

Installation and Service Instructions

Roof-Mounted Air Conditioner KK2000 E

ID No. 98278C



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1. INTRODUCTION

1.1 Contents and Purpose

These installation and service instructions contain important information to support trained personnel in the assembly, control, operation, and maintenance of the roof-mounted air conditioner KK2000 E.

1.2 Relevance of Emphasized Text

These instructions contain texts emphasised with CAUTION, WARNING, and NOTE, which mean as follows:

CAUTION

This header is used when not following instructions or procedures correctly or at all can result in injuries or death.

WARNING

This header is used when not following instructions or procedures correctly or at all can result in damages to components.

NOTE

This header is used to point out a special situation.

1.3 Additional Documents for Reference

Installation instructions for the Air Top 3500 (77625):

Operating Manual for the Air Top 3500 (776,246):

1.4 Safety Information and Requirements

The roof-mounted air conditioner KK2000 E is constructed according to the latest technology and is safe for operation when mounted and used correctly according to the information in these installation and service instructions.

As a rule, the general national accident prevention regulations and applicable operating safety instructions are to be adhered to.

This includes safety regulations from the civil engineers professional association for the construction and operation of earth-moving machinery.

(Technischer Aufsichtsdienst, Landsberger Str. 309, 80687 Munich, Germany)

DIN ISO 3471 roll protection attachments

DIN ISO 3449 protective attachments for falling objects

DIN ISO 3411 machine operator, height and size, minimum free area, guidelines, safety regulations, basic requirements and information sheets from the specialist committee at the center for safety and health – BGZ – under the umbrella of the association of professional associations.

(Carl Heymanns Verlag KG, Luxemburger Str. 449, 50939 Cologne, Germany)

“General Safety Requirements” beyond the scopes of these regulations are explained below.

The special safety requirements for these instructions are explained in the individual sections or in procedures in specially emphasized text.

General Safety Requirements

By not following the installation instructions and the information contained therein you release Webasto from all liability. This also applies for non-specialist repairs or when original spare parts are not used. This can result in loss of the vehicle's general operating permit (ABE).

Regulations from professional associations, especially regarding head clearance, falling objects, and vehicle tipping, must be considered.

When installing the roof-mounted air conditioner, adhere to the applicable regulations.

Electrical lines and operating elements on the air conditioner must be arranged in the vehicle so that the function of this is not adversely affected under normal operating conditions.

Safety Information for Maintenance Work

If there are malfunctions in the coolant cycle, the system must be checked and properly repaired by a specialist repair center. The coolant may never be released into the air (§ 8, CFC chlorofluorocarbon prohibition from May 06, 1991).

Never warm up coolant bottles with an open flame.

Liquid coolant may not come into contact with skin. Read and observe the safety data sheet.

When working with coolant, wear protective clothing and goggles.

CAUTION

Do not perform any welding or soldering on the enclosed coolant system or in the vicinity. The heat increases the pressure in the system. There is a danger of explosion.

Before starting work, let the system completely cool down. There is a danger of burns on the condenser, compressor, and the hoses.

Assembly, service and repair work must be performed by trained personnel. Work may only be performed when the motor is stopped and the power supply has been switched off.

Disconnect the battery before opening the roof-mounted air conditioner and working on the electric wiring.

Do not wear metal jewellery when working on electric components (remove bracelets, watches, necklaces, rings).

2. GENERAL DESCRIPTION

The air conditioner and the heater unit are operated independently with separate control elements. A relay ensures that both units cannot be operated simultaneously.

The compressor has a hydraulic drive.

The air conditioning and the heater unit are designed for operation with circulating air.

Option: The KK2000 E can also be delivered without a heater unit.

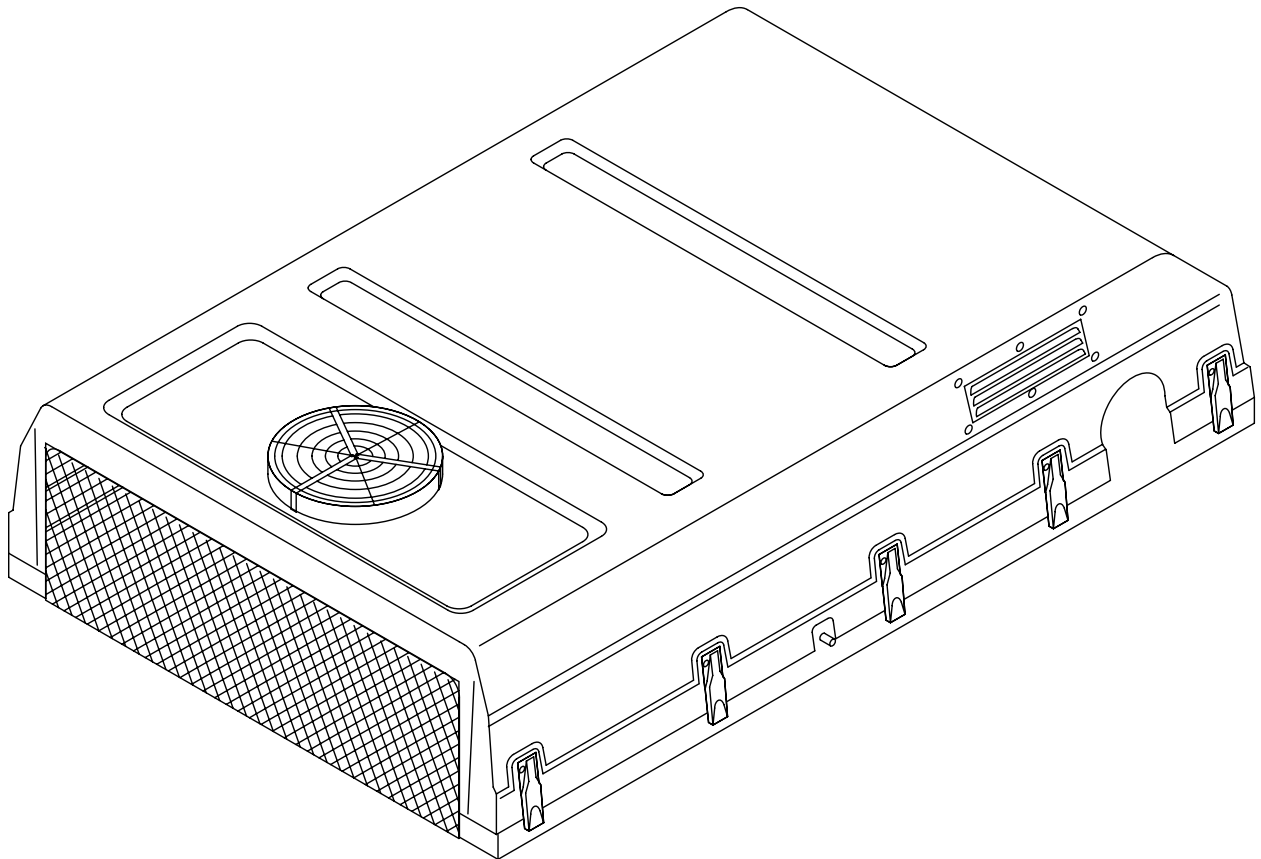


Figure 2.1

2.1 Roof-Mounted Air Conditioner

The roof-mounted air conditioner is shown in figure 2.2.

It contains:

- The cover (1) with openings as well as protective screens for the condenser air intake and exhaust, this is the outer contour section.
- The base plate (8) as a load-bearing structural component.

