

ENGLISH

RIEDEL
PRECISION IN COOLING

OPERATING MANUAL

L 0/5 TR2

TRUMPF



RIEDEL
PRECISION IN COOLING

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Vom Anwender einzutragen

To be entered by the user :

A remplir par l'utilisateur:

Da completare da parte dell'utente

Datos a cumplimentar por el usuario

Inventarnummer:

Inventory number:

No. d'inventaire

No. d'inventario

Nº de inventario

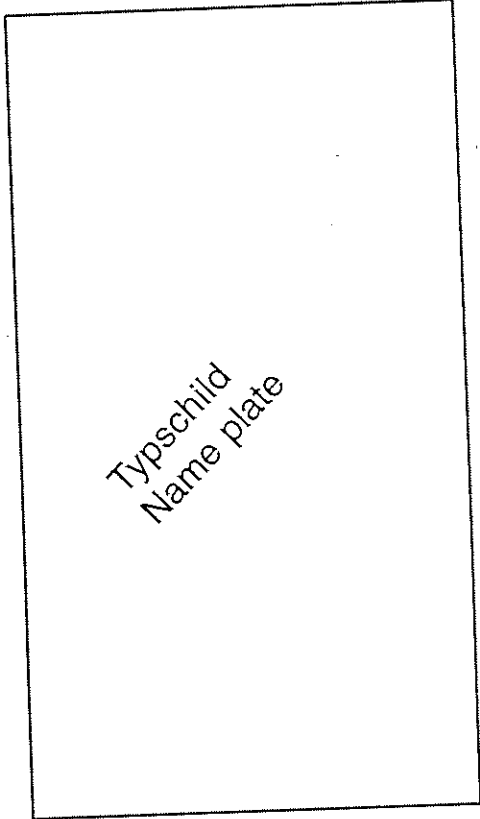
Aufstellungsort:

Installation site:

Lieu d'implantation

Luogo di installazione

Lugar de ubicación



Typschild
Name plate

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1. FOR YOUR SAFETY

1.1 Regulations

The design, construction and development of the process cooler are in compliance with the following national and international regulations.

EC Directives / Standards

- EC Machinery Directive 2006/42/EEC
- EC EMC Directive 2004/108/EEC
- EC Pressure Equipment Directive 97/23/EEC

- EN 378 T1/T2/T3/T4 Refrigeration plants and heat pumps
- EN 60529 Degrees of protection provided by enclosures (IP)
- EN ISO 12000-1, -2 Safety of machinery
- EN ISO 13857 Safety of machinery
- EN 349 Safety of machinery
- EN 60204-1 Elektrische Ausrüstung von Maschinen
- EN 61000-6-2 Electromagnetic compatibility - generic emission standard for industrial environment
- EN 61000-6-4 Electromagnetic compatibility - generic immunity standard for industrial environment

National Directives

- BGR 500 Accident prevention regulations concerning refrigeration plants and heat pumps

1.2 Signs and Symbols

Throughout this operating manual, the information and notices below are identified by graphical symbols:

Piktogramme



Danger!

Safety note pointing out an imminent danger. Failure to heed the warning may result in serious bodily injury and even death.



Caution!

Safety note to indicate the presence of a potential hazard. Failure to heed the safety notice may result in minor bodily injury or damage to the equipment.



Information!

This symbol identifies important information or a useful tip concerning the application of the equipment.



Work Procedure

This symbol identifies a work procedure.

1.3 Safety Notices

For the installation, operation and maintenance of the process cooler, the following regulations and safety notices have to be observed:



Any work on the process cooler may only be performed by qualified personnel

All relevant accident prevention regulations have to be observed

Do not allow anybody to stand or pass underneath the forks when lifting and setting down the process cooler; stay clear of the danger area.

The process cooler must be properly secured in order to prevent it from tipping over

The safety devices must not be deactivated

The electrotechnical connections of the process cooler as well as all servicing and repair work must be performed according to and conforming with all relevant VDE, EN and IEC standards. Beyond that, the technical connection requirements of the local electrical utility company have to be observed

The process cooler must always be disconnected from the power source before performing any service work on it



Specific regional or national provisions applicable in the country where the unit will be installed must be adhered to

The closed refrigeration circuit contains refrigerants and refrigeration oil. These must be properly disposed of when performing service work or placing the unit out of service (environment)

The cooling water additives have a caustic effect on skin and eyes. When working with cooling water additives, eye protection devices and gloves must be worn. Follow the directions on the product's label

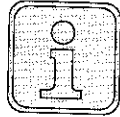
Anyone working on the refrigeration circuit must be protected by personal protective equipment

The process cooler is to be used exclusively for the cooling of water in accordance with TRUMPF specifications



Watch out for any incompatibilities of materials in the entire water circuit.

1.4 Handling of Refrigerants



When handling refrigerants it is imperative that the relevant statutory regulations and guidelines be complied with. Only adequately skilled personnel may carry out this kind of work.

The proper disposal of refrigerants and parts of the system that are no longer serviceable lies within the responsibility of the operator of the process cooler.

1.5 Safety Requirements

concerning the operation of refrigeration systems within the European Union

The following information applies to refrigeration systems with closed refrigeration circuits that are operated within the European Union. In some member states additional requirements may apply, e.g. for reasons relating to environmental policy.

Components are incorporated in the refrigeration systems whose working pressures are subject to the regulations laid down in the Pressure Equipment Directive 97/23/EEC and European standard EN 378 (Parts 1 - 4, edition September 2000).



Apart from the requirements relating to the design, equipment and testing of the process coolers prior to delivery, also the operator of such systems has to comply with requirements imposed by standard EN 378 and any additional regulations that may apply. These concern the **installation**, the **operation** and the **periodic inspections** of process coolers.

1.5.1 Installation

With regard to the installation of refrigeration systems in spaces below ground level or on upper floors of a building without an adequate number of emergency exits, the requirements of EN 378 with regard to the installation site and the protection of people are to be complied with.

With regard to the refrigerant charge inside this process cooler, a minimum room volume of

7 m³

must be maintained.

This ensures that any sudden refrigerant loss (leakage) in the case of damage to the unit and the resulting oxygen displacement will not pose any risk to the health of persons that may be present in the room.

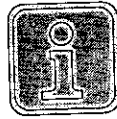
1.5.2 Operation



The **owner** or the **operator** of the process cooler **is obligated to establish emergency practices** (in the case of accidents and malfunctions). A short version of the operating instructions must be drawn up by the operator – based on this present Operating Manual – which shall be made known to his employees.

This quick reference sheet must be posted in the immediate vicinity of the process cooler and must be clearly legible.

See sample on page 37



The owner or operator is obligated to maintain a system log for the process cooler.

The system log shall either be kept on site near the process cooler, or in the event that the data are stored in a computer of the owner or operator, a printout of the log must be kept in the vicinity of the process cooler. It must be ensured that these data are accessible to competent persons for the performance of repairs and periodic inspections.

See sample on page 35

1.5.3 Periodic Inspections

To ensure compliance with minimum safety and health requirements as set forth in standard EN 378, periodic tests (regular inspections) of the process cooler have to be carried out by competent persons.



The operator is responsible for the performance of these regular inspections.

(See Chapter 13 Periodic Inspections).

1.6 Purpose of the Process Cooler

The process cooler described in this manual is designed exclusively for the cooling of a TRUMPF machine and features one water circuit.

2. DESCRIPTION OF PROCESS COOLER

The process cooler is a cooling plant ready for plug-in, comprising a refrigeration and water circuit including all fittings and regulating/control equipment required for automatic operation.

The process cooler is designed for the cooling of water in a temperature range from +15°C to +35°C.

The heat extracted from the water is given off to the surrounding air via the refrigeration circuit through action of the fans.

2.1 Refrigeration Circuit

The refrigeration circuit is a closed system in which the refrigerant circulates as the working medium.

The water heated by the machine to be cooled is recooled in the evaporator (5). The liquid refrigerant is thereby passed through the piping in a counter-flow arrangement with respect to the water. The refrigerant evaporates as it takes up the waste heat from the machine's cooling water.

The vaporized refrigerant is drawn in by the compressor (1) and then compressed (rise in pressure and temperature). The refrigerant also absorbs the heat of the compressor motor; this heat is given off to the surrounding air in the form of waste heat by the condenser (2) by means of the fan (3).

The refrigerant is thus liquefied and is passed to the inlet of the expansion valve (4) via the liquid receiver and the filter drier (11). The expansion valve permits liquid refrigerant to enter the evaporator as a function of the temperature.

The cycle is now completed.

The refrigeration performance is controlled by the cycling on and off of the compressor.

(See 15.2 P&I Flow Diagram)

2.2 Water Circuit

The water circuit with its integrated tank (35) is designed as a system open to the atmosphere.

The constancy of the water outlet temperature is influenced by the water volume inside the tank (35). The pump (30) conveys the water out of the tank to the TRUMPF machine, then through the evaporator (5) and back to the tank.

(See 15.2 P&I Flow Diagram)

2.3 Safety and Monitoring Devices

2.3.1 Safety Device

High-Pressure Control (HP)

The high-pressure control is designed to protect the process cooler against an extremely high operating pressure in the refrigeration circuit.

In the event of a malfunction, the HP control switches the process cooler off, and the malfunction is signalled to the control panel (F4). Restarting the process cooler is not possible until the pressure has dropped to the preset pressure difference and the reset button on the pressostat has been pressed.

2.3.2 Monitoring Devices

Low Pressure Control (LP)

The low-pressure control protects the process cooler against extremely low operating pressure in the refrigeration circuit. In the event of a malfunction, the control switches off the process cooler and signals the malfunction to the control panel (F5).

Restarting of the process cooler is effected automatically as soon as the pressure has risen by the preset pressure difference.

Winter Starting Aid

The winter starting aid is designed to prevent any low pressure malfunctions in low ambient temperatures during the start-up phase of the cooling operation until normal operating conditions have been established.

Compressor Overheating Protection

The compressor is equipped with an internal Klixon (overheat protector). In the event of an increase in motor current in conjunction with a rise in winding temperature, the Klixon will trip causing the compressor to be switched off. The Klixon is reset automatically after the windings have cooled down.

Bimetal Contact - Fan Motor

In the event of an increase in motor current in conjunction with an increase in winding temperature, cooling operation is switched off by the thermal contact.

This malfunction is indicated at the control panel (F4).

Air Filter Monitor

The max. permissible contamination level of the air filter element is monitored via the condensation pressure. If the max. permissible pressure is exceeded, a "Filter contaminated (F6)" warning message is displayed on the control panel.

Float Switch

The float switch monitors the water level in the tank. Maintaining the minimum water level ensures that the water outlet temperature remains constant. In the event of a water shortage, the pump will be switched off. The water shortage will be indicated at the control panel (F3). The float switch is located inside the tank.

Fan Control

The condensation pressure is controlled by cycling the fan on and off. This type of control permits an adaptation to varying operating conditions at relatively constant condensation temperatures. "High-pressure fault (F4)" is displayed on the control panel.

Temperature Limit Values

The water temperatures are monitored by limit values and if the preset limit values are overshoot or undershot, this will be displayed on the control panel (F7, F8).

Control and Operating Unit (Differential Control)

The control and operating unit (control panel) controls the water circuit and the refrigeration circuit. Water temperatures as well as warnings and malfunctions are displayed on the display of the control panel. (See Chapter 11 Operation)

2.4 Electrotechnical / Control Equipment

The electrotechnical equipment of the process cooler is installed in the control cabinet. All required components for the automatic switching, controlling and regulating operation are contained in the control cabinet.

The connection of the process cooler to the TRUMPF machine is effected via the interface =M+6-X6.1.

The interface transmits the following signals:

- " Process cooler On " continuous signal from the machine to the process cooler
- " Malfunction " continuous signal from the process cooler to the machine

The control and operating unit maintains the water outlet temperature at a constant value, based on a differential setpoint value, by cycling the compressor in the refrigeration circuit as required.

The current actual value of the water outlet temperature is displayed on the control panel.

3. TECHNICAL DATA

General		L 0/5 TR2	
Main dimensions	Width	640	
	Depth	765	
	Height	1321	
Net weight	kg	180	
Operating weight	kg	220	
Versions			
Air temperature		Min.	Max.
3 x 400V/50Hz indoor installation	°C	+ 5	+ 45
3 x 460V/60Hz indoor installation	°C	+ 5	+ 45
Water Circuit			
Water temperature	°C	15 - 35	
max. deviation	K	± 2	
Water flow rate in circuit	l/min	2,4	
Free pump pressure	bar	3,5	
Tanki capacity	l	40	
Pump 400V/3/50Hz	Type	CM 3-6	
Pump 460V/3/60Hz	Type	CM 3-6	
Water connections, outlet Control cabinet	mm	13	
Water connections, outlet Engine	mm	19	
Water connections, inlet Control Cabinet	mm	13	
Water connections, inlet Engine	mm	19	
Refrigeration Circuit			
Useful refrigeration capacity	kW	6	
at max. ambient temperature	°C	40	
Refrigerant		R 134a	
Refrigerant charge	kg	1,7	
Frequency	Hz	50	60
Air volume flow	m³/h	2800	3000
Sound pressure level at 1m distance	dB(A)	66	69
Max. heat transfer to air	kW	7	9
Electrical System			
Operating voltage	V/Ph/Hz	400V/3/50Hz	460V/3/60Hz
Control voltage	V	24VDC	24VDC
Max. voltage tolerance	%	± 10	± 10
Power consumption	kW	2,6	3,9
Operating current, total	A	5,5	6,1
Max. start-up current	A	18,7	19,2
Apparent power	kVA	3,8	4,8
Recommended fuse protection (circuit breaker)	A	10	10

4. HANDLING AND STORAGE



The safety notices contained in Chapter 1 must be complied with !

