

TECHNISCHE DOKUMENTATION
TECHNICAL DOCUMENTATION
DOCUMENTATION TECHNIQUE
TECHNISCHE DOCUMENTATIE

Besteller: **LEISTRITZ EXTRUSIONSTECHNIK**
Customer:
Commettant:
Leverancier:

Auftrags-Nr.: **94968 / 14**
Confirmation-No.:
Confirmation-No.:
Ordernummer:

Gerätetyp: **STW 150/1-6-B12/20-NS/E**
Type of unit:
Type:
Apparaatentype:

Geräte-Nr.: **144123**
Unit-No.:
Appareil-No.:
Serienummer:

TECHNISCHE ÄNDERUNGEN UND VERBESSERUNGEN
VORBEHALTEN !

WE RESERVE THE RIGHT FOR TECHNICAL ALTERATIONS AND
IMPROVEMENTS !

SPECIFICATIONS ET DESCRIPTIO NS SOUS RESERVE DE MODIFICATION
DANS LE SENS DU PROGRES TECHNIQUES !

TECHNISCHE WIJZIGINGEN EN VERBETERINGEN VOORBEHOUDEN !



Contens

TECHNICAL DOCUMENTATION T25601-E for

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13.12.11 - Im

STW 150/1-...-N1 /E
STW 150/1-...-NS /E
STW 150/1-...-S /E
STW 150/1-...-SG /E
STW 150/1-...-G /E
STW 150/1-...-G2 /E

SC

1 TECHNICAL DATA

- 1.1 Order data-sheet
- 1.2 Data-sheet
- 1.3 Flow diagram
- 1.4 Circuit diagram
- 1.5 Replacement- and wearing-parts list heat-balancing unit
- 1.6 Acceptance record
- 1.7 Parameter-list
- 1.8 Manufacturer's Declaration

2 ADVICE ON SAFETY

- 2.1.1 Correct use of equipment
- 2.1.2 Notes on safety for the operator
- 2.2 **Transport, storage**
 - 2.2.1 Transport
 - 2.2.2 Storage
- 2.3 **Assembly**
 - 2.3.1 Electrical connection
 - 2.3.2 Mechanical connection
- 2.4 **Taking the unit into operation**
 - 2.4.1 Initial Commissioning
 - 2.4.1.1 Filling the heat-balancing unit as well as the consumer
 - 2.4.2 Venting
 - 2.4.3 Operation
 - 2.4.4 Shutting down
 - 2.4.5 Taking the unit into operation again



2.5 Maintenance

2.6 Malfunctions and rectification

3 APPENDIX

3.1 Decalcification

3.2 Water quality

3.3 Operation "SC"

1 Technical Data

1.1 Order data-sheet

1.2 Data-sheet

1.3 Flow diagram

1.4 Circuit diagram

1.5 Replacement- and wearing-parts list heat-balancing unit

1.6 Acceptance record

1.7 Parameter-list

1.8 Manufacturer's Declaration

Auftrags-Datenblatt

Kunde: LEISTRITZ Extrusionstechnik
90014 Nürnberg

Kunden-Bestell-Nr.: 108710-300 / 13.02.14 / Fr. Kerstin Renner

Auftragsbestätigungs-Nr.: **94968 / 14**

Geräte-Nr.: **144123**

Beschreibung: **SINGLE-Temperiersystem**
STW 150/1-6-B12/20-NS/E
Mehrbereichsspannung: 380-415 V / 50 Hz
- werkseitig eingestellte Nennspannung für
Steuertrafo: 4 0 0 V
Heizleistung: 6,0 kW
Kühlleistung: 116.000 W
Umlaufmedium: Wasser bis 150 °C
- Vorlauftemperatur bis max. 95 °C

ansonsten gemäß technischer Spezifikation:
U:\SINGLE\Artikel-Spezifikationen\
150 N - G\kundenspezifisch\Leistriz\
STW 150_1-NS_E 'SC'.doc

Sonderausrüstung (ein- bzw. angebaut):

Art.-Nr. 54.999 bis max. 95 °C Vorlauftemperatur

Art.-Nr. 54.999 Kühlung über Plattenwärmetauscher, Typ: B12/20

Art.-Nr. 50.999 Regel- und Steuereinheit SC Standard

Art.-Nr. 54.999 leistungsstärkere Pumpe, Typ: CRI 5-11,
Q=max. 100 l/min., p=max. 7,5 bar,
Motorleistung: 2,2 kW

Art.-Nr. 54.999 Verrohrung für EXTRUDER-Betrieb:
Kühler im Rücklauf, Überlauf auf separaten
Anschluß geführt (über 3 bar Überströmventil)

Art.-Nr. 54.999 Mehrbereichsspannung: 380-415 V / 50 Hz
- werkseitig eingestellte Nennspannung
für Steuertrafo (T-Nr. 14725): 400 V

Art.-Nr. 54.999 Sonderausdehnungsbehälter
- Füllstandsniveau abgesenkt
- längerer Magnetschwimmerschalter (T-Nr. 07645)
- Anschluß der Befüllung am Ausdehnungs-

Auftrags-Datenblatt

Kunde: LEISTRITZ Extrusionstechnik
90014 Nürnberg

Kunden-Bestell-Nr.: 108710-300 / 13.02.14 / Fr. Kerstin Renner

Auftragsbestätigungs-Nr.: **94968 / 14**

behälter (Muffe 3/4" weiter nach unten versetzt)

Art.-Nr. 54.999 geräteinterner Bypass mit Überströmventil,
eingestellt auf 4 bar, Typ: 06-195, R 1"

Art.-Nr. 54.999 Rückschlagventil 1" im Rücklauf
(Verhinderung des Zurückfließens von Wasser)

Art.-Nr. 50.999 **A n s c h l ü s s e :**
- Umlaufmedium: G 1" IG - DIN ISO 228-1
nach u n t e n abgehend
- Kühlwasser: G 1" - DIN ISO 228-1
nach u n t e n abgehend
- separate Befüllung: G 3/8" AG (Meco)
nach u n t e n abgehend
- Überlauf: Stutzen 1/2" (Schauchstutzen 14 mm)
nach u n t e n abgehend

Art.-Nr. 54.999 o h n e manuelle Befüllung

Art.-Nr. 50.109 Anschluß für Schnittstelle
über 9-polige D-Sub-Steckverbindung
für Profibus DP

Art.-Nr. 54.999 automatische Systembefüllung über separaten
Anschluß o h n e Schmutzfänger
- INFO: Schmutzfänger ist nicht notwendig, da an-
lagenseitig ein Wasserfilter vorgeschaltet ist

Art.-Nr. 54.999 Rücklauf und Kühlwasserzuluß o h n e Schmutz-
fänger
- INFO: Schmutzfänger ist nicht notwendig,
da an den Anschlüssen des Geräteständers
Schmutzfänger montiert sind

Art.-Nr. 50.999 Kühlwasserverrohrung, Magnetventil und
externer Kühlwasserverteiler (inkl. Schmutz-
fänger) auf einen minimalen Kühlwasser-
differenzdruck von 0,7 bar ausgelegt
- Nennweite des Kühlwasseranschlusses vergrößert
sich auf 1"

Art.-Nr. 54.999 komplette hydraulische Installation in VA

Auftrags-Datenblatt

Kunde: LEISTRITZ Extrusionstechnik
90014 Nürnberg

Kunden-Bestell-Nr.: 108710-300 / 13.02.14 / Fr. Kerstin Renner

Auftragsbestätigungs-Nr.: **94968 / 14**

(Umlauf- und Kühlwasserseite), Kühlung über
nickelverlöteten Plattenwärmetauscher

Art.-Nr. 54.999 Kühlwasserseite isoliert, um Schwitzwasserbildung
zu vermeiden, Vorlauftemperatur Kühlsole ca. 6°C

Art.-Nr. 54.29 16 A-Stecker / CEE
komplett montiert

Art.-Nr. 54.999 vorbereitet zur Aufnahme in Gerätestände,
14 4125

Art.-Nr. 54.54 Sonderlackierung: STEEL IT

=====
Pos. 1.0, Material-Nr. 0061506
=====

Lackierung: STEEL IT
Beschriftung: englisch
Techn. Dokum.: 2 x deutsch / englisch in
Papierform, 1 x deutsch / englisch als pdf-Datei
per e-mail an: krenner@leistriz.com, Pos. 2.0

TECHNICAL SPECIFICATION

SINGLE - Pressurized temp. control unit with forced circulation

Equipment series:	STW 150/1-NS/E
Circulating medium:	Water up to 150° C (302° F) in return run (without pressure overlay)
Heating capacity:	Refer to our quotation/order confirmation
Cooling capacity:	Refer to our quotation/order confirmation

Reference values for cooling capacity data:

80°C (176° F) pre-run temperature
15°C (59° F) cooling water temperature
difference of pressure: cooling water inlet and outlet at least 3 bar (43.51 PSI)

Equipment:

- Controller SC standard
- "Ready for operation" on 4-pin plug connection at the front of the unit (collective alarm, limit comparator and "pump on")
- Level monitoring by magnetic float-switch
- Flow monitoring by recording surface temperature of heating rods
- Copper tube bundle heat exchanger in return run
- Heating with stainless steel tubular heaters
- Dirt trap in cooling water supply and return line of circulating system
- Bypass between pressure- and return-line of small dimension
- Only manual filling via hose nipple with ball valve
- Corrosion resistant components (stainless steel/brass)
- Ventilation and overflow with overflow valve 3 bar (43.51 PSI) into cooling water outlet
- Without system closing
- Electrical wiring to series terminal strips
- Control cabinet IP 54

Delivery:

- Unit on rollers and ready for connection

Stainless steel centrifugal pump	CRI 5-11
• Output rate max.	100 l/min (26.41 gal/min)
• Pressure max.	7.5 bar (108.77 PSI)
• Motor capacity	2.2 kW (2.95 hp)

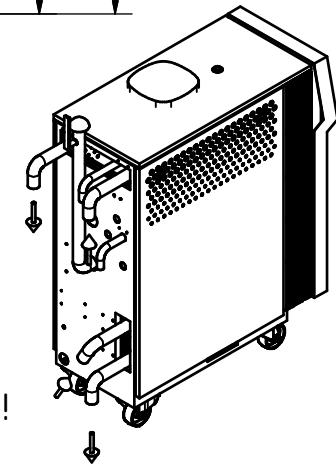
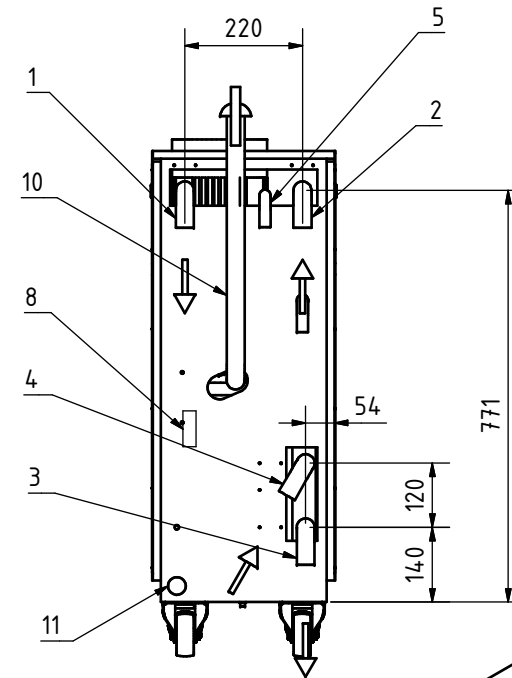
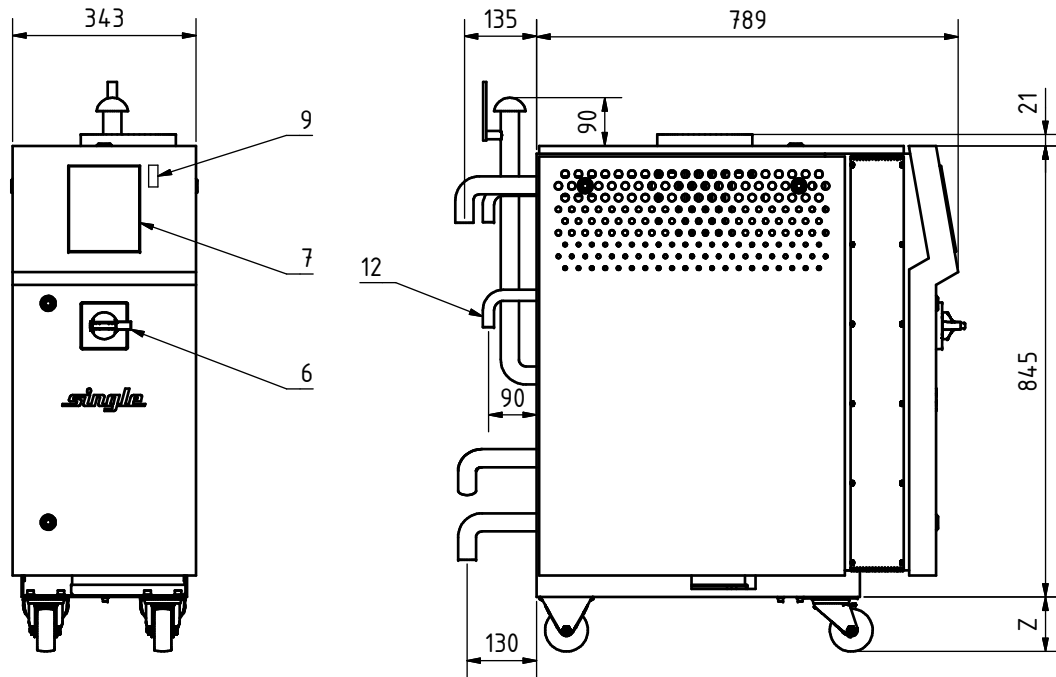
Connections:

- **Circulating medium** Socket G 1
- **Cooling water** Hose nipple acc. to cooling capacity

Dimensions:

- **Length x Width x Height** 760 mm x 340 mm x 950 mm (without connections)
- **Weight (approx.)** 140 kg
- **Color** acc. to customer's request

Technical changes reserved
D-Hochdorf, May 10, 2011



Maß Z : 100 Rollen
100 Kufen (Option)

Technische Änderungen vorbehalten !
Technical changes reserved !

- 1 Vorlauf AD 28 L / to process / alimentation
- 2 Rücklauf AD 28 L / from process / retour
- 3 Kühlwasserzufluss AD 28 L / cooling water in / arrivée d'eau froide
- 4 Kühlwasserabfluss AD 28 L / cooling water out / écoulement d'eau froide
- 5 Befüllung Ø14 (Schmutzfänger) (Option) / filling (strainer) / remplissage (filtre)
- 6 Hauptschalter / main switch / interrupteur principal
- 7 Regler / controller / régulateur
- 8 mehrpolige Steckverbindung (Option) / multi plug connection / connecteur multiple
- 9 Schnittstelle (Option) / interface
- 10 Einfüllstutzen (Option) / filling nozzle / manchon de remplissage
- 11 Anschlusskabel / connection cable / câble de connexion
- 12 Überlauf AD 18 L / over flow / trop plein

Abweichende Angaben siehe Auftragsbestätigung !
Special equipment not mentioned: please see order confirmation attached !

