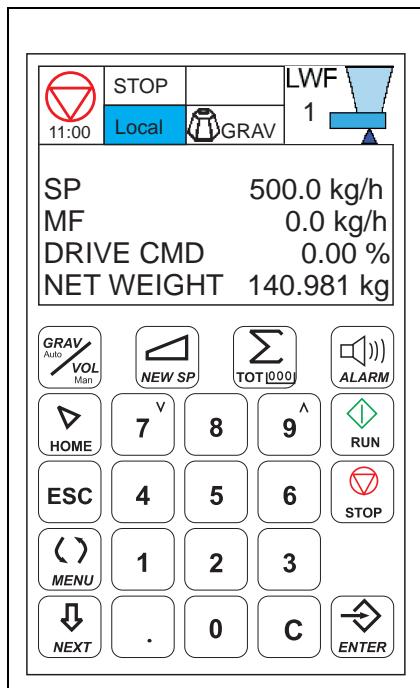










Fig. 2.4 Faceplate

2.3 Status symbols function

Status symbol	Status name	Function
	RUN	Feeder is running.
	STOP	Feeder is stopped.
	WAIT	Feeder won't run. Caused by the following: <ul style="list-style-type: none"> • No setpoint is entered. • Feedfactor is <0>: • Feeder has a failed interlock.
	GRAV	Automatic control is ON
	VOL	Automatic control is OFF
	CALIB	Feeder is running an automatic calibration cycle.
	Emptying	Feeder is running under the Empty Feeder function. Press the STOP key to halt.
	Jog / Screw fill	Jog cycle is running. Screw fill cycle is running.
	LOCAL	Feeder setpoint entry from feeder HOME menu in weight units per hours or minutes. This entry can also be entered via the KCM, KSU-II, KSL, K-Vision or KSC or can come from a host. Highlighted in BLUE.
	RATIO	Feeder setpoint entry from feeder HOME menu by percentage. Feeder operating setpoint tracks an incoming analog signal as a multiple of the entered ratio percentage value.




Status symbol	Status name	Function
	DIRECT	Feeder setpoint is derived from an incoming analog value and cannot be changed.
	LINE#	Feeder setpoint is entered from a KSC, K-Vision or KSL. A K-Vision, KSL or KSC Line screen is used for recipe control. The Line number is specified.
	PERT	Scale disturbance
	REFIL	Feeder hopper is being refilled.
	DISA	The external Interlock or run enable input is not active. Feeder start is disabled.
	ALSH	An alarm has occurred resulting in an automatic machine stoppage.
	LOAD	KCM programmed loader is reloading.

Table page 2 of 2

2.3.1 Keypad functions









Key layout	Key name	Function
	GRAV/VOL	Key for switching between gravimetric and volumetric control mode.
	NEW SP	For entering the operating setpoint value for LOCAL and RATIO setpoint modes.
	TOT <u>I000</u>	For reading, erasing or pre-loading the totalizer value (totalled feeding quantity).
	ALARM	Alarm display, acknowledge and clearing of alarms. First push = bringing up the alarm page 2 nd push = acknowledge alarms 3 rd push = clear Alarms
	HOME	For returning to the operating level. Display of the main Process Variables
	ESC	For exiting a menu item or a programming level by one step.
	MENU	For entering the programming level. selection of a sub-menu
	NEXT	Selects the next parameter in the menu or value.

Table page 1 of 2






Key layout	Key name	Function
	ENTER	Entered values are stored or commands are carried out.
	RUN	Starts the feeding process if all interlocks and operating conditions are satisfied.
	STOP	Stops the feeder.
	0 to 9	Numeric keypad.
	C	Clears the last character entered. Also cycles the display in a direction opposite to the NEXT key when pressed.

Table page 2 of 2

3 Operation and Programming

3.1 Operating Levels

3.1.1 Operating level (HOME menu)

- Press **HOME** to access this menu. The main Process variables are displays such as setpoint value, mass flow, drive command, speed etc.
- Press **NEXT** or **C** to scroll up and down on the screen.

3.1.2 Special Functions

- The setpoint is entered, the totalizer reset, alarm signals cancelled and the feeding process started and stopped at the operating level if these operations have not been blocked in the SECURITY menu

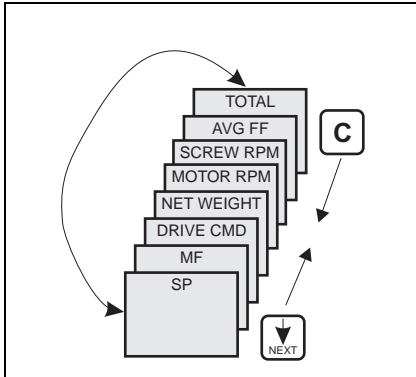


Fig. 3.1 Operating Level

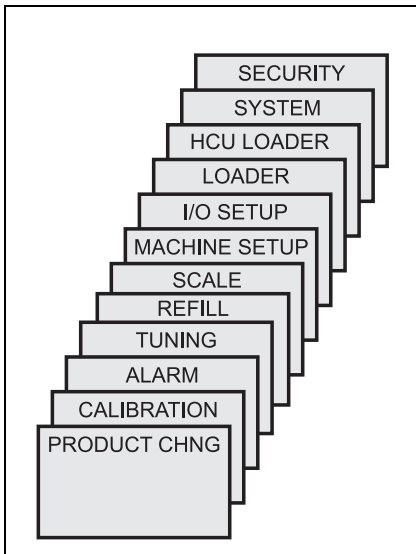


Fig. 3.2 Programming Level

3.1.3 Programming level (MAIN menu)

- Press **MENU** to access this menu. All the feeder and system parameters are displayed for configuring the KCM. The main menu consists of 8 to 12 sub-menus.
- Press **NEXT** or **C** to scroll up and down on the screen.
- Press **ESC** to exit menus and submenus or cancel and entry.

3.1.4 Menu overview

- Product Change menu
- Calibration menu
 - Feedfactor sub-menu
- Alarm menu
 - Alarm limits sub-menu
 - Alarm setup sub-menu
- Tuning menu
- Refill menu
- Scale menu
 - General scale sub-menu
 - SFT setup sub-menu
- Machine
 - General sub-menu
 - Motor sub-menu
 - Service sub-menu
 - Performance sub-menu
- I-O Setup menu
 - Digital Input sub-menu
 - Digital Output sub-menu
 - Setpoint Input sub-menu
 - Analog Output sub-menu
 - Modbus I/O sub-menu
- Loader menu
- HCU Loader menu
- LSR Loader menu
- System menu
 - Communications sub-menu
 - SW Versions sub-menu
 - Parameter Backup sub-menu
 - Clock sub-menu
- Security menu

3.2 Operating level HOME menu

3.2.1 HOME menu

The operating level's display (HOME menu) is structured as follows:

Line 1 status line:

- Shows whether gravimetric or volumetric mode is being used.
- Displays setpoint mode <Local>, <Line>, <Ratio> or <Direct>.
- Displays for refilling, calibrating, interlocks (shutdown), etc.
- Displays the feeder type and address.

Lines 2: Alarm Present Flag.

Lines 3 to 6:

Displays the process's characteristic values such as setpoint, massflow drive command etc.

- Press **NEXT** or **C** to scroll up and down on the screen.

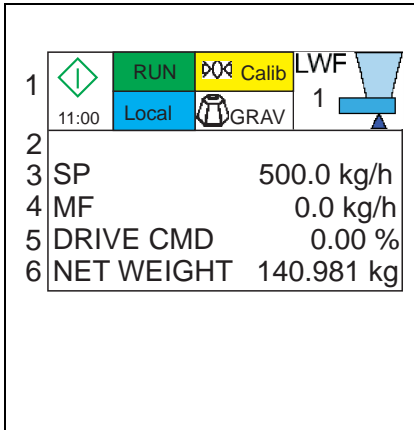


Fig. 3.3 Operating menu

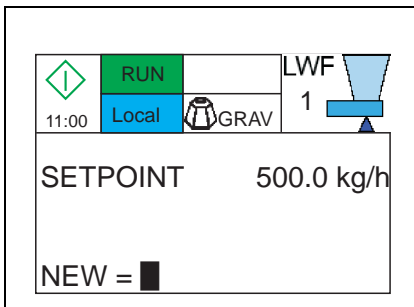


Fig. 3.4 Entering a new setpoint

3.2.2 Entering a setpoint-SP

1. Press the **NEW SP** key for the prompt.
2. Enter the desired setpoint value and confirm with **ENTER** or **ESC** to discard.

The setpoint can only be accessed when the <SECURITY> menu has been programmed to allow it.

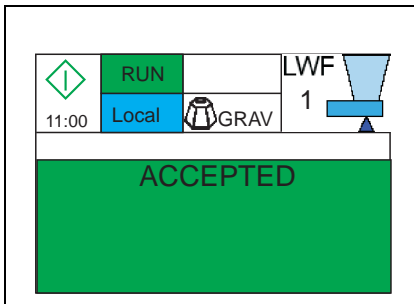


Fig. 3.5 Entry accepted message

Entry has been accepted.

The altered setpoint value will appear in the setpoint value line if it has been accepted

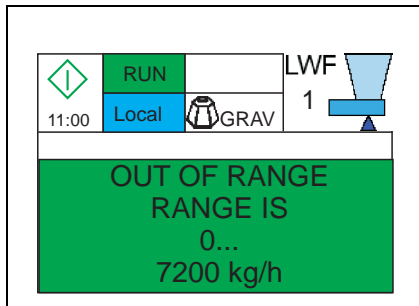


Fig. 3.6 Out of range message

Entry has **not** been accepted

Check the parameter <MAX SETPT> in the <MACHINE> menu, <GENERAL> sub-menu. The operating <SP> value must be less than or equal to the <MAX SETPT>. or the error in fig. 3.6 will be displayed.

Where the range limit is known, it will be displayed.

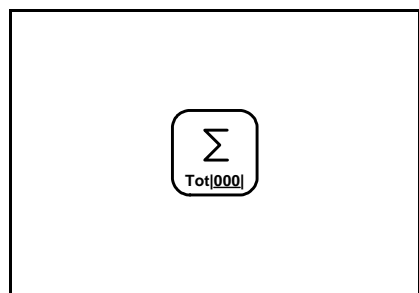


Fig. 3.7 Totalizer key usage

3.2.3 Totalizer key function

⇒ Press **TOTAL** for the <TOTALIZER> display. Read, clear or change the totalizer value.

Totalizer access selections via the <SECURITY> menu.

- Hide: No access to **TOTAL** key.
- Clr Only: Use **ENTER** to clear totalizer
- RD Only: Cannot clear totalizer
- Any Num: Enter any number into the totalizer, Input <0> to erase the totalizer and then press **ENTER** to accept.

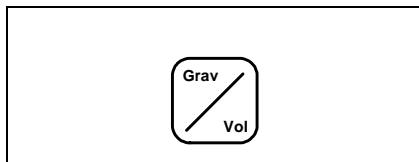


Fig. 3.8 Gravimetric/Volumetric mode

3.2.4 Gravimetric and volumetric toggle control

⇒ Switch the controller to the desired mode with the **GRAV/VOL** key. The first field in the status line changes to the selected state.

Works only on operator level <HOME> Menu



Fig. 3.9 Alarm key usage

3.2.5 Alarm key functions

When alarm is displayed.

1. Press **ALARM** key
2. Read the alarm display.
3. Acknowledge the alarm signal by pressing **ALARM**.
4. Clear the alarm signal by pressing **ALARM** again.
5. To return to the normal display press **ESC** or **HOME**.



For alarm handling details see section 8.

3.2.6 Setting display brightness

Press **ESC** and **7** to decrease, **ESC** and **9** to increase the display brightness.

3.2.7 Screen saver

The screen saver is enabled per default.

The screen saver Software will automatically and gradually dim the Backlight if no user accessed the KCM Keypad.

The value can be set in the <MACHINE> menu, <GENERAL> sub-menu.

3.3 Programming level MAIN menu

Note:

- Press **NEXT** or **C** to scroll up and down on the display.
- The green highlighted line shows the active menu or variable to be selected

To switch to the programming mode:

1. Press **MENU**. The main menu is displayed.
2. Select the desired sub-menu with **NEXT** or **C**.
3. Confirm the selection with **ENTER**.

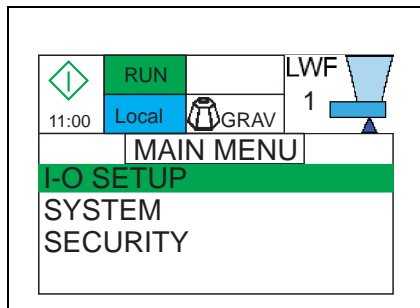


Fig. 3.10 I-O SetUp menu selection

To select a specific parameter:

1. Select the program parameter.
2. Confirm the selection with **ENTER**.

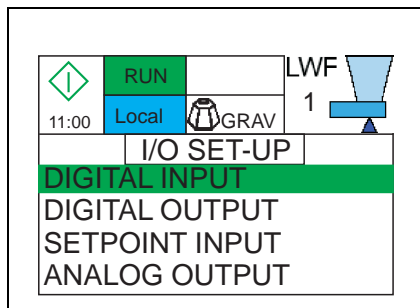


Fig. 3.11 Selecting sub-menu

To change the program parameter value:

1. Enter a new number for numeric values or select new entry with **NEXT** or **C** for pre-defined or text based parameters.
2. Confirm the entry with **ENTER** or discard with **ESC**.

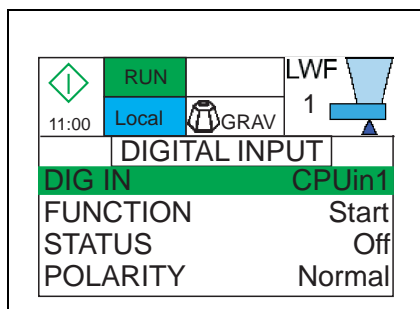


Fig. 3.12 Selecting a parameter

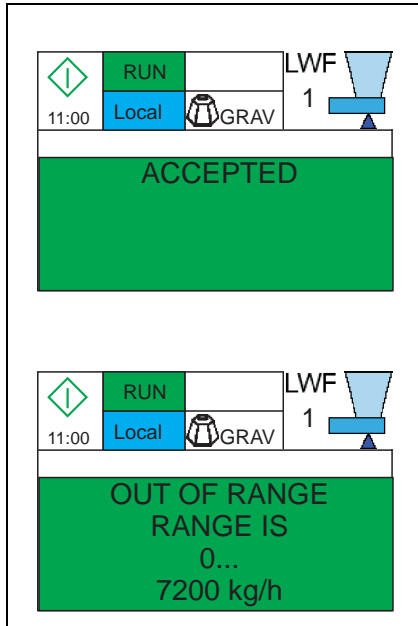


Fig. 3.13 Entry messages

After the new value has been confirmed, the display will show for about two seconds whether the new value has been accepted and will then return to the sub-menu.

If the entry is not accepted an <Out of Range> message will appear.

- ⇒ Select the new program parameter with **NEXT** or exit the selected sub-menu with **ESC** and select new sub-menu.
- ⇒ Press **ESC** to exit out of programming one level at a time.
- ⇒ Press **HOME** to return to the operating/overview level.

3.4 Security menu programming



For the KCM built-in display, the default is for <Data Lock> = <Off>. To program the lockout function see programming manuals.

3.4.1 Setting menu security

Selecting security access for programming menus is done as follows:

1. Press **MENU**.
2. Select the <SECURITY> menu.
3. Press **ENTER**.
4. For each access to menus, SP, <Feeder being viewed>, select from one of the following actions:
 - <Hide>
 - <RD/WR> - read/write
 - <Read>
5. Press **ENTER** after each selection.
6. Press **ESC** when done.

For totalizer key access refer to section [3.2.3](#)

3.5 Language selection

To select the operating language of the KCM:

1. Press **MENU**.
2. Select the <MACHINE> menu.
3. Select the <GENERAL> sub-menu.
4. Select the <LANGUAGE> parameter.
5. Select the language desired from the following list:
 - <English>
 - <Deutsch>
 - <Francais>
 - <Espanol>
 - <Italian>
 - <Custom>
6. Press **ENTER** when the choice is selected.
7. Press **HOME** to exit.



Custom Languages must be loaded to the KCM, otherwise English will be displayed.



For downloading Custom languages see KCM programming manual.

4 Switching the Feeding System ON and OFF



- ▲ Do not have any personnel in contact with moving portions of the feeding machinery as serious injury will occur when the machine starts.



- ▲ Ensure that no uncontrolled refilling is being carried out when switching on and off the installation.
- ▲ Ensure that all visible connections and equipment are in order.



- ▲ Most programming will be done with the KCM in the stopped condition. For certain tests, the feeder must be operating.

4.0.1 Checks prior to first operation


- Check to verify all machine safety guards are in place.
- Verify that material flow to each machine is OFF.
- Verify that all electrical connections are secure and correct.
- Verify that no person can come into contact with moving machine parts when they are operational.
- Review all safety warnings prior to starting any machinery

Provide all documentation and make it easily accessible prior to starting equipment.

4.1 Switching to 'ON'

⇒ Use the main switch to turn the feeding system on.

If alarms are present

Press **ALARM**  to query the alarm (see the alarm section 8).

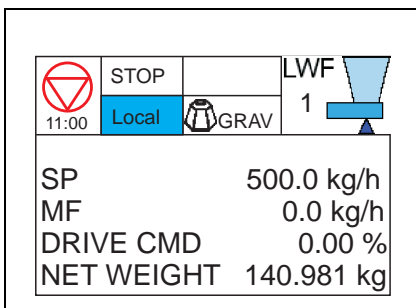


Fig. 4.1 Home menu

4.2 Switching to "OFF"

⇒ Switch the feeding system OFF with the main switch

Ensure that the upstream equipment such as refilling device, pre-feeder, receiver discharge etc. are also shut off.

5 START/STOP the Feeder




- ▲ Before starting the feeding process, emptying, taring and calibrating the feeder make sure that no one is working on the feeder and that there are no foreign objects in the feeder's hopper. Be sure that all safety devices are operating correctly.

5.1 Checking feeder parameters



To operate the feeder safely the feeders programming parameters may only be altered by trained staff.

1. Enter machine parameters according to the machine data sheet (see programming manuals)
 2. Enter the parameters in the <PRODUCT CHANGE> menu in accordance to the process recipe and product feed.
- ⇒ If alarms are present

Press **ALARM**  to query the alarm (see the alarm section 8).

3. Perform feeder calibration if necessary (see section 7).
4. Select the <HOME> menu and check the machine status.

5.2 Status check

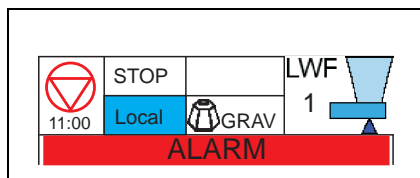


Fig. 5.1 Overview menu-status

Verify that the Status line indicates the desired operation.

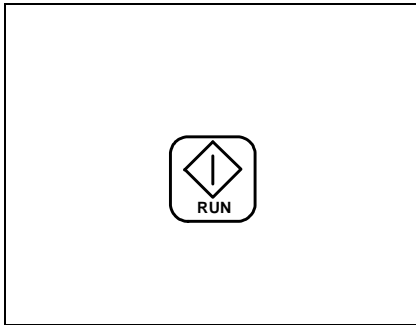



Fig. 5.2 Run button


5.3 Starting the feeder

1. Enter a setpoint value.
2. Press **GRAV/VOL** to set the controller to GRAV or AUTO respectively.
3. Check and reset totalizer if necessary.
4. Press **RUN**.

Note: The Symbol  is shown when the drive is active.

5.4 Stopping the feeder

⇒ Press **STOP**.

Note: The Symbol  is shown when the drive is stopped.

Note: If a refill has started, it will continue filling the feeder until the programmed maximum refill value is reached.

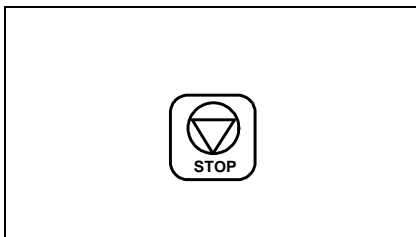


Fig. 5.3 Stop button

5.5 Feeder Stopped By Message

5.5.1 Alarm Setup sub-menu

In the Alarm setup menu the parameter <STOP BY> shows the cause that last stopped the feeder.

Parameter	Possible cause of Feeder stops
STOP BY	Board Reset: e.g. after power on Local Display: Stop key pressed on KCM, KSU-II External Display: Stop key pressed on KSL, KSC, K-Vision, K-Link ALS Input: Programmable digital input activated Run Disa: Programmable digital input or MDU Run enable input activated Stop Input: Programmable digital input activated MDU DISA: Safety switch on drive board activated Zero SP: Feeder start with Setpoint = 0 Emptying: Emptying cycle terminated Interlock: Programmable digital input activated Calib: Calibration cycle terminated

6 Operation



For Start/Stop operation refer to section 5.

6.1 <HOME> menu parameters

The following parameters can be viewed for control.

Parameter	Definitions
SP Setpoint or RATIO SP Ratio%	<p>Current setpoint value in weight/time values (feedrate). Ratio SP is only displayed if parameter <SETPOINT MODE> is set to <Ratio>.</p> <p>Input range: 0 to variable <MAXIMUM SETPOINT>.</p> <p>Note: Units set by <UNITS> variable in the <Menu MACHINE SETUP>, <Sub-menu GENERAL>.</p>
MF	Massflow, current product flow rate.
DRIVE CMD	Current level of the drive-command output in percentage. It defines the motor velocity or vibratory tray displacement.
NET WEIGHT	Current net weight of product on the scale.
MOTOR RPM or DISP	Current motor speed in RPM or vibratory tray displacement in μM .
SCREW RPM	Shows the current screw speed in rpm, when the <GEAR REDUCTION> in the <Menu MACHINE SETUP>, <Submenu MOTOR> is entered.
AVG FF	This value, by definition, is the estimated mass flow rate expected at 100% drive command. In conjunction with setpoint, this value determines the motor speed/vibratory displacement when in volumetric control mode.
TOTAL	<p>Discharged product quantity - Totalizer.</p> <p>See section 3.2.3. for clearing / changes totalizer.</p>

6.2 Programming

Note: The **BOLD PARAMETERS** are command actions in the KCM menu.

- ⇒ Set up the <PRODUCT CHANGE> menu as required.
- ⇒ Perform the <CALIBRATION> function if necessary (see section 7).




To get the feeder to run initially, it may be necessary to enter a value of <INIT FF> in the <PRODUCT CHANGE> .

6.2.1 <PRODUCT CHANGE> menu

Parameter	Definition	Settings
REFILL	<p>ENABLED Setting for continuous feeding and automatic refill. The net weight alarm limit is active.</p> <p>DISABLED The feeder hopper can be emptied without refilling being triggered. The net weight alarm limit is disabled.</p> <p>IF RUNNING If Running is selected, Refill is enabled if the feeder runs, otherwise it is disabled.</p> <p>Default: DISABLED</p>	<p>Normally set to <Enable> but for cleaning set to <Disable>.</p>
REFILL MAX	<p>Input of the upper refilling limit at which refilling is stopped.</p> <p>Warning: Do not exceed the hopper capacity or scale capacity when entering the top refilling limit.</p>	<p>= 0.75*hopper volume* density or 0.75*(Scale range-tare) whichever is less. Adjust as necessary</p>
REFILL MIN	<p>Input of the lower refilling limit at which refilling is started.</p> <p>Warning: Feeding behavior can be affected if the refilling limit is set too low. Do not uncover feeder horizontal agitator.</p>	<p>Initially set REFILL MIN = 0.4 x REFILL MAX.</p>
START REFILL NOW	<p>This command starts the refill when the net weight is less the <REFILL MAX>.</p>	

Table page 1 of 5

Parameter	Definition	Settings
GEARSWITCH	<p>Defines how the unit will change gear reductions on the K2M feeder with motor reversing gear reduction switching. Selections are:</p> <ul style="list-style-type: none"> • <High> selects high speed/lowest gear reduction and scales the average feedfactor accordingly. • <Low> selects low speed/highest gear reduction and scales the average feedfactor accordingly. • <Auto Hi> When entering a setpoint which will generate a drive command of more than 50% and the GEARSWITCH is on Auto Lo, the gear will switch to high and the GEARSWITCH parameter changes to Auto Hi. • <Auto Lo> When entering a setpoint which will generate a drive command of less than 10% and the GEARSWITCH is on Auto Hi, the gear will switch to low and the GEARSWITCH parameter changes to Auto Lo. 	<p>To activate, a digital output must be set to <HILOGear> and the proper gear reductions entered in the <Menu MACHINE SETUP>.</p>
AUTO TARE	<p>This command sets the netweight to zero and overwrites the tare weight <TARE>.</p> <div style="text-align: center;">  <p>CAUTION</p> </div> <p>Disable the refill first then do the taring.</p> <p>⇒ Select <AUTO TARE ></p> <p>⇒ Press ENTER</p> <p>Note:</p> <ul style="list-style-type: none"> • The function <AUTO TARE> is used to establish the feeder weight when the product hopper is empty. • If the Tare weight matches the empty feeder weight, netweight shows the weight of the feeding material in the hopper 	
TARE	<p>Input of a known tare value with the keypad. Normally it is automatically updated when executing the AutoTare function.</p>	<p>Input range: 0 to weighting range</p>
NET WEIGHT	<p>Current net weight of product on the scale.</p>	
Table page 2 of 5		


Parameter	Definition	Settings
<p>AUTO FF CALIB</p>	<p>The starting feeding factor (maximum mass flow rate) is calculated during calibration in volumetric mode (constant speed).</p> <div style="text-align: center; border: 1px solid black; padding: 5px; width: fit-content; margin: 10px auto;">  </div> <p>▲ This command will start the feeder. Ensure that no one is working at the machine.</p> <p>⇒ Select <AUTO FF CALIB>.</p> <p>⇒ Press ENTER</p> <p>⇒ Press RUN when prompted.</p> <p>Notes:</p> <ul style="list-style-type: none"> • AUTOFFCALIB can be aborted with the STOP key. • The drive command is set by the value <CAL DC>. • The calibration time by <CALIB TIME>. • The discharged amount of product is shown by <CAL PROD FED>. • The calibration can only be started when the feeder is not running. • Refilling and feeding errors during calibration reset the program parameter FF INIT to <0> and activate the <FEEDFACTOR ERR> alarm. 	
<p>CALIB REMAIN [s]</p>	<p>A count down timer for the auto calibrate cycle. It shows how many seconds are left in the Calibration cycle.</p>	
<p>INIT FF</p>	<p>Input of the starting feeding factor to determine the motor speed. The Drive Command is calculated as follows:</p> $\frac{\text{Setpoint}}{\text{InitialFeedfactor}} \times 100 = \text{DriveCommand}$ <p>The starting feed factor can also be calculated with the command variable <AUTO FF CALIB>.</p> <p>Value of <0> will cause a Feedfactor Alarm and the feeder will <u>not</u> run.</p>	<p>If a prior value has not been recorded for entry, enter a value equal to the <Maximum Setpoint> on the <MACHINE> menu to start.</p>

Table page 3 of 5

Parameter	Definition	Settings
BULKDENSITY	<p>If the variable <VOL RATE>, in the <SERVICE VARIABLE INDEX>, is set any value other than <0>, this variable will be displayed.</p> <p>Bulk Density</p> <p>As the feeder runs in gravimetric control, the Bulk Density value will be updated by the calculation: $BD = FF/VOL RATE$</p> <p>Note:</p> <p>To use this variable, do the following:</p> <ol style="list-style-type: none"> 1. Enter the bulk density (BD) of the material being fed. 2. Perform an Auto Feedfactor calibration. The result is the value <VOL RATE>, calculated as the ratio of Feedfactor (FF) / Entered Bulk Density. The value <VOL RATE> is found in the Service Variable Index. <p>When the feeder runs in gravimetric control, the <BULKDENSITY> parameter will reflect the current material bulk density.</p>	

EMPTY FDR

Empty feeder function. When started, the feeder runs at a drive command of 70%. The feeder stops automatically if no weight loss is detected.



This command will start the feeder. Ensure that no one is working at the machine.

⇒ Select <EMPTY FDR>.

⇒ Press **ENTER**.


⇒ Press **RUN** when prompted.

The message <ACCEPTED> appears.

Notes:

- The <EMPTY FDR> can be aborted with the **STOP** key.
- <Empty Drive Cmd> may be changed by the Service Variables.
- The <Refill> is automatic disabled. Be sure that the refill is not started externally.
- After finish the work enable the refill again.
- The Net Weight Low alarm is also generated when the Empty Fdr cycle finishes.

Table page 4 of 5

Parameter	Definition	Settings
ACTIFLOW CALIB	<p>ActiFlow calibration function</p> <ol style="list-style-type: none">1. Fill the feeder with material.2. Set material characteristic “Easy, Medium, Hard or Mainline the KCM ActiFlow menu.3. Run the ActiFlow calibration. <p>Notes:</p> <ul style="list-style-type: none">• This calibration routine will run a frequency sweep on the ActiFlow to find the mechanical resonance point of the feeder. During the calibration is no material fed.• Its important to have the feeder filled with material to a normal operating level before running this step, because the resonance point is significantly affected by material.	
SCREW FILL	<p>When started, the motor will run (At the Calib DC) until weight loss is detected. Then the motor automatically stops.</p> <div></div> <p>This command will start the feeder. Ensure that no one is working at the machine.</p> <ul style="list-style-type: none">⇒ Select <SCREW FILL>.⇒ Press ENTER.⇒ Press RUN when prompted. <p>The message <ACCEPTED> appears.</p> <p>Notes:</p> <ul style="list-style-type: none">• The <SCREW FILL> can be aborted with the STOP key.• <Empty Drive Cmd> may be changed by the Service Variables.	

6.2.2 <CALIBRATION> menu

This menu is divided into two sub-menus

Notes:

- Section 6.2.4 is for motor driven feeders.
- Section 6.2.5 is for vibratory feeders

6.2.3 <CALIBRATION> sub-menu

This menu is provided for easy calibration of the feeder.

Parameter	Definition	Settings
INIT FF	Refer to section 6.2.1	
AVG FF	<p>The value shows the estimated mass flow value expected at 100% drive command and is calculated as:</p> $\frac{\text{Massflow}}{\text{DriveCommand}} \times 100 = \text{AverageFeedfactor}$ <p>Average Feedfactor represents the massflow capacity of the feeder and is affected by bulk material characteristics and the current feeder mechanical configuration.</p> <p>Notes:</p> <ul style="list-style-type: none"> • The feeder will <u>not</u> run with a Feedfactor of <0>. • This value is not shown for vibratory feeders. 	
AUTO FF CALIB	Refer to section 6.2.1	
CAL PROD FED	Shows the amount of material discharged during calibration cycle as calculated by the controller.	
ACT PROD FED	After the calibrate cycle has been completed, enter the weight of the actual delivered product into this variable. The will be automatically calculated.	Enter the value of product from the calibration sample.
SPAN	<p>This is the weight span that corrects for massflow inaccuracy. For accurate feeding, the span must be nearly 1.000 or there is a problem with the weighing system.</p> <p>Note:</p> <ul style="list-style-type: none"> • This value is automatically calculated when an entry is made to the <ACT. PROD FED> variable. • The value can also be entered manually <p>For details on calibration see section 7.</p>	<p>Range: 0.1 to 10.0</p> <p>Default: 1.000</p>

Table page 1 of 2

Parameter	Definition	Settings
CAL CORRELA [%]	Will be automatically calculated during calibration. The value shows the reliability of the calibration data. A value of 100% means that the weight samples taken during calibration are extremely uniform indicating smooth product discharge and no weight disturbances.	Best to achieve a value >90%
CAL CORR LIM [%]	If the <CALIB CORRELATION> is below this limit value the feedfactor will be set to <0>, the calibration test aborted and a Feedfactor Alarm will be generated. Note: This value self-adjusts after each completed calibration cycle.	Start with 80% and raise to 90% if able. This value will change after each calibration test.
CAL DC [%]	Calibrating drive command used during the auto calibration cycle.	0 to 100% See section 7.
CALIB TIME [sec]	Input of the duration of the automatic calibration cycle.	0 to 999 seconds See section 7.

Table page 2 of 2

6.2.4 <FEEDFACTOR> sub-menu-motor driven feeders

Parameter	Definition	Settings
REFILL ARRAY	ON	Refilling feedfactor storage array is on. The feeding factor values are stored in these registers when the gravimetric mode is active. During refilling, the stored feeding factor values in conjunction with setpoint are used to establish proper drive command.
	OFF	The refilling feedfactor storage array is off. The last average feedfactor just prior to refill is used in conjunction with setpoint to control feeding during refilling.
Not used for vibratory control.		
FF FACT 9	Display of the feeding factor values in the refilling feedfactor array. These factors are calculated in the gravimetric mode and used during refilling in the volumetric mode when the refilling array registers are activated.	
FF FACT 5		
FF FACT 1	Full(9) = 10% below the top refilling limit. Middle(5) = 50% below the top refilling limit. Empty(1)= 10% above the lower refilling limit.	
	Note: Consistency of values indicate little variance in bulk material flow properties. This is ideal. Rapidly changing bulk density can affect feeder performance over the refill range. This would be evidenced by widely varying values of feedfactor. If the values vary highly, consider modifying refill levels, both maximum and minimum, to achieve more consistent feedfactors over the refill range.	

6.2.5 <FEEDFACTOR> sub-menu-vibratory feeders



The following parameters are only displayed if a vibratory feeder is connected.

Parameter	Definition
MF @ 8% DC	These individual values are calculated automatically by the function <AUTO FF CALIB>.
MF @ 12% DC	When the setpoint change exceeds the <SEPT CHG LIM>, the controller switches to using the appropriate MF value at the Drive Command expected.
MF @ 17% DC	
MF @ 23% DC	
MF @ 33% DC	
MF @ 50% DC	
MF @ 70% DC	
MF @ 100 DC	Only Display.

6.3 Emptying the feeder




If the same product is to be used again later, record the operating parameters on the programming sheet. The <REFILL> will be automatically <Disabled> when this procedure is run. Be careful not to allow external means to reinstate the <REFILL> to <Enable>.



- ▲ This command will start the feeder. Ensure that no one is working at the machine.

Emptying process:


1. Select the <PRODUCT CHANGE>.
2. Select the <EMPTY FDR> function.

3. Press 

4. Press 

Note:

- The feeder runs in volumetric control at the <EmptyDC> value until the net weight stops changing and then the feeder stops automatically.

- The function <EMPTY FDR> can be stopped with 

5. Switch the feeder system off with the main switch.
6. The feeder can now be cleaned.



- ▲ Only clean the feeder system when the main power switch is 'OFF'.



Set the variable <REFILL> from <Disabled> to <Enable> in the <PRODUCT CHANGE>, <GENERAL> menu when ready to proceed with feeding a new product.

7 Calibration

There are different calibration tasks and they are done on a regular basis depending on the process or after maintenance work and especially after replacing components of the weighing system.



- All work should be done when the <SETPOINT MODE> = <Local> and any interlocks from external equipment are deactivated.
- Record the tare, span and feedfactor values after calibration for future use.

7.0.1 Calibration tasks

- **Scale taring**
- **Scale friction test** (static weight reading, repeatability)
- **Feeding factor calibration**
- **Flowrate calibration** (by SPAN correction)
 - Comparing a static reference weight with the net-weight indication from the controller.
 - Comparing a product sample weight with the computed weight from the controller.

You can choose one of the following methods to validate flowrate:

- Auto Feedfactor Calibration/ Auto Calibration - see section [7.2.1](#)
- Totalizer (not for Vibratory) see section [7.2.1](#)

- **Flowrate accuracy check** (repeatability)

7.0.2 Span limits

Standard limits for for the different scales and feeder types:

- 3 point weighing system SFT, SFS platform scale: 0.99 to 1.01
- D/B/H4 platform scales, K2G/K4G scales: 0.95 to 1.05



For specific tolerances see the weight test certificate (12.23-0009) in the project manual if provided.

7.0.3 Accuracy for reference equipment

- Calibrated test weights with accuracy class M2, ANSI std. E617-class 4 (<0.02% 1- 50 kg)
- Reference scale error (<0.05% of reading)

7.1 Calibrating

7.1.1 Scale friction test (repeatability)

This procedure is used to check the repeatability of the weighing system using a small weight maximum 2% of scale range.

It is used before taring, linearity check and SPAN correction, after working on the feeder e.g. cleaning, screw change, maintenance work to ensure little mechanical friction on the weighing system.

Sources of scale friction are:

- Stretched, tensioned or twisted flexible connections (bellows)
- Tight or rigid cabling to the feeder
- Plugged hopper ventilation
- Over and under pressure in closed systems
- Faulty scale or SFT

Procedure

1. Stop flow to feed hopper by disabling the refill.
2. Record the current netweight for reference.
3. Place a small weight on to the scale.
4. After 5 seconds take off the weight.
5. Read the current netweight and compare with the previous one.
6. The repeatability should be within +/- 0.01% of the scale range.
7. On platform scales, the friction test has to be done with an empty and with a full hopper. For more complete check test at 25, 50, 75% of the scale capacity.
8. If the netweight value is drifting more than +/- 0.01% of the scale range over less than a period of 30 minutes, check for mechanical friction or high vibration on the scale.



For more information see the weight test certificate in the project manual (Form 12.23-0009) if provided.

7.1.2 Taring

1. Empty the feeder (see section [6.3](#))
2. Perform a friction test if necessary (see section [7.1.1](#))
3. Select <AUTO TARE> in the <PRODUCT CHANGE> menu.
4. Press **ENTER** twice to tare. The feeder is tared now.
The current tare value is displayed in the <TARE > parameter.
5. Record the tare weight
6. Check <Net Weight> value. The displayed net weight must be near <0.00> (+/- 0.01% of the scale range).

7.1.3 Scale calibration using static weight



The weighing system has to be linear within tolerances specified from the factory. For more information see the weight test certificate (Form 12.23-0009) in the project manual if provided or contact Coperion K-Tron.

This procedure is used to correct the weight reading of the weighing system using reference weights or using pre-weighed product samples. It is done after replacing components on the weighing system.

Equipment

Test weight or product sample size of min. 10% of the scale capacity.

Scale Capacity = {Scale Range-Tare}

Procedure

1. Tare the scale (see section [7.1.2](#))
2. Apply test weight (as close to the hopper centerline as possible) or fill the hopper with the product sample.
3. Read new <NET WEIGHT> value and calculate the correction factor as:

$$\text{NewWtSpan} = \text{DisplayedWtSpan} \times \frac{\text{ReferenceWeight}}{\text{NetWeightReading}}$$

4. Enter new span value in (for limits see section [7.0.2](#))
5. Remove the test weight and check that <NET WEIGHT> returns to <0.000> (+/- 0.01% of the scale range).

7.1.4 Feedfactor calibration

The LWF controller calculates the starting feeding factor during calibration. The feedfactor indicates the estimated flowrate at 100% drive command. The feedfactor in conjunction with the operating massflow setpoint, provides the drive command reference for initial operation upon start-up.

The optimal average feed factor is constantly recalculated in gravimetric mode.

The feed factor calibration is necessary after changing product, feeding tools, gear reduction or before flow rate accuracy tests to achieve the best performance.

The feedfactor can be entered manually if known.



- ▲ Feedfactor calibration cannot be done during feeding into the process.
- ▲ Avoid accidental refilling and scale disturbances while calibrating, otherwise the feedfactor may be erroneous.
- ▲ After a SPAN adjustment redo the feedfactor calibration.

Preparation

- Supply enough bulk material to be fed.
- Container to capture material.

Procedure

1. Fill the hopper with product
2. Enter 100 as <INIT FF> value in the <CALIBRATION> menu, <FF CALIBRATION> sub-menu.
3. Enter 50 as <Operating SP> value.
4. Place the feeder in volumetric control-<VOL>-with **GRAV/VOL**.
5. Press **RUN** to start the feeder.
6. Allow the feeder to run for around 30 seconds or until the metering device has filled and feeding material is evenly discharging.
7. Press **STOP**
8. Start **AUTO FF CALIB** in the <CALIBRATION> menu, <CALIBRATION> sub-menu (see section 6.2.3).



- For screw feeders the default calibration drive command is 10% and the calibration time is 30sec.
 - For vibratory feeders, the unit will run automatically at 7 different drive commands beginning at 8% and ending at 70%. The run time will be about 1 minute.
9. Place the feeder in gravimetric control-<GRAV>-with **GRAV/VOL**.

Validation

- Check the (INIT FF) value and verify that the operating setpoint is between 5% and 95% of the feedfactor. If not, reconfigure the feeder to meet these conditions: e.g. change its feeding capacity.

7.1.5 Flow rate calibration-general

Preparation

To properly perform the calibration test, you need to do the following:

1. Calculate the minimum sample size for one sample and select proper sample scale range and container capacity.
2. Determine the Calibrate Drive Command value to use.
3. Calculate the value of Calibrate Time to use.

You need to know the following prior to beginning this test:

- Range of the LWF scale system
- Expected operating setpoint for the feeder during normal service
- Feedfactor for the material being fed. From testing, reference section [7.1.4](#).

1. Calculate sample size

Minimum sample size = 0.1 x scale range

Sample container must hold that amount.

Scale net capacity bigger than sample size and container weight but must meet the accuracy requirement (see section [7.0.3](#))

2. Calculate calibrate drive command

$$\text{CalibDriveCommand}[\%] = \frac{\text{ExpectedOperatingRange}[\text{kg/h}]}{\text{Feedfactor}} \times 100$$

where the feedfactor is from the test run in section [7.1.4](#).

If this equation cannot be calculated, use a calibrate drive command of between 40-60%.

3. Calculate Calibrate Time

$$\text{CalibTime} = \frac{\text{ScaleRange}[\text{kg(lb)}] \times 36000}{\text{Feedfactor} \times \text{CalDriveCommand}[\%]}$$

If this equation cannot be calculated, use 300 seconds minimum.

7.2 Flow rate calibration using Auto FF Calib function

It is done in general after replacing SFTs (loadcells) and on a regular basis during preventive maintenance. The maintenance interval is depending on the process requirements.



For more information see the weight test certificate or feeder's maintenance and technical manual.



- If an error occurs or the <CAL CORRELA> value falls outside the <CAL CORR LIM>, the feedfactor will be set to zero and the automatic span update will not occur. Check the operation of the feeder and redo the test.
- If the calculated value is outside the <AutoSpanLimit>, the auto calibration test will fail. Have a qualified technician examine the scale for defects.

7.2.1 Flowrate calibration procedure

The calibration routine calculates the feedfactor for LWF .

Set-up:

1. Open the <CALIBRATION> menu.
2. Set the <CALIB TIME> for enough product.
3. Set the minimum <CAL DC> to 10% for enough product.
4. Set <INIT FF> to 100 or leave it at the present value.
5. Set the <CAL CORREL LIM > to 90%.
6. Record the displayed as noted.

Doing the test:


1. Perform <AUTO FF CALIB>.
2. When the feeder stops, weigh the content of the container.
3. Enter the value of material delivered from the prior step into the variable <ACT PROD FED>.

Validation:

If the calibration was correctly done, the will be updated.

7.3 Flowrate calibration using totalizer

Set-up:

1. Enter a desired operating <SETPOINT> on the <HOME> menu.
2. Press the **GRAV/VOL** key to <VOL/MAN>.
3. Press **RUN** to start feeder.
4. Wait until the product flow at the discharge is consistent.
5. Press **STOP** to halt flow.
6. Press the  key to open totalizer.
7. Press **ENTER** or enter a value of <0> if prompted.
8. Press **HOME**.
9. Verify <TOTAL> value is now <0>.
10. Place the tared container immediately under the feeder discharge.

Doing the test:

1. Press **RUN**.
2. Fill the collection container with enough product (see preparation in calibration section of specific feeder type).
3. Press **STOP**.
4. Weigh the sample in the collection container
5. Record <TOTALIZER> value from the <HOME> menu.
6. Compare weighed sample to <TOTALIZER> value.
7. Determine the span-correction factor by using the following formula:

$$\text{NewSpan} = \text{DisplayedSpan} \times \frac{\text{ProductSampleWeight}}{\text{DisplayedTotalizerValue}}$$

8. Open the following menus:
 - <SCALE> menu, <GENERAL> sub-menu- value.
9. Enter new span value as calculated in step 7.

7.4 Flowrate accuracy check by sampling

This procedure is used to test the linearity and repeatability of the feeder by comparing multiple product samples to the massflow setpoint.

It is done after replacing components on the weighing system, during commissioning and on a regular basis for validation depending on the process requirements.



For more information see Coperion K-Tron Feeder Accuracy Definition document I-060001 or KS-SP15.

8 Alarms - What to Do

When alarms occur, it is important to note them on the local display.

8.1 Stage 1- Soft alarm

The text alarm is displayed in yellow highlighted when a soft alarm is pending.

Soft alarms are alarms that are programmed with an alarm delay time. If they are not more active before the alarm delay time, they are automatically deleted. If the alarm delay time expires and the alarm is still active, a hardware alarm is issued.

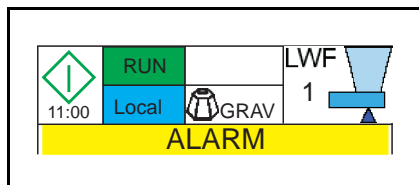


Fig. 8.1 Stage 1 alarm display

8.2 Stage 2 - Hard alarm

If a hardware alarm is active the alarm text is highlighted in red and flashes.

The alarm relay output de-energizes. This is a hard alarm condition.

Press **ALARM**  to query the alarm

Note:

- Pressing **ALARM** will acknowledge the alarm and re-energizes the alarm relay.
- Pressing **ALARM** a second time will clear the alarm if possible.

If more than one alarm condition is present, they will be displayed in order of the alarm number.

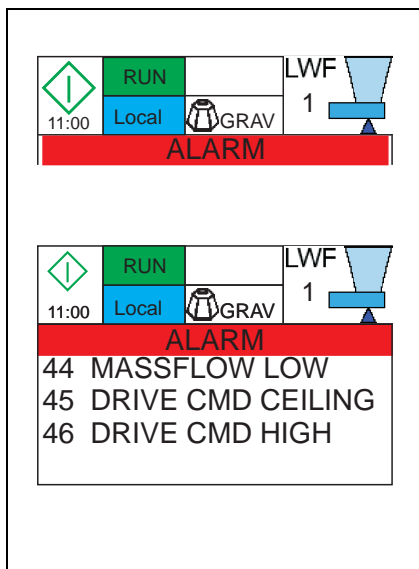


Fig. 8.2 Stage 2 alarm display



The alarm relay is configured for failsafe operation. It is not energized for an alarm.


8.3 Possible responses to the error condition

The error corrects itself.

- ⇒ The alarm display will extinguish.
- ⇒ The ALARM no longer flashes.

The error must be corrected.

1. Press **STOP** to stop feeding.

2. Press **ALARM**  to acknowledge the alarm.

3. Correct the error.

4. Press **ALARM** to clear the alarm signal.

5. Press **RUN** to start the feeder.



- ▲ If this requires work on the feeder, switch off the feeding system. Power the feeder when repairs are complete.
-

9 Alarm Messages- Cause and Remedy

9.1 System alarms

Note:

The associated number is the alarm number used for configuration and data communications.



- The HCU is the control unit for the Hurricane vacuum material loader for the feeder. It is programmed via the KCM and its alarms are reported there.
- The first number is the KCM alarm, the second the HSU alarm. (KCM#/HSU#). This code begins at KCM alarm (21) and ends at KCM alarm (29).

Alarm Num- Alarm	Cause	Remedy
00 HARDWARE ERROR	<ul style="list-style-type: none"> • KCM Hardware error. EEPROM data is corrupt. For example, this message will occur after updating or changing firmware on the KCM. 	<ul style="list-style-type: none"> ⇒ Check KCM CPU. ⇒ Clear alarm and try unit.
01 KEPROM MEM FAIL	<ul style="list-style-type: none"> • The K-PROM cannot be accessed by the KCM CPU. 	<ul style="list-style-type: none"> ⇒ Correctly insert K-PROM. ⇒ Replace with known good K-PROM.
02 KEPROM*KGR*FAIL	<ul style="list-style-type: none"> • Checksum error in kgr file area. 	<ul style="list-style-type: none"> ⇒ Verify K-PROM is properly installed. ⇒ Replace K-PROM.
03 POWER GLITCH	<ul style="list-style-type: none"> • Power dip detected. CPU did not reset. 	<ul style="list-style-type: none"> ⇒ Verify AC mains are within specification, ⇒ Replace drive pcb. (power supply)
04 KEPROM WRITE COUNT EXCEEDED	<ul style="list-style-type: none"> • KEPROM write counter exceeds more than 100000 writes. 	<ul style="list-style-type: none"> ⇒ Check communication. ⇒ Replace K-PROM.
05 INT CHAN FAIL	<ul style="list-style-type: none"> • Internal channel has failed to communicate between the CPU and drive boards. (also SFTs and HCU) 	<ul style="list-style-type: none"> ⇒ Check Internal Channel connections. ⇒ Replace either CPU or Drive pcb. (also check SFTs and HCU if used)

Table page 1 of 7

Alarm Num- Alarm	Cause	Remedy
06 WT PROC FAILURE	<ul style="list-style-type: none"> • SFT(s) failed. • Serial communication to the load cell interrupted. • f = SFT internal failure. communication OK. • t = No communication from the SFT to the controller board. • ?= Not valid answer from SFT. 	⇒ Locate which SFT has failed on the <SFTs> line in the <SCALE> Menu, <SFT> sub-menu.
07 INCORRECTNUM.S FT	<ul style="list-style-type: none"> • Number of SFTs found during polling does not equal that required. 	⇒ Check <SFT REQUIRED> number is valid. See <SCALE> menu, <SFT> sub-menu. ⇒ Check for all SFTs being operational.
08 BAD SFT STATUS	<ul style="list-style-type: none"> • SFT is showing an incorrect status. 	⇒ Replace SFT if problem persists.
09 NO MDU FOUND	<ul style="list-style-type: none"> • The KCM CPU did not find a motor drive on the internal channel on power-up. 	⇒ Check drive pcb LEDs for correct function. ⇒ Check Internal channel connections. ⇒ Replace drive or CPU pcb.
10 MOTOR ALARM	<ul style="list-style-type: none"> • The KCM CPU lost the motor drive on the internal channel while in operation. 	⇒ Check drive pcb LEDs for correct function. ⇒ Check Internal channel connections. ⇒ Replace drive or CPU pcb.
11 MDU SERIAL TIMEOUT	<ul style="list-style-type: none"> • Motor drive has lost communication with the KCM CPU and then turns off all digital outputs and shuts of drive power. 	⇒ Check Internal channel connections. ⇒ Replace drive or CPU pcb.
12 MDU THERMAL OVL	<ul style="list-style-type: none"> • Drive temperature has been exceeded > 75 deg C. Drive stops. 	⇒ Reduce operating temperature
13 MDU SPEED DEV	<ul style="list-style-type: none"> • No speed feedback signal is present when motor is asked to run. • Speed deviation from target > ± 5 rpm • Wrong motor voltage programmed. 	⇒ Check speed pick-up for operation and replace if necessary. ⇒ Check speed pick-up wiring and power connections. ⇒ Check programming. ⇒ Replace drive. ⇒ Check motor.

Table page 2 of 7

Alarm Num- Alarm	Cause	Remedy
14 MOTOR OVERLOAD	<ul style="list-style-type: none"> Motor current limit is exceeded. <p>Note: The Safety switch is not designed to be used as a normal way of interlocking the KCM. It is used for safety control only.</p>	<ul style="list-style-type: none"> ⇒ Reduce motor load. ⇒ Check motor power limit in the <MECHANICAL> menu, <MOTOR> sub-menu. ⇒ Review material/feeder selection.
15 MDU SAFETY RELAY	<ul style="list-style-type: none"> Safety relay failed to close contacts on power up and contacts remained closed after power down. 	<ul style="list-style-type: none"> ⇒ Replace Drive pcb.
16 MOTOR/ENCDR FAIL	<ul style="list-style-type: none"> Dual tach signals connected, one failed. Over-voltage on drive power supply. Motor voltage applied but no speed feedback. Drive temperature > 85 deg. C. 	<ul style="list-style-type: none"> ⇒ Check tachometer-replace. ⇒ Check motor brushes. ⇒ Replace motor if required. ⇒ Replace KCM drive board. ⇒ Check for excessive line voltage. ⇒ Reduce operating temperature.
17 MDU UNCONTROLLED	<ul style="list-style-type: none"> Speed feedback but no motor voltage applied. 	<ul style="list-style-type: none"> ⇒ Replace drive board.
18 MDU EEPROM FAILED	<ul style="list-style-type: none"> EEPROM checksum failed. 	<ul style="list-style-type: none"> ⇒ Cycle power. If error persists, replace drive pcb.
19 MDU DRIVE FAILED	<ul style="list-style-type: none"> MDU drive pcb has failed. (vibratory drive only. Drive coil current too high) 	<ul style="list-style-type: none"> ⇒ Exchange vibratory drive pcb. ⇒ Check drive coil for proper impedance.
20 MDU POLARITY	<ul style="list-style-type: none"> Coil polarity is incorrect on the vibratory drive. (Vibratory feeder only) Displacement frequency out of range. 	<ul style="list-style-type: none"> ⇒ Change the feedback coil polarity by swapping leads at KCM.
21 LDR REMOVED	<ul style="list-style-type: none"> HCU or LSR was removed. 	<ul style="list-style-type: none"> ⇒ Connect HCU or LSR at the KCM and switch KCM On. ⇒ Repoll SFT channel to re-connect. ⇒ Clear NOVRAM if necessary.
22 LDR ALARM	<ul style="list-style-type: none"> HCU or LSR has an alarm. 	<ul style="list-style-type: none"> ⇒ See following alarms for trouble shooting.

Table page 3 of 7

Alarm Num- Alarm	Cause	Remedy
23/01 LDR EEPROM FAILED	<ul style="list-style-type: none"> EEPROM failed. 	<ul style="list-style-type: none"> ⇒ Clear alarm. ⇒ Change EEPROM. ⇒ Cycle power.
24/02 LDR DRIVER FAILED	<ul style="list-style-type: none"> The controller's digital output driver has detected a fault. 	<ul style="list-style-type: none"> ⇒ Change HCU/LSR. ⇒ Latched.
25/03 LDR SUPP.HOPP.LOW	<ul style="list-style-type: none"> Material is below the level of the supply hopper proximity sensor. Sensor failed. 	<ul style="list-style-type: none"> ⇒ Refill or change supply hopper. ⇒ Check P17 or P23 (HCU). ⇒ Check sensor. <p>Note: Alarm will automatically clear when material is above sensor.</p>
26/04 LDR D.P.ALARM	<ul style="list-style-type: none"> The differential pressure across the filter is too high indicating a clogged filter. 	<ul style="list-style-type: none"> ⇒ Clean or replace filter. ⇒ Check P24 and P16 (HCU). ⇒ Check P17 (HCU)
27/05 LDR CYC.COUNT AL	<p>If HCU P20 Discharge Mode =01“Fill” mode then: „Gravity Gate mode“</p> <ul style="list-style-type: none"> Max. numbers of load cycle exceeded, because Buffer Hopper Low input has been active (on) for more than the allowed load cycles. The Buffer Hopper Low signal going inactive clears the load cycle counter. <p>If P20 Discharge Mode =02 (LWF) mode then: „Power mode“</p> <ul style="list-style-type: none"> Discharge Request input has been on for more than the allowed load cycles. The Discharge Request signal going inactive clears the load cycle counter. 	<ul style="list-style-type: none"> ⇒ Check Parameter Number of load cycles. ⇒ Check conveying rate. ⇒ Check Buffer hopper sensor. ⇒ Check Parameter Number of load cycles. ⇒ Check conveying rate. ⇒ Check discharge request signal.
28/06 LDR DISCH VALVE	<ul style="list-style-type: none"> Discharge valve has failed to either open or close properly. This alarm is automatically disabled in P18 Operating Modes 03 and 04. 	<ul style="list-style-type: none"> ⇒ Check sensor on the discharge valve. ⇒ Check P26 (HCU).
29/07 LDR REV.FULL AL.	<ul style="list-style-type: none"> Receiver is still full after discharge. Receiver proximity switch too sensitive adjusted or failed. 	<ul style="list-style-type: none"> ⇒ Check receiver. Material bridging in the receiver. Clean receiver. ⇒ Check Receiver proximity switch or P17 (HCU).

Table page 4 of 7

Alarm Num- Alarm	Cause	Remedy
30 KLINK WRONG KGR	<ul style="list-style-type: none"> Protocol of KGR file does not match that required by the installed communication circuit card. 	⇒ Make corrections as necessary.
31 KLINK NO KGR	<ul style="list-style-type: none"> No KGR file loaded 	⇒ Load KGR file with SmartConfig or switch to <Built-IN> KGR file.
32 HPORT FAIL	<ul style="list-style-type: none"> Host communication pcb error. 	⇒ Check communications pcb for proper LED operation. ⇒ Exchange communications pcb as necessary.
33 HPORT FAIL INIT	<ul style="list-style-type: none"> Host communication pcb could not be initialized. 	⇒ No host communications pcb is installed. ⇒ Check host communications pcb connections. ⇒ Replace host communications pcb.
34 HPORT ILLEGAL BD	<ul style="list-style-type: none"> Improper pcb installed in the host port location. 	⇒ Install correct host communications pcb.
35 KPORT FAIL	<ul style="list-style-type: none"> K-Port has failed 	⇒ Replace CPU pcb.
36 KPORT FAIL INIT	<ul style="list-style-type: none"> K-Port communication pcb could not be initialized. 	⇒ Replace CPU pcb.
37 KPORT ILLEGAL BD	<ul style="list-style-type: none"> Host communication pcb is installed on the wrong port location-(K-Port). 	⇒ Check host communications pcb for proper mounting location.
38 KGR PARAM ERROR	<ul style="list-style-type: none"> One or more feeder parameters are not correct for the specified feeder. 	⇒ Correct KGR file. ⇒ Use <Built-IN> KGR file.
39 EXT IO FAIL	<ul style="list-style-type: none"> The MODBUS I-O connection has failed. 	⇒ Check connections to remote I-O device. ⇒ Check remote I-O device wiring.
40 EXT ALR ACTIVATED	<ul style="list-style-type: none"> Digital input on KCM selected for External Alarm is active. 	⇒ Investigate the cause of this input being active and correct.
41 INTERLOCK FAIL	<ul style="list-style-type: none"> Drive pcb Run Enable digital input is open during operation. 	⇒ Check the Drive pcb Run Enable digital input for proper function.

Table page 5 of 7

Alarm Num- Alarm	Cause	Remedy
42 START IGNORED	<ul style="list-style-type: none"> Start conditions not fulfilled. 	<ul style="list-style-type: none"> ⇒ Check status line. ⇒ Check for setpoint and re-enter if necessary. ⇒ Check all KCM digital inputs for correct operation.
43 MASSFLOW HIGH	<ul style="list-style-type: none"> The current massflow is above the tolerance entered in <ALARM> menu parameter <MF ERR+>. 	<ul style="list-style-type: none"> ⇒ Increase the alarm start delay time in the <ALARM> menu. ⇒ Increase the tolerance <MF ERR+> value. ⇒ Check for proper feeding of material. ⇒ See if another alarm <DRIVE CMD LO> is present.
44 MASSFLOW LOW	<ul style="list-style-type: none"> The current massflow is below the tolerance entered in <ALARM> menu parameter <MF ERR->. 	<ul style="list-style-type: none"> ⇒ Increase the alarm start delay time in the <ALARM> menu. ⇒ Increase the tolerance <MF ERR-> value. ⇒ Check for proper feeding of material. ⇒ Re-range the feeder to achieve the desired feedrate. ⇒ Lower the operating setpoint <SP>. ⇒ See if another alarm <DRIVE CMD HI> is present.
45 DRIVE CMD CEILING	<ul style="list-style-type: none"> Drive command has reached the limit <DC CEILING> 	<ul style="list-style-type: none"> ⇒ Reduce drive command. ⇒ Increase Drive Command Ceiling. See <MECHANICAL SETUP>, <MOTOR> sub-menu.

Table page 6 of 7

Alarm Num- Alarm	Cause	Remedy
46 DRIVE CMD HIGH	<ul style="list-style-type: none"> The drive command has exceeded the value <DRV CMD HI> Limit in the <ALARM> menu. 	<ul style="list-style-type: none"> ⇒ Check for proper feeding of material. <ul style="list-style-type: none"> – Check for bridging in hopper – Check for adequate product in hopper ⇒ Lower the operating setpoint <SP>. ⇒ Increase the <DRV CMD HI> value in the <ALARM> menu. ⇒ Check for motor rotation. <ul style="list-style-type: none"> – Replace KCM if drive has failed. – Check motor. – Check speed sensor.
47 DRIVE CMD LOW	<ul style="list-style-type: none"> The drive command has dropped below the value <DRV CMD LO> Limit in the <ALARM> menu. 	<ul style="list-style-type: none"> ⇒ Raise the operating setpoint <SP>. ⇒ Increase the <DRV CMD LO> value in the <ALARM> menu.
48 CHECK_MOTOR_B RUSHES	<ul style="list-style-type: none"> DC motor brushes may be wearing out and ready to fail. 	<ul style="list-style-type: none"> ⇒ Motor brushes need inspection and replacement if worn. ⇒ If brushes are OK, re-enter a relevant brush life number in the Performance sub-menu.
49 RESET WHILE RUNNING	<ul style="list-style-type: none"> A board reset occurred during running. 	<ul style="list-style-type: none"> ⇒ Check power supply.
50 ACTIFLOW FAILURE	<ul style="list-style-type: none"> ActiFlow Alarm. 	<ul style="list-style-type: none"> ⇒ Check Status.
62 BATTERY LOW	<ul style="list-style-type: none"> The KCM back-up batteries have failed. 	<ul style="list-style-type: none"> ⇒ Check there is the „shipping insalubrities installed in the battery circuit. ⇒ The battery jumper JP-8 is removed. ⇒ Replace battery.

Table page 7 of 7

9.2 Display messages

Message	Cause	Remedy
Out of Range Tare Failed	<ul style="list-style-type: none"> Maximum permissible input value has been exceeded. 	⇒ Enter a value within the permitted limits of the parameter. See the specific programming manual for more information.
Nak'd Feeder Running	<ul style="list-style-type: none"> Not acknowledged as the command cannot occur when the feeder is running. 	⇒ Stop the feeder before making the entry.

9.3 Feeder won't start - displayed messages

Message	Cause	Remedy
Wait	<ul style="list-style-type: none"> No setpoint is entered. Feedfactor, if required, is <0>. Interlock has failed. 	⇒ Enter an operating <SP>. ⇒ Enter an <Initial Feedfactor> if required. ⇒ Check interlocks.
Alsh	<ul style="list-style-type: none"> Automatic alarm shutdown because of an alarm. 	⇒ Correct alarm problem with the ALARM key.
Disa	<ul style="list-style-type: none"> Start via bit input disabled. (Interlock or Run enable). 	⇒ Check interlocks to the KCM.

