BETRIEBSANLEITUNG

OPERATING INSTRUCTIONS

INSTRUCTIONS DE SERVICE

Nr. / no. 07 03 445

YOUR PARTNER IN PROCESS COOLING

OPERATING INSTRUCTIONS

CE

These operating instructions have to be read carefully before putting the chiller into operation.

Please observe these instructions, otherwise the manufacturers liability for subsequent damage will be cancelled. All rights required for further technical development and modification, are reserved.

IMPORTANT!

Proper use of the chiller

This chiller is designed for the cooling of water only. For the use of other agents (e.g. deionised water) please contact the manufacturer. Limits indicated in the technical data must be adhered to strictly, otherwise the manufacturers liability for subsequent damage will be cancelled. Chilling of flammable or explosive substances is prohibited.

IMPORTANT!

Please keep these operating instructions for further use!

1 SAFETY / PREVENTION OF ACCIDENTS

General information

These operating instructions contain valuable information which has to be observed during initial start-up, operation and maintenance. Therefore these instructions are to be read by the installer and operating personnel in charge, before putting the chiller into operation.

All general safety instructions mentioned in this chapter and special security instructions given in other sections of this manual have to be observed.

Personnel qualification and training

Operating, maintenance, inspection and installation personnel must be qualified. Responsibility and supervision must be clearly explained to the operator.

Danger due to non-observance of safety instructions

Non-observance of safety instructions may cause injuries, endanger the environment or damage the chiller. Non-observance of safety instructions will cancel the manufacturers liability for subsequent damage.

Safety conscious operation

The safety instructions given in these operating instructions, including national regulations on accident prevention as well as any specific chiller safety instructions must be observed.

Safety instructions for user / operator

Protective guards that have been installed to prevent contact with moving parts may not be removed when the unit is being operated. Danger resulting from the use of electrical power is excluded (for detailed information, refer to the VDE regulations and the regulations of the local power supply authorities).

Safety instructions on maintenance, inspection, and installation work

Basically none of the cleaning or maintenance tasks may be performed until the unit has come to a complete standstill. As soon as this work has been completed, all the safety devices and protective equipment must be mounted or installed according to their proper function.

Arbitrary modification and production of spare parts

The unit may be converted only if an agreement has been reached with the manufacturer. Original spare parts and accessories accepted by the manufacturer serve as safety guarantee. Use of other parts may cancel the manufacturer‘s liability for subsequent damages

1 SAFETY / PREVENTION OF ACCIDENTS

Non-permissible operating methods

The operational safety of the delivered unit is guaranteed only if the unit is properly used as intended.

Limits indicated in the technical data must not be exceed

Health hazards with the refrigerant

The refrigerant has only a very low acute health hazard. It has narcotic effects only at extremely high concentrations. After acute exposure to extremely high concentrations the substance is eliminated over the lungs very quickly. The refrigerant has a certain irritating effect on skin and mucous membranes. Exposure of the skin to liquid refrigerant can cause frost bite. In the presence of open flames or hot surfaces refrigerant can decompose and form toxic decomposition products (e.g. hydrogyn chloride, phosgene). The refrigerant evaporates when exposed to air . Intentional exposure of refrigerant is not permissible. The chiller must be handled with great care to prevent any damage occuring through transport operations.

Safety symbols

Warning!

This symbol is to be found next to all the safety instructions involving work that may result in serious injuries. Observe these instructions and proceed with extreme caution in such instances. Inform all other users as well. In addition to the instructions included in this manual, the applicable general safety and accident prevention regulations must also be taken into account.

Attention!

This symbol is to be found next to the items in this manual that must be strictly observed to ensure proper application of the guidelines, regulations, instructions and procedure of tasks and to make sure that the machine or other parts are not damaged or destroyed.

Note!

This symbol explains that chiller is designed according to state-of-the-art technology and is safe to operate. Dangerous situations may, however, be the result if the unit is used by personnel without adequate qualification or if it is not used correctly according to its intended purpose. Accordingly, this may affect efficient operation of the unit.

2 TRANSPORT

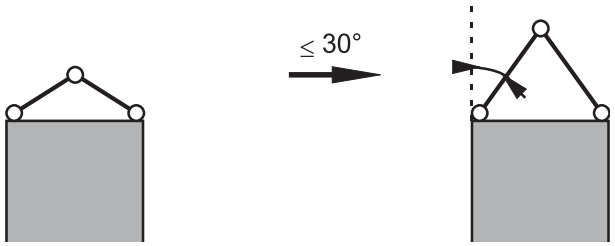
The chiller may only be transported in original packaging to the site of initial operation. In case of damage the manufacturer must be informed immediately. If the unit is moved to another location in a factory, all connections must be disconnected from the unit. Moving the unit to another location must be carried out without causing damages. If damage occurs despite these instructions, the unit must be checked by an expert and repaired as required before it is put into operation again.

Note:
The Manufacturers Liability excludes any Damage to the Chiller subsequent to Transportation.

When transporting the unit, consider the weight limits indicated in the technical data. Use a fork-lift, truck or a crane with the corresponding load-capacity.

The fully-hermetic compressor is mounted on rubber. Always transport the chiller as mentioned below. Avoid vibrations during transport. Failure to observe can result in compressor damage.

Instructions during transport!



Attention: Never remove the top cover if transporting the chiller by means of a hoist (via eyelets)!

3 INSTALLATION AND INITIAL OPERATION

Installation

Prior to installation and commissioning of the chiller, please observe the following points strictly:

The fresh air intake temperature may not exceed the max.ambient temperature (refer to name plate)

Assure that the required quantity of air is available at air cooled chillers.

Assure that the chiller hot air outlet does not warm up the environment or room excessivly.

Min.distance of fresh air intake: at least 1,0 m (air cooled version)

Min.distance of hot air outlet: at least 3,0 m (air cooled version)

Connection of an air supply and exhaust duct is admitted only for machines with radial fans.