Kunde: Leistritz		Nicht tolerierte Maße nach DIN ISO 7168 m		Maßstab: 1:10 (1:15)		Gewicht:	
1.Verw.:		CAD DIN A3		Werkstoff:			
		Datum	Name	(Benennung)			
		Bearb.: 15.06.2010	Eichhorn	Maßbild/ diagram/ encombrement STW 150/1..NS / E			
		Gepr.:					
				(Teile-/Zeichnungsnummer)			
				M 20155			
1		Pos.3+4 getauscht	16.05.2013	Eich.			Blatt 1
Index	Änderung	Datum	Name	Ers. durch:		Ers. für:	

single

Legende

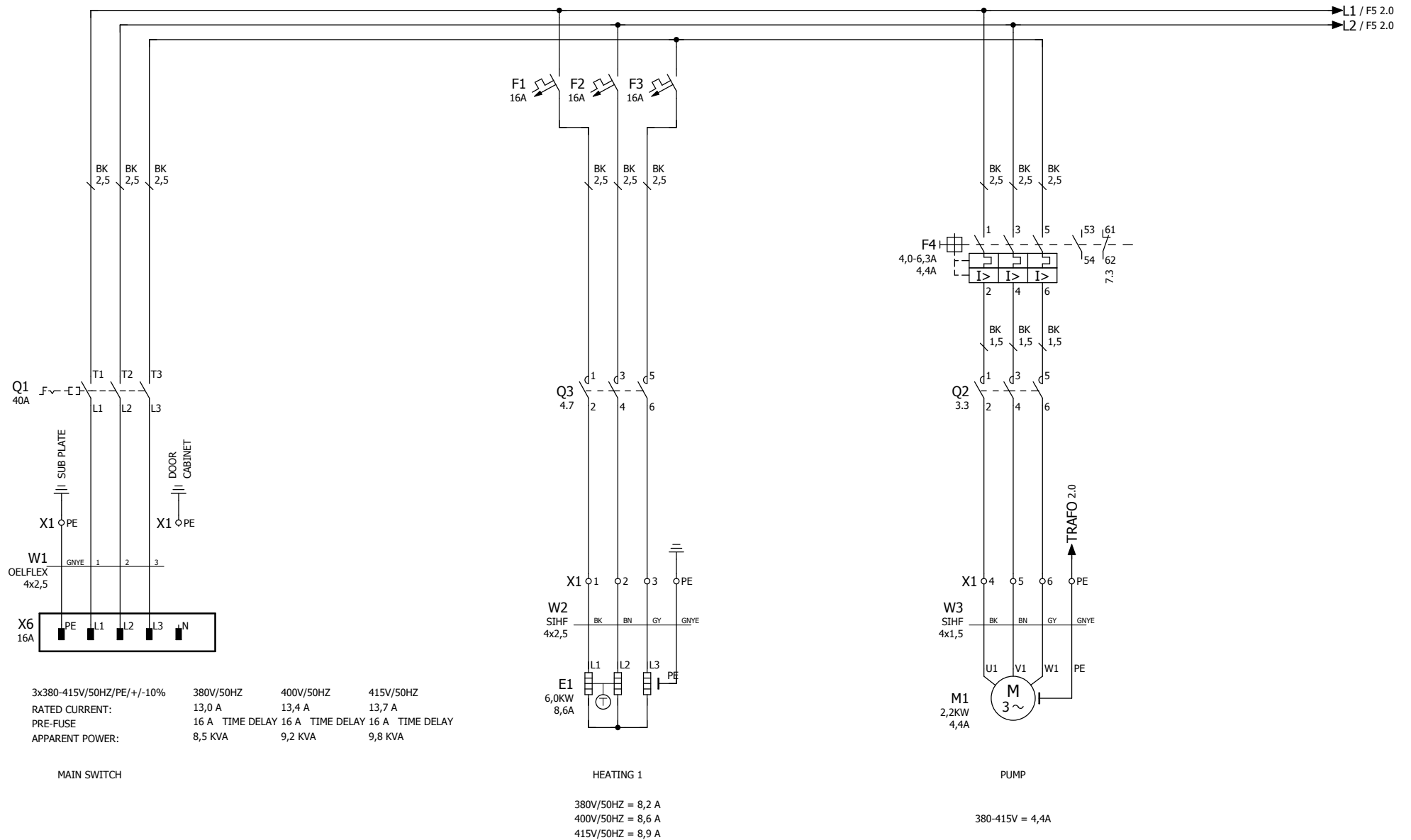
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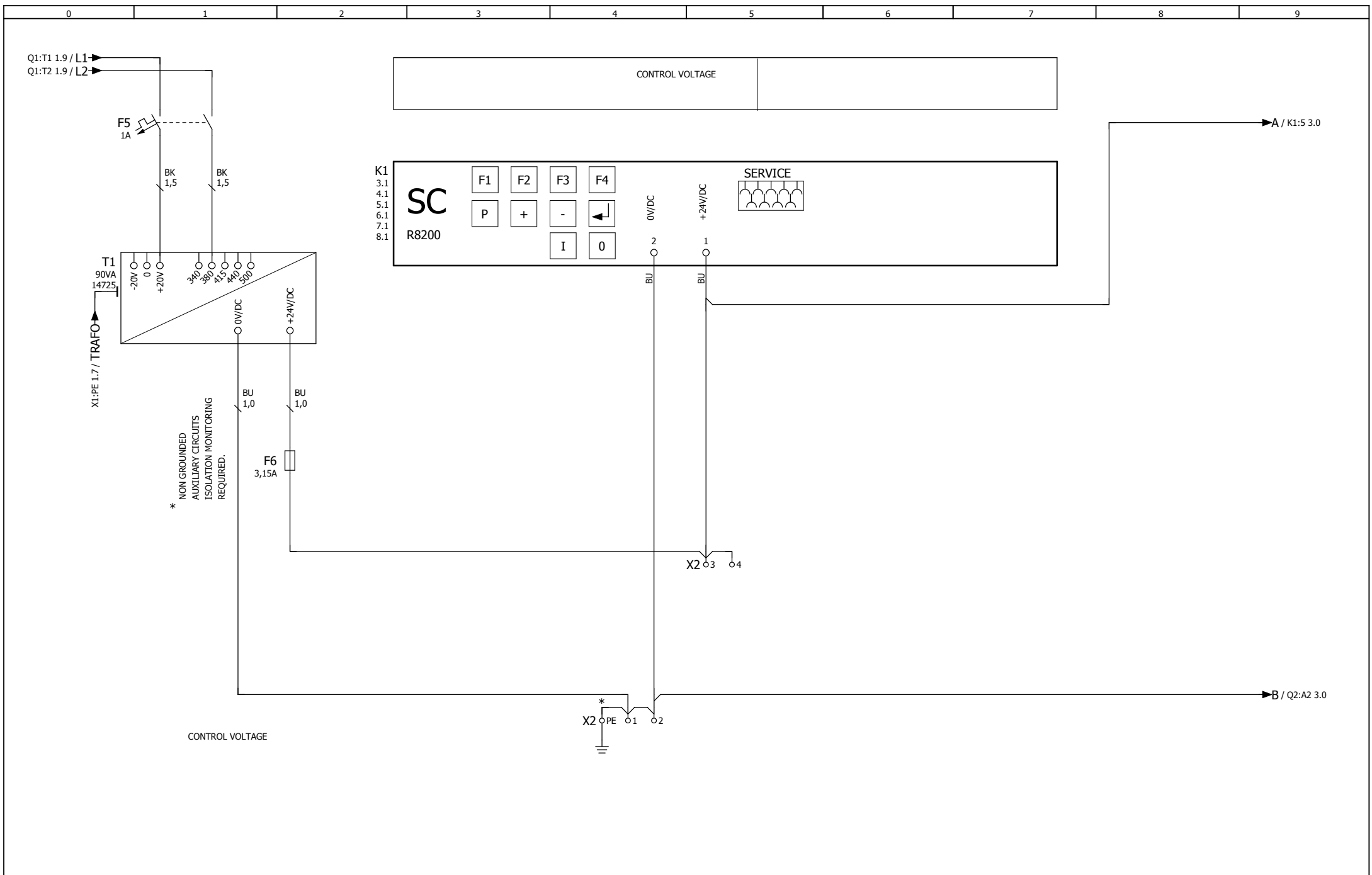
légende

- | | |
|--|---|
| <p>1 Single Controller</p> | <p>10 Magnetventil
solenoid valve
électrovanne</p> |
| <p>2 Temperatursensor Pt 100
temperature sensor
sonde de température</p> | <p>11 Wärmetauscher
heat exchanger
échangeur de chaleur</p> |
| <p>3 Erhitzer
heater
caléfacteur</p> | <p>12 Schmutzfänger
strainer
filtre</p> |
| <p>4 Pumpe
pump
pompe</p> | <p>13 Rückschlagventil
non-return valve
clapet de retenue</p> |
| <p>5 Ausdehnungsbehälter
expansion tank
vase de dilatation</p> | |
| <p>6 Schwimmerschalter
float switch
contacteur à flotteur</p> | |
| <p>7 Sicherheitsventil
safety valve
vanne de sécurité</p> | |
| <p>8 Überströmventil
over-flow valve
vanne de surcharge</p> | |
| <p>9 Absperrventil
shut-off valve
robinet d'arrêt</p> | |

1

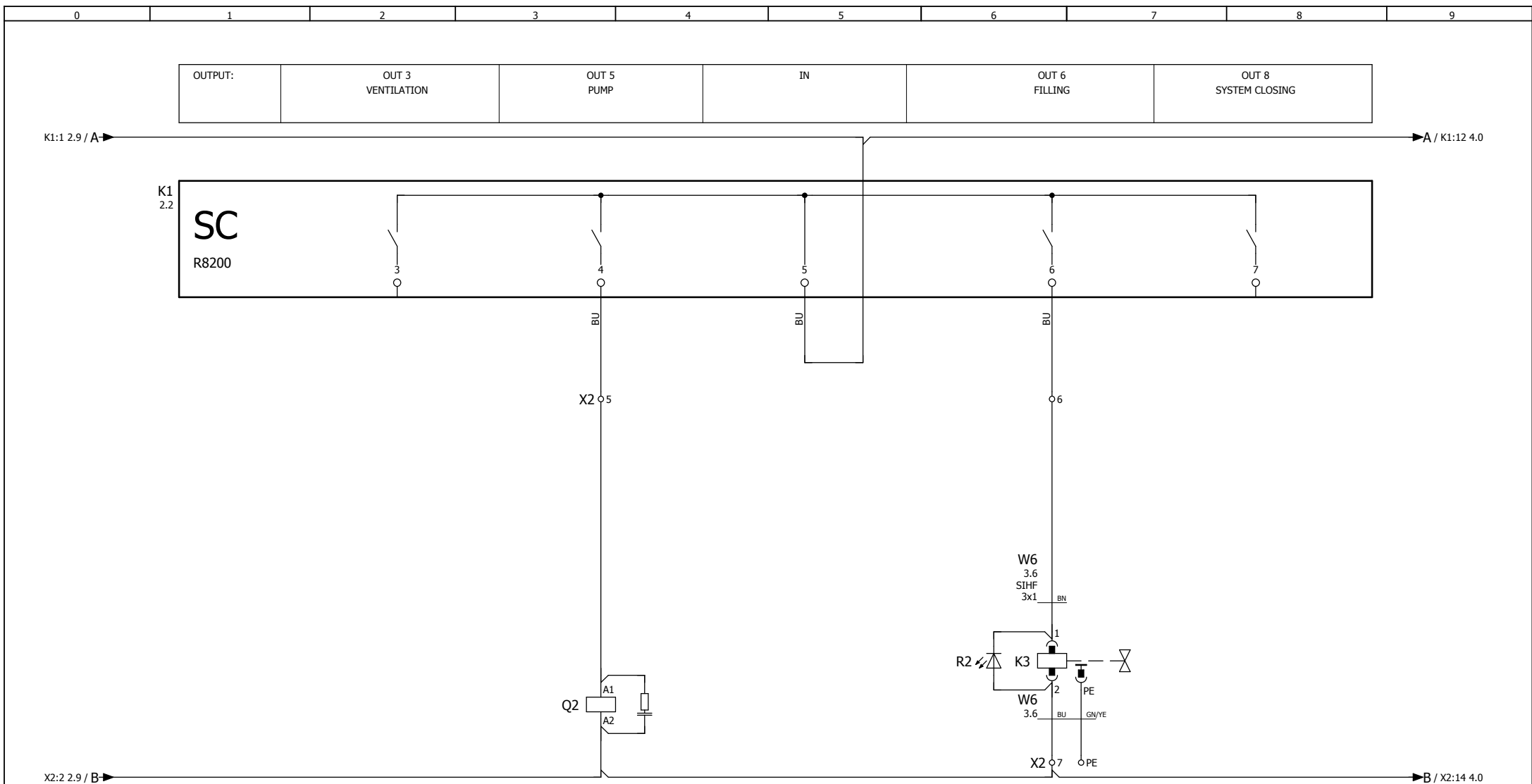
			Datum	19. Dez. 2011	Drucküberlagertes Temperiersystem	SINGLE Temperiertechnik	STW 150/1-...-B../...-NS/E mit SC, automatische und manuelle Befüllung	Baureihe 150NS		
			Bearb.	KUE				Zeichnungs-Nr.:	Bypass	
Änderung	Datum	Name	Norm		Urspr.	Ers. f.	Ers. d.	MSR 4414		2 B1.





1		DATE 01.04.2014		TEMPERATURE REGULATING SYSTEM		STW 150/1-6-B12/20NS/E		SERIES: 1501NS		=	
		EDITOR VETTER		LEISTRITZ		380-415V/50HZ		DRAWING-NO.: E 18162		+	
MODIFICATION		DATE		REPLACEMENT OF		REPLACED THROUGH		PAGE 2		FROM 12	
		NAME		ORIGINAL				EPLAN P8 EN61346-2		PAGE 2	





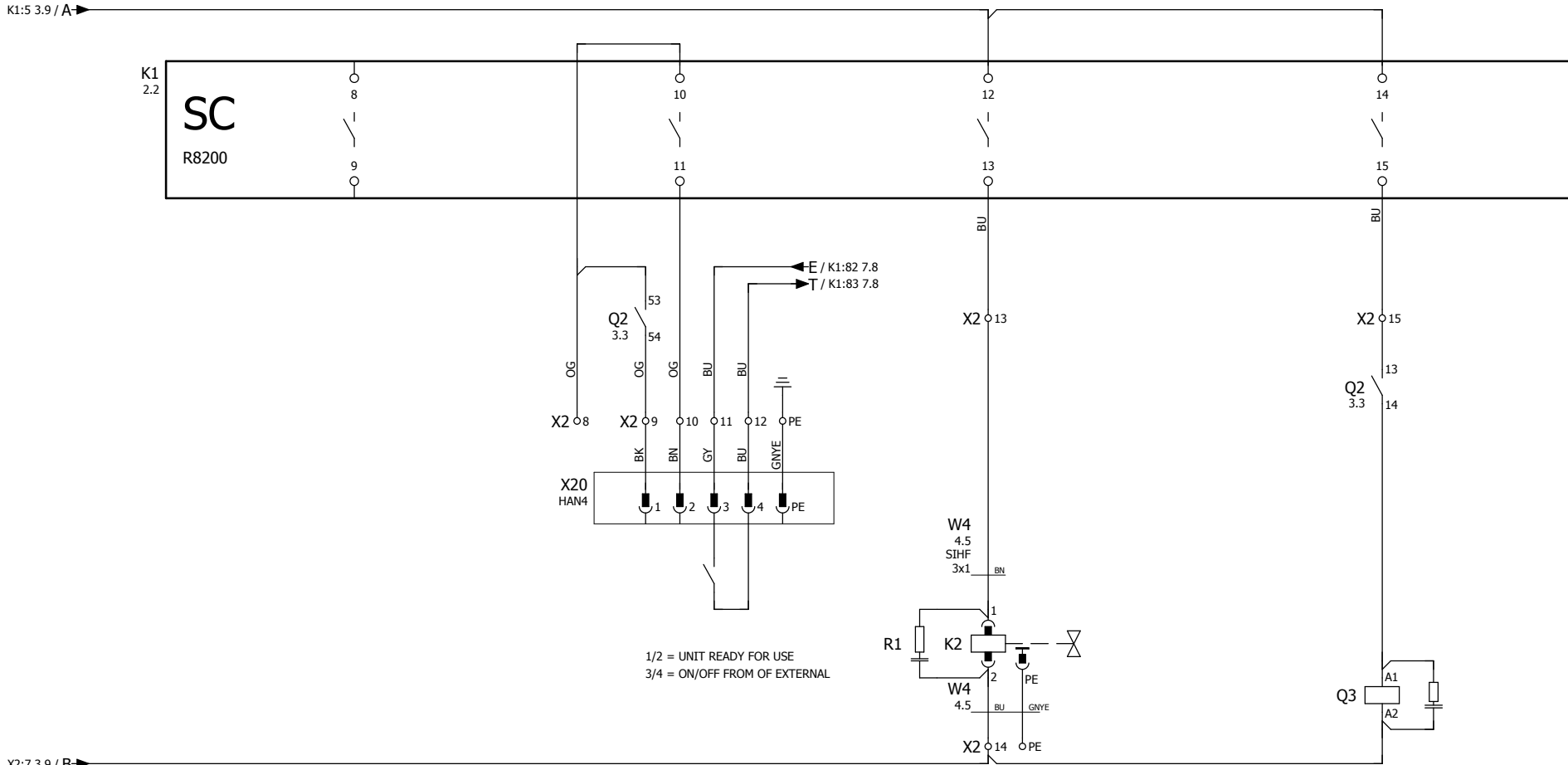
PUMP

SOLENOID VALVE
FILLING

- 1.6 — 2
- 1.7 — 3
- 1.7 — 6
- 4.7 — 13
- 4.3 — 54
- 6.1 — 62

2														4	
		DATE	01.04.2014	TEMPERATURE REGULATING SYSTEM				STW 150/1-6-B12/20NS/E		SERIES:	1501NS	=			
		EDITOR	VETTER	LEISTRITZ				380-415V/50HZ		DRAWING-NO.:	E 18162	+			
MODIFICATION	DATE	NAME	ORIGINAL	REPLACEMENT OF	REPLACED THROUGH					EPLAN P8 EN61346-2		PAGE	3		
											FROM	12			