9.4 Feeder won't run in GRAV

Message	Cause	Remedy
Feeder remains in VOL control	<ul style="list-style-type: none"> Conditions for gravimetric control not fulfilled. 	⇒ Check input for forced VOL function. ⇒ If LWF, check refill function and net weight. ⇒ Check for weight related alarms. ⇒ Check for weight less than <Net Weight Low> Limit. (LWF) ⇒ Check for weight greater than <Net Weight High> limit. (LWF)

9.5 Process alarms

Process alarms	Cause	Remedy
52 FEEDFACT. BAD	<ul style="list-style-type: none"> Feedfactor is zero or feeding condition changed so that the feedfactor exceed the set limit in the <ALARM> menu <FF DEV LIMIT>. 	<ul style="list-style-type: none"> ⇒ Enter new feedfactor. ⇒ Check feedfactor limit in <ALARM> menu <FF DEV LIMIT>. ⇒ Check feeding condition.
53 SCALE OVERRANGE	<ul style="list-style-type: none"> The weight on the scale is above the scale gross range permitted. 	<ul style="list-style-type: none"> ⇒ Check the scale for proper operation. ⇒ If LWF, reduce level of refilling - <REFILL MAX> parameter.
54 SCALE UNDERRANGE	<ul style="list-style-type: none"> The gross weight is below zero. 	<ul style="list-style-type: none"> ⇒ Check the scale.
55 NETWT > LIMIT	<ul style="list-style-type: none"> The material weigh in the hopper is above the limit set in the <ALARM> menu. <NW HI LIMIT>. 	<ul style="list-style-type: none"> ⇒ Check for proper hopper filling. ⇒ Check the tare value. ⇒ Check for scale or weigh bridge measurement errors.
56 NETWT < LIMIT	<ul style="list-style-type: none"> The material weigh in the hopper is below the limit set in the <ALARM> menu.<NW LO LIMIT>. 	<ul style="list-style-type: none"> ⇒ Check for proper hopper filling. ⇒ Check the tare value. ⇒ Check for scale or weigh bridge measurement errors.
57 REFILL EXPIRED	<ul style="list-style-type: none"> The programmed refilling time (program parameter <ALARM> menu, <MAX REFILL TIME> was exceeded without refilling being completed. 	<ul style="list-style-type: none"> ⇒ Check refilling device, increase the time in program parameter <ALARM> menu, <ALARM LIMITS> sub-menu, <MAX REF TIME> or refill faster if necessary.
58 LOADER TIMEOUT	<ul style="list-style-type: none"> Loader hopper is empty 	<ul style="list-style-type: none"> ⇒ Check loader and material supply.
61 LOW CONTROL GAIN	<ul style="list-style-type: none"> Adaptive gain is 10 or below. 	<ul style="list-style-type: none"> ⇒ Check for excessive PERT values. ⇒ Reduce scale disturbances. ⇒ Increase operating setpoint.

9.5.1 Massflow variances in LWF feeding

Alarms	Cause	Remedy
General massflow fluctuations LWF	• Vibrations and drafts on feeder.	⇒ Improve the location of the scales. <ul style="list-style-type: none"> – Reduce the <CTRL GAIN> in the <TUNING> menu. – Increase the filter length display in program parameter <TUNING> menu, <DISPLAY FILTER>. – Increase the tolerance limit in program parameter <ALARM> menu, <MF ERR+/->. – Protect the feeder from drafts and air currents.
	• Irregular discharge.	⇒ Install different feeder screws when operating at low feeder-screw speeds. ⇒ Check for material flow problems such as bridging in the feeder hopper.
	• Irregular motor speed.	⇒ Re-enter start feeding factor <INIT FF> in the <PRODUCT CHANGE> menu and check in volumetric mode if the speed is constant. Is the speed constant? If so: ⇒ Re-calibrate the new feeding factor, reduce the <CTRL GAIN> in the <TUNING> menu, if necessary. If not: ⇒ Check the motor setting and the pick-up: verify the discharge feeder screws are not bound.
	• Friction on the scales (to be ascertained with a static weight test).	⇒ Check all mechanical connections to the scale, they must be flexible. The scale may not touch anything. ⇒ Replace scale.

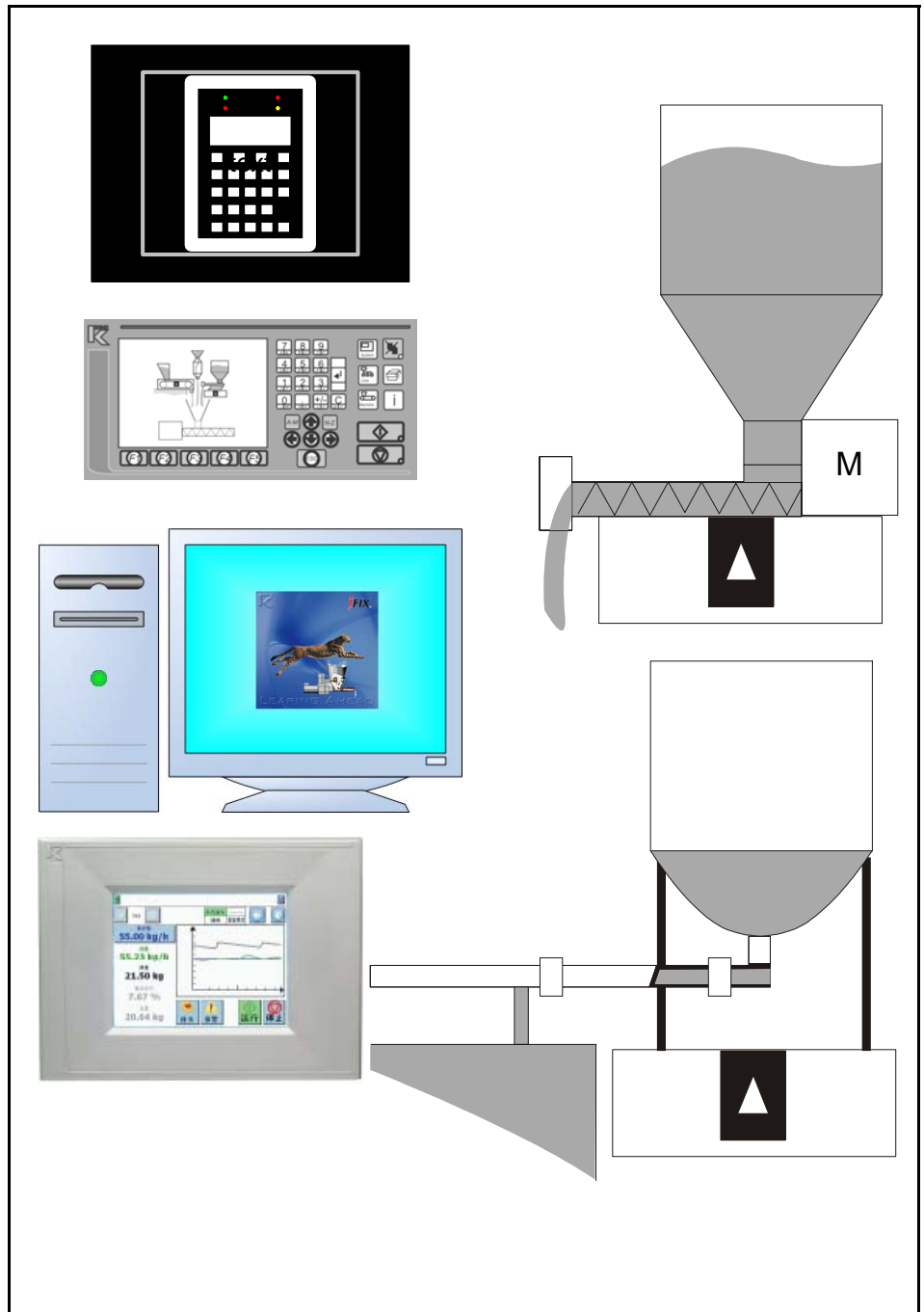
Table page 1 of 2

Alarms	Cause	Remedy
	<p>During Refill: MASSFLOW HIGH.</p> <ul style="list-style-type: none"> • Increased degree of feeder-screw filling or even the material is flowing through during refilling. • Pressure increase in the hopper during refilling. The reduction in pressure when refilling is completed affects the weight. <hr/> <ul style="list-style-type: none"> • Pressure fluctuations in the storage container caused by pressure, suction or insufficient ventilation. 	<p>⇒ Increase lower refilling level in program parameter <PRODUCT CHANGE> menu, <REFILL MIN>, reduce the refilling speed or fit different feeder screws if necessary.</p> <p>⇒ Make sure that the air can escape more easily. Replace the hopper's air filter if necessary.</p> <p>⇒ Increase <POST REFILL DELAY>.</p> <hr/> <p>⇒ Improve ventilation, install a pressure compensator on the ventilation connection during the suction process.</p>
	<p>During Refill: MASSFLOW LOW</p> <ul style="list-style-type: none"> • Fluidized material caused by the vortices of air in the hopper during refilling. • Continuous trickle from the refilling device. • The weight can be adversely affected if refilling is not stopped in time (within a few seconds). 	<p>⇒ Increase lower refilling level in program parameter <PRODUCT CHANGE> menu, <REFILL MIN>, reduce the refilling speed if necessary.</p> <p>⇒ If equipped with pneumatic slide gates, make sure that the slide gate closes sufficiently. Where liquids are being processed, the refilling valve must be located directly above the hopper. Increase mode-switch delay in program parameter <PRODUCT CHANGE> menu, <POST REFILL DELAY>.</p>
	<ul style="list-style-type: none"> • Hopper is overfilled. The material is contacting the inlet portion thus causing friction in weighing. 	<p>⇒ Reduce the top refilling level in program parameter <PRODUCT CHANGE> menu, <REFILL MAX>, reduce the refilling speed.</p>

Table page 2 of 2

PROGRAMMING INSTRUCTIONS

KCM LWF Programming
Software Version 2.0



Service

If you need assistance, please call your local service centre or

Coperion K-TRON Schweiz GmbH Tel. 0041 (0) 62 / 885 71 71
Lenzhardweg 43/45 Fax 0041 (0) 62 / 885 71 80
CH-5702 Niederlenz

Coperion K-Tron Pitman, Inc. Tel. 001 (0) 856 / 589 0500
590 Woodbury Glassboro Road Fax 001 (0) 856 / 589 81 13
Sewell, New Jersey 08080 USA

Coperion K-TRON Salina Tel. 001 (0) 785 / 825 16 11
606 N. Front St. Fax 001 (0) 785 / 825 8759
Salina, KS 67402-0017

Web: www.coperionktron.com

Before you call...

- ⇒ Do you have alarm displays? Are you able to eliminate the causes?
- ⇒ Have you modified part of the system, product or operating mode?
- ⇒ Have you tried to remedy the fault in accordance with the operating instructions?
- ⇒ Note the project or order number You will find these on the machine or in the system manual.
 - Example: 0403214

Using the manual:

- ⇒ This arrow identifies an individual action.
- 1. Numbers identify a sequence of actions which have to be executed step-by-step.
- ▲ This symbol identifies a general safety note.



Reference to another manual.



Important information.



This symbol indicates that tools are required for the following task.



Specifies where information or a situation must be checked.

If an error or omission is found, please contact:

documentation@coperionktron.com

Doc. No.: 0590020601-EN

Date: 2014/Jan/13

Original: 0590020601-EN

Coperion K-Tron assumes no responsibility for damages resulting from misuse of any equipment or negligence on the part of operating personnel. Further, you may kindly refer to the purchase order, confirmation or other document that contains the express Coperion K-Tron warranty disclaimer limiting or excluding certain warranties with respect to the company's equipment. Except as otherwise expressly provided by Coperion K-Tron in any such document, COPERION K-TRON MAKES NO WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, NOR ANY OTHER WARRANTY, EXPRESS OR IMPLIED, WITH RESPECT TO THE EQUIPMENT.

Table of Contents

1	Programming Reference	7
1.0.1	Additional programming information	7
1.0.2	Manual notation	8
1.0.3	Abbreviations and terminology	9
1.0.4	Menu and sub-menu listing	10
1.1	Product change menu	11
1.1.1	Product change parameters	11
1.2	Calibration	16
1.2.1	Calibration sub-menu	16
1.2.2	Feedfactors sub-menu for motor driven feeders	19
1.2.3	Feedfactors sub-menu for vibratory feeders	20
1.3	Alarm menu	21
1.3.1	Limits sub-menu	21
1.3.2	Alarm setup sub-menu	23
1.4	Tuning menu	25
1.4.1	Tuning parameters	25
1.4.2	Method selection versus tuning parameters table	27
1.5	Refill Menu	28
1.6	Scale menu	30
1.6.1	General sub-menu	30
1.6.2	SFT sub-menu	31
1.6.3	Manual addressing of SFTs	33
1.7	Machine setup menu	34
1.7.1	General sub-menu	34
1.7.2	Changing feeder control application type	35
1.7.3	KSU-II/KCM screen saver description	36
1.7.4	Motor sub-menu	37
1.7.5	Motor sub-menu for DC motor	37
1.7.6	Motor sub-menu for AC Interface drive	39
1.7.7	Motor sub-menu for vibratory drive	40
1.7.8	Motor sub-menu for universal stepper motor	41
1.7.9	Motor sub-menu for HiPo, LoPo Stepper motor	42
1.7.10	Stepper motor programming table	43
1.7.11	Service sub-menu	44
1.7.12	Performance sub-menu	45
1.7.13	Actiflow sub-menu	47
1.8	I/O Menu	48
1.8.1	Digital input sub-menu	49
1.8.2	Digital output sub-menu	50
1.8.3	Setpoint input sub-menu	51
1.8.4	Analog output sub-menu	52
1.8.5	Modbus I-O sub-menu	53
1.8.6	Adding External Modbus I-O, an example	54
1.9	Loader menu	55
1.9.1	Loader parameters	55

1.10	HCU / LSR loader set-up	56
1.11	System setup (only KSU-II/KCM)	58
1.11.1	Communication sub-menu	58
1.11.2	SW Version Submenu	59
1.11.3	Drive type by displayed MDU#	60
1.11.4	Parameter Backup sub-menu	61
1.11.5	Changing the K-PROM password.	61
1.12	Security menu (only KSU-II/KCM)	62
1.12.1	Security parameters	62
1.12.2	Function data lock out	63
2	Calibration	64
3	Other Programming	65
3.1	Setting refill parameters	65
3.1.1	Setting the Refill Max value	65
3.1.2	Setting the Refill Min value	65
3.1.3	Setting the Post Refill Delay	65
3.1.4	Setting the Refill Timer	66
3.2	Calibrating analog I-O	67
3.3	Using an external motor drive	68
4	Alarm Messages- Cause and Remedy	69
4.1	System alarms	69
4.2	LWF alarms	76
4.3	Display messages	77
4.4	Feeder won't start - displayed messages	77
4.5	Feeder won't run in GRAV	77
4.6	Massflow variances in LWF feeding	78
5	Appendix	80
5.1	Special KCM LWF features	80
5.1.1	Automatic Gear Switching for LWF	80
5.1.2	SFT Addressing	82
5.1.3	LWF tuning for the KCM	83
5.1.4	Pert values and control response	83
5.1.5	Tuning parameter descriptions	84
5.1.6	Refill Algorithms for the KCM	85
5.1.7	Refill using the integrated loader function	88
5.2	Programming the loader function	93
5.3	Programming parameters for HCU	94
5.4	Status tables	95
5.4.1	DC Drive hex status codes-1600/450 W drives	95
5.4.2	Vibratory drive hex status codes	96
5.4.3	Stepper drive hex status codes for all types	97
5.4.4	AC drive interface hex status codes	98
5.4.5	SFT status table	99

5.4.6	Actiflow drive hex status codes	100
5.5	Loading language file	101
5.6	Service variables	102
5.7	LWF PSR Map	104
5.8	LWF ASR Map	106
5.9	Parameter listing-LWF	112

1 Programming Reference



See operating manual for operator instruction with safety notes



The following programming instructions covers LWF application programming for the displays KSU-II/KCM, KSL, K-Vision, KSC. This manual is only for skilled staff instructed by Coperion K-Tron (Switzerland) LLC.

The menu architecture for the application is the same for all displays. The main differences between the displays are the navigation and the short variable name for the KSU-II/KCM.

1.0.1 Additional programming information

See instructions below for information on the following points::

- User interface operation; keypad and display function
- For feeder calibration
- General operation
- Technical specifications



0490020611 = KCM-KD / KSU-II operation with calibration procedures

1090020602 = KCM-GD operation with calibration procedures

0690020604 = K-Vision operation with calibration procedures

0490020602 = KSC operation with calibration procedures

0290020613 = KSL operation with calibration procedures

0490020614 = Smart Connex II Overview

0690020601 = KCM General PC Utilities

0490020605 = KCM Electronics

1090020601 = KCM GD Electronics

1.0.2 Manual notation

The following is standard through out this manual.

- KSU-II / KCMPParameter name shown as <PARAM NAME>
- KSL / KSC Parameter name shown as <Param Name>
- Parameter value shown as <Param Value>
- Menu name as <Menu NAME>
- Alarm message as <Alarm Message>
- Display indication or key action result as <INDICATION>.
- Dialog box indication as <Dialog>.
- Key or button as **KEY**



The first parameter name (in CAPS) is for KSU-II/KCM display. The second parameter name below the first is for the KSL and KSC.

The **BOLD PARAMETERS** are command functions for the KSU-II/KCM. For KSL and KSC functions keys are used instead of command functions.

1.0.3 Abbreviations and terminology

- Config port = diagnostic serial data port
- CPU = central processing unit, microprocessor
- Drive-MDU = Common representation of all types of drive boards (450 / 1600 watt DC drive, AC drive interface, stepper motor drive, vibratory drive)
- HCU = Hurricane pneumatic loader control
- Host Channel = serial data connection to remote host computer
- HSU = User interface for HCU
- HMI = human, machine interface, usually a PC utilizing a commercial SCADA software package
- Internal Channel = serial data connection to SFTs/HCU and internal motor drives
- KCM = Coperion K-Tron (Switzerland) LLC control module, the SmartConnex II integrated feeder controller
- KCM = KCM with local keypad and display
- KCM-SD = KCM with status display only
- kgr = host communication file residing in KCM
- KSC = Coperion K-Tron (Switzerland) LLC Smart Commander, a PC based HMI system for use with up to 30 controllers
- KSL = Coperion K-Tron (Switzerland) LLC line interface for up to 8 feeders
- K-Vision = Coperion K-Tron (Switzerland) LLC line interface for up to 16 feeders
- K-Net = KCM serial data connection to KSU-II, KSL, K-Vision or KSC
- K-Port 1 and K-Port 2 = data port for a Coperion K-Tron (Switzerland) LLC specific communication
- KSU-II = Coperion K-Tron (Switzerland) LLC single unit user interface for the KCM
- LWF = loss-in-weight feeder
- pcb = printed circuit board
- SCADA = supervisory, control and data acquisition system
- Smart Connex II = second version of SmartConnex architecture
- SFT = Smart Force Transducer

1.0.4 Menu and sub-menu listing

- Product Change menu
- Calibration menu
 - Calibration sub-menu
 - Feedfactor sub-menu
- Alarm menu
 - Alarm limits sub-menu
 - Alarm setup sub-menu
- Tuning menu
- Refill menu
- Scale menu
 - General sub-menu
 - SFT sub-menu
- Machine
 - General sub-menu
 - Motor sub-menu
 - Service setup sub-menu
 - Performance sub-menu
 - Actiflow sub-menu -appears when a actiflow is connected to KCM
- I-O Setup menu
 - Digital Input sub-menu
 - Digital Output sub-menu
 - Setpoint Input sub-menu
 - Analog Output sub-menu
 - Modbus I/O sub-menu
- Loader menu-hidden if HCU or LSR is connected
- HCU Loader menu-appears when HCU is connected to KCM
- LSR Loader menu-appears when LSR is connected to KCM
- System menu
 - Communications sub-menu
 - SW Versions sub-menu
 - Parameter Backup sub-menu
- Security menu


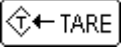

1.1 Product change menu

This menu allows easy product changeover. See section • for manuals to be used specifically when calibrating the feeder.

1.1.1 Product change parameters

Parameter	Definition
REFILL	ENABLED Setting for automatic refill. The net weight alarm limit is active.
Refill Enable	DISABLED The feeder hopper can be emptied without refilling being triggered. The net weight alarm limit is disabled.
	IF RUNNING Refill is enabled if the feeder runs, otherwise it is disabled. Default: DISABLED
REFILL MAX.	Input of the upper refilling limit at which refilling is stopped.
Refill Level Maximum	Warning: Do not exceed the hopper capacity or scale capacity when entering the top refilling limit. See section 3.1.1. Input range: <0.95 x Gross scale range Default: 0.06 kg
	REFILL MIN
Refill Level Minimum	Warning: Feeding behavior can be affected if the refilling limit is set too low. Do not uncover feeder horizontal agitator. Input range: < Refill Maximum Default: 0.05 kg
	START REFILL NOW

Table page 1 of 5

Parameter	Definition
<p>GEARSWITCH</p> <p>Note: Not used for vibratory feeders</p>	<p>Defines how the unit will change gear reductions on the K2 feeder with motor reversing gear reduction switching. To activate, a digital output must be set to <HILOGear>. Selections are: High, Low, Auto Hi, Auto Lo</p> <p>Notes:</p> <ul style="list-style-type: none"> • See more detail of operation section 5.1.1. • To fix the reduction at either High or Low speed, select either High or Low entries. • This value is only displayed when internal KCM motor drives are used. • <Low> selects low speed/highest gear reduction. • <High> selects high speed/lowest gear reduction. • <Auto Hi> When entering a setpoint which will generate a drive command of more than 50% and the GEARSWITCH is on Auto Lo, the gear will switch to high and the GEARSWITCH parameter changes to Auto Hi. • <Auto Lo> When entering a setpoint which will generate a drive command of less than 10% and the GEARSWITCH is on Auto Hi, the gear will switch to low and the GEARSWITCH parameter changes to Auto Lo.
<p>AUTO TARE</p> <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 10px 0;">CAUTION</div>	<p>This command allows the current weight value to be entered into the TARE memory when the product hopper is empty.</p> <p>Switch of the automatic refill and then tare.</p> <p>⇒ For KSU-II/KCM select parameter then press </p> <p>⇒ For KSL press F5-MORE then </p> <p>⇒ For KSC press </p>
<p>TARE</p> <p>Tare Weight</p>	<p>Weight of the feeder and hopper with no material. This value will set automatically when Auto Tare function is executed.</p> <p>Input range: 0 to scale range [kg]</p>
<p>NET WEIGHT</p> <p>Net Weight</p>	<p>Display of the current weight of the feeding material on the scale.</p> <p>Net weight = Gross Weight - Tare</p> <p>Range: Display only 0 to scale range [kg]</p>
Table page 2 of 5	





Parameter	Definition
AUTO FF CALIB	<p>This action permits easy feeder calibration. For this the program parameter <CAL DC> and <CAL TIME> have to be entered. Material is discharged for the value of <CAL TIME> and the starting feeding factor is calculated.</p> <p>Notes:</p> <ul style="list-style-type: none"> • Calibration can be canceled with STOP. • Pressing ENTER instead of RUN as noted above will abort the AUTOFFCALIB routine and return the user to the HOME menu. • Performing an AUTOFFCALIB function on an already running feeder will have no effect upon operation.
<div style="border: 1px solid black; padding: 5px; display: inline-block;">⚠ WARNING</div>	<p>▲ This command will start the feeder. Make sure that nobody is working on the machine.</p>
	<p>⇒ For KSU-II/KCM select this parameter, press ENTER  twice and then press RUN </p>
	<p>⇒ For KSL press MORE-F5 then press  then press RUN.</p>
	<p>⇒ For KSC press  then RUN.</p>
	<p>Attention:</p> <p>Refilling and feeding errors during calibration reset the program parameter FF INIT to <0> and activate the <FEEDFACTOR ERR> alarm.</p>
CALIB REMAIN [s]	A count down timer for the auto calibrate cycle. It shows how many seconds are left in the Calibration cycle.
INIT FF	Input of the starting feeding factor to determine the motor speed. The Drive Command is calculated as follows:
Initial Feedfactor	<p>DriveCommand(%) = 100 x (Setpoint/Initial Feedfactor)</p> <p>The starting feed factor can also be calculated with the command variable <AUTO FF CALIB>. Value of <0> will cause a Feedfactor Alarm.</p> <p>The feeder will <u>not</u> run with a Feedfactor of <0>.</p> <p>Input range: 0 to 99999 Default: 100 kg/hr</p>

Table page 3 of 5

Parameter	Definition
<p>BULKDENSITY</p> <p>Bulk Density</p>	<p>If the variable <VOL RATE>, in the <SERVICE VARIABLE INDEX>, is set any value other than <0>, this variable will be displayed.</p> <p>As the feeder runs in gravimetric control, the Bulk Density value will be updated by the calculation: $BD = FF/VOL RATE$</p> <p>Note:</p> <p>To use this variable, do the following:</p> <ol style="list-style-type: none"> 1. Enter the bulk density (BD) of the material being fed. 2. Perform an Auto Feedfactor calibration. The result is the value <VOL RATE>, calculated as the ratio of Feedfactor (FF) / Entered Bulk Density. The value <VOL RATE> is found in the Service Variable Index. <p>When the feeder runs in gravimetric control, the <BULKDENSITY> parameter will reflect the current material bulk density.</p>

EMPTY FDR

Empty feeder function. When started, the feeder runs at a drive command of 70%. The feeder stops automatically if no weight loss is detected.


Note:


<Empty Drive Cmd> may be changed by the Service Variables.



▲ This command will start the feeder. Make sure that nobody is working on the machine.

⇒ For KSU-II/KCM select EMPTY FDR, then press **ENTER** 

twice then **RUN** .

⇒ For KSL press **MORE-F5-** then press  then press **RUN**.

⇒ For KSC, press the  then **RUN**.

Notes:

- The <EMPTY FDR> action can be halted with the **STOP** key.
- The Net Weight Low alarm is also generated when the Empty Fdr cycle finishes.

Table page 4 of 5

Parameter	Definition
ACTIFLOW CALIB	<p>ActiFlow calibration function</p> <ol style="list-style-type: none">1. Fill the feeder with material.2. Set material characteristic “Easy, Medium, Hard or Manual“ in the KCM ActiFlow menu.3. Run the ActiFlow calibration. <p>Notes:</p> <ul style="list-style-type: none">• This calibration routine will run a frequency sweep on the ActiFlow to find the mechanical resonance point of the feeder. During the calibration is no material fed.• Its important to have the feeder filled with material to a normal operating level before running this step, because the resonance point is significantly affected by material.
SCREW FILL	<p>When started, the motor will run (At the Calib DC) until weight loss is detected. Then the motor automatically stops.</p>

Table page 5 of 5

1.2 Calibration

Use the FF Calibration menu to perform feeder calibration.
 If the VOL RATE function is activated in the Service Variable Index, the volumetric rate will be calculated if a product bulk density is entered in the PRODUCT CHANGE menu.



- Section 1.2.2 is for motor driven feeders
- Section 1.2.3 is for vibratory feeders

1.2.1 Calibration sub-menu

Parameter	Definition
<p>INIT FF</p> <p>Initial Feedfactor</p>	<p>Input of the starting feeding factor to determine the motor speed. The Drive Command is calculated as follows (not for vibratory feeders):</p> $\text{DriveCommand}(\%) = 100 \times (\text{Setpoint}/\text{Initial Feedfactor})$ <p>The starting feed factor can also be calculated with the command variable <AUTO F.F. CALIB>. Value of <0> will cause an Feedfactor Alarm see page 21. The feeder will <u>not</u> run with a Feedfactor of <0>.</p> <p>Input range: 0 to 99999 Default: 100 kg/hr</p>
<p>AVG FF</p> <p>Average Feedfactor</p>	<p>The value shows the estimated mass flow value expected at 100% drive command and is calculated as (not for vibratory feeders):</p> $\text{AverageFeedfactor} = 100 \times (\text{Massflow}/\text{DriveCommand}(\%))$ <p>Average Feedfactor represents the massflow capacity of the feeder and is affected by bulk material characteristics and the current feeder mechanical configuration.</p> <p>Notes:</p> <ul style="list-style-type: none"> • The feeder will <u>not</u> run with a Feedfactor of <0>. <p>Input range: Display only</p>

Table page 1 of 3





Parameter	Definition
AUTO FF CALIB	<p>This action permits easy feeder calibration. For this the program parameter <CAL DC> and <CAL TIME> have to be entered. Material is discharged for the value of <CAL TIME> and the starting feeding factor is calculated.</p> <p>Notes:</p> <ul style="list-style-type: none"> • Calibration can be canceled with STOP. • Pressing ENTER instead of RUN as noted above will abort the AUTOFFCALIB routine and return the user to the HOME menu. • Performing an AUTOFFCALIB function on an already running feeder will have no effect upon operation. <p>▲ This command will start the feeder. Make sure that nobody is working on the machine.</p> <p>⇒ For KSU-II/KCM select this parameter, press ENTER  twice and then press RUN .</p> <p>⇒ For KSL press MORE-F5 then press  then press RUN.</p> <p>⇒ For KSC press  then press RUN.</p> <p>Attention</p> <p>Refilling and feeding errors during calibration reset the program parameter FF INIT to <0> and activate the <FEEDFACTOR ERR> alarm.</p>
CAL PROD FED	Shows the amount of material discharged during calibration cycle as calculated by the controller.
Calibrate Product Fed	Input range: Display only in set units
ACT PROD FED	After the Feedfactor test has been completed, enter the weight of the actual delivered product in this variable. The in the CALIBRATION Menu will be automatically calculated.
Actual Product Fed	If you wish to calculate the manually, just ignore this entry and proceed to the SCALE Menu, GENERAL SCALE Sub-menu and enter the computed span there.

Table page 2 of 3

Parameter	Definition
<p>SPAN</p> <p>Weight Span</p>	<p>This is the weight span and it is automatically calculated when an entry is made to the <ACT. PROD FED> variable. This is the value that corrects for massflow inaccuracy. For feeding, the span must be nearly 1.000 or there is a problem with the weighing system. This value is 'read only'.</p> <p>If you wish to calculate the manually, just ignore this entry and proceed to the SCALE Menu, GENERAL SCALE Sub-menu and enter the computed span there.</p> <p>Default: 1.000</p>
<p>CAL CORRELA-[%]</p> <p>Calibrate Correlation</p> <p>Note: Not used for vibratory feeders</p>	<p>Will be automatically calculated during calibration. The value shows the reliability of the calibration data. A value of 100% means that the weight samples taken during calibration are extremely uniform indicating smooth product discharge and no weight disturbances.</p> <p>Input range: Display only [%]</p>
<p>CAL CORR LIM-[%]</p> <p>Calibrate Corr Limit</p> <p>Note: Not used for vibratory feeders</p>	<p>If the <CALIB CORRELATION> is below this limit value the feedfactor will be set to <0>, the calibration test aborted and a Feedfactor Alarm will be generated.</p> <p>Note: This value self-adjusts after each completed calibration cycle.</p> <p>Input range: 0 to 99.9% Default: 80%</p>
<p>CAL DC-[%]</p> <p>Calibrate Drive Cmd</p> <p>Note: Not used for vibratory feeders</p>	<p>Drive command used during the auto calibration cycle.</p> <p>Input range: 0 to 100% Default: 10%</p>
<p>CAL TIME-[sec]</p> <p>Calibrate Time</p> <p>Note: Not used for vibratory feeders</p>	<p>Input of the duration of the automatic calibration cycle.</p> <p>Input range: 15-999 seconds Default: 30 seconds</p>

Table page 3 of 3

1.2.2 Feedfactors sub-menu for motor driven feeders

Parameter	Definition
<p>REFILL ARRAY</p> <p>Feedfactor Array or Density Array</p>	<p>ON Refilling feedfactor storage array is on. The feeding factor values are stored in these registers when the gravimetric mode is active. During refilling, the stored feeding factor values in conjunction with setpoint are used to establish proper drive command.</p> <p>OFF The refilling feedfactor storage array is off. The last average feedfactor just prior to refill is used in conjunction with setpoint to control feeding during refilling.</p> <p>Input range: On or Off Default: Off</p> <p>Notes:</p> <ul style="list-style-type: none"> • When <ON>, the Refill Array routine checks that the array FF Empty and FF Full are within 0.5 to 2.0 times the current average feed factor, otherwise the FF array is cleared. • If the feed factor changes more than 15% (0.5 times the service variable RefArr DevLim), the refill array is cleared.
<p>FEED FACT 1, 5, 9</p> <p>FF Hopper Full</p> <p>FF Hopper Mid</p> <p>FF Hopper Empty</p>	<p>Display of the feeding factor values in the refilling feedfactor array. These factors are calculated in the gravimetric mode and used during refilling in the volumetric mode when the refilling array registers are activated.</p> <p>Full(9) = 10% below the top refilling limit. Middle(5) = 50% below the top refilling limit. Empty(1)= 10% above the lower refilling limit.</p> <p>Note:</p> <p>Consistency of values indicate little variance in bulk material flow properties. This is ideal. Rapidly changing bulk density can affect feeder performance over the refill range. This would be evidenced by widely varying values of feedfactor. If the values vary highly, consider modifying refill levels, both maximum and minimum, to achieve more consistent feedfactors over the refill range.</p> <p>Input range: Display only [MF@100%DC]</p>

1.2.3 Feedfactors sub-menu for vibratory feeders

Parameter	Definition
MF @ 8% DC	These individual values are calculated automatically by the function <AUTO FF CALIB>.
Vibratory FF 8%	
MF @ 12% DC	When the setpoint change exceeds the <SEPT CHG LIM>, the controller switches to using the appropriate MF value at the Drive Command expected.
Vibratory FF 12%	
MF @ 17% DC	
Vibratory FF 17%	
MF @ 23% DC	
Vibratory FF 23%	
MF @ 33% DC	
Vibratory FF 33%	
MF @ 50% DC	
Vibratory FF 50%	
MF @ 70% DC	
Vibratory FF 70%	
MF @ 100% DC	
Vibratory FF 100%	

1.3 Alarm menu

This menu sets the alarm parameters and limits.



Any alarm that is set in percent, is disabled when the entry is <0>.

1.3.1 Limits sub-menu

Parameter	Definition
MASSFLOW ERR+[%] Massflow (+) Alarm Limit	Massflow error limit is the permissible difference in percentage between the setpoint and mass flow without triggering an alarm.
MASSFLOW-[%] Massflow (-) Alarm Limit	Input range: 0 to 100% Default:10%
DRIVE CMD HI [%] Drive Command High Limit	The Drive Command High alarm is triggered when <Actual Drive Command> exceeds this value. Input range: >DRIVE CMD LO to 102% Default: 99%
DRIVE CMD LO [%] Drive Command Low Limit	The Drive Command Low alarm is triggered when <Actual Drive Command> is below this value. Input range: < DRIVE CMD HI to 0% Default: 0%
FF DEV LIM [%] Feedfactor Deviation Limit	Maximum permissible difference between the AVG FF (Average Feedfactor) and the INIT FF (Initial Feedfactor). Not for vibratory feeders. Input range: 0 to 100% Default:0%
MAX REF TIME [sec] Refill Time Max or Refill Time Maximum	Input of the maximum refilling time. See section 3.1.4 for more detail. If the maximum/upper refilling limit is not reached when this time has passed, an alarm will be triggered. Input range: 5 to 999 seconds Default: 30 seconds
NW LO LIMIT Net Weight Low Limit	Minimum product level, by weight, below which an alarm is immediately triggered. If this condition is triggered, the controller switches to volumetric control. This value is only active if Refill is Enabled. Input range: 0 to < REFILL MIN Default: 0.0 kg-no alarm

Table page 1 of 2

Parameter	Definition
NW HI LIMIT	Maximum product level, by weight, above which an alarm is immediately triggered. If this condition is triggered, the controller switches to volumetric control.
Net Weight High Limit	Input range: 0 to scale range Default: 0 kg = no alarm

Table page 2 of 2

1.3.2 Alarm setup sub-menu

Parameter	Definition												
ALARM DELAY [sec] Alarm Delay	Time between the alarm detection and activation of the alarm relay output when the alarm is of the type <Timed> or <Timed-Stop>. The alarm output will not be activated and the alarm will be cancelled if the fault is corrected within this time period. Input range: 0 to 999 seconds Default: 30 seconds.												
STARTUP DELAY [sec] Startup Delay	Time during which process related alarm signals are suppressed when the machine is being started up. See section 1.3.1. e.g. Massflow High error is suppressed. Input range: 0 to 999 seconds Default: 60 seconds.												
STOP CLRS ALARM Clear Alarm on Stops	Select <Yes> if alarms are to be cleared when a stop occurs. Select <No> if alarms are not to be cleared during a Stop action. Default: No												
ALR Number of Selected Alarm	Input of the alarm number, which can be selected from the list in the appendix. With the programming variable ALARM MODE the selected alarm number can be influenced. Input range: See section 4.2.												
ALR Name of Selected Alarm	Shows the alarm function for the selected alarm number.												
ALARM MODE Selected Alarm Mode	The selected alarm at the variable Alarm number can be influenced as follows: <table border="1"> <thead> <tr> <th>Setting</th> <th>Definition</th> </tr> </thead> <tbody> <tr> <td>IGNORE</td> <td>Alarm will be ignored.</td> </tr> <tr> <td>IMMED</td> <td>Alarm will be activated immediately but ALS output will not change.</td> </tr> <tr> <td>IMMED-STOP</td> <td>Alarm will be activated immediately and ALS output switches ON.</td> </tr> <tr> <td>TIMED</td> <td>Alarm will be activated after entered startup up- and alarm delays but ALS output will not change.</td> </tr> <tr> <td>TIMED-STOP</td> <td>Alarm will be activated after entered startup and alarm delays and ALS output switches ON.</td> </tr> </tbody> </table> Selection will depend upon the action desired.	Setting	Definition	IGNORE	Alarm will be ignored.	IMMED	Alarm will be activated immediately but ALS output will not change.	IMMED-STOP	Alarm will be activated immediately and ALS output switches ON.	TIMED	Alarm will be activated after entered startup up- and alarm delays but ALS output will not change.	TIMED-STOP	Alarm will be activated after entered startup and alarm delays and ALS output switches ON.
Setting	Definition												
IGNORE	Alarm will be ignored.												
IMMED	Alarm will be activated immediately but ALS output will not change.												
IMMED-STOP	Alarm will be activated immediately and ALS output switches ON.												
TIMED	Alarm will be activated after entered startup up- and alarm delays but ALS output will not change.												
TIMED-STOP	Alarm will be activated after entered startup and alarm delays and ALS output switches ON.												

Table page 1 of 2

Parameter	Definition
STOP BY	This message displays what caused the KCM to last stop. Note:
Feeder Stopped By	The KSL will display this data on the Alarm Log screen. <ul style="list-style-type: none">• Board reset: KCM CPU was shutdown• Local display: KSU-II/KCM STOP key pressed• External display: KSL or KSC STOP key pressed• ALS Input: Alarm shutdown input caused the stop• Run DISA: Run Enable input caused the stop• Stop input: External bit input stop function• MDU DISA: Drive disabled stopping the output• Calib: Controller has completed its calibration routine• Watchdog: an internal timer failure reset the KCM CPU• Zero SP: The setpoint went to zero while the machine was running• Emptying: The emptying function, when complete, causes the KCM drive to stop• Interlock: The interlock input prevents the KCM from running

Table page 2 of 2

1.4 Tuning menu

This menu programs the tuning and control parameters for the application. Please review the section 5.1.3 and the two sections following for more information on control performance.

1.4.1 Tuning parameters



Parameters marked ** are only displayed when <METHOD> = <Manual>.

Parameter	Definition									
METHOD Method	<p>If not set to Manual, tuning parameters <CTRL GAIN> and <DISPLAY FILTER> will be set automatically based upon the level of aggressiveness selected. A selection of <Slow> results in slower control response. A selection of <Very Aggressive> results in rapid control response. Select the level of tuning that suits your process.</p> <p>Selecting <Manual> permits the viewing of <ADAPT GAIN>, <SFT CUTOFF>, <SAMPLE TIME> and setting of <ADAPTIVE TUNE>, <DISPLAY FILTER> and <CTRL GAIN>.</p> <p>Selections: Manual, Very Slow, Slow, Moderate, Normal, Aggressive, Very Aggressive</p> <p>Default: Aggressive</p>									
DISPLAY FILTER** Display Filter**	<p>Input of the time over which the mass flow display is determined. The greater the value the smoother the massflow display reading. This value has no effect upon feeder control response.</p> <p>Input range:0 to 999 seconds Default: 30 seconds</p>									
CTRL GAIN-[%]** Motor Control Gain**	<p>The control loop response amplification factor that determines the control signal for the motor controller. A value of 30 is recommended for most applications and is considered fairly aggressive control.</p> <table border="1"> <thead> <tr> <th>Setting</th> <th>Reaction</th> <th>Consequence</th> </tr> </thead> <tbody> <tr> <td>Large value 100</td> <td>Control very active</td> <td>Risk of oscillations great</td> </tr> <tr> <td>Small value 10</td> <td>Control less active</td> <td>Risk of oscillations low</td> </tr> </tbody> </table> <p>Input range: 1 to 100% Default: Depends on <Method></p>	Setting	Reaction	Consequence	Large value 100	Control very active	Risk of oscillations great	Small value 10	Control less active	Risk of oscillations low
Setting	Reaction	Consequence								
Large value 100	Control very active	Risk of oscillations great								
Small value 10	Control less active	Risk of oscillations low								
ADAPTIVE TUNE Adaptive Tuning	<p>When set to <On> automatically sets the values of <SAMPLE TIME>, <SFT CUTOFF> and <ADAPT GAIN> for optimal gravimetric feeding performance.</p> <p><On> is recommended!</p> <p>Input range: On or Off Default: On</p>									

Table page 1 of 3

Parameter	Definition
<p>ADAPT GAIN-[%]**</p> <p>Adaptive Gain%**</p>	<p>This value represents the amount of gain, as a product with the Control Gain, that is used to set control loop response.</p> <p>If Adaptive Tuning is <On>, the value is calculated according the scale disturbance in ppm/Update, the entered setpoint and the scale range. This value is a multiplier for the CTRL GAIN.</p> <p>When the adaptive tuning is <On>, this value is automatically set. E.g. 100% = good control, 10% = poor control.</p> <p>Input range: 1 to 100% Default: 100%</p>
<p>SAMPLE TIME- [msec]**)</p> <p>Weight Sample Time**</p>	<p>Setting of the SFTs' measuring cycle in milliseconds. The weight loss is measured using this time interval during feeding. When the <ADAPTIVE TUNE> is <On>, this value is automatically set. This value can only be manually set when <ADAPTIVE TUNE> is <Off>.</p> <p>Input range: 80 to 8,000 msec. Default: 160 msec.</p>
<p>CUTOFF FRQ-[Hz]**</p> <p>SFT CutOff Frequency**</p>	<p>Cutoff frequency for the SFT internal digital filter. A lower value represents a more stable weight display albeit slower control response. When the Adaptive Tuning is <On>, this value is automatically set. User can change this entry when Adaptive Tuning is <Off>.</p> <p>Input range: 0.033 Hz to 9.999 Hz Default: 0.4 Hz</p>
<p>PERT VALUE</p> <p>Pert Value</p>	<p>Pert Value shows the signal/noise ratio of scale disturbance in percentage to the setpoint. It is a measure of scale disturbance relative to setpoint. A low reading is best. If Setpoint is <0>, then the reading is in grams. See appendix for details of using this value to determine feeder performance.</p> <p>Input range: Read only</p>
<p>SPEED MODULAT</p> <p>Modulation or Speed Modulation</p> <p>Note: Not for vibratory feeders</p>	<p>If <Gear Reduction> input > 0.00, the screw modulation can be activated. Used only for single screw feeder types. Operating screw speed needs to be below 60 rpm for modulation to work.</p> <p>Attention: An incorrect input of <Gear Reduction> leads to the oscillation in massflow output.</p> <p>Input range: On or Off Default: Off</p> <p>Note: This parameter is displayed at the KSU-II/KCM only if the proper motor drive is installed and the proper gear reduction is entered. This parameter is not used for vibratory drives.</p>

Table page 2 of 3

Parameter	Definition
<p>SETPT CHG LIM</p> <p>Vibratory SP</p> <p>Note: Vibratory feeders only</p>	<p>Defines control behavior during setpoint changes when a vibratory feeder is used. If the setpoint change exceeds the input value, the behavior is executed on the basis of the calculated calibration curve. See FF@%DC in the CALIBRATION menu, FEEDFACTOR sub-menu.</p> <p>Input range: 0 to 100% of the entered Setpoint Default: 10%.</p>
V-AGIT.PERIOD	<p>If there is a detectable weight disturbance signal with approximately the same period as the the agitator interval time (in seconds), the software algorithm will work to cancel it out. The algorithm self synchronizes around the entered time period.</p> <p>Alternatively the synchronization can be made with an optional digital input from a sensor that delivers 1 impulse per agitator turn. This would be required if the agitator speed is variable.</p>

Table page 3 of 3

1.4.2 Method selection versus tuning parameters table



**The user sets these entries plus <ADAPT TUNE> to <On, Off>.

Setting	Display Filter Seconds	Ctrl Gain
Manual	**	**
Very Slow	120	2.0
Slow	90	4.0
Moderate	60	8.0
Normal	45	15
Aggressive	30	30
Very Aggressive	20	50

1.5 Refill Menu

This menu allows easy refill set-up.

Parameter	Definition
REFILL	Enabled Setting for automatic refill. The net weight alarm limit is active.
Refill Enable	Disabled The feeder hopper can be emptied without refilling being triggered. The net weight alarm limit is disabled. If Running If <Running> is selected, refill is only enabled when the feeder runs, otherwise it is disabled. Default: Disabled
REFILL MAX.	Input of the upper refilling limit at which refilling is stopped. See section 3.1.1 for more information.
Refill Level Maximum	Warning: Do not exceed the hopper capacity or scale capacity when entering the top refilling limit. Input range: < 0.95 x Gross scale Default: 0.06 kg
REFILL MIN	Input of the lower refilling limit at which refilling is started. See section 3.1.2 for more information.
Refill Level Minimum	Warning: Feeding behavior can be affected if the refilling limit is set too low. Do not uncover feeder horizontal agitator. Input range: < Refill Maximum Default: 0.05 kg
POST REFILL DELAY	Delay time before the feeder switches back to gravimetric mode after the refill turns off. See section 3.1.3 for more information.
Post Refill Vol/Grav Delay	Input range: 0 to 60 seconds Default: 10 sec.
REFILL MODE	Selections: Auto, AutoTerm, Man
Refill Mode	This entry controls how the refill is executed and particularly what occurs if a refill failure happens. Use <Auto> for automatic refill systems else use <Man> for LWF hoppers that are refilled by hand. AutoTerminate allows the refill device to shut off if a refill fails. See section 5.1.3 for more information. Default: Auto

Table page 1 of 2


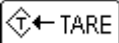

Parameter	Definition
VALVE DELAY	<p>This Entry is used to activate the refill complete target software.</p> <p>The exact time of closing the "Refill Window" output signal varies automatically based on the "as measured" refill rate and the parameter ValveDelayTime to avoid over filling the feeder. A higher refill rate turns off the refill window output bit sooner to prevent overflow. The parameter ValveDelayTime is the time in milliseconds that it takes the valve to actually close plus the time the material falls.</p> <p>Input range: 0 to 9999 msec. Default: 0 msec.</p>
FLT CLEAR TM Blow Off Time	<p>Time in milliseconds to provide a pulse to use for a filter clearing function on a vacuum loader or a jet filter. A digital output must be assigned for <BlowOff>. Not for HCU controlled loaders.</p> <p>Input range: 100-9999 msec. Default: 1000 msec.</p>
MIN OPEN TIME	<p>This Entry is used to set the minimum refill valve open time. This is used when refilling needs a pneumatic flow aid or filter clean pulse that causes a weight spike which stops refill by mistake.</p>

Table page 2 of 2

1.6 Scale menu

This menu programs the scale parameters and SFT operation in two separate menus/screens.

1.6.1 General sub-menu

Parameter	Definition
TARE	Weight of the feeder with no material. This value will set automatically when Auto Tare function is executed.
Tare Weight	Input range: 0 to scale range [kg]
AUTO TARE	<p>This command allows the current weight value to be entered into the TARE memory when the product hopper is empty.</p> <p>⇒ For KSU-II/KCM select parameter then press </p> <p>⇒ For KSL press F5-MORE then </p> <p>⇒ For KSC press </p>
SPAN	Input of the span correction factor for fine compensation of mechanical scale weighing errors. This value may automatically change if the Auto Span feature is used in the CALIBRATION menu.
Weight Span	Input range: 0.4 to 2.5 Default: 1.000
NET WEIGHT	Display of the current weight of the feeding material on the scale.
Net Weight	<p>Net weight = Gross Weight - Tare</p> <p>Range: Display only 0 to scale range [kg]</p>
GROSS WT	Display of the current total weight of the feeder and feeding material on the scale.
Gross Weight	Range: Display only, 0 to scale range [kg]
SCALE RANGE	Input of the scale's nominal capacity. This value will be read automatically from the connected load cell (s). If an mechanical reduction is used (e.g. B3 weighing bridges) enter the new weighing range with the service variable Scale Range.
Scale Range	Range: read only

1.6.2 SFT sub-menu





Parameter	Definition
SFT REQUIRED Number of SFTs Required	<p>Input of the number of connected SFTs.</p> <p>Input <1> for single point weighing system e.g. K-SFS or D5 scale or <3> for a three SFT weighing system.</p> <p>Input range: 0 to 6</p>
REPOLL	<p>This command will cause the controller to execute a poll on the weight/internal channel to locate connected and operational SFTs by address.</p> <p>⇒ For KSU-II/KCM select this parameter and press  twice.</p> <p>⇒ For KSL press </p> <p>⇒ For KSC press </p>
AUTO READDRESS	<p>This parameter allows SFTs to be auto-readdressed automatically. See section 5.1.2 for more information.</p> <p>⇒ For KSU-II/KCM, press  key for KSU-II/KCM.</p>
SFTs SFT Configuration	<p>The addresses and error signals of the connected weighing cells are displayed. Typically the parameter will appear as: <-1-----D> or <-123-----D>.</p> <p>The number representing the address of the SFT.</p> <p>Other codes in place of the SFT address include:</p> <p>? =Invalid response from SFT</p> <p>--=No SFT at this address</p> <p>t =SFT no longer responds. Weight channel data communication failure</p> <p>f =Internal failure in the SFT, replace SFT</p> <p>For a new initialization of the display press ENTER twice at the variable <REPOLL>.</p> <p>Address <D> that is shown in the SFT configuration is the KCM drive address.</p> <p>If an HCU is present, in KCM SW version 1.3 and later, address <E> will be displayed.</p> <p>Input range: Display only</p>

Table page 1 of 2

Parameter	Definition
<p>SFT SELECTED</p> <p>Node # Of Selected SFT</p>	<p>Selects the SFT to query parameters: SFT #, SFT SN#, SFT ADDRESSED, SFT WEIGHT, SFT TYPE, SFT STATUS. Input range: 0 to 11</p>
<p>SFT ADDRESSED</p> <p>SFT Addressed</p>	<p>Switching <Off> will address the selected SFT to <0>. Switching <On> sets the SFT address selected in the SFT SELECTED program parameter if there is an available spare SFT. Input range: On or Off</p>
<p>SFT WEIGHT</p> <p>SFT Weight</p>	<p>Displays the current gross weight on the selected SFT. Input range: Display only</p>
<p>SFT TYPE</p> <p>SFT Type</p>	<p>Displays the type of the selected SFT. Input range: Display only</p>
<p>SFT STATUS</p> <p>SFT Status</p>	<p>SFT error display. The <Process Status Word> of the selected SFT is displayed. Any status word except 00000183 or 00000181 indicate SFT failure. For mor informations see chapter 5.4.5. Input range: Display only</p>
<p>SFT #</p> <p>SFT Software</p>	<p>Display of the software version of the selected SFT. Input range: Display only</p>
<p>HW #</p> <p>SFT SN #</p>	<p>Display of the hardware version of the selected SFT. Input range: Display only</p>
<p>SFT Serial # (Number)</p>	<p>Reports the serial number of the selected SFT.</p>
<p>SFT TEMPERATURE</p> <p>SFT Temperature</p>	<p>Indicates the SFT's internal temperature, in degrees Celsius, of the selected SFT, if the SFT software supports this display parameter.</p>

Table page 2 of 2

1.6.3 Manual addressing of SFTs

To set the address of a newly installed SFT to a prescribed address, follow the next procedure.

1. Select SCALE menu, SFT sub-menu.
2. View SFTs variable to verify the SFT in question is at address <0>.
3. Select <SFT SELECTED>.
4. Enter the new SFT address.
5. Select <SFT ADDRESSED>.
6. Select <On>.
7. View SFTs variable to verify the SFT is now at the desired address.

To manually change the address of a properly installed SFT to a new defined address, follow the next procedure.

1. Select SCALE menu, SFT sub-menu.
2. View SFTs variable to verify the SFT address to be changed is present.
3. Select <SFT SELECTED>.
4. Enter the SFT address seen from step 2.
5. Select <SFT ADDRESSED>.
6. Select <Off>.
7. View SFTs variable to verify the SFT address is now <0>.
8. Select <SFT SELECTED>.
9. Enter new SFT address.
10. Select <SFT ADDRESSED>.
11. Select <On>.
12. View SFTs variable to verify the SFT is now at the desired address.

1.7 Machine setup menu

This menu programs the feeder specific information. The data is arranged in three separate screens or menus.

1.7.1 General sub-menu

Parameter	Definition										
SETPOINT MODE Setpoint Mode	<table border="0"> <thead> <tr> <th>Setting</th> <th>Meaning</th> </tr> </thead> <tbody> <tr> <td>LOCAL</td> <td>Feeder is operated as an individual unit.</td> </tr> <tr> <td>RATIO</td> <td>Percentage of an external analog setpoint input = operating setpoint.</td> </tr> <tr> <td>DIRECT</td> <td>External analog setpoint input = operating setpoint.</td> </tr> <tr> <td>LINE1-8</td> <td>Feeder Setpoint is entered from the Line overview Page. In this mode the feeder is assigned to a line. It's called recipe mode. Use Line1 for KSL.</td> </tr> </tbody> </table> <p>Input range: See list Default Local</p>	Setting	Meaning	LOCAL	Feeder is operated as an individual unit.	RATIO	Percentage of an external analog setpoint input = operating setpoint.	DIRECT	External analog setpoint input = operating setpoint.	LINE1-8	Feeder Setpoint is entered from the Line overview Page. In this mode the feeder is assigned to a line. It's called recipe mode. Use Line1 for KSL.
Setting	Meaning										
LOCAL	Feeder is operated as an individual unit.										
RATIO	Percentage of an external analog setpoint input = operating setpoint.										
DIRECT	External analog setpoint input = operating setpoint.										
LINE1-8	Feeder Setpoint is entered from the Line overview Page. In this mode the feeder is assigned to a line. It's called recipe mode. Use Line1 for KSL.										
MAX SETPT Maximum Setpoint	<p>Input of a maximum permissible setpoint value. This value depends on the maximum throughput performance of the feeder.</p> <p>Note: This value also scales the ratio setpoint input and massflow and setpoint analog outputs.</p> <p>Input range: 0 to 999999 kg/h Default: 7200 kg/hr.</p>										
UNITS Units Selection	<p>Selection of the desired units.</p> <p>Note: This selection change automatically all weight specific units.</p> <p>Setup: kg/h, kg/min, lb/h, lb/min, T/h (metr. Ton), ET/h (engl. Ton), gr/h, gr/min.</p> <p>Input range: See list Default kg/h</p>										
RUN TIME-[hours] Feeder Run Time	<p>Display of the total run time in hours. A value may be entered as a baseline.</p> <p>Input range: Normal Display only</p>										
FDR ADDR Feeder Number or Feeder Address	<p>Address of the selected KCM.</p> <p>Note:</p> <ul style="list-style-type: none"> If the KCM CPU DIP switch, positions <1> to <5> are all set to <0>, then the feeder address is set by this entry, else it is from the DIP switch and then this parameter is 'read only'. 										

Table page 1 of 2

Parameter	Definition
<p>APPLICATION</p> <p>Control Type or Application Type</p>	<p>Input of the application type:</p> <p>Selection: LWF, WBF, SFM, PID, VOL, LWB, WBB, SFB, XTR, Confirm Input range: See list Default: LWF for LWF</p>
<p>LANGUAGE</p> <p>Only in KSU-II/KCM</p>	<p>Selects the desired language for the Display. Choices are English, German, French, Spanish, Italian and Custom.</p>
<p>SCREEN SAVER</p> <p>Only in KSU-II/KCM</p>	<p>When set to <On> activates the KSU-II and KCM screen saver function.</p> <p>Input range: On or Off Default: On</p>
<p>Feeder Name</p> <p>Only for KSL</p>	<p>Enter feeder name at KSL only.</p>

Table page 2 of 2

1.7.2 Changing feeder control application type

To change the feeder from one application type to another, perform the following procedure.

1. Select <APPLICATION>
2. With **NEXT**, select the desired new application like <WBF>.
3. Press **ENTER**.
4. Press **ENTER** again or wait for the parameter <APPLICATION> to again appear.
5. Select <Confirm>
6. Press **ENTER** to load new application.

1.7.3 KSU-II/KCM screen saver description

The screen saver is used to protect the screen from burning out when always the same data is shown. The screen saver is based on the parameter <MACHINE SETUP> menu, <GENERAL> sub-menu, <SCREEN SAVER> parameter to <On/Off>. The value On or Off is held in the KSU-II EEPROM. This allows to program each KSU-II individually to have the screen saver on or off. The default value is On.

The screen saver functions as follows:

1. After setting the screen saver to ON or in case it is already ON whenever a key is entered, a 12 hour timer starts to count down.
2. If the 12 hour timer has counted down to 0, the screen is set to its lowest brightness level. The screen data displayed is unchanged. The 12 hour timer restarts.
3. If the 12 hour timer has counted down again to 0, the KSU-II is set to the Home page and the screen is cleared. A screen saver character (all pixels on) moves smoothly through each character position line by line. When it reaches the last character position it restarts on the first top left position.
4. When the screen saver is in state 2 or 3 above, any key entered in the keypad will restore the screen to the normal brightness and screen data. The 12 hour timer restarts.

1.7.4 Motor sub-menu



Some parameters will not be displayed for every drive case. T

The motor sub-menu is shown for four types of drives.

- DC drives for 450 and 1600 watts
- AC interface drive
- Vibratory drive
- Stepper motor drive in three versions

1.7.5 Motor sub-menu for DC motor

Parameter	Definition
GEAR REDUC Gear Reduction or Total Gear Reduction	This parameter is used if the Screw Modulation or the Auto Gear Reduction functions are used. This entry must be the total reduction value between the drive motor and the feed screw. This entry is the lowest reduction or simply provides the highest screw speed for any given motor rpm. Input range: 0 to 999 Default: 0
GEAR REDUC L Gear Reduction Low	This parameter is used if the Auto Gear Reduction function is used. This entry must be the total reduction value between the drive motor and the feed screw. This entry is the highest reduction or simply provides the lowest screw speed for any given motor rpm. This entry is checked against the GEAR REDUC value to be sure that the magnitude of the entry is correct. Input range: 0 to 999 Default: 0
PICK UP TEETH Speed Pickup Teeth	Input of the number of teeth on the pick up gear. This gear is used for measuring the speed. Input range: 0 to 9999 Default: 120
ACTUAL POWER-[watts] Actual Motor Power	Displays the actual consumed motor power. Input range: Display only [W]
MAX. MOT POWER-[watts] Max Motor Power	This entry sets the maximum output power to the motor. (See nameplate on motor for value) Input range: 25 to 1600 W Default: Depends upon installed drive
MAX MOT VOLTAGE Motor Voltage	This entry sets the maximum output voltage to the motor. (See nameplate on motor for value) Input range: 90 to 220 Vdc Default: 180 Vdc

Table page 1 of 2

Parameter	Definition
MAX MOT SPEED - [rpm] Maximum Motor Speed	Input of the maximum motor rpm for 100% drive command. Input range: Drive specific. Default: drive specific (See nameplate on motor for value)
MDU STATUS MDU Status	The MDU status codes reveal operational condition of the Drive. See listing of MDU status codes in section 5.4.1 .
DC CEILING-[%] Drive Command Ceiling	Limitation of the drive command output to the motordrive. Input range: 10 to 125% Default: 110%

Table page 2 of 2

1.7.6 Motor sub-menu for AC Interface drive

Parameter	Definition
<p>GEAR REDUC</p> <p>Gear Reduction or Total Gear Reduction</p>	<p>This parameter is used if the Screw Modulation or the Auto Gear Reduction functions are used. This entry must be the total reduction value between the drive motor and the feed screw. This entry is the lowest reduction or simply provides the highest screw speed for any given motor rpm.</p> <p>Input range: 0 to 999 Default: 0</p>
<p>GEAR REDUC L</p> <p>Gear Reduction Low</p>	<p>This parameter is used if the Auto Gear Reduction function is used. This entry must be the total reduction value between the drive motor and the feed screw. This entry is the highest reduction or simply provides the lowest screw speed for any given motor rpm. This entry is checked against the GEAR REDUC value to be sure that the magnitude of the entry is correct.</p> <p>Input range: 0 to 999 Default: 0</p>
<p>PICK UP TEETH</p> <p>Speed Pickup Teeth</p>	<p>Input of the number of teeth on the pick up gear. This gear is used for measuring the speed.</p> <p>Input range: 0 to 9999 Default: 120</p>
<p>MAX MOT SPEED - [rpm]</p> <p>Maximum Motor Speed</p>	<p>Input of the maximum motor rpm for 100% drive command.</p> <p>Input range: Drive specific. Default: drive specific (See nameplate on motor for value)</p>
<p>MDU STATUS</p> <p>MDU Status</p>	<p>The MDU status codes reveal operational condition of the Drive. See listing of MDU status codes in section 5.4.1.</p>
<p>DC CEILING-[%]</p> <p>Drive Command Ceiling</p>	<p>Limitation of the drive command output to the motordrive.</p> <p>Input range: 10 to 125% Default: 110%</p>

1.7.7 Motor sub-menu for vibratory drive

Parameter	Definition
KV DEVICE	Selection of the used Vibratory type. KV1=1, KV2=2, KV3=3.
Vibratory Type	Input range: 1,2,3 Default: KV2=2
VIB SPAN	Span adjustment for vibratory tray displacement. The displacement must be measured at the vibratory and the SPAN calculated according following formula:
Vibratory Displacement Span	$\text{NewSpan} = \text{OldSpan} \times ((\text{Expected_Displacement})/(\text{Measured_Displacement}))$ Input range: 0.5 to 2.0 Default= 1.000
VIB DRIVE%	
VIB FREQ Hz	
MDU STATUS	The MDU status codes reveal operational condition of the Drive. See listing of MDU status codes in section 5.4.2 .
MDU Status	
DC CEILING-[%]	Limitation of the drive command output to the vibratory drive. Input range: 10 to 125% Default: 110%
Drive Command Ceiling	

1.7.8 Motor sub-menu for universal stepper motor



- Some parameters will not be displayed for every drive case. This section is used for stepper motor driven feeders. A chart of stepper motor sizes will be provided to aid in proper programming.
- The following chart is provided to program the universal stepper drive 0000005987 only.

Parameter	Definition
GEAR REDUC Gear Reduction or Total Gear Reduction	This parameter, if entered as the gear reduction value between the stepper motor and the disk/screw, results in the disk/screw speed being displayed in the parameter <SCREW SPEED>. Input range: 0 to 999 Default: 0
PICK UP TEETH Speed Pickup Teeth	Input of the number of pulses per revolution of the optical encoder. This encoder is used for measuring the speed. Input range: 0 to 9999 Default: 400
ACTUAL POWER [watts] Actual Motor Power	Displays the actual consumed stepper motor power. Input range: Display only [W]
MAX. MOT POWER [watts] Max Motor Power	This entry sets the maximum output power to the stepper motor. (See nameplate on motor for this value, then use table 1.7.10 to set power.) Input range: 25 to 194 W Default: Depends upon drive
MAX MOT SPEED [rpm] Maximum Motor Speed	Input of the maximum motor rpm for 100% drive command. Input range: Drive specific. Default: drive specific (See table 1.7.10 for values)
MDU STATUS MDU Status	The MDU status codes reveal operational condition of the Drive. See listing of MDU status codes in section 5.4.1.
DC CEILING [%] Drive Command Ceiling	Limitation of the drive command output to the motordrive. Input range: 10 to 125% Default: 100%

1.7.9 Motor sub-menu for HiPo, LoPo Stepper motor



This chart is used to program the HiPo and LoPo stepper drives, part numbers 0000004568 and 0000001430 respectively.

