

## Table of Content 862504001

<b>1. User manual</b>	2
<b>2. Legal regulations</b>	3
<b>3. Safety instructions</b>	4
<b>4. Functional principle</b>	5
<b>5. Technical data</b>	6
<b>6. Performance graph</b>	7
<b>7. Mounting</b>	8
<b>8. Mounting Principle</b>	12
<b>9. Cut Out Dimension</b>	13
<b>10. Electrical Connection</b>	14
<b>11. Controller</b>	16
<b>12. Wiring Diagram</b>	20
<b>13. Taking into Operation</b>	21
<b>14. Trouble Shooting</b>	22
<b>15. Maintenance &amp; Cleaning</b>	23
<b>16. Transport &amp; Storage</b>	24
<b>17. Parts supplied / Spare parts / Accessories</b>	25



# 1. User manual

This instruction manual contains information and instructions to enable the user to work safely, correctly and economically on the unit. Understanding and adhering to the manual can help one:

- Avoid any dangers.
- Reduce repair costs and stoppages.
- Extend and improve the reliability and working life of the unit.

**PLEASE ENSURE TO USE THE RIGHT VERSION OF THE INSTRUCTION MANUAL SUITABLE FOR YOUR UNIT.**

## Intended use

The unit is to be used exclusively for the dissipation of heat from control cabinets and enclosures (stationary, not moving) in order to protect temperature sensitive components in an industrial environment. To meet the conditions of use, all the information and instructions in the instruction manual must be adhered to.



### General danger

Indicates compulsory safety regulations which are not covered by a specific pictogram such as one of the following.



### High electric voltage

Indicates electric shock danger.



### Important safety instruction

Indicates instructions for safe maintenance and operation of the unit.



### Attention

Indicates possible burns from hot components.



### Attention

Indicates possible damage to the unit.



### Instruction

Indicates possible danger to the environment.

## 2. Legal regulations

### Liability

The information, data and instructions contained in this instruction manual are current at the time of going to press. We reserve the right to make technical changes to the unit in the course of its development. Therefore, no claims can be accepted for previously delivered units based on the information, diagrams or descriptions contained in this manual. No liability can be accepted for damage and production caused by:

- Disregarding the instruction manual
- Operating error
- Inappropriate work on or with the unit
- The use of non-specified spare parts and accessories
- Unauthorised modifications or changes to the unit by the user or his personnel

The supplier is only liable for errors and omissions as outlined in the guarantee conditions contained in the main contractual agreement. Claims for damages on any grounds are excluded.

### 3. Safety instructions

Upon delivery the unit is already meeting current technical standards and can therefore be safely taken into operation. Only authorised personnel is allowed to work on the unit. Unauthorised personnel must be prohibited from working on the unit. Operating personnel must inform their superiors immediately of any malfunction of the unit.

Please note that before starting to work on or with the unit, a procedure must be carried out inside the cabinet on which the unit is to be mounted.

Before commencing work inside the cabinet, the control cabinet manufacturer's instruction must be read with regards to:

- Safety instructions.
- Instructions on taking the cabinet out of operation.
- Instructions on the prevention of unauthorised cabinet reconnection.

The electric equipment meets the valid safety regulations. One can find dangerous voltages (above 50 V AC or above 100 V DC)

- Behind the control cabinet doors.
- On the power supply in the unit housing.

The unit has to be operated according to the type plate and the wiring diagram, and must be protected externally from overloading and electrical faults via suitable protective devices.



#### **Danger through incorrect work on the unit**

The unit can only be installed and maintained by technical competent and qualified personnel, using only supplied material according to the supplied instructions.



#### **Danger from electrical voltage**

Only specialised personnel are allowed to maintain and clean the unit. The personnel must ensure that for the duration of the maintenance and cleaning, the unit is disconnected from the electrical supply.



#### **Attention**

Damage to the unit through the use of inappropriate cleaning materials. Please do not use aggressive cleaning material.



#### **Instruction**

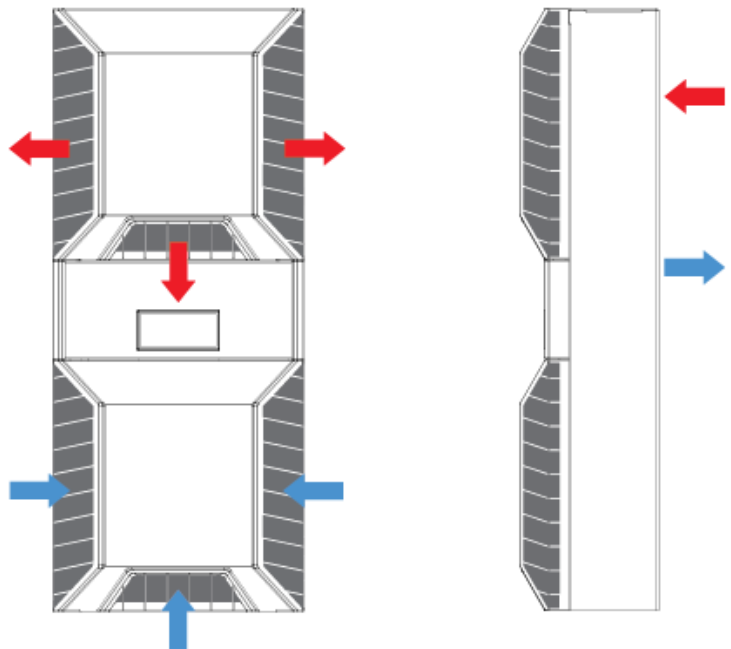
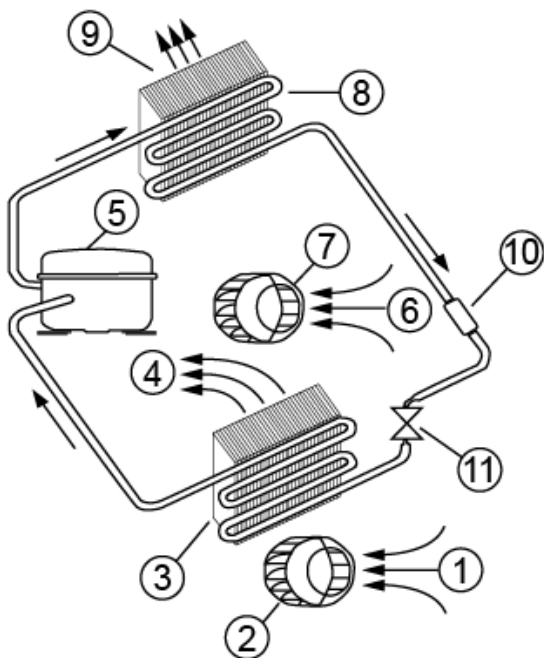
Damage to the environment through unauthorised disposal. All spare parts and associated material must be disposed according to the environmental laws.