As a rule, the process cooler must be transported in upright position without water charge !

In-house handling is carried out by a forklift, lift truck or crane. This process cooler must be placed on a level surface in order to prevent any distortion of the baseframe.

4.1 Handling Specifications

- Weight (see Chapter 3 Technical Data)
- Main dimensions (see Chapter 3 Technical Data)
- Ambient temperatures -20°C to $+60^{\circ}\text{C}$

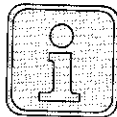
In ambient temperatures $<0^{\circ}\text{C}$ the water circuits must be completely drained, including pumps, water filters and tanks.
(See Chapter 8 Decommissioning)

4.2 Handling By Forklift

During handling, the process cooler must remain secured to a pallet in upright position.

4.3 Handling By Lift Truck

During handling, the process cooler must remain secured to a pallet in upright position.



The lifting speed should be kept to a minimum!
Be careful not to damage the water connections!
 (See Chapter 8 Decommissioning)

4.4 Handling by Crane

For handling the process cooler by crane, a lifting eye is provided in the center of the upper frame.

Lifting Speed

Keep lifting speed to a minimum
 (VLift $<10\text{m}/\text{min}$ - precision lifting, jerk-free lifting operation)

Depositing the process cooler

To prevent any distortions of the lower frame from occurring, the process cooler must be lowered onto a level surface.

4.5 Storage of the Process Cooler

This process cooler must be stored on a level surface, or supported on additional cross beams, in a dry room, protected from frost.
 Permissible storage temperatures: -20°C to 60°C .

For storage in ambient temperatures below 0°C , it is imperative that decommissioning measures be taken.

5. INSTALLATION



The safety notices contained in Chapter 1 must be complied with !

At storage temperatures $< 10\text{ }^{\circ}\text{C}$ allow for an appropriate acclimatisation period before turning the unit on (formation of condensation water) !

Remove transport packaging !

5.1 Indoor Installation

The process cooler must be installed in a freeze-proof room on a level, horizontal surface capable of supporting the weight of the unit. The process cooler and the TRUMPF machine must be installed, as standard, at the same level.



For different installation conditions, consult the manufacturer.

To ensure trouble-free operation of the process cooler as well as to provide adequate access for the performance of maintenance and repair work, the minimum clearances must be met during installation.

(see Technical Data, Dimensions)

These installation requirements ensure that the cooling air can be freely drawn in and discharged without obstructions; it can thus be largely prevented that the hot air discharged in upward direction is reintroduced into the process cooler (air short-circuiting).

Moreover, for proper heat dissipation at the installation site, a sufficient number of air changes must be ensured.

6. MOUNTING



The safety notices contained in Chapter 1 must be complied with !

6.1 Connection of Water Piping

The material and nominal widths of the pipes must conform to TRUMPF specifications.

Water piping connection	Procedure
Hoses	Avoid contamination
Piping	Avoid contamination. Flush lines and install a water filter on the external water side.

➔ Use hose adapter.

The hose lines of the external water circuits must be connected to the corresponding connection sockets on the process cooler.

6.2 Electrotechnical Installation



The electrotechnical installation of the process cooler must be performed according to and conforming with all relevant VDE, EN and IEC standards. Beyond that, the technical connection requirements of the local utility company have to be observed as well!

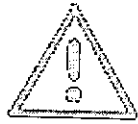
Connection of power supply cables	Procedure
3x 400 V / PE / 50 Hz 3x 460 V / PE / 60 Hz	Standard: Connection to TRUMPF machine's control cabinet
24 V / DC	Connection to TRUMPF machine's control cabinet

- ➔ Remove panel assembly to the right of the control cabinet.
- ➔ Pass the connecting cables through the openings in the base plate.
- ➔ Mount cable with the associated partition plate to the base plate.
- ➔ Establish electrical connection in accordance with the circuit diagram.
- ➔ Mount sensor in the machine bed of the TRUMPF machine and connect to the plug in the process cooler (see also circuit diagram)

7. COMMISSIONING



The safety notices contained in Chapter 1 must be complied with !



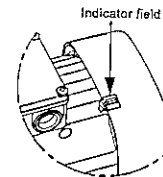
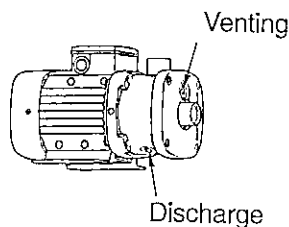
At storage temperatures <math>< 0^{\circ}\text{C}</math> allow for a sufficient acclimatisation period before turning on the unit (formation of condensation water). The process cooler is designed exclusively for the cooling of water. For filling the water circuits, ensure that only water is used that complies with Trumpf specifications !

The mains disconnect switch is located on the TRUMPF machine.



Turn mains disconnect switch to the "0" position
Set circuit breaker in the process cooler to the "0" position
Remove panel assemblies
Remove tank filler cap or use filling device
Fill tank up with water up to the -MAX- mark on the filling level indicator

Turn mains disconnect switch to the "1" position
Set circuit breaker to the "1" position (see circuit diagram)
Vent pump using the vent valve (L 0/6) on the pump housing
Enable the power supply from the TRUMPF machine
Check that the phase sequence is correct (clockwise rotating field)

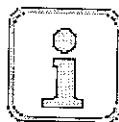


Indicator field rotation

black white//reflecting

Direction of correct

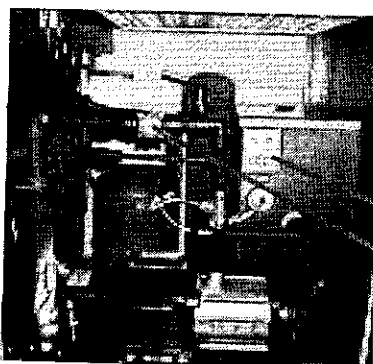
wrong



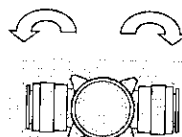
In the event that the pumps rotate in the wrong direction, disconnect the process cooler from the mains power supply and reverse any 2 phases of the main power cable.



Visually inspect entire water circuit for leaks
Check that the water level is within the permissible range by inspecting the water level indicator and top up, if necessary
Mount tank filler cap and panel assemblies
Acknowledge (reset) all (non-reset) fault alarms at the control panel
Check preset values
(See Chapter 11 Operation)
The process cooler is ready for operation, and the control and operating unit takes over the control of the water outlet temperature.



50Hz 60Hz



50 Hz open
60 Hz closed

8. DECOMMISSIONING



The safety notices contained in Chapter 1 must be complied with !



Disconnect process cooler from mains power supply
Completely drain water circuit, including tank, pump(s), piping and filters
(See P&I flow diagram in the appendix)

Take freeze protection measures (consult manufacturer)

9. SHUTDOWN IN EMERGENCIES



The safety notices contained in Chapter 1 must be complied with !



Turn mains disconnect switch (TRUMPF machine control unit) to "OFF"



Activating the "Emergency stop" button at the machine control unit (TRUMPF machine) will not cause the process cooler to be disconnected from the mains power supply.

10. ENVIRONMENTAL REQUIREMENTS

When repairing or placing the process cooler out of service (decommissioning), the environment-relevant requirements regarding recovery, reuse and disposal of fuels/oils and components according to DIN EN 378 are to be complied with.

The operator of the process cooler is responsible for the proper disposal of used fuels, oils and system components:

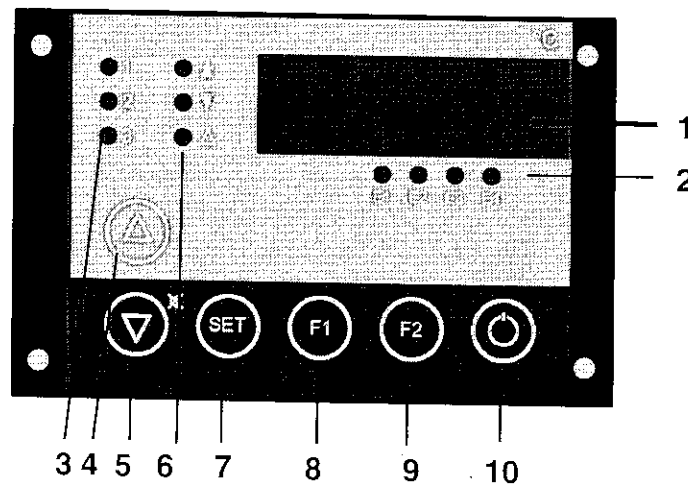


The disposal of the water containing additives is to be effected in agreement with the competent local authorities.

11. OPERATION

The process cooler is ready for operation, and the control and operating unit takes over the control of the water outlet temperature. The process cooler cannot be put into operation if a water shortage alarm signal is pending.

11.1 Temperature Controller



- | | |
|---|---|
| <p>1 Display</p> <p>2 Status displays
 E1 Pump+water level status
 E2 High pressure + TK fan status
 E3 Low pressure status
 E4 Filter element status</p> <p>3 Control modes
 1 Pump On
 2 Control setting 1 On
 3 Control setting 2 On</p> <p>4 UP button
 to increase setpoint/parameter value</p> <p>5 DOWN button
 to decrease setpoint/parameter value</p> | <p>6 Alarm displays
 "Arrow up" fixed setpoint control, upper limit value, f. differential control
 "Arrow down" fixed setpoint control, lower limit value, f. differential control
 "Alarm" common fault alarm</p> <p>7 SET to call up setpoint or parameter display</p> <p>8 F1 button -> special function after parameter enabling</p> <p>9 F2 button -> special function after parameter enabling (sensor in machine bed)</p> <p>10 Stand By button
 Controller On/Off</p> |
|---|---|

Actual values

In the main view, the outlet temperature of the water circuit is indicated on the display.

Adjustment of setpoint values

The setpoint adjustment function is locked.

The setpoint can be adjusted by simultaneously pressing the SET button and the UP or DOWN button (option).

Differential control

When the controller is operated in the differential control mode, the controller generates its control setpoint value from the sum of the measured reference variable (machine bed temperature) and the preset default differential value (setpoint preset in the controller) with the goal to match the measured controlled variable (water outlet temperature) to this value.

A switchover from differential temperature control to fixed setpoint control takes place whenever preset temperature limits are overshoot or undershot.

11.2 Parameter List

See appendix

12. MAINTENANCE

The safety notices contained in Chapter 1 must be complied with !



Disconnect the process cooler from the mains power supply prior to opening the cabinet !

No specific refrigeration technology know-how is required for the performance of maintenance activities. This work can be carried out by a properly trained person with appropriate special knowledge.

Component	Interval	Activity	Material	Mat. No.
Process cooler general	see maintenance instructions of TRUMPF machine	<ul style="list-style-type: none"> - Visual inspection of air filter element for contamination - Visual inspection of refrigeration circuit for leaks - In the case of oil leaks, call Riedel customer service: Tel: +49 (0) 9221 / 709-545 Fax: +49 (0) 9221 / 709-529 		
Water circuit Cooling water	see maintenance instructions of TRUMPF machine	<ul style="list-style-type: none"> - Visual inspection of water circuit for leaks - Check water level, top up 		
Cooling air circuit Filter element Condenser	see maintenance instructions of TRUMPF machine	<ul style="list-style-type: none"> Replace or clean filter element Clean condenser with compressed air, do not damage fins 		

13. REGULAR INSPECTIONS

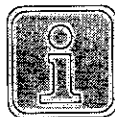


The safety notices contained in Chapter 1 must be complied with !

Throughout the service life of the process cooler, monitoring and inspections must be carried out in compliance with local or national regulations !

In the absence of relevant national provisions with respect to repeat tests, regular device-specific tests should be performed in accordance with EN 378-2.

In addition, Regulation (EC) No. 842/2006 applies in the EC member states. This regulation prescribes, among other things, regular tightness checks of the refrigeration circuit to prevent refrigerant emissions.



The operator is responsible for the performance of these regular checks.

Scope of tests

Test Designations	Monitoring	Checks		
	Visual inspection	Pressure test	Refrigerant leak test	Funct.check HP pressostat
M1	X	X	X	X
M2	X		X	X
M3	X		X	
M4	X		X ¹⁾	X

Monitoring and testing must be carried out by a competent person (in accordance with EN13313) or a specialist enterprise in compliance with environmental requirements with respect to reuse and disposal of fuels/oil and component parts.

Definition of Test Designations

M1 : Repeat tests must be carried out following any intervention in the refrigeration cycle due to required repair or service activities (replacement of components, elimination of leaks, replacement of filter-drier cartridges).

M2 : Repeat tests must be carried out prior to restarting a process cooler following a shutdown period of more than 2 years.

M3 : Following the initial startup of the process cooler at the end customer's site, repeat tests must be carried out whenever the unit is moved to a new location. Due to special transport safety measures, the relocation of the process cooler from the manufacturer's plant to the end customer does not - statistically - result in any increased failure rate and therefore *requires no repeat test* to be carried out.

M4 : The repeat test must be carried out every year.

¹⁾ Regular leak check acc. to Regulation (EC) No. 842/2006

The **visual inspection** comprises:

Checking the air filter mats of the condenser for cleanliness.

Checking the intactness of the joint sealing in the refrigeration cycle (pipe joints at compressor) (red seals).

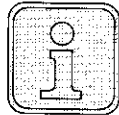
Visual inspection of the refrigeration circuit for oil leaks in the area of the compressor and condenser connecting lines (suction line, pressure line).

