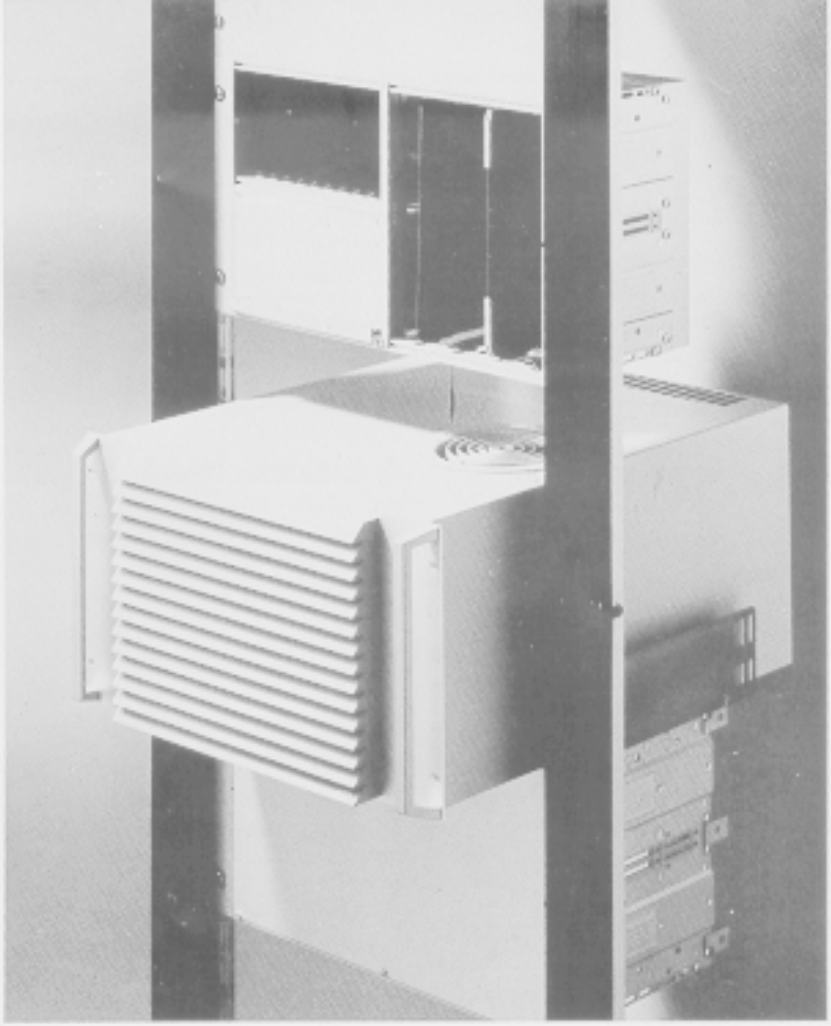


Schaltschrank-Kühlgerät SK 3292/78

Cooling unit · Climatiseur · Kylaggregat
Koelaggregaat · Condizionatore per armadi

Montage- und Betriebsanleitung

Assembly and operating instructions
Processus de montage et instructions de service
Montage- en gebruiksaanwijzing
Montage- och bruksanvisning
Istruzioni di montaggio e manutenzione

Umschalten auf Perfektion RITTAL

Contents

1. Application

Enclosure cooling units have been developed and designed to dissipate heat loss from enclosures and to cool the air inside the enclosure to protect temperature sensitive components. Enclosure cooling units are particularly suitable for the temperature range of 40 – 55° C, where comparable units such as air/air heat exchangers or fan units with filters, which due to their method of application cannot be used to dissipate heat loss efficiently and economically.

2. Technical Data

		SK 3278.134	SK 3292.134
Operating voltage		:115 V/50/60 Hz	230 V/50/60 H
Rated current		:8,0 A / 9,4 A	3,8 A / 4,5 A
Starting current		:21 A / 22 A	10,0 A / 11,8 A
Pre-fuse		:10 A / 10 A	6 A / 6 A
Rated outp	L 35 L 35	:615 W / 680 W	585 W / 650 W
	L 35 L 50	:680 W / 750 W	650 W / 720 W
Useful cooling output: DIN 3168/ EN 814	L 35 L 35	:1000 W/1000 W	1000 W/1000
	L 35 L 50	:660 W / 660 W	660 W / 660 W
Refrigerant		:R 134a, 700g	R 134 a, 700g
Permissible pressure		:20 bar	20 bar
Temperature range		:+20 up to +55°C	+20 up to +55°
Noise level		:63 dB (A)	63 dB (A)
Protective category EN 60529 :			
	Internal circulation	IP 54	IP 54
	External circulation	IP 34	IP 34
Weight		:38 kg	35 kg

Install the cooling at the bottom of the 19" cabinet.

3.1. Trace the air outlet by means of a template at the rear door and cut it out afterwards (fig. 1).

3.1. Fix the grille in the cut out.

3.3. Fix the air duct adaptor at the unit. With larger enclosure depth line up several adaptors and fix them with clamps.