OUTPUT:	OUT 9 DISCHARGE/LEAKAGE-STOP	OUT 4 ALARM	OUT 2 COOLING	OUT 1 HEATING
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1/2 = UNIT READY FOR USE
3/4 = ON/OFF FROM OF EXTERNAL

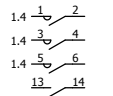
SOLENOID VALVE
COOLING

HEATING

PLUG CONNECTOR AT EQUIPMENT BACK

UNIT OPERATING CONDITIONAS O.K.
CONTACT OPENS
WITHOUT POTENTIAL

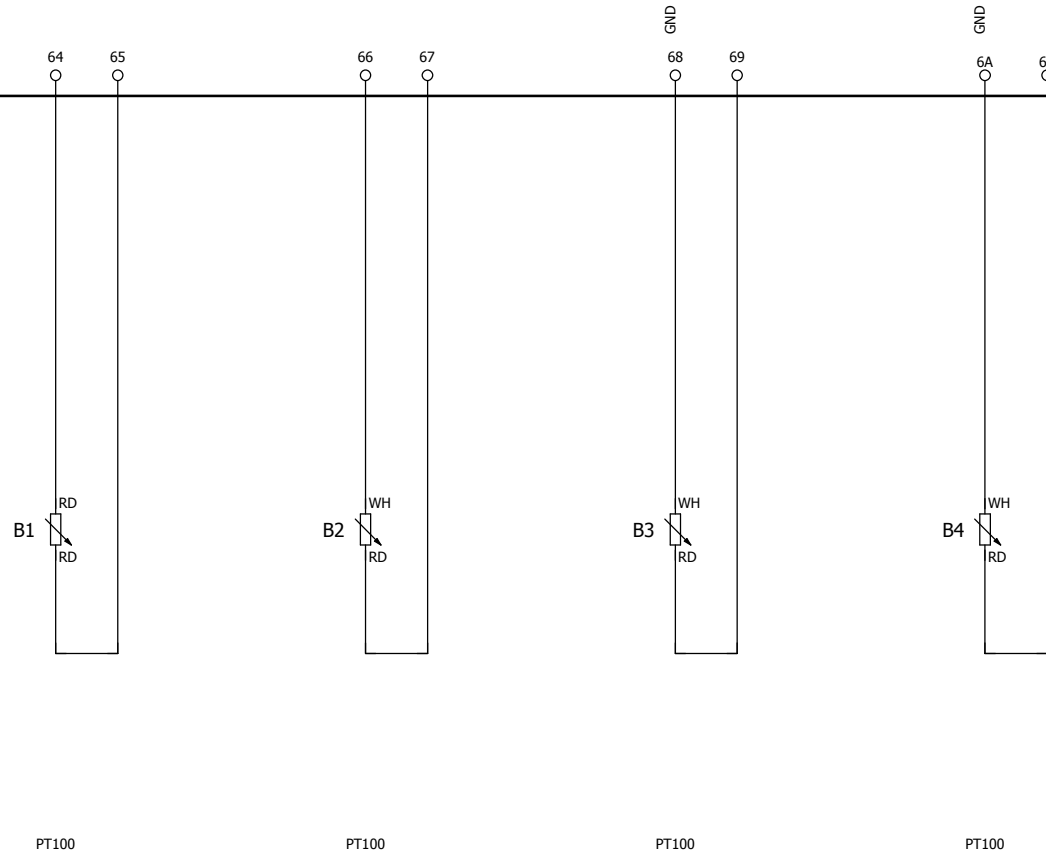
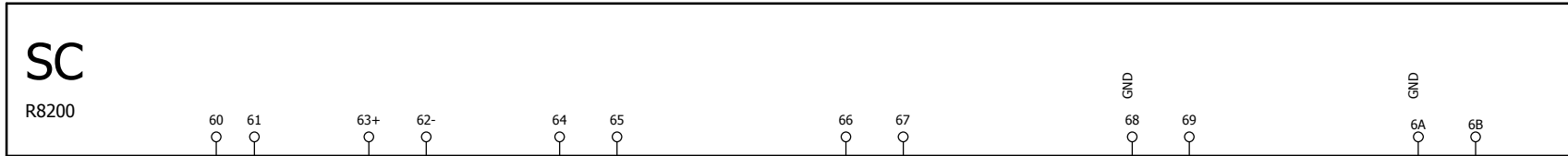
X20



3		5	
DATE	01.04.2014	TEMPERATURE REGULATING SYSTEM	STW 150/1-6-B12/20NS/E
EDITOR	VEITNER	LEISTRITZ	SERIES: 1501NS
EXAMINED			DRAWING-NO.: E 18162
MODIFICATION	DATE	NAME	ORIGINAL
REPLACEMENT OF	REPLACED THROUGH		
		380-415V/50HZ	
		EPLAN P8 EN61346-2	
		PAGE 4	
		FROM 12	

OUTPUT:	S4 CONFIGURATION OIL UNIT	OUT 1.1 HEATING 0/18V/DC	PT100 FILM TEMPERATURE	PT100 PRERUN TEMPERATURE	PT100 CONTROL	PT100 FROM PROCESS
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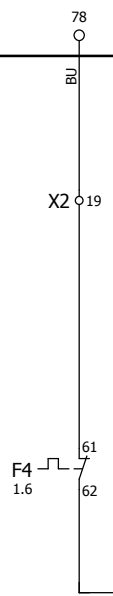
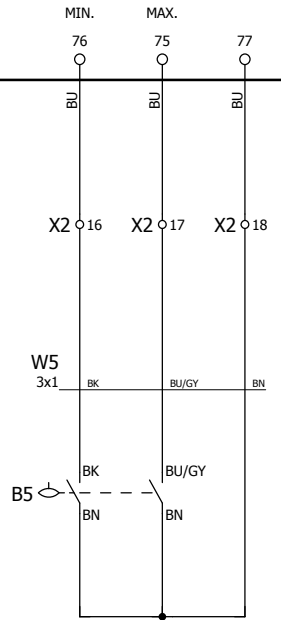
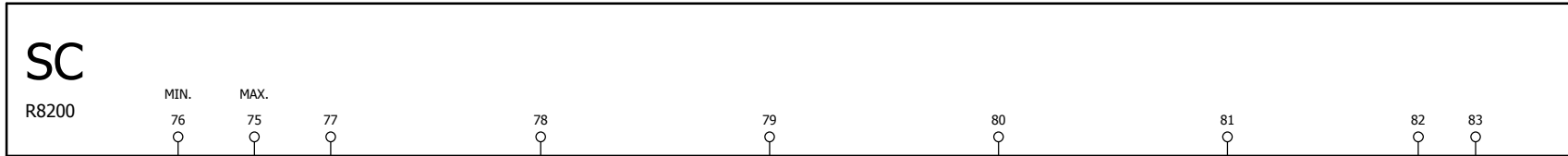
K1
2.2



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		EDITOR	VETTER	LEISTRITZ						+
MODIFICATION	DATE	NAME	ORIGINAL	REPLACEMENT OF	REPLACED THROUGH			DRAWING-NO.:	E 18162	EPLAN P8 EN61346-2
							380-415V/50HZ			5 12

INPUT:	S5 S6 LEAD IN. FLOAT SWITCH	S9 MOTOR PROTECTION	S7 FLOW CONTROLLER	S1 EXTERNAL CONTROLLER EXTERNAL SENSOR		S8 ON/Off
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K1
2.2



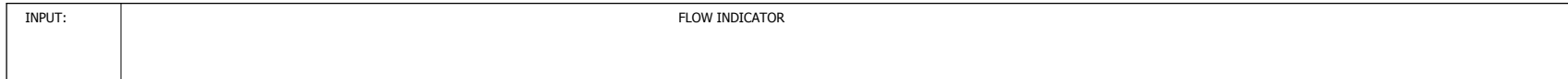
X2:11 4.4 / E
X2:12 4.4 / T

FLOAT SWITCH

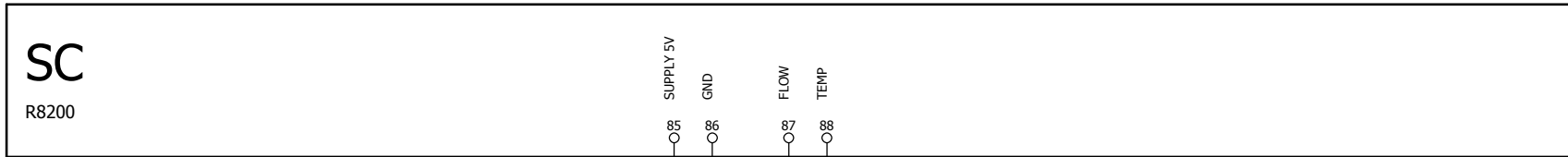
MOTOR PROTECTION

ON/Off
EXTERNALLY

		DATE	18.03.2013	TEMPERATURE REGULATING SYSTEM			STW 150/1-6-B12/20NS/E	SERIES:	1501NS	=	
		EDITOR	VEITNER	LEISTRITZ						+	
MODIFICATION	DATE	NAME	ORIGINAL	REPLACEMENT OF	REPLACED THROUGH			DRAWING-NO.:	E 18162	EPLAN P8 EN61346-2	PAGE FROM



K1
2.2



7

9

			DATE	01.04.2010	TEMPERATURE REGULATING SYSTEM		STW 150/1-6-B12/20NS/E	SERIES:	1501NS	=		
			EDITOR	VETTER	LEISTRITZ						+	
MODIFICATION	DATE	NAME	ORIGINAL		REPLACEMENT OF		REPLACED THROUGH	380-415V/50HZ	DRAWING-NO.:	E 18162	EPLAN P8 EN61346-2	PAGE FROM

PARTS LIST

CONSTR. DESIG.	QUANTITY	NUMBER	DESIGNATION	MODEL NUMBER	MANUFACTURER
B1	1	10973	RESISTANCE THERMOMETER	W 6/150 m.1,5 m Messltg. 350°C	JUMO
B2	1	04483	RESISTANCE THERMOMETER	W 6/70 m.2,0 m Silikonltg.	JUMO
B3	1	04483	RESISTANCE THERMOMETER	W 6/70 m.2,0 m Silikonltg.	JUMO
B4	1	04483	RESISTANCE THERMOMETER	W 6/70 m.2,0 m Silikonltg.	JUMO
B5	1	07645	MAGNET FLOAT SWITCH	EVS(H)S-L 570-SV-1,5 sil.	KSR-KUEBLER
E1	1	12163	HEATER ELEMENT WITH PROTECTION TUBULAR	403CM600/44/30 230/400V	ELTRA HEIZELEMENTE
F1	1	04380	AUTOMATIC CUT OUT SWITCH	FAZ B16/1 16A 1-POL.	MOELLER ELECTRIC GMBH
F2	1	04380	AUTOMATIC CUT OUT SWITCH	FAZ B16/1 16A 1-POL.	MOELLER ELECTRIC GMBH
F3	1	04380	AUTOMATIC CUT OUT SWITCH	FAZ B16/1 16A 1-POL.	MOELLER ELECTRIC GMBH
F4	1	20119	MOTOR PROTECTION SWITCH	PKZM0-6,3	MOELLER ELECTRIC GMBH
F4	1	10035	AUXILIARY SWITCH	NHI-E-11-PKZ0	MOELLER ELECTRIC GMBH
F5	1	05609	AUTOMATIC CUT OUT SWITCH	FAZ-2-S1/2 1A 2-POL.	MOELLER ELECTRIC GMBH
F6	1	10200	FINE WIRE FUSE	3,15 A 20 x 5 TRAEGE	WICKMANN
F6	1	04377	SAFETY DEVICE CLAMP	ASK 1/T5 35 Nr. 4745.6	WEIDMUELLER
F6	1	02020	SEAL PLATE	AP (1,5) Nr. 3803.6	WEIDMUELLER
K1	1	17682	OPEN- AND CLOSED LOOP CONTROL SYSTEM	R 8200-S-1-SI1-0-6 24V/DC	ELOTECH
K1	1	18152	INTERFACE MODULE	M8200-PROFIBUS DP	ELOTECH
K2	1	18164	SOLENOID VALVE	6213-A-20,0-AA-VA R1" 24V/DC	BUERKERT GMBH
K3	1	13781	SOLENOID VALVE	6213-A-10,0-NBR-VA-1/2"-24VDC	BUERKERT GMBH
M1	1	12039	PUMP	CR15-11 380-415V 50HZ	GRUNDFOS GMBH
Q1	1	06195	MAIN SWITCH	KG41B T203/D-A194 VE	DEUTSCHE SOLENOID
Q2	1	14741	CONTACTOR	DILM7-10 24V/DC	MOELLER ELECTRIC GMBH
Q2	1	14747	AUXILIARY CONTACTOR	DILA-XHI11	MOELLER ELECTRIC GMBH
Q3	1	14741	CONTACTOR	DILM7-10 24V/DC	MOELLER ELECTRIC GMBH
R1	1	04953	RC-ELEMENT FOR MAGNETIC SOLENOID	VBS-RC 10/24 L Nr. 03124068	MURRELEKTRONIK GMBH
R2	1	04953	RC-ELEMENT FOR MAGNETIC SOLENOID	VBS-RC 10/24 L Nr. 03124068	MURRELEKTRONIK GMBH
T1	1	14725	TRANSFORMER	90VA PRIM.340-520V	RUFA-TRANSFORMATORENBAU
X1	4	05275	PE-CLAMP 3-WIRE	Nr. 280-637	WAGO KONTAKTTECHNIK
X1	6	05273	TERMINAL BLOCKS	Nr. 280-641	WAGO KONTAKTTECHNIK
X1	1	06072	PE-CLAMP 2-WIRE 4MM ²	Nr. 281-607	WAGO KONTAKTTECHNIK
X2	4	19834	PE-CLAMP 4-WIRE	1 MM ²	WAGO KONTAKTTECHNIK
X2	4	19836	LINK PLUG	1 MM ²	WAGO KONTAKTTECHNIK
X2	21	19833	TERMINAL BLOCKS	1 MM ²	WAGO KONTAKTTECHNIK
X3	1	05976	BUSH INSERT SUB-D 9-POL.	Nr. 77SD E09S	NOVITRONIC GMBH
X3	2	05977	ATTACHMENT SCREW	F-GSCH-1/5	NOVITRONIC GMBH
X3	1	10988	DUST CAP SUB D	CS 09S Buchse 9-polig	NOVITRONIC GMBH
X6	1	04137	THREEPHASE CONNECTOR	PCE 015-6 16A	MENNEKES
X20	1	05388	PIN INSERT	HAN 4A-M Nr.09200042611	HARTING
X20	1	04449	BUSH INSERT	4 pol. HAN 4A-BU-S	HARTING
X20	1	11261	BASE HOUSING	Nr. 19200031252	HARTING
X20	1	06617	HOUSING	HAN 3A-GG-M20 Nr.19200031440	HARTING

SIN_04_1033 / 1.Jan.2007

11

			DATE	02.04.2014	TEMPERATURE REGULATING SYSTEM		STW 150/1-6-B12/20NS/E	SERIES:	1501NS	=	
			EDITOR	VETTER	LEISTRITZ					+	
MODIFICATION	DATE	NAME	ORIGINAL		REPLACEMENT OF		REPLACED THROUGH	DRAWING-NO.:	E 18162	EPLAN P8 EN61346-2	PAGE FROM

Spare and expendable parts-list no. NS08252.2**STW 150/1-6-B12/20-NS/E 25.999 400V/50Hz;9p.PB-Stv. S**

Design: LEISTRITZ (Serie08/aut.Bef./Verr. in VA) 16.03.10

Parts No.	Qty. Parts	Description
12039	1	PUMP CRI5-11 380-415V 50HZ
14140	1	MECHANICAL SEAL fuer CR(I), (N) 1, CR 3, CR 5
14725	1	TRANSFORMER 90VA PRIM.320-520V
12163	1	TUBULAR HEATER 403CM600/44/30 230/400V
..07549	1	VITON-O-RING F. HEATER 49 x 3,5
10973	1	RESISTANCE THERMOMETER W 6/150 m.1,5 m Messltg. 350°C
04483	3	RESISTANCE THERMOMETER P W 6/70 m.2,0 m Silikonltg.
17682	1	OPEN-/CLOSED LOOP CONTROL R 8200-S-1-SI1-0-6 24V/DC
06195	1	MAIN SWITCH KG41B T203/D-A194 VE
07645	1	MAGNETIC FLOAT SWITCH ERV3/8-VS(H)S-L570-V52R-1,5SIL
..03747	1	VITON-O-RING f. FLOAT SWITCH 56 x 3,0 BL-VI 1980
14741	2	CONTACTOR DILM7-10 24V/DC
20119	1	MOTOR PROTECTION CIRCUIT B PKZM0-6,3
10035	1	AUXILLIARY SWITCH NHI-E-11-PKZ0
10200	1	FINE WIRE FUSE 3,15 A 20 x 5 TRAEGE
05609	1	AUTOMATIC CIRCUIT BREAKER FAZ-2-S1/2 1A 2-POL.
04380	3	AUTOMATIC CIRCUIT BREAKER FAZ B16/1 16A 1-POL.
04377	1	FUSE CLAMP ASK 1/TS 35 Nr. 4745.6
06256	2	MAGNETIC VALVE CABLE 1,5 M 3 G 1, Aderendhülse kurz
04953	2	RC-ELEMENT SOLENOID VALVE VBS-RC 10/24 L Nr. 3124068
03902	1	NON-RETURN VALVE VA R1/2" PN40
11613	1	OVERFLOW VALVE G1/2"
12851	1	OVERFLOW VALVE R1"
12187	1	SAFETY VALVE, STAINLESS STE Typ 66.2, 1.4302, D=12,5 mm

Spare and expendable parts-list no. NS08252.2**STW 150/1-6-B12/20-NS/E 25.999 400V/50Hz;9p.PB-Stv. S**

Design: LEISTRITZ (Serie08/aut.Bef./Verr. in VA) 16.03.10

13781	1	SOLENODI VALVE VA 6213-EV-A10,0BBVAGM84-6-024/
12050	1	PLATTENWAERMETAUSCHER B 12/20 M NICKELVERLOETET
03747	1	VITON-O-RING f. FLOAT SWITCH 56 x 3,0 BL-VI 1980
07549	1	VITON-O-RING F. HEATER 49 x 3,5
18348	2	DICHTUNG FUER KUEHLKOERP NS, N1.1, D1, H1.2
06330	4	SEAL F. SOLENOID VALVE S4-4146 aus SI 60 rot/pr
09240	4	PACKING 38x25x1,0 mm Mat.AFM 34
10534	1	NON-RETURN VALVE V2A R1" PN40
08387	1	SEAL 24x18x1 mm Mat.AFM 34
18164	1	MAGNETVTL VA 6213-EV-A20,0-AAVAGM86-6-024/

The right is reserved to carry out technical specification**Preisbinde-Frist 30 Tage!!!****The specified number of expendable parts is only a pragmatcal value without obligation!**



Abnahme-Protokoll Acceptance-Record

Kunde: **LEISTRITZ Extrusionstechnik**
Customer

AB-Nr.: **94968 / 14**
Confirmation-No.

