

Rittal
SK



Schaltschrank-
Kühlgerät

Cooling unit

Climatiseur

Koelaggregaat

Kylaggregat

Condizionatore
per armadi

Refrigerador
para armarios

クーリングユニット



KTS 8607.xxx

PSK 4607.xxx

KTS 8687.xxx

PSK 4687.xxx

KTS 8807.xxx

PSK 4807.xxx

KTS 8887.xxx

PSK 4887.xxx

SK 3306.xxx

SK 3308.xxx

Montageanleitung

Assembly instructions

Notice de montage

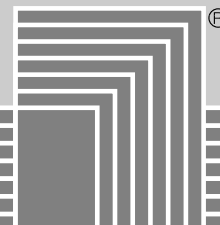
Montage-instructie

Montageanvisning

Istruzioni di montaggio

Instrucciones de montaje

取扱説明書



Umschalten auf Perfektion

RITTAL

Contents

1. Application
2. Technical data
3. Assembly and safety instructions
4. Commencing operation and control behaviour
5. Technical information
6. Maintenance
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It is essential to read the assembly and operating instructions prior to assembly or putting the equipment into operation.

1. Application

**PSK 46.... / PSK 48.... /
KTS 86.... / KTS 88....**

(climate control enclosure)

Enclosure cooling units are designed and built to dissipate heat from enclosures by cooling the air inside the enclosure and protecting temperature sensitive components.

The climate controlled enclosure system is a complete solution, consisting of an enclosure frame and a cooling unit. The cooling module is pre-installed in the recess of the door. Thus installation of further equipment and cutouts for air inlet and outlet openings are not required.

SK 3306.... / SK 3308....

(climate control door)

SK climate control doors allow cooling units to be retro-fitted to existing TS/PS/ES enclosures (width 600 or 800 mm, height 1800/2000 mm) without time-consuming assembly work, by simply replacing the door.

2. Technical data

(see table 2.1).

3. Assembly and safety instructions

To ensure correct function of the external air circulation, a plinth of a min. height of 100 mm (e.g. SO 2813.200 for PSK 4607.100 or SO 2833.200 for PSK 4807.100) is required. Because the centre of gravity is at the front, the climate controlled enclosure should be fixed to the floor, via the plinth.

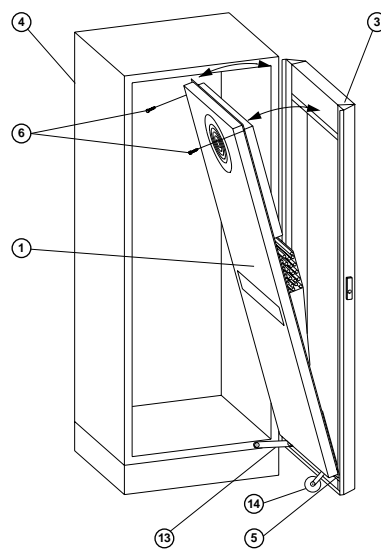
Prior to mounting, ensure that:

- the site for the enclosure, and hence the arrangement of the cooling unit, is selected so as to ensure good ventilation;
- the location is free from excessive dirt and moisture;
- the ambient temperature is no higher than + 55 °C;
- 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;
- the condensate can drain freely. Any extension of the discharge must be free from kinks, with a downward slope;
- to avoid an increase in condensation, a door operated switch (e.g. PS 4127.000) should be used which will switch the cooling unit off when the enclosure door is opened. The door operated switch PS 4127.000 can make contact at the upper or lower parts of the tubular door frame.

Tab. 2.1 **Technical data**

Model No.	KTS 8607.100* PSK 4607.100* KTS 8687.100 PSK 4687.100 SK 3306.800* SK 3306.100* SK 3306.880 SK 3306.180	KTS 8607.840* PSK 4607.140* KTS 8687.840 PSK 4687.140 SK 3306.840* SK 3306.140* SK 3306.884 SK 3306.184	KTS 8807.100* PSK 4807.100* KTS 8887.150 PSK 4887.150 SK 3308.800* SK 3308.100* SK 3308.880 SK 3308.180	KTS 8807.140* PSK 4807.140* KTS 8887.140 PSK 4887.140 SK 3308.840* SK 3308.140* SK 3308.884 SK 3308.184
Operating voltage	230 V 50/60 Hz	400 V, 2 ~ 50/60 Hz	230 V 50/60 Hz	400 V, 2 ~ 50/60 Hz
Rated current	3.2 A/ 3.8 A	1.9 A/2.2 A	4.0 A/ 4.5 A	2.3 A/2.6 A
Starting current	11.0 A/12.0 A	6.3 A/6.9 A	9.0 A/10.0 A	5.2 A/5.7 A
Pre-fuse T	10.0 A/10.0 A	6.0 A/6.0 A	10.0 A/10.0 A	6.0 A/6.0 A
Duty cycle	100%	100%	100%	100%
Power consumption L35 L35 L50 L50	525 W/630 W 605 W/725 W	540 W/650 W 625 W/750 W	650 W/750 W 750 W/850 W	670 W/780 W 780 W/880 W
Useful cooling output DIN 3168/EN 814 L35 L35 L35 L50	1100 W/1250 W 820 W/1000 W	1100 W/1250 W 820 W/1000 W	1500 W/1510 W 1065 W/1240 W	1500 W/1510 W 1065 W/1240 W
Refrigerant R134 a	675 g	675 g	700 g	700 g
Permissible pressure	23 bar	23 bar	23 bar	23 bar
Temperature range	+ 20°C to + 55°C			
Noise level	62 dB (A)			
Prot. category EN 60529	Internal circuit IP 54			
Dimensions	W x H x D mm KTS/PSK 600 x 1800/2000* x 682 SK 592 x 1775/1975* x 155		W x H x D mm KTS/PSK 800 x 1800/2000* x 682 SK 792 x 1775/1975* x 155	
Weight	PSK 155 kg SK 60 kg	PSK 158 kg SK 63 kg	PSK 182 kg SK 67 kg	PSK 185 kg SK 70 kg
Colour	RAL 7032			

