English

Contents

1. Application

Enclosure cooling units are designed and built to dissipate heat from enclosures, by cooling the air inside the enclosure and protecting temperature sensitive components. Enclosure cooling units are particularly suitable for the temperature range of - 40 °C to + 50 °C.

2. Technical data

(see table 2.1)

Tab. 2.1 **Technical data**

		SK 3317.200	SK 3317.200
Operating voltage		400 V* ± 10%, 50 Hz	460 V* +10%/-5%, 60 Hz
Nennstrom		3.2 A	3.2 A
Anlaufstrom		15.0 A	16.5 A
Vorsicherung T		10.0 A	10.0 A
Nom. refrigeration	L35 L35 L35 L50	910 W 1065 W	1150 W 1320 W
Useful cooling output DIN 3168/EN 814	L35 L35 L35 L50	1740 W 1165 W	1735 W 1212 W
Refrigerant		R134 a, 1000 g	R134 a, 1000 g
Permissible pressure		24 bar	24 bar
Temperature range		+ 20 to + 50°C	+ 20 to + 50°C
Noise level		62 dB (A)	62 dB (A)
Protection category EN 60 529	Internal circuit External circuit	IP 54 IP 34	IP 54 IP 34
Weight		80 kg	80 kg

* switchable transformer

3. Safety instructions

- Electrical connection and repairs may only be carried out by authorised technicians.
- Do not open the unit during operation! The unit may only be opened when it is switched off.
- Before the cover is closed the unit must be earthed.
- Prior to operation the unit must be earthed properly.
- The unit must only be operated with the pre-fuse specified on the rating plate.

4. Assembly

Prior to mounting, ensure that:

- the site for the enclosure, and hence the arrangement of the cooling unit, is selected so as to ensure good ventilation of the external circuit;
- the location is free from excessive dirt and moisture;
- the mains connection ratings, as stated on the name plate, are available;
- the ambient temperature is no higher as stated on the name plate;
- the packaging shows no signs of damage;
- the enclosure is sealed on all sides. Condensation will occur if the enclosure is leaky;
- air inlet and outlet are not obstructed on the inside of the enclosure;
- units are only fitted vertically in the specified position. Max. deviation from true vertical: 2°.

4.1 Assembly with 180° special hinge

The climate door is fastened to the enclosure by means of two hinges. The hinges must be fixed on the enclosure frame before mounting the door.

If the holes required were not drilled in the factory the holes must be made in the area of the right hand corner pieces of the frame. Please ensure that the fixing holes are only drilled into the PS fixing profile and do not damage the thread behind it.

The hinges are fixed by means of 5 cheese head screws with a M8 x 20 hexagon socket. The climate door with the welded hinge plates is located in the lower door hinge plate by means of the pin welded to the hinge. The top hinge is screwed to the enclosure by means of a countersunk screw M8 x 35, 2 washers A8.4 x 1.6 and the polystop nut M8.

