

OPERATING INSTRUCTION

INDUSTRIAL COOLERS RANGE OPTI

Type	:	OLB 10 T	
Supplier	:	KKT KRAUS Industriekühlung GmbH Mühlach 13 a D-90552 Röthenbach Tel. 0049 (0)911 - 95333 - 0 Fax. 0049 (0)911 - 95333 - 33	
Serial No.	:	IK 5486 / 01 / 06	
Year of man.	:	2006	
Refrigerant	:	R 134 A	
Net cooling capacity	:	8	kW
Liquid	:	Drinking-water	
Cold medium outlet temp. nominal / min / max	:	20 / 8 / 35	°C
Hysteresis	:	+ 2	K
Tank	:	100	l
Ambient temperature nominal / min / max	:	50 / 10 / 50	°C
Air flow	:	5500	m ³ /h
Sound pressure level	:	69	dB(A) in 5 m
Weight empty / when operating	:	225 / 325	kg
Primary pump(s) (evaporator)	:	MHI 205	
Secondary pump(s)	:		
Condenser pump(s)	:		

Attention! Working at the industrial cooler is only allowed for skilled and trained persons. Refrigerant is pressurised. Do not loosen components of the system. Danger of injury! Refrigerant pipelines can be very hot or cold. Danger when touching! Before working disconnect the mains cable.

Attention! Use only the above stated medium! Other liquids only after written release!

Attention! Do not switch off and on the main switch repeatedly! **Danger of freezing!**

User's notes

Inventory No. : _____

Registration No. : _____

Place of installation : _____

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1. Transport

After delivery check the cooler. Any damages have to be clarified immediately to the transport manager as to the insurance company. The internal transport could be handled with a fork lift. In any case the unit has to be in an upright position. **Caution! Do not dump!**

2. Installation

The installation should be horizontal on a qualified basement. (weights including tank-filling see tech. data)
All sides of the industrial cooler should be free for maintenance of about 1 m. as well as for the free air inlet. Make sure that there is no air short-circuit and no warm air is taken in from other systems. Ensure sufficient air exchange when erecting the unit in an enclosed room.
Cooler with external tank should not be placed higher than the tank. The place of the consumer is allowed to be max. 8 m higher than the cooler.

3. Air side (not relevant for water-cooled condenser units)

The fans suck the fresh air through the condenser. There the air is heated up and blown out at the top or at the side. It is possible to install a short air channel at the outlet up to a length of 4m with an elbow of 90°. The max. allowed air speed in the channel is up to 3m/s. (air flow rate see techn. data.)

4. Liquid side

Medium pipes between the cooler and the external components could be in steel, copper or plastic. The nominal diameter should be equivalent to the connections at the cooler up to a distance of abt. 5 m. (see flow chart). Any necessary reductions should be added only at the consumer side! For longer distances check the pressure head of the pump and use if necessary a larger pipe-diameter.

5. Filling the system

Attention!

Use only media according to the specification at the cover sheet!

- system with internal tank: open the front cover panel, remove the tank cover or, if available, the screw-cap of the filling hose and fill the tank up to „max.“ of the level control sight glass.
- system with external tank: check filling and refill if necessary.
- closed pressure system: filling under pressure, venting of the system To do so wait until liquid emerges without bubbles, then close again. Check size of expansion vessel.

Attention! For all systems: Vent all not self-bleeding pumps! Add pre-mixed anti-freezing agent!

6. Electrical side

For the electrical connection use the terminal in the switch box (see elect. Diagram) . The design of the mains cable has to be in accordance with the current and the regulations of the authorities at site.

Attention!

Start only after filling the system!

Risk for damaging the sliding ring gaskets of the pump

7 Set into operation

Attention!

For the range SPEZIAL remove the transport safety device of the compressors!

Observe the information labels!

Open all valves in the system of the industrial cooler and in the lines to the consumer resp. external tanks and condenser cooling liquid supply (see flow chart). Assemble all cover sheets to the cooler and close the switch box. Switch on the main switch and if included, also the control switch for the pumps as the remote control (see options).

Observe and control the tank level and refill again if necessary up to the mark „MAX“.

Check of the correct sense of rotation

- for air-cooled units: the sense of rotation has to be in accordance with the direction sign on the fan
- for air and liquid-cooled units: the sense of rotation has to be in accordance with the direction sign of the pump(s)

If the sense of rotation is not correct, it is possible to change 2 phases on the mains cable to turn the direction.

8. Switching off and standstill of the unit

With the unit at standstill and in case of frost, initiate suitable measures in order to protect the operating medium from freezing.

For longer standstills of the unit, drain the operating medium and store or dispose it according to the instructions of the manufacturer. Rinse unit several times using clean water, store it at a frost-proof place.

9. Protection from freezing

When erecting the cooler or components of the whole unit in an area which is subject to frost, protect the liquids using an anti-freezing agent, if necessary (for type and concentration please refer to the cover sheet). If it is not allowed to use an anti-freezing agent, freezing of the liquid can be prevented by installing the options of thermostatic pump control and heating systems.

Attention! Drain the whole operating medium in case of longer power failure or switching off of the cooler via the main switch and in case of frost!

The temperature in the evaporator is always clearly lower than the liquid temperature generated. Thus even in the obviously safe range (e.g. water + 8 °C, environment + 35 °C) there may be the risk of freezing!

Thus use the specified liquid in any case.

10. Basic settings

all pressure values Pe [bar]	R134A	R407C	R404A
Low pressure switch	OFF-ON	OFF-ON	OFF-ON
Water	1,9-2,7	4,6-6,0	5,0-6,4
Water/Antifrogen N 20 % by vol.	1,0-1,6	3,0-4,0	3,3-4,5
Water/Antifrogen N 35 % by vol.	0,3-0,8	1,7-2,5	2,0-2,8
Water/Antifrogen N 50 % by vol.			0,3-0,8
High pressure cut out	22,7	28,0	28,0
Fan control (optional)			
Y ON	9,0	16,4	17,2
Y OFF	7,0	12,4	13,2
Δ ON	12,0	21,4	21,9
Δ OFF	9,0	16,4	16,9
Overheating	8 K	8 K	8 K
Under-cooling	2 K	2 K	2 K

11. Maintenance

The industrial coolers shall be inspected in accordance with EN 378-2 and the national regulations at least once a year. The maintenance work can be carried out by the KKT after-sales service department of a specialised company authorised by KKT and shall cover the following minimum maintenance work;

- Check the safety switching devices for pressure limitation

In addition the following should be done:

- Check the heat exchanger area for contamination
- The refrigeration circuit for leaks, in particular to the liquid circuit;
- All safety, control, regulation and measuring devices and alarm systems for proper functioning and state of operation;
- The composition of the operating medium;
- The liquid circuit for leaks.

After repair work, major modifications to the unit, change over to a different refrigerant, after a standstill of the unit of more than two years or after having re-erected the unit at a different place, carry out the repeated tests in accordance with EN 378-2 Annex A – D, unless otherwise stipulated in national regulations.

All components of refrigeration units, e.g. refrigerants, operating medium, dryer, thermal insulation must be recovered, re-used properly and/or disposed off by an authorised specialised company.

It is the responsibility of the owner of the unit to follow the specified maintenance intervals.

12. Trouble shooting

Attention ! Service on the electrical or the refrigeration side is only allowed by trained and skilled technicians. Observe the accident prevention regulations !

