



Air Heater V 7 S

Installation instructions

Eberspächer

UNCONTROLLED
COPY

EN

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Engine-independent air heater V 7 S for diesel fuel

Heater

Order no.

V 7 S - 24 volt

25 1728 00 00 00



**Please give this manual to the customer
after installation of the heater.**

3 Installation

Installation and location

Installation in the driver's cab or passenger compartment of coaches and busses with more than 9 seats is not allowed. Exception see page 5, statutory regulations, arrangement of the heater.

The electronic control is integrated in the heater which makes wiring during installation much easier.

Fasten the heater with both consoles and 4 anti-vibration pads on the floor of the vehicle.

Please note!

- When fitting the heater, ensure there is sufficient space for heater air intake and for removing the glow plug and controller (see page 11, main dimensions).
- The regulations and safety instructions to be observed for this chapter are on page 4 – 7.

Location

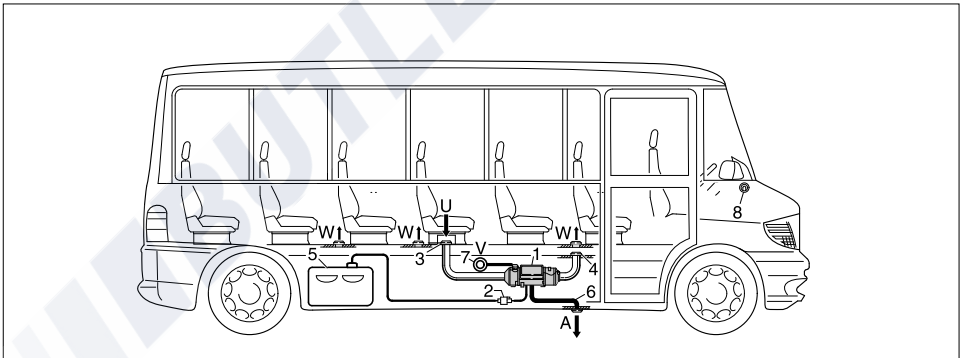
Installation position in a coach or bus.

The heater is installed in a coach or bus preferably in a separate, splash-proof position outside the passenger compartment.

If there is no space available outside the passenger compartment, the heater can also be installed in a

box complying with the statutory regulations (see page 5) which has been sealed off from the passenger compartment.

The box must be ventilated to the outside. Break-throughs to the outside must be splash-proof.



- | | | |
|---------------------------------------|-------------------------|-------------------|
| 1 Heater | 5 Fuel tank | U Air circulation |
| 2 Dosing pump | 6 Exhaust pipe | V Combustion air |
| 3 Heater air supply (air circulation) | 7 Combustion air supply | W Hot air |
| 4 Heater air outlet | 8 Control element | A Exhaust |



3 Installation

Location

Installation position in a truck cargo compartment

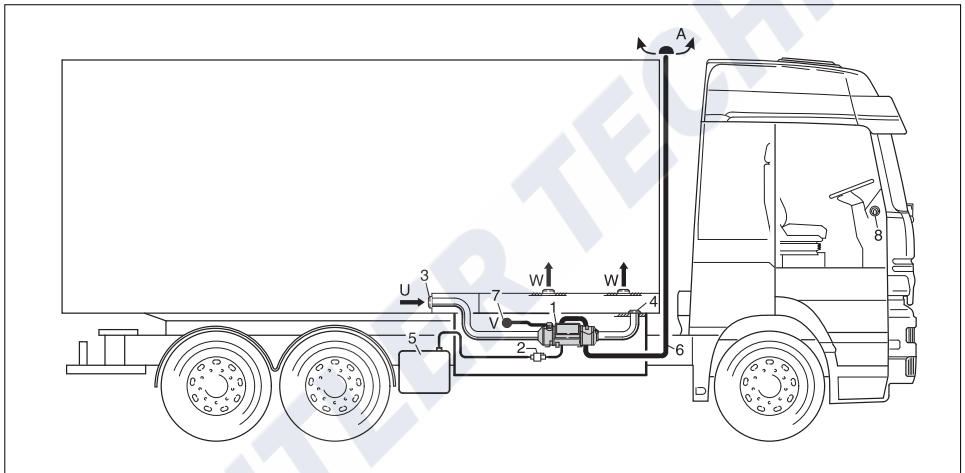
For cargo compartment heating, the heater is fastened in a splash-proof position on the vehicle preferably in a box outside the cargo compartment. If no suitable place is available outside the cargo compartment, then the heater can also be fastened to the floor of the cargo compartment in a suitable position.