3.4. Stick sealing onto the adaptor.

3.5. Screw handle onto the front panel of the unit.

3.6. Place unit on sliding rails and fasten it by means of 4 screws.

Prior to assembly, ensure that

- the site for the enclosure and the attachment of the cooling unit is suitably selected to ensure good ventilation;
- the site is free from dirt and humidity;
- the mains supply corresponds to the values stated on the rating plate;
- the continuous ambient temperature does not exceed 55° C;
- the packaging does not show any damage. Traces of oil on damaged packaging indicate loss of refrigerant, and the unit has incurred a leak in the system. Each case of packaging damage may be the cause for a subsequent failure of function;
- the enclosure is sealed all-round. Defective sealing of an enclosure can lead to condensate forming.

4. Electrical Connection

The supply voltage must correspond to the nominal voltage stated on the rating plate. There must be no additional pre-control of temperature on the infeed side.

The refrigerator should only be connected via a circuit breaker with a 3 mm minimum gap, for example a motor protection device.

5. Initial Operation and Control Behaviour

Following the assembly of the unit, electrical connection may be made after a waiting period of approximately 15 minutes (oil must collect in the compressor, in order to guarantee lubrication and cooling).

5.1 Regulation
The refrigerator operates automatically, i.e., the electrical connection having been effected, the ventilator of the evaporator works continuously thus assuring the permanent ventilation of the air inside the cabinet. The result is equal temperatures inside the cabinet. The built-in thermostat (regulation of the desired temperature inside the cabinet) allows automatic interruption of the operation of the refrigerator by the previously fixed value of 5 K. The factory has adjusted this switch difference at 35° C which means that the divice switches on at 35° C and turns off at 30° C.

5.2 Temperature regulation through thermostat:
Screw off maintenance flap (fig. 2). The temperature setting ranges between 20–60° C. The switch on temperature has to be be set at the setting knob. In order to avoid cycle operation of the compressor, the switch difference should not be altered or fall below 5 K.

6. Technical Information

The cooling unit (compression refrigeration machine) consists of four main parts: coolant condenser (compressor), evaporator, liquefier (condenser), and the control or expansion valve, which are connected by appropriate pipework. This system is filled with a (readily boiling substance) the coolant. The coolant R 12 (difluorodichlormethane CCL_2F_2) is non-combustible and does not form an explosive mixture, even with air. At up to 20 % by volume in the air, R 12 is practically odourless and nontoxic. A filter drier which is integrated into the hermetically sealed cooling circuit, offers effective protection against humidity, acid, melted particles, and foreign bodies inside the cooling circuit.

6.1 Cooling unit operation (cooling circuit, fig. 3)
When the coolant condenser is put into operation, it extracts coolant vapour from the evaporator. The heat required to evaporate the coolant is drawn from the vicinity of the evaporator (internal circulation within the enclosure) and effects its cooling. The heat fed to the coolant in the evaporator by virtue of the compression is dissipated by the liquefier to its environment (assisted by fans). With the condensation which then occurs, the coolant again becomes liquid.

In the thermostatically controlled expansion valve, the pressure of the liquid coolant is reduced to the required evaporator pressure. Heat from the liquid will be released due to cooling connected with the reduction this heat eva-

porates part of the coolant liquid. The mixture of cold liquid and (throttle) vapour is returned to the evaporator. This closes the cooling circuit the heat transfer process described starts afresh.

6.2 Safety Equipment

- Within its cooling circuit, the cooling unit has a component tested combined high/low pressure monitor in accordance with VBG 20, § 7.1, which, on the one hand, is set to maximum operating pressure and operates by means of an automatic reset device on recurring pressure drop, whilst on the other hand, it is set to minimum operating pressure in the evaporator in order to prevent the evaporator from icing up.
- Switch-off facility for high-pressure monitor at a limit temperature of 60° C, max.
- The automatic reset device (re-start) operates after the liquefying pressure has dropped to 14 bar. This corresponds to a liquefying temperature of 59° C. The fault cause of the pressure-side switchoff must however be removed first. With the integration of the high/low-pressure monitor, the cooling unit is inherently safe.
- The coolant compressor and the fans are fitted with a thermic winding protection switch to protect against excess current and excess temperature.

6.3 Condensate evaporator:
The cooling unit is fitted with an automatically regulated condensate evaporator which works as follows:

Condensate which may develop at the evaporator is drained off to the air duct of the liquefier fan where it is collected. The heated air skims over the water surface, collects water particles, and discharges them to the outside.

6.4 General

- Storage temperature: Cooling units must not be exposed to temperatures above 70° C during storage.
- Position during transportation: Cooling units should always be transported in the upright position.
- Waste disposal: The closed cooling circuit contains coolant and oil which must be disposed of in a suitable manner. Rittal Werk can take care of the disposal.