- Pump does not run

- level control has actuated?
- over current relay has actuated?
- fill in more medium
- cable contact? - fasten terminal screws

- medium temperature too high

- compressor is working?
- control switch in pos. „cooling“?
- control the set-point of the operation thermostat

- compressor works but liquid temperature is too high

- ambient temperature too high?
- condenser air volume enough?
- condenser cooling liquid enough?
- too much heat load?
- serve for fresh air, avoid air-short-circuit!
- all cover sheets assembled? - condenser fins clean?
- dimension of the pipes enough?
- all valves open?
- right adjustment of the cooling liquid valve?
- serve for more installed cooling capacity, one more cooler

- Low pressure switch has actuated

- liquid flow too small?
- liquid temperature too low?
- ambient temperature too low?
- shortage of refrigerant?
- rotary direction of the pump correct? If necessary change phases
- all valves open? - filter clean?
- control set-point of the thermostat
- serve for warm cooling air
- **call KKT Service!**

- High pressure switch has actuated

- ambient temperature too high?
- air flow condenser?
- serve for fresh air, obtain air short circuit!
- all cover sheets assembled? - fins clean?

- Level control switch has actuated

- shortage of medium;
- fill in the right medium acc. to the cover sheet

- Safety high pressure switch has actuated - call KKT Service!

13. General description

The KKT KRAUS industrial coolers are compact cooling units which are tested at the manufacturer's according to EN 378-1 cool liquid media including all necessary components for fully automatic operation. The cooling medium is delivered through the evaporator (heat exchanger) and the heat is transferred in the contrary flow system to the evaporating refrigerant. The compressor is compressing the refrigerant-gas at a higher temperature and pressure level.

In the condenser the air-flow or the condenser cooling liquid is transferring out the condenser heat load and the gas becomes liquid.

The expansion valve decreases the high pressure and the refrigerant can become gas again in the evaporator, where the circuit process can start again.

With the help of the digital controller, the outlet medium temperature is controlled by switching the compressor or the hot gas bypass valve (optional). The installed or the external tank serves for limiting the allowed switching frequency.

The cooler can be assembled with exact designed pumps and a lot of options to meet the different requirements.

14. Components

14.1 Compressor

Unit to increase the pressure of a gaseous refrigerant mechanically.

14.2 Condenser

Heat exchanger in which refrigerant vapour is liquefied by dissipating heat

14.3 Fans

The fans with internal and external protection grill suck in the cooling air through the condenser. The warm air is blown out at the top or at the side (see dimension sheet). The fans are designed with an internal fully motor protection (Klixon). The speed control (if included) is realised by a pressure controlled switch (see flow chart and elect. Diagram).

14.4 Evaporator

Heat exchanger in which liquid refrigerant evaporates because the liquid to be cooled absorbs heat

14.5 Pressure controller

14.5.1 Low pressure switch

The low pressure switch controls the evaporating temperature and cuts-off the compressor in case of decreasing the switch point. The pressure switch protects the compressor and the system against frost and ice. The re-set of the switch is automatically after the pressure has risen.

14.5.2 High pressure cut off

The high pressure switch controls the condensing pressure and cuts off the compressor in case of reaching the max. pressure. The re-set of the system is only possible, after the pressure has decreased and the reset-knob has been pressed.

14.6 Switch box

The switch box is ready mounted and connected according to the EN 60 204 regulations. (see electrical diagram)

14.7 Operating thermostat

The medium temperature is controlled by the operation thermostat. Depending of the set point and the medium temperature the compressor is cut-in / out. The digital temperature read out indicates the actual medium temperature. By pressing the set-knob the display shows the adjusted temperature.

By additional pressing the knob \uparrow or \downarrow it is possible to change the set point. To protect the cooler against set points outside the limits, the adjustment is blocked on the max. and min. side.

15. Options

(please see the table of contents page 2 which options are included in your cooler)

15.1 Pump(s)

The ready installed and connected primary pump(s) (see cover sheet and pump curve) deliver the medium to the evaporator and for units with one pump to the consumer (see flow chart). With the main switch, and if included with the control- or the remote-switch, the pump is cut-in. The pump is locked with the compressor. If the pump is not running, there is no cooling possible.

The secondary pump(s) (see cover sheet) deliver the medium to the consumer.

The pump in the condenser circuit serves for the circulation to the condenser and the glycol cooler or cooling tower (see flow chart).

15.2 Liquid pressure gauge

The liquid pressure gauge indicates the liquid pressure.

15.3 Fixed bypass

Bypass line on the medium side between high- and low-pressure side. It is always open and it is adjustable with a hand valve. It serves for a minimum medium flow to protect the pump. In the normal operation a certain flow is furthermore always bypassing the consumer.

15.4 Overflow valve

Ready installed and adjusted between the pressure side of the pump and the return line. In case of a closed liquid-valve on the consumer side, the flow rate is reduced and the liquid pressure rise. At the adjusted max. point, the valve opens automatically and the requested min flow rate is bypassing the consumer. The functioning of the industrial cooler is independent of the flow rate through the consumer. The overflowing valve is ready adjusted at the work shop. In order to receive the best result do not alternate the setting point. (for more information see PI-diagram)

15.5 Flow control switch

Controls the liquid flow through the evaporator in order to prevent freezing. In case of low flow rate, the compressor is cut-off.

15.6 Filter

The filter is placed in the liquid inlet line to the evaporator, serves for clean liquid and protects the evaporator against dirt and blocking of the flow. The filter should be regularly observed and cleaned.

15.7 Capacity control

Multistage control of the compressors eventually over cylinder switch-off or hot-gas-bypass control with solenoid valve.

15.8 Logical sequence relay

Optimal and logical control for start and stop of compressors

15.9 Tank

Size see first page

Filling always up to the max. Draining with the help of the flexible sight glass and if included with the optional filling and draining cock.

15.9.1 Level control switch

Control of the medium level in the tank,
e.g. 2-stage 1: control level 2: dry running protection of the pump

15.9.2 Floating valve

Mechanical floating valve for controlling and filling the tank level.

15.10 Remote control

Potential free contact for start / stop of the chiller with installed 24 V AC or DC relay. (see electrical diagram)

15.11 Temperature Control „limit“

The temperature is monitored via a thermostat. A failure signal is given if the set values are exceeded and/or fallen below.

15.12 Common alarm

The red-fault-signal lamp in the switch-box door indicates, if one of the safety devices has actuated. Furthermore it is possible to locate the fault with the help of the light-diodes inside the switch box. For external fault indication use the pot. free fault signal on terminal.

15.13 Fan control switch

The fan speed is controlled by a pressure or thermostatic switch. (see flow chart) e. g. Necessary at low ambient temperature.

15.14 Crankcase heater

Heating up of the refrigerant-oil to protect against oil-foam in the starting phase of the compressor in case of low ambient temperatures. The optional is necessary for outdoor installation.

15.15 Electrical heater

Heating of the medium, e.g. for frost protection

15.16 Heat recovery

Additional copper-brazed plate heat exchanger as liquid cooled condenser. It is possible to transfer 0%-100% of the condensing energy to the liquid system with temperatures of more than 25°C. The installed pressure controlled liquid valve serves for the adjusted pressure in the Freon system.

15.17 Energy Saving System ESS

In case of suitable low ambient temperatures, the system switches over to ESS. In this way the process heat is transferred out directly via the cooling tower or the glycol-cooler to the ambient without the operation of the compressor.

15.18 Thermostatic pump control

In case of decreasing the set temperature, the pumps will start automatically e. g. for frost protection. Mostly together with the option electrical heater. **Do not switch off the main switch.**

16. Instructions for the protocol for the unit

The owner or user of the unit is obliged to keep and update a unit protocol for the refrigeration system.

The following data shall be contained in the protocol:

- WHO, WHEN, WHAT
- Details concerning all maintenance and repair works
- For each manipulation, the quantity and type (new, re-used or recycled) of the filled in refrigerant, and the quantity of the refrigerant drained from the system
- If an analysis of the re-used refrigerant is available, record the results also in the protocol
- Origin of the re-used refrigerant
- Modification to and replacement of components of the system
- Results of all regular routine inspections
- Longer standstill periods

The protocol shall be kept either in the machine room or the data shall be stored in the computer of the user. In this case, a current print shall be kept in the machine room.

