

1 Introduction

1.1 Special forms of notation, presentations and icons

These instructions use special forms of notation and icons to underline various different contents.

Icons



Danger !

This icon draws your attention to a threat of danger to life and limb. Failure to comply can possibly lead to severe personal injury.



Caution !

This icon draws your attention to a dangerous situation for a person and / or product. Failure to comply can result in injury to persons or damage to the machine.

Please note!

This draws your attention to recommendations and helpful tips for operation and installation of the heater.

1 Introduction

1.2 Important information before operation

Range of application of parking heater

Water parking heater operating independently of an engine is intended for installation in the following vehicles:

- All kinds of vehicles (below nine seats)
- Construction machinery
- Agricultural machinery
- Boats, ships and yachts
- RV

Intended purpose of the heater

- Pre-heating, de-misting windows
- Heating and keep warm in the following area:
 - Driver and working cabs
 - Freight compartments
 - Passenger and crew compartments
 - RV

On account of its functional purpose, the heater is **not** approved for following application:

- Long-term continuous operation.
 - Living room, garages
 - Houseboats
- Heating or drying:
 - Living body (people or animals), blowing directly
 - Goods
 - Blow hot air to container



Caution !

Safety introduction of range of application and intended use.

- The heater may only be used and operated for the range of applications stated by YUSENN in compliance with the “Operation Instruction” included with every heater.

1 Introduction

1.3 Safety instructions for installation and operation of air parking heater

- **Installation of parking heater**

- Parts of the structure and the other components near the heater must be protected from the excess heat exposure and possible contamination from fuel or oil.

- During installation, there must be adequate clearance to all parts, good ventilation and using fire-proof materials.

- All appropriate precautions must be taken when arranging the heater to minimize the risk of injuries to persons or damage to other property.

- **Fuel supply**

- The fuel intake connection must not be located in the passenger compartment must be sealed with a properly closing lid to prevent any fuel leaks.

- A warning sign is to be fixed to the intake connection indicating that the heater must be turned 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 inlet**

- The air for the heater combustion chamber must not be sucked in from the passenger compartment of the vehicle.

- The air intake must be arranged or protected in such a way that it cannot be blocked by other objects.

1 Introduction



Danger !

Risk of injury fire and poisoning!

- The heater must only be started up when the maintenance flap is closed and the outlet hood is mounted in position.
- The maintenance flap must not be opened during operation.
- Disconnect the vehicle battery before commencing any kind of work.
- Before working on the heater, switch the heater off and let all hot parts cool down.
- The heater must not be operated in closed rooms, e.g. in the garage or in a multi-storey car park.
- Adjustable hot air outlets must always be adjusted so that they cannot blow hot air directly at living creatures (people, animals) or objects sensitive to temperature (loose and / or fastened).



Caution !

Important instructions for installation and repair of water parking heater

- The heater must only be installed by a partner or individual authorised by the YUSENN, according to the specifications made in this document and possibly any special installation suggestions, the same applies to any repairs to be carried out in the case of repairs or guarantee claims.
 - Only allow to use original spare parts provided by YUSENN to operate the heater.
 - Repairs by unauthorised third parties and nonoriginal spare parts is not allowed.
 - The following are not allowed:
 - Modifications to heating-relevant components.
 - Use of third-party components not approved by YUSENN.
 - Only original accessories and original spares may be used for installation or repairs.
 - Turn off the heater before refueling.
 - During doing electric welding of vehicle, please disconnect the electricity of heater and take off the leads.
 - The heater may not be operated wherever inflammable fumes or dust can be produced, e.g. near to
 - Fuel depots.
 - Warehouse or similar place.
 - Damaged fuse must be substituted by one same as original numerical value.
 - Turn off the heater by operating the main power switch on vehicle is not allowed.

Please note!

After installation, please label “ stop heater before refueling ” around fuel inlet.

2 Product Introduction

2.1 Scope of supply

Scope of supply for parking heater

Parking heater	Order No.	Remarks
DA2 12V	161-10000	Included: 1. Heater 2. Metering pump 3. Temperature control switch
DA2 24V	161-20000	Included: 1. Heater 2. Metering pump 3. Temperature control switch
DA4 12V	162-10000	Included: 1. Heater 2. Metering pump 3. Temperature control switch
DA4 24V	162-20000	Included: 1. Heater 2. Metering pump 3. Temperature control switch

