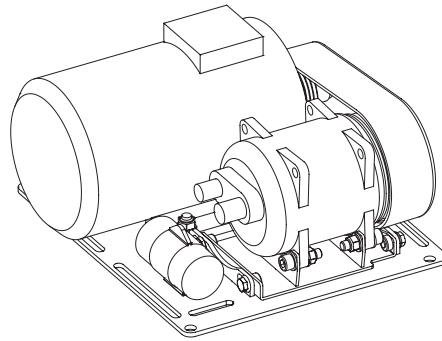




WAECO Frigo 2500

Stand-by cooling installation kit

Installation manual

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1 Explanation of symbols

**CAUTION!**

Failure to observe this instruction can lead to injury.

**NOTICE!**

Failure to observe this instruction can cause material damage and impair the function of the product.

**NOTE**

Supplementary information for installation of the product.

This note is for technical and expert of the vehicle air condition technology. It does not replace missing knowledge in the vehicle air condition and transport refrigerant technology. These notes serve only for better orientation with the installation of the WAECO Frigo cooling. The completeness of all installation steps is not given in this note.

2 Leaflet

(Please read before installing the cooling system!)

Before proceeding with the installation of the WAECO Frigo - cooling system start, we would like to point out a few important things:

2.1 Which refrigerant to use?

The WAECO Frigo - cooling system is filled at temperatures up to + 0 ° C (32°F) minimum with the refrigerant R134a. For temperatures up to -18° C (-0.4°F) the cooling system is filled with the refrigerant R404a.

2.2 What compressor oil to use?

For WAECO Frigo - refrigerant R134a systems, please use the already known PAG oils. For refrigerant R404a, please use already POE 68 oil.

2.3 What to do if a replacement part from the WAECO Frigo - cooling system is required?

The installation manual includes a parts list, in which all parts are listed with corresponding item number.

So please save the installation instructions for future reference.

From the part number in the installation instructions, please place your order via cooling equipment spare parts directly from company:

Dometic WAECO International GmbH - Hollefeldstr. 63 - 48282 Emsdetten -
Technical Service -Phone: ++49 (0) 2572 / 879 - 191 - Telefax: ++49 (0) 2572 / 879
- 391 - Mail: tkd@dometic-waeco.de

2.4 The intervals at which maintenance should a WAECO Frigo - cooling system done?

Servicing should be performed annually (eg while replacing the dryer, new coolant, etc.).

Cooling system within the service intervals are checked for functionality - Generally Frigo must WAECO (see service manual).

2.5 Is there a possibility to attend a training course?

Yes, contact in this regard to Dometic WAECO International GmbH Emsdetten, Germany.

3 Installation instructions



NOTE

The installation instructions are intended to give you important information on the installation and at the same time serve as a reference in case of repairs. Be the installer WAECO Frigo - Refrigeration Equipment for wear by inexpert installation significantly to the necessary operational safety and proper performance of the cooling system.

3.1 Necessary checks before starting the installation or servicing

- Check that the idle speed has the required value.
- Check the output voltage of the alternator (14 - 15 volts).
- Check the operation of the evaporator fan at all stages.
- Check the functioning of, or check and solenoid valves.
- Check the operation of all-electric vehicle components.

If errors or discrepancies are found, please inform your workshop management or the vehicle owner.

3.2 General Precautions when installing a WAECO Frigo - Refrigeration Equipment

3.3 Preparing for installation



CAUTION!

- Read the respective accompanying installation instructions (driving cooling stand cooling, engine kit, etc.) and these installation instructions carefully.
- When dealing with refrigerants during evacuation and filling eye protection must always be worn! Furthermore, no refrigerant is allowed to touch the skin.

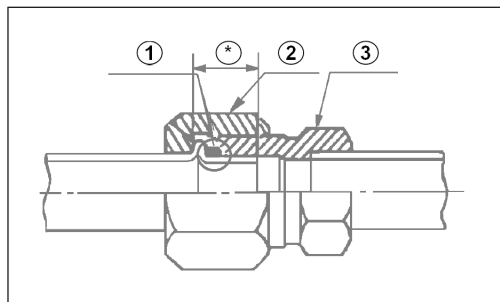
- Check the completeness of the WAECO Frigo - cooling system based on the parts list.
- Remove. Caps of compressor, condenser, evaporator, refrigerant lines until just before installation of the parts concerned, because the only way to keep the system from moisture and dust free.
- Before connecting a pass refrigerant piping few drops of oil on the cold seat the O-ring and union nut.