17. Ersatzteile

Bei Ersatzteilbedarf Fabrik Nr. (IK ...) unbedingt angeben.

Elektro

Axialventilator
 Glühlampe
 Hilfskontakt
 Lastschütz
 Leistungsschalter
 Leuchtanzeige-Klemme
 Leuchtmelder
 Regler
 Relaissockel
 Sicherung
 Sicherungsautomat
 Steckrelais
 Tauchfühler
 Temperaturanzeige
 Zeitrelais

Kältekreislauf

Expansionsventil
 Filtereinsatz H 48
 Filtertrockner
 Kleindruckschalter
 Kondensator
 Plattenwärmeaustauscher
 Ventil-Einsatz
 Ventil-Oberteil
 Verdampfer
 Verdichter

Wasserkreislauf

Kühlwasserregler
 Niveauschalter
 Pumpe
 Überströmventil

Zubehör

Antifrogen N
 Antifrogenspindel Type: N
 Elektro-Heizkörper
 Kurbelgehäuseheizung
 Manometer
 Säure-Tester
 Service-Kit
 Wärmeleitpaste

Spare Parts

For spare part orders please give us the Serial No. (IK ...) of the cooler.

electro

fan
 lamp
 auxiliary contact
 contactor
 circuit breaker
 visual indication binder
 signal lamp yellow
 regulator
 relay socket black
 fuse
 automatic fuse
 relay
 sensor
 thermometer
 time relay
refrigerant circuit
 expansion valve
 filter cartridge H 48
 filter drier
 pressure switch
 condenser
 evaporator
 expansion valve insert
 expansion valve upper-part
 evaporator
 compressor

water circuit

cooling water controller
 level control switch
 pump
 overflow valve

accessories

glycol AFN
 glycol tester AFN
 heater
 crankcase heater
 pressure gauge
 acid tester
 service kit
 pasta

18. Hints concerning the refrigerant

R134A	R407C	R404A
1,1,1,2 tetra fluoroethane F ₃ C-CH ₂ F	1,1,1,2 tetra fluoroethane F ₃ C-CH ₂ F	1,1,1,2 tri fluoroethane H ₃ C-CF ₃
	Penta fluoroethane HF ₃ C- CF ₃	Penta fluoroethane HF ₃ C- CF ₃
	Difluoromethane CH ₂ F ₂	1,1,1,2 tetra fluoroethane F ₃ C-CH ₂ F

Possible risks

- Thermal degradation in toxic and etching products:

Hydrogen fluoride	Hydrogen fluoride	Hydrogen fluoride, Carbon oxides
Phosgene fluoride	Phosgene fluoride, traces possible	Phosgene fluoride, traces possible
- Liquefied gas: Emerging liquid may cause frost injuries

First Aid measures

- After inhalation: Bring the injured to fresh air, protect yourself, and keep him/her quiet. Consult physician. Artificial respiration in case of respiratory arrest.
- After skin contact: Replace wetted clothing. In case of skin contact wash off with plenty of water. In case of continuous pain or red skin call physician.
- After eye contact: In case of eye contact rinse with plenty of lukewarm water with the lids wide open for at least 15 minutes, consult physician.
- After swallowing: Swallowing is not deemed to be a potential exposure (gas).
- Notes for the physician: Do not administer Catecholamines or Adrenaline – Ephedrine preparations.

Measures for fire fighting

- Suitable fire extinguishing materials: The product proper does not burn. Adapt fire extinguishing measures to the fire in the environment. Cool containers with water spray.
- Specific hazards due to the material, its decomposition products or gases formed: Forms dangerous gases and vapours when decomposed
- Specific protection equipment for fire fighting: Use respirators which are independent of the ambient air and acid-resistant protection overall when fighting in close vicinity
- Further information: The effects of fire may cause the container to burst and/or explode. Ignitable gas/air mixture can be formed under certain conditions.

Measures in case of unintended release

- Environment: If possible, prevent release into the environment
- Cleaning methods: Let the product evaporate
- Further information: Prevent the product from entering the sink or enclosed rooms.

Handling and storage

- Handling: Fire and explosion prevention
Heating will result in pressure increase and risk of bursting. Cool containers at risk by water. Open container slowly and cautiously.
- Storage: The containers can be stored in the open. Provide sufficient ventilation for enclosed rooms. Avoid excessive heat sources – danger of bursting, Keep the container tightly closed. Storage class; 2A

Personal protective equipment

- Protection of respiratory tract: Not applicable if sufficient ventilation is provided.
Use respirator which is independent of the ambient air within enclosed rooms, in case of insufficient oxygen supply, in case of considerable release which cannot be controlled. Use respirators only in compliance with the international/national standards. Use isolation devices only, no filter devices.
- Hand protection: Chemical-resistant gloves. Recommended material: Polyvinyl alcohol
- Eye protection: Tightly closing goggles.
- General protection and hygiene measures:
Do not inhale vapours/aerosols.
Do no eat, drink or smoke during work.

19. To be completed by the operator!

Responsible for the refrigeration system

Name_____
Street, house No._____
Postal code, place_____
Telephone

Fire brigade

Street, house No._____
Postal code, place_____
Telephone

Police

Street, house No._____
Postal code, place_____
Telephone

Hospital

Street, house No._____
Postal code, place_____
Telephone

Centre for persons injured by fire

Street, house No._____
Postal code, place_____
Telephone**Attention! In emergencies, switch off the cooler by switching off the main switch and/or switching off the main fuse!**

20. Legende

Absperrorgan
 Betriebsthermostat
 eingebauter Tank
 Expansionsventil
 fester Bypass
 Flüssigkeitsdruckmanometer
 Gerätegrenze
 Grenztemperatur
 Hochdruckbegrenzer
 Lüftersteuerung
 Messanschluss Hochdruckseite
 Minisammler
 Niederdruckwächter
 Rücklauftemperatur
 Schauglas
 Schmutzfänger
 Schwimmerschalter 2-stufig
 Trockner
 Überströmventil
 Verdampfer
 Verdichter
 Verflüssiger
 Vorlauftemperaturanzeige