## 4. Functional principle

The cooling unit for enclosures works on the basis of a refrigeration circuit consisting of four main components: compressor, evaporator, condenser and expansion device.

The circuit is hermetically sealed and R134a refrigerant circulates inside it (R134a is chlorine free and has an Ozone Destruction Potential [ODP] of 0 and a Global Warming Potential [GWP] of 1430). The compressor compresses the refrigerant (thus taking it to high pressure and high temperature), and pushes it through the condenser, where it is cooled by ambient air thus passing from the gas to the liquid state. At the liquid state it then passes through the capillary pipe being a much lower pressure the refrigerant arrives to the evaporator where it absorbs the necessary heat to change from liquid to gas state. The gas is then drawn back into the compressor completing the cycle.

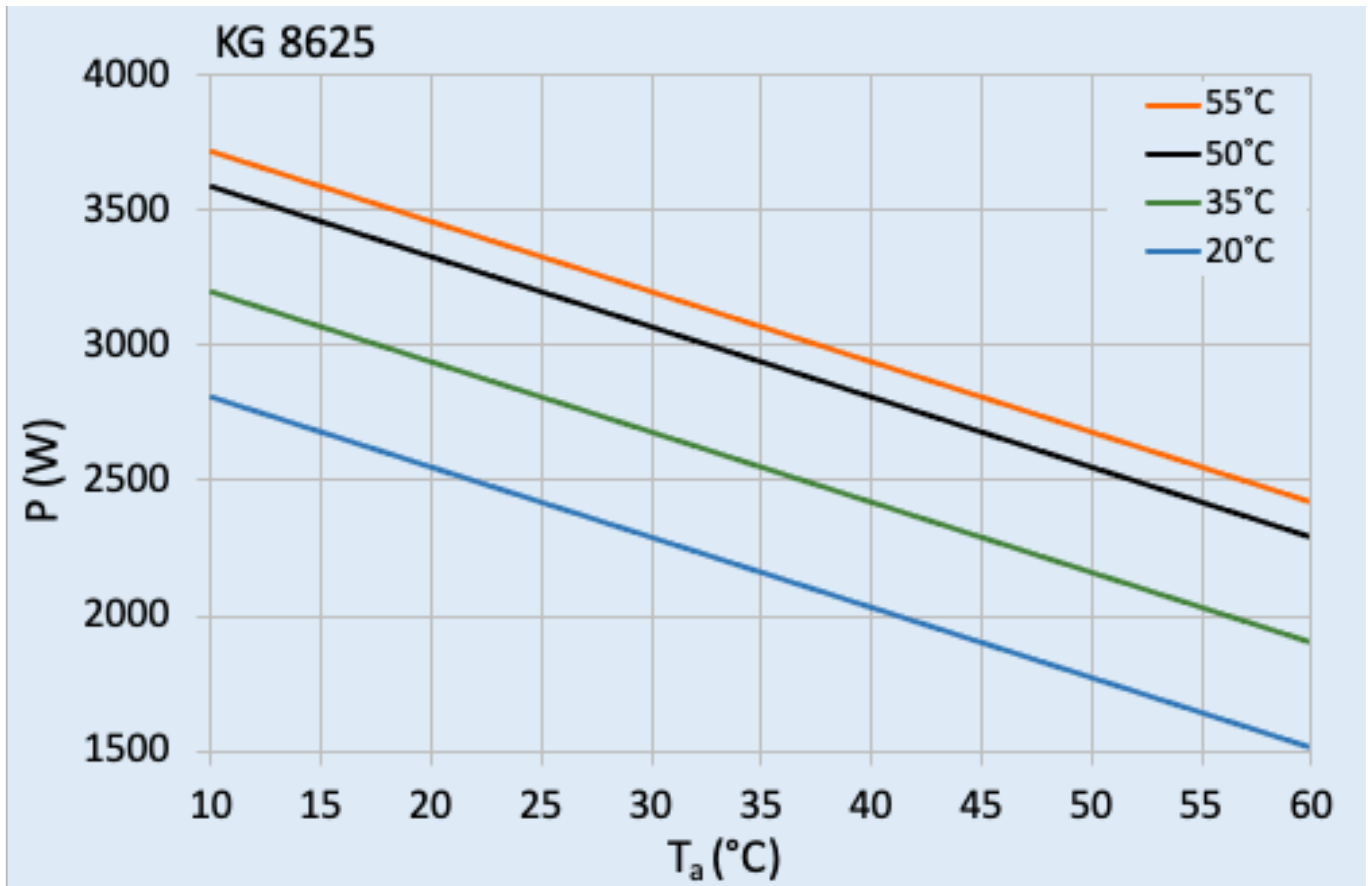
- |                           |                           |
|---------------------------|---------------------------|
| 1 Air intake cabinet side | 6 Air intake ambient side |
| 2 Radial fan cabinet side | 7 Air intake ambient side |
| 3 Evaporator              | 8 Condenser               |
| 4 Air outlet cabinet side | 9 Air outlet ambient side |
| 5 Compressor              | 10 Filter dryer           |
|                           | 11 Expansion device       |



