INSTALLATION AND USER GUIDE
HYDROPLATE HYDRONIC HS3
MODULAR KIT (LEAVE WITH VEHICLE)

29.2100.20.1026 · Issue C · 04/2021

Eberspächer

CONTENTS

1 INTRODUCTION

CONCEPT OF THIS MANUAL

This manual aims to support the service company installing the heater and to provide the user with all important information about the heater. It also refers to, and should be used in conjunction with, the technical manual as supplied with the heater on a CD ROM.

The manual has been divided into chapters to make it

The Eberspächer "Hydroplate" system uses a Hydronic D4E or D5E water heater and our Hydroplate tank. This modular version is required when the heater has to be installed remotely outside of the living area of the vehicle / application. It requires a diesel fuel supply from either the vehicle fuel tank or a separate diesel tank. The heater will require a 12V (20 Amp) or 24V (10 Amp) DC power supply, as well as a pumped domestic water supply for hot water output.

The Hydroplate system is generally used when stationary, but can be used whilst on the move. Depending on heater model used it has either 4.3kW or 5kW output. Depending on the heat requirement, the heater adjusts continuously between the heating outputs:
Max – Min – Off (pause mode). The temperature thresholds for these are permanently programmed in the electronic control box.

After following the accompanying instructions, all you need to do is switch the system on, after approximately 10-15 minutes hot water will be available for washing and showering. The continuity of hot water will be dependent on the flow rate of the domestic water pump (6-11 l/m) as an average. Its optimum use is in short bursts of up to 3 minutes at a time, however depending on required temperature, flow could be longer.

Blown hot air is also available from this system when using a matched matrix, either 1.7kW for small areas, or a larger 4kW matrix with multiple outlets for larger applications.

Operation is from an 'EasyStart Pro' controller for hot water. Blown air heating is either automatic, or via an independent switch or thermostat.

Hydroplate Hydronic Modular

1 INTRODUCTION

SPECIAL TEXT STRUCTURE, PRESENTATION AND PICTURE SYMBOLS

Special text formats and picture symbols are used in these instructions to emphasise different situations and subjects. Please refer to the following examples for their meanings and appropriate action.

SPECIAL STRUCTURE AND PRESENTATIONS

This dot (■) indicates a list which is introduced by a heading.
If an indented dash (–) follows a dot, this list is sub-section to the dot.

PICTURE SYMBOLS

§ **REGULATION!**

This information indicates a statutory regulation.
Any violation of these regulations results in expiry of the type-approval for the PTC heating element and exclusion of any guarantee and liability claims against Eberspächer Climate Control Systems GmbH & Co. KG.

DANGER!

This information points out a potential serious or fatal danger. Ignoring this information can result in severe injuries.

This arrow → indicates the appropriate precaution to take to avert the danger.

ATTENTION!

This information points out a dangerous situation for a person and / or the product. Failure to comply with this information can result in personal injuries and / or damage to the unit.

This arrow → indicates the appropriate precaution to take to avert the danger.

NOTE

These remarks contain recommendations for use, and useful tips for the operation, installation and repair of the heater.

IMPORTANT INFORMATION BEFORE STARTING WORK

RANGE OF APPLICATION OF THE HEATER

The water heater operating independently of an engine is intended for installation in the following vehicles, depending on its heating output:

- Vehicles of all kinds.
- Construction machinery.
- Agricultural machinery.
- Boats, ships and yachts (only diesel heaters).
- Camper vans / trailers / caravans.

NOTE

Installation of the heater is NOT permitted in vehicles used for the transport of dangerous goods as per ADR / ADR99.

PURPOSE OF THE HEATER (USING THE VEHICLE HEAT EXCHANGER)

- Pre-heating, de-misting windows.
- Heating and keeping the following warm:
  - Driver and working cabs, ship's cabins.
  - Freight compartments.
  - Passenger and crew compartments.
  - Vehicle engines and units.
  - Camper vans.

On account of its functional purpose, the heater is NOT approved for the following applications:

- Long-term continuous operation, e.g. for preheating and heating of:
  - Residential rooms.
  - Garages.
  - Work huts, weekend homes and hunting huts.
  - Houseboats, etc.

ATTENTION!

Use, operation and deployment of the heater outside the range indicated by the manufacturer can cause considerable injuries to people and / or damage to machinery and property.

→ Only use the heater for the stipulated purpose and in the permitted range of application.

1 INTRODUCTION

STATUTORY REGULATIONS

The Federal Motor Transport Authority has issued an approval for a component according to ECE-R122 and ECE-R10 for the heater for installation in motor vehicles, with the following official type-approval markings noted on the heater's nameplate.

Heater type:	ECE type approval mark:
Hydronic S3	(E1) 122 R – 000449 10 R – 057330

§ REGULATION!

Excerpt from ECE regulation No. 122 of the European Parliament and the Council!

General regulations

- Operating state display:
  - A clearly visible operating display in the user's field of vision must indicate when the heater is switched on and off.

Regulations concerning installation in the vehicle

Scope

- Subject to differing stipulations in the following section, combustion heaters must be installed according to the regulations 5.3 of ECE-R122.
- It is assumed that Class O vehicles with heaters for liquid fuel conform to the regulations 5.3 of ECE-R122.

Arrangement of the heater

- Parts of the structure and other components near the heater must be protected from excessive heat exposure and possible fuel or oil contamination.
- The combustion heater shall not constitute a risk of fire, even in the case of overheating. This requirement shall be deemed to be met if the installation ensures an adequate distance to all parts and suitable ventilation, by the use of fire resistant materials or by the use of heat shields.
- Do not install the heater in the passenger compartment of class M_2 and M_3 vehicles. However, a heater a hermetically sealed enclosure which also complies with the aforementioned conditions may be used.
- Attach the nameplate, or a duplicate, so that it can be easily read when the heater is installed in the vehicle.
- Take every reasonable precaution in positioning the heater to minimize the risk of injury or damage to items carried in the vehicle.

Fuel supply

- If a separate fuel tank is used, the filler neck cannot be located in the passenger compartment and must be fitted with a properly closing cap to prevent any leaks.
- In heaters for liquid fuel where the heater fuel supply is separate from the vehicle fuel supply, the type of fuel and filler neck must be clearly marked.
- Attach a notice to the filler neck informing that the heater must be switched off before refuelling.

Exhaust system

The exhaust outlet must be arranged so as to prevent any penetration of exhaust fumes into the vehicle interior through the ventilation system, warm air intakes or open windows.

Combustion air intake

- Do not draw the air for the combustion chamber of the heater from the passenger compartment of the vehicle.
- Position or protect the air inlet so that it cannot be blocked by objects.

Automatic control of the heating system

If the engine fails, the heating system must be switched off automatically and the fuel supply stopped within 5 seconds. The heater may remain in operation if a manual device has already been activated.

NOTE

- The heater is not approved for installation in the driver's cab or passenger compartment of Class M_1 vehicles (vehicles for passenger transport / cars) and N vehicles (vehicles for the transport of goods).
- Compliance with the statutory regulations, the additional regulations and the safety instructions is prerequisite for guarantee and liability claims.
- Failure to comply with the statutory regulations and safety instructions and incorrect repairs, even if original spare parts are used, make the guarantee null and void and exclude any liability whatsoever of Eberspächer Climate Control Systems GmbH & Co. KG.
- The statutory regulations are binding and must also be observed in countries which do not have any special regulations.
- Subsequent installation of this heater must comply with these installation instructions.
- When installing the heater in vehicles not subject to the German Road Traffic Licensing Regulations (StVZO), the respective specially valid regulations and installation instructions must be observed.
- Installation of the heater in special vehicles must comply with the regulations applying to such vehicles.
- Further installation requirements are printed in the relevant sections of these installation instructions.

1 INTRODUCTION

HAZARD INFORMATION AND WARNINGS FOR INSTALLATION AND OPERATION

DANGER!

Risk of injury, fire and poisoning!

- Disconnect the vehicle battery before starting any kind of work.
- Before working on the heater, switch the heater off and let all hot parts cool down.
- Do not start up the heater in enclosed spaces, e.g. garage or multi-storey car park.

CAUTION!

Safety instructions for installation and operation!

- Have the heater installed only by a service partner authorised by the manufacturer according to the instructions in this manual, possibly according to special installation recommendations; the same applies to any repairs to be carried out in the case of repairs or guarantee claims.
- Repairs by third-parties not authorised by the manufacturer and / or with non-original spare parts are dangerous and therefore not allowed. They result in expiry of the type-approval of the heater; and thus, when installed in motor vehicles, they can cause expiry of the vehicle's operating licence.
- The following measures are not allowed:
  - Changes to heating-relevant components.
  - Use of third party parts not approved by the manufacturer.
  - Installation or operation deviating from the statutory regulations, safety instructions or specifications relevant to safe operation as stated in the installation instructions and operating instructions. This applies in particular to the electrical wiring, fuel supply, combustion air system and exhaust system.
- Only use original accessories and original spare parts for installation and repairs.
- Only use the control units approved by the manufacturer to operate the heater. Use of other control units can cause malfunctions.
- Before the heater is installed again in another vehicle, rinse the heater parts carrying water with clear water.
- When carrying out electric welding on the vehicle, disconnect the positive cable at the battery and attach it to ground to protect the control box.
- Replace defective fuses only with fuses with the specified fuse rating.
- It is not permitted to operate the heater where there are readily flammable materials (e.g. dry grass, leaves, paper, etc.) in the area of the exhaust system or where ignitable fumes and dust can form, e.g. near a:
  - Fuel depot;
  - Coal depot;
  - Wood depot;
  - Grain store or similar.
- Switch off the heater before refuelling.
- If the heater is fitted in a safety casing, etc., the heater's installation box must not be used as storage space and must be kept clear. In particular, do not store or transport fuel canisters, oil cans, spray cans, gas cartridges, fire extinguishers, cleaning rags, items of clothing, paper etc. on or next to the heater.
- If fuel escapes from the heater's fuel system (leak), arrange for immediate repair of the damage by an Eberspächer partner.
- Use only anti-freeze products approved by the vehicle manufacturer to top-up; please refer to the vehicle's operating manual. Blending with unapproved anti-freeze can cause damage to the engine and heater.
- Do not cancel the after-running of the heater prematurely, e.g. by pressing the battery isolating switch, except for an emergency stop.

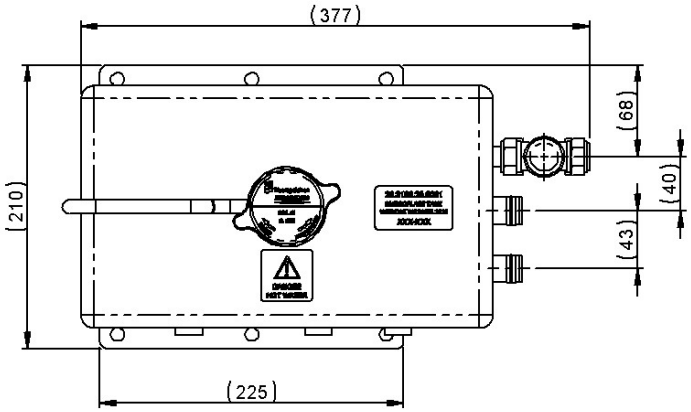
NOTE

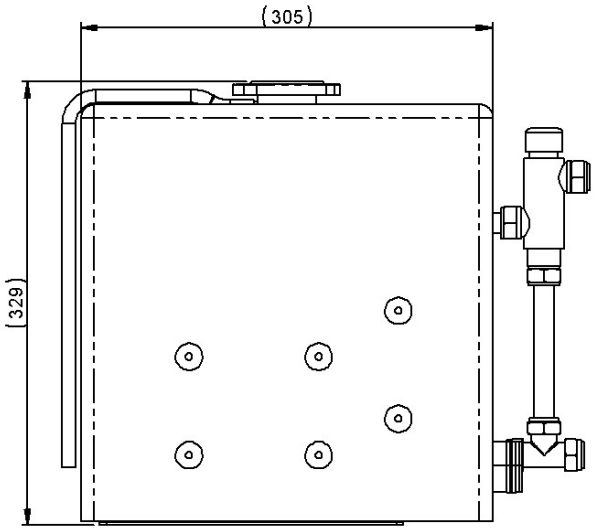
- All deviations from the safety requirements for installation and operation are to be agreed with the manufacturer in writing before they are implemented.
- Following installation, attach the “Switch off heater before refuelling!" sticker near the tank filler neck.

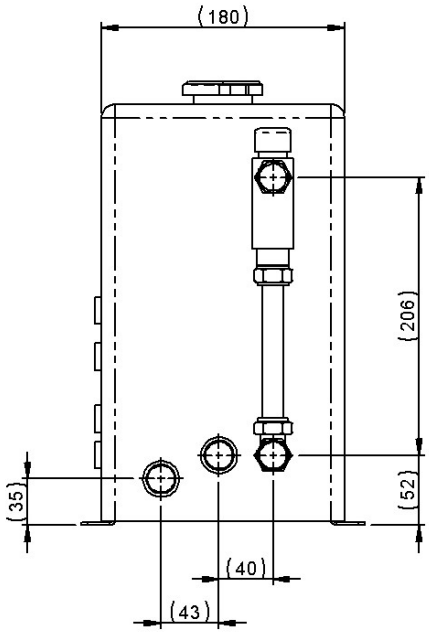
ACCIDENT PREVENTION

Always follow all general accident prevention regulations and shop and operating safety instructions.