7. Maintenance and faults

7.1 Maintenance

The refrigerator circuit requires no maintenance and is filled with the required quantity of refrigerant in a hermetically sealed system before leaving the factory. It is tested to leaks and given a trial run.

The integrated ventilators have roller-bearings, are protected against moisture and dirt and equipped with thermostats. The durability of the apparatus amounts to at least 30.000 operating hours. This means that the refrigerator does practically not need any maintenance; except, in case of need, the cleaning of the parts of the exterior circuit. Depending on the amount of dirt, these components can be cleaned periodically by means of compressed air. The use of filter mats (SK 3286) is only recommended if big dirt particles in the air may cause a clogging of the condenser.

Exchange of filtering mat, fig. 2

Warning:

Before carrying out any maintenance work, turn off the current at the supply of the apparatus.

7.2 Faults

a) Faults on refrigerator or loss of refrigeration:

- The compressor cuts out too soon -check thermostat setting or switch mechanism (thermostat might be defect).

  Warninig: The refrigerator should not switch off and on more than 10 times during one hour.
- Condenser dirty – see 6.1 above.
- Failure of a condenser fan or an evaporator fan.
- Leak in the refrigerant circuit/the compressor runs continuously – check for leaks with a leak detector.
- Too much heat – cooling power not sufficient relative to the heat loss from equipment within the cabinet/ambient temperature above 55° recommended maximum.

b.) Electrical faults:

- Equipment does not work – check supply voltage on terminals.
- Failure of individual components:

1. Fans do not start:

   Check supply voltage on terminals noting the switch mode of the pressure gauge and thermostat.

2. Compressor does not start:

   Check voltage supply on terminals, noting the switch mode of the pressure gauge and thermostat. Bear in mind that the cut-in time of the coil protection switch depends on the heat stored in the motor coil. If the switch cuts out with the compressor cold, 5 minutes may pass before it switches on again. If it switches off with the compressor warm (housing temperature above 80° C), the time before it switches on again will be longer. If the compressor housing temperature exceeds 120° C, it may take up to 45 minutes before the switch cuts in again.

   Check the connections to the compressor itself and test the supply to ensure that it is within the prescribed tolerance (see 4. Electrical Connection).

   Check that the cable connections on the terminal block are tight.

8. Lieferumfang

1 Kühlgerät
2 Dichtband
2 Luftkanäle
1 Luftaustrittsgitter
4 U-Klammern
4 Flachkopfschrauben M 6 x 15
4 U-Scheiben
1 Montage- und Betriebsanleitung
1 Schablone

Garantie:
Auf dieses Gerät gewähren wir 1 Jahr Garantie bei fachgerechter Anwendung vom Tage der Lieferung an.
Innerhalb dieses Zeitraumes wird das eingeschickte Gerät im Werk kostenlos repariert oder ausgetauscht.

9. Ersatzteilliste

	SK 3292	SK 3278
Wartungsklappe	209 626	209 626
Lamellengitter	208 675	208 675
Lufteintrittsgitter Ø 170	207 118	207 118
Kompressor	206 613	208 827
Expansionsventil	206 611	206 611
Thermostat	208 961	208 961
Pressostat	210 162	210 162
Filtertrockner	208 453	208 453
Anlaufkondensator 80 µ F	207 092	–
Radialventilator Ø 175	207 112	209 049
Radialgebläse	209 316	209 812
Betriebskondensator	209 319	209 648
Verflüssiger	209 615	209 615
Verdampfer	209 616	209 616
Versandbeutel kompl.	260 830	260 830

8. Extent of Supplies

1 Cooling unit
1 Sealing strip
2 Air ducts
1 Air outlet grille
4 U-clamps
4 Flat head screws M 6 x 15
4 Washers
1 Mounting and assembly instructions
1 Template

Warranty:
We grant a one year's guarantee from the day of delivery, if this apparatus is correctly used.
Within this period of time we will charge no costs for the repair or exchange of the device if it is back to our factory.

9. List of Spares

	SK 3292	SK 3278
Maintenance flap	209 626	209 626
Plastic grille	208 675	208 675
Air inlet grille Ø 170	207 117	207 118
Compressor	206 613	208 827
Expansion valve	206 611	206 611
Thermostat	208 961	208 961
Pressure gauge	210 162	210 162
Filter dryer	208 453	208 453
Starting condenser 80 µ F	207 092	–
Radial fan Ø 175	207 112	209 049
Radial blower	209 316	209 812
Operating condenser	209 319	209 648
Liquerfier	209 615	209 615
Evaporator	209 616	209 616
Dispatch bag, complete	260 830	260 830

8. Mode de livraison

1 Climatiseur
1 Joint d'étanchéité
2 Canaux d'air
1 Grille de sortie d'air
4 Brides en U
4 Vis à tête plate M 6 x 15
4 Rondelles en U
1 Instructions de montage et de fonctionnemt
1 Matrice

Garantie:
Nous vous assurons une année de garantie à compter dè les jour de la livraison si l'appareil est proprement utilisé.
En dedans de cette période, nous réparerons ou échangerons l'appareil, s'il nous est renvoyé, sans vous charger des frais.

