



Water heater *HYDRONIC** 10

Installation Instructions

Eberspächer®

Customer documentation

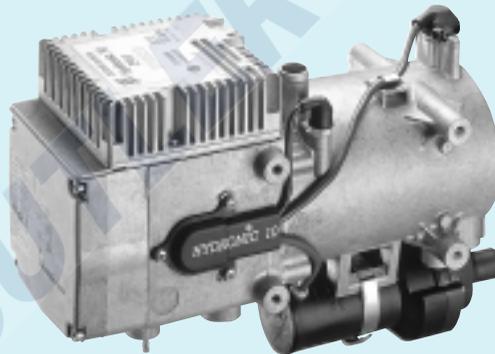
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HYDRONIC 10 engine-independent water heater for diesel fuel

Basic unit	Order No.	Universal installation kit	Order No.
<i>HYDRONIC</i> 10 – 12 volt	25 2160 05 00 00		25 2160 80 00 00
<i>HYDRONIC</i> 10 – 24 volt	25 2161 05 00 00		



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Modifications reserved

Scope of supply

Quantity / Name	Order No.
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Basic unit with standard equipment	
<i>HYDRONIC</i> 10 – 12 volt	25 2160 05 00 00
<i>HYDRONIC</i> 10 – 24 volt	25 2161 05 00 00

The standard equipment includes:

1 Standard unit with control unit and water pump (not available by itself)	
<i>HYDRONIC</i> 10 – 12 volt	25 2160 01 00 00
<i>HYDRONIC</i> 10 – 24 volt	25 2161 01 00 00

1 Fuel dosing pump with built-in fuel filter

1 Relay

also to be ordered:

1 Universal installation kit	25 2160 80 00 00
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Special accessory

1 Cable harness for TRS operation (GGVS or ADR)	25 2160 80 06 00
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1 Return valve	254 00 074
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1 Thermostat	330 00 124
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1 Conversion kit for external installation of the water pump	22 1000 10 01 00
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See Additional Parts Catalog for further accessories.

Optional operating elements

Quantity / Name	Order No.
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1 "mini" timer – 12 / 24 volt	22 1000 31 31 00
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The "mini" timer can be combined with radio-wave remote control TP 41.

1 Radio-wave remote control TP 41 – 12 / 24 volt	22 1000 31 35 00
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Radio-wave remote control TP 41 can be used either separately or in combination with the "mini" timer (Cat. No. 22 1000 31 31 00).

1 Modular timer – 12 / 24 volt	22 1000 30 34 00
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The modular timer can be combined with radio-wave remote control TP 4.

1 Set of mounting parts for modular timer (only required when installing with trim)	25 1482 70 01 00
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1 Radio-wave remote control TP 4 – 12 / 24 volt	22 1000 30 63 00
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Radio-wave remote control TP 4 can only be used in combination with the modular timer.

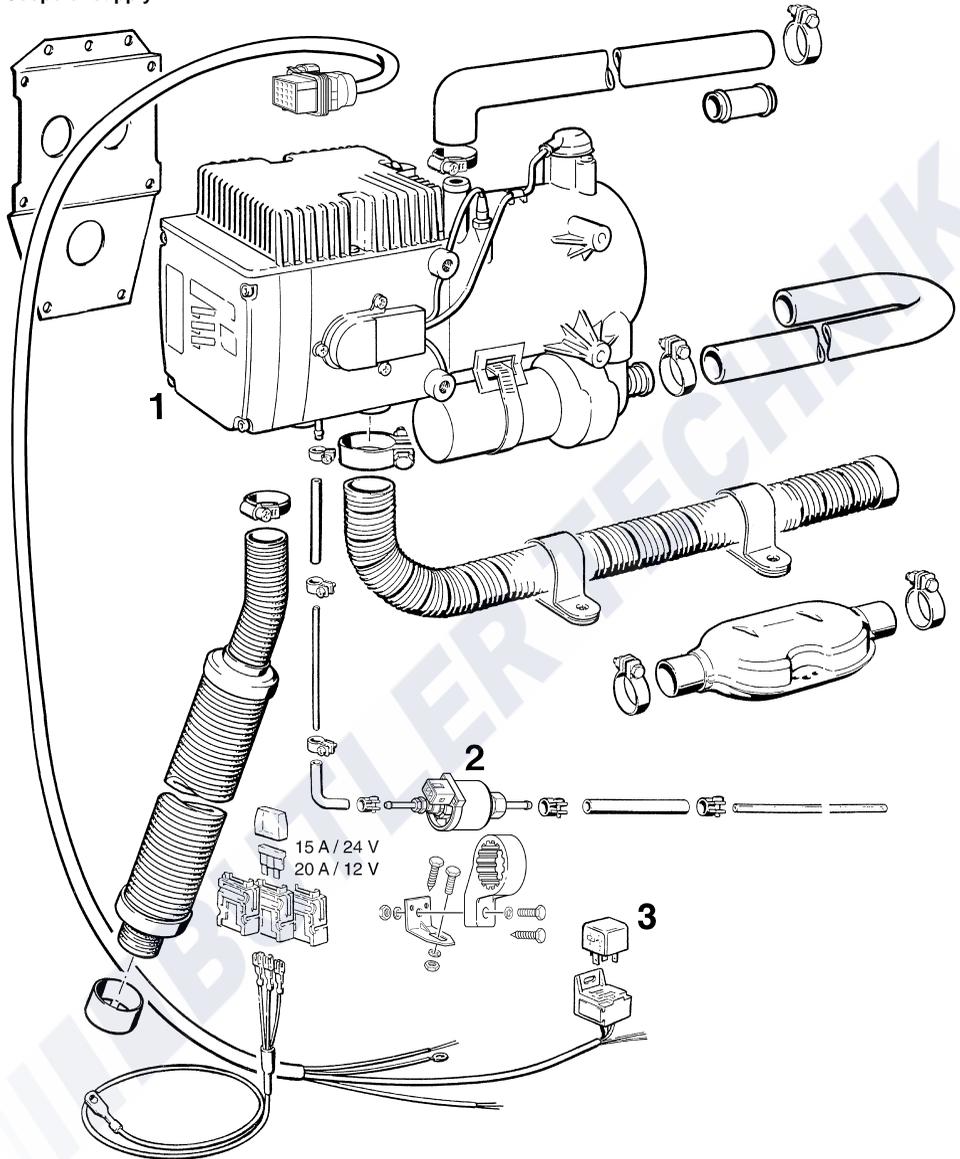
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Scope of supply



- ① Water heater *HYDRONIC 10*
- ② Fuel dosing pump
- ③ Relay

Parts without a Fig. No. are contained in the universal installation kit.