Integrated in this are:

- Radial fan (5),
- Accumulator dryer (13) with glass front (14), high pressure switch (15) and low pressure switch (20)
- Condenser (3)
- Vaporizer (6)
- Expansion valve (11)
- Coolant lines (9, 10)
- Cable harness with flat fuse holder (2) and relay holder (16)
- Axial blower (4)
- Compressor (18) with hydraulic engine (19)
- AT 3500 heater (optional) (12)

Roof-Mounted Air Conditioner KK2000 E

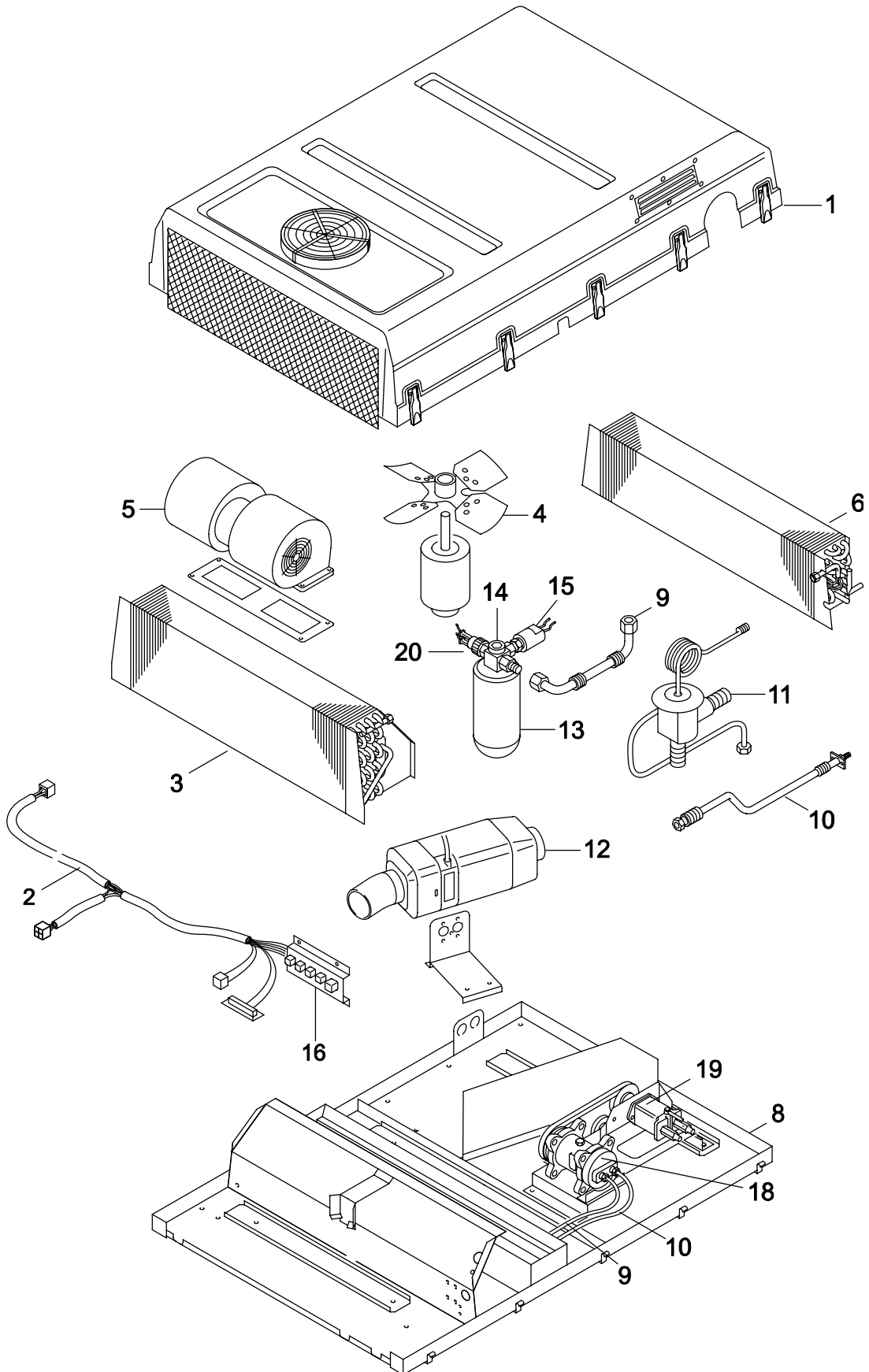


Figure 2.2

2.2 Air Manifold Plate

The air manifold plate (figure 2.3) contains:

- Air manifold plate (1) with dividing sheet (8)
- Adjustable air blowers (5,6)

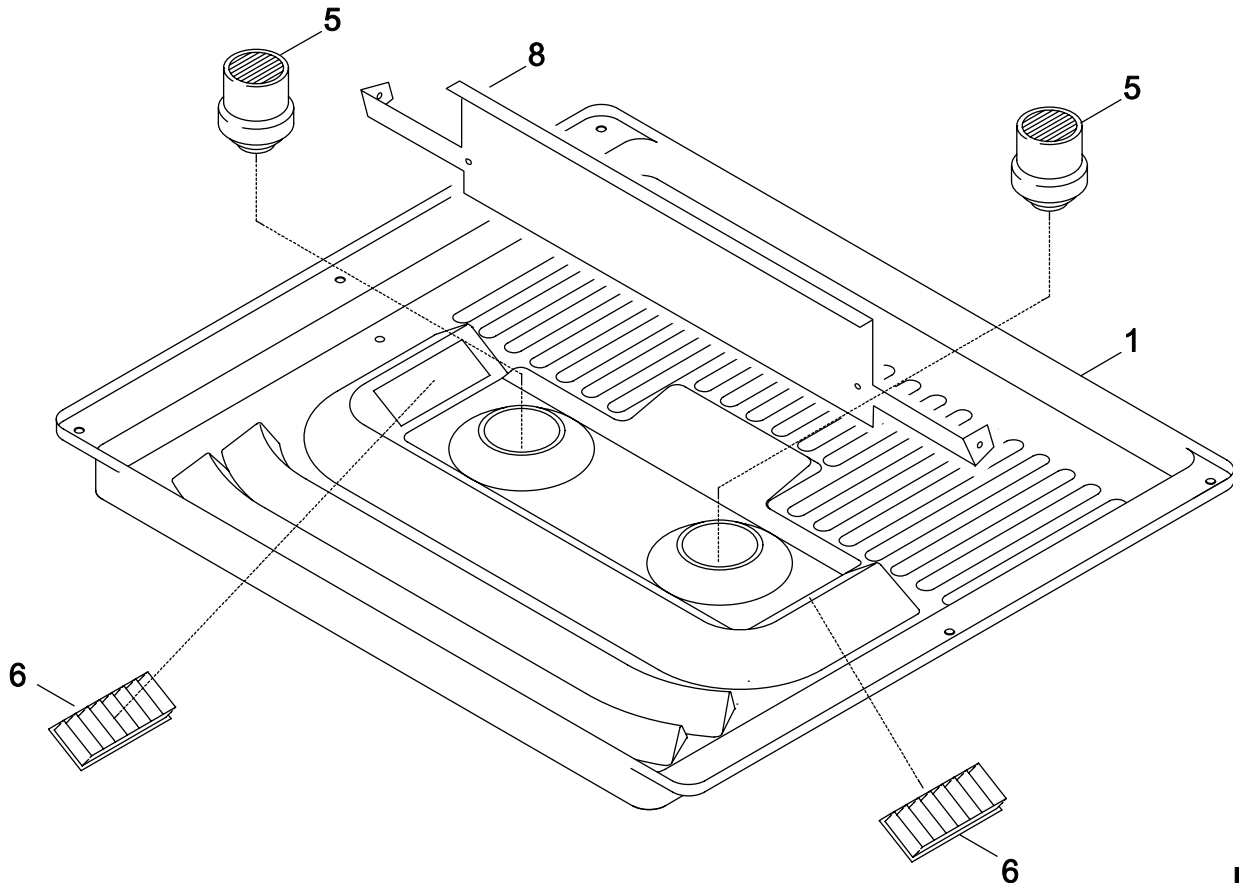


Figure 2.3.

F

2.3 Electrics

The circuit diagrams for the KK2000 E are shown in figure 3.1.

The connection must use a battery discharge protection switch with a fuse. This way the system can only be operated when the vehicle engine is running.

2.4 Workings of the Air Conditioning

2.4.1 Ventilation

Turn the thermostat to the far left (OFF).