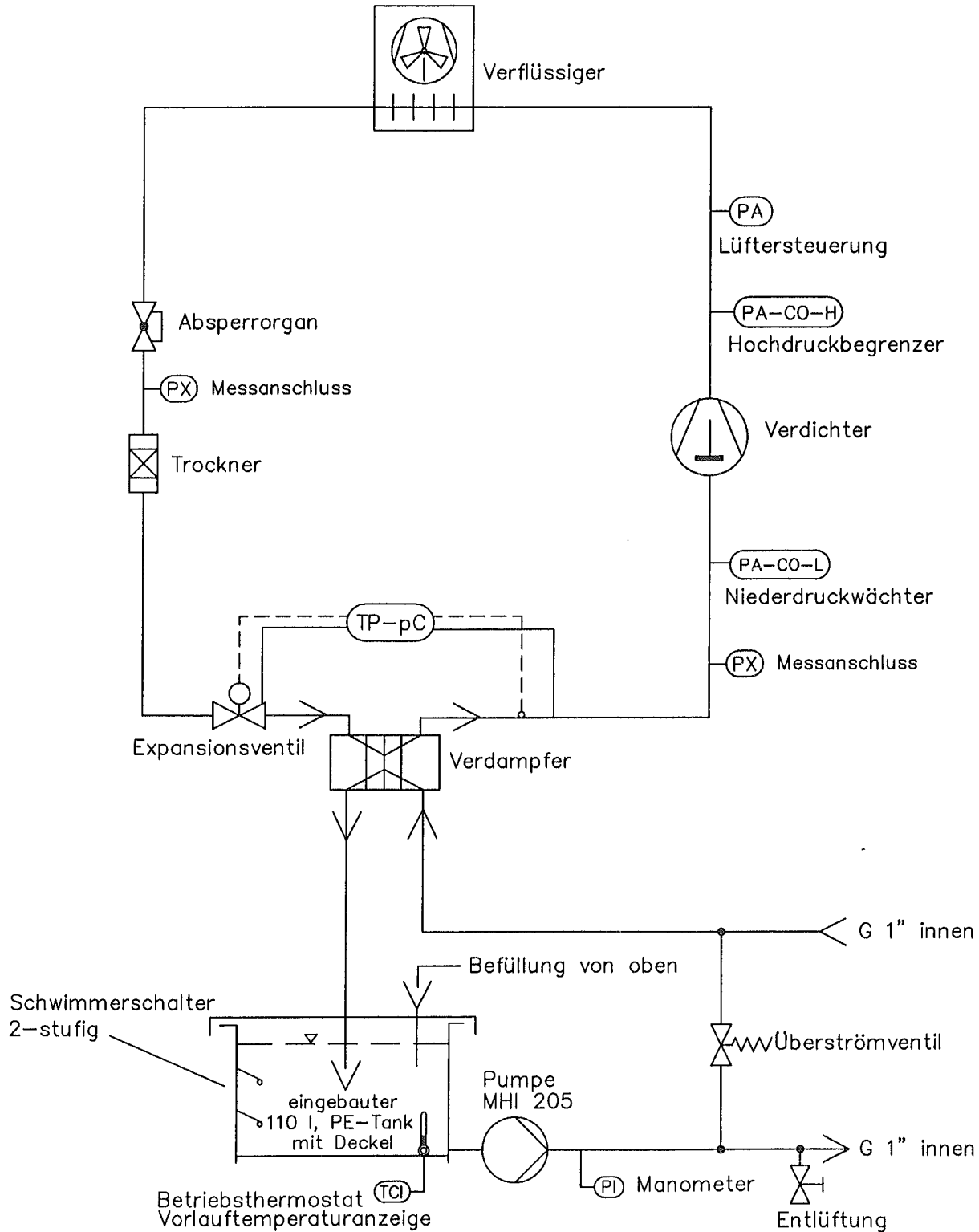
Flüssigkeit Austritt G x" innen
 Flüssigkeit Eintritt G x" innen
 Flüssigkeitsstandsanzeige
 Hauptschalter
 Kabeldurchlass
 Kontrolllampen
 Luft Austritt
 Luft Eintritt
 Manometer
 Steuerschalter (optional)
 Thermometer (optional)

Legend

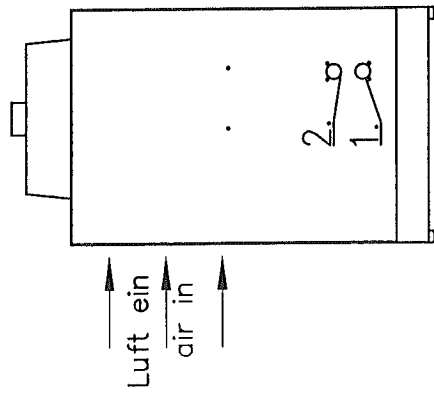
valve
 operating thermostat
 installed tank
 expansion valve
 fixed bypass
 liquid pressure gauge
 boundary of gear
 temperature control limit
 high pressure cut out
 fan control
 measure connection high pressure
 accumulator
 low pressure switch
 return temperature
 sight glass
 filter
 level control switch 2-stages
 filter dryer
 overflowing valve
 evaporator
 compressor
 condenser
 liquid outlet temperature

liquid out G x" female
 liquid in G x" female
 liquid level
 main switch
 cable passage
 signal lamps
 air out
 air in
 pressure gauge
 control switch (optional)
 thermometer (optional)

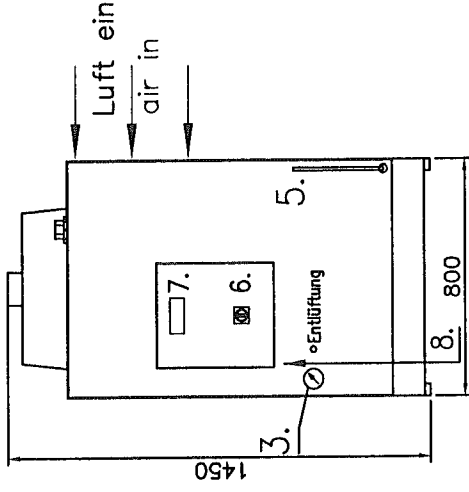
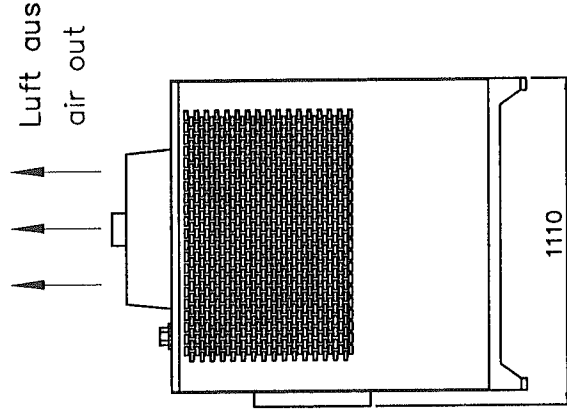
OLB 10 T



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ZUST	ÄNDERUNG	DATUM	NAME	ZEICHNUNGSNR.:	CAD-NR.:	BEARBEITER	DATUM:	Blatt Nr.



- 1 = Flüssigkeit Ein G 1" innen
Liquid in female
- 2 = Flüssigkeit Aus G 1" innen
Liquid out female
- 3 = Manometer (optional)
Liquid pressure gauge
- 4 = Befüllung
Filling



- 5 = Flüssigkeitsstandsanzeige
Liquid level
- 6 = Hauptschalter
Main switch
- 7 = Betriebsthermostat
Operation thermostat
- 8 = Kabeldurchlaß
Cable passage



90552 RÖTHENBACH
MÜHLACH 13a
TEL: 0911- 95333-0
FAX: 0911- 95333-33

Industriekühler Hauptabmessungen OLB 10 T
Industrial - Cooler dimensions

BEARBEITER: RJ

ERST.-DATUM: 20.04.06

PROJEKT NR.: IK 5486 - HA

BEARBEITER:

ÄND.-DATUM:

ÄNDERUNG:

Telefon
Telefax

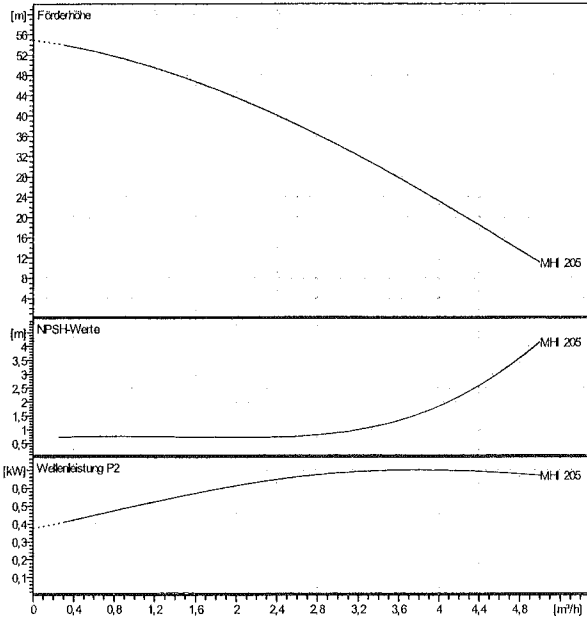
MHI 205 3~

WILO

Kunde
Kunden Nr.
Ansprechpartner
Bearbeiter

Projekt
Projekt Nr.
Positions-Nr.
Einbauort

Seite 1 / 1
Datum 19.07.2005



Betriebsdatenvorgabe

Förderstrom	0	m³/h
Förderhöhe	0	m
Fördergut	Wasser	
Fluidtemperatur	20	°C
Dichte	0,9983	kg/dm³
Kinematische Viskosität	1,005	mm²/s
Dampfdruck	0,02337	bar