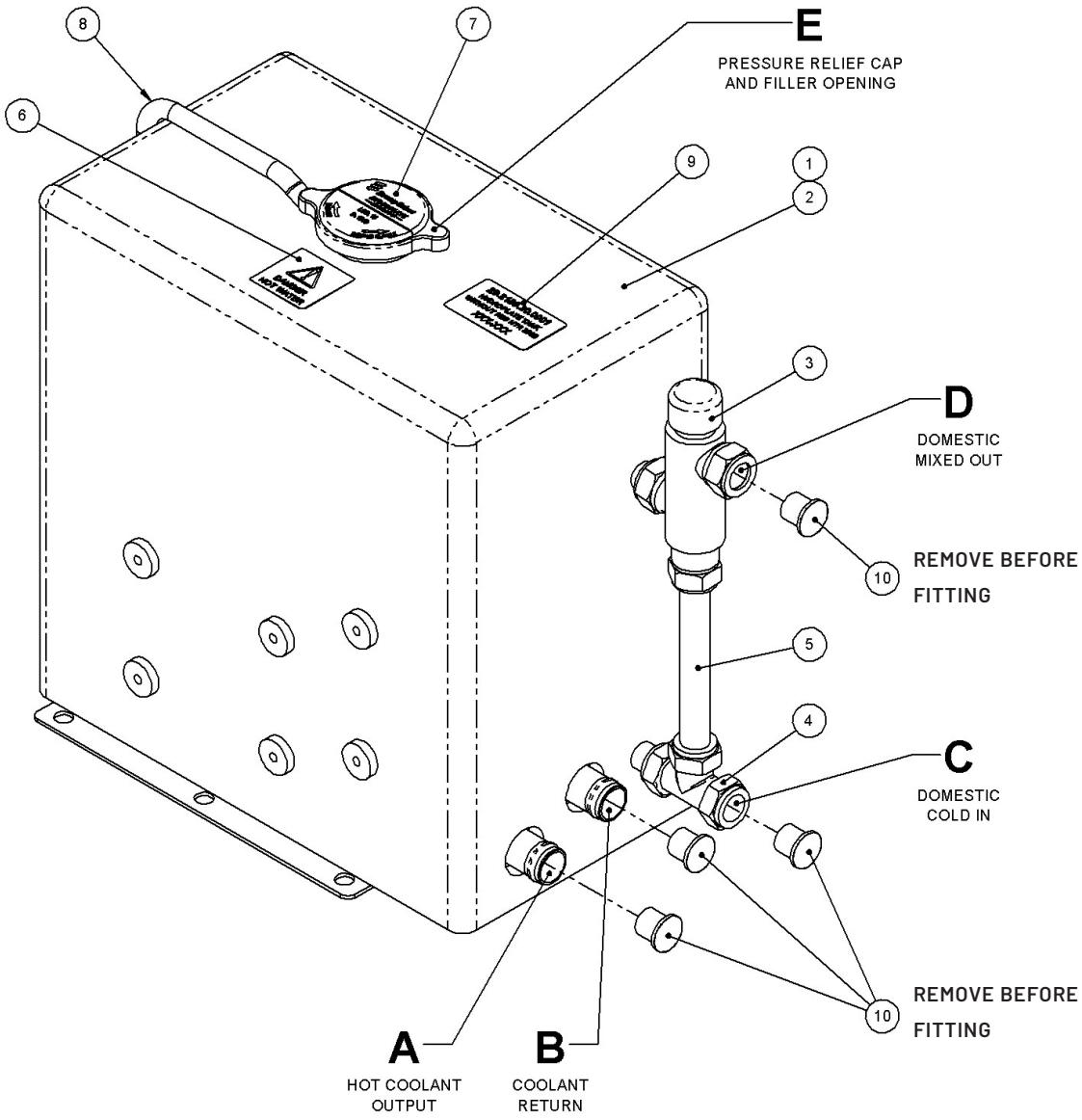
2 PRODUCT INFORMATION







2 PRODUCT INFORMATION



10	-	CAP / BUNG (REMOVE BEFORE FITTING)	4
9	-	STORES LABEL	1
8	29.2100.17.1110	HOSE TRANS SIL 8mm OD 5mm ID HT /M	500mm
7	29.2100.17.1076	LABEL HYDROPLATE GEL FOR CAP ROUND	1
6	81.1301.00.0649	LABEL YELLOW DANGER HOT	1
5	29.2100.01.7273	TUBE 15mm OD COPPER	135mm (+/-1mm)
4	29.2100.17.1035	TEE 15 X 15 X 15 COMPRESSION FITTING	1
3	29.2100.01.7556	VALVE - BLENDER 15mm	1
2	29.2100.11.1006	MAXITHERM JACKET FOR HS3 PLATE TANK	1
1	29.2180.01.0556	HYDROPLATE TANK HS3 2020 BEADED	1
ITEM NO.	PART NUMBER	DESCRIPTION	QTY.

2 PRODUCT INFORMATION

Heater Version			Hydronic S3 Economy		
Heater Version			D4 E CS	D5 E CS	
Heating Medium			Mixture of water and antifreeze (Proportion of antifreeze at least 10% up to 50% maximum)		
Fuel			Diesel – standard commercially available (EN 590) Blending with max. 30% FAME according to EN 14214 is permitted.		
Rated Voltage			12 Volt		
Working Range			Maximum	Minimum	Maximum	Minimum
Heat Flow (Watt)			4,300	1,300	5,000	1,300
Fuel Consumption (l/h)			0.53	0.15	0.59	0.15
Average Electrical Power Consumption (Watt) without Water Pump, without Vehicle Fan Relay		During Operation	27	5	32	5
		While Starting	135			
Operating Range Lower Voltage Limit: An undervoltage protection installed in the control box switches off the heater if the lower voltage limit is reached.			10.5 Volt			
Upper Voltage Limit: An overvoltage protection installed in the control box switches off the heater if the upper voltage limit is reached.			16 Volt			
Allowable Operating Pressure			up to 2.5 bar overpressure max.			
Water Volume in the Heater			approx. 0.09 l			
Minimum Water Flow Rate of the Heater			300 l/h			
Allowable Ambient Temperature (Also note and follow the information for installation of the heater and metering pump!)	Heater	During Operation	-40°C to +80°C			
		Not in Operation	-40°C to +105°C, short-term +125°C (5 x 2h)			
	Metering Pump	During Operation	-40°C to +50°C			
		Not in Operation	-40°C to +105°C			
	Drawn-in Combustion Air		max. +45°C, short-term +80°C (15 minutes)			
Interference Suppression Class			5 (EN 55025)			
Weight – Without Coolant Liquid and Additional Parts			2 kg			
Degree of Protection DIN 40050, Part 9		Heater (in operation)	IP5K6K[1)]			
		Heater (not in operation)	IP5K9K[1)]			
Technical Data, Water Pump						
Rated Voltage			12 Volt			
Nominal Current			max. 1.6 A			
Nominal Delivery Pressure			0.2 bar			
Delivery Rate			≥ 500 l/h			

1) The heater is protected against harmful quantities of dust, powerful water jet under increased pressure and water during high-pressure/steam cleaning (provided it is not in operation). The control box is dustproof, completely protected against powerful water jet under increased pressure and water during high-pressure/steam cleaning (provided it is not in operation).

ATTENTION!

Operating the heater outside the specified technical data can cause malfunctions.

→ The technical data must be complied with at all times.

NOTE

If no limit values are given, the technical data listed is with the usual heater tolerances of ±10% at nominal voltage and Esslingen reference altitude.

2 PRODUCT INFORMATION

Heater Version			**Hydronic S3 Commercial**		
Heater Type			D5 L	D6 L	
Heating Medium			Mixture of water and antifreeze (Proportion of antifreeze at least 10% up to 50% maximum)		
Fuel			Diesel – standard commercially available (EN 590) Blending with max. 30% FAME according to EN 14214 is permitted.		
Rated Voltage			24 Volt		
Working Range			Maximum	Minimum	Maximum	Minimum
Heat Flow (Watt)			5,000	1,300	5,600	1,300
Fuel Consumption (l/h)			0.59	0.15	0.65	0.15
Average Electrical Power Consumption (Watt) without Water Pump, without Vehicle Fan Relay		During Operation	32	5	37	5
		While Starting	135			
Operating Range Lower Voltage Limit: An undervoltage protection installed in the control box switches off the heater if the lower voltage limit is reached.			20.4 Volt			
Upper Voltage Limit: An overvoltage protection installed in the control box switches off the heater if the upper voltage limit is reached.			32 Volt			
Allowable Operating Pressure			up to 2.5 bar overpressure max.			
Water Volume in the Heater			approx. 0.09 l			
Minimum Water Flow Rate of the Heater			300 l/h			
Allowable Ambient Temperature (Also note and follow the information for installation of the heater and metering pump!)	Heater	During Operation	-40°C to +80°C			
		Not in Operation	-40°C to +105°C, short-term +125°C (5 x 2h)			
	Metering Pump	During Operation	-40°C to +50°C			
		Not in Operation	-40°C to +105°C			
	Drawn-in Combustion Air		max. +45°C, short-term +80°C (15 minutes)			
Interference Suppression Class			5 (EN 55025)			
Weight – Without Coolant Liquid and Additional Parts			2 kg			
Degree of Protection DIN 40050, Part 9		Heater (in operation)	IP5K6K[1)]			
		Heater (not in operation)	IP5K9K[1)]			
Technical Data, Water Pump						
Rated Voltage			24 Volt			
Electrical power consumption			max. 35 W			
Nominal Delivery Pressure			0.15 bar			
Delivery Rate			1,400 l/h			

1) The heater is protected against harmful quantities of dust, powerful water jet under increased pressure and water during high-pressure/steam cleaning (provided it is not in operation). The control box is dustproof, completely protected against powerful water jet under increased pressure and water during high-pressure/steam cleaning (provided it is not in operation).

ATTENTION!

Operating the heater outside the specified technical data can cause malfunctions.

→ The technical data must be complied with at all times.

NOTE

If no limit values are given, the technical data listed is with the usual heater tolerances of ±10% at nominal voltage and Esslingen reference altitude.

3 INSTALLATION

INSTALLATION LOCATION

Before you begin, we advise that you take some time to plan the installation and read this manual and take a look at the accompanying CD with the heaters technical information on.

Where and how you install your system will depend on various limitations of both your vehicle / application design and construction, as well as the technical constraints of the heater.

Because of this we have endeavoured to give helpful advice within the different sections of this manual, so we advise that each section is read fully before commencing the installation.

When planning the most appropriate position of the heater, fan matrix and controller in relation to each other, it is important to consider the standard wiring loom lengths that are supplied with the kit. Although every effort has been made to supply adequate lengths sometimes, due to the design of a particular vehicle, the looms or pipework supplied may not be long enough in which case, please contact your dealer for advice.

As a general guide, before you begin be aware of the location of the vehicles fuel and water tanks, the batteries and any cold box, fridge or cooker that may prohibit the routing of the water hoses.

Before installing the heater, ensure that in doing so you are not infringing upon, or contravening any legal requirements of the vehicle use or construction. For instance, if the vehicle is to be used for hire purposes, it may require additional systems or warning labels to be installed, which may not be mentioned in this manual. Similarly, advice from the vehicle manufacturer may be required if you plan to cut through bulkheads, floors or fittings that may be structurally important to the vehicle design.

When considering the most appropriate position to mount the Hydroplate tank, it should be installed within an external locker or cupboard of the vehicle.

The Hydroplate unit requires and envelope space of approximately 400 x 330 x 300mm. It is best practice to try and site the heater and fan matrix in close proximity, in order to minimise the length of the water pipe work.

Consider if the area offers adequate protection.

The tank unit can only be mounted in its upright position. The heater fan matrix must be mounted lower than the Hydroplate unit for automatic venting of the heater fan matrix. If this is not possible, an additional air bleed vent must be fitted at the highest point in the water circuit.

NOTE

- The regulations and safety instructions to be observed for this chapter.
- The installation suggestions made in the installation instructions are examples. Other installation locations are possible if they correspond to the installation requirements stated in these installation instructions.

3 INSTALLATION

HEATER INSTALLATION POSITIONS

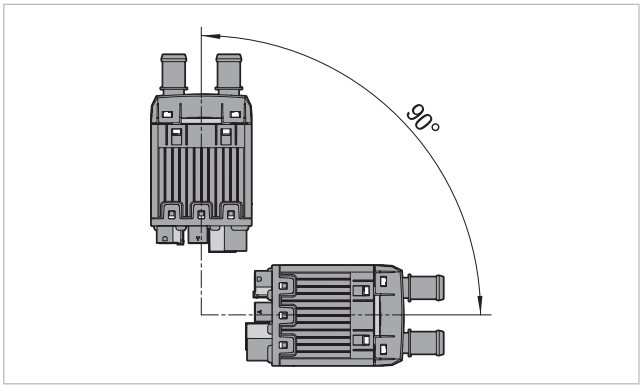
The heater should preferably be installed in the normal position. Depending on the installation conditions, the heater can be installed within the allowable swivel ranges.

NOTE

In heating mode, the normal and maximum installation positions shown can differ by up to +15° in all directions for a short time.
These differences, caused by tilted positions of the vehicle, do not have any negative effects on the heater's function.

INSTALLATION POSITION – HEATER UPRIGHT / ON ITS SIDE

The upright installation position (normal position) with swivel range up to the horizontal (heater on its side) installation position is allowable. All installation positions between 0° and 90°are permitted.

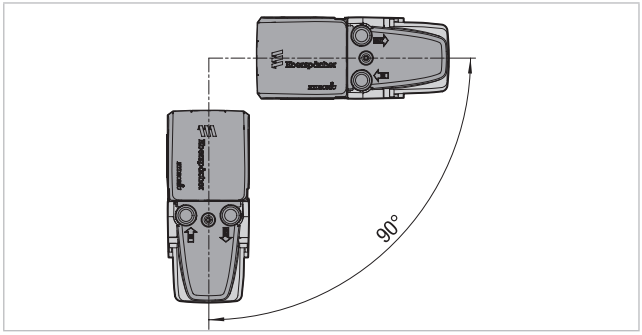


NOTE

If a heater is swivelled out of the normal position, the exhaust connections must always be at the bottom.

