YJH-Q5A

The User Manual of Liquid Parking Heater

YJH-Q5A

New High Auto Radiator Manufacturing Co.,Ltd

YJH-Q5A

YJH-Q5A Installation Instructions

Attention:

Improper installation or repair of New High heating and cooling systems can cause fire or the leakage of deadly carbon monoxide leading to serious injury or death.

To install and repair New High heating and cooling systems you need to have completed a New High training course and have the appropriate technical documentation, special tools and special equipment.

NEVER try to install or repair New High heating or cooling systems if you have not completed a New High training course, you do not have the necessary technical skills and you do not have the technical documentation, tools and equipment available to ensure that you can complete the installation and
repair work properly.

ALWAYS carefully follow Webasto installation and repair instructions and heed all WARNINGS.

Webasto rejects any liability for problems and damage caused by the system being installed by the system being installed by
untrained personnel.

Content:

YJH-Q5A

1. Installation

1.1. Requirements for installation

YJH-Q5A Liquid parking heater has passed the type test. When you install this liquid parking heater, you need to follow the instruction manual.

1.1.1. Operating indicator

There is a visible operating indicator within the sight of the operator. It must be confirmed whether the parking heater is on or off.

1.2. General requirements

1.2.1. The exhaust gas

The exhaust pipe must maintain sufficient distance (At least 20mm) from temperature-sensitive automotive components (Bottom protective layer, plastic film, etc.)

1.2.2. Fuel pipe

The fuel pipe must be laid in a cool area to prevent the fuel pipe from forming bubbles due to be heated.

1.2.3. Electrical components

Electrical components such as relays, fuses, and switches must be properly installed to prevent moisture(jet water, high-pressure cleaner, etc.) from infiltrating.

2.1. Application range

2.1.1. Based on section 2.1.2, the parking heater must be installed according to the requirements of this appendix.

2.1.2. For trailers equipped with liquid parking heater, they must comply with the requirements of this appendix.

2.2. The installation location of the liquid parking heater

2.2.1. It is necessary to protect components near the body and the parking heater from excessive heat radiation and from pollution by fuel or oil.

2.2.2. Fire-fighting heaters do not allow fire risks even when they are overheated. This requirement can be met if attention is paid to install the heater with sufficient space to all parts, take appropriate ventilation measures, and use fireproof material or insulation board.

2.2.3. The parking heater can not be installed in the passenger compartment. However, it is possible to install in a well-sealed shell structure that meets the conditions described in Section 2.2.2.

2.2.4. In order to minimize the risk of personal injury or damage to carry-on items, all necessary precautions must be taken when installing the heater.

2.3. Fuel supply

2.3.1 The fuel filler can not be arranged in the passenger compartment and must be tightly closed with a lid to avoid fuel spillage.

2.3.2. For the parking heaters that use liquid fuel and the liquid fuel delivery line is separate from the fuel delivery line of the vehicle, and the type of fuel and the filler port must be clearly marked.

2.3.3. A reminder sign must be placed on the fuel filler to mark that the parking heater must be turned off before refueling.

2.4. Exhaust system

2.4.1. The exhaust port must be installed like this:

Avoid exhaust gas entering the interior of the car's compartment through ventilating equipment, warm air vents or opened windows.

2.5. Combustion air inlet duct

2.5.1. The air of parking heater's combustion chamber can not be drawn from the passenger compartment of the vehicle.

2.5.2. When you install the air intake, it should be ensured that it will not be blocked by other items.

2.6. Hot air inlet duct

2.6.1. The supplied hot air must consist of fresh air or recyclable air drawn from a clean area, and this area cannot be contaminated by engines, heaters, or other sources of exhaust gas in the vehicle.

2.6.2. You must protect the air intake port with a grille or other suitable tool.

2.7. Hot air exhaust duct

2.7.1. The hot air pipe in the vehicle must be installed correctly, in order to ensure that the risks of injury and equipment damage can not be happened.

2.7.2. When you install the exhaust port, it should be ensured that it will not be blocked by other items.

Notes:

The parking heater can not be installed in the passenger compartment of the vehicle. However, it is possible to install in a well-sealed shell structure that meets the conditions described in Section 2.2.2.

2. Application range/Specification

2.1. The application range of Liquid parking heater

If the liquid parking heater YJH-Q5A installed in your vehicle, It can be used to:

----Staying Warm and heating in the driver's cab.

----Defrosting the front windshield and preheating the water-cooled engine.

Liquid parking heaters are not affected by the vehicle's engine during operation. Meanwhile, the heaters are connected to the vehicle's cooling system, fuel system, and electrical system.

2.2. Specification

YJH-Q5A - B Auxiliary parking heater

Liquid parking heater by using gasoline as fuel

YJH-Q5A - D Auxiliary parking heater

Liquid parking heater by using diesel as fuel

YJH-Q5A - PME Auxiliary parking heater

Liquid parking heater by using "biodiesel" as fuel

3. Installation location

The liquid parking heater is only allowed to be installed outside the car.

The heater is preferably installed in the engine compartment, the splash guard area of the front mudguard, or the front mudguard.

In order to ensure that the heater and the water pump can be automatically vented, the heater should be installed at a position as low as impossible. Especially for the water pump that cannot be pumped independently.

Attention:

- The nozzle of water pipe can not be facing down in any possible installation position.
- The parking heater can not be installed on:

  -----Near or above the high-temperature parts in the vehicle;

  -----The direct splash area of the wheel;