3.4 Table of permitted tightening torques for screws used in Nm

M5 (0.80)	M6 (1.00)	M8 (1.25)	M10 (1.25)	M10 (1.25)	M12 (1.50)
4 – 6	8 – 12	20 – 30	40 – 55	37 – 52	70 – 90
M12 (1.75)	5/8"-18UNF	3/4"-16UNF	7/8"-14UNF	1"-14UNS	
60 – 85	2 – 4	3 – 5.5	4 – 6	4 – 6	

3.5 Installation of O-rings fittings

- Stroke compressor oil on connecting threads and the O-ring in the marked (*) area.
- Screw the matching connection thread by hand.
- When tightening or loosening of a connection with two wrenches always work to prevent twisting of the wires.
- O-ring fittings are available with a smaller torque than 45° SAE (cone fittings) to tighten, since excessive torque will damage the seal seat, thus triggering leaks.
- Make sure that the O-ring is located at the specified office of the fittings before beginning the installation



No.	Importance
*	Area with compressor oil
1	O-ring
2	Fitting nut
3	Connecting thread

3.6 Table of permitted tightening torques for O-rings in Nm

M5 (0.80)	M6 (1.00)	M8 (1.25)
4 – 6	8 – 12	20 – 30

3.7 Instructions for wiring

**NOTE**

- Route the electrical cables so that they have more than 15 mm distance from rotating parts and more than 150 mm of highly heated parts of the vehicle.
- Attach the wiring harness to the harness with cable ties or mounting brackets.
- You out wiring that prevents damage caused by sharp-edged parts of the vehicle run.
- Insert the compact connectors together so far, is fixed to snap point or latch.
- In heavily splash zones (engine compartment, underbody) protect the affected connections through additional protective spray wax, tape or the like.

3.8 Notes for the hose routing

**NOTE**

- Route the hoses so that they have more than 15 mm distance from rotating parts and more than 150 mm of highly heated parts of the vehicle.
- Secure the hoses with the supplied cable ties or mounting brackets.
- Carry out the installation of the hoses that prevents damage caused by sharp - edged parts of the vehicle.
- In strongly protect splash zones (engine compartment, underfloor) the affected hose and connection fittings with additional protection spray wax or the like.

3.9 Advice for executed holes

**NOTE**

Before and during drilling on the course of existing, especially visible cables, wires and other Komponenten, pay attention!

3.10 Notes after the final assembly

**NOTE**

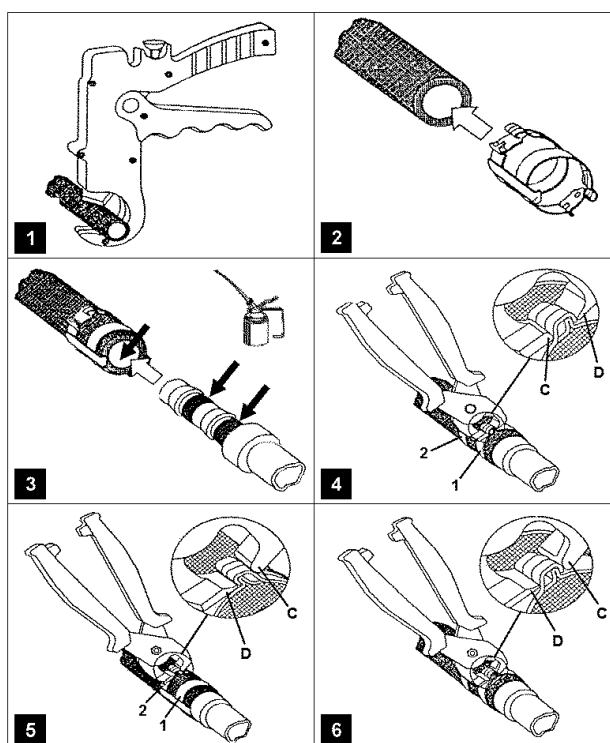
- Perform a leak with a UV - so that leakage of the WAECO Frigo leak detection lamp through - cooling system can be avoided.
- Check the operation of all components of the cooling system.
- Make sure that the cooling system creates the components no risk of injury to the vehicle occupants (eg sharp edges) and onboard safety equipment is not impaired in their function!

4 Notes on the installation of FRIGOCLIC - Fittings

**NOTE**

- Use to mount Frigoclic-fittings only the appropriate mounting kit for this Mounting Kit Partno.: 8885300060.
- Check the clamping sleeve after installation for proper closure.
- Remove the O-rings and ferrules from the reuse of fittings.
- Remove the hose used scissors to cut the hose end. are avoided.
- Check the operation of all components of the cooling system.
- Make sure that the cooling system creates the Komponenten no risk of injury to the vehicle occupants (eg sharp edges) and on-board safety equipment is not impaired in their function!