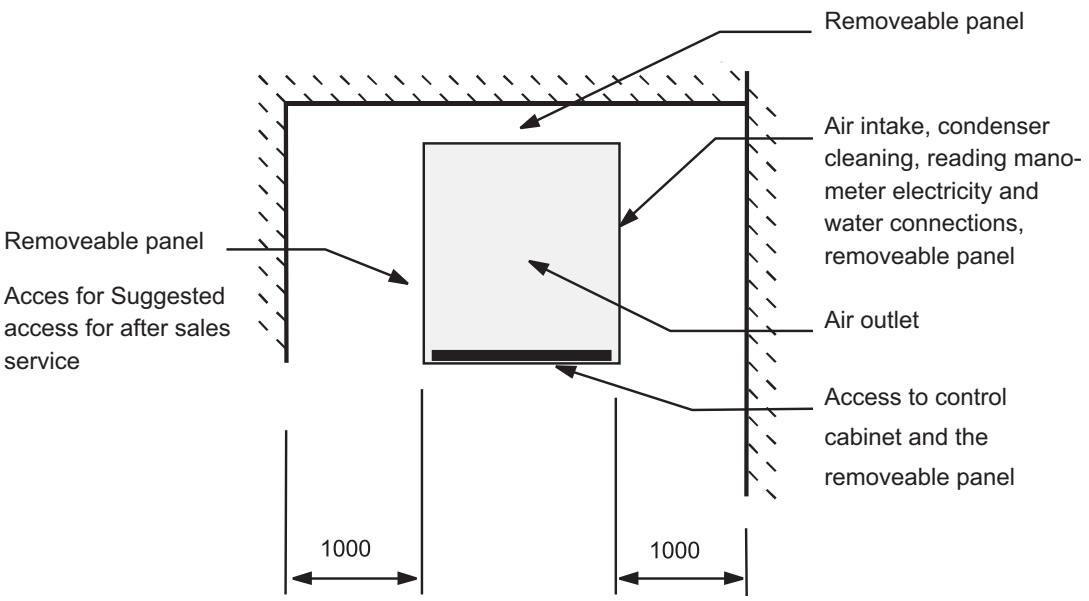
The fresh air intake of the unit (condensor) may not be situated infront of a heat rejecting device like a pump or electric motor.

The unit must be set up on level, solid surfaces only, in order to ensure the required stability. For outside erected chillers, the minimum outdoor temperature should be considered from the technical data.

Floor space

A minimum space must be left free around the installation, so that there is access to the various components and to the control cabinet.

The unit can be installed in a corner. However, its movability must be ensured to enable access to the various components.



The distance from any constructions blocking the air supply must be at a minimum distance of 1 meter.

Options

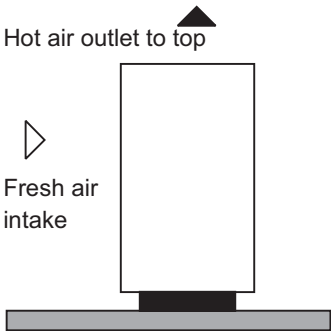
Option No 1:

The most frequent example. Air is taken in and evacuated in the same room. A large sized room is required.

Hot air outlet: min. 3 m

Fresh air intake: min.1 m

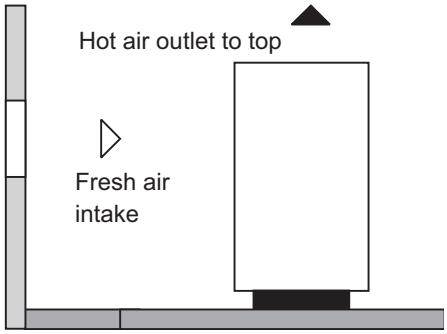
Note: The hot air outlet may not shortcycle with the fresh air intake.



Option No 2:

Air taken in from an adjoining room or from outside.If the incoming air in winter is too cold, provide a condensation pressure controller and the compressor casing resistance. A screen can be provided in winter so that taking in the cold air can however be prevented.

Note: The hot air outlet may not shortcycle with the fresh air intake.



Option No 3:

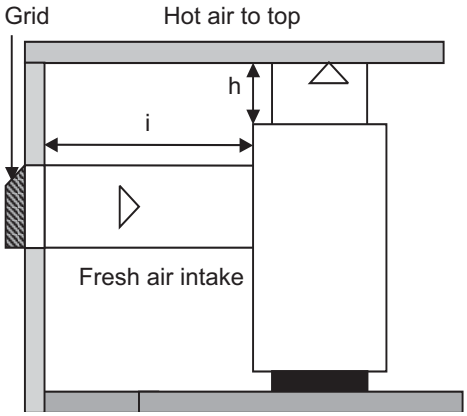
Air intake and evacuation to outside or an adjoining room using ducts.

For the maximum permissible pressure loss, note the dimensions h+i

Take the same precautions as in Option No 2 for the air intake temperatures in winter.

Note:Only permissable on chillers with radial fans.

h+i = 5 m max. with grid
h+i = 7 m max. without grid

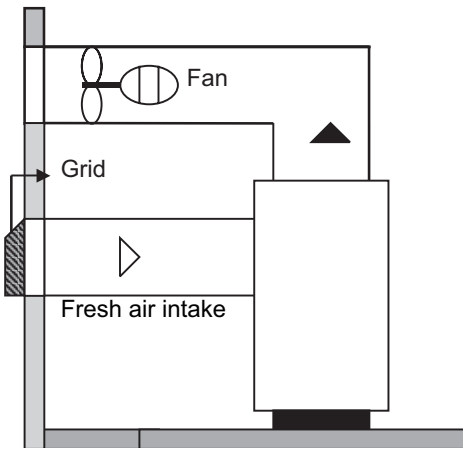


Option No 4:

Air intake and evacuation at the same floor level, either to outside or to an adjoining room.

A large bend is required in the duct so as to reduce pressure loss.

Use the same precautions as in option No 2.



3 INSTALLATION AND INITIAL OPERATION

Electrical connection

The chiller is ready for connection and should only be connected to a three phase current network (mains voltage refer to technical data).

The power supply has to be connected in a ***right handed rotatory field***. In order to confirm the correct connection the direction of rotation of the fan motor must turn in the same direction as the arrow.

All electrical connections in the switch board are to be tightened prior to commissioning.

Incorrect connection of power supply and incorrect power supply will cancel the manufacturers liability for subsequent damage.

Hydraulic connection

After completing the electrical connection it is necessary to connect the Chiller to the consumer VIA flexible or fixed pipes.

Selection of materials of pipes. PVC, Plastic, Stainless Steel, Copper and Brass are permissible.

Note: Mild Steel and Galvanized Steel is not permissible.

Selection of cross – section of pipes (for advise please refer to manufacturer).

Insulated pipes are to be used if the distance between the chiller and the consumer is greater than 5 m.

Refer to technical data (pump diagram) for flow rate and pressure available from the chiller.

Before starting up it is always necessary to prime the pump with the medium to be transported. (refer to BLEEDING OF PUMP in this chapter).

If the consumer is placed on a higher level than the chiller unit, a non-return valve has to be installed in the water outlet as well as an solenoid valve has to be installed in the water inlet.

Connect water inlet port to cnsumer return line.

Connect water outlet port to consumer inlet line.

Connect water supply port to tap/fresh water supply.

Please test float valve adjustment (option). Float valve is factory adjusted at 3 bar water pressure.

Incorrect hydraulic installation will cancel the manufacturers liability for subsequent damage.

3 INSTALLATION AND INITIAL OPERATION

Refilling of the tank

Automatic refill (Option)

Tap/fresh water feed connected to water supply port guarantees constant level in the tank, so that evaporator always remains submerged.

Manual refill (Option)

Filling of water manually through water inlet port or directly into tank.