Pumpendaten

Fabrikat	WILO	
Typ	MHI 205 3~	
Anlagenart	Einzelpumpe	
Nenndruckstufe	PN 10	
Min. Fluidtemperatur	-15	°C
Max. Fluidtemperatur	110	°C

Hydraulische Daten (Betriebspunkt)

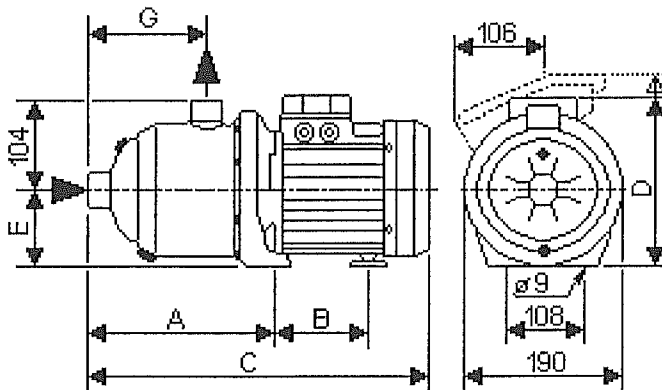
Förderstrom		m³/h
Förderhöhe		m
Drehzahl	2900	1/min
Wellenleistung P2		kW
NPSH		m

Werkstoffe / Dichtung

Pumpengehäuse	1.4301
Welle	1.4301
Laufäder	1.4301
Gleitringdichtung	B-Kohle/Keramik

Abmessungen

	mm					
A	253					
B	87,5					
C	423					
D	192					
E	90					
G	158					

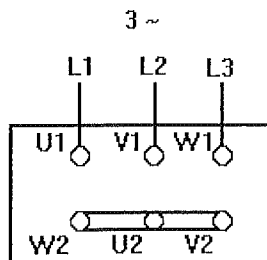


Saugseite	Rp 1	/ PN 0	
Druckseite	Rp 1	/ PN 0	
Gewicht	11,3		kg

Motordaten

Nennleistung P2	0,75	kW
Nenn Drehzahl	2900	1/min
Nennspannung	3~ 400 V, 50 Hz	
Max. Stromaufnahme	2,1	A
Schutzart	IP 54	
Zulässige Spannungstoleranz	+/- 10%	

Artikelnummer der Standardausführung 4024289



KKT Kraus Kälte- und Klimatechnik

Stromlaufplan wiring diagram

Projekt project	P 511269/06	IK 5486/01/06
Anlage / Typ sub-group / type	Industriekühler / OLB 10 T industrial cooler / OLB 10 T	
Kunde customer	Bruker BioSpin MRI GmbH	

Gezeichnet mit EUCAD (R)

Änderung	Datum	Name	Norm
c			
b	28.04.2006	Besch.	Rupprecht
a		Gespr.	

Ersatz durch:

Ersatz für:

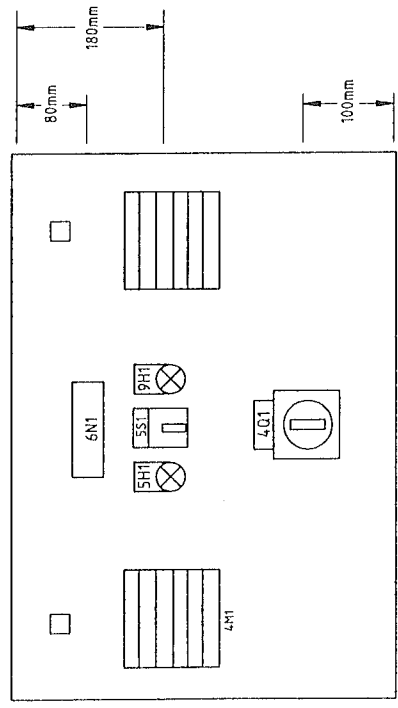
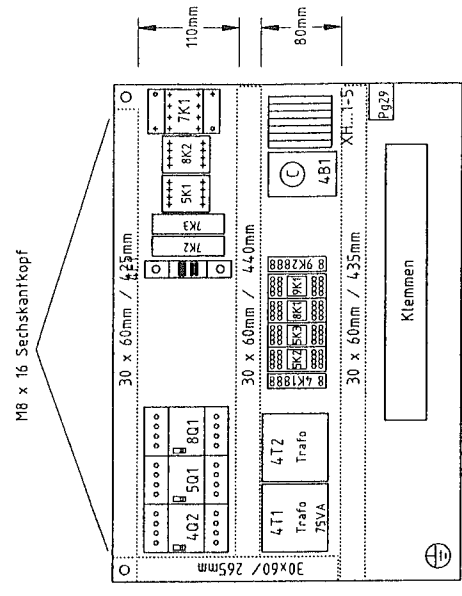
Ursprung: KKT Kraus

Achtung !
 Vor Inbetriebnahme - alle Schrauben an Schützen , Klemmen , Relais und Reglern nachziehen.
 Attention
 before first initial operation starting - tighten all screws on contactors , relais , terminals and controller.

Drahtfarben / colors of wiring :

Netzspannung / line	3/400V/PE	50Hz	Hauptstromkreise / main power : schwarz / black
Schutzart / protection class	IP 54		Schutzleiter / protective conductor : grün-gelb / green-yellow
Steuerspannung / control voltage	24VAC		Neutralleiter / neutral conductor : hellblau / lightblue
Anschlußleistung / connected load	ca. 4,75 kW / 7,6 kVA		Steuerspannung / control voltage 24VAC (U) : rot / red
max. Stromaufnahme / max. current	ca. 11 A		Steuerspannung / control voltage 24VAC (V) : rot-schwarz / red-black
Vorsicherung / main fuse	16 A		Steuerspannung / control voltage 24VDC+ : dunkelblau / darkblue
			Steuerspannung / control voltage 24VDC- : dunkelblau / darkblue
			Fühlerleitung / sensor conductor: weiß / white
			Pot.-freie Verdrahtung / wiring without potential : orange / orange