Mounting cut-out climate door

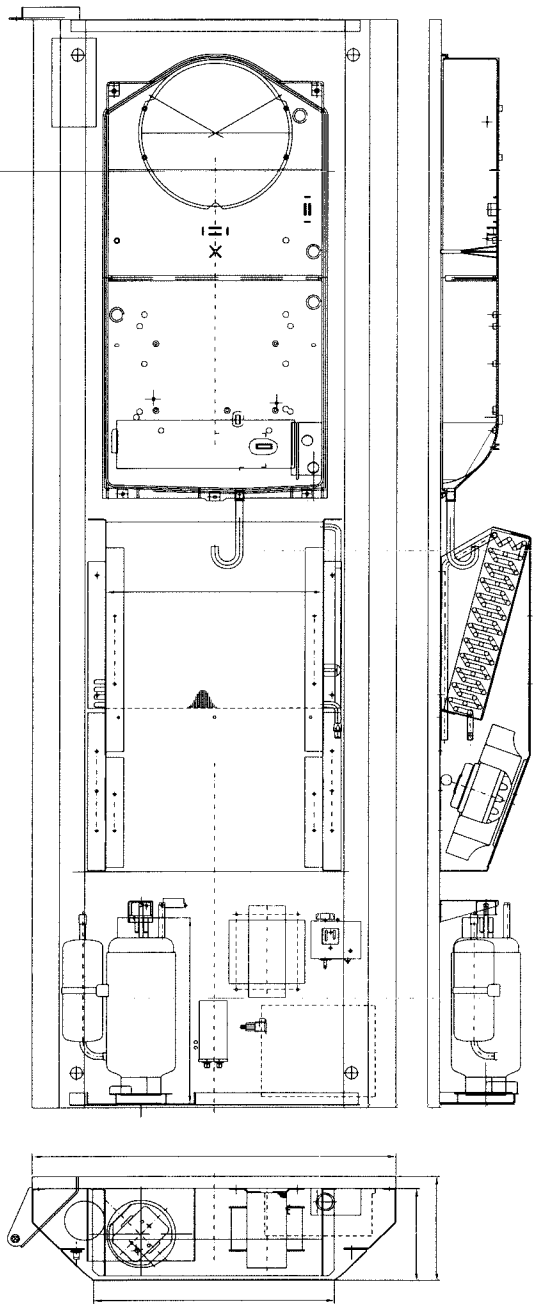


Fig. 4.1 **Position of the holes in the PS profile top**

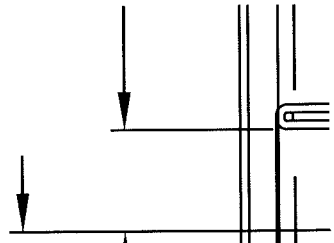
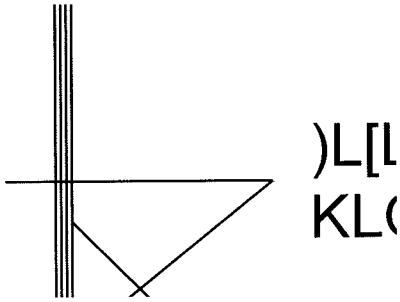


Fig. 4.2 **Position of the holes in the PS profile bottom**



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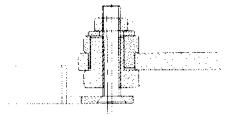
4.2 Height adjustment and closing pressure

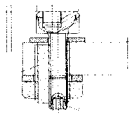
Optimum height and the closing pressure of the climate control door to the enclosure were finely adjusted in the factory.

Fig. 4.2.1 **Top hinge**



The heighton adjustment can be varied by unscrewing the hex-nut M8 pos. (1) and regulating the hex-nut M8 pos. (2). The closing pressure can be infinitely varied by turning the eccentric bush/SW 22 (pos. (3)) and the eccentric nut/SW 22 pos. (4). In order to prevent a misadjustment of the height while regulating the closing pressure the flat head counter sunk screw pos. (2) needs to arrested by means of an Allen key. Afterwards the hex-nut M8 Pos. (1) has to be tightened again.

Fig. 4.2.2 **Bottom hinge**



In order to adapt the heighton adjustment to the top hinge, the hex-socket set screw M8 pos. (5) has to be unfastened and the eccentric screw/SW 17 pos. (6) has to be regulated according to the heighton adjustment of the upper hinge.
Afterwards the hex-socket set screw needs to be tightened again.
The closing pressure can be adjusted to the top hinge by unscrewing the hex-nut M16 pos. (7) and by regulating the eccentric screw/SW 13 pos. (8) afterwards. The adjustment needs to be fixed with the M16 nut pos. (7).

Attention! The adjustment of the individual eccentrics should not excced 360°.

4.3 Assembly with standard 180° hinge

The climate door is fastened to the enclosure by means of three hinges. The hinges must be screwed to the three locations provided for them in the enclosure frame (see assembly instruction PS 4000, page 13) before mounting the door.
After all the counterparts of the hinges have been fastened to the climate door the door can be fixed to the frame by means of the hinges.

5. Electrical connection

The connected voltage and frequency must correspond to the values stated on the name plate. The cooling unit must be connected to the mains via an isolating device, which ensures at least 3 mm contact opening when switched off. The unit must not have any additional temperature control connected before it. Line protection should be provided by means of the pre-fuse specified on the name plate. Observe the relevant regulations during installation!