The waterlevel can be observed by the water sightglass which can be seen from the outside of the housing .

Ensure that the evaporator is submerged.

Important:
Prior to filling of the tank it is esessential to test the water quality and if required carry out watertreatment (refer to chapter 7).

To avoid corrosion at the evaporator, we recommend to use water with a low salt content (chloride content < 20 mg/l). To avoid thickening of the tank water, we recommend to replace the system content every 1 to 3 months an increasing evaporation of the tank water means an increasing chloride content (please refer to chapter 7).

For chillers running at temperatures lower than freezing point, a water/glycol mixture at the appropriate ratio should be filled.

30% Glycol up to –10°C, at lower temperatures please refer to the manufacturer.

The tank should be filled to the max. level of the water level tube (Option).

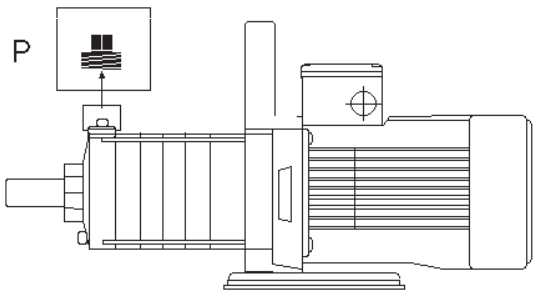
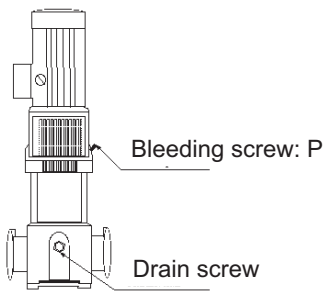
Prior to start up it is always necessary to prime the pump with the medium to be transported.

Prior to start up the pump must be bled in order to remove air from the pump.

Bleeding of the pump

Remove bleeding screw P

Reinstall bleeding screw and tighten as soon as medium exits from filler fitting.

CH pump	CR pump
	

3 INSTALLATION AND INITIAL OPERATION

Start–up of chiller

Control switch »Standard«:

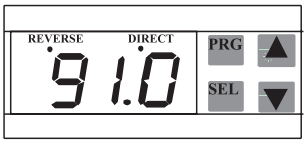
After successful completion of all instructions given in this chapter, the refrigerating plant is switched on by means of the main switch or master switch (if installed). The **OPERATION** light will light up during normal operation.

Master switch position: **O = Off** **1 = Operation**

In case of irregularities occurring during operation or extraordinary noise, the chiller has to be switched off by means of the control switch (please contact the manufacturer).

Confirm the correct power supply connection.The direction of rotation of the fan motor must turn in the same direction as the arrow.

If the FAULT light lights up or the chiller does not start at all please refer to chapter 5.



Description of the display unit and setting of water outlet temperature

DISPLAY SCREEN: Shows the value of the cold water outlet sensor.In case of alarm, the sensor value is shown alternately with the codes of the active alarm. When programming, it displays the codes of the parameters and their values in flashing mode.

DECIMAL LED: On when the set quantity is displayed in decimal mode.

REVERSE LED: Flashes when at least one relay is active in heating mode.

DIRECT LED: Operates when at least one relay is active in cooling mode.

SEL BUTTON: For displaying and saving the water temperature set point.
Pressed at the same time as the PRG button for 5 seconds it gives access to the password for changing the unit's operating parameters.

PRG BUTTON: For stopping the buzzer in case of alarm. cancels the alarm signals if the cause of the alarm has disappeared. Ends the programming by entering the values of the changed parameters into memory

s**-Button:** Increases the set point or any other parameter value selected.

t**-Button:** Reduces the set point or any other parameter value selected.

When the display shows the water outlet temperature of the main circuit (in normal operation), pressing this button shows the water outlet temperature of the 2nd circuit (optional).

The parameters of the controller are locked and can only be accessed VIA password (please refer to the manufacturer for access to the parameters).

3 INSTALLATION AND INITIAL OPERATION

Temperature adjustment of the medium

Set-point

1. Press key SEL for approx. 5 seconds. Indication display: »ST 1«.
2. Let go SEL-key. Indication display: Set-point 1.
3. Use keys UP and DOWN to adjust Set-point 2.
4. Press SEL-key. Indication display »ST 2«.
5. Press SEL-key to return to operation mode.

Parameter	Set point	Description
ST 1		Set-point: cooling Can be changed within limitations given by factory
ST 2 (option)		Not connected

Maximum temperature of the medium is limited by controller.

Hysteresis
Hysteresis is set by manufacturer and must not be changed by customer.

Correction of failures

Indication	Description	Cause	Correction
Er0	Failure: Sensor	Sensor cable broken or short-circuited Connection failure Sensor defective	Check connections between sensor and thermostat Check sensor signal NTC = 10 kΩ at temp. of 25°C
Er1	Failure: Sensor NTC2	As described for ErO, only for room sensor	As described for Er0, only for NTC2
Er2	Failure: Store	Current supply interrupted during programming process (indication of alarm)	In case failure is not corrected, exachange unit
Er3	Alarm external	Digital input contact open	
Er4 / HI	Alarm »HIGH«	Temparature of medium exceeds max. value	Temperature of medium too high
Er5 / LOW	Alarm »LOW«	Temparature of medium below min. value	Temperature of medium too low

Attention:
In case of failure, acoustic signal and indication of failure must be reset by means of key PRG (annotation: indication of failure disappeares only if failure is corrected). Delay of alarm (mode 5 only) is reset automatically if reason for alarm is not given any more.

4 CARE AND MAINTENANCE

General

In case of irregularities occurring during operation or extraordinary noise, the chiller has to be switched off by means of the control or main switch.(please contact the manufacturer)

Fluid (water)