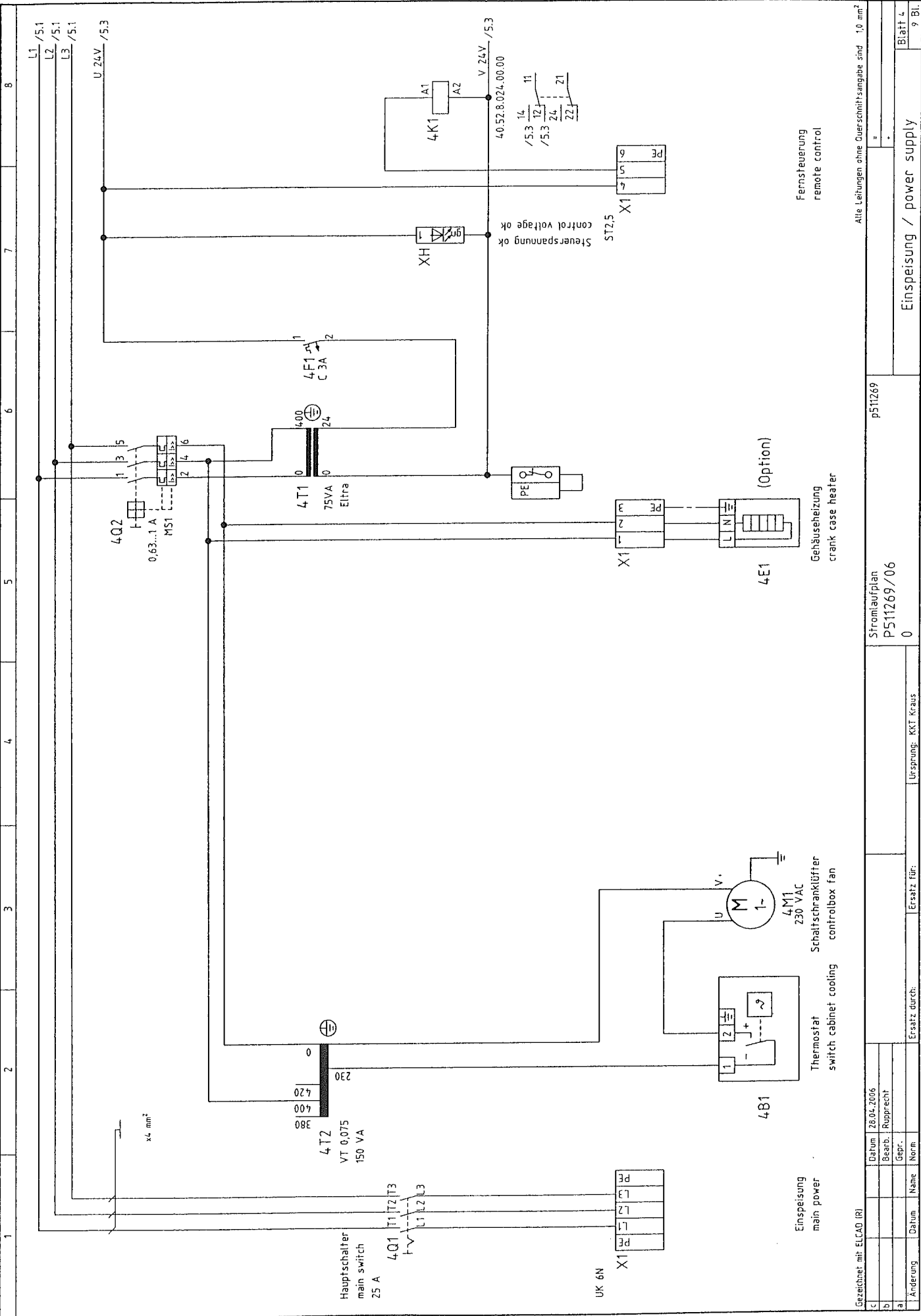
Gezeichnet mit ELCAD IRI		Alle Leitungen ohne Querschnittsangabe sind mm ²	
C	Datum	28.04.2006	p511269
b	Bearb.	Rupprecht	
a	Gepr.		
Aenderung	Datum	Name	Norm
		Ersatz durch:	Ersatz für:
			Ursprung: KKT Kraus
Stromlaufplan		p511269	
P511269/06			
0		Techn. Daten/technical parts	
		Blatt 2	
		9 Bl.	



Gehäuse
 Fab.: Riffal
 Typ : AE 1045
 Farbe : RAL 1013 struktur
 Abmessungen : B 500mm x H400mm x T210mm

Schilder: deutsch/ englisch

Gezeichnet mit ELCAD (R)		Alle Leitungen ohne Querschnittsangabe sind		mm ²
c	Datum	28.04.2006		
b	Bearb.	Rupprecht		
a	Bepr.			
Änderung	Datum	Name	Norm	
		Ersatz durch:	Ersatz für:	
		Stromlaufplan		p511269
		P511269/06		
		0		
		ANSICHTSSKIZZE / VIEW		Blatt 3
				9 Bl.



Fernsteuerung
remote control

4E1 (Option)
Gehäuseheizung
crank case heater

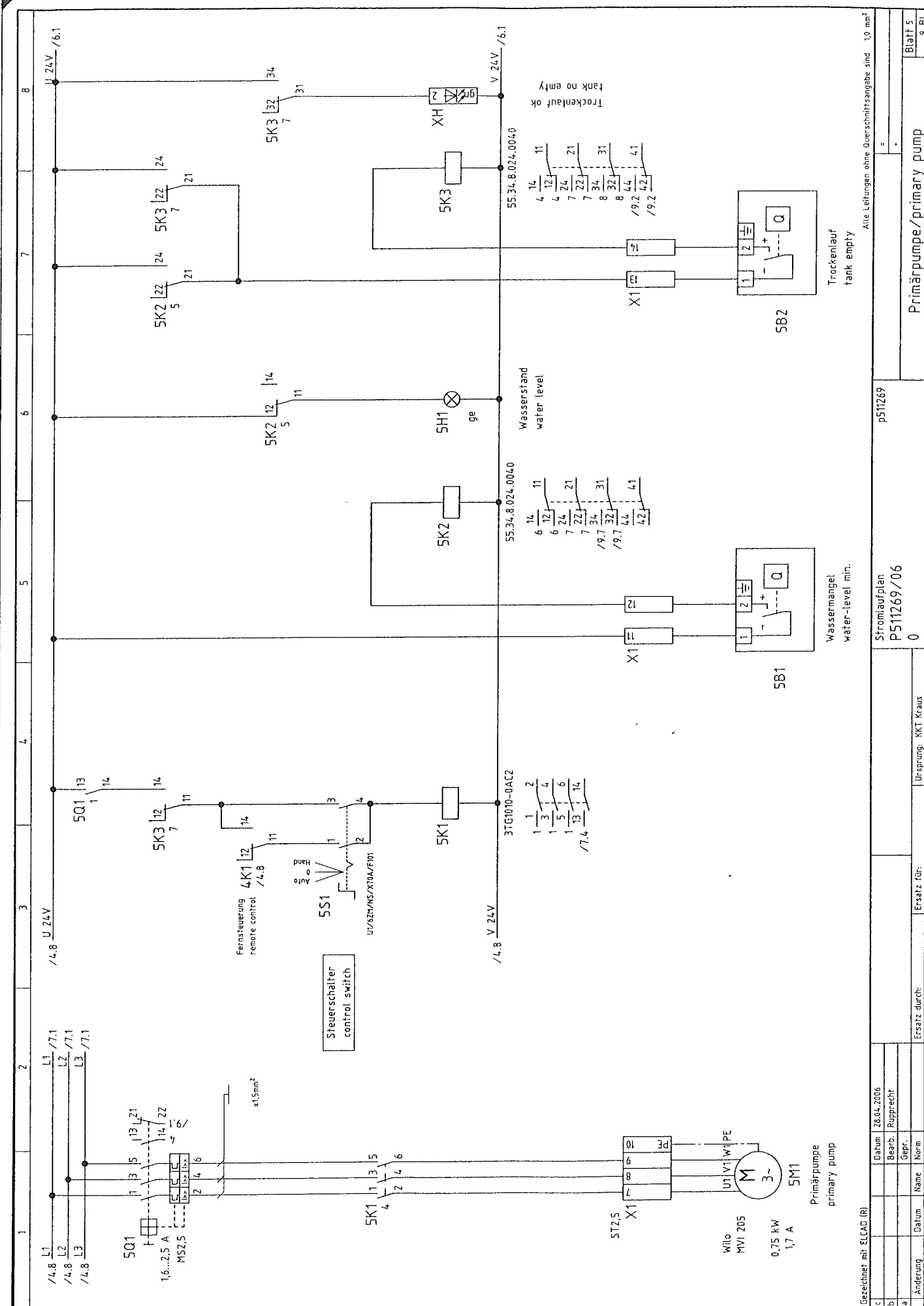
4M1
230 VAC
Schaltschranklüfter
control box fan