  -----Lower than the wading line of the vehicle

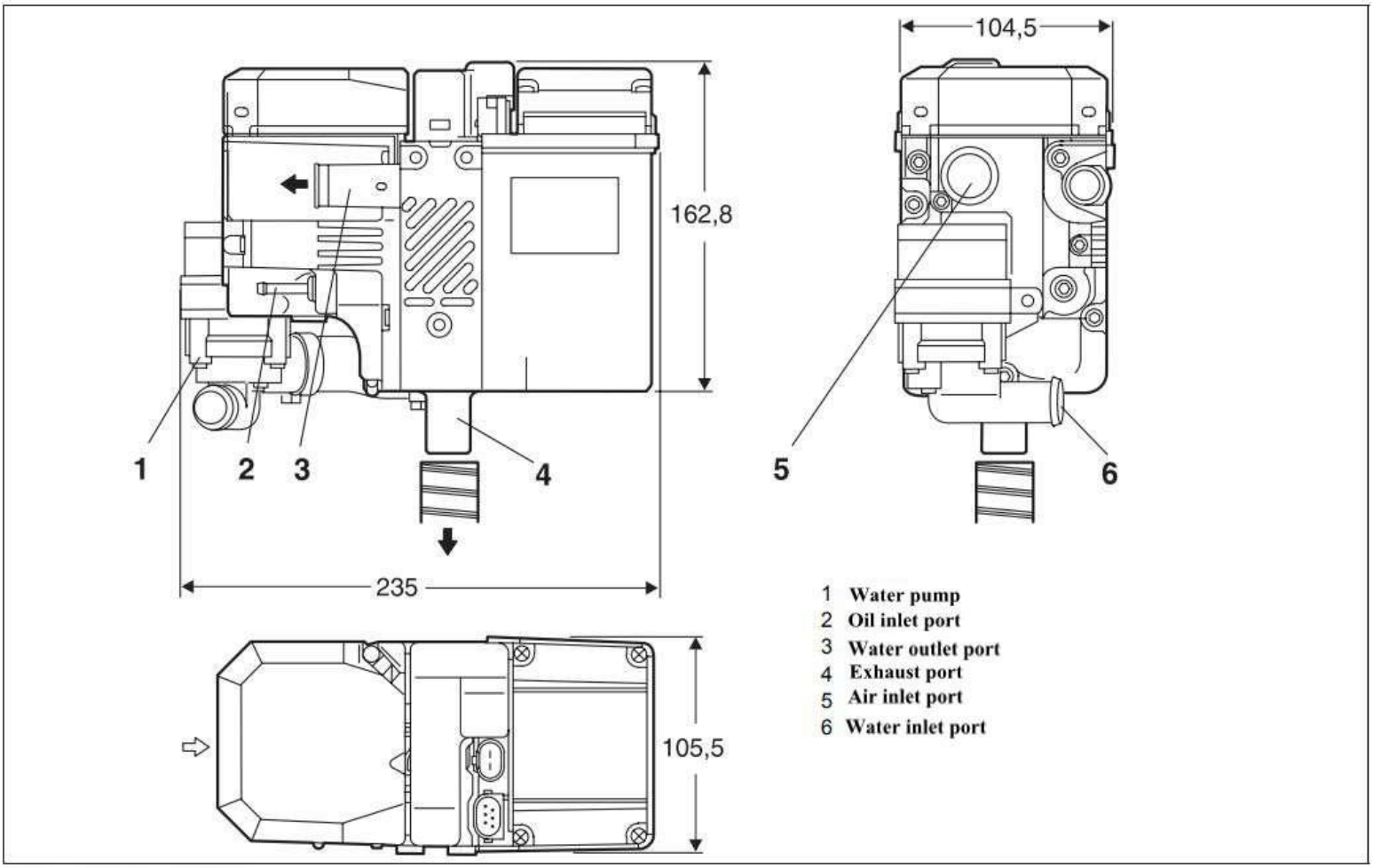


Figure 2: YJH-Q5A Installation diagram

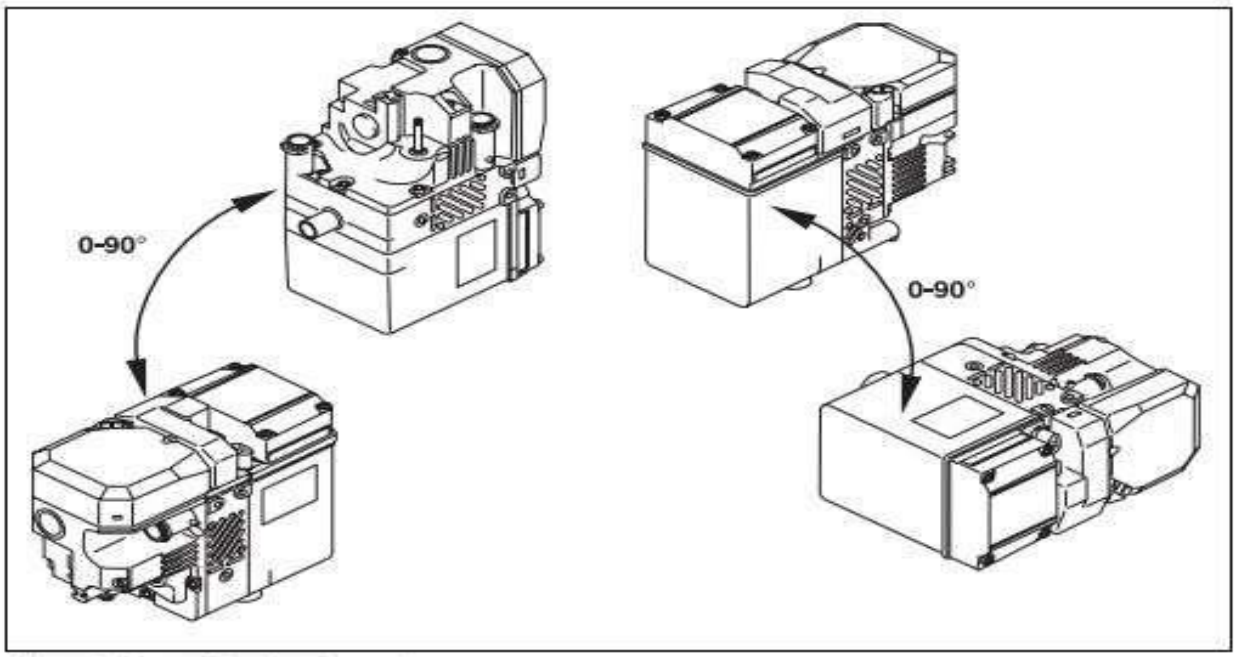


Figure1 **Installation location**

4.Nameplate

The nameplate must be installed where it will not be damaged, and it must be easily observed after the heater is installed.

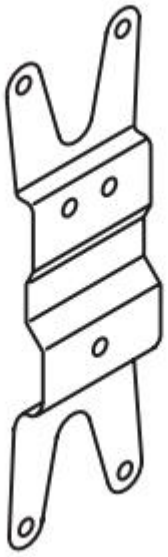
5. Standard bracket

You should use at least four M6 bolts to attach the standard bracket to the body or intermediate bracket of the vehicle.