- 1) Cut shears the tube ends and the tube straight and expand the tube end prior to mounting fittings to the mandrel.
- 2) Push the ferrule onto the hose end. Position the stop of the clamping sleeve to the hose end.
- 3) O-rings and the hose end with oil. If reusing the fittings, replace the O-rings. Insert fitting into the hose end.
- 4) During the clamping of the sleeve ensure that the stop is located on the hose end. The clamping sleeve top (1) clamp. To clamp the peak (C) and (D) the installation tool use shown.
- 5) The collet down (2) clamp. To clamp the peak (C) and (D) the installation tool use shown.



- 6) As shown apply to loosen the clamp, the peaks (C) and (D) of the assembly tool.

5 Safety notes for the standby cooling



CAUTION!

- The 230 V connection of stationary cooling may only be operated via a residual current circuit breaker with 30 mA rated fault current and a grounded, splash-proof socket!
- If the mains fuse or circuit breaker trigger the error when connecting WAECO Frigo standby cooling, the cause must be eliminated only by a qualified electrician!
- The protective cover of the appliance plug must always be closed when the cooling stand is not operating!
- When using a cable reel, this is sure to fully unroll, since otherwise the cable may heat up too much and can have a cable fire!

**NOTE**

- Before starting the vehicle, always disconnect the power cord from the vehicle side outlet.
- The state cooling operate only on a level surface to ensure the drainage of condensate.
- The vehicle must be properly secured before operating the auxiliary cooling.
- The vehicle's engine must be switched off and the ignition key removed.
- All cargo hold doors must be securely closed.

6 Installation notes for the battery charger

**NOTE**

- The battery charger can be mounted horizontally or vertically.
- Use in a well ventilated installation.
- In the installations in small closed rooms sufficient ventilation must be present.
- The free space around the battery charger must be at least 5 cm.
- Make sure that the vents remain free on the front, bottom, and on the back of the battery charger.
- Select a mounting surface which is flat and has sufficient strength.
- The space behind the unit for the mounting bracket when choosing the mounting location aware.
- The 220 V wire is to be attached to the charger so that it does not, etc. can be solved by vibration.
- For directions and more information on the installation and operation of the battery charger can be found in the enclosed installation and operating instructions.

**CAUTION!**

The unit does not operate in:

- Damp or wet locations
- Dusty environment
- The presence of flammable materials
- Hazardous areas

7 Technical data and dimensions

7.1 Electric motor

Power supply	Type	Protection	Mains power supply	Power/r.p.m.	Weight
207-253V	B3	IP54	230V/50Hz/9.3A	1.5 kW/ 2760	15 kg

7.2 Standby compressor

Type	Power	Clutch	Version	Displacement	R.p.m. max.	Oil Quantity
Seltec TM08 XS	12 V	PV6 Ø123 mm	6 Piston Axial compressor	82 ccm	6000 U/min	150 ccm (POE68)



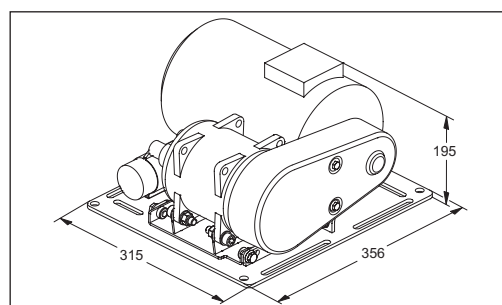
NOTICE!

The delivery of the compressor is carried out by default without lubricant! Before starting up the compressor must be filled with the basic amount of oil: Oil POE 68 Partno.: 8887200006.

7.3 Control unit

Power supply	Protective device	Protection	Dimensions
230V / 50Hz	Overload protection with warning buzzer and RESET button	IP 54	180 x110 x110 mm

7.4 Standby unit



7.5 Battery charger



NOTE

Technical data of the battery charger, see installation and operating instructions.

8 Scope of delivery


NOTE

Refrigerant hoses are not included!

Pos.	Part No.	Description	Qty.
1		Standby unit	1
2	FS-SE-01	Control unit	1
3	9102500030	Battery charger MCA1250 12V 50 A	1
4	A460915	Connection socket	1
5	A460960	Connecting cable Heavy Duty	1
6	A460804	Extension cable	1
7	8881500216	Check valve	2
8	8881300031	Wiring	1
9	8885300134	Oilseparator	1
10	4442500805	Bracket for Oilseparator	1
11	8887500102	Label, Attention standby cooling	1
12		Fittingkit for standby cooling	1
12.1	8881400689	Fitting 13/32"	1
12.2	8881400684	Fitting 1/2"	1
12.3	8881400573	Fitting 3/4" 13/32"	1
12.4	8881400574	Fitting 7/8" 1/2"	1
12.5	8881400751	Fitting 3-way-adapter	1
12.6	8881400578	Fitting 5/8" 90° 5/16"	1
12.7	8881400579	Fitting 3/4" 90° 13/32"	2
12.8	8881400699	Clamp Refrimaster 5/16"	2
12.9	8881400700	Clamp Refrimaster 13/32"	10
12.10	8881400725	Clamp Refrimaster 1/2"	6
13		Fixingkit	1
13.1	0211 42 16	Screw 4,2x16	2
13.2	0057 05 40	Screw M5x40 DIN933	1
13.3	0057 05 16	Screw M5x16 DIN933	2
13.4	368 5	Nut M5 DIN985	3
13.5	0411 5 15	Washer M5 DIN522	4
14	4443000379	Cover for Relais	1