Turn the blower switch from OFF to the right to level 1, 2, or 3, depending on the amount of air desired. By adjusting the dischargers (5,6 figure 2.3), you can change the air flow to suit your individual needs. The flow from the slots remains constant for the front windshield.

2.4.2 Cooling

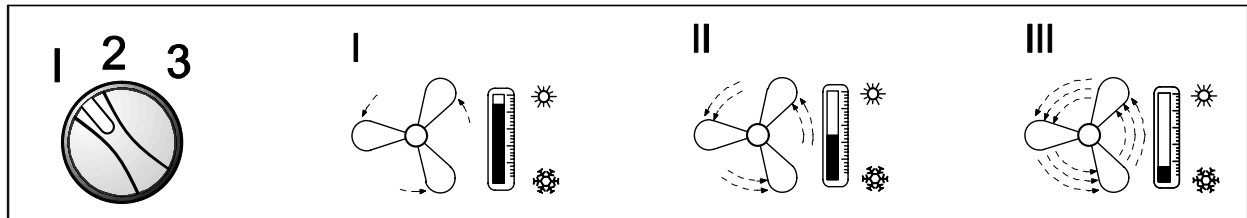
Adjust the blower switch as described in section 2.4.1. The thermostat switch must be switched on for the compressor to work. Turn to the right until you reach the desired air temperature. The lowest temperature is when it is turned all the way to the right.

For maximum cooling effects, the blower switch must be set to 3.

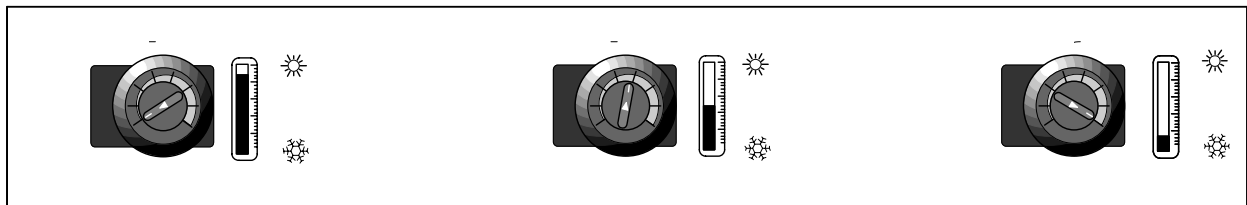
Switch on/switch off:



Blower strength:



Selecting the temperature with the set value indicator:



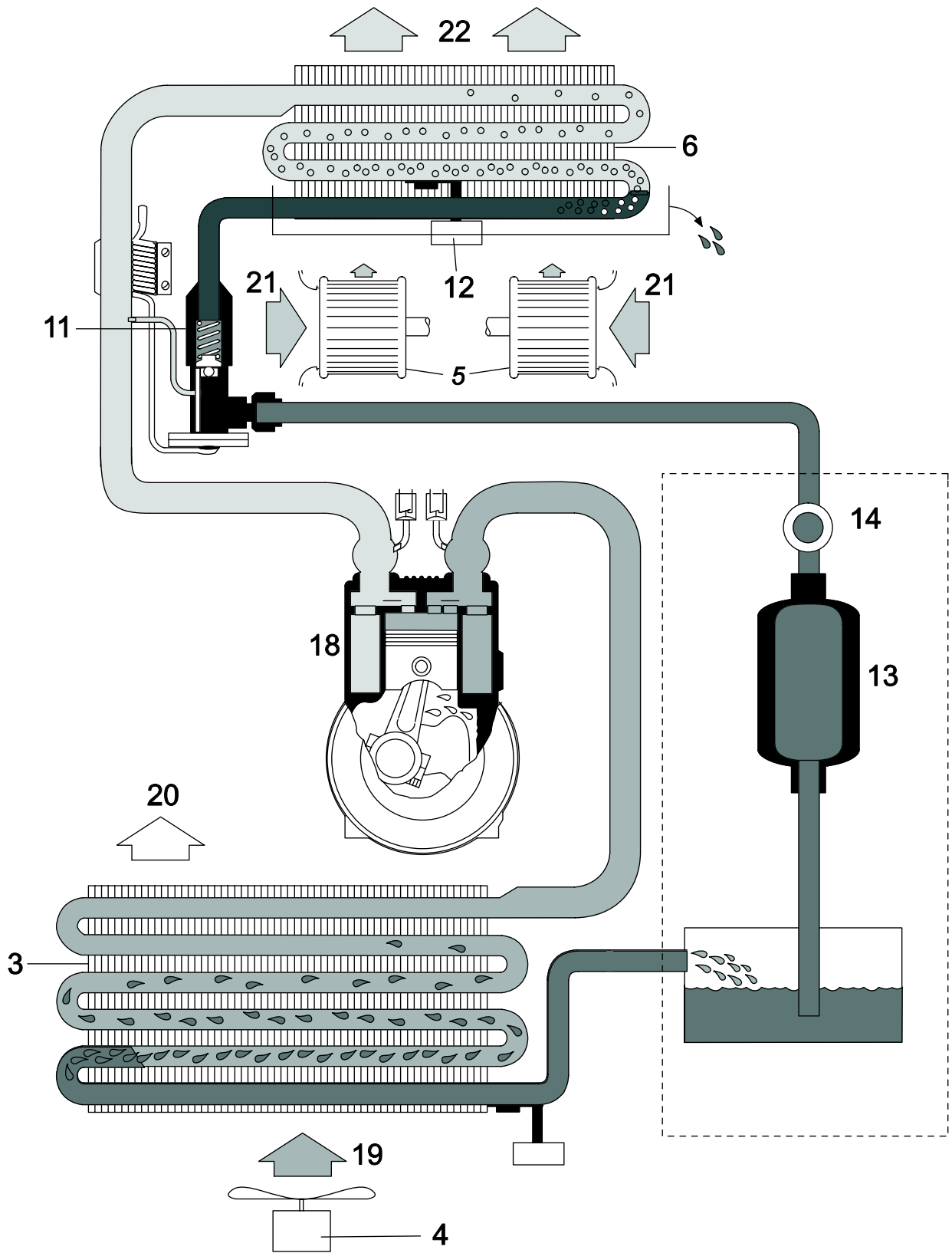


Figure 2.4.

Coolant lifecycle (figure 2.4)

When the air conditioner is switched on, the compressor (18) links up using the magnetic coupling and is run by the vehicle's engine drive belts. It compresses the coolant gas and transports it to a condenser (3) where it is condensed by heat exhaust.

The condenser transfers the condensation heat to the exhaust air ventilated through the condenser (19 and 20). The axial blower (4) provides sufficient ventilation even if the vehicle is not moving.

The liquid coolant flows through the accumulator dryer (13) to the expansion valve (11), it relaxes with regulated pressure drops and returns to the gas form after intense heating in the vaporizer (6).

The warm air (21) in the vehicle cabin is sucked in by the radial blowers (5), cooled in the vaporizer, dried and returned to the cabin through a air manifold plate (22). The condensation is separated and sent out.

During operation, the coolant cycle is monitored by the thermostat switch (12) (S2, see circuit diagram, figure 3.1) and the pressure switch (15) (S3, see circuit diagram, figure 3.1). These two switches are used to turn the magnetic coupling on and off and to couple and uncouple the compressor.

When the air conditioner is switched off, the magnetic coupling and the blower motors will have no power. The coolant system and the air circulation system are switched off.

2.5 Design, Task, and Function of the Components (figure 2.4)

Condenser

The condenser (3) consists of a continuous helical tube and blades that are connected together to a large heat exchange surface.

It cools down the hot coolant gas until it liquefies and is undercooled, and it transfers the condensation heat over the blades to the outside air that flows through them.

Accumulator dryer

The accumulator dryer with glass front (13) is a compensation and storage container for coolant. The lower section contains drying granulates that extract small amounts of water from the coolant and chemically bind it. This reduces the danger of icing in the expansion valve and protects the compressor from damages. During operation, the glass front (14, figure 2.4) shows if enough coolant is in the system.