Inspection of the condenser heat exchanger surface and the refrigerant piping for corrosion damage.

Inspection of the mounting and attachment of all piping and components for security.

Visual leakage inspection of the water circuits under operating conditions.

Check that operating manual is available on site.



The repeat tests must be documented in the system logbook.

14. MALFUNCTIONS / TROUBLESHOOTING

The safety notices contained in Chapter 1 must be complied with !



Check that all shut-off valves are in the "OPEN" position !

The basis for troubleshooting are the circuit diagram, the flow diagram and the messages displayed on the control panel.

Fault Messages

The common fault alarm is transmitted to the TRUMPF machine via the interface.

Overview of fault messages:

- Motor failure, pump	Input	E1
- High pressure and fan bimetal contact fault	Input	E2
- Low pressure fault	Input	E3
- 'Filter contaminated' fault	Input	E4
- Fault in controller module		

UP or DOWN arrow is illuminated

- For differential setpoint control, setpoint limits are parameterised for switchover to fixed setpoint control.
- When these limit values are overshoot or undershot, the corresponding LED indicator will be illuminated.




Faults are indicated on the display as follows:






F1 - F8 and setpoint display are flashing alternately.

○ LED off

● LED on

Fault Display	Malfunction / Cause	Remedy
No display	No voltage present Main switch on TRUMPF machine not turned on	Turn main switch to position -1-
	24VDC control voltage not available Control voltage not activated on TRUMPF machine	Switch on control voltage on TRUMPF machine
	Control-circuit circuit breaker has tripped	Check control-circuit circuit breaker
 F1	Sensor 1 fault, controlled variable Sensor 1 break or short-circuit	Check sensor in water outlet of process cooler, replace if necessary
 F2	Sensor 2 fault, command variable Sensor 2 break or short-circuit	Check sensor in machine bed of TRUMPF machine, replace if necessary

Fault Display	Malfunction / Cause	Remedy
<p>F3</p> <p>○ ● ● ●</p> <p>E1 E2 E3 E4</p> 	<p>Bimetal contact has tripped (L 0/3)</p> <p>Motor protecting switch has tripped (L 0/6)</p> <p>Pump motor overloading due to mechanical sluggishness</p>	<p>Check pump, replace if necessary</p>
	<p>Float switch has tripped</p>	<p>Check float switch, replace if necessary</p>
	<p>Liquid loss in water circuit</p>	<p>Check water circuit for leaks, fill up tank completely with water</p>
	<p>Leak in pump, pump seal</p>	<p>Replace pump, replace seal</p>
	<p>Missing tank filler cap, water evaporation</p>	<p>Put tank filler cap in place</p> <p>Water shortage has the following effects: Shut-off of pump and cooling operation</p>
	<p>Acknowledge/reset fault with DOWN button</p>	
<p>F4</p> <p>● ○ ● ●</p> <p>E1 E2 E3 E4</p> 	<p>High-pressure fault</p> <p>High-pressure pressostat has tripped</p>	<p>A HP fault has the following effect: Cooling is shut off, pump continues to operate For proper heat dissipation, a sufficient number of air changes must be ensured at the installation site</p>
	<p>Cooling air temperature too high</p>	
	<p>Fan fails to rotate</p>	<p>Check fan for proper operation</p>
	<p>Condenser or filter element contaminated</p>	<p>Clean condenser with compressed air (do not damage fins) or replace filter element</p>
	<p>Water temperature too high</p>	<p>Drain water and replace with fresh water</p>
	<p>Load consumption too high</p>	<p>Reduce load consumption or switch off</p>
	<p>Panel assemblies not mounted to unit</p>	<p>Mount panel assemblies</p>
		<p>Cooling operation is restarted after the pressure has decreased and the RESET button on the pressostat has been pressed</p>
		<p>Acknowledge/reset fault with DOWN button</p>
	<p>Overheat protection (bimetal contact) of fan has tripped</p> <p>Motor overloading due to mechanical sluggishness</p>	<p>Check fan, replace if necessary</p> <p>Automatic restart after motor has cooled down</p>
<p>Acknowledge/reset fault with DOWN button</p>		
<p>F5</p> <p>● ● ○ ●</p> <p>E1 E2 E3 E4</p> 	<p>Low-pressure fault</p>	<p>A LP fault has the following effect: Cooling is shut off, pump continues to operate</p>
	<p>Refrigerant shortage due to leak in refrigeration circuit</p>	<p>The elimination of malfunctions in the refrigeration circuit may only be performed by qualified personnel!</p>
	<p>Refrigerant shortage</p>	
	<p>Defective expansion valve</p>	<p>Call customer service!</p>
	<p>Permanent formation of bubbles in sight glass</p>	<p>The fault message is reset automatically after the cause of the low-pressure fault has been eliminated. Compressor and fan are enabled after a delay of 180 sec.</p>
	<p>- Ambient temperature too low</p>	<p>Observe installation requirements</p>
	<p>- Water temperature too low</p>	<p>Increase water temperature</p>
<p>- Water volume insufficient</p>	<p>Observe installation requirements</p>	
<p>Filter contaminated</p>	<p>Clean filter, replace if necessary</p>	
<p>Shut-off valve closed</p>	<p>Check shut-off valve</p>	

Fault Display	Malfunction / Cause	Remedy
<p>F5A</p> <p>● ● ○ ● E1 E2 E3 E4</p> 	<p>Low-pressure fault (SHUT-OFF)</p> <p>Refrigerant shortage due to leak in refrigeration circuit</p> <p>Refrigerant shortage</p> <p>Defective expansion valve</p> <p>Permanent formation of bubbles in sight glass</p>	<p>Cooling operation is switched off, pump continues to operate</p> <p>The elimination of malfunctions in the refrigeration circuit may only be performed by qualified personnel!</p> <p>Call customer service!</p> <p>The fault message is reset automatically after the cause of the low-pressure fault has been eliminated. Compressor and fan are enabled after a delay of 180 sec.</p> <p>Acknowledge/reset fault with DOWN button</p>
<p>F6</p> <p>● ● ● ○ E1 E2 E3 E4</p> 	<p>Filter element or condenser contaminated</p>	<p>Fault F6 has the following effect: Pump and cooling operation continue to operate.</p> <p>Clean condenser with compressed air (do not damage fins) or replace filter element</p> <p>Caution: If the filter element is not cleaned/replaced, a high-pressure fault (F4) will occur. After the filter element has been cleaned/replaced, the fault will be reset automatically.</p>
<p>F7</p> 	<p>Temperature limit values exceeded Sensor F1 (water circuit)</p> <p>Water temperature too low</p> <p>Water temperature too high</p>	<p>Increase water temperature</p> <p>Allow water to cool or replace</p> <p>Fault (F7) is reset automatically after the malfunction has been eliminated</p>
<p>F8</p> 	<p>Temperature limit values exceeded Sensor F2 (machine bed)</p> <p>Temperature too low</p> <p>Temperature too high</p>	<p>Check machine bed (ambient temperature)</p> <p>Check machine bed (ambient temperature)</p>
<p>EP</p> 	<p>Eeprom error</p> <p>Parameters are permanently checked in the controller for consistency during operation.</p>	<p>Any error in this memory is indicated by a common fault alarm.</p> <p>Replace controller.</p>
<p>● ● ● ● E1 E2 E3 E4</p>		

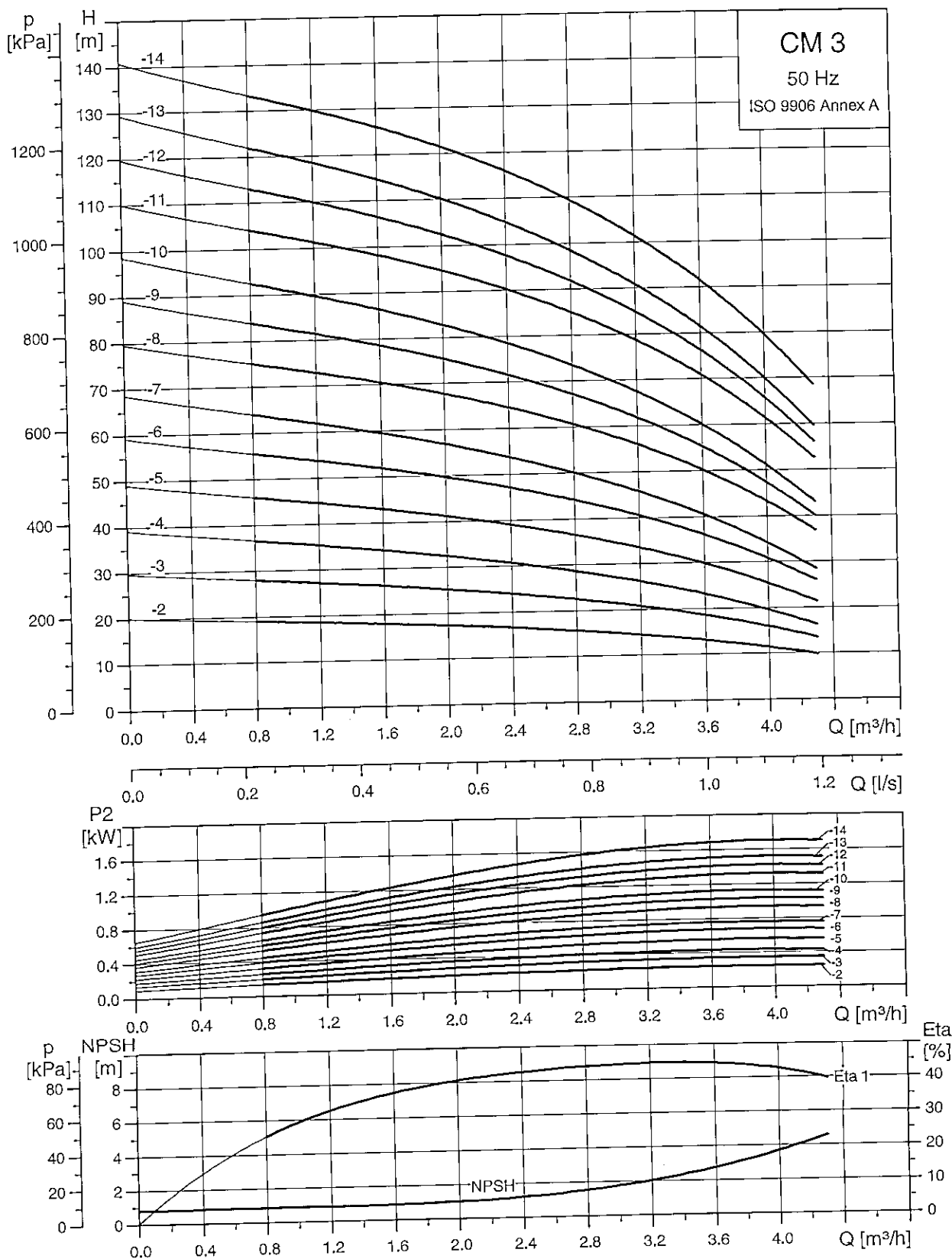
15.3 Spare Parts List

Hauptbauteile L 0/5 TR2 Kältemittelkreislauf		Components L 0/5 TR2 Refrigeration Circuit		
Pos.	Benennung	Designation	Riedel Artikel-Nr.	TRUMPF Material-Nr.
1	Verdichter	Compressor	451812.41.18	1674942
2	Verflüssiger	Condenser	451840.40.17	1742978
2a	Filtermatte EU2 - F100	Filter mat EU2 - F100	451842.40.03	1739742
3	Ventilator	Fan	451801.48.97	1740318
4	Expansionsventil	Expansion valve	451809.41.46	1674938
5	Verdampfer	Evaporator	451842.40.01	1739726
6	ND - Pressostat	Pressure pressostat LP side	451820.44.30	1674957
7	HD - Pressostat	Pressure pressostat HP side	451820.44.32	1674962
8	ND - Pressostat Lüfter	Pressure pressostat HP side	451820.44.31	1674983
10	Absperrventil	Shut-off valve	451840.40.39	1675724
11	Filtertrockner	Filter drier	451840.40.37	1674972
12	Schauglas	Sight glass	451842.40.04	1743709
16	Pressostat Filtermatte	Pressostat filter mat	451820.44.33	1744227