Caution!

The heater air outlets must be arranged in such a way that the flow of hot air is not impaired or hindered by the load.

The box must be ventilated to the outside. Break-throughs to the outside must be splash-proof.



- | | | |
|---------------------------------------|-------------------------|-------------------|
| 1 Heater | 5 Fuel tank | U Air circulation |
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Please note!

- The installation suggestions made in the installation instructions are just examples. Other installation locations are possible, as long as they correspond to the installation requirements stated in these instructions.
- Other installation information (e.g. for boats and ships) is available from the manufacturer on request.
- Observe the tolerable installation position together with the operating and storage temperatures.

3 Installation

Possible installation positions

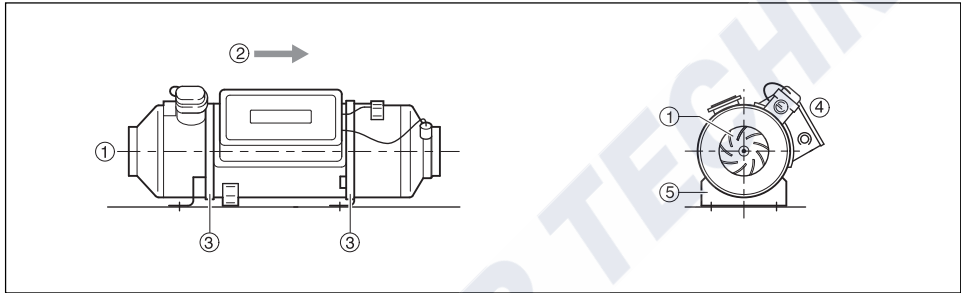
The heater must be installed in its normal position, as shown in the drawing.

In heating mode, it is possible for the heater's position to deviate by up to $\pm 15^\circ$ in all directions without impairing the heater function, for example when the vehicle is on a slope or when the heater is fitted on board a boat.

Please note!

Apart from this, after the heater has started up, continuous operation in a position deviating by $\pm 30^\circ$ from the normal position is possible in the case of operating positions which change at short notice. The heater cannot operate if its position deviates by more than 30° from the normal position.

Normal position horizontal (exhaust connection downwards)



- ① Heater air intake opening (impeller)
- ② Direction of flow
- ③ Clamping strap
- ④ Position of the glow plug
- ⑤ Fastening bracket

Mounting and fastening

The heater can be fastened to the floor of the vehicle or to a vertical vehicle wall using the anti-vibration pads.

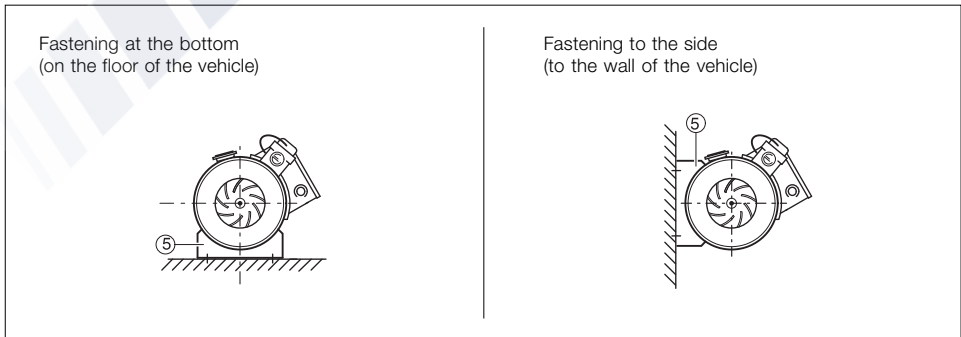
Drill the 4 holes for the two fastening brackets and the breakthrough for the exhaust pipe in the floor or wall of the vehicle.