Thermostatic expansion valve

The thermostatic expansion valve (11) regulates the flow of coolant to the vaporizer according to the coolant needs or the temperature in the vaporizer. The thermostatic expansion valve is the control element between the high pressure and low pressure sections in the coolant circuit.

Vaporizer

The vaporizer (6) has the same basic design as the condenser. In this, the coolant flowing through the lines from the expansion valve converts from liquid to gas and is overheated.

The necessary steam heat is drawn over the blades from the flowing cabin air and transferred to the coolant through the pipe walls. The cooling air is dried and the condensation water from this is lead outside.

Pressure switch

The high pressure and low pressure switch monitors the pressure ratios in the high pressure section of the coolant circuit and uses the magnetic coupling to switch the compressor off if the pressure drops too low (such as a loss of coolant) or if the pressure is too high (such as overheating in the condenser).

Thermostat switch

The thermostat switch (12) is a temperature switch. It measures the temperature between the vaporizer blades and switches off the power to the compressor's magnetic coupling if there is a danger of icing and, after a slight warm up, switches it on again.

Axial blower

The axial blower (4) consists of a direct current motor and fan wheel.

Once the air conditioner is switched on, it will constantly be run with board voltage and supply the condenser with the required external air.

Radial blower

The radial blower (5) contains a multi-stage DC motor that can be run at three different speeds. It vacuums the cabin air through the vaporizer and blows it through the nozzles in the air manifold plate back into the cabin.

Compressor

The compressor (figure 2.5) consists of the swash plate compressor and the magnetic coupling with fan belt washer. It is switched on and off as needed with the magnetic coupling when the air conditioning system is on.

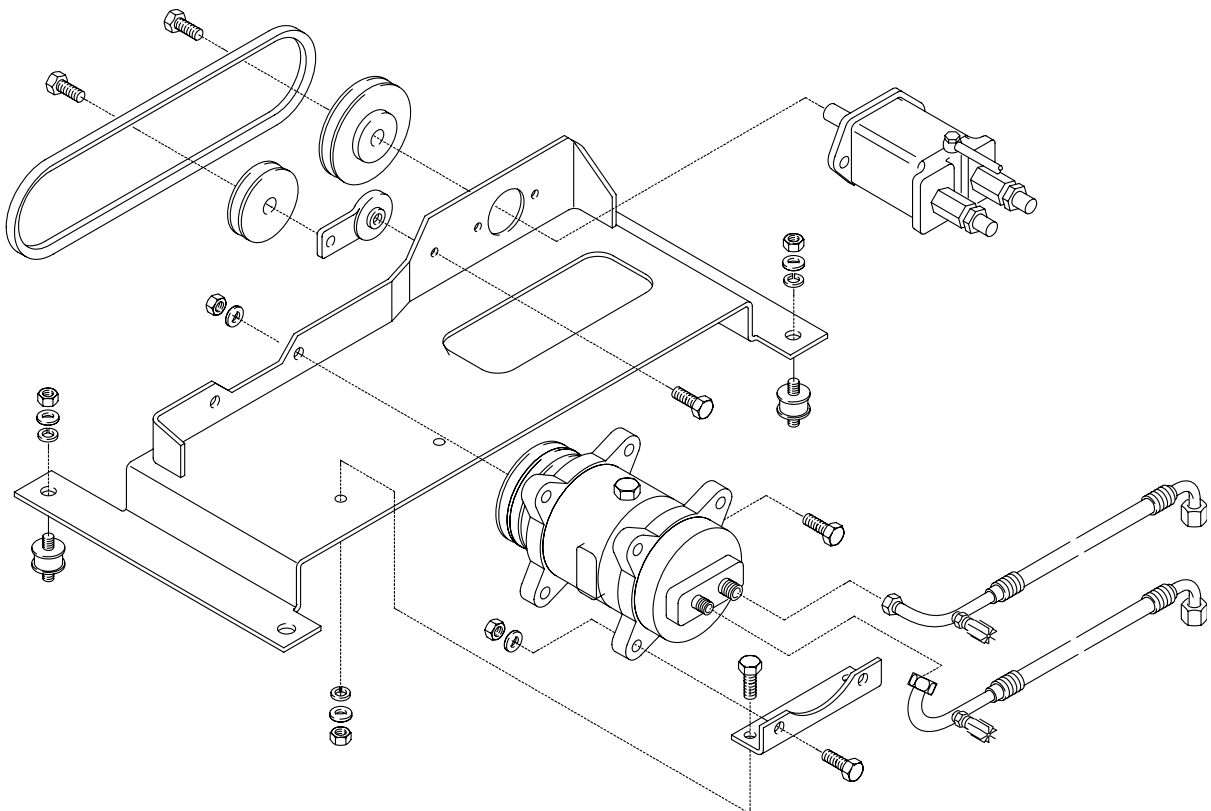


Figure 2.5.

3. TECHNICAL DATA

3.1 Air Conditioning

Description

Dimensions, roof-mounted air conditioner

– Length x Width x Height

Weight (body) with AT 3500

Weight (body) without AT 3500

Operating voltage

Fuses

Type KK2000 E

1301 mm X 814 mm X 284 mm

approx. 95 kg

approx. 90 kg

24 Volt DC

See key to circuit diagram, p. 17

Power consumption

at vaporizer blower level

– Air conditioning (W)

– Air circulation (W)

	1	2	3
Air conditioning (W)	220	260	330
Air circulation (W)	100	140	210

Operating control

Rotational direction

Left	Right
High	Low
Temperature	Temperature

Switch points for low pressure switch

– Off

– On

2 bar

4 bar

Switch points for high pressure switch

– Off

– On

24 bar

17 bar

Coolant

R134a

Coolant filling amount

approx. 0.9 kg

Coldness at compressor speed of n=3000 rpm and outside temperatures of 40° Celsius.

6.4 kW

Vaporizer – Air flow volume (free blowing)

– level 1

– level 2

– level 3

approx. 460 m³/h

approx. 660 m³/h

approx. 900 m³/h

3.2 Compressor

Description

Dimensions (length x width x height)

Weight (body):

Rotational direction

Piston displacement/rotation

Refrigerator oil (type/amount)

Coolant connections

– Pressure end (standard)

– Intake end (standard)

Installation position, movement area:

– Around the lateral axis

– Around the horizontal

Magnetic coupling

– Power supply

– Power consumption

Operational rotation speed

Outlet valve for cut-in pressure

Type Seltec TM15 HD

235 mm X 124 mm X 136 mm

4.5 kg

left/right

131 cm³

PAG ZXL 100 PG / 150 + 20 cm³

3/4" UNF O-Ring

7/8" UNF O-Ring

max. ± 30°

max. ±10°

24 Volt DC

max. 45 Watt

700 to max. 6000 /min.