Gerätetyp: **STW 150 / 1 - 6 - B12 / 20 - NS / E**
Type of unit

Geräte-Nr.: **14 4123**
Unit-No.

1.0 Mechanische Prüfungen Mechanical test

- 1.1 **Gerät auf Dichtheit geprüft**
Unit checked for leaks
- 1.2 **Prüfung der Pumpe auf**
Pump checked for
- Förderleistung
Output rate
 - Förderdruck
Output pressure

2.0 Prüfung der elektrischen Ausrüstung Check of the electrical equipment

- 2.1 **Sichtprüfung auf Einhaltung der VDE-Vorschriften**
Visual inspection of compliance with VDE-regulations
- 2.2 **Gesamt-Funktion**
nach Schaltplan Nr.: E 18162
Overall performance according to circuit diagram No.:
- 2.3 **Isolationsprüfung** ∞ M Ω
Insulation test
- 2.4 **Hochspannungsprüfung** 1000V_{AC}
High voltage test
- 2.5 **Schutzleiterprüfung** < 0,1 Ω
PE-conductor test
- 2.5.1 **Ableitstrom** 0,01 mA
Leakage current
- 2.6 **Schwimmerschalter Funktionsprüfung**
Float switch performance test
- 2.7 **Motorschutzschalter auf Nennstrom eingestellt** 4,4 A
Motor protection switch set to nominal current of
- 2.8 **Strömungsüberwachung**
Flow monitoring
- eingestellt auf Ansprechpunkt 125 °C
Set to response point
 - Störmeldung und Funktion geprüft
Fault indication and performance checked
- 2.9 **Vorlaufemperaturwächter**
Inlet temperature monitor
- eingestellt auf Ansprechtemp. 95 °C
Set to response temperature
 - Störmeldung und Funktion geprüft
Fault indication and performance checked

2.10 Filmtemperaturbegrenzer

- Film temperature limiter
- eingestellt auf Ansprechtemp. - °C
Set to response temperature
 - Störmeldung und Funktion geprüft
Fault indication and performance checked

2.11 Funktionsprüfung und Stromwerte der Heizungen

Performance check and current-values of the heating circuits

Spannung 400 V
Voltage

	L1	L2	L3
I/II	8,3	8,4	8,5
III/IV			
V/VI			
VII/VIII			
IX/X			
XI/XII			

2.12 Kühlleistung 116000Watt

- Cooling capacity
bei 80 °C Vorlaufemperatur
at °C to process temperature
und 15 °C Kühlwassereintrittstemperatur
and °C cooling water inlet temperature

2.13 Durchflussmessung

überprüft und eingestellt
Flow measurement checked and adjusted

2.14 Schnittstelle - Funktion getestet

Interface - performance checked
Typ: Profibus RS 485
Type

Hochdorf, den 26.05.2014

Prüfer:
Tester:

Björn
Salomon
Stefan

SINGLE Temperiertechnik GmbH - Ostring 17-19 - 73269 Hochdorf - GERMANY

Parameterliste - List of Parameters

Kunde Customer	LEISTRITZ Extrusionstechnik	Datum Date	26.05.2014
Gerätetyp Type of unit	STW 150 / 1 - 6 - B12 / 20 - NS / E	Reglertyp Type of controller	SC-Standard SV17/13
Gerätenummer Number of unit	14 4123	Seriennummer Serial No	20614-033

Parameterbezeichnung	Parameter designation		
Einstellung Alarmer, Grenzwerte	Alarms and limit values		
Alarm Limit	Alarm limit	Aus	
1.Sollwert	1st setpoint	0-90	°C
2.Sollwert	2nd setpoint	0	°C
3.Sollwert	3rd setpoint	0	°C
Alarm Vorlauf	Alarm to process	95	°C
Aqua Timer	Aqua timer	5	
Alarm Durchfluss	Alarm flow	Aus	
Alarm Volumenstrom	Alarm	n.v.	l/min
Alarm Druck hoch	Alarm pressure high	n.v.	bar
Alarm Druck niedrig	Alarm pressure low	n.v.	bar
Alarm 2	Alarm 2	n.v.	°C
obere Sollwertbegrenzung	Upper setpoint limit	90	°C
untere Sollwertbegrenzung	Lower setpoint limit	0	°C
Alarm Filmtemperatur	Alarm film temperature	125	°C
Alarm ΔT	Alarm ΔT	Aus	K
Grenzwert Rücklauf	From process limit	Aus	°C
Kaskadenregelung	Cascade control	Aus	
Extern Sensor Logic	External Sensor Logic	b	
Systemverschlusstemperatur	System closing temperature	Aus	°C
Gerätefunktionen	Device functions		
Entleerzeit	Draining time	10	s
Befüllung	Filling	Automatik	
Wasserwechselkonfiguration	Configuration change of water	n.v.	
Wasserwechselzeit	Tme for change of water	n.v.	s
Wasserwechselintervall	Interval for change of water	n.v.	min
Wasserwechsel manuell	Change of water manually	n.v.	
Abkühlen vor dem Ausschalten	Cooling before shut down	Co.OF	
Kühlungsart	Cooling mode	indirekt	
Sollwertauswahl	Selection of setpoint	Sollwert1	
externer Sensor	External sensor	Aus	
Istwertausgang / PB	actual value output / PB	Aktueller Regelfühler	
Abschalttemperatur	Shut down temperature	50	°C
Aquatimer Startzeit	Aqua timer start time	60	min
Maximale Fülldauer	Fill time max	2	min
Wiedereinschaltsperr	Reclosing lockout	Aus	
Parametersperre	Parameter lock	Aus	
Schreiberfunktion Samplezeit	Record. function: sample time	3 Min. Ges. 12h	
Sprache	Language	Englisch	

SINGLE Temperiertechnik GmbH - Ostring 17-19 - 73269 Hochdorf - GERMANY

Parameterliste - List of Parameters

Kunde Customer	LEISTRITZ Extrusionstechnik	Datum Date	26.05.2014
Gerätetyp Type of unit	STW 150 / 1 - 6 - B12 / 20 - NS / E	Reglertyp Type of controller	SC-Standard SV17/13
Gerätenummer Number of unit	14 4123	Seriennummer Serial No	20614-033

Parameterbezeichnung	Parameter designation		
Schaltuhr	Timer		n.v.
Uhrzeit	Time of day		n.v.
Wochentag	Weekday		n.v.
Jahr	Year		n.v.
Monat	Month		n.v.
Tag	Day		n.v.
Service-Intervall Betriebsstunden	Service interval operating hours		Aus
Service-Intervall Jahr	Service interval year		n.v.
Service-Intervall Monat	Service interval month		n.v.
Service-Intervall Tag	Service interval day		n.v.
Konfiguration Limitkomparator	Config. limit comparator		n.v.
Konfiguration Sammelalarm	Config. collective alarm		Öffner
Konfiguration OUT13	Config. OUT13		n.v.
Programmierung c.OFF	Programming c.OFF		c.OFF
Druckeinheit	Unit of pressure		Aus
Durchflusseinheit	Unit of flow		Aus
Werkseinstellung	Factory setting		Aus
Gerätebezeichnung	Name of unit		
Regelung	Control		
Stellgradbegrenzung Heizen	Regulation ratio heating		100 %
Stellgradbegrenzung Kühlen	Regulation ratio cooling		100 %
Proportionalwert XP - Heizen	XP-heating		2 %
Vorhaltezeit TV - Heizen	TV-heating		18 s
Nachstellzeit TN - Heizen	TN-heating		90 s
Proportionalwert XP - Kühlen	XP-cooling		4 %
Vorhaltezeit TV - Kühlen	TV-cooling		18 s
Nachstellzeit TN - Kühlen	TN-cooling		90 s
Schalthyserese Heizen / Kühlen	Hyst. switch heating/cooling		Aus
Schaltzykluszeit Heizen	Switch cycle time heating		20 s
Schaltzykluszeit Kühlen	Switch cycle time cooling		10 s
Temperatureinheit	Temperature unit		°C
Selbsoptimierung	Self-optimization		Aus
Sollwertrampe steigend	Setpoint ramp increasing		Aus K/min
Sollwertrampe fallend	Setpoint ramp decreasing		Aus K/min
Hysterese Kühlung einschalten	Switch on hyst. cooling		n.v.
Hysterese Kühlung ausschalten	Switch off hyst. cooling		n.v.
Iswertausgang oberer Wert	Act. value output: upper value		n.v.
Iswertausgang unterer Wert	Act. value output: lower value		n.v.

SINGLE Temperiertechnik GmbH - Ostring 17-19 - 73269 Hochdorf - GERMANY

Parameterliste - List of Parameters

Kunde Customer	LEISTRITZ Extrusionstechnik	Datum Date	26.05.2014
Gerätetyp Type of unit	STW 150 / 1 - 6 - B12 / 20 - NS / E	Reglertyp Type of controller	SC-Standard SV17/13
Gerätenummer Number of unit	14 4123	Seriennummer Serial No	20614-033

Parameterbezeichnung	Parameter designation		
Offsetwerte	Offset values		
Istwertoffset int. Fühler	Actual value offset int. sensor	Aus	K
Istwertoffset ext. Fühler	Actual value offset ext. sensor	Aus	K
Istwertoffset Rücklauf	Actual value offset from process	Aus	K
Istwertoffset Vorlauffühler	Actual value offset to process	Aus	K
Istwertoffset Filmfühler	Actual value offset film temperature	Aus	K
Durchfluss Offset	Flow offset	Aus	l/min
Schwelle Durchfluss dP	Threshold flow dP	20	mA
Kühlen Stellgradoffset	Cooling regul. ratio offset	Aus	%
Schnittstelle	Interface		
Schnittstellenadresse	Interface address	13	↗
Protokoll	Protocol	Profibus dP	
Baudrate	Baud rate	Nicht Erkannt?	kb
Datenformat	Data format	7E1	
Programmregler	Profile controller		
Rezept 1	Recipe 1	keine Eingabe	
Rezept 2	Recipe 2	keine Eingabe	
Rezept 3	Recipe 3	keine Eingabe	
Rezept 4	Recipe 4	keine Eingabe	
Rezept 5	Recipe 5	keine Eingabe	
Rezept 6	Recipe 6	keine Eingabe	
Rezept 7	Recipe 7	keine Eingabe	
Rezept 8	Recipe 8	keine Eingabe	
Rezept 9	Recipe 9	keine Eingabe	
Rezept 10	Recipe 10	keine Eingabe	
Schaltuhr	Timer	Ein	Aus
Mo	Mon	06:00	22:00
Di	Tue	06:00	22:00
Mi	Wed	06:00	22:00
Do	Thu	06:00	22:00
Fr	Fri	06:00	22:00
Sa	Sat	06:00	22:00
So	Sun	06:00	22:00



SINGLE Temperiertechnik GmbH - Ostring 17-19 - 73269 Hochdorf - GERMANY

Parameterliste - List of Parameters

Kunde Customer	LEISTRITZ Extrusionstechnik	Datum Date	26.05.2014
Gerätetyp Type of unit	STW 150 / 1 - 6 - B12 / 20 - NS / E	Reglertyp Type of controller	SC-Standard SV17/13
Gerätenummer Number of unit	14 4123	Seriennummer Serial No	20614-033

Parameterbezeichnung	Parameter designation		
EcoTemp	EcoTemp		
Zeit 1	Time 1	n.v.	sec
Zeit 2	Time 2	n.v.	sec
Zeit 3	Time 3	n.v.	sec
Werkzeugrezepte	Tool recipes		
Werkzeug 1	Tool 1	keine Eingabe	
Werkzeug 2	Tool 2	keine Eingabe	
Werkzeug 3	Tool 3	keine Eingabe	
Werkzeug 4	Tool 4	keine Eingabe	
Werkzeug 5	Tool 5	keine Eingabe	
Werkzeug 6	Tool 6	keine Eingabe	
Werkzeug 7	Tool 7	keine Eingabe	
Werkzeug 8	Tool 8	keine Eingabe	
Werkzeug 9	Tool 9	keine Eingabe	
Werkzeug 10	Tool 10	keine Eingabe	
Werkzeug 11	Tool 11	keine Eingabe	
Werkzeug 12	Tool 12	keine Eingabe	
Werkzeug 13	Tool 13	keine Eingabe	
Werkzeug 14	Tool 14	keine Eingabe	
Werkzeug 15	Tool 15	keine Eingabe	
Werkzeug 16	Tool 16	keine Eingabe	
Werkzeug 17	Tool 17	keine Eingabe	
Werkzeug 18	Tool 18	keine Eingabe	
Werkzeug 19	Tool 19	keine Eingabe	
Werkzeug 20	Tool 20	keine Eingabe	

EG - KONFORMITÄTSERKLÄRUNG

im Sinne der EG-MASCHINENRICHTLINIE 2006/42/EG, Anhang II 1.A

Declaration of conformity

within the meaning of the EC machinery directive-lines 2006/42/EG, annex II 1.A

Déclaration de conformité

au sens déf. par les dispositions européennes 2006/42/EG, annexe II 1.A

Declaración de conformidad

A efectos de la norma sobre máquinas de la 2006/42/EG, apéndice II 1.A

Verklaring van overeenstemming

conform de EG-machinerichtlijn 2006/42/EG, bijlage II 1.A

Hersteller:

Manufacturer: Fabricant:
Fabricante: Fabrikant:

SINGLE

TEMPERIERTECHNIK GMBH
Ostring 17 - 19
D- 73269 Hochdorf

Hiermit erklären wir, daß die /das

We hereby declare, that the
Par la présente, nous déclarons que le/la
Por la presente declaramos que el/la
Hiermee verklaren wij, dat de

Bezeichnung:

SINGLE - Temperiersystem

Designation:
Indication:
Referencia:
Omschrijving:

Typ: STW 150/1-6-B12/20-NS/E

Type:
Type:
Tipo:
Type:

Geräte-Nr.: 144123

Unit N°:
Appareil:
Numero de aparato:
Seriennummer:

den folgenden Dokumenten und Bestimmungen entspricht.

complies with the following documents and regulations.
est conforme aux documents et stipulations cités ci-après.
cumple los siguientes documentos y disposiciones.
aan de volgende documenten en bepalingen voldoet.