9. Liste de pièces de rechange

	SK 3292	SK 3278
Capot d'entretien	209 626	209 626
Grille à lamelles	208 675	208 675
Grille de sortie d'air Ø 170	207 118	207 118
Compresseur	206 613	208 827
Soupape d'etente	206 611	206 611
Thermostat	208 961	208 961
Pressostat	210 162	210 162
Sécheur de filtre	208 453	208 453
Condensateur de démarrage 80 µ F	207 092	–
Ventilateur radial Ø 175	207 112	209 049
Soufflerie radiale	209 318	209 812
Condensateur de régime	209 319	209 648
Condenseur	209 615	209 615
Evaporateur	209 616	209 616
Sac d'envoi complet	260 830	260 830

8. Levering

1 Koelaggregaat
1 Afdichtband
2 Luchkanalen
1 Uitlaatrooster
4 U-klemmen
4 Vlakschroeven M 6 x 15
4 Sluitringen
1 Montage- en bedieningsaanwijzing
1 Boorsjablon

Garantie:
Zie algemene leveringsvoorwaarden.

9. Reserveonderdelen

	SK 3292	SK 3278
Onderhoudsklepje	209 626	209 626
Lamelrooster	208 675	208 675
Luchtinlaatrooster Ø 170	207 118	207 118
Kompressor	206 613	208 827
Expansieventiel	206 611	206 611
Thermostat	208 961	208 961
Pressostaat	210 162	210 162
Filter/droger	208 453	208 453
Aanloopkondensator 80 µ F	207 092	–
Radiaalventilator Ø 175	207 112	209 049
Radiaalventilatorbehuizing	209 318	209 812
Bedrijfskondensator	209 319	209 648
Kondensator	209 615	209 615
Verdamper	209 616	209 616
Toebehoren kompleet	260 830	260 830

8. Leveransomfattning

1 Kylaggregat
1 Tätningsband
2 Luftkanaler
1 Luftutblåsgaller
4 U-klämmor
4 Skruvar M 6 x 15
4 Skivor M 6
1 Montage- och bruksanvisning
1 Mall

Garanti:
På detta aggregat lämnär vi I års fabriksgaranti från leveransdagen, vid fackmannamässig användning.
Inom denna tidsrymd repareras eller ubyts aggregatet kostnadsfritt vid insändandet till vår fabrik.

9. Reservdelslista

	SK 3292	SK 3278
Manöverlucka	209 626	209 626
Lamellgaller	208 675	208 675
Luftgangsgaller Ø 170	207 118	207 118
Kompressor	206 613	208 827
Expansionsventil	206 611	206 611
Thermostat	208 961	208 961
Pressostat	210 162	210 162
Filtertorkare	208 453	208 453
Startkondensator 80 µ F	207 092	–
Radial fläkt Ø 175	207 112	209 049
Radiellt utblas	209 318	209812
Driftskondensator	209 319	209 648
Kondensor	209 615	209 615
Förangare	209 616	209 616
Leveransförpackning komplett	260 830	260 830

8. La fornitura comprende

1 Condizionatore
1 Guarnizione
2 Canali dell'aria
1 Griglia aria uscente
4 Staffa ad U
4 Viti a testa piatta M 6 x 15
4 Rosette ad U
1 Opuscolo delle Istruzioni di montaggio e manutenzione
1 Dima di foratura

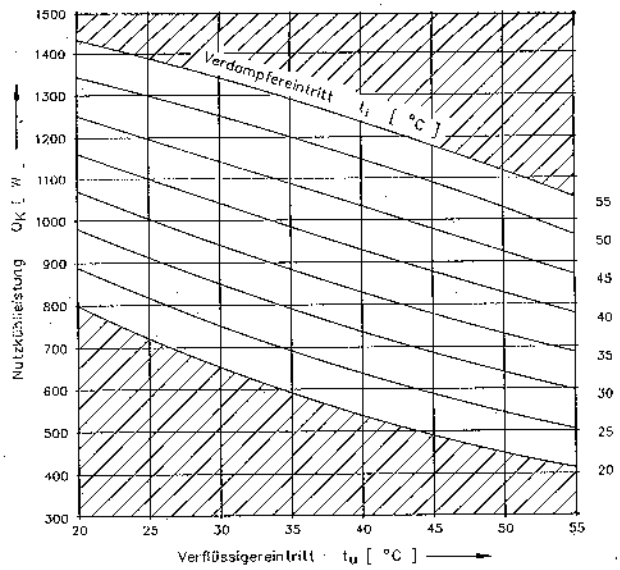
Garanzia:
Questo condizionatore è garantito per un anno, dal giorno della fornitura, per impiego a regola d'arte.
In caso di quasto durante questo periodo di tempo, il condizionatore dovrà essere spedito in fabbrica e verrà riparato o sostituito gratuitamente.