34.5 - 39.2 bar

3.3 Circuit Diagram

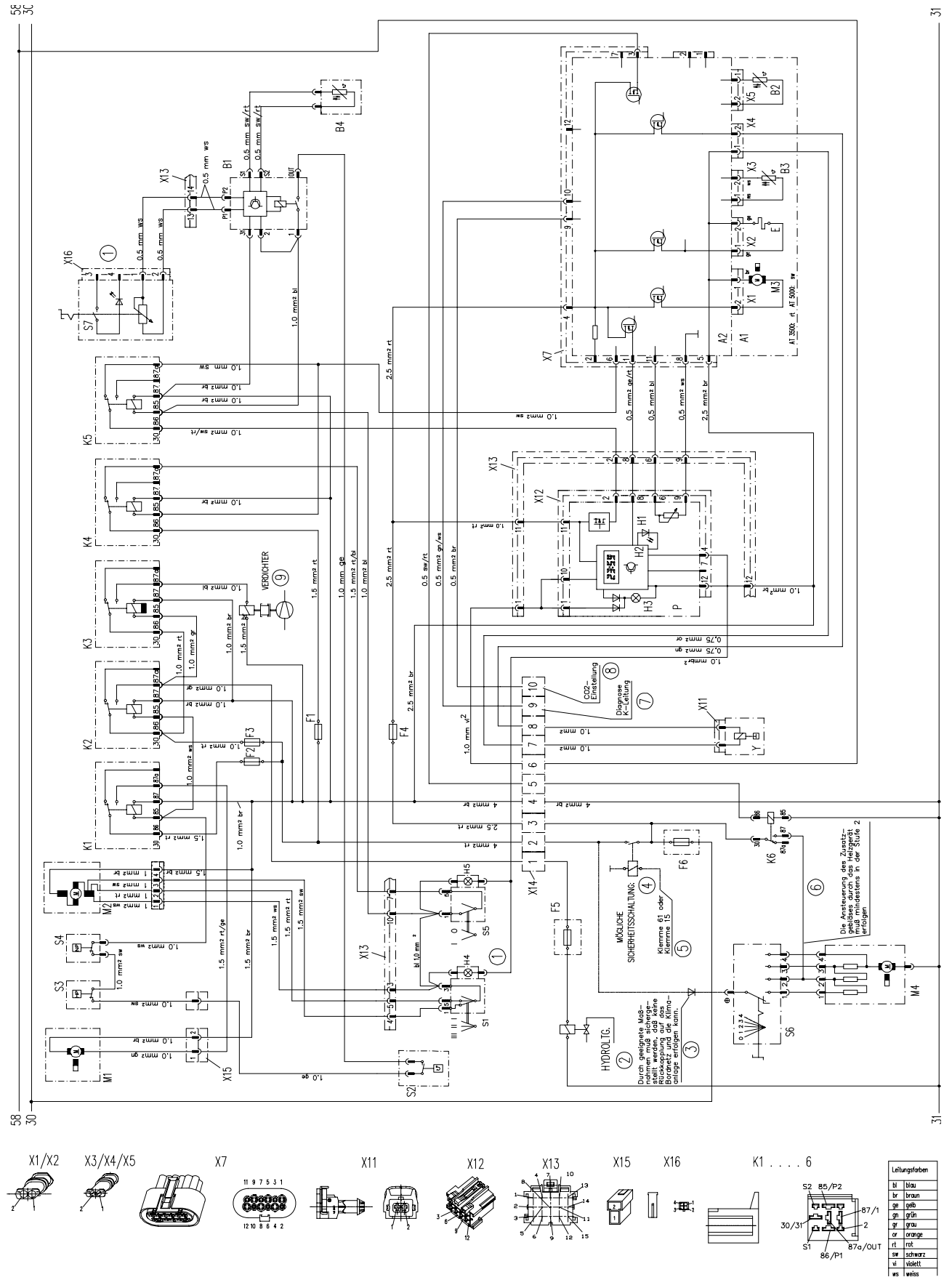


Figure 3.1.

Roof-Mounted Air Conditioner KK2000 E

Key to circuit diagram:

- ① Switch mounted in the vehicle console. 1x set value indicator, 2x switch
- ② Hydro line
- ③ Take appropriate steps to ensure that there cannot be feedback to the board power and the air conditioner.
- ④ Possible safety switch
- ⑤ Terminal 61 or terminal 15
- ⑥ The additional blower must be triggered by the heater unit at least at level 2.
- ⑦ K line diagnosis
- ⑧ CO₂ adjustment
- ⑨ COMPRESSOR

Item	Description		Item	Description	Comment
A1	Heater unit		M1	Engine	Condenser blower
A2	Controller		M2	Engine	Vaporizer blower
			M3	Engine	Fuel and hot air blowers
B1	Thermostat module		M4	Engine	Additional blowers
B2	Temperature gauge				
B3	Temperature gauge	Overheat protection	P	Combi time switch	Time Switch and set value indicator
B4	Temperature gauge				
			S1	Pressure switch	Blower 1/2/3
E	Light pin/flame detector		S2	Thermostat switch	Icing protection
			S3	High pressure switch	
F1	Fuse 15A	Blade-type fuse as SAE J 1284	S4	Low pressure switch	
F2	Fuse 15A	Blade-type fuse as SAE J 1284	S5	Pressure switch	Cooling ON/OFF
F3	Fuse 7.5A	Blade-type fuse as SAE J 1284	S6	Switch	Additional blowers
F4	Fuse 15A	Blade-type fuse as SAE J 1284			
F5	Fuse 8A		S7	set value indicator	Cool
F6	Fuse 25A		X1	2 pin plug-in connection	at A2 (STB)
			X2	2 pin plug-in connection	at A2 (STV)
H1	LED red (at pos. P)	Light up immediate heater button, ready indicator Power on control	X3	2 pin plug-in connection	at A2 (STU)
H2	Heating symbol in the display (at P)	Operating indicator	X4	2 pin plug-in connection	at A2 (STZ)
H3	Lights (at P)	Key and display lighting	X5	2 pin plug-in connection	at A2 (STY)
H4	Lights (at S1)	Power on control for the cooling	X7	12 pin plug-in connection	at A2 (ST1)
H5	Lights (at S5)	Power on control for the cooling	X11	2 pin plug-in connection	at Y
			X12	12 pin plug-in connection	at P
K1	Relay		X13	15 pin plug-in connection	
K2	Relay		X14	15 pin terminal strip	
K3	Time relay		X15	2 pin plug-in connection	
K4	Relay		X16	4 pin plug-in connection	at S7
K5	Relay				
K6	Relay		Y	Metering pump	