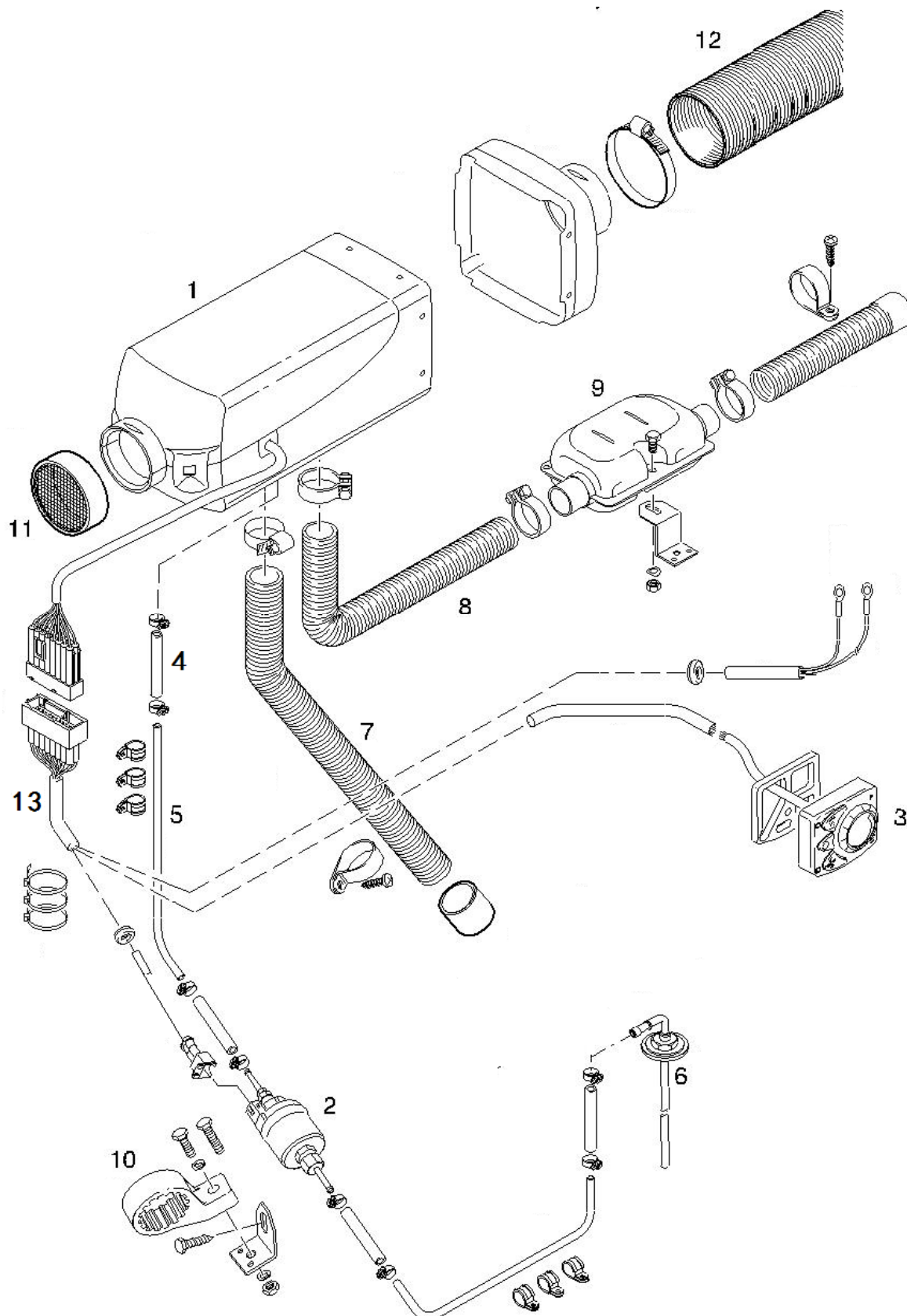
Scope of supply for installation kit

Figure No.	Order No.	Designation
1	161-10022	Rubber oil hose $\phi 3.5 \times 3$ 80mm 4 piece
2	161-10021	Nylon oil hose $\phi 4 \times 1.25$ 6 meter
3	161-10026	Cumbustion air inlet tube $\phi 25$ 0.6 meter 1 piece
4	161-10027	Stainless steel exhaust tube $\phi 25$ 0.6 meter 1 piece
5	161-10028	Hot air outlet tube $\phi 60$ 60metre 1 piece
6	161-10029	Air outlet $\phi 60$ 1 piece
7	161-10033	Wiring harness 4meter 1 piece
8	161-10023	Jacket for oil pump 1 Piece
9	161-10034	Fixed plate 1 Piece
10	161-10025	Strapping tape 5*150 10 pieces
11*	161-10024	Fuel filter 1 Piece
12*	161-10030	Muffler 1 piece
13	520-00004	8-10 mini hose clamp 14 Piece
14	520-00001	25-40 stainless steel hose clamp 4 Piece
15	520-00011	50-70 stainless steel hose clamp 2 Piece
16	523-00002	Fastening clamp for exhaust tube installation R-type $\phi 27$ with rubber 2 Piece
17	523-00003	Fastening clamp for Combustion air inlet tube R-type $\phi 27$ 2 Piece
18	530-00027	Self drilling screw M5 \times 20 10 Piece

Remarks: Accessories with * will not be included normally. But it depends on your choice.

2 Product Introduction

2.2 Figure of scope of supply for heater and installation kit



2 Product Introduction

2.3 Technical data / Gasoline heaters

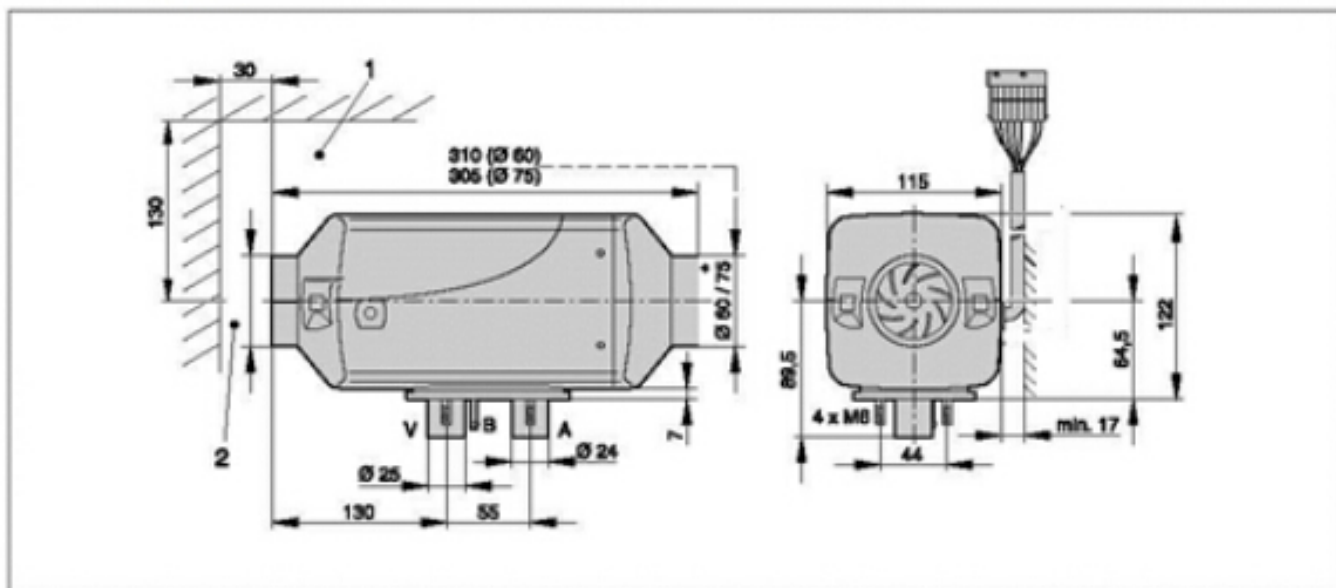
Model	DA2				
Heating medium	Air				
Fuel	Diesel				
Control of the heat flow	Stage				
	Power	Large	Medium	Small	Off
Heat flow (W)	2200	1800	1200	850	-
Fuel consumption (L/h)	0.28	0.23	0.15	0.1	-
Electricity power consumption in operation (W)	34	23	12	8	5
Electricity power consumption in start (W)	≤100				
Nominal voltage	DC12/24V				
Maximum air intake temperature	40°C				
Weight	approx 2.8KG				

Model	DA4				
Heating medium	Air				
Fuel	Diesel				
Control of the heat flow	Stage				
	Power	Large	Medium	Small	Off
Heat flow (W)	4000	3200	2400	1600	-
Fuel consumption (L/h)	0.5	0.4	0.3	0.2	-
Electricity power consumption in operation (W)	55	30	16	8	5
Electricity power consumption in start (W)	≤100				
Voltage	DC12/24V				
Maximum air intake temperature	40°C				
Weight	approx 4.5KG				