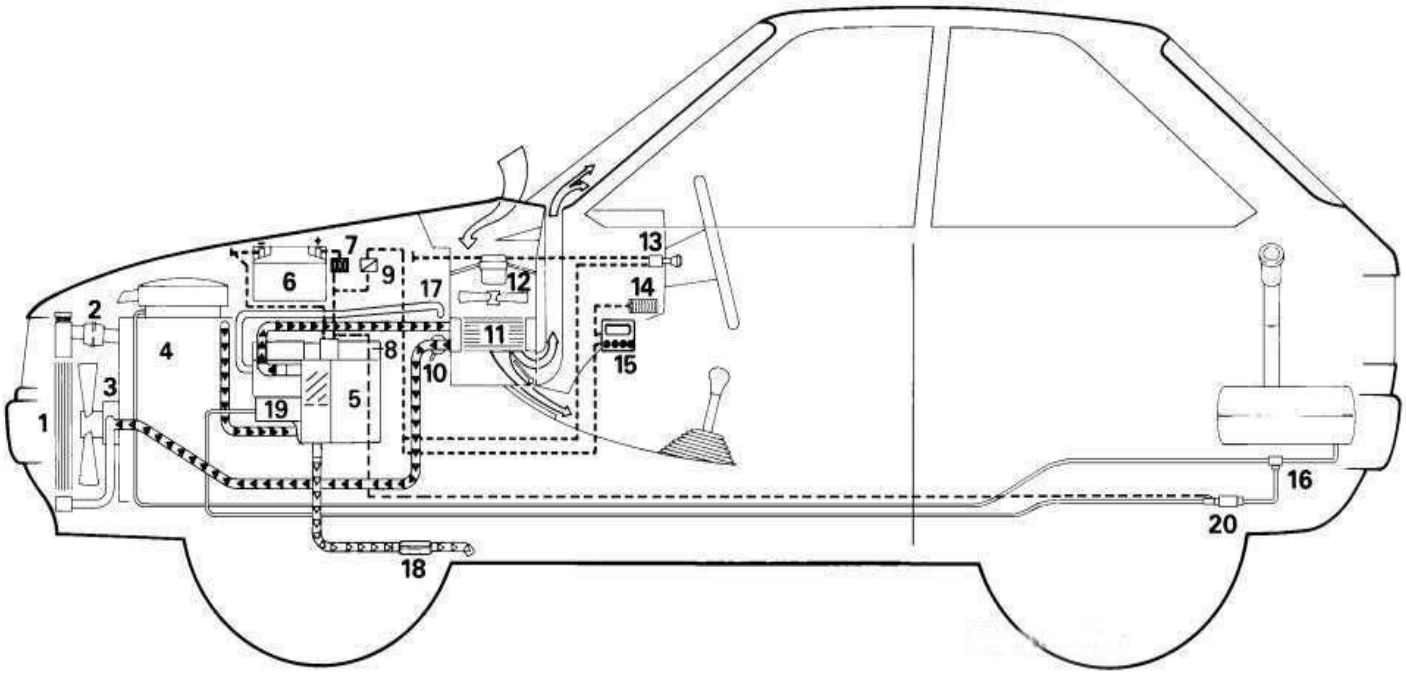
If the surface of vehicle's body is flat, the gasket used must have a diameter of at least 22mm.

You cannot use the self-tapping screws to fix the positioning bracket on the body.

You should professionally and properly install the brackets while observing the minimum bending radius. At the same time, you need to follow the technical regulations.



6. Installation example of car



1	Radiator	8	Heater controller	15	Timer
2	Thermostat of cooling water	9	Blower relay	16	Oil extraction nozzle
3	Water pump(automotive engine)	10	Adjustable valve of air conditioner	17	Air intake muffler
4	Automomotive engine with standard equipment	11	Warm core of air conditioner		Air intake pipe
5	Liquid parking heater	12	Blower of air conditioner	18	Exhaust muffler
6	Storage battery	13	Blower switch of air conditioner	19	Water pump
7	Fuse base	14	Fuse box of vehicle	20	Oil pump

Figure 3:YJH-Q5A Installation example of car

7. Connected to cooling system

Connect the parking heater to the car's cooling system as shown in Figure 3, 4 and 5. The cooling water in the circulation loop must have at least 4 liters.

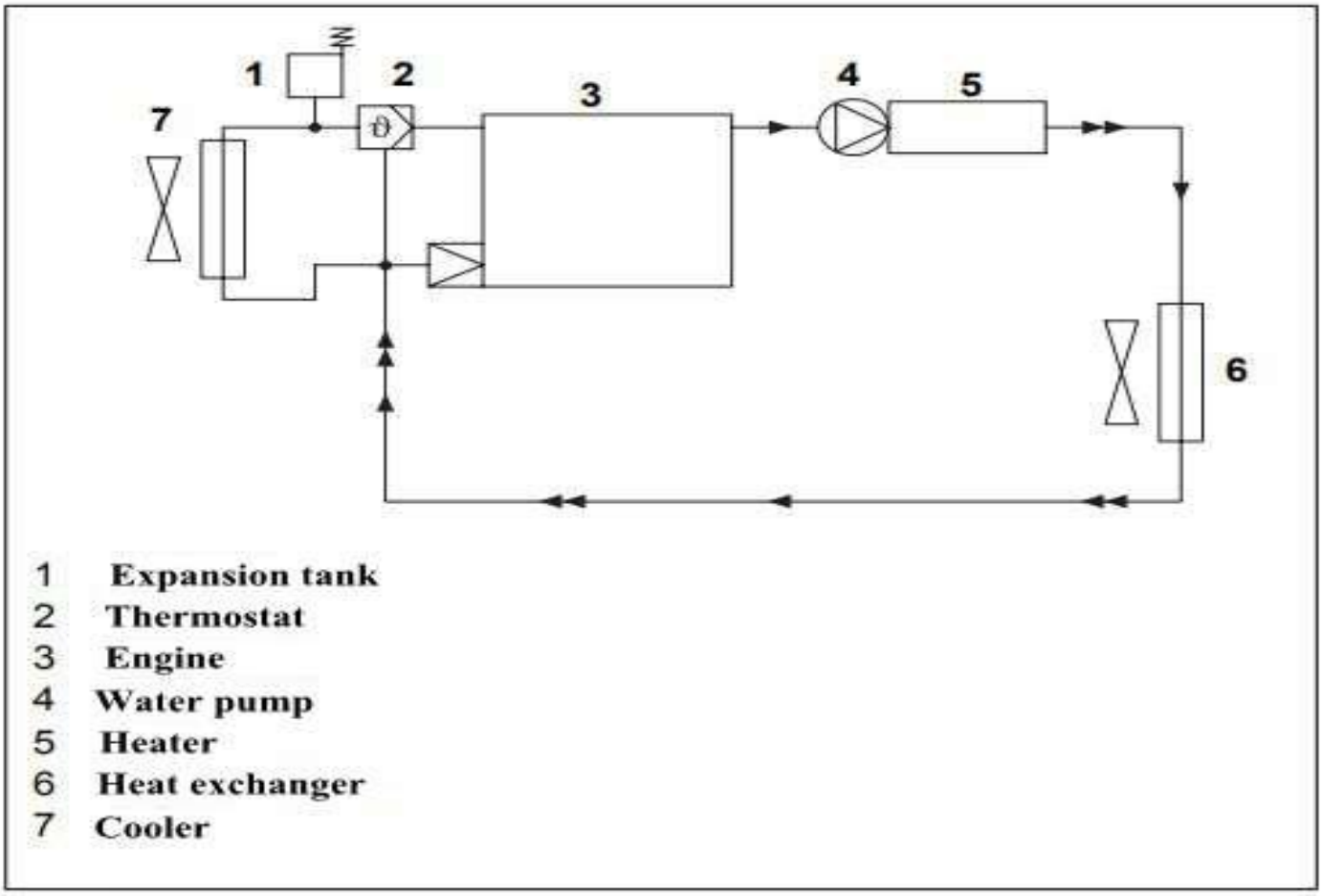


Figure 4: Installed in the engine water circulation loop (Series connection)

The parking heater should be connected to the cooling water circulation loop in the inlet pipe of the car-borne heat exchanger.