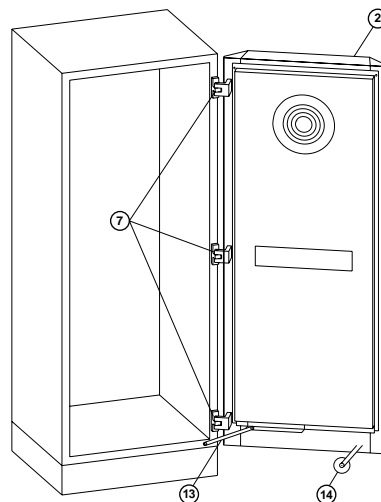
Fig. 3.1 **Installation of cooling module (supplied pre-assembled)**



Place the cooling module ① into the lower guide rail ⑤ and fix by means of screws M6 ⑥ (see fig. 3.1).

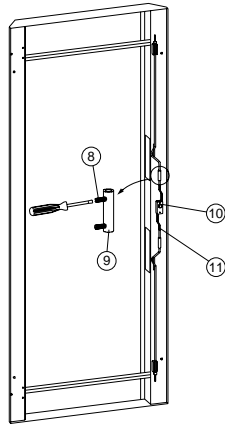
- ① Cooling module
- ② Air-conditioning door
- ③ Door
- ④ Enclosure frame
- ⑤ Guide rail
- ⑥ Screws M6 (cooling module)
- ⑦ Screws M6 (hinges)
- ⑧ Bulkhead panel (fig. 3.3)
- ⑨ Setscrews (fig. 3.3)
- ⑩ Drain plug (fig. 3.3)
- ⑪ Door handle (fig. 3.3)
- ⑫ Locking bars (fig. 3.3)
- ⑬ Door stay
- ⑭ Ride-up roller

Fig. 3.2 **Fitting of climate control door for SK 3306.... / SK 3308....**



Dismantle the PS enclosure door, including the hinges, via three screws M6 ⑦. The climate control door ② can then be fitted via the pre-assembled hinges, using screws M6 ⑦. Fit the ride-up roller ⑭ and the door stay ⑬ according to enclosed assembly instructions.

Fig. 3.3 Change of door hinging



Remove the cooling module ①, see fig. 3.1 (protective earth conductor must first be disconnected). Slacken the setscrews M4 ⑨, and the sleeves. Dismantle the door handle ⑪ including short locking bars and refit after turning it through 180°. Please note: When fitting locking bars ⑫, it is important to ensure correct tightening of the setscrews ⑨. In order to ensure safe function of the locking mechanism, it must be checked regularly for correct fit. The opening angle of the hinges is 120° (max.). Fit the square tube, together with ride-up roller ⑭, and door stay ⑬ according to the enclosed assembly instructions. Exchange the upper contact hazard protection grille for the lower grille, and vice versa. Install the cooling module and route the condensate drain, free from kinks, through the recess provided.

4. Commencing operation and control behaviour

Commissioning, electrical connection, and any repairs which may be necessary, must only be carried out by authorised, qualified staff. The pre-fuse specified on the rating plate must be installed as line protection. The valid regulations must be observed during installation.

- Before commencing operation, ensure that
- the mains connection data specified on the rating plate of the unit is guaranteed;
 - the cooling unit is connected to the mains via a disconnecting device with a guaranteed contact opening of at least 3 mm in the deactivated state;
 - no additional thermostat is connected upstream of the unit at the supply end;
 - if the cooling unit has been lying in a horizontal position, wait 30 minutes before making the electrical connection. The oil must first be allowed to collect in the compressor, in order to ensure proper lubrication and cooling;
 - after the unit has been switched off via the door limit switch or automatic setpoint disactivation, there is a 2 minute pause before the compressor switches back on. In this connection, we recommend that you use a time-delay relay for door limit switch operation.
- Connect the mains cable to the plug-in terminal strip X10, see wiring diagram (terminal L1, N, \perp).
- Note the designations on the terminal strip (see wiring diagram).
 - Disconnect the unit before checking protective earth conductor, high voltage, and insulation in the enclosure.