Parameter	Definition
<p>GEAR REDUC</p> <p>Gear Reduction or Total Gear Reduction</p>	<p>This parameter if entered as the gear reduction value between the stepper motor and the disk/screw, results in the disk/screw speed being displayed in the parameter <SCREW SPEED>.</p> <p>Input range: 0 to 999 Default: 0</p>
<p>PICK UP TEETH</p> <p>Speed Pickup Teeth</p>	<p>Input of the number of pulses per revolution of the optical encoder. This encoder is used for measuring the speed.</p> <p>Input range: 0 to 9999 Default: 400</p>
<p>MAX MOT SPEED - [rpm]</p> <p>Maximum Motor Speed</p>	<p>Input of the maximum motor rpm for 100% drive command.</p> <p>Input range: Drive specific. Default: 60</p> <p>(See table 1.7.10 for values)</p>
<p>MDU STATUS</p> <p>MDU Status</p>	<p>The MDU status codes reveal operational condition of the Drive. See listing of MDU status codes in section 5.4.1.</p>
<p>DC CEILING-[%]</p> <p>Drive Command Ceiling</p>	<p>Limitation of the drive command output to the motordrive.</p> <p>Input range: 10 to 125% Default: 100%</p>

1.7.10 Stepper motor programming table



- Stepper motor mounted optical encoder provides 400 pulses per revolution-quadrature.
- For BSP150-S, use a gear reduction of 2.00.
- This list may change. Review stepper motor label before selecting stepper drive and programming.

Feeder Type	Max Motor RPM	Maximum Power Setting-W	Required Stepper Drive
BSP100	60	49	0000001430 0000005987
BSP135	60	194	0000004568 0000005987
BSP150-S	120**	194	0000004568 0000005987
KM-T12	150	43	0000005987 0000001430

1.7.11 Service sub-menu

Parameter	Definition
S.VAR Service Variable Function	Display of the service variable name. See list in the appendix see section 5.6.
S.VAR VALUE Service Variable Value	Display and change of the service program value as selected with S.VAR.
TRACETICK Tracetick	<p>This parameter sets the time interval for recording operating data to KCM internal memory so that it can be retrieved and viewed on a PC for later analysis.</p> <p>Two types of data are recorded: Trace data e.g. massflow and operational status. e.g. gravimetric control. The second data type recorded is Alarm History data.</p> <p>Selections:</p> <p>Stop: The trace recording is stopped and the data can be read from the Configuration serial data port using HyperTerminal. When <Stop> is selected, the data can be read from the KCM at any time as long as power to the KCM is not interrupted.</p> <p>Restarting of the <TRACETICK> can be done without losing data if done within 1 hour of stopping the trace.</p> <p>1 sample: Each sample point of data is recorded. No more than five minutes of data can be stored without older data being over-written.</p> <p>1/4 second: 4 samples per second of data</p> <p>1 second: 1 sample per second of data</p> <p>5 seconds: 1 sample of data every 5 seconds</p> <p>15 seconds: 1 sample of data every 15 seconds</p> <p>60 seconds: 1 sample of data every 60 seconds</p> <p>Default: 1 second</p> <p>Notes:</p> <ul style="list-style-type: none"> The default value of 1 second will return after a KCM power interruption. Any other value of <Trace Tick> is not stored during a power interruption. There are 3600 individual samples of data in storage. So for a 1 second timetick, 1 hour of data is preserved. For a 60 second timetick, 60 hours of data are stored. Please see manual 0690020601 for operational details on using this resource.

1.7.12 Performance sub-menu



Depending upon drive type, certain parameters will not be displayed.

Parameter	Definition
CONTROL-% Control-%	<p>This parameter is a quality indicator of loss-in-weight feeding performance. This value uses the same technique like the pert value calculation in relation to the setpoint where 100% means no noise, 0% means too much noise. If the controller is in volumetric or pert, the value is slowly decreased.</p> <p>A value > 80% means usually a good performance.</p>
GRAV RATIO-% Gravimetric Ratio-%	<p>The time ratio the machine runs in gravimetric mode and has no pert disturbance. The value is filtered with a time constant of 15 minutes.</p> <p>A value of 100% means the feeder is always in gravimetric mode and shows no Pert disturbance while 0% means the feeder is never in Gravimetric mode.</p>
INT CHANNEL-% Internal Channel-%	<p>The internal channel performance is calculated in two parts, the bandwidth load and the error counter where it considers 10 errors per minute as bad and 100% load as bad. Both values are taken in square as follows:</p> $\text{IntChanPrf}\% = 100 * 1 - [(\text{Load}^2 + (0.1 * \text{Err}/\text{min})^2) / 2]$ <p>Example: 5 errors/min and 50% load = 75% performance. Expect normal values of 75% to 99%.</p>
KCM TEMP [deg C] KCM Temperature	<p>Displays the actual temperature in the KCM in °C. Input range: Display only.</p>
TORQUE-% Only for DC motor and stepper motor drives Torque-%	<p>The motor torque is derived from the power indication according to the following formula:</p> $\text{Torque} = 100 * (\text{actual power} * \text{nominal speed}) / (\text{nominal power} * \text{actual speed}).$ <p>Notes:</p> <ul style="list-style-type: none"> • On low speeds, this indication might be inaccurate. • 100% torque is the maximum allowed. • Not for vibratory feeders or for AC Drive Interface. • At low speeds, torque will reach a maximum of 100% before <Actual Power> reaches <Maximum Motor Power>. At high speeds, the opposite will occur.

Table page 1 of 2

Parameter	Definition
BRUSH REMAIN-%	The DC motor brush life is estimated according to the following formula:
Brush Remain-%	$\text{Estimated_Life} = \text{Expected_Life} * \text{Nominal_Power} / \text{Current_Power}$ To indicate the remaining life, the following formula is calculated once per second:
Only for DC motors	$\text{Brush_Remain} = \text{Brush_Remain} - [(100/(3600*5000))*(\text{MotorPower} / \text{Nominal_Power})]$ Where: 100 indicates in percent (3600 * 5000) expected life in seconds (Motor_Power / Nominal_Power) The current power ratio, limited to ≥ 0.1 If the motor is new, one should enter 100% in <BRUSH REMAIN> Also after checking the brushes, the parameter can be modified on the basis of current brush life.

Table page 2 of 2

1.8 I/O Menu

These menus program the digital and analog I-O functions. The KSL shows these variables over four pages; Digital Output, Digital Input, Analog Input, Analog Output. The KSC uses 3 screens.



See KCM Electronics manual for wiring details

I/O Definitions:

- DENA = drive enable
- ALS = alarm shutdown
- Inputs with an * are activated by an edge transition. All other inputs are by level
- ^ indicates a digital output that can be mapped to DIGOUT MAP
- CPU_In1...CPU_In4 are for the programmable digital inputs on the CPU pcb, terminal block J8
- MDU_In1... MDU_In2 are for the programmable digital inputs on the MDU (Drive) pcb, terminal block J1
- CPU_Out1...CPU_Out4 are for the programmable digital outputs on the CPU pcb, terminal block J8
- MDU_Rel1... MDU_Rel3 are for the programmable relay outputs on the MDU (Drive) pcb, terminal block J5
- External_In1...External_In8 and External_Out1...External_Out8 are used for remote MODBUS I-O.

1.8.1 Digital input sub-menu

Parameter	Definition
DIG IN Digital Input	<p>Selection of the desired bit input of the KCM for programming. Select any of the following inputs: CPU1-CPU4, MDU_IN1, MDU_IN2, Spare 1, Spare 2, Ext _In1 - Ext _In8.</p> <p>Note: For Ext In function to work, Modbus I-O must be configured first and the external I-O module (e.g.WAGO) connected via K-Port 2. Input Range: See list</p>
FUNCTION Digital Input Function	<p>Input function of the selected output no. [1-24]. Selection: None, Start*, Stop*, Interlock, Run Enable, ALS Input, Ack Alarm*, Clr Alarm*, Start/Stop, Vol Mode, Loc/Ext, Rat/Dir, Ext Alarm, Total Clr*, Data Lock, Empty*, Ref Bypass, Ref Cmd*, Calib*, Loader Lvl, Loader Ena, Jog, ScrFill</p> <p>Input Range: See list Default: CPU_In_1 = Start, CPU_In_2 = Stop, CPU_In_3 = ALS Input.</p> <p>Note:</p> <ul style="list-style-type: none"> • Ref Cmd is only functional if refill is enabled and net weight is < Refill Max weight. Ref Bypass is only functional if the Refill is Enabled. • If refill is active and running, initiating a Refill Command input will terminate the refill. If the refill is not active, initiating the Refill Command input will cause the Refill cycle to begin as stated under the prior conditions. <p>Note; If feeder is running then:</p> <ul style="list-style-type: none"> • Interlock requires no Start command upon release of Interlock for the feeder to re-start • Run Enable requires a Start command upon release of Run Enable to re-start the feeder
STATE Digital Input State	<p>Displaying the actual status of the selected digital input. Input range: Display only (Off or 0 = not active, On or 1 = active)</p>
POLARITY Polarity	<p>The selected digital input changes the function from e.g NO to NC. Selections are: Input range: Normal or Inverse Default: Normal</p>

1.8.2 Digital output sub-menu



It is not allowed to change Digital output function, polarity and map if the feeder is running.

Parameter	Definition
DIG OUT Digital Output	<p>Selection of the desired bit output of the KCM for programming. Select CPU_Out1 to CPU_Out4, MDU Relay 1, MDU Relay 2, MDU Relay 3, Spare, Ext_Out1 to Ext_Out8.</p> <p>Input Range: See list</p> <p>Note: For Ext Out function to work, Modbus I-O must be configured first and the external I-O module (e.g.WAGO) connected via K-Port 2.</p>
FUNCTION Digital Output Function	<p>Input function of the selected output no. [1-16]</p> <p>Selections: None, Run, Any Alarm, Alarm Relay, ALS Out, Drive Ena, Grav Mode, PSR_MAP^, ASR_MAP^, Totalizer_Pulse, Refill, Refill Expired, Loader, Blow_Off, HiLo_Gear.</p> <p>Input Range: See list</p> <p>Default: CPU_Out_1 = Feeder Run, CPU_Out_2 = Refill, CPU_Out_3 = Hard Alarm, CPU_Out_4 = Drive Enable, MDU_Relay1 = None, MDU_Relay2 = Refill, MDU_Relay3 = None</p>
STATE Digital Output State	<p>Displaying the actual status of the selected digital output.</p> <p>Input range: Display only (Off or 0 = not active, On or 1 = active)</p>
POLARITY Polarity	<p>The selected digital output changes the function from e.g. NO to NC.</p> <p>Selections are: Normal or Inverse</p> <p>Default: Normal</p>
EXT TOT PULS External Totalizer Pulse	<p>Input of the resolution of an external Totalizer</p> <p>Input range: 0* to 999999 Default: 0 kg/pulse</p> <p>The maximum pulse rate is 3 pulses/second.</p> <p>The calculation of the increment is as follows:</p> $\text{Ext Tot Increment}(\text{min}) = \text{Massflow}[\text{kg/hr}]/1000$
DIGOUT MAP Digital Output Map	<p>If at the variable <FUNCTION> the selection PSR-MAP or ASR MAP was made, it is possible to program any output function listed in the table in the appendix. See sections 5.7 and 5.8.</p>

1.8.3 Setpoint input sub-menu



Refer to manual KCM Electronics for more information.



For calibration, see section [3.2](#).

Parameter	Definition
<p>SOURCE</p> <p>Analog Input Source</p>	<p>Selection of the desired remote setpoint input for the KCM. Select CPU_0-10kHz, CPU_Analog, Extern</p> <p>Notes:</p> <ul style="list-style-type: none"> • See KCM Electronics manual for wiring details when selecting CPU source inputs. • For Extern function to work, Modbus I-O must be configured first and the external I-O module (e.g.WAGO) connected via K-Port 2. • Check the jumper on the KCM CPU for the following possible choices: 0-5 Vdc, 0-10 Vdc, 0-20 mA if CPU_Analog is the input selection.
<p>AIN VALUE-[%]</p> <p>Analog Input Value%</p>	<p>Display of the actual input value in percentage of the maximum value, AinMax as defined below.</p> <p>Input range: Display only</p>
<p>AIN MIN-[%]</p> <p>Analog In Value Min</p>	<p>Scaling of the analog output for the minimum value. (Offset adjustment e.g. 20% for 4 mA).</p> <p>This value can be used also to invert the analog input.</p> <p>Input range: 0 to *100%</p> <p>*Inverted 100%</p>
<p>AIN MAX-[%]</p> <p>Analog In Value Max</p>	<p>Scaling of the analog output for the maximum value.</p> <p>This value can be used also to invert the analog input.</p> <p>Input range: 100 to *0% Default: 100%</p> <p>*Inverted 0%</p>
<p>DEADBAND-[%]</p> <p>Deadband</p>	<p>Input of the deadband in percentage of the maximum value. Changes at the input below this value will have no change to the setpoint value.</p> <p>Input range: 0 to 100% Default: 0%</p>

1.8.4 Analog output sub-menu



- The KCM CPU only outputs a 0-20 mA current value. Use appropriate resistors to convert to the desired voltage.
- Maximum source voltage is 12 Vdc for the current output.
- For calibration, see section [3.2](#).



Refer to KCM Electronics manual for more information on electrical connections and operational limitations.

Parameter	Definition												
AOUT NUM	Selection of the desired analog output for the KCM. Select: CPU, EXT1 - EXT3.												
Analog Output	Input range: See list Note: For Ext1-Ext3 functions to work, Modbus I-O must be configured first and the external I-O module (e.g.WAGO) connected via K-Port 2.												
FUNCTION	The analog output can be assign with the following function:												
Analog Output Function	<table border="0"> <tr> <td>SETPOINT</td> <td>(20mA/Max. setpoint) x Actual setpoint</td> </tr> <tr> <td>MASSFLOW</td> <td>(20mA/Max. setpoint) x Massflow</td> </tr> <tr> <td>NETWEIGHT</td> <td>(20mA/Scale range) x net weight</td> </tr> <tr> <td>DRIVE COMMAND</td> <td>(20mA/100%) x Percent drive command</td> </tr> <tr> <td>MOTOR SPEED</td> <td>(20mA/Max Mot RPM) x Act Mot Spd</td> </tr> <tr> <td>FEEDFACTOR</td> <td>(12mA/Init FeedFactor) x actual feedfactor)</td> </tr> </table> Input range: See list Default: None	SETPOINT	(20mA/Max. setpoint) x Actual setpoint	MASSFLOW	(20mA/Max. setpoint) x Massflow	NETWEIGHT	(20mA/Scale range) x net weight	DRIVE COMMAND	(20mA/100%) x Percent drive command	MOTOR SPEED	(20mA/Max Mot RPM) x Act Mot Spd	FEEDFACTOR	(12mA/Init FeedFactor) x actual feedfactor)
SETPOINT	(20mA/Max. setpoint) x Actual setpoint												
MASSFLOW	(20mA/Max. setpoint) x Massflow												
NETWEIGHT	(20mA/Scale range) x net weight												
DRIVE COMMAND	(20mA/100%) x Percent drive command												
MOTOR SPEED	(20mA/Max Mot RPM) x Act Mot Spd												
FEEDFACTOR	(12mA/Init FeedFactor) x actual feedfactor)												
AOUT VALUE%]	Display of the actual output value in percentage of the maximum value.												
Analog Output Value%	Input range: Display only												
AOUT MIN	Scaling of the analog output for the minimum value. (Offset adjustment e.g. 20% for 4 mA)												
Analog Output Minimum	This value can be used also to invert the analog output. Input range: 0 to *100% (*Inverted 100%)												
AOUT MAX.	Scaling of the analog output for the maximum value.												
Analog Output Maximum	This value can be used also to invert the analog output. Input range: 100 to *0% Default: 100% (*Inverted 0%)												
DEABAND-[%]	Input of the deadband in percentage of the maximum value. Changes at the output below this value will have no change to the process value.												
Analog Output Deadband	Input range: 0 to 100% Default: 0%												

1.8.5 Modbus I-O sub-menu

Note:

- This menu is not available on the KSL, K-Vision or KSC.

Parameter	Definition
<p>ADDR 80 - 83</p>	<p>These are the read only I-O addresses for any external Modbus I-O that has been connected to K-Port 2. For each address, the module type (if connected) or problem will be indicated. Possibilities at each address are: WAGO, MISSING, CONFLICT, NONE</p> <p>WAGO = the Wago system of Modbus I-O modules is connected.</p> <p>CONFLICT = Addresses of connected modules are in conflict after powering the system. Select <REBIND NOW>. Press ENT twice to clear the fault.</p> <p>MISSING or CHANGED = Module that was present is no longer found. Select <REBIND NOW>. Press ENT twice to clear the fault.</p> <p>Input range: 80 to 83 Default: 80</p>
<p>DETAILS</p>	<p>This read only parameter presents information about the operation of each connected external Modbus I-O device.</p> <p>Node Select: 80, 81, 82, 83</p> <p>Type Select: Anlg In, Anlg Out, Dig In, and Dig Out are the possible functionality for connected modules</p> <p>I/O Point: 1-8.</p> <p>– Up to 8 points, of the same type, are possible at any address.</p>
<p>REBIND NOW</p>	<p>When the I-O functions have been configured, press the ENT key twice to rebind variables to the I-O points installed.</p> <p>Note:</p> <p>If alarm 39 occurs (Ext_IO_Fail), the Rebind Now function can clear the alarm. However, this action will remove all external I-O function. It is best to examine why the external module failed before executing Rebind Now.</p> <p>The Rebind Now function assigns <None> to any previously programmed external I-O point and then performs a new binding based upon the rule as follows:</p> <p>Lowest module by address with lowest I-O point is assigned the lowest I-O number</p> <p>e.g. Four digital input module at address 80 is automatically bound with EXTIN1 at module input 0 to EXTIN 4 at module input 3.</p> <p>After the Rebind Now action, each I-O point requires reassignment of its function. e.g. <Start>.</p>

1.8.6 Adding External Modbus I-O, an example

Follow this procedure to configure remote I-O.

- ⇒ Preset the Modbus I-O module to an address of 80, 81, 82 or 83.
- ⇒ Program the Modbus I-O module to follow the K-Port 2 communication specifications
 - 19,200 baud, 8E1
- ⇒ Program K-Port 2 for Modbus I-O
- ⇒ Make all wiring connection between the KCM and the external modules

Then do the following:

1. Power the KCM and the external I-O modules together.
2. Use the Modbus I-O menu to perform the following set-up.

Note:

If it is not possible to power the KCM and modules together, then once everything is powered, select <REBIND NOW> parameter to permit module binding.

3. Verify that at the module preset address, the specific module is found by name at the parameter <ADDR80-83>. e.g. 80 = WAGO.
4. Open the <DETAILS> menu.
5. Enter module address at <NODE SELECT>.
6. Open <TYPE SELECT>.
7. Note that if the automatic binding was done properly, the module will have each I-O point already set to a KCM input or output point.

e.g. If the module was a digital 4 input module at address 80, the screen would look like this:

```
I/O POINT 1 -> EXTIN1  
I/O POINT 2 -> EXTIN2  
I/O POINT 3 -> EXTIN3  
I/O POINT 4 -> EXTIN4  
I/O POINT 5 -> None  
I/O POINT 6 -> None  
I/O POINT 7 -> None  
I/O POINT 8 -> None
```

8. Go to the specific I-O menu and set the function for each active I/O point. e.g. set the digital input function for <Clr Tot>.
9. Test the function of each module I-O point.

1.9 Loader menu

This menu programs the vacuum loader function. No HCU is required. See section 5.2 for more information on loader applications.

Notes:

- In later KCM S/W versions 1.3 and later, this menu will be hidden if an HCU is connected to the KCM.
- Be sure the parameter <LOADER FUNCTION> in this menu is <Disabled> if a loader with HCU control is to be used.

1.9.1 Loader parameters

Parameter	Definition
LOADER FUNCTION Loader Function	Selects whether loader runs or not. Select <KCM IO> or <EXTERNAL> to run, <OFF> to stop.
MAX LOAD TIME Max Load Time	Load time in seconds to reach the high level proximity sensor. An alarm will occur if the high level is not reached in this time. Default: 30 seconds
SHUTDOWN TIME Shutdown Time	Time, in seconds, for the motor to wind down at the end of the load cycle. Default: 5 seconds
DISCHARGE TIME Discharge Time	Time, in seconds, it takes to discharge the loader contents. Default: 10 seconds
VALVE CLOSE TIME Valve Close Time	Time, in seconds, it takes for the discharge valve to close at the end of a discharge. Default: 5 seconds

1.10 HCU / LSR loader set-up

This menu programs the Hurricane loader function. This menu is used in place of the HSU.



- This menu is only displayed, if a HCU / LSR is connected.
- The HCU / LSR Loader controller is connected to the KCM via the Internal Channel.
- Be sure that the **LOADER** parameter is <disabled> in the **LOADER** menu. Hide the **LOADER** menu.



- See manual 0290023601 for more HCU loader operational information.
- See KCM Electronics manual for more information.
- See manual 1090034605 for more LSR operational information.


Parameter	Definition
COMMAND	The following commands can be selected and be executed with the ENTER key:
Loader Command	None No function
	Run Starts the conveying cycle
	Stop Stop the conveying cycle
	Clr Alrm Deletes all pending alarms
	Disch On Starts discharge
	Disch Off Stops discharge
 WARNING	▲ Conveying starts if you press ENTER at the selection <RUN>.
	The process can be stopped only by selection of the command stop. The START/STOP key on the control unit does not have a function for the loader.
CYCLE	Displays the current active cycle.
Active Cycle	Motor Motor Timer active. After the timer expired the motor will stop.
	LoadDly Delay until the valve is closing and a new conveying cycle is starting.
	Load Hurricane is conveying material.
	Line Clr Conveying pipe emptying cycle is active.
	DischDly Discharge delay time. Delay = Time until the motor stops.
	Disch Discharge cycle: Display only.
	Input range: Display only

Table page 1 of 2

Parameter	Definition
TIME [sec] Active Time	Remaining time in the current active cycle. Input range: Display only
STATUS Loader Status	Display of the current status of the HCU. Normal OK. ALARM HCU has an alarm. PROG HCU in programming mode. REC FULL Receiver is full. BUFFER FULL Buffer hopper is full. HCU COM FAIL Serial communication between KCM and HCU interrupted. Input range: Display only
PARAM NUM Only in KSU-II/KCM	Input of the parameter number. The name and value represented by the parameter number will be displayed under the variables PARAM DESC and PARAM VALUE respectively. Input range: see section 5.3 and manual 0290023601.
PARAM VALUE Parameter Value	Input of the desired value for the selected PARAM NUM. input range: see section 5.3 and manual 0290023601.
PARAM NAME Parameter Name	Display of the parameter name selected with PARAM NUM. Input range: Display only See section 5.3 and manual 0290023601.

Table page 2 of 2

1.11 System setup (only KSU-II/KCM).



This menu is only used with the KSU-II/KCM display and not available for KSL, K-Vision or KSC.

This menu programs the key communication functions for the KCM.

Note:

- Siemens 3694R protocol is not supported.

1.11.1 Communication sub-menu

Parameter	Definition
HOST PROT	Input of the desired communication protocol Input range: Modbus, ALLEN BRAD AB-CIF, Siemens 3694R, ProfibusDP, Modbus/TCP, DeviceNet, Ethernet/IP, ModbusPlus, Profinet IO. Default: None
HOST FILE	Select either a custom downloaded *.kgr file for data communications or select a pre-loaded file (built-in). See manual 0590020611 for details. Input range: Kgr File, Small, Full. Default: Kgr File
IP	IP Adress Only present when an Ethernet Host board is installed. If the KGR file is used, this parameter is read-only.
NM	Net Mask Only present when an Ethernet Host board is installed. If the KGR file is used, this parameter is read-only.
GW	GateOnly present when an Ethernet Host board is installed. If the KGR file is used, this parameter is read-only.
K-PORT1 PROT	Selects the function for K-Port1, Choices are: None, KSU, KSL, KSC/K-Vision. Default: KSU
BAUD RATE	Displays baud rate selections when K-Port1 is set to KSC/K-Vision or if set to KSL and the service variable K10S_KCDR is <1>. Choices are: 9600, 19200, 38400, 57600, 115200
K-PORT 2 PROT	Selects the function for K-Port2, Choices are: None, KSU, Modbus I-O, KSC/K-Vision. Default: KSU

Table page 1 of 2

Parameter	Definition
BAUD RATE	Displays baud rate selections when K-Port2 is set to KSC/K-Vision. Choices are: 9600, 19200, 38400
CONF MODE	Input of the protocol for the following: Diag, KMB, Config, User IF Input range:see above Default: User IF Notes: <ul style="list-style-type: none"> • Select <KMB> for ParamStore. • Select <Config> for SmartConfig activities. • Select <User IF> for PC access to KCM parameter data via the Conf port. • Select <Diag> is used for diagnostic trace functions and for loading a language file.

Table page 2 of 2

1.11.2 SW Version Submenu

Parameter	Definition
SELECT ONE	Selection of the Hardware
SW#	The application software part number and revision.
HW#	The hardware number and revision.
SER#	The serial number.

Note:

- Before calling Coperion K-Tron (Switzerland) LLC service, have the SW version numbers available for your system.

1.11.3 Drive type by displayed MDU#

MDU # Software from Display	MDU Drive Type	PCB Part Number
04900-20211	1600 Watt DC motor drive	0000002610
02900-20200	450 Watt DC motor drive	0000007405
04900-20202	AC drive interface	0000003413
03900-20202	Vibratory drive	0000000684
04900-20212	Universal stepper drive	0000005987
02900-26200	LoPo stepper drive	0000001430
02900-26200	HiPo stepper drive	0000004568

1.11.4 Parameter Backup sub-menu

This menu provides a method for parameter back-up in the KCM K-Prom.



It is important to save your programming to the K-Prom using the steps below, once your programming is verified and complete.

Parameter	Definition
PASSWORD	Password to access the <ACTION> function of saving and recalling data from a K-PROM.
Entered Password	Default: <1234> See section 1.11.5 on how to change this entry.
ACTION	Action functions are: Save, Recall.
Backup Action	<SAVE> stores active operational data to the back-up storage area of the K-PROM. <RECALL> places into active operational memory the saved K-PROM data.

1.11.5 Changing the K-PROM password.



See manual 0690020601 for detailed information on changing the K-PROM password with your PC.

1.12 Security menu (only KSU-II/KCM)

This menu sets access for all menus in the KSU-II/KCM.



- The access to the parameter in the security menu can be deactivated by the data lockout input of the KSU-II/KCM display (see section 1.12.2).
- All programmed security selections (e.g RD/WR) will be deactivated immediately by programming the ACCESS TYPE.
- Menus marked with * are hidden by default.

1.12.1 Security parameters

Parameter	Definition
PRODUCT CHANGE	AccessType Permission
CALIBRATION	RD/WR Reading and writing possible.
ALARM*	READ Read only possible.
TUNING*	HIDE No access menu. Menu is not visible.
REFILL*	
SCALE*	
MACHINE SETUP*	
I-O SETUP*	
LOADER*	
HCU LOADER*	
SYSTEM*	
FDR BEING VIEWED*	
TOTAL KEY	Select: <Clear Only>, <Rd Only>, <Any Num> as entries.
SP ACCESS	Select: RD/WR, Read. Hide.
VOL & ALR CLR	Select: Enable, Disable. Vol/Alarm when enabled, allows use of the Grav/Vol key and permits alarms to be acknowledged or cleared.

1.12.2 Function data lock out

To activate the security function it is necessary to assign a digital input to <Data Lock> by KCM/KD or use the data lock input from KSU-II and to connect a key switch to that input. To enable the security menu to change the settings the key switch needs to be closed. When the settings are made and the key switch is opened, the security menu and all the menus set to read only, will be read only. To prevent that an operator can disable the key switch in the I/O menu, the I/O menu should be set to read only or to hidden. For additional information see manuals for KCM Electronics manual and for KSU-II 0490020604.

Programming procedure:

1. Close key switch.
2. Select <SECURITY> Menu
3. Select menu which needs to change.
4. Press **ENTER** key.
5. Select with **NEXT** key the security mode RD/WR or read or hide.
6. Press **ENTER** key.
7. Open key switch.
8. Check the menu for function.

2 Calibration

Calibration should be done on a regular basis and the tare values and MF or WT Span values recorded for future use.

Refer to the operating manuals for this activity.



- For detailed operating instructions, use operating manual KCM.
- For KSL operation, use manual 0590020613

3 Other Programming

3.1 Setting refill parameters

3.1.1 Setting the Refill Max value

1. Select the REFILL menu.
2. Select <REFILL MAX> parameter.
3. Enter a suitable value.
4. Execute a refill to verify that the scale does not over-range or that material does not back-up into the hopper in-feed port.

3.1.2 Setting the Refill Min value

1. Select the REFILL menu.
2. Select <REFILL MIN> parameter.
3. Enter a value that is = $0.4 \times \text{REFILL MAX}$ value.
4. Execute a refill to verify that the horizontal agitator if the feeder is so equipped, is not uncovered at any time. Adjust the value if necessary.



It is important that the horizontal agitator does not become uncovered during normal operation as it may affect feeder performance.

3.1.3 Setting the Post Refill Delay

Note:

Only adjust this value if the feeder is unstable (noted by highly varying motor speed) immediately after a refill.

1. Select the REFILL menu.
2. Select <POST REFILL DEL> parameter.
3. Enter a value that is twice the entered value.
4. Execute a refill to verify that motor speed is now quite stable immediately after a refill. If not, repeat step 3 until a stable exit from refill is achieved.

Note:

Don't exceed 30 seconds for <POST REFILL DELAY> unless otherwise advised.

3.1.4 Setting the Refill Timer

Refill timer set-up equipment required:

- Stop watch

Refill timer set-up procedure:

1. Execute a refill
2. Start a stop watch when the refill begins
3. Stop the stop watch when the refill is complete and the discharge device stops discharging product.
4. Select the ALARM menu.
5. Select the sub-menu ALARM LIMITS.
6. Select <MAX REFILL TIME> parameter.
7. Enter a value =1.25* the stop watch value.

3.2 Calibrating analog I-O

The formula for an analog value output can be demonstrated by the following formula as an example. Setpoint will be used as the value and 20 mA is the full scale representation.

$$\text{Val} = 20 \times \left[\left(\frac{\text{Setpoint}}{\text{MaxRate}} \right) \times (\text{AoutMax} - \text{AoutMin}) + \text{AoutMin} \right]$$

Deadband works as indicated in the following equations.

$$\text{Val} \leq \text{Deadband}(\text{Val} \rightarrow 0)$$

$$\Delta\text{Val} \leq \text{Deadband}(\text{Val} \rightarrow \text{PreviousVal})$$

$$\Delta\text{Val} > \text{Deadband}(\text{Val} \rightarrow \text{NewVal})$$

To calibrate an analog output, do the following. In this example, setpoint is the output parameter. Have your calibration meter connected to the analog output.

1. Enter Setpoint = 0.
2. Modify the min value so that the actual analog output is correct.
Note: for a 4-20 mA signal, this will be around 20%.
3. Enter Setpoint = Max Setpoint, Adjust Aout max value so that analog output is exactly correct.
4. Double check with Setpoint = 0, but no adjustment is normally required.

3.3 Using an external motor drive

To use an external motor drive rather than the internal KCM motor drive, do the following:

1. The AC Interface drive board is installed.
2. In the ANALOG OUTPUT sub-menu, set the following:
 - <ANALOG NUM>: <CPU>

Note:

The CPU outputs 0-20 mA only.

- <FUNCTION>: <Drive Command>
 - <DEADBAND>: <0.25>
 - <AOUT MAX>: 100% (This is the output span value)
 - <AOUT MIN>: 20% (This is the offset value)
3. Make the wiring connects per the provided drawing.
 4. Run the feeder in volumetric control.
 5. Adjust <Aout Max> to get the desired motor speed for a given value of drive command.

4 Alarm Messages- Cause and Remedy

4.1 System alarms



- The associated number is the alarm number used for configuration and data communication.
- The HCU is the control unit for the Hurricane vacuum material loader for the feeder. It is programmed via the KSU-II/KCM and its alarms are reported there.
- The first number is the KCM alarm, the second the HSU alarm. (KCM#/HSU#). This code begins at KCM alarm (21) and ends at KCM alarm (29).

Alarm Num- Alarm	Cause	Remedy
00 HARDWARE ERROR	<ul style="list-style-type: none"> • KCM Hardware error. EEPROM data is corrupt. For example, this message will occur after updating or changing firmware on the KCM. 	<ul style="list-style-type: none"> ⇒ Check KCM CPU. ⇒ Clear alarm and try unit.
01 KPROM MEM FAIL	<ul style="list-style-type: none"> • The K-PROM cannot be accessed by the KCM CPU. 	<ul style="list-style-type: none"> ⇒ Correctly insert K-PROM. ⇒ Replace with known good K-PROM.
02 KPROM*KGR*FAIL	<ul style="list-style-type: none"> • Checksum error in kgr file area. 	<ul style="list-style-type: none"> ⇒ Verify K-PROM is properly installed. ⇒ Replace K-PROM.
03 POWER GLITCH	<ul style="list-style-type: none"> • Power dip detected. CPU did not reset. 	<ul style="list-style-type: none"> ⇒ Verify AC mains are within specification. ⇒ Replace drive pcb (power supply).
04 KPROM WRITE COUNT EXCEEDED	<ul style="list-style-type: none"> • The K-Prom Write Counter exceeds 100'000 writes 	<ul style="list-style-type: none"> ⇒ Check communication. ⇒ Replace with known good K-PROM.
05 INT CHAN FAIL	<ul style="list-style-type: none"> • Internal channel has failed to communicate between the CPU and drive boards. (also SFTs and HCU) 	<ul style="list-style-type: none"> ⇒ Check Internal Channel connections. ⇒ Replace either CPU or Drive pcb. (also check SFTs and HCU if used)

Table page 1 of 7

Alarm Num- Alarm	Cause	Remedy
06 WT PROC FAILURE	<ul style="list-style-type: none"> • SFT(s) failed. • Serial communication to the load cell interrupted. • f = SFT internal failure. communication OK. • t = No communication from the SFT to the controller board. • ?= Not valid answer from SFT. 	<ul style="list-style-type: none"> ⇒ Locate which SFT has failed on the <SFTs> line in the <SCALE> Menu, <SFT> sub-menu.
07 INCORRECTNUM.S FT	<ul style="list-style-type: none"> • Number of SFTs found during polling does not equal that required. 	<ul style="list-style-type: none"> ⇒ Check <SFT REQUIRED> number is valid. See <SCALE> menu, <SFT> sub-menu. ⇒ Check for all SFTs being operational.
08 BAD SFT STATUS	<ul style="list-style-type: none"> • SFT is showing an incorrect status. 	<ul style="list-style-type: none"> ⇒ Replace SFT if problem persists.
09 NO MDU FOUND	<ul style="list-style-type: none"> • The KCM CPU did not find a motor drive on the internal channel on power-up. 	<ul style="list-style-type: none"> ⇒ Check drive pcb LEDs for correct function. ⇒ Check Internal channel connections. ⇒ Replace drive or CPU pcb.
10 MOTOR ALARM	<ul style="list-style-type: none"> • The KCM CPU lost the motor drive on the internal channel while in operation. 	<ul style="list-style-type: none"> ⇒ Check drive pcb LEDs for correct function. ⇒ Check Internal channel connections. ⇒ Replace drive or CPU pcb.
11 MDU SERIAL TIMEOUT	<ul style="list-style-type: none"> • Motor drive has lost communication with the KCM CPU and then turns off all digital outputs and shuts of drive power. 	<ul style="list-style-type: none"> ⇒ Check Internal channel connections. ⇒ Replace drive or CPU pcb.
12 MDU THERMAL OVL	<ul style="list-style-type: none"> • Drive temperature has been exceeded > 75 deg C. Drive stops. 	<ul style="list-style-type: none"> ⇒ Reduce operating temperature
13 MDU SPEED DEV	<ul style="list-style-type: none"> • No speed feedback signal is present when motor is asked to run. • Speed deviation from target > ± 5 rpm • Wrong motor voltage programmed. 	<ul style="list-style-type: none"> ⇒ Check speed pick-up for operation and replace if necessary. ⇒ Check speed pick-up wiring and power connections. ⇒ Check programming. ⇒ Replace drive. ⇒ Check motor.

Table page 2 of 7

Alarm Num- Alarm	Cause	Remedy
14 MOTOR OVERLOAD	<ul style="list-style-type: none"> Motor current limit is exceeded. <p>Note: The Safety switch is not designed to be used as a normal way of interlocking the KCM. It is used for safety control only.</p>	<ul style="list-style-type: none"> ⇒ Reduce motor load. ⇒ Check motor power limit in the <MECHANICAL> menu, <MOTOR> sub-menu. ⇒ Review material/feeder selection.
15 MDU SAFETY RELAY	<ul style="list-style-type: none"> Safety relay failed to close contacts on power up and contacts remained closed after power down. 	<ul style="list-style-type: none"> ⇒ Replace Drive pcb.
16 MOTOR/ENCDR FAIL	<ul style="list-style-type: none"> Dual tach signals connected, one failed. Over-voltage on drive power supply. Motor voltage applied but no speed feedback. Drive temperature > 85 deg. C. 	<ul style="list-style-type: none"> ⇒ Check tachometer-replace. ⇒ Check motor brushes. ⇒ Replace motor if required. ⇒ Replace KCM drive board. ⇒ Check for excessive line voltage. ⇒ Reduce operating temperature.
17 MDU UNCONTROLLED	<ul style="list-style-type: none"> Speed feedback but no motor voltage applied. 	<ul style="list-style-type: none"> ⇒ Replace drive board.
18 MDU EEPROM FAILED	<ul style="list-style-type: none"> EEPROM checksum failed. 	<ul style="list-style-type: none"> ⇒ Cycle power. If error persists, replace drive pcb.
19 MDU DRIVE FAILED	<ul style="list-style-type: none"> MDU drive pcb has failed. (vibratory drive only. Drive coil current too high) 	<ul style="list-style-type: none"> ⇒ Exchange vibratory drive pcb. ⇒ Check drive coil for proper impedance.
20 MDU POLARITY	<ul style="list-style-type: none"> Coil polarity is incorrect on the vibratory drive. (Vibratory feeder only) Displacement frequency out of range. 	<ul style="list-style-type: none"> ⇒ Change the feedback coil polarity by swapping leads at KCM.
21 HCU REMOVED	<ul style="list-style-type: none"> HCU was removed. 	<ul style="list-style-type: none"> ⇒ Connect HCU at the KCM and switch KCM On. ⇒ Repoll SFT channel to re-connect HCU. ⇒ Clear NOVRAM if necessary.
22 HCU ALARM	<ul style="list-style-type: none"> HCU has an alarm. 	<ul style="list-style-type: none"> ⇒ See following alarms for trouble shooting.

Table page 3 of 7

Alarm Num- Alarm	Cause	Remedy
23/01 HCU EEPROM FAILED	<ul style="list-style-type: none"> EEPROM failed. 	⇒ Clear alarm. Change EEPROM or HCU. ⇒ Cycle power to the HCU.
24/02 HCU DRIVER FAILED	<ul style="list-style-type: none"> The controller's digital output driver has detected a fault. 	⇒ Change HCU. ⇒ Latched.
25/03 HCU SUPP.HOPP.LOW	<ul style="list-style-type: none"> Material is below the level of the supply hopper proximity sensor. Sensor failed. 	⇒ Refill or change supply hopper. ⇒ Check P17. ⇒ Check sensor or P23. Note: Alarm will automatically clear when material is above sensor.
26/04 HCU D.P.ALARM	<ul style="list-style-type: none"> The differential pressure across the filter is too high indicating a clogged filter. 	⇒ Clean or replace filter. ⇒ Check P24 and P16. ⇒ Check P17
27/05 HCU CYC.COUNT AL	<p>If P20 Discharge Mode =01“Fill” mode then:</p> <ul style="list-style-type: none"> Max. numbers of load cycle exceeded, because Buffer Hopper Low input has been active (on) for more than the allowed load cycles. The Buffer Hopper Low signal going inactive clears the load cycle counter. <p>If P20 Discharge Mode =02 (LWF) mode then:</p> <ul style="list-style-type: none"> Discharge Request input has been on for more than the allowed load cycles. The Discharge Request signal going inactive clears the load cycle counter. 	⇒ Check Parameter P25 Number of load cycles. ⇒ Check conveying rate. ⇒ Check Buffer hopper sensor. ⇒ Check Parameter P25 Number of load cycles. ⇒ Check conveying rate. ⇒ Check discharge request signal.
28/06 HCU DISCH VALVE	<ul style="list-style-type: none"> Discharge valve has failed to either open or close properly. This alarm is automatically disabled in P18 Operating Modes 03 and 04. 	⇒ Check sensor on the discharge valve. ⇒ Check P26.
29/07 HCU REV.FULL AL.	<ul style="list-style-type: none"> Receiver is still full after discharge. Receiver proximity switch too sensitive adjusted or failed. 	⇒ Check receiver. Material bridging in the receiver. Clean receiver. ⇒ Check Receiver proximity switch or P17.

Table page 4 of 7

Alarm Num- Alarm	Cause	Remedy
30 KLINK WRONG KGR	<ul style="list-style-type: none"> Protocol of KGR file does not match that required by the installed communication circuit card. 	⇒ Make corrections as necessary.
31 KLINK NO KGR	<ul style="list-style-type: none"> No KGR file loaded 	⇒ Load KGR file with SmartConfig or switch to <Built-IN> KGR file.
32 HPORT FAIL	<ul style="list-style-type: none"> Host communication pcb error. 	⇒ Check communications pcb for proper LED operation. ⇒ Exchange communications pcb as necessary.
33 HPORT FAIL INIT	<ul style="list-style-type: none"> Host communication pcb could not be initialized. 	⇒ No host communications pcb is installed. ⇒ Check host communications pcb connections. ⇒ Replace host communications pcb.
34 HPORT ILLEGAL BD	<ul style="list-style-type: none"> Improper pcb installed in the host port location. 	⇒ Install correct host communications pcb.
35 KPORT FAIL	<ul style="list-style-type: none"> K-Port has failed 	⇒ Replace K-Port comm pc card.
36 KPORT FAIL INIT	<ul style="list-style-type: none"> K-Port communication pcb could not be initialized. 	⇒ Replace K-Port comm pc card.
37 KPORT ILLEGAL BD	<ul style="list-style-type: none"> Host communication pcb is installed on the wrong port location-(K-Port). 	⇒ Check host communications pcb for proper mounting location.
38 KGR PARAM ERROR	<ul style="list-style-type: none"> One or more feeder parameters are not correct for the specified feeder. 	⇒ Correct KGR file. ⇒ Use <Built-IN> KGR file.
39 EXT IO FAIL	<ul style="list-style-type: none"> The MODBUS I-O connection has failed. 	⇒ Check connections to remote I-O device. ⇒ Check remote I-O device wiring.
40 EXT ALR ACTIVATED	<ul style="list-style-type: none"> Digital input on KCM selected for External Alarm is active. 	⇒ Investigate the cause of this input being active and correct.
41 INTERLOCK FAIL	<ul style="list-style-type: none"> Drive pcb Run Enable digital input is open during operation. 	⇒ Check the Drive pcb Run Enable digital input for proper function.

Table page 5 of 7

Alarm Num- Alarm	Cause	Remedy
42 START IGNORED	<ul style="list-style-type: none"> Start conditions not fulfilled. 	<ul style="list-style-type: none"> ⇒ Check status line. ⇒ Check for setpoint and re-enter if necessary. ⇒ Check all KCM digital inputs for correct operation.
43 MASSFLOW HIGH	<ul style="list-style-type: none"> The current massflow is above the tolerance entered in <ALARM> menu parameter <MF ERR+>. 	<ul style="list-style-type: none"> ⇒ Increase the alarm start delay time in the <ALARM> menu. ⇒ Increase the tolerance <MF ERR+> value. ⇒ Check for proper feeding of material. ⇒ See if another alarm <DRIVE CMD LO> is present.
44 MASSFLOW LOW	<ul style="list-style-type: none"> The current massflow is below the tolerance entered in <ALARM> menu parameter <MF ERR->. 	<ul style="list-style-type: none"> ⇒ Increase the alarm start delay time in the <ALARM> menu. ⇒ Increase the tolerance <MF ERR-> value. ⇒ Check for proper feeding of material. ⇒ Re-range the feeder to achieve the desired feedrate. ⇒ Lower the operating setpoint <SP>. ⇒ See if another alarm <DRIVE CMD HI> is present.
45 DRIVE CMD CEILING	<ul style="list-style-type: none"> Drive command has reached the limit <DC CEILING> 	<ul style="list-style-type: none"> ⇒ Reduce drive command. ⇒ Increase Drive Command Ceiling. See <MECHANICAL SETUP>, <MOTOR> sub-menu.

Table page 6 of 7

Alarm Num- Alarm	Cause	Remedy
46 DRIVE CMD HIGH	<ul style="list-style-type: none"> The drive command has exceeded the value <DRV CMD HI> Limit in the <ALARM> menu. 	<ul style="list-style-type: none"> ⇒ Check for proper feeding of material. <ul style="list-style-type: none"> – Check for bridging in hopper – Check for adequate product in hopper ⇒ Lower the operating setpoint <SP>. ⇒ Increase the <DRV CMD HI> value in the <ALARM> menu. ⇒ Check for motor rotation. <ul style="list-style-type: none"> – Replace KCM if drive has failed. – Check motor. – Check speed sensor.
47 DRIVE CMD LOW	<ul style="list-style-type: none"> The drive command has dropped below the value <DRV CMD LO> Limit in the <ALARM> menu. 	<ul style="list-style-type: none"> ⇒ Raise the operating setpoint <SP>. ⇒ Increase the <DRV CMD LO> value in the <ALARM> menu.
48 CHECK_MOTOR_B RUSHES	<ul style="list-style-type: none"> DC motor brushes may be wearing out and ready to fail. 	<ul style="list-style-type: none"> ⇒ Motor brushes need inspection and replacement if worn. ⇒ If brushes are OK, re-enter a relevant brush life number in the Performance sub-menu.
49 Reset while running	<ul style="list-style-type: none"> It is set if the feeder was running before the power down or reset occurred. 	<ul style="list-style-type: none"> ⇒ Check power supply
50 Actiflow Failure	<ul style="list-style-type: none"> Actiflow has an alarm. 	<ul style="list-style-type: none"> ⇒ Check Status
62 Battery Low	<ul style="list-style-type: none"> The KCM back-up batteries have failed. 	<ul style="list-style-type: none"> ⇒ Check there is the "shipping insulator" still installed in the battery circuit. ⇒ The battery jumper JP-8 is removed. ⇒ Replace battery.

Table page 7 of 7

4.2 LWF alarms

Process alarms	Cause	Remedy
52 FEEDFACT. BAD	<ul style="list-style-type: none"> Feedfactor is zero or feeding condition changed so that the feedfactor exceed the set limit in the <ALARM> menu <FF DEV LIMIT>. 	<ul style="list-style-type: none"> ⇒ Enter new feedfactor. ⇒ Check feedfactor limit in <ALARM> menu <FF DEV LIMIT>. ⇒ Check feeding condition.
53 SCALE OVERRANGE	<ul style="list-style-type: none"> The weight on the scale is above the scale gross range permitted. 	<ul style="list-style-type: none"> ⇒ Check the scale for proper operation. ⇒ If LWF, reduce level of refilling - <REFILL MAX> parameter.
54 SCALE UNDERRANGE	<ul style="list-style-type: none"> The weight on the scale is below the zero or gross weight < 0. 	<ul style="list-style-type: none"> ⇒ Check the scale and re-tare.
55 NETWT > LIMIT	<ul style="list-style-type: none"> The material weigh in the hopper is above the limit set in the <ALARM> menu. <NW HI LIMIT>. 	<ul style="list-style-type: none"> ⇒ Check for proper hopper filling. ⇒ Check the tare value. ⇒ Check for scale or weigh bridge measurement errors.
56 NETWT < LIMIT	<ul style="list-style-type: none"> The material weigh in the hopper is below the limit set in the <ALARM> menu.<NW LO LIMIT>. 	<ul style="list-style-type: none"> ⇒ Check for proper hopper filling. ⇒ Check the tare value. ⇒ Check for scale or weigh bridge measurement errors.
57 REFILL EXPIRED	<ul style="list-style-type: none"> The programmed refilling time (program parameter <ALARM> menu, <MAX REFILL TIME> was exceeded without refilling being completed. 	<ul style="list-style-type: none"> ⇒ Check refilling device, increase the time in program parameter <ALARM> menu, <ALARM LIMITS> sub-menu, <MAX REF TIME> or refill faster if necessary.
58 LOADER TIMEOUT	<ul style="list-style-type: none"> Loader hopper is empty 	<ul style="list-style-type: none"> ⇒ Check loader and material supply.
61 LOW CONTROL GAIN	<ul style="list-style-type: none"> Adaptive gain is 10 or below. 	<ul style="list-style-type: none"> ⇒ Check for excessive PERT values. ⇒ Reduce scale disturbances. ⇒ Increase operating setpoint.

4.3 Display messages

Message	Cause	Remedy
Out of Range Tare Failed	<ul style="list-style-type: none"> Maximum permissible input value has been exceeded. 	⇒ Enter a value within the permitted limits of the parameter. See the specific programming manual for more information.
Nak'd Feeder Running	<ul style="list-style-type: none"> Not acknowledged as the command cannot occur when the feeder is running. 	⇒ Stop the feeder before making the entry.

4.4 Feeder won't start - displayed messages

Message	Cause	Remedy
Wait	<ul style="list-style-type: none"> No setpoint is entered. Feedfactor, if required, is <0>. Interlock has failed. 	⇒ Enter an operating <SP>. ⇒ Enter an <Initial Feedfactor>. ⇒ Check interlocks.
Alsh	<ul style="list-style-type: none"> Automatic alarm shutdown because of an alarm. 	⇒ Correct alarm problem and then clear the alarm with the ALARM key.
Disa	<ul style="list-style-type: none"> Start via bit input disabled. (Interlock or Run enable). 	⇒ Check interlocks to the KCM.

4.5 Feeder won't run in GRAV

Message	Cause	Remedy
Feeder remains in VOL control	<ul style="list-style-type: none"> Conditions for gravimetric control not fulfilled. 	⇒ Check input for forced VOL function. ⇒ If LWF, check refill function and net weight. ⇒ Check for weight related alarms. ⇒ Check for weight less than <Net Weight Low> Limit. ⇒ Check for weight greater than <Net Weight High> limit.

4.6 Massflow variances in LWF feeding

Alarms	Cause	Remedy
General massflow fluctuations LWF	<ul style="list-style-type: none"> Vibrations and drafts on feeder. 	<ul style="list-style-type: none"> ⇒ Improve the location of the scales. <ul style="list-style-type: none"> – Reduce the <CTRL GAIN> in the <TUNING> menu. – Increase the filter length display in program parameter <TUNING> menu, <DISPLAY FILTER>. – Increase the tolerance limit in program parameter <ALARM> menu, <MF ERR+/->. – Protect the feeder from drafts and air currents.
	<ul style="list-style-type: none"> Irregular discharge. 	<ul style="list-style-type: none"> ⇒ Install different feeder screws when operating at low feeder-screw speeds. ⇒ Check for material flow problems such as bridging in the feeder hopper.
	<ul style="list-style-type: none"> Irregular motor speed. 	<ul style="list-style-type: none"> ⇒ Re-enter start feeding factor <INIT FF> in the <PRODUCT CHANGE> menu and check in volumetric mode if the speed is constant. Is the speed constant? If so: <ul style="list-style-type: none"> ⇒ Re-calibrate the new feeding factor, reduce the <CTRL GAIN> in the <TUNING> menu, if necessary. If not: <ul style="list-style-type: none"> ⇒ Check the motor setting and the pick-up: verify the discharge feeder screws are not bound.
	<ul style="list-style-type: none"> Friction on the scales (to be ascertained with a static weight test). 	<ul style="list-style-type: none"> ⇒ Check all mechanical connections to the scale, they must be flexible. The scale may not touch anything. ⇒ Replace scale.

Table page 1 of 2

Alarms	Cause	Remedy
General massflow fluctuations LWF (continued)	<p>During Refill: MASSFLOW HIGH.</p> <ul style="list-style-type: none"> Increased degree of feeder-screw filling or even the material is flowing through during refilling. Pressure increase in the hopper during refilling. The reduction in pressure when refilling is completed affects the weight. 	<p>⇒ Increase lower refilling level in program parameter <PRODUCT CHANGE> menu, <REFILL MIN>, reduce the refilling speed or fit different feeder screws if necessary.</p> <p>⇒ Make sure that the air can escape more easily. Replace the hopper's air filter if necessary.</p> <p>⇒ Increase <POST REFILL DELAY>.</p>
	<ul style="list-style-type: none"> Friction on the scales (to be ascertained with a static weight test). Pressure fluctuations in the storage container caused by pressure, suction or insufficient ventilation. 	<p>⇒ Check all mechanical connections to the scale, they must be flexible. The scale may not touch anything.</p> <p>⇒ Replace scale.</p> <p>⇒ Improve ventilation, install a pressure compensator on the ventilation connection during the suction process.</p>
	<p>During Refill: MASSFLOW LOW</p> <ul style="list-style-type: none"> Fluidized material caused by the vortices of air in the hopper during refilling. Continuous trickle from the refilling device. The weight can be adversely affected if refilling is not stopped in time (within a few seconds). 	<p>⇒ Increase lower refilling level in program parameter <PRODUCT CHANGE> menu, <REFILL MIN>, reduce the refilling speed if necessary.</p> <p>⇒ If equipped with pneumatic slide gates, make sure that the slide gate closes sufficiently. Where liquids are being processed, the refilling valve must be located directly above the hopper. Increase mode-switch delay in program parameter <PRODUCT CHANGE> menu, <POST REFILL DELAY>.</p>
	<ul style="list-style-type: none"> Hopper is overfilled. The material is contacting the inlet portion thus causing friction in weighing. 	<p>⇒ Reduce the top refilling level in program parameter <PRODUCT CHANGE> menu, <REFILL MAX>, reduce the refilling speed.</p>

Table page 2 of 2

5 Appendix

5.1 Special KCM LWF features

5.1.1 Automatic Gear Switching for LWF

Notes:

- See KCM Electronics manual for wiring information on reversing motor rotation.
- Automatic gear switching is only possible on selected Coperion K-Tron (Switzerland) LLC feeders that utilize the dual speed gearbox. Refer to the feeder manual for specific details.

To use the gear switching one must connect a reversing contactor to a digital output of the KCM. It can be a CPU on-board output or a relay of the motor drive board. The output will be activated for low gear and deactivated for high gear.

It is recommended to use two digital outputs where one output polarity is inverted. Each output should control one contactor, one for normal, one for reverse. The motor shall be disconnected if the contactors are inactive. There should be further an interlock so that it is not possible that both contactors are activated at the same time.

This has the advantage that not correct entered parameters or a hardware fault (e.g. a power failure) will not reverse the motor while it is running.

Gear switching is automatically enabled, if in the programming, a digital output is assigned to <HI/LO Gear>.

When gear switching is enabled, the following parameters are visible in the menu:

MACHINE SETUP menu, MOTOR sub-menu- GEAR RED LOW and additionally in the PRODUCT CHANGE menu, GEARSWITCH (choices: High, Low, Auto Hi, Auto Lo).

To work properly, the correct high and low gear reduction values must be entered to the GEAR REDUC. and the LOW GEAR REDUC.L. parameters. The value <Gear Reduc> is the highest screw speed/lowest value reduction while the <Gear Reduc L.> is the lowest screw speed/highest reduction value.

The lower gear reduction ranges from 1 to 10 times the high gear reduction. Auto-checking of the parameters is done to verify the proper relationship between the two entries.

Switching is only enabled if the feeder is stopped, the Drive has no run signal and the raw speed from the Drive is < 2 rpm for at least 3 seconds.

When the gear switches from high to low or vice versa, the initial and the average feed factor will be set to the average feed factor times the

gear ratio. The screw speed modulation algorithm will automatically use the correct gear reduction.

To operate the gear switch manually, the user can select High or Low to the GEARSWITCH parameter in the PRODUCT CHANGE menu.

To operate the gear switch automatically, the user can select Auto Hi or Auto Lo to the GEARSWITCH parameter in the PRODUCT CHANGE menu.

When entering a setpoint which will generate a drive command of more than 50% and the GEARSWITCH is on Auto Lo, the gear will switch to high and the GEARSWITCH parameter changes to Auto Hi. When entering a setpoint which will generate a drive command of less than 10% and the GEARSWITCH is on Auto Hi, the gear will switch to low and the GEARSWITCH parameter changes to Auto Lo.

5.1.2 SFT Addressing

SFT version 'S' and later version SFTs, have special means to allow readdressing of individual SFTs with the same address. These are:

1. A command to poll and identify SFT's with the same address based on their serial number.
2. A command to change the address of a SFT also based upon serial number.

Terminology:

- New SFT: software version = 'S' or later
- Old SFT: software version 'N' to 'R'
- Note: SFT version 'M' (1st FAST SFT 1997) will not automatically address since they have no means to change the address 'on the fly'
- Spare SFT: SFT has address <0>
- Poll: Polling the internal channel address 0 to 12 to see on which address any connected SFT responds
- Auto Address: Automatically change the address of a Spare SFT to the next available address
- Auto Readdress: Automatically readdresses all SFT's from 1 to n

Auto addressing rules:

1. Auto addressing takes place on power-on with a present spare SFT on address 0.
2. If an SFT is found on address 0, it gets readdressed to the next available address.
3. If one or more new spare SFT's are found on address 0, they get readdressed to the next available address.
4. A single SFT on any address > 0 stays at the same address after addressing.
5. If there are several SFT's occupying the same address, these SFT's get addressed to the next available address.
6. If an old SFT is found together with new ones on the same address, the new ones get readdressed, the old one stays at the same address.

Auto readdressing by user command only rules:

The rules are the same as for auto addressing but:

1. All new SFT's get readdressed to 1, 2, 3 ... n where the old SFT's will stay on their current address.
2. SFT's get addressed in the order they are found. Thus, if there is no conflict and the addresses are 1...n, the final addresses will be the same as before.

5.1.3 LWF tuning for the KCM

The Pert Value shows us the noise condition of the netweight even if the self tuning is off and the feeder is stopped. This is called net weight quality.

Pert Value shows the signal/noise ratio in percentage to the setpoint.

Please refer to the next table to determine system performance.

5.1.4 Pert values and control response

Pert Value	Control Action/Response	Adaptive Gain
0-33%	Very good control response	80%
33-67%	Good to fair control response	50%
67-100%	Fair to poor control response	20%
100-250%	Very poor control action	10%
Over 250%	Most likely no control	



Be aware on accuracy tests the massflow results from the reference scale and feeder can deviate.

Reasons for massflow deviation may include:

- Feeder measures the product flow and the noise (e.g. Side wind on hopper, vibration at the scale, wiring contact, pressure and vacuum effects)
- Reference scale measures only the product flow without the noise.

Note:

- Review sections [1.4.2](#), [5.1.4](#) and [5.1.5](#) for acceptable control values.

5.1.5 Tuning parameter descriptions

Parameter	Range	Description
Adaptive Gain	5-100%	<p>If the adaptive gain feature of the KCM is <On>, this value shows the amount of adaptive gain set by the controller.</p> <p>Self Tuning: On</p> <p>The adaptive gain will automatically adjust to give the best gravimetric performance.</p> <ul style="list-style-type: none"> – Value depends on the weight sample quality – High value = good quality feeding (small massflow deviations) <p>Self Tuning: Off</p> <ul style="list-style-type: none"> – Value is fixed and can be changed manually. – Increase value = more responsive control. – Lower PERT Threshold
Massflow/Display filter	0 to 999 [sec]	<p>Settling time (90%) of the massflow estimate. A longer time yields a smoother massflow display.</p> <p>Note:</p> <p>This variable does not influence control response.</p>
SFT Cut-Off Freq		<p>Filter setting from gross weight. Normally, with Self Tuning set to <On>, the SFT Cut-Off Freq will automatically adjust to give the best possible gravimetric control.</p> <p>Self Tuning: On</p> <ul style="list-style-type: none"> – Setting is dependent on setpoint. On small setpoint values, it will be reduced towards 0.033 Hz. <p>Self Tuning: Off</p> <ul style="list-style-type: none"> – Value is fixed and can be changed manually – Value may not be greater than 0.4 Hz for normal operation but may go as high as 2 Hz during refill. – Increasing value, increases control response and control is more sensitive to weight disturbance. – Decreasing value, makes the massflow more stable and control slower to respond.(more sluggish) <p>Example: Expected response time to gross weight reading after a weight step change.</p> <ul style="list-style-type: none"> • SFT Cut-Off 0.4 Hz = 2.5 seconds • SFT Cut-Off 0.1 Hz = 10 seconds

5.1.6 Refill Algorithms for the KCM

Refill modes selections include:

- Manual
- Automatic-Auto
- Automatic_Terminate

Refill Mode: Manual

Manual refill mode is designed for those applications, particularly for low federate applications where bulk material will be randomly added to the feeder.

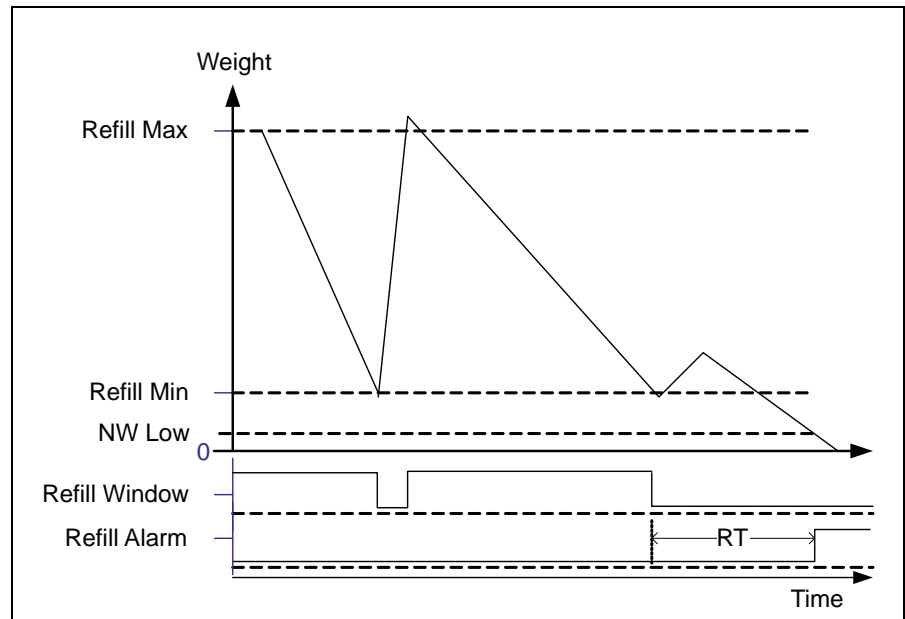


Fig. 5.1 Manual refill function diagram

The KCM is always in gravimetric control mode. The KCM switches to Volumetric control when the hopper weight drops below the Net Weight Low (NW Low) value. If the Refill Window remains active the Refill Timer times out and activate the refill timer output. As shown above the value RT is the Refill Timer setting. When the net weigh drops below the NW Low value, the controller switches to VOL control.