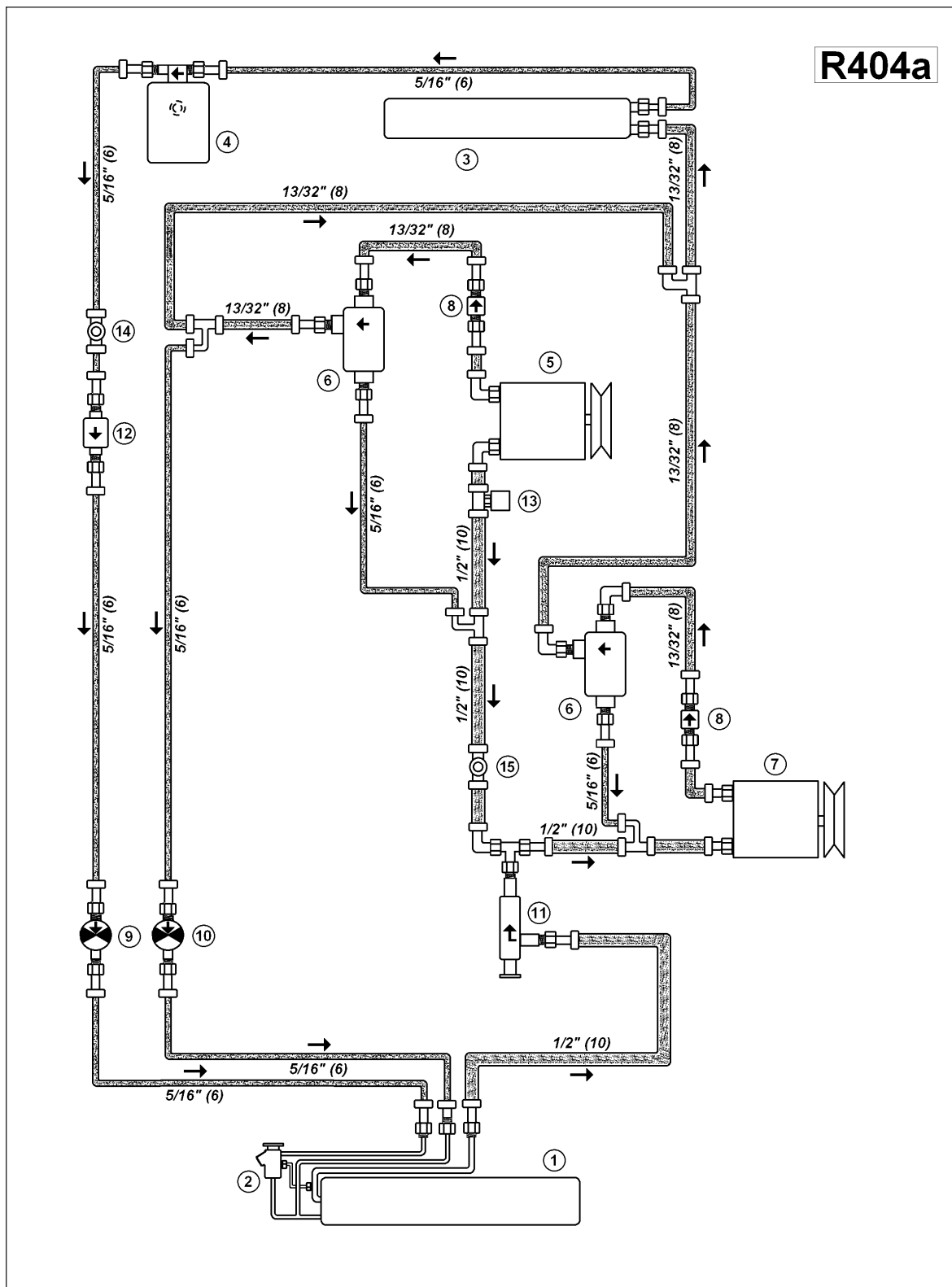
8.1 Recommended refrigerant hoses

Part No.	Description	Qty.
8881700127	Hose Refrimaster Plus 5/16"	1 m
8881700128	Hose Refrimaster Plus 13/32"	5 m
8881700129	Hose Refrimaster Plus 1/2"	5 m

9 Flow diagram

**NOTE**

When installing the check valves respect to the specified flow direction!