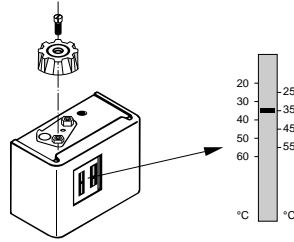
The cooling unit operates automatically, i.e. following the electrical connection, the evaporator fan will run continuously to circulate the air inside the enclosure. This provides a uniform temperature distribution in the enclosure. The built-in temperature controller (setting the desired internal temperature) effects automatically controlled switch-off of the cooling unit by the value of the fixed switching difference setting of 6 K. This is set at the factory to + 35°C.

4.1 Temperature setting on the controller

Setting range + 20°C to + 55°C.

Adjustment of the enclosure's set-point temperature is made on the thermostat inside the unit. For access to the thermostat remove cooling module (see fig. 3.1).

Fig. 4.1 Thermostat

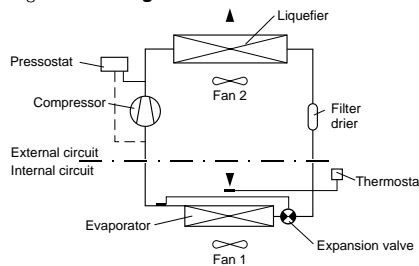


5. Technical information

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 (CH₂FCF₃) coolant is free from chlorine. It has an ozone destroying potential (ODP) of 0 and is therefore environmentally friendly. A filter drier which is integrated in the hermetically sealed cooling circuit, provides effective protection against moisture, acid, dirt particles, and foreign bodies within the cooling circuit.

5.1 Operation of the cooling unit

Fig. 5.1 Cooling circuit



The compressor takes the gaseous coolant from the evaporator and compresses it to a higher pressure in the condenser. During this process the temperature of the coolant rises above the ambient temperature and heat can be dissipated to the environment via the surface of the condenser. Then the coolant is liquefied and, by means of a thermostatically controlled expansion valve, returned to the evaporator, where it evaporates at low pressure. The heat required for complete evaporation is drawn from the enclosure interior causing it to cool down. The cooling cycle is thus completed, the aforementioned process of the heat transfer starts afresh.

5.2 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.

5.3 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.

5.4 General

Storage temperature: The cooling units must not be subjected to temperatures above + 70°C during storage.

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.

6. 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 to 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.

7. Scope of supply and guarantee

Scope of supply
PSK 46... / PSK 48... /
KTS 86... / KTS 88...

(Climate controlled enclosure):

Enclosure frame respectively (without side panels) incl. pre-assembled climate control door SK 3306... or SK 3308..., ride-up roller PS 4538.000, door stay PS 4583.000 and assembly and operating instructions.

Scope of supply
SK 3306... / SK 3308...

(Climate control door):

Climate control door (door with pre-assembled cooling module), 3 Allen screws M6, ride-up roller PS 4538.000, door stay PS 4583.000 and assembly and operating instructions.

Guarantee:

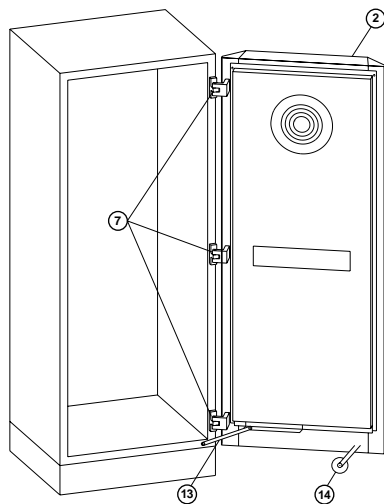
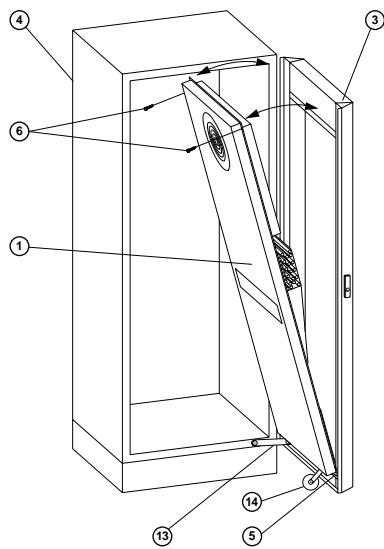
This unit is covered by a 1-year guarantee from the date of supply, subject to correct usage. Within this period, the returned unit will be repaired in the factory or replaced free of charge.

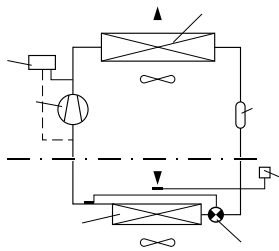
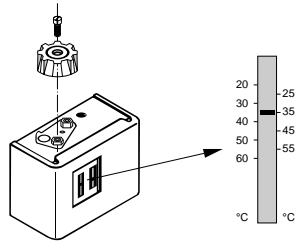
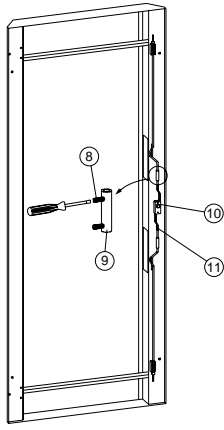
The cooling unit is to be used for the cooling of enclosures only. If it is connected or handled improperly the manufacturer's guarantee does not apply and in this case we are not liable for any damage caused.