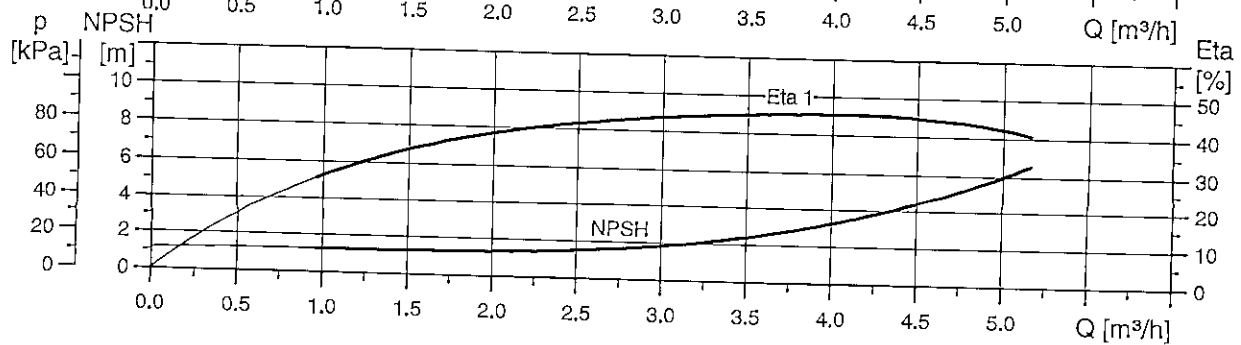
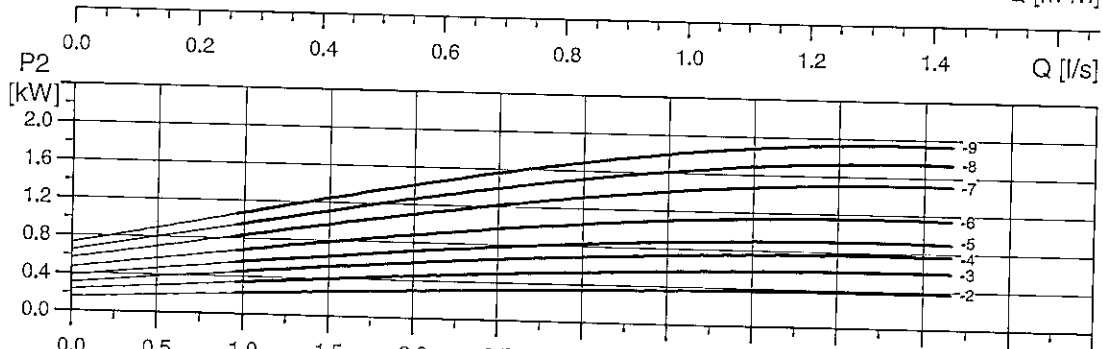
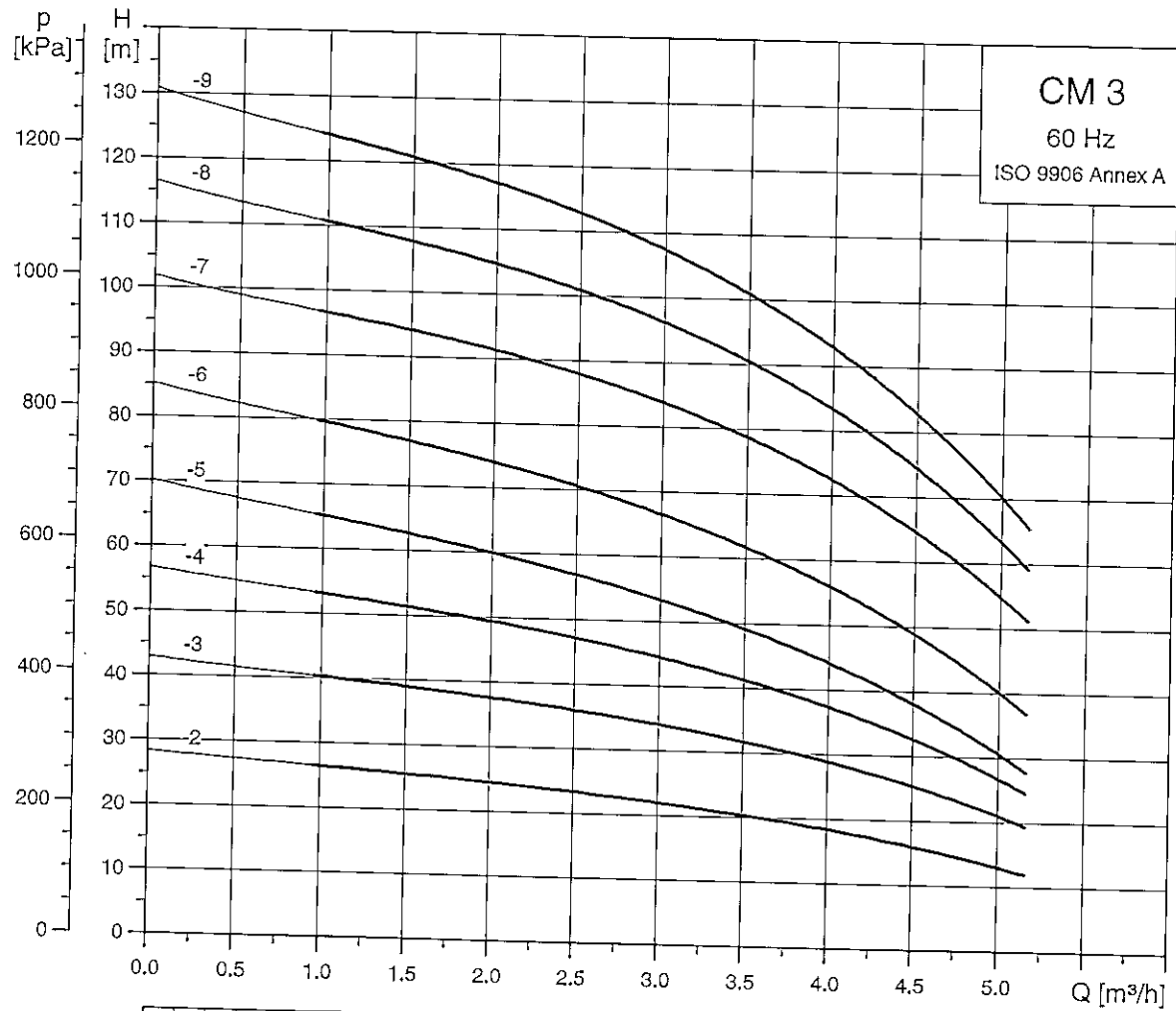
Hauptbauteile L 0/5 TR2 Wasserkreislauf		Components L 0/5 TR2 Water Circuit		
Pos.	Benennung	Designation	Riedel Artikel-Nr.	TRUMPF Material-Nr.
30	Pumpe	Pump	451820.43.50	1739729
35	Tank	Tank	451842.28.06	1739741
36	Schwimmerschalter	Float switch	451801.45.51	1235459
39	Temperaturfühler	Temperature sensor	451804.42.86	0147284
40	Einschraubfühler mit Stecker	Temperature sensor with plug	451809.44.25	1739728
52	Absperrhahn	Shut-off calve	451809.41.13	1674988

Hauptbauteile L 0/5 TR2 Elektrotechnik		Components L 0/5 TR2 Electrotechnical		
Pos.	Benennung	Designation	Riedel Artikel-Nr.	TRUMPF Material-Nr.
-1F1	Sicherungsautomat	Autom. circuit breaker	451804.50.08	1674969
-5K1	Schütz Pumpe	Contactora	451809.41.81	1675719
-5K2	Schütz Verdichter	Contactora	451809.41.80	1675750
-5K3	Schütz Lüfter	Contactora	451809.41.81	1675719
2Q1	Motorschutzschalter	Motor protecting switch	451809.43.60	1675718
-3N1	Steuer- und Regeleinheit	Control unit	451820.28.53	1675010
=M+6-X6.1	Harting Buchse	Harting connector	451801.49.89	
-3B1	Temperaturfühler	Temperature sensor	451804.42.86	0147284
=M+6-B5	Einschraubfühler mit Stecker	Temperature Sensor with plug	451809.44.25	siehe.Pos.

15.4 Pump Characteristics



TM04 3335 4308



15.5 Sample System Log

Device type: _____

Max. allowable working pressure: _____

Refrigerant: _____

Year of manufacture: _____

Refrigerant charge weight: _____

1 Details of all maintenance and repair activities

2 Whenever the system is charged the quantities and kind of (new, reused or recycled) refrigerant charge, and whenever the refrigerant is drained from the unit, the quantities of refrigerant that have been drained

3 In the event that an analysis of any reused refrigerant is available, the results thereof

4 The origin of any reused refrigerant

5 Any modification to and replacement of components of the process cooler

6 Results of all periodic routine tests

7 Extended periods of non-use

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PREKINSTANULI CIGARETTA

15.6 Sample Quick Reference Sheet

Please carefully complete this quick reference sheet, cut it out, cover it with protective film and affix it to the unit in an easily accessible place !

This short guide contains important information for use in cases of emergency and malfunctions !

EMERGENCY

The mains disconnect switch of the process cooler must be turned off in emergencies !

To be entered by the user:

FIRST AID

Responsible person: _____
 Plant management: _____
 Emergency doctor: _____
 Fire brigade: _____
 Police: _____

TECHNICAL DATA

see also nameplate

Device type: L 0/5 TR2
 Refrigerant: R 134a
 Refrigerant formula: $\text{CF}_3\text{CH}_2\text{F}$
 Refrigerant charge: 1.7 kg
 Max. allow. working pressure: 20.2 bar

Year of manufacture: _____
 Serial number: _____
 TRUMPF ordering no. _____
 Power requirements: _____ V / _____ Ph / _____ A
 Rated current: _____

**Manufacturer
 Customer Service**

Glen Dimplex Duetschland GmbH
 GB RIEDEL Kältetechnik
 Am Goldenen Feld 18
 95326 Kulmbach
 Germany
 Telephone: +49 (0) 9221 / 709 555
 Fax: +49 (0) 9221 / 709 549
 e-mail: info@riedel-cooling.com
<http://www.riedel-cooling.com>

ENGLISH

RIEDEL
PRECISION IS COOLING



Elektro-Dokumentation

electrical documentation · documentation électrique

Auftraggeber	: Trumpf
<small>customer · donneur d'ordres</small>	
Gerätetyp	: L0/5-TR2
<small>device type · type d'appareil</small>	
Projektnummer	: 2KT3050002_L05-TR2_Rev2
<small>project number · numéro de projet</small>	
Zeichnungsnummer	: 2KT3 050 002
<small>drawing number · numéro de dessin</small>	
Zng.Nr. Auftraggeber	:
<small>drawing num. customer · No dessin du client</small>	

RIEDEL®

PRECISION IN COOLING

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<http://www.riedel-cooling.com>

Erstellt mit ELCAD/AUCOPLAN (R) 7.4.0 SP4

Schutzvermerk nach DIN 34 / DIN ISO 16016 beachten!

Technische Änderungen vorbehalten!

Verteiler: 1, 2, 3, 7, 9

WPK 19/11	21.09.2011	GU	Datum	08.11.2012	TRUMPF	RIEDEL <small>PRECISION IN COOLING</small>	Deckblatt 1	451842.28.02
Rev1_9651	23.01.2011	GU	Bearbeiter	GU				
Rev2_9919	08.07.2012	GU	Geprüft					
R. Änderung	Datum	Name	Norm	Ursprung	Ersatz für	Ersatz durch	Deckblatt	

451842.62.01 2KT3050002_L05-TR2_Rev2 Blatt 1
2 Bl.

Technische Daten technical datas · données techniques

Nennspannung nom. voltage tension nominale	: 3/PE ~ 50Hz 400V ±10% 3/PE ~ 60Hz 460V ±10%
Max. Stromaufnahme max. current consumption consommation de courant max.	: 5,5A 6,1A
Max. Vorsicherung max. fusing protection préliminaire max.	: 16A SCCR = 5kA CLASS CC
Max. Leistungsaufnahme max. power consumption consommation de puissance max.	: 2,6kW 3,9kW
Scheinleistung apparent power Puissance apparente	: 3,8kVA 4,9kVA
Steuerspannung control voltage tension de commande	: DC 24V
Farbe colour couleur	: RDS250 20 20

Verdrahtungsfarben (DIN EN 60204-1) wiring colors · couleurs de câblage

Kurzzeichen nach DIN IEC 757
short marks according to DIN IEC 757 · symboles selon DIN IEC 757

Schwarz black noir	BK (RAL 9005)	: Hauptstromkreise AC und DC main circuits AC and DC circuits électriques principaux AC et DC
Hellblau light blue bleu clair	BU (RAL 5015)	: Neutralleiter neutral conductor conducteur neutre
Rot red rouge	RD (RAL 3000)	: Steuerstromkreise AC 230V control circuits AC 230V circuits électriques de commande AC 230V
Rot red rouge	RD (RAL 3000)	: Steuerstromkreise AC 12V/24V control circuits AC 12V/24V circuits électriques de commande AC 12V/24V
Dunkelblau dark blue bleu sombre	BU (RAL 5010)	: Steuerstromkreise DC 24V control circuits DC 24V circuits électriques de commande DC 24V
Orange / Gelb orange / yellow orange / jaune	OG (RAL 2003) YE (RAL 1021)	: Verriegelungsstromkreise, Fremdspannung interlock circuits, separate source voltage circuits électriques de verrouillage, tension étrangère (Gelb nur bei Anlagen nach UL/CSA) (yellow units for UL/CSA only) (jaune uniquement pour les installation selon UL/CSA)
Violett violet violet	VT (RAL 4005)	: Messleitungen measuring lines lignes de mesure
Grün-Gelb green-yellow vert-jaune	GNYE (RAL 6018-1021)	: Schutzleitersystem protective system système de conducteur de protection