9.1 Description of flow diagram

Pos.	Description	Notes
1	Evaporator	
2	Expansionvalve	
3	Condenser	
4	Reciever drier	
5	Compressor	Drive cooling
6	Oilseparator	
7	Compressor	Standby cooling
8	Check valve	
9	Solenoid valve	Normaly open
10	Solenoid valve	Normal closed
11	Suction pressure regulator	
12	Filter	
13	Suction pressure switch	
14	Servicevalvel	High pressure
15	Servicevalve	Suction pressure

10 Installation of the battery charger

10.1 Mounting of battery charger


NOTE

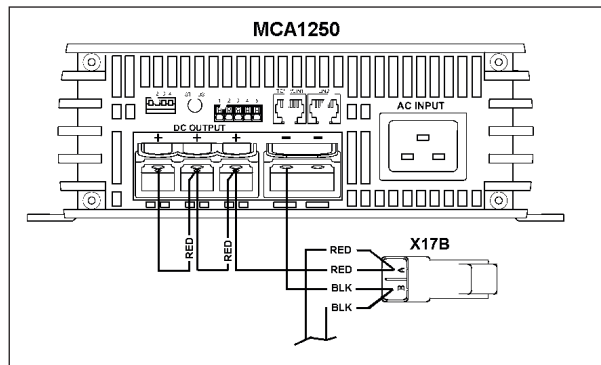
Information for detailed installation can be found in the enclosed installation and operating instructions.

10.2 Connection of battery cables


NOTE

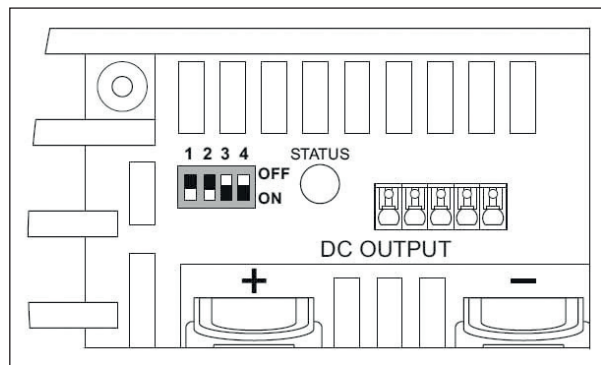
Information for detailed installation can be found in the enclosed installation and operating instructions.

- Shown connect the connection cable to the charger.
- See also the wiring diagram.



10.3 Adjustment and Operation

- Set DIP switches as shown in Figure.
- The main switch and attach permanently to "ON".



10.4 Function control



NOTE

Information for detailed the function can be found in the enclosed installation and operating instructions.

11 Installation of the DEFA - Connector



CAUTION!

- The DEFA - plug connector must be mounted so that it is protected against splash water and mechanical damage!
- The plug connector must be mounted so that the DEFA - connection cable can be used without difficulty!



NOTE

The DEFA - connector can be either built-in or externally mounted with resting brackette.

11.1 Assembly to the vehicle



NOTICE!

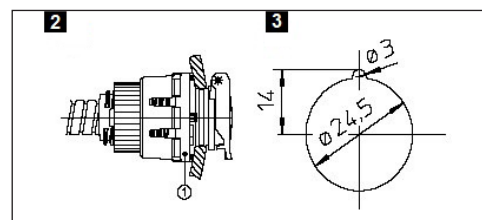
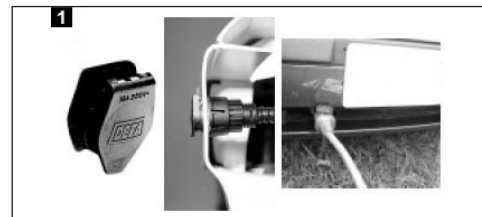
The ground (black wire with ring terminal) to be mounted on the metal parts of the body. The assembly point is similar to the grounding line of paint, oil paint clean!



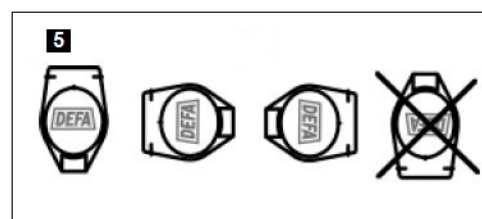
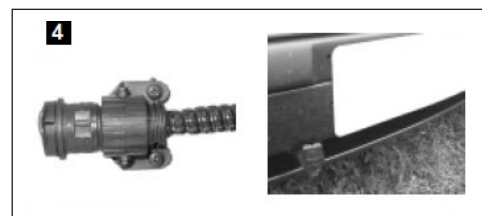
CAUTION!