8. Spares list

(see page 18).

	KTS 8607.100* PSK 4607.100* KTS 8687.100 PSK 4687.100 SK 3306.800* SK 3306.100* SK 3306.880 SK 3306.180	KTS 8607.840* PSK 4607.140* KTS 8687.840 PSK 4687.140 SK 3306.840* SK 3306.140* SK 3306.884 SK 3306.184	KTS 8807.100* PSK 4807.100* KTS 8887.150 PSK 4887.150 SK 3308.800* SK 3308.100* SK 3308.880 SK 3308.180	KTS 8807.140* PSK 4807.140* KTS 8887.140 PSK 4887.140 SK 3308.840* SK 3308.140* SK 3308.884 SK 3308.184
	230 V 50/60 Hz	400 V, 2- 50/60 Hz	230 V 50/60 Hz	400 V, 2- 50/60 Hz
	3.2 A/ 3.8 A	1.9 A/2.2 A	4.0 A/ 4.5 A	2.3 A/2.6 A
	11.0 A/12.0 A	6.3 A/6.9 A	9.0 A/10.0 A	5.2 A/5.7 A
	10.0 A/10.0 A	6.0 A/6.0 A	10.0 A/10.0 A	6.0 A/6.0 A
	100%	100%	100%	100%
L35 L35 L50 L50	525 W/630 W 605 W/725 W	540 W/650 W 625 W/750 W	650 W/750 W 750 W/850 W	670 W/780 W 780 W/880 W
DIN 3168/EN 814 L35 L35 L35 L50	1100 W/1250 W 820 W/1000 W	1100 W/1250 W 820 W/1000 W	1500 W/1510 W 1065 W/1240 W	1500 W/1510 W 1065 W/1240 W
R134 a	675 g	675 g	700 g	700 g
	23 bar	23 bar	23 bar	23 bar
	+ 20°C ~ + 55°C			
	62 dB (A)			
	KTS/PSK 600 x 1800/2000* x 682 SK 592 x 1775/1975* x 155		KTS/PSK 800 x 1800/2000* x 682 SK 792 x 1775/1975* x 155	
	PSK 155 kg SK 60 kg	PSK 158 kg SK 63 kg	PSK 182 kg SK 67 kg	PSK 185 kg SK 70 kg
	RAL 7032			





TS/PS/ES

**PSK 46.... / PSK 48.... /
KTS 86.... / KTS 88....**

**PSK 46.... / PSK 48.... /
KTS 86.... / KTS 88....**

Position Item Pos. Pos. Pos. Posición	Ersatzteil- liste	Spare List	Liste de pièces détachées	Lijst reserve- delen	Reserv- delslista	Lista dei pezzi di ricambio	Lista de piezas de repuesto	
	D	GB	F	NL	S	I	E	J
	Bezeichnung	Description	Signification	Benaming	Beteckning	Descrizione	Descripción	
1	Kompressor	Compressor	Compresseur	Compressor	Kompressor	Compressore	Compresor	
5	Verflüssiger- ventilator	Condensing fan	Ventilateur du condenseur	Condensor- ventilator	Kondensorfläkt	Ventilatore del condensatore	Ventilador del condensador	
10	Verdampfer- ventilator	Evaporator fan	Ventilateur de l'évaporateur	Verdamper- ventilator	Förångarfläkt	Ventilatore dell'evaporatore	Ventilador del evaporador	
15	Versandbeutel	Dispatch bag	Pochette d'accessoires	Zakje toebehoren	Tillbehörspåse	Sacchetto accessori	Bolsa de accesorios	
20	Expansionsventil	Expansion valve	Soupape de détente	Expansieventiel	Expansionsventil	Valvola d'espansione	Válvula de expansión	
25	Filtertrockner	Filter dryer	Assècheur de filtre	Filterdroger	Filtertork	Filtro essicatore	Secador del filtro	
30	Pressostat	Pressostat	Pressostat	Pressostaat	Pressostat	Pressostato	Presostato	
35	Thermostat	Thermostat	Thermostat	Thermostaat	Thermostat	Termostato	Termostato	
48	Lamellengitter	Louvred grille	Grille à lamelles	Rooster	Lamellgitter	Griglia a lamelle	Rejilla	
70	Temperaturfühler	Temperature sensor	Sonde de température	Temperatuur- sensor	Temperaturgivare	Sonda di temperatura	Sonda térmica	
75	Haube	Cover	Couvercle	Afdekkap	Huv	Calotta	Capucha	
80	Transformator	Transformer	Transformateur	Trafo	Trafo	Trasformatore	Transformador	
85	Tropfenabscheider	Mist collector	Paregouttes	Lekbok	Kondensvatten auskyljare	Separatore gocce	Colector de gotas	
90	Verdampfer	Evaporator	Évaporateur	Verdamper	Kondensor	Evaporatore	Evaporador	
100	Verflüssiger	Condenser	Condenseur	Condensor	Förångar	Condensatore	Condensador	