## 5. Technical data

<b>Order Number</b>	862504001
<b>Cooling capacity L35L35 (EN14511-3)</b>	2550 W
<b>Cooling capacity L35L50 (EN14511-3)</b>	2160 W
<b>Compressor type</b>	BLDC Rotary Piston
<b>Refrigerant / GWP</b>	R134a / 1430
<b>Refrigerant charge</b>	368 g / 13 oz.
<b>High / low Pressure</b>	30 / 6 bar 435 / 88 psig
<b>Operating Temperature Range</b>	10°C - 60°C
<b>UL temperature range</b>	10°C - 60°C
<b>Air flow volume (system / unimpeded)</b>	Ambient air circuit: 680 / 1200 m <sup>3</sup> /h Cabinet air circuit: 500 / 850 m <sup>3</sup> /h
<b>Mounting</b>	Wall mounted / Recessed
<b>Housing Material</b>	Mild steel, powder coated
<b>Dimensions A x B x C (D+E)</b>	1,350 x 395 x 210 (55+155) mm
<b>Weight</b>	45 kg
<b>Cut out dimensions</b>	1315 x 365mm
<b>Voltage / Frequency</b>	115-250 V ~ 50/60 Hz
<b>UL Voltage / Frequency</b>	120-230V 60Hz
<b>Current L35L35</b>	9.2 A / 4.6 A
<b>Starting current</b>	16 A / 8 A
<b>Max. current</b>	12.6 A / 6.3 A
<b>Nominal power L35L35</b>	1.02 kW
<b>Max. power</b>	1.42 kW
<b>Fuse</b>	24 A (T) / 12 A (T)
<b>Short-circuit current rating</b>	5 kA
<b>Rated current compressor</b>	1.83 A
<b>Full load current fans</b>	1.4 A
<b>Connection</b>	5 pole terminal for signals 4 pole terminal for power 3 pole terminal block for RS 485 Modbus
<b>Ingress Protection</b>	IP 54 / Type 12
<b>Approvals</b>	CE, cURus, cULus

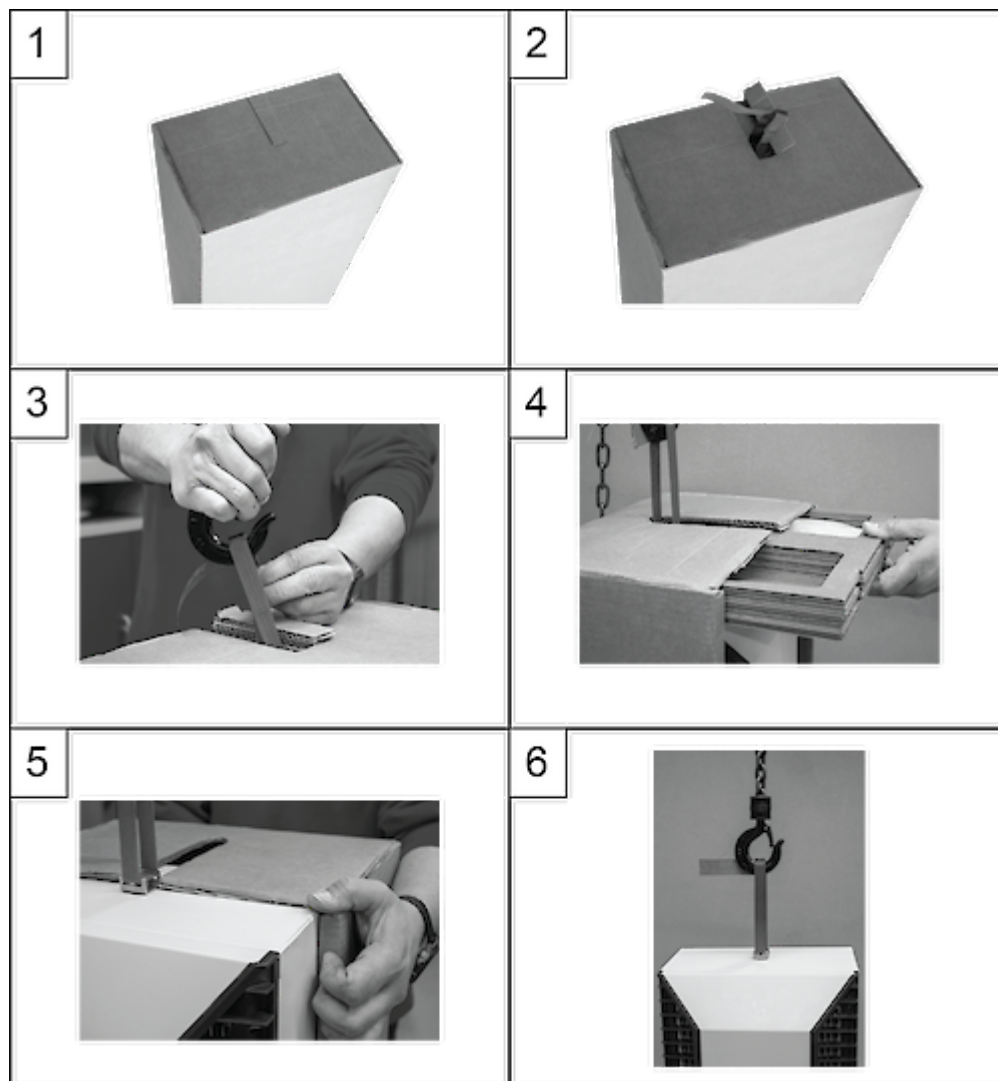
## 6. Performance graph



## 7. Mounting

### Unpacking unit:

Please follow the below steps to unpack the unit.



#### STEP 1:

Stand the cooling unit upright with the pre-cut packaging opening facing up.

#### STEP 2:

Pull off the packaging opening.

#### STEP 3:

Hang the transport loop of the unit in the transport hook and lift it slightly.

#### STEP 4:

Pull off the packaging and slide out the tray with installation material and the short version of the operating manual.

#### STEP 5:

Pull off the remaining packaging.

#### STEP 6:

The cooling unit can now be attached to the enclosure.