4. INSTALLATION INSTRUCTIONS

4.1 Installation Diagrams for Cabins without Roof Gaps

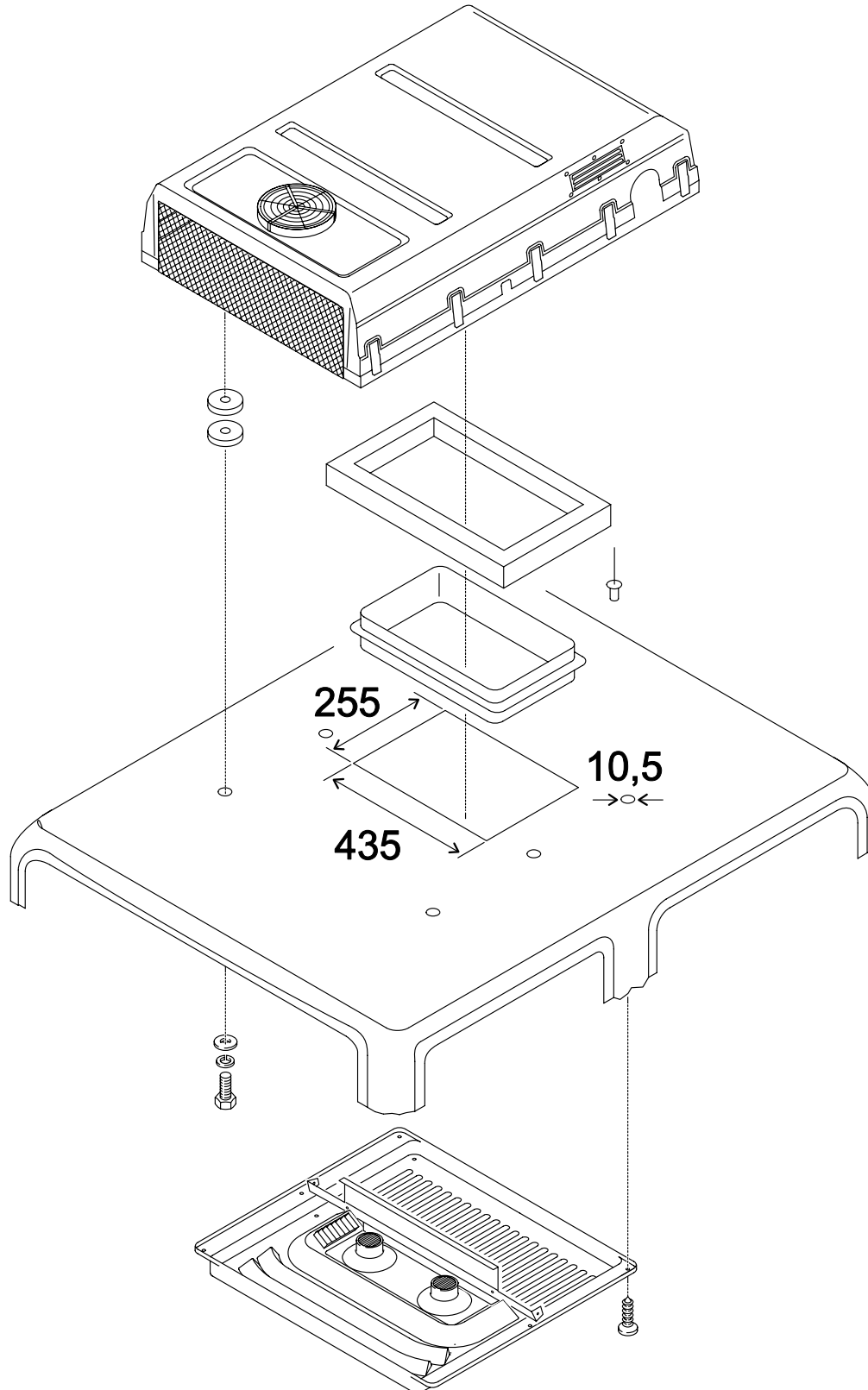


Figure 4.1.

4.2 Checklist for the Installation of the KK2000 E with Heater Unit

- In the heater unit's combustion air intake line, make an hole of 11 mm inner diameter if the exhaust and intake lines do not exceed 4.5 meters.
- The heater unit's combustion air intake line must be at least 600 mm.
- Make sure the complete fuel guide to the heater unit is filled before the first initialization.
- Fasten the fuel line for the heater unit in the KK2000 E with the clamp provided on the base plate in the system so that the fuel line cannot be damaged by the hot exhaust pipe.
- If a fuel filter is installed for the heater unit, then this must be replaced yearly.
- To install the heater unit, the information in the installation instructions, ID no. 776 252, must also be observed.
- The hot air tube duct from the KK2000 E system to the cabin must be sealed completely.

5. INITIALIZATION

5.1 Safety Information

Observe the safety information in chapter 1.4.

5.2 Operator Information

WARNING

- Only start the air conditioning system when the vehicle engine is running otherwise the battery will be drained.
- To prevent leaks in the shaft seals or the compressor, there are two cases to consider:
 - (1) If the vehicle has not been operational for a longer period of time, then the compressor does not need to be switched on as well.
 - (2) However, if the vehicle will be used for a longer period of time without using the air conditioner, then it is recommended that the compressor be started once every two weeks. Otherwise the shaft seals could be damaged if the compressor is not operated for a long period of time.

NOTE

- Corresponding to the electrical connection (see figure 3.1), the system should only be turned on or operated when the vehicle engine is running.
- Note that this drains the vehicle battery.

5.3 Operating, Control, and Safety Switch

5.3.1 The system is operated with the rotary switch and indicator on the operating panel.

5.3.2 The blower switch is the main switch for the air conditioner. This can also be used to vary the speed of the vaporizer blowers and the corresponding air flow.

- level 1 50% air flow
- level 1 70% air flow
- level 1 100% air flow

5.3.3 Use the thermostat switch to switch off the coolant compressor and to regulate the room temperature. The control operation is started by switching the coolant compressor off and on. The switching is regulated by the air temperature and the compressor speed.

5.3.4 A pressure switch is installed in the accumulator dryer to protect the compressor and the entire air conditioning system. This switches the coupling off in abnormal operating situations.

5.4 Operating the Air Conditioning System

See Chapter 2.4.

5.5 Operating the Air Top 3500 Heater Unit

See the Operating Manual for the Air Top 3500

6. MAINTENANCE

6.1 Safety Information

Observe the safety information and regulations in chapter 1.4.

6.2 General

- a) Only trained personnel in authorized repair depots may perform any work on the coolant system.
- b) As with all parts of a vehicle, the air conditioner is also subjected to constant stress. To ensure perfect operation of the system and to prevent damages to the parts, the prescribed service work must be performed regularly.
- c) The correct handling of the system with records of all prescribed service work is required for the any warranty claims for damages to parts subject to service.

6.3 Care and Maintenance

- a) Independent of the following time plan, shortly after the first use of the vehicle, check all device mountings and coolant lines for tightness.
- b) Even when the air conditioner is not in operation, wear to or loosening of individual components may occur from normal aging or from driving. Therefore, the corresponding checks are to be performed independent of the system operating time.
- c) Independent of the operating time for the system, there may be a loss of coolant even if the line connections are perfectly sealed. Due to the material structure of the coolant hose lines, these have a diffusion rate that can vary according to the ambient temperatures. If there is a relatively large loss of coolant in a short interval, then it can be assumed that there is a leak in the system.
- d) If the condenser or vaporizer blades are only slightly soiled, clean them by applying compressed air against the normal air flow.

If these are highly soiled or greasy, first use soapy water or a suitable cleaning solution (not aggressive to copper or aluminium) to clean them and then use compressed air or water.

- e) The filter dryer must be changed at least once per year. When working on the coolant system, change the accumulator dryer as a rule.

WARNING

The coolant may never be released into the air (§ 8, CFC chlorofluorocarbon prohibition from May 06, 1991).

6.4 Checklist for Care and Maintenance

System component	Maintenance work	Occurrence		
		m	6m	a
Coolant system				
– Lines	Check condition and sealing (leak search device)			X
– Connections	Check sealing with leak search device			X
– Coolant level	Check coolant amounts on glass front and pressure	X		
– Condenser	Check condition of blades (clean if dirty)		X	
– Accumulator Dryer	Replace			X
– Condensation water drainage	Check opening is not clogged and clean if dirty		X	
– Roof-Mounted Air Conditioner	Check entire condition and connections for tightness.			X
Compressor				
– Magnetic coupling	Check that the coupling/start of compressor does not slip		X	
– Compressor	Check for noise when running		X	
– Fan belts	Check for perfect condition and tension.			X
– Fastening element	Check for condition and tightness.			X
Elect. Connections				
– Connection lines	Check for perfect condition.		X	
– plug-in connections	Check for perfect condition and tightness.		X	

Legend: m – monthly, a – annually (a – if operated all year, perform twice a year)

6.5 Trouble-Shooting and Correction Measures

General

- a) Proceed systematically for trouble-shooting and correction. Take the corresponding steps for general malfunctions or deviations from expected conditions in the pressure check as described below.
- b) Certain problems can only be detected and corrected by trained personnel with special tools.
- c) If there damages to the compressor (for example, defective valve plates), the expansion valve must be replaced as the possible cause of damage.

Steps in the event of malfunctions in the electrical system

Systematically check individual circuits using the circuit diagram (see figure 3.1) and localize any errors. Place special emphasis on the function of plug connections, switches, relays, etc.

Generally check the following malfunction causes or rule out a malfunction for the following reasons:

- Defective fuses
- Corrosion at the plug contacts
- Loose contact on the plugs
- Crimping problem on the plugs
- Corrosion on the lines and fuses
- Corrosion at the battery plugs

Steps in the event of malfunctions in the air conditioning system

- Defective vaporizer or condenser blower
- Soiled or clogged air filter, condenser or vaporizer blades.
- Loss of coolant or too little coolant in the system

If the system continues to switch off, have it checked by an authorized repair center.

Note

To prevent icing in the vaporizer blades, avoid a combination of a lower blower level (1) and lowest thermostatic setting (max. right) at especially high humidities.

If ice does build up, resulting in a noticeable reduction in air flow, then switch the blower to maximum (3) and the thermostat switch to the max. left setting for 2 to 3 minutes.