9. Elenco parti di ricambio

	SK 3292	SK 3278
Coperchio per la manutenzione	209 626	209 626
Griglia in plastica a lamelle	208 675	208 675
Griglia d'uscita a lamelle Ø 170	207 118	207 118
Compressore	206 613	208 827
Valvola d'espansione	206 611	206 611
Termostato	208 961	208 961
Pressostata	210 162	210 162
Filtro essicatore	208 453	208 453
Condensatore d'avviamento 80 µ F	207 092	–
Ventilatore radiale Ø 175	207 112	209 049
Aspiratore radiale del condensatore	209 318	209 812
Condensatore d'esercizio	209 319	209 648
Condensatore	209 615	209 615
Evaporatore	209 616	209 616
Sacchetto della confezione complete	260 830	260 830

Kennlinienfeld SK 3292/78 (DIN 3168)

Performance diagram
Champs de lignes caractéristiques
Karakteristiek
Karakteristik kurva
Diagramma delle curve caratteristiche



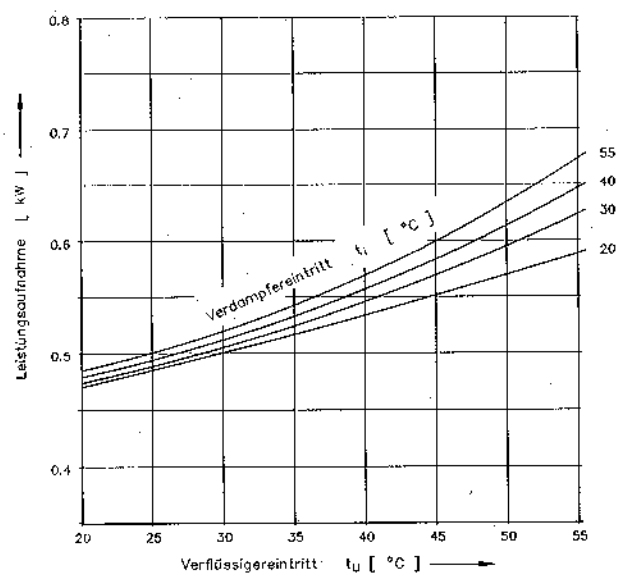
$\dot{Q}_K$ = Cooling output
Puissance frigorifique utilisée
Nuttig koelvermogen
Kyleffekt
Potenza frigorifera utile

t_u = Liquefier entry
Entrée du condenseur
Condensorinlaat
Kondensoringång
Ingresso condensatore

t_j = Evaporator entry
Entrée de l'évaporateur
Verdamperinlaat
Förångaringång
Ingresso evaporatore

Kennfeld Leistungsaufnahme SK 3292/78

Performance input diagram
Puissance absorbée
Karakterstiek vermogensopname
Karakteristik kurva ineffekt
Diagramma delle potenze



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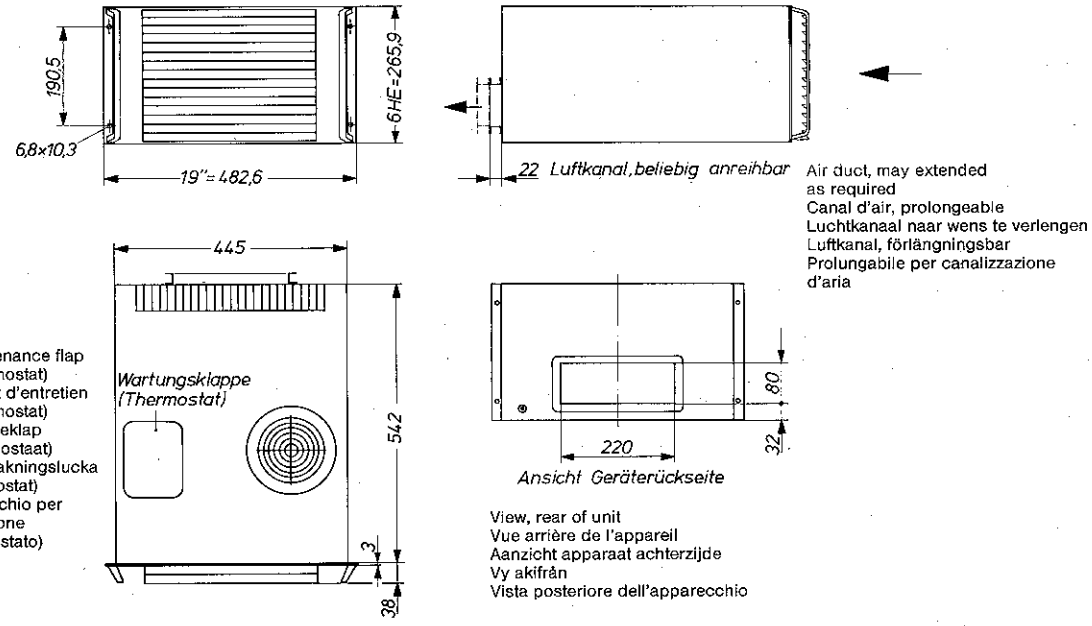
Performance entry [kW]
Puissance absorbée [kw]
Vermogensopname [kW]
Ineffekt [kW]
Diagramma delle potenze [kW]