## Mounting:



*The power supply rating on unit rating plate must comply with mains rating.*



*Always disconnect the power supply before opening the unit.*

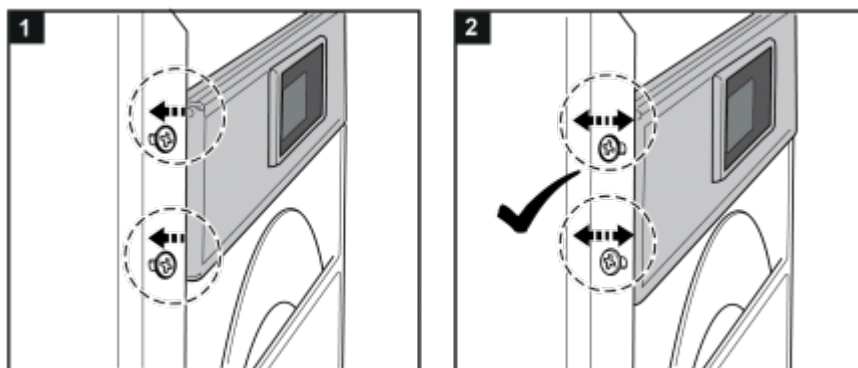
The heat load to be dissipated from enclosure should not exceed specific cooling output of the unit at any condition. At cooling unit selection always cater for a safety margin of at least 15% extra cooling output in the worst conditions.

Air inlets and outlets must be completely free from obstruction. Ensure that flows of air leaving and entering the cooling unit, internal and external, are not obstructed. It must also be ensured in accordance with UL, that the air outlet is not blowing air directly at an equipment operator. Should this be the case a barrier or duct shall be provided to redirect the airflow.

Cooling unit enclosure air suction hole must be installed in the highest possible point.

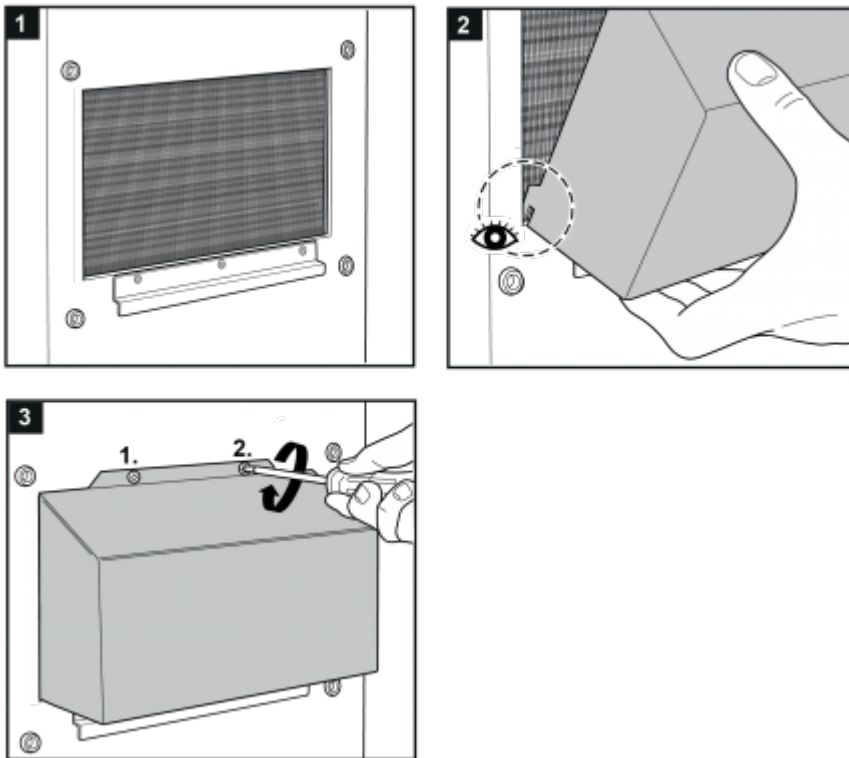
When installing the unit on a door ensure it can take the weight. Before drilling the enclosure ensure the fixing elements and couplings will not interfere with the equipment inside the enclosure itself. Disconnect power before starting any work inside the enclosure.

If the unit is mounted in a recessed position, the controller bracket can be pulled according to the wall thickness of the enclosure outwards as per steps below.



### Cold air outlet duct:

When using a cold air outlet duct please follow the steps below.



### Filter installation:

If you install / replace a filter please follow the steps below.



**Condensate management:**

High humidity and low temperatures inside the enclosure can lead to condensation on the evaporator. Condensate that flows back into the enclosure can damage sensitive control electronics. The integrated condensate evaporation of the cooling unit releases the condensate to the environment.

If too much condensation forms, the condensation is drained out of the cooling unit from the front through the lower gill grilles. If this hose is removed, the cleaning drain **MUST** be open (see also point 13. Maintenance & Cleaning).

In order to prevent the formation of excessive condensate, you should nevertheless:

- check the seals on regular intervals
- consider installing a door contact switch (order no. 3100001). This will prevent condensation forming when enclosure door is left open.

## 8. Mounting Principle



### NOTES:

- Do not use within the first 15 minutes after installation!
- Use only the supplied mounting hardware.
- Tighten Screws to 4.5 Nm.
- Ensure the mounting surface does not warp after assembly and reinforce it if necessary.