Angewandte harmonisierte Normen, insbesondere
Applied, harmonized standards, in particular
Normes appliquées et harmonisée, en particulier
Norma armonizada y utilizada, particularmente
Toegepaste geharmoniseerde normen, in het bijzonder

DIN EN ISO 12100-1:2003
EN 60204-1 :2006
EN 61000-6-2 :2005
EN 61000-6-4 :2007

Dokumente: Bedienungsanleitung:
Documents: Manual
Documents: Mode d'emploi
Documentos: Manual de instrucciones
Documenten: Handleiding

Bestimmungen:
Regulations: EMV-Richtlinie 2004/108/EG
Stipulations: Niederspannungsrichtlinie 2006/95/EG
Disposiciones: Druckgeräterichtlinie 97/23/EG
Bepalingen:

Name der Person, die bevollmächtigt ist, die technischen Unterlagen
zusammenzustellen:

Name of the person authorized for compilation of the technical
documentation.

Nom de la personne autorisée à établir la documentation technique.
Nombre de la persona autorizada a confeccionar la documentación técnica.
Naam van de persoon die gerechtigd is om de technische documentatie op
te stellen.

Johannes Kübler
Ostring 17-19 / D-73269 Hochdorf



Hochdorf, den 26.05.2014

i.A. J. Kübler

ppa. F.Sporck

Declaration of conformity
within the meaning of the PRESSURE EQUIPMENT DIRECTIVE 97/23/EG

Hersteller: **SINGLE**
manufacturer: TEMPERIERTECHNIK GMBH
Ostring 17-19
D- 73269 Hochdorf

Hiermit erklären wir, daß die /das
We hereby declare, that the

Bezeichnung: designation: **SINGLE-Temperiersystem**

Typ: **STW 150/1-6-B12/20-NS/E** **Geräte-Nr.:** **144123**
type: unit N°:

mit der Richtlinie 97/23/EG übereinstimmt, und folgendem Konformitätbewertungsverfahren unterzogen wurde:
agree with the guideline 97/23/EG, and was verified by the follow conformity assessment procedur:

Konformitätbewertungsverfahren: **Modul A Baugruppe der Kategorie I**
conformity assessment procedur: module assembly of the category

Die Baugruppe besteht aus folgenden Druckgeräten:

The assembly consists of the follow pressure equipment:

Bezeichnung designation	Teile-Nr. part no.	max. Betr.-druck max. operat. pressure	Volumen volume	Konformitätsbewertungsverfahren conformity assessment procedur:
AD-Behälter	13587	6 bar	11 Ltr.	Modul A
Erhitzer	6547	16 bar	1 Ltr.	Art.3 / Abs.3
Plattenwärmetauscher	12050	10 bar	0,63/0,56 Ltr.	Art.3 / Abs.3
Sicherheitsventil, Typ 66.2	12187	6 bar	nein	TÜV-SV.07-809
Pumpe, Typ CRI5-11	12039	25 bar	nein	nein
Rohrleitung DN 25	nein	25 bar	nein	Art.3 / Abs.3

angewandte harmonisierte Normen und techn. Spezifikationen: AD 2000, DIN EN ISO 9606-1
applied harmonized regulations and technical specifiations:

weitere angewandte EG-Richtlinien: EG-Maschinenrichtlinie 2006/42/EG
other applied EG-regulations:

Dokumente: Bedienungsanleitung
documents

Hochdorf, den



Geschäftsführer F. Spork

2 Advice on safety

2.1.1 Correct use of equipment

The heat-balancing unit is suitable for water as circulating medium at temperatures of up to 90 °.

In order to prevent malfunctions, please take note of the data regarding the water quality (See Water quality).



2.1.2 Notes on safety for the operator

- Only carry out authorised work on the unit when it has been isolated from the electric power supply!
- Adhere to the general rules regarding safety in the electrical engineering sector!
- Always wear protective clothing when working on hot machine components!
- Turn the plant OFF when leaks occur! Rectify the fault!
- Check tightness of pipe-line fittings and connections at operating temperature! Coupled-up pipes and connecting lines get hot!



Risk of getting burnt!

- Hot steam escapes when the safety valve responds during a malfunction. Turn the unit OFF at once and allow it to cool down!
- Do not open the hydraulic section at temperatures above 90 °C! The unit is pressurised!
- There is a high risk of sustaining burns from escaping steam!

2.2 Transport, storage

2.2.1 Transport

Transport the heat-balancing unit **in an upright** position.

Empty the unit completely before transporting!

The unit is mobile (roller mounted).

2.2.2 Storage

Storing temperature: 5°C - 50°C

Store heat-balancing units in dry, closed rooms.

2.3 Assembly

2.3.1 Electrical connection

Before connecting and commissioning the heat-balancing unit, please ensure, that the mains supply is identical with that on the machine label !



Connect the unit to a properly installed socket-outlet, which is protected by slow fuses, or to any other suitable supply!

The heat-balancing unit's total connected load can be found either in the circuit diagram or on the performance label.

The unit has been wired in our factory for connection to a clockwise rotating 3 phase supply.

Connect the cable as follows:

Phase	Coloured cable	Numbered cable
L1	black	black 1
L2	brown	black 2
L3	blue	black 3
PE	green/yellow	green/yellow

Ensure that the installation meets the requirements of your local Electricity Authority and the Safety at Work Code of Practice !

2.3.2 Mechanical connection

- **Connecting the circulating medium**

The consumer is connected to the heat-balancing unit with the connections marked

INLET and **RETURN**

Hoses and connections must be absolutely leak-proof, as well as heat- and pressure-resistant. We recommend, that metal-armoured Teflon-hoses are employed for this purpose, or that special corrugated metal hoses are used, equipped at either end with the correct size of fitting.

The connecting sizes for the heat-balancing unit are given in the enclosed dimensions sheet.

- **Connecting the cooling water**

The cooling water connections on the heat-balancing unit are marked

Cooling water inlet and **Cooling water return**

These connecting sizes are also shown in the above mentioned dimensions sheet.
Cooling water pressure: Δp min. 3 bar max. 6 bar

If cooling water inlet and outlet are being cut off, a safety valve between unit and shut off valve with a respaning pressure of 6 bar has to installed by customer.

Optional: Connection for mould evacuation

The compressed air is connected to the port so labelled by a hose suitable for that purpose. The pressure must not exceed a maximum of 5 bar!

Optional: Connection for separate filling

If the temperature control unit is equipped with separate filling, a corresponding water supply connection is required.
The connection is marked "**Filling**".

2.4 Taking the unit into operation

2.4.1 Initial Commissioning

2.4.1.1 Filling the heat-balancing unit as well as the consumer

Type:	Internal capacity::
STW 150 -...- N1 /E	ca. 10 Liter
STW 150 -...- NS /E	ca. 20 Liter
STW 150 -...- S /E	ca. 25 Liter
STW 150 -...- SG /E	ca. 30 Liter
STW 150 -...- G /E	ca. 50 Liter
STW 150 -...- G2 /E	ca. 80 Liter

After switching on the power supply the respective operating status is indicated.

With the “Filling” parameter two different filling modes can be selected.

- Manual filling “Filling” parameter = Manual
- Automatic filling “Filling” parameter = Automatic

Automatic filling

If the heat-balancing unit is set to the automatic filling position, the heat-balancing unit fills automatically with heat-transfer medium from the supply-source through the level-control. It is imperative, that the supply line for the medium is open and that the medium supplied is as clean and as free from chalk as possible. (⇒Water quality)

Although this filling method facilitates working, there is always a risk of contamination and firing-up of heating circuit and pump, however.

2.4.2 Venting

The heat-balancing unit is vented through the expansion vessel.

2.4.3 Operation

Turn on the temperature control unit with the “I” (green) button.

After setting the desired temperature in the SC’s control field, the temperature of the external system can be regulated.

It is advisable to check whether the heat transfer fluid is flowing through all the return lines from the mould to the temperature control unit.

2.4.4 Shutting down

On principle, the heat-balancing unit should be cooled down to approx. 60°C before it is switched OFF.

There are 2 possibilities for achieving this:

- The setpoint is set to 60°C in the control field with the „+/-“ buttons and confirmed with the „ENTER“ button.
This will result in the entire system being cooled down to 60°C.
Following this the button “0” (red) can be operated in order to turn off the temperature control unit.
- If the SC is programmed to carry out the cooling automatically, then the temperature control unit automatically cools down to the programmed value.

In both cases the temperature control unit still remains under power.

In order to completely remove the unit from the power supply the main switch must be turned off or the connection plug pulled (see SC handbook).

2.4.5 Taking the unit into operation again

Once the unit had been shut down, as described under "Shutting down", proceed as follows for taking it into operation again:

Connect the power supply and turn on the main switch.

The temperature control unit is switched on with the green "I" button.

The pump starts running and the heating, i.e. cooling is automatically activated. The operating status of the temperature control unit is displayed continuously.

2.5 Maintenance

When using hard water for cooling purposes, descaling of the heat-exchanger must be carried out at regular intervals (e.g. once every 12 weeks). Also refer to Chapter "Descaling".

When refilling with fresh water, we recommend adding an anti-corrosion agent to the heat transfer medium.

The solenoid- and non-return valves installed must be checked regularly for correct functioning.

The dirt-traps installed at the cooling water inlet and in the heat-balancing unit's eingebauten return line must be cleaned regularly. This requires the dirt trap to be opened, so that the screen insert can be cleaned.

Components found to be faulty must be exchanged immediately. Replacement parts can be obtained from our Replacement Parts Department.

When ordering parts, it is imperative, that the **unit model and number** are quoted. Also, a correct description of the component as well as its accurate **part number** must be quoted!

Retighten electrical terminal clamps and fuse caps regularly, at least once a year.

2.6 Malfunctions and rectification

Fault	Cause	Rectification
Alarm "Tank empty"	<ul style="list-style-type: none"> • The medium in the expansion vessel is below the minimum level • Unit has not been filled • Cooling water supply not connected • Cooling water supply is shut off • Float switch is broken 	<ul style="list-style-type: none"> • Fill the unit with medium • Fill the unit • Connect the cooling water supply • Open the cooling water supply • Check / replace the float switch
Alarm Film temperature too high	<ul style="list-style-type: none"> • Up to film-temperature (Safety alarm) 	<ul style="list-style-type: none"> • Check the flow-rate (too little heat dissipated at the heater) • Re-enable by actuating the „ON / OFF“ button, or by mains-reset
Alarm Minimum flow undershot	<ul style="list-style-type: none"> • no flow; only applies to unit equipped with flow monitoring 	<ul style="list-style-type: none"> • No minimum flow • Check flow-rate (clean the dirt-trap, if necessary).
Alarm pre-run temperature too high	<ul style="list-style-type: none"> • Inlet temp. up to limiting value 	<ul style="list-style-type: none"> • check the set limiting value • Controller malfunction
Alarm Motor protection switch triggered	<ul style="list-style-type: none"> • Phase missing • Motor blocked 	<ul style="list-style-type: none"> • Check motor protection switch i.e. release • Check voltages • Check motor

Caution!

The pump can only be taken into operation, when the medium is at the correct level.



3 Appendix

3.1 Decalcification

Cleaning requirements:

Scale formation which adversely affects the required operation can be expected due to insufficient flow speeds, high temperatures, unfavourable turbulence, high degrees of hardness or strong contamination. Therefore, SINGLE Temperiertechnik recommends cleaning at regular intervals. Various factors and issues must be noted for the optimum cleaning of tempering machines and other affected system parts.

Instructions for optimum cleaning:

The cleaning agent flow rate should be similar to the normal flow rate. If the flow rate is smaller, the cleaning time is extended accordingly. Only use approved cleaning systems for the cleaning, e.g. decalcification pump SRG EKP 20 S U (or the larger EKP 45 or EKP 90; cleaning systems can be requested from SINGLE Temperiertechnik).

Decalcification and removal of inorganic coatings:

Fill the cleaning system with water, circulate the water and check the connections for leaks before the actual cleaning. Do not add the concentrated acids until there are no leaks. For example, 5 – 20% inhibited phosphoric acid (e.g. BEIZER 640) should be used for the cleaning. The cleaning liquid must be pumped through the parts of the system to be cleaned. The formation of gas can be expected if calcium or similar deposits are present. It should be ensured that gases produced are purged and that no gas cushion is generated. In the case of gas formation, the formation of foam can also be expected; a suitable antifoam agent (e.g. ST-DOS S-913) should therefore be ready for use.

The cleaning is monitored using pH measurement. The pH value should be approx. 2.0 when phosphoric acid is used. If the pH value increases, the cleaning solution should be intensified with acid. However, a concentration of 40% should not be exceeded.

When the cleaning is complete (no rise of the pH value during the cleaning), the cleaning solution must be neutralised outside the tempering machine using an appropriate alkaline solution (e.g. sodium hydroxide, e.g. ST-DOS N-720) (pH value between 6.5 and 10.0) and can then be disposed of accordingly. Afterwards, the cleaned system must be carefully rinsed with clean water. For neutralising the inhibited residual acid in the tempering machine, this must be treated with a weak sodium hydroxide solution (e.g. ST-DOS N-730) before the last rinsing.

If other cleaning chemicals are used, strictly observe the instructions and recommendations of the manufacturer or supplier.

Summary of the cleaning process:

- Product selection
- Completely disconnect heat exchanger / tempering machine from the mains power supply
- Connection of the cleaning pump (pump, hoses, preparation tank)
- Execution of the leak tightness test (only with water)
- Preparation of the cleaning solution
- The basic principle is: First the water then the acid, otherwise it won't be placid!**
- Circulation of the cleaning solution
- pH control. Monitoring of the cleaning progress and the tempering machine
- Completion of the cleaning / neutralisation outside the system
- Post-treatment / rinsing the cleaned system.

Suitable cleaning products and cleaning equipments can be ordered from, for example, Schweitzer-Chemie GmbH in 71691 Freiberg, <http://www.schweitzer-chemie.de> .

3.2. Water quality

REQUIREMENTS AND WATER-CARE FOR COOLING SYSTEMS (CHILLERS) AND TEMPERATURE CONTROL UNITS

Depending on the type of the equipment to be cooled or temperature-controlled, the water quality of the cooling water must meet certain requirements. In order to protect the equipment against corrosion and deposits, SINGLE Temperiertechnik recommends **treating the water with a suitable agent**, for example, with ST-DOS H-390 (corrosion protection with non-ferrous metal protection and hardness stabilisation up to a maximum temperature of 180 °C) or ST-DOS H314 (in case of high temperatures / extruder). Furthermore, depending on the installed materials, the temperatures and the method, the following requirements on the water quality must be met.

As a rule the following data apply:

HYDROLOGICAL DATA	MAX	UNIT
PH-value	7,5 – 9	-
Conductivity	< 150	mS/m (T = 25°C)
Total hardness	< 15	°dH
Carbonate hardness	< 4	°dH
Carbonate hardness in case of stabilization of hardness	< 15	°dH
Chlorid Cl	<100	mg/l
Sulphate-So4	< 150	mg/l
Ammonium NH4	< 1	mg/l
Iron Fe	< 0,2	mg/l
Manganese Mg / Copper Cu	< 0,1	mg/l
free from solids / Rust		

Furthermore the following applies:

- Systems with stainless steel (e.g. V2A or V4A)

Chlorid Cl	Temp. < 50 °C	max. 100	mg/l
Chlorid Cl	Temp. 50 up to 90 °C	max. 50	mg/l
Chlorid Cl	Temp. > 90 °C	max. 30	mg/l
- Temperatures below 5°C
When employing chillers at temperatures below + 5°C, an anti-freeze medium with corrosion inhibitor must be added, e.g. ST-DOS F-190.
- Temperatures over 90°C
In case the water is heated to over 90°C, we recommend the use of a water softener. For suitable water softening systems please feel free to ask SINGLE Temperiertechnik GmbH or <http://www.schweitzer-chemie.de>.
- Temperatures over 120°C
At water temperatures over 120°C glycol may not be used.
- In case of temperatures above 150 °C / extruder, we recommend the use of low-salt water, soft water, maximum conductivity 5 mS/m.

If the recommended water qualities are observed, any damage to the equipment caused by corrosion and deposits for which SINGLE Temperiertechnik assumes no liability can be minimised. Depending on the condition of the tools, how often the tools are replaced and the available filter technology, we recommend a corresponding change of water of the heating circuit. Corroded tools, short lives of tools = more frequent replacement, clean tools, long lives, clean water = less frequent change of water.