Installation instruction

Heaters are used in conjunction with the vehicle heating system to preheat truck engines, warm cabs and defrost windows .

They are connected up to the cooling water circuit, the electrical system and the fuel system of the vehicle.

Approval, official regulations, general

1. For vehicles registered in West Germany (subject to the road traffic regulations StVZO), the heaters are approved by the Federal Motor Vehicle Office and receive an official test symbol indicated on the name plate. The year of first operation is a requirement of German approval not representing a model number.
2. If the heater is installed in special-purpose vehicles (e.g. vehicles transporting dangerous cargoes), the regulations applicable to such vehicles must be observed.
3. The heater must not be operated in closed rooms, e.g. garages. The heater must always be switched off when the petrol tank is to be filled.
4. The heaters must be installed by a workshop approved by the manufacturer and in compliance with the installation instructions.
5. The heaters may only be used for the purpose specified by the manufacturer and in compliance with the operating instructions supplied with every heater. Operating the heater is not permitted where inflammable vapours or dust can build up (e.g. near fuel, coal or sawdust stores, grain silos etc.).
6. Differences from the installation instructions, particularly with regard to the water supply connection, wiring (wiring diagrams, fuel supply, combustion air and exhaust ducts, and use of operating and control elements not supplied by the manufacturer, are only permissible with the written approval of the manufacturer. Since water heaters are incorporated into the cooling system of the vehicle engine, they form an integral part of the cooling system.

The following points must therefore be borne in mind:

- 6.1 The heater must always be mounted below the cooling water level of the radiator or vehicle heat exchanger in such a way that it operates in the flow direction of the engine circuit.
- 6.2 The entire cooling system including the heater must be bled to free it of bubbles following installation and in accordance with the engine manufacturer's specifications. All water connections (clips) must be tightened sufficiently to prevent all leaks and then retightened after 2 hours of operation or 100 km driving.

- 6.3 All water ducts must be protected against chafing and excessive temperatures (radiated heat from exhaust pipes).
- 6.4 Following any work on the cooling water system (repairs, cooling water change), the system must be bled as set forth in 6.2.
- 6.5 The coolant should contain at least 10 % antifreeze all year round as corrosion protection. In cold weather the coolant must contain antifreeze in sufficient quantity. Operating the heater with frozen coolant is not permitted.

If the above instructions are not complied with, the manufacturer's warranty for the entire heater system is null and void, and possibly the general operating permit for the vehicle.

7. Every combustion process generates exhaust gas, which has toxic constituents. Because of this and the high temperatures generated, the exhaust duct must comply without fail with the installation instructions. Failure to comply with the instructions or operation of the heater in closed rooms (garages) harbours the risk of poisoning.
8. When the heater or the heating system is damaged, an authorized workshop must be called in to repair the damage in an expert manner and using genuine spare parts. Makeshift repairs (on one's own initiative) or the use of non-genuine spare parts are dangerous, and therefore not permitted. When carried out in cars, they invalidate the general design approval of the heater and consequently the general permit of the vehicle.
9. The warranty conditions are set forth in the heater booklet given to you by the after-sales service workshop when the heater is installed. Only our warranty conditions shall apply.

Safety Instructions

A trial run of the heater should be performed before the heating period commences. The heater must be switched off if dense smoke is persistently formed and closed down by removing the safety device. The heater should only be operated again after it has been inspected by trained Eberspächer servicing personnel. Observance of these operating instructions is a precondition for liability claims.

Non-observance of the technical description, mounting and operating instructions, as well as unprofessional repairs or the use of non-original spare parts, exclude any liability on the part of Eberspächer.

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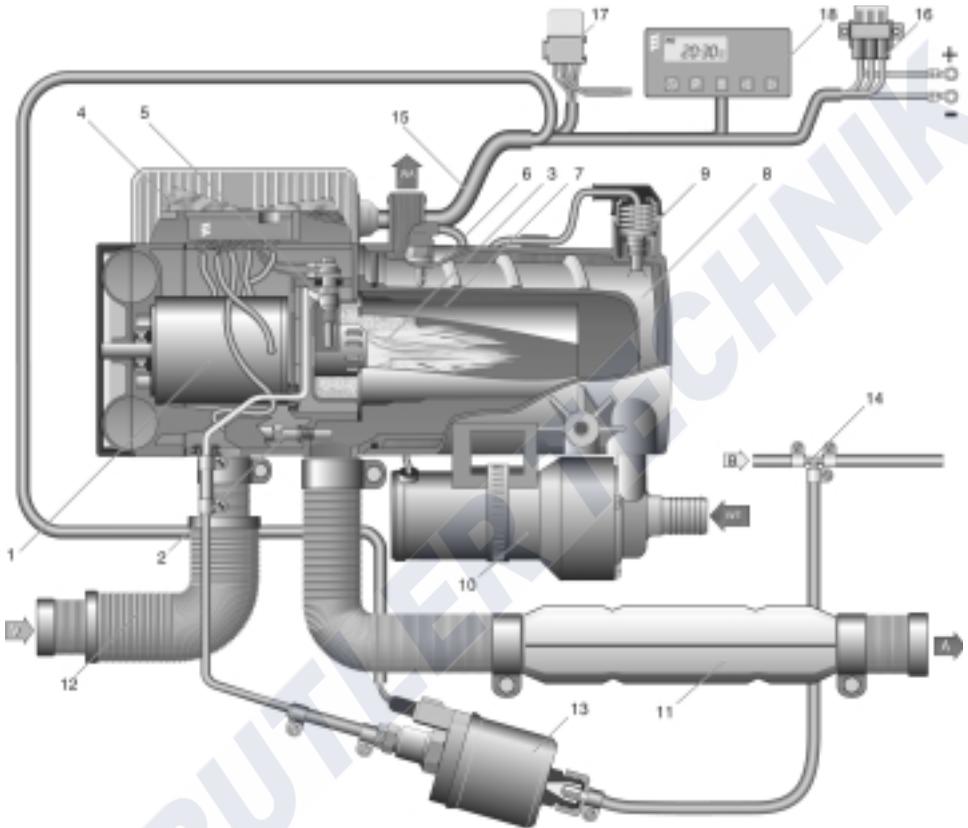
Specification