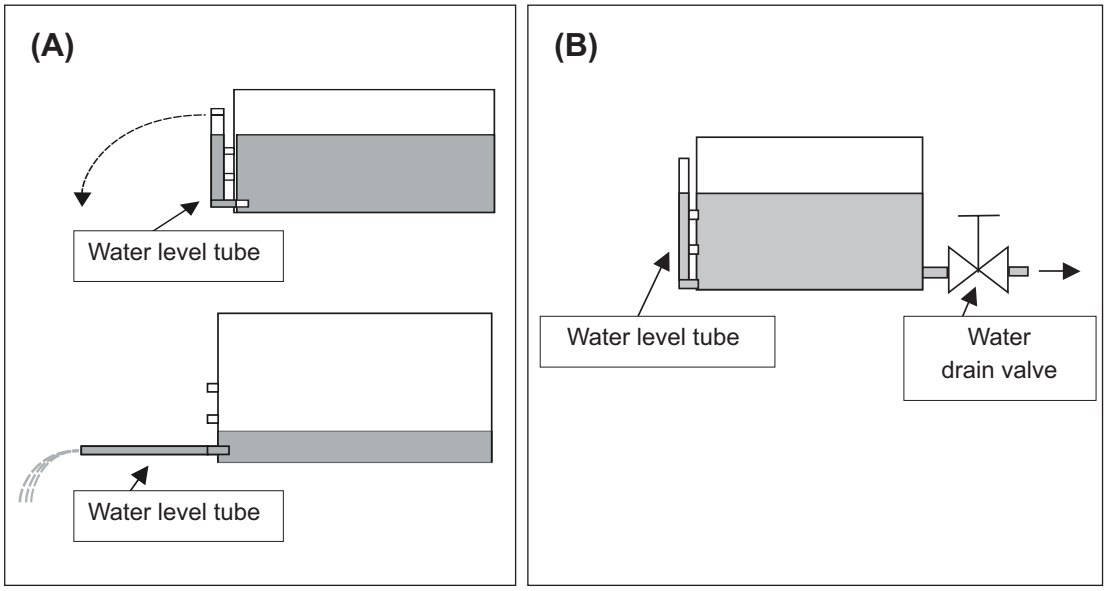
Cleanliness of the water/fluid should be tested daily. If required, the water/fluid has to be drained and the evaporator, tank and pump has to be rinsed or cleaned. Dedending on the grade of dirt on the evaporators,the future cleaning cycles will be determined.

Drain water from the tank as follows:

Solve the advance for emptying the tank

Option - Turn the water level sight glass (pipe) to the side (**A**)

Option - drain water through water drain valve (**B**)



4 CARE AND MAINTENANCE

Refilling of fluid

Automatic refill (option)

Automatic water feed guarantees constant level in the tank, ensure that the evaporator always remains submerged. Float valve function has to be tested regularly.

Manual refill (option)

Ensure that the evaporator is always submerged.

Water supply

Larger volumes of fresh water supply may disturb the equilibrium of mixture or reduce concentration of antifreezing agent. The content of concentration should be checked and determined at required intervals of time.

Standstill for prolonged period

Longer standstill of chiller requires draining of tank and complete water circuit. For renewed start-up of the chiller the same steps as for the initial start-up must be considered.

Cleaning of condenser (air-cooled chillers)

Make sure that the cooling fins of the condenser remain clean in order to guarantee the required heat exchange.

The condensor must be cleaned in monthly intervals or if required at shorter time intervals.

Dust and dirt clogging up the cooling fins should be removed by means of compressed air.

If the chiller is equipped with an air filter, the filter has to be exchanged (please contact the supplier).

Remove grid in order to change filter or/and carefully clean the condenser with compressed air.

Note:
Please ensure to switch »0« the main switch, before any maintenance or repairment work has to be performed on the chiller.

5 FAULT DIAGNOSIS

By means of the following instructions a quick failure analysis can be made. The user can repair some failures without any assistance. Please do not hesitate in phoning the manufacturers after sale service department if assistance is required.

Corrective maintenance of the refrigeration cycle must be performed by competent refrigeration specialists only. In case of any problems concerning the refrigeration cycle, please contact the manufacturer

If error message at the display appears ...

... refer to **Correction of failures** matrix (see page 10)

If error message at the display does not appear ...

... refer to **Unit does not start** matrix (see page 16)

Note:
Please ensure to switch »0« the main switch, before any maintenance or repairment work has to be performed on the chiller.

5 FAULT DIAGNOSIS

(parts are identified on the wiring diagram)

Fault	Possible cause	Repairement
Compressor clixon cuts out		
	Compressor current too high	Incorrect power supply L1, L2, L3 testing of ocurrent (ampere)
		Current and power supply OK: compressor or clixon defect
	Compressor defect	Repairement only by refrigeration specialist
	Clixon (Kriwan) defect	Repairement only by refrigeration specialist
	Evaporation temp. too high	Fluid (water, emulsion, oil) temp. too high
Low pressure switch tripped		**Resetting of low pressure switch**
	Fluid (water, emulsion, oil) level in tank too low	Testing of correct fluid level - refilling tank
	Refrigerant leakage	Repairement only by refrigeration specialist
	Expansion valve defect	Repairement only by refrigeration specialist
	Option:solenoid valve defekt	Repairement only by refrigeration specialist
	Fluid temperature too low	Refer to technical specification
	Ambient temp. too low	Refer to technical specification
High pressure switch tripped		**Resetting of high pressure switch**
	Clogged or dirty airfilter	Replace airfilter
	Clogged or dirty condensor	Clean condensor
	Fan motor rotation - wrong way around	Testing of correct rotation - see rotation arrow on condensor
	Fan motor defect	Replacement of fan motor
	Fluid (water, emulsion,oil) temperature to high	Refer to technical specification
	Watervalve at watercooled units	Testing of correct waterflow
	Ambient temperature to high	Measure air inlet temp. at condensor refer to chapter 3

5 FAULT DIAGNOSIS

(parts are identified on the wiring diagram)

Fault	Possible cause	Repairement
Overload tripped		**Resetting of overload**
	Current of the specific part too high	Testing of current (ampere), replace defect part
	Burnt or broken cable	Repair broken cable
	Loose connection	Tighten all contacts and terminals
	Insufficient power supply	Test power supply
Option: Flow switch tripped		
	Flow switch dirty	Clean flow switch
	Flow switch defect	Replace flow switch
	Pump defect	Replace pump
	Pump rotation - wrong way around	Testing of correct pump rotation, see arrow on pump
	Fluid (water, emulsion, oil) level too low	Testing of sufficient fluid in system and damaged or clogged up piping
Option Anti-freeze thermostat	Fluid (water, emulsion, oil) temperature too low	**Test the setting of the Anti-freeze thermostate** Testing of correct temperature setting on controller controller defect
Option: float switch tripped	Water level in tank too low	Testing of waterlevel, refilling of tank
	Float switch defect	Replace floatswitch

5 FAULT DIAGNOSIS

(parts are identified on wiring diagram)

Fault	Possible cause	Repairment
Unit does not start		
	No power supply	Test power supply
	Broken main fuse	Replace main fuse
	Transformer fuse broken	Replace transformer fuse
	Temperature controller broken	Replace temperature controller
	Fluid temperature outside min. or max. allowable values	Testing of correct temperature setting
Fluid (water, oil) temp. too high		
	Clogged or dirty air filter	Replace air filter
	Dirty evaporator	Clean evaporator
	Dirty condensor	Clean condensor
	Refrigerant leakage (bubbles in sight glass)	Repairement only by refrigeration specialist
	Temp.controller setting incorrect	Re-adjustment of temp. controller
	Water level in tank too low	Testing of waterlevel refilling of tank
	Ambient temp. too high	Refer to technical specification or chapter 3
	Consumer capacity too high	**Test consumer capacity and compare with chiller capacity**

6 IMPORTANT INFORMATION ON WATER QUALITY

In order to achieve a correct and trouble-free operation on your water chiller it is necessary to examine the water quality and, when necessary, carry out water treatment. Corrosion, furring and biological problems can occur in the water system.