After loosening the clamping straps ③, the fastening brackets ⑤ can be turned around the horizontal axis to adapt to the installation conditions.

If necessary, the fastening points should be reinforced!

Please note!

Comply with the prescribed installation position!





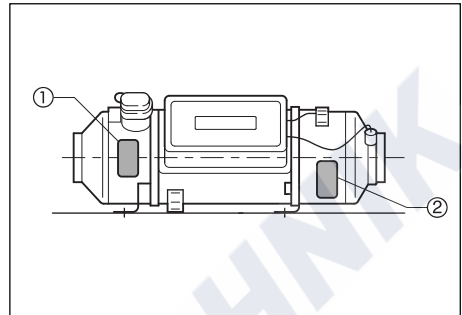
3 Installation

Nameplate

The nameplate is fastened in a clearly visible position to the jacket of the heater.
The second nameplate (duplicate) is included in the scope of supply of the heater and can be adhered as required in a clearly visible position on or near the heater.

Please note!

The regulations and safety instructions to be observed for this chapter are stated on page 4 – 7.



- ① Original nameplate
- ② Second nameplate (duplicate)

3 Installation

Heater air system

Parts for the heater air system are not included in the scope of supply and must be chosen as required from the accessories catalogue.

⚠ Danger!

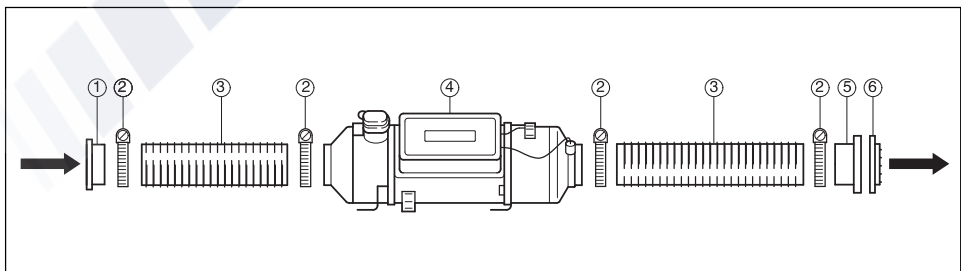
Risk of burning and injuries!

- The hoses of the heater air system and the hot air outlet are to be routed and fastened in such a way that they pose no temperature risk to people, animals or materials sensitive to temperature from radiation / contact or blowing directly. If necessary, a cover is to be fitted to the heater air system or hot air outlet.
- The outflow hood must be fitted on the hot air outflow side. A safety grid must be fitted to the heater air intake side and outflow side if no air hoses are mounted, to prevent any injuries from the heater air fan or burns from the heat exchanger.
- High temperatures occur in the heater air system during and after the heater has been working. This is why it is important to avoid working in the vicinity of the heater air system while the heater is working. In such cases, switch the heater off beforehand and wait until all parts have cooled down completely. If necessary, wear safety gloves.

Please note!

- The regulations and safety instructions to be observed for this chapter are on page 4 – 7.
- Note the equipment code in the technical data (page 10) when connecting up air-conveying parts.

Heater air system (example)



- ① Intake fitting with safety grid
- ② Hose clip
- ③ Flexible hose

- ④ Heater
- ⑤ Outlet fitting
- ⑥ Outflow

⚠ Caution!

- The heater air intake openings must be arranged in such a way that under normal circumstances, it is not possible for exhaust from the vehicle engine and heater to be sucked into the system, or for the heating air to be contaminated with dust, salt spray, etc.
- For circulating air, position the circulating air intake in such a way that the outflowing hot air cannot be directly sucked in again.
- In the event of possible overheating, increased heater air temperatures or surface temperatures can occur immediately before the defect shutdown.
- Only temperature-resistant hot air hoses approved by us must be used for the heater air system!
- When checking the functions, the mean outflow temperature measured after the heater has been running about 10 minutes at approx. 30 cm from the outlet should not exceed 110 °C (at an intake temperature of approx. 20 °C).



