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# 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.

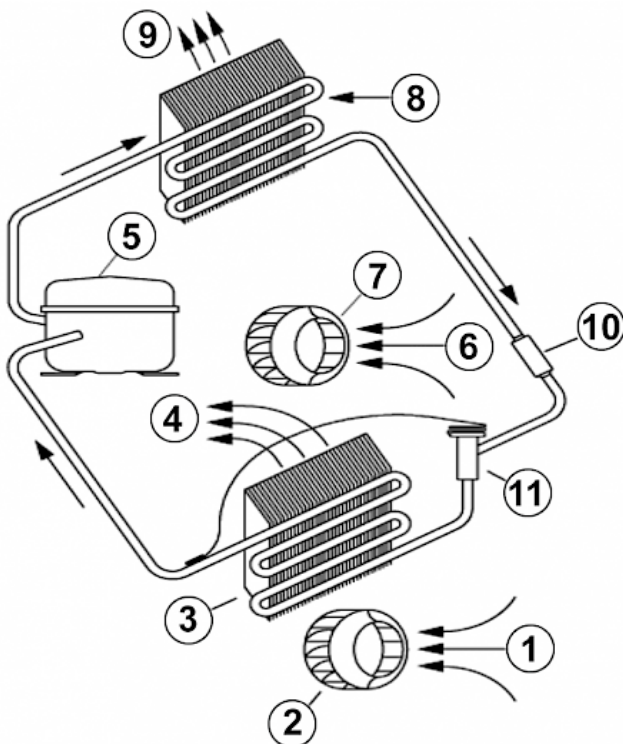
## 4. Settings

The cooling unit is intended to be used as a complementary accessory to larger industrial equipment, and is used where heat needs to be dissipated from electrical control cabinets or similar enclosures in order to protect heat sensitive components. It is not intended for household use. The unit has two completely separate air circuits which ensure that the clean cabinet air does not come into contact with the ambient air which may well be dirty or polluted. The cooling unit can dissipate large quantities of heat from electrical enclosures into the ambient air and at the same time reduce the internal temperature to below that of the ambient air. The unit works without problems in extreme ambient conditions (e.g. dusty and oily air). The operating temperature range is between +20°C and +55°C. Units can be ordered with an additional electrical cabinet heater. For the cooling capacities and environmental ratings please refer to the type plate data.

## 5. Functional principle

The unit functions on the principle of the compression refrigerator. The main components are: refrigerant compressor, condenser, choke and evaporator. these four components of the refrigerant plant are connected with each other by pipes to form a hermetically sealed system in which the refrigerant (R134a) circulates. R134a is chlorine free and has an Ozone Destruction Potential [ODP] of 0 and a Global Warming Potential [GWP] of 1430.

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



## 6. Technical data

<b>Order Number</b>	20200481
<b>Cooling capacity L35L35</b>	max. 450 W
<b>Cooling capacity L35L50</b>	max. 225 W
<b>Compressor type</b>	Speed Control rotary compressor
<b>Refrigerant / GWP</b>	128 g / 4.5 oz
<b>High / low Pressure</b>	30 / 6 bar 440 / 88 psig
<b>Operating Temperature Range</b>	+10°C - +55°C
<b>Air flow volume (system / unimpeded)</b>	Ambient air circuit: 230 / 275 m <sup>3</sup> /h Cabinet air circuit: 150 / 275 m <sup>3</sup> /h
<b>Mounting</b>	19" rack
<b>Housing Material</b>	Mild steel, powder coated
<b>Dimensions A x B x C (D+E)</b>	133 (3U) x 483 x 483 mm
<b>Weight</b>	8.6 kg
<b>Voltage / Frequency</b>	48 V DC
<b>Current L35L35</b>	max. 7.5 A
<b>Max. current</b>	9.5 A
<b>Nominal power L35L35</b>	max. 360 W
<b>Max. power</b>	450 W
<b>Fuse</b>	16 A (T)
<b>Short-circuit current rating</b>	5 kA
<b>Connection</b>	Connection terminal block
<b>Ingress Protection</b>	IP 54
<b>Approvals</b>	CE

## 7. 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.

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.

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. Following this 1:1 Scale Drilling Template drill the holes and make the required cuts on the enclosure. This template may have been affected by storage conditions, please check this template by verifying values of the largest dimensions before drilling. Fit the sealing strip on the cooling unit on the side connected to the enclosure and follow the installation diagram.