The following information is important for the assessment of a half-open system:

- water quality
- all materials having contact with the cooling water
- max. and min. system water temperature
- requirements for water quality

1. Deionized / Demineralized / Destilled / Return Osmosis water

When using deionized, demineralized, destilled or return osmosis water it is required to add a corrosion inhibitor or glycol to the water system.

2. Fresh water/ City water / Tap water

When using fresh water, city water or tap water it is recommended to analyse the water by a specialist to minimize the risk of any chiller damage through a high chloride content. A high chloride content (>20mg/l) in the system water can cause corrosion on the stainless steel evaporator.

It is required to make use of a corrosion inhibitor as additive to the system water. We recommend the use of ***Nalco 77382 at a concentration of 5g/l in the complete water system***, unless an Inhibitor with similar characteristics is prescribed from the manufacturer.

Organic sediments and algae in the water cycle can be controlled by analysing the number of organic germs. If the number of organic germs exceeds 1000 KBE/ml, we recommend to use ***Biozid Nalco 77352 at a concentration of 100mg/l***. After 3 to 4 days it is recommended to exchange the complete system water. The chiller can operate during this period.

Evaporation leads to a concentration of minerals and chloride in the system water, especially at the surface level. The water parameters which are initially below the guide values, can increase to exceed the guideline value as a result of the evaporation. An excessive chloride content in the system water will cause corrosion on the stainless steel evaporators and stainless steel tank. We therefore recommend to regularly monitor the water quality and if necessary drain the concentrated water from the system in order to rematch the water values to the parameters as per guideline. It is recommended to exchange the water at least once or more times per year and to inspect the evaporators on regular intervals.

Water quality parameters:

ph-value:	7-9	alkality (°dH):	<1
conductivity:	<300 µS/cm	chloride content:	<20 mg/L
hardness (°dH):	<0,1	organic germs:	<1000 KBE/ml

For any further questions please contact the water specialist (S. 18)

Ignorance of the above information cancels the Manufacturers liability for subsequent damage.

6 IMPORTANT INFORMATION ON WATER QUALITY

For assistance regarding watertreatment please contact:

GERMANY
Nalco Deutschland GmbH
Ludwig-Landmann-Strasse 405
D-60486 Frankfurt am Main
Phone: 069-793-40
Fax: 069-793-4295

FRANCE
Nalco
N°5 rue Rosa Bonheur
F-59290 Wasquehal
Phone: 03 20 11 70 00
Fax: 03 20 11 70 70

EUROPE
Nalco European Operations
2342 BV Oegstgeest
P.O. Box 627, NL-2300 Leiden, The Netherlands
Phone: 31-71-524-1100
Fax: 31-71-524-1197

USA
Nalco Company
Nalco Center
1601 W. Diehl Road
Naperville, IL 60563-1198 U.S.A.
Phone: 630-305-1000
Fax: 630-305-2900

SOUTH AMERICA
Nalco Latin America Operations
Av. Das Nacoes Unidas
17.891, 11o, Andar
Santo Amaro 04795-100
Sao Paulo, Brazil
Phone: 55-11-5644-6500
Fax: 55-11-5641-7687

ASIA
2 International Business
2-20 The Stategy Tower 2
Singapore 609930
Phone: 0065 (0) 68 61 40 11
Fax: 0065 (0) 68 61 40 11

7 PLATE HEAT EXCHANGER (OPTION)

Cleaning of plate exchanger

Soldered heat exchanger: For the removal of lime- and rust deposits, purifying agent SWEPcip AS, RS, CS or S (according to material) is suitable. Cleaning may be performed by means of SWEP cleaning device C.I.P 90 (circulation method) or a stationary pump.

Screwed heat-exchanger: In this case the heat exchanger can also be disassembled for cleaning.

Steel	Lime	Rust	Lime + Rust
	SWEPcip AS	SWEPcip RS	SWEPcip S
Max. Temp:	80 °C	80 °C	50 °C
Max. time:	8 h	8 h	8 h
Mixture ratio:	1:10	1:5	1:5

Stainless steel	Lime	Rust	Lime + Rust
	SWEPcip AS	SWEPcip CS	SWEPcip AS
Max. Temp:	80 °C	80 °C	80 °C
Max. time:	8 h	8 h	8 h
Mixture ratio:	1:10	1:5	1:10

See attached concept for further technical data.

8 Waste disposal

The refrigerant cycle of the chiller contains an enviroment friendly refrigeration fluid. Only registered and qualified refrigeration companies are permissible to carry out work on the chiller. Before attending any repairments or maintanance work on the refrigeration cycle the refrigerant must be recovered by means of a recovery unit. Any intention blowing off the refrigerant is prohibited. Disposal of the refrigerant and any other parts like compressor oil or waste water must be completed according to local regulations only.

Specification subject to change.

FOR YOUR NOTICE

T E C H N I C A L D A T A S H E E T

Cooler
Typ: CWK 50-S

1. GENERAL DATA

Refrigerant gas:		R134a			
Specifications:					
Nominal ambient air:	°C	37			
Coolant temperature:	°C	0	0	20	
Cooling Capacity:	W			6500	
Min ambient air:	°C	10			
Max ambient air:	°C	42			
Min coolant temperature:	°C	10			
Max coolant temperature:	°C	25			
Evaporator material:		Copper			
Temperature control:		electronic, direct			
Temperature display:		digital			
Control voltage:		24V AC			
Main Power supply:		3/PE/50/60Hz 400V/+-10%			
Total absorbed power:	kW	3.4	1.4	1.4	max: 4.9
Full load current:	A	6.4	2.8	2.8	max: 8.9
Safety fuse protection:	A	16.00			
Paint:		RAL			
Cabinet structure:		Stainless steel, not painted			

2. AIR CONDENSER: air cooled, axial

Nominal Air Flow:	m^3/h	4300.00	
Number of fan:	Unit	1	
Nom Absorbed power:	kW	0.44	
Starting current:	A	0.76	

3. COMPRESSOR: full hermetic (dome)

Number:	Unit	1	
Technology:		direct	
Total absorbed power:	kW	1.95	max: 3.50
Full load current:	A	3.60	max: 6.10

4. PUMP:

First PUMP:		horizontal centrifugal pump	
Type:		CH2-50	
Number:	Unit	1	
Total absorbed power:	kW	0.76	
Full load current:	A	1.70	
Nominal flow rate:	m^3/h	0.96	
Nominal pressure rate:	bar	4.00	