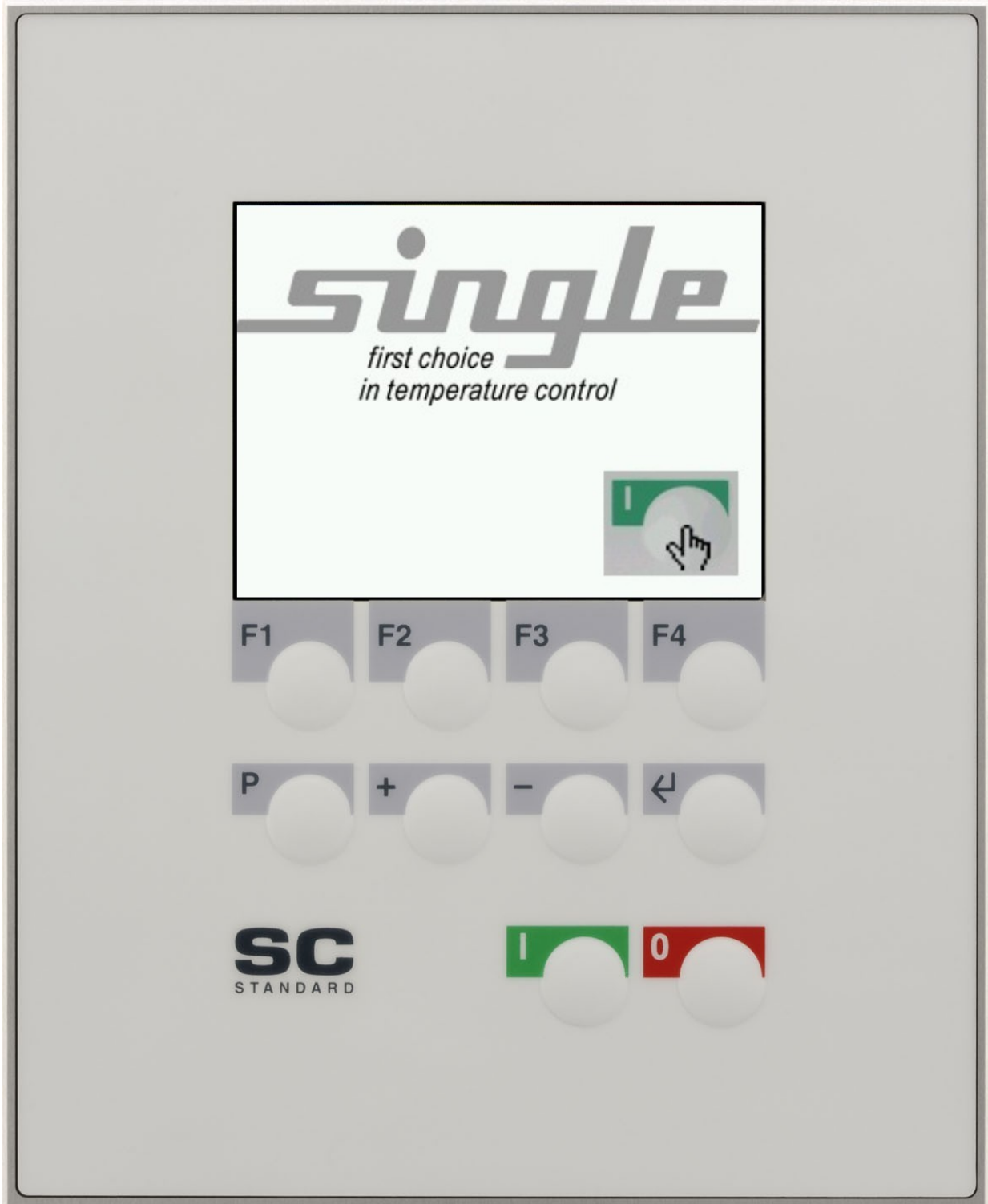


3.3. Operation "SC"



Operating Instructions

SC Standard / SC Professional



SC_EN_11_20

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1 Configuration and operation of the controller

1.1 Operating elements

F-buttons:

The F1 and F4 buttons are function keys. During operation they are assigned a variety of different functions. The currently active function is indicated in the display above.

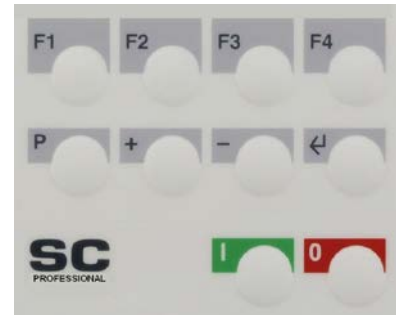


Figure 1-1



-button (P)

Pressing the P button opens the main menu. In the main menu the F buttons are used for navigation.



- button (+)

The (+) button is used to increase the set-point and parameter values. Each change must be confirmed by pressing the ↵ button.



- button (-)

The (-) button is used to decrease the set-point and parameter values. Each change must be confirmed by pressing the ↵ button.



- button (Enter)

All changes must be confirmed with this button. (set-point and parameter)



- button (On)

The system is “working”, the pump and controller are “active”.



- button (Off)

All systems are “off”. If power is still present the start screen is displayed.

1.2 Screens

The three most important screens.

1.2.1 Start screen

Following the power-up of the controller the company logo appears as start screen. (see figure 1-2)

Depending on the programming of the controller, i.e. the temperature control unit equipment, the following symbols can appear in the start screen:

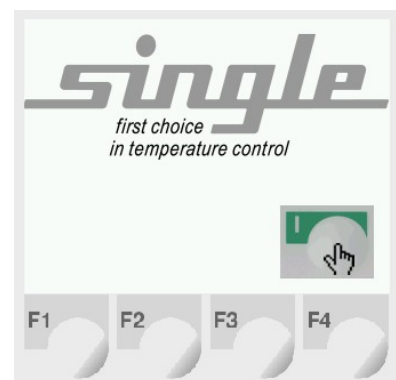
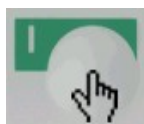


Figure 1-2



Manual switching-on via the “On” button



Switching-on of the equipment via the time switch is active



External switching-on of the equipment is activated

1.2.2 Process screen

The process screen (figure 1-3) appears following the switching-on of the temperature control unit. It indicates the current set values and the operating status.

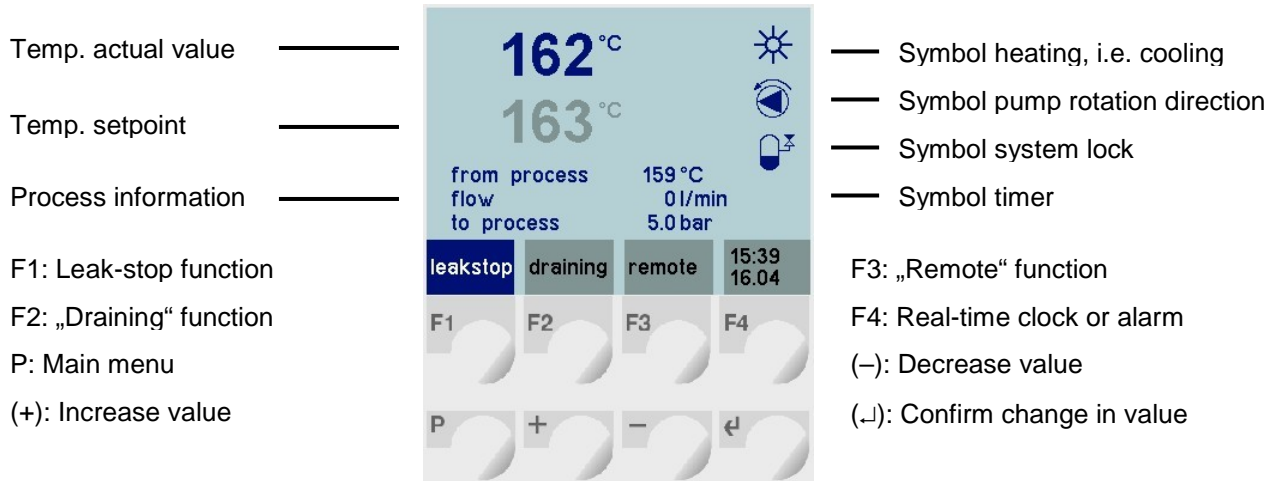


Figure 1-3

1.2.3 Main menu

Pressing the P button opens the main menu. (figure 1-4)

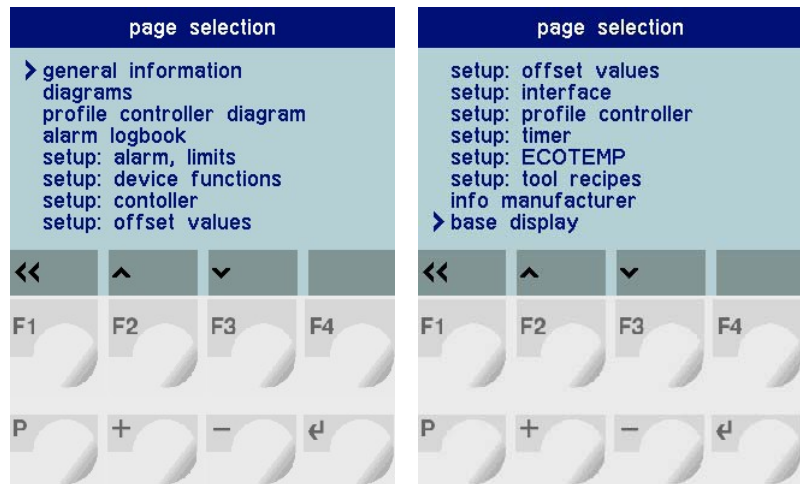


Figure 1-4

Description of the individual items:

General information:

→ Overview of the current set values

Diagrams

→ Displays consecutive process diagrams of the actual value, supply, return and film temperature, flow rate and supply pressure

Profile controller diagram

→ Graphic presentation of the recipes

Alarm logbook

→ List of the alarm messages

Setup: alarm, limits

→ Parameter list for the alarm and limit values

Setup: device functions

→ Parameter list for the equipment functions

Setup: controller

→ Parameter list for the controller

Setup: offset values

→ Parameter list for the offset values

Setup: interface

→ Parameter list for the interfaces

Setup: profile controller

→ Programming recipes

Setup: timer

→ Programming the time switch

Setup: ECOTEMP

→ Programming of the ECOTEMP mode

Setup: tool recipes

→ Setting and administering 20 tool recipes

Info: manufacturer







→ Contact details, software version

Process screen

→ Exiting the main menu, return to the process screen

1.3 Symbols and their meaning

During operation a series of different signs and symbols appear in the display. Their meaning is given in the following list.

Symbol				
Meaning	Heating	Cooling	Timer active	System closing active
Symbol			ECOTEMP	
Meaning	Pump in normal operation	Pump in leak stop operation	Mode ECOTEMP active	

2 Description of the parameters and their adjustment

The parameter level is reached via the main menu. Pressing the P button opens the main menu. With the F3 button the cursor can be moved downwards, i.e. upwards with the F2 button. Once the desired menu item has been reached it can be opened using the (↵) button. The F1 button returns the user to the previous level. The parameters can be found in the first four menu items "Setting". The parameters can be changed using the value adjustment buttons (+) and (-). Once the desired value has been reached it must again be confirmed with the (↵) button.

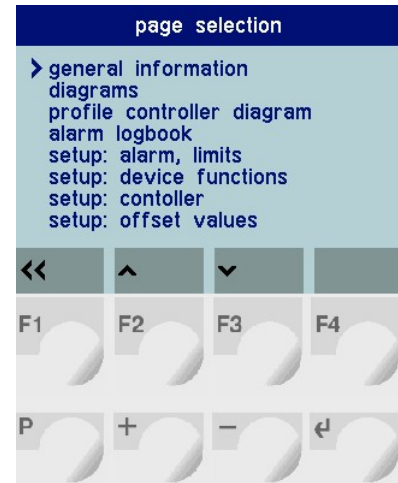


Figure 2-1

2.1 Setup alarm, limits

When the "Setup alarm, limits" menu is opened the following screen appears. The current parameter is highlighted in grey. The current setting is indicated in the blue framed field.

In the following table all the parameters from this level together with their setting range are listed.

Note: Temperature and pressure in the following table can also be shown in °F and psi.

The values indicated are based on °C and bar and are converted as required.

Warning: The parameters highlighted in grey are only available in the Professional version.



Figure 2-2

Setup alarm, limits				
Parameter	Value range		Unit	Meaning
	Start	End		
Alarm limit	Off, 0	100		Setpoint = alarm tripping value / alarm trigger point
1st setpoint				see upper setpoint limit
2nd setpoint				see lower setpoint limit
3rd setpoint				only active when the external sensor has entered "sensor breakage"
Alarm to process	Off, -30	154	°C	-
Aqua timer	Off, 1	40		Setpoint = max. permissible filling cycles after one hour operation
Alarm flow	Off, 1	600	l/min	Setpoint = minimum desired amount if not reached alarm is triggered
Alarm volume flow stream	Off, 1	600	l/min	Setpoint = minimum desired amount if not reached alarm is triggered
Alarm pressure high	Off, 0.1	25	bar	upper alarm value
Alarm pressure low	Off, 0.1	25	bar	lower alarm value

Setup alarm, limits				
Parameter	Value range		Unit	Meaning
	Start	End		
Alarm 2	Off, 1	600	l/min	Setpoint = alarm tripping value / alarm trigger point
upper setpoint limit	0	400	°C	Upper value of the setpoint adjustment range
lower setpoint limit	-30	149	°C	Starting value of the setpoint adjustment range
Alarm film temperature	Off, -30	400	°C	Film temperature limit value
Alarm ΔT	Off, 0.1	20	°K	Delta T monitoring of supply/return temp
From process limit	-29.9	400	°C	-
Cascade control	Off, 1	100	°K	Output limiting with external temperature sensor = active. Value = temperature difference to the setpoint in °K. Continuous monitoring of the supply temperature dependent on setpoint (value = 5 equivalent to 5°K)
external sensor logic	=b	1.#b	-	Selection facility for the settling performance, when an external thermocouple is employed =b during start-up phase and/or after setpoint alteration, the APE-limitation (band for internal temperature) always remains active 1.#b during the start-up phase and/or after setpoint alteration, the internal temperature is allowed to exceed the band just once Band-limitation only becomes active, when setpoint = actual temperature
System closing temperature	Off, 35	90	°C	-

2.2 Device functions

When the “Device functions” menu is opened the following screen appears. The current parameter is highlighted in grey. The current setting is indicated in the blue framed field.

In the following table all the parameters from this level together with their setting range are listed.

Warning: The parameters highlighted in grey are only available in the Professional version.

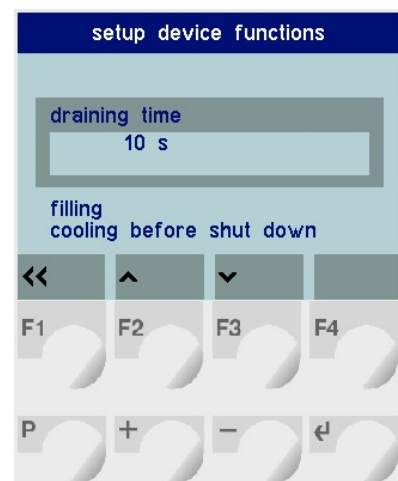


Figure 2-3

Device functions				
Parameter	Value range		Unit	Meaning
	Start	End		
Draining time	10	900	Sec.	Blow, i.e. suction time for devices with mould draining
Filling	Hand	Automatic		Hand indicates manual filling of the equipment Automatic indicates automatic filling of the equipment - Automatic is not possible with heat transfer equipment
Configuration change of water	Manually	Time-controlled		Manual: the water change is started manually After switching on: water change is carried out following every mains reset and switching-on Time controlled: Water change is carried out according to the set interval
Time for change of water	1	30	Sec.	Duration of the water change
Interval for change of water	1	300	Min.	Time until the next water change is carried out
Change of water manually	On	Off		Start with manual water change
Cooling before shut down	Off	co.OF		Off means that the equipment is switched off directly via the "0" button. co.OF means that the equipment is first cooled and then switched off via the "0" button (pump follower control)
Cooling mode	Indirect	Blocked		
Selection of setpoint	-	-		Setpoints 1, 2 and external
External sensor	Off	On		
Actual value output PB (Profibus)	-	-		Current control sensor: Output of the present actual value via PB and power output External sensor: Output of the external sensor via PB and power output Internal sensor: Output of the internal sensor via PB and power output
Shut down temperature	Off, 9.1	100.0	°C	
Aqua timer start time	5	120	Min.	Is activated following the set time after on/off the time count begins again
Fill time max.	Off, 1	99	Min.	Alarm starts when filling time exceeds adjusted value.
Reclosing lockout	Off	On		Following mains reset the controller remains switched off. To switch the controller back on buttons "0" and "I" have to be pushed
Parameter lock	Off	All		In order to accept the value change keep "Enter" pressed (5-10 sec.)
Record. Function: sample time	1 sec.	10 min.		Example: A setting of 1 sec. means that a value is saved every second.
Language	-	-		German, English, French, Spanish, Polish, Dutch, Italian, Czech, Russian, Mandarin, Portuguese, Finnish, Japanese, Greek, Slovak
Timer	Active	Inactive		active: Temperature control unit switched on/off according to times programmed into the time switch.