**Note:** In case of 19" rack mounted units please ignore the above mounting instructions.

## 8. Electrical Connection



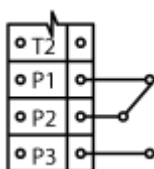
*High electric voltage present. Installation, maintenance, cleaning and any other work must be carried out by qualified personnel only. The personnel must ensure that for the duration of this work the unit and the cabinet are disconnected from the electrical supply and protected against unauthorised/accidental reconnection.*

**Note:** As soon as preparations are finished, mounting procedures may proceed.

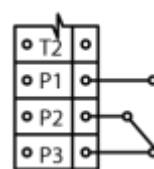
### Connection to the main electrical supply

The mains connection is made via a connector / terminal block. To connect the unit to the mains proceed as follows:

- Take the control cabinet out of operation in the prescribed manner.
- See the connection details on the circuit diagram.
- Note the connections on the connector / terminal block from the following table



Normal (with power on)



Alarm (normal with power on)



#### Terminal

1 +		+ve supply
2 -		-ve supply
3	T1	Door contact (bridged with T2)
4	T2	Door contact (bridged with T1)
5	P1	Alarm contact
6	P2	Alarm contact
7	P3	Alarm contact

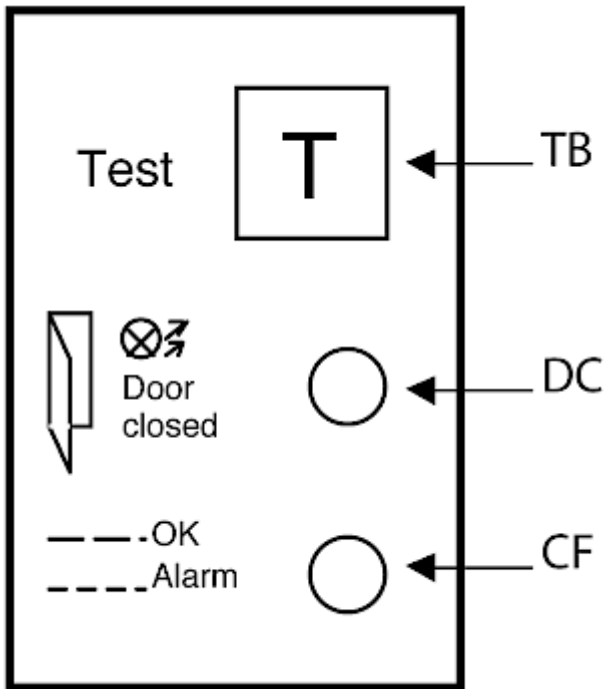
### Attention

Between contact T1 & T2 there is a 12V DC potential. These connections are to be connected to a door switch only! If no door switch is used, these contacts are to be bridged and protected from unauthorized and/or accidental external contact. Contacts P1, P2 & P3 are potential free and require an external power source if wired to operate external components (indicator lamps, switches...). The load on these contacts is not to exceed 30V DC, 4 A or 120/250V AC, 4A. If wired to external components it must be ensured that the wiring and connections are double insulated and safe against touch and protected from unauthorized and/or accidental external contact.



*Ensure that the correct polarity is maintained. The fans should have clockwise rotation.*

### KEYPAD



- TB Testbutton  
 DC LED Door Contact (ON when door closed)  
 CF LED Controller Function (blinks when controller is running)

### Fault warning connection

The fault warning is connected via terminals P1, P2 & P3 on the connection terminal block. The temp. adjustment range is between 25°C (left-hand stop) and 55°C (right-hand stop). The alarm temp. is preset at 50°C.

### To change the alarm setting:

- Remove the outer cover.
- Remove the fixing screws from the PCB cover and the earth wire from inside it.
- Lift off the PCB cover
- Using a screwdriver turn the alarm temp. potentiometer on the PC-board slightly to the right (higher) or the left (lower)
- please note that the setting for the alarm signal must be at least 5°C higher than the setting for the cabinet's internal temperature
- Close the unit as prescribed.

Check that the new setting meets requirements and if not repeat the above process.

### Door contact switch connection

If required the unit can be switched on or off via a door contact switch (terminal T1&T2). When delivered the door contact terminals are bridged.

### To connect the door contact switch:

- Remove the bridge from terminals T1 & T2.
- Connect the door contact switch to terminals T1 & T2.