Refill Mode: Auto

Automatic refill mode-terminate is designed for those applications where material addition to the feeder is from an automated refill system.

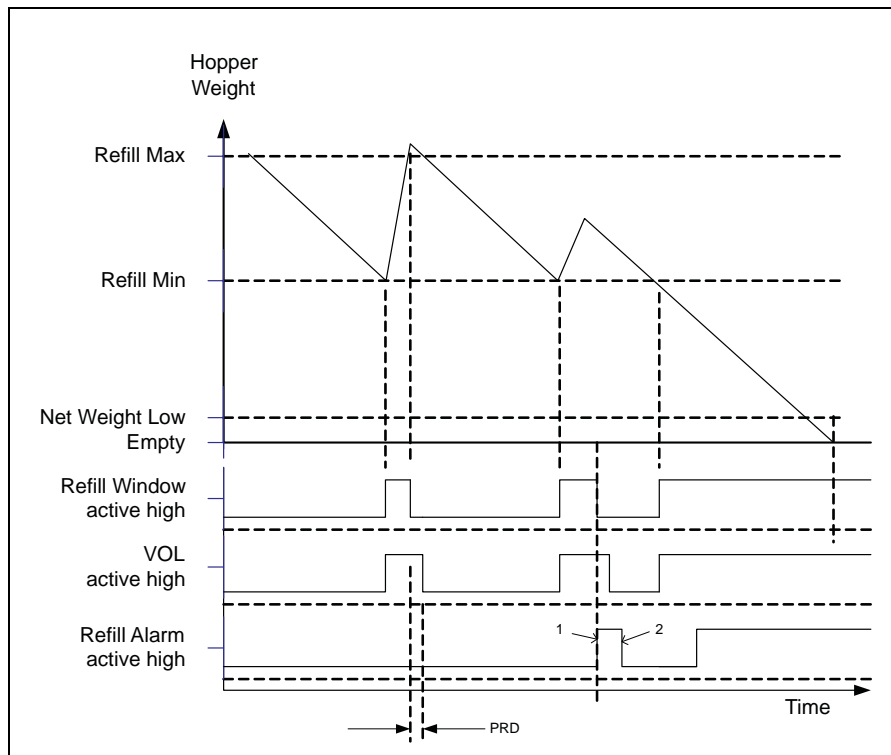


Fig. 5.2 Auto refill function diagram

At point #1, the refill timer expires and the refill timeout alarm activates. This resets the Refill Window. At point #2, the Refill Timer alarm has been cleared by the operator.

Note:

- PRD = post refill delay time

Refill Mode: Auto Terminate

Automatic refill mode-terminate is designed for those applications where material addition to the feeder is from an automated refill system.

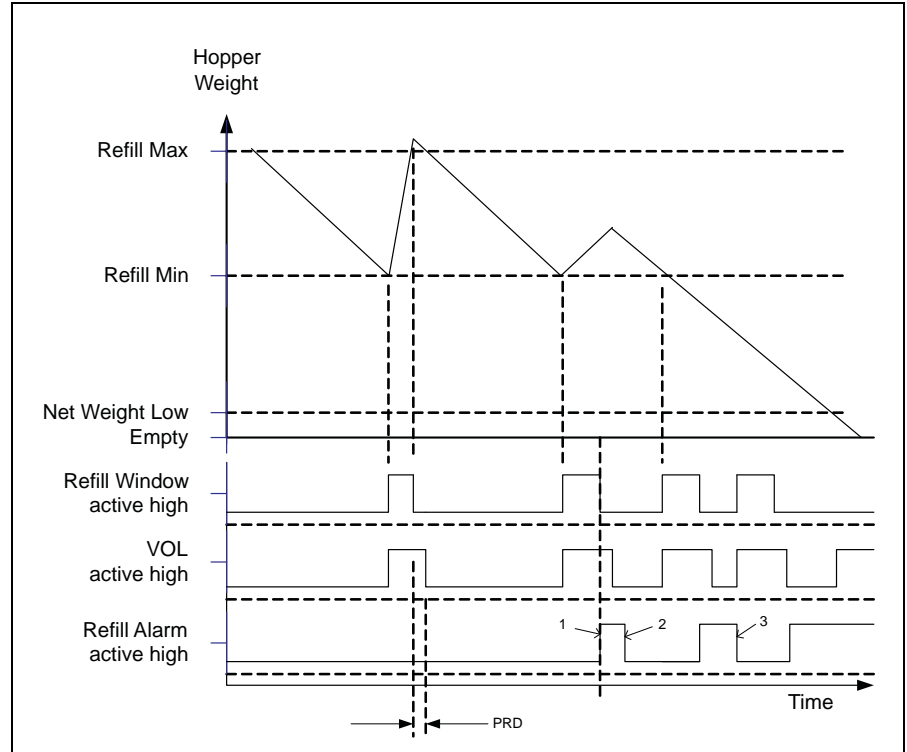


Fig. 5.3 Auto terminate refill function diagram

At point #1, the refill timer expires and the refill timeout alarm activates. This resets the Refill Window. At point #2, the Refill Timer alarm has been cleared by the operator. Clearing the Refill Alarm reactivates the refill window when the weight is below Refill Minimum as shown at point #3.

Notes:

- PRD = post refill delay time

5.1.7 Refill using the integrated loader function

If the <Loader> function parameter is set to <On> and <Refill> is <Enabled> and the loader enable bit input is activated, the internal KCM loader algorithm is enabled.

Normal operation sequence:

- When the refill completes, it waits for a programmable <Valve Close Timer>.
 - If the proximity high level switch input is deactivated, the loader motor starts.
 - When the loader is full, the high level proximity input is activated. This must happen before the programmable <Maximum Load Time>, otherwise it will generate an alarm.
 - The high level proximity input must be activated for 2 seconds until it stops the motor.
- Alarm conditions:
 - High level proximity input does not get activated after the maximum load time.
 - High level proximity input is not activated before a refill

A normal refill and load cycle is shown next.

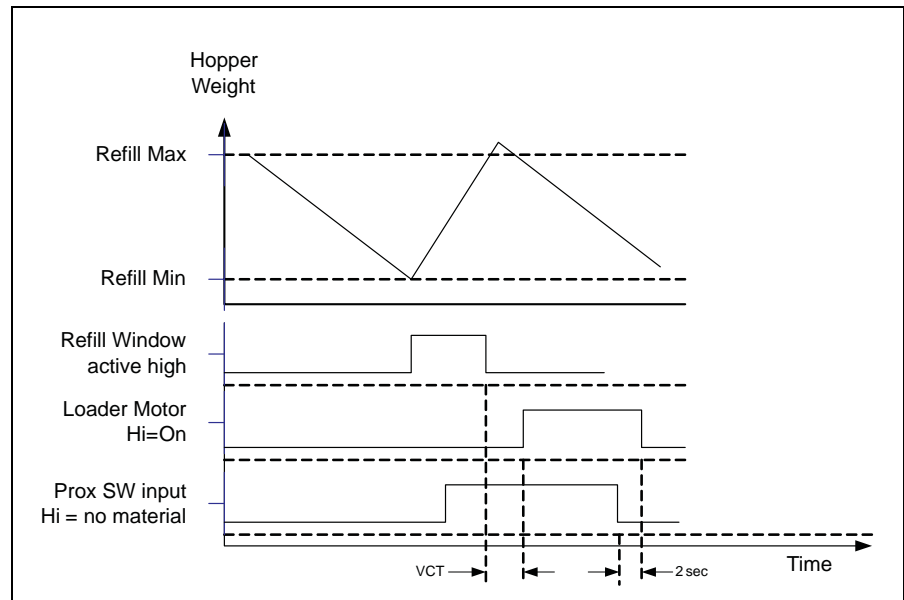


Fig. 5.4 Normal refill and load cycle function diagram

Notes:

- VCT = valve close time
- Prox Switch input High = no material at probe

The next diagram shows the refill & load cycle when loading of the loader hopper fails.

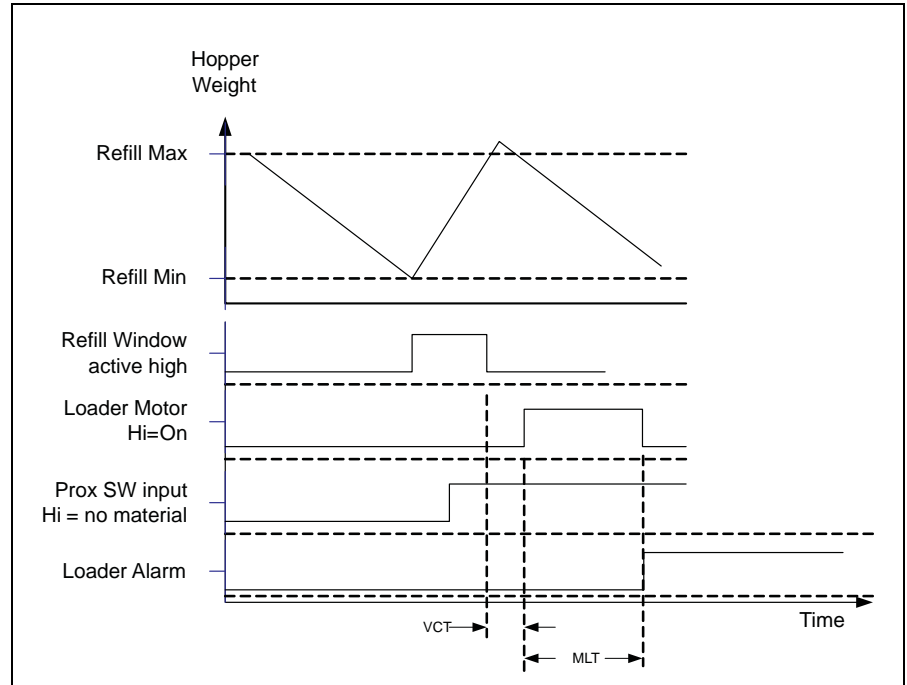


Fig. 5.5 Normal refill but failed loading function diagram

Notes:

- Loading restarts after refill or after alarm clear.
- VCT = valve close time
- MLT = maximum load time
- Prox Switch input High = no material at probe

The next diagram shows refill with empty loader due to failed proximity switch

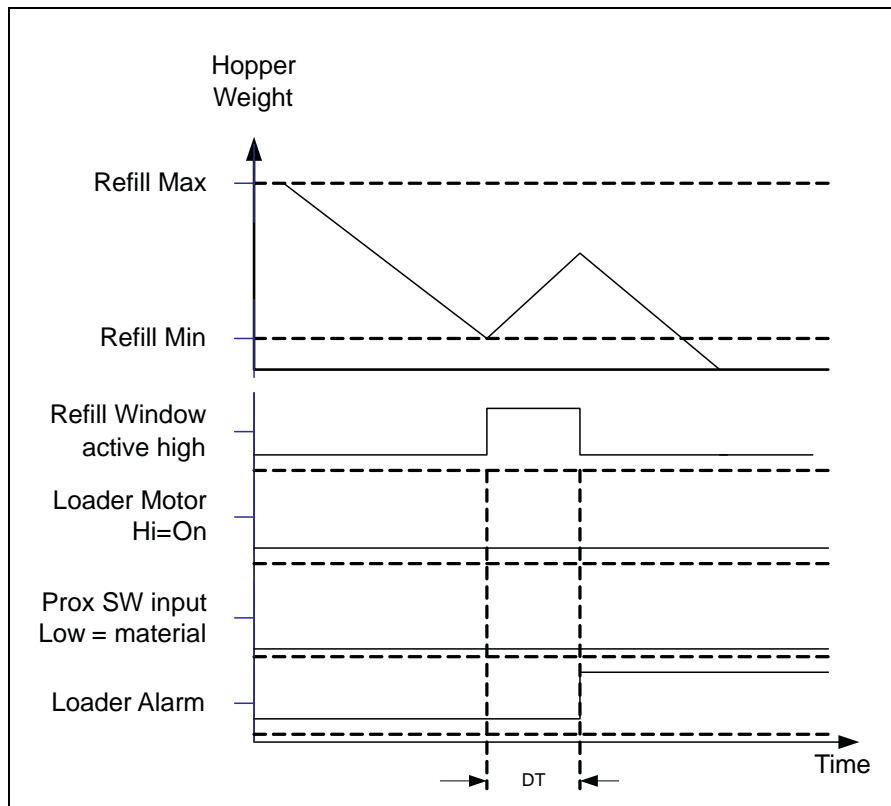


Fig. 5.6 Refill with empty loader due to a failed high level prox. switch

Notes:

- DT = discharge time
- Prox Switch input Low = material at probe

The next diagram shows refill during loading of the loader hopper.

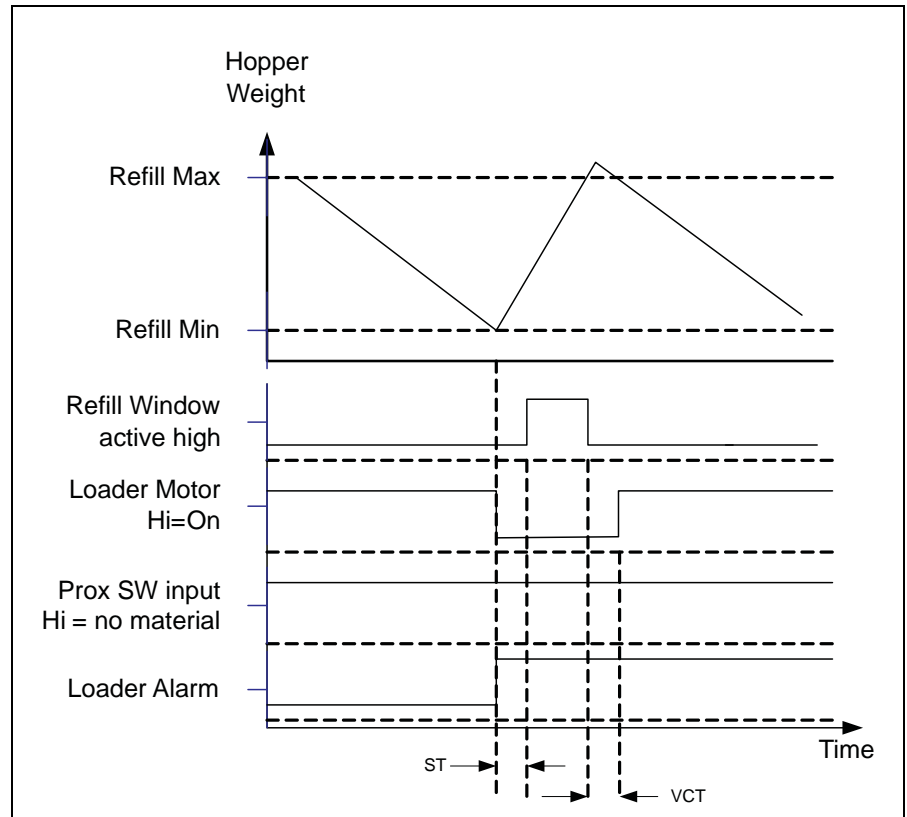


Fig. 5.7 Refilling while loading the hopper loader function diagram

Note:

VCT = valve close time

ST = shutdown time for the loader motor

The next diagram shows loading an empty hopper.

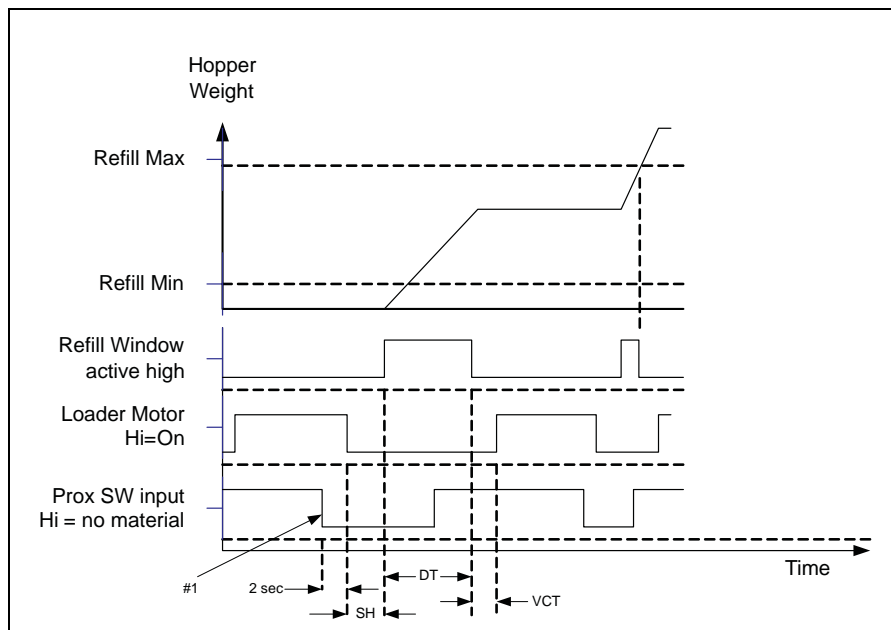


Fig. 5.8 Loading an empty loader and refilling function diagram

Notes:

- SH = loader motor shutdown time
- DT = discharge time
- VCT = valve close time
- #1 refers to when the loader is full and the high level proximity switch is On.

When the refill does not complete by the weight level, there is a programmable <Discharge Timer> parameter. If the valve is open for this time, it will close so the loader can start. After the loader is full and the motor stops, it waits for a programmable <Motor Shutdown Time>. After this time, it will reopen the valve. This cycle continues until the refill is completed.

5.2 Programming the loader function

Use this procedure to program the KCM for the internal loader function. This is not for the LSR/HCU loader function.

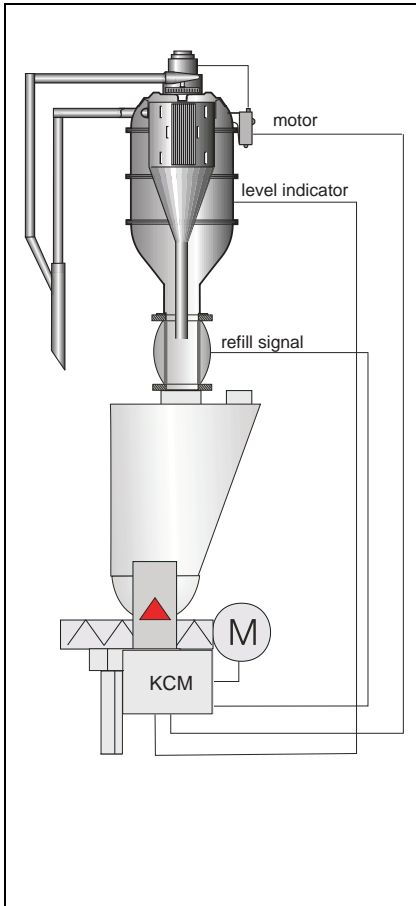


Fig. 5.9 KCM with Loader

The Level Indicator must be placed so that it is covered when the loader is full. The loader motor will stop and start based on this signal.

1. Connect the motor contactor to a relay output of the Drive Board (e.g. REL 3).
2. Connect the Refill valve to a relay output of the Drive Board (e.g. REL 2).
3. Connect the level indicator to a bit input of the Drive Board (e.g. IN 1).
4. In the I/O menu, program the following parameters:
 - <MDU IN1> to <Loader Level>
 - <MDU REL 3> to <Loader>
 - <MDU REL 2> to <Refill>
5. In the security menu, change the security mode of the loader menu to <RD/WR>. This will not be possible if a bit input is assigned to DATA LOCK and the bit input is not activated. In this case, activate the data lockout input or program the corresponding bit input in the I/O menu to <None>.
6. In the Loader menu, program the <LOADER FUNCTION> to <On>.
7. In the product change menu, program appropriate refill levels and set <REFILL> to <Enable>.

The loader will start and the feeder will refill.

Note:

- The loader will only work if refill is enabled.
- Refill and loader can be interlocked with Run/Stop input of the feeder controller. When programming <REFILL> to <If Running>, the loader will only run if the feeder also runs.
- If a bit input is programmed to <Ldr Enable>, the loader will only work if the corresponding bit input is activated.
- Section 5.3 discusses HCU programming parameters.

5.3 Programming parameters for HCU

This table shows parameter number and description, which can be entered in the section 1.10 for HCU loader control. 1.9.1 For a detailed description of all parameters see manual 0290023601.

Param Number/ Param description	KSU Param.	Min	Max	Step	Default	Actual
P1 – Load Timer (Cycle 3)	Load	5 sec	300 sec	1 sec	20 sec	
P2 – Clear Timer (Cycle 4)	LineClr	0 sec	30 sec	1 sec	0 sec	
P3 – Discharge Timer (Cycle 6)	Disch	2 sec	90 sec	1 sec	10 sec	
P4 – Filter Delay Timer	Fill Dly	1 sec	5 sec	0.1 sec	5 sec	
P5 – Filter Pulse Timer	Fil Pul	0 sec	0.5 sec	0.1 sec	0.1 sec	
P6 – Motor Timer (Cycle 1)	Motor	30 sec	1620 sec	30 sec	5 min	
P7 – Load Delay Timer (Cycle 2)	Ld Dly	0 sec	20 sec	1 sec	5 sec	
P8 – Discharge Delay Timer (Cycle 5)	Dis Dly	0 sec	20 sec	1 sec	5 sec	
P9 – Input Filter: Receiver Proximity Sensor	In: Rec	0.1 sec	10 sec	0.1 sec	3 sec	
P10 – Input Filter: Buffer Hopper Proximity Sensor	In: BuH	0.1 sec	10 sec	0.1 sec	3 sec	
P11 – Input Filter: Supply Hopper Proximity Sensor	In: SuH	0.1 sec	10 sec	0.1 sec	1 sec	
P12 – Input Filter: Remote Start	In: Strt	0.1 sec	10 sec	0.1 sec	0.5 sec	
P13 – Input Filter: Remote Stop	In: Stop	0.1 sec	10 sec	0.1 sec	0.5 sec	
P14 – Input Filter: Discharge Valve Switch	In: DisV	0.1 sec	10 sec	0.1 sec	1 sec	
P15 – Input Filter: Filter Pressure Switch	In: FiPs	0.1 sec	10 sec	0.1 sec	1 sec	
P16 – Input Filter: Discharge Request	In: DiRe	0.1 sec	10 sec	0.1 sec	1 sec	
P17 – Input XOR Mask	Xor Msk				7F(dec127)	
P18 – Oper M (Operating Mode) 1 = Self contained with discharge valve, 2 = Single central with discharge valve, 3 = Self contained, 4 = Single Central	Oper M				1	
P19 – Clean Filter 0 = disables all cleaning, 1 = clean during discharge cycle, 2 = clean during load cycle, 3 = clean during both discharge and load cycles.	Clean M				1	
P20 – Discharge Mode, 1 = Fill mode, 2 = LWF mode	Disch				1	
P21 – Controller Address	HCUAdd				0x01	
P22 – Controller Software Version	HCU SW					
P23 – Supply Hopper Low Alarm Timer	AI ShLo	0 sec	600 sec	10 sec	0 disable	
P24 – Differential Pressure High Alarm Timer	AI DPHi	0%	100%	1%	0 disable	
P25 – Load Cycle Alarm Counter	AI Cycle	0 cycle	20 cycle	1 cycle	0 disable	
P26 – Discharge Valve Alarm Timer	AI Valve	0 sec	15 sec	1 sec	10 sec	
P27 – On/Off Counter	O/F Cnt			N/A		
P28 – Run Time Counter	Run Cnt			N/A		
P28 – Handheld display Software version	HSU SW			N/A		
P63 – Digital input states	Dig In			N/A		

5.4 Status tables

5.4.1 DC Drive hex status codes-1600/450 W drives

Notes:

- Failure modes occur on bits 7 to 15, excluding 9
- These codes are displayed at the KCM interface

Bit	Function	Hex Code
0	1 = Motor Run. 0 = Stop.	0001
1	1 = safety switch closed. 0 = open.	0002
2	1 = Drive enable input closed. 0 = open.	0004
3	1 = Bit 1 Input activated (low level). 0 = not activated, (high level).	0008
4	1 = Bit 2 Input activated (low level). 0 = not activated, (high level).	0010
5	1 = Relay 2 energized. 0 = off.	0020
6	1 = Relay 3 energized. 0 = off.	0040
7	1 = Serial Master Time-out.	0080
8	1 = Thermal pre-alarm (>70C).	0100
9	1 = Relay 1 energized. 0 = off.	0200
10	1 = Speed deviation	0400
11	1 = Current limit	0800
12	1 = Safety relay failure	1000
13	1 = General motor failure.	2000
14	1= Control-less running	4000
15	1 = EEPROM failure.	8000

5.4.2 Vibratory drive hex status codes

Notes:

- Failure modes occur on bits 7 to 15, excluding 9
- These codes are displayed at the KCM interface

Bit	Function	Hex Code
0	1 = Motor Run. 0 = Stop.	0001
1	1 = safety switch closed. 0 = open.	0002
2	1 = Drive enable input closed. 0 = open.	0004
3	1 = Bit 1 Input activated (low level). 0 = not activated, (high level).	0008
4	1 = Bit 2 Input activated (low level). 0 = not activated, (high level).	0010
5	1 = Relay 2 energized. 0 = off.	0020
6	1 = Relay 3 energized. 0 = off.	0040
7	1 = Serial Master Time-out.	0080
8	1 = Thermal pre-alarm (>75C).	0100
9	1 = Relay 1 energized. 0 = off.	0200
10	1 = Displacement deviation	0400
11	1 = Current limit/feedback failed	0800
12	1 = Frequency limit	1000
13	1 = General drive failure.	2000
14	1 = Polarity error	4000
15	1 = EEPROM failure.	8000

5.4.3 Stepper drive hex status codes for all types

Notes:

- Failure modes occur on bits 7 to 15, excluding 9
- These codes are displayed at the KCM interface

Bit	Function	Hex Code
0	1 = Motor Run. 0 = Stop.	0001
1	1 = safety switch closed. 0 = open.	0002
2	1 = Drive enable input closed. 0 = open.	0004
3	1 = Bit 1 Input activated (low level). 0 = not activated, (high level).	0008
4	1 = Bit 2 Input activated (low level). 0 = not activated, (high level).	0010
5	1 = Relay 2 energized. 0 = off.	0020
6	1 = Relay 3 energized. 0 = off.	0040
7	1 = Serial Master Time-out.	0080
8	1 = Thermal pre-alarm (>70C).	0100
9	1 = Relay 1 energized. 0 = off.	0200
10	Not used.	0400
11	1 = Motor rotation failure.	0800
12	1 = Safety relay failure.	1000
13	1 = General motor failure.	2000
14	Not used.	4000
15	1 = EEPROM failure.	8000

5.4.4 AC drive interface hex status codes

Notes:

- Failure modes occur on bits 7 to 15., excluding 9
- These codes are displayed at the KCM interface

Bit	Function	Hex Code
0	1 = Motor Run. 0 = Stop.	0001
1	1 = safety switch closed. 0 = open.	0002
2	1 = Drive enable input closed. 0 = open.	0004
3	1 = Bit 1 Input activated (low level). 0 = not activated, (high level).	0008
4	1 = Bit 2 Input activated (low level). 0 = not activated, (high level).	0010
5	1 = Relay 2 energized. 0 = off.	0020
6	1 = Relay 3 energized. 0 = off.	0040
7	1 = Serial Master Time-out.	0080
8	1 = Thermal pre-alarm (>75C).	0100
9	1 = Relay 1 energized. 0 = off.	0200
10	Not used.	0400
11	Not used.	0800
12	Not used.	1000
13	Not used.	2000
14	Not used.	4000
15	1 = EEPROM failure.	8000

5.4.5 SFT status table

This table shows the table of the possible Status displayed in the scale menu at the variable SFT Status [1.6.2](#).

Bit	Function	Hex Code
0	1 = Group mode	0001
1	1 = Group leader	0002
2	Not used	0004
3	1 = Continuous mode	0008
4	1 = Error received	0010
5	1 = Baud Rate range error	0020
6	1 = Not used	0040
7	1 = Filter on	0080
8	1 = Weight conversion complete	0100
9	1 = EEPROM read or write error	0200
10	1 = K-FFP (Fast Frequency Processor) error	0400
11	1 = Ft - temperature frequency out of range	0800
12	1 = Fw - weight frequency out of range	1000
13	1 = Weight window range error	2000
14	1 = Temperature window range error	4000
15	1 = General alarm	8000

Example:

0183= group mode, group leader, filter on, weight conversion complete.

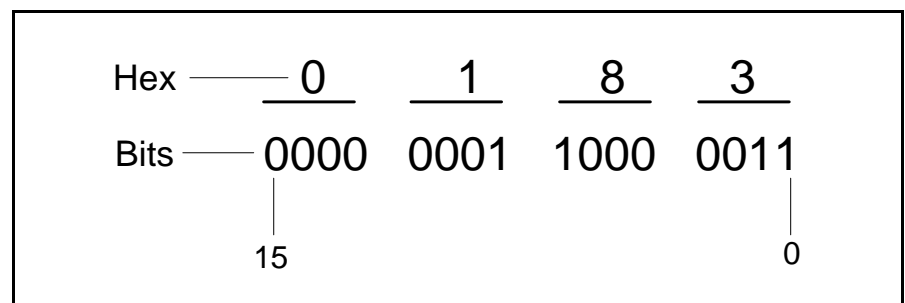


Fig. 5.10 SFT hex codes

5.4.6 Actiflow drive hex status codes

Notes:

- Failure modes occur on bits 7 to 15, excluding 9
- These codes are displayed at the KCM interface

Bit	Function	Hex Code
0	1 = Activator Run. 0 = Stop.	0001
1	1 = safety switch closed. 0 = open.	0002
2	unused	0004
3	1 = Bit 1 Input activated (low level). 0 = not activated, (high level).	0008
4	1 = Bit 2 Input activated (low level). 0 = not activated, (high level).	0010
5	unused	0020
6	unused	0040
7	1 = Serial Master Time-out.	0080
8	unused	0100
9	1 = Relay 1 energized. 0 = off.	0200
10	1 = Displacement deviation	0400
11	1 = Current limit/short-circuit	0800
12	1 = Spring failure	1000
13	1 = General drive failure.	2000
14	unused	4000
15	1 = Sensor failure.	8000

5.5 Loading language file



It is important to erase any previous file before downloading a new one since it will not overwrite an existing file.

Downloading a language file

1. To load the language file to the KCM, switch parameter SYSTEM - COMMUNICATION - CONFIG MODE to "Diag".
2. Connect the PC with a null modem cable to the config port and run a terminal program like Windows HyperTerminal with 19200, 8, n, 1.
3. Press enter on the PC to start the interactive menu. Next press "2" to select Flash File Information,
4. Press "4" to erase the previous file and "y" to confirm the erase.
5. Press "3" to download the file, then load the file with Z-Modem from HyperTerminal.

5.6 Service variables

This table shows the Service Index which can be entered for Service Variables on page 44. A service technician can enter current values for reference.

Desc	Variable	Current Value
PreLoad MF=SP	When set to <1> the MF value is preloaded with SP upon KCM starts or large SP changes. When set to <2> the MF will equal Setpoint even in Volumetric mode.	
KLink Tx Delay	Enable K-Link to delay TxD to prevent network overloads	
Empty DC	Value of drive command when emptying the feeder. Default is 70%.	
Auto Span Limit	Limit in actual range of the allowed span deviation from 1.000 to allow a auto-span calculation to proceed. Default is 0.98-1.02 or an entry of 2.	
Com1 Read	K-Port 1 reads per second; <=100	
Com1 Write	K-Port 1 writes per second:<=10	
Com1 Err	K-Port 1 error counter:<= 1/hour	
Com2 Read	K-Port 2 reads per second:<=100	
Com2 Write	K-Port 2 writes per second:<=10	
Com2 Err	K-Port 2 error counter:<= 1/hour	
Host Read	Host channel reads per second: <=100	
Host Write	Host channel writes per second: <=10	
Host Err	Host channel error counter: <= 1/hour	
IntCh Msgs	Internal channel (SFT/MDU/LDR/Actiflow) messages per second	
IntCh Err	Internal channel (SFT/MDU/LDR/Actiflow) error counter	
IntCh Load	Internal channel (SFT/MDU/LDR/Actiflow) loading in percent: <= 50%	
IntCh Node	Internal channel (SFT/MDU/LDR/Actiflow) last failed node	
IntCh Opcode	Internal channel (SFT/MDU/LDR/Actiflow) last opcode	
KpromWriteCount	Counter for the write cycles to the Kprom	
RefArr Dev Lim	LWF Only: Sets the maximum FF deviation allowed in the refill array. If the FF deviation from Refill Complete to Refill Request is greater than the RefArrDevLim, the limit is used, else the actual FF values are used. Default is 30% deviation.	
Modulation%	LWF only: Shows the percent screw modulation used when <Modulation> selected. When 0%, the modulation effect is zero.	
KCDR-K10S	When set to <1> configures K-Port1 to function with a K-Commander-KCDR, a separate K-Link unit (black box) or KDU using extended software. When this entry is set to <0> K-Port1 returns to its normal function. If <KPORT1 PROT> is set to <KSL> and this entry is set to <1> then K-Port1 baud rate is selectable. When set to <2> then alarms will self clear even the alarm timed out.	
SWUpdateMode	When set to <0>, it means the comm board and all slave devices are allowed to use IAP. When set to <1>, the KCM reload the comm board software on next power up, even if the s/w versions seem the same. When set to <1> and an SFT REPOLL is executed, then the software of all devices connected on the internal serial channel are reloaded regardless of if they have the same version as stored in the KCM. When set to <2>, it inhibits all IAP function.	
Table page 1 of 2		

Desc	Variable	Current Value
PertValueMode	0 = PertValue is displayed in Grams 1 (default) = PertValue is displayed as a % of setpoint. With setpoint=0, pertvalue is shown in Grams.	
MFDispFilter2	For LWF Only: If <0>, the massflow display is filtered only by the variable <MF Display Filter>. If <1>, the display is filtered by 1 times more. If <2>, the display is filtered by two times more. etc. Maximum value = 100.	
VolRate	If set to other than <0>, this will add a variable <BULK DENSITY> to the <PRODUCT CHANGE> menu. After a Auto FF calibration is done, this value will display the volumetric capacity of the feeder.	
ForceVibAlgo	This allows to interface the AC board to 3rd party vibratory drive. If set to <1> that is used to unhide the menu parameters for the tuning and calib.	
ScaleRange	Input from the scale range.	
RefillRepTm	This parameter is zero by default. When 0, the refilling functions are all the same as before. To enable this feature, (auto restart) this new parameter must be set to a non-zero value, such as 60 (seconds) and the refill must be programmed to Auto Terminate. Then, when there is a refill time out and the Net Weight is still below the refill request point, the refill terminates (as normal), but also will start the AutoTerm Refill Repeat Timer. When this AutoTerm Refill Repeat Timer expires, the refill cycle starts over again automatically. This continues until the weight goes at least above the refill request point.	
Table page 2 of 2		

5.7 LWF PSR Map

PSR(Process number)	Description
02 RUN	• Motor/machine running
03 DISABLE	• Run disabled by Interlock input or run enable input
04 ENABLE	• Drive output enabled
05 ALS_IN	• Alarm shutdown input active
06 ALS-OUT	• Alarm shutdown output active
07 AL_RELAY	• Alarm relay active
08 HARD ALARM	• Complement of AL_Rel
09 SOFT ALARM	• On for any alarm present
13 EMPTYING	• Machine is being emptied by Empty function
15 WAIT	• Feeder received a start command but is waiting
20 START_OK	• Start input will start feeder
21 STARTED	• Started status.
22 K-LINK INIT COMPLETE	• K-Link initialization has been completed.
23 KSU II PRESENT	• KSU II is connected to KCM.
24 LOC/EXT	• If in External Setpoint mode, value is 1.
25 RAT/DIR	• If in Direct Setpoint mode, value is 1. Only valid, if Bit 24 is set to <1>.
32 HCU_ALARM	• HCU loader alarm
33 HCU_REC_FULL	• Loader receiver is full
34 HCU_BUF_FULL	• HCU alarm
35 HCU COMMFAIL	• HCU communication failure to CPU
36 HCU_LOADING	• HCU loading status
40 HARD_INTERLOCK	• Drive (MDU) hard interlock input status
41 INTERLOCK_IN	• Interlock input status.
42 ENABLE_IN	• Run enable input status.

Table page 1 of 2

PSR(Process number)	Description
45 REFILL_BP_IN	• Refill bypass input status
46 VOL_MODE_IN	• Volumetric input status
47 EXTERN_IN	• Extern (local) input status
48 DIRECT_IN	• Direct (ratio) input status
49 EXT_AL_IN	• External alarm input status
51 GEAR_SW_OUT	• Hi (Lo) gear switch output enabled
52 BLOWOFF_OUT	• Filter blowoff function set
64 DISP_PRESENT	• KCM/KD internal display present
65 CPU_INIT_CPL	• CPU initialization complete
66 MASS_MODE	• Unit in Grav mode
67 CALIB	• Currently running an auto calibrate routine
68 PERT	• Unit in PERT condition
69 REFILL	• Feeder is refilling by automatic means
70 REF_TIMEOUT	• Refill timer has expired
75 LOADER_FULL(• Loader full input to control
76 LOADING	• Loader motor is running
77 LOAD_ENA	• Loader is enabled to run

Table page 2 of 2

5.8 LWF ASR Map



See section 4.2 for alarm specifics.

ASR(Alarm number)	Description
00 HARDWARE ERROR	<ul style="list-style-type: none"> KCM Hardware error. EEPROM data is corrupt. For example, this message will occur after updating or changing firmware on the KCM.
01 KEPROM MEM FAIL	<ul style="list-style-type: none"> The K-PROM cannot be accessed by the KCM CPU.
02 KEPROM*KGR*FAIL	<ul style="list-style-type: none"> Checksum error in kgr file area.
03 POWER GLITCH	<ul style="list-style-type: none"> Power dip detected. CPU did not reset.
05 INT CHAN FAIL	<ul style="list-style-type: none"> Internal channel has failed to communicate between the CPU and drive boards. (also SFTs and HCU)
06 WT PROC FAILURE	<ul style="list-style-type: none"> SFT(s) failed. Serial communication to the load cell interrupted. f = SFT internal failure. communication OK. t = No communication from the SFT to the controller board. ? = Not valid answer from SFT.
07 INCORRECTNUM.S FT	<ul style="list-style-type: none"> Number of SFTs found during polling does not equal that required.
08 BAD SFT STATUS	<ul style="list-style-type: none"> SFT is showing an incorrect status.
09 NO MDU FOUND	<ul style="list-style-type: none"> The KCM CPU did not find a motor drive on the internal channel on power-up.
10 MOTOR ALARM	<ul style="list-style-type: none"> The KCM CPU lost the motor drive on the internal channel while in operation.

Table page 1 of 6

ASR(Alarm number)	Description
11 MDU SERIAL TIMEOUT	<ul style="list-style-type: none"> Motor drive has lost communication with the KCM CPU and then turns off all digital outputs and shuts of drive power.
12 MDU THERMAL OVL	<ul style="list-style-type: none"> Drive temperature has been exceeded > 75 deg C. Drive stops.
13 MDU SPEED DEV	<ul style="list-style-type: none"> No speed feedback signal is present when motor is asked to run. Speed deviation from target > ± 5 rpm Wrong motor voltage programmed.
14 MOTOR OVERLOAD	<ul style="list-style-type: none"> Motor current limit is exceeded. <p>Note: The Safety switch is not designed to be used as a normal way of interlocking the KCM. It is used for safety control only.</p>
15 MDU SAFETY RELAY	<ul style="list-style-type: none"> Safety relay failed to close contacts on power up and contacts remained closed after power down.
16 MOTOR/ENCDR FAIL	<ul style="list-style-type: none"> Dual tach signals connected, one failed. Over-voltage on drive power supply. Motor voltage applied but no speed feedback. Drive temperature > 85 deg. C.
17 MDU UNCONTROLLED	<ul style="list-style-type: none"> Speed feedback but no motor voltage applied.
18 MDU EEPROM FAILED	<ul style="list-style-type: none"> EEPROM checksum failed.
19 MDU DRIVE FAILED	<ul style="list-style-type: none"> MDU drive pcb has failed. (vibratory drive only. Drive coil current too high)

Table page 2 of 6

ASR(Alarm number)	Description
20 MDU POLARITY	<ul style="list-style-type: none"> Coil polarity is incorrect on the vibratory drive. (Vibratory feeder only) Displacement frequency out of range.
21 HCU REMOVED	<ul style="list-style-type: none"> HCU was removed.
22 HCU ALARM	<ul style="list-style-type: none"> HCU has an alarm.
23/01 HCU EEPROM FAILED	<ul style="list-style-type: none"> EEPROM failed.
24/02 HCU DRIVER FAILED	<ul style="list-style-type: none"> The controller's digital output driver has detected a fault.
25/03 HCU SUPP.HOPP.LOW	<ul style="list-style-type: none"> Material is below the level of the supply hopper proximity sensor. Sensor failed.
26/04 HCU D.P.ALARM	<ul style="list-style-type: none"> The differential pressure across the filter is too high indicating a clogged filter.
27/05 HCU CYC.COUNT AL	<p>If P20 Discharge Mode =01“Fill” mode then:</p> <ul style="list-style-type: none"> Max. numbers of load cycle exceeded, because Buffer Hopper Low input has been active (on) for more than the allowed load cycles. The Buffer Hopper Low signal going inactive clears the load cycle counter. <p>If P20 Discharge Mode =02 (LWF) mode then:</p> <ul style="list-style-type: none"> Discharge Request input has been on for more than the allowed load cycles. The Discharge Request signal going inactive clears the load cycle counter.
28/06 HCU DISCH VALVE	<ul style="list-style-type: none"> Discharge valve has failed to either open or close properly. This alarm is automatically disabled in P18 Operating Modes 03 and 04.

Table page 3 of 6

ASR(Alarm number)	Description
29/07 HCU REV.FULL AL.	<ul style="list-style-type: none"> Receiver is still full after discharge. Receiver proximity switch too sensitive adjusted or failed.
30 KLINK WRONG KGR	<ul style="list-style-type: none"> Protocol of KGR file does not match that required by the installed communication circuit card.
31 KLINK NO KGR	<ul style="list-style-type: none"> No KGR file loaded
32 HPORT FAIL	<ul style="list-style-type: none"> Host communication pcb error.
33 HPORT FAIL INIT	<ul style="list-style-type: none"> Host communication pcb could not be initialized.
34 HPORT ILLEGAL BD	<ul style="list-style-type: none"> Improper pcb installed in the host port location.
35 KPORT FAIL	<ul style="list-style-type: none"> K-Port has failed
36 KPORT FAIL INIT	<ul style="list-style-type: none"> K-Port communication pcb could not be initialized.
37 KPORT ILLEGAL BD	<ul style="list-style-type: none"> Host communication pcb is installed on the wrong port location-(K-Port).
38 KGR PARAM ERROR	<ul style="list-style-type: none"> One or more feeder parameters are not correct for the specified feeder.
39 EXT IO FAIL	<ul style="list-style-type: none"> The MODBUS I-O connection has failed.
40 EXT ALR ACTIVATED	<ul style="list-style-type: none"> Digital input on KCM selected for External Alarm is active.
41 INTERLOCK FAIL	<ul style="list-style-type: none"> Drive pcb Run Enable digital input is open during operation.
42 START IGNORED	<ul style="list-style-type: none"> Start conditions not fulfilled.
43 MASSFLOW HIGH	<ul style="list-style-type: none"> The current massflow is above the tolerance entered in <ALARM> menu parameter <MF ERR+>.
44 MASSFLOW LOW	<ul style="list-style-type: none"> The current massflow is below the tolerance entered in <ALARM> menu parameter <MF ERR->.

Table page 4 of 6

ASR(Alarm number)	Description
45 DRIVE CMD CEILING	<ul style="list-style-type: none"> Drive command has reached the limit <DC CEILING>
46 DRIVE CMD HIGH	<ul style="list-style-type: none"> The drive command has exceed the value <DRV CMD HI> Limit in the <ALARM> menu.
47 DRIVE CMD LOW	<ul style="list-style-type: none"> The drive command has dropped below the value <DRV CMD LO> Limit in the <ALARM> menu.
48 CHECK_MOTOR_B RUSHES	<ul style="list-style-type: none"> DC motor brushes may be wearing out and ready to fail.
49 RESET_WHILE_RU N	<ul style="list-style-type: none"> It is set if the feeder was running before the power down or reset occurred
50 ACF_FAIL	<ul style="list-style-type: none"> Actiflow has an alarm
52 FEEDFACT. BAD	<ul style="list-style-type: none"> Feedfactor is zero or feeding condition changed so that the feedfactor exceed the set limit in the <ALARM> menu <FF DEV LIMIT>.
53 SCALE OVERRANGE	<ul style="list-style-type: none"> The weight on the scale is above the scale gross range permitted.
54 SCALE UNDERRANGE	<ul style="list-style-type: none"> The weight on the scale is below the zero or gross weight < 0.

Table page 5 of 6

ASR(Alarm number)	Description
55 NETWT > LIMIT	<ul style="list-style-type: none"> The material weigh in the hopper is above the limit set in the <ALARM> menu. <NW HI LIMIT>.
56 NETWT < LIMIT	<ul style="list-style-type: none"> The material weigh in the hopper is below the limit set in the <ALARM> menu.<NW LO LIMIT>.
57 REFILL EXPIRED	<ul style="list-style-type: none"> The programmed refilling time (program parameter <ALARM> menu, <MAX REFILL TIME> was exceeded without refilling being completed.
58 LOADER TIMEOUT	<ul style="list-style-type: none"> Loader hopper is empty
61 LOW CONTROL GAIN	<ul style="list-style-type: none"> Adaptive gain is 10 or below.

Table page 6 of 6

5.9 Parameter listing-LWF

Menu	Variable	Value
Home		
	SP	
	MF	
	Drive Cmd-%	
	Net Weight	
	Motor RPM	
Not always visible	Screw RPM	
	Displacement(vib)	
	Ave FF	
	Total	
Product Change Menu		
	Refill	
	Refill Max	
	Refill Min	
	Gearswitch	
	Tare Weight	
	Net Weight	
	Init Feedfactor	
Not always visible	Bulk Density	

Menu	Variable	Value
Calibration Menu		
Calibration sub	Initial Feedfactor	
	Average Feedfactor	
	Cal Product Fed	
	Act Product Fed	
	Span	
	Cal Correla	
	Cal Corr Limit	
	Cal DC-%	
	Cal Time [sec]	
Calibration Menu	Refill Array	
Feedfactor sub		
	FeedFactor 1	
	Feedfactor 5	
	Feedfactor 9	
For vibratory only	FF@8%, FF@12%, FF@17%, FF@23%, FF@33%, FF@50%, FF@70%, FF@100%	
Alarm Menu		
Limits sub	Massflow Err (+)-%	
	Massflow Err (-)-%	
	Drive Cmd Hi-% (
	Drive Cmd Lo-%	

Menu	Variable	Value
Alarm Menu	FF Dev Limit-%	
Limits sub		
	Net Weight Low Limit	
	Max Refill Time	
	NW Hi Limit-%	
	NW Lo Limit-%	
Alarm Menu	Alarm Delay-sec.	
Set-up sub		
	Startup Delay-sec.	
	Stops Clrs Alarms	
	ALR Number	
	ALR Mode	
	Stop By:	Read only
Tuning Menu		
	Method	
	Display Filter	
	CTRL Gain	
	Adaptive Tune	
	Adaptive Gain	
	Sample Time	
	SFT Cutoff Frq	
	Pert Value	
	Modulation	
Vibratory only	SP Change Limit	

Menu	Variable	Value
Refill Menu		
	Refill	
	Refill Max	
	Refill Min	
	Post Refill Delay	
	Refill Mode	
	Valve Delay	
	Flt Clear Time	
Scale Menu		
General sub	Tare	
	Span	
	Net Weight	
	Gross Weight	
	Scale Range	
SFT sub	SFT Required	
	SFTs	
	SFT Selected	
	SFT Addressed	
	SFT Weight	
	SFT Type	
	SFT Status	
	SFT #	
	SFT SN#	
	SFT Temperature	

Menu	Variable	Value
Machine Menu		
General sub	Setpoint Mode	
	Max Setpoint	
	Units	
	Run Time - hours	
	Fdr Address	
Machine Menu	Application	
General sub		
	Language	
	Screen Saver	
Machine Menu	Gear Reduction	
Motor sub		
	Gear Reduction L	
	Pick-Up Teeth	
	Actual Power	
	Maximum Motor Power	
	Maximum Motor Voltage	
	Maximum Motor Speed	
	MDU Status	
	DC Ceiling	
Vibratory only	KV Device	
Vibratory only	Vib Span	
Machine Menu	Tracetick	
Service sub		

Menu	Variable	Value
Machine Menu	Control	
Performance sub		
	Grav Ratio	
	Int Channel	
	KCM Temperature	
	Torque	
	Brush Remain	
Machine Menu	Displace.	
Actiflow sub		
	Min	
	Max	
	Status	
	Voltage	
	Current	
	Frequency	
I-O Menu	CPU1	
Digital Inputs		
	CPU2	
	CPU3	
	CPU4	
	MDU1	
	MDU2	
	Ext1	

Menu	Variable	Value
	Ext2	
	Ext3	
	Ext4	
	Ext5	
	Ext6	
	Ext7	
	Ext8	
I-O Menu	CPU1	
Digital Outputs		
	CPU2	
	CPU3	
	CPU4	
	MDURelay1	
	MDURelay2	
	MDURelay3	
I-O Menu	Ext1	
Digital Outputs, con't		
	Ext2	
	Ext3	
	Ext4	
	Ext5	
	Ext6	
	Ext7	
	Ext8	

Menu	Variable	Value
	Ext Total Pulse	
	DigiOut Map	
Setpoint sub	Source	
	AinValue-%	
	Ain Min-%	
	Ain Max-%	
	Deadband-%	
Analog Out Menu sub	Aout Num	
	Function	
	Aout Value	
	AoutMin	
	AoutMax	
	Deadband	
I-O Menu	Address 80	
Modbus I-O Menu sub		
	Address 81	
	Address 82	
	Address 83	
Loader Menu		
	Loader Function	
	Max Load Time	
	Shutdown Time	
	Discharge Time	

Menu	Variable	Value
Valve Close Time		
HCU Loader	Refer to 0290023601	
System Menu		
Host Prot		
Host File		
System Menu	K-Port 1 Prot	
Baud Rate		
K-Port 2 Prot		
Config Mode		
SW#		
HW#		
MDU#		
Password		
Security Menu		
Product Change		
Calibration		
Alarm		
Tuning		
Refill		
Scale		
Machine Set-Up		
I-O Set-Up		
Loader		

Menu	Variable	Value
	HCU Loader	
	System	
	Fdr Being Viewed	
	Tot Key	
	SP Access	
	Vol/Alarm Clear	

Chapter 6:

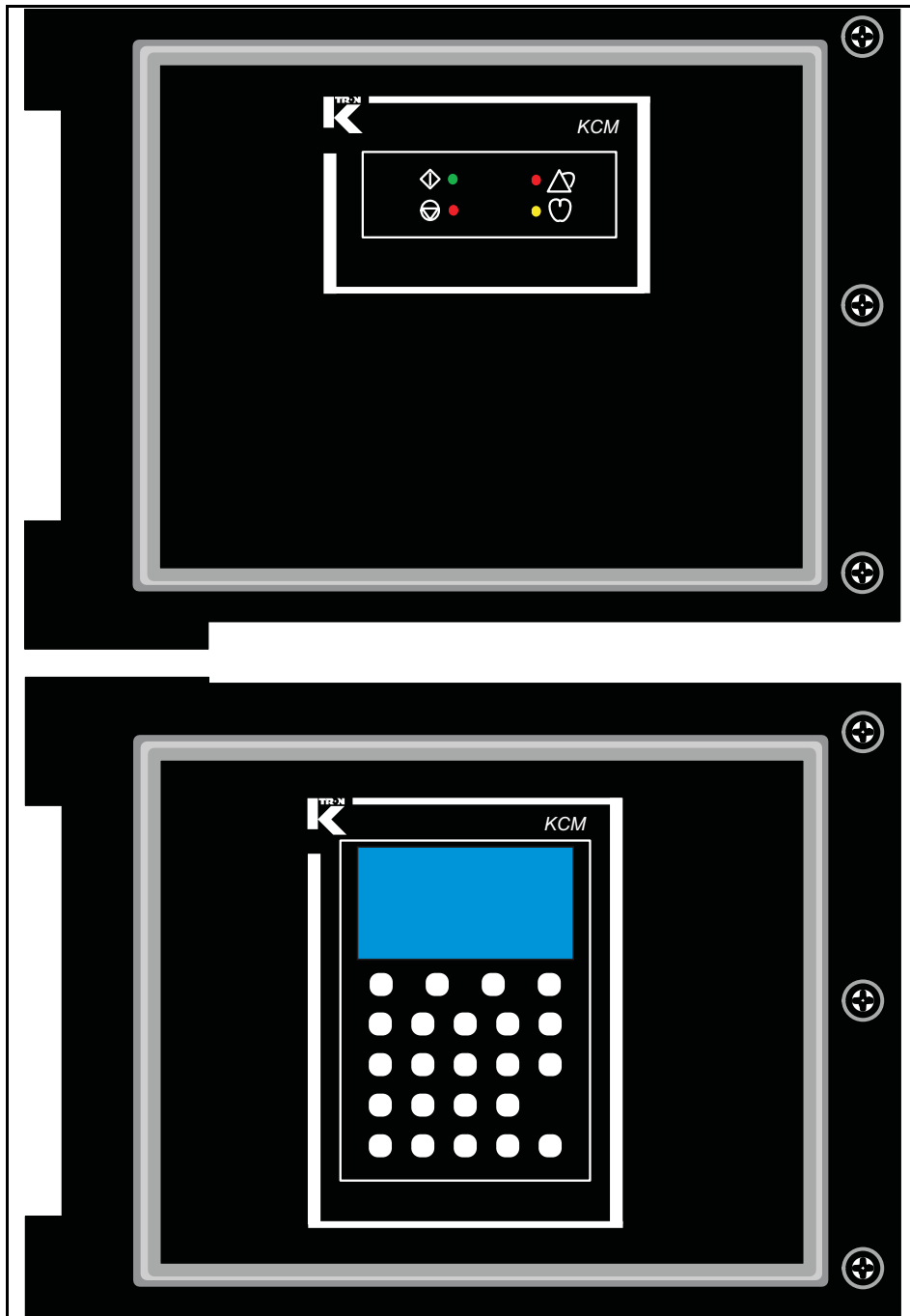
Controller

- KCM Electronics

1090020601

TECHNICAL INSTRUCTION

KCM



Read this document prior to operating the device.
This document contains all safety and warning notes.
Original operating instructions

1090020601-EN Rev. 1.3.0

Service

If you need assistance, please call your local service centre or

Coperion K-TRON Schweiz GmbH Tel. 0041 (0) 62 / 885 71 71
Lenzhardweg 43/45 Fax 0041 (0) 62 / 885 71 80
CH-5702 Niederlenz

Coperion K-Tron Pitman, Inc. Tel. 001 (0) 856 / 589 0500
590 Woodbury Glassboro Road Fax 001 (0) 856 / 589 81 13
Sewell, New Jersey 08080 USA

Coperion K-TRON Salina Tel. 001 (0) 785 / 825 16 11
606 N. Front St. Fax 001 (0) 785 / 825 8759
Salina, KS 67402-0017

Web: www.coperionktron.com

Before you call...

- ⇒ Do you have alarm displays? Are you able to eliminate the causes?
- ⇒ Have you modified part of the system, product or operating mode?
- ⇒ Have you tried to remedy the fault in accordance with the operating instructions?
- ⇒ Note the project or order number You will find these on the machine or in the system manual.
 - Example: 0403214

Using the manual:

- ⇒ This arrow identifies an individual action.
- 1. Numbers identify a sequence of actions which have to be executed step-by-step.
- ▲ This symbol identifies a general safety note.



Reference to another manual.



Important information.



This symbol indicates that tools are required for the following task.



Specifies where information or a situation must be checked.

If an error or omission is found, please contact:

documentation@coperionktron.com

Doc. No.: 1090020601-EN

Date: 2014/Jan/10

Original: 1090020601-EN

Coperion K-Tron assumes no responsibility for damages resulting from misuse of any equipment or negligence on the part of operating personnel. Further, you may kindly refer to the purchase order, confirmation or other document that contains the express Coperion K-Tron warranty disclaimer limiting or excluding certain warranties with respect to the company's equipment. Except as otherwise expressly provided by Coperion K-Tron in any such document, COPERION K-TRON MAKES NO WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, NOR ANY OTHER WARRANTY, EXPRESS OR IMPLIED, WITH RESPECT TO THE EQUIPMENT.

Table of contents

1	Safety Notes	9
1.1	Safety symbols definitions	9
1.1.1	Electrical Hazard Icon	10
1.1.2	Ground Icon	10
1.1.3	ATEX Icon	10
1.2	Operator responsibilities	10
1.3	Proper use	11
1.4	Special provisions X	11
1.5	Organizational measures	11
1.6	Safety-conscious operation	11
1.7	Safety devices	12
1.8	High voltage	12
1.9	Additional equipment	12
1.10	Customer service and repairs	12
1.11	Removal from service	13
2	Assembly and Function	14
2.1	Field of application	14
2.1.1	Explosion proof marking	14
2.1.2	Zones and device categories (gas)	14
2.1.3	Zones and device categories (dust)	15
2.1.4	Dust deposits and glow temperature	15
2.1.5	Abbreviations	16
2.1.6	Additional programming information	17
2.2	Overview	18
2.3	Structure	19
2.3.1	Enclosure	19
2.3.2	Circuit assemblies	20
2.4	Safety devices and warnings	21
2.4.1	Safety devices	21
2.4.2	Warnings	21
3	Technical Data	22
4	Installation	28
4.1	Unpacking	28
4.2	Tools	28
4.3	Dimensions KCM	29
4.4	Dimensions KCM SS	30
4.5	KCM-SS Hygiene mounting	30
4.6	Terminal descriptions	31

4.6.1	Terminal block specifications	31
4.6.2	Keying diagrams for specified connectors	31
4.7	CPU connection summary	32
4.7.1	CPU DB-9 Configuration port - P1	32
4.7.2	CPU digital I-O - J8	32
4.7.3	CPU frequency and analog I-O - J9	32
4.7.4	Internal channel; CPU to Drive - J11	33
4.8	K-Port connection summary	34
4.8.1	K-Port protocols	34
4.8.2	K-Port protocol table	34
4.8.3	K-Port details	35
4.8.4	K-Port 1 connections - J14	35
4.8.5	K-Port 2 connections - J15	35
4.9	Host port connections	36
4.9.1	Host port details	36
4.9.2	Host connections for AB-DF1 and Modbus using K-Port1	36
4.10	Drive connection summary	37
4.10.1	Drive digital inputs- J1	37
4.10.2	Drive Internal Channel; Drive to CPU - J3	38
4.10.3	Drive SFT connections - J4/J7/J8	38
4.10.4	Drive output relays - J5	39
4.10.5	AC Interface specific output relays - J9/J6	39
4.10.6	DC Motor drive power - J6.	40
4.10.7	DC Motor drive feedback - J2	40
4.10.8	Change DC Motor shaft rotation	40
4.10.9	Stepper drive specific connections	41
4.10.10	Universal stepper motor drive power - J6	41
4.10.11	LoPo/HiPo stepper motor drive power - J6	41
4.10.12	Stepper motor drive feedback - J2	42
4.10.13	Stepper drive rotation error	42
4.10.14	Vibratory drive power - J6	43
4.10.15	Vibratory drive feedback - J2	43
4.10.16	Vibratory drive phase angle correction	43
4.10.17	AC interface drive power - J6	44
4.10.18	AC interface frequency feedback - J2	44
4.10.19	AC interface analog I-O - J9	45
4.11	I-O wiring connections	46
4.11.1	Safety input wiring to KCM Drive - J1	46
4.11.2	Drive enable input to KCM Drive - J1	46
4.11.3	Digital input #1 and #2 at Drive pc board	47
4.11.4	Drive output relays K1-K3 - J5	47
4.11.5	AC interface drive output relay K4 - J9	48
4.11.6	AC interface drive output relay K5 - J9	48
4.11.7	AC interface drive output relay K6 - J6	48
4.11.8	KCM CPU digital outputs - J8	49
4.11.9	KCM CPU digital inputs - J8	49
4.11.10	KCM CPU analog output - J9	50
4.11.11	KCM CPU analog input - J9	50
4.11.12	KCM CPU frequency input - J9	51

4.12	Connecting the KCM	52
4.12.1	General wiring instructions	52
4.12.2	Recommended wire sizes and maximum lengths	53
4.13	Power wiring; specific requirements	54
4.13.1	Power mains disconnect requirements	54
4.13.2	Protective ground	54
4.13.3	AC input wiring details to KCM	54
4.13.4	Shielding and cable glands	55
5	KCM Set-Up	56
5.1	Initial set-up for KCM CPU	56
5.1.1	CPU pc board jumper settings	56
5.1.2	KCM CPU DIP switch setting	57
5.1.3	KCM addressing with CPU DIP switch positions 1-5	57
5.1.4	K-Port 1 function via KCM CPU DIP switch positions 6-8	57
5.1.5	K-PROM configuration	58
5.1.6	Display backlight control	58
5.1.7	Setting display brightness	58
5.2	Initial set-up for KCM drives	59
5.2.1	Drive jumper settings-all drive types listed	59
5.3	DC drive set-up	60
5.3.1	DC drive selection notes:	60
5.3.2	DC Motor selection table by drive type and line voltage	60
5.3.3	450/1600 Watt DC drive pc board DIP switch settings	61
5.3.4	Additional jumper settings for 450 watt drive	61
5.4	AC drive set-up	62
5.4.1	AC drive interface pc board DIP switch settings	62
5.5	Stepper drive set-up (all types)	63
5.5.1	Stepper motor programming table	63
5.5.2	Stepper drive pc board DIP switch settings	63
5.6	Vibratory drive set-up	64
5.6.1	Vibratory drive pc board DIP switch settings	64
5.6.2	Vibratory drive adjustment	64
5.7	GWB Application drive set-up	66
5.7.1	GWB Hardware overview	66
5.7.2	Setup DC Drive Boards	67
5.7.3	Setup Vibrator Drive Boards	67
5.7.4	Setup Stepper Drive Boards	68
5.7.5	Setup AC Drive Boards	68
6	Transportation, Storage, Disposal	69
6.1	Notes on transportation	69
6.2	Notes on storage	69
6.3	Notes on disposal	69
7	Operation	70
7.1	Initial operation	70
7.1.1	KCM-SD LED status display	71

7.1.2	LED function listing	71
7.2	Emergency stop procedure	72
7.3	Switching ON and OFF	72
8	Cleaning	73
9	Maintenance	74
9.0.1	Required skills/training for maintenance of the KCM	74
9.0.2	General tools required	74
9.1	Preventive maintenance	74
9.2	Parameter Backup	75
9.3	KCM fuse replacement	75
9.3.1	Auto-resetting drive fuses	75
9.3.2	Resetting auto-resetting fuses	75
9.3.3	List of auto resetting fuses	76
9.3.4	Replacing fuses	76
9.3.5	1600 watt DC Motor drive fuse location-0000002610	77
9.3.6	450 watt DC Motor drive fuse location-0000007405	77
9.3.7	Vibratory drive fuse location-000000684	77
9.3.8	AC motor drive interface fuse location-000003413	78
9.3.9	Stepper drive interface fuse location-0000005987	78
9.4	Battery replacement	79
9.5	KCM service connections	80
9.5.1	Forcing the Config Port to UserIF protocol	80
9.5.2	USB	80
10	Troubleshooting	81
10.1	General information on fault detection	81
10.2	KCM CPU LEDs	82
10.2.1	CPU pc board LEDs	83
10.2.2	K-Port LEDs	83
10.3	KCM Drive and Power Supply Details	84
10.3.1	Drive board LEDs	84
10.3.2	KCM Drive pc board LEDs-all types	85
10.3.3	Measuring motor power	85
10.3.4	Measure and adjust speed frequency signal	85
10.4	DC Motor drive problems and solutions	86
10.5	Vibratory drive problems and solutions	87
10.6	Stepper drive problems and solutions	88
10.6.1	Stepper alarm LED flash sequence	89
10.7	AC interface drive problems and solutions	90
11	Optional Devices	91
11.1	Host communication circuit cards	91
11.2	Encoder interface circuit card	91
11.3	Field power supply	92

11.4	SFT expander circuit card	93
11.5	Daisy chain connector	93
12	Appendix	94
12.1	Cable length specifications	94
12.1.1	DC Motor cable lengths: 230 Vac	94
12.1.2	DC Motor cable lengths: 115Vac	94
12.1.3	Cable lengths for speed feedback signals	95
12.2	KCM I/O defaults	96
12.2.1	Default KCM Programmable I-O table.	96
12.2.2	I-O function selection	97
12.3	I-O function and KCM state indications	99
12.3.1	State indications	99
12.4	KCM wiring examples	101
12.4.1	System wiring examples	101
12.4.2	KCM to KSU-II wiring at K-Port 1/2	101
12.4.3	KCM to KSL wiring at K-Port 1	102
12.4.4	KCM to KSC wiring at K-Port 1- Digi card	103
12.4.5	KCM to KSC wiring at K-Port 1- Moxa card	104
12.4.6	KCM to KSC wiring at K-Port 1- Coperion K-Tron (Switzerland) LLC converter	105
12.4.7	KCM to WAGO I-O wiring at K-Port 2	106
12.4.8	KCM to KF2 Host port wiring	107
12.4.9	KCM to BM-85 Host port wiring	108
12.4.10	450 watt DC drive wiring example - 0000007405	109
12.4.11	KCM without SIB board - DC Motor - 0000002610	110
12.4.12	Remote KCM with SIB pcb at feeder	111
12.4.13	Field wound DC Motor wiring example	113
12.4.14	Stepper drive wiring example for 0000005987	114
12.4.15	Encoder Line Driver Board	115
12.4.16	Vibratory feeder wiring example - 0000000684	116
12.4.17	AC drive wiring example - 0000003413	117
12.4.18	KCM interlock wiring example	118
12.4.19	Hi/Lo Auto gear external switching circuit	119
12.4.20	KCM to HCU wiring example	120
12.4.21	KCM to LSR wiring example	120
12.4.22	Schematic of SIB board-9191601650	121
12.4.23	Belt slip wiring for WBF and WBB applications.	122
12.5	Summary of KCM I-O	123
12.5.1	CPU I-O	123
12.5.2	Common Drive I-O	124
12.5.3	SFT Connections for all drives	124
12.5.4	Specific 450/1600 Watt DC Drive connections	125
12.5.5	Specific Stepper Drive connections	125
12.5.6	Specific Vibratory Drive connections	126
12.5.7	Specific AC Drive connections	126

1 Safety Notes



- ▲ The explosion-proof control is one of the products with increased risk of damage, as it is used in hazardous locations. For handling with this device is therefore an increased duty of care. The front cover is part of the ignition protection and should not be opened in an explosive atmosphere.
- ▲ Protect the explosion-proof control from direct sunlight.