4B1
Thermostat
switch cabinet cooling

Einspeisung
main power

Alle Leitungen ohne Querschnittsangabe sind 1,0 mm²

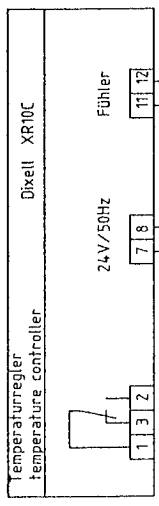
Gezeichnet mit ELCAD (R)		p511269		Einspeisung / power supply	
c	Datum	28.04.2006	Stromaufplan		
b	Bearb.	Rupprecht	P511269/06		
a	Gepr.		0		
Änderung		Datum	Name	Norm	Ursprung: KKT Kraus
					Ersatz für:



Gezeichnet mit E/CAD (R)		p511269		Primärpumpe/primary pump	
a	Änderung	Datum	Name	Bepr.	Norm
b		28.04.2006	Rupprecht		
c					
Ersatz durch:			Ersatz für:		
0			KKT Kraus		
Ursprung:			P511269/06		
Strömungsplan			p511269		
Alle Leistungen ohne Querschnittsangabe sind 1,0 mm ²					
Blatt 5			9 Bl.		

Temperaturregler
Austritt/outlet
temperature controller

6N1



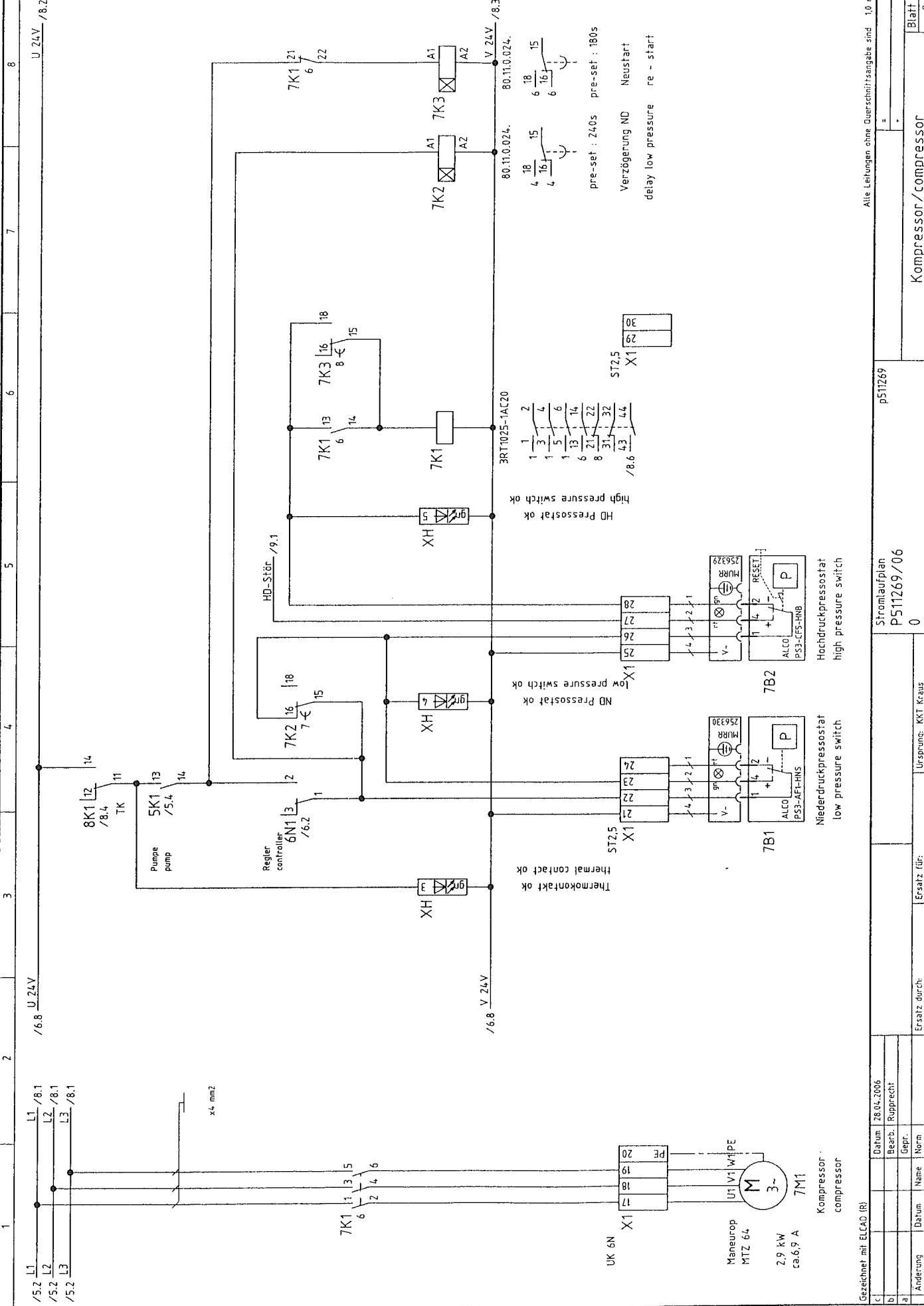
/7.4

ST 2.5
X1

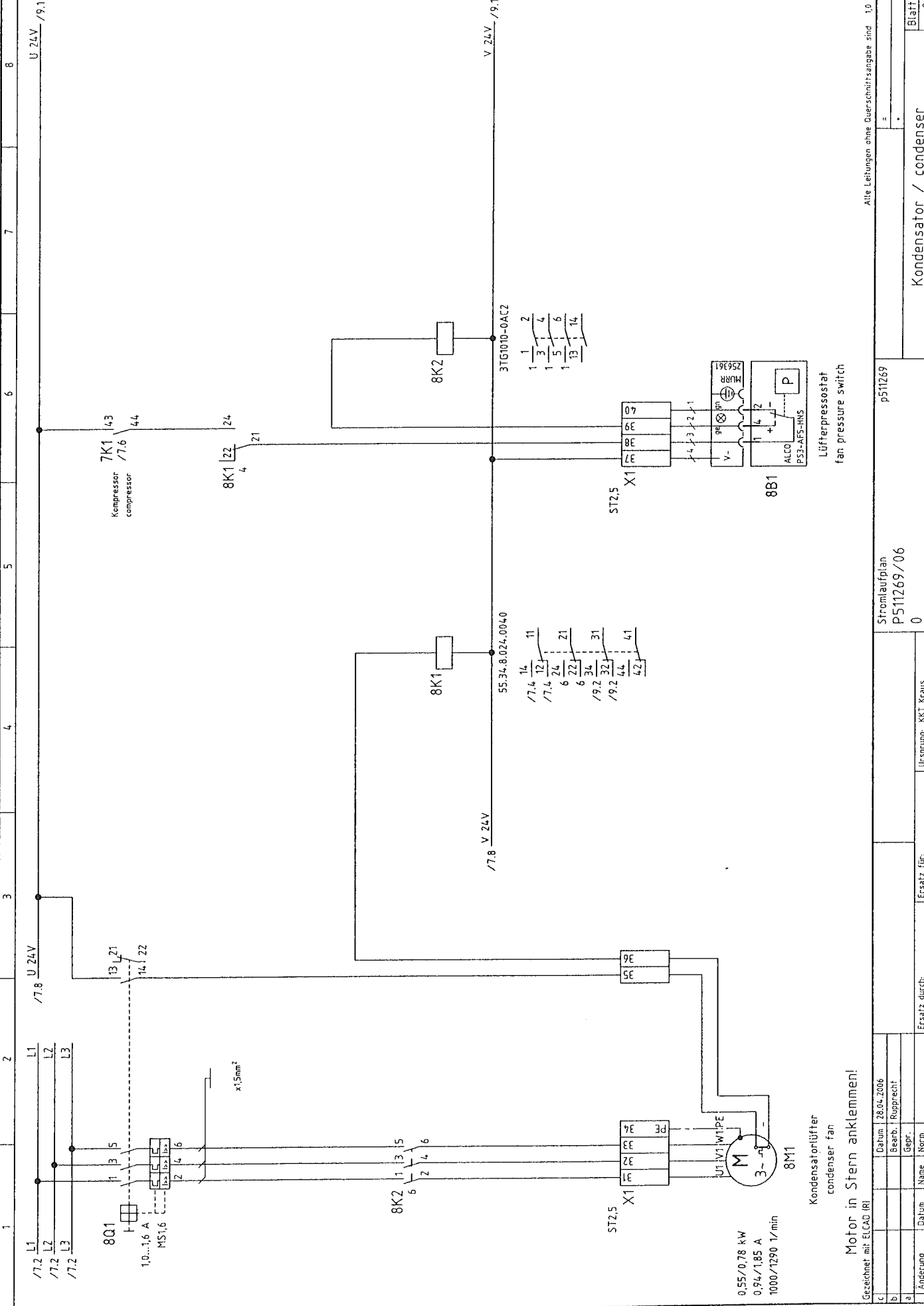
6B1

Temperaturfühler
Austritt/outlet
temperature sensor

Gezeichnet mit: ELCAO (R)		Datum: 28.04.2006		Alle Leitungen ohne Querschnittsangabe sind 1,0 mm ²	
a	Änderung	Gepr.	Norm	0	Temperaturregler/controller
b		Bearb.			
c					
				Stromlaufplan	p51269
				P51269/06	
				0	Blatt 6
				Ersatz durch:	9. Bl.
				Ursprung: KKT Kraus	