Heater		HYDRONIC 10			
Heating medium		Water, cooling water			
Regulation of heating capacity		Power	Large	Medium	Small
Heating capacity (watts)		9500	7500	3200	1500
Fuel consumption (l/h)		1.2	0.9	0.4	0.18
Electric power consumption (watts)	in operation – 12 volt	125	80	48	36
	in operation – 24 volt	115	73	45	33
	on start-up – 12 volt	139			
	on start-up – 24 volt	137			
	in the regulation break "Off"	28			
Rated voltage		12 V or 24 V			
Operating range					
Min. voltage An undervoltage protection device incorporated in the control unit cuts out at approx. 10.5 V or 20 V		10.5 V or 20 V			
Max. voltage An overvoltage protection device incorporated in the control unit cuts out at approx. 15 V or 30 V		15 V or 30 V			
Max. allowable working pressure		up to 2.0 bar overpressure			
Water flow rate of water pump against 0.14 bar		1400 l/h			
Min. water flow rate of heater		500 l/h			
Fuel see also "Fuel at low temperatures"		diesel fuel – commercial grade			
Max. allowable ambient temperature	Operation	–40 °C to +80 °C			
	Storage	–40 °C to +85 °C			
Radio interference suppression level		5 for UKW / KW / MW / LW			
Weight incl. control unit and water pump, without dosing pump		approx. 6.5 kg			

Technical data ± 10 %



Cross-section



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- 1 Combustion motor
- 2 Flame sensor
- 3 Combustion chamber
- 4 Control unit
- 5 Heater plug
- 6 Temperature sensor
- 7 Flame tube
- 8 Heat exchanger
- 9 Overheating switch

- 10 Water pump
- 11 Exhaust silencer
- 12 Combustion air silencer
- 13 Fuel feeder pump
- 14 Fuel branch piece
- 15 Cable tree
- 16 Fuse bracket
- 17 Relay for switching on the vehicle's fan
- 18 Automatic switch

- WE = Water inlet
- WA = Water outlet
- V = Combustion air
- B = Fuel
- A = Fumes

Operating instruction

Function description

Switching on

When the heater is turned on, the control lamp in the switch or in the automatic heater switch lights up. The combustion-air fan and the water pump start up and the heater plug's preheating phase commences.

Start-up

After the preheating phase of approx. 60 seconds, the feeder pump starts up and fuel is supplied to the combustion chamber. Ignition follows. Then the combustion-air fan speeds up infinitely along with the feeder pump's impulse frequency to the "POWER" stage with 9500 watts to achieve the required temperature in the combustion chamber. The time-controlled heater plug is switched off. A second start commences when the flame sensor does not recognize a flame. The heater with after-running switches to fault when a flame is not recognized during the second phase.

Control in heating mode

When the heater is first started up after switch-on, or during normal operation, it works in the "POWER" setting 9500 W until

- either the water temperature exceeds the switch-over threshold "POWER" / "LARGE" (e.g. 72 °C),
- or the max. operating time of two hours for this stage is exceeded.

Depending on the amount of heat extracted, the heater switches to one of the "POWER – LARGE – MEDIUM – SMALL – OFF" stages. If the cooling water temperature reaches 55 °C temperature reaches a maximum of 85 °C in the individual control stages.

- The heater switches to "POWER" mode when the heat extracted equals or exceeds 9500 watts.
- The heater will switch between "POWER and LARGE" when heat extraction is between 9500 and 7500 watts.
- The heater will switch between "LARGE and MEDIUM" when heat extraction is between 7500 and 3200 watts.
- The heater will switch between "MEDIUM and SMALL" when heat extraction is between 3200 and 1500 watts.

- The heater operates in the "SMALL" stage when heat extraction is 1500 watts or less. The heater will switch from "SMALL" into the control break when heat extraction in the "SMALL" stage is so low that the cooling water temperature reaches 85 °C. It will follow the after-running of 210 seconds. The water pump continues until the heater is restarted. The heater starts in "MEDIUM" when the cooling water has cooled down to 70 °C (as an example).

Attention!

Set the vehicle's heater lever to "WARM" (maximum setting) and the fan to "slow" (low power consumption) before activating or preprogramming heater operation.

The operating instructions for the timers and switches are supplied with the operating elements.

In the case of vehicles equipped with an automatic heater, set the heating lever to MAX and the flap to the desired OPEN position before switching off the ignition.

Operating elements (see Page 2).

If switches other than those normally used in the automotive industry are to be used, make sure that their current carrying capacities amount to at least 1 amperes.

Version TRS 003

The stipulations of TRS 003 must be fulfilled when the heaters are to be installed to heat driver cabs in tanker vehicles transporting hazardous materials in areas where the German highway code (StVZO) applies. See circuit diagram.

The heater must only be operated in TRS mode if a special cable harness (supplementary part) is installed, cat. no. 25 1816 80 06 00.

Heating operation at high altitudes

- up to 1500 m: unrestricted heating operation,
- above 1500 m: Heating operation is possible during a short stay (e.g. crossing a mountain pass, taking a rest).

If a longer stay is planned (e.g. winter camping), the fuel has to be adapted to the altitude. In this case, please consult the heater manufacturer for advice.

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Control and safety equipment

The flame is monitored by the flame sensor, the max. permissible temperature by the overheating sensor. Both affect the control unit which switches the heater off when faults occur.

- The start will be repeated if the heater doesn't ignite within 105 seconds after fuel has started to be supplied.
The heater will be switched off if it doesn't ignite within 75 seconds after fuel has started to be supplied with the second start.
After a certain number of unsuccessful starting attempts, a fault cutout is triggered.*
- A new start will be triggered if the flame extinguishes itself during operation. The heater will be switched off if it does not ignite within 105 seconds after fuel has started to be supplied. Switch the heater on and off again to cancel deactivation due to faults.
- The overheating sensor is triggered by overheating,** which will result in the fuel supply being interrupted. The heater will then be switched off. Once the cause of overheating has been remedied, the heater can be restarted by switching on and off again***.
After a certain number of cutouts caused by overheating have occurred, a fault cutout is triggered.*
- If the voltage drops below the lower limit or rises above the upper limit, a fault cutout is triggered.
- The heater will not start if the heater plug is faulty and the electric line to the feeder pump has been interrupted.
- The speed-regulated combustion motor is permanently monitored. In the event of a fault, if it doesn't start, is blocked or when its speed falls below 40 % of the desired revolutions, the heater will switch to fault after a delay of 60 seconds.