- 1 M6 screws
- 2 M6 toothed washers
- 3 M6 flat washers
- 4 Enclosure
- 5 Mounting gasket
- 6 Lifting sling
- 7 Cover
- 8 M4 screws

Fig. 1 Recessed

Fig. 2 External

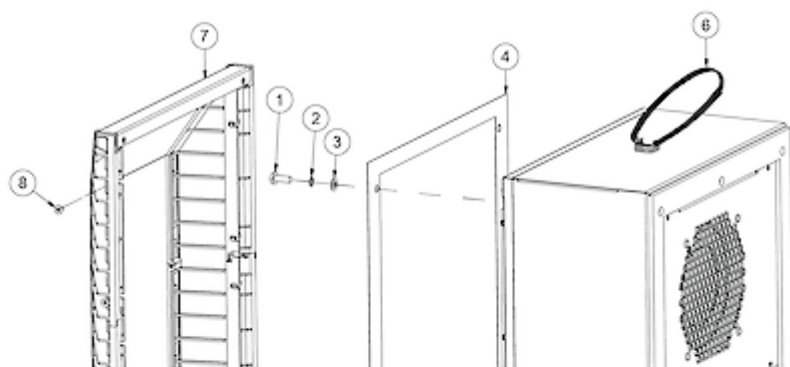


Fig. 1

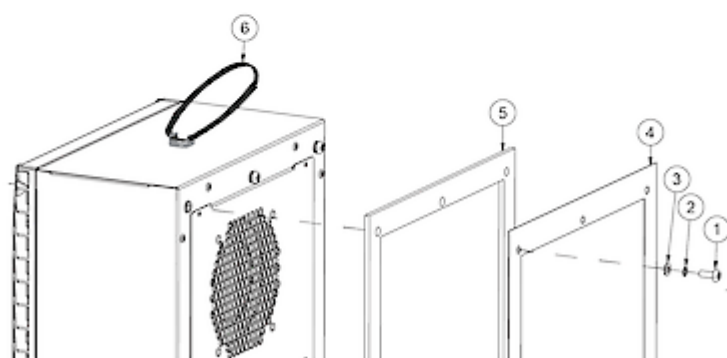


Fig. 2



## 10. Electrical Connection



*Caution, risk of death*

*Unconnected and / or faulty protective conductor systems can lead to dangerous voltages and electric shocks which can cause serious accidents.*

*Work on electrical connections may only be carried out by trained electrical engineers.*

### **Alarm Contacts**

Alarm contacts rated according to:

EN60730-1 8(4)A N.O., 6(4)A N.C., 2(2)A N.O./ N.C. @ 250Vac 100000 cycles

UL 873 8A resistive 2FLA 12LRA, pilot duty C300 @ 250Vac 30000 cycles

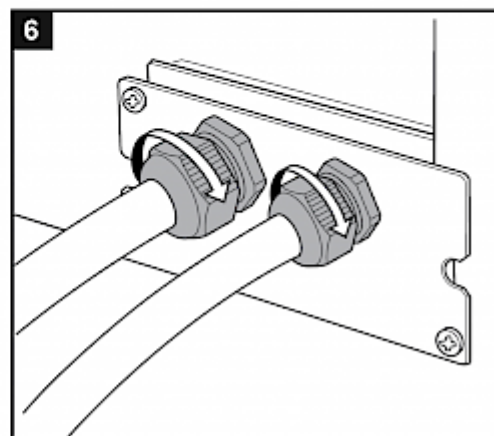
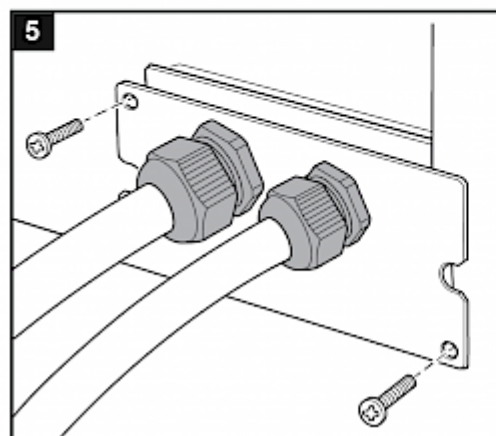
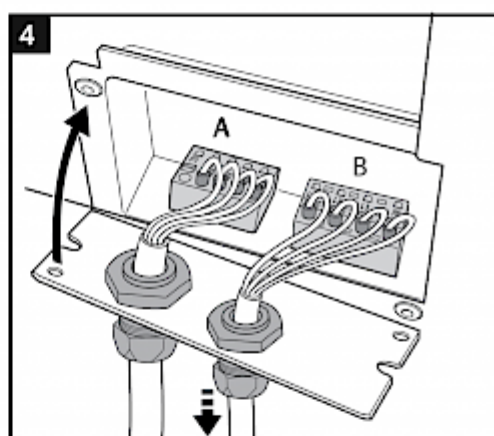
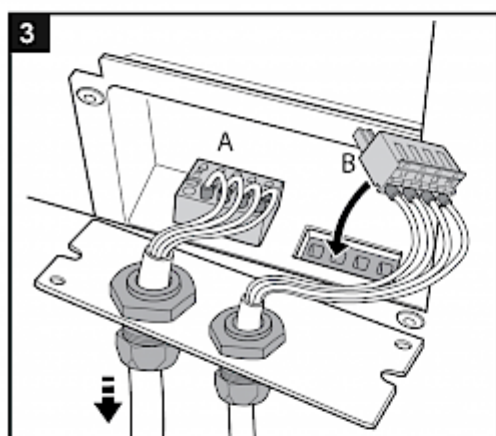
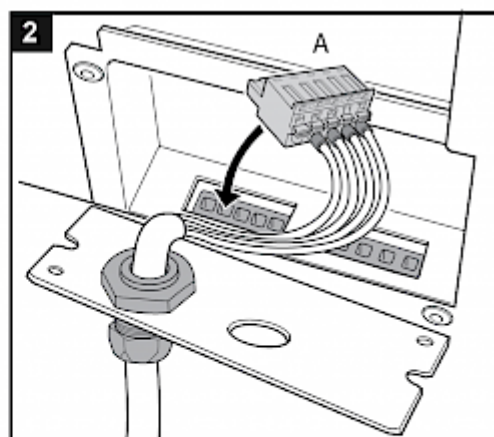
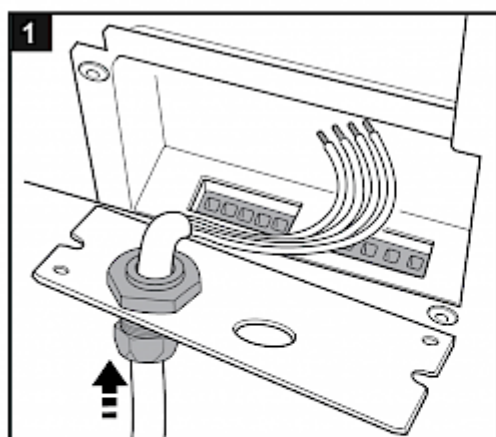
These contacts are not suitable for fluorescent loads (neon lights, etc.) that use starters (ballasts) with phase shifting capacitors. Fluorescent lamps with electronic controllers or without phase shifting capacitors can be used, depending on the operating limits specified for each type of relay.