Bei Bestellung unbedingt angeben

Typ:

Fabrikations-Nr.:

Herstelldatum:

Ersatzteil-Nr.:

Absolutely necessary in case of order

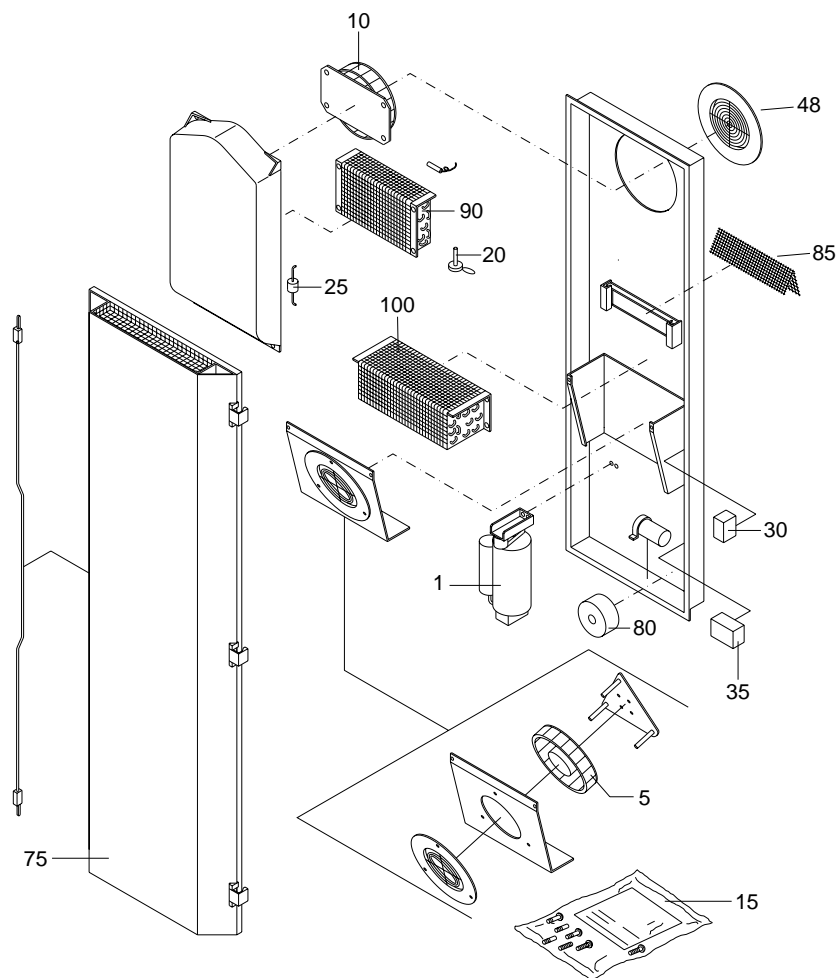
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Fabrication no.:

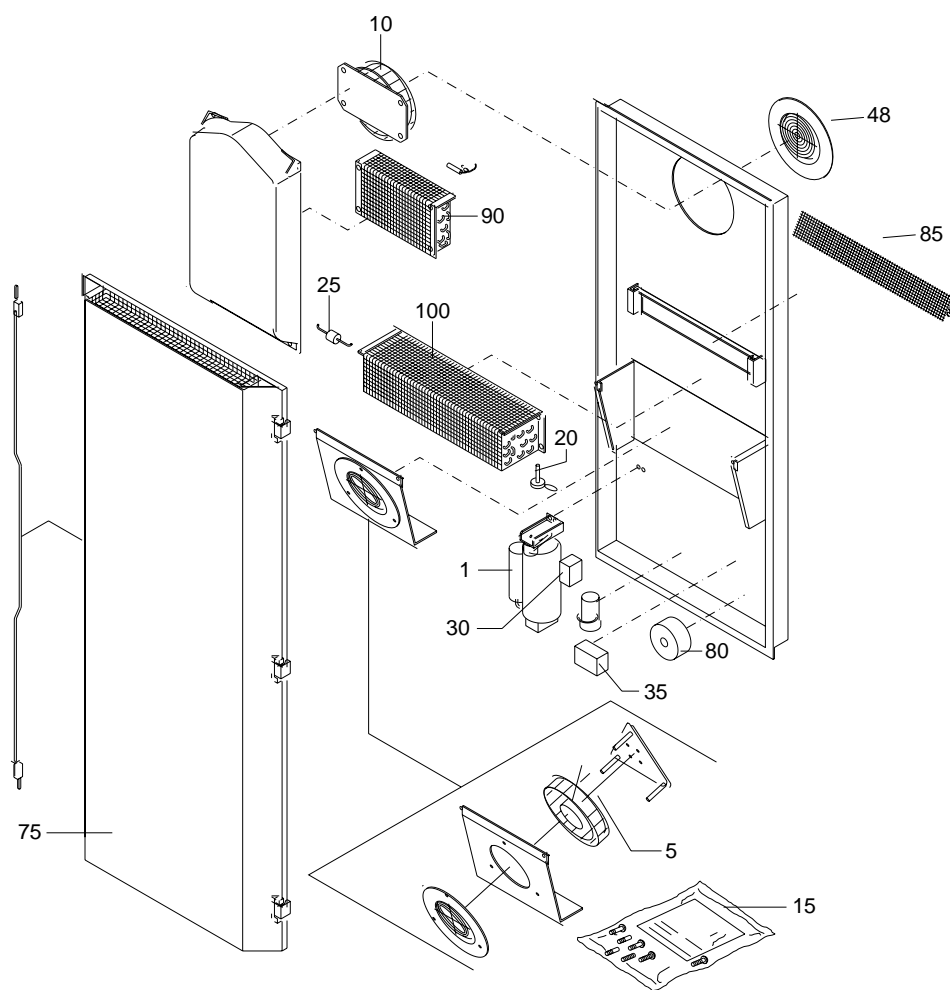
Manufacturing date:

Spare part no.:

SK 3306....



SK 3308....



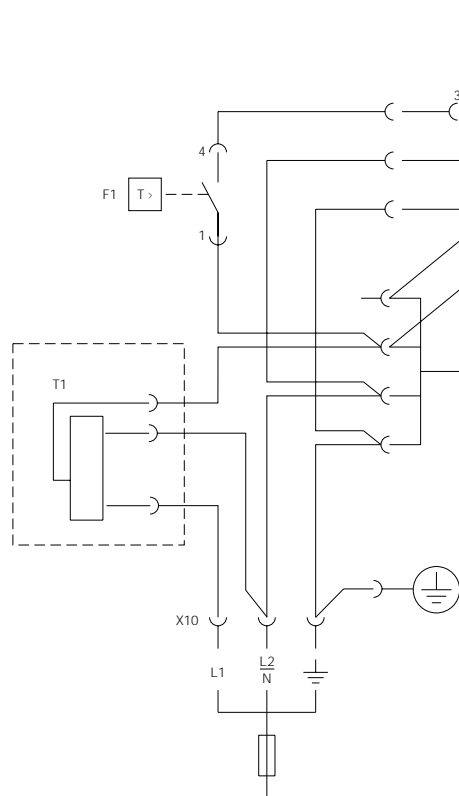
Anschlußschema

Wiring Diagram

Schéma électrique

Aansluitschema

SK 3308...
SK 3306...



Technische Daten siehe Typenschild
Technical data see specification plate
Données techniques voir plaque signalétique
Technische gegevens: zie typeplaatje
Tehniska data se tipyskylt
Informazioni tecniche vedi targhetta di tipo
Datos técnicos vea placa de características

C1 = Betriebskondensator Kompressor
C2/C4 = Betriebskondensator Lüfter
F1 = Thermostat
F2 = Hochdruckwächter
F3 = Thermokontakt Verdichter
M1 = Kompressor
M2 = Verflüssigerventilator
M4 = Verdampferventilator
X10 = Anschlußklemmleiste
X10 = L1, N, \perp = Netzanschluß
T1 = Transformator (400-V-Gerät)

C1 = Operating capacitor compressor
C2/C4 = Operating capacitor fan
F1 = Thermostat
F2 = High-pressure monitor
F3 = Thermal contact compressor
M1 = Compressor
M2 = Liquefier fan
M4 = Evaporator fan
X10 = Supply terminal strip
X10 = L1, N, \perp = Mains connection
T1 = Transformer (400 V cooling unit)

C1 = Bedrijfscondensator compressor
C2/C4 = Bedrijfscondensator ventilatoren
F1 = Thermostaat
F2 = Hogedrukpressostaat
F3 = Clixon compressor
M1 = Compressor
M2 = Condensorventilator
M4 = Verdamperventilator
X10 = Aansluitklemmenstrook
X10 = L1, N, \perp = netaansluiting
T1 = Trafo (400 V koelaggregaat)

C1 = Driftskondensator Kompressor
C2/C4 = Driftskondensator Fläkt
F1 = Termostat
F2 = Högedrukpressvakt
F3 = Termokontaktmellanrum
M1 = Kompressor
M2 = Kondensatorfläkt
M4 = Förångarfläkt
X10 = Nätslutningsplint
X10 = L1, N, \perp = nätanslutning
T1 = Trafo (400 V kylaggregat)