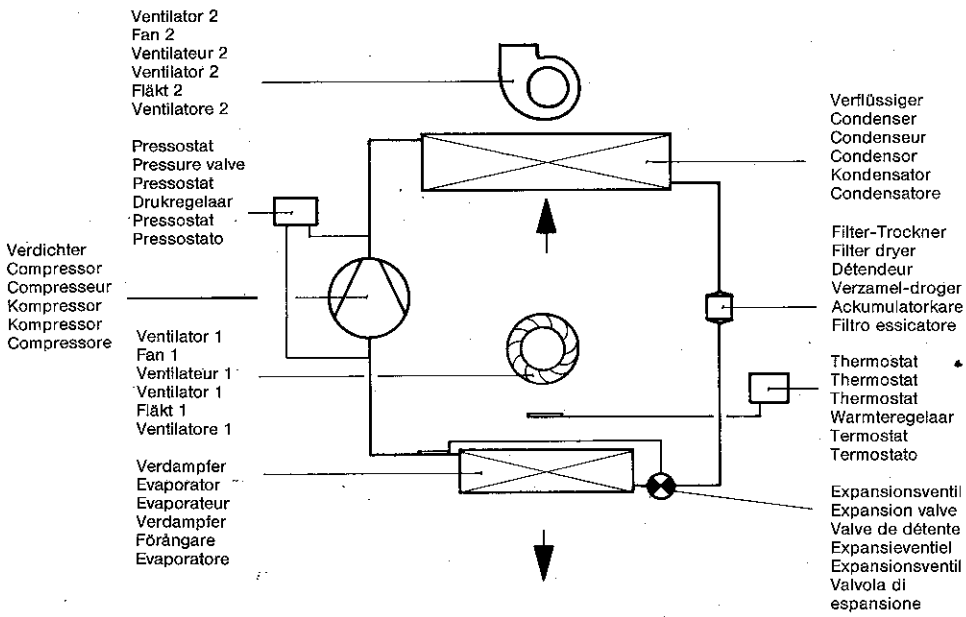


Abb. 3
Fig. 3
fig. no. 3
afb. 3
Bild 3
Fig. 3

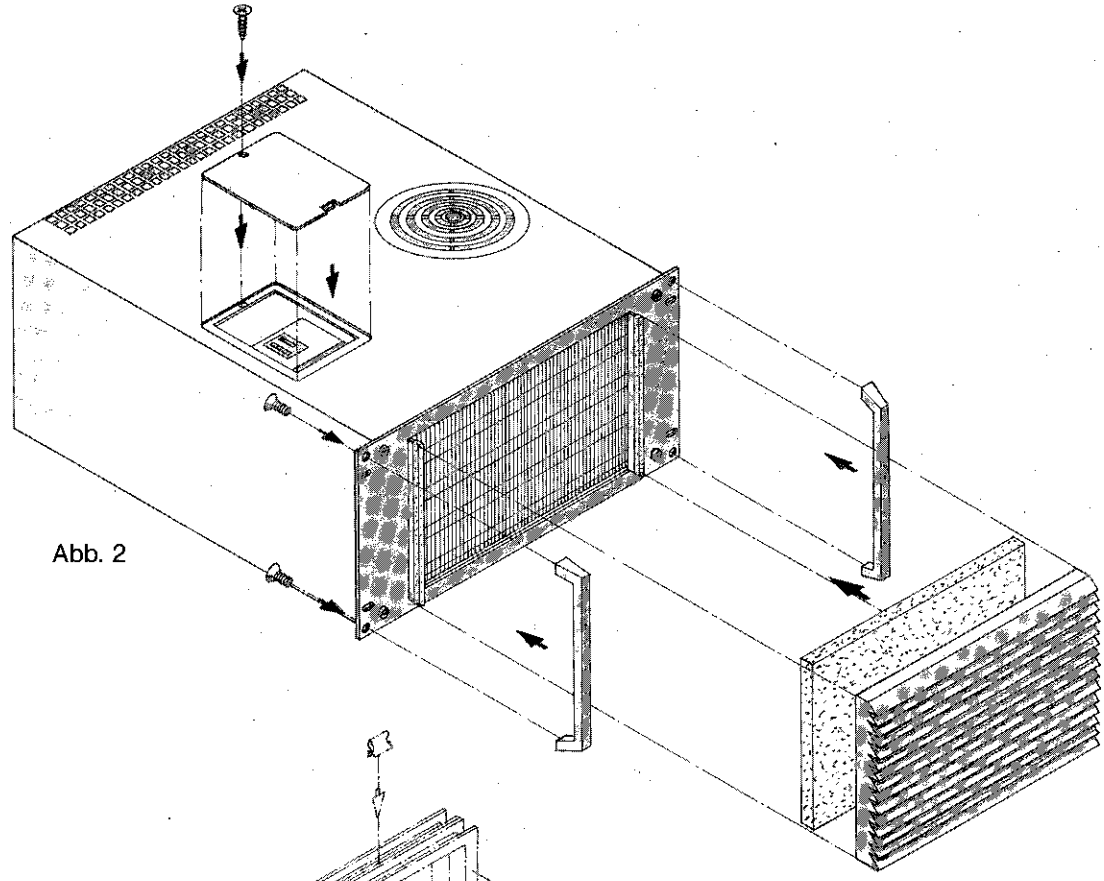