Attention:

- You should use an appropriate container to collect spilled cooling water.
- In principle, you should use the water pipes provided by our factory. If you want to use other water pipes, you must meet standards. The water pipes can not have any kinks, and they should be laid up as far as possible so that they can be discharged smoothly. To prevent the water pipes from leaking, you should use the hose clamp to connect the water pipes.
- The position of hose clamp should be installed between the flared caliber of heater and the main unit of heater. Furthermore, the tightening torque of hose clamp must be 2.0+0.5Nm.
- Before using the heater for the first time or after changing the cooling water, you must take care to exhaust the air in the cooling system carefully. The parking heaters and water pipes should be installed to ensure that the parking heater has a good exhaust effect during static conditions.
- Poor exhaustion may cause the fault caused by overheating during operation.
-

7.1 The installation of water pump

The water pump can be installed either in a default position on the heater or installed in the water circulation loop which separated from the heater. Please pay attention to the flow direction of water,(the water outlet port at top and the water inlet port at bottom)

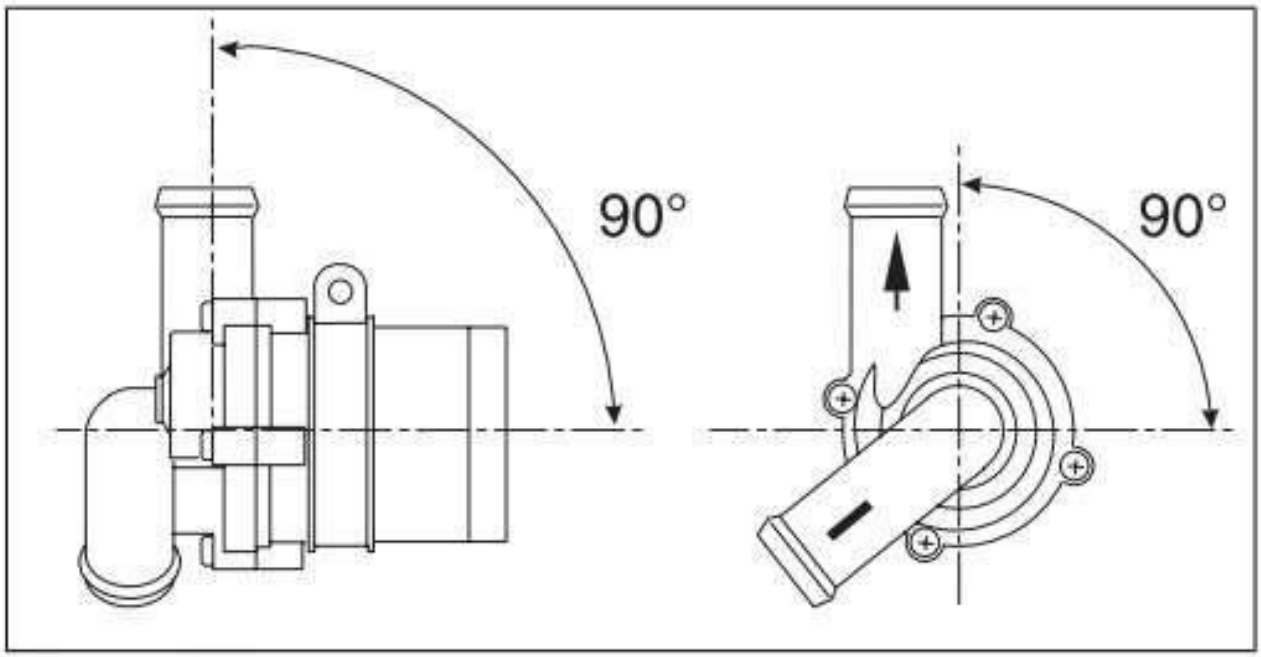


Figure 5: Installation location of water pump(U4847)

In addition, the incorrect installation can lead to the functional failure of the water pump.

The connection of oil pipeline

8.1 Oil line in fuel tank without check valve

You need to connect the oil circuit of the parking heater as shown in Figure 3 to the oil return pipe.

8.2 Oil line system with check valve in oil tank and oil line system with single oil supply

You need to install a connector of oil tank with 90°outlet on oil tank's fittings.(Figure 6)