INSTALLATION POSITION – HEATER HORIZONTAL / VERTICAL

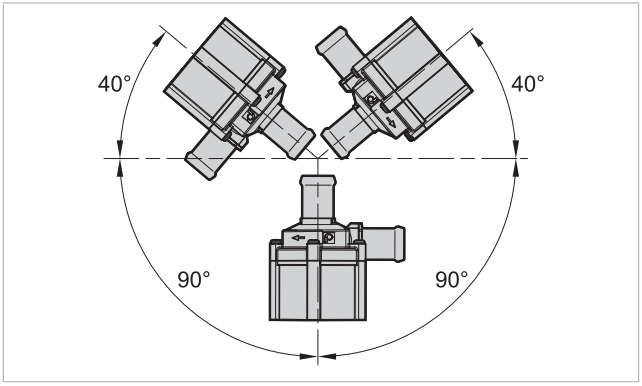
The horizontal installation position with swivel range up to the vertical installation position is allowed. All installation positions between 0° and 90°are permitted.



WATER PUMP INSTALLATION POSITION

Depending on the installation conditions, the water pump can be installed within the allowable swivel ranges, see sketch.

The water pump is not self-priming. The water inlet must therefore be arranged so that it is always completely filled with coolant liquid.



NOTE

The installation position of the water pump with the pump head facing downwards is not permissible for automatic venting.

INSTALLATION LOCATION

The heater and the water pump are installed externally.

The heater and the water pump must be installed below the minimum allowable coolant liquid level (header tank, radiator, vehicle's heat exchanger) so that the heat exchanger of the heater and the water pump can vent independently.

NOTE

- Note and observe the relevant regulations and safety instructions from page 6.
- The installation suggestions made in the installation instructions are examples. Other installation locations are possible if they comply with the installation requirements stated in these installation instructions.
- Note and observe the allowable installation positions together with the operating and storage temperatures.
- Ensure adequate distance from hot vehicle parts.
- Do not install the water pump at the lowest point of the coolant liquid circuit, as otherwise the particles in the coolant liquid circuit settle in the water pump.

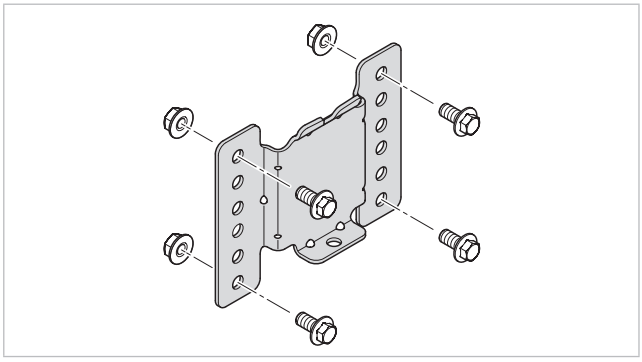
3 INSTALLATION

FIXING THE HEATER

Use the bracket included in the installation kit to fix the heater in a suitable position on the vehicle. The installation steps for the diesel and petrol heater are the same.

INSTALLATION STEPS

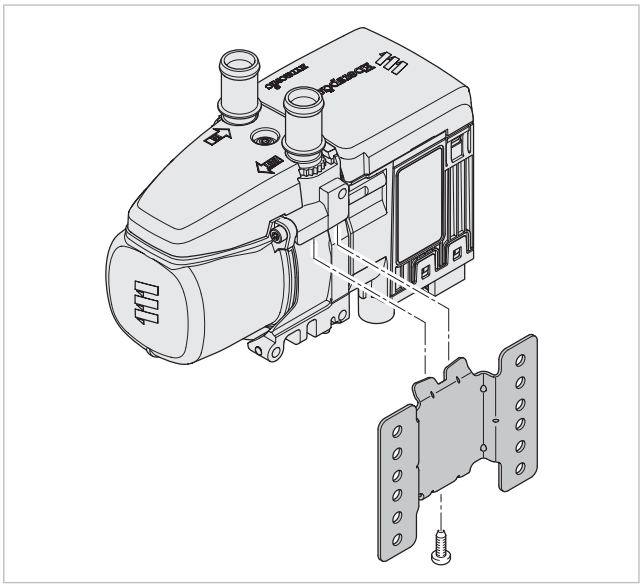
1. Use 4 hexagon screws M6 x 12 and 4 hexagon nuts M6
   or
   4 thread-forming screws to fix the bracket (tightening torque: 9^{+1} Nm).



NOTE

Preferably use the top and bottom fastening holes, see sketch. If using the other holes, ensure a minimum distance between the fastening screws.

2. Insert the heater in the bracket and fix onto the bracket with one screw M6 x 16, SW T30 (tightening torque: 10^{+1} Nm).



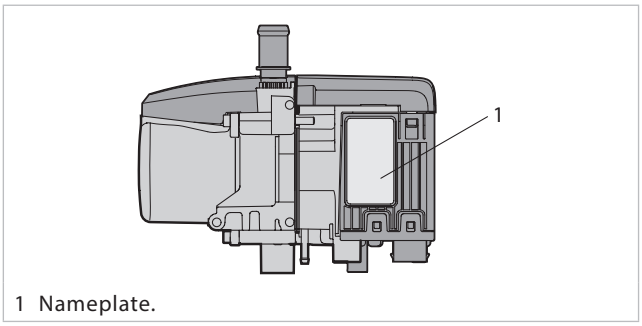
FIXING THE WATER PUMP

Use the water pump bracket included in the installation kit to fix the water pump in a suitable position on the vehicle. Then insert the water pump in the rubber element and press in until the water pump has latched into position.

NAMEPLATE

The nameplate (1) is fastened to the side of the heater.

The 2nd nameplate (duplicate) is enclosed with the heater and must be glued onto a readily visible place in the vehicle.



1 Nameplate.

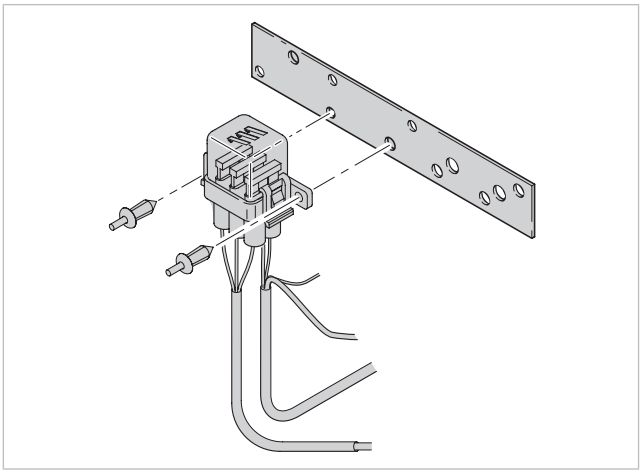
NOTE

Note and observe the relevant regulations on page 6.

FIXING THE FUSE HOLDER

Use a hexagon screw size M6 x 12 and hexagon nut size M6 to fix the bracket in a suitable position within the vehicle's engine compartment.

Fix the fuse holder to the bracket using 2 blind rivets 4 x 8; to do this, press in the bolts of the two split rivets until the fuse holder is installed securely on the bracket.



3 INSTALLATION

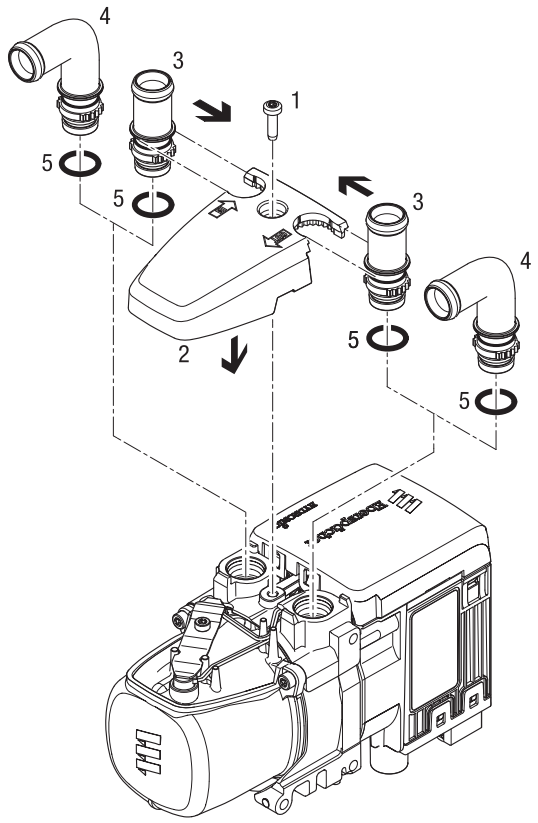
FIXING THE FAN RELAY BLOCK (IF REQUIRED)

Use a cable tie or blind rivet to fix the fan relay block in a suitable, accessible position inside the vehicle, to do this, push in the bolt of the split rivet 5.5 x 12 until the relay block is securely installed.

INSTALLING THE WATER CONNECTION SOCKETS

The heater scope of supply includes two straight water connection sockets and the installation kit includes two angled water sockets.

Depending on the installation conditions, the straight water connection sockets (3) and the angled water connection sockets (4) can be installed with the sensor cover.



1 Screw M5 x 18
2 Sensor cover
3 Connection (straight)
4 Connection (angled)
5 O-ring

Installation steps

- Insert O-ring (5) in the groove of the connection socket.
- Insert connection sockets (3 or 4) in the recesses of the sensor cover (2). The collar at the connection socket is above the cover.
- Position and fix the connection sockets with the teething in the sensor cover.
- Position the sensor cover on the heater with the connection socket first.
- Push the connection socket completely into the connection holes in the heat exchanger.
- Adjust the direction for the angled connection sockets:
  - Lift the sensor cover up to the collar of the connection sockets.
  - Turn connection socket in the required direction.
  - Push sensor cover downwards and readjust the connection socket position until the teething intermesh once again.
- Use screw M5 x 18 to fix the sensor cover (tightening torque $6.5^{+0.5}$ Nm).

3 INSTALLATION

CONNECTION OF THE WATER CIRCUIT

See Heating Circuit examples below*. The heater is connected to the Hydroplate tank using 20mm rubber hose (supplied) and is secured using the appropriate clips. The matrix is connected in series using 15mm hose (with reducer) to the larger 20mm hose.

In order to obtain the best performance from the system, restrictions in the water flow should be kept to a minimum. The use of very tight bends (e.g. elbow fittings, and large variations in height) should be avoided where possible.

CONNECTION OF THE DOMESTIC WATER CIRCUIT

See Heating Circuit examples below*. The Hydroplate requires a cold water supply to the lower 15mm connector. The hot water supply to the domestic system is taken from the output of the blender valve. This is to be set as indicated, to prevent harm from scolding. This pipework can be of standard size, as used within the application being fitted to.

*Heating circuits shown are not to scale (components and layout will vary according to installation).

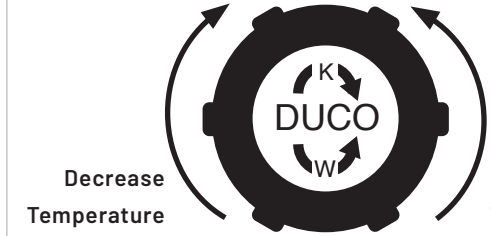
DANGER!

Adjusting the blender valve!
The blender valve is manually adjusted and should ideally be set at between 50°C to 55°C. To increase the temperature turn the knob on the valve anti-clockwise, and to reduce the temperature turn the knob clockwise.

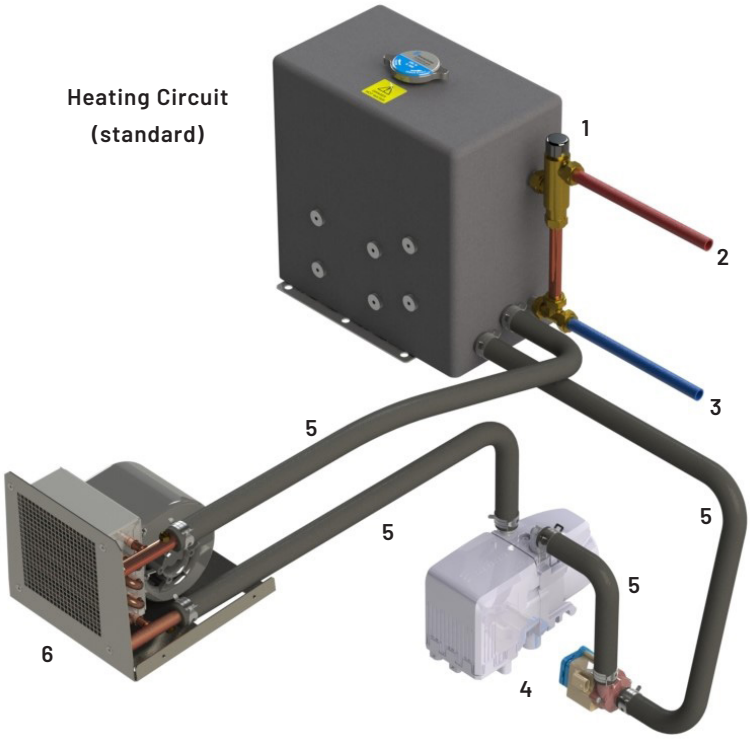
NOTE

One full revolution of the knob in either direction increases or decreases the temperature by approximately 10°C.