Abb. 2

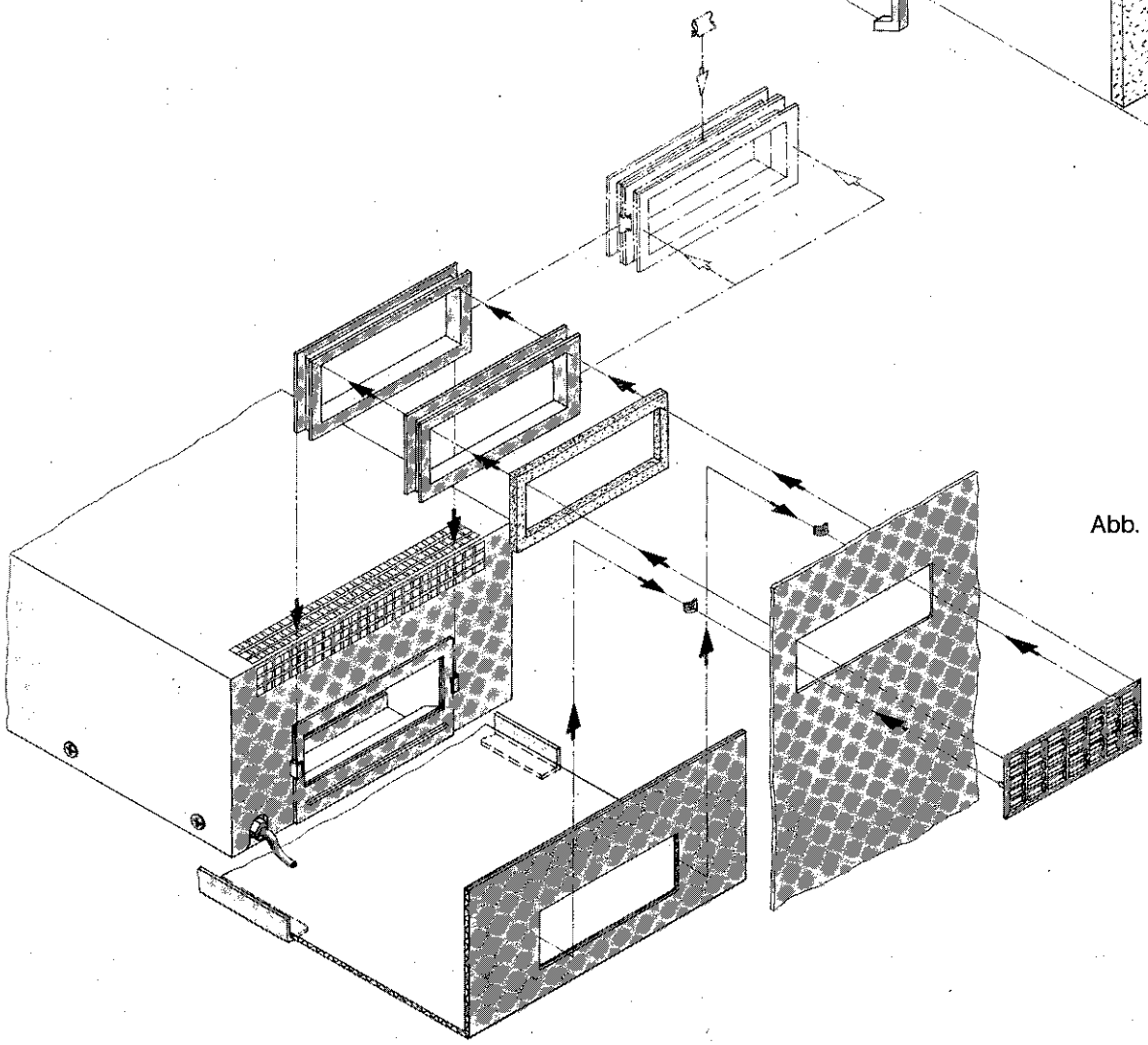
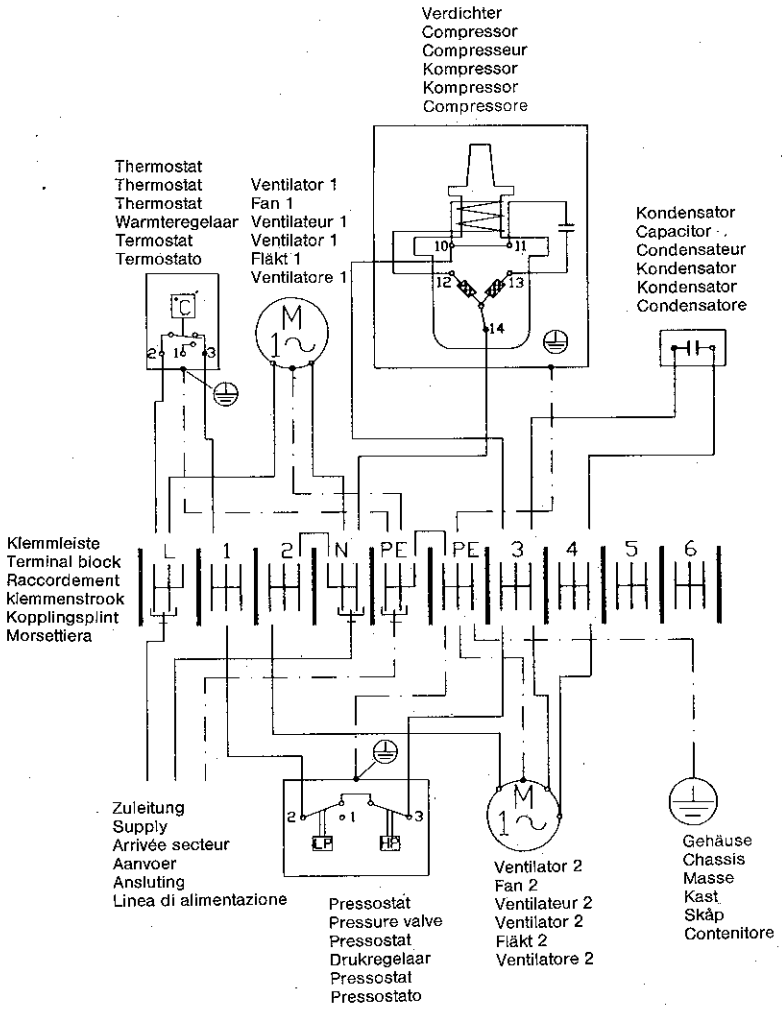