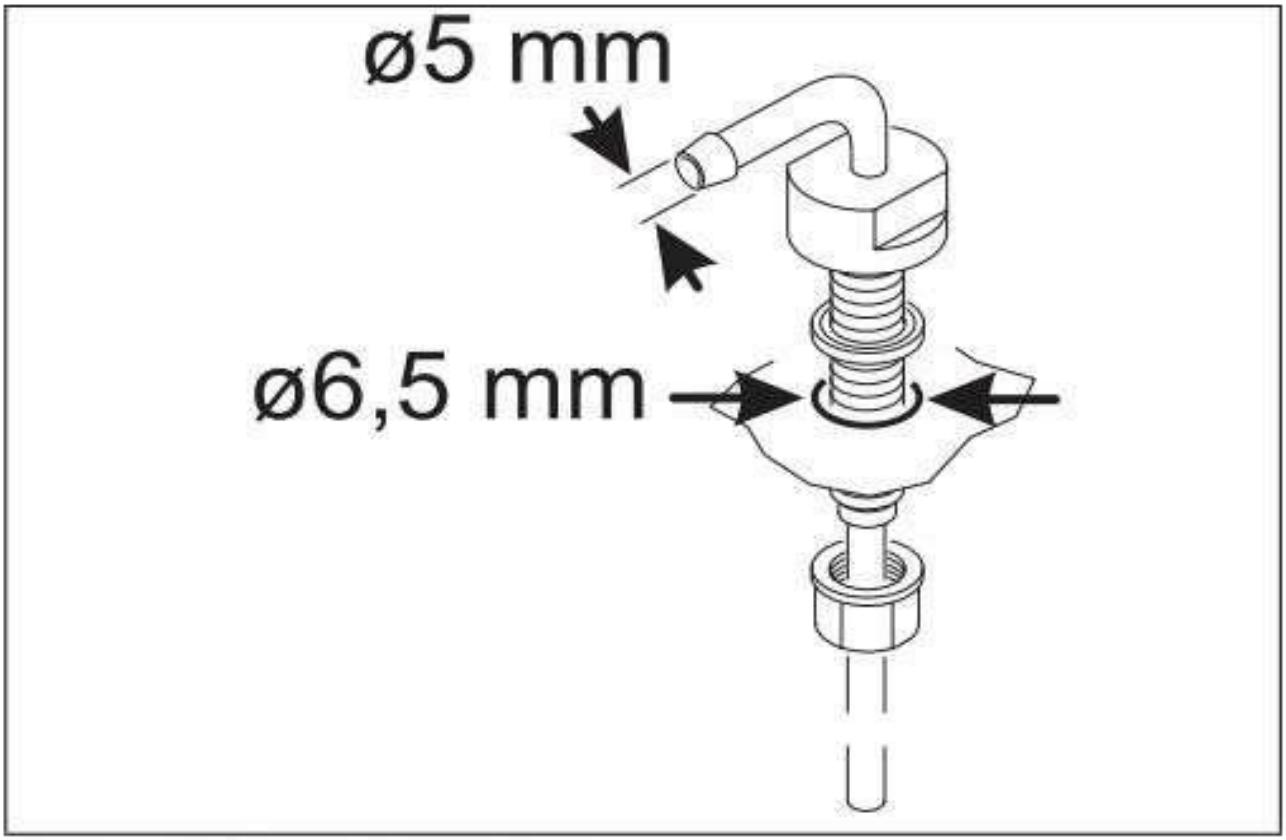


Figure 6: Oil tank's fitting with 90°outlet on

8.3. Oil supply system

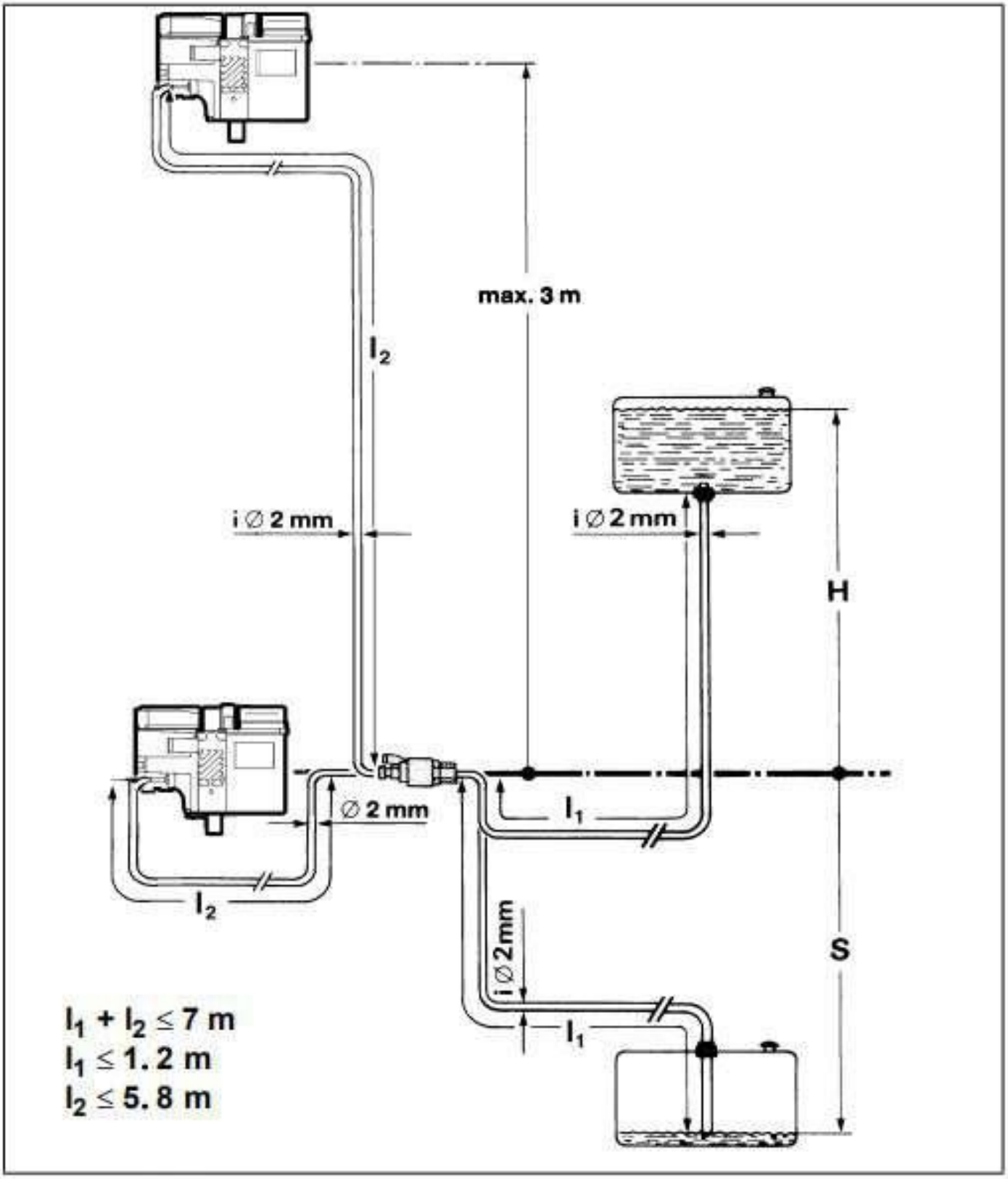


Figure 7: Oil supply system

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The following table shows the allowable pressure values at the oil extraction point.

Maximum oil supply height H(m)	Allowed maximum overpressure in oil pipe (bar)
0.00	0.2
1.00	0.11
Maximum suction height S(m)	**Allowed maximum negative pressure in oil pipe (bar)**
0.00	-0.10
0.50	-0.06
1.00	-0.02

Note:

- The direction of oil flow can usually be identified from the mark on the oil filter.
- If you want to take the oil from the oil supply pipe or the oil return pipe, you must use our factory's device of oil extraction. (Figure 8)
- The installation of oil extraction device is able to allow any air or air bubbles can be automatically discharged to the oil tank.
- The fuel should not be drawn out from nearby regions of the engine. Because the engine is radiating, air bubbles are likely to form in the tubing and cause operational faults.
- If the parking heater is installed in an electric spray car, you need to make sure whether the oil pump is installed inside or outside the oil tank. In addition, if the oil pump is installed inside the oil tank, you have to take the oil from the oil return pipe. For this purpose, you must ensure that the oil return pipe has a sufficient length to the bottom of the oil tank, otherwise the oil return pipe have to be extended.