Device functions				
Parameter	Value range		Unit	Meaning
	Start	End		
Time of day	00:00	23:59	hh:mm	Setting the local time for controllers with real time clock
Weekday	Mo	Su	Week-day	Setting the day of the week for controllers with real time clock
Year	1980	2099	Year	Setting the year for controllers with real time clock
Month	1	12	Month	Setting the month for controllers with real time clock
Day	1	31	Day	Setting the day for controllers with real time clock
Service interval operating hours	Off, 0	10000	h	Setting the service interval according to operating hours
Service interval year*	Off, 2008	2099	Year	Setting the service interval according to year
Service interval month*	1	12	Month	Setting the service interval according to date blocked if "service interval year" is deactivated
Service interval day*	1	31	Day	Setting the service interval according to date blocked if "service interval year" is deactivated
Config. limit comparator	N/C con.	N/O con.	-	
Config. collective alarm	N/C con.	N/O con.	-	
Configuration OUT13	N/C con.	N/O con.	-	-
Programming c.OFF	c.OFF	c.Gr	-	Programming c.OFF After switch-off via the pump run-on control, 100% cooling is effective until cooling temperature is reached. Programming c.Gr After switch-off via the pump run-on control, the default cooling gradient is effective until the cooling temperature is reached.
Unit of pressure	off, bar	psi	-	
Unit of flow	off, l/min	gal/min	-	
Factory setting	Off	On		Activation and resetting of parameter to the factory setting
Name of unit	-	-	-	Freely selectable via the keyboard (compare tool designation, chapter 4.3.1) The machine designation is displayed in the initial screen and in the "Process values, summary" mask.

*This setting is only possible for machines with a real time clock (RTC)

2.3 Controller

When the “Controller” menu is opened the following screen appears. The current parameter is highlighted in grey. The current setting is indicated in the blue framed field.

In the following table all the parameters from this level together with their setting range are listed.

Warning: The parameters highlighted in grey are only available in the Professional version.

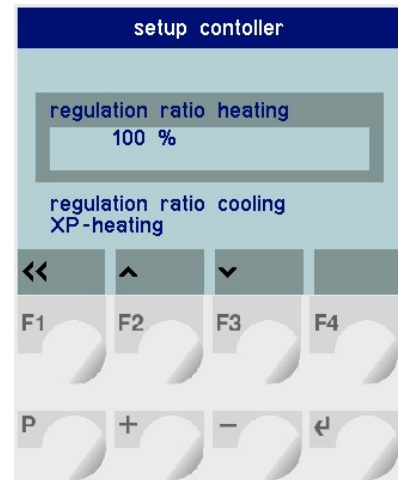


Figure 2-4

Controller				
Parameter	Value range		Unit	Meaning
	Start	End		
Regulation ratio heating	0	100	%	The control variable limiter comes into force when the control variable calculated by the controller is greater than the max. permissible (limited) control variable.
Regulation ratio cooling	0	100	%	
XP-heating	Off, 0.1	99.9	%	Proportional range of the controlled system
TV-heating	Off, 1	200	Sec.	Lead time of the controlled system
TN-heating	Off, 1	999	Sec.	Reset time of the controlled system
XP-cooling	Off, 0.1	99.9	%	Proportional range of the controlled system
TV-cooling	Off, 1	200	Sec.	Lead time of the controlled system
TN-cooling	Off, 1	999	Sec.	Reset time of the controlled system
Hyst. switch heating/cooling	Off, 0.1	10.0	°C	The setpoint for cooling is increased by the set value, preventing frequent switching between heating and cooling operation.
Switch cycle time heating	1	240	Sec.	The switching cycle time determines the max. switching frequency of the control element.
Switch cycle time cooling	1	240	Sec.	
Temperature unit	°C	°F		Preselection °C, °F and 0,1°C
Self-optimization	Off	On		-
Setpoint ramp increasing	Off, 0.1	99.9		-
Setpoint ramp decreasing	Off, 0.1	99.9		-
Switch on hyst. cooling	0,5	10,0	°K	Cooling is switched on at a temperature of "nominal value + set-point value"
Switch off hyst. cooling	0,5	10,0	°K	Cooling is switched off at a temperature of "nominal value - set-point value"
Act. value output: upper value	luW+80	400	°C	Starting value range = min. scale + 80°
Act. value output: lower value	-30	loW-80	°C	End value range = max. scale - 80°

2.4 Offset values

When the “Offset values” menu is opened the following screen appears. The current parameter is highlighted in grey. The current setting is indicated in the blue framed field.

In the following table all the parameters from this level together with their setting range are listed.

Warning: The parameters highlighted in grey are only available in the Professional version.

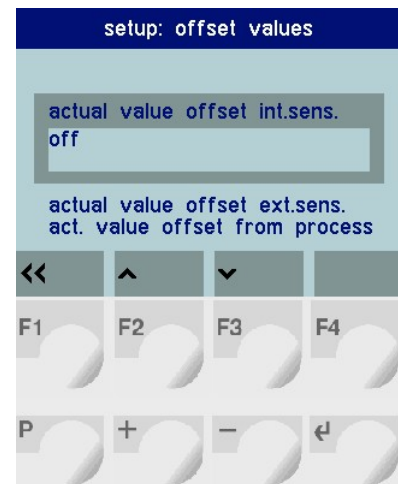


Figure 2-5

Interface				
Parameter	Value range		Unit	Meaning
	Start	End		
Actual value offset int. sensor	- 199	+ 199	K	
Actual value offset ext. sensor	- 199	+ 199	K	
Actual value offset from process	- 199	+ 199	K	
Actual value offset to process	- 199	+ 199	K	
Actual value offset film temperature	- 199	+ 199	K	
Flow offset	- 99	+ 99	l/min	
Threshold flow dP	off, 10	50	mV	Threshold value at which the flow meter displays a value.
Cooling regul. ratio offset	off, 1	100	%	With continuous cooling and a small control variable output an offset can be set so that the continuous valve does not open immediately.

2.5 Interface

When the “Interface” menu is opened the following screen appears. The current parameter is highlighted in grey. The current setting is indicated in the blue framed field.

In the following table all the parameters from this level together with their setting range are listed.

Warning: The parameters highlighted in grey are only available in the Professional version.

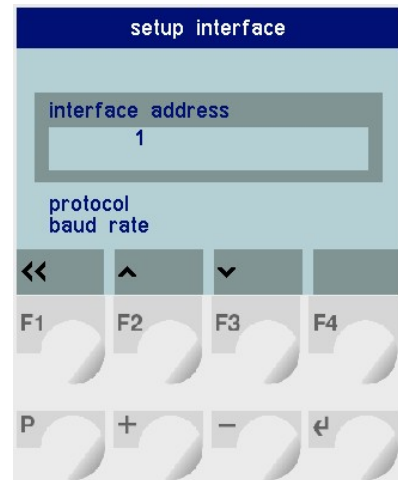


Figure 2-6

Interface				
Parameter	Value range		Unit	Meaning
	Start	End		
Interface address	1	255		For multiple devices on one interface different addresses are required
Protocol	Off	St		Off = Interface operation deactivated Arburg = Arburg-Protocol Boy = Dr. Boy- Protocol Engel = Engel- Protocol Krauss-Maffei = Krauss-Maffei- Protocol Elotech Standard = Elotech- Protocol Profibus Gateway = Profibus- Protocol SPI = Single Standard- Protocol Profibus-DP = Profibus-DP- Protocol Euromap 66 CAN = Euromap- Protocol Modbus RTU = Modbus- Protocol
Baud rate	Off, 0.3	19.2		
Data format	7E1	8n2		

2.6 EcoTemp

When the “EcoTemp” menu is opened the following screen appears. The current parameter is highlighted in grey. The current setting is indicated in the blue framed field. In the following table all the parameters from this level together with their setting range are listed.

Further details can be found in chapter 4.3.



Figure 2-7

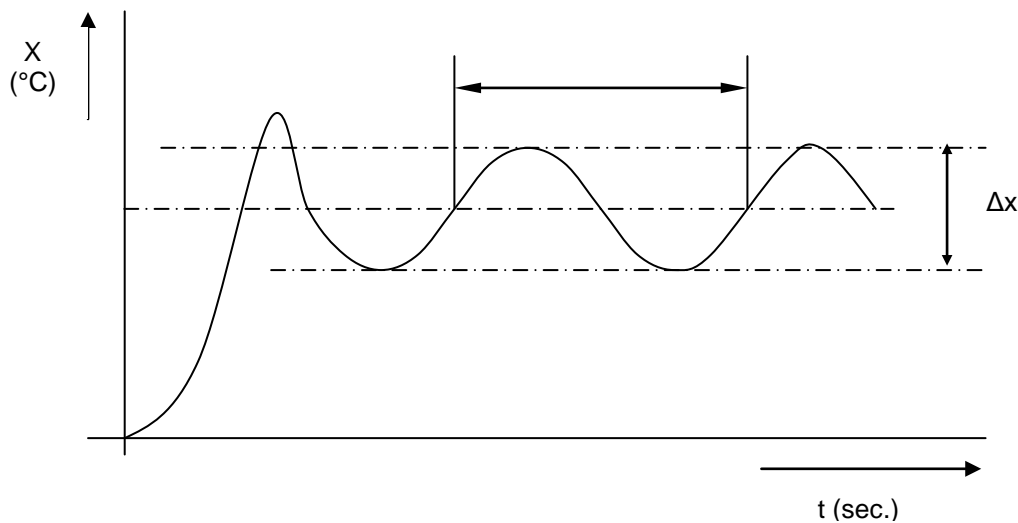
EcoTemp				
Parameter	Value range		Unit	Meaning
	Start	End		
EcoTemp	Off	On		
Start non-cooling time	0.0	100.0	s	Start of the non-cooling time
Duration non-cooling time	0.0	1000.0	s	Duration of the non-cooling time
Timer for standby-mode	0	2000	s	Timer for the standby-mode

3 Configuration

3.1 Setting the control parameter

3.1.1 Determining the parameters with closed control circuit

If the time response of the controlled system is unknown and if the control circuit can be made instable for short periods, then the controller is operated with $x_p = 0$ (on-off, without time response). The control parameters are calculated from the resulting waveform as follows:



T = oscillation period

Δx = oscillation amplitude of the actual value

Delay time: $T_u = \frac{1}{4} * T$

Lead time: $T_v = \frac{4}{10} * T_u$

Reset time: $T_n = 5 * T_v$

Proportional range: $x_p = \frac{\Delta x * 2}{\text{Meßbereichsumfang}} * 100\%$

Span SC: 430 K

We recommend setting the proportional range “cooling” to two times the value.

3.1.2 Self-optimisation

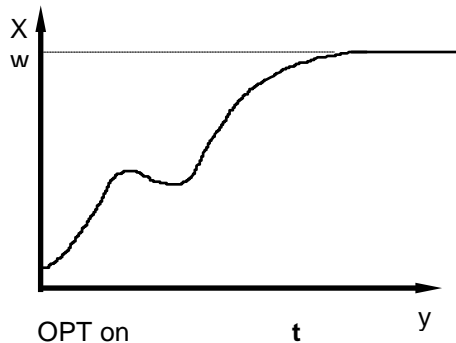
The optimisation algorithm with closed control circuit ascertains the characteristics of the controlled system and calculates the feedback parameters (x_p , T_v , T_n) and the switching cycle time ($C = 0.3 * T_v$) for a PD/I controller valid over a wide range.

If the controller is operated as a “heating-off-cooling” controller then the parameter values determined under “heating” are used for “cooling”.

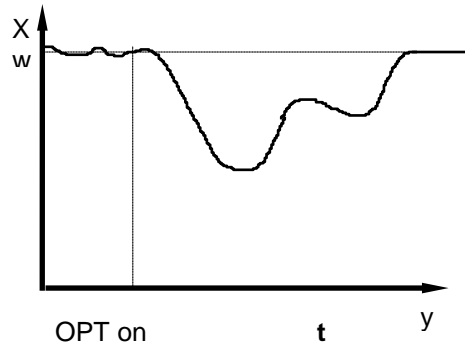
The optimisation is carried out during start-up shortly before the setpoint. This must be at least 5 % of the span. During the optimisation to a setpoint that has already been reached, the temperature is reduced by approx. 5% of the span in order to accurately determine the controlled system gain.

The optimisation algorithm can be triggered at any time by selecting “Self-optimisation = ON” and confirming with the “Enter” button. During the optimisation process “Opt. Activ” is shown in the display. With 3-point controllers (heating-off-cooling) the temperature reduction is accelerated via short-term activation of the cooling.

After the feedback parameters have been calculated the controller maintains the actual value at the current setpoint.



OPT on
Optimisation during heating of the controlled system



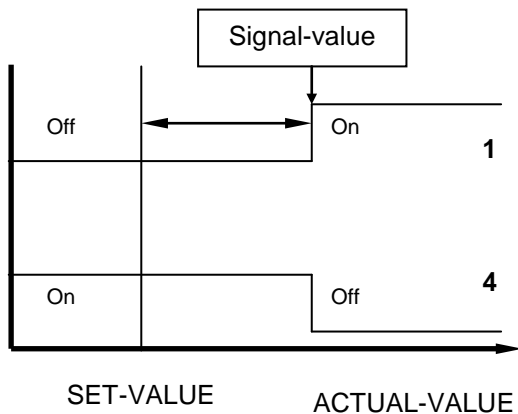
OPT on
Optimisation to setpoint already "attained"

By selecting "Self-optimisation = OFF" and pressing the "Enter" button, the optimisation process can be interrupted.

3.2 Significance of the alarm configuration

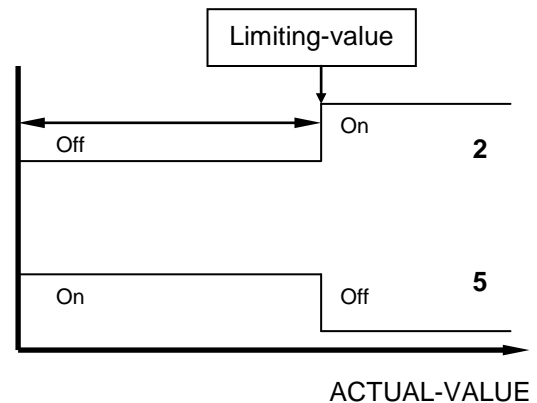
Signal contacts are input and displayed as a function of the set-value selected.

Switching performance: **Configuration:**



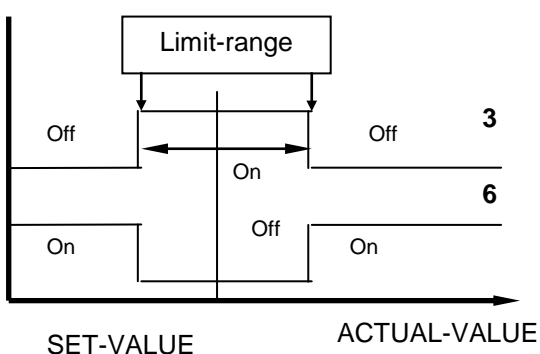
Limiting contacts are input and displayed as absolute values.

Switching performance: **Configuration:**



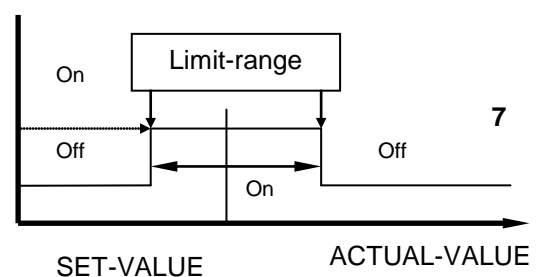
The limit comparator is input and displayed as a function of the set-value selected. The input value is effective below and above the set-value.

Switching performance: **Configuration:**



The alarm relay of limit comparators with readiness performance is being energized, once the controller is turned ON. It is de-energized, when the actual-value has made the OK-zone and has passed out of it again.

Switching performance: **Configuration:**



4 Application examples

The following sub-chapter explains the deployment of the program controller and time switch.

4.1 Setting the program controller

The menu item “Setting program controller” can be found in the main menu. By pressing the (↵) button the following overview is opened (figure 4-1).

This lists the ten possible settings.



Figure 4-1

4.1.1 Recipe – configuration

Figures 4-2 and 4-3 show a configured recipe:

The adjustable value ranges are based on the given parameter ranges for the setpoint (see chapter 2.1). The same applies for the time switch.

In the first column (temperature) the setpoint temperatures valid for the respective phase are entered. The second column indicates the duration for which the current setpoint is approached.

It should be noted that the time duration that is set also includes the change in the temperature value. Therefore in stage 6 the time required for the controller to cool the medium from 155°C to –12°C is also included in the 6 minutes for which the setpoint of – 12°C is to apply.