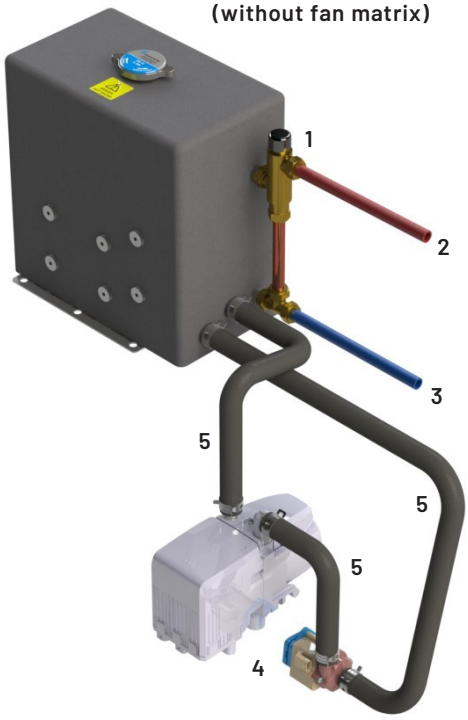
Blender Valve Adjustment



Heating Circuit (standard)



Heating Circuit (without fan matrix)



1 Blender Valve
2 Hot water output to domestic tap
3 Cold water input from storage tank (via pump)
4 HS3 Water Heater & Water Pump (fitted externally)
5 Water Hose (modified as required)
6 Fan Matrix (optional)

3 INSTALLATION

DANGER!

Risk of injuries and burns!

The water stored in the Hydroplate reaches temperatures in excess of 80°C, therefore if the blender valve is not adjusted correctly, to reduce the temperature of the domestic hot water, scalding may result.

It is possible for the coolant and components of the coolant circuit to get very hot.

- Ensure you allow sufficient time (approximately 30 minutes), before removing header tank pressure cap to prevent scolding. Push and twist anti-clockwise to remove.
- The Hydroplate is fitted with a blender (thermostatic) valve to limit the temperature of the water that can be used for washing, bathing, etc. It must be set to a safe temperature.
- The water pipework must be routed and fastened in such a way that there is no risk to people, animals or materials that are sensitive to temperature from contact, radiation or blown hot air from matrices.
- If necessary, cover or protect exposed pipework or deflect hot air from any matrix that poses a potential risk.
- High temperatures occur during and after heater operation. Avoid working in the heater vicinity while it is in operation. Switch the heater off and allow it to cool before commencing work. Wear safety gloves, if necessary.
- Before working on the coolant circuit, switch the heater off and wait until all components have cooled down completely, if necessary where safety gloves.

NOTE

- When installing the heater, please take note of the direction of flow of the coolant circuit.
- Route the water hoses without any kinks and in a rising position if possible.
- When routing the water pipes, observe a sufficient clearance to hot vehicle parts.
- Protect all water hoses / water pipes from chafing and from extreme temperatures.
- Secure all hose connections with hose clips (tightening torque = 1.5Nm).
- After the unit has been operating for 2 hours, tighten the hose clips again.
- The minimum water flow rate is only guaranteed if the temperature difference of the heating medium does not exceed 10°C between water inlet and water outlet during heating.
- The coolant liquid must contain at least 50% antifreeze all year round as corrosion protection.
- Fill the heater and water hoses with a 50/50 anti-freeze mix before operating.
- Before operating the heater, or after changing the cooling liquid, the whole coolant circuit including heater must be vented free of bubbles, i.e. Bleed system and remove any air.

3 INSTALLATION

INSTALLING THE FAN MATRIX

When looking for the best positioning of the fan matrix and installation of the ducting through the vehicle, consider the following points:

- The fan matrix must be positioned at floor level and is fitted with a centrifugal fan suitable for ducting the warm air through a number of outlets, one of which must always be open.
- The fan matrix must be located in a well-ventilated area, otherwise the matrix performance will be reduced. Ensure there is either a cut out made or a grill fitted, which will allow air to flow into the area where the fan matrix is fitted.

Please refer to Fan Matrix Positioning Example Figure, which shows both the above options and, also details the minimum cross sectional area required to allow sufficient air flow to the matrix.

Whichever method is chosen, care must be taken to ensure there is a minimum distance of 500mm between any hot air outlets and the air intake, otherwise the fan matrix will pull in warm air which could result in the system short cycling.

The hot air outlets are best positioned low down and close to the floor, as the heat will rise.

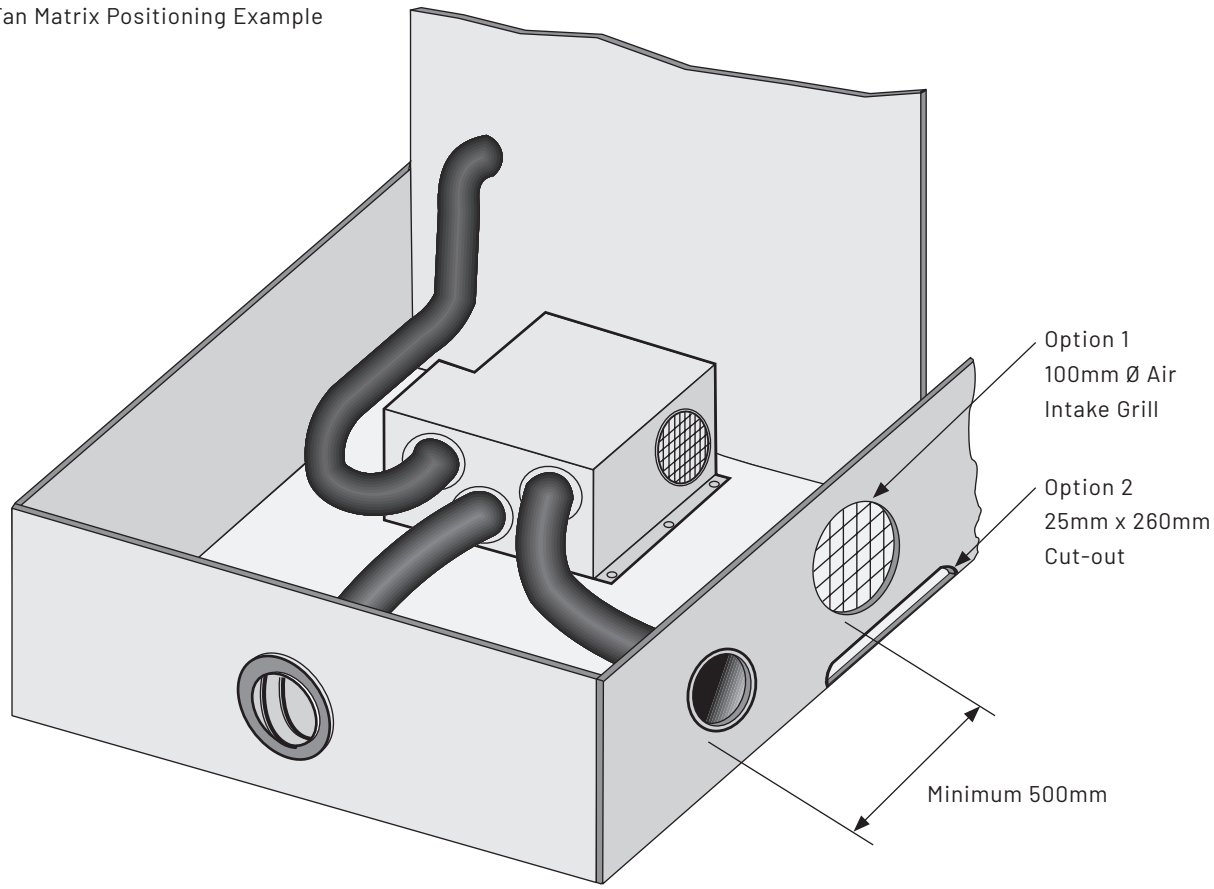
When fitting the ducting, plan for the 'runs' or 'routes' to be as straight as possible, avoiding areas where ducting could be crushed or damaged.

Consider the vehicles layout both night and day to avoid stored bedding from crushing the ducting or blocking outlets.

When an outlet enters a wet area such as the bathroom, ensure the ducting has a swan neck to help avoid the ingress of any water.

Both open and closable outlets are provided when using a multiple outlet matrix.

Fan Matrix Positioning Example



3 INSTALLATION

EXHAUST SYSTEM

DANGER!

Risk of injuries and burns!

Every type of combustion produces high temperatures and toxic exhaust fumes. This is why the exhaust system must always be routed as described in these installation instructions.

- → Do not perform any work on the exhaust system while the heater is working.
- → Before working on the exhaust system, switch off the heater first and wait until all the parts have completely cooled down, wear safety gloves if necessary.
- → Do not inhale exhaust fumes.

ATTENTION!

The whole exhaust system gets very hot while the heater is running and immediately afterwards. This is why the exhaust system must always be routed as described in these installation instructions.

- → The exhaust pipe must end in the open air.
- → The exhaust pipe may not protrude beyond the lateral limits of the vehicle.
- → Lay the exhaust pipe sloping slightly downwards. If necessary, make a drain hole with approx. Ø 5mm at the lowest point as a condensation outlet.
- → Important functional parts of the vehicle may not be impaired (maintain sufficient clearance).
- → Mount the exhaust pipe with sufficient clearance to heat-sensitive parts. Pay particular attention to fuel lines (made of plastic or metal), electrical cables and brake hoses, etc.!
- → Exhaust pipes must be safely fixed (recommended clearance of approx. 50cm) to avoid damage from vibrations.
- → Lay the exhaust system so that the outflowing exhaust gases are not drawn in as combustion air.
- → The mouth of the exhaust pipe must not become clogged with dirt and snow.
- → The mouth of the exhaust pipe must not point in the direction of travel.
- → Always fix the exhaust silencer to the vehicle.
- → Lay the exhaust system so that the exhaust fumes do not flow directly onto heat-sensitive components.

NOTE

- → Note and follow the regulations and safety instructions for this chapter from page 6.
- → The exhaust pipe end should be much shorter than the flexible exhaust pipe from the heater to the exhaust silencer.
- → To avoid contact corrosion, the clips for fixing the exhaust pipe must be made of stainless steel. For the Order No. of the fixing clips, please refer to the "Product Information" document.

The exhaust system consists of a flexible exhaust pipe, di 24mm, 900mm long, a flexible exhaust pipe end with end sleeve, di 24mm, 300mm long and an exhaust silencer.

All parts for the exhaust system including the fixing parts are included in the installation kit (for allowable line lengths, see sketch on page 19).

INSTALLING THE EXHAUST SYSTEM

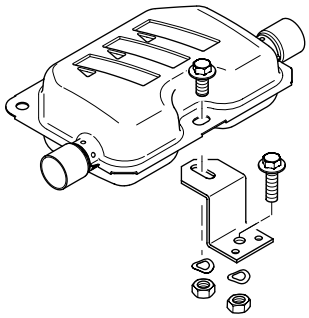
Use a bracket to fix the exhaust silencer in a suitable place on the vehicle (see sketch).

Lay the flexible exhaust pipe from the heater to the exhaust silencer and fasten with pipe clips (tightening torque $6^{+0.5}$ Nm), adjust the length if necessary.

If necessary, shorten the exhaust pipe end with end sleeve, push onto the exhaust silencer and fix with a pipe clip (tightening torque $6^{+0.5}$ Nm).

If necessary, use pipe clips to fasten the flexible exhaust pipe and the exhaust pipe end in suitable positions in the vehicle (recommended guide value at approx. 50cm spacings).

If necessary attach spacer rings on the flexible exhaust pipe and onto the exhaust pipe end, to ensure a safe distance from heat-sensitive parts of the vehicle. If



3 INSTALLATION

COMBUSTION AIR SYSTEM

ATTENTION!

Safety instructions for the combustion air system!

- → The combustion air opening must remain free at all times.
- → Lay the combustion air intake to ensure that exhaust fumes cannot be drawn in as combustion air.
- → Do not direct the combustion air intake against the vehicle's airstream.
- → The combustion air intake must not become clogged with dirt and snow.
- → Install the combustion air intake system sloping slightly downwards. If necessary, make a drain hole approx. Ø 5mm at the lowest point to drain off condensation.
- → If necessary, use fastening clips or cable ties to fix the flexible combustion air hose to the vehicle in suitable places.

INSTALLING THE COMBUSTION AIR SYSTEM

A combustion air intake silencer with flexible pipe, di = 20mm, 760mm long, is included in the installation kit.

Push the flexible pipe from the combustion air intake silencer onto the combustion air connection socket of the heater and fix with a hose clip (tightening torque $3^{+0.5}$ Nm).