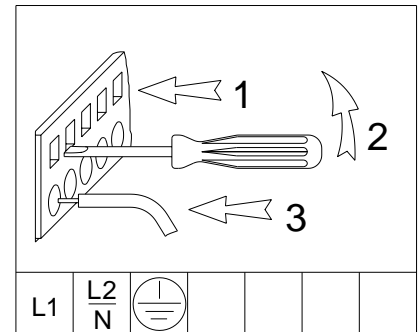
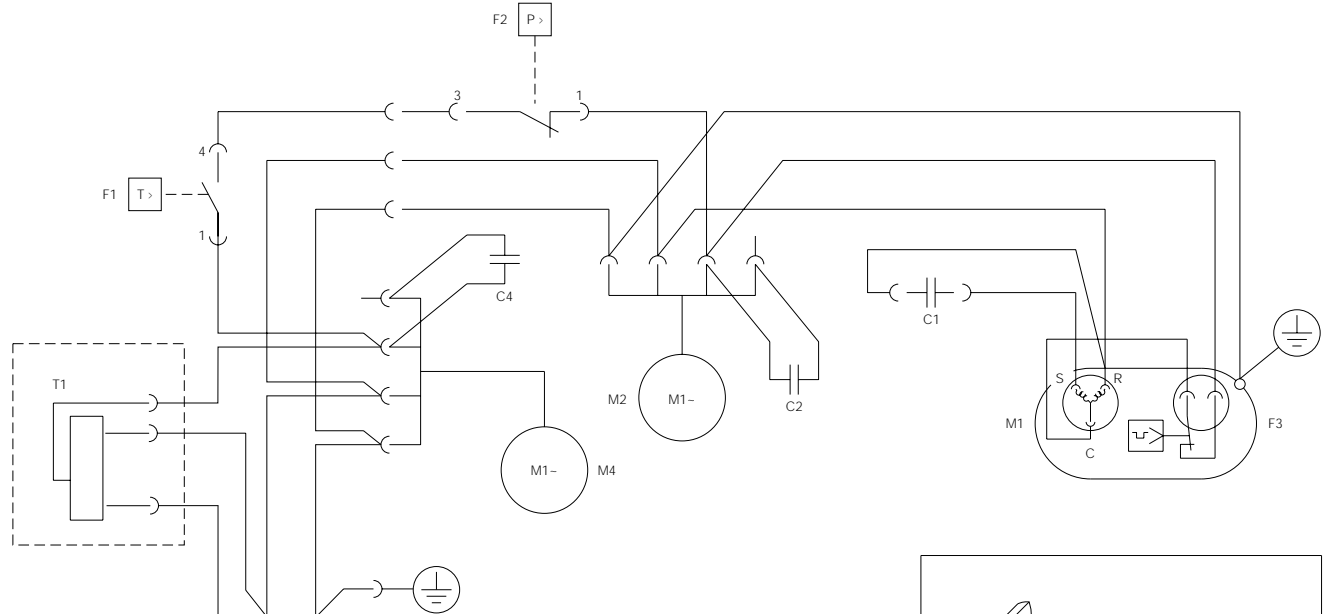
C1 = Condensador electrolítico de servicio del compresor
C2/C4 = Condensador electrolítico de servicio del ventilador
F1 = Termostato
F2 = Presostato
F3 = Contacto térmico compresor
M1 = Compresor
M2 = Ventilador del condensador
M4 = Ventilador del evaporador
X10 = Regleta de bornes
X10 = L1, N, \perp = Conexión de red
T1 = Transformador (refrigerador 400 V)

Anslutningsschema

Schema allacciamenti

Esquema de conexiones

SK 3308...
SK 3306...



C1 = Condensateur pour régime du compresseur
C2/C4 = Condensateur pour régime du ventilateur
F1 = Régulateur de température
F2 = Pressostat
F3 = Contact thermique du compresseur
M1 = Compresseur
M2 = Condenseur - ventilateur
M4 = Evaporateur - ventilateur
X10 = Borne plate de raccordement
X10 = L1, N, \perp = Raccordement au réseau
T1 = Transformateur (climatiser 400 V)

C1 = Condensatore d'esercizio compressore
C2/C4 = Condensatore d'esercizio ventilatore
F1 = Termostato
F2 = Pressostato
F3 = Termocontatto compressore
M1 = Compressore
M2 = Ventilatore del condensatore
M4 = Ventilatore dell'evaporatore
X10 = Morsettiera d'allacciamento
X10 = L1, N, \perp = Allacciamento rete
T1 = Trasformatore (apparecchio 400 V)

Kennlinienfeld (DIN 3168)

Performance Diagram

Diagramme des lignes caractéristiques

Karakteristik kurva

Diagramma delle curve caratteristiche

Diagrama de potencia

冷却能力線図

Q_k = Dauer-Nutzkühlleistung (W)

Cooling output

Puissance frigorifique utilisée

Nuttig koelvermogen

Kyleffekt

Potenza frigorifera utile

Potencia útil de refrigeración

冷却能力

T_i = Schaltschrank-Innentemperatur (°C)

Enclosure internal temperature

Température à l'intérieur de l'armoire

Temperatuur in de kast

Temperatur inne i skåpet

Temperatura interna dell'armadio

Temperatura interior del armario

de mando

内部温度 (蒸発器入口温度)

T_u = Umgebungstemperatur (°C)