* Connection of diagnosis unit (order no. 22 1512 89 00 00) instead of timer (3.2.5 in circuit diagram) can read off possible mistakes, or cancel the interlocking.
For operation and fault list, operating instructions for diagnosis unit.

** (no water, poorly ventilated cooling water circulation)

*** (that is if the unit has cooled sufficiently)

You can repair the following faults yourself

If the heater does not start after being switched on:

1. Check the 3 fuses:
15 A / 24 V, 20 A / 12 V for the heater,
5 A for activation,
25 A for the vehicle fan (when this fuse has blown, the heater will start, but no hot air will be delivered)

in the fuse box between the battery and heater.
2. Check the heater plug and change if necessary.
3. Switch the heater off. and back on again.

Please note:

- To provide protection against corrosion, the cooling agent should contain at least 10 % antifreeze the whole year round.
- When carrying out electric welding on the vehicle, the plus pole must be disconnected from the battery and connected to ground to protect the control unit.
- Switch on the heater for a short time once a month during periods in which it is not used (for approx. 10 seconds). This will prevent the water pump and combustion engine from seizing.

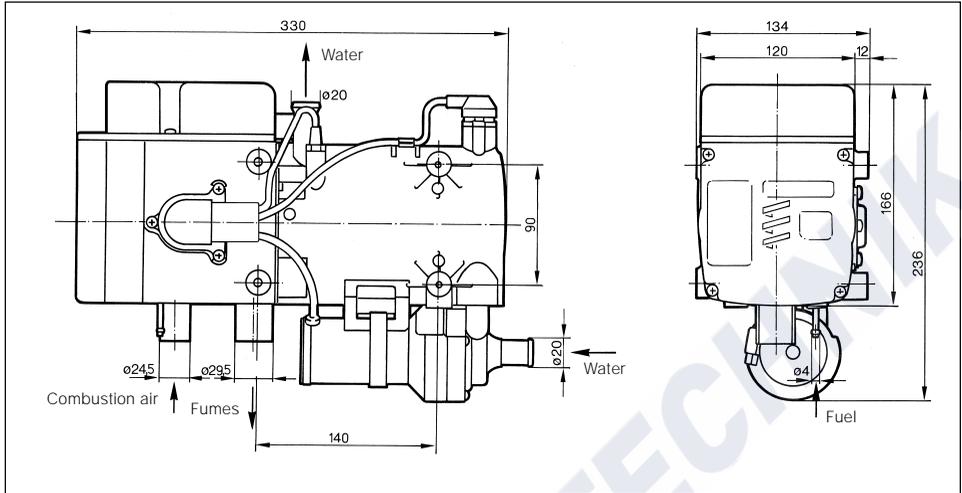
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Principal dimensions



Installing the heater

The heater is installed in the engine compartment, as low down as possible so that the heat exchanger and water pump can bleed themselves. Note which installation positions are permissible.

Factory plate

The factory plate must be clearly visible with the heater installed. If necessary, a second plate (duplicate) may be affixed, with the same information as the original, to a place on the heater clearly visible after installation, or to a cover placed in front of the heater. A second plate is unnecessary if the original is visible after removal of a cover without the aid of tools.

The factory plate is fitted to the basic heater.

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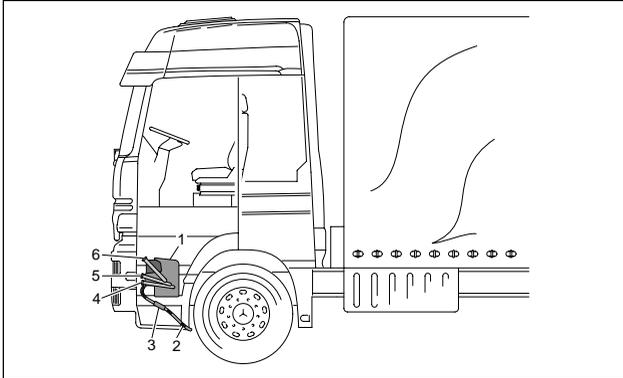
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Installation instruction / Example of installed heater

Water heater in a transport vehicle

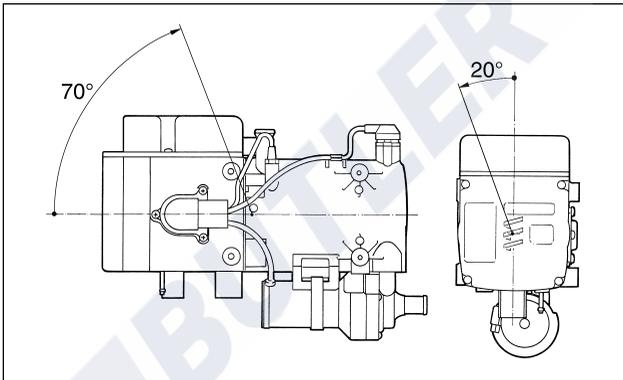


Installation position

If the vehicle is a transport vehicle, the water heater should be installed in the engine compartment, preferably below the level of the cab.

- ① Water heater
- ② Running the exhaust
- ③ Silencer
- ④ Water outlet from heat exchanger
- ⑤ Water inlet to heat exchanger
- ⑥ Water outlet from engine

Permissible mounting positions



The water heater should be installed in the normal position shown in the diagram. The maximum permitted variation on this position is also shown. If any other mounting position is required, consult the manufacturer.

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Connection to the cooling water circuit

The pressure in the cooling water circuit must be limited by a pressure relief valve (e.g. radiator filler cap) to a maximum of 2 bars gauge pressure.

There are four possibilities to do so:

1. Using a thermostat in the supply line to the heater.

Initially, the heat from the additional heater is supplied only to the driver's cab up to a cooling water temperature of about 70 °C = small circuit, rapid heating.