### **SCCR**

Refer to *UL508A Supplement SB* and *Seifert Systems' document [Short Circuit Current Rating \(SCCR\)](#)* on methods how to modify the available short circuit current within a circuit in the panel.

### **Connect unit:**

Connect the cooling device according to the instructions below. The cable cross-section must correspond to the required power for the current consumption, but max. 2.5 mm<sup>2</sup> / AWG 14.



## 11. Controller

The display is used to

- Control / Alarm Set Point Settings
- Temperature Readings
- Alarm Readings



The main menu will display the following by default

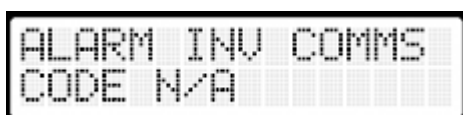


**TEMP READINGS:** temperature readings and alarm display

**TEMP SETPOINTS:** to change set points by pressing **UP** or **DOWN** button and **SET** to choose an option



**TEMP READINGS** showing the temperature readings and any alarms. Each alarm will be shown by flashing every few seconds.



The example is showing a communication loss with the inverter alarm.

Press **MENU** to return to the main menu.

### List of possible alarms which generate an alarm condition

ALARM COMPRESSOR	
ALARM INT BLOWER	
ALARM AMB BLOWER	
ALARM HIGH TEMP	High Temperature Alarm
ALARM INV COMMS	No Communication with Inverter Alarm
ALARM SENS FAIL	Temperature Sensor Fail Alarm
ALARM LOW TEMP	Low Temperature Alarm
ALARM CONT COMMS	No Communication with Main Controller Alarm

### List of possible warnings which do not generate an alarm condition

WARNG COMPRESSOR
WARNG INT BLOWER



## List of possible alarms which generate an alarm condition

WARNG AMB BLOWER

DOOR CONTACT                      Door Contact Open

In case the inverter issues an alarm on any of the motors, the system switches off the respective motor and tries to restart it after 2 minutes. At this stage, the display shows only a **Warning**. If after 3 consecutive restarts, the motors still do not start, then the display shows an **Alarm**.





**TEMP SETPOINT** screen: showing which set point to view / modify. All screens are shown here

SETPOINT CONTR Control Set Point

SETPOINT ALR H High Alarm Set Point


SETPOINT ALR L Low Alarm Set Point

SETPOINT HEAT Heater Set Point

SETPOINT SEL Select between Modbus / Display, set points or Onboard Potentiometer

TEMP SEL Select between Celsius or Fahrenheit.

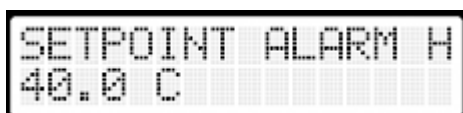
Press **MENU** to return to the main menu.



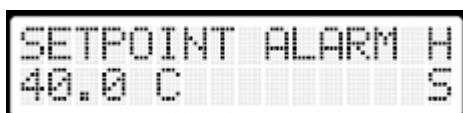
**SETPOINT CONTR:** showing control set point. Temperature can be modified using the **UP** or **DOWN** buttons.



To save the new temperature, press the **SET** button, and an **S** will be shown in the display. Press **MENU** to return to the **TEMP SETPOINTS** screen



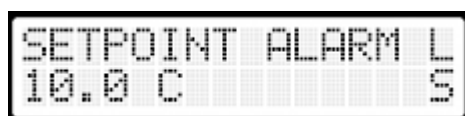
**SETPOINT ALARM H:** showing high alarm set point. Temperature can be modified using the **UP** or **DOWN** buttons.



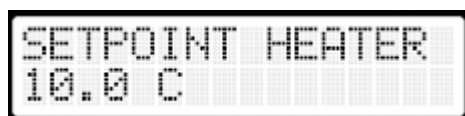
To save the new temperature, press the **SET** button, and an **S** will be shown in the display. Press **MENU** to return to the **TEMP SETPOINTS** screen.



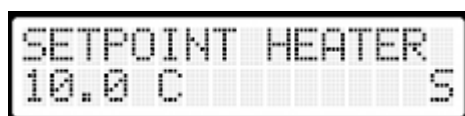
**SETPOINT ALARM L:** showing low alarm set point. Temperature can be modified using the **UP** or **DOWN** buttons.



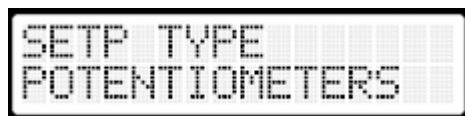
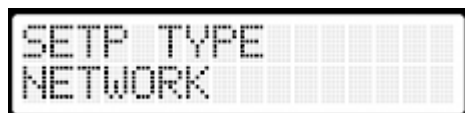
To save the new temperature, press the **SET** button, and an **S** will be shown in the display. Press **MENU** to return to the **TEMP SETPOINTS** screen.



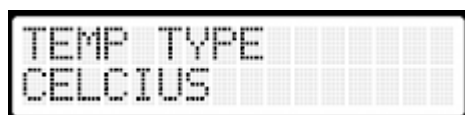
**SETPOINT HEATER:** showing low alarm set point. Temperature can be modified using the **UP** or **DOWN** buttons.