Steps in the event of Malfunctions in the Coolant System

- If there are malfunctions in the coolant cycle, the system must be checked and properly repaired by an authorized repair center. The coolant may never be released into the air.
(§ 8, CFC chlorofluorocarbon prohibition from May 06, 1991)

6.6 Checks Before Initialization

To prevent unnecessary disassembly or redundant work, check the condition of the air conditioner before starting maintenance work.

Visual check

- a) External condition of the roof unit:
 - No tears on the cover
 - Air inlets and outlets clean and not damaged
 - Mounting points are tight, no corrosion
 - Hose and cable connections in perfect condition
 - Metal holes in perfect condition.

- b) Condition of the air manifold plate
 - Mounting points/screws are tight
 - Ventilation switches in perfect condition.
 - Ventilation inlet /outlet screens not damaged, clean

6.7 Maintenance Work

WARNING

Coolant may never be released into the air (§ 8, CFC chlorofluorocarbon prohibition from May 06, 1991).

NOTE

Observe the safety information and regulations in chapter 1.4. and requirements in chapter 6.2.

- For maintenance purposes, only use original spare parts and return the system to the original condition.

- a) For maintenance, as a rule only use the original spare parts or standard parts listed in Chapter 7.
- b) When work is performed, the system must be returned to its original condition.

6.8 Checks and Work after Initialization

Check the coolant pressure and function of the pressure switch

- a) Check if warm air is flowing
- b) Check the system for leaks

General instructions:

Moisture and air or other foreign gasses in the coolant system cause disturbances and can damage parts in the air conditioner. Therefore the system must be carefully dried and evacuated before filling with coolant (at least 1.5 hours). This does not apply to a newly assembled air conditioner, but also to repairs when the coolant must be drained.

The final vacuum in the system may not be more than 0.005 bar over the absolute vacuum. The absolute pressure in the system should therefore be \leq 0.005 bar.

The value shown on the manometer for the absolute pressure depends on the external atmospheric pressure. Note the following:

Coolant can leak through the smallest holes, therefore the coolant system must be absolutely sealed. To prevent unnecessary loss of coolant, it is recommended that the sealing be checked repeatedly during the evacuation.

The quick-snap valves are attached to the fittings on the coolant hoses. The quick-snap valves for the pressure lines or the suction lines differ in diameter so that they cannot be switched.

c) Evacuation

Switch on the vacuum pump and vacuum the system for 30 minutes. The absolute pressure must be at least 0.005 bar.

During the evacuation with the pump running again close all valves on the test device and check the manometer display. If the vacuum does not change in one minute, then it can be assumed that the system is sealed. Open the valves again after every pressure check.

Increase in pressure means the system is not sealed. In this case, stop the evacuation and find and seal the leaks. Then evacuate the system again.

Close all valves on the test device. Switch off the vacuum pump. Let the system stand for one (1) hour and check the vacuum. If the vacuum changes, then there is a leak in the system which must be sealed before repeating the evacuation.

d) Checking the high pressure monitor

- Connect the test panels to the system.
- Remove fuse F2 (condenser blower) and attach the cover.
- Keep the engine running at average speed and switch on the air conditioning.
- Check whether the compressor switches off at a pressure of 24 bar.
- Remove cover and replace fuse F2 (condenser blower).
- Check whether the compressor switches on again when the pressure drops to 17 bar.

Refilling coolant in partially filled systems

a) General instructions

Coolant is normally not consumed. Only leaks that may develop during operation can cause a loss of coolant.

Insufficient amounts of coolant can result in reduced air conditioner performance. Extreme loss will lead switch off the low pressure switch.

A glass front is on the accumulator dryer to check the coolant level. When this is filled correctly and with a higher rpm, the coolant will flow smoothly about 5 minutes after the air condition is started. Individual air bubbles are irrelevant. The coolant only needs to be filled when foam is noticeable.

The coolant is normally refilled as a gas. When this is completely emptied, the system must be properly evacuated before filling the coolant. (see 6.8.c)

b) Refilling coolant

Coolant in a gaseous state can only be refilled when the compressor is running and only on the vacuum side of the system.

The coolant bottle must be vertical to fill the system with the valve on top. The check boards are used for filling.

WARNING

If coolant is added as a liquid on the vacuum side (bottle upside down), then the compressor will be destroyed by the liquid.

c) Prepare and fill according to the operating instructions for the R134 maintenance device. Filling is complete when no more bubbles can be seen forming in the glass front.

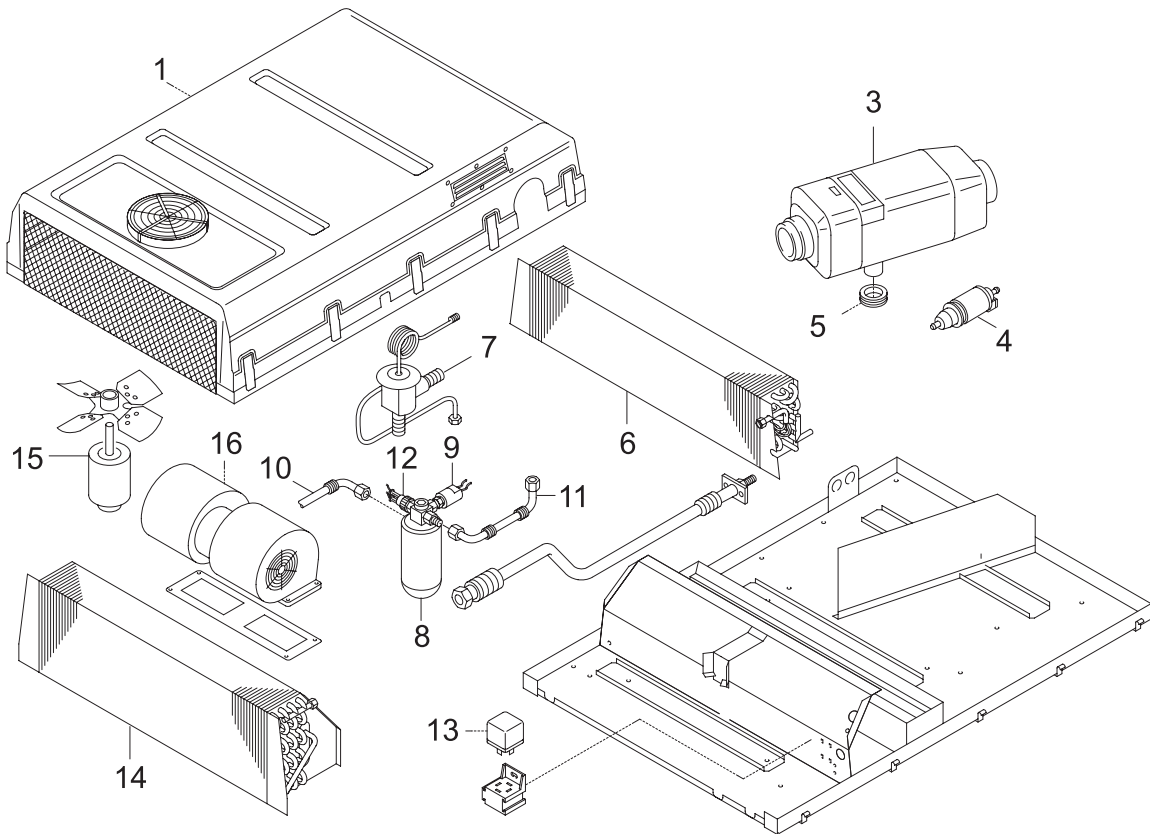
d) Final work

- Switch off the air conditioner and vehicle engine
- Removing the test manometer
- Screw on the gasket caps.