If the cooling water temperature rises further, the thermostat changes gradually (changeover completed at 75 °C) to the large circuit = additional engine preheating.

Important!

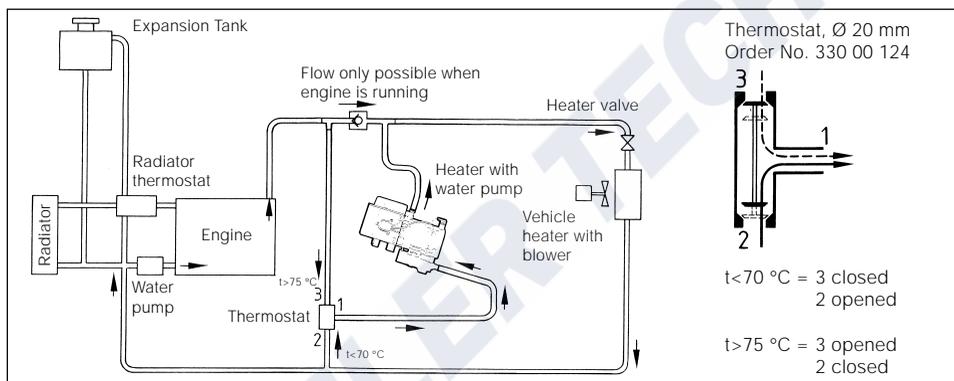
When operating with an additional heater, the heating valve must always be wide open.

Recommendation:

Use a switch with an N / C limit position contact for all heating circuits.

Very important:

Make the connections 1, 2 and 3 as shown in the sketch.

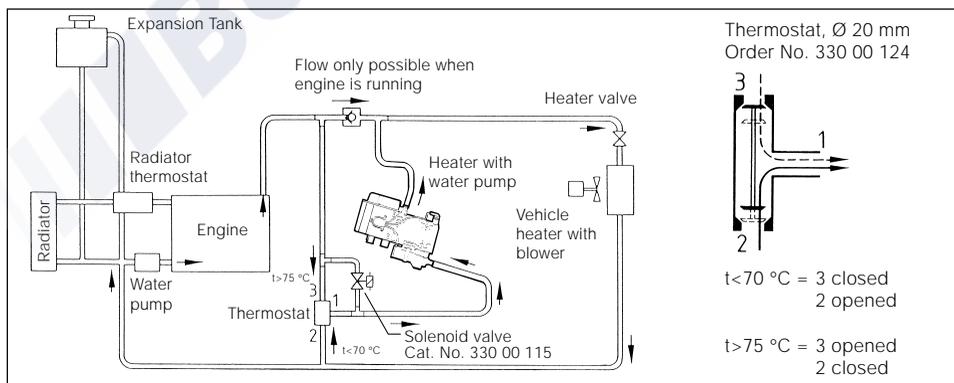


2. With thermostat as in example 1.

Additional solenoid valve bypasses the thermostat when open (voltage applied). This enables the engine too to be preheated right from the start.

Advantage:

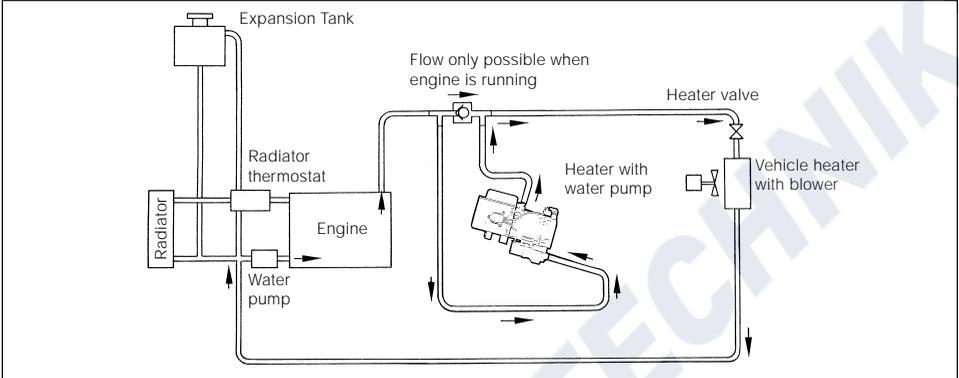
Engine preheating can be activated regardless of temperature.



3. Heater in coolant line between engine and heat exchanger of vehicle, with non-return valve installed parallel. No thermostat.

Advantage:
Easy assembly.

Disadvantage:
Continuous flow through engine. Low cab heating efficiency in the case of large engines. For that reason only recommended for small engines.

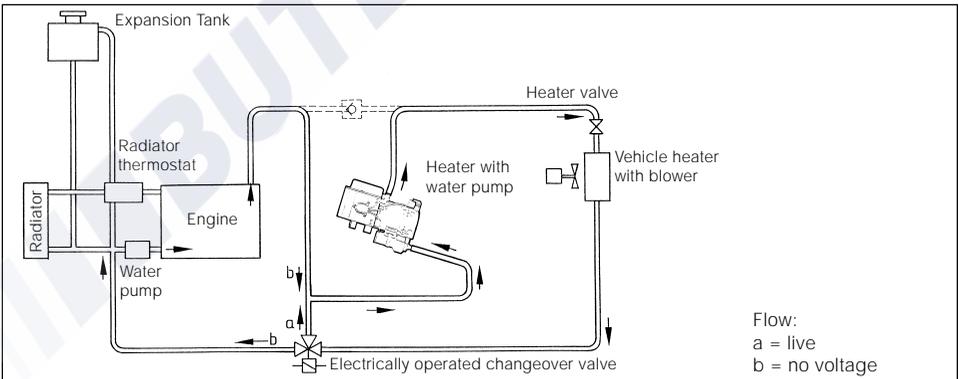


4. Instead of the thermostat in Example 1, an electrically operated changeover valve can be used for optional switching to small circuit (cab heating only) or large circuit (cab heating plus engine preheating).

Advantage:
Selection of heating circuit regardless of the temperature.