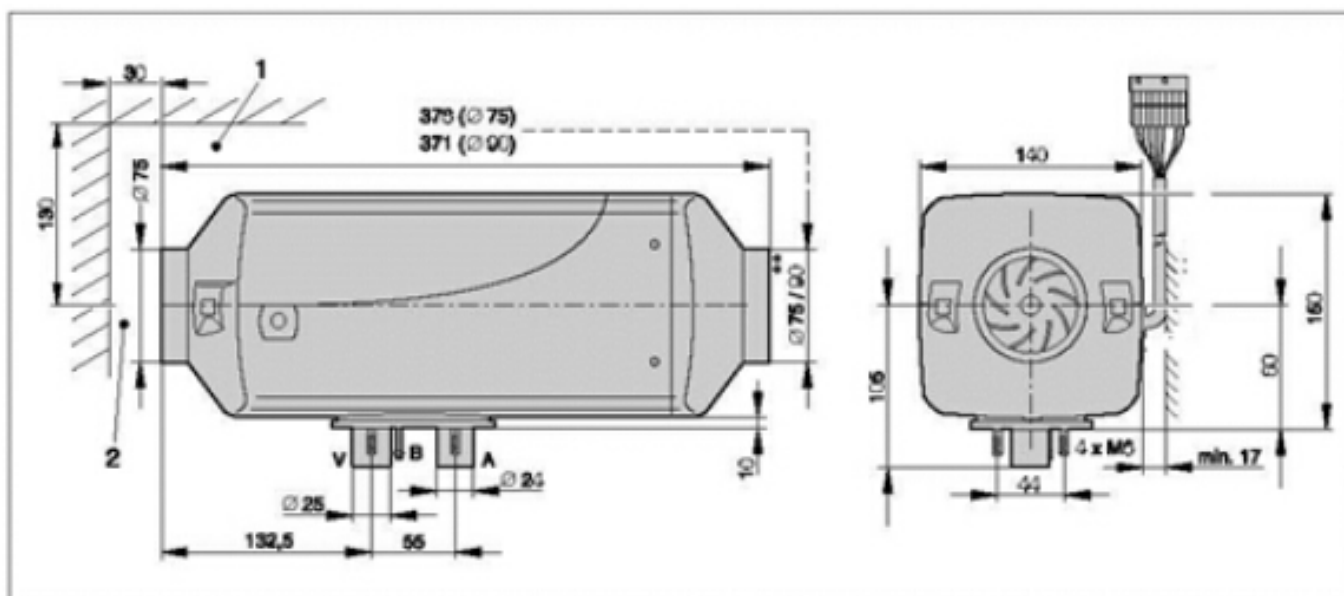
2 Product Introduction

2.4 Dimension of heaters

Dimension of DA2 heater



Dimension of DA4 heater



1. Minimum installation clearance (space) for opening the lid and for dismantling the glow plug and the controller.

2. Minimum installation clearance (space) for intake of heater air.

A: Exhaust

B: Fuel

V: Combustion air

3 Installation

3.1 Installation and mounting position

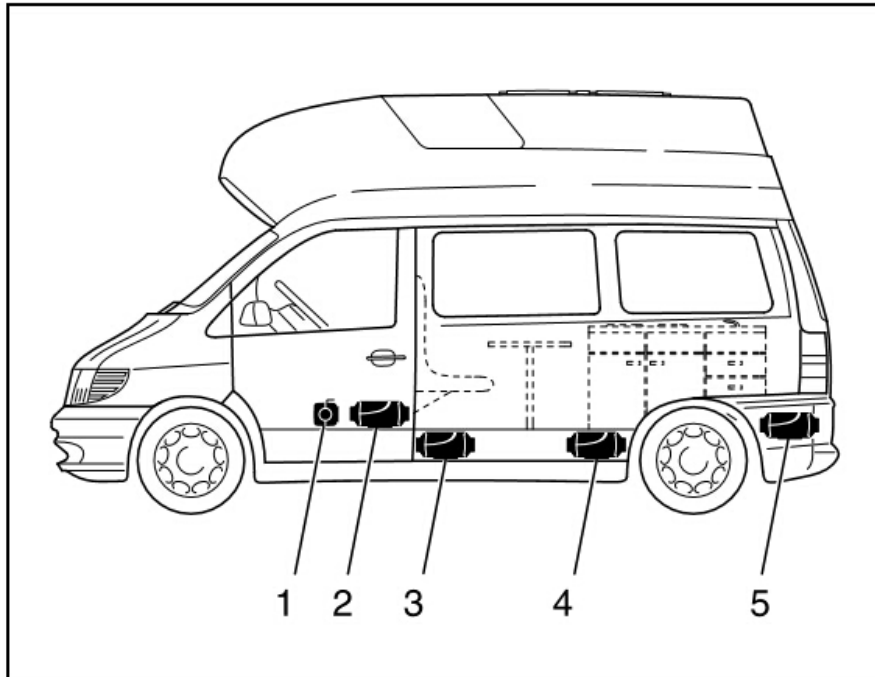
- The heater is suitable and allowed for installation in parts of vehicles' passenger compartment.
- The heater can be mounted with assembled flange seal at the foot to the vehicle floor or back wall of the vehicle.

Please note!

- The detachable connection of exhaust pipe, combustion air pipe and fuel hose is not allowed when heater is installed inside the vehicle.
- Flange seal must be installed at heater to seal hole of exhaust hose, combustion air hose and fuel pipe.
- Installation in the cab or passenger compartments of coaches or buses with more than 9 seats is not allowed.
- When installing the heater, always make sure there is sufficient clearance left for intake of the heater air and for dismantling the glow plug and controller.

3.2 Mounting position at vehicle

3.2.1 Installation in VAN



1 Heater in front of the passenger seat

2 Heater between the driver's seat and the passenger seat

3 Heater under the vehicle floor

4 Heater in the living room.

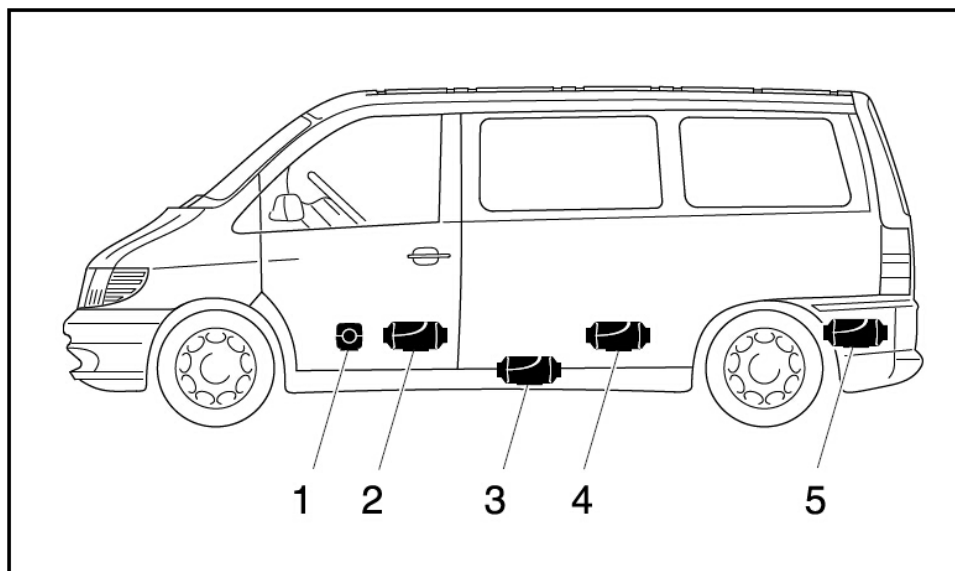
5 Heater in the boot

- In a camper van, the heater is preferably installed in the inner compartment or luggage compartment. If it is not possible to install the heater in the passenger compartment or boot, the heater can also be mounted, protected against splashing water, under the vehicle floor.

3 Installation

3.2 Mounting position at vehicle

3.2.2 Installation in a car or people carrier



1 Heater in front of the passenger seat

2 Heater between the driver's seat and the passenger seat

3 Heater under the vehicle floor

4 Heater under the back seat

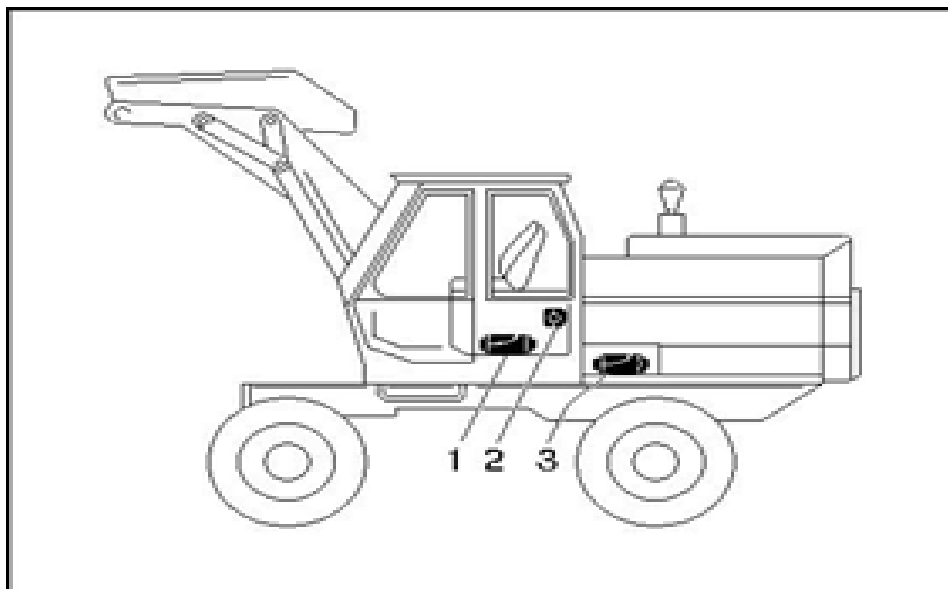
5 Heater in the boot

- In a car or people carrier, the heater is preferably installed in the inner compartment or luggage compartment. If it is not possible to install the heater in the passenger compartment or boot, the heater can also be mounted, protected against splashing water, under the vehicle floor.