- Never connect the ground wire to the negative terminal of the vehicle battery!
- Handle the connection cable with caution. Lay the cables so that they are not damaged by hot, hot, moving and / or sharp objects such as turbocharger, exhaust manifold, radiator fan, doors or hood!
- The protective cover must always be on the contact, if that is not attached!
- Only the original DEFA - Power cable with original DEFA - Connector can be used!
- The DEFA - connection cable may only be connected to a grounded outlet!

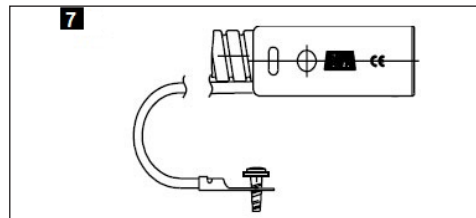
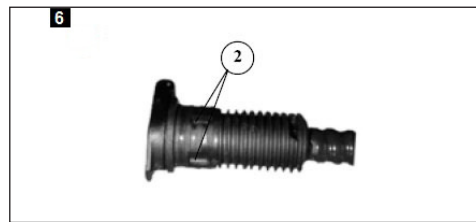
- For flush mounting on curved surfaces of the mounting ring (Fig. 1) can be used (Fig. 2).
- The O-ring (30x3.2) is placed between the nut / ring and the body.
- Drill a hole with a diameter of 24.5 mm.
- A wedge for example a track with Ø 3-round file filing (Fig. 3).



- The Brackette can be mounted on both sides depending on the specific site.
- The contact can be adjusted back and forth and rotated such that the desired position is achieved.
- Typically the contact is fitted so that the cover is hinge-top (Fig. 5).



- The contact is possible to mount so that it is slightly tilted forward. If the contact is mounted so that the front shows up, is the lowest of the three attenuation (Fig. 2) to open to allow water to drain.
- For this purpose, a knife, etc. be used (Fig. 6).
- This applies both in the assembly in Brackette and during installation.
- After installation of the DEFA - Connector, it must be marked with the accompanying sign, see photo below.



12 Notes for mounting of the cooling unit



NOTICE!

- Carefully remove the protective cap of the compressor because it is filled with inert gas under certain circumstances!
- When first level of cooling, the compressor as minden least 5 times must be short and off, otherwise there is the risk of subsequent compressor damage!
- Under certain circumstances it is necessary to put an additional ground wire of the prior compressor!
- When operating the auxiliary cooling an additional condenser fan while the compressor run times shall be in operation!
- It is important to ensure that the electric motor is always well ventilated!
- If installed in a closed seat console, under certain circumstances, an additional opening must be created!



NOTE

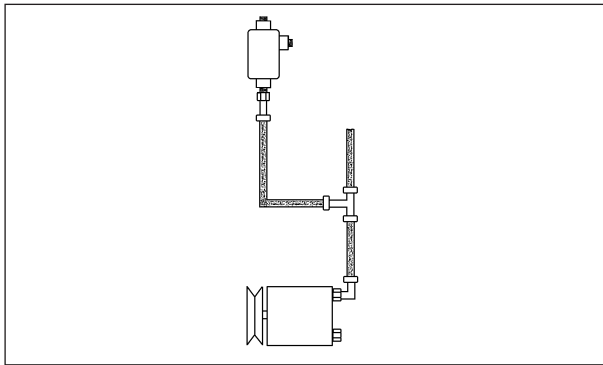
- After the first test run of the standby cooling, the belt should be checked for the correct voltage.
- The suction line should be insulated during installation in the interior against condensation. This also applies to the connection fitting directly on the standby compressor.

13 Installation of the Oilseparator

**NOTICE!**

The oil separator must be installed at the highest point vs. the position of the compressor thus ensuring that the oil in the separator flows into the compressor!

- Specify and assemble suitable location for the oil separator.



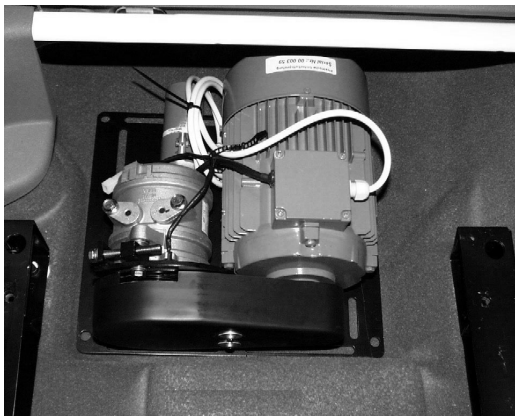
14 Installation of the cooling unit

14.1 VW Caddy

**NOTICE!**

- For safety when drilling on the course of existing, especially visible cables, wires and other components, pay attention!
- The drive unit must be mounted so that the passengers no dangers of injury (eg by sharp edges or belt drive) and on-board safety equipment is not impaired in their function!
- Always make sure when installing the control unit, which is the RESET - button is always accessible.