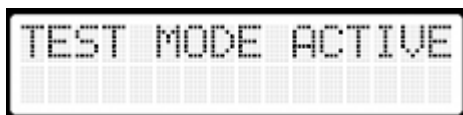
To save the new temperature, press the **SET** button, and an **S** will be shown in the display. Press **MENU** to return to the **TEMP SETPOINTS** screen.



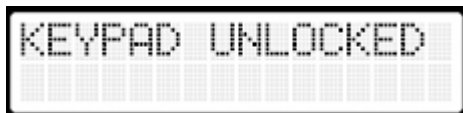
**SETPOINT TYPE:** showing which set point type is chosen. Set point type can be modified using the **UP** or **DOWN** buttons. To save the new set point type press the **SET** button, and an **S** will be shown in the display. Press **MENU** to return to the **TEMP SETPOINTS** screen



**TEMP TYPE:** showing which temperature type is chosen. Temp Type can be modified using the **UP** or **DOWN** buttons. To save the new temp type press the **SET** button, and an **S** will be shown in the display. Press **MENU** to return to the **TEMP SETPOINTS** screen



To activate Test Mode, press the **UP** and **DOWN** buttons for 3 seconds while in the Main Menu. A notification will be shown that the unit has gone into Test Mode. This notification is only displayed for a few seconds.



The set point / settings modification feature can be Locked / Unlocked from Modbus or from the Display itself. Locking or Unlocking the set point / setting modification can be done with the following sequence:

**MENU - UP - SET - DOWN - MENU**

This sequence can be executed only when in the main menu (TEMP READINGS / TEMP SETPOINTS screen). Each button needs to be pressed for at least 2 seconds and the total sequence need to be done in 20 seconds.



When entering the sequence, the display shows that the sequence is being registered if after pressing the second button, TEMP SETPOINTS is followed by a dot, as in the image shown above.

### RS 485 Modbus Interface

Modbus is a serial protocol used for communication between a Master and a number of Slave Devices. The master requests information from the slaves by specifying the slave address, a read or write command and which register address it will read from or write to. Modbus can read or write a single register or multiple registers at the same time.

You can download the Modbus settings from [here](#) or

[https://www.seifertsystems.com/site/assets/files/6903/rdtg2001-0\\_1\\_-\\_generic\\_modbus\\_table.pdf](https://www.seifertsystems.com/site/assets/files/6903/rdtg2001-0_1_-_generic_modbus_table.pdf)

## 12. Wiring Diagram

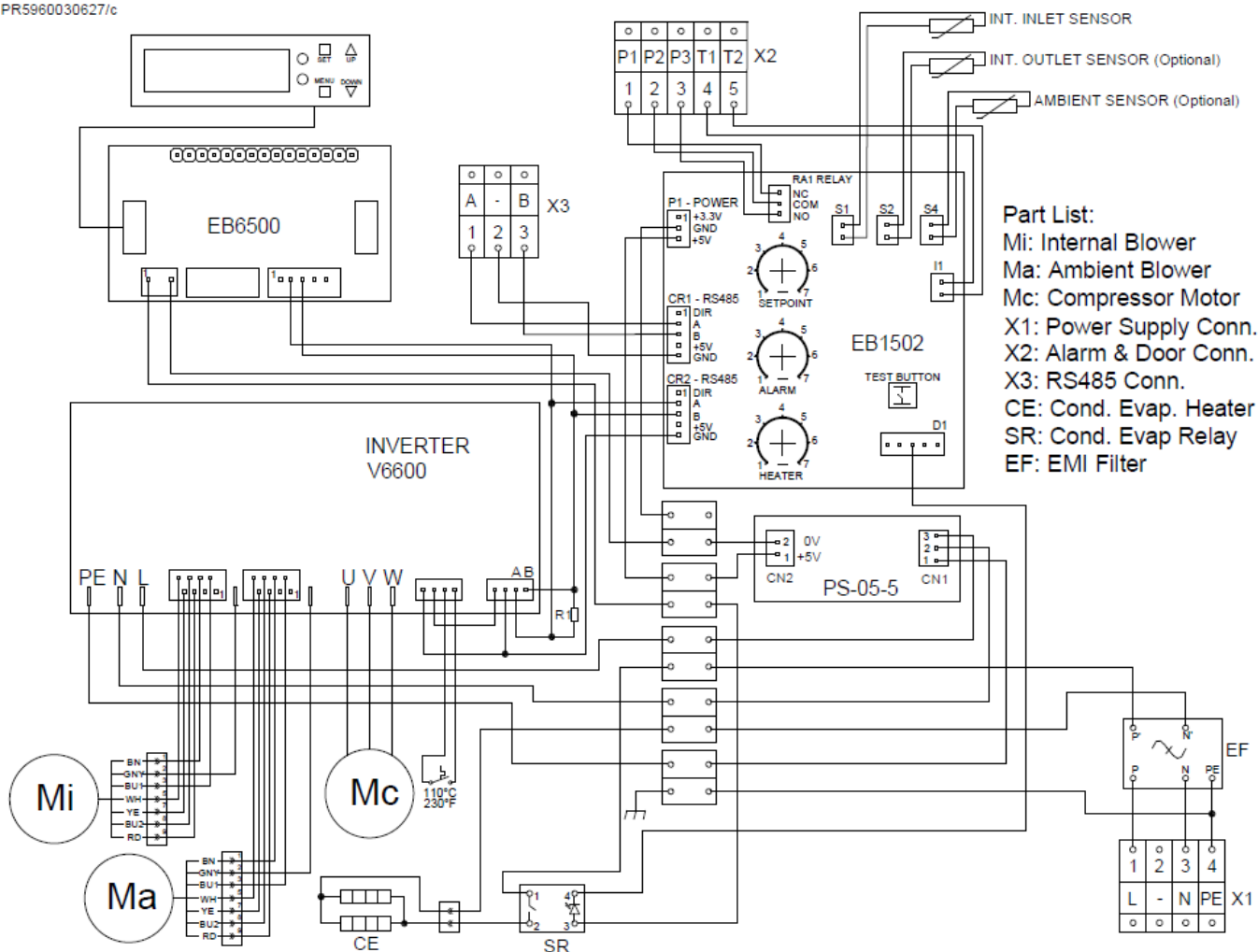
Power connector

- 1 L1
- 2 /
- 3 N
- 4 PE

Signal connector

- 1 Alarm (NC)
- 2 Alarm (COM)
- 3 Alarm (NO)
- 4 Door contact
- 5 Door contact

PR5960030627/c



## 13. Taking into Operation

### **Attention!**

The unit can be damaged by lack of lubricant. To ensure that the compressor is adequately lubricated the oil, which has been displaced during transport, must be allowed to flow back into it. The unit must therefore be allowed to stand for at least 30 min. before being connected to the mains and taken into operation.