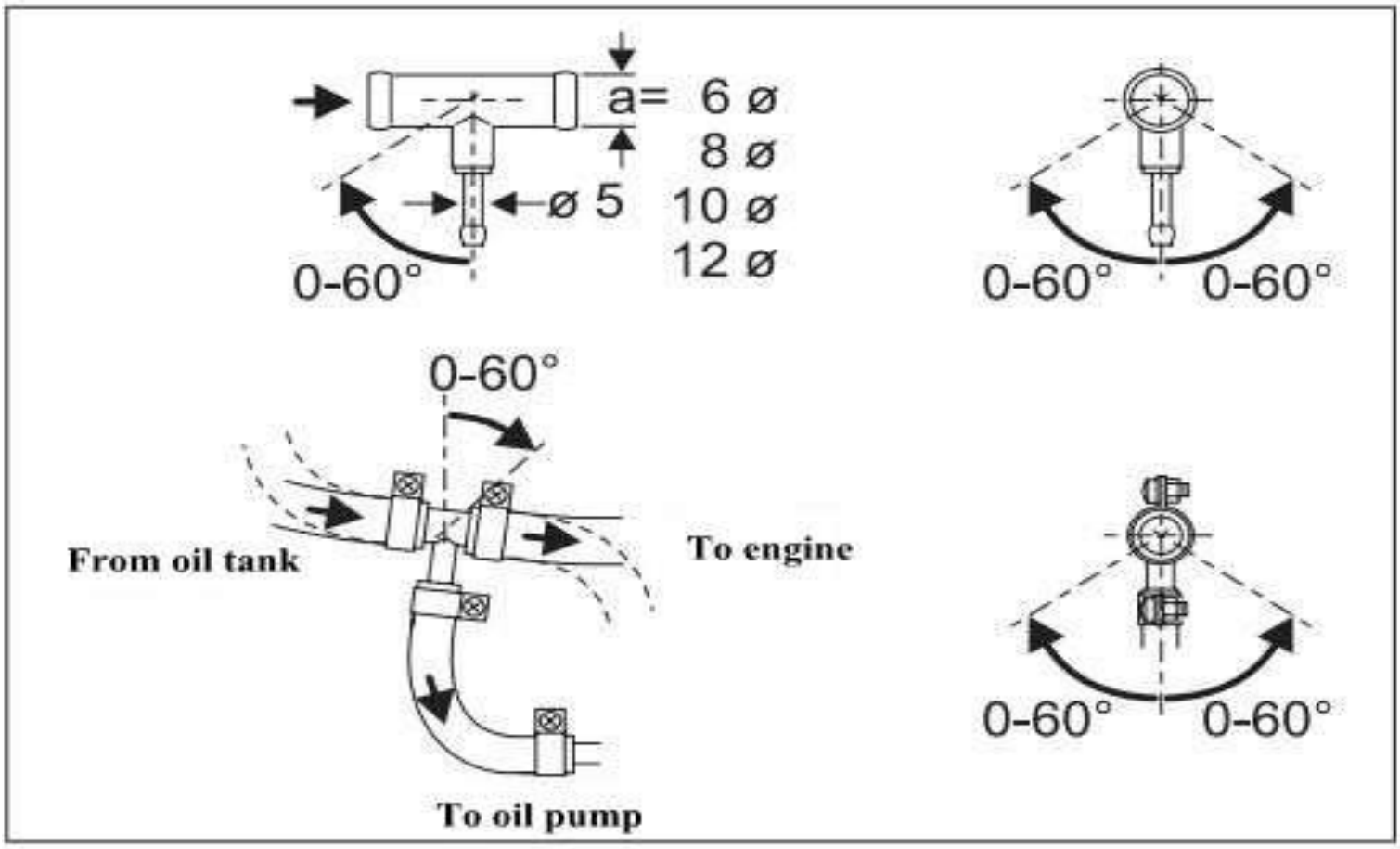


Figure 8: Oil extraction device

8.4 Oil pipeline

Note:

You need to tighten the hoop of oil pipeline with 1.0+0.4 Nm of tightening torque.

Attention:

- Because it cannot be confirmed that the oil pipeline is continuously laid upwards in most situations, the inner diameter of the oil pipeline must not exceed a established size. And if the oil pipeline is sagging or laying down slantingly, air bubbles will accumulate in oil pipeline with an inside diameter greater than 4 mm, then causing failure. All in all, if you use the diameter shown in Figure 7, it is guaranteed that no air bubbles will form. The oil pipeline from the oil pump to the parking heater should not be laid obliquely downwards.
- In order to avoid sagging, you should use the latest technical methods to fix the oil pipeline safely.
- When installing the oil pipe, you should protect the pipe from hitting by gravel and high temperature (exhaust pipe).

8.5 Connecting two oil pipelines with a hose

Figure 9 shows how to properly connect the fuel hose with a hose.