3 Installation

Exhaust system

Mounting the exhaust system

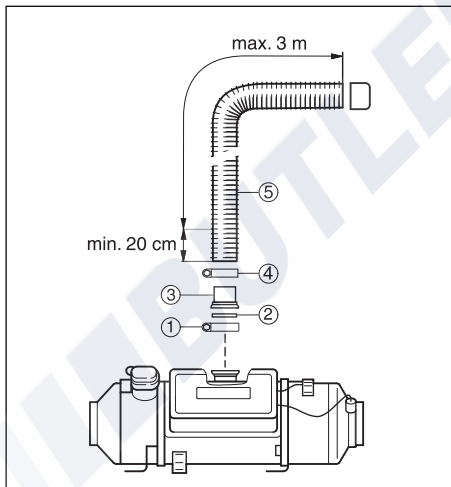
Fix the exhaust connection, with the seal and a hose clip, to the heater's exhaust flange.

Fix the \varnothing 42 mm flexible exhaust pipe to the exhaust connection with a pipe clip. Lay the flexible exhaust pipe along the outer contour of the vehicle and use pipe clips to fix to the vehicle at suitable places. The exhaust pipe can be between a minimum of 20 cm and a maximum of 3 m long, depending on the installation conditions.

After finishing all installation work, place an end sleeve on the exhaust pipe end.

Please note!

- The exhaust connection, seal and clip are included in the heater's scope of supply.
- The \varnothing 42 mm flexible exhaust pipe, the end sleeve and fastenings for the flexible exhaust pipe are not included in the scope of supply and have to be ordered separately, please refer to Page 8. For further exhaust system parts, please refer to the additional parts catalogue.



- ① Clip
- ② Seal
- ③ Exhaust pipe
- ④ Pipe clip
- ⑤ Flexible exhaust pipe \varnothing 42 mm
- ⑥ End sleeve, exhaust



Caution!

Safety instructions!

The whole exhaust system gets very hot during and immediately after the heater has been working. This is the reason why the exhaust system must be installed according to these instructions.

- The exhaust outlet must end in the open air.
- The exhaust pipe must not protrude beyond the lateral limits of the vehicle.
- Install the exhaust pipe sloping slightly downwards. If necessary, make a drain hole approx. \varnothing 5 mm at the lowest point to drain off condensation.
- Important functional parts of the vehicle must not be impaired (keep sufficient clearance).
- Mount the exhaust pipe with sufficient clearance to heat-sensitive parts. Pay particular attention to fuel pipes (plastic or metal), electrical cables and brake hoses etc.!
- Exhaust pipes must be fastened safely (recommended clearance of 50 cm) to avoid damage from vibrations.
- Route the exhaust system so that the emitted fumes are not sucked in with the combustion air.
- The mouth of the exhaust pipe must not get clogged by dirt and snow.
- The mouth of the exhaust pipe must not point in the direction of travel.



Danger!

Risk of injuries and burns!

Every type of combustion produces high temperatures and toxic exhaust fumes. This is the reason why the exhaust system must be installed according to these instructions.

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

Please note!

- The regulations and safety instructions to be observed for this chapter are on page 4 – 7.
- If a silencer is fitted, the exhaust end pipe must be much shorter than the flexible exhaust pipe between the heater and the exhaust silencer.

3 Installation

Combustion air system

Mounting the combustion air system

The combustion air is sucked in to the heater directly at the solenoid or through a flexible combustion air hose (inner Ø 25 mm, max. 3 m long).

The flexible combustion air hose can be shortened depending on the installation conditions.

Fasten the flexible combustion air hose to the heater with a pipe clip and to suitable places in the vehicle with hose clips or cable ties.

After completing all work, push an end sleeve over the flexible combustion air hose.

If no combustion air hose has been mounted, push the end sleeve onto the solenoid.