3 Installation

3.2 Mounting position at vehicle

3.2.3 Installation in an excavator cab (only diesel heaters)



1 Heater in the seat box

2 Heater on the cab rear wall

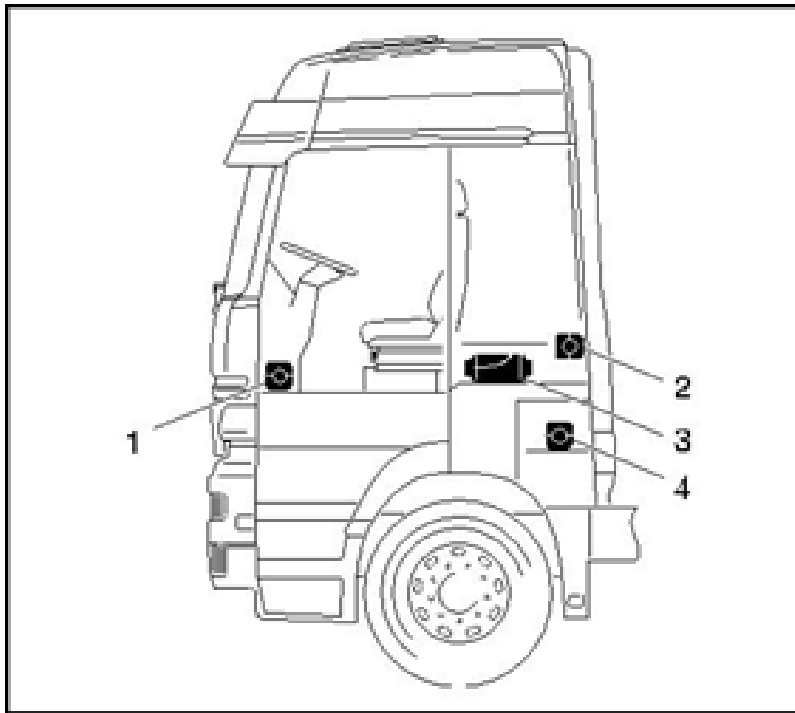
3 Heater in a protective case

- In an excavator, the heater is preferably installed in the cab. If it is not possible to install the heater in the cab, the heater can also be installed in a storage box outside the cab.

3 Installation

3.2 Mounting position at vehicle

3.2.4 Installation in truck (only by diesel heaters)



1 Heater in the passenger's foot room

2 Heater on the cab rear wall

3 Heater under the driver's seat back

4 Heater in the tool box

In a truck, the heater is preferably installed inside the driver's cab. If it is not possible to install the heater inside the driver's cab, it can also be mounted in the tool box or in a storage box.

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.

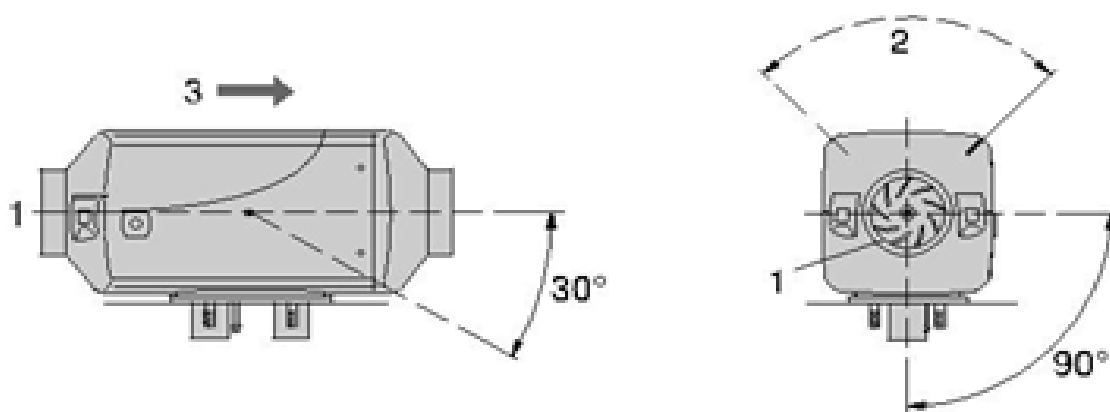
3 Installation

3.3 Possible installation angle

The heater should preferably be installed in the normal position. As the sketch, depending on the installation conditions, the heater can be tilted by max. 30° (flow direction to the bottom) or turned by max. 90° around its own longitudinal axis (exhaust connection horizontal, glow plug points upwards!).

Please 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.



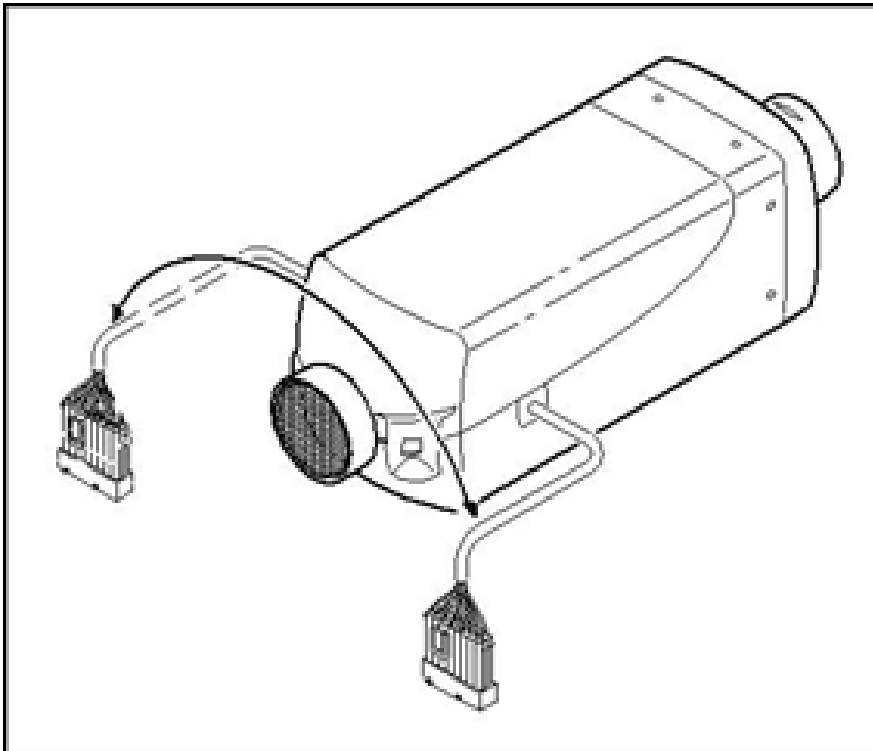
1 Heater air intake opening (fan wheel)

2 Position of the glow plug

3 Direction of flow

3 Installation

3.4 Cable harness connection, right or left



- If necessary, the cable harness connection can be changed over to the other side of the heater. To do so, the controller has to be removed and the lower semi-circular cable harness cover unclipped. The cable harness can then be rerouted in the controller.
- Then mount the controller again, position the jacket shell and insert the cable harness bush and the bungs in the corresponding recesses in the lower jacket shell.

3 Installation

3.5 Mounting and fastening

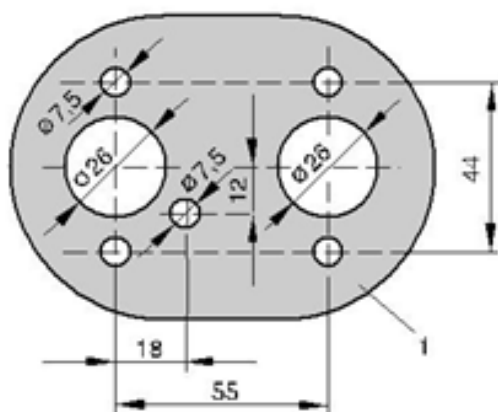
Make the necessary breakthroughs for exhaust, combustion air and fuel as shown in the hole diagram.

The support surface for the heater foot must be flat.

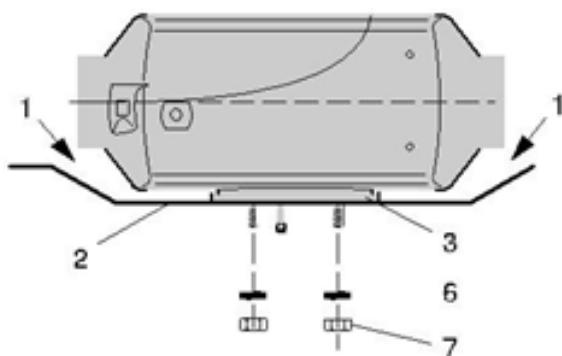
The hole Ø 10.5 mm for the cable harness “dosing pump” is not included in the picture drawing and must be drilled after installation.

If the sheet metal of the support surface is thinner than 1.5 mm, an additional reinforcement plate will have to be fitted.