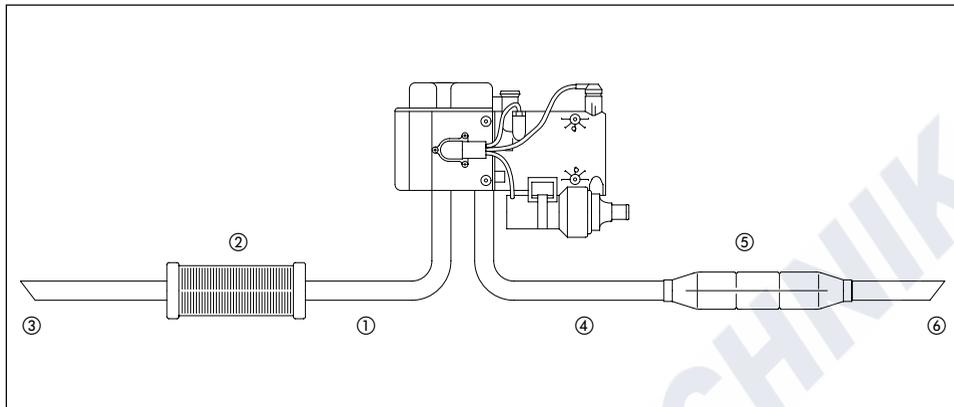
Disadvantage:
No automatic regulation possible, unlike in thermostat operation (1. and 2.).

Recommendation: An additional non-return valve prevents any loss in the efficiency of engine preheating when the additional heater is switched off.



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Combustion air supply / Fume exhaust



Combustion air supply

A silencer is fitted to the heater. The combustion air intake tube can also be extended by up to 2 m using a flexible tube. The inner diameter should be 25 mm. Avoid sharp bends.

The combustion air has to be taken from the outside (not from the occupant cell or the boot). Arrange the combustion air inlet so that exhaust gas cannot be directly drawn in again.

Do not install the combustion-air line so that its inlet opening faces the oncoming wind; position it in such a way that it cannot be blocked by snow or dirt and that water can drain from it.

Attach the end sleeve. This will guarantee that a ball with a diameter of 16 mm cannot be inserted. (Requirement in the "Technical Requirements for Heaters".)

Fume exhaust

A flexible fume hose (inner diameter 30 mm, 1300 mm long) is included. It must be cut at a suitable place so that the fume silencer can be connected between it (see Fig. on Page 3).

The exhaust tubes can be shortened or extended up to a maximum of 2 m if necessary.

Exhaust tubes may not protrude beyond the vehicle's sides. Either fit the exhaust lines so that they are inclined downwards slightly or drill drainage holes of around 5 mm diameter at the lowest points so that condensation can run off.

The exhaust outlet and the combustion air inlet must be so arranged that exhaust cannot be sucked in again directly.

The exhaust outlet must be on the outside. Exhaust lines must be laid in such a way that neither the penetration of exhaust into the vehicle interior nor the intake of exhaust through the vehicle blower need be expected¹⁾, and that the operation of essential vehicle parts is not affected (ensure adequate clearance). Place the outlet opening of the exhaust line in such a way that it cannot be clogged by dirt and snow and that any water which does enter can run off. Do not install facing the slipstream.

Attach the end sleeve. This will guarantee that a ball with a diameter of 16 mm cannot be inserted. (Requirement in the "Technical Requirements for Heaters".)

¹⁾ This requirement is deemed met when the outlet of the exhaust pipe points upwards or to the side, or – when the exhaust is run under the vehicle floor – is positioned close to the side or rear edge of the cab or vehicle.

- ① Combustion air connection dia. 25 mm
- ② Combustion air silencer
- ③ Exhaust pipe dia. 30 mm
- ④ Exhaust silencer
- ⑤ Intake aperture – protect from penetration by the airstream, snow, dirt and water

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Fuel supply

Requirements:

The fuel line running to the engine must be tightly sealed to ensure.

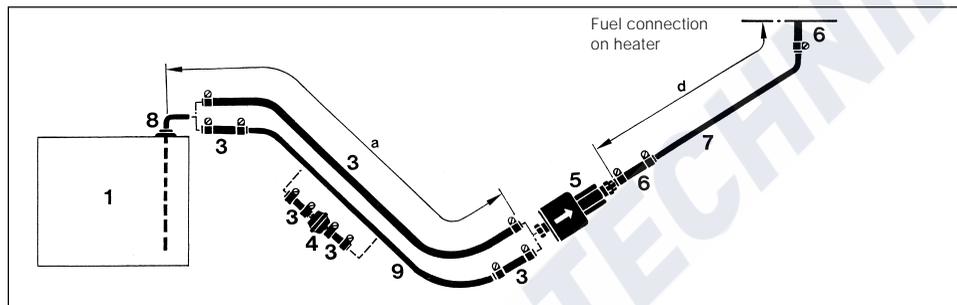
The supply pressure in the fuel line must not exceed 0.3 bar in all operation conditions.

- Fuel is preferably tapped from the vehicle fuel tank or from a separate fuel tank with separate riser pipe (tank connection).**

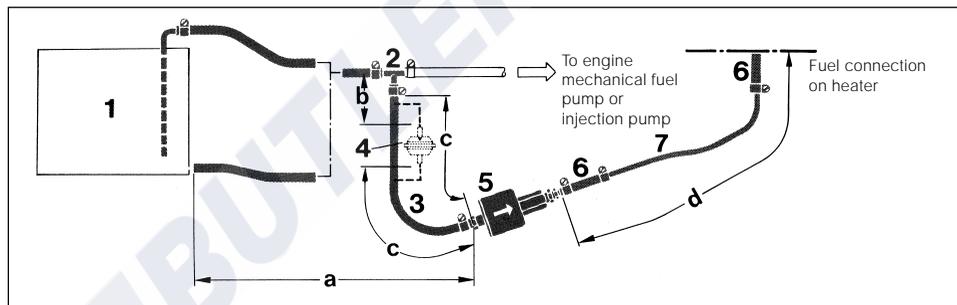
Important!

Be sure to comply with the following instructions in order to avoid damaging the heater and / or engine.

Before using the water heater, prime the fuel pipes by starting the vehicle engine.