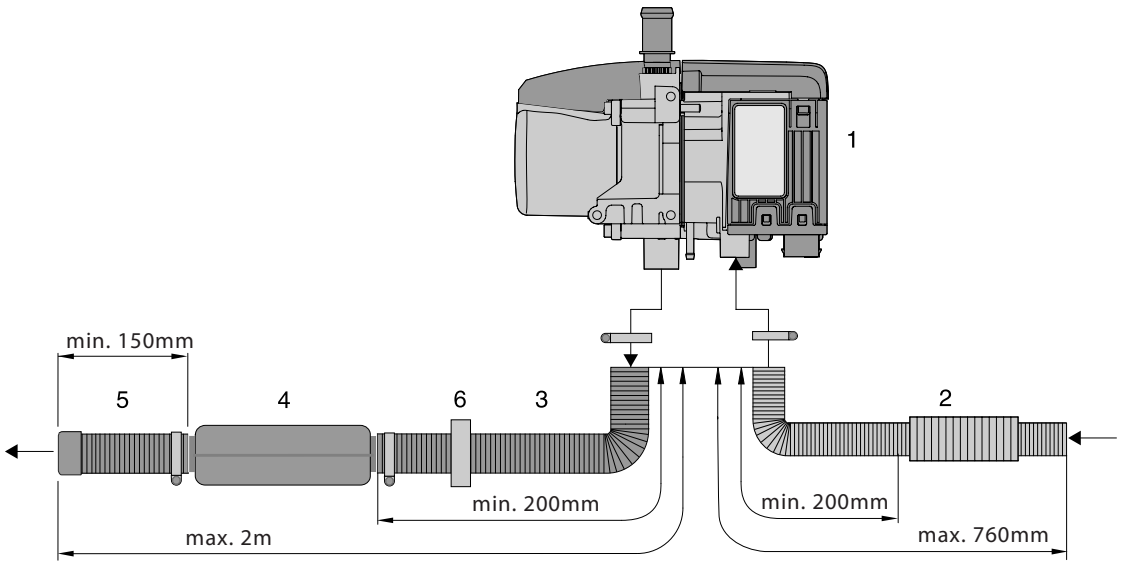
Lay the combustion air intake silencer so that the combustion air is removed from an area, which fulfils the named conditions.

If necessary, the flexible pipe from the combustion air intake silencer can be shortened according to the installation conditions.

When shortening the flexible pipe, ensure the cutting edge is clean, small cut-off pieces could block the combustion air fan.

NOTE

Note and follow the regulations and safety instructions for this chapter from page 6.



1. Heater
2. Combustion air intake
3. Flexible exhaust pipe
4. Exhaust silencer
5. Exhaust pipe end with end sleeve
6. Spacer ring

3 INSTALLATION

FUEL SUPPLY

DANGER!

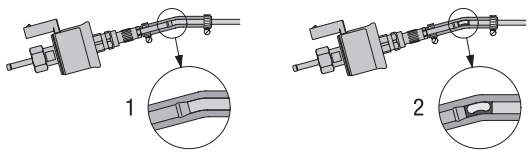
Risk of fire, explosion, poisoning and injury!
Caution when handling fuel.

- → Switch off the vehicle engine and the heater before refuelling and before working on the fuel supply.
- → Avoid naked flames when handling fuel.
- → Do not smoke.
- → Do not inhale petrol fumes.
- → Avoid any contact with the skin.

ATTENTION!

Always note and follow the safety instructions when installing the metering pump and when laying the fuel lines.
Deviations from the instructions stated here are not allowed. Failure to comply can result in malfunctions.

- → To install the fuel hose at the heater, moisten it and push it carefully onto the fuel connection socket.
- → Use a sharp knife only to trim the fuel hoses and pipes. Interfaces must not be crushed and must be free of burrs.
- → Wherever possible, lay the fuel lines from the metering pump to the heater with a continuous rise.
- → Fuel lines must be securely fixed to avoid damage and / or noise due to vibrations (recommended guideline value: clearance of around 50cm).
- → Especially in electric vehicles, ensure that the fuel lines are fixed so that sound transfer to the vehicle is prevented.
- → Fuel lines must be protected against mechanical damage.
- → Lay the fuel lines so that any twisting of the vehicle, engine movements, etc. do not have a disadvantageous effect on their durability.
- → Use hose clips to secure all hose connections in the fuel supply.
- → Parts carrying fuel must be protected from interfering heat.
- → Never route or fasten the fuel lines directly along the heater or vehicle exhaust system.
- → When systems cross, always ensure there is a sufficient heat clearance. If necessary, attach heat deflection plates.
- → Dripping or evaporating fuel must never be allowed to collect on hot parts or ignite on electric equipment.
- → When connecting fuel lines with a fuel hose, always install the fuel lines with a butt joint to prevent any bubbles from forming.



1 Correctly laid lines.
2 Incorrectly laid lines – bubbles form.

NOTE

- The installation kit contains all parts required for the fuel supply.

3 INSTALLATION

PREFERRED FUEL EXTRACTION WITH TANK CONNECTION OR WITH ADAPTER – FOR DIESEL VEHICLES

ATTENTION!

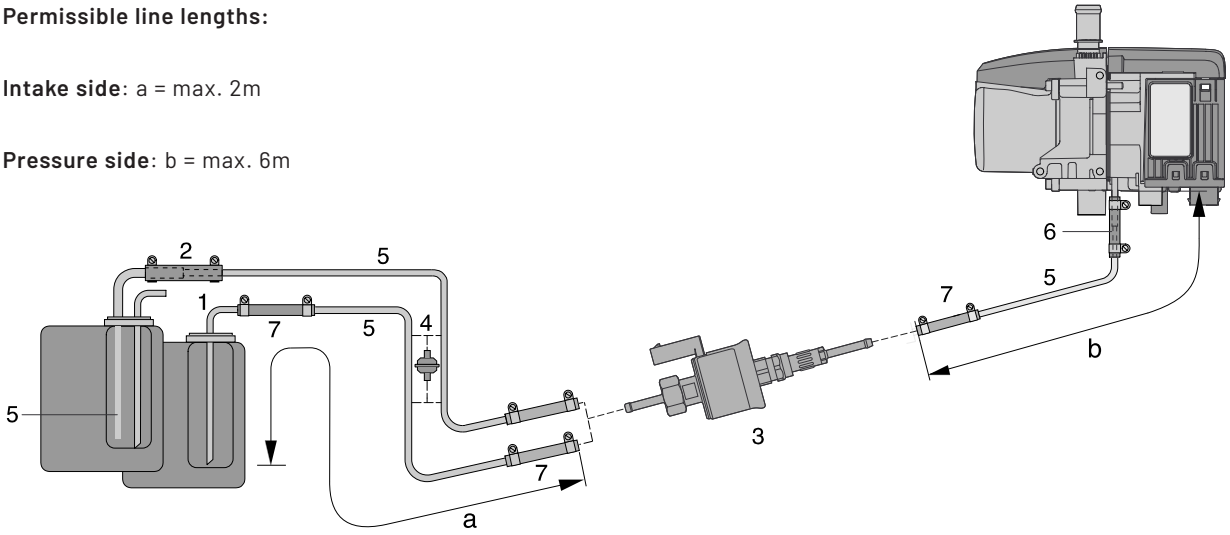
Fuel supply safety instructions!
The fuel must not be conveyed by means of gravity or overpressure in the fuel tank.

- The fuel may only be pumped by the metering pump included in the scope of supply and approved by the manufacturer.

Permissible line lengths:

Intake side: a = max. 2m

Pressure side: b = max. 6m



1 Tank connection, di = Ø 2mm, da = Ø 4mm – installed in the vehicle's own tank fitting.
2 Adapter, Ø 7.5 / 3.5mm – connected to the vehicle's own tank fitting, at a connection socket Ø 8mm, used to pass through the intake line (fuel pipe 4 x 1) up to just before the bottom of the tank.
3 Metering pump.
4 Fuel filter – only required for contaminated fuel.
5 Fuel pipe, 4 x 1 (di = Ø 2mm).
6 Adapter, Ø 4.5 / 3.5mm.
7 Fuel hose, 3.5 x 3 (di = Ø 3.5mm), approx. 50mm long.

NOTE

- Connect fuel pipe, 4 x 1, (Item 5) to the heater using adapter, Ø 4.5 / 3.5mm, (Item 6).
- Installation of the fuel filter (Item 4) requires two adapters Ø 5 / 3.5mm, Order No. 360.75.300.
- Use two hose clips Ø 11 to secure the adapter Ø 7.5 / 3.5mm (Item 2) (tightening torque: $1^{+0.2}$ Nm).
- When installing tank connection (Item 1), maintain a minimum distance of $5^{\pm 2}$ mm from the end of the riser to the bottom of the tank.

3 INSTALLATION

FUEL EXTRACTION USING T-PIECE FROM THE FUEL RETURN LINE LAID BETWEEN THE VEHICLE ENGINE AND THE TANK FITTING – FOR DIESEL VEHICLES ONLY

ATTENTION!

Fuel supply safety instructions!

→ To install the fuel hose at the heater, moisten it and push it carefully onto the fuel connection socket.

→ It is not permitted to extract fuel downstream of the vehicle's own fuel pump.

→ If using a T-piece in a plastic pipe, always insert support sleeves in the plastic pipe.

→ Always insert the T-piece in the fuel return line.

→ Connect the T-piece and the plastic pipe with the relevant fuel hoses and secure with hose clips.

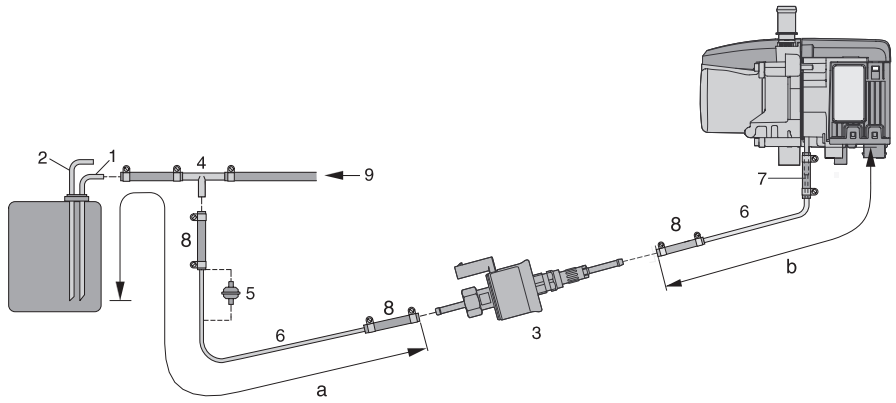
→ If the pressure in the fuel line is more than 2.0 bar to max. 4.0 bar, use a pressure reducer (Order No. see 22.1000.20.0800) or a separate tank connection.

→ If the pressure in the fuel line is above 4.0 bar, or if there is a non-return valve in the return line (in the tank), use a separate tank connection.

NOTE

° Deliver the vehicle with an almost empty tank.

° After cutting the fuel return line, with the vehicle engine switched off, use suction to check whether fuel extraction from the vehicle tank without air bubbles is ensured. This ensures that the fuel return line ends just above the bottom of the tank and non-return valve is installed.
If this is not so, the fuel must be extracted using a separate tank connection.



1 Fuel return line from the vehicle's tank fitting.
2 Fuel flow line from the vehicle's tank fitting.
3 Metering pump (admission pressure resistant up to 2.0 bar).
4 T-piece.
5 Fuel filter – only required for contaminated fuel.
6 Fuel pipe, 4 x 1 (di = Ø 2mm).
7 Adapter, Ø 4.5 / 3.5mm.
8 Fuel hose, 3.5 x 3 (di = Ø 3.5mm), approx. 50mm long.

Permissible line lengths:

Intake side: a = max. 2m

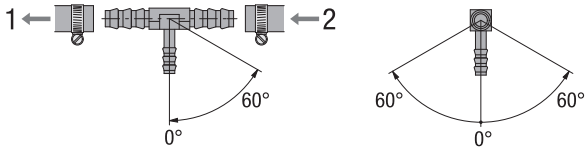
Discharge side: b = max. 6m

NOTE

- Connect fuel pipe, 4 x 1, (Item 6) to the heater using adapter, Ø 4.5 / 3.5mm, (Item 7).
- Items 4 and 5 are not included in the "installation kit" scope of supply. See supplier.

T-PIECE INSTALLATION POSITION

Use the installation positions shown when inserting the T-piece.



1 Direction of flow to the fuel tank.
2 Direction of flow from the vehicle engine.

3 INSTALLATION

ATTENTION!

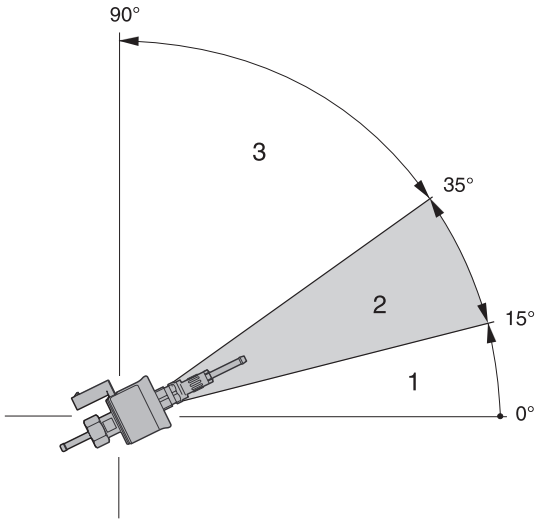
Metering pump installation safety instructions!

→ Always install the metering pump with the delivery side rising upwards – minimum angle 15°.

→ Do not install the metering pump and filter near silencers and exhaust pipes and therefore protect against unacceptable heating (petrol max. 20°C, diesel max. 50°C).

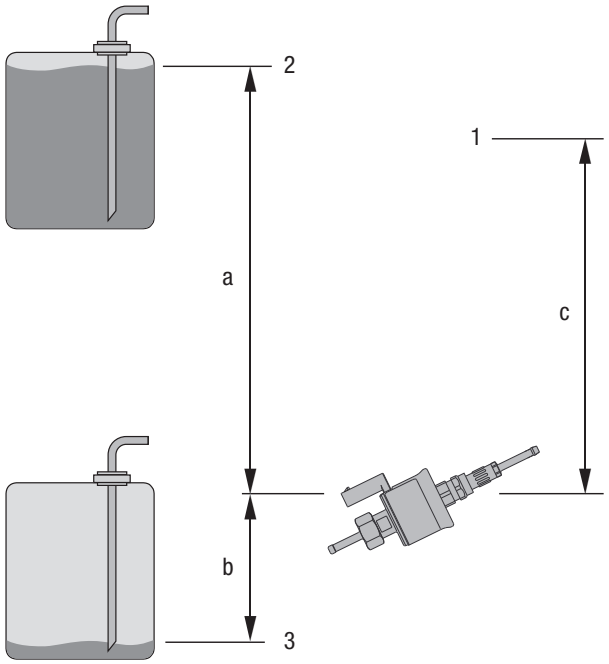
METERING PUMP INSTALLATION

Always install the metering pump with the delivery side rising upwards. Any mounting position between 15° and 90° is allowed, although a mounting position between 15° and 35° is preferable.