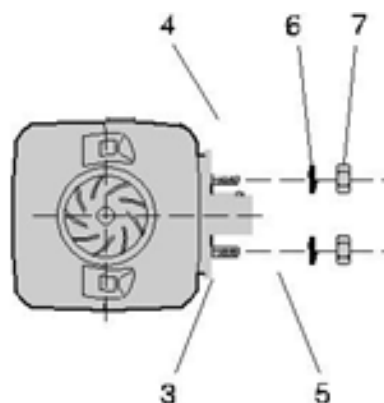
Picture Hole



Fastening the unit on the vehicle floor



Fastening the heater horizontally to the vehicle wall



1 There must be sufficient clearance between the heater and the vehicle floor – also check that the fan wheel runs freely.

2 The mounting surface must be flat and smooth.

3 The flange seal must be mounted.

4 The vehicle wall must be flat and smooth.

5 Reinforcement plate

6 Spring washer

7 Hexagon nut M6

3 Installation

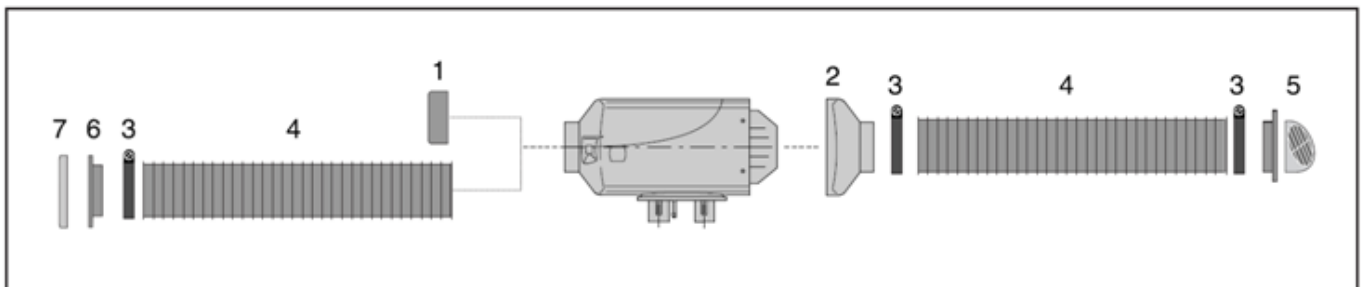
3.6 Heater air system

Danger! Risk of injuries and burns!

- 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.
- 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.

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, it is possible for local hot air temperatures of up to max. 150 °C or surface temperatures of up to max. 90°C to occur immediately before the defect shutdown. Therefore 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).
- If there is a risk of the driver and passengers touching the heater when the vehicle is being driven normally, a contact protection device must be fitted.



- 1. Safety grid
- 2. Outflow hood
- 3. Hose clip
- 4. Flexible hose

- 5. Rotating outflow
- 6. Connection fitting
- 7. Safety grid

3 Installation

3.7 Installation of exhaust system

- The installation kits include a flexible exhaust pipe, inner Ø 24 mm, 1000 mm long and an exhaust silencer.
- The flexible exhaust pipe can be shortened to 20 cm or lengthened to max. 2 m, depending on the installation conditions.
- Fasten the exhaust silencer to a suitable position in the vehicle.
- Route the flexible exhaust pipe from the heater to the exhaust silencer and fasten with pipe clips. Use a pipe clip to fix a short exhaust pipe end (with end sleeve) to the exhaust silencer.



Caution

Safety instructions!

- The whole exhaust system gets very hot while the heater is running and immediately afterwards. This is why the exhaust system must be routed according to these installation instructions.
- The exhaust outlet must end in the open air.
- The exhaust pipe may not protrude beyond the lateral limits of the vehicle.
- Install the exhaust pipe sloping slightly downwards. If necessary, make a drain hole with an approx. Ø of 5 mm 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 pipes (made of plastic or metal), electrical cables and brake hoses etc.!
- Exhaust pipes must be securely fixed (recommended clearance of 50 cm) to avoid damage due to vibrations.
- Lay the exhaust system so that the outflowing exhaust gases are not sucked 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.



Danger!

Risk of injuries and burns!

- Every type of combustion produces high temperatures and toxic exhaust fumes. This is why the exhaust system must be routed according to 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.

Please note!

- The exhaust pipe end should be much shorter than the flexible exhaust pipe from the heater to the exhaust silencer.
- External diameter of combustion air hose is Ø20. External diameter of exhaust pipe is Ø24.
- In order to avoid rust, stainless steel pipe clip must be used to fixing the exhaust pipe.

3 Installation

3.8 Installation of combustion air system

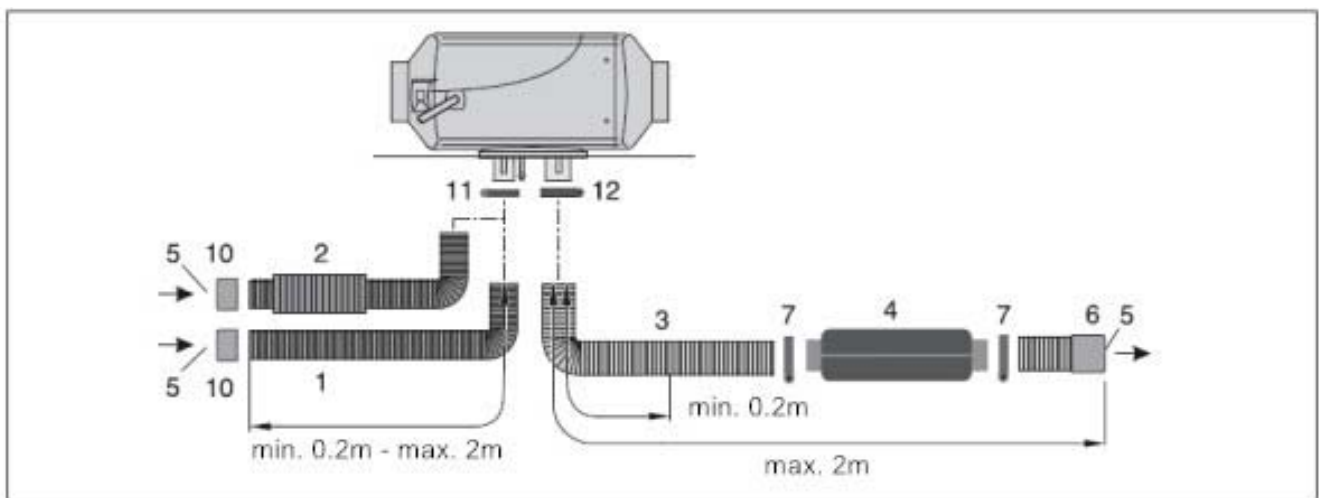
- The universal installation kit includes a flexible combustion air hose, inner Ø 25 mm, 1000 mm long. The flexible exhaust pipe can be shortened to 20 cm or lengthened to max. 2 m, depending on the installation conditions.
- Fasten the combustion air hose to the heater with a pipe clip and at suitable points with hose clips or cable ties. Fit an end sleeve after completing the installation.



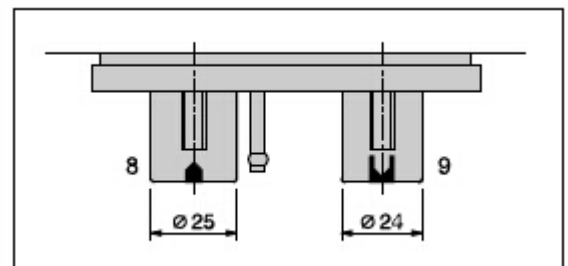
Caution!

Safety instructions for the combustion air system!

- The combustion air opening must be free at all times.
- Lay the combustion air intake to ensure that exhaust fumes cannot be sucked in as combustion air.
- Arrange the combustion air intake so that it is not directed against the wind blast or airstream.
- Do not allow the combustion air intake to become clogged with dirt and snow.
- Install the combustion air intake system sloping slightly downwards.