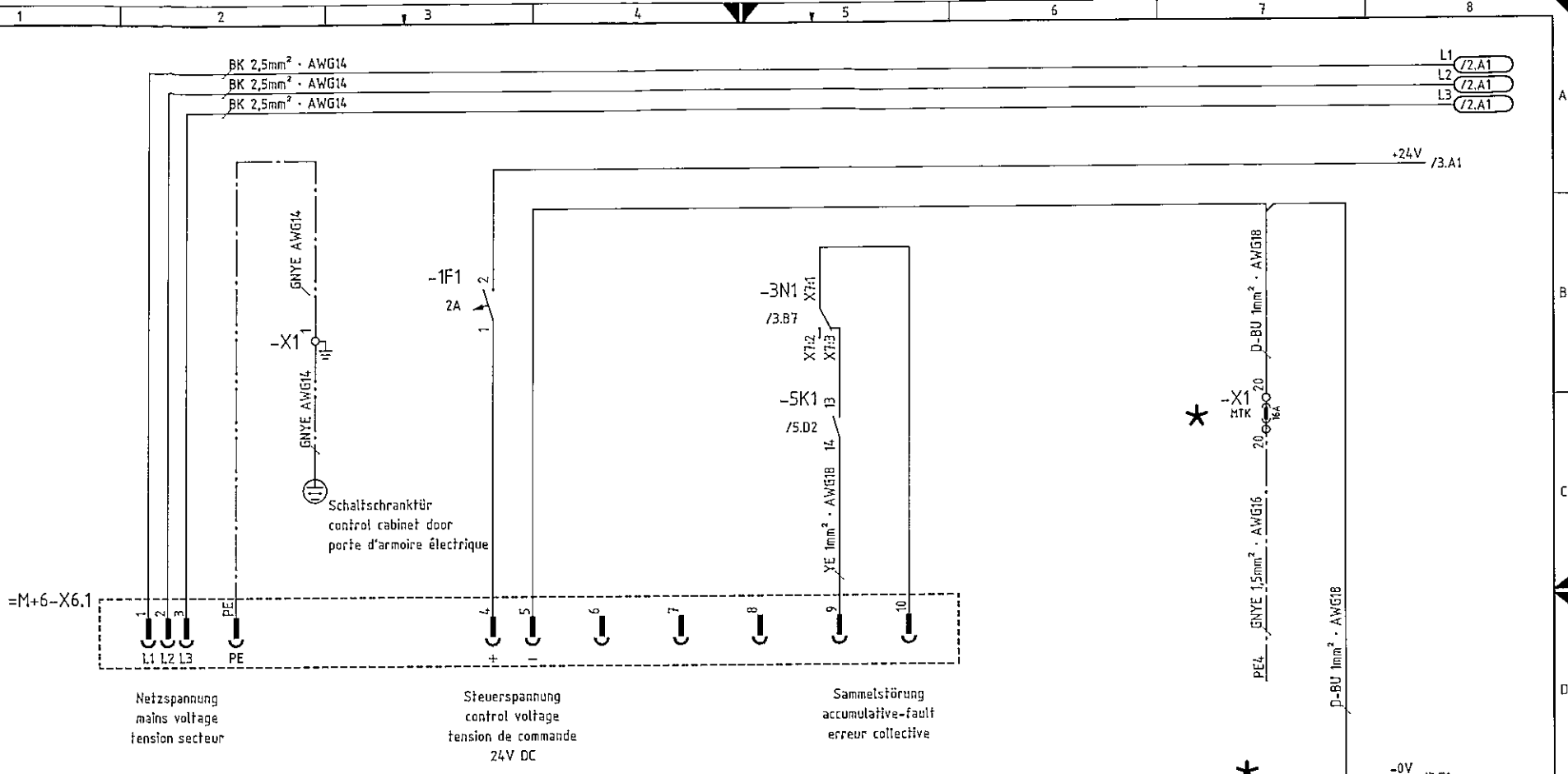
Datum		08.11.2012		TRUMPF		RIEDEL		Deckblatt		451842.62.01		2KT3050002_1.05-TR2_Rev2		Blatt 2	
Bearbeiter		GU				PRECISION IN COOLING		2						2 Bl.	
Geprüft								Technische Daten							
R. Änderung		Datum		Name		Norm		Ursprung		Ersatz für		Ersatz durch			

Technische Änderungen vorbehalten!

Schutzvermerk nach DIN 34 / DIN ISO 16016 beachten!

Erstellt mit: ELCAD/AUCOPLAN (RI) T4.0 SPL

Alle Leitungen ohne Querschnittsangaben sind 100SY-K-BU AWG18mm²



Nennspannung:	3/PE ~ 50Hz 400V ±10%
nom. voltage:	3/PE ~ 60Hz 460V ±10%
tension nominale:	
Max. Stromaufnahme:	5,5A · 6,1A
max. current consumption:	
consommation de courant max:	
Max. Leistungsaufnahme:	2,6kW · 3,9kW
max. power consumption:	
consommation de puissance max:	
Max. Vorsicherung:	16A
max. fusing:	
protection préliminaire max:	

ACHTUNG
 Bei Entfernen der Brücke muß eine Isolationsüberwachung eingebaut werden

Caution!
 When bridge is removed, an isolation supervision has to be installed

attention!
 au démontage du pont, il faut monter une surveillance de l'isolation

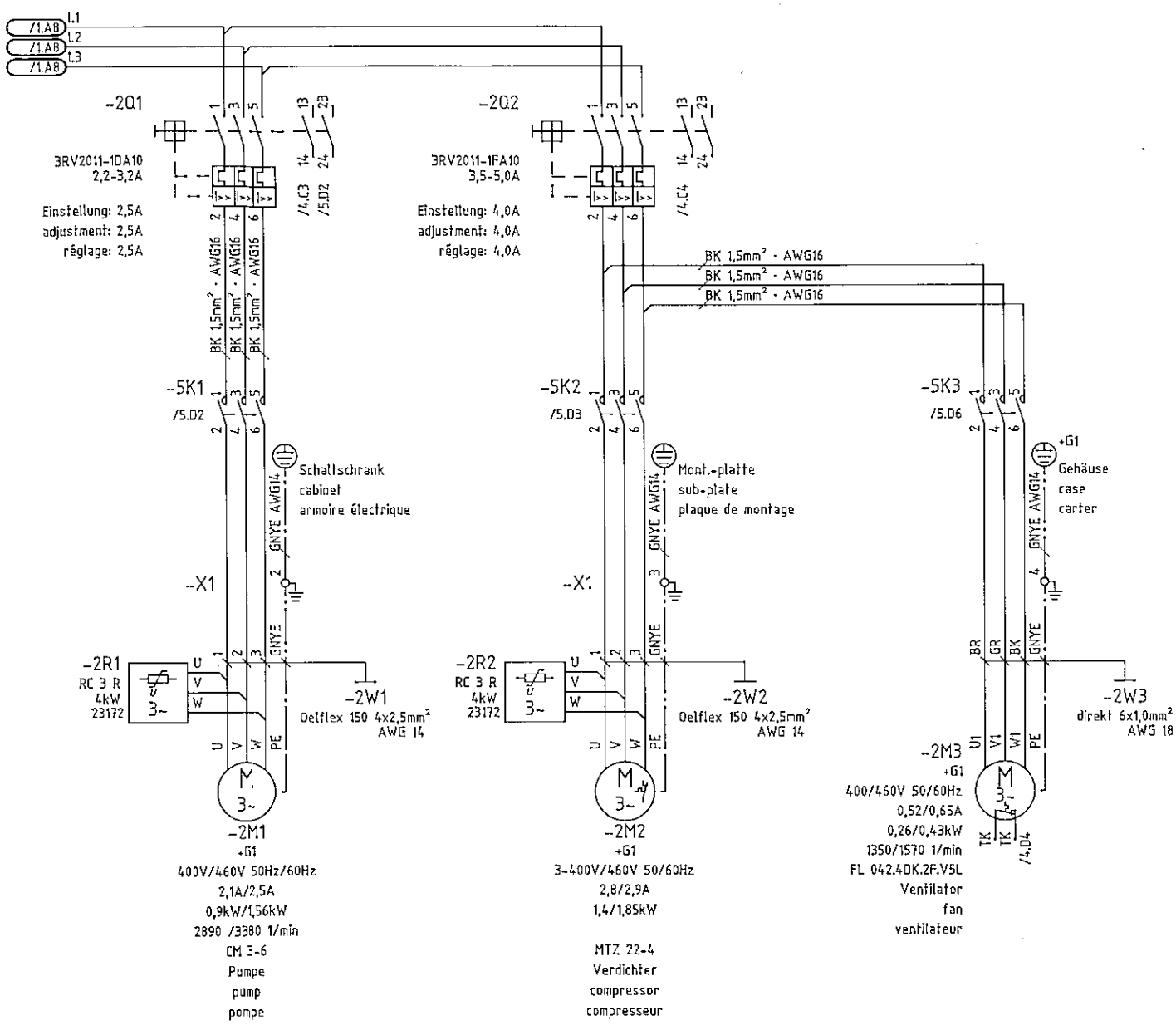
« Blattfolge » 2

Date: 08.11.2012		TRUMPF		Stromlaufplan 1		451842.62.01		2KT3050002_L05-TR2_Rev2		Blatt 1	
Bearbeiter: GU		[Logo]		Einspeisung, Geräteschnittstelle		51842.62.01		2KT3050002_L05-TR2_Rev2		5 Bl.	
Geprüft:		Ersatz für:		Ersatz durch:		451842.62.01		2KT3050002_L05-TR2_Rev2		5 Bl.	
Name Norm:		Ursprung:		Ersatz durch:		451842.62.01		2KT3050002_L05-TR2_Rev2		5 Bl.	

Technische Änderungen vorbehalten!

Schutzvermerk nach DIN 34 / DIN ISO 16016 beachten!

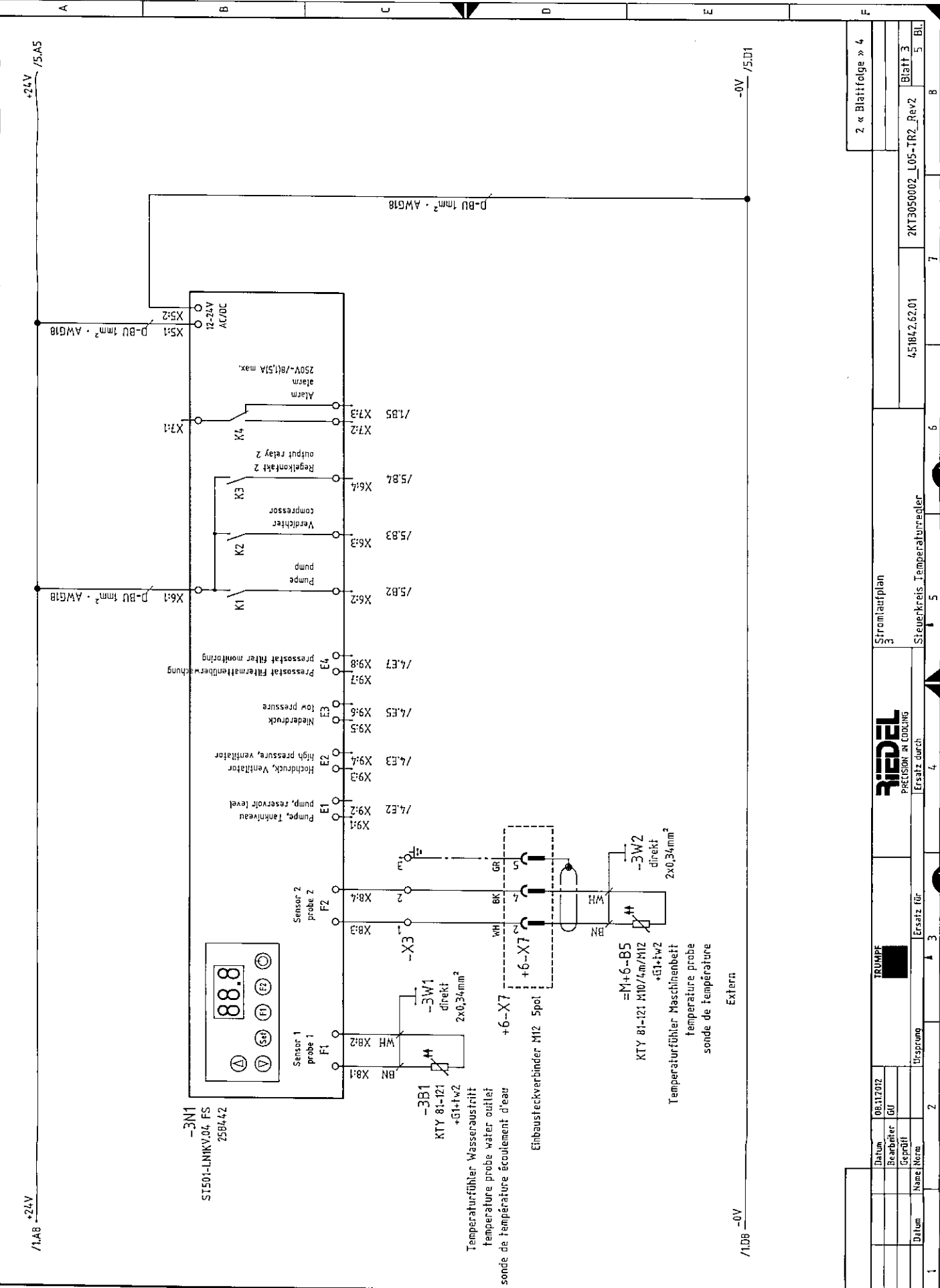
Erstellt mit ELCAD/AUCOPLAN (R) 74.0 SP4
Alle Leitungen ohne Querschnittsangaben sind H05V-K BU AWG16mm²



1 « Blattfolge » 3

Datum		08.11.2012		TRUMPF		RIEDEL		Stromlaufplan		451842.62.01		2KT3050002_L05-TR2_Rev2		Blatt 2	
Bearbeiter		GU				PRECISION IN COOLING		2						5 Bl.	
Geprüft				Ursprung		Ersatz für		Ersatz durch		Lastkreis Verdichter, Ventilatoren					

1	2	3	4	5	6	7	8
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2 « Blattfolge » 4	
Blatt 3	5 BL
2KT3050002_L05-TR2_Rev2	
45184.2.62.01	B