Gezeichnet mit ELCAD (R)			Datum: 28.04.2006		
a	Bearb.: Rupprecht		Ersatz durch:		
b	Gepr.:		Ursprung: KKT Kraus		
c	Datum:	Name:	Ersatz für:		
Kompressor compressor			Stromlaufplan P511269/06		
Alle Leitungen ohne Querschnittsangabe sind 1,0 mm ²			p511269		
Kompressor/compressor			Blatt 7		
			9 Bl.		



Alle Leitungen ohne Querschnittsangabe sind 1.0 mm²

Blatt 8
9 Bl.

Kondensator / condenser

Stromlaufplan
P511269/06
0

Ursprung: KK7 Kraus

Ersatz für:

Datum 28.04.2006
Bearb. Rupprecht
Gepr.

Änderung	Datum	Name	Norm	Ersatz durch:

/8.8 U 24V

5Q1 21 /5.1 22

5K3 42 /5.7 41

8K1 32 /8.4 31

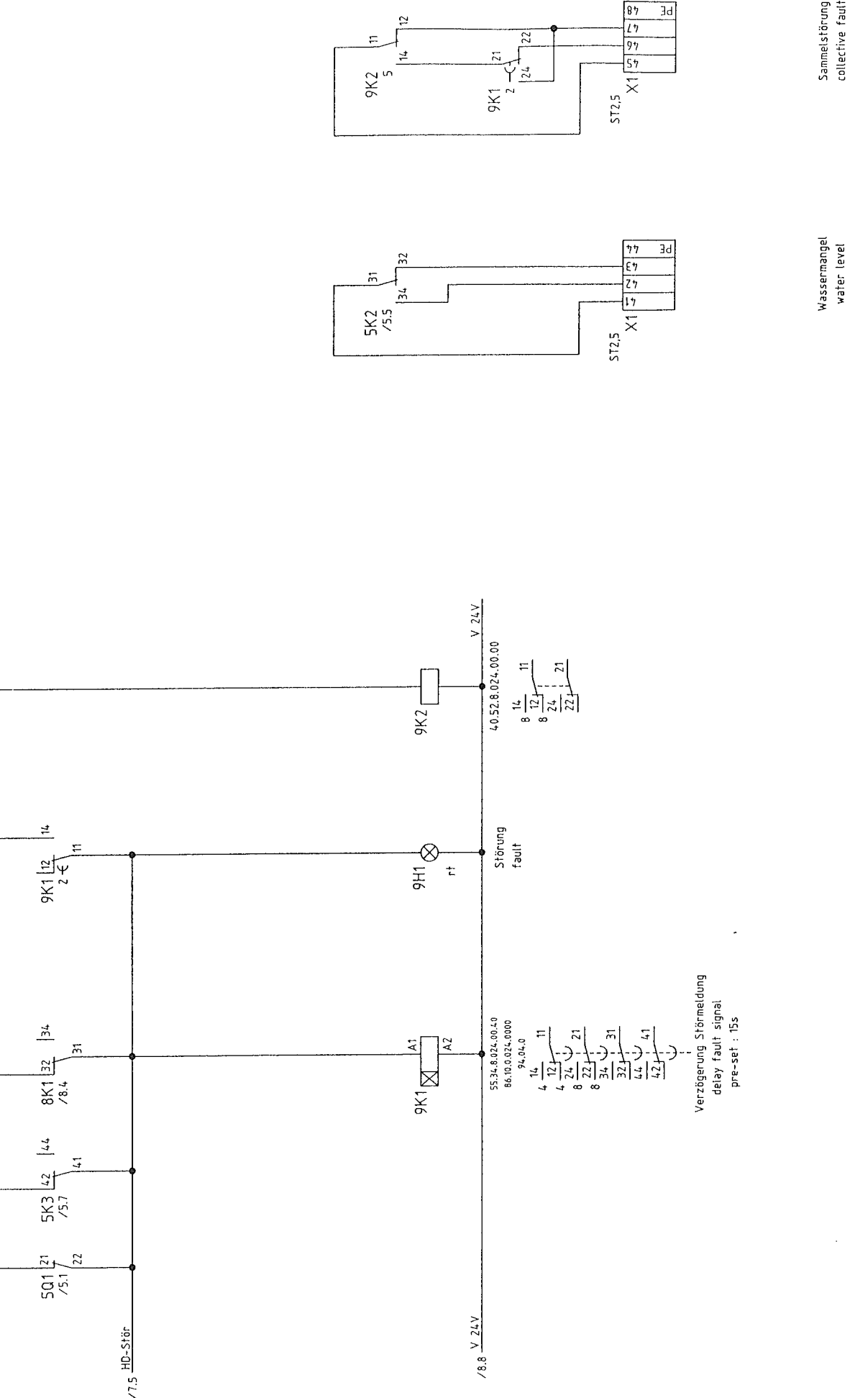
9K1 12 2 11

9K2 5 11 14 12

5K2 /5.5 31 34 32

9K1 2 21 24 22

ST2.5 X1 87 87 L7 97 97 57 57



Verzögerung Störmeldung
delay fault signal
pre-set : 15s

Wassermangel
water level

Sammelstörung
collective fault

Gezeichnet mit ELCAD [R]

c	Datum	28.04.2006
b	Beantw.	Rupprecht
a	Gepr.	
	Name	
	Datum	
	Ersatz durch:	
	Ersatz für:	
	Ursprung:	KKT-Kreis
	Stromlaufplan	P511269/06
		0
		p511269
		=
		-
		Blatt 9
		9 Bl.

Alle Leitungen ohne Querschnittsangabe sind 1,0 mm²

Störmeldung / fault signal