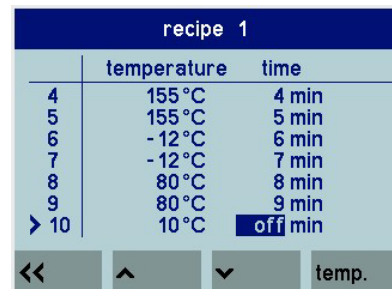
The cursor navigation in the vertical direction is again carried out using the buttons F2 and F3. Changing between the columns is carried out using the F4 button. In figure 4-2 the cursor is at temperature 1; accordingly the cursor shifts to time 1 when the F4 button is pressed. The opposite is the case in figure 4-3. The cursor is at temperature 10; above button F4 is Temp. Pressing F4 returns the cursor to the temperature column.

The value is adjusted in each case by pressing the (+) and (–) buttons; the value changes are accepted as customary by pressing (↵).



	Temperatur	Zeit
> 1	15.0 °C	1 min
2	95.0 °C	2 min
3	95.0 °C	3 min
4	155.0 °C	4 min
5	155.0 °C	5 min
6	-12.0 °C	6 min
7	-12.0 °C	7 min

Figure 4-2



	temperature	time
4	155 °C	4 min
5	155 °C	5 min
6	-12 °C	6 min
7	-12 °C	7 min
8	80 °C	8 min
9	80 °C	9 min
> 10	10 °C	off min

Figure 4-3

4.1.2 Recipe – graphic display

The recipes from the program controller menu can also be shown in the form of graphic process diagrams. In order to do this first return to the main menu. The graphic menu is opened via the item “Program controller display” (figure 4-4).

The different recipes can be displayed one after the other using the F3 button. The F2 button starts the recipe.

If the recipe is active the curve is coloured in blue (figure 4-5). At the same time the function of the F2 button changes to “Pause” and the F3 button to “End”. Following manual or automatic termination of the recipe the button assignment from figure 4-4 returns, enabling a new start or a change of recipe.

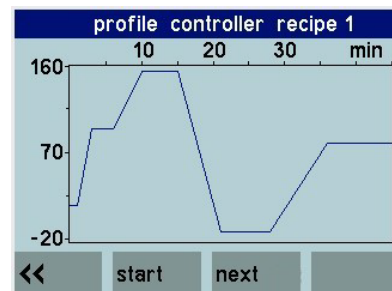


Figure 4-4

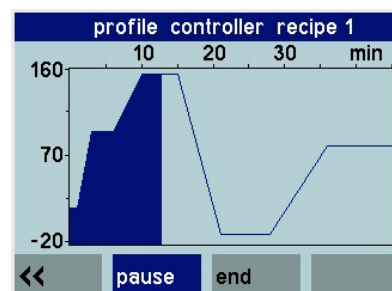


Figure 4-5

4.2 Clock module

The unit can be activated or deactivated at a particular point in time with the help of the clock module. In addition, these components allow a service interval to be set.

4.2.1 Timer

The timer can also be comfortably accessed via the main menu.

The start and termination times are entered, i.e. changed in the same manner as described in chapter 4.1 for the recipes. The vertical selection is carried out using F2 and F3. The value changes are carried out using (+) and (-) and the confirmation with (↵). Changing between the columns is again carried out via the F4 button.



Figure 4-6

4.2.2 Service interval display

When a clock module is present, three entries/ parameters can be found in the "setting: machine functions" menu: "Service interval year", "Service interval month" and "Service interval day". The next service appointment can be entered here by the usual method (changing the value with (+) and (-), entry with (↵)). Once the interval has expired, the "Service" display will appear on the main screen.

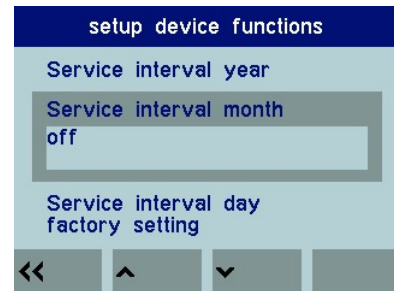


Figure 4-7

4.3 Mode EcoTemp

The menu item "Setup EcoTemp" can be found in the main menu. By pressing the (↵) button the following overview is opened (figure 4-8).

4.3.1 Functional description

The EcoTemp-module provides an intermittent flow within the cavity wall. It thereby controls the cooling and the non-cooling time of the temperature control unit. The systematically gradated mould temperature over cycle time provides a variety of benefits for the process, the part surface and the strength as well as for the economic efficiency.

Additionally there is a watchdog-time available that leads the TCU to standby after a certain period of time.



Figure 4-8

4.3.2 Service interval display

The first parameter in the submenu allows to switch between activation and deactivation of the EcoTemp mode. An activated EcoTemp mode is shown by the lettering "ECOTEMP" in the upper right of the process screen.

The arrow keys allow to choose the parameter that needs to be changed. Pressing the (+) and (-) buttons will change the values of the selected parameter. (↵) will confirm the modified values.

Parameter Time1:

Time1 delays the non-cooling time. In normal case this time has to be adjusted on value "0". In some cases, however, further cooling could be required after the cycle-start signal.

Parameter Time2:

Time2 defines the duration of the non-cooling time.

Parameter Time3:

Time3 is the timer for the standby mode. The interval for Time3 should last a bit longer than the cycle time. If the cycle-signal fails to appear, the unit will switch to standby-mode after the adjusted period of time

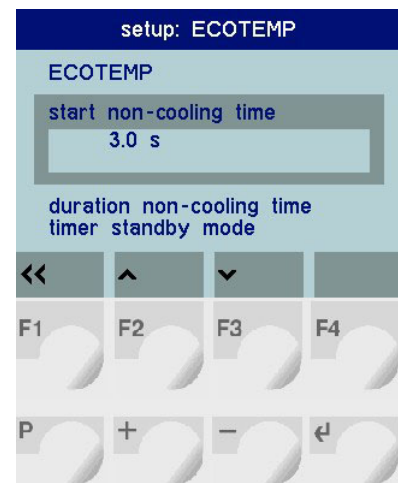
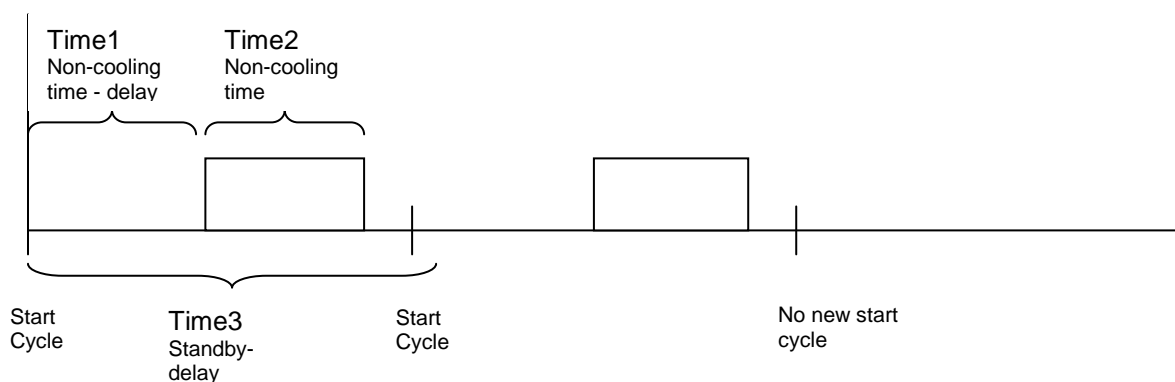


Figure 4-9

4.3.3



4.4 Tool recipes

The "Setup tool recipes" menu item is also found in the main menu. If different tools are used with a tempering unit, as needed, this function will appear in the foreground. The tool recipes allow specific parameters to be provided for a maximum of 20 tools.

Attention: The "Setup tool recipes" level is completely blocked when the unit is in operational mode. Settings and changes can only be made when the unit is in its idle state!

4.4.1 Tool designation

At the factory, the tool recipes are numbered serially from 1 to 20. However, these names can be replaced, removed or deleted at any time.

This is done by selecting the desired formula with the cursor and pressing the F4 button. The character set (Fig. 4-11) will open with the following key functions:

F1	F2	F3	F4	P	+	-	↵
up	down	to the left	to the right	-	insert character	delete character	confirm entry

The characters are selected using the function keys; (+) takes over characters, (-) deletes characters, and input is confirmed with (↵). The character selected is displayed in red.

4.4.2 Saving and loading tool recipes

The tool recipes can be selected with the arrow keys and opened with (↵). If the controller is not in idle state (temperature control is active) the red display will be shown "blocked" on the display.

The menu can be opened in the idle state. The preset parameters of the tool recipes are then shown. (Fig. 4-12) The list can be scrolled through using the F2 and F3 keys. By pressing F4, the values displayed can be saved, loaded or overwritten with the current settings.

An empty screen will be shown if no parameters have been configured in the selected recipe. If this is the case, you can jump to a dialog menu by pressing F4 (Save). (Fig. 4-13) The controller parameters currently set for the recipe selected are taken over with F2.

If parameters have already been set, re-enter the dialog menu with F4 (save/load). You can now replace the saved values by the current settings (Fig. 4-14) with F2 - or load the values saved with the aid of the F3 key. Once the unit has been switched on again, the current tool recipe will be executed. By changing the parameters during the working process, the active recipe will be deactivated and work continued with the newly set values. In order to control the temperature again with a tool recipe, the controls must be deactivated again and the recipe re-loaded.



Figure 4-10

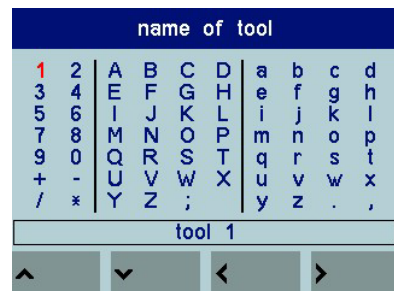


Figure 4-11

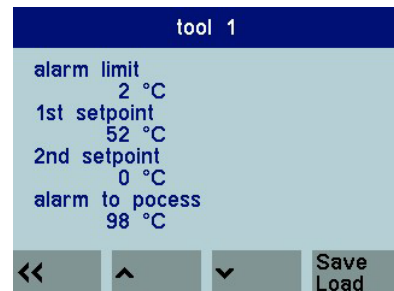


Figure 4-12

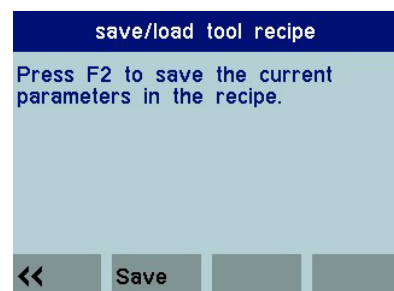


Figure 4-13

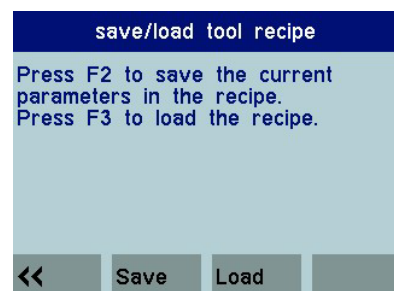


Figure 4-14

5 Technical data and wiring diagram

5.1 Technical data

Format:	Front dimensions: 134 x 164 mm Mounting depth: SC-S 24V DC: 60 mm SC-P 24V DC: 79 mm
Display: Inputs Pt 100 (DIN)	Degree of protection: IP 00 Colour LCD display; 3,5"; 320 x 240 pixel; LED backlight Measuring range: -30...400°C resolution 0.1°K SC-S: 4 x 2-wire circuit SC-P: 4 x 2-wire and 1 x 3-wire circuit Sensor break and short circuit monitoring are present. Sensor voltage: ≤ 1 mA Calibration accuracy: ≤ 0.2 % Linearity and indication error ≤ 0.2 % +/- 1 digit Ambient temperature influence on the span: ≤ 0.02 % / K Measuring range: -30...400°C Sensor break fuse and internal reference junction installed. Reference temperature of the junction: 20°C Reverse voltage protection present. No balancing necessary up to 50 Ohm output resistance. Calibration accuracy: ≤ 0.25 % Linearity and indication error ≤ 0.2 % +/- 1 digit Ambient temperature influence on the span: ≤ 0.01 % / K
Thermocouple input: Only for SC-P	0...10 V DC, input resistance: > 1MOhm or 0 ...20 mA, 4...20 mA, input resistance: 1 Ohm Calibration accuracy: $\leq 0,2$ % 0 ...10V DC, output load: min. 10kOhm/Volt or 0 ...20 mA, 4...20 mA, output load: max. 500 Ohm Calibration accuracy: $\leq 0,2$ %
Analogue inputs: Only for SC-P	Suitable for the connection of external, floating contacts. Switching voltage: approx. 24 V DC, max. 1 mA.. Supply current: approx. 12 mA Input resistance: approx. 13 KOhm
Analogue outputs: Only for SC-P	Auxiliary voltage 5V DC Input voltage 0...10V; input resistance approx. 440 KOhm Calibration accuracy: $\leq 0,2$ % Voltage, bistable, 0/18 V DC, max. 10 mA, short-circuit proof or Relay, (normally open contact) max. 250 V AC, max. 2.5 A with cos-phi = 1 Relay, (normally open contact) max. 250 V AC, max. 2.5 A with cos-phi = 1 or Voltage, bistable, 0/18 V DC, max. 10 mA, short-circuit proof Relay, (normally open contact) max. 250 V AC, max. 2.5 A with cos-phi = 1
Digital inputs:	
Flow transmitter contact: (Impeller wheel) Only for SC-P	
Flow transmitter contact: (Grundfos)	
Control output "heating":	
Control output "cooling":	
Outputs, relay:	
Interfaces (option):	RS232, RS485, TTY(0/20mA) CAN EUROMAP 66 Profibus DP
Data storage:	EAROM, semiconductor memory
Auxiliary voltage:	24V DC $\pm 25\%$ 10W alternative 230V AC, ± 10 %, 48...62 Hz; 10VA
Electrical connections:	Plug-in terminal strips, degree of protection IP 20 (DIN 40050), insulation group C
Permissible area of application:	Working temperature range: 0...50°C / 32...122°F Storage temperature range: -30...70°C / -22...158°F Climatic class: KWF DIN 40040; Equivalent to average annual relative humidity of 75 %, without condensation

Subject to technical changes without prior notice!

5.2 Wiring diagram SC-Standard

	L	1
	N	2
OUT 3	Ventilating / venting	3
OUT 5	Pump	4
COM	OUT 3,5,6,8	5
OUT 6	Filling	6
OUT 8	System closing / water change	7
OUT 9	Draining / leak-stop	8
		9
OUT 4	Alarm	10
		11
OUT 2	Cooling	12
		13
OUT 1	Heating	14
		15

		Serial Interfaces				
		RS 232	RS 485	TTY 20 mA	Profibus	CAN
70	RxD in		B	TxD in	RxTx N	L
71	TxD out		A	TxD out	RxTx P	H
72	TxD in			RxD out	Controlsignal	
73	RxD out			RxD in	+5V	
74	GND	GND			GND	GND
75	Level max	S6				
76	Level min	S5				
77	+ 24 V	S5, S6				
78	Motor protection	S9				
79	Flow watchdog	S7				
80	Ext. Controller	S1				
81	+ 24 V	S1, S7, S9				
82	ON external					
83	+ 24 V	S8				

60	Configuration	S2
61	+ 24 V	
62	Heating -	OUT 1.1
63	Heating +	
64	Film temperature	GND
65		Pt 100
66	To process temperature	GND
67		Pt 100
68	Closed-loop control	GND
69		Pt 100
6A	Return run temperature	GND
6B		Pt 100

85	+5V	VFS
86	GND	
87	Flow monitoring input	0-10 V
88	Sensor input	0-10 V


5.3 Wiring diagram SC-Professional

L1	Phase	17
L2	Phase	18
L3	Phase	19
		20
OUT 7	Group alarm	21
		22
OUT 11	Oil-cracking alarm / unlocking	23
		24
OUT 12	ON / S1 active	25
		26
OUT 13	Alarms active during: limiting value-returnline; min.volume;ΔT-Inlet-, returnline;pressure, min / max;2. Limit Soll/Ist	27
		28

40		GND
41	Actual-value output port	Bridge 10 V
42		0/4...20 mA; 0..10
43		S 10
44		+24 V S 10
45	2. Set-value / external set-value active	S 4
46		+24 V S 4
47	Almost empty	S 3
48		+24 V S 3
49	Continuously / logical +	Heating / cooling
50	Continuously / logical -	Heating / cooling

54	Flow sensor DFG	+
55		GND
56	+24 V Output	Supply current
57	Pressure	10 V
58	GND pressure/flow	GND
59	Flow	10 V

90	Free	
91		GND
92	External set-value	0...10 V
93		0/4...20 mA
94		GND
95	External sensor	+
96		-



Thermocouple	Resistance thermometer	Current signal with termination resistance of 1 OHM
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