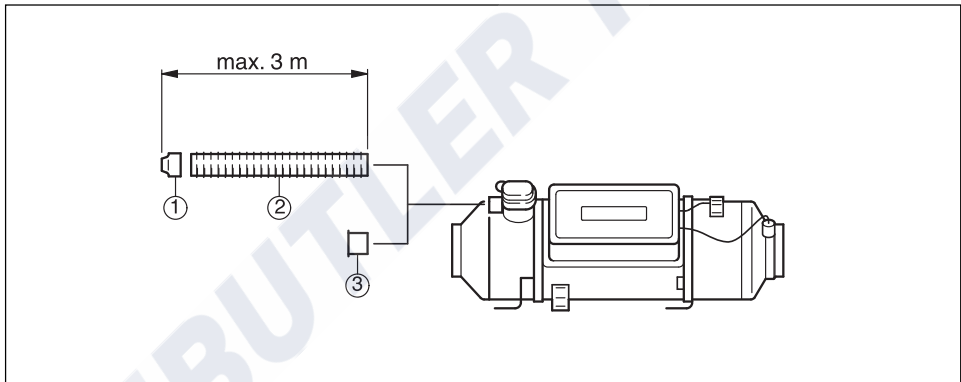
Caution!

Safety instructions for the combustion air system!

- The combustion air opening must be free at all times.
- Position the combustion air intake to be sure that exhaust fumes cannot be sucked in with the combustion air.
- Do not arrange the combustion air intake to pointing against the wind blast.
- The combustion air intake must not get clogged with dirt and snow.
- Install the combustion air intake system sloping slightly downwards. If necessary, make a drain hole approx. Ø 5 mm at the lowest point to drain off condensation.

Please note!

- The regulations and safety instructions to be observed for this chapter are on page 4 – 7.



- ① End sleeve for combustion air hose
- ② Combustion air hose
- ③ End sleeve solenoid



3 Installation

Fuel supply

Mounting the dosing pump, routing the fuel pipes and mounting the fuel tank

The following safety instructions must be observed when mounting the dosing pump, routing the fuel pipes and mounting the fuel tank. Deviations from the instructions stated here are not allowed.

Failure to comply can result in malfunctions.



Danger!

Risk of fire, explosion, poisoning and injuries!

Caution when handling fuel.

- Switch off the vehicle engine and heater before refuelling and before working on the fuel supply.
- No naked lights when handling fuel.
- Do not smoke.
- Do not inhale petrol fumes.
- Avoid any contact with the skin.

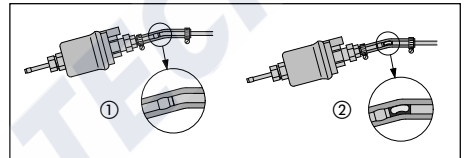


Caution!

Safety instructions for routing the fuel pipes!

- Only use a sharp knife to cut off fuel hoses and pipes. Interfaces must not be crushed and must be free of burrs.
- The fuel pipe from the dosing pump to the heater should be routed at a continuous rise.
- Fuel pipes must be fastened safely to avoid any damage and / or noise production from vibrations (recommended clearance of approx. 50 cm).
- Fuel pipes must be protected from any mechanical damage.
- Route the fuel pipes so that any distortion of the vehicle, engine movements etc. cannot have any lasting effect on the service life.

- Parts carrying fuel must be protected from interfering heat.
- Never route or fasten the fuel pipes to the heater or vehicle exhaust system. When the systems cross, always ensure there is a sufficient heat clearance. If necessary, install heat deflection plates.
- Dripping or evaporating fuel must never be allowed to collect on hot parts or ignite on electric systems.
- When connecting fuel pipes with a fuel hose, always mount the fuel pipes in a butt joint to prevent any bubbles from forming.



- ① Correct connection
- ② Incorrect connection – bubble formation



Safety instructions for fuel pipes and fuel tanks in buses and coaches

- In buses and coaches, fuel pipes and fuel tanks must not be routed through the passenger compartment or driver's cab.
- Fuel tanks in buses and coaches must be positioned in such a way that the exits are not in direct danger from a possible fire.

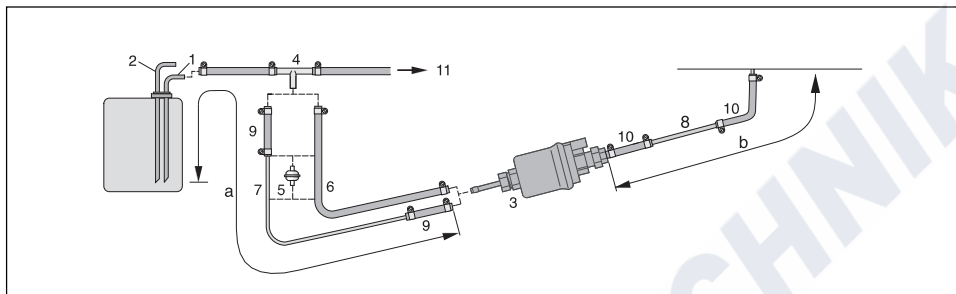
Please note!