- If difficulties arise in installing the rising tank connection, the supply line can be tapped.**



- ① Fuel tank (vehicle tank or separate tank)
- ② Fuel branch
- ③ Fuel hose, internal dia. 5 mm
- ④ Fuel pre-filter – only necessary when contaminated fuel is used
- ⑤ Fuel metering pump (15° to vertically upwards)
- ⑥ Fuel hose, internal dia. 3.5 mm
- ⑦ Fuel pipe, plastic, internal dia. 2 mm
- ⑧ Riser pipe (tank connection), internal dia. 4 mm
- ⑨ Fuel pipe, internal dia. 4 mm

Permitted line lengths

Suction side

- a = max. 2 m
- b = max. 50 mm
- c = max. 300 mm

Discharge side

- d = max. 6 m
- at least 1.5 m
- (should shorter fuel lines be necessary please contact the manufacturer in advance)

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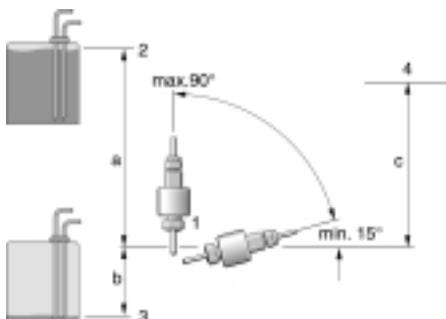
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Mounting position for metering pump

Permitted height for induction and discharge sides of metering pump



- ① Metering pump
- ② Max. fuel level
- ③ Min. fuel level
- ④ Connection to heater

Mounting position for delivery pump

Install metering pump with discharge side at an angle of min. 15° to 90° sloping upwards in vehicle.

Fuel line, metering pump to heater, should not have a slope if at all possible.

Permitted height of induction and discharge sides

Discharge side height from vehicle tank to metering pump:

a = max. 1000 mm

Suction head: with tank at zero pressure:

b = max. 750 mm

Note:

Check whether tank ventilation is working properly

Height of induction side if fuel drawn from a vehicle tank in which a partial vacuum occurs on withdrawal:

b = max. 400 mm

Note: Valve 0.03 bars in tank cap

Pressure head, metering pump to heater:

c = max. 2000 mm

Important!

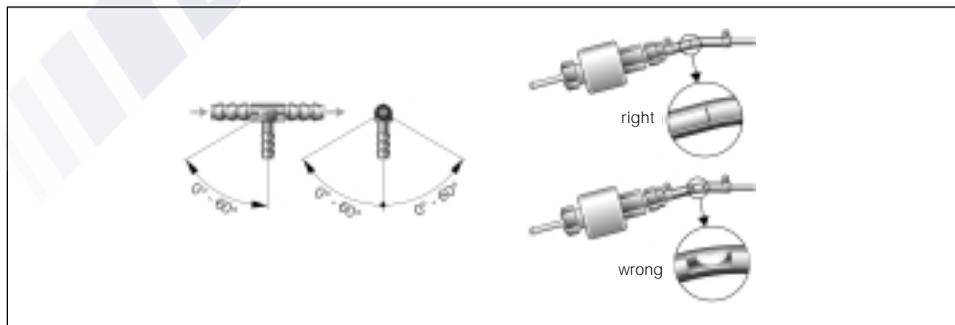
If the pressure in the inflow and return lines is over 0.3 bar but not more than 2.0 bar, a pressure reducer (Order No. 20 1645 89 30 00) or separate tank connection (riser mounted in tank fitting) must be used.

If the pressure in the inflow and return lines is over 2.0 bar, a separate tank connection (riser mounted in tank fitting) **must be used**.

- Cut fuel tubes and pipes to length only with a sharp knife. Cuts may not be indented, and must be burr-free.
- Protect fuel line, filter and metering pump from

overheating; do not install near silencers and exhaust pipes.

- For connection of the fuel branches, always use rubber tubing, never plastic pipe.
- Sections 45 and 46 of the German road traffic regulations also apply, with due alteration of details, for the fuel lines and additional tanks of heaters.
- Connect up fuel pipes with a fuel tube. Fit the fuel pipe flash.
- If a T-piece is installed, adhere to the installation positions shown in the drawing.



Fuel at low temperatures

The heater works well on the same commercial-grade fuel (Diesel) as your engine.

Mixing winter diesel oil with waste oil is prohibited.

Adaption to normal winter temperatures is automatically allowed for by the oil refineries (winter diesel).

Difficulty could only arise in the event of an extreme drop in temperatures (as it would for the engine – see engine instructions).

If the heater is supplied from a separate fuel tank, the following rules should be followed: At temperatures above freezing (0 °C or 32 °F), any type of diesel fuel can be used.

If no special diesel fuel for low temperatures is available, gasoline or kerosene should be added to the winter diesel oil in accordance with the table shown adjacent.

Temperature	Winter diesel oil	Additive
0 °C to -25 °C	100 %	---
-25 °C to -40 °C	50 %	50 % kerosene or gasoline*

*or special types of diesel fuel

Fuel lines and fuel metering pump have to be filled with the new fuel by operating the heater for 15 minutes.

Fuel for special cases

In special cases, the heaters can also be run on heating oil (at temperatures above 0 °C) or kerosene. Please consult the manufacturer if you have any doubts.

Electrical system

Electrical leads, switches and controls must be arranged in the vehicle so that their operation under normal conditions is not impaired in any way.

The indicator lamp (built into the control switch) should be positioned within the driver's field of vision or be capable of being seen without any great effort.

The leads between the battery and heater must comply with the specifications below to ensure that the permitted nominal voltage loss of 0.5 V at 12 V and 1 V at 24 V in the leads is not exceeded.

- Positive and negative lead lengths
- < 5 m = lead cross-section 4 mm²
 - 5 m – 8 m = lead cross-section 6 mm²

If the positive lead is to be connected to the fusebox (e.g. terminal 30), the lead in the vehicle from the battery to the fusebox must be included in the calculation of the overall lead length and the lead extended accordingly, if necessary.

Grease any plug-in and earth connections outside the cab / passenger compartment with protective contact grease.