1 Installation position between 0° – 15° is not allowed.
2 Preferred installation position within range 15° – 35°.
3 Installation position within the range 35° to 90° is allowed.

PERMISSIBLE SUCTION AND PRESSURE HEAD OF THE METERING PUMP



1 Connection at the heater.
2 Max. fuel level.
3 Min. fuel level.

Pressure head from vehicle tank to metering pump:
a = max. 3,000mm

Suction head in pressure-less vehicle tank:
b = max. 500mm for petrol
b = max. 1,000mm for diesel

Suction head in a vehicle tank in which negative pressure occurs during extraction (valve with 0.03 bar in the tank cap):
b = max. 150mm for petrol
b = max. 400mm for diesel

Pressure head from the metering pump to the heater:
c = max. 2,000mm

NOTE

Check tank ventilation.

3 INSTALLATION

FUEL QUALITY FOR PETROL HEATER

The heater runs problem-free on standard commercially quality fuel, which you use to run your vehicle engine. Commercially available maximum addition of ethanol to DIN 51600 and DIN EN 228.

NOTE

Heaters B4E and B5E are not approved for operation with ethanol fuel E85 to DIN 15293.

FUEL QUALITY FOR DIESEL HEATER

- The heater runs problem-free on standard commercial quality diesel fuel, which you use to run your vehicle engine. Commercially available maximum addition of biodiesel to EN 590.
  During the winter months the diesel fuel is adapted to the low temperatures of 0°C to -20°C.
  This means that problems can only arise if extreme drops in temperature occur – as is the case for the vehicle engine too
  – please refer to the vehicle manufacturer's instructions.
- In special cases and at outdoor temperatures above 0°C the heater can also be run on EL heating oil according to DIN 51603 (from an additional tank).
- If the heater is run from a separate tank, please comply with the following rules:
  - at outside temperatures above 0°C, use diesel fuel to EN 590 or EL heating oil to DIN 51603;
  - at outside temperatures of 0 °C to -20 °C, use winter diesel fuel to EN 590;
  - at outside temperatures of -20 °C to -40 °C, use Arctic diesel or polar diesel.

NOTE

- It is not permitted to add used oil!
- Following operation with winter or cold diesel, the fuel lines and the metering pump must be filled with the standard diesel fuel after letting the heater run for 15 minutes!
- Heaters B4E and B5E are not approved for operation with biodiesel to DIN 14214.

4 OPERATION AND FUNCTION

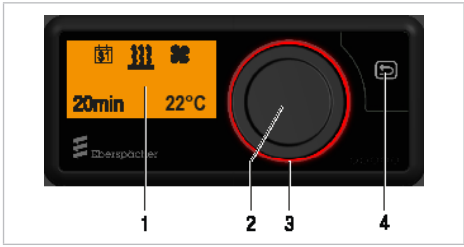
GENERAL INFORMATION

EasyStart Pro has a simple operating structure. All settings, functions and parameters are controlled with a single operating button. Full operating instructions are available on the CD-ROM with controller.

If the power supply in the vehicle is interrupted (e.g. the battery is disconnected), EasyStart Pro retains all the basic settings, with the exception of date and time. When the power supply is restored, only the date and time have to be set again for timer mode.

EasyStart Pro is a permanently installed control unit for air and water heaters. It is based on the CAN bus communication and has been designed for the new Hydronic S3 Economy / Commercial and Airtronic S2 / M2 heater generations. It is generally installed in the cockpit or dash panel of the vehicle and allows you to make all the necessary settings for heater, ventilator and timer mode of up to two heaters separately or of two identical heaters (Airtronic 2 or Hydronic S3) in a group.

DESCRIPTION OF OPERATING COMPONENTS



1 Display

The display shows the following parameters:

- Current operating mode.
- Current interior temperature.
- Operating mode.
- Timer positions.
- Settings.
- Error codes.

2 Operating Button

The operating button is used to operate, select and program all the functions and values in EasyStart Pro.

- Turning selects a value / function within a menu.
  - Turning to the right increases a value or selects the next menu item to the right.
  - Turning to the left decreases a value or selects the next menu item to the left.
- Pressing confirms the flashing menu item or value on the display.
- If EasyStart Pro is in sleep mode (display OFF), pressing or turning "wakes up" the active display mode.
  - When the heater is running, the currently remaining operating time of the heater is displayed. If several heaters are running, the currently remaining operating times will be displayed alternately.

NOTE

- A LONGPRESS (min. 2 sec.) immediately starts all connected heaters. The standard operating time here is set at the factory to 30 minutes.
- During operation, a LONGPRESS (min. 2 sec.) immediately switches off all connected heaters.
- If terminal 58 has voltage, sleep mode will not be activated as long as the vehicle lights are switched on.

3 LED Ring

The LED ring with its different colours serves to indicate the operating mode.

- Red ring: Heating mode.
- Blue ring: Ventilator mode.
- Orange ring: Residual heat mode.
- White ring: System configuration.
- Red flashing ring: Fault in one of the connected heaters or in EasyStart Pro.

4 Button Back

The BACK button causes a jump back to the menu or command at the next higher level. If EasyStart Pro is in sleep mode (display OFF), pressing "wakes up" the active display mode.

- If all heaters are switched off, the Start mask will be displayed.
- When the heater is running, the currently remaining operating time of the heater is displayed. If several heaters are running, the currently remaining operating times will be displayed alternately.

4 OPERATION AND FUNCTION

NOTES ON OPERATION AND SETTING

ACTIVATING EASYSTART PRO

If the display is not lit, EasyStart Pro has to be activated. Pressing the operating button or BACK button displays the Start mask; you can then continue with operation or setting.

DISPLAY

The display is lit:

- During operation of EasyStart Pro.
- When terminal 58 has voltage, for example when the vehicle lights are switched on (optional).
- When the heater is ON (the display goes out after approx. 30 seconds).

Display Language is set by the workshop during installation. In the delivery condition of EasyStart Pro, German or English are available as display languages. A further 25 display languages are currently available. If necessary, agree on the display language to be set with your installation workshop. It will then undertake the necessary configuration.

Display goes out after approx. 30 seconds if:

- No settings are made.
- No heater is switched on.
- When using terminal 58, when the vehicle lights are switched off.

EasyStart Pro then goes to sleep mode. Before going to sleep mode, an overview mask is displayed. EasyStart Pro then has to be activated (see above) before a new input can be made.

ACTIVATING A FUNCTION

The symbol of the function to be activated appears in the middle and flashing in the display.

Flashing Function / Flashing Value

- Select the flashing function in the menu bar by pressing the operating button.
- Increase or decrease the flashing value by turning the operating button. Then confirm the selected value by pressing the operating button.

Cancel Settings

Any settings being made can be cancelled with the BACK button .

NOTE

Settings and changes must always be confirmed by pressing the operating button, otherwise they will be lost.

SETTING THE OPERATING TIME

The operating time can be set individually using the operating button.

- Turning to the right increases the operating time.
- Turning to the left decreases the operating time.
- Setting range for the operating time: min. 10 minutes to max. 120 minutes in one-minute steps.
- The operating time can be prolonged to infinite. Above the 120th minute, the input is made in 60-minute steps.

NOTE

- With air and water heaters, continuous heating mode [∞] is also possible.
- The operating times of all the connected heaters can be set independently of one another.

OPERATING MODES

Heating

- In this operating mode, a water heater heats the vehicle engine via the coolant circuit and the vehicle interior via the ventilation louvres, irrespective of the configuration.
- An air heater heats the vehicle interior with warm air that is distributed by a fan in the heater.

Ventilation

In this operating mode, the water or air heater supplies the vehicle interior with fresh outdoor air via the ventilation louvres. This operating mode is only possible if the function is supported by the heater version (see also the Technical Description of the heater).

4 OPERATION AND FUNCTION

NOTE

The number of symbols and displays differs depending on the installed heater and feature options.

FACTORY SETTING

Timer Mode (For all Heaters)

- Weekday group: Mon – Fri.
- Departure time: 07:00 h.

Air Heaters

- Operating time: 30 minutes.
- Maximum operating time: 720 minutes.
- Target temperature: 22°C / 72°F.

Water Heaters

- Operating time: 30 minutes.
- Maximum operating time: 720 minutes.

OPERATING AND CONFIGURING EASYSTART PRO

Menu bar

Status area

Menu Bar

The following menus can be selected from the menu bar (turn the operating button to the right):

Symbol	Menu
	Heat
	Ventilate
	Residual heat
	Settings
	Timer

NOTE

- The Ventilation function is only displayed if the heater supports this function.
- The timer function is not available on vehicles in ADR mode.
  - ADR mode is reserved for vehicle transporting hazardous goods on the road (e.g. road tankers).

Status Area

When the menu (heating, ventilation, settings, timer or residual heat) is activated, various items of information are display in the status area. These are presented and described in the respective sections of these operating instructions.

Input Area

Menu bar

Input area

Display

e.g. Heating ON / Operating time 107 min.

In the menu bar, the symbol of the selected menu item appears in the middle of the display. The corresponding setting value flashes in the input area and can be altered by turning the operating button to the left or right and confirmed by pressing.

HEATING

In the Start mask, a flashing heater symbol in the menu bar and the current temperature and status of the heater are displayed.

Possible actions are:

- HEATING IMMEDIATELY with LONGPRESS.
- HEATING ON with settings.

4 OPERATION AND FUNCTION

HEATING IMMEDIATELY WITH LONGPRESS

- Press operating button for longer than 2 seconds.

→ Heating mode starts immediately with the last operating time used. The LED ring lights up red and the residual heating mode time is displayed.

NOTE

The function LONGPRESS ON is not available in ventilator and residual heat mode.

HEATING ON with Settings

- Press the operating button.
- Select the operating time by turning the operating button.

NOTE

With air heaters, select and confirm the target temperature.

- Confirm the operating time by pressing the operating button.

→ Heating mode starts with the set operating time. The LED ring lights up red, the residual heating mode time and the current temperature are displayed.

- Heating mode ends at the end of the set operating time.

NOTE

If an air heater is operated with EasyStart Pro, the desired temperature can also be set in heating mode.
14°C – 36°C in 1°C steps.
57°F – 97°F in 1°F steps.

Changing the Operating Time During Heating Mode

- Press the operating button.
- Select and confirm flashing menu .
- Select and confirm the settings by turning and pressing the operating button .
- Set the desired operating time by turning and press to confirm.

NOTE

With air heaters, select and confirm the target temperature beforehand.

- Heating mode is continued with the set operating time. The LED ring lights up red and the residual heating mode time is displayed.

HEATING OFF During Heating Mode

- Press the operating button.
- Select and confirm flashing menu .
- When OFF flashes on the display, press the operating button again.
- Heating mode is terminated.

NOTE

- LONGPRESS terminates heating mode immediately and all further connected heaters are also switched off.
- If the heater is connected to the vehicle battery (e.g. car battery), the operating time of the heater should not exceed the subsequent driving time of the vehicle.
- This will ensure that the vehicle battery is sufficiently charged. Example:
  Operating time of the heater: 25 minutes.
  Driving time of the vehicle: min. 25 minutes.

VENTILATION

In the Start mask, a flashing fan symbol in the menu bar and the current temperature and status of the heater are displayed.

VENTILATION ON with Settings

- Press the operating button.
- Select the operating time by turning the operating button and confirm, or confirm the displayed operating time.

→ Ventilation mode starts with the set operating time. The LED ring lights up red and the residual ventilation mode time is displayed.

- Ventilation mode ends at the end of the set operating time.

Changing the Operating Time During Ventilation Mode

- Press the operating button.
- Select and confirm flashing menu .
- Select and confirm the settings by turning and pressing the operating button .
- Set the desired operating time by turning and press to confirm.

→ Ventilation mode is continued with the set operating time. The LED ring lights up blue, the residual ventilation mode time and the current temperature are displayed.

4 OPERATION AND FUNCTION

VENTILATION OFF During Ventilation Mode

Press the operating button.

- Select and confirm flashing menu .
- When OFF flashes on the display, press the operating button again.
- Ventilation mode is terminated.

NOTE

LONGPRESS terminates ventilation mode immediately. All connected heaters are switched off.

SETTINGS

In the Start mask, a flashing gear wheel in the menu bar and the set day of the week and the current time are displayed. Possible actions are:

- Standard settings for day of the week, time and temperature format.
- Heating at high altitudes: ON / OFF.
- Low temperature during heating: ON / OFF.
- Fault diagnosis: Display of error messages.
- Reset user settings.

Standard Settings

- Set time:
  - Select and confirm.
  - Set the hours and confirm.
  - Set the minutes and confirm.
- Set time format:
  - Select and confirm.
  - Select between 12 h and 24 h format and confirm.
- Set weekday:
  - Select and confirm.
  - Set the day of the week and confirm.
- Set temperature format:
  - Select and confirm.
  - Select between °C and °F and confirm.

Heating Mode at High Altitudes

NOTE

This function applies only to the Hydronic S3 12V. This setting is not visible on heaters with integrated altitude sensor as it is not required.