Stromlaufplan	
Ersatz durch	
Steuerkreis Temperaturreaktor	

TRUMPF	
Ersatz für	
URSPRUNG	

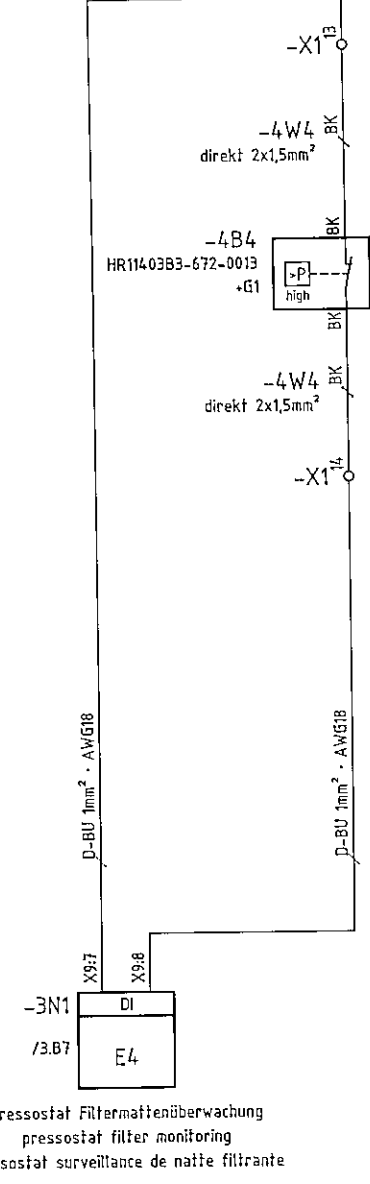
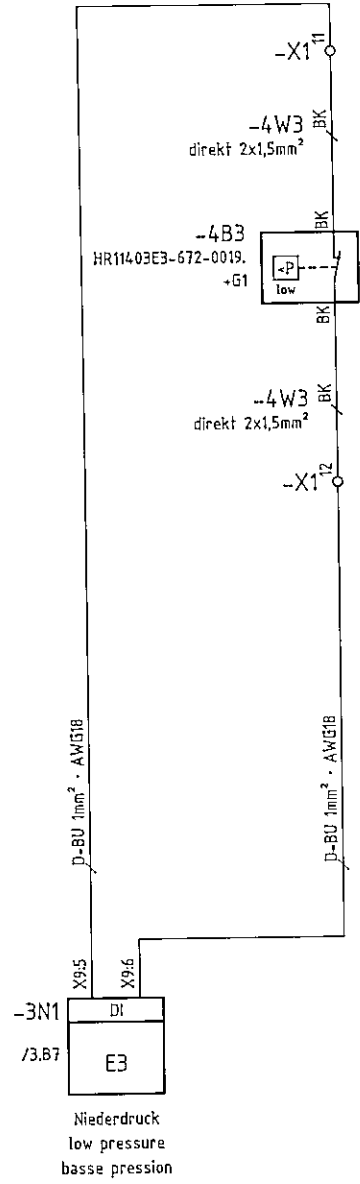
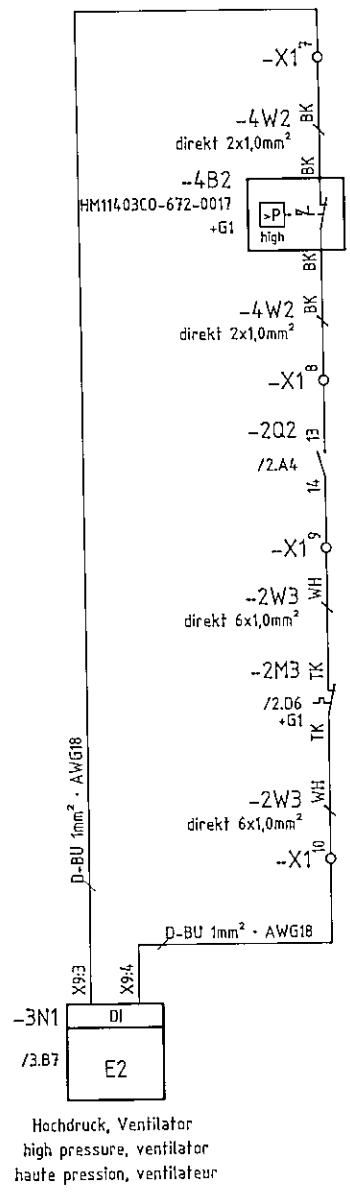
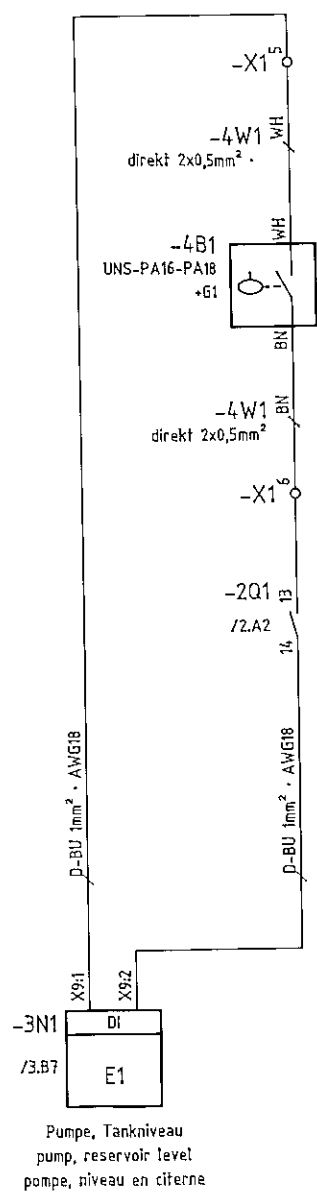
Datum	08.11.2012
Bearbeiter	GU
Geprüft	
Name	NORM
Datum	

Technische Änderungen vorbehalten!

Schutzvermerk nach DIN 34 / DIN ISO 16016 beachten!

Erstellt mit ELCAD/AUCOPLAN (R) 7.4.0 S/P4

Alle Leitungen ohne Querschnittsangabe sind H05V-K BU AWG18mm²

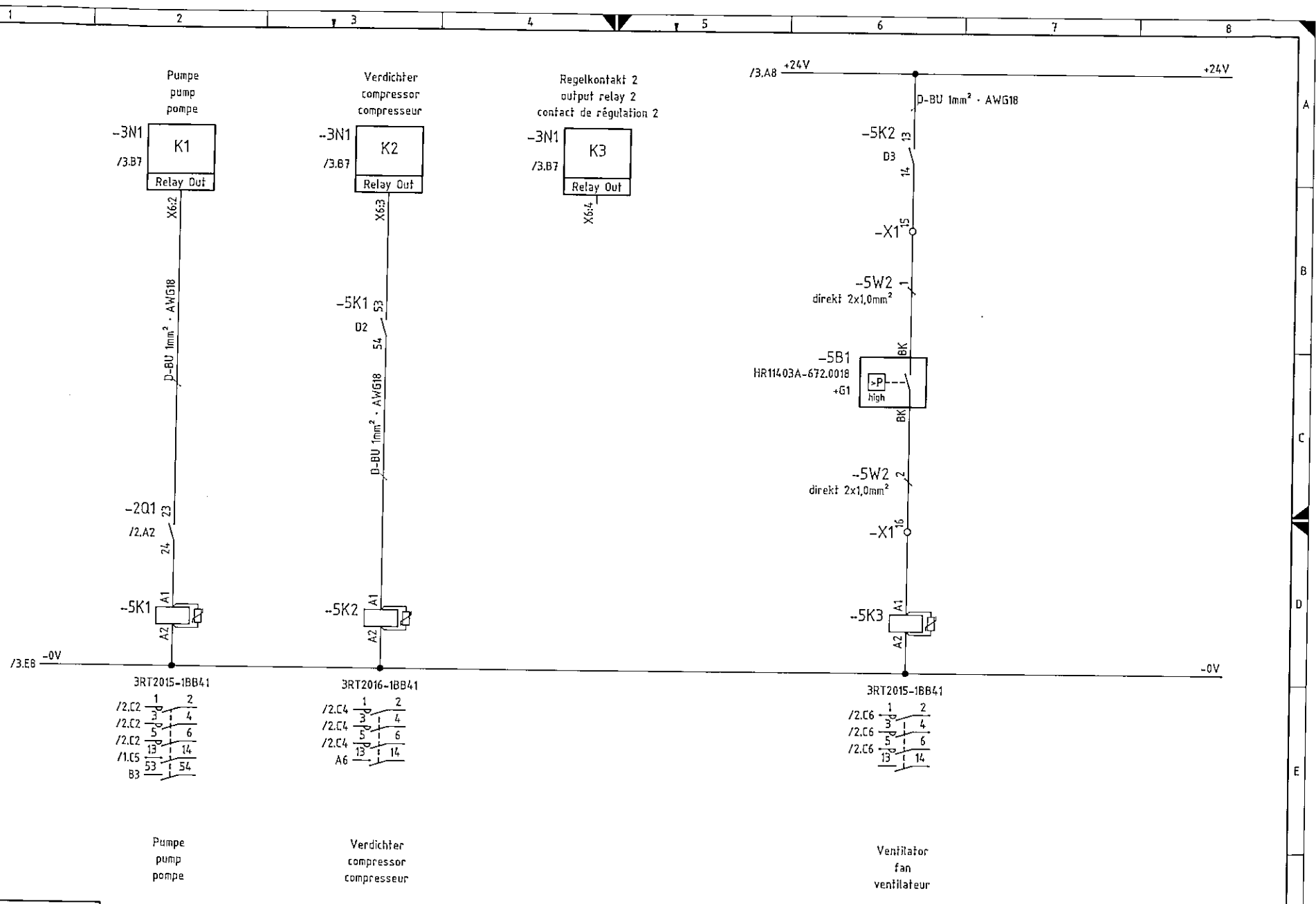


3 « Blattfolge » 5

R. Änderung		Datum	Name	Norm	Ursprung	Ersatz für	Ersatz durch	Stromlaufplan 4	Steuerkreis Digitaleingänge	451842,62.01	2KT3050002_L05-TR2_Rev2	Blatt 4 5 Bl.
1		08.11.2012	GU		TRUMPF							

Technische Änderungen vorbehalten!

Schutzvermerk nach DIN 34 / DIN ISO 16016 beachten!
 Erstellt mit ELCAD/AUCOPLAN (R) 14.0 SP4
 Alle Leitungen ohne Querschnittsangabe sind HO5V-K BU AWG18mm²



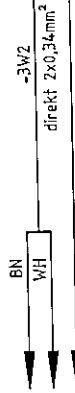
Datum		08.11.2012		TRUMPF		RIEDEL		Stromlaufplan		4 « Blattfolge »	
Bearbeiter		GU		[Logo]		PRECISION IN COOLING		Steuerkreis Relaisausgänge		Blatt 5	
Geprüft				Ersatz durch		Ersatz durch		451842.62.01		2KT3050002_L05-TR2_Rev2	
Änderung		Datum		Name		Norm		Ursprung		5 Bl.	
1		2		3		4		5		8	

Erstellt mit ELCAD/AUCOPLAN (RI 7.4.0 SPA)

Schutzvermerk nach DIN 34 / DIN ISO 16016 beachten!

Technische Änderungen vorbehalten!

+G1+1w2--M+6-BS:1
:2
-SH:



--6--X7	
Klemmen-Anzahl : 3	
2	-X3
4	-X3
5	-X3

R. Änderung	Datum	Name	Norm	Ursprung	Ersatz für	Ersatz durch	Anschlussplan 1	45184262.01	2KT3050002_L05-TR2_Rev2	Blatt 1 4 Bl.
							--6--X7			



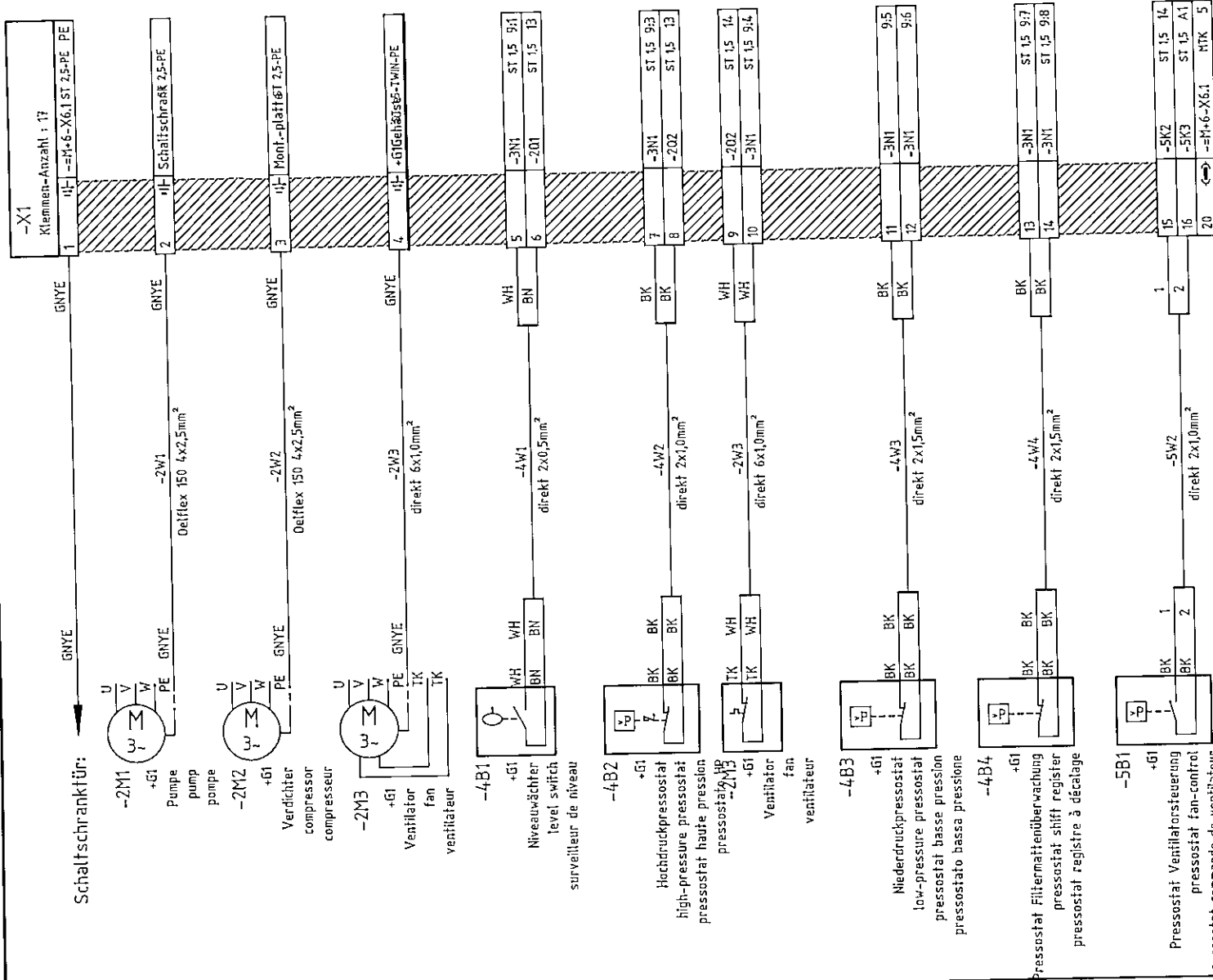
System mit ELCO/ADUPLAN (R) 71.0 SP4

Schutzvermerk nach DIN 34 / DIN ISO 16016 beachten!