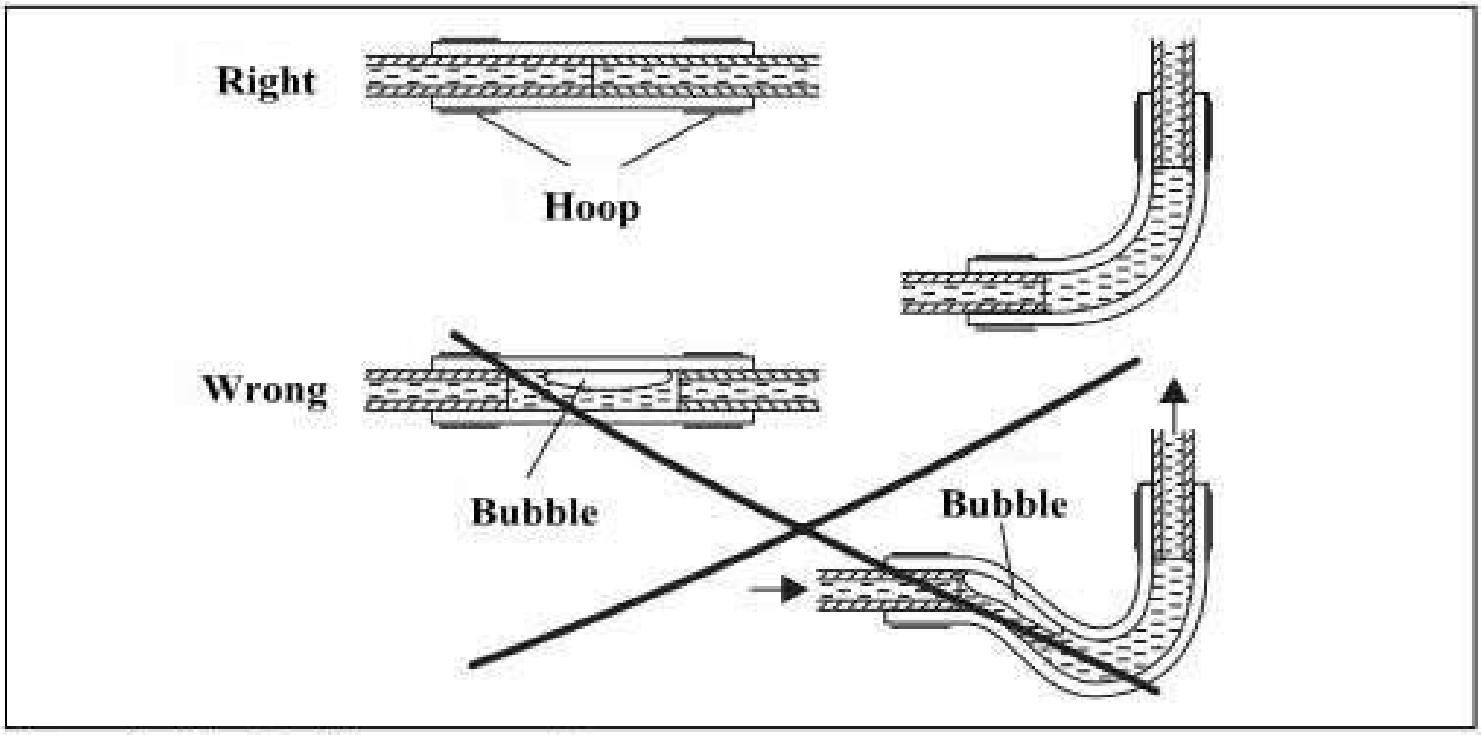


Figure 9: Pipeline/Hose connection

8.6 Oil pump

The oil pump is a combined system that combined by oil delivery, oil supply metering and fuel cut-off, and it is bound to the relevant installation standards (see Figures 7, 10, and 11).

8.6.1 Installation location

- Before you install the oil pump, make sure that the maximum pressure at the oil extraction point cannot exceed 0.2 bar.
- It is recommended to install the pump in a low-temperature location. The ambient temperature cannot exceed +20°C during operation.
- The oil pump and oil pipe must not be installed within the heat radiation range of hot car parts. You can use a heat shield if it is necessary. And the best installation location is near to the oil tank.

8.6.2 How to install and fix the oil pump

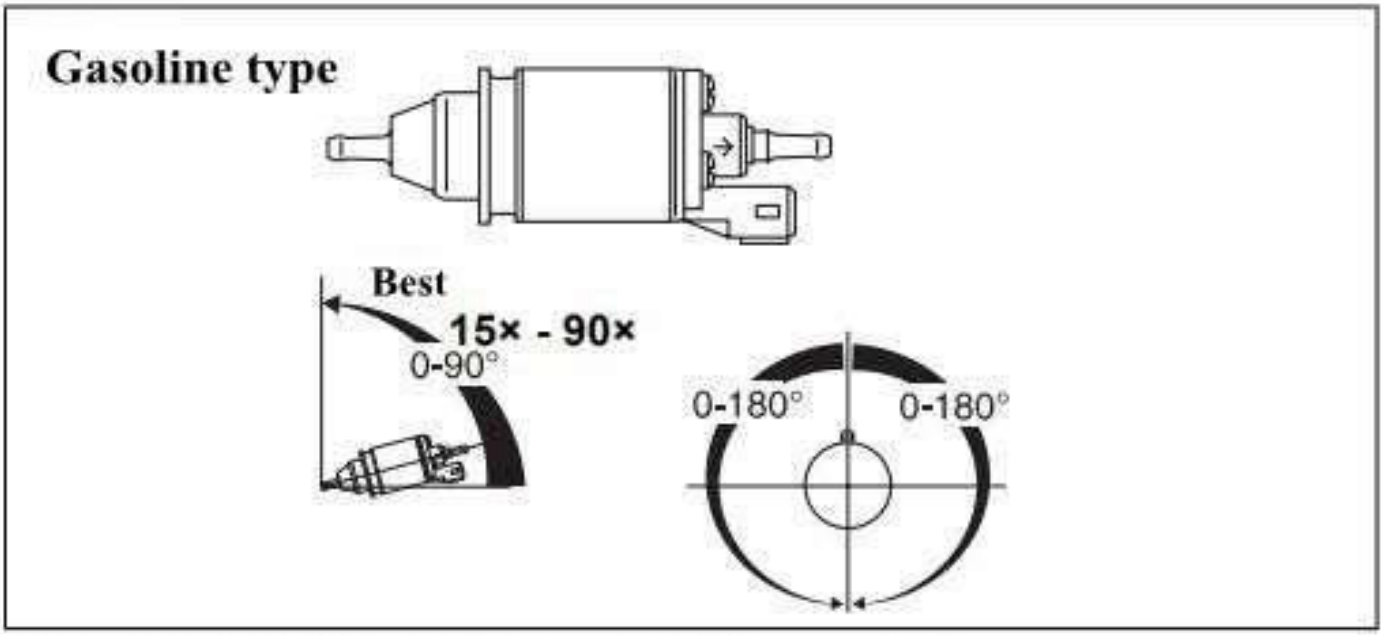


Figure 10: The installation location of oil pump DP 2

You should use a shock-absorbing device to fix the oil pump. In order to ensure a good self-venting effect, the installation location should meet the requirements of Figures 10 and 11.

8.7 The Label

A label “Turn off the heater when refueling” should be stuck to the filler port. In addition, you can also stick it in a position easily visible to the driver.

9. Supply system of combustion air

- The combustion air inlets should be installed in a location that will not be blocked by rubbish. Please do not let the combustion air inlets face the direction of travel. And you must use the air intake duct by combustion air.
- The combustion air must be drawn at a low temperature (The temperature is less than or equal to 20°C), splash protected location above the vehicle's wading line.
- It is not allowed to draw combustion air from the space where people are staying. Besides, if the heater is installed in a closed area, the vent diameter should be at least 3 cm^2.
- When the parking heater is installed in a common space near the oil tank, the combustion air must be drawn from outside the vehicle, and the gas of combustion must be discharged outside the vehicle. At the same time, the design of opening should be prevented from splashing by water.

9.1 Air intake muffler

The air intake muffler is installed downwards with an angle between 0°and 90°.