When operating the heater at an altitude above 1,500m above sea level, an adjustment has to be made in this menu in order to regulate the fuel supply according to the altitude.

- Select and confirm.
- Select between ON (above 1,500m above sea level) and OFF (below 1,500m above sea level) and confirm.

Low Temperature Heating Mode fulfils the following functions:

- Water heaters: Comfort function at higher outdoor temperatures. The function modifies the control thresholds of the heater in order to harmonise heating mode, e.g. in the summer months.
- Air heaters: Reduction of the outlet temperature at the air louvre by approx. 10°C / 18°F (depending on the air routing), e.g. if the air louvre is near the body or discharges onto temperature-sensitive components in the vehicle.
  - Select and confirm.
  - Select between ON and OFF and confirm.

Fault Diagnosis

- Select and confirm.
- Select and confirm the connected heater or control unit.
- The faults are displayed in the order of their occurrence.

NOTE

- If a fault occurs, the symbol appears on the display during operation:

- The LED ring flashes red as soon as a fault occurs. It stops flashing when the error message has been cancelled by pressing the operating button.
- Further information on fault diagnosis from Eberspächer Dealer.

4 OPERATION AND FUNCTION

Resetting the User Settings

- Select and confirm.
- YES resets the user settings in the EasyStart Pro and deletes the programmed timer, date and other settings.
- NO retains the existing user settings in the EasyStart Pro.

TIMER

General Information on Programming the Timer Positions
The timer selection menu controls up to three programmable timer positions. The timer positions can either all take place on one weekday or can be distributed between different weekdays or weekday ranges.

Weekday ranges, e.g.
Mon – Fri 5 x heat / ventilate.
Mon – Sun 7 x heat / ventilate.

If a programmed weekday range is activated, all the days of the week are processed in turn as long as the timer is active. Renewed programming is not necessary.

NOTE

- If EasyStart Pro is activated with a programmed weekday range Mon – Fri on Sunday, the heater heats or ventilates from the following Monday to Friday with the set defaults (5x HEATING / VENTILATION).
- If EasyStart Pro is activated with a programmed weekday range Mon – Fri on Wednesday, the heater heats or ventilates on Wednesday, Thursday and Friday. In the following wee, operation is continued with the set defaults on Monday and Tuesday (5x HEATING / VENTILATION).
- When a weekday range has been processed, the time position has to be reactivated for the following week.
- If the symbol is not displayed in the menu bar, the heater is in ADR mode. Timer mode is not possible here.

Start Time

The heater starts on the selected day on reaching the set starting time.

NOTE

"Start time" mode is set at the factory. "Departure time" mode has to be configured by the specialist workshop during installation.

Start Time Conditions

Under the following conditions, the preselected heating mode is not started on the current day.

- The current day and the preselected day are identical.
- The current time lies within the time period, departure time minus operating time.

Example:

Current day / preselected day: Thu.
Current time: 18:45 h.
Departure time: 19:00 h.
Operating time: 30 minutes.
Consequently: Time range for operating time: 18:30 to 19:00 h.
The current time lies within the time period of the operating time. The heater is not switched on. The program will be run during the next week.

In all other configurations the start takes place according to the preset operating time.

Departure Time (With Water Heaters)

The heater starts on the selected day before reaching the set departure time so that engine and vehicle interior are heated up in good time. This takes place in line with parameters such as current temperature, preselected operating time and engine displacement.

Programming the Timer

Display ON, the Start display appears.

- Select in the menu bar with the operating button.

Picture 1: Display if no timer is activated.

Picture 2: Display if a timer is activated, here T2.

4 OPERATION AND FUNCTION

- Confirm timer selection by pressing the operating button.
- The first timer position T1 appears. Turn the operating button to select the alternative timer positions T2 or T3.

Picture 3: T1 with factory settings.

- The factory settings are:
  - Heating mode.
  - Weekday range Mon – Fri.
  - Starting time: 7:00 h.
  - Operating time: 30 minutes.
- Call up timer T1 by pressing the operating button. You are now in configuration mode.

- The following settings are possible:
  - Timer T1 ON / OFF by turning and pressing the operating button.
  - Step 1: After selecting in the menu bar, next select the day of the week / weekday range by turning the operating button. Each day of the week is selected individually and confirmed by pressing. Pressing a second time deselects the day of the week again. At the end of the selection, turn the operating button to [OK] and press to confirm.

  - Step 2: Setting the starting time. Turning and pressing confirms first the hour, then the minutes.

  - Step 3: Selection of heating or ventilation mode.

NOTE

If an air heater is operated with EasyStart Pro, the desired temperature in heating mode can also be set before setting the operating time:
14°C – 36°C in 1°C steps.
57°F – 97°F in 1°F steps.

  - Step 4: Select the operating time: min. 10 minutes – max. 120 minutes.

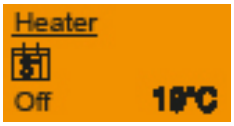
NOTE

If the heater is connected to the vehicle battery (e.g. car battery), the operating time of the heater should not exceed the subsequent driving time of the vehicle. This will ensure that the vehicle battery is sufficiently charged. Example:
Operating time of the heater: 25 minutes.
Driving time of the vehicle: min. 25 minutes.

- Select the heating level (only for water heaters with automatic operating time calculation):
  - ECO heating level = normal heating.
  - HIGH heating level = comfort heating.
- After activation of timer T1, the following appears on the display.

  - Heating mode.
  - Weekday range Mon – Fri.
  - Starting time: 6:30 h.
  - Operating time: 25 minutes.
- Timer T1 is activated. The heater will be started at the set time on the next working day and will run for 25 minutes.

- If a timer is activated, the timer symbol appears on the display.



- Timer positions T2 and T3 can be configured in the same way.

NOTE

To edit an existing timer, it first has to be selected and then switched to configuration mode by pressing the operating button. Then carry out steps 1 to 4 as described above.

To deactivate a timer position, it first has to be selected with the operating button. Press once and with OFF flashing, press the operating button again. All operating settings of the timer remain saved.

NOTE

When a weekday range has been processed, the time position has to be reactivated for the following week.

4 OPERATION AND FUNCTION

HEATER WIRING

ATTENTION!

Safety instructions for wiring the heater!
The heater is to be connected up electrically according to the EMC directives.
EMC can be affected if the heater is not connected up correctly. For this reason, comply with the following instructions:

→ Ensure that the insulation of electrical cables is not damaged. Avoid: chafing, kinking, jamming or exposure to heat.

→ In waterproof connectors, seal any connector chambers not in use with filler plugs to ensure they are dirt-proof and water-proof.

→ Electrical connections and ground connections must be free of corrosion and firmly connected.

→ Lubricate connections and ground connections outside the heater interior with contact grease.

NOTE

Comply with the following when wiring the heater and the control element:

- Electrical leads, switchgear and controllers must be arranged in the vehicle so that they can function perfectly under normal operating conditions (e.g. heat exposure, moisture, etc.).
- The following cable cross sections are to be used between the battery and heater. This ensures that the maximum tolerable voltage loss in the cables does not exceed 0.5V for 12V or 1V for 24V rated voltage.
- Cable cross sections for a cable length of:
  - Up to 5m (plus cable + minus cable) = cable cross section 4mm^2.
  - From 5 to 8m (plus cable + minus cable) = cable cross section 6mm^2.
- If the plus cable is to be connected to the fuse box (e.g. terminal 30), the vehicle cable from the battery to the fuse box must be included in rating the overall.

4 OPERATION AND FUNCTION

OPERATING INSTRUCTIONS
The heater is operated by a control unit. Detailed documentation / CD for operation is enclosed with the control unit.

NOTE
The documentation / CD will be issued to you by the installation workshop.

IMPORTANT INSTRUCTIONS FOR OPERATION
INITIAL COMMISSIONING OF THE HEATER
The following points are to be checked by the company installing the heater during initial commissioning.

- Following installation of the heater, the coolant liquid circuit and the whole fuel supply system must be carefully vented. Comply with the instructions issued by the vehicle manufacturer.
- During the heater trial run, all water and fuel connections must be checked for leaks and secure, tight fit.
- If faults occur while the heater is running, use a diagnostic unit to determine and correct the cause of the fault.

SAFETY CHECKS BEFORE STARTING UP THE HEATER
After a lengthy stoppage (summer months), check all components for secure fit (tighten screws where necessary).

Carry out a visual check of the fuel system for leaks.

DESCRIPTION OF FUNCTIONS

SWITCHING ON
When the heater is switched on, the ⧛ symbol appears in the control unit or the operating display lights up.

HEATING MODE
The water pump starts up and, following a preset sequence, the combustion air fan, glow plug and metering pump are started.

The glow plug is switched off once a stable flame has formed in the combustion chamber.

Depending on the heat requirement, the heater adjusts continuously between the heating outputs: Max – Min – Off (pause mode). The temperature thresholds for these are permanently programmed in the electronic control box.

If the coolant liquid is cold the heater starts in "Max" control stage. If the water temperature continues rising to 75°C (water outlet temperature of the heater), the heater adjusts the heat output continuously depending on the heat removed (heat requirement), in order to keep the water outlet temperature at a constant 75°C. The heater provides the exact heat output required, if this is between the "MAX" and "MIN" control stages.

- If the heat output of the heater in control stage "MIN" is higher than the removed heat (heat requirement) and the water temperature rises to 85°C, the heater adjusts to control stage "OFF" (pause mode) and then starts the after-run.
- If the water temperature cools to 70°C during pause mode, a controlled start follows in "MIN" control stage. The heater now adjusts the heat output continuously, depending on the removed heat, between the "MAX" and "MIN" control stages.
  During pause mode the water pump continues to run and the On symbol ⧛ continues to be displayed in the control unit.

PRE-HEATER MODE FOLLOWING LENGTHY STOPPAGE
Following a lengthy stoppage (e.g. summer break) it is recommended that you switch on the heater for at least half an hour.

The empty fuel lines are filled quickly; the next start of the heater
(pre-heater mode) can take place without problems.

HEATING AT HIGH ALTITUDES
When using the heater at high altitudes, please note:

- Heating at altitudes up to 1,500m:
  - Unlimited heating possible.
- Heating at altitudes over 1,500m – 3,000m:
  - The heater can be run for short periods (e.g. driving through a mountain pass or taking a break in your journey).
  - In case of a lengthy stay, e.g. winter camping, fault-

4 OPERATION AND FUNCTION

CONTROL AND SAFETY DEVICES

- If the diesel heater does not ignite within 70 seconds, the start is repeated.
  If the heater still does not ignite within the specified safety time (240 seconds), a safety shut-down occurs. After an unacceptable number of failed start attempts, the control box is locked.*
- If the flame goes off by itself during operation, the heater is restarted.
  If the heater does not ignite or ignites but goes out again within 10 minutes, a safety shutdown occurs. The safety shut-down can be cancelled by briefly switching off and on again (heater ON / OFF).
- In the case of overheating (e.g. water shortage, poorly ventilated coolant liquid circuit), the overheating sensor triggers, the fuel supply is interrupted and the heater is automatiWeby shut down. Once the cause of the overheating has been eliminated, the heater can be re-started by switching off and on again.
  Precondition: the heater has cooled down sufficiently, water temperature < 70°C.
  After a maximum of 10 shutdowns on overheating, the control box is locked*.
- If the lower or upper voltage limit is reached, the heater is shut down automatically.
- The heater does not start up if the glow plug is defective or if the electric cable to the metering pump is interrupted.
  The speed of the fan motor is monitored continuously. If the fan motor does not start up, if it is blocked or if the speed falls below 40% of the set speed, a safety shutdown occurs after 60 seconds.

* Cancellation of the lock or reading out errors is possible:

- With the EasyScan diagnostics tool.

For operating details and error list, refer to the »Troubleshooting and Repair Instructions« of the heater and / or the »PLUS-EasyStart / Altitude Kit Installation Instructions, Special Functions and Diagnosis«.

NOTE

Do not repeat the switching off / on routine more than twice.

EMERGENCY STOP – EMERGENCY OFF

If an emergency stop – EMERGENCY OFF – is necessary during operation, proceed as follows:

- Switch the heater off at the control unit, or
- Remove the fuse, or
- Disconnect the heater from the battery.

5 ELECTRICS

HEATER WIRING

ATTENTION!

Safety instructions for wiring the heater!
The heater is to be connected up electrically according to the EMC directives. EMC can be affected if the heater is not connected up correctly. For this reason, comply with the following instructions:

→ Ensure that the insulation of electrical cables is not damaged.
Avoid:
Chafing, kinking, jamming or exposure to heat.

→ Seal any connector chambers of watertight connectors not in use with filler plugs to ensure they are dirt-proof and water-proof.

→ Electrical connections and negative connections must be free of corrosion and firmly connected.

→ Lubricate connections and ground connections outside the heater interior with contact grease.

NOTE

- Electrical leads and components must be positioned in the vehicle so that they can function perfectly under normal operating conditions without impairment (e.g. due to heat exposure, moisture, etc.).
- Ensure that you keep to the specified cable length and cable cross-section of the positive cable 4^2 and the negative cable 2.5^2 between the battery and the heater.
- This ensures that the max. allowable voltage drop in the cables does not exceed 0.5V for 12V rated voltage.
- If the cable (positive cable + negative cable) is lengthened up to 6 m, the next-higher cable cross-section must be selected.
- If the positive cable is to be connected to the fuse box (e.g. terminal 30), the vehicle's cable from the battery to the fuse box must also be included in the calculation for the total cable length and re-dimensioned if necessary.
- Insulate unused cable ends.
- The 12 Volt relay (-K1, from terminal 30 to terminal 87a) has a maximum current carrying capacity of 40A; i.e. the value of the vehicle's own fan fuse may not be more than 40A. Circuit diagram see page 32.