- Remove both seats.
- Replace cooling unit behind the passenger seat and perform drilling.
- Install the cooling unit.
- Install the control unit and battery charger behind the driver's seat.



- Label for standby cooling clearly visible on the dash mount.

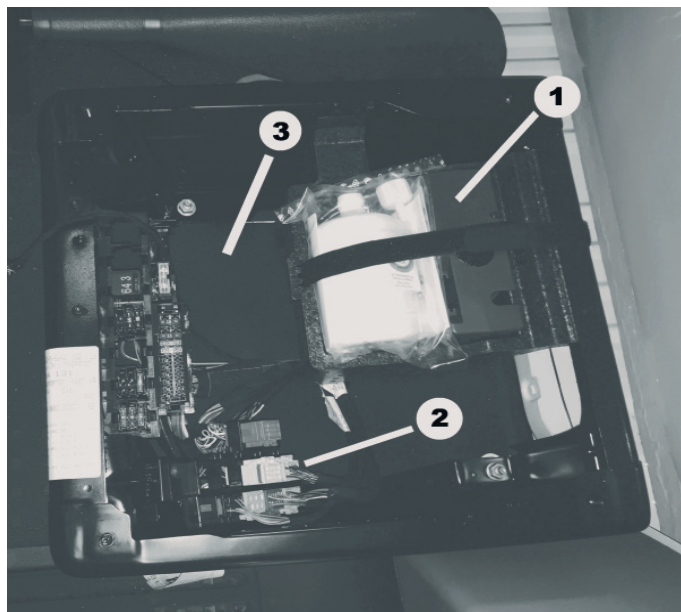
14.2 VW Transporter



NOTICE!

- For safety when drilling on the course of existing, especially visible cables, wires and other components, pay attention!
- The drive unit must be mounted so that the passengers no dangers of injury (eg by sharp edges or belt drive) and on-board safety equipment is not impaired in their function!
- Always make sure when installing the control unit, which is the RESET - button is always accessible.

- Remove the driver's seat.
- Remove the existing material (1) and place in a different location in the vehicle.
- Loosen and mounted on the rear of the console relay block (2).
- Floor covering (3) over a large area, and remove square existing cables there embarrassed.



- Loosen, lift and put aside seat console.
- Install the cooling unit, with the belt cover to the front of the front two screws and position the seat console over.

**NOTE**

At the back of the drive unit is clamped by the frame of the seat console.

- Install the seat console.
- Install the driver's seat.
- Install the control unit at the rear wall.
- Install the Battery charger in the console of the passenger seat mount.
- Label for standby cooling clearly visible on the dash mount.

14.3 Other Vehicles

- Define suitable location for the unit in the vehicle.
- Position the unit and select suitable attachment points.

**NOTICE!**

- For safety when drilling on the course of existing, especially visible cables, wires and other components, pay attention!
- The drive unit must be mounted so that the passengers no dangers of injury (eg by sharp edges or belt drive) and on-board safety equipment is not impaired in their function!

- Drill the holes in the vehicle and assemble the unit.
- Assemble the battery charger at the rear wall.

**NOTE**

Always make sure when installing the control unit, which is the RESET - button is always accessible.

- Assemble the control unit.
- Label for standby cooling clearly visible on the dash mount.

15 Electrical connection

**HINWEIS**

The connection of the supplied cable for the set 8881500031 as cooling occurs at the 6-pin connector from the wiring harness between 8881800029.

- Remove the existing connector with the two cable bridges.
- Make other connections according to wiring diagram.
- Relay from the harness 8881800031 mount on the existing relay holder from the evaporator fan relay.