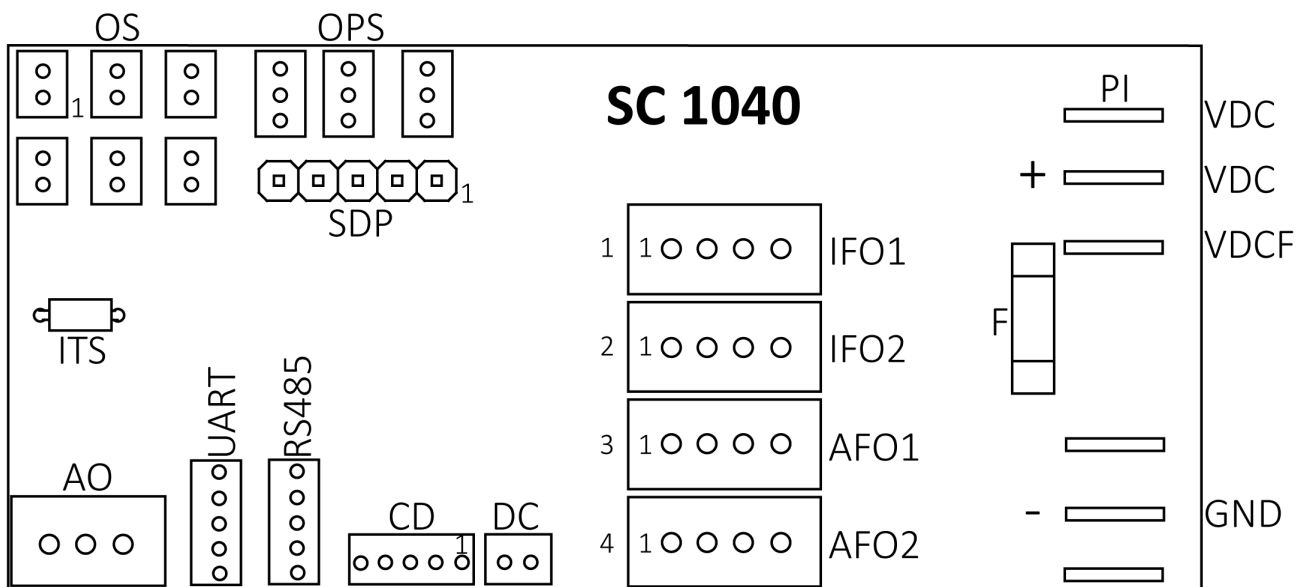
- The contact must be closed when the cabinet door is closed.

**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.

## 9. Controller Layout Description

OS	Optional sensor
OPS	Optional powered sensor
SDP	Simple display port
ITS	Internal temperature sensor
AO	Alarm output
UART	UART
RS485	RS485
CD	Compressor data
DC	Door contact
IFO1	Internal fan out 1
IFO2	Internal fan out 2
AFO1	Ambient fan out 1
AFO2	Ambient fan out 2
F	Fuse
PI	Power in
VDC	VDC
VDCF	VDC fused
GND	Ground



## 10. Wiring Diagram

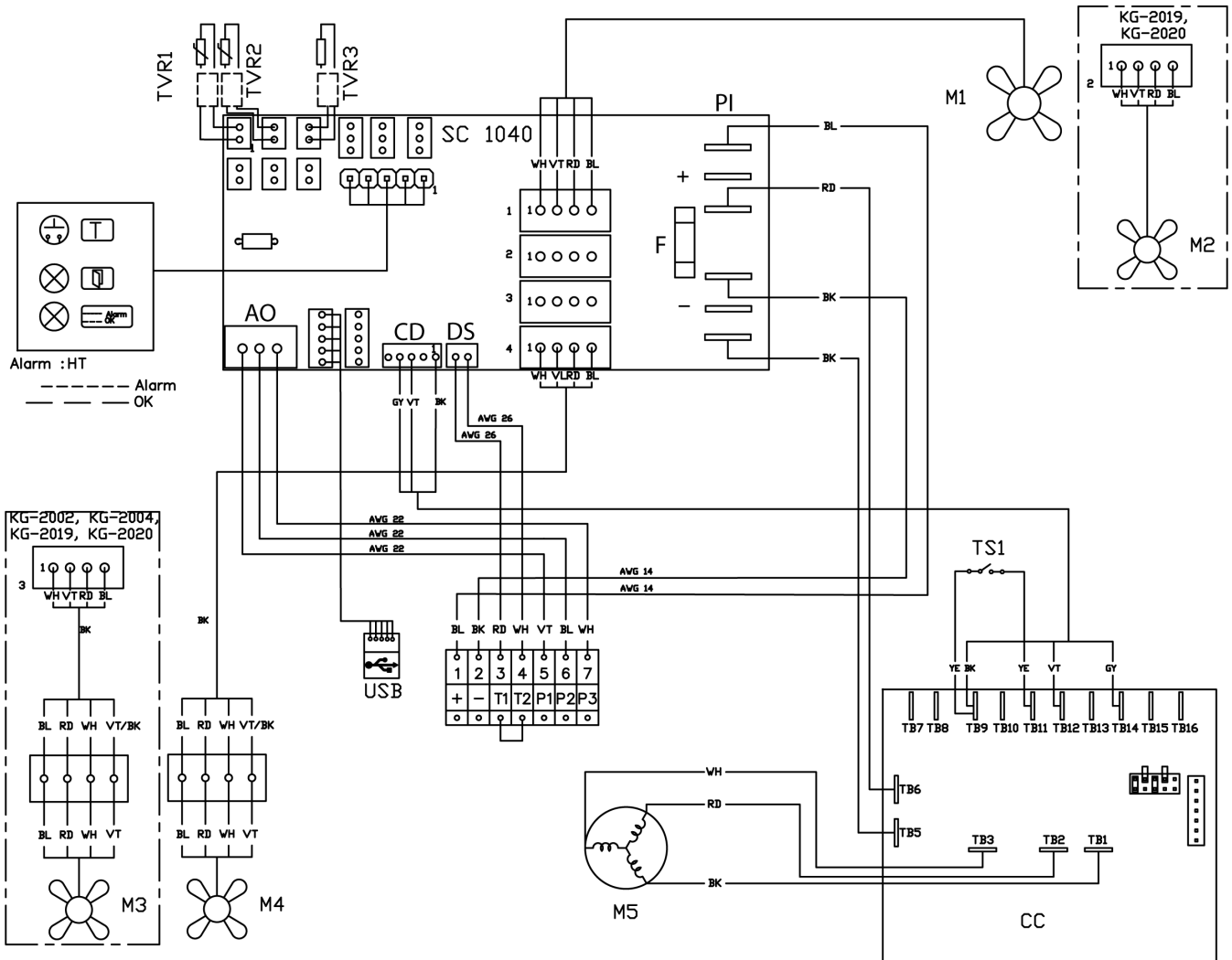
HT	High Temperature
TVR1	Ambient (optional)
TVR2	Pressure pipe (optional)
TVR3	Control temp (optional)
AO	Alarm output
CD	Compressor data
DS	Door switch
F	Fuse 16 A(T)
PI	DC Power
M1	Internal fan
M2	Internal fan
M3	Ambient fan
M4	Ambient fan
M5	Compressor
CC	Compressor controller
TS1	Comp. thermal switch (optional)