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5. LIQUID TANK:		plastic

Volume:	l	26.00
Outlet / inlet connections:	Inch	IG 3/4

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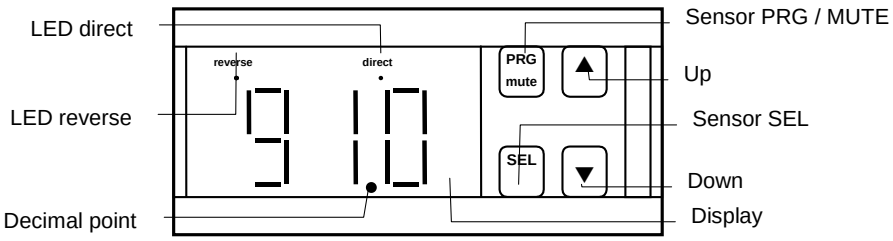
6. WEIGHT AND PHYSICAL SIZE:

Length:	mm	715
Width:	mm	715
Height:	mm	800
Weight :	kg	125

Adjustment of the water flow temperature

Set value controlled



Description of the controller

Display: During normal operation display indicates value measured by sensor. In case of alarm measured value and alarm code are indicated alternately. Parameter is indicated during programming process.
Decimal point: Indication of decimal value.
REVERSE: LED for Reverse flashes if at least one relay with this function was activated. Number of flash signals indicates number of relays activated with Reverse. Flash signals are interrupted by a pause of 2 seconds.
DIRECT: LED for Direct flashes if at least one relay with this function was activated.
SEL-key: SEL indicates and chooses set-point.
"PRG/MUTE"-key: In case of alarm signal buzzer is switched off by means of PRG/Mute-key.
"Up"-key: Use UP-key to enlarge set-point or parameter values.
"Down-key": Use DOWN- key to reduce se- point or parameter values. If measured value is indicated by sensor 1 measured value of sensor 2 (if existant) can be indicated on NTC input version by pressing Down-key.

Adjustment of controller by manufacturer

Switching stages adjusted by manufacturer:
Stage 1: Set point ST1 is set on 20° C by factory. Relay switches on cooler as soon as set temperature is exceeded.
Stage 2: Set-point ST2 is not adjusted by factory.

Indication on display

During normal operation display indicates actual values measured by sensor of medium.

Temperature adjustment of the medium

Set-point:

1. Press key SEL for approx. 5 seconds. Indicaiton Display: „ST 1"
2. Let go SEL-key. Indication Display: Set-point 1
3. Use keys UP and DOWN to adjust Set-point 1.
4. Press SEL-key. Indication Display: „ST 2"
5. Press SEL-key to return to operation mode.

Parameter	Set point	Description
ST1	20°C	Set-point: cooling Can be changed within limitations given by factory (10-40°C)
ST2		Not connected

Maximum temperature of the medium is limited on 40° C by controller.

Hysteresis: Hysteresis is set by manufacturer and must not be changed by customer.

Correction of failures

Indication	Description	Cause	Correction
Er0	Failure: Sensor	Sensor cable broken or short-circuited Connection failure Sensor defective	Check connections between sensor and thermostat Check sensor signal NTC = 10 kΩ at temperature of 25°C
Er1 (NTC)	Failure: Sensor NTC 2	As described for Er0, only for room sensor	As described for Er0, only for NTC 2
Er2	Failure : Store	Current supply interrupted during programming process (indication of alarm)	In case failure is not corrected, exchange unit
Er4	Alarm „HIGH"	Temperature of medium exceeds +42° C	Temperature of medium too high
Er5	Alarm „LOW"	Temperature of medium below + 8° C	Temperature of medium too low

Attention:
In case of failure, acoustic signal and indication of failure must be reset by means of key PRG (Annotation: indication of failure disappears only if failure is corrected). Delay of alarm (Mode 5 only) is reset automatically if reason for alarm is not given any more. Manual resetting may be required for parameters P27 (Er4 and Er5) and C29 (Er3) only (see technical instruction). In case of failure indication: Er0, Er1 and Er2 normal function of the controller is restored again as soon as the reason for failure indication is not given any more.