Technische Änderungen vorbehalten!

==M+6-X6.1	
Klemmen-Anzahl : 11	
1	L1
2	L2
3	L3
4	-JET
5	-X1
6	
7	
8	
9	-5K1
10	-3M1
PE	-X1

				Anschlussplan 2		45184.2.62.01		2KT3050002_105-TR2_Rev2		Blatt 2 4. Bl.	
Datum: 08.11.2012		Bearbeiter: GU...		Ursprung: ...		Ersatz für: ==M+6-X6.1		45184.2.62.01		2KT3050002_105-TR2_Rev2	



R. Änderung	Datum	Name	Norm	Ursprung	Ersatz für	Ersatz durch

TRUMPF

RIEDEL
PRECISION IN COOLING

5	Anschlussplan
-X1	

45184.2.62.01	2KT3050002_L05-TR2_Rev2	Blatt 3 4 Bl.
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3 statt mit ECOGRADUOLPER RT 15,0 SP4

Schutzvermerk nach DIN 34 / DIN ISO 16016 beachten!

Technische Änderungen vorbehalten!

-X3	
Klemmen-Anzahl : 3	
1	-3NT ST 15X8,3
2	-3NT ST 15X8,4
3	--6-X7 ST 15 - 5

2
4

--6-X7

Datum: 06.11.2012		TRUMPF		Anschlussplan			
Bearbeiter: GU		RIEDEL		PRECISION IN COOLING			
Geprüft:		Ersatz für: -X3		45184.2.62.01		2KT3050002-1.05-TR2 Rev2	
Datum:		Ursprung:		Blatt 4		4 Bl.	

Geräte-Stückliste · devices-parts-list · liste des appareils

Technische Änderungen vorbehalten!

Schutzvermerk nach DIN 34 / DIN ISO 16016 beachten!

erstellt mit ECDRAWPLAN (R) 14.0 SP4

№	Betriebsmittel item moyens d'exploitation	Menge quantity quantité	Bezeichnung identifier désignation	Typ type type	Artikelnummer part number référence article	№	Betriebsmittel item moyens d'exploitation	Menge quantity quantité	Bezeichnung identifier désignation	Typ type type	Artikelnummer part number référence article
1	-1F1	1	Leitungsschutzschalter miniature circuit breaker disjoncteur-interrupteur de ligne	SSY4102-7	451804.50.08	20	--6-X7	1	Gegenmutter locknut Contre-écrou	RSKFM 16	451809.41.39
2	-2Q1	1	Leistungsschalter circuit breaker sectionneur de puissance	BRV2011-1DA10	451809.43.60	21	+G1+fw2--M+6-B5	1	Temperaturfühler	KTY 81-121 M10/4m/M12	451801.48.99.
3	-2Q1	1	Hilfsschalter auxiliary contact combinateur auxiliaire	BRV2901-1F	451809.43.92	22	--M+6-X6.1	1	Steckereinsatz male plug garniture de fiche	09 33 010 2616	
4	-2Q1	1	3-phasen Sammelschiene 3-phase bus-bar barre omnibus triphasée	BRV1915-1AB	451801.47.43	23	--M+6-X6.1	1	Anbaugehäuse mounting case boîtier rapporté	09 30 010 0301	451801.49.89
5	-2Q1	1	3-Phasen Einspeiseklemme 3-phases 3-phase line side terminal 3 phases borne d'alimentation	BRV1925-5EB		24	-Schaltschrank	1	Wandschaltschrank wall-mounted enclosure armoire électrique murale	AF-1853	
6	-2Q2	1	Leistungsschalter circuit breaker sectionneur de puissance	BRV2011-1FA10	451809.41.70						
7	-2Q2	1	Hilfsschalter auxiliary contact combinateur auxiliaire	BRV2901-1F	451809.43.92						
8	-2R1	1	Entstörmodul surge suppressor module d'antiparasitage	RC 3 R	451801.46.56						
9	-2R2	1	Entstörmodul surge suppressor module d'antiparasitage	RC 3 R	451801.46.56						
10	+G1+fw2-3B1	1	Temperaturfühler temperature probe sonde de température	KTY 81-121	451804.42.86						
11	-3N1	1	Thermostatregler thermostat régulateur à thermostat	ST501-LNIKV.04 FS	451820.28.53						
12	-5K1	1	Schütz contactor contacteur	3RT2015-1BB41	451809.41.81						
13	-5K1	1	Hilfsschalter auxiliary contact combinateur auxiliaire	BRH2911-1BA10	451809.42.07						
14	-5K1	1	Entstörmodul surge suppressor module d'antiparasitage	3RT2916-1BB00	451809.43.24						
15	-5K2	1	Schütz contactor contacteur	3RT2016-1BB41	451809.41.80						
16	-5K2	1	Entstörmodul surge suppressor module d'antiparasitage	3RT2916-1BB00	451809.43.24						
17	-5K3	1	Schütz contactor contacteur	3RT2015-1BB41	451809.41.81						
18	-5K3	1	Entstörmodul surge suppressor module d'antiparasitage	3RT2916-1BB00	451809.43.24						
19	--6-X7	1	Rundsteckverbinder circular plug-in connector connecteur circulaire	RKFM 5/0,5m	451809.41.38						

Bemerkungen :

		Datum	08.11.2012								
		Bearbeiter	GU								
		Geprüft									
Änderung	Datum	Name	Norm	Ursprung	Ersatz für	Ersatz durch					
									45184.2.62.01	2KT3050002_1.05-TR2_Rev2	Blatt 1 1 Bl.

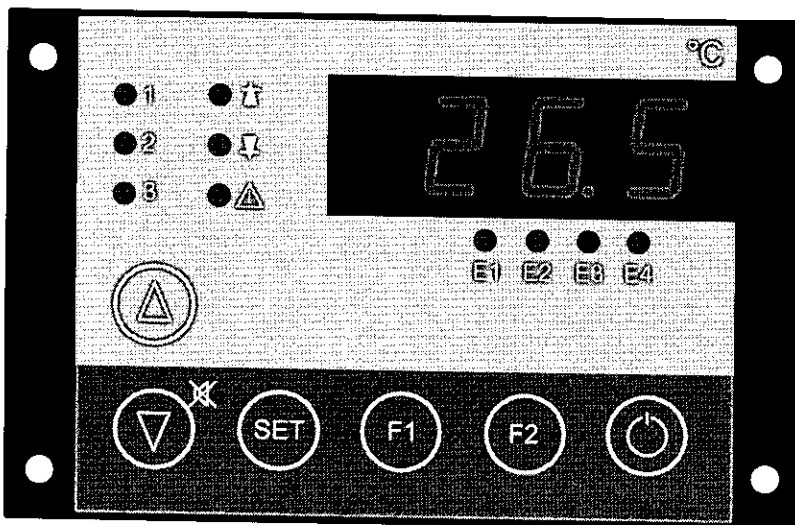


Geräte-Stückliste

RIEDEL Kältetechnik	
ST501-LN1KV.04 FS-KKW	258442/ 900219.020
GDD Lg.- Nr. 451820.28.53	2KT3050002
Trumpf L05-TR2	Stand: 30.09.11
WPK 19/11	451842.60.18

Temperature Controller

Parameterliste / List of parameter



Erste Bedienungsebene (Sollwerteneinstellung)

Die Digitalanzeige zeigt den aktuellen Istwert an. Der Sollwert ist im Werk eingestellt und ist mit der SET-Taste abrufbar. Aus Sicherheitsgründen darf dieser Wert nur von autorisierten Personen verändert werden.

First Display Level (Setpoint Setting)

The digital display indicates the actual value. The main setpoint is adjusted in the work and is callable with the SET key. For safety reasons this value may be changed only by authorized persons.

Zweite Bedienungsebene (P- Parameter)

Diese Parameterebene wurde im Werk eingestellt. Aus Sicherheitsgründen soll sie nur an autorisierte Personen mitgeteilt werden.

Second Display Level (P-Parameters)

This parameter level was preset at the factory. Only authorised persons should be able to access these parameters for safety reasons.

Dritte Bedienebene (A - Parameter)

Diese Parameterebene wurde im Werk eingestellt. Aus Sicherheitsgründen soll sie nur an autorisierte Personen mitgeteilt werden

Third Display Level (A-Parameters)

This parameter level was preset at the factory. Only authorised persons should be able to access these parameters for safety reasons

Par	Funktionsbeschreibung <i>Function</i>	Einstellbereich <i>Adjustable range</i>	Kundenwert <i>Customer setting</i>
S1	Sollwert Regelkontakt 1 (Regelsollwert oder Differenztemperatur) <i>Setpoint control output 1 (adjustment setpoint or difference temperature)</i>	P4...P5	0K

Par	Funktionsbeschreibung <i>function</i>	Einstellbereich <i>Adjustable range</i>	Kundenwert <i>Customer setting</i>
			.
P1	Sollwert / Delta W Regelkontakt 2 <i>Setpoint / Delta W control output 2</i>	P4...P5, falls A5=0 -99...99,9 K, falls A5=1 <i>P4...P5, if A5=0</i> -99...99,9 K, if A5=1	0,6K
P2	Hysterese Regelkontakt 1 <i>Hysteresis control output 1</i>	0,1...99,9 K	3,4K
P3	Hysterese Regelkontakt 2 <i>Hysteresis control output 1</i>	0,1...99,9 K	0,6K
P4	Sollwertgrenze oder Differenzwertgrenze unten <i>Lower setpoint limit or difference boundary</i>	-99 °C...P5	-5,0K
P5	Sollwertgrenze oder Differenzwertgrenze oben <i>Upper setpoint limit or difference boundary</i>	P4...999 °C	5,0K
P19	Tastenverriegelung (Sollwertverstellung gesperrt) <i>Interlock button (setpoint adjustment disabled)</i>	0: Nicht verriegelt 1: Verriegelt <i>0: not locked</i> <i>1: locked</i>	1
P20	Anzeige Istwert Fühler F1 <i>Display of actual value sensor F1</i>	-----	-----
P21	Istwertkorrektur Fühler F1 <i>Actual value correction sensor F1</i>	-20...20,0 K	0,0 K
P22	Anzeige Istwert Fühler F2 <i>Display of actual value sensor F2</i>	-----	-----
P23	Istwertkorrektur Fühler F2 <i>Actual value correction sensor F2</i>	-20...20,0 K	0,0 K
P30	Grenzwert unten für Alarm, Fühler F1 <i>Lower limit for alarm, sensor F1</i>	-99...999 °C/K	10°C
P31	Grenzwert oben für Alarm, Fühler F1 <i>Upper limit for alarm, sensor F1</i>	-99...999 °C/K	40°C
P32	Grenzwert unten für Alarm, Fühler F2 <i>Lower limit for alarm, sensor F2</i>	-99...999 °C/K	-10,0 °C
P33	Grenzwert oben für Alarm, Fühler F2 <i>Upper limit for alarm, sensor F2</i>	-99...999 °C/K	99,9°C
P34	Hysterese Alarmkontakt <i>Hysteresis alarm contact</i>	0,1...99,9 K	1,0 K
P35	Sollwertgrenze unten für Festwertregelung <i>Lower setpoint limit for fixed setpoint control</i>	-99...999 °C	15,0 °C
P36	Sollwertgrenze oben für Festwertregelung <i>Upper setpoint limit for fixed setpoint control</i>	-99...999 °C	35,0°C