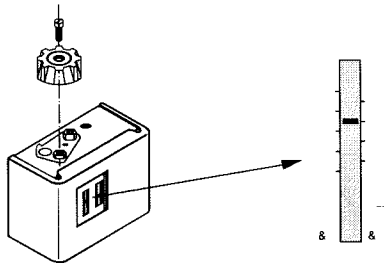
6. Commencing operation and control behaviour

Following the completion of mounting and a waiting period of approximately 2 hours (to allow oil to collect in the compressor in order to ensure lubrication and cooling) electrical connection can be made.

6.1 Control by thermostat

The cooling unit operates automatically, i.e. following the electrical connection, the evaporator fan will run continuously to circulate the air inside the enclosure. This provides a uniform temperature distribution in the enclosure. The built-in temperature controller (setting the desired internal temperature) effects automatically controlled switch-off of the cooling unit by the value of the fixed switching difference setting of 5 K. This is set at the factory to + 35 °C.

Fig. 6.1 **Thermostat**



6.2. Temperature setting at the controller

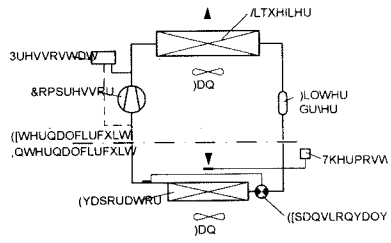
1. Remove the setting knob after slackening the screw.
2. Remove locking plate.
3. Replace the setting knob and set the desired temperature. Setting range + 20 °C to + 50 °C
4. Replace the locking plate and fix the setting knob by tightening the screw.
5. To avoid cyclic operation of the compressor, it is imperative that the set switching difference of 5 K is not changed and does not deviate to a lower value.

7. Technical information

The cooling unit (compression refrigeration unit) consists of four main components: the coolant compressor, evaporator, condenser, and the control or expansion valve, which are connected by suitable pipework. This circuit is filled with a readily boiling substance, the coolant. The R134 a (CH_2FC_3) coolant is free from chlorine. It has an ozone destroying potential (ODP) of 0 and is therefore environmentally friendly. A filter dryer which is integrated in the hermetically sealed cooling circuit, provides effective protection against moisture, acid, dirt particles, and foreign bodies within the cooling circuit.

7.1 Operation of the cooling unit

Fig. 7.1 **Operation of the cooling unit**



When a coolant compressor is put into operation, the coolant vapour evaporates from the evaporator. The heat required for the evaporation of the coolant is drawn from the evaporator environment (internal circuit of the enclosure), causing it to cool down. The heat fed to the coolant in the evaporator is its environment (assisted by fans), making the coolant once more liquid due to the condensation which takes place. In the thermostatically controlled expansion valve, the liquid coolant is reduced to the particular evaporator pressure required. The cooling which occurs due to the reduction of pressure, releases the heat from the liquid, which evaporates part of the coolant flow. The mixture of cold liquid and throttle vapour is returned to the evaporator. The cooling cycle is thus completed, the aforementioned process of the heat transfer starts afresh.

7.2 Safety equipment

The cooling circuit of the cooling unit embodies a component tested high-pressure monitor to VBG 20.7.1 which is set to maximum operating pressure and operates via an automatic reset device at recurring pressure drop. The coolant compressor and the fans are equipped with thermal winding protection against excess current and excess temperature.

7.3 Condensate discharge

Condensate which may form on the evaporator (under high air humidity, low enclosure temperatures) is discharged through a hose at the evaporator partition, at the bottom of the unit.
Blockage of condensate must be avoided.

7.4 General

Storage temperature: The cooling units must not be subjected to temperatures above + 70 °C during storage. Transport attitude: The cooling units must always be transported upright. Waste disposal: The closed cooling circuit contains coolant and oil which must be correctly disposed of for the protection of the environment. The disposal can be carried out at Rittal-Werk. Technical modifications reserved.

8. Maintenance

As a maintenance-free, hermetically sealed system, the cooling circuit has been filled in the factory with the required amount of coolant, and tested for leaks and subjected to a function trial run. The installed maintenance-free fans use ball bearings, they are protected against moisture and dust, and are fitted with a temperature monitor. The life expectancy is at least 30,000 operating hours. The cooling unit is thus largely maintenance-free.
All that may be required from time is that the components of the external air circuit are cleaned by compressed air. The use of a filter mat is recommended only if large particles of lint are present in the air, so that blockage of the condenser is prevented.
Caution: Prior to any maintenance work, the power to the cooling unit must be disconnected

9. Scope of supply and guarantee

9.1 SK 3317.200:

1 cooling unit fastened to the enclosure and ready for connection
1 operating instruction

Guarantee:

This unit is covered by a 1-year guarantee from the date of supply, subject to correct usage. Within this period, the returned unit will be repaired in the factory or replaced free of charge.
The cooling unit is to be used for the cooling of enclosures only. If it is connected or handled improperly the manufacturer's guarantee does not apply and in this case we are not liable for any damage caused.