Installation, commissioning and programming of the specified equipment should only be undertaken by qualified personnel.

1.1 Safety symbols definitions



- ▲ DANGER indicates a extremely hazardous situation which, if not avoided, could lead to heavy bodily injury or to death.



- ▲ WARNING indicates a potentially hazardous situation which, if not avoided, could lead to heavy bodily injury or to death.



- ▲ CAUTION with safety alert indicates a potentially hazardous situation which, if not avoided, could lead to light bodily injuries.



- ▲ CAUTION indicates a potentially hazardous situation which, if not avoided, may result in property damage.



- ▲ The safety alert symbol is used to alert to the potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.



1.1.1 Electrical Hazard Icon

This sign indicates an electrical hazard. It is located on covers and doors. Only qualified personnel are allowed to remove these covers or open the doors.



1.1.2 Ground Icon

This sign indicates that a ground/PE connection is required.



1.1.3 ATEX Icon

Important information to explosion protection.

1.2 Operator responsibilities



- ▲ For install and the mounting for explosion-proof equipment following and observe the standards and directives: Standards 99/92EG (ATEX 137)
- ▲ Ensure that only qualified and trained personnel work with the device.
- ▲ Establish personnel responsibilities for operation and maintenance.
- ▲ Ensure that personnel have read and understood the operating instructions to all installation components, particularly these safety notes.
- ▲ The operator must have damaged or missing components replaced immediately.
- ▲ The operator of the equipment is responsible for compliance with the legally prescribed accident and safety regulations.

1.3 Proper use



- ▲ The operation of the device in hazardous areas is only allowed in areas with classification zone 22.
 - ▲ Only operate the device in conjunction with the feeder equipment from Coperion K-Tron (Switzerland) LLC.
 - ▲ Only operate the device in accordance with the specified technical data.
 - ▲ Avoid larger dust deposits on the device.
 - ▲ Protect from direct sunlight.
 - ▲ When processing dangerous materials, also comply with the safety notes which govern the handling of such materials.
 - ▲ Any modifications and changes on safety devices are prohibited
 - ▲ Do not use the equipment in a manner not intended by the manufacturer.
 - ▲ Do not use the equipment in a manner not intended by the manufacturer.
-

1.4 Special provisions X



- ▲ The equipment must be protected against direct sunlight.
-

1.5 Organizational measures



- ▲ Observe the safety notes for the connected feeding devices.
 - ▲ In addition to the operating instructions, always comply with generally prescribed safety regulations governing accident prevention and environmental safety.
-

1.6 Safety-conscious operation



- ▲ Read the operating instructions, in particular these safety notes, and follow these instructions.
 - ▲ Ensure that only authorized personnel enter the working and danger area of the equipment.
 - ▲ Any changes (including changes in the operational behavior) which affect safety must be immediately reported to the responsible member of the staff.
 - ▲ Always keep safety in mind while working.
 - ▲ Before working on the equipment always switch the feeding equipment off at the main power switch.
-

1.7 Safety devices



- ▲ Never open or remove covers or hoods while the equipment is in operation.
 - ▲ Do not modify the electrical safety devices, for example fuses. Increased risk of accident.
 - ▲ Replace damaged cables and connections immediately.
 - ▲ Switch off the power to the equipment. Do not open the enclosure in an explosive atmosphere. Before accessing internal components, allow 3 minutes to lapse prior to opening the enclosure. This ensures safe discharge of high voltage components.
-

1.8 High voltage



- ▲ Only qualified electricians may work on the electrical equipment of the equipment.
 - ▲ High voltage may be present on the line power cables of the device.
 - ▲ Switch off the power to the device for 3 minutes before:
 - any disassembly, maintenance and repair work
 - replacing the drive
 - ▲ Protect the device against moisture entrance.
-

1.9 Additional equipment



- ▲ Modifications to the equipment are prohibited.
 - ▲ The operator is responsible for complying with all safety regulations related to interoperation with any additional equipment.
-

1.10 Customer service and repairs



- ▲ Have repairs to the equipment carried out by
 - your authorized Coperion K-Tron (Switzerland) LLC customer service centeror
 - qualified personnel, trained by Coperion K-Tron (Switzerland) LLC.
 - ▲ Only use original Coperion K-Tron (Switzerland) LLC parts for repairs.
 - ▲ In EX equipment may only manufacturer-approved batteries used. Replacement from the battery, see section [9.4](#).
-

1.11 Removal from service



- ▲ The operator is responsible for the proper removal and disposal of the equipment from service.
-

2 Assembly and Function

2.1 Field of application



The owner is responsible for ensuring that the system is installed in the intended zone. The corresponding category is described in the declaration of conformity.

KCM XPC3 stands for Coperion K-Tron (Switzerland) LLC **Control Module** and XPC3 for **Explosion-protection of Category 3**.

The KCM is a control and a drive module for Coperion K-Tron (Switzerland) LLC feeders. The KCM is normally mounted directly on the feeder. It can also be mounted remotely. The KCM can be used as controller for feeding processes which require explosion protection in zone 22.

2.1.1 Explosion proof marking

The marking on the device shows the device category. The declaration of conformity shows the zone in which the device may be used.

2.1.2 Zones and device categories (gas)

Zone	Description	Use of KCM
Zone 0	An area in which an explosive atmosphere, i.e. a mixture of air and flammable gases, vapours or mists is either frequently or constantly present over an extended period.	Not allowed
Zone 1	An area in which a dangerous mixture of air and flammable gases, vapours or mists sometimes forms during normal operation, constituting an explosive atmosphere.	Not allowed
Zone 2	An area in which a dangerous mixture of air and flammable gases, vapours or mists constituting an explosive atmosphere usually does not exist or only for short periods.	Not allowed

2.1.3 Zones and device categories (dust)

Zone	Description	Use of KCM
Zone 20	An area in which a dangerous, explosive atmosphere in the form of a cloud of flammable dust suspended in the air is either constantly present, or frequently or for long periods at a time.	Not allowed
Zone 21	An area in which a dangerous, explosive atmosphere in the form of a cloud of flammable dust suspended in the air may form at times under normal operating conditions.	Not allowed
Zone 22	An area in which a dangerous, explosive atmosphere in the form of a cloud of flammable dust suspended in the air may form at times under normal operating conditions.	Allowed

2.1.4 Dust deposits and glow temperature



- ▲ Observe the requirements of the standard IEC/EN 60079-14 Chapter 5.6.3.1 with regard to reduced glow temperature at dust deposits.

In case of dust deposits of up to 5 mm:

- Glow temperature of the material at a thickness of the layer of dust 5 mm: \geq max. Surface temperature (T_{max}) + 75 K.
 $T_{max} = T_{5\text{ mm}} - 75\text{ °C}$

In case of dust deposits greater than 5 mm to max. 50mm:

- The difference to be observed between the glow temperature of the material and the surface temperature (T_{max}) depends on how thick the dust layer is. The context is shown in Fig. 1 of the standard EN 60079-14 Chapter 5.3.3.2.1
- Avoid Dust deposits > 5mm (see [8 cleaning](#)).

Dust deposits \geq 50 mm avoid or complete covered:

- not allowed

2.1.5 Abbreviations

- AB = Allen Bradley data comm-DF1 protocol
- Config port = diagnostic serial data port from KCM
- CPU = central processing unit, microprocessor
- DPDT = Relay Double Pole, Double Throw
- Drive = Common representation of all types of drive pc boards (450 watt DC drive, 1600 watt DC drive, AC drive interface, stepper motor drive, vibratory drive)
- HCU = Pneumatic loader control
- Host Channel = serial data connection to remote host computer
- HSU = Pneumatic loader control programming interface
- HMI = human, machine interface, usually a PC utilizing a commercial SCADA software package
- Internal Channel = serial data connection to SFTs/ loader controls, internal motor drives and ActiFlow
- KCM = Coperion K-Tron (Switzerland) LLC Control Module, feeder controller
- KCM-KD = KCM with local Keypad and graphic display since 2010, before 4x20 characters display
- KCM-SD = KCM with Status Display only
- KGR = host communication file residing in KCM
- K-PROM = parameter and k-link file storage in the KCM
- KSC = Coperion K-Tron (Switzerland) LLC Smart Commander, a PC based HMI system for use with up to 30 feeders
- KSL = Coperion K-Tron (Switzerland) LLC line interface for up to 8 feeders
- K-Net = KCM serial data connection to KSU-II, KSL, K-Vision or KSC
- K-Port 1 and K-Port 2 = data ports for a Coperion K-Tron (Switzerland) LLC specific interface
- KSU-II = Single unit user interface for the KCM
- K-Vision = Coperion K-Tron (Switzerland) LLC line interface for up to 16 feeders
- LSR = Pneumatic loader control
- LWF = loss-in-weight feeder
- MDU = Motor Drive Unit, Drive Board
- pcb = printed circuit board
- PID = proportional, integral, differential process controller
- SCADA = supervisory, control and data acquisition system
- Smart Connex II = second version of SmartConnex architecture
- SFM = Smart Flow meter
- SFT = Smart Force Transducer

- SPDT =Relay Single Pole, Double Throw
- SPST =Relay Single Pole, Single Throw
- VOL = volumetric feeder controller
- WBF = weigh belt feeder

2.1.6 Additional programming information



See the following documents for more detailed programming information.

- Operation for LWF/WBF/PID/SFM/VOL Feeder
- Operation for LWB/WBB/SFB/GWB Feeder
- LWF Programming
- WBF programming
- PID programming
- SFM programming
- VOL programming
- LWB programming
- WBB programming
- SFB programming
- GWB programming



- The Coperion K-Tron (Switzerland) LLC's supplied operating instructions describe how to use the connected feeder.

2.2 Overview

The KCM is the controller member of the SmartConnex II family. This family is comprised of a KCM feeder controller, a KSU-II remote display unit, a K-Vision for up to 16 feeders and a KSC for interface for up to 30 feeders.

The KCM is comprised primarily of a cpu pc board, and a drive pc board. Drive choices include a 1600 watt DC drive, a 450 watt DC drive, a vibratory drive for KV1-KV3 vibratory trays, a stepper drive for feeders that utilizes a stepper bi-phase motor and lastly, an AC drive interface pc board for use with variable frequency drives (VFD) or remote DC drives.

This manual will describe the full family of KCM components, including all drive applications supported.

The KCM is available in two packages: full local keypad and 3.5" color LCD (KCM-KD) or 4 LED status display (KCM-SD).

2.3 Structure

The KCM includes the following components, some which are optional.

2.3.1 Enclosure

First, the pc board assemblies are housed in an Aluminium profile or stainless steel housing with a swing-out cast cover. The enclosure is designed to mount directly to a feeder or be located in a control panel. All cabling is brought through the side of the housing incorporating cable glands. The enclosure is Nema 4/IP 65 rated.

Wiring access is made through IP cable glands at the underside of the KCM.



Fig. 2.1 KCM-KD



Fig. 2.2 KCM-SD

2.3.2 Circuit assemblies

The KCM CPU pc board is mounted to the rear of the front swing-out cover. The drive pc board with KCM power supply is mounted to the bottom heatsink plate of the housing. (Fig. 2.3)

There are two choices for the on-board KCM operational display. First, a fully functional display and keypad assembly may be mounted to the rear of the KCM cpu pc board and permit access via the front of the cover for all operational actions. (Fig. 2.1) The second choice provides only the four status LEDs that indicate machine running and alarm. (Fig. 2.2) The first case permits operation of the KCM without any other external components and is suited for simple machine mount installations where operator interaction is required at the controller. The second case requires the addition of one or more of the following: KSU-II, KSC, K-Vision or KSL user interface. The choice depends upon application. If communications to a host computer or PLC is required, a Host Communications pc board is mounted to the KCM CPU pc board. Also connected to the KCM CPU is the K-PROM memory module that contains all parameter and KGR file data.

Lastly, if the speed signal is differential, a plug-in circuit card permits the receipt of this signal where normally a single ended input is received.

KCM element identification

- (1) CPU circuit card
- (2) Drive circuit card
- (3) Host comm. circuit card
- (4) K-PROM circuit card

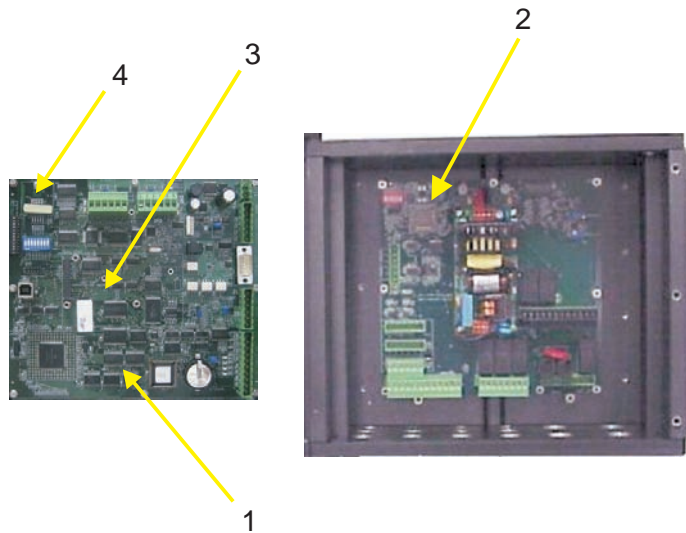


Fig. 2.3 KCM open

2.4 Safety devices and warnings



- ▲ For operation in the allowed hazardous zone, only use certified explosion-proof cable glands and blind covers ATEX category 2GD.

2.4.1 Safety devices



- ▲ The front cover is Part of the ignition protection and it must not be opened unless power has been removed and no explosive atmosphere is present.

2.4.2 Warnings

On the front panel of the KCM, either with the full keypad or LED display, the following safety messages are supplied.



Fig. 2.4 KCM safety label



Make all ground/PE connections to these points as indicated.

CAUTION

- ▲ Protect the equipment from direct sunlight.

3 Technical Data





Specification	Limitations	Notations
Manufacturer	Coperion K-Tron (Switzerland) LLC	
Device name	KCM KCM SS	
Device marking KCM		See declaration of conformity
(only ATEX devices)	 II 3D Ex tc III C T65°C IP65 T _{amb} -20 to +50°C 0590024903-D X	
Device marking KCM SS		See declaration of conformity
(only ATEX devices)	 II 3D Ex tc III C T65°C IP65 T _{amb} -20 to +40°C 1190021904-A X	
Service application	KCM must only be installed in an industrial or manufacturing power environment. Connection in a residential power system is not permitted.	
Power line/supply	103 - 264 VAC	
Line frequency	47-63 Hz	
Inrush current-maximum	≤ 20A	
Size	H x T x B 325 x 130 x 310 mm	
Weight	7,2kg (16lb)	
Operating temperature	0 to +50°C (32 to +122°F)	KCM for 1600W DC Drive in stainless steel housing only up to 40°C, 104°F
Storage temperature	-25 to +80°C (-13 to +176°F)	
Maximum ambient humidity	<95% at 35°C (95°F) non condensing	
Pollution degree	Category II	
Over voltage category	Category II	

Table page 1 of 6

Specification	Limitations	Notations
Maximum input power	<p>DC Motor-1600 watt drive: 2.0 KVA at 230 Vac 1.2 KVA at 115 Vac</p> <p>DC Motor-450 watt drive: 0.5 KVA at 230 Vac 0.5 KVA at 115 Vac</p> <p>Vibratory drive: 250 VA at 115/230 Vac</p> <p>Stepper drive-0000005987: 150 VA at 115/230 Vac</p> <p>Stepper drive-0000004568: 100 VA at 115/230 Vac</p> <p>Stepper drive-0000001430: 75 VA at 115/230 Vac</p>	
Internal fuse ratings	<p>DC Motor-1600 watt drive: F1/F2 - 12.5 AT, 5x20 mm</p> <p>DC Motor-450 watt drive: F1/F2 - 6.3 AT, 5x20 mm</p> <p>Vibratory Drive: F1 - 2.0 AT, 5x20 mm</p> <p>Stepper drive-0000005987: F4 - 2.0 AT, 5x20 mm</p> <p>AC Interface: F1/F2 - 6.3 AT, 5x20 mm</p>	

Table page 2 of 6

Specification	Limitations	Notations
Maximum output power	<p>DC Motor-1600 watt drive: 800 W at 115 Vac nominal line voltage 1600 W at 230 Vac nominal line voltage</p> <p>DC Motor-450 watt drive: 225 W at 90 or 100 Volt motor 450 W at 180 or 200 Volt motor</p> <p>Vibratory Drive: Max. 60 W, 25-100 Hz</p> <p>Stepper drive-0000005987: 1.4 or 2.46 A/coil peak per at nominal line voltage (≤194 watts)</p> <p>Stepper drive-0000004568: 2.46 A/coil peak per at nominal line voltage. (≤194 watts)</p> <p>Stepper drive-0000001430: 1.4 A/coil peak per at nominal line voltage. (≤49 watts)</p>	Current range selected from motor power settings.
DC Motor output voltage	<p>With 115 Vac supply: 160 Vp, square-wave PWM 0-99.6%</p> <p>With 230 Vac supply: 322 Vp, square wave PWM 0-99.6%</p>	
Stepper motor output voltage	<p>48 V maximum-(PWM)* 24 V maximum-(PWM)**</p>	<p>*For 0000005987 drive **For 0000004568 and 0000001430 drives</p>
Motor field output DC	<p>Pulsing DC at 2A. 162 Vp DC at 115 Vac 325 Vp DC at 230 Vac</p>	For DC Motor drive. Special option 0000000639. Not for standard KCM.
Maximum DC Motor speed	2500 rpm at 125% drive command	Maximum input frequency from the motor tachometer cannot exceed 10 kHz.
Speed accuracy DC Motor	±1 rpm	

Table page 3 of 6

Specification	Limitations	Notations
Stepper speed range	0.3-150 rpm with standard quadrature encoder.	Maximum encoder frequency ≤ 1250 Hz. Tachometer signal: 5V CMOS level with pull-up to +5VDC. Maximum motor speed is motor dependent.
Speed accuracy-stepper drive	± 0.01 rpm	
Maximum current from 24 VDC	500 mA maximum, all Process 24 VDC connections	Sourced from KCM internal power supplies.
Communications interface		
Internal data comm.	9 bit proprietary	For SFT connections-six SFT permitted.
External data comm.	KMB Modbus, KSU-II protocol, K10S protocol	K-Port1 and K-Port2
Host data comm.	Modbus RTU Allen Bradley DF1 ProfibusDP Profinet ModbusPlus ModbusTCP AB DeviceNet AB EtherNet/IP	Requires communication adapters specific to the protocol.
Surge immunity	Meets EN61000-4-5, Criteria C	Motor may stop during a surge or transient condition.
Relay K1-K3 contact ratings	5 A, 250 Vac, 5 A, 30 Vdc Maximum switching power 1250 VA, 150 W	Relay K1-K2 are SPDT Relay K3 is SPST
Relay K4-K6 contact ratings	5 A, 250 Vac, 5 A, 30 Vdc Maximum switching power 1250 VA, 150 W	On AC interface circuit board only Relay K4-K6 are DPDT
Digital input ratings	0-5 Vdc input range, 24 Vdc maximum. 4.75 k Ω pull-up resistor	KCM CPU pc board
Digital output ratings	40 Vdc maximum at 100 mA maximum load	KCM CPU pc board

Table page 4 of 6

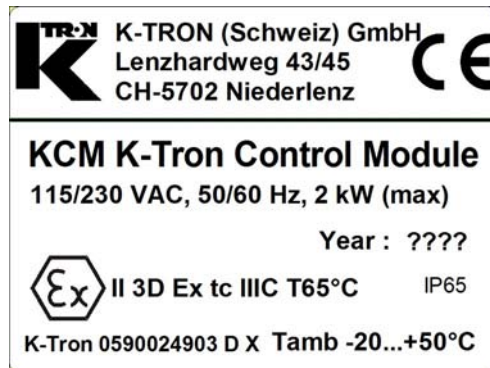
Specification	Limitations	Notations
Analog input rating	0-20 mA/4-20 mA with 100 Ω impedance or 0-5 Vdc with 94.5 k Ω impedance or 0-10 Vdc with 65.3 k Ω impedance or	Input value selected by jumpers on the KCM CPU circuit card.
Analog output rating	0-20 mA/4-20 mA selectable by software	KCM CPU pc board Span and zero by software programming
Frequency input ratings	input frequency range: 0-20 kHz Minimum pulse width: 15 μ sec, on/off Logic level: 5-12 Vdc for true With 24 Vdc, use 2.2 k Ω Resistor in series.	KCM CPU pc board
AC MDU speed frequency input rating	Vmax < 25 Vdc, Vmin > 4.0 Vdc, Ion (typ) > 15 mA	Opto-isolated input
+ 24 Vdc supply ratings	I max out = 500 mA	
+ 5 Vdc supply rating	I max out = 50 mA	For speed sensor
+12 Vdc supply	I max out = 250 mA	For SFTs/HCUs only
Program data storage	Up to 8 k bytes of data stored on a non-volatile circuit	K-PROM plug-in memory device
Maximum altitude	< 2000m	

Table page 5 of 6

Specification	Limitations	Notations
Vibration	$\leq \pm 0.49 \text{m/sec}^2$ ($\pm 0.05\text{G}$, 10 to 50 Hz, all directions)	
MTBF/MTTR	> 45000 hours/< 15 minutes	
Approvals	Met labs to UL 61010-1 CSA-Canada CE-Europe	

Label KCM

(only ATEX devices)



Label KCM SS

(only ATEX devices)



Table page 6 of 6

4 Installation



- ▲ Protect the explosion-proof control from direct sunlight.
- ▲ Ensure that the KCM is connected and put into operation only by authorized personnel.



- ▲ KCM mounting must be vertical and protect from direct sunlight.
- ▲ Minimum lateral mounting spacing between KCMs is 25 mm. (support rail to support rail)
- ▲ Minimum vertical mounting spacing between KCMs is 75 mm. (case to case)
- ▲ If no SFT Interface board is used, the KCM must be mounted within 30 m (100 Ft.) of the feeder.

4.1 Unpacking

Carefully unpack the KCM from the shipping container and check that all items have been supplied. The KCM may be mounted on the feeder.

4.2 Tools



The following tools are recommended when working with the KCM:

- Medium phillips screwdriver
- Small blade jewelers screwdriver
- Medium blade screwdriver
- 18 mm open end wrench
- 24 mm open end wrench

4.3 Dimensions KCM

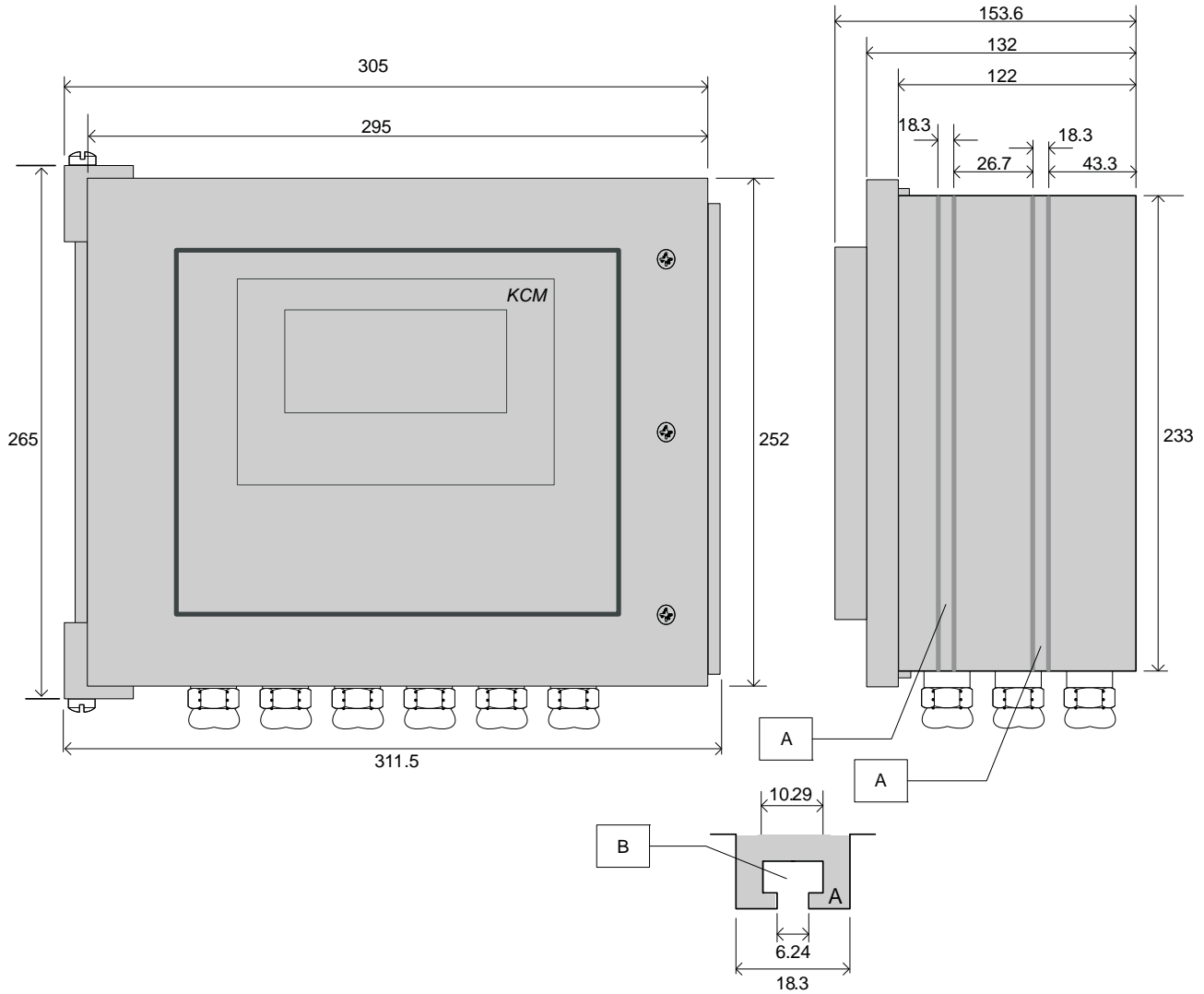


Fig. 4.1 Dimensions - in mm

Notes:

- Slot A holds a M6 hex head bolt.
- Use 8 bolts per KCM for secure mounting.
- Cable gland hole sizes are:
 - 12 x M16x1.5 mm
 - 4 x M20x1.5 mm

4.4 Dimensions KCM SS

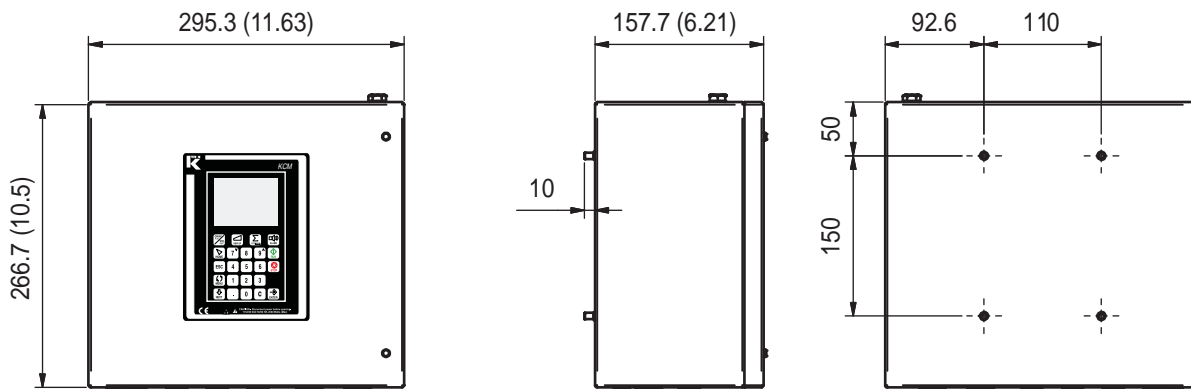


Fig. 4.2 Dimensions - in mm

4.5 KCM-SS Hygiene mounting

A specially designed controller mounting is available to improve the cleaning capacity for hygienic applications. In this mounting, the cable connections and sealing plugs of eight drill holes in the controller housing are removed and the controller is fixed to the cable channel with a clamping plate. The cables are directly slotted through four drill holes (1) from the cable channel to the controller and the connection is sealed with an O-ring (2). This means that the cable channel and the ATEX controller form a single unit and may be regarded as part of the housing. Thus the same regulations apply to both the cable channel and the controller. In addition, care must be taken that only ATEX-compatible cable connections are used for the cable channel.

The shields of the cables are be fastened with cable lugs and screws on the clamping plate.

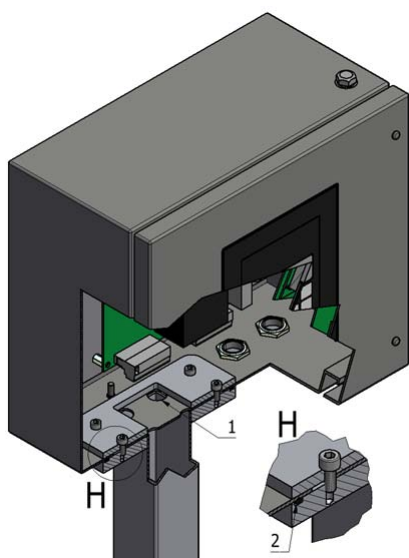


Fig. 4.3 Hygiene mounting

4.6 Terminal descriptions

4.6.1 Terminal block specifications

Each terminal block is made up of two components; a removable plug and stationary socket. Each is keyed with plastic keys to prevent misconnection and all are unique. Both the socket and plug are keyed as necessary

Specification	Ratings and limitations
Maximum wire size	2.5 mm ² or 12 AWG max. according to regulations in your country.
Minimum wire size	24 AWG or 0.2 mm ²
Maximum rated contact current	12 A
Maximum rated contact voltage	250V
Maximum screw terminal torque	0.5 Nm

4.6.2 Keying diagrams for specified connectors

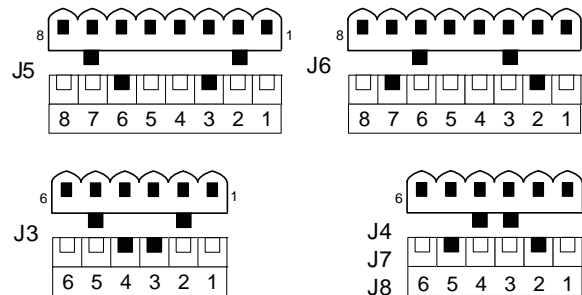


Fig. 4.4 Power pc board keying diagram

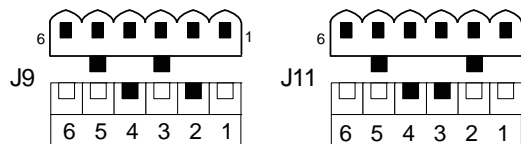


Fig. 4.5 KCM cpu keying diagram

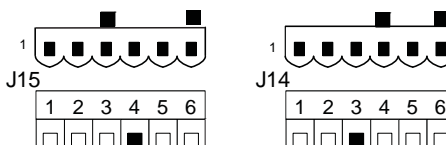


Fig. 4.6 K-Port keying diagram

4.7 CPU connection summary



See programming manuals for configuration of I-O.

4.7.1 CPU DB-9 Configuration port - P1

Terminal	Function	Notes
P1-2	Rx	To PC, serial port, pin 3
P1-3	Tx	To PC, serial port, pin 2
P1-5	Common	To PC, serial port, pin 5

4.7.2 CPU digital I-O - J8

Terminal	Function	Notes
J8-1	Digital Input 1	Programmable via the user interface
J8-2	Digital Input 2	Programmable via the user interface
J8-3	Digital Input 3	Programmable via the user interface
J8-4	Digital Input 4	Programmable via the user interface
J8-5	Com	Ground reference
J8-6	Digital Output 1	Programmable via the user interface
J8-7	Digital Output 2	Programmable via the user interface
J8-8	Digital Output 3	Programmable via the user interface
J8-9	Digital Output 4	Programmable via the user interface
J8-10	Com	Ground reference

4.7.3 CPU frequency and analog I-O - J9

Terminal	Function	Notes
J9-1	Frequency Input (+)	Programmable via the user interface
J9-2	Frequency Input (-)	
J9-3	Analog Output (+)	Programmable via the user interface
J9-4	Analog Output (-)	
J9-5	Analog Input (+)	Programmable via the user interface
J9-6	Analog Input (-)	

4.7.4 Internal channel; CPU to Drive - J11

Terminal	Function	Notes
J11-1	Power	+ 24Vdc power from Drive power supply
J11-2	Common	Ground/common from Drive power supply
J11-3	RxD+	Internal data channel to Drive
J11-4	RxD-	Internal data channel to Drive
J11-5	TxD+	Internal data channel to Drive
J11-6	TxD-	Internal data channel to Drive

4.8 K-Port connection summary



- ▲ Based upon the KCM power budget, only one KSU-II can be powered from the KCM.
- ▲ If a second KSU-II is connected to a KCM, use a separate 24 Vdc power supply for that KSU-II.
- ▲ For host connections, see the appropriate communication adapter card manual
- ▲ For host communication applications that use the K-Port comm, use the following connection information.

4.8.1 K-Port protocols

KMB = (K-BUS, MAIN) used by KCM, KSU-II, K-Vision and KSC

K10S = (K10S 9 bit) use for KSL to KCM

Modbus = KCM to remote I/O- e.g. WAGO

4.8.2 K-Port protocol table

Device	K-Port Use	Protocol	KCM Action	Configuration
KSU-II	1, 2	KMB	Slave node	Fixed, 38.4 kbaud, 8E1
KSC	1	KMB	Slave node	Programmable baud rate, 8E1
K-Vision	1, 2	KMB	Slave node	Programmable baud rate, 8E1
KSL	1	K10S	Slave node	Fixed, 19.2 kbaud, 9 bit Programmable baud rate when FakeK10S (Service variable) is on.
WAGO I-O	2	Modbus	Master node	Fixed 19.2 kbaud, 8E1

4.8.3 K-Port details

Each K-Port supports RS485 (4 wire and 2 wire).

K-Port 1 is used for KSC, K-Vision and KSU-II to KCM connections.

K-Port 2 is used for KCM to remote Modbus I-O and KSU-II to KCM connections.

4.8.4 K-Port 1 connections - J14

Terminal	Function	Notes
J14-1	Power	+ 24Vdc power supply for KSU-II
J14-2	Common	Ground/common from Drive power supply
J14-3	TxD+	K-Port1 RS485 TxD+
J14-4	TxD-	K-Port1 RS485 TxD-
J14-5	RxD+	K-Port1 RS485 RxD+
J14-6	RxD-	K-Port1 RS485 RxD-

4.8.5 K-Port 2 connections - J15

Terminal	Function	Notes
J15-1	Power	+ 24Vdc
J15-2	Common	Ground/common from Drive power supply
J15-3	TxD+	K-Port2 RS485 TxD+
J15-4	TxD-	K-Port2 RS485 TxD-
J15-5	RxD+	K-Port2 RS485 RxD+
J15-6	RxD-	K-Port2 RS485 RxD-

4.9 Host port connections



For the host port protocols of Modbus TCP, Ethernet IP, DeviceNet, ModbusPlus, ProfibusDP, Profinet, please refer to the following manuals for wiring details.

Protocol	Document Number
DeviceNet	0590020609
Ethernet IP Modbus TCP Profinet	0590020610
ModbusPlus	0590020608
ProfibusDP	0590020607

4.9.1 Host port details

The host port can be configured for Profibus, Profinet ModbusPlus, Modbus TCP, DeviceNet, Ethernet IP, Modbus RTU or AB DF1.

In each case, a specific communications card for that protocol is required and must be installed into the Host port slot on the CPU circuit card. In the case of Modbus RTU or AB DF1 protocols, the K-Port1 is used.

4.9.2 Host connections for AB-DF1 and Modbus using K-Port1

Terminal	Function	Notes
J14-1	Power	Unused
J14-2	Common	Ground/common
J14-3	TxD+	RS485 TxD+
J14-4	TxD-	RS485 TxD-
J14-5	RxD+	RS485 RxD+
J14-6	RxD-	RS485 RxD-

4.10 Drive connection summary

The first group of connections, tables 4.10.1 to 4.10.4 are common for all drive types.



See programming manuals for application information.

4.10.1 Drive digital inputs- J1



Input #1/#2 functions are programmable.

Terminal	Function	Notes
J1-1	+ 24 Vdc	DC voltage supply at 500 mA-fused.
J1-2	Safety Switch Input	Connect J1-2 to J1-1 to energize internal safety relay.
J1-3	+ 24 Vdc	Same as J1-1
J1-4	Drive Enable Sig (+)	Connect J1-4 to J1-3 to permit a run enable. See next.
J1-5	Drive Enable Sig (-)	Connect J1-5 to J1-6 to permit a run enable
J1-6	Common	Ground or common connection
J1-7	+ 24 Vdc	Same as J1-1
J1-8	Input signal #1	This input is programmable
J1-9	Common	Same as J1-6
J1-10	+ 24 Vdc	Same as J1-1
J1-11	Input signal #2	This input is programmable
J1-12	Common	Same as J1-6

4.10.2 Drive Internal Channel; Drive to CPU - J3

Terminal	Function	Notes
J3-1	Power	+ 24 Vdc power from Drive power supply
J3-2	Common	Common from Drive power supply
J3-3	TxD+	Internal data channel to CPU
J3-4	TxD-	Internal data channel to CPU
J3-5	RxD+	Internal data channel to CPU
J3-6	RxD-	Internal data channel to CPU

4.10.3 Drive SFT connections - J4/J7/J8



- For the 450 watt DC Motor drive, SFTs connect only to J4.

Terminal	Color	Function	Notes
J4/7/8-1	Gray	Power	+ 12 Vdc power from drive power supply
J4/7/8-2	Pink	Common	Ground/common from drive power supply
J4/7/8-3	Green	TxD+	Internal data channel to SFT
J4/7/8-4	Yellow	TxD-	Internal data channel to SFT
J4/7/8-5	White	RxD+	Internal data channel to SFT
J4/7/8-6	Brown	RxD-	Internal data channel to SFT

4.10.4 Drive output relays - J5



- Relay functions are programmable.
 - Contact ratings: 250 Vac, 30 Vdc, 5 A, maximum

Terminal	Function
J5-1	Relay #1, common
J5-2	Relay #1, N.O.
J5-3	Relay #1, N.C.
J5-4	Relay #2, common
J5-5	Relay #2, N.O.
J5-6	Relay #21, N.C.
J5-7	Relay #3, common
J5-8	Relay #3, N.O.

4.10.5 AC Interface specific output relays - J9/J6



- These relays are found only with the AC interface drive pcb.
 - Relay K4 - Run Enable out
 - Relay K5 - Alarm Reset out
 - Relay K6 - AC line switching out- double pole
 - Contact ratings: 250 Vac, 30 Vdc, 5 A, maximum

Terminal	Function
J9-6	Relay #K4, COM
J9-7	Relay #K4, N.O.
J9-8	Relay #K5-COM.
J9-9	Relay #K5-N.O.
J6-1	Relay #K6 - N.O.
J6-2	Relay #K6 - N.O.

4.10.6 DC Motor drive power - J6.



Connections for both the 450 and 1600 watt DC Motor drives.

Terminal	Function	Notes
J6-1	Motor Power (-)	DC Motor voltage (-)
J6-2	Motor Power (+)	DC Motor voltage (+)
J6-3	PE/GRD	Earth/ground
J6-4	PE/GRD	Earth/ground
J6-5	PE/GRD	Earth/ground
J6-6	Neutral	Neutral leg of a 115 Vac line or 230 Vac
J6-7	L2	Second leg of a 230 Vac line
J6-8	L1	Line input (hot) either 115 Vac or 230 Vac

4.10.7 DC Motor drive feedback - J2

Terminal	Function	Notes
J2-1	+ 5 Vdc	+ 5 Vdc power at 100 mA for sensor power
J2-2	Frequency In A	Input channel A from speed sensor. Also used if the sensor has only a single output.
J2-3	Frequency In B	Input channel B from a quadrature velocity sensor.
J2-4	Common	Common for sensor

Note:

- If a SFT Interface board is mounted to the feeder and where the KCM is remotely mounted for DC Motor applications, a small circuit card (0000006384) with a differential line receiver is plugged into J2 to receive the single differential speed signal from the feeder. The speed signal is connected to this circuit card.

4.10.8 Change DC Motor shaft rotation

To change the shaft rotation, switch the polarity of the motor armature leads either at the KCM DC Drive or at the motor. Do this only with power removed from the KCM.

4.10.9 Stepper drive specific connections



▲ Two stepper drive wiring configurations for J6 are used. The Universal Stepper drive, 0000005987 is described in table [4.10.10](#). The LoPo and HiPo stepper drives, 0000001430 and 0000004568 are described in table [4.10.11](#)

4.10.10 Universal stepper motor drive power - J6

Terminal	Function	Notes
J6-1	Stepper drive Phase 1(+)	Phase 1 of the stepper drive
J6-2	Stepper drive Phase 1(-)	Phase 1 of the stepper drive
J6-3	Stepper drive Phase 2(+)	Phase 2 of the stepper drive
J6-4	Stepper drive Phase 2(-)	Phase 2 of the stepper drive
J6-5	PE/GRD	Earth/ground
J6-6	PE/GRD	Earth/ground
J6-7	PE/GRD	Earth/ground
J6-8	Neutral	Neutral leg of a 115 Vac line or 230 Vac
J6-9	L2	Second leg of a 230 Vac line
J6-10	L1	Line input (hot) either 115 Vac or 230 Vac

4.10.11 LoPo/HiPo stepper motor drive power - J6

Terminal	Function	Notes
J6-1	Stepper drive Phase 1(+)	Phase 1 of the stepper drive
J6-2	Stepper drive Phase 1(-)	Phase 1 of the stepper drive
J6-3	Stepper drive Phase 2(+)	Phase 2 of the stepper drive
J6-4	Stepper drive Phase 2(-)	Phase 2 of the stepper drive
J6-5	PE/GRD	Earth/ground
J6-6	PE/GRD	Earth/ground
J6-7	Neutral(L2)	Neutral leg of a 115 Vac line or 230 Vac
J6-8	L1	Line input (hot) either 115 Vac or 230 Vac

4.10.12 Stepper motor drive feedback - J2

Terminal	Function	Notes
J2-1	+ 5 Vdc	+ 5 Vdc power at 100 mA for sensor power
J2-2	Frequency In A	Input channel A from velocity sensor. Also used if the sensor has only a single output.
J2-3	Frequency In B	Input channel B from a quadrature velocity sensor.
J2-4	Common	Common for sensor

4.10.13 Stepper drive rotation error

Switch the two encoder leads, to J2 terminal block, terminals 2 and 3 if the motor does not rotate in the proper direction.

Note:

- The alarm 14 MDU_Current will occur if this change is to be made.

Notes:

- Stepper motor mounted optical encoder provides 400 pulses per revolution, quadrature.
- For BSP150-S, use a gear reduction of 2.00.
- This list may change. Review stepper motor label before selecting stepper drive and power programming.

4.10.14 Vibratory drive power - J6

Terminal	Function	Notes
J6-1	Vibratory feeder coil (-)	Variable amplitude and frequency power to vibratory feeder drive coil.
J6-2	Vibratory feeder coil (+)	Variable amplitude and frequency power to vibratory feeder drive coil.
J6-3	Vibratory feeder ground/ PE	Earth/ground
J6-4	PE/GRD	Earth/ground
J6-5	PE/GRD	Earth/ground
J6-6	Neutral	Neutral leg of a 115 Vac line or 230 Vac
J6-7	L2	Second leg of a 230 Vac line
J6-8	L1	Line input (hot) either 115 Vac or 230 Vac

4.10.15 Vibratory drive feedback - J2

Terminal	Function	Notes
J2-1	Feedback coil (+)	Signal from displacement measurement coil from the KV vibratory feeder.
J2-2	Feedback coil (-)	Signal from displacement measurement coil from the KV vibratory feeder.

4.10.16 Vibratory drive phase angle correction

Switch the two leads to J2 terminal block if the KV drive does not control properly.

Note:

- The alarm MDU_Polarity(20) will occur if this change is to be made.

4.10.17 AC interface drive power - J6

Terminal	Function	Notes
J6-1	Switched line power L2 to remote motor contactor	Fused and switched through relay K6 from the input line power at J6-7.
J6-2	Switched line power L1 to remote motor contactor	Fused and switched through relay K6 from the input line power at J6-8.
J6-3	PE/GRD	Earth/ground
J6-4	PE/GRD	Earth/ground
J6-5	PE/GRD	Earth/ground
J6-6	Neutral	Neutral leg of a 115 Vac line or 230 Vac
J67	L2	Second leg of a 230 Vac line
J6-8	L1	Line input (hot) either 115 Vac or 230 Vac

4.10.18 AC interface frequency feedback - J2



- For AC Drive frequency feedback input:
 - $V_{max} < 25.0 \text{ Vdc}$, $V_{min} > 4.0 \text{ Vdc}$, $I_{on} (\text{typ}) > 15 \text{ mA}$

Single Ended Encoder Signal

Terminal	Function	Notes
J2-1	+ 5 Vdc	+ 5 Vdc power at 100 mA for sensor power
J2-2	Connect to J2-1	Positive side of the opto isolator. Configured for current sinking tachometer.
J2-3	Tachometer Frequency Input	Frequency input from the tachometer, negative side of the opto isolator. Configured for current sinking tachometer.
J2-4	Common	Common for sensor

Differential Encoder Signal

Terminal	Function	Notes
J2-1	+ 5 Vdc	+ 5 Vdc power at 100 mA for sensor power
J2-2	Freq (+)	Frequency input from the tachometer.
J2-3	Freq (+)	Frequency input from the tachometer.
J2-4	Common	Common for sensor

4.10.19 AC interface analog I-O - J9

Terminal	Function	Notes
J9-1	Analog current output (+)	For drive command control to external drive. No programming required. Analog signal max 20 mA. Burden resistor maximum 500 Ohm.
J9-2	Analog current output (-)	
J9-3	Frequency Out (+)	For drive command control to external drive. 5 Vdc amplitude.
J9-4	Frequency Out (-)	
J9-5	+24 Vdc	Maximum current 500 mA, fused
J9-6	See section 4.10.5	
J9-7	See section 4.10.5	
J9-8	See section 4.10.5	
J9-9	See section 4.10.5	
J9-10	Common	

4.11 I-O wiring connections

Notes:

- The <F> symbol shows the field side of the diagram. Internal circuits are shown to aid understanding of function.
- Sections 4.11.1 to 4.11.7 define I-O for drive cards in various configurations with sections 4.11.1 to 4.11.4 describing I-O common to all drives.
- Sections 4.11.8 to 4.11.12 define I-O from the KCM CPU circuit card.

4.11.1 Safety input wiring to KCM Drive - J1

Notes:

- The maximum voltage drop across the contacts is 2.0 Vdc.
- Safety input wiring is made at terminal strip J1 on the drive pcb.
- The Safety Input must be at 24 Vdc to engage the safety relay and permit KCM drive output.
- Failure of this input will cause <#15 MDU_SRRelay> alarm.

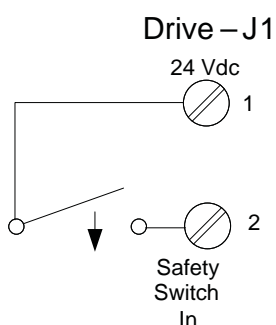


Fig. 4.7 Safety switch wiring-Drive

4.11.2 Drive enable input to KCM Drive - J1

Notes:

- The maximum voltage drop across the contacts is 2.0 Vdc.
- The Drive Enable Input must be at 24 Vdc to permit KCM drive output.
- The input signal as shown is optically isolated from the KCM.
- Drive enable input wiring is made at terminal strip J1 on the drive pcb.

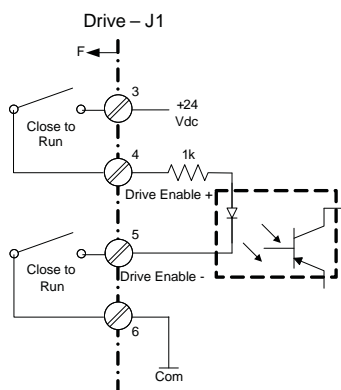


Fig. 4.8 Drive enable wiring-Drive

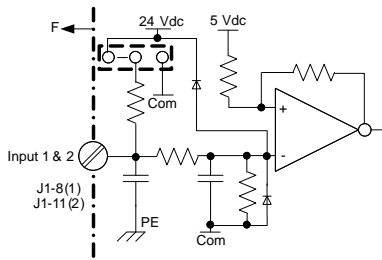


Fig. 4.9 Digital input example-Drive

4.11.3 Digital input #1 and #2 at Drive pc board

Notes:

- These two digital inputs are found on the Drive pcb at terminal J1.
- These two inputs on the drive circuit board have the possibility to be wired for either pull-up or pull down applications. Both digital inputs are programmable in function.
- If the jumper is connected to +24 Vdc, the input must be taken to common to function. If the jumper is connected to common, the input must be taken to at least +5 Vdc to operate.
- A low input provides an 'ON' condition with <Normal> polarity.
- Minimum pulse width for drive board digital input signal is 200 mS. For higher speed inputs, use the CPU board digital inputs.
- Function is programmed as <MDUin1> or <MDUin2>.
- Drive digital input wiring is made at terminal strip J1 on the drive pcb.
 - MDUin1 = J1-8
 - MDUin2 = J1-11

4.11.4 Drive output relays K1-K3 - J5

K1-K2 drive board relay wiring.

Notes:

- Relay 1 and Relay 2 are SPDT types, while Relay #3 is a SPST type.
- Relay function is programmable via the user interface.
- Function is programmed as <MDUrel1, MDUrel2, MDUrel3>.
 - MDUrel1 = relay K1, MDUrel2 = relay K2, MDUrel3 = relay K3
- Relay wiring is made at the drive pcb, terminal strip J5.
 - K1-NC = J5-3, K1-NO = J5-2, K1-COM = J5-1
 - K2-NC = J5-6, K2-NO = J5-5, K2-COM = J5-4

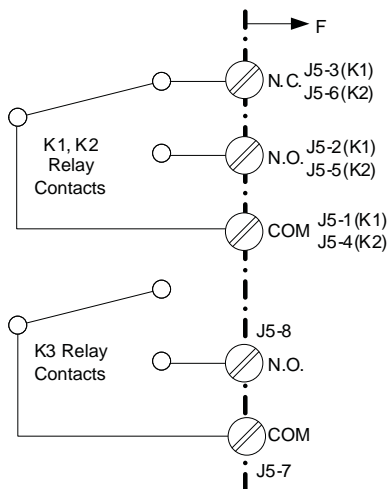


Fig. 4.10 Drive relays K1-K3

4.11.5 AC interface drive output relay K4 - J9

- K4 is relay that provides a run enable control signal to an external device on the AC Interface drive circuit card. When the contacts are closed, the AC interface is permitting an external device to run, if that device's interlock is wired to this relay.

Notes:

- Relay connections on the AC drive pcb are at terminal strip J9.
 - K4-NO = J9-7, K4-COM = J9-6

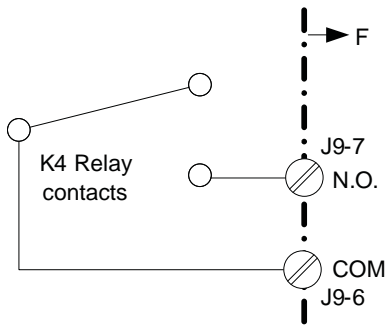


Fig. 4.11 AC interface relay K4

4.11.6 AC interface drive output relay K5 - J9

AC Interface relay K5 is an alarm reset relay. When an alarm is cleared, this relay energizes for 2 seconds after an alarm clear command from the user interface.

Notes:

- Relay connections on the AC drive pcb are at terminal strip J9.
 - K5-NO = J9-9, K5-COM = J9-8

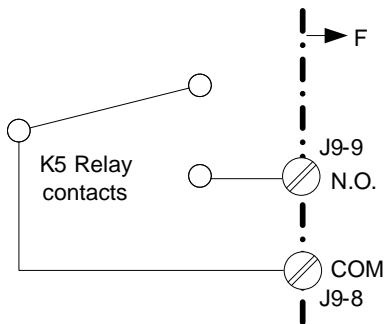


Fig. 4.12 AC interface relay K5

4.11.7 AC interface drive output relay K6 - J6

AC Interface relay K6 serves to interlock AC line power to an external drive through the interlock action of the safety relay on the AC interface. When the safety condition is true, the relay energizes connecting fused L1 and L2 respectively to L1 Safe(J6-2) and L2 Safe(J6-1) on connector J6. Each line is fused at 6.3 A.

Note:

- Relay connections on the AC drive pcb are at terminal strip J6
 - K6-NO = J6-2, K6-NO = J6-1

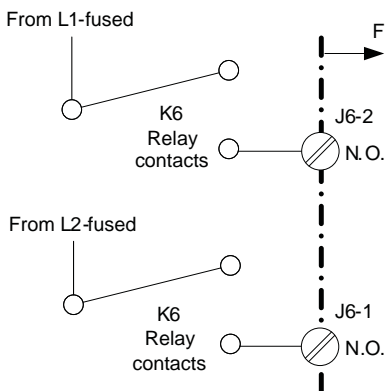


Fig. 4.13 AC interface relay K6

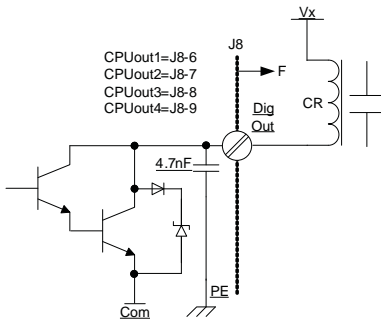


Fig. 4.14 CPU digital output example

4.11.8 KCM CPU digital outputs - J8

This is an example of one of four programmable digital outputs available from the KCM CPU pc board. This example is driving a relay-CR.

Notes:

- Four programmable outputs are available.
- Functions are programmed as <CPUout1, CPUout2, CPUout3, CPUout4>.
- A “low” output (sinking) condition = “true”.
- Maximum value of Vx = 40 Vdc. Maximum sink current = 100 mA
- Connections are made at the CPU pcb, terminal strip J8.
 - CPUout1 = J8-6
 - CPUout2 = J8-7
 - CPUout3 = J8-8
 - CPUout4 = J8-9

4.11.9 KCM CPU digital inputs - J8

This is an example of one of the four programmable digital inputs on the KCM CPU circuit card.

Notes:

- Maximum current from terminal 3, +24 Vdc, all connections, is 350 ma.
- A low input provides an ‘ON’ condition with <Normal> polarity.
- Connections are made at the CPU pcb, terminal strip J8.
- Vin maximum = 24 Vdc
- Functions are programmed as <CPUin1, CPUin2, CPUin3, CPUin4>.
 - CPUin1 = J8-1
 - CPUin2 = J8-2
 - CPUin3 = J8-3
 - CPUin4 = J8-4

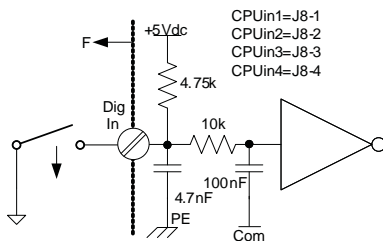


Fig. 4.15 CPU digital input example

4.11.10 KCM CPU analog output - J9

This circuit shows the analog output (0-20mA/4-20mA) that is available from the CPU pcb at terminal J9.

The output function is programmed via the I-O menu, Analog Output sub-menu.

- I Output (+) = J9-3
- I Output (-) = J9-4

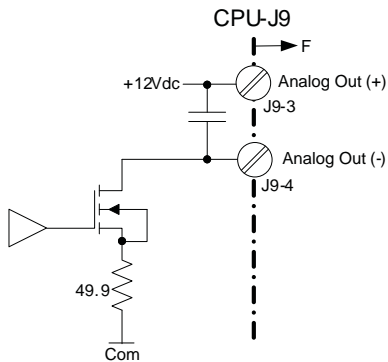


Fig. 4.16 CPU analog output circuit

4.11.11 KCM CPU analog input - J9

This circuit shows the selectable range analog input that is available at the CPU pcb at terminal J9.

The input function is programmed via the I-O menu, Setpoint Input sub-menu as parameter <SOURCE> = <CPU Analog>.

Use only one jumper at the required location for the voltage or current input used.

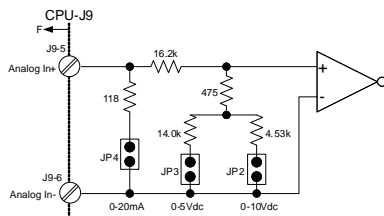


Fig. 4.17 CPU analog input circuit

Notes:

- JP2 = 0-10 Vdc
- JP3 = 0-5 Vdc
- JP4 = 0-20 mA
 - Input (+) = J9-5
 - Input (-) = J9-6
- 0-20mA/4-20mA with 100 Ω impedance
- 0-5 Vdc with 94.5 kΩ impedance
- 0-10 Vdc with 65.3 kΩ impedance

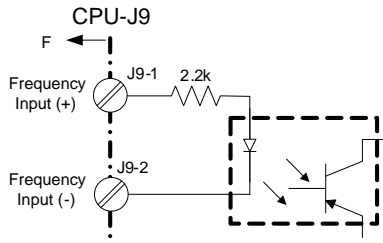


Fig. 4.18 CPU frequency input circuit

4.11.12 KCM CPU frequency input - J9

This circuit shows the frequency input that is available at the CPU pcb at terminal J9.

The input function is programmed via the I-O menu, Setpoint Input sub-menu as parameter <SOURCE> = <CPU =0-10kHz>. See the specific application programming manual for exact programming.

- Logic level = 5-12 Vdc for a “true”
- For 24Vdc Power supply use an additional 2.2kOhm resistor in series.
- Frequency range = 0-20 kHz
- Minimum pulse width = 15 μ sec
 - Freq input (+) = J9-1
 - Freq input (-) = J9-2

4.12 Connecting the KCM



- ▲ The KCM is auto-switching for AC power. No selection is required for 115 Vac or 230 Vac power lines.
-

It is necessary to make the following connections:

- Power line
 - DC drive motor, stepper motor, KV1-KV3 vibratory drive or AC interface application
 - Tachometer or speed pick-up for DC drives, the feedback coil for KV1-3 vibratory drives and the quadrature encoder output for the stepper drive
 - Necessary input/output connections for the alarm relay, for enabling signals and/or for any other I-O functions
 - Safety switch connections as required
 - Data lines to operating unit and/or SCADA.
-



- ▲ Do not put material into a feeder before running the motor. Motor direction must be determined before bulk material is added, or feeder damage may result.
-

4.12.1 General wiring instructions

- Do not run AC mains or DC Motor wiring in the same conduits with signal wiring.
- All wiring must be accessible for service.
- Use of solid conductor wire is not permitted.
- Wire insulation must be suitable for the applicable service.
- Cables are not included in the items supplied.
- The cables for the speed pick-up or tachometer and data connections have to be shielded.
- For some applications, it is beneficial to shield the drive power lines as well.
- Follow wire length limitations as specified.
- Use only the provided wiring diagram for connection. The schematics supplied in the appendix are for review only.
- Electrical connection diagram examples are found in the Appendix.
- If the KCM SS used in conjunction with the Hygiene mounting must be read the instructions in section [4.5](#).