- The regulations and safety instructions to be observed for this chapter are on page 4 – 7.

3 Installation

Fuel supply

Fuel feed point with T-piece from the fuel supply line from the tank fitting to the vehicle engine



- ① Fuel feed pipe from tank connection
- ② Fuel return pipe to the tank connection
- ③ Dosing pump
- ④ T-piece
- ⑤ Fuel filter – only necessary for contaminated fuel.
- ⑥ Fuel hose, 5 x 3 (di = Ø 5 mm)
- ⑦ Fuel pipe, 6 x 1 (di = Ø 4 mm)
- ⑧ Fuel pipe, 4 x 1 (di = Ø 2 mm)
- ⑨ Fuel hose, 5 x 3 (di = Ø 5 mm), approx. 50 mm long
- ⑩ Fuel hose, 3,5 x 3 (di = Ø 3.5 mm), approx. 50 mm long
- ⑪ To the engine, mechanical fuel or injection pump.

Possible pipe lengths

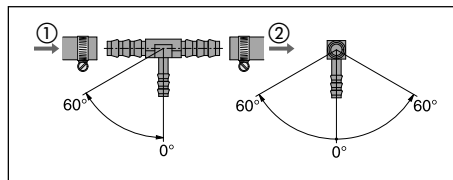
Intake side	Pressure side
a = max. 2 m	b = max. 6 m

Please note!

- Insert T-piece ④ before the fuel pump in the fuel feed pipe.
- Order no. for the parts of the fuel system: see accessories catalogue.

Installation position of the T-piece

Use the installation positions shown in the diagram when inserting a T-piece.



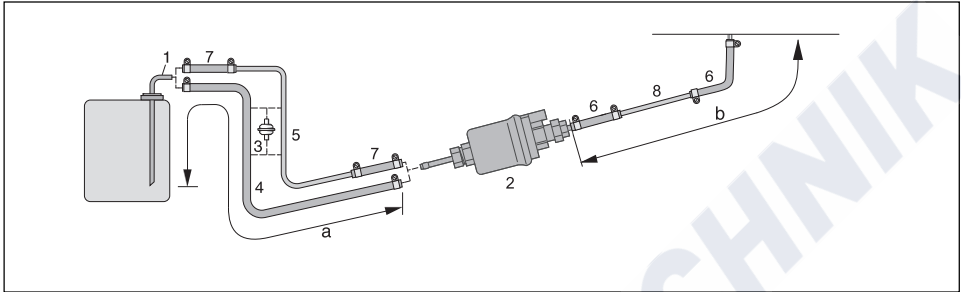
- ① Direction of flow from the fuel tank
- ② Direction of flow to the vehicle engine



3 Installation

Fuel supply

Fuel feed point with tank connection – ascending pipe, integrated in the vehicle tank or in the tank fitting



- ① Tank connection for metal tank, di = Ø 4 mm
- ② Dosing pump
- ③ Fuel filter – only necessary for contaminated fuel.
- ④ Fuel hose, 5 x 3 (di = Ø 5 mm)
- ⑤ Fuel pipe, 6 x 1 (di = Ø 4 mm)
- ⑥ Fuel hose, 3.5 x 3 (di = Ø 3.5 mm), approx. 50 mm long
- ⑦ Fuel hose, 5 x 3 (di = Ø 5 mm), approx. 50 mm long
- ⑧ Fuel pipe, 4 x 1 (di = Ø 2 mm)

Possible pipe lengths

Intake side
a = max. 2 m

Pressure side
b = max. 6 m

Please note!

- Order no. for the parts of the fuel system: see accessories catalogue



Caution!

Safety instructions for the fuel supply!