Abb. 1

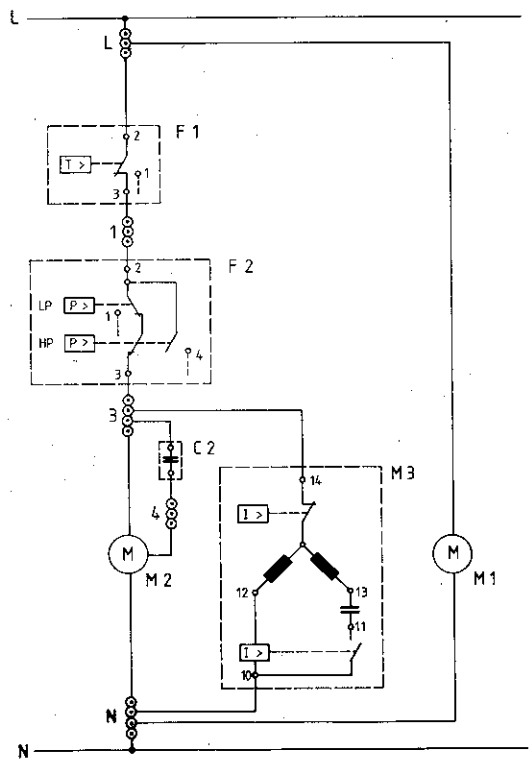
Wirkschaltplan
Circuit diagram
Schéma des connexions
Schakelschema
Koopplingsschema
Schema di allacciamento



Stromlaufplan
Blockdiagram
Circuit électrique
Stroomschema
Strömschema
Circuito elettrico

⊙ Klemmleiste
Terminal block
Raccordement
Klemmenstrook
Kopplingsplint
Morsettiera

o Geräteklemmen
Component terminals
Boitier de raccordement
Appartenklemmen
Skåpplint
Morsetti dell'apparecchio



F 1 = Thermostat
Thermostat
Thermostat
Warmteregelaar
Termostat
Termostato

F 2 = Pressostat
Pressure valve
Pressostat
Drukregelaar
Pressostat
Pressostato

M 1 = Ventilator Verdampfer
Fan Evaporator
Ventilateur evaporator
Ventilator verdampfer
Fläkt Förangare
Ventilatore evaporatore

M 2 = Ventilator Verflüssiger
Fan Condenser
Ventilateur condenseur
Ventilator condenser
Fläkt Kondensor
Ventilatore condensatore

M 3 = Verdichter
Compressor
Compresseur
Kompressor
Kompressor
Compressore

C 2 = Kondensator
Capacitor
Condensateur
Kondensator
Kondensator
Condensatore