4.12.2 Recommended wire sizes and maximum lengths

Connection	Wire sizes DIN mm ² and AWG and maximum lengths
AC power supply	Maximum: 2.5 mm ² or 12 AWG Minimum: 2.0 mm ² or 14 AWG according to regulations in your country
DC Motor armature and field	See section 12.1. for more information
Stepper motor windings	Maximum: 1.5 mm ² or 14 AWG, 100 m Minimum: 0.3 mm ² or 22 AWG, 30 m
Stepper motor tachometer	Maximum: 1.3 mm ² or 16 AWG, 100 m (shielded) Minimum: 0.3 mm ² or 22 AWG, 30 m (shielded) Scale interface pcb/encoder interface required for > 30 m See section 12.1. for more information
KV1-KV3 vibratory	Maximum: 2.5 mm ² or 12 AWG-shielded, 50 m Minimum: 1.0 mm ² or 16 AWG-shielded, 30 m See table in appendix
Relay K1-K6	Maximum: 2.5 mm ² or 12 AWG, 35 m Minimum: 1.0 mm ² or 16 AWG, 25 m
Velocity feed back-single ended	Maximum: 1.3 mm ² or 16 AWG, 30 m (shielded) Minimum: 0.5 mm ² or 24 AWG, 30 m (shielded)
Velocity feed back-differential (SIB installed) with Encoder Interface on Drive pcb	Maximum: 1.3 mm ² or 16 AWG, 300 m (shielded) Minimum: 0.5 mm ² or 24 AWG, 50 m (shielded)
Digital Input/output	Maximum: 1.3 mm ² or 16 AWG, 500 m (shielded) Minimum: 0.5 mm ² or 24 AWG, 500 m (shielded)
K-Port	Maximum: 1.3 mm ² or 16 AWG, 500 m (shielded) Minimum: 0.5 mm ² or 24 AWG, 500 m (shielded)
DC Power to KSU-II from KCM	Maximum: 1.3 mm ² or 16 AWG, 100 meters Minimum: 0.5 mm ² or 24 AWG, 20 meters

4.13 Power wiring; specific requirements

Use this section as a guideline for power wiring installation.



- ▲ Each KCM must have its own power mains disconnect or circuit breaker.
- ▲ The disconnecting means or circuit breaker must be in close proximity to the equipment and within easy reach of the operator.
- ▲ The disconnecting means or circuit breaker must be labeled as the disconnecting device for the connected equipment.
- ▲ There must be no power consuming components electrically connected between the supply mains and the disconnecting device.
- ▲ The disconnecting means or circuit breaker must not interrupt the protective earth conductor

4.13.1 Power mains disconnect requirements

Circuit breaker must meet IEC-898, UL-1077, VDE-0641 or CSA22.2-No.235. ABB S271 breaker with 'K' trip curve meets the requirement.

Note:

- Current limit is to be 15A maximum

4.13.2 Protective ground

Protective earth or ground connections must be made to KCM ground terminals with the indicated label.

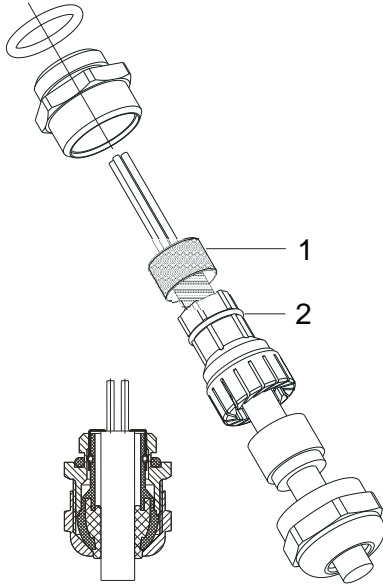
4.13.3 AC input wiring details to KCM

- KCM AC input terminals are: L1, L2, N-neutral, G-ground/PE
- For 115 VAC inputs, connect the hot wire to "L1" as it is fused. Connect the neutral wire to "N"
- For 2 phase (220-240VAC applications in the US) connect the first leg to "L1" and the second leg to "L2" which is also fused

4.13.4 Shielding and cable glands



- ▲ For operation in the allowed hazardous zone, only use certified explosion-proof cable glands and blind covers ATEX category 2GD on the KCM.



- ⇒ Connect the shields of all cable connections to low-impedance equi-potential bonding (< 0.1 ohm) via the cable glands on both sides.
- ⇒ Lay the shielding (1) evenly over the O-ring (2).
- ⇒ If the KCM SS used in conjunction with the Hygiene mounting must be read the instructions in section 4.5.

Fig. 4.19 Cable gland shielding

5 KCM Set-Up

5.1 Initial set-up for KCM CPU



▲ Do not open the KCM unless power has been removed and no explosive atmosphere is present.

5.1.1 CPU pc board jumper settings



- JP2 through JP4 selects the range for an analog input. A jumper can be in only one of those three locations
- When CPU_Analog_Out is selected, place the jumper into the required voltage or current location.

JP	Normal Position	Function
JP-1	1-2	[1-2] - normal processor operation [2-3] - processor reset
JP-2	1-2	Connect [1-2] for 0-10Vdc analog input.
JP-3	1-2	Connect [1-2] for 0-5 Vdc analog input.
JP-4	1-2	Connect [1-2] for 4-20 mA analog input.
JP-5	1-2	[1-2] - RS485-4 wire to Drive [2-3] - RS485, 2 wire to Drive
JP-6	1-2	[1-2] - RS485-4 wire K-Port1 [2-3] - RS485, 2 wire K-Port1
JP-7	1-2	[1-2] - RS485-4 wire K-Port2 [2-3] - RS485, 2 wire K-Port2
JP-8	1-2	Battery Connect. Remove jumper to disconnect battery



Make sure battery isolation paper is removed at commissioning. Replacement from the battery, see section [9.4](#).

5.1.2 KCM CPU DIP switch setting

Positions 1-5 set the address of the KCM on the K-Net. Positions 6-8 control the function of the K-Port channel #1.



▲ Off = <0>, On = <1> for each switch position

5.1.3 KCM addressing with CPU DIP switch positions 1-5

Address	SW1	SW2	SW3	SW4	SW5
0	Off	Off	Off	Off	Off
1	On	Off	Off	Off	Off
2	Off	On	Off	Off	Off
3	On	On	Off	Off	Off
4	Off	Off	On	Off	Off
5	On	Off	On	Off	Off
.....					
31	On	On	On	On	On

Note:

- The address of <00000> as set above is a special case. If the switch is set to <00000>, the KCM address is set under software control via the user interface.

5.1.4 K-Port 1 function via KCM CPU DIP switch positions 6-8

K-Port #1 Function	SW6	SW7	SW8
Software controlled	Off	Off	Off
Set for KSU-II use	On	Off	Off
Set for KSL use	Off	On	Off
Set for KMB, 19.2 kbaud (K-Vision, KSC or PC Tool) use	On	On	Off
Set for KMB, 38.4 kbaud (KSC or PC Tool) use	Off	Off	On



When Dip Switch 6-8 are ON for more than 2 seconds (under power), the config port is set to User IF.

5.1.5 K-PROM configuration



The K-PROM stores the actual data only on power shutdown not on CPU reset.

The K-PROM must be installed on the KCM CPU pc board and it will be loaded by the Config port connection for communications or via the user interface for operations. The K-PROM can be moved from a failed KCM to a replacement KCM as the parameter and communication data are stored therein. This exchange eliminates the need for controller re-programming.

The K-PROM is installed upside down on the KCM CPU circuit card in the location marked "K-PROM card". It is secured by an M3 screw.



Fig. 5.1 K-PROM

5.1.6 Display backlight control

The KCM-GD 3.5 inch LCD display has auto dimming to prolong the life of the display module. If no operator activity occurs for many hours, the display will auto dim.

Hitting any key will bring the display back to full brightness.

5.1.7 Setting display brightness

Press ESC and 7 to decrease, ESC and 9 to increase the display brightness manually.

5.2 Initial set-up for KCM drives



- ▲ Each drive board incorporates a DIP switch for programming. Pick the correct chart for each.
- ▲ Each drive board also requires settings for on-board jumpers. See drive specific charts for those as well.
- ▲ Off = <0>, On = <1> for each DIP switch position
- ▲ AC Drive, 450/1600W DC drive and vibratory DIP switch address setting is different from the Stepper drive.

5.2.1 Drive jumper settings-all drive types listed

These settings must be made for all KCM drives. See below.

Notes:

- Digital input #1 or #2 must be set <True-On-1> to perform the programmed function
- A <True> condition is at least a +5 Vdc input
- Different drives use different JP jumpers for the specified function

450 W DC	1600 W DC	Steppers	Vibratory	AC	Normal Position	Function
JP-3	JP-1	JP-1	JP-3	JP-1	1-2	[1-2] - RS485-4 wire to SFTs [2-3] - RS485, 2 wire Position [1-2] is normal
JP-1	JP-3	JP-2	JP-1	JP-3	1-2	[1-2] - Digital Input #1 input set for a pull-up resistor. Input is active low. [2-3] - Digital Input #1 input set for a pull-down resistor. Requires an active high to force off.
JP-2	JP-2	JP-3	JP-2	JP-2	1-2	[1-2] - Digital Input #2 input set for a pull-up resistor. Input is active low. [2-3] - Digital Input #2 input set for a pull-down resistor. Requires an active high to force off.

5.3 DC drive set-up

5.3.1 DC drive selection notes:

- The 450 W DC drive provides a max at 2.50 Amps out. For 100 V motors this corresponds to a max nameplate power of 240 W. For 200 V motors this corresponds to a max nameplate of 500 W.
- The 1600 W DC drive provides a maximum at 8.0 Amps out. For 100 V motors this corresponds to a max nameplate power of 800 W. For 200 V motors this corresponds to a max nameplate of 1600 W.
- The 450 W drive includes a voltage doubler that allows it to drive 180 V / 200 V motors from a 115 VAC input.
- The 1600 W drive does not have a voltage doubler, so to drive 180 V / 200 V motors it must have a 230 VAC input.
- DC drives auto-detect the input line voltage

5.3.2 DC Motor selection table by drive type and line voltage

Drive Rating Watts	Nominal AC Input VAC	Motor Voltage VDC	Nameplate Motor Power Watts (max)
450	115 / 230	90	225
450	115 / 230	100	250
450	115 / 230	180	450
450	115 / 230	200	500
1600	115 / 230	90	720
1600	115 / 230	100	800
1600	115	180	not allowed
1600	230	180	1440
1600	115	200	not allowed
1600	230	200	1600

5.3.3 450/1600 Watt DC drive pc board DIP switch settings

Action	Switch Pos	Range
Tachometer Pulses per revolution	1	Off = 100 On = 120
Tachometer signal type	2	Off = single channel encoder On = dual channel encoder
Drive address	3, 4, 5	(345) 000 = 0, 001 = 1, 010 = 2, 011 = 3 111 = 7
Not used	6	

5.3.4 Additional jumper settings for 450 watt drive

JP	Normal Position	Function
JP-4	1-2	[1-2] - SLM/KCM control [2-3] - K10S protocol Position [1-2] is normal
JP-5	1-2	[1-2] - SLM/KCM control [2-3] - K10S protocol Position [1-2] is normal

5.4 AC drive set-up

5.4.1 AC drive interface pc board DIP switch settings

Action	Switch Pos	Range
Analog Output	1	Off = 0-20 mA On = 4-20 mA
Function of MDU Input 2	2	Off = KCM programmable On = MDU alarm input
Output frequency range	3, 4	(34) 00 = 10 kHz, 10 = 15 kHz, 01 = 20 kHz, 11 = 25 kHz
Drive address (1-4)	5, 6	(56) 00 = 1, 10 = 2, 01 = 3, 11 = 4

5.5 Stepper drive set-up (all types)

5.5.1 Stepper motor programming table

Feeder Type	Max Motor RPM	Maximum Power Setting-W	Required Stepper Drive
BSP100	60	49	0000001430 0000005987
BSP125	60	49 or 194	0000004568 (194 watts) 0000001430 (49 watts) 0000005987
BSP135	60	194	0000004568 0000005987
BSP150-S	120**	194	0000004568 0000005987
KM-T12	150	43	0000005987 0000001430

5.5.2 Stepper drive pc board DIP switch settings

Action	Switch Pos	Range
Drive address (0-3)	1, 2	(12) 00 = 0, 10 = 1, 01 = 2, 11 = 3
Output current at STOP condition	3	Off = 0% current to stepper motor during a stopped condition. On = 50% current to stepper motor to hold its position during a stopped condition. Off = normal.
Tachometer signal type	4	Off = single channel encoder On = dual channel encoder

5.6 Vibratory drive set-up



For loss-in-weight feeding or loss-in-weight batching only.

5.6.1 Vibratory drive pc board DIP switch settings

Action	Switch Pos	Range
Drive address (1-7)	1, 2, 3	(123) 000 = 0, 001 = 1, 010 = 2, 011 = 3 111 = 7
Operating mode	4	Off = normal operation On = reset cold start frequency

5.6.2 Vibratory drive adjustment



⇒ Set the <Vibratory Type> parameter in the MACHINE Menu according to the type of vibratory drive. i.e. KV1...KV3.

The displacement of the vibratory controller has to be adjusted via the operator interface in the in the <MACHINE> menu, parameter <Vibratory Span>.

Program the feedfactor values according to the following list.

⇒ This values are set in the <CALIBRATION> menu <FEEDFACTOR> sub-menu:

- MF@8% Drive Command
- MF@12% Drive Command
- MF@17% Drive Command
- MF@23% Drive Command
- MF@33% Drive Command
- MF@50% Drive Command
- MF@70% Drive Command
- MF@100% Drive Command

⇒ Enter a starting setpoint according to the following chart <Setpoint to enter>.

Vibratory Type	Setpoint to enter	Expected Displacement	Max. Displacement
KV1	50 kg/hr	0.75 mm	1.0 mm
KV2	66 kg/hr	1.0 mm	1.5 mm
KV3	50 kg/hr	0.75 mm	2.0 mm



Fig. 5.2 Displacement label

1. Switch the feeder to <Volumetric> mode.
2. Start the feeder.
3. Read displacement from label on vibratory drive.
4. Calculate <Vib Span> according to the following formula.

Vibratory span formula:

New <Vib Span> = (Displayed Vib Span)* (expected displacement/Actual displacement.)

5. Enter calculated new <Vib Span> in the MACHINE menu.

Example: Vibratory type = KV2, actual displacement = 1.1 mm, displayed <Vib Span> = 1.000

$$\text{New <Vib Span>} = 1.00 * (1.0 \text{ mm}/1.1 \text{ mm}) = 0.9$$

5.7 GWB Application drive set-up



For operating and programming see project manual.

The GWB (gain-in-weight batching) mode allows up to 8 feeders to fill batches into one container in sequence. The increase in weight in the collector container is measured. The weight information from the scale is used to control the feeders.

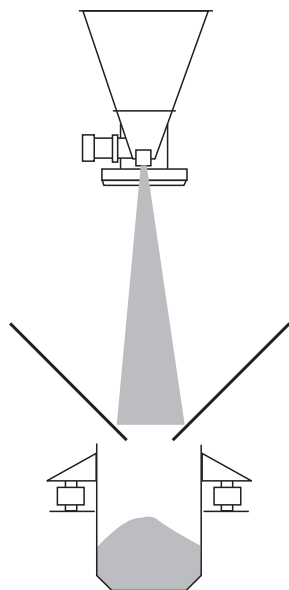


Fig. 5.3 GWB Mode

5.7.1 GWB Hardware overview

Each ingredient feeder requires a KCM Drive board. All KCM Drive boards are usable:

- 450 watt DC Motor drive
- 1600 watt DC Motor drive
- Stepper motor drive
- Vibratory drive
- AC Interface.

Each motor drive board must be uniquely addressed from 1 to 8.

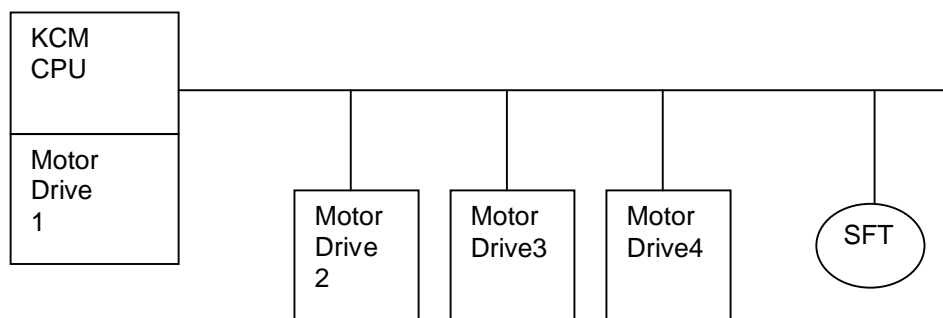


Fig. 5.4 KCM GWB Overview

i

- The KCM stepper and the AC interface boards can only have address 1 to 4 so no it is not possible to use these units for feeder 5 .. 8
- Addressing the Motor Drive Boards using their DIP switches.
- When using the KCM GWB with several motor drive boards (MDU), it is critical to address the MDU boards. It is important to have the motor drives start with address 0,0,0. There are eight ingredient feeders possible with the GWB, and the motor drive boards have addresses selected by three or two dip switches. The board addresses based on the switches range from 0 .. 7, and represent ingredient feeder numbers of 1..8. It is important to start with ingredient 1 and go up from their without skipping. In other words, if there are three ingredients to be a GWB system, the drive boards should have 0,0,0, then 0,0,1 then 0,1,0 as the board

5.7.2 Setup DC Drive Boards

Both of these DC Motor drive boards have a 6 position DIP switch to set the address. The address is based on switches 3, 4, and 5. as shown below.

SW3	SW4	SW5	Ingredient Address
0	0	0	1
0	0	1	2
0	1	0	3
0	1	1	4
1	0	0	5
1	0	1	6
1	1	0	7
1	1	1	8

5.7.3 Setup Vibrator Drive Boards

The Vib. Drive board has a four position DIP switch. The addresses are based on switches 1, 2, 3 as shown below.

SW1	SW2	SW3	Ingredient Address
0	0	0	1
0	0	1	2
0	1	0	3

SW1	SW2	SW3	Ingredient Address
0	1	1	4
1	0	0	5
1	0	1	6
1	1	0	7
1	1	1	8

5.7.4 Setup Stepper Drive Boards

The Stepper bd. has a 4 position DIP switch and due to needing two other hardware flags, there are only two DIP switches used for setting the address of the board as shown below.

SW1	SW2	Ingredient Address
0	0	1
0	1	2
1	0	3
1	1	4

5.7.5 Setup AC Drive Boards

The AC Interface board has a 6 position DIP switch. There are only two DIP switches used for setting the address of the board, these are switches numbered 5 and 6 as shown below.

SW5	SW6	Ingredient Address
0	0	1
0	1	2
1	0	3
1	1	4

6 Transportation, Storage, Disposal

6.1 Notes on transportation

When transporting the KCM off-site, use the saved packing material provided in the original shipment and re-package the KCM as received.

6.2 Notes on storage

To store the KCM, secure unit in the anti-static packing materials. The storage location must be clean and dry and not exceed the rated storage temperature limits as stated.

6.3 Notes on disposal

If the KCM is to be disposed, follow procedures for industrial electronic disposal as required by law.

7 Operation



- ▲ Do not open the KCM unless power has been removed and no explosive atmosphere is present.
- ▲ Allow 3 minutes for power to dissipate prior to opening the enclosure.
- ▲ Do not operate machinery unless all guards are in place and all safety checks have been made.
- ▲ Keep people away from the machine while in operation.
- ▲ The KCM must only be installed, wired, programmed and put into service by authorized personnel.



- ▲ The user must be trained in operation of the KCM control system prior to first operation.
- ▲ Skills to operate and service the equipment can be gained through the Coperion K-Tron (Switzerland) LLC Institute.

7.1 Initial operation

- ⇒ Be sure that all wiring has been correctly completed.
- ⇒ Verify that all equipment is properly installed and secure.
- ⇒ Power the KCM and separate user interface if provided
- ⇒ Verify the KCM or other display executes its start-up sequence.
- ⇒ Refer to the appropriate manual for either programming or running the KCM controller.

7.1.1 KCM-SD LED status display

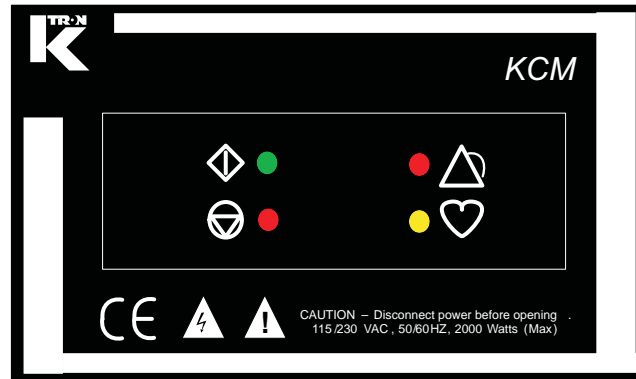
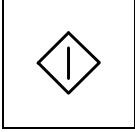
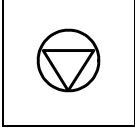
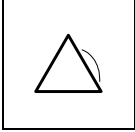
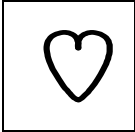


Fig. 7.1 KCM-SD LED status display

7.1.2 LED function listing

LED	LED name	Function
	RUN LED	Illuminates when the feeder is in operation.
	STOP LED	Power check. Illuminates when the feeder system has been switched on but no feeding operations are currently in process.
	ALARM LED	When an alarm is first detected, the LED illuminates.(Pending alarm condition) If the alarm persists, once the alarm delay time has passed, the LED flashes to indicate a hard alarm. The alarm relay will activate if programmed.
	HEARTBEAT LED	Blinks as the KCM CPU is running.



When using the KCM with a display and keypad mounted to its surface (KCM-KD), refer to the operating manual for operational information.

7.2 Emergency stop procedure

- Each KCM must have a main switch to supply its main power.
 - The main switch should be within easy reach of the operator
- ⇒ To shutdown the KCM quickly, switch off the appropriate main switch.

7.3 Switching ON and OFF

- ⇒ Use the main switch to remove or apply power to the KCM.
- ⇒ Use the front mounted LEDs to verify power has been applied.
- ⇒ Review the project manual to operate the feeding equipment respectively.

8 Cleaning



- ▲ The front cover is Part of the ignition protection and it must not be opened unless power has been removed and no explosive atmosphere is present.
- ▲ If the KCM SS used in conjunction with the Hygiene mounting must be read the instructions in section 4.5.

⚠ DANGER

- ▲ Remove all power and wait 3 minutes before opening enclosure for internal cleaning.

⚠ WARNING

- ▲ Do not use corrosive cleaning agents.
- ▲ Wear protective gloves and eye protection when using cleaning solutions.
- ▲ Do not allow any dust or moisture to penetrate the enclosure.

CAUTION

- ▲ Always wear an anti-static wrist strap when working with sensitive electronic assemblies to prevent static damage.

- ⇒ To clean externally, use a damp cloth to remove debris using normal industrial cleaners.
- ⇒ Only clean the external portions of the KCM with its enclosure fully closed.
- ⇒ Only use cleaners that meet the following specifications.
5.0 < ph < 8.5



- Phillips screwdriver is required to open the swing panel.

Notes:

- If it is necessary to clean the internal printed circuit board components, use only dry, clean air at a maximum pressure of 4 bar or 60 psi.
- Never permit conductive materials to come in contact with the KCM internal printed circuit boards.

9 Maintenance



- ▲ The front cover is Part of the ignition protection and it must not be opened unless power has been removed and no explosive atmosphere is present.
- ▲ If the KCM SS used in conjunction with the Hygiene mounting must be read the instructions in section 4.5.

 **DANGER**

- ▲ During operation and immediately after shut-down, the capacitors and, therefore, the printed circuit boards of the KCM are under high voltage. For this reason, before opening the KCM.
 1. Disconnect the KCM from the power supply.
 2. Wait at least 3 minutes before opening the KCM.

CAUTION

- ▲ Always wear an anti-static wrist strap when working with sensitive electronic assemblies to prevent static damage.

9.0.1 Required skills/training for maintenance of the KCM

The service person must be skilled in power electronics, explosion protection and trained to service the KCM.

9.0.2 General tools required



- Small flat blade screwdriver
- Phillips screwdriver

9.1 Preventive maintenance

Carry out the following preventive maintenance work after every 10,000 hours of operation or yearly:

- ⇒ Parameter Backup. Backup from Parameters and communication configuration.
- ⇒ Check for damage and/or corrosion on the screwed connections, particularly the AC line and motor drive terminals.
- ⇒ Check the security of all connections and cable glands.
- ⇒ Check the operational readiness of all external safety switches or interlocks.

9.2 Parameter Backup

There are 2 methods for parameter backup.

- Parameter Backup in the KCM-K PROM (see programming instructions).
- The data can be read with a separate software - Paramstore (procedure see Paramstore instructions).

9.3 KCM fuse replacement



- ▲ The front cover is Part of the ignition protection and it must not be opened unless power has been removed and no explosive atmosphere is present.



- ▲ Do not replace any fuse while under power.
- ▲ Wait 3 minutes after disconnecting KCM power prior to opening the case.

Notes:

- Some fuses are self-resetting and require no replacement.
- Fuse replacement begins at section [9.3.4](#).
- It is important to discover the reason for overloading the fuse that protects the +24 Vdc I-O supply and correct the problem prior to re-applying power.
- Self resetting fuses may automatically reset if the problem is resolved even without disconnecting line power.
- Drive pcb numbers are shown for identification.

9.3.1 Auto-resetting drive fuses

Each drive uses auto-resetting fuses. Follow the next procedure to permit reset.

9.3.2 Resetting auto-resetting fuses

1. Switch off KCM power.
2. Find the source of overload and correct the problem.
3. Wait one minute, the fuse will reset.
4. Re-power KCM.

9.3.3 List of auto resetting fuses

The following is a list of the function for each auto-resetting fuse in each drive.

- 1600 watt DC Motor drive:
 - F3: Failure will cause power loss of 24 Vdc at the I-O.
 - F4/F5: Failure will cause power loss to the KCM CPU.
- 450 watt DC Motor drive
 - F3: Failure will cause power loss of 24 Vdc at the I-O.
- Vibratory Drive:
 - F2: Failure will cause power loss of 24 Vdc at the I-O.
- Stepper drive-0000005987 only
 - F2: Failure will cause power loss of 24 Vdc at the I-O.
 - F1/F3: Failure will cause power loss to the KCM CPU.
- Stepper drives-0000004568 and 0000001430 only
 - F1: Failure will cause power loss of 24 Vdc at the I-O.
 - F2/F3: Failure will cause power loss to the KCM CPU.
- AC Drive Interface:
 - F3: Failure will cause power loss of 24 Vdc at the I-O.
 - F4/F5: Failure will cause power loss to the KCM CPU.

Note:

- The fuses described next are replaceable.

9.3.4 Replacing fuses



- ▲ The front cover is Part of the ignition protection and it must not be opened unless power has been removed and no explosive atmosphere is present.



- ▲ Do not replace any fuse while under power.
- ▲ Wait 3 minutes after disconnecting KCM power prior to opening the case.

-
1. Disconnect power from the KCM via approved lock-out/tag-out procedures.
 2. After waiting 3 minutes, open the KCM cover.
 3. Identify the faulty fuse and replace with correct fuse.
 4. Close cover on KCM and return to service.

9.3.5 1600 watt DC Motor drive fuse location-0000002610

Following fuses are (5x20 mm, slow-blow) used:

F1/F2 -12.5AT, 5x20 mm, 250Vac fuse.

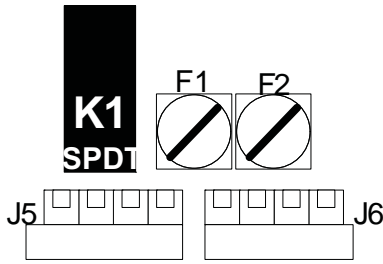


Fig. 9.1 Fuse location,
1600 W DC Motor drive

9.3.6 450 watt DC Motor drive fuse location-0000007405

Following fuses are (5x20 mm, slow-blow) used:

F1/F2-6.3AT, 5x20 mm, 250Vac fuse.

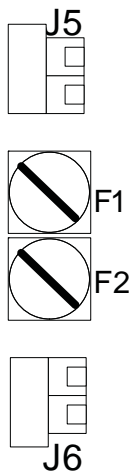


Fig. 9.2 Fuse location,
450 W DC Motor drive

9.3.7 Vibratory drive fuse location-000000684

Following fuses are (5x20 mm, slow-blow) used:

F1- 2.0AT, 5x20 mm, 250Vac fuse.

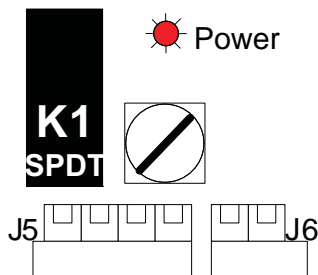


Fig. 9.3 Fuse location, vibratory drive

9.3.8 AC motor drive interface fuse location-000003413

Following fuses are (5x20 mm, slow-blow) used:
F1/F2-6.3AT, 5x20 mm, 250Vac fuse.

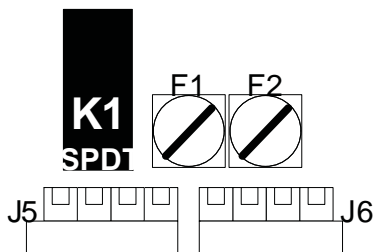


Fig. 9.4 Fuse location, AC interface

9.3.9 Stepper drive interface fuse location-0000005987

Following fuses are (5x20 mm, slow-blow) used:
F4-2.0AT, 5x20 mm, 250Vac fuse.

Note:

The HiPo and LoPo stepper have no replaceable fuses.

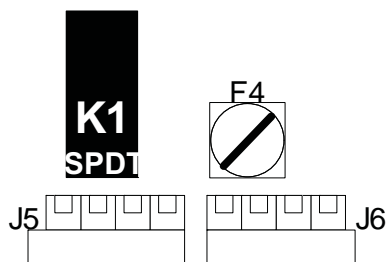


Fig. 9.5 Fuse location, Stepper Drive

9.4 Battery replacement



- ▲ The front cover is Part of the ignition protection and it must not be opened unless power has been removed and no explosive atmosphere is present.
- ▲ Danger of an explosion exists if battery is incorrectly replaced.
- ▲ Order Batteries directly from Coperion K-Tron (Switzerland) LLC 9104-40001 or:

Manufacturer	Renata	Energize	Duracell
Type	CR2032	CR 2032	DL2032D



- The KCM periodically tests the battery by applying a small resistive load and then measuring the battery voltage. If the measured voltage is less than 2.5 volts, an alarm 'Battery Low' is posted.
 - The expected battery life is at least five years if the KCM is typically powered up.
 - If the KCM is powered down, the battery hold up life is approximately two years.
 - Replace battery only with the same or recommended equivalent type.
 - Dispose of used battery according as required by law.
1. Switch off power to the KCM.
 2. Wait for three minutes prior to opening KCM cover.
 3. Open KCM.
 4. Replace battery BT1.
 5. Re-install cover.
 6. Return KCM to service.

9.5 KCM service connections

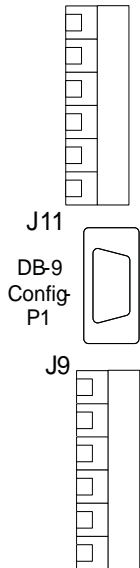


Fig. 9.6 KCM Config port on CPU pcb

The Config data ports are service connections to the KCM. Service connection to the KCM is possible by the USB port (J13) or the RS-232 port (P1). A PC with Coperion K-Tron (Switzerland) LLC applications such as Loader, SmartConfig and ParamStore are used with the KCM to upload new application programs, upload custom <KGR> data communications files and to download entered operating parameters respectively.

⇒ To access the Config ports, merely open the KCM front cover. The Config DB-9 port and the USB port is on the cpu pc board on the back of the front panel cover.

To use the USB, connect a cable from your computer to this port. The cable is the USB A to B type.

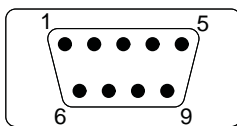


Fig. 9.7 Config port connections RS232

Use a standard female to female DB-9 connector with a null modem between the KCM Config port on the KCM CPU pcb and the PC.

This table provides wiring for the Config port connector.

- 2 = RxD, Receive data
- 3 = TxD, Transmit data
- 5 = Signal common

Note:

- A null modem cable is required for connection to a PC.
- The PC requires an RS232C serial port.

9.5.1 Forcing the Config Port to UserIF protocol

Use this procedure to reset the Config Port to the UserIF protocol for reading KCM menu and parameter data with a connected PC.

1. Power the KCM.
2. Using the S1 DIP switch on the KCM CPU pcb, place switches 6, 7, 8 in the "ON" position for at least two seconds.
3. KCM Config port will then become UserIF protocol configured.
4. Return switches 6, 7, and 8 to the "OFF" or original positions.

9.5.2 USB

The USB Port is designed to duplicate all functions of Config port using USB cable to a PC.

10 Troubleshooting



- ▲ The front cover is Part of the ignition protection and it must not be opened unless power has been removed and no explosive atmosphere is present.

10.1 General information on fault detection



- ▲ Immediately after shut-down, the capacitors and, therefore, the conducting parts of the KCM are under high voltage.

For this reason, before opening the KCM:

- Disconnect the KCM from the power supply;
- Wait the prescribed time of 3 minutes.

10.2 KCM CPU LEDs



▲ It is dangerous to open the KCM cover without removing power as high voltage is present on the Drive printed circuit board.

Use the internal LEDs to evaluate KCM function. A listing is provided to help diagnose problems.

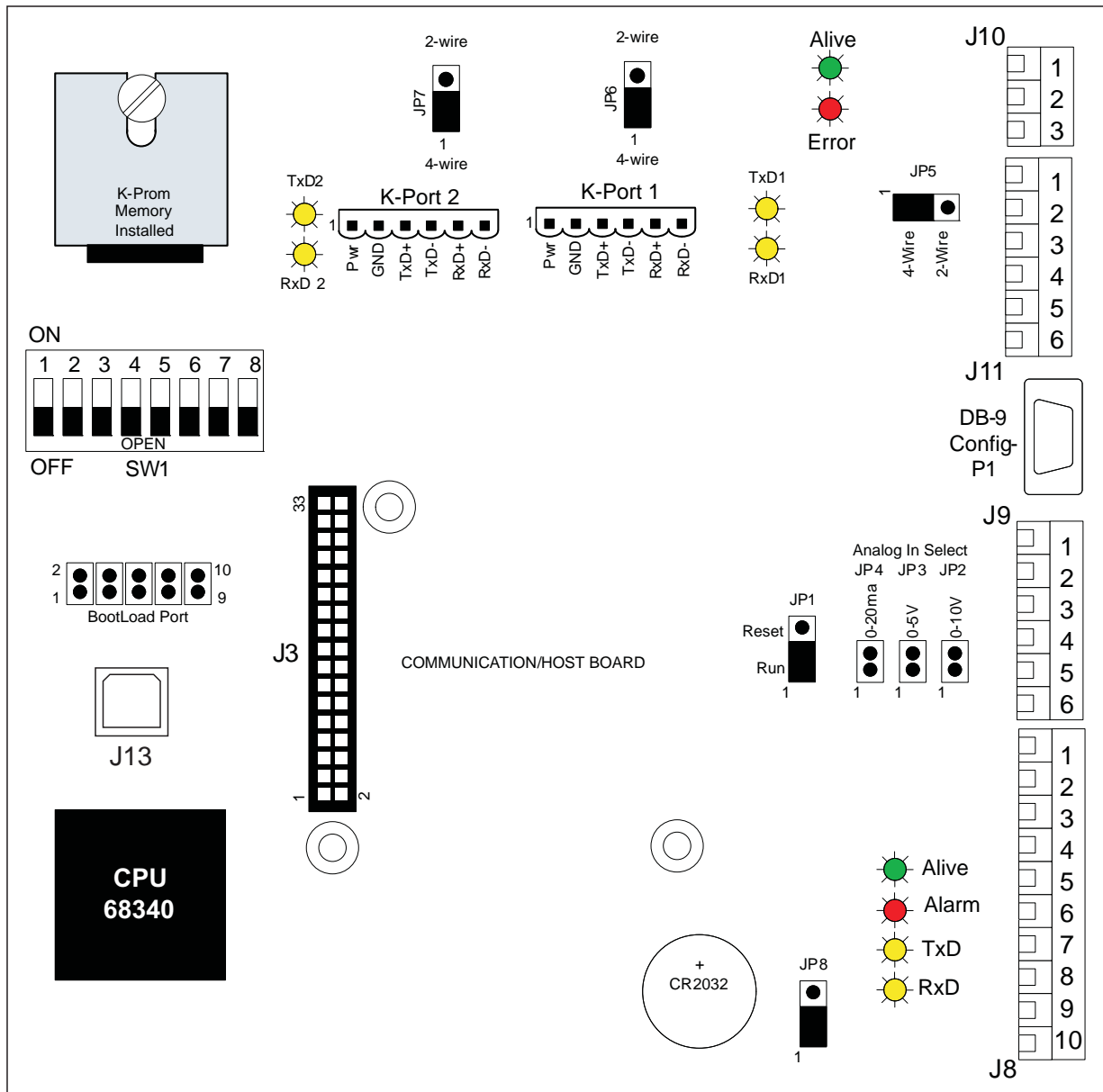


Fig. 10.1 KCM CPU LED locations

10.2.1 CPU pc board LEDs

Refer to [Fig. 10.1](#) for locations on cpu pcb near location J8.

LED	Function	Notes
Alive	CPU is operational	If not flashing, CPU has failed or has no power.
TxD	Transmit data on the internal channel	Data is being sent to the drive pc board on the Internal data channel. CPU is the channel master.
RxD	Receive data on the internal channel	Data is being received from the drive pc board on the Internal data channel. CPU is the channel master.
Alarm	Alarm function	KCM pc board has an alarm condition

10.2.2 K-Port LEDs

Refer to [Fig. 10.1](#) for locations on cpu pcb near location J14/J15.

LED	Function	Notes
TxD1	Data transmitting from K-Port #1	Data is being sent to a KSU-II, KSL or KSC user interface. If a problem, check K-Port #1 programming.
RxD1	Data received into K-Port #1	Data is received from a KSU-II, KSL or KSC user interface. If a problem, check K-Port #1 programming.
TxD2	Data transmitting from K-Port #1	Data is being sent to a KSU-II, Modbus I-O or KSC user interface. If a problem, check K-Port #2 programming.
RxD2	Data received into K-Port #2	Data is received from a KSU-II, Modbus I-O or KSC user interface. If a problem, check K-Port #2 programming.
Alive	K-Port is active	If not flashing, K-Port has failed.
Error	Indicates a K-Port error	K-Port has an alarm condition

10.3 KCM Drive and Power Supply Details

There are a series of drive circuit boards used for a variety of drive application. A listing is below.

Note:

- The 0000005987 stepper drive replaces both the LoPo and HiPo stepper drive when available.

10.3.1 Drive board LEDs

The next image is the 1600 watt DC Motor drive showing LED positions. Other drives will have the LEDs in different locations. Please be careful.

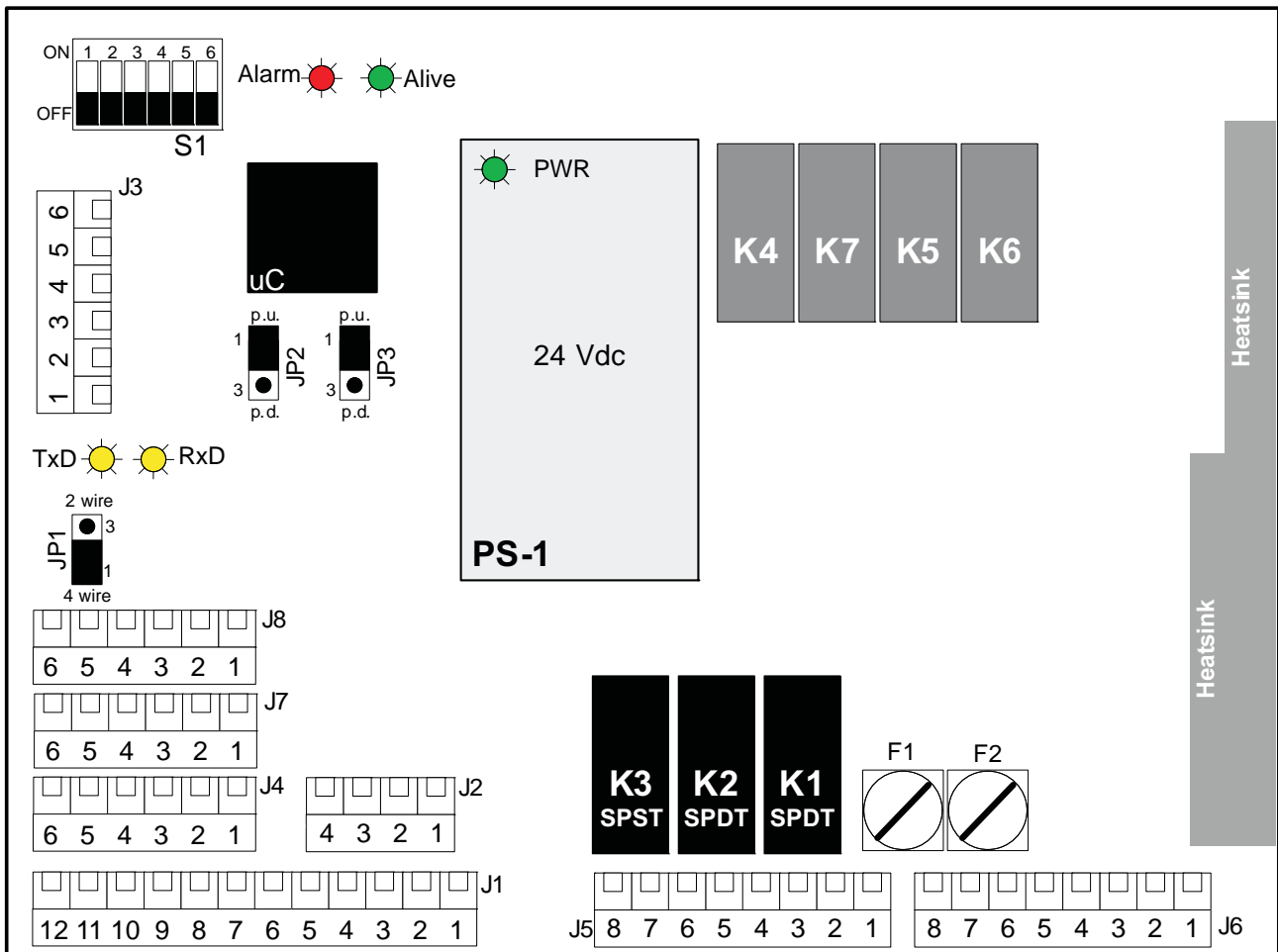


Fig. 10.2 1600 watt DC drive LED locations-0000002610

10.3.2 KCM Drive pc board LEDs-all types

LED	Function	Notes
Alive	CPU is operational	If not flashing, Drive has failed or has no AC line power
TxD	Transmit data on the internal channel	Data is being sent to the KCM CPU pc board on the Internal data channel. CPU is the channel master.
RxD	Receive data on the internal channel	Data is being received from the KCM CPU pc board on the Internal data channel. CPU is the channel master.
Alarm	Alarm function	Drive pc board has an alarm condition. Marked as <Error> on the AC interface pc board.
Power	Shows power at drive	Only on the Vibratory drive.

Note:

- Power supplies mounted on the drive pc board surface may also have LEDs indicating operation. If Off, check line power.

10.3.3 Measuring motor power

Connect an external current/power measuring device only to the AC current input of the KCM, as the control of the motor takes place via pulse width modulation and the current to the motor cannot be measured using conventional instruments.

10.3.4 Measure and adjust speed frequency signal

The speed signal is a square-wave signal from 0 to 10.8 kHz/5 V DC. The signal can be measured at the following locations:

- At the feeder: connect oscilloscope between common and signal.
- At the KCM: connect oscilloscope between J2-4 (COM) and J2-2- (signal).

Notes:

- If a scale interface pcb is used, connect to LK4-42 for common and check the signal at LK-4 pins 47 and 48 for complementary frequency signals. Amplitude of the waveform will be about 3.5 vdc.
- The gap between the pick-up gear and the face of the pick-up is critical to feeder operation. If the gap is too large the waveform and frequency from the sensor will not be correct. If the gap is too close, pick-up damage will result. A piece of paper is a practical gapping tool.
- Set pick-up and check the gap and the waveform.
- Normally the speed pick-up is located near the motor shaft of the feeder drive motor.

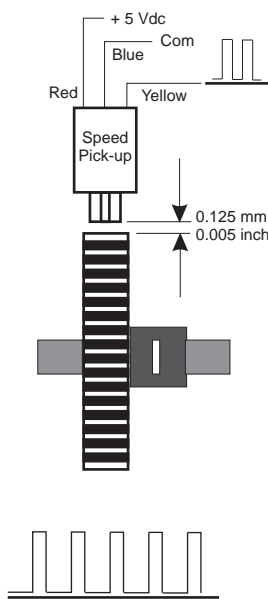


Fig. 10.3 Speed pick-up adjustment

10.4 DC Motor drive problems and solutions

Note

- Before you change one of the programming variables, check the parameter against standards.

Problem	Possible Cause	Remedy
Motor does not start.	<ul style="list-style-type: none"> • No setpoint from KCM. • Safety switch is active. • Motor cable has been disconnected. • Failed motor. 	<ul style="list-style-type: none"> ⇒ Enter setpoint at operating unit. ⇒ Check safety switch on the feeder or its connection at KCM. ⇒ Check motor cables. ⇒ Replace motor. ⇒ Check for alarms that might stop the machine. ⇒ Check display status for <Wait>, <Disa>, <Alsh>. ⇒ Check that KCM has power.
Motor runs at maximum speed.	<ul style="list-style-type: none"> • Speed sensor has failed. • If scale interface pc board (SIB) is used, the SIB has failed. • Setpoint is too high. 	<ul style="list-style-type: none"> ⇒ Check signal, replace sensor. ⇒ Check signal, if pick-up is OK, and SIB is used, replace SIB. ⇒ If signals are OK, replace KCM. ⇒ Reduce setpoint.
Motor does not achieve desired speed.	<ul style="list-style-type: none"> • Incorrect motor power setting. • Incorrect gear teeth setting. 	<ul style="list-style-type: none"> ⇒ Check programming.
Alv LED is <Off>	<ul style="list-style-type: none"> • No AC power to drive • Drive has failed 	<ul style="list-style-type: none"> ⇒ Check input power for proper connections. ⇒ Replace drive.

10.5 Vibratory drive problems and solutions

Note

- Before you change one of the programming variables, check the parameter against standards.

Problem	Possible Cause	Remedy
Vibratory does not start.	<ul style="list-style-type: none"> • No setpoint from KCM. • Safety switch is active. • • Power cable is disconnected. • Failed drive unit. 	<ul style="list-style-type: none"> ⇒ Enter setpoint at operating unit. ⇒ Check safety switch on the feeder or its connection at KCM. ⇒ Check vibratory power cables. ⇒ Replace motor. ⇒ Check for alarms that might stop the machine. ⇒ Check display status for <Wait>, <Disa>, <Alsh>. ⇒ Check that KCM has power.
Tray runs at maximum displacement.	<ul style="list-style-type: none"> • Displacement sensor has failed. • Setpoint is too high. 	<ul style="list-style-type: none"> ⇒ Check signal, replace sensor. ⇒ If signals are OK, replace KCM. ⇒ Reduce setpoint.
Tray displacement does not reach desired value.	<ul style="list-style-type: none"> • Incorrect vibratory programming. • Displacement sensor not set correctly. 	<ul style="list-style-type: none"> ⇒ Check programming. ⇒ Check displacement sensor.
Alv LED is <Off>	<ul style="list-style-type: none"> • No AC power to drive • Drive has failed 	<ul style="list-style-type: none"> ⇒ Check input power for proper connections. ⇒ Replace drive.

10.6 Stepper drive problems and solutions

Note

- Before you change one of the programming variables, check the parameter against standards.

Fault	Possible Cause	Remedy
Motor does not run. Alarm LED is <Off>.	<ul style="list-style-type: none"> • No setpoint from KCM. • No Drive Enable signal. • Safety switch is open. • No AC power. 	<ul style="list-style-type: none"> ⇒ Enter operating setpoint. Press <Start>. ⇒ Check for Drive Enable signal now. ⇒ Check safety switch input. ⇒ Enter setpoint at operating unit. ⇒ Check safety switch on the feeder or its connection at KCM. ⇒ Check motor cables. ⇒ Replace motor. ⇒ Check for alarms that might stop the machine. ⇒ Check display status for <Wait>, <Disa>, <Alsh>. ⇒ Check that KCM has power.
Motor does not run. Alarm LED is <On>.	<ul style="list-style-type: none"> • Motor cable fault. • Motor short. • Motor is overloaded. 	<ul style="list-style-type: none"> ⇒ Check motor cable and motor. ⇒ Check reason for motor overload and correct.
Motor does not reach desired speed.	<ul style="list-style-type: none"> • Inadequate motor power • Setpoint is too high. • Motor speed not smooth. 	<ul style="list-style-type: none"> ⇒ Check load on motor. ⇒ Verify motor power programming against label on stepper motor. ⇒ Reduce setpoint.
Alarm LED indicates over temperature	<ul style="list-style-type: none"> • Load is too high • Ambient temperature is too high 	<ul style="list-style-type: none"> ⇒ Reduce motor load. ⇒ Reduce operating temperature.
Alv LED is <Off>	<ul style="list-style-type: none"> • No AC power to stepper drive • Stepper drive has failed 	<ul style="list-style-type: none"> ⇒ Check input power for proper connections. ⇒ Replace stepper drive.
Alarm LED is blinking a specified count	<ul style="list-style-type: none"> • Various internal or external problems to the stepper drive are evident 	<ul style="list-style-type: none"> ⇒ See service specific information at section 10.6.1.

10.6.1 Stepper alarm LED flash sequence

Alarm	Description	Number of Blinks
EEPROM failure	• Invalid EEPROM data detected upon power-up	⇒ 1
Over temperature	• Motor Drive IC indicates a thermal warning. Temperature at motor driver chips is > 145°C. Clear fault and re-start drive.	⇒ 2
Reserved	•	⇒ 3
Serial master time-out.	• No valid messages from the KCM CPU in 10 seconds.	⇒ 4
Safety switch open	• Open safety switch result in a feeder stoppage or the start command to be ignored.	⇒ 5
Zero speed failure	• Motor is being driven by the Stepper but no encoder pulses are being read.	⇒ 6
Encoder failure	• Two channel encoder operation is selected SW1 DIP position 4 = <1>. and the motor is being driven by the motor drive. No encoder pulses received for channel A or B.	⇒ 7
Motor rotation failure	• Motor is being driven by the Stepper but the encoder detects either a jammed motor or reverse rotation.	⇒ 8
High temperature	• Temperature at drive is above 70 degrees C.	⇒ 9

Notes:

- All alarms remain latched until the alarm is no longer present and the alarm has been cleared by the serial master. Alarms 1, 2, 4, 6, 7, 8, 9 are cleared by the Alarm Clear message from the KCM CPU. Alarm 5 is cleared only by the Stop command from the KCM CPU.
- Only Over Temperature (2), Serial Master Time-out (4) and Safety Switch Open (5) alarms will cause the Stepper drive to stop the motor. For all other alarms, the drive will try to run the motor.
- Blink sequence <9> is not used for stepper drives 0000001430 and 0000004568.

10.7 AC interface drive problems and solutions

Note

- Before you change one of the programming variables, check the parameter against standards.

Problem	Possible Cause	Remedy
Motor does not start.	<ul style="list-style-type: none"> • No setpoint from KCM. • Safety switch is active. • Motor cable has been disconnected. • Failed motor. • Contactor failed. • F1 or F2 fuses have failed. • AC drive has failed. 	<ul style="list-style-type: none"> ⇒ Enter setpoint at operating unit. ⇒ Check safety switch on the feeder or its connection at KCM. ⇒ Check motor cables. ⇒ Replace motor. ⇒ Check for alarms that might stop the machine. ⇒ Check display status for <Wait>, <Disa>, <Alsh>. ⇒ Check that KCM has power. ⇒ Verify contactor is functional, if used. ⇒ Check F1 and F2 on AC interface drive pcb. ⇒ Replace AC drive.
Motor runs at maximum speed.	<ul style="list-style-type: none"> • Speed sensor has failed. • If scale interface pc board (SIB) is used, the SIB has failed. • Setpoint is too high. 	<ul style="list-style-type: none"> ⇒ Check signal, replace sensor. ⇒ Check signal, if pick-up is OK, and SIB is used, replace SIB. ⇒ If signals are OK, replace KCM. ⇒ Reduce setpoint.
Motor does not achieve desired speed.	<ul style="list-style-type: none"> • Incorrect motor power setting. • Incorrect gear teeth setting. • AC drive incorrectly programmed. 	<ul style="list-style-type: none"> ⇒ Check programming.
Alv LED is <Off>	<ul style="list-style-type: none"> • No AC power to drive • AC Interface Drive pcb has failed 	<ul style="list-style-type: none"> ⇒ Check input power for proper connections. ⇒ Replace AC Interface drive.

11 Optional Devices

Options that can modify or extend the KCM's performance are defined here. Host communication circuit cards are described in manuals that are identified in this section.

11.1 Host communication circuit cards

These circuit cards plug into the Host slot on the KCM CPU circuit card. The host port is configured via the KSU-II SYSTEM menu or via the PC connected to the Config port on the KCM.

Protocol	Part Number	Document Number
DeviceNet	0000005105	0590020609
ProfibusDP	0000005108	0590020607
Modbus Plus	0000005107	0590020608
Ethernet/IP or EthernetTCP	0000005106	0590020610
Modbus RTU or AB DF1	0000001737	Use this document - see K-Port Comm Board.
Profinet	0000023130	1190020601

11.2 Encoder interface circuit card

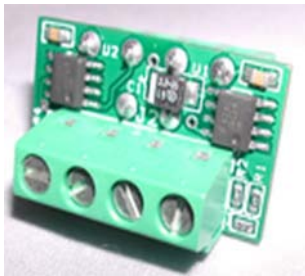


Fig. 11.1 Encoder interface photo

Differential speed signals that come from the Scale Interface pcb are converted to single ended inputs for the KCM drive boards by the use of the Differential Receiver-Encoder Interface pcb. (Fig. 11.1)

- Differential receiver pcb (0000006384) must be installed onto J2 on the drive circuit card when the Scale Interface pcb interfaces to the KCM. (Fig. 12.11)
- For a single differential speed input from the scale interface pcb, bring into <SPD1 +/-> and select <Single input> for the tachometer selection as shown in Fig. 12.12.



- The 0000006384 encoder interface functions with all drives except the AC interface drive.

11.3 Field power supply

In some select applications, a field wound DC Motor is used. In that instance, a KCM DC Field Supply is used. (part number 0000000639) It is mounted near the motor. It is supplied with line power and the supply will output DC field power. For 115 Vac line, expect approximately 150 Vdc output. For 230 Vac line, expect about 300 Vdc output. These values will change based upon line voltage, line frequency and field loading as the DC output utilizes filter capacitors to minimize ripple.

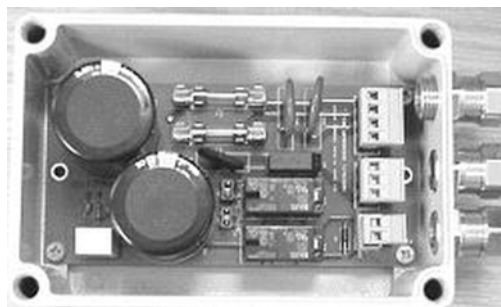


Fig. 11.2 Field supply

The unit can be configured for either 115 Vac or 230 Vac single phase. Two different modes of operation may be used.

- **Mode 1: Constant Field**
JP1 and JP2 are installed and JP3 and JP4 removed. Field power is present as soon as line power is applied to the power supply. No connection to X3 is required.
- **Mode 2: Controlled Field**
JP3 and JP4 are installed and JP1 and JP2 removed. The field power is controlled by X3. When X3 is closed, field power is available. When X3 opens, field power is removed from the motor.
- See [Fig. 12.13](#) for wiring details.

Note:

- The power supply uses two, 2 A, 5x20 mm Slo-Blo fuses.

11.4 SFT expander circuit card

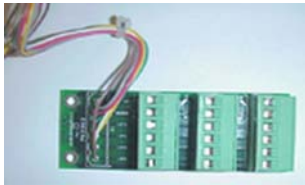


Fig. 11.3 SFT Expander

The SFT expander circuit card (part number 0000003411) is used only with the 450 watt DC drive when more than one SFT is to be connected. The expander card plugs into J4 of the 450 watt DC drive card. The expander card mounts into the KCM housing and provides three SFT connections as shown.

11.5 Daisy chain connector



Fig. 11.4 Daisy chain connector

The daisy chain connector permits easy cabling of K-Net connections from one KCM to another without having to have 2 wires in any terminal. point. This connector plugs into either K-Port 1 or K-Port 2.

12 Appendix

12.1 Cable length specifications

12.1.1 DC Motor cable lengths: 230 Vac

Motor Type	Voltage Rating	Current Rating	Cable length for a diameter of 1.5 mm ² or 16 AWG, in meters	Cable length for a diameter of 4 mm ² or 12 AWG, in meters
Lenze 55 W	180V	0.46A	300	300
Lenze 70 W	180V	0.7A	300	300
Bison 95 / 98 W	180V-200V	0.6A/ 0.75A	300	300
Baldor 95 / 124 W	180V-200V	0.86 A/ 0.75 A	300	300
Lenze 250 W	180V	1.7A	300	300
Seramel 370 W	180V	2.6A	257	300
Stephan 370 W	180V	2.4A	278	300
Baldor 450 W	200V	2.5A	267	300
ABB 780 W	180V	4.1A	162	272
Baldor 1000 W	200V	5.6A	118	198
Baldor 2000/1600 W	200V	11.5A/ 9.2A	56/71	95/120

12.1.2 DC Motor cable lengths: 115Vac

Motor	Voltage Ratings	Current Ratings	Cable length for a diameter of 1.5 mm ² or 16AWG, in meters	Cable length for a diameter of 4 mm ² or 12 AWG, in meters
Lenze 70 W	90V	1.25A	264	300
Lenze 250 W	100V	3.5A	93	156
Stephan 370 W	90V	4.9A	65	111
Baldor 450 W	100V	5.4A	59	100
Grossenbacher 700 W	90V	9.5	33	56

12.1.3 Cable lengths for speed feedback signals

Notes:

- The Scale Interface pc board (SIB) pc board is located in a junction box on the side of the feeder and is used when the KCM is not mounted on the feeder.
- The cable must be fully shielded.
- Use the Scale Interface pc board (SIB) if more than 30 meters of transmission distance between feeder and controls is required.

Pick-Up/Encoder	Pick-up Type	Cable length without Line-Driver in SIB., in meters	Cable length with Line-Driver* in SIB., in meters
Jaquet	FTG 1088.01 Ex	30	300
W+S (Lenze-Motor 55W)	HGI 490 063600	30	300
HP (Bison-Motor 95/98W)	HEDS 5600 C06	30	300
HP (Baldor Motor 95/124W)	HEDS 5600 C06	30	300
US Digital	HEDS 9100-H00	30 If motor coil and encoder signals are in the same cable the signals must be individually shielded. See section 12.4.14 for more information.	100 With encoder signals in separate shielded cable.

12.2 KCM I/O defaults

The following table shows the standard bit I/O assignment. If other function are needed reassignment is possible with the operating unit.

12.2.1 Default KCM Programmable I-O table.

In/output	Location	LWF/LWB	WBF	SFM	PID/VOL
CPU Input 1	J8-1	Start	Start	Start	Start
CPU Input 2	J8-2	Stop	Stop	Stop	Stop
CPU Input 3	J8-3	ALS	ALS	ALS	ALS
CPU Input 4	J8-4	None	None	None	None
CPU Output 1	J8-6	Run	Run	Run	Run
CPU Output 2	J8-7	Alarm Relay	Alarm Relay	Alarm Relay	Alarm Relay
CPU Output 3	J8-8	ALS Out	ALS Out	ALS Out	ALS Out
CPU Output 4	J8-9	Drive Enable	Drive Enable	Drive Enable	Drive Enable
CPU Freq Input	J9-1/2	Ext. Setpoint	Ext. Setpoint	Ext. Setpoint	Ext. Setpoint
CPU Analog Output	J9-3/4	None	None	None	None
CPU Analog Input	J9-5/6	None	None	None	None
Drive Relay 1	J5-1/2/3	Feeder Run	Feeder Run	Drive enable	Feeder Run
Drive Relay 2	J5-4/5/6	Refill	None	None	None
Drive Relay 3	J5-7/8	Alarm	Alarm	Alarm	Alarm
Drive Input 1	J1-8	None	None	None	None
Drive input 2	J1-11	None	None	None	None

12.2.2 I-O function selection

Following the possible selection on the KSU-II operator interface for the I/O assignment. Open I/O menu and select the desired sub-menus.

Abbreviations:

- CONT = LWF, WBF, PID, VOL and SFM control (continuous)
- BATCH = LWB, WBB and SFB control (batch)
- LWF = loss-in-weigh feeder
- LWB = loss-in-weight batcher
- WBF = weigh belt feeder
- WBB = weigh belt batcher
- SFM = Smart Flow Meter flow indicator and controller
- SFB = Smart Flow Meter batcher
- PID = process controller
- VOL = volumetric controller
- XTR = Extrusion Control

For	Analog output	For	Analog input
	None		
All	Setpoint		
All	Massflow		
All	Drive Command		
All	Motor Speed		
LWF/LWB/PID/SFM/SFB	Feedfactor		None
WBF/WBB	Prefeeder	All (Not XTR)	Setpoint
WBF/WBB	Beltloading	All	CPU 0-10 kHz
WBF/WBB	Belt Speed	All	Extern
LWB/WBB/SFB	Batch%	XTR	Hauloff
LWB/WBB/SFB	Batch Size	XTR	XtrSetpt
PID	PVU Input	XTR	XtrSpeed
LWF/LWB	Net Weight	XTR	Pressure
SFM/SFB	Net Chute		
SFM/SFB	Net Divert		
WBF/WBB	NetWeight1		
WBF/WBB	Netweight2		
XTR	FdrSetp		
XTR	Level		

For	Digital output	For	Digital input
			None
		All	Start
		All	Stop
	None	All	Interlock
All	Run	All	Run Enable
All	Any Alarm	All	ALS Input
All	Alr Relay	All	Ack Alarm
All	ALS Out	All	Clr Alarm
All	Drive Ena	All	Start/Stop
All (Not VOL/XTR)	Grav Mode	All (Not VOL/XTR)	VOL Mode
XTR	Auto Mode	XTR	MAN Mode
All	PSR Map	All	Local/External
All	ASR Map	All	Ratio/Direct
All	Total Pulse	All	External Alarm
LWF/LWB	Refill	All	Total Clr
LWF/LWB	Refill Expired	All	Data Lock
WBF/WBB	Tare Run	LWF/LWB	Refill Bypass
WBF/WBB	Prefeeder	LWF/LWB	Refill Command
SFM/SFB	Bypass	LWF/LWB/WF/WB	Empty
SFM/SFB/LWF/LWB	Blow-off	All (Not XTR)	Calibrate
LWF/LWB	Loader	WBF/WBB	Belt drift
LWF/LWB	Hi/Low Gear	WBF/WBB	Belt Index
LWB/WBB/SFB	Dribble	WBF/WBB	Dynamic Tare
LWB/WBB/SFB	Batch Complete	SFM/SFB	Bypass
XTR	FDR Ena	SFM/SFB	Normal FB
		LWB/WBB/SFB	BatchPause
		LWF/LWB	Loader Lvl
		LWF/LWB	Loader Ena

12.3 I-O function and KCM state indications

12.3.1 State indications

- RUN - Motor is running (speed feedback)
- DISA - Indicates the feeder is disabled and can not start.
Conditions are as follows:
 - RUN ENABLE digital input is OFF. In this case, All START commands are ignored. A start command is required after the digital input is cleared. Pressing START will generate alarm 42 - "Start Ignored". This function can be programmed to any digital input. Run Enable input issues a STOP command when de-energized.
 - DRIVE ENABLE digital input is disabled. This digital input is enable from JU1 on the Motor Drive board (jumper terminal 3 to 4 AND 5 to 6). If disabled, all START commands are ignored. A start command is required after the digital input is cleared. Pressing START will generate alarm 42 - "Start Ignored". This input is predefined by JU1.
 - DOWNSTREAM INTERLOCK digital input is active (ON). If a START command is issued, "WAIT" is displayed. See "WAIT" indication below. This function can be programmed to any digital input.
- ALSH - Indicates the Alarm shutdown digital input is high. All START commands are ignored. A start command is required after alarm shutdown digital input is cleared. This function can be programmed to any digital input. Run Enable input issues a STOP command when activated.
- WAIT - Start command is issued, but feeder cannot run. This can be from setpoint = 0, feed factor = 0, or the DOWNSTREAM INTERLOCK digital input is active. The start command is NOT ignored and the feeder will run when the conditions are cleared.
- {blank} - If no status is displayed, the controller had a STOP command and all other conditions are cleared.