Ambient temperature

Température ambiante

Omgevingstemperatuur

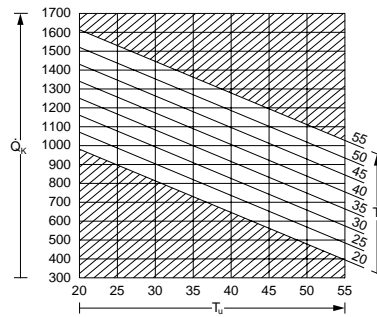
Omgivningstemperatur

Temperatura ambiente

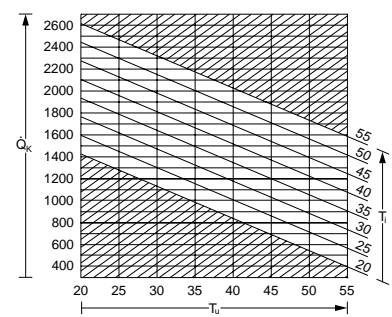
Temperatura ambiente

外部温度 (凝縮器入口温度)

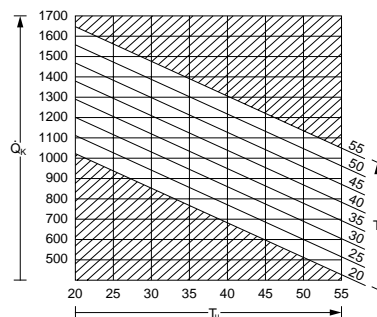
Kennlinienfeld
SK 3306.... / PSK 46.... / KTS 86....
(DIN 3168) (50 Hz)



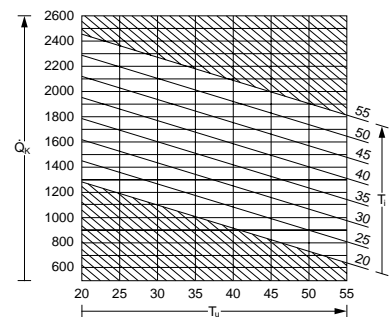
Kennlinienfeld
SK 3308.... / PSK 48.... / KTS 88....
(DIN 3168) (50 Hz)



Kennlinienfeld
SK 3306.... / PSK 46.... / KTS 86....
(DIN 3168) (60 Hz)



Kennlinienfeld
SK 3308.... / PSK 48.... / KTS 88....
(DIN 3168) (60 Hz)



Kennlinienfeld Leistungsaufnahme

Performance Input Diagram

Puissance absorbée

Karakteristiek vermogensopname

Karakteristik kurva ineffekt

Diagramma delle potenze assorbite

Diagrama de absorción de potencia

消費電力線図

P_{ei} = Leistungsaufnahme (kW)

Performance entry

Puissance absorbée

Vermogensopname

Ineffekt

Potenza assorbita

Absorción de potencia

消費電力

T_i = Verdampfeintritt (°C)

Evaporator entry

Entrée de l'évaporateur

Verdamperinlaat

Förångaringång

Ingresso evaporatore

Entrada del evaporador

内部温度 (蒸発器入口温度)

T_u = Verflüssigereintritt (°C)

Liquifier entry

Entrée du condenseur

Kondensorinlaat

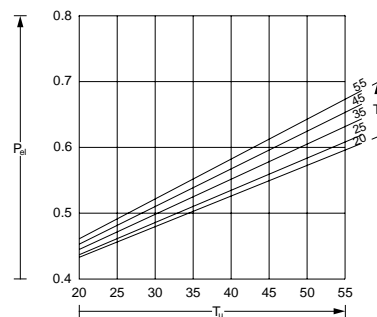
Kondensoringång

Ingresso condensatore

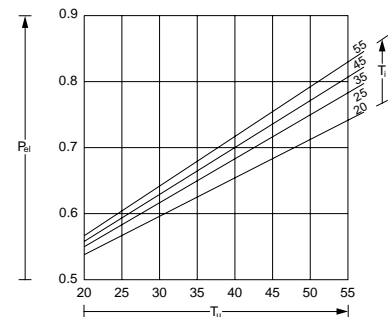
Entrada del condensador

外部温度 (凝縮器入口温度)

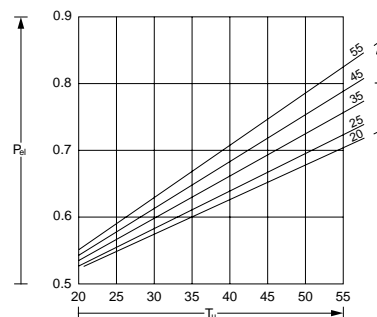
Kennfeld Leistungsaufnahme
SK 3306.... / PSK 46.... / KTS 86....
(DIN 3168) (50 Hz)



Kennfeld Leistungsaufnahme
SK 3308.... / PSK 48.... / KTS 88....
(DIN 3168) (50 Hz)



Kennfeld Leistungsaufnahme
SK 3306.... / PSK 46.... / KTS 86....
(DIN 3168) (60 Hz)



Kennfeld Leistungsaufnahme
SK 3308.... / PSK 48.... / KTS 88....
(DIN 3168) (60 Hz)