The unit / system must be protected with a MCB Type D or K. Upon connection the internal fan will start working. If the temperature inside the enclosure is higher than the set value of the controller both the compressor and external air fan start working. The cooling cycle will either stop once the air inside the enclosure reaches the set temperature minus hysteresis or once the minimum On-time is reached. The setpoint for the internal enclosure temperature is pre-set at 35°C.

The hysteresis is 5K, the minimum ON-time is 2 minutes, the minimum OFF-time is 4 minutes.

## 14. Trouble Shooting

Failure	Reason	Troubleshooting
<i>Unit doesn't start</i>	No power supply	Check the electrical connection
	Cabinet temperature is lower than set point	Wait until the set point is reached. The unit will then start automatically. If the set point of the cabinet temperature is too high, reduce it accordingly.
	Door contact is open	Close the cabinet door or bridge the door contact.
<i>Unit doesn't cool</i>	Compressor is faulty	Please get in contact with one of our service partners.
	The circuit breaker of the compressor got activated	Check the cooling capacity. In case the cooling capacity is too small, install the unit at a different place or add another cooling unit.
	The evaporator and / or condenser are extremely dirty.	Evaporator and /or condenser need cleaning
<i>Evaporator is iced up</i>	Not enough refrigerant due to leaking cooling circuit	Refill refrigerant and re-seal cooling circuit. Please contact the manufacturer.
	Ambient temperature is much lower than the stated operating temperature range	Install the unit at a different place. The ambient temperature must be within the stated operating temperature range.
	The control cabinet is not sealed properly.	The control cabinet needs re-sealing.
	Fan or fan capacitor on the cold side are faulty	Replace fan and/or fan capacitor.
<i>Too much condensate</i>	Cabinet door not closed	Ensure that cabinet door is closed properly
	The cabinet is not sealed properly	The control cabinet needs re-sealing.
	Incomplete gasket between cooling unit and cabinet	Please check gasket
<i>Uneven air circulation inside the cabinet</i>	Cabinet air intake and air outlet are blocked	Ensure that both are unblocked and that air can circulate
	Cabinet volume too big for this cooling unit	Check the cooling capacity. In case the cooling capacity is too small, install the unit at a different place or add another cooling unit.
<i>Condenser fan doesn't work</i>	Fan is faulty	Replace fan
<i>Evaporator fan doesn't work</i>	Fan is faulty	Replace fan

**Note:** Before you contact one of our service partners please press the test button of the controller. Like this the fans and the evaporator are getting switched on independent of the internal cabinet temperature. In cases of emergency you can contact us under one of the tel. numbers stated on the last page.

## 15. Maintenance & Cleaning



*Always switch power supply off before starting any maintenance on the unit.  
Wait for 5 minutes for electrical components to discharge.*

The cooling unit is generally maintenance free and can be operated without filters in most environments.

If the ambient air is extremely dusty, we recommend installing filter mats (see accessories). These should be cleaned or replaced at regular intervals. Oily or greasy filter mats should be replaced immediately. Do not use a steam jet or high pressure to clean the filter mats. Do not wring out the filter mats. If the ambient air is extremely oily, we recommend the use of metal filters (see accessories). They can be cleaned with standard cleaning agents and reused. In addition the unit should have regular functional tests (approx. every 2,000 hours depending on the grade of ambient pollution).

*Note:* The use of filter mats / metal filters reduces the cooling capacity of the unit..

### **Disposal**

The cooling unit contains R134a refrigerant and small quantities of lubricating oil. Replacement, repairs and final disposal must be done according to the regulations of each country for these substances.

## 16. Transport & Storage

### Malfunction due to transport damage

On delivery the carton box containing the unit must be examined for signs of transport damage. Any transport damage to the carton box could indicate that the unit itself has been damaged in transit which in the worst case could mean that the unit will not function.

The unit can only be stored in locations which meet the following conditions:

- temperature range: - 40°C to 70°C
- relative humidity (at 25°C): max. 95 %
- the cooling unit should always be stored according to the installation position

### Returning the unit





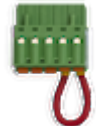






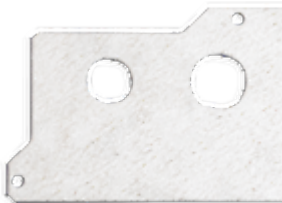


To avoid transport damage the unit should be returned in the original packing or in a packing case and must be strapped to a pallet. If the unit cannot be returned in the original packing please ensure that:

- A space of at least 30 mm. must be maintained at all points between the unit and the external packing.
- The unit must be firmly fixed in the packing.

The unit must be protected by shock resistant padding (hard foam corner pieces, strips or cardboard corner pieces).



## 17. Parts supplied / Spare parts / Accessories

Description	QTY	Image
Instruction manual	1	
CE Declaration	1	
M6 * 16 bolts	12	
A6.4 toothed washers	12	
A6.4 washers	12	
M4 * 12 bolts	2	
5 - pole terminal block for signals	1	
4 - pole terminal block for electrical connection	1	
3 - pole terminal block for RS 485 Modbus	1	
Cable gland M16 * 1.5	1	
Lock nut M16 * 1.5	1	
Cable gland M20 * 1.5	1	
Lock nut M20 * 1.5	1	
Supply plate	1	
Drain fitting	1	
Foam tape		

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