Notes:

- A START and STOP command can be issued from the Coperion K-Tron (Switzerland) LLC operator interface, Digital Input, or host communications.
- Run Enable, Drive Enable, and Alarm Shutdown inputs issue a STOP command when activated. A Start command must be issued AFTER the inputs are cleared for the feeder to run.
- In "Normal Mode" not energized = OFF, energized = ON
In "Inverse Mode" ON/OFF are reversed.
- Downstream Interlock requires an initial Start command. Toggling this digital input does not issue a STOP command and therefore does not require a Start command. The exception is if a Stop command is issued, a new Start command is required. If state is

DISA, start command is required. If the state is "WAIT", a start command is not required.

- On power-up, KCM is Stopped. A Start Command is always required.
- If the host communications is reading the CondensedProcStatus, the KCM state can be determined from the following bits in the status word. Assuming the word starts at bit 0, bits 2 and 3 would help identify the state.

12.4 KCM wiring examples

12.4.1 System wiring examples



- ▲ The 450 watt DC Motor drive and the 1600 watt DC Motor drive are wired in a similar manner but will be shown independently.
- ▲ As for all applications, refer to the wiring diagrams supplied for your project as the official source for wiring your system.
- ▲ These wiring diagrams are provided as basic information only. Your system may be wired differently. Please be careful!
- ▲ SIB means scale interface circuit board mounted at the machine for speed signal interfacing.
- ▲ Line voltage input is 115/230 Vac single phase, 50/60 Hz.
- ▲ Wire colors, if shown, may change for your application. Refer to your provided electrical diagrams for specific colors.

12.4.2 KCM to KSU-II wiring at K-Port 1/2

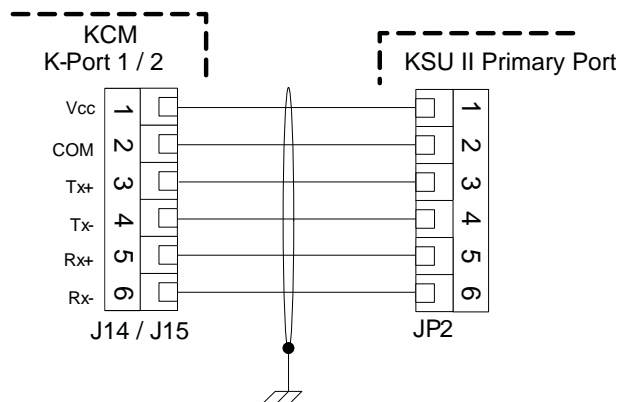


Fig. 12.1 KCM to KSU-II wiring example



- If the KSU-II is more than 10 meters from the KCM, KSU-II power must be supplied from an independent power supply.
- Either K-Port #1 or #2 may be used.
- Only one KSU-II may be powered from a single KCM.

12.4.3 KCM to KSL wiring at K-Port 1



- K-Port #1 is to be used only.

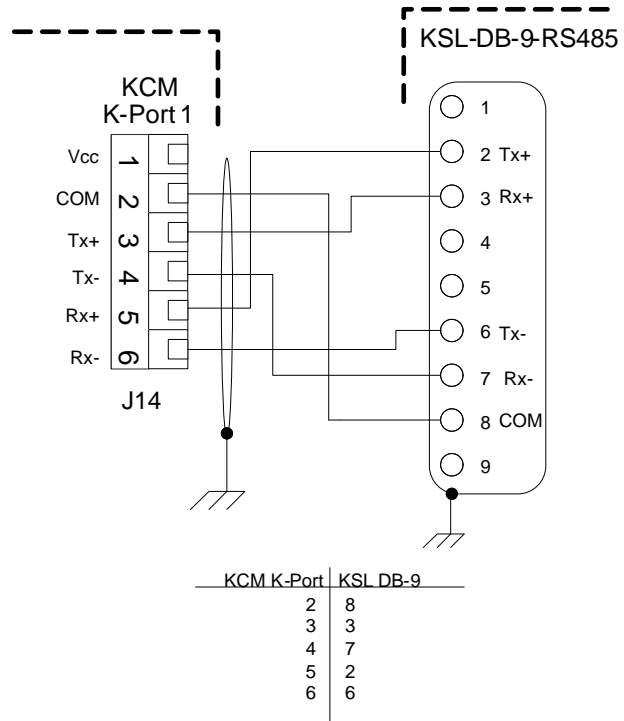


Fig. 12.2 KCM to KSL wiring

12.4.4 KCM to KSC wiring at K-Port 1- Digi card



- The wiring may be different for other RS485 serial communication cards.
- K-Port #1 is to be used only.

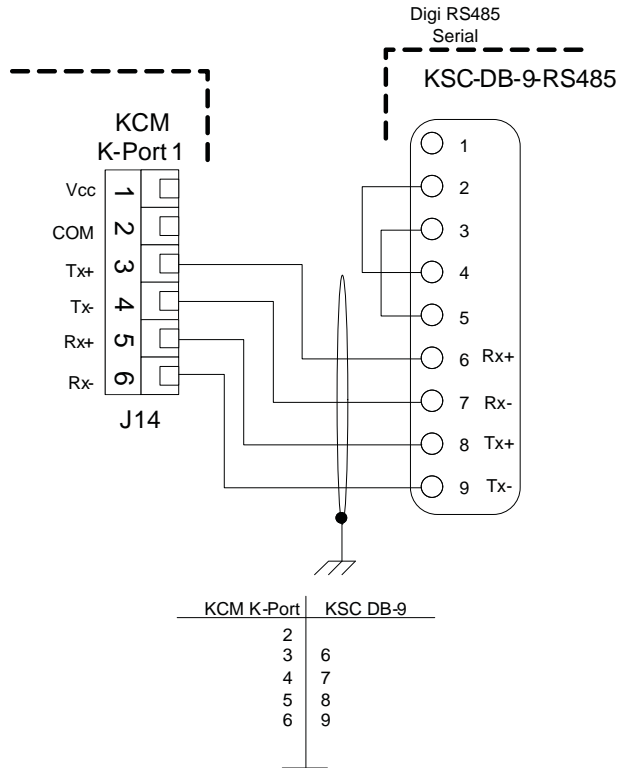


Fig. 12.3 KCM to KSC wiring with Digi RS485 serial port

12.4.5 KCM to KSC wiring at K-Port 1- Moxa card



- The wiring may be different for other RS485 serial communication cards.
- K-Port #1 is to be used only.

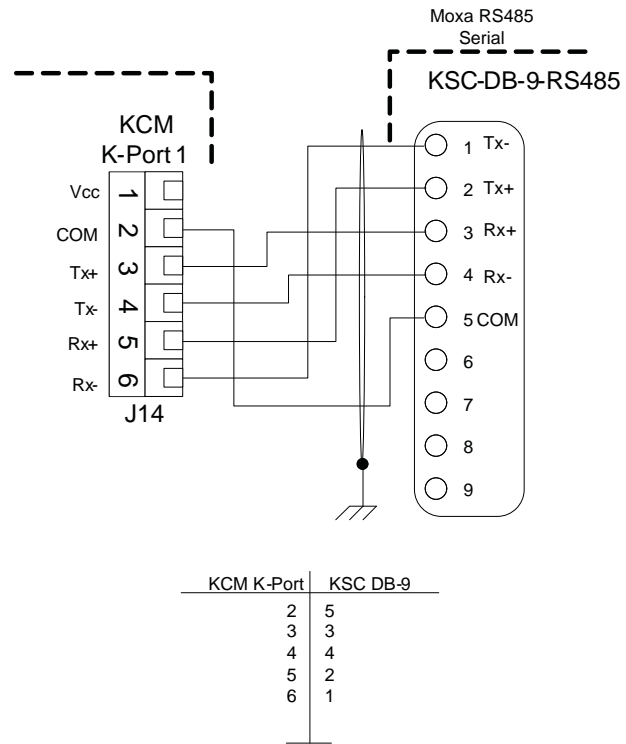


Fig. 12.4 KCM to KSC wiring with Moxa RS485 serial port

12.4.6 KCM to KSC wiring at K-Port 1- Coperion K-Tron (Switzerland) LLC converter

i

- The wiring may be different for other RS485 serial communication cards.
- K-Port #1 is to be used only.

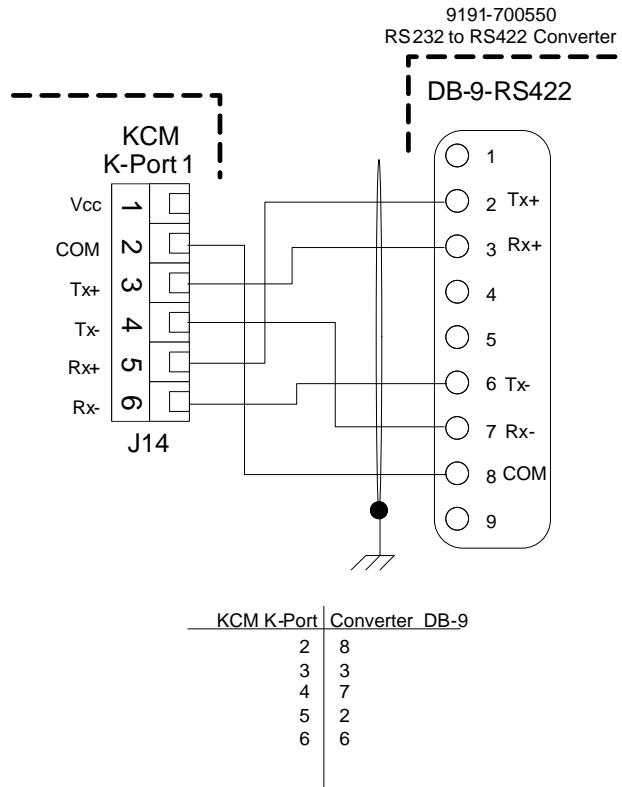


Fig. 12.5 KCM to KSC wiring with interface 9191-700550 serial converter

12.4.7 KCM to WAGO I-O wiring at K-Port 2

i

- Refer to WAGO manual 750-138 for more information
- Only K-Port #2 is used
- WAGO bus coupler must be configured to function with the KCM

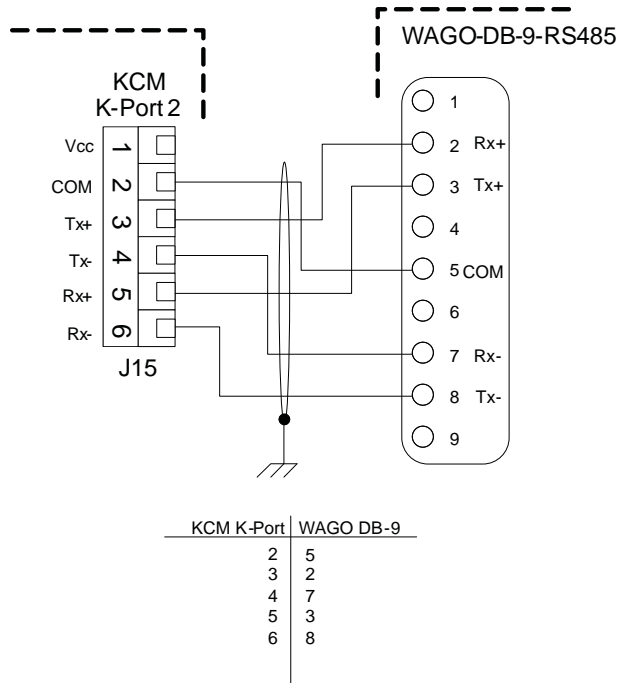


Fig. 12.6 KCM to WAGO coupler wiring

12.4.8 KCM to KF2 Host port wiring

This example shows the comm circuit card in the Host slot on the KCM CPU circuit card.

The AB KF2 module is wired to J1 connector.

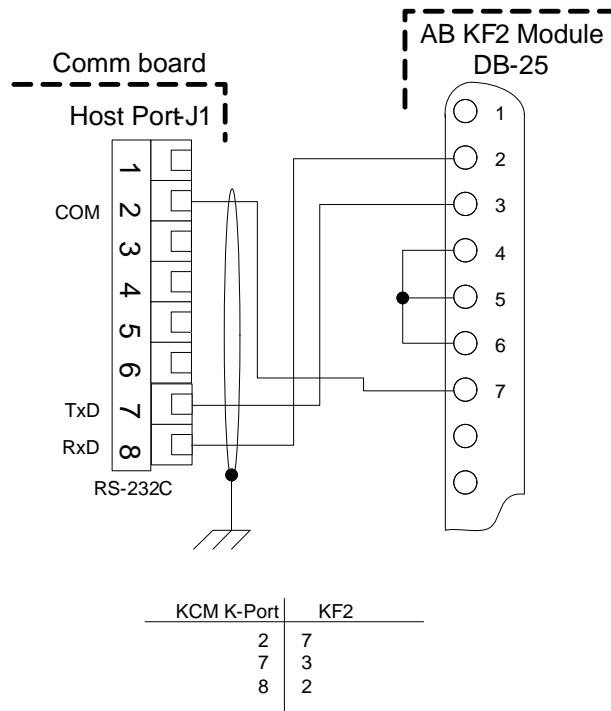


Fig. 12.7 AB KF2 to KCM wiring example

12.4.9 KCM to BM-85 Host port wiring

This example shows the comm circuit card in the Host slot on the KCM CPU circuit card.

The Modicon BM-85 multiplexer module is wired to J1 connector.

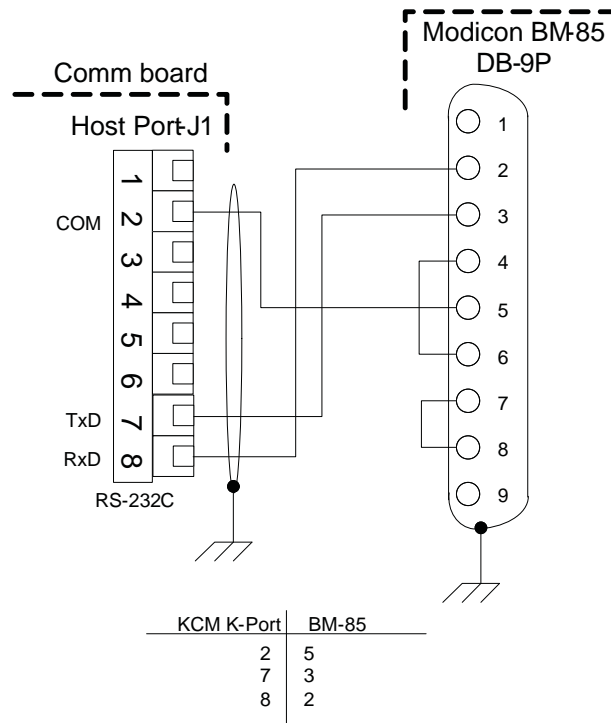


Fig. 12.8 Modicon BM-85 to KCM wiring example

12.4.10 450 watt DC drive wiring example - 0000007405

i

- Not all terminal blocks are shown in this example.

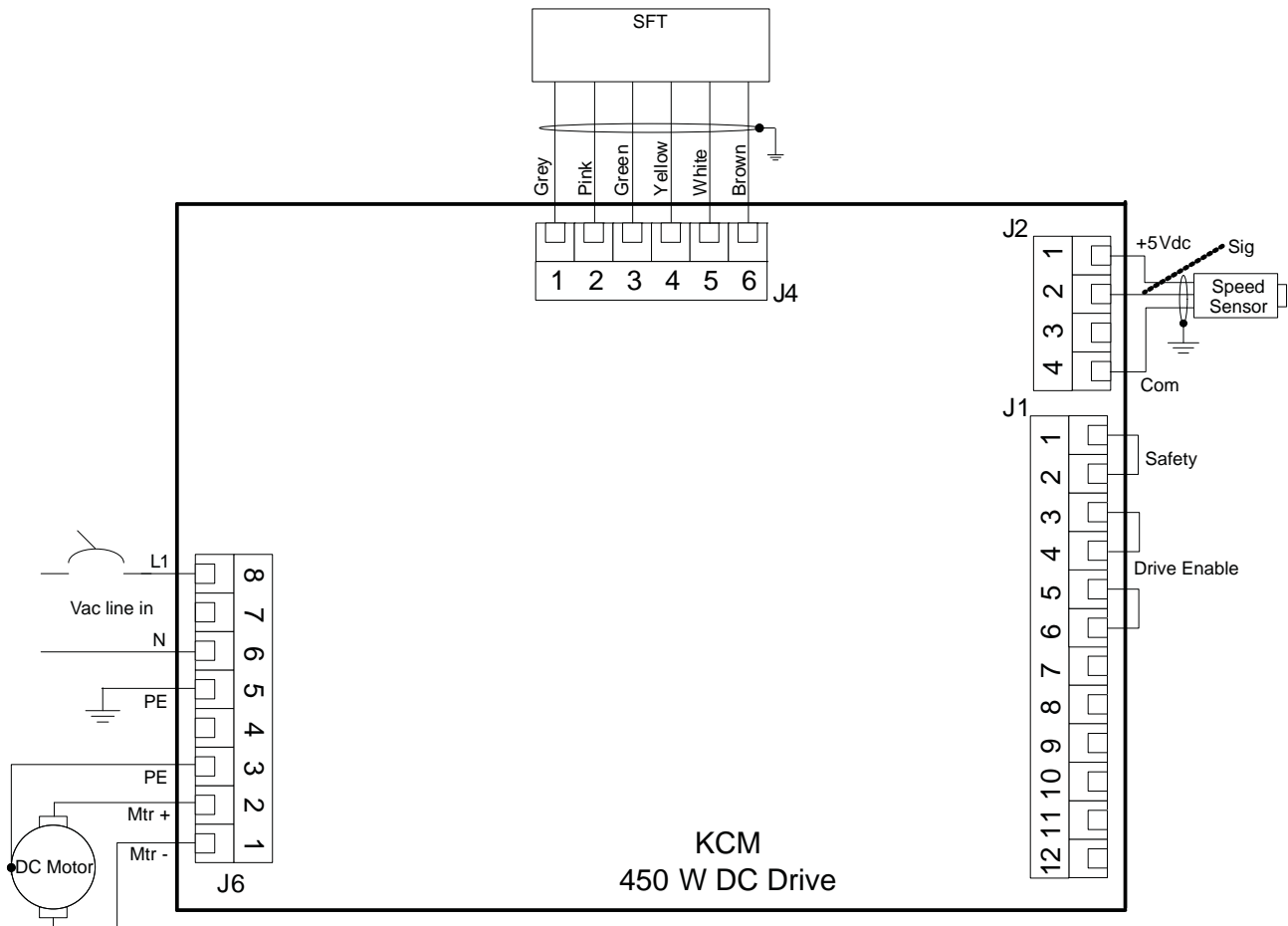


Fig. 12.9 450 watt DC drive wiring example

12.4.11 KCM without SIB board - DC Motor - 000002610

Typical system wiring diagram with a feeder mounted KCM.



- Not all terminal blocks are shown in this example.

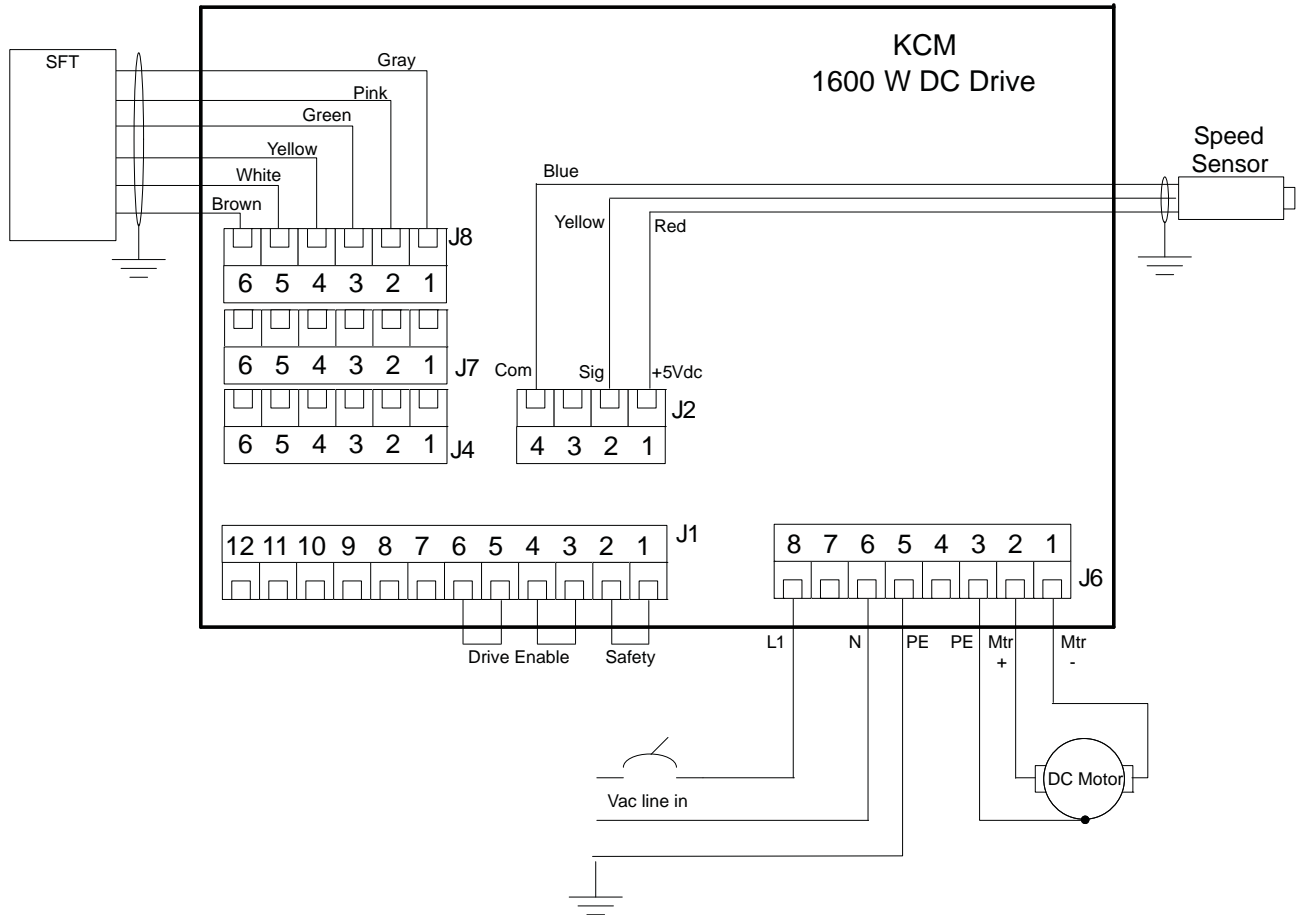


Fig. 12.10 Feeder mounted KCM wiring example - 1600 W DC Drive

12.4.12 Remote KCM with SIB pcb at feeder

This is a feeder wiring example for a remote KCM with a feeder mounted SIB circuit card for differential speed signal interfacing. (Fig. 12.11 and Fig. 12.12) The speed encoder interface is shown mounted to J2 in this example. (See Fig. 12.12).

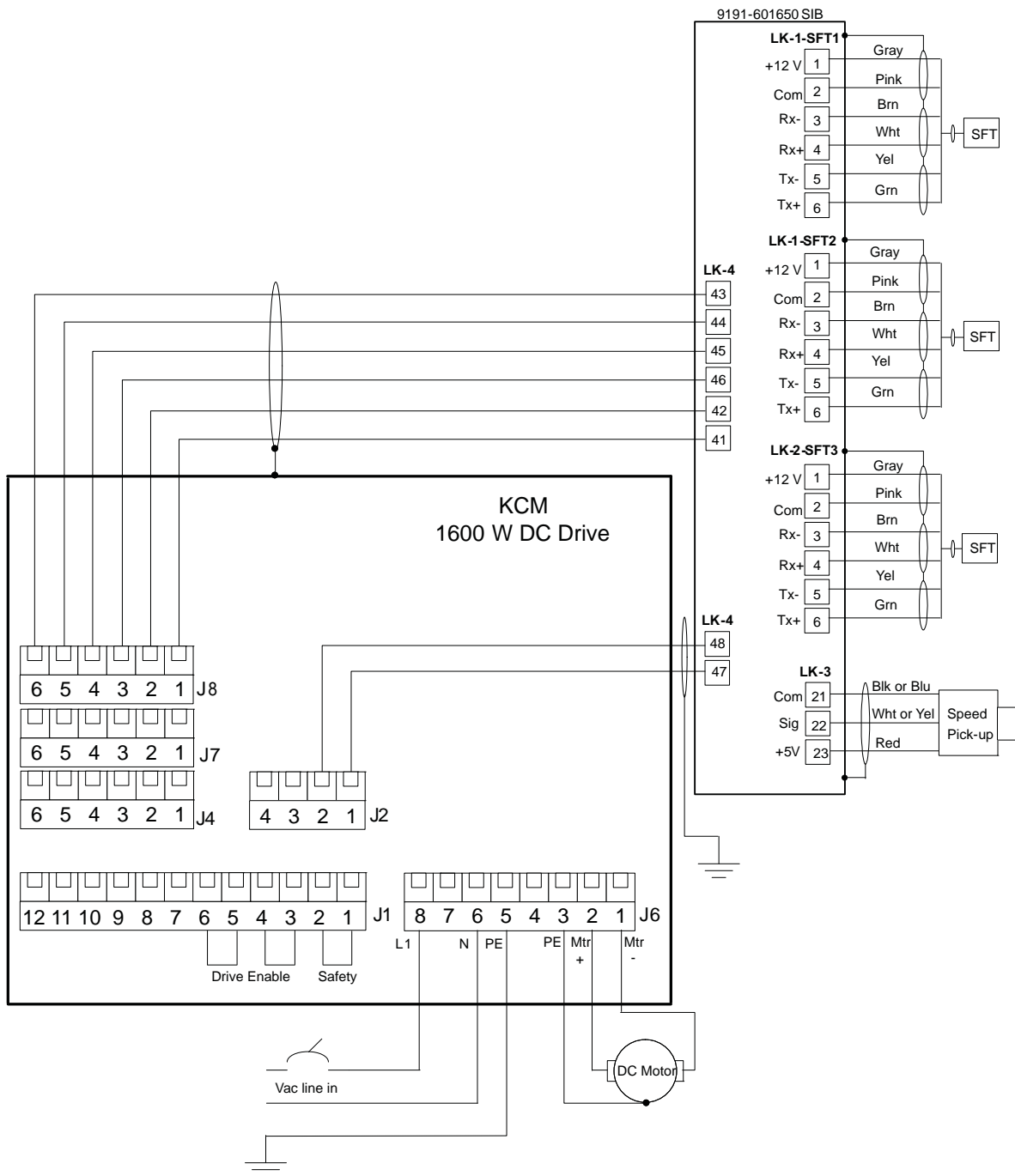


Fig. 12.11 KCM using the SIB pcb example with differential receiver on J2

Notes:

- Differential receiver-encoder interface pcb (0000006384) must be installed onto J2 on the Drive circuit card when the Scale Interface pcb interfaces to the KCM. (Fig. 12.12)
- Fig. 12.11 wiring shows the speed connection signals using the encoder interface circuit card

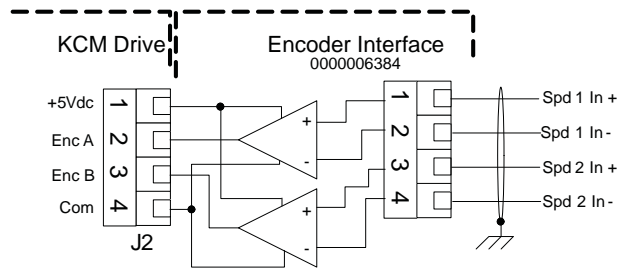


Fig. 12.12Differential input for DC Motor drives wiring-Encoder Interface



- ▲ The Encoder Interface pcb functions with all drives except the AC interface drive when used to connect the KCM to the feeder mounted scale interface pcb.

12.4.13 Field wound DC Motor wiring example



- ▲ **Danger of voltage**
Removal of JP3 and JP4 removes the discharge resistor R2 from the circuit. If no motor is connected, caution must be observed to assure that no parts of the body come in contact with the high voltage areas of the circuit board until the output circuit is fully discharged.

This diagram shows one potential way to wire the field supply if a field wound DC Motor is used.

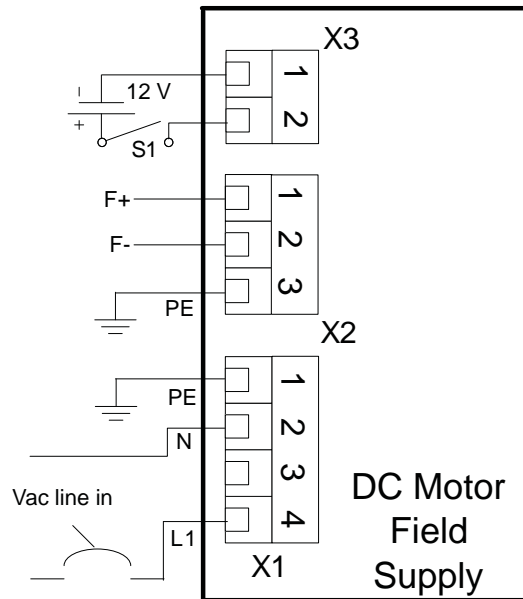


Fig. 12.13 Field supply wiring



- The 12 Vdc power supply needs to source at least 100 ma.
- F+, F- are the field connections to the field wound DC Motor.

12.4.14 Stepper drive wiring example for 000005987



- Not all terminal blocks are shown in this example.
- In the example shown the encoder and motor signals in the same cable. This requires individually shield twisted pair with the signals groups as shown and an overall shield.
- For >30 m an SIB board must be used and the motor and encoder signals run in separate cables.
- Wire colors shown for standard cable Alpha 2463C. Color codes may change. Please refer to provided wiring diagrams.
- For the stepper drives 000001430 and 000004568, Line power is made to terminals 7 and 8 on J6. All other wiring is the same. Refer to section 12.5.5 for details.

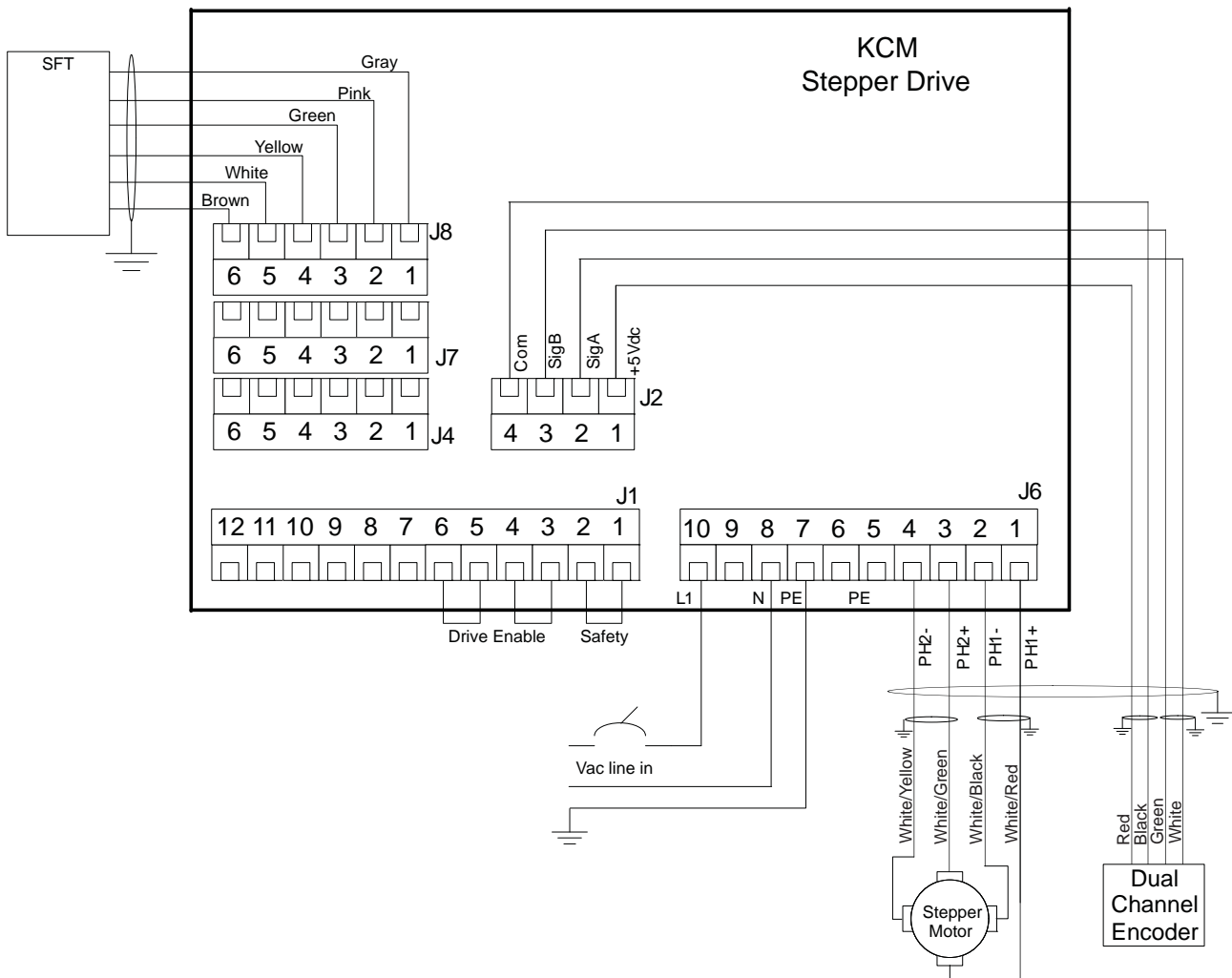


Fig. 12.14KCM stepper drive field wiring example

12.4.15 Encoder Line Driver Board



- For cable length > 2 m the Encoder Line Driver Board 0000020276 is installed at the stepper motor.

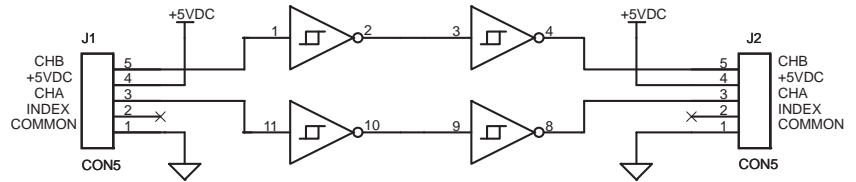


Fig. 12.15Encoder Line Driver Board

12.4.16 Vibratory feeder wiring example - 0000000684



- Not all terminal blocks are shown in this example.

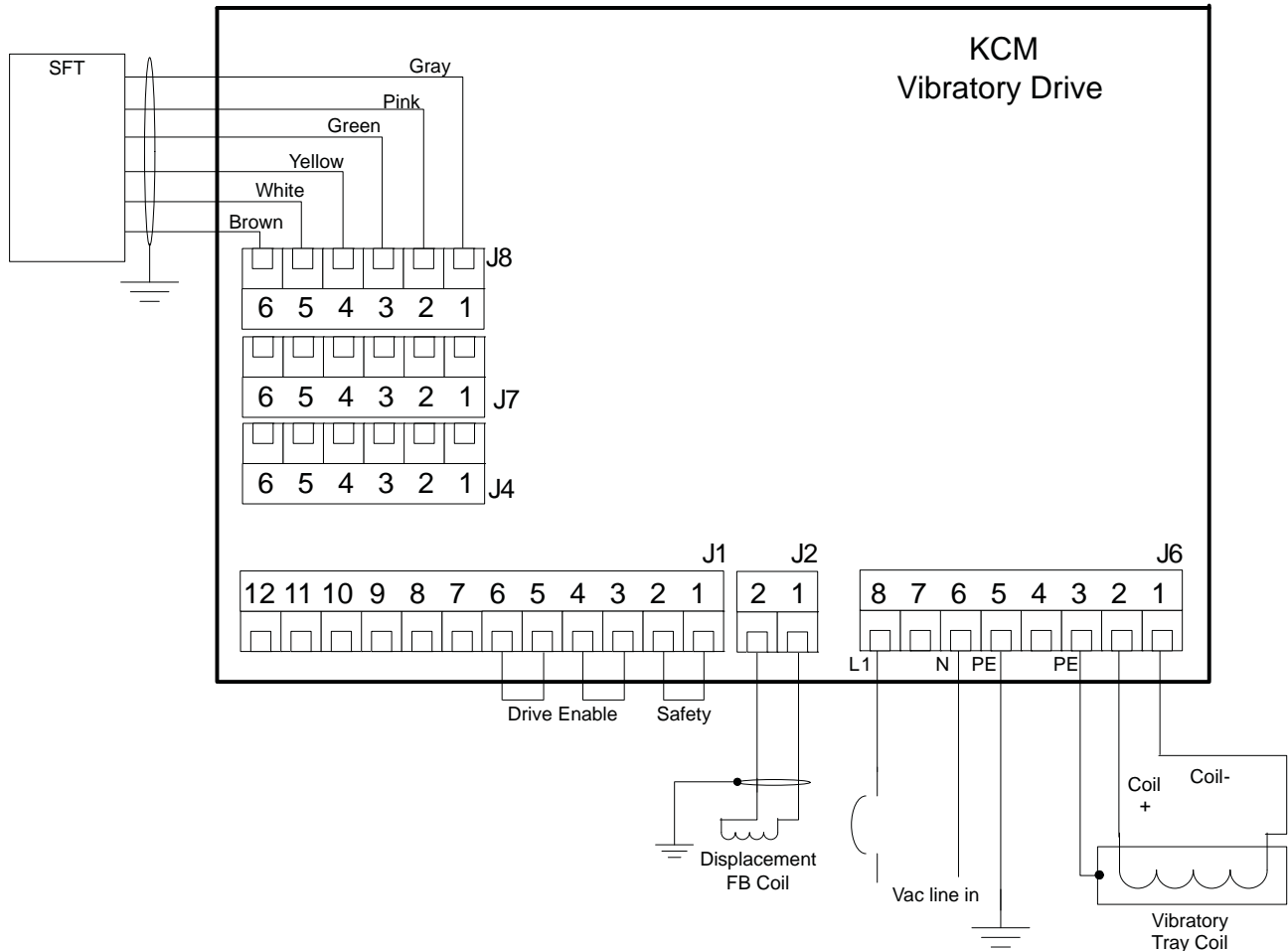


Fig. 12.16KCM vibratory drive field wiring example

12.4.17 AC drive wiring example - 0000003413



- Not all terminal blocks are shown in this example.
- There are a number of ways to wire the AC drive. The example above shows an NPN tachometer (current sinking) input as a frequency source and a current output to the remote variable frequency AC drive. (VFD)
- CR is a contactor for the 3 phase AC line to the VFD.

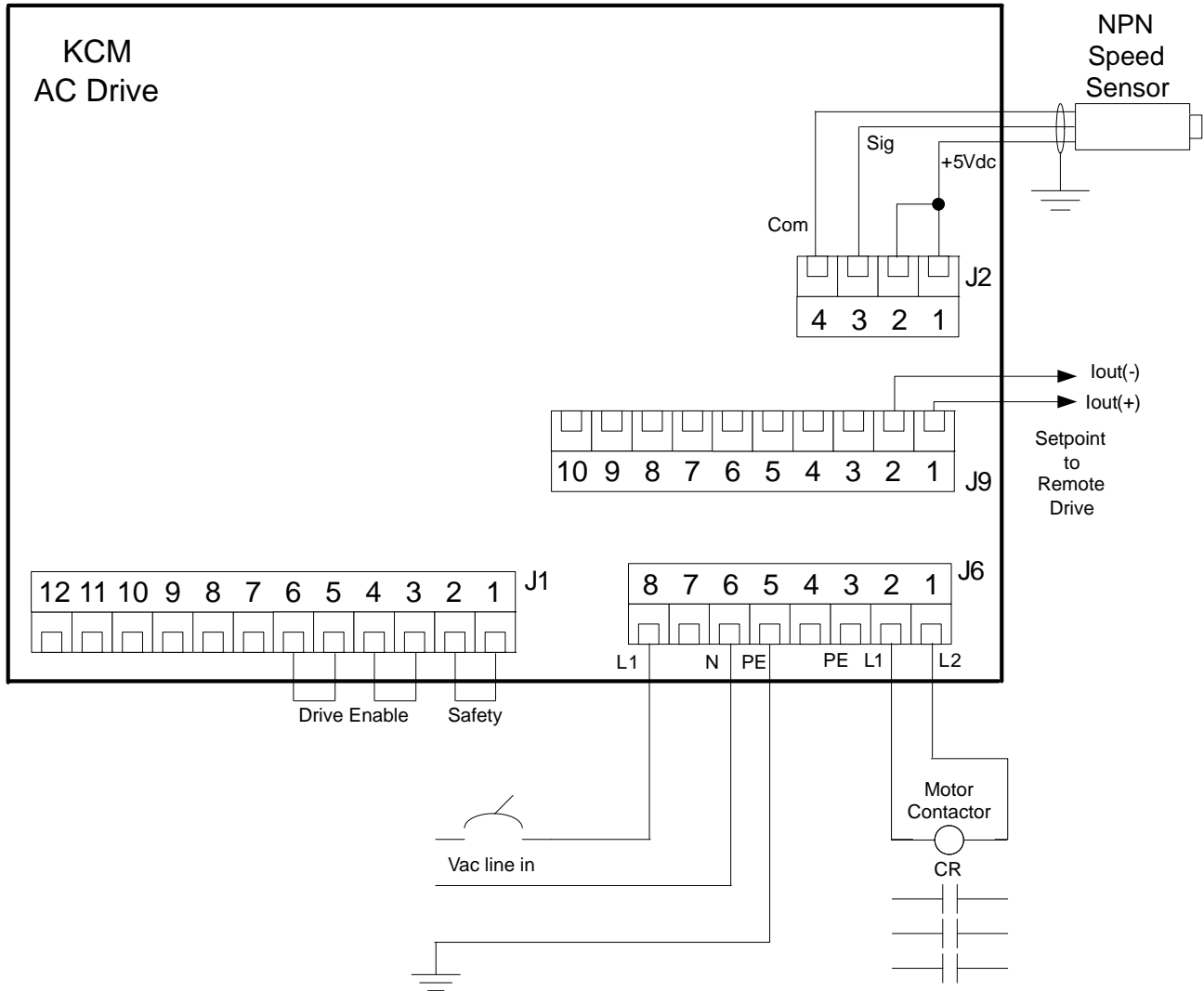


Fig. 12.17KCM AC interface wiring example

12.4.18 KCM interlock wiring example

This diagram is an example of how to connect multiple KCMs together using the Bit Output and Bit Input control for an alarm interlock. When any of the three KCMs goes into alarm, all shutdown. This assumes that the KCM programming is proper.

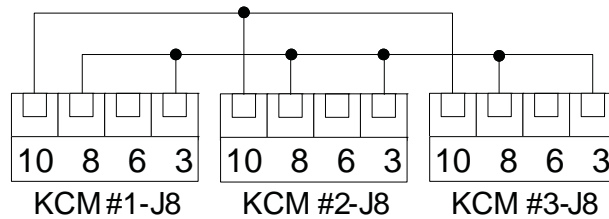


Fig. 12.18KCM interlock wiring for ALS

KCM programming example for ALS interlock wiring:

- CPU digital input #3 programmed for <ALS Input>
- CPU digital output #3 programmed for <ALS Out>
- Terminal 10 is common
- ALS Digital Output is programmed for either <Timed Stop> or <Immediate Stop>

12.4.19 Hi/Lo Auto gear external switching circuit

The following diagram shows how to safely wire the KCM for automatic gear switching functions for the LWF/LWB application when a K2M feeder with dual speed gearbox is used.

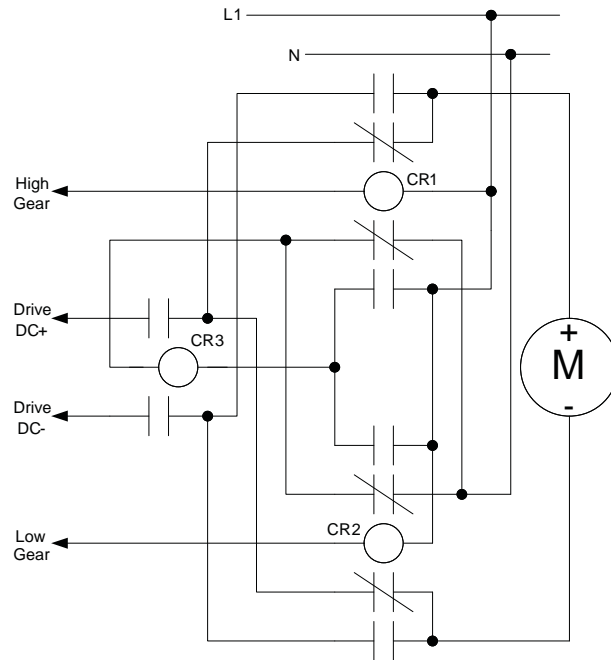


Fig. 12.19 HiLo gear selection wiring

Set-up is as follows:

- ⇒ Program correct gear reductions in MACHINE menu
- ⇒ Program MDU Relay 1 function as Hi/Lo Gear, polarity - normal
- ⇒ Program MDU Relay 2 function as Hi/Lo Gear, polarity - inverse
- ⇒ Connect KCM DC drive inputs as shown in [Fig. 12.9](#)
- ⇒ Test function and re-connect DC Motor wiring if screw speed changes are reversed.



- CR1-CR3 are independent AC contactors with 15 A contacts

12.4.20 KCM to HCU wiring example

Typical system wiring diagram for interconnecting a pneumatic loader using an HCU loader controller to the KCM.



- Refer to the HCU electronics manual for additional wiring information.

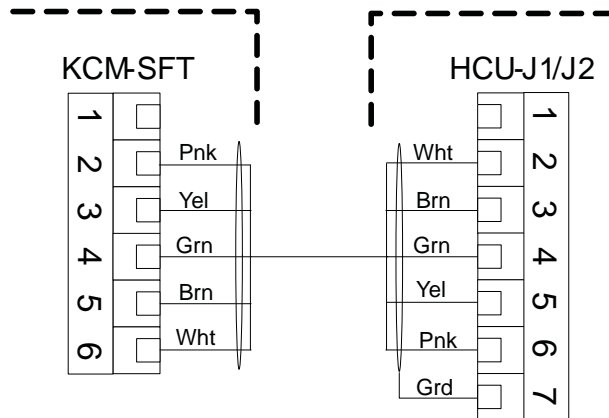


Fig. 12.20 HCU wiring example

12.4.21 KCM to LSR wiring example

Typical system wiring diagram for interconnecting a pneumatic loader using an LSR controller to the KCM.



- Refer to the LSR manual for additional wiring information.

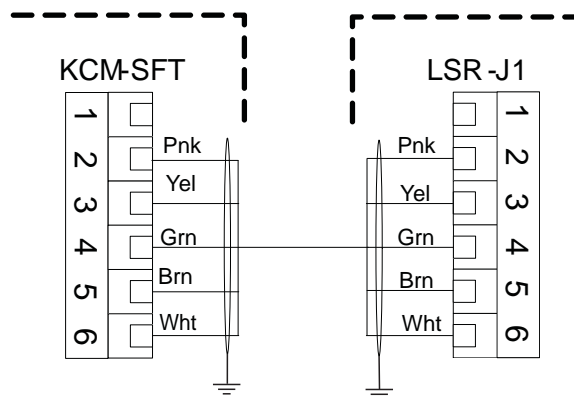


Fig. 12.21 LSR wiring example

12.4.22 Schematic of SIB board-9191601650

The Scale Interface pc board-SIB is used when the KCM is mounted away from the feeder.



- Do not connect SFT power to LK-5
- Turn the DIP switch to <On> for all active SFT positions.

Note: if LK-5 is used, all poles of the DIP Switch must be open

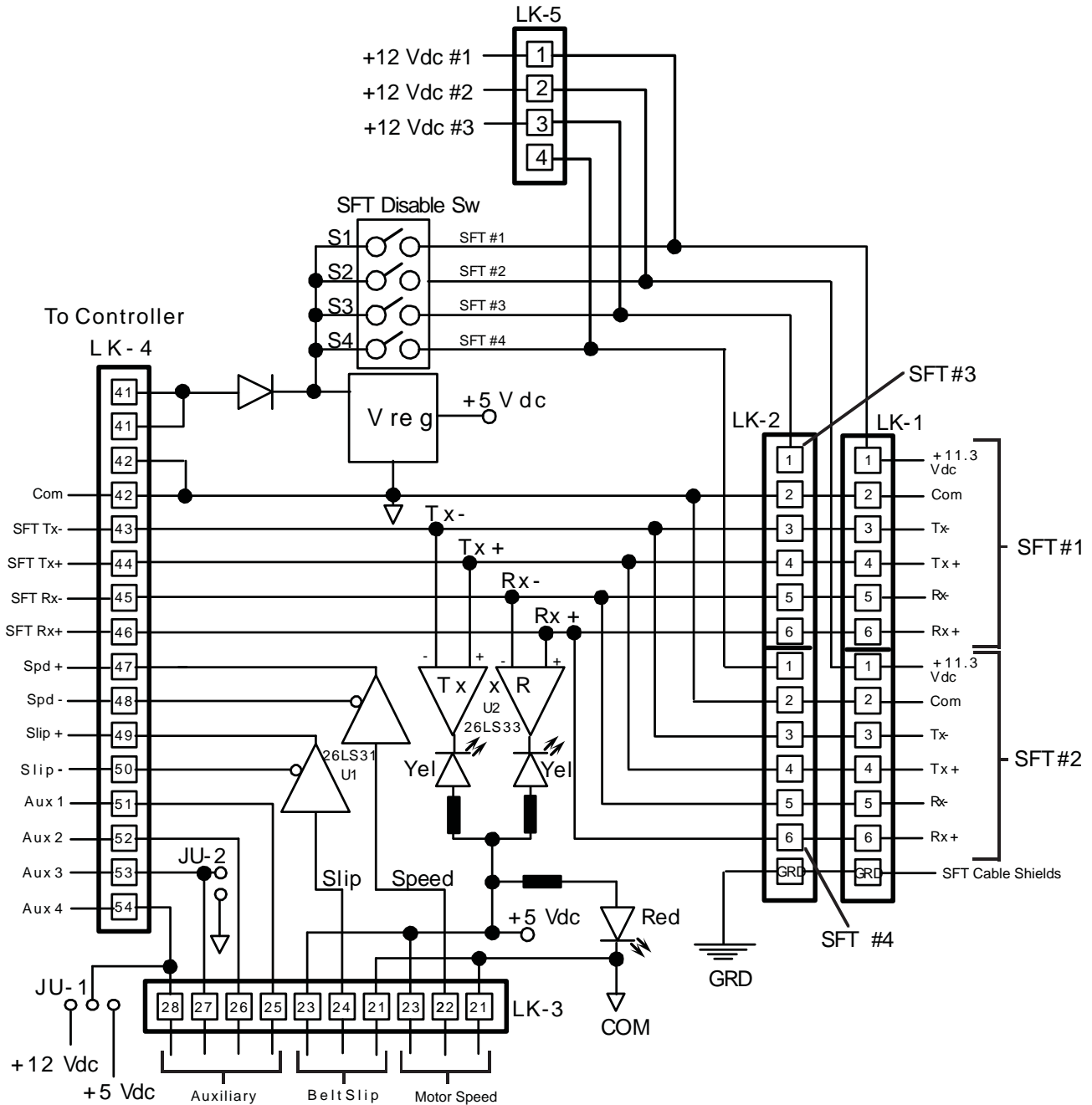


Fig. 12.22SIB schematic

12.4.23 Belt slip wiring for WBF and WBB applications.



- See the WBB or WBF programming manual for specific programming for belt slip operation.

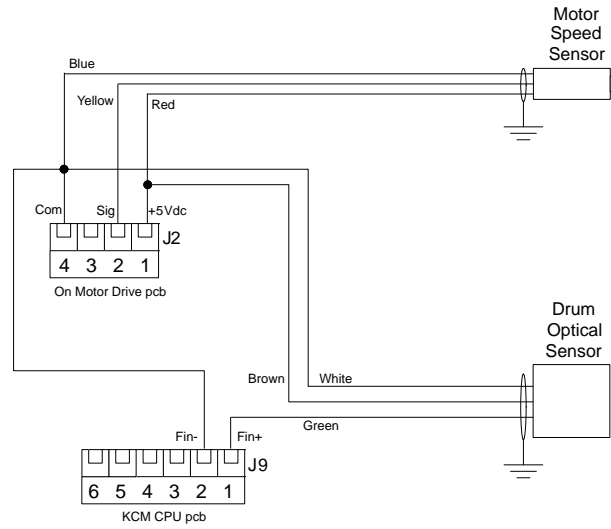


Fig. 12.23Belt slip wiring example

12.5 Summary of KCM I-O

12.5.1 CPU I-O

#	J1/J2 K-Port 1/2	J8 CPU Digital I-O	J9 Analog/Freq	J10 Alternate DC	J11 Internal channel, DC power
1	Power(+24Vdc)	Dig In 1	Fin+, (0-10kHz)	+14 to 40 Vdc	+24 Vdc from Drive pcb
2	Common	Dig In 2	Fin-	Common	Common
3	TxD+, RS485	Dig In 3	Aout+ (0-20mA)	Earth/PE	RxD+, RS485
4	TxD-, RS485	Dig In 4	Aout-		RxD-, RS485
5	RxD+, RS485	Common	Ain+ (0-5/10 Vdc, 0-20 mA)		TxD+, RS485
6	RxD-, RS485	Dig Out 1	Ain-		TxD-, RS485
7	TxD, RS232	Dig Out 2			
8	RxD, RS232	Dig Out 3			
9		Dig Out 4			
10		Common			

12.5.2 Common Drive I-O

These connections are common to all drive types. See later specific sections for other drive connections.