Elektrodokumentation
Electrical documentation

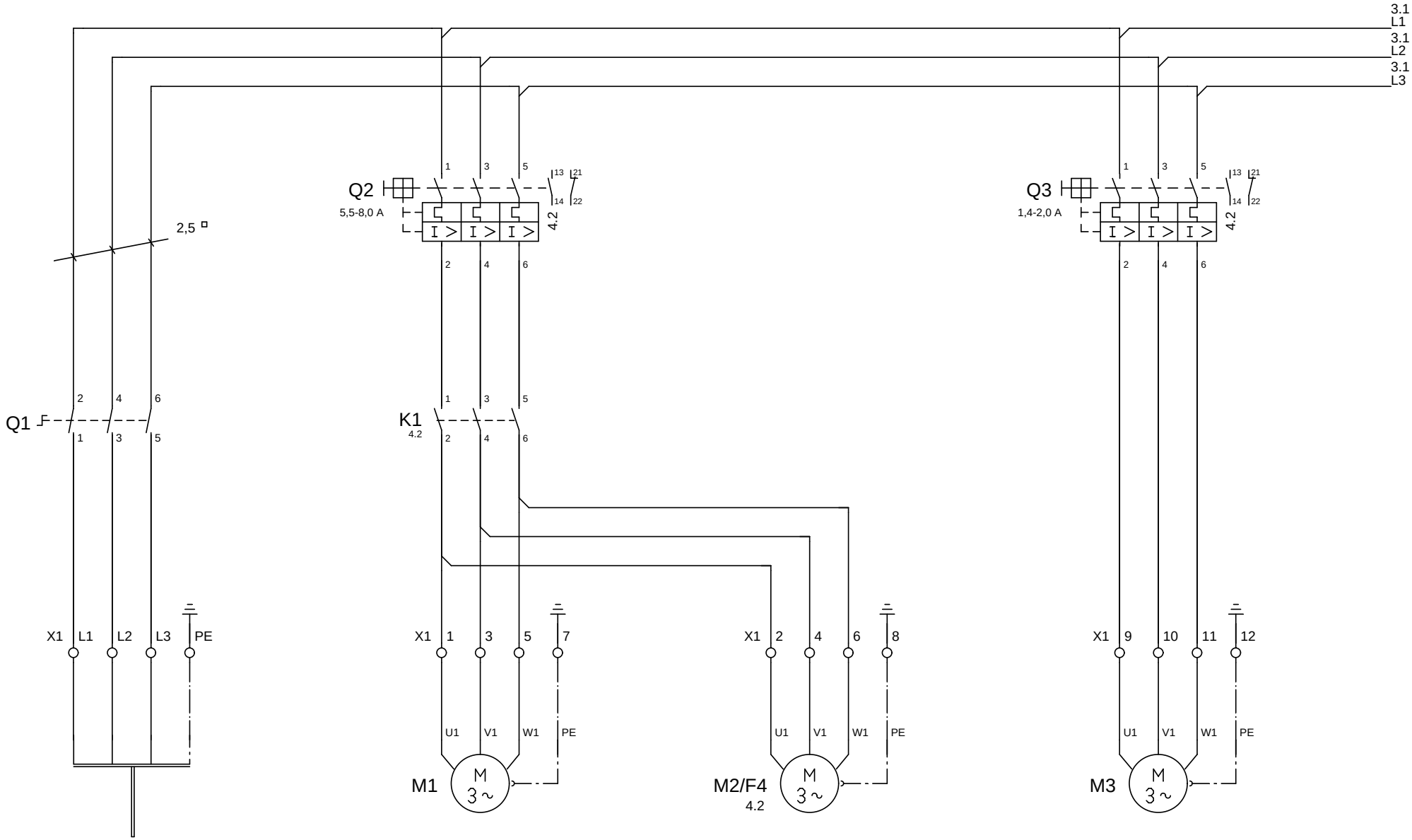
Anschlußdaten
Technical data

Maschinentyp : CWK 50-S
Type

Anschlußpannung Voltage	:	400 V +- 10 %
Frequenz frequency	:	50/60 Hz
Steuerspannung 1 control voltage 1	:	24 V AC
Steuerspannung 2 control voltage 2	:	---
Anschlußleistung Total absorb power	:	4,5 KW
Max. Betriebsstrom Full load Current	:	7,9 A
Max. Vorsicherung Safety Fuse	:	16 A

				Datum	4.4.2007			Anschlußdaten Technical data	Zeichng. Nr.	E0005322	=
				Bearb.	Bruchhof						+
				Gepr.	Lacher				Typ	CWK 50-S	Blatt 1
Zust.	Änderung	Datum	Name	Norm		Ursp.	Ers. f.	Ers. d.			von 6 Blatt

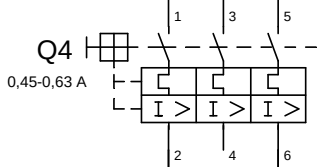
Sämtliche Leitungen ohne besondere Querschnitts-angabe sind H05V-K 1,5mm ²
all cables without numbers are H05V-K 1,5mm ²



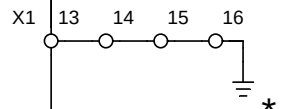
				Datum	4.4.2007			Hauptstromkreise Main circuit	Zeichng. Nr. E0005322	=
				Bearb.	Bruchhof					+
				Gepr.	Lacher				Typ CWK 50-S	Blatt 2
Zust.	Änderung	Datum	Name	Norm		Ursp.	Ers. f.	Ers. d.		von 6 Blatt

Sämtliche Leitungen ohne besondere Querschnitts-angabe sind H05V-K 1,5mm ²
all cables without numbers are H05V-K 1,5mm ²

2.8
L1
2.8
L2
2.8
L3



T1/F1



Bei Entfernung dieser PE-Verbindung
wird Isolationsüberwachung erforderlich.
With removal of PE-connection
you need an isolation control