Par	Funktionsbeschreibung Function	Einstellbereich Adjustable range	Kundenwert Customer setting
A1	Schaltsinn Regelkontakt 1 (nicht wirksam wenn A98 = 1) Switch mode control output1 (not active when A98 = 1)	0: Heizkontakt 0: Heating contact 1: Kühlkontakt 1: Cooling contact	1
A2	Schaltsinn Regelkontakt 2 (nicht wirksam wenn A98 = 1) Switch mode control output2 (not active when A98 = 1)	0: Heizkontakt 0: Heating contact 1: Kühlkontakt 1: Cooling contact	1
A3	Funktion von Regelkontakt 1 bei Fühlerfehler Function of control output1 in case sensor error	0: Bei Fehler ab 0: By failure release 1: Bei Fehler an 1: By failure step up	0
A4	Funktion von Regelkontakt 2 bei Fühlerfehler Function of control output2 in case sensor error	0: Bei Fehler ab 0: By failure release 1: Bei Fehler an 1: By failure step up	0
A5	Auswahl Sollwert / DeltaW Regelkontakt 2 Selection setpoint / DeltaW control output 2	0: Betrieb mit Sollwert 0: Setpoint 1: Betrieb mit Delta W 1: Delta W	1
A8	Anzeigemodus Istwertanzeige (nicht für die Parameterebene wirksam) Display mode actual value display (not active for parameter level)	0: Ganzzahlig 0: Integer 1: Auflösung 0,5 K 1: Resolution 0,5 K 2: Auflösung 0,1 K 2: Resolution 0,1 K	2
A19	Parameterverriegelung Parameter locking	0: Keine Verriegelung 1: A-Parameter verriegelt 2: A- und P-Parameter verriegelt 0: No lock 1: A-parameter locked 2: A- and P-parameter locked	1
A20	Reset Störung E1 ("F3", Pumpe oder Wasserniveau) Reset fault E1 („F3“, pump or water level)	0: Manueller Reset 0: Manual reset 1: Selbsttätiger Reset 1: Automatic reset	0
A21	Reset Störung E2 ("F4", Hochdruck od Thermokontakt Lüfter) Reset fault E2 („F4, high pressure or TK fan)	0: Manueller Reset 0: Manual reset 1: Selbsttätiger Reset 1: Automatic reset	0
A22	Reset Störung E4 ("F6", Filter verschmutzt) Reset fault E4 („F6, filter mat dirty)	0: Manueller Reset 0: Manual reset 1: Selbsttätiger Reset 1: Automatic reset	1
A23	Reset Grenzwertalarm Fühler F1 ("F7", Über- oder Untertemperatur) Reset limit value sensor F1 („F7“, excess- or insufficient temperature)	0: Manueller Reset 0: Manual reset 1: Selbsttätiger Reset 1: Automatic reset	1
A24	Reset Grenzwertalarm Fühler F2 ("F8", Über- oder Untertemperatur) Reset limit value sensor F2 („F8“, excess- or insufficient temperature)	0: Manueller Reset 0: Manual reset 1: Selbsttätiger Reset 1: Automatic reset	1
A30	Funktion Ausgang Alarm Function output alarm	0: Grenzwertalarm, relativ 1: Grenzwertalarm, absolut 0: Boundary value, relative 1: Boundary value, absolute	1
A31	Sonderfunktion bei Alarm Special function by alarm	0: Nicht aktiv 0: Not active 1: Anzeige blinkt 1: Display flashing	1
A32	Art der Anzeige Setpoint display	0: Istwertanzeige 1: Soll- bzw. Differenzwertanzeige 0: Actual value display 1: Setpoint-display only	0
A40	Hystereseemodus Regelkontakt 1 Hysteresis control contact 1	0: Symmetrisch 0: Symmetric 1: Einseitig 1: One-sided	0
A41	Hystereseemodus Regelkontakt 2 Hysteresis control contact 2	0: Symmetrisch 0: Symmetric 1: Einseitig 1: One-sided	0
A50	Mindestaktionszeit Regelkontakt 1 "Ein" Minimum ON Time control output 1	0...600 Sec.	0 Sec
A51	Mindestaktionszeit Regelkontakt 1 "Aus" Minimum OFF Time control output 1	0...600 Sec.	120 Sec.
A52	Mindestaktionszeit Regelkontakt 2 "Ein" Minimum ON Time control output 2	0...600 Sec.	0 Sec

Par	Funktionsbeschreibung <i>Function</i>	Einstellbereich <i>Adjustable range</i>	Kundenwert <i>Customer setting</i>
A53	Mindestaktionszeit Regelkontakt 2 "Aus" <i>Minimum OFF Time control output 2</i>	0...600 Sec.	0 Sec.
A54	Regelverzögerung nach "Netz-Ein" auch bei Steuerschalter ein <i>Time Delay for control after Mains ON</i>	0...600 Sec.	10 Sec.
A56	Unterdrückung Grenzwertalarm nach "Netz-Ein" <i>Alarm Signal Delay after Mains ON</i>	0...60 Min.	10 Min.
A57	Unterdrückung Niederdruckalarm nach "Erster Verdichterstart" <i>Low pressure alarm Delay after "first compressor start"</i>	0...600 Sec.	60 Sec.
A58	Unterdrückung Niederdruckalarm nach "Eintritt der Störmeldung" <i>Low pressure alarm Delay after "low pressure alarm"</i>	0...120 Sec.	8 Sec.
A59	Überwachungsphase für ND-Störungen <i>Time for number of low pressure alarms defined in parameter A60</i>	0...60 Min.	30 Min.
A60	Anzahl der ND-Störungen vor Verdichtersperrung <i>Number of low pressure alarms before compressor stop</i>	0...100	8
A61	Unterdrückungsmodus für die ND-Störung (Zeitspanne A57) <i>LP-override (first compressor start)</i>	0: Unterdrückung einmalig nach dem ersten Verdichterstart 1: Unterdrückung stets nach jedem Verdichterstart <i>0: LP-override only once after first compressor start</i> <i>1: LP-override at every compressor after 0% output</i>	0
A62	Verdichterauszeit nach "Eintritt von HD- oder ND-Störung" <i>Minimum action time cooling1 K2 Off Compressor time out after LP- or HP alarm</i>	0...600 Sek.	180 Sek.
A63	Alarmmodus bei Verdichter od. Lüfterstörung Eingang E4 <i>Alarm mode with compressor or fan alarm entrance E4</i>	0: mit Abschaltung der Regelkontakte (K2,K3) 1: keine Abschaltung der Regelkontakte (K2,K3) <i>0: with disconnection of the control contacts (K2, K3)</i> <i>1: without disconnection of the control contacts (K2, K3)</i>	1
A65	Fühlerauswahl <i>Sensor selection</i>	11: Pt100 Zweileiteranschluss 21: PTC 22: PT1000 Zweileiteranschluss <i>11 PT100 two conductor connection</i> <i>21: PTC</i> <i>22: PT1000 two conductor connection</i>	21
A70	Softwarefilter <i>Software filter</i>	1: Nicht aktiv 2...32: Mittelwert über 2...32 Messwerte <i>1: Not active</i> <i>2...32: Average value about 2...32 measured data</i>	2
A80	Temperaturskala und Anzeige im Standby-Mode <i>Display at Standby-mode</i>	0: Fahrenheit (AUS) 1: Celsius (AUS) 2: Fahrenheit (OFF) 3: Celsius (OFF) <i>0: Fahrenheit (AUS)</i> <i>1: Celsius (AUS)</i> <i>2: Fahrenheit (OFF)</i> <i>3: Celsius (OFF)</i>	3

Par	Funktionsbeschreibung <i>Function</i>	Einstellbereich <i>Adjustable range</i>	Kundenwert <i>Customer setting</i>
A85	Funktion Abruftaste 1 <i>Function key 1</i>	0: Keine Funktion 1: Istwert F2 bzw. Führungsgröße 2: Abruf des Regelsollwerts 3: Abruf der Regeldifferenz <i>0: No function 1: Actual value of sensor F2(leading value) 2: Display of control setpoint 3: Display of actual differential value</i>	0
A86	Funktion Abruftaste 2 <i>Function key 2</i>	0: Keine Funktion 1: Istwert F2 bzw. Führungsgröße 2: Abruf des Regelsollwerts 3: Abruf der Regeldifferenz <i>0: No function 1: Actual value of sensor F2(leading value) 2: Display of control setpoint 3: Display of actual differential value</i>	1
A87	Funktion Standby-Taste <i>Function standby-taste</i>	0: Keine Funktion 1: Standby-Funktion <i>0: Not activated 1: Controller ON/OFF (Stand-By)</i>	0
A90	Ausgangsverbindung K1 <i>Output connection K1</i>	1: Verbindung zum Pumpenkontakt <i>1: Connection pump contact</i>	1
A91	Ausgangsverbindung K2 <i>Output connection K2</i>	2: Verbindung zu Regelkontakt 1 <i>2: Connection adjustment contact 1</i>	2
A92	Ausgangsverbindung K3 <i>Output connection K3</i>	3: Verbindung zu Regelkontakt 2 <i>3: Connection adjustment contact 2</i>	3
A93	Ausgangsverbindung K4 <i>Output connection K4</i>	4: Verbindung zum Alarmkontakt <i>4: Connection alarm contact</i>	4
A94	Schaltsinn E1 MS- Pumpe und Niveaufwächter <i>Switch mode E1 Motor protection pump and float switch</i>	0: Offen aktiv 1: Geschlossen aktiv <i>0: Open active 1: Closed active</i>	0
A95	Schaltsinn E2 HD- Pressostat <i>Switch mode E2 High pressure switch</i>	0: Offen aktiv 1: Geschlossen aktiv <i>0: Open active 1: Closed active</i>	0
A96	Schaltsinn E3 ND- Pressostat <i>Switch mode E3 Low pressure switch</i>	0: Offen aktiv 1: Geschlossen aktiv <i>0: Open active 1: Closed active</i>	0
A97	Schaltsinn E4 Filter verschmutzt <i>Switch mode E4 Filter dirty</i>	0: Offen aktiv 1: Geschlossen aktiv <i>0: Open active 1: Closed active</i>	0
A98	Bypassaktivierung <i>Bypass activation</i>	0: Keine Bypassregelung 1: Regelmodus mit Bypass aktiv <i>0: No bypass control 1: Control mode with active bypass</i>	0
A99	Betriebsmodus <i>Operational mode</i>	0: Normaler Temperaturregler, Fühler 2 nicht aktiv 1: Differenztemperaturregler 2: Normaler Temperaturregler, Fühler 2 für Grenzwertalarm aktiv <i>0: Normal thermostat, sensor 2 not active 1: Difference thermostat, 2: Normal thermostat, sensor 2 active for limit value alarm</i>	1
Pro Per	Anzeige Programmversion <i>Program version</i>	-----	-----

Meldungen der Störüberwachung:
 Message of the fault control

Meldung Message	Ursache Account	Rücksetzen am Regler Backspace at controller	Maßnahme / Ursache Action / account
F1	Fühlerfehler Fühler 1 (Bruch oder Kurzschluß am Fühler F1) Sensor fault sensor 1 (break or short circuit sensor F1)	von selbst Self locking	Kontrolle des Fühlers Check sensor
F2	Fühlerfehler Fühler 2 (Bruch oder Kurzschluß am Fühler F2, falls Betriebsart Differenzregelung) Sensor fault sensor 2 (break or short circuit sensor F2, if control mode difference adjustment)	von selbst Self locking	Kontrolle des Fühlers Check sensor
F3	Pumpenstörung oder Wassermangel (ausgelöst durch Digitaleingang E1) Pump fault or water shortage (triggered at digital input E1)	Quittieren mit AB- Taste Quit with DOWN- taste	Motor Pumpe überprüfen, Motorschutzschalter in Stellung 1 Wasser nachfüllen, Check pump, move motor protection switch to 1 Refill water,
F4	Hochdruckalarm (ausgelöst durch Digitaleingang E2) High pressure alarm (triggered at digital input E2) Thermokontaktstörung Lüfter hat ausgelöst (ausgelöst durch Digitaleingang E4) thermocontact fan fault (triggered at digital input E4)	Quittieren mit AB- Taste Quit with DOWN- taste	Umgebungstemp. zu hoch, Wassertemperatur zu hoch, Verflüssiger verschmutzt, Quittieren am HD-Pressostat (Sperrzeit 180 Sek.) Ambient temperature to high, Water temperature to high, Condenser dirty, Reset at the HP Pressostat (OFF Time 180 sec.) Motor Lüfter überprüfen, Check motor fan
F5	Niederdruckalarm (ausgelöst durch Digitaleingang E3) Low pressure alarm (triggered at digital input E3)	von selbst Self locking	Wasserdurchfluss zu gering, (Sperrzeit 180 s) Kältemittelverlust Umgebungstemp. zu niedrig Wassertemperatur zu niedrig Water flow to small (blocking time 180 sec.) Refrigerant shortage Ambient temperature to low Water temperature to low,
F5A	Niederdruckabschaltung (ausgelöst durch häufigen Niederdruckalarm) Low pressure deactivation (triggered at frequency low pressure alarm)	Quittieren mit AB- Taste Quit with DOWN- taste	Kältemittelverlust Refrigerant fault
F6	Filter verschmutzt (ausgelöst durch Digitaleingang E4) Motor fault compressor or thermocontact fan fault (triggered at digital input E4)	von selbst Self locking	Filtermatte reinigen, Verflüssiger reinigen Check motor compressor or fan Move motor protection switch to 1
F7	Grenzwertalarm Fühler F1 (falls Grenzwertalarm und Sonderfunktion aktiviert) Limit value alarm sensor F1 (if limit value alarm and special function is active)	von selbst Self locking	Kühlleistung prüfen Check refrigerating capacity
F8	Grenzwertalarm Fühler F2 (falls Grenzwertalarm und Sonderfunktion aktiviert) Limit value alarm sensor F2 (if limit value alarm and special function is active)	von selbst Self locking	Kühlleistung prüfen Check refrigerating capacity
EP	Datenverlust im Parameterspeicher Data loss parameter storage		Reparatur des Reglers Controller repair