6.9 Visual Check

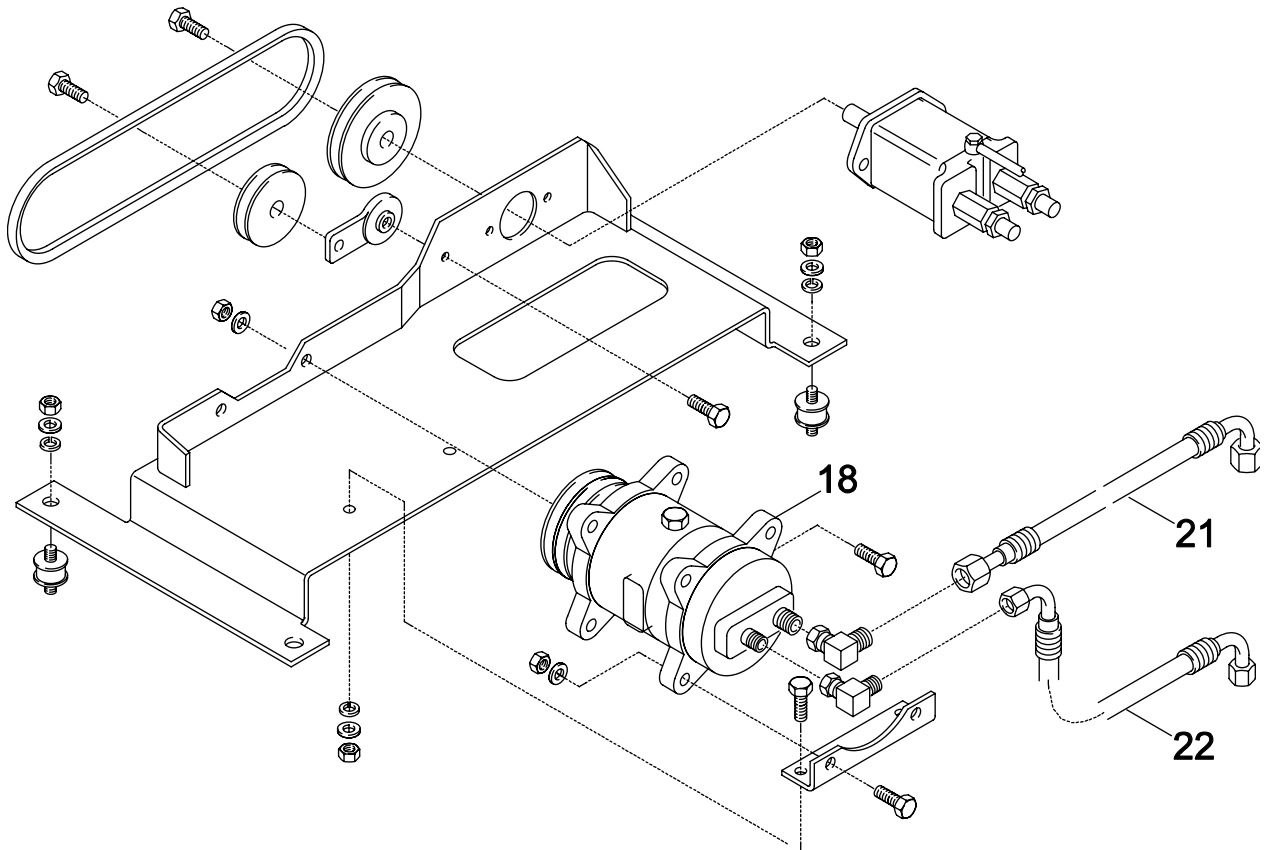
When the maintenance is complete, check again visually according to chapter 6.6.

7. SPARE PARTS



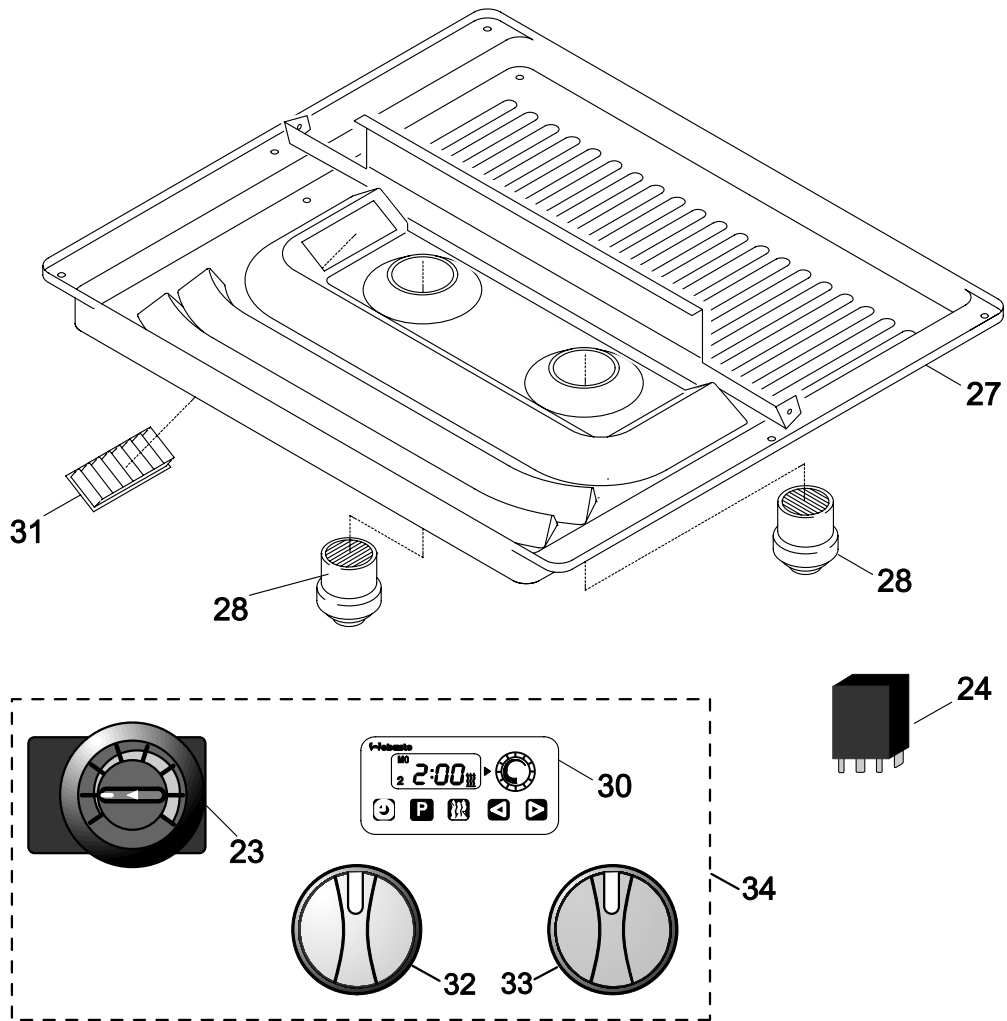
Item	Part name	Ident. No.:
1	Cover, complete	65653A
2	Cable harness, KK2000 E (not illustrated)	9013192A
3	Heater unit AT 3500	65441D
4	Metering pump	26590B
5	Protective rubber sleeve, exhaust	89509A
6	Vaporizer complete, KK2000	9002502A
7	Thermal expansion valve	9002737A
8	Filter dryer R134a	45358A
9	High pressure switch	45404A
10	Coolant line NW 10	9002060A
11	Coolant line NW 8	72045A
12	Low pressure switch	38883A
13	Relay, start delayed	25536B
14	Condenser KK2000	9002487B
15	Axial blower (condensation blower)	44590A
16	Radial blower, spal	80522A

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Item	Part name	Ident. No.:
18	Compressor TM-15HD	80739B
21	Coolant hose NW 13 KK2000	67780B
22	Coolant hose NW 10 KK2000	67779B

Roof-Mounted Air Conditioner KK2000 E



Item	Part name	Ident. No.:
23	Operating control for thermostat module	67638A
24	Thermostat module	66784A
27	Air manifold plate construction	9013676A
28	Dischargers, round	49932A
30	Combination operating control	85340C
31	Discharger, long	45374A
32	Fan switch, 3 level, procurement through Plasser&Theurer	
33	Air conditioner switch ON / OFF (green), procurement through Plasser&Theurer	
34	External control housing from Plasser&Theurer	