PARTS LIST FOR HEATER CIRCUIT DIAGRAM AND AND CABLE HARNESS CIRCUIT DIAGRAM

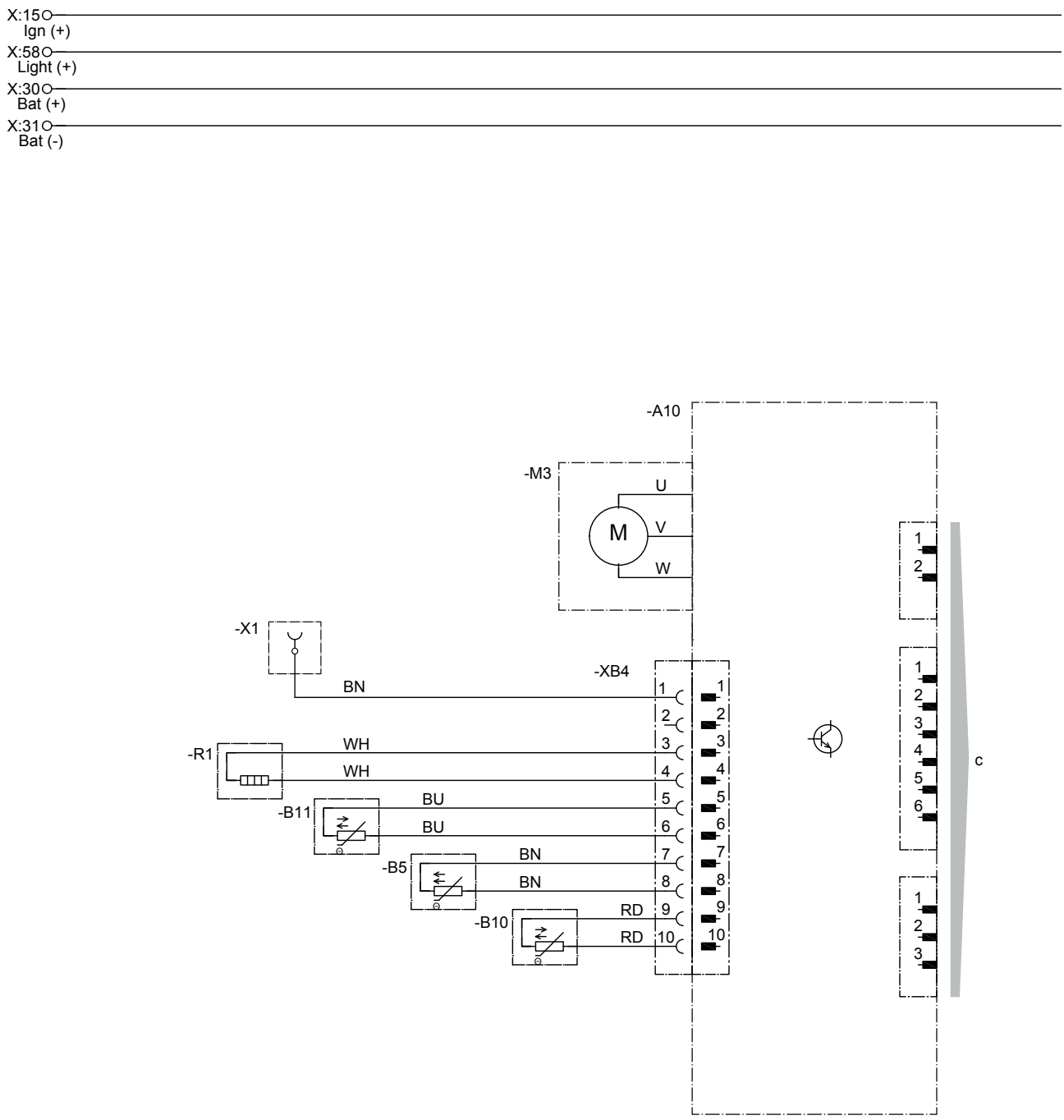
-A10	Control box
-A30	Fuse holder, 3 pin
-B5	Flame sensor
-B10	WAF
-B11	WEF
-F1	Fuse, heater
-F2	Fuse, control unit
-F3	Fan relay fuse
-K1	Fan relay
-M3	Burner motor
-M10	Water pump
-R1	Glow plug
-R2	Terminating resistor 120 Ω
-R3	Terminating resistor 9,2 Ω
-X1	Ring terminal end
-XB1	Bush housing, heater power supply
-XB2	Bush housing, heater signals
-XB3	Bush housing, heater water pump
-XB6/1	Bush housing, EasyScan
-XB6/3	Bush housing, EasyFan
-XB7	Relay block
-XB8/1	Bush housing, metering pump plug-in connection
-XB8/2	Bush housing, water pump
-XS6/1	Mating connector with terminating resistor
-XS8	Connector housing, metering pump plug-in connection
-Y1	Fuel metering pump
a	to the heater
b	Activation, vehicle fan
c	to the cable harness
d	to the control unit
e	EasyScan connection
f	EasyFan connection

CABLE COLOURS

RD	red	GR	grey	BK	black
BU	blue	YE	yellow	GN	green
WH	white	VT	violet	BN	brown

5 ELECTRICS

HEATER CIRCUIT DIAGRAM



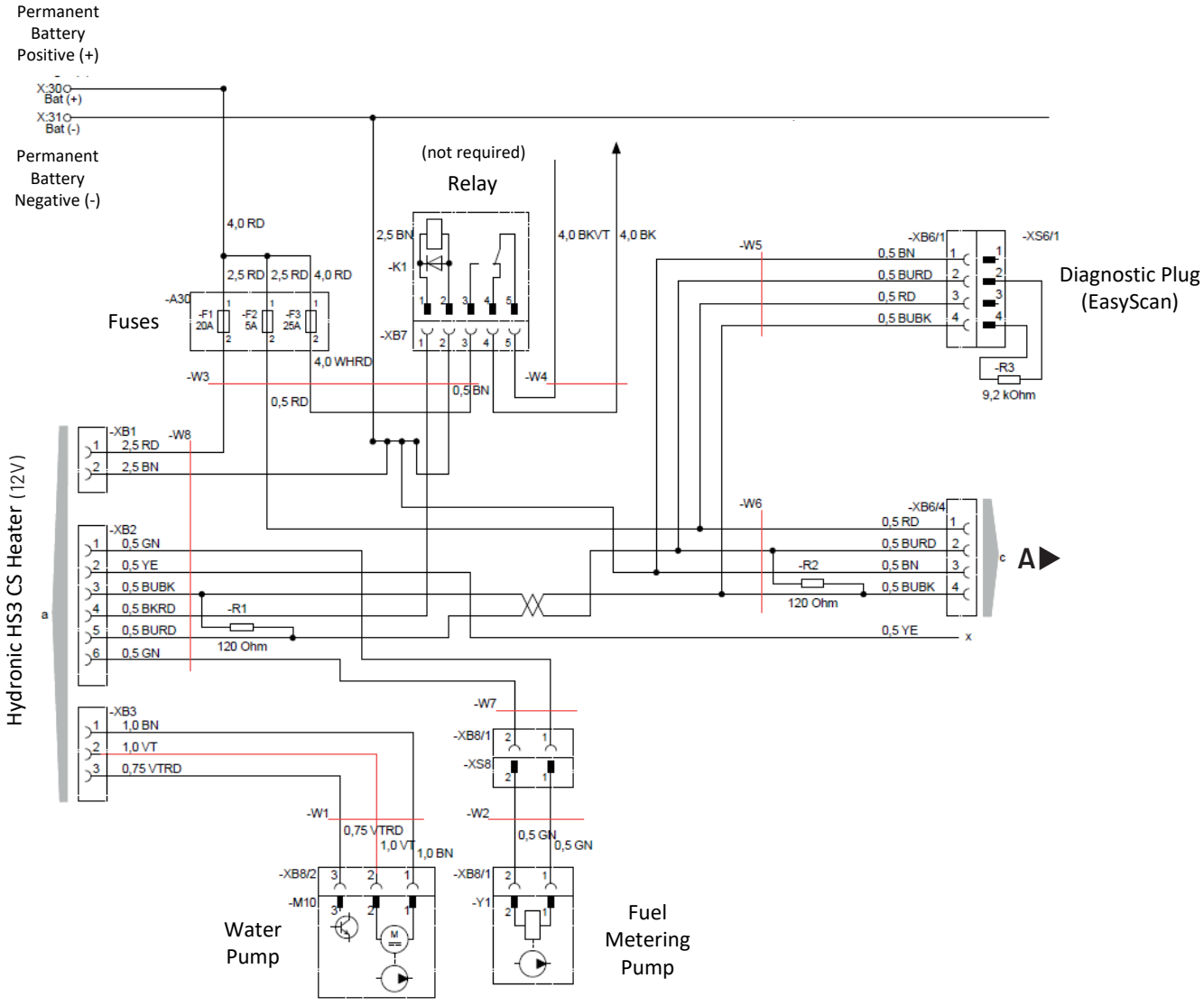
*for parts list see page 36

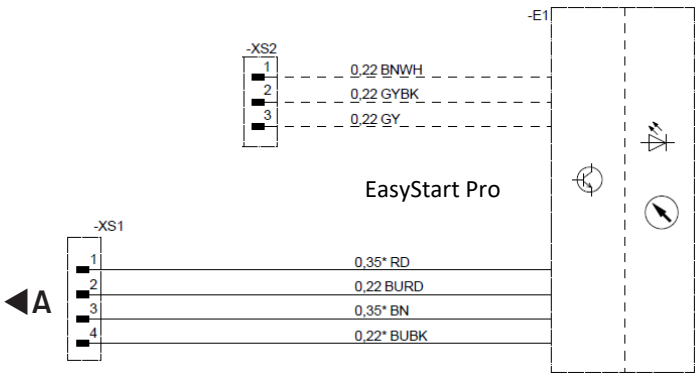
25 2652 00 9601

5 ELECTRICS

CABLE HARNESS CIRCUIT DIAGRAM

*for parts list see page 36





6 TROUBLESHOOTING / MAINTENANCE /

IN CASE OF FAULTS, PLEASE CHECK THE FOLLOWING POINTS

- If the heater does not start after being switched on:
  - Switch the heater off and on again.
- If the heater still does not start, check whether:
  - There is fuel in the tank?
  - The fuses are OK?
  - The electrical cables, connections, etc. are OK?
  - Anything is clogging the combustion air supply or exhaust system?

EMERGENCY SHUTDOWN – EMERGENCY OFF

If an emergency shutdown – EMERGENCY OFF – is necessary during operation, proceed as follows:

- Switch the heater off with the control, or
- Pull the fuse out, or
- Disconnect the heater from the battery.

TROUBLESHOOTING

If the heater remains faulty even after these points have been checked, or another malfunction occurs in your heater, please contact your nearest Eberspächer Dealer.

MAINTENANCE INSTRUCTIONS

- Switch the heater on once a month for about 10 minutes, even outside the heating period.
- Before the heating period starts, the heater should undergo a trial run.

If persistent extreme smoke develops, unusual burning noises or a clear fuel smell can be perceived, or if electric / electronic parts heat up, the heater must be switched off and put out of service by removing the fuse.

In this case, the heater should not be started up again until it has been checked by qualified personnel that have been trained on Eberspächer heaters.

- Check the openings of the combustion air supply and exhaust system after longer standstill periods, clean if necessary.

WINTERISATION

The Hydroplate should be purged of domestic water when the vehicle is left unused for long periods of time, particularly in cold conditions where freezing may occur, this procedure is known as winterisation.

To manually drain the Hydroplate system, fully open all the domestic taps in the system and the drain valve on the water tank or pipework.

The heater and header tank will have an antifreeze mix, so will not require draining at this time.

SERVICE

If you have any technical queries or problems with your heater, dial the following service phone number:

01425 480151 for your local Eberspächer Dealer.

7 ENVIRONMENT

CERTIFICATION

The high quality of the Eberspächer products is the key to our success. To guarantee this quality, we have organised all work processes in the company along the lines of quality management (QM). Even so, we still pursue a large number of activities for continuous improvement of product quality in order to keep pace with the similarly constantly growing requirements made by our customers.

All the steps necessary for quality assurance are stipulated in international standards. This quality is to be considered in a total sense. It concerns products, processes and customer - supplier relationships. Officially approved public experts assess the system and the corresponding certification company awards a certificate.

Eberspächer has qualified for the following standards:
Quality management in accordance with
ISO TS 9001:2015 und IATF 16949:2016
Environmental management system in accordance with
ISO 14001:2015

DISPOSAL

Disposal of Materials

End-of-life devices, defect components and packaging material can all be separated and sorted into pure-grade factions so that all parts can be disposed of as required in an environment-friendly manner recycled where applicable.

Electric motors, control boxes and sensors (e.g. temperature sensors) are deemed to be “electrical and electronic scrap”.

Dismantling the Heater

The heater is dismantled according to the repair stages in the current troubleshooting / repair instructions.

Packaging

The packaging of the heater can be kept in case the heater has to be sent back.

EU DECLARATION OF CONFORMITY

We herewith declare that the version of the heater placed on the market by us conforms to the applicable provisions of the following EC Directives.

EC Directive 2014/30/EU

CE

The full Declaration of Conformity can be viewed and downloaded from the download centre at www.eberspaecher.com.

8 LISTS

LIST OF ABBREVIATIONS

EC TYPE APPROVAL
Permit awarded by the Federal Vehicle Office for the production of a heater for installation in motorised vehicles.

EMC DIRECTIVE
Electromagnetic compatibility.

PME
Bio-diesel according to DIN V 51 606.

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Eberspächer