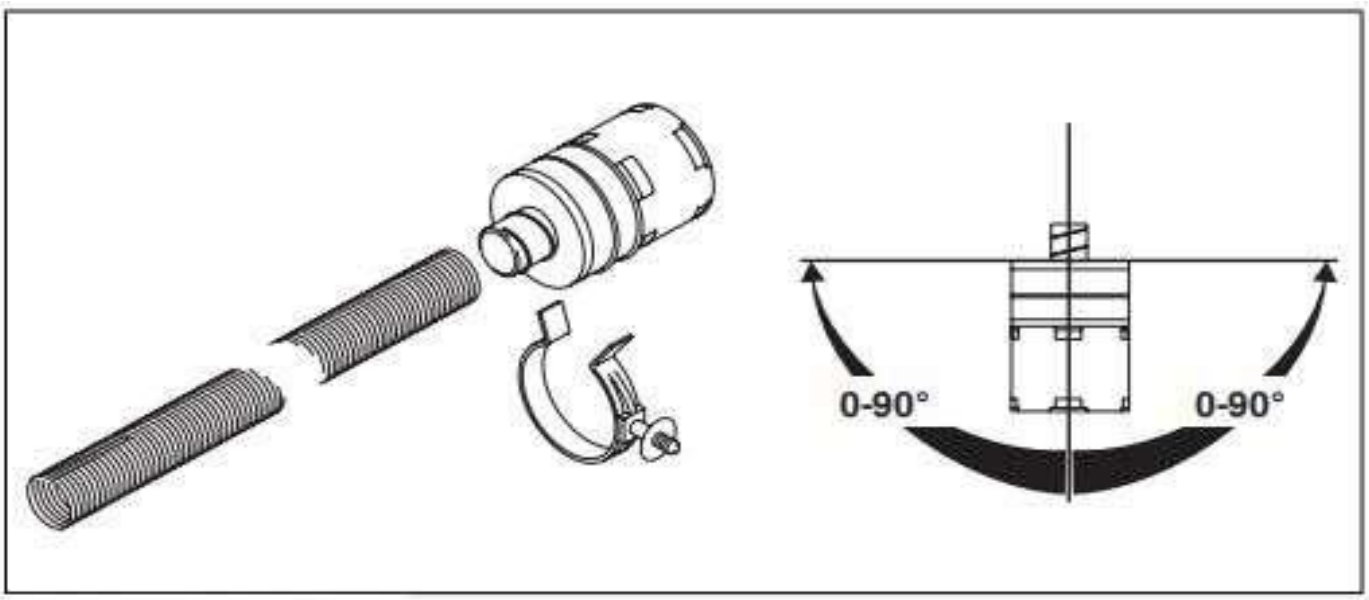


Figure 12: Installation location of air intake muffler

Notes:

- The maximum length of the air intake pipe is 400 mm, and the side with grooves (18mm approximately) is attached to the inlet of the parking heater. And you need to fix it with the hoop.
- At the side without grooves of the intake pipe, please screw the intake muffler to the stop

position (there is no need to fix it with a hoop).

Attention:

- Pay attention to maintain a sufficient distance from the exhaust system!
- The intake muffler should be fixed in place according to the installation situation using the included mounting clamps or other mounting devices that comply with the state-of-the-art technology.

9.1.1 Fix air intake muffler with mounting clip

----Drill a hole with a diameter of 6.5 mm in a proper place.

----Press the mounting clip into the hole.

----Install the air intake muffler into assembly clip.

10. Exhaust pipe

- Multiple bends(the angle is 270°, the minimum bending radius is 50 mm) can occur when laying exhaust pipes(the inner diameter is 22mm)
- The total length of the exhaust pipe should not be less than 500 mm. Meanwhile, the maximum tube length is 1000 mm.
- You'd better install the exhaust muffler near the parking heater, but please keep it at least 200 mm of distance from the parking heater.
- It is not allowed to install the exhaust muffler near the air intake port. And It is not allowed to fix the exhaust muffler and exhaust pipe to the temperature-sensitive vehicle parts and must maintain a sufficient distance from it, at least 20 mm.
- The opening of the exhaust pipe can not be blocked. And, the opening of the exhaust pipe can not face the vehicle parts and should have access protection. At the same time, the distance between the opening of the exhaust pipe and the ground must not be less than 0.2m (> 0.2m).
- The muffler must be used while the parking heater is running.

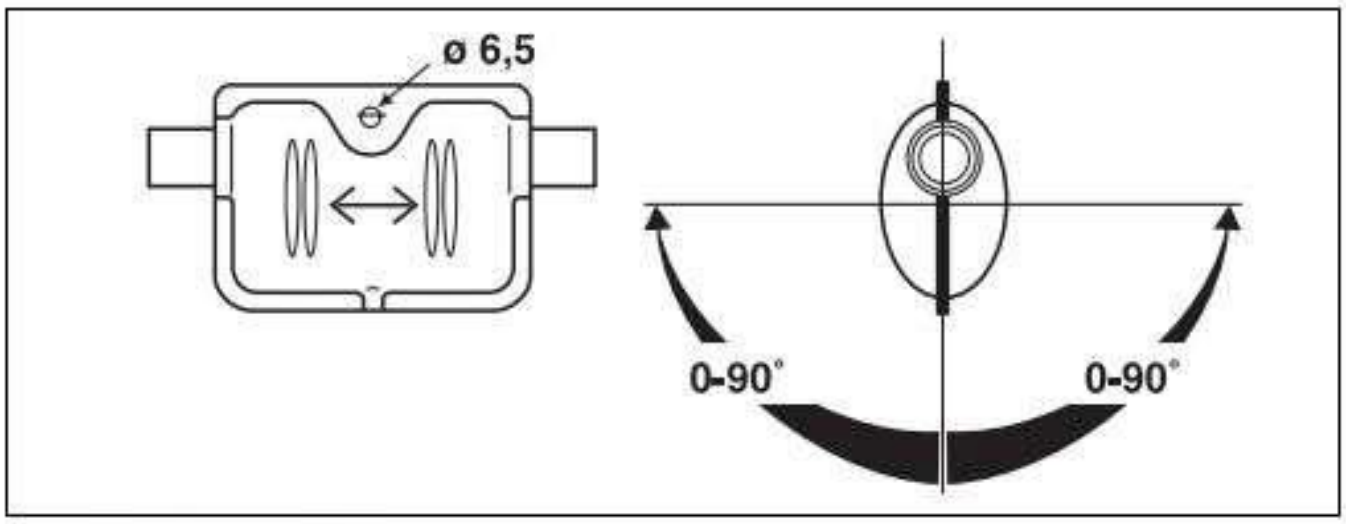


Figure 13: Exhaust muffler (Exhaust direction is arbitrary)

- The opening of the exhaust pipe cannot towards the driving direction. (Figure 14)