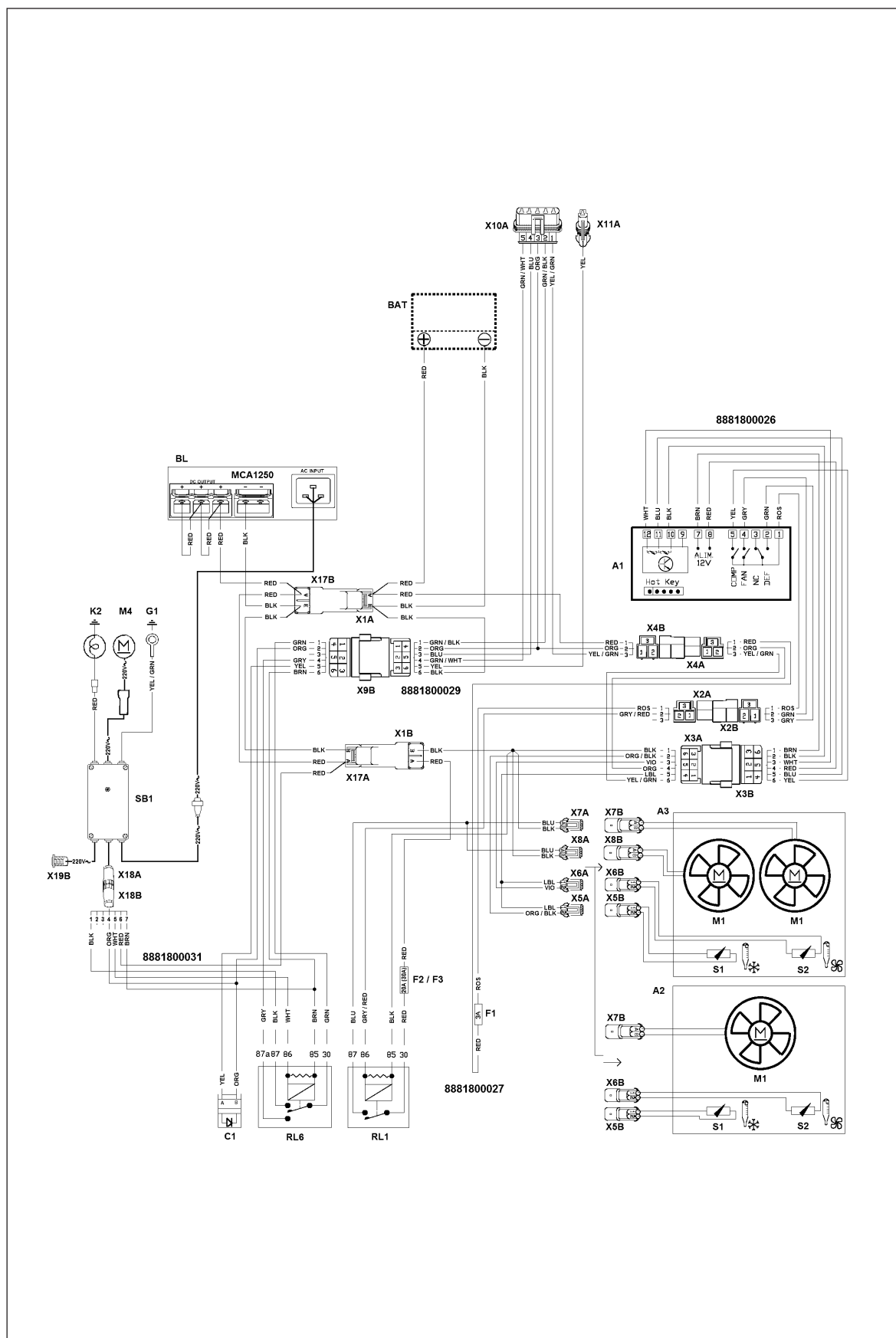
15.1 Electrical connection for 230V in the interior



CAUTION!

- The ground wire armored wire only connect directly to the chassis of the vehicle. Never connect the ground wire to the battery negative (ground wire)!
 - Treat the ground wire of the control box with caution.
 - The wire so embarrassed that they can not be damaged by warm, hot, moving and / or sharp objects!
- The connectors (7-pin), the electric motor (4-pole) and the standby compressor (1-pin) and connect it to the control unit.
 - Power cable of the battery charger and connect it to the control unit.
 - Connect armored cable for 230V to the control unit.
 - Power switch of the battery charger on.

16 Wiring diagram



16.1 Description of wiring diagram



NOTE

- The dashed parts represent components of the original electric system.
- Unlisted Notes are described in the installation instructions.

Pos.	Description	Function
BAT	Battery	
BL	Battery charger	
C1	Blocking diode	
G1	Ground	
K2	Standby compressor	
M4	Electric motor 220V	
RL5	Relais 12V 30A	Condenser fan
RL6	Relais 12V 30A	Standby compressor / drive compressor
SB1	Control unit	Standby cooling
X9B	6-way connector	Connect with wiring
X17A	2-way connector	
X17B	2-way connector	
X18A	7-way connector	
X18B	7-way connector	
X19B	DEFA-plug - in connector	Input 220V

16.2 Colors of wiring

BLK	BLU	BRN	GRN	GRY	LBL	ORG	RED	ROS	VIO	WHT	YEL
Black	Blue	Brown	Green	Grey	Lightblue	Orange	Red	Pink	Violett	White	Yellow

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