#	J1-Digital Inputs	J3-Int Channel, PS	J5-Relays
1	+24 Vdc	+24 Vdc to KCM	Relay 1 Com
2	Safety Input	Common	Relay 1 NO
3	24 Vdc power	TxD+ RS485	Relay 1 NC
4	Drive Ena +	TxD- RS485	Relay 2 Com
5	Drive Ena -	RxD+ RS485	Relay 2 NO
6	Common	RxD- RS485	Relay 2 NC
7	24 Vdc power		Relay 3 Com
8	MDU In 1 Signal		Relay 3 NO
9	Common		
10	24 Vdc power		
11	MDU In 2 Signal		
12	Common		

12.5.3 SFT Connections for all drives



- Only J4 is used on the 450 watt DC drive
- Not for PID or VOL applications

#	J4/J7/J8 SFT
1	+12 Vdc @ 100mA
2	Common
3	TxD+ RS485
4	TxD- RS485
5	RxD+ RS485
6	RxD- RS485

12.5.4 Specific 450/1600 Watt DC Drive connections

#	J2-Encoder	J6-Line Power/ Motor
1	+ 5 Vdc	DC Motor -
2	Frequency In A	DC Motor +
3	Frequency In B	PE/GRD
4	Common	PE/GRD
5		PE/GRD
6		Neutral
7		L2
8		L1

12.5.5 Specific Stepper Drive connections

#	J2-Encoder	J6-Line Power/ Motor- 0000005987	J6-Line Power/ Motor- 0000001430 and 0000004568
1	+ 5 Vdc	Phase 1 +	Phase 1 +
2	Frequency In A	Phase 1 -	Phase 1 -
3	Frequency In B	Phase 2 +	Phase 2 +
4	Common	Phase 2 -	Phase 2 -
5		PE/GRD	PE/GRD
6		PE/GRD	PE/GRD
7		PE/GRD	Neutral(L2)
8		Neutral	L1
9		L2	
10		L1	

12.5.6 Specific Vibratory Drive connections

#	J2-Encoder	J6-Line Power/ Motor
1	Displacement coil feedback +	Vib Coil -
2	Displacement coil feedback -	Vib Coil +
3		PE/GRD
4		PE/GRD
5		PE/GRD
6		Neutral
7		L2
8		L1

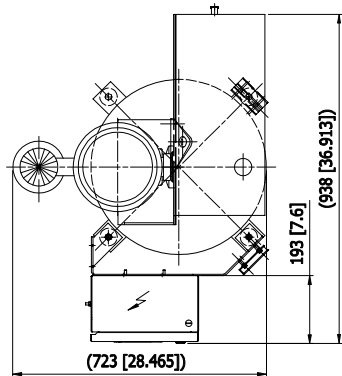
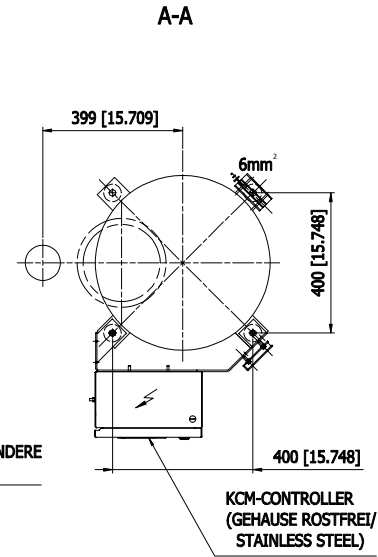
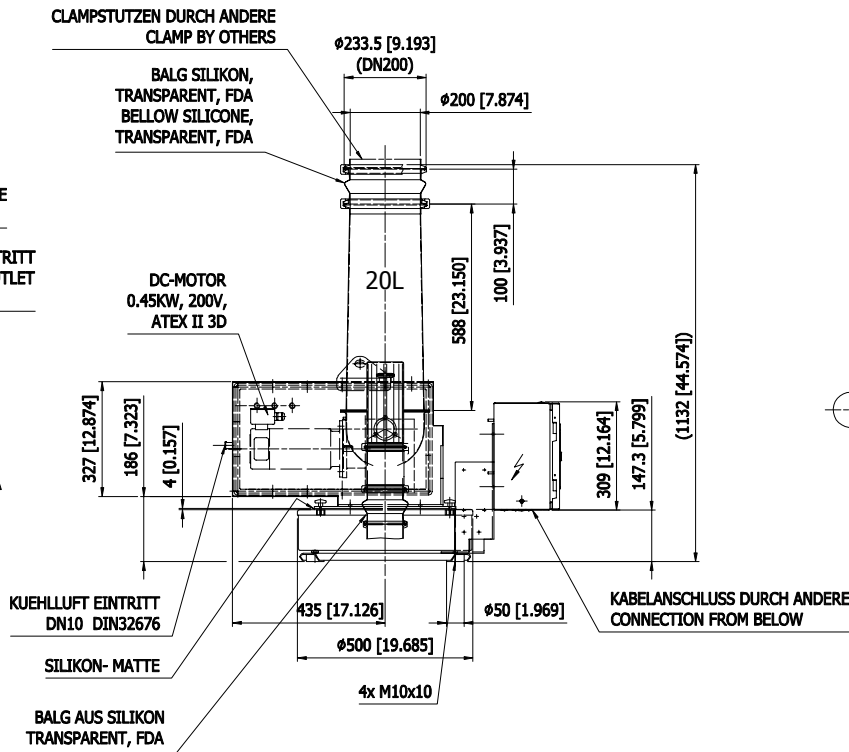
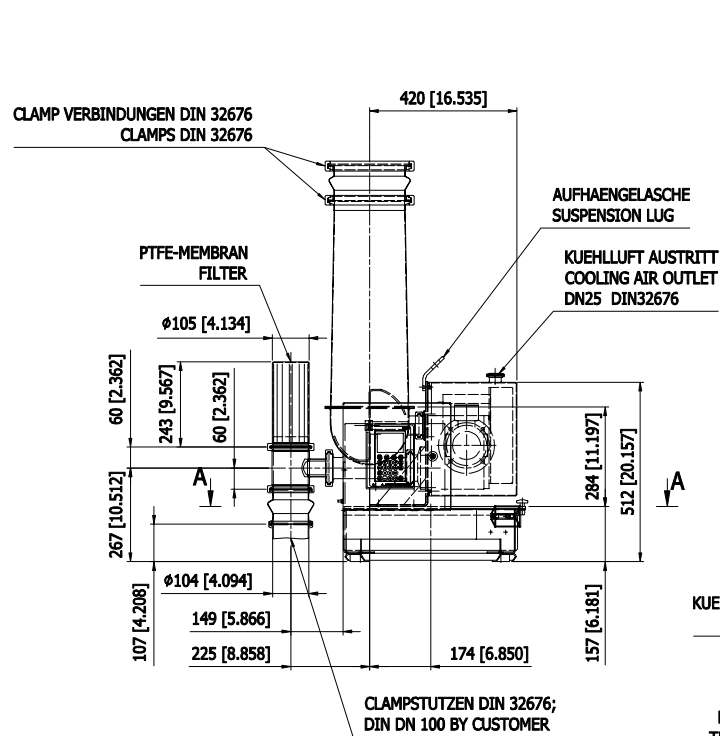
12.5.7 Specific AC Drive connections

#	J2-Encoder	J6-Line Power/ Motor	J9-Drive Interface
1	+ 5 Vdc	MDU L2 Power Control Relay NO	I Out +
2	Frequency Input +	MDU L1 Power Control Relay NO	I Out -
3	Frequency Input -	PE/GRD	Freq Out +
4	Common	PE/GRD	Freq Out -
5		PE/GRD	+2 4Vdc @ 0.2 A
6		Neutral	Drive Ena Relay Common
7		L2	Drive Ena Relay NO
8		L1	Alarm Reset Relay Com
9			Alarm Reset Relay NO
10			Common

Chapter 7:

Mechanical Drawings

- 1401237500



	Gas:	-
	Atex-Zone Process:	-
	Atex Zone outside:	-
	Dust:	-
	Atex-Zone Process:	21
	Atex Zone outside:	22

GEWICHT CA.
WEIGHT APPR. 100KG

ATEX ZONE 22/21		SCALE	1:10	DRAWN	DD.MM.YYYY	SIGN
K-PH-ML-D5-KT35-H-2.2D-20L KCM / ATEX		FIRST ANGLE		APPROVED	DD.MM.YYYY	SIGN
DC-MOTOR 0.45KW		PAGE	01 OF 01	CATEGORY	P-Level	REV
		DIMENSION SHOWN IN MILLIMETERS [INCHES]	FORMAT	NUMBER		
ALL RIGHTS RESERVED © 2014 WWW.COPERIONKTRON.COM			A2	1401237500		A

Chapter 8:


Electrical Drawings

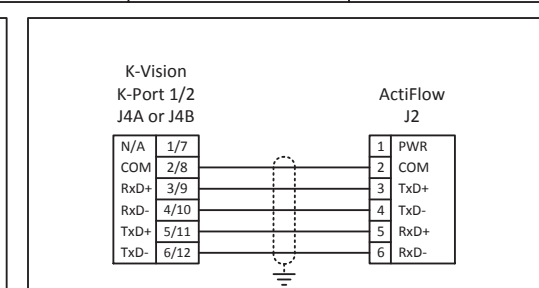
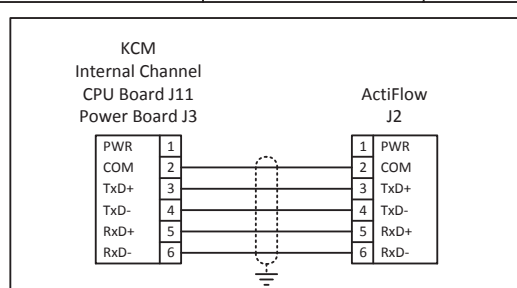
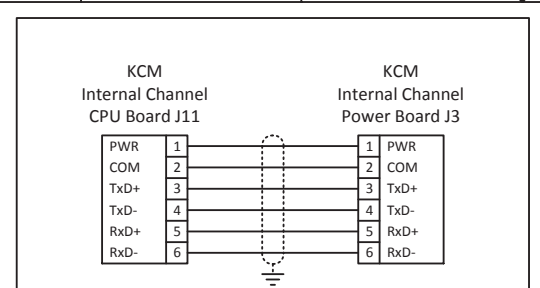
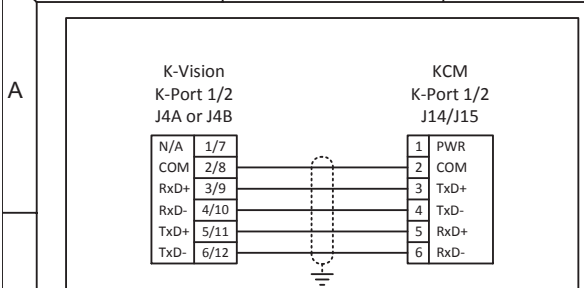
- 1401237700

Company -				Salesman KH. Klein		Project No. 1401237		Language 1 EN	
Customer LEISTRITZ Extrusionstechnik GmbH				Project Manager M. Keller		Main Delivery Date 30.05.2014		Language 2 -	
Customer Order No. JB107858-300		Customer Reference N-40101394 / 4439		Country Germany		Process Engineer -		Advance Delivery Date -	
				Electrical Engineer L. Hausammann		Subsequent Delivery Date -		Document PDF <input checked="" type="checkbox"/>	
				Software Engineer -				Document DXF <input type="checkbox"/>	

<div style="position: absolute; top: 0; left: 0; width: 100%; height: 100%; background-color: #f0f0f0; border: 1px solid #ccc;"></div>									
--	--	--	--	--	--	--	--	--	--

Rev.	Date	User	Comment						
A	10.04.2014	LHA	First Issue						

	10.04.2014	Drawn	LHA	Title		Main Supply	Cold Water	Air Supply	N2 Gas	Size
	10.04.2014	Checked	LLA	cover sheet		230 VAC	-	-	-	
		Approved		Document Chapter		Auxiliary Supply	Hot Water	Pharma Air	Steam	Hazard Classification
	Date		Name	700		-	-	-	-	
										Total Pages
										20

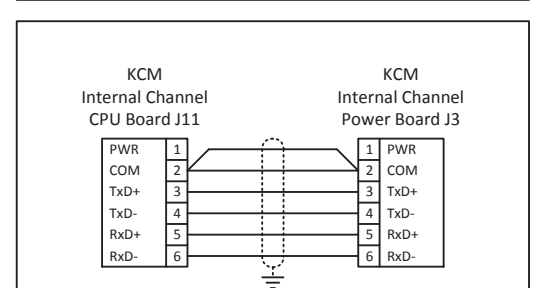
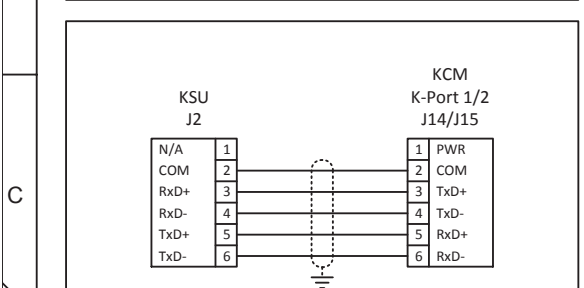


Standard Connection K-Vision <-> KCM

Connection KCM CPU Board <-> KCM Power Board
CPU powered internal

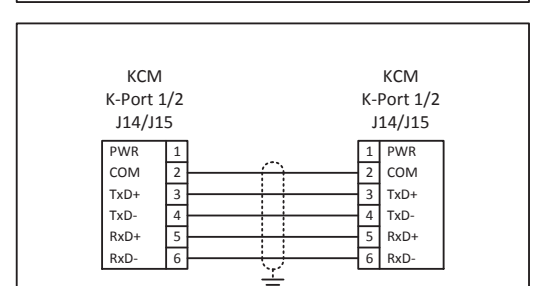
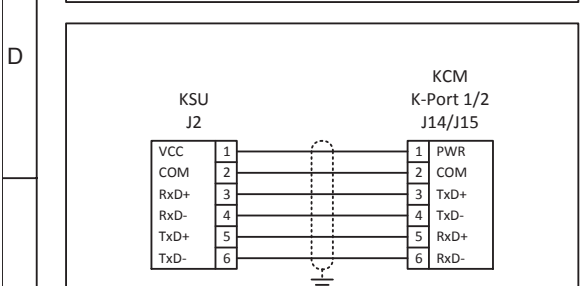
Connection KCM <-> ActiFlow

Connection K-Vision <-> MPC 2400



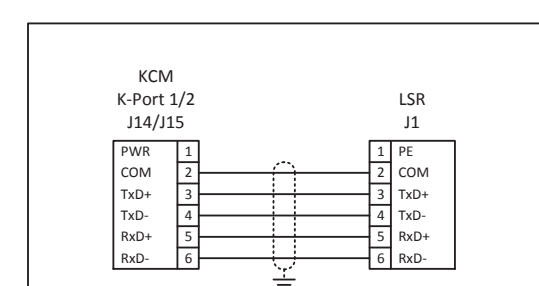
Connection KSU <-> KCM; KSU powered by customer

Connection KCM CPU Board <-> KCM Power Board
CPU powered external



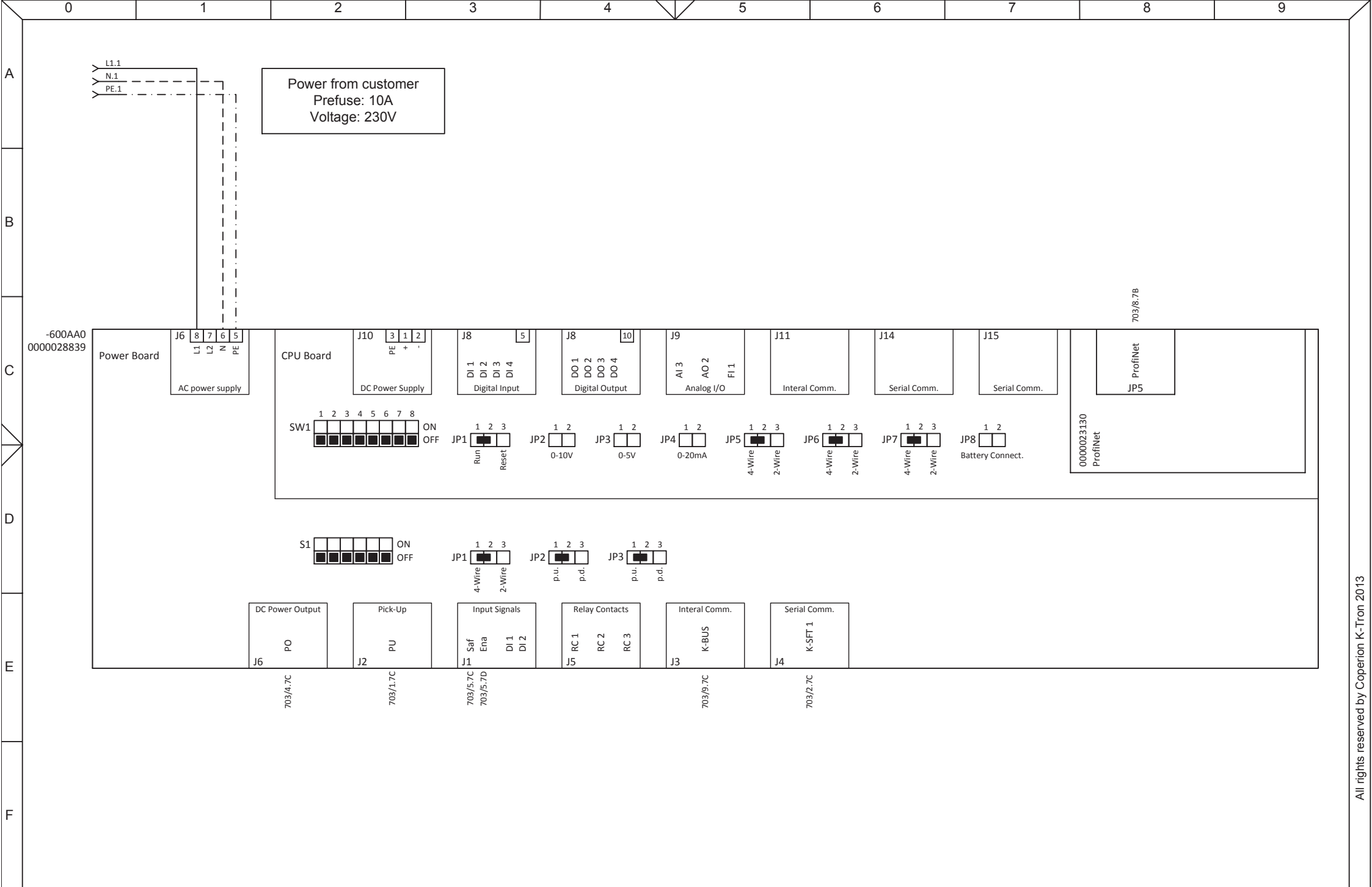
Connection KSU <-> KCM; KSU powered by KCM

Connection KCM <-> KCM



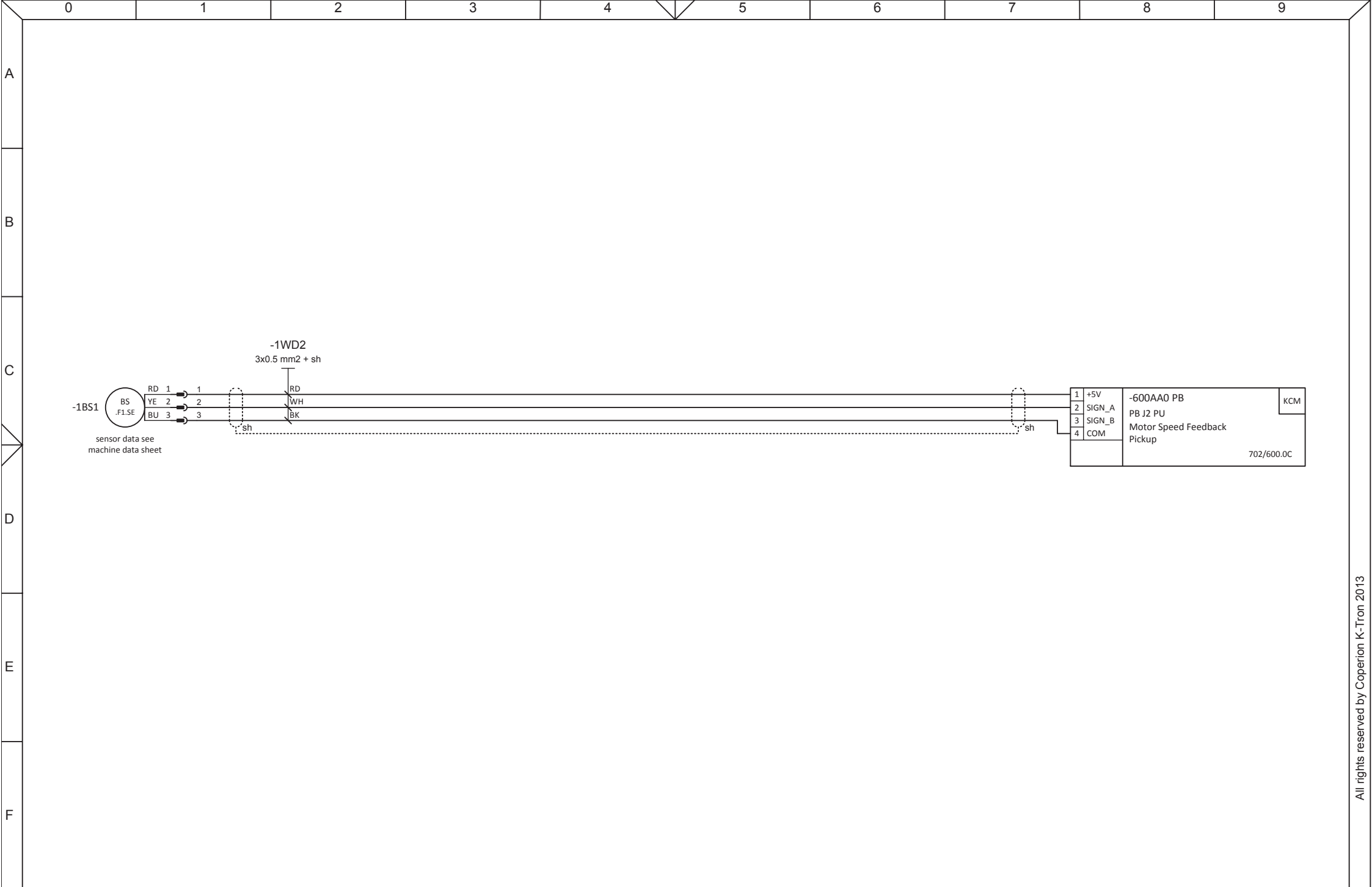
Connection KCM <-> LSR

A	10.04.2014	Drawn	LHA	Project No.	Title	Function	Supply	Page	
	10.04.2014	Checked	LLA	1401237	Topology - Connection Overview			1	
		Approved		Document Chapter	TAG No.	Location	Hazard Classification <small>in out</small>	Size	Page- 1 of
	Rev.	Date	Name	701	Type			A3	Page+ 600

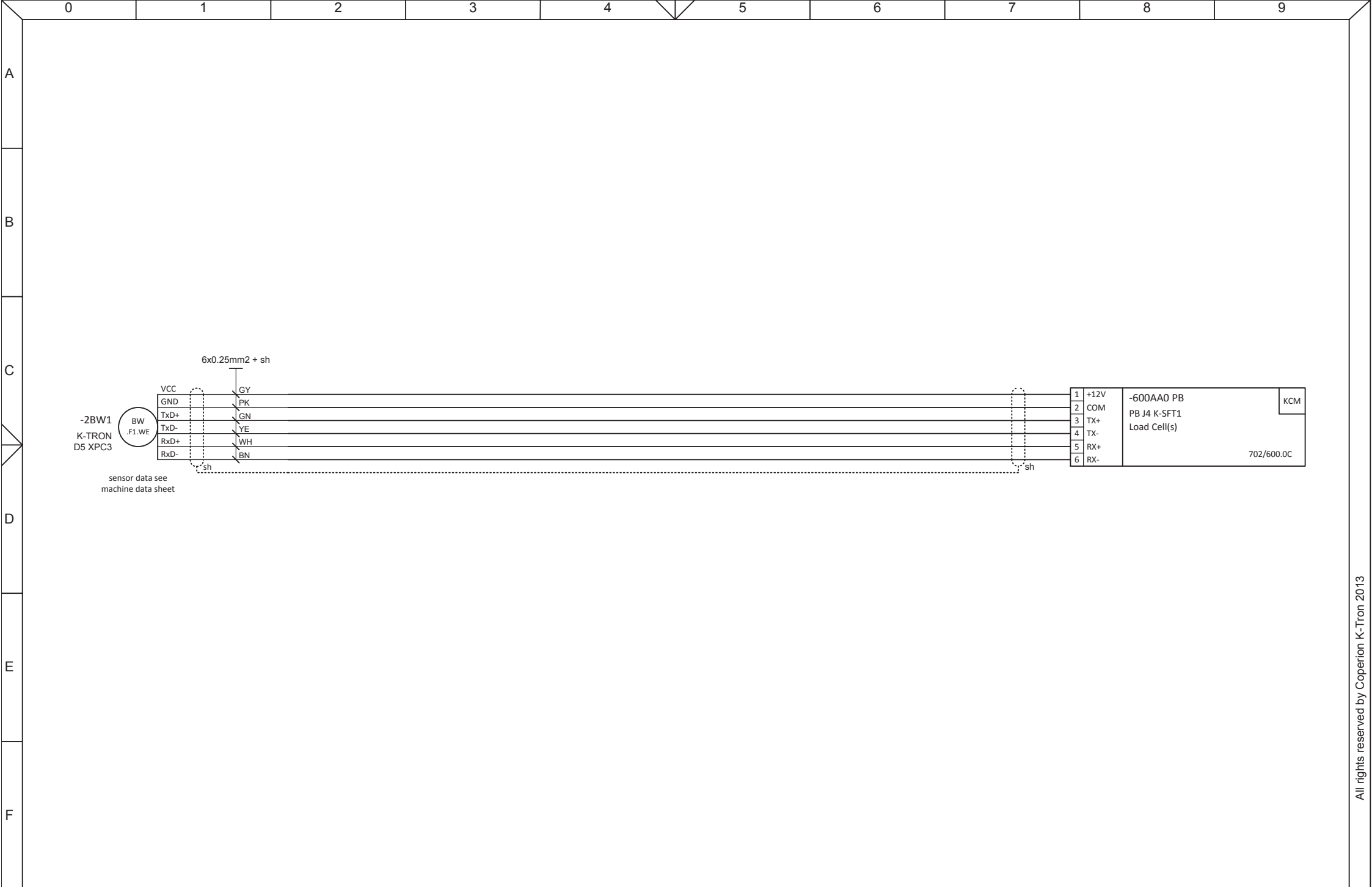


	A	10.04.2014	Drawn	LHA	Project No.	Title		Function	Supply	Page	
		10.04.2014	Checked	LLA	1401237	feeder controller - KCM		.F1.A2	230 VAC	600	
			Approved		Document Chapter	TAG No.		Location	Hazard Classification	Size	Page- 1 of
	Rev.	Date		Name	702	-	Type	+Feeder 1	- / 21 - / 22	A3	Page+ 1 of 0

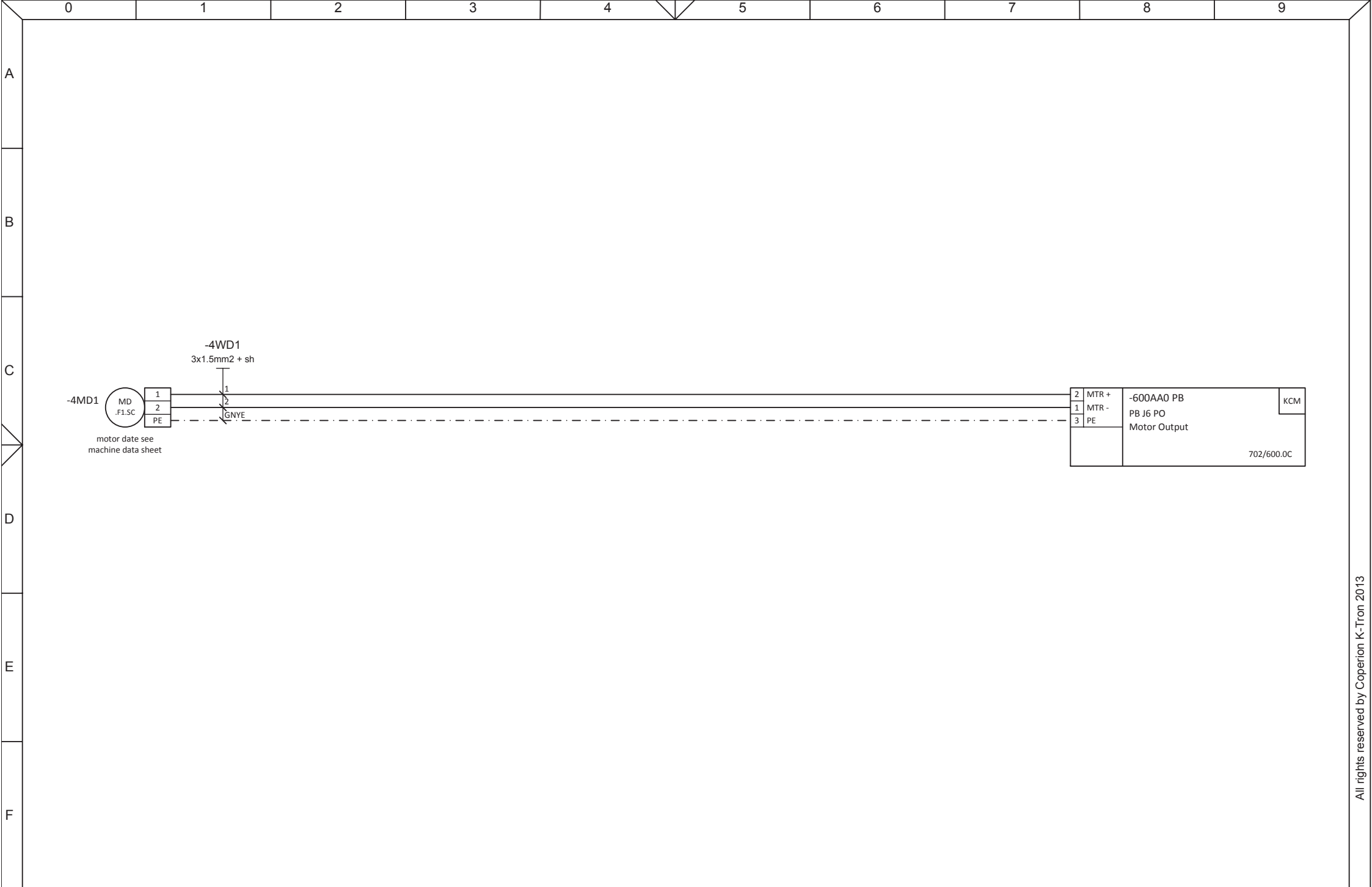
All rights reserved by Coperion K-Tron 2013



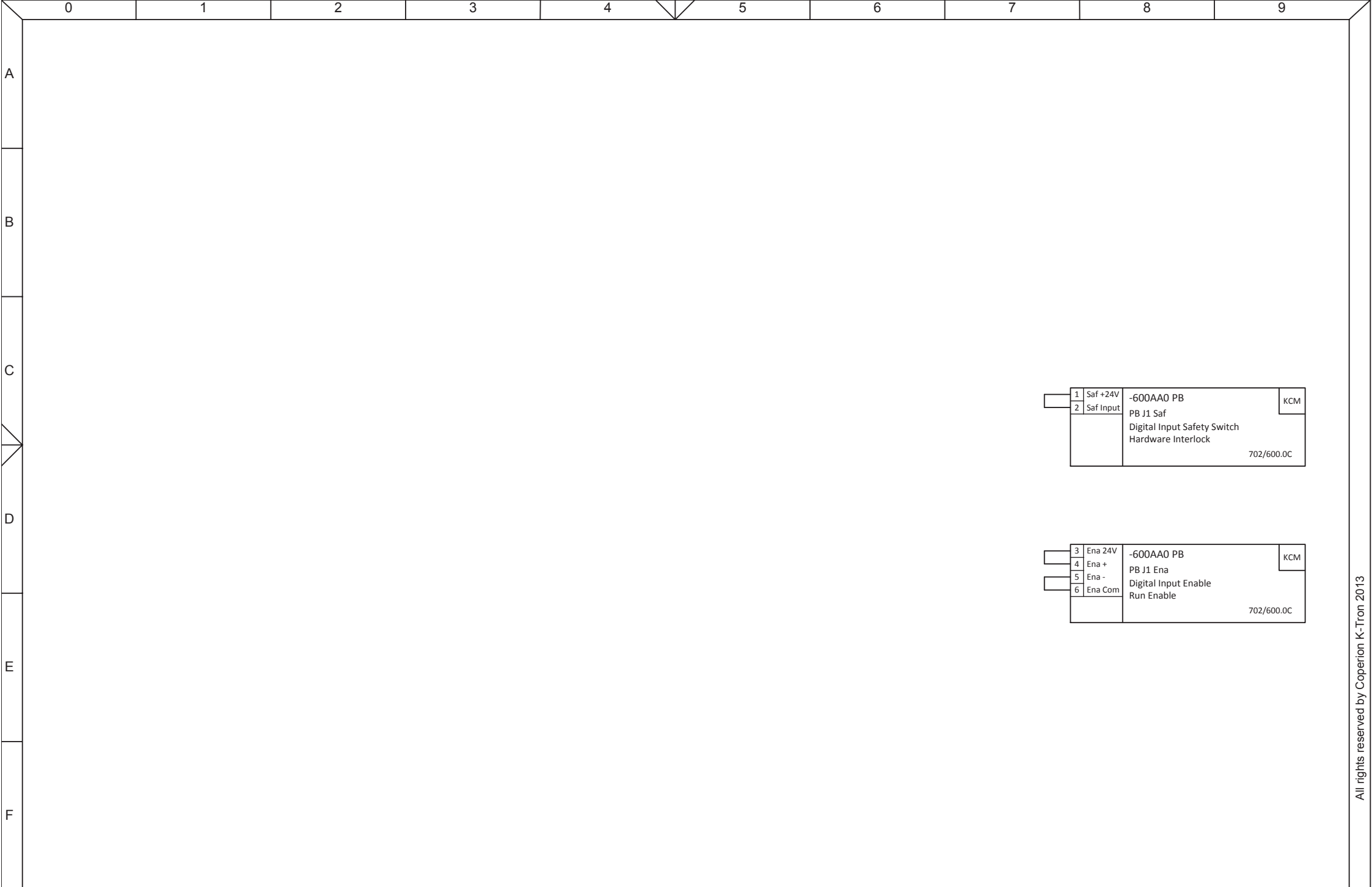
	A	10.04.2014	Drawn	LHA	Project No.	Title	Function	Supply	Page	
		10.04.2014	Checked	LLA	1401237					speed sensor (pickup)
		Approved		Document Chapter	TAG No.	Type	Location	Hazard Classification	Size	Page- 600 of 6
	Rev.	Date	Name	703	-	K-PH-ML-D5-KT35	+Feeder 1	- / 21 - / 22	A3	Page+ 2



	A	10.04.2014	Drawn	LHA	Project No.	Title		Function	Supply	Page	
		10.04.2014	Checked	LLA	1401237	load cell(s) - D5		.F1.WE	230 VAC	2	
		Approved		Document Chapter	TAG No.	Type	Location	Hazard Classification	Size	Page-	1 of
	Rev.	Date	Name	703	-	K-PH-ML-D5-KT35	+Feeder 1	- / 21 - / 22	A3	Page+	4 of 6



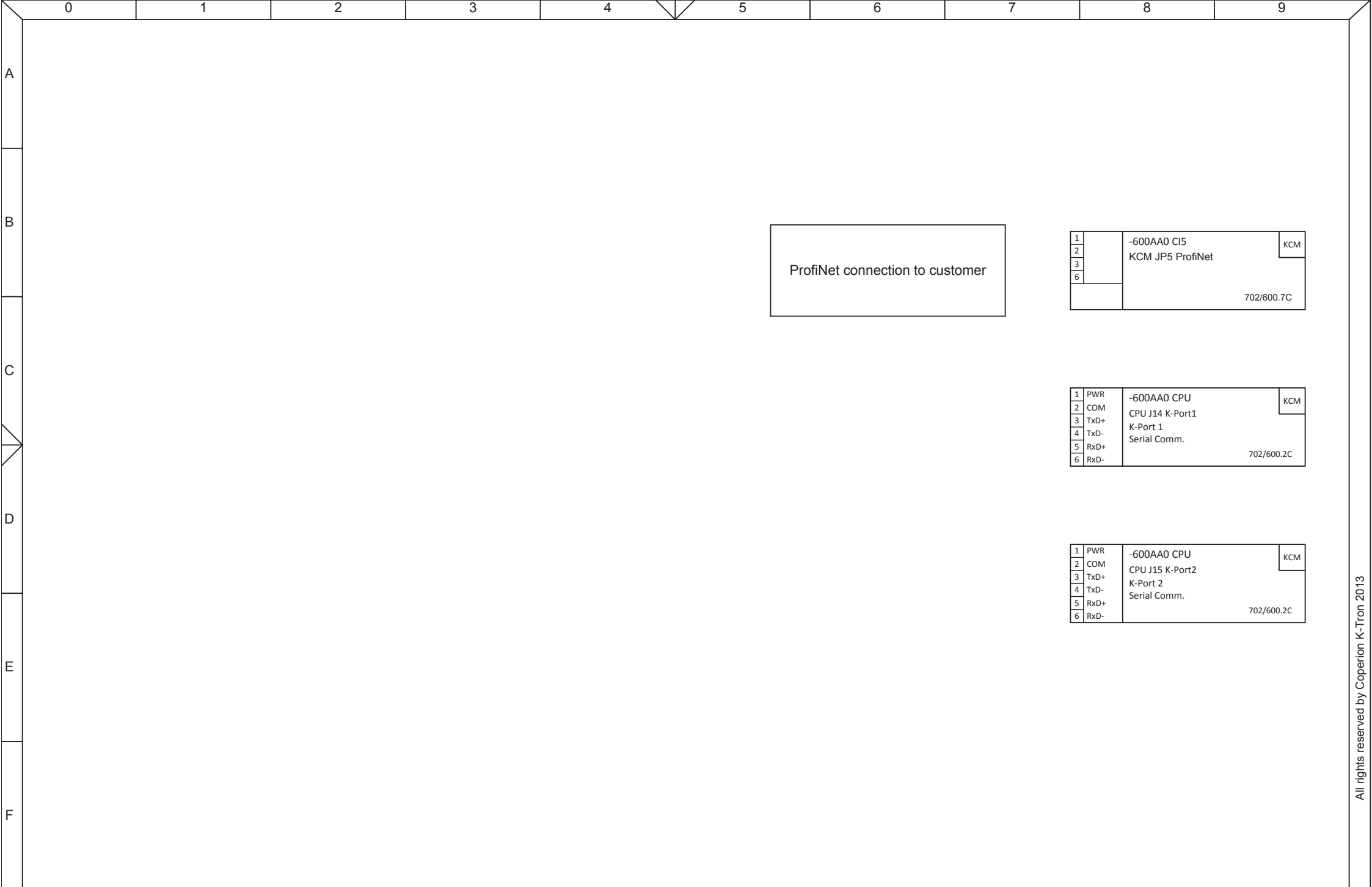
	A	10.04.2014	Drawn	LHA	Project No.	Title	Function	Supply	Page			
		10.04.2014	Checked	LLA	1401237					power output	.F1.SC	230 VAC
		Approved		Document Chapter	TAG No.	Type	Location	Hazard Classification	Size	Page-	2	of
	Rev.	Date	Name	703	-	K-PH-ML-D5-KT35	+Feeder 1	- / 21 - / 22	A3	Page+	5	6



1	Saf +24V	-600AA0 PB PB J1 Saf Digital Input Safety Switch Hardware Interlock 702/600.0C	KCM
2	Saf Input		

3	Ena 24V	-600AA0 PB PB J1 Ena Digital Input Enable Run Enable 702/600.0C	KCM
4	Ena +		
5	Ena -		
6	Ena Com		

	A	10.04.2014	Drawn	LHA	Project No.	Title		Function	Supply	Page	
		10.04.2014	Checked	LLA	1401237	safety stop / enable		.F1.SS	230 VAC	5	
			Approved		Document Chapter	TAG No.	Type	Location	Hazard Classification	Size	Page- 4 of
	Rev.	Date		Name	703	-	K-PH-ML-D5-KT35	+Feeder 1	- / 21 - / 22	A3	Page+ 8



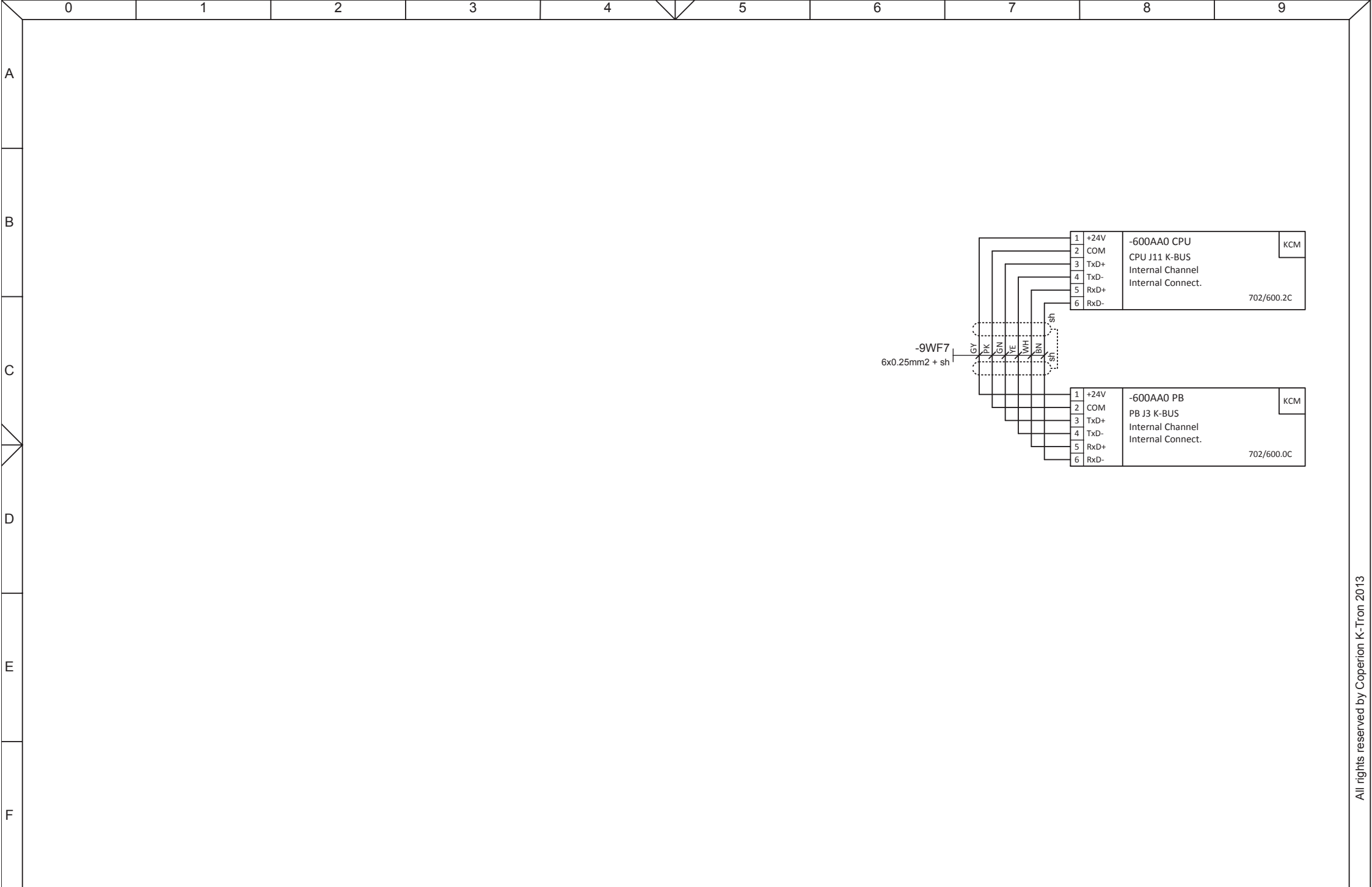
ProfiNet connection to customer

1		-600AA0 C15 KCM JP5 ProfiNet	KCM
2			
3			
6			
		702/600.7C	

1	PWR	-600AA0 CPU CPU J14 K-Port1 K-Port 1 Serial Comm.	KCM
2	COM		
3	TxD+		
4	TxD-		
5	RxD+		
6	RxD-		
		702/600.2C	

1	PWR	-600AA0 CPU CPU J15 K-Port2 K-Port 2 Serial Comm.	KCM
2	COM		
3	TxD+		
4	TxD-		
5	RxD+		
6	RxD-		
		702/600.2C	

	A	10.04.2014	Drawn	LHA	Project No.	Title		Function	Supply	Page		
		10.04.2014	Checked	LLA	1401237	host communication		.F1.QC	230 VAC	8		
			Approved		Document Chapter	TAG No.	Type	Location	Hazard Classification	Size	Page-	5
		Rev.	Date	Name	703	-	K-PH-ML-D5-KT35	+Feeder 1	- / 21 - / 22	A3	Page+	9
											of	6



coperion K-TRON	A	10.04.2014	Drawn	LHA	Project No.	Title		Function	Supply	Page	
		10.04.2014	Checked	LLA	1401237	internal communication		.F1.LC	230 VAC	8 of 9	
		Approved		Document Chapter	TAG No.	Type	Location	Hazard Classification	Size	Page-	8
	Rev.	Date	Name	703	-	K-PH-ML-D5-KT35	+Feeder 1	- / 21 - / 22	A3	Page+	10

Chapter 9:

Spare Parts

- 1401237100
- KCM / KSU II

Other Spare Part List see Operating Instructions!



KCM/ KSU II Ersatzteilliste

KCM/ KSU II Spare Parts List

Seq.	Item Number	Beschreibung in Deutsch	Description in English
KCM Unterteil ohne Deckel KCM Box without Cover			
	0000011361	KCM ohne Deckel Stepper Motor	KCM Without Cover stepper drive
	0000004179	KCM ohne Deckel 450 W Motor	KCM Without Cover 450 W Motor
	0000004180	KCM ohne Deckel 1600 W Motor	KCM Without Cover 1600 W Motor
	0000004324	KCM ohne Deckel Vibrator	KCM Without Cover Vibrator
	0000004323	KCM ohne Deckel Interface AC Motor	KCM Without Cover Interface AC Motor





KCM/ KSU II Ersatzteilliste

KCM/ KSU II Spare Parts List

Seq.	Item Number	Beschreibung in Deutsch	Description in English
------	-------------	-------------------------	------------------------

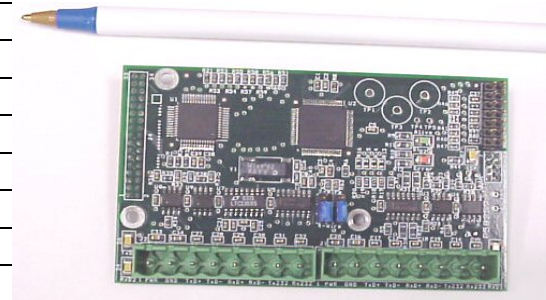
KCM Boards

	000007405	KCM DC Drive Board 450W	KCM DC Drive Board 450W
	000002610	KCM DC Drive Board 1600W	KCM DC Drive Board 1600W
	000005987	KCM Stepper Board Drive	KCM Stepper Board Drive
	000000684	KCM Vibratory Board Drive	KCM Vibratory Board Drive
	000003413	KCM AC Drive Interface Board	KCM AC Drive Interface Board



KCM Communication Board K- Port

	000001737	KCM Kommunikation Board K- Port	KCM Communication Board K- Port





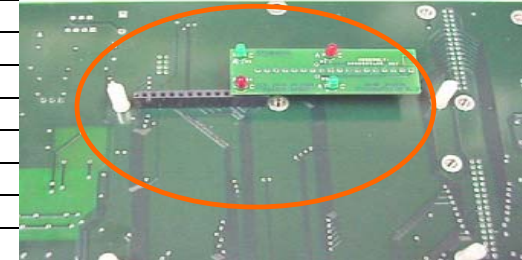
KCM/ KSU II Ersatzteilliste

KCM/ KSU II Spare Parts List

Seq.	Item Number	Beschreibung in Deutsch	Description in English	
------	-------------	-------------------------	------------------------	--

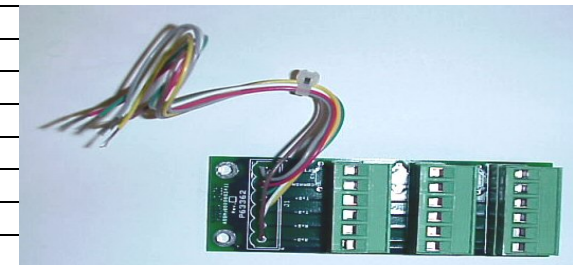
KCM LED Board

	0000002608	KCM LED Board	KCM LED Board	



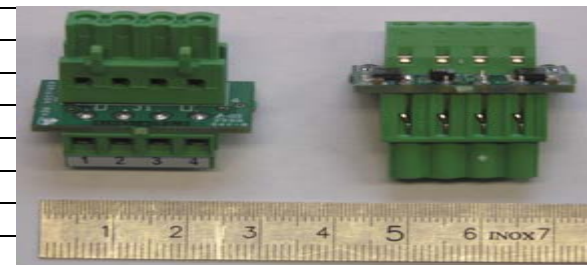
KCM 3x SFT Board

	0000003411	KCM 3x SFT Board	KCM 3x SFT Board	



Encoder Interface Print KCM

	0000006384	Encoder Interface Print KCM	Encoder Interface Print KCM	





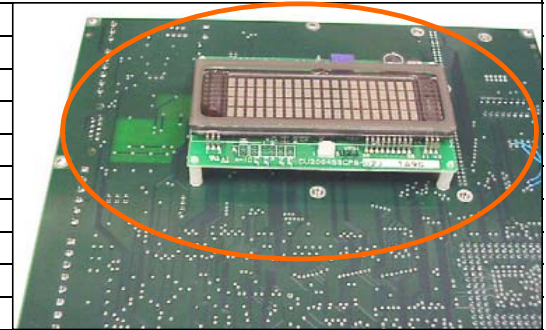
KCM/ KSU II Ersatzteilliste

KCM/ KSU II Spare Parts List

Seq.	Item Number	Beschreibung in Deutsch	Description in English
------	-------------	-------------------------	------------------------

FL Display KCM

Seq.	Item Number	Beschreibung in Deutsch	Description in English
	0000004040	FL Display KCM	FL Display KCM



Kabel KCM / KSU II

Seq.	Item Number	Beschreibung in Deutsch	Description in English
	0000009438	Kabel M16 jack KSU II / KCM	Cable M16 jack KSU II / KCM
		Benötigter Artikel am KSU II	Used Part on KSU II
	0000009437	Verbindungskabel 2m zu KCM steckbar	Cable 2m To KCM / Plugged



KCM/ KSU II Ersatzteilliste

KCM/ KSU II Spare Parts List



Seq.	Item Number	Beschreibung in Deutsch	Description in English	
------	-------------	-------------------------	------------------------	--

KCM Communications Boards
KCM Communications Boards

	000005105	KCM Devicenet Module	KCM Devicenet Module	



	000005106	KCM Ethernet IP Module Modbus TCP	KCM Ethernet IP Module Modbus TCP	




	000005107	KCM Modbus Plus Module	KCM Modbus Plus Module	



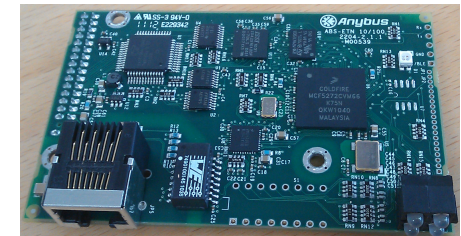
KCM/ KSU II Ersatzteilliste

KCM/ KSU II Spare Parts List



Seq.	Item Number	Beschreibung in Deutsch	Description in English	
	000005108	KCM Profibus DP Module	KCM Profibus DP Module	
	9198-40295	Kabel zu Profibus DP Modul	Cable to Profibus DP Modul	

000023130 Profinet I/O Modul



Chapter 10:

Address List

- Address list K-Tron Companies and Reps

Coperion K-TRON Companies

ASIA

see also Representatives ASIA

Coperion K-Tron Asia Pte. Ltd.

No. 21 Bukit Batok Crescent

Wcega Tower #22-79

SG-658065 Singapore

Singapore

Tel. +65 6899 7255

Fax +65 6569 7600

e-mail kap@coperionktron.com

CHINA

Coperion K-Tron (Shanghai) Co. Ltd.

Building A2-A3, No. 6000, Shen Zhuan Road,

Songjiang district,

CN-201619 Shanghai

China

Tel. +86 (21) 6375 7925

Fax +86 (21) 6375 7930

e-mail kcn@coperionktron.com

FRANCE

Northern Part

see also Sub-Representatives Europe

Coperion K-Tron France Sarl

56 boulevard de Courcerin

FR-77183 Croissy-Beaubourg

France

Tel. +33 (1) 64 80 16 00

Fax +33 (1) 64 80 15 99

e-mail kf@coperionktron.com

FRANCE

Southern Part

Coperion K-Tron France Sarl

56 boulevard de Courcerin

FR-77183 Croissy-Beaubourg

France

Tel. +33 (475) 25 46 17

+33 (608) 62 55 54 mobile

Fax +33 (475) 25 47 52

e-mail kf@coperionktron.com

GERMANY

see also Sub-Representatives Europe

Coperion K-Tron Deutschland GmbH

Im Steinigen Graben 10

DE-63571 Gelnhausen

Germany

Tel. +49 (6051) 9626-0

Fax +49 (6051) 9626-44

e-mail kd@coperionktron.com

SWITZERLAND

Coperion K-Tron (Schweiz) GmbH

Lenzhardweg 43/45

CH-5702 Niederlenz

Switzerland

Tel. +41 (62) 885 71 71

Fax +41 (62) 885 71 80

+41 (62) 885 71 86 Sales

+41 (62) 885 71 84 Service

e-mail ks@coperionktron.com

UNITED KINGDOM

see also Sub-Representatives Europe

Coperion K-Tron Great Britain Ltd.

4 Acorn Business Park

Heaton Lane

GB-Stockport SK4 1AS

Great Britain

Tel. +44 (161) 209 4810

Fax +44 (161) 474 0292

e-mail kb@coperionktron.com

USA

Coperion K-Tron Salina, Inc.

606 North Front Street / P.O. Box. 17

Salina, KS 67402-0017

USA

Tel. +1 (785) 825 -1611

Fax +1 (785) 825-8759

e-mail info@coperionktron.com

USA, CANADA,
LATIN AMERICA

Coperion K-Tron Pitman, Inc.

590 Woodbury Glassboro Road

08080 Sewell, NJ

USA

Tel. +1 (856) 589-0500

Fax +1 (856) 589-8113

e-mail ka@coperionktron.com

Representatives EMEA/India

AUSTRIA

SOBITSCH Industrie Produkte & Anlagen GmbH
Theodor-Körner-Strasse 120A
AT-8010 Graz
Austria

Tel. +43 316 26 30 20
Fax +43 316 26 30 70
e-mail office@sobitsch.at

**BELGIUM
Luxembourg**

K-Tron Benelux B.V.
Sluiswachter 20
3861 SN Nijkerk
Postbus 1033
NL-3860 BA Nijkerk
Netherlands

Tel. +31 337115111
Fax +31 33 246 4011
e-mail w.vantHazeveld@ktron.nl

BULGARIA

Unister Ltd.
75, Krum Popov Str.
BG-1241 Sofia
Bulgaria

Tel. +359 2 96 32 799
Fax +359 2 96 34 271
e-mail alexanderyordanov@unister.bg

CROATIA

ASF
Vinkoviceva 25
HR-10 000 Zagreb
Croatia

Tel. +385 (1) 460 99 79
Fax +385 (1) 46 83 968
e-mail asf@zg.t-com.hr

CZECH REPUBLIC

Otto Kühnen Praha s.r.o.
Boleslavska 31/4
CZ-250 00 Brandys-Stara Boleslav
Czech Republic

Tel. ++420 326 396 080
Fax ++420 326 396 165
e-mail peter.bayer@kuehnen.com

DENMARK

Tekemas A/S
Valhojs Allé 154
DK-2610 Rødovre
Denmark

Tel. +45 (36) 70 60 00
Fax +45 (36) 70 60 59
e-mail tekemas@tekemas.dk

FINLAND

MS-Genetec OY
Massbyntie 54 - 10
FI-01150 Söderkulla
Finland

Tel. +358 (9) 868 45500
Fax +358 (9) 868 45501
e-mail mika.saanila@ms-genetec.fi

GREECE

Industria S.A.
Industrial & Technical Installations
9, Klisthenous Str.
GR-105 52 Athens
Greece

Tel. +30 6944 353 175
Fax +30 6957 200 941
e-mail charalampos.fostiropouls@industria.gr

HUNGARY

Otto Kühnen Budapest
Narcisz u. 21
HU-2030 Erd
Hungary

Tel. ++36 309 772729
Fax +43 1 31356-60
e-mail valo.gabor@kuehnen.com

INDIA

ICE (Asia) Pvt. Ltd.
Broadway, 3rd Floor
Dr. Babasaheb Ambedkar Road
Dadar (East)
IN-400 014 Mumbai
India

Tel. +91 (22) 2410 3916 /17 /18
Fax +91 (22) 2410 3920
e-mail ice@ice-asia.com

IRAN

***!!!** no business allowed until further notice ***!!!**

Keyhanideh Co.

No: 13,4 th floor, No. 256, between 17th and 19th street
Gisha Street,
IR-Tehran
Iran

Tel. +98 (21) 8868 2509

+98 (21) 8868 5101

Fax +98 (21) 8868 2509

e-mail kico-tech@keyhanideh.ir
m.mokhtari@kico.ir**ISRAEL****CLC Chemical Process Equipment Ltd.**

5 Osishkin Street
Floor 4, Office No. 20
IL-47225 Ramat Hasharon
P.O. Box 1140
IL-47111 Ramat Hasharon
Israel

Tel. +972 (3) 540 7466

Fax +972 (3) 540 7488

e-mail clc@clc-ltd.co.il
roy@clc-ltd.co.il**ITALY****Montenegro S.r.l.**

Via Volturno, 37
IT-20681 Brugherio (MB)
Italy

Tel. +39 (039) 883 107

Fax +39 (039) 870 023

e-mail info@montenegrosrl.it**NETHERLANDS****K-Tron Benelux B.V.**

Sluiswachter 20
3861 SN Nijkerk
Postbus 1033
NL-3860 BA Nijkerk
Netherlands

Tel. +31 33 711 5111

Fax +31 33 246 4011

e-mail w.vantHazeveld@ktron.nl**PAKISTAN****Excel Trade Intl. Pvt Ltd.**

B-183 Block 3, K.A.E.C.H.S.
PK-Karachi
Pakistan

Tel. +92 (21) 4535718

+92 (21) 4537366

Fax +92 (21) 4535717

e-mail ashraf@exceltradeintl.com

POLAND

Tekpro Sp. z o.o.
Wojska Polskiego 9
PL-39-300 Mielec
Poland

Tel. +48 (1778) 86 428
Fax +48 (1774) 5150
e-mail sprzedaz@tekpro.pl

PORTUGAL

P + F Electrónica, Lda
Zona Industrial Vista Alegre, Lote 2,
Pavilhão 14
PT-3850 - 184 Albergaria-a-Velha
Portugal

Tel. +351 (234) 310 683
Fax +351 (234) 310 703
e-mail info@pfe.pt

ROMANIA

IMARK SISTEM Srl
Dr. Balta Doamnei 57-61
RO-032624 Bucharest
Romania

Tel. +40 0372 765 910
Fax +40 021 255 71 75
e-mail leonard.stancescu@immarke.ro

**RUSSIA
Moscow
& various regions**

000 "Invent Service"
Profsoyuznaya street,
House 93A, office 234
RU-117279 Moscow
Russia

Tel. +7 (495) 620 62 04
Fax +7 (495) 620 62 05
e-mail sales@invent-group.ru
kuttan@invent-group.ru

**RUSSIA
St. Petersburg
& various regions**

Afaya
Korablestroiteley, 12, b.1
RU-199226 St. Petersburg
RUSSIA
Russia

Tel. +7 (812) 600 70 39
Fax +7 (812) 600 70 39
e-mail shaburova.u@afaya.ru

SAUDI ARABIA

ZENTECH Jubail Zenith Tech. & Industrial Services Co., Ltd.
Support Industries Area, Street No. 114
SA -31961 Jubail Industrial City
P.O. Box 11124
SA- 31961 Jubail Industrial City
Kingdom of Saudi Arabia

Tel. +966 (3) 341 1140
Fax +966 (3) 341 1150
e-mail zuhair.felimban@zentech-co.com

SERBIA

Agroprem AM
Vuka Karadzica 8
RS-11000 Beograd
Serbia

Tel. +381 11 412 44 47
Fax +381 11 263 12 78
e-mail agroprem@sezampro.rs

SLOVAK REPUBLIC

Otto Kühnen Praha s.r.o.
Boleslavská 31/4
CZ-250 00 Brandys-Stara Boleslav
Czech Republic

Tel. ++420 326 396 080
Fax ++420 326 396 165
e-mail peter.bayer@kuehnen.com

SLOVENIA

Vodilo
Dunajska c. 411
SI-1231 Ljubljana
Slovenia

Tel. +386 (1) 561 87 58
Fax
e-mail peter.lesnjak@gmail.com

SOUTH AFRICA

Producer Industrial Equipment
28 Madge Ave.
Northcliff
ZA-2195 Johannesburg
P.O. Box 4613
ZA-2118 Cresta
South Africa

Tel. +27 11 476 4554
Fax +27 11 478 0052
e-mail pro.industrial@vodamail.co.za

SPAIN

Aguilar & Pineda Asociados S.L.
Luciano Aguilar S.A.
Mallorca 279, pral. 2
ES-08037 Barcelona
Spain

Tel. +34 934 87 66 67
Fax +34 934 87 30 02
e-mail jpedemon@laguilar.es

SWEDEN

Christian Berner AB
Designvägen 1
SE-43522 Mölnlycke
P.O. Box 88
SE-43522 Mölnlycke
Sweden

Tel. +46 (31) 33 66 900
Fax +46 (31) 33 66 934
e-mail infose@christianberner.com

TURKEY

Alkem Teknik Hizmet Ltd. Sti.
Hanimefendi Sok 117 / 8
TR-80260 Sisli/Istanbul
Turkey

Tel. +90 (212) 230 13 83
+90 (212) 231 16 36
Fax +90 (212) 232 00 93
e-mail malce@alkemteknik.com

UNITED ARAB EMIRATES

Al Mazroui Engineering Co. for Trade
Agencies
Al Najda Street, Al Yassat Tower,
Suite: 603, P.O. Box 97
UAE - Abu Dhabi
P.O. Box 60957
UAE - Dubai
United Arab Emirates

Tel. +971 4 282 86 92
Fax +971 4 286 89 87
e-mail fadiagha@mazeng.ae

Representatives ASIA

AUSTRALIA

Brolton Group Pty Ltd.
69 Princes Street,
AU-2765 Riverstone NSW
Australia

Tel. +61 2 9838 1311
Fax +61 2 9838 3113
e-mail ktronsales@brolton.com.au

CHINA

Anhui, Chongqing, Gansu,
Guangxi, Gizhou, Henan, Hubei,
Hunan, Jiangxi, Inner Mongolia,
Ningxia, Shaanxi, Shandong,
Sichuan. Xiniian. Yunnan Area

STECO Process Equipment & Systems
Pte. Ltd.
Room B9, 4th floor, Fusha Business Mansion
No, 1215 Zhongyi Road
CN-201101 Shanghai PRC
China

Tel. +8621 345 20 701
Fax +8621 345 20 702
e-mail csteo@steco-process.com

CHINA

Beijing Area

Compass Bulk Handling System Pte. Ltd.
Building 2A, No. 17 Huanke Middle Road,
Jingqiao Science Industrial Park,
Zhongguancun Tongzhou Park,
Tongzhou Distr., Beijing 101102 CN
China

Tel. +86 (10) 597 71 616
Fax +86 (10) 597 71 515
e-mail info@compassbulkhandling.com

CHINA

Fujian Area

Annet Technology & Trade Co. Ltd.
Suite 2F, C Atlantic Plaza
No. 11 Hubin Road
CN - 361001 Xiamen
China

Tel. +86 (592) 2396 270
Fax +86 (592) 2396 271
e-mail xm-annet@xm-annet.com

CHINA

Hong Kong &
Guangdong Area

Leitz Pacific Ltd
Rm 1018,10/F, New Tech Plaza
34 Tai Yau Street
San Po Kong, Kowloon
Hong Kong
China

Tel. +852 2 851 1262
Fax +852 2 851 1266
e-mail covalent.ho@leitz-pacific.com

CHINA
People Rep. of China

ShangHai DeQianSheng Industry & Trade Co., Ltd. Tel. +86 (21) 525 89 077
Fax +86 (21) 525 89 012
Room 715-716, Hualian Development Building e-mail tygerzhang@msn.com
ChangNing District
CN-200052 Shanghai
China

CHINA
People Rep. of China

Grandway Technology International Co. Ltd. Tel. +86 852 225 75 022
Fax +86 852 917 90 606
Unit 9, 8th Floor, Topsail Plaza e-mail carvent@grandway.cn
11 on Sum Street
Shatin, Hong Kong
China

CHINA
People Rep. of China

Yiao Powder Engineering & Technology (Shanghai) Co. Ltd. Tel. +86 21 504 797 96
Fax +86 21 504 797 96-804
Rm 1213, No. 899 Dongfang Road e-mail joew@yiaosystem.com
China Coal Mansion
CN-200120 Shanghai, Pudong New Distr.
China

CHINA
People Rep. of China

Shanghai KSD Bulk Solid Engineering Co. Ltd. Tel. +86 21 32140425
Fax
4th F. 22/376 Yan An Rd. e-mail wuyafeng@shksd.com
CN-200040 Shanghai
China

CHINA
People Rep. of China

Shanghai Bloom Powder Engineering Inc. Tel. +86 21 69792788
No. 1356 Xinxie Road, Huaxin Town Fax
Qingpu e-mail zhangll@bloom-powder.com
CN-201708 Shanghai
China

CHINA
Shanghai Area

Leitz Pacific Ltd - Shanghai
1A, Lane 1300, East Kangqiao Rd
CN-201319 Pudong, Shanghai
China

Tel. +86 (21) 6819 0098
Fax +86 (21) 6819 0008
e-mail shihong.cui@leitz-pacific.com

CHINA
Shenzhen Area

Leitz Pacific Ltd
Flat D, 12/F Caihong Building,
South Caitian Road
Futian District,
Shenzhen CN
China

Tel. +86 (755) 8292 4610
Fax +86 (755) 8292 4576
e-mail covalent.ho@leitz-pacific.com

INDONESIA (C+P)

Wahana Mitra Abadi
JL Telesonic no. 10
Komplek Surya Kadu blok I/10
ID-Jatake-Tangerang
Indonesia

Tel. +62(21) 294 380 30
Fax +62(21) 294 380 59
e-mail bernadus@wahana-mitra.com

INDONESIA (F+P)

PT Tirtamas Anugrah
Jatibening Circle
Jalan Caman Raya No. 17C
ID-17421 Jatibening Bekasi
Indonesia

Tel. +62 (21) 8499 8236-38
Fax +62 (21) 8497 4793
e-mail victor.bondan@pt-tma.co.id

JAPAN

APTe Japan Co., Ltd.
No. 2 Kosei Bldg. 1-14-20-, Shin-Yokohama
JP-222-0033 Kohoku-ku, Yokohama
Japan

Tel. +81 45 478 4360
Fax +81 45 478 4361
e-mail aono-k@adprotec.co.jp

KOREA

InFeed Corp.
#29, Gwirae-gil 46 beon-gil, Jeongnam-myeon
KR-445-961 Hwaseong-si, Gyeonggi-do
Korea

Tel. +82 (31) 8059 4455
Fax +82 (31) 8059 4458
e-mail chkkim@infeed.co.kr

MALAYSIA

MagAir (M) Sdn Bhd.
171, Jalan Aminuddin Baki
Taman Tun Dr. Ismail
MY-60000 Kuala Lumpur
Malaysia

Tel. +60 (3) 7728-2100
Fax +60 (3) 7728-2991
e-mail magair@tm.net.my

NEW ZEALAND

A.E. Tilley Ltd.
Jean Batten Street
Rongotai
NZ-Wellington
New Zealand

Tel. +64 (4) 387 7009
Fax +64 (4) 387 9114
e-mail reception@aetilley.co.nz

PHILIPPINES

GCH International Mercantile Inc.
Room 506, One Corporate Plaza
845 Pasay Road
PH-1260 Makati City, Metro Manila
Philippines

Tel. +63 (2) 818 1501
+63 (2) 818 5029
Fax +63 (2) 893 5873
e-mail gchi2@ultimate.info.com.ph

SINGAPORE

BMM International Pte. Ltd.
31, Tai Hwan Terrace
SG-555258 Singapore
Singapore

Tel. +65 6283 6983
Fax +65 6382 1396
e-mail htan@bmm-intl.com

TAIWAN

Innovation System Engineering Co., Ltd. Tel. +886 2 2681 8333
No. 187, Shuxin Rd., Shulin Dist. Fax +886 2 2681 7333
TW-238 New Taipei City e-mail charles.duh@msa.hinet.net
Taiwan

THAILAND

Pacific Intertech Co. Ltd Tel. +66 (2) 967 9134
29/9 Moo 3, Rawadee Road, Taladkwan Fax +66 (2) 967 9135
TH-11000 Muang Nonthaburi, Nonthaburi e-mail sales@pacificintertech.com
Thailand

VIETNAM

Song Song Co., Ltd. Tel. +84 8 3911 18 77
4/F, 119 Dien Bien Phu Str. Dist. 1 Fax +84 8 3911 17 91
VN-Ho Chi Minh City e-mail hai@songsong.com.vn
Vietnam

Sub-Representatives Europe

Coperion K-Tron France Sarl, FR-Croissy-Beaubourg:

FRANCE Food Industry

Agro Food Integrity Sarl
19, Rue Daru
FR-75008 Paris
France
France

Tel. 0033 3 37 40 63 55

Fax

e-mail stanislas.capelle@agro-food-integrity.com

Coperion K-Tron Deutschland GmbH, DE-Gelnhausen:

GERMANY
BavariaIndustrievertretung Karlheinz Fischer
Oskar-von-Miller-Strasse 4e
DE-82256 Fürstenfeldbruck
Germany

Tel. +49 (0) 8141 34 81 78

Fax +49 (0) 8141 52 45 21

e-mail fischer-karlheinz@t-online.de

Coperion K-Tron Deutschland GmbH, DE-Gelnhausen:

GERMANY
Northern PartIngenieur-Büro Haupthoff-Lau
Konrad-Reuter-Str. 41A
DE-22393 Hamburg
Germany

Tel. +49 040 600 7235

Fax +49 040 600 7236

e-mail info@haupthoff-lau.de

Coperion K-Tron Great Britain Ltd. GB-Stockport

UNITED KINGDOM
Northern Ireland and
IRELAND Rep. of IrelandProduction Services Ltd
74 Whitebeam Road, Clonskeagh
IE-Dublin 14
Ireland

Tel. +353 (1) 269 0661

Fax +353 (1) 269 0662

e-mail psl@iol.ie

UNITED KINGDOM
Scotland

J. Inglis Engineering Sales
8 Dunure Place, Newton Mearns
UK-Glasgow G77 5TZ
United Kingdom

Tel. +44 (141) 639 2182
Fax +44 (141) 616 3491
e-mail jinglis@dron8.freemove.co.uk