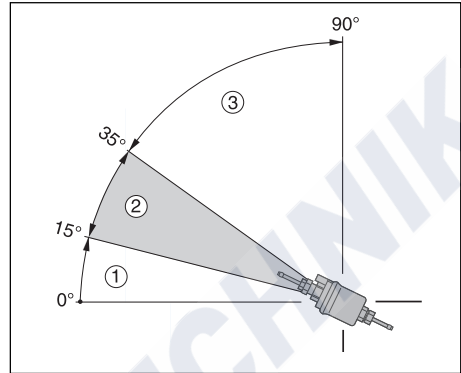
- The fuel must not be conveyed by gravity or overpressure in the fuel tank.
- Withdrawal of fuel after the vehicle's fuel pump is not allowed.
- When the pressure in the fuel pipe is more than 0.2 bar to max. 2 bar, use a pressure reducer (order no. 22 1000 20 09 00) or separate tank connection.
- When the pressure in the fuel pipe is more than 2 bar or there is a non-return valve in the return pipe (in the tank), a separate tank connection must be used.
- When using a T-piece in a plastic pipe, always use support sleeves in the plastic. Connect the T-piece and the plastic pipe with corresponding fuel hoses and secure with hose clips.

3 Installation

Fuel supply

Installation position of the dosing pump

Always mount the dosing pump with the pressure side rising upwards. Every installation position over 15° is allowed, although an installation position between 15° and 35° is preferable.



- ① Installation position between 0° and 15° is not allowed.
- ② Preferred installation position in range 15° to 35°.
- ③ Installation position in range 35° to 90° is allowed.

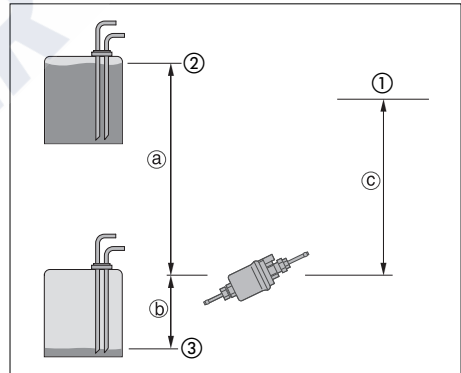
Possible suction and pressure height of the dosing pump

Pressure height from vehicle tank to dosing pump:
a = max. 1000 mm

Intake height in pressure-less vehicle tank:
b = max. 750 mm

Intake height in vehicle tanks with withdrawal by negative pressure (valve with 0.03 bar in tank cap):
b = max. 400 mm

Pressure height of the dosing pump to the heater:
c = max. 2000 mm



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

Please note!

Check tank venting.



Caution!

Safety instructions for installing the dosing pump

- Always mount the dosing pipe with the pressure side rising upwards – minimum incline 15°.
- Protect the dosing pump and filter from intolerable heat, do not mount near to the silencers and exhaust pipes.



3 Installation

Fuel supply

Fuel quality

The heater can run on commercially available diesel fuel as per DIN EN 590 as used in the vehicle tank.

Fuel for special cases

In special cases (above 0 °C), the heater can also run on fuel oil EL or paraffin.

Fuel for low temperatures

Refineries and fuel service stations automatically adjust the fuel to normal winter temperatures (winter diesel). This means that difficulties are only to be expected for extreme drops in temperature, as also apply to the vehicle engine. Please also refer to the vehicle manual.

If the heater is run from a separate tank, please comply with the following rules:

For temperatures above 0 °C, any kind of diesel fuel as per DIN EN 590 can be used.

If no special diesel fuel is available for low temperatures, then paraffin or petrol should be mixed with the fuel according to the following table:

Temperature	Winterdiesel	Addition
0 °C to -25 °C	100 %	-
-25 °C to -40 °C	50 %*	50 % paraffin or petrol

* or 100 % special cold diesel fuel (Arctic diesel)

Operation with biodiesel (PME)

The heater is **not** certified for operation with biodiesel.

Please note!

- Mixtures with used oil are **not** allowed!
- After refuelling with winter or cold diesel or the listed blends, the fuel pipes and the dosing pump must be filled with the new fuel by letting the heater run for 15 mins.!