- 1 Combustion air hose, di = 25 mm
- 2 Combustion air silencer
- 3 Exhaust pipe, di = 24 mm
- 4 Exhaust silencer
- 5 Intake / outlet opening – protect from wind, snow, dirt and water.
- 6 End sleeve, exhaust
- 7 Hose clip
- 8 Combustion air connection
- 9 Exhaust connection
- 10 End sleeve, combustion air
- 11 Hose clip
- 12 Exhaust hose clip



3 Installation

3.9 Fuel supply

3.9.1 Installing the metering pump, laying the fuel pipes and installing the fuel tank

The following safety instructions must always be observed when installing the metering pump, laying the fuel pipes and installing the fuel tank. Deviations from the instructions stated here are not allowed. Failure to comply can result in malfunctions.

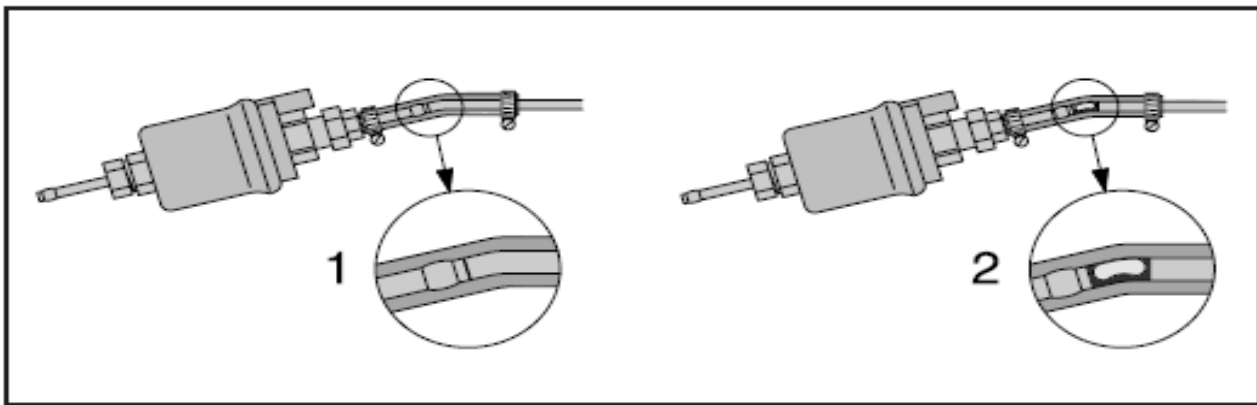
⚠ Danger!

Risk of fire, explosion, poisoning and injuries!

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

⚠ Caution!

Safety instructions for laying the fuel pipes!



1 Correctly laid lines

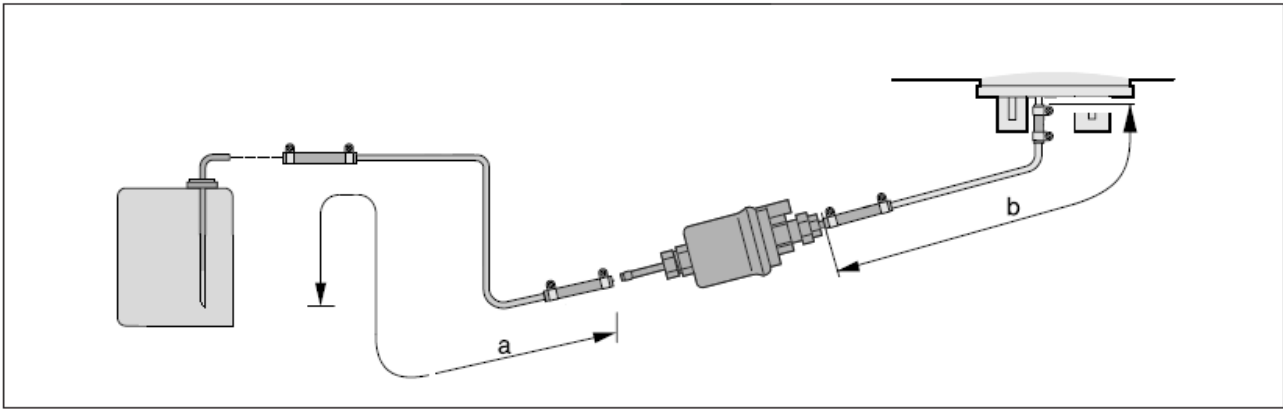
2 Incorrectly laid lines – bubbles form

- A sharp knife is only allowed to use to cut fuel hoses and pipes to length. Interfaces must not be crushed and must be free of burrs.
- Wherever possible, lay the fuel pipes from the metering pump to the heater with a continuous rise.
- Fuel pipes must be securely fixed to avoid damage and / or noise due to vibrations (recommended guideline value: clearance of around 50 cm).
- Fuel pipes must be protected against 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.
- Fixing all the hose connections with hose clips.
- Parts carrying fuel must be protected from interfering heat.
- Never route or fasten the fuel lines to 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 systems.
- When connecting fuel pipes with a fuel hose, always install the fuel pipes with a butt joint to prevent any bubbles from forming.

3 Installation

3.9 Fuel supply

3.9.2 Length of fuel pipe

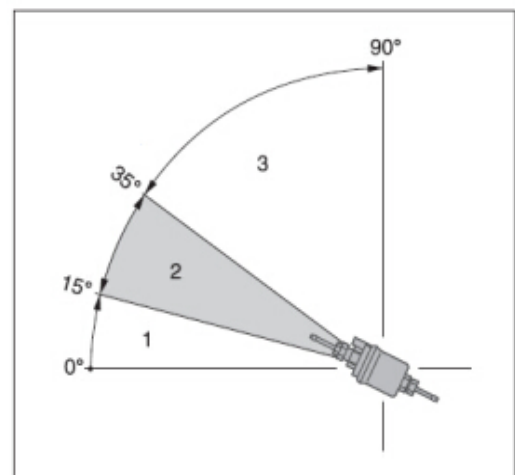


Intake side: a= max. 5m

Pressure side: b= max. 6m

3.9.3 Installation position of metering 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.



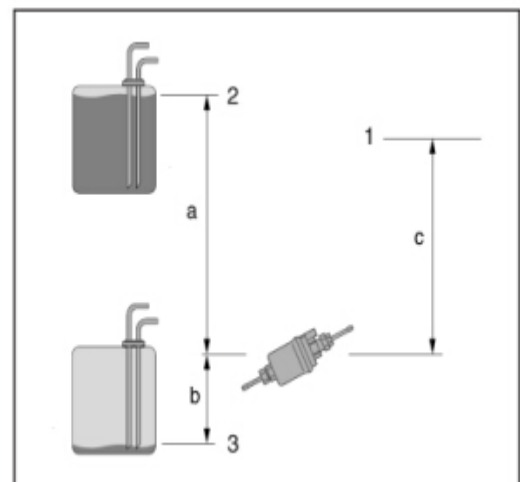
3.9.4 Possible suction and pressure height of metering pump

- Pressure height from vehicle tank to dosing pump:
a = max. 3000 mm
- Intake height in pressure-less vehicle tank:
b = max. 1000 mm for diesel
- 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



Caution!

Be sure to use fuel corresponding with environmental temperature



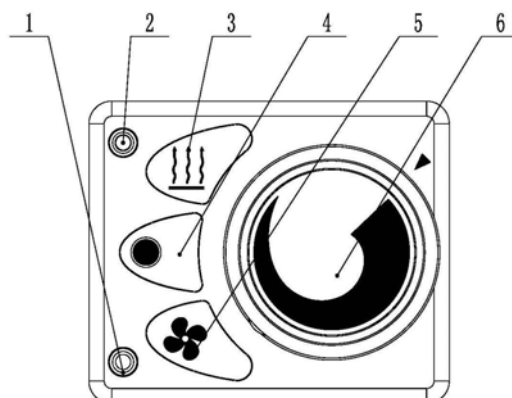
- 1 Connection to heater
- 2 Max. fuel level
- 3 Min. fuel level