D 10. Schalt- und Klemmenplan

Anschlußschema:

F1	= Thermostat
F2	= Pressostat
F3	= Thermischer Wicklungsschutz
M1	= Verdichter
M2	= Verflussigerventilator
M4	= Verdampferventilator
C1 - C4	= Betriebskondensatoren
T1	= Transformator
S1	= Turendschalter

Kundenseitiger Anschluß:

L1, L2, PE	= Netzanschluß
Nr. 1	= L1 (Phase)
Nr. 2	= L2/N (Neutral)
grün/gelb	= PE (Erdung)

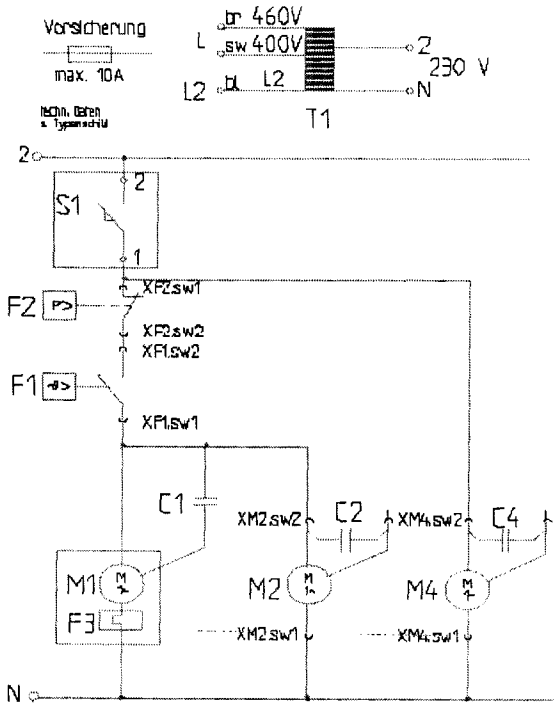
GB 10. Wiring- and terminal diagram

Wiring diagram:

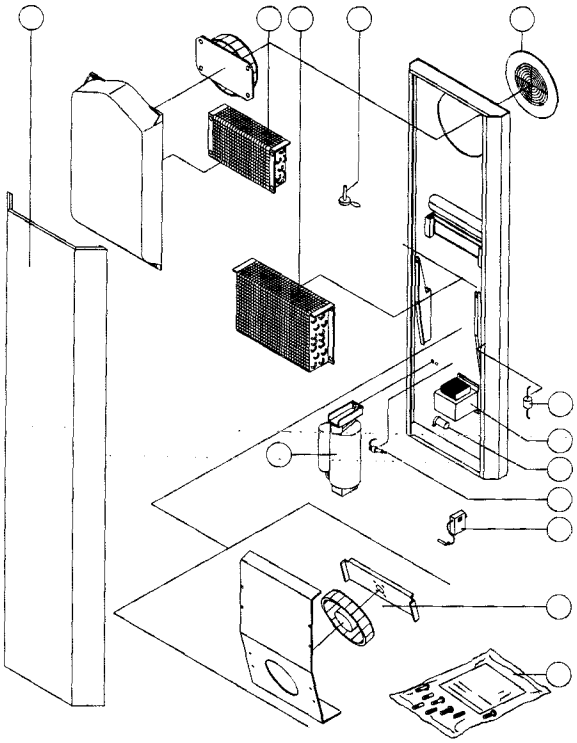
F1	= Thermostat
F2	= Pressostat
F3	= Thermal winding protection
M1	= Compressor
M2	= Liquefier fan
M4	= Evaporator fan
C1 - C4	= Operating capacitors
T1	= Transformer
S1	= Door limit switch

Electrical connection by customer:

L1, L2, PE	= Mains connection
No. 1	= L1 (phase)
No. 2	= L2/N (neutral)
green/yellow	= PE (ground)