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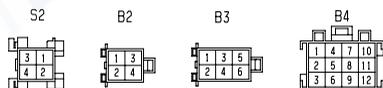
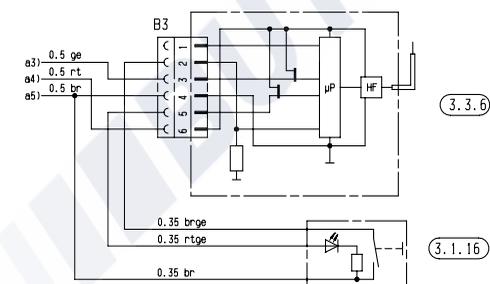
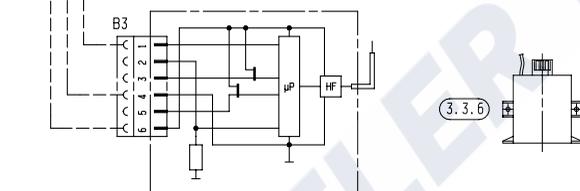
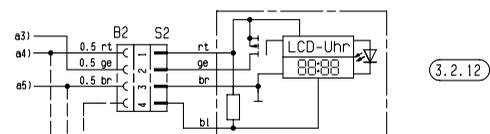
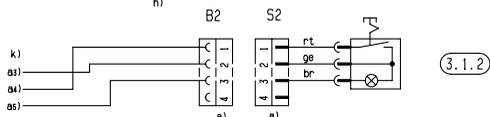
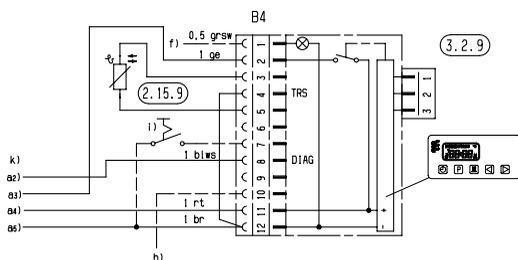
S

GB

F

Operating elements

HYDRONIC 10 – 12 volt / 24 volt



Parts list

- 1.1 Burner motor
- 1.2 Glow plug
- 1.5 Overheating sensor
- 1.12 Flame sensor
- 1.13 Temperature sensor

- 2.1 Control unit
- 2.2 Fuel metering pump
- 2.5.7 Vehicle blower relay
- 2.5.18 Switch-over relay for water circulation system, to be fitted by customer if required
- 2.7 Main fuse
- 12 volt = 20 A
- 24 volt = 15 A
- 2.7.1 Fuse for control switch 5 A
- 2.7.5 Fuse for vehicle blower 25 A
- 2.12 Water pump

- 3.1.2 Heating switch (continuous operation)
- 3.1.16 Key button, radio remote control
- 3.2.9 Timer
- 3.2.12 Timer "Mini 98" version
- 3.3.6 Radio remote control

- 5.1 Battery
- 5.10 Vehicle blower

- a) Connection for operating device
- b) External control for water pump (with plus signal)
- c) Water circulation changeover: relay closes at a water temperature of 68 °C and opens at 63 °C
- d) Ignition (terminal +15)
- f) Light (terminal 58)
- g) Connection for heater
- h) Ignition (terminal 15)
- i) Connection for external heating key 
- k) Connection leads in plug B2, B3 or B4
- l) Reduction in temperature
- x) Cut open wire

- a2) Diagnosis
- a3) Switch-on signal, S+
- a4) Plus supply, +30
- a5) Minus supply, -31
- a6) Battery separating switch (+) on / off (diode: order number 208 00 012)

* Length A – B and C – D:
 < 5 m: cross-section 4 mm²
 > 5 m < 8 m: cross-section 6 mm²

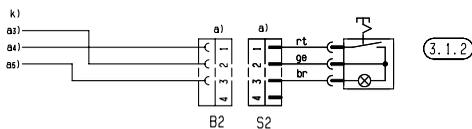
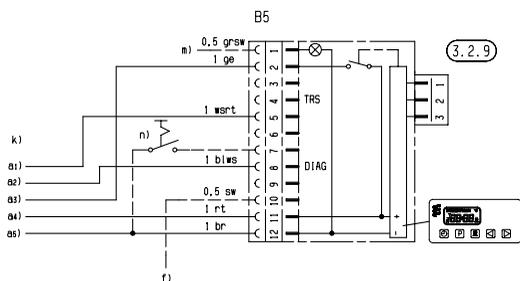
Plug housing and socket housing are shown from the conductor entry side

Cable colours

- sw = black
- ws = white
- rt = red
- ge = yellow
- gn = green
- vi = violet
- br = brown
- gr = grey
- bl = blue
- li = lila

25 2160 00 96 02 C

Operating elements "TRS"
HYDRONIC 10 – 12 volt / 24 volt



25 2160 00 96 01 C

Cable colours

- sw = black
- ws = white
- rt = red
- ge = yellow
- gn = green
- vi = violet
- br = brown
- gr = grey
- bl = blue
- li = lila

Parts list

- 1.1 Burner motor
- 1.2 Glow plug
- 1.5 Overheating sensor
- 1.12 Flame sensor
- 1.13 Temperature sensor
- 2.1 Control unit
- 2.2 Fuel metering pump
- 2.5.7 Vehicle blower relay
- 2.5.18 Switch-over relay for water circulation system, to be fitted by customer if required
- 2.7 Main fuse
 - 12 volt = 20 A
 - 24 volt = 15 A
- 2.7.1 Fuse for control switch 5 A
- 2.7.5 Fuse for vehicle blower 25 A
- 2.12 Water pump (max. additional load: 4 A)
- 3.1.2 Heating switch (continuous operation)
- 3.2.9 Timer
- 5.1 Battery
- 5.10 Vehicle blower
- a) Connection for operating device
- b) External control for water pump (with plus signal)
- c) with TRS D+ (alternator)
- d) with TRS HA- (auxiliary drive / secondary drive) plus switch
- e) Water circulation changeover: relay closes at a water temperature of 68 °C and opens at 63 °C (with reduction in temperature 58 °C / 45 °C)
- f) Ignition (terminal +15)
- k) Connection leads in plug B2 or B5
- l) Connection for heater
- m) Light (terminal 58)
- n) Connection for external heating key 
- p) Reduction in temperature
- x) Cut open wire
- a1) TRS feedback
- a2) Diagnosis
- a3) Switch-on signal, S+
- a4) Plus supply, +30
- a5) Minus supply, -31
- a6) Battery separating switch (+) on / off (diode: order number 208 00 012)

* Length A – B and C – D:
 < 5 m: cross-section 4 mm²
 > 5 m < 8 m: cross-section 6 mm²

Plug housing and socket housing are shown from the conductor entry side