4 Controller Switch and Circuit

4.1 Controller switch

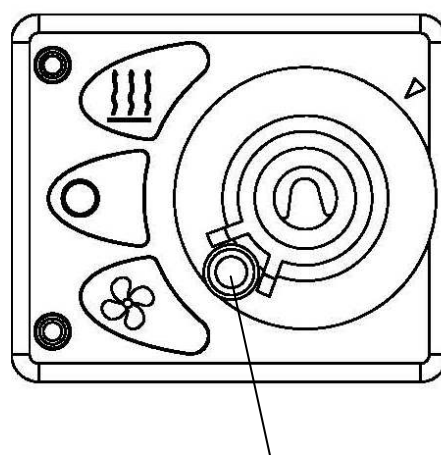
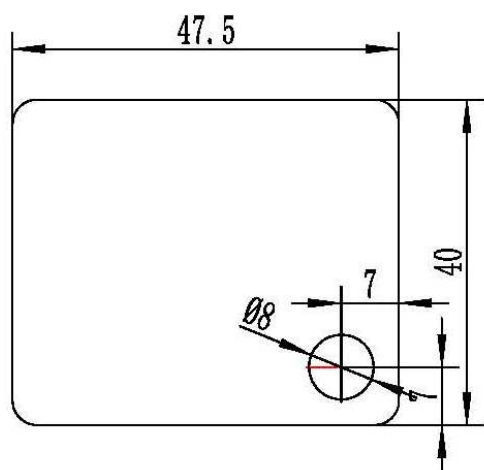
Heater is controlled by a controller switch to realize functions of switching operation mode of the heater (burning or ventilation), start, shut down and temperature control. Detailed operating way is explained at part 5 operation and working condition of this manual.

1. Ventilation indicting light
2. Burning indicting light
3. Burning button
4. Stop working button
5. Ventilation button
6. Temperature regulating knob



4.2 Installation of controller switch

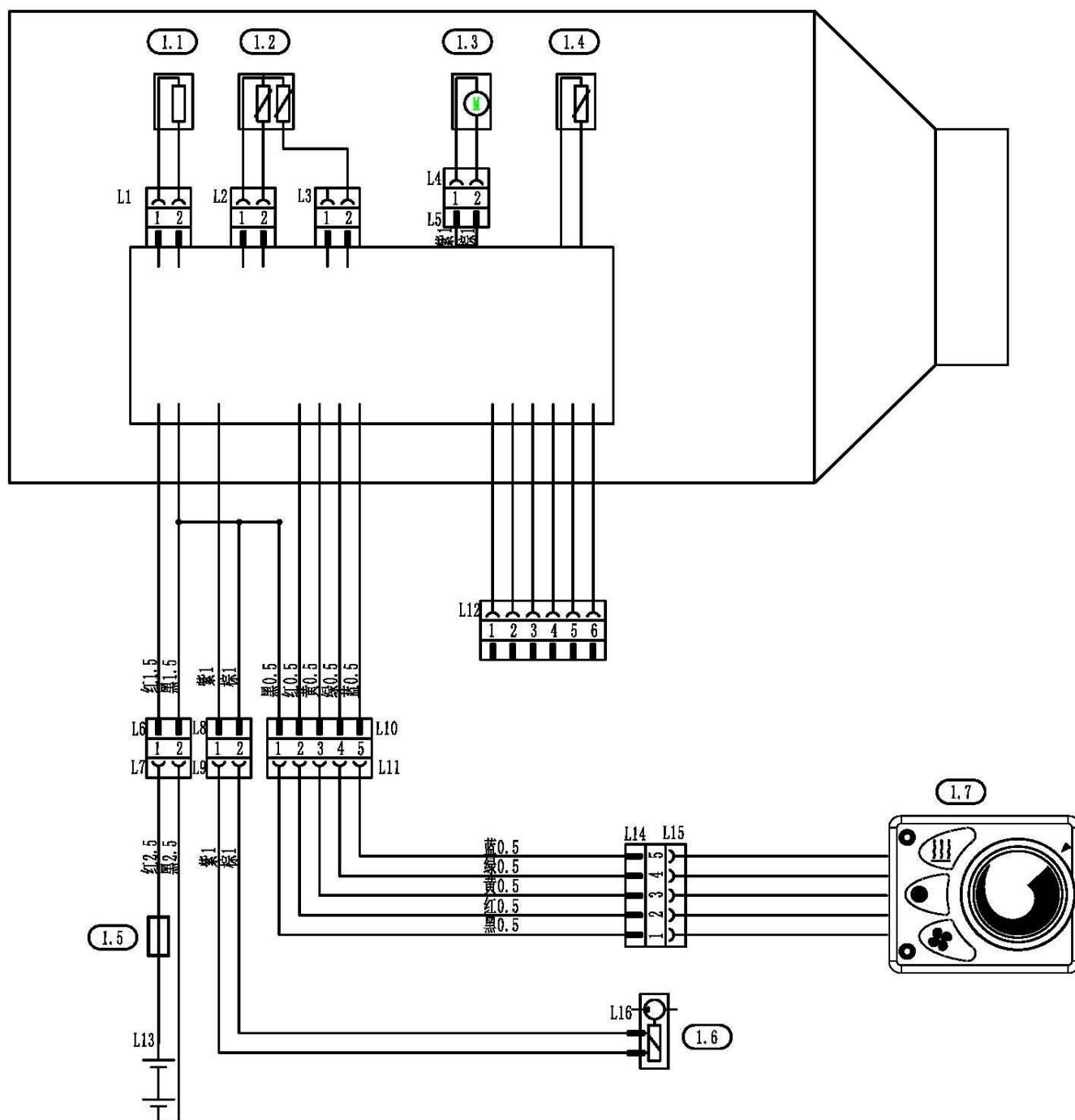
- Select suitable position on panel. Dimension of switch is 47.5mm *40mm.
- Make a cable hole according to belowed figure.
- Remove the temperature regulating knob. Then switch harness goes through the hole. The switch is fixed with self-tapping screws st3.5 × 12.
- After installing the temperature regulating knob, plug in wiring harness connector according to circuit diagram.



Fixed hole

4 Controller Switch and Circuit

4.3 Circuit



- 1.1 Ceramic glow plug
- 1.2 Overheating and flame sensor
- 1.3 Motor
- 1.4 Temperature sensor
- 1.5 15A Insurance
- 1.6 Metering pump
- 1.7 Controller switch

5 Operation and working condition

5.1 Operation instruction

The heater is operated by controller switch.

Important tips about operation:

- Do safety check before starting up the heater. check all components for secure fit (tighten screws where necessary). Carry out a visual check whether fuel system, combustion air system, exhaust system is unobstructed.
- Normal operation of heater at altitudes up to 1500 m.
- Heater can be used for short periods at altitude 1500 - 3000m. Over 3000m, the heater must be customized.
- During the initial start-up of the heater, odours can be produced for a short time. This is fully normal during the first few minutes of operation and does not indicate a malfunction in the heater.
- During the initial start-up of the heater, there may be alarm situation caused by ignition failure. This is because fuel is needed to fill in fuel pipe. Start heater nominally in some times will fix it.

Operating instructions of controller switch

- Press ventilation button on switch. Heater is just ventilated without combustion. At this period, the ventilation lamp lights up.
- Press burning button on the switch, and then heater starts burning processes. Combustion and ventilation lamp lights up simultaneously.
- As a fault occurs during operation of the heater, combustion indicator light flashes to indicate cause of the malfunction.
- Press the stop button. The heater stops working (combustion or ventilation). After delayed stop, the light goes out.
- Temperature regulating knob is used for setting temperature to realize heater's automatic temperature control. Adjustment range is 10-30 ° C.
- Switch between ventilation and combustion state is realizable.

5 Operation and working condition

5.2 Description of working condition

Switch on

- Press combustion button on control switch, combustion and ventilation indicating light lights up. Then, heater starts running with glow plug working and fan running at low speed.
- If there is still too much residual heat in the heat exchanger from when the heater was last used, firstly only the fan starts up (cold blowing). Once the residual heat has been cleared, the heater starts.

Heating process

- After approx. 60 seconds the fuel supply starts and the fuel / air mixture in the combustion chamber ignites.
- After the flame sensor has detected the flame, the glow plug is switched off after approx. 90 sec. The heater has reached the “POWER” stage gradually (maximum fuel quantity, maximum fan speed).

Temperature control

- The control can be used to preset an interior temperature. According to the size of heating space and prevailing outdoor temperature, heater's temperature can be set within the range of +10 °C to +30 °C.