**WARNING:** Unit is not protected against reversed polarity on DC source

### Wire Colour

BL	Blue
RD	Red
WH	White
BK	Black
VT	Violet
YE	Yellow
GY	Grey



## 11. 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. Compressor based cooling units / 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. Once the air inside the enclosure reaches the set temperature the compressor and external fan will stop. The unit is pre-set at 35°C, which is suitable for most of the electronic devices.

## 12. Trouble Shooting

Failure	Condition	Cause	Solution
Unit does not cool	Internal fan does not work	Power not connected.	Verify power supply
	Internal fan works, external fan and compressor don't work	Enclosure temperature is below setting temperature (St)	Verify values of parameter "St"
		Door switch contact is open	Verify door switch
		Controller doesn't work	Replace controller
	Internal fan works, external fan and compressor don't work Display shows alternating "OFF" and temperature	The sequence of the phases inside the power supply connector is incorrect	Change phases inside power supply connector
Unit does not cool	External and internal fan work, compressor does not work	Compressor motor electrical failure	Verify external fan, verify ambient temperature, clean condenser
		Capacitor for compressor failed	Replace capacitor
	Compressor works, external fan doesn't work	External fan needs to be replaced	Replace external fan
Enclosure over heating	Compressor and fans (external and internal) work all the time	Unit cooling undersized	Enclosure needs a bigger cooling unit
	Enclosure needs a bigger cooling unit	Thermal compressor protector triggered	Verify ambient temperature, clean condenser
		Refrigerant leakage	Contact dealer/service center
Excessive condensate	Door enclosure open	Ambient air gets into the enclosure	Ensure door is closed, add a door switch and connect it to controller
	Door enclosure closed	Enclosure IP degree minimum IP54	Seal openings on enclosure
		Damaged misplaced sealing strip	Repair strip accordingly

## 13. Maintenance & Cleaning



*Always switch power supply off before starting any maintenance on the unit.*

The cooling unit is generally maintenance free and can be operated without filters in most environments. For units with filters these should be checked, cleaned and if necessary replaced on a regular basis. In addition the unit should have regular functional tests (approx. every 2,000 hours depending on the grade of ambient pollution).

### 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.

## 14. 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 %

### 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 shipped in the same position as it was mounted.
- The unit must be protected by shock resistant padding (hard foam corner pieces, strips or cardboard corner pieces).

## 15. Parts supplied / Spare parts / Accessories

1 x Control cabinet air conditioner  
 1 x Instruction Manual  
 1 x CE Declaration of Conformity  
 4 x Lock Nut M6 DIN 985 A2  
 4 x Washer A6.4 DIN 125 A2  
 4 x Slotted Studs M6 \* 25  
 1 x Drain pipe  
 1 x Connector

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