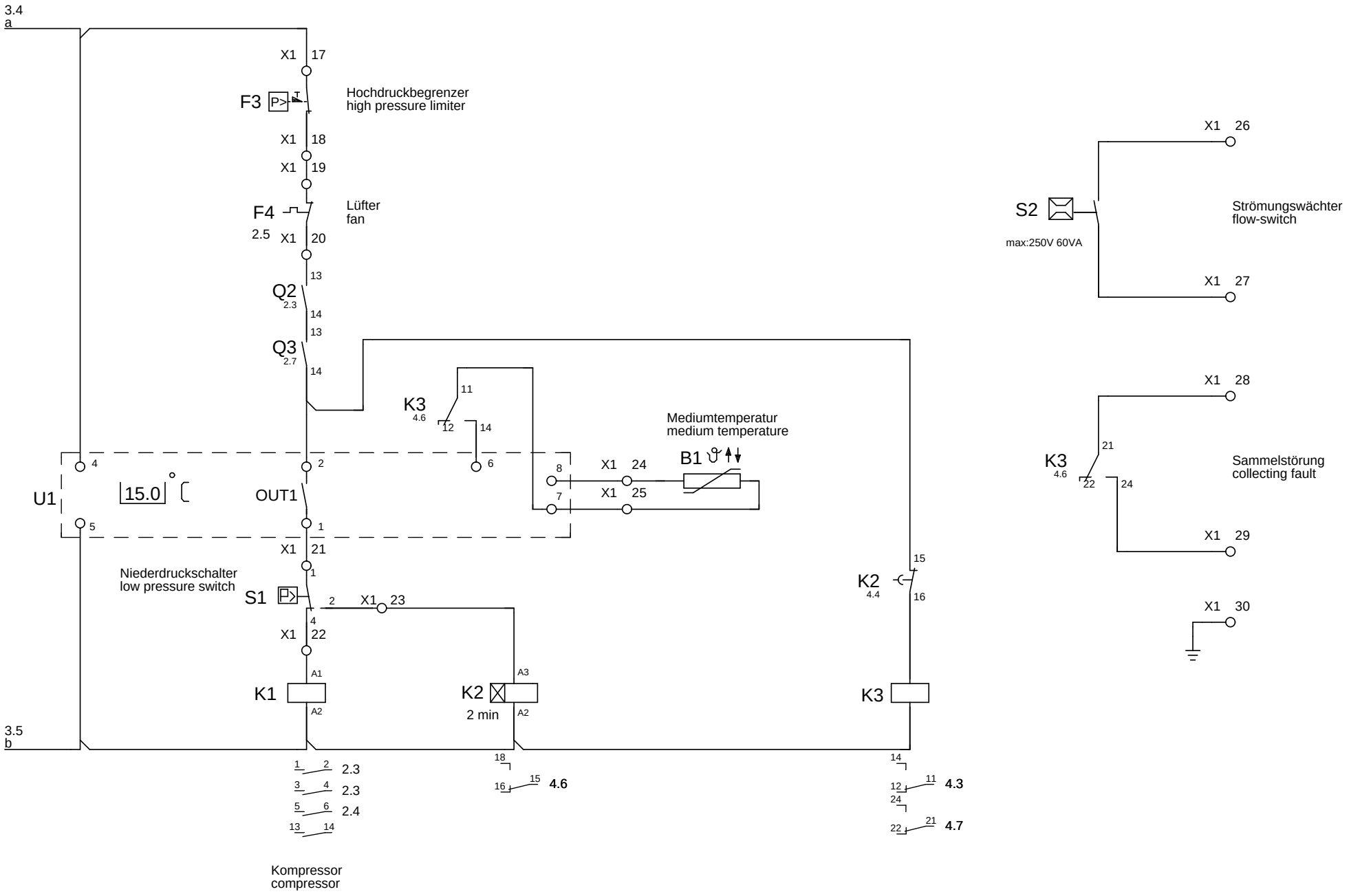
4.1
a

4.1
b

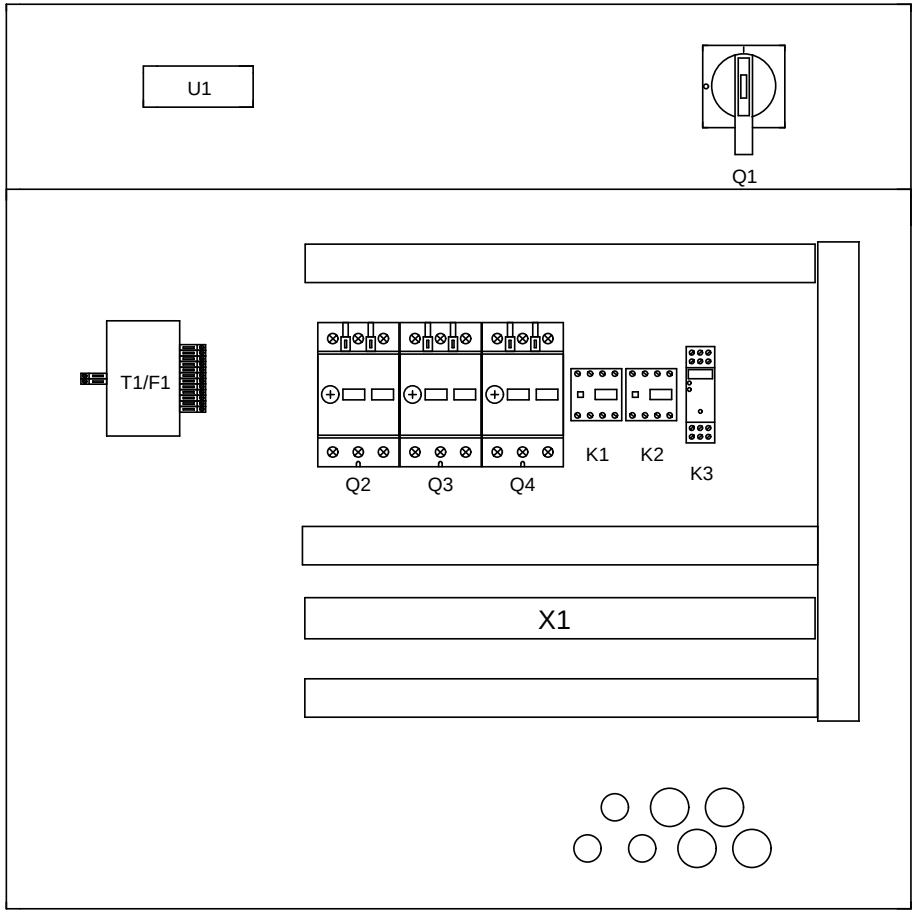
Steuerspannung
control voltage

				Datum	4.4.2007			Steuerspannung control voltage	Zeichng. Nr. E0005322	=
				Bearb.	Bruchhof					+
				Gepr.	Lacher				Typ CWK 50-S	Blatt 3 von 6 Blatt
Zust.	Änderung	Datum	Name	Norm		Ursp.	Ers. f.	Ers. d.		

Sämtliche Leitungen ohne besondere Querschnitts-angabe sind H05V-K 1,0mm ²
all cables without numbers are H05V-K 1,0mm ²



				Datum	4.4.2007			Steuerstromkreise Control circuit	Zeichng. Nr. E0005322	=
				Bearb.	Bruchhof					+
				Gepr.	Lacher				Typ CWK 50-S	Blatt 4
Zust.	Änderung	Datum	Name	Norm		Ursp.	Ers. f.	Ers. d.		von 6 Blatt



				Datum	4.4.2007			Schaltschrankaufbau Switch-box structure	Zeichng. Nr.	E0005322	=
				Bearb.	Bruchhof						+
				Gepr.	Lacher				Typ	CWK 50-S	Blatt 5
Zust.	Änderung	Datum	Name	Norm		Ursp.	Ers. f.	Ers. d.			von 6 Blatt

Pos. pos.	Seite page	Bez. Label	Benennung designation	Typ type	Hersteller manufacturer	Artikelnummer Part number
1	4	B1	Fühler sensor	NTC 030WP00, 3,0m Kabel, IP 67	CAREL	10197
2	4	F3	Hochdruckbegrenzer high pressure limiter	ACB 061F9502 29 bar / 24 bar	Danfoss GmbH	28124
3	4	K1	Schütz contactor	3RT10 16-1AB01 S00 24 V AC	SIEMENS	10481
4	4	K2	Zeitrelais Time delay	3RP2025-1AP30	SIEMENS	12483
5	4	K3	Schütz contactor	RCL 424524 , 2 Wechsler 24 V AC	Weidmüller GmbH & Co KG	10346
6	4	K3	Schütz contactor	SRC 2CO , Relaissockel	Weidmüller GmbH & Co KG	10366
7	2	M1	Kompressor compressor	ZR34, K3E, TFD 522	Copeland	10275..
8	2	M2/F4	Lüfter fan	FL050-VDK.4I.6S Art.Nr.132 503	Ziehl-Abegg AG	30416
9	2	M3	Pumpe pump	CH2-50, 3x400V 50/60Hz	GRUNDFOS GmbH	33422
10	2	Q1	Hauptschalter main-switch	H226-41300-033, N1	Sälzer GmbH	12395
11	2	Q2	Motorschutzschalter circuit-breaker	3RV10 11-1HA10 S00 5,5-8,0 A	SIEMENS	10412
12	2	Q3	Motorschutzschalter circuit-breaker	3RV10 11-1BA10 S00 1,4-2,0 A	SIEMENS	10404
13	3	Q4	Motorschutzschalter circuit-breaker	3RV10 11-0GA10 S00 0,45-0,63 A	SIEMENS	12419
14	4	S1	Niederdruckschalter low pressure switch	PS3-AF1, HNS 0,3/1,8 bar	ALCO	18891
15	4	S2	Strömungswächter flow-switch	MR1K-020GM010 , 1-10 l/min	Honsberg & Co. KG	24526
16	3	T1/F1	Transformator transformer	400/24V, AC, 63VA, +/-5%	TEK	10517
17	4	U1	Thermostat thermostat	IR32 W00 H11, 2-stufig, 12-24V AC/DC	CAREL	10515
18	2	zu Q2	Hilfsschalter auxiliary switch	3RV19 01-1E	SIEMENS	10395
19	2	zu Q3	Hilfsschalter auxiliary switch	3RV19 01-1E	SIEMENS	10395

				Datum	4.4.2007			Stückliste Bill of Materials	Zeichng. Nr.	E0005322	=
				Bearb.	Bruchhof						+
				Gepr.	Lacher				Typ	CWK 50-S	Blatt 6
Zust.	Änderung	Datum	Name	Norm		Ursp.	Ers. f.	Ers. d.			von 6 Blatt

PRODUKT-ÜBERSICHT

O V E R V I E W

P R O S P E C T U S