SK 3317.200



11. Ersatzteilliste SK 3317.200
11. Spares list SK 3317.200

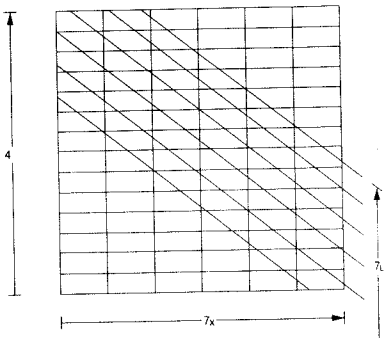
	D	GB
Position	Bezeichnung	Description
1	Kompressor	Compressor
2	Anlaßvorrichtung	Starting device
5	Verflüssigerventilator	Liquefier fan
10	Verdampferventilator	Evaporator fan
15	Versandbeutel	Dispatch bag
20	Expansionsventil	Expansion valve
25	Filtertrockner	Filter dryer
30	Pressostat	Pressostat
35	Thermostat	Thermostat
48	Lufteintrittsgitter	Louvred grille inlet
75	Haube	Cowl
80	Transformator	Transformer
90	Verdampfer	Evaporator
100	Verflussiger	Liquefier

Bei Bestellung unbedingt angeben		Absolutly necessary in case of order	
Geratetyp:	_____	Type:	_____
Fabrikations-Nr.:	_____	Fabrication no.:	_____
Herstelldatum:	_____	Manufacturing date:	_____
Ersatzteil-Nr.:	_____	Spare part no.:	_____

Kennlinienfeld (DIN 3168)
Performance diagram

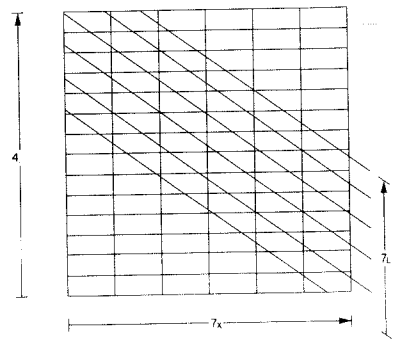
$\dot{Q}_x$ = Cooling output
T_v = Liquifier entry
T_1 = Evaporator entry

Kennlinienfeld SK 3317.200 (DIN 3168) (50 Hz)



7x 8PJHEXQJVWHPSHUDWXU&
4 'DXHU1XW]NÄKOOHLVWXQJ:
7L 6FKDOWVFKUDQN,QQHQWHPSHUDWXU&

Kennlinienfeld SK 3317.200 (DIN 3168) (60 Hz)

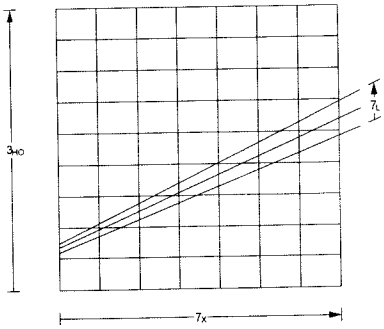


7x 8PJHEXQJVWHPSHUDWXU&
4 'DXHU1XW]NÄKOOHLVWXQJ:
7L 6FKDOWVFKUDQN,QQHQWHPSHUDWXU&

Kennfeld Leistungsaufnahme
Performance input diagram

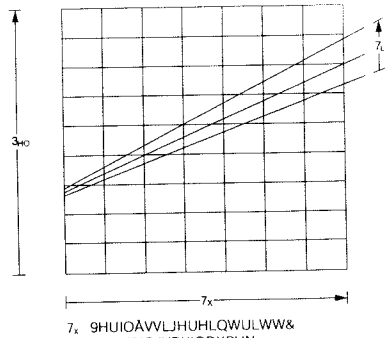
P_{el} = Performance entry

Kennfeld Leistungsaufnahme SK 3317.200 (DIN 3168) (50 Hz)



7x 9HUIOÄVVLJHUHLQWULWW&
3el /HLVWXQJVDXIQDKPH:
7L 9HUGDPSIHUHLQWULWW&

Kennfeld Leistungsaufnahme SK 3317.200 (DIN 3168) (60 Hz)



7x 9HUIOÄVVLJHUHLQWULWW&
3el /HLVWXQJVDXIQDKPH:
7L 9HUGDPSIHUHLQWULWW&