Control in the heating mode

- During the heating mode, the room temperature or the temperature of the sucked in heating air is constantly measured. Based on these and the preset temperature by controller switch, heater's working condition will be adjusted. If the temperature is higher than the temperature selected on the control element, the heater starts to regulate its output.
- There are 4 control stages so that the outflow of heat produced by the heater can be adjusted finely to the heating requirements. Fan speed and fuel quantity correspond to the particular control stage.
- If preset temperature is as “t”, heating air temperature is as “T”:
 $T \leq t-4$, heater works at 100% efficiency;
 $t-4 < T \leq t-2$, the heater works at 80% efficiency;
 When $t-2 < T \leq t-1$, the heater works at 60% efficiency;
 In $t-1 < T \leq t$, the heater works at 40% efficiency;
 At $T > t$, the heater stops working.
 With the heater stops working, the temperature gradually decreases. When $T \leq t-4$, the heater is restarted.

Ventilating mode

- Press the ventilation button. heater will works in ventilation mode. Changeover in mode of ventilation and burning can be realized at any time.

Switching off

- Press the stop working button. Heater switches off, metering pump stops working and glow plug is switched on for approx. 40 seconds. After fan runs on for approx. 4 minutes to cool down, heater is shutdown and indicating light goes out.

5 Operation and working condition

5.3 Control and safety devices

- If the heater does not ignite within 90 seconds after starting the fuel pump, the start is repeated. If the heater still does not ignite after another 90 seconds of pumping fuel, the heater is switched off. The fuel supply is off and the fan runs on for approx. 4 minutes to cool down. Meanwhile, burning indicating light flashes.
- If the flame goes off by itself during operation, the heater is restarted. If the heater does not ignite within 90 seconds after the fuel pump has started, the heater is switched off. The fuel supply is off and the fan runs on for approx. 4 minutes to cool down. Meanwhile, burning indicating light flashes.
- In the case of overheating, the combined sensor (flame sensor / overheating sensor) triggers, the heater switched off and the fan runs on for approx. 4 minutes to cool down. Meanwhile, burning indicating light flashes.
- When heater defects malfunction of motor, over-heating sensor, flame sensor, temperature sensor, ceramic glow plug, metering pump, voltage or circuit, burning indicating light will flash.



Caution!

- The heater can be restarted by switching on again.
- Restart of heater can't be more than three times.

5 Operation and working condition

5.4 Flash condition of malfunction indicating light

When heater has malfunctions, the burning indicating light will flash as alarm. Different flash frequency refers to different code and malfunction reason.

[illegible]

Code of malfunction	Description of malfunction	Malfunction reason	Troubleshooting
1	Over-voltage or Under-voltage	Voltage is beyond nominal voltage $\pm 25\%$	Check your power supply by multimeter. If below nominal voltage 25%, pls recharge or change battery. If above nominal voltage 25%, please change your power supply.
2	Over-heating	1. Blockage in the air inlet or air outlet	Please clean the air inlet or air outlet if there is a block.
		2. Blockage in the exhaust pipe	Please clean the exhaust pipe if there is a block.
3	Fault of flame sensor	1. Incorrect connection	Check whether all the plug-in connects correctly and lead is loose. If yes, please fix it.
		2. Short circuit or open circuit of lead	Check whether there is short circuit or open circuit of lead of flame sensor by multimeter. If yes, please fix it or replace it.
		3. Damage of motor	Check whether there is a damage of flame sensor by multimeter. If yes, please replace it.
4	Fault of motor	1. Incorrect connection	Check whether all the plug-in connects correctly and lead is loose. If yes, please fix it.
		2. Short circuit or open circuit of lead	Check whether there is short circuit or open circuit of lead of motor by multimeter. If yes, please fix it or replace it.
		3. Damage of motor	Check whether motor rotation is normal after energized detection. If not, please replace it.
5	Fault of glow plug	1. Incorrect connection	Check whether all the plug-in connects correctly and lead is loose. If yes, please fix it.

5 Operation and working condition

5.4 Flash condition of malfunction indicating light

Code of malfunction	Description of malfunction	Malfunction reason	Troubleshooting
5	Fault of glow plug	2. Short circuit or open circuit of lead	Check whether there is short circuit or open circuit of lead of motor by multimeter. If yes, please fix it or replace it.
		3. Damage of glow plug	Check glow plug's resistance between two leads. If it is not between 1-4 ohms, pls replace it
6	Fault of over-heating sensor	1. Incorrect connection	Check whether all the plug-in connects correctly and lead is loose. If yes, please fix it.
		2. Short circuit or open circuit of lead	Check whether there is short circuit or open circuit of lead by multimeter. If yes, please fix it or replace it.
		3. Damage of over-heating sensor	Check whether there is a damage of over-heating sensor. If yes, please replace it.
7	Fault of fuel metering pump	1. Incorrect connection	Check whether all the plug-in connects correctly and lead is loose. If yes, please fix it.
		2. Short circuit or open circuit of lead	Check whether there is short circuit or open circuit of lead by multimeter. If yes, please fix it or replace it.
		3. Damage of fuel metering pump	Check fuel pump's resistance between two leads. If it is not between 15-25 ohms, pls replace it
8	Fault of temperature sensor	1. Short circuit or open circuit of lead	Check whether there is short circuit or open circuit of lead by multimeter. If yes, please fix it or replace it.
		2. Damage of temperature sensor	Check whether there is a damage of temperature sensor. If yes, please replace it.
9	Ignition failure	1. No fuel in the container	Check whether there is fuel or enough fuel in tank
		2. Fuel pipe blocked or broken	Check whether the pipe is blocked by impurity and each connection is intact. if so, please repair or replace it.
		3. Fuel pipe blocked by fuel condensation	If there is fuel condensation, please use fuel which is suitable for low temperature to replace previous fuel.
		4. Blockage in exhaust pipe	Please clean the exhaust pipe if there is a block.
		5. Fault of controller	Replace the controller
10	Flame failure	1. No enough fuel in container	Provide enough fuel
		2. Fault of ignition sensor	Troubleshooting or replace it.



Caution!

- Malfunction indication only refers to reason of heater's shutdown, not damage of parts. The heater can be restarted by switching on again.
- If there is malfunction occurred, heater should be started after troubleshooting.

6 Troubleshooting /Maintenance/Service

6.1 If any faults occur, please check the following items

- 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:
 - Fuel in the tank?
 - The fuses are OK?
 - The electrical cables, connections, terminals, are OK?
 - The intake air, hot air, combustion air or exhaust systems are blocked?

If, after checking these items, the heater is still faulty or another malfunction occurs in your heater, please contact the service provider approved by YUSENN.

Please note!

Please note that guarantee claims can expire if the heater is modified by a third party or if non-original parts are installed.

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 thick, persistent smoke develops, unusual burning noises, the heater must be switched off and removed the fuse. In this case, the heater should not be started up again until it has been checked by qualified service provider approved by YUSENN.
- Check the intake air, hot air, combustion air or exhaust systems after longer standstill periods, clean if necessary!

Service

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

400-832-1517

6 Detailed list of air parking heater

Figure No.	Material number	Name	Quantity
1	161-10700	Controller module	1
2	161-10015	Fixing bolt for controller	1
3	161-10003	Top hood-shape cover	1
4	161-10009	Clamp spring	1
5	161-10019	Temperature sensor for outlet air	1
6	161-10011	Protective hood for glow plug	1
7	161-10900	Ignition sensor assembly	1
8	161-10005	Net	1
9	161-10601	Heat exchanger	1
10	161-10006	Burner gasket	1
11	161-10013	Fixing screw of burner	3
12	161-10500	Burner assembly	1
13	161-10014	Protective hood for fuel pipe	1
14	161-10008	Heat exchanger gasket	1
15	161-10400	Motor assembly	1
16	161-10012	Fixing screw for motor bracket	4
17	161-10017	Air inlet grid	1
18	161-10301	Bottom hood-shape cover	1
19	161-10007	Rubber gasket	1
20	161-10303	Snap-gauge of bottom hood-shape cover	1
21	161-10004	Hot air outlet cover	1

6 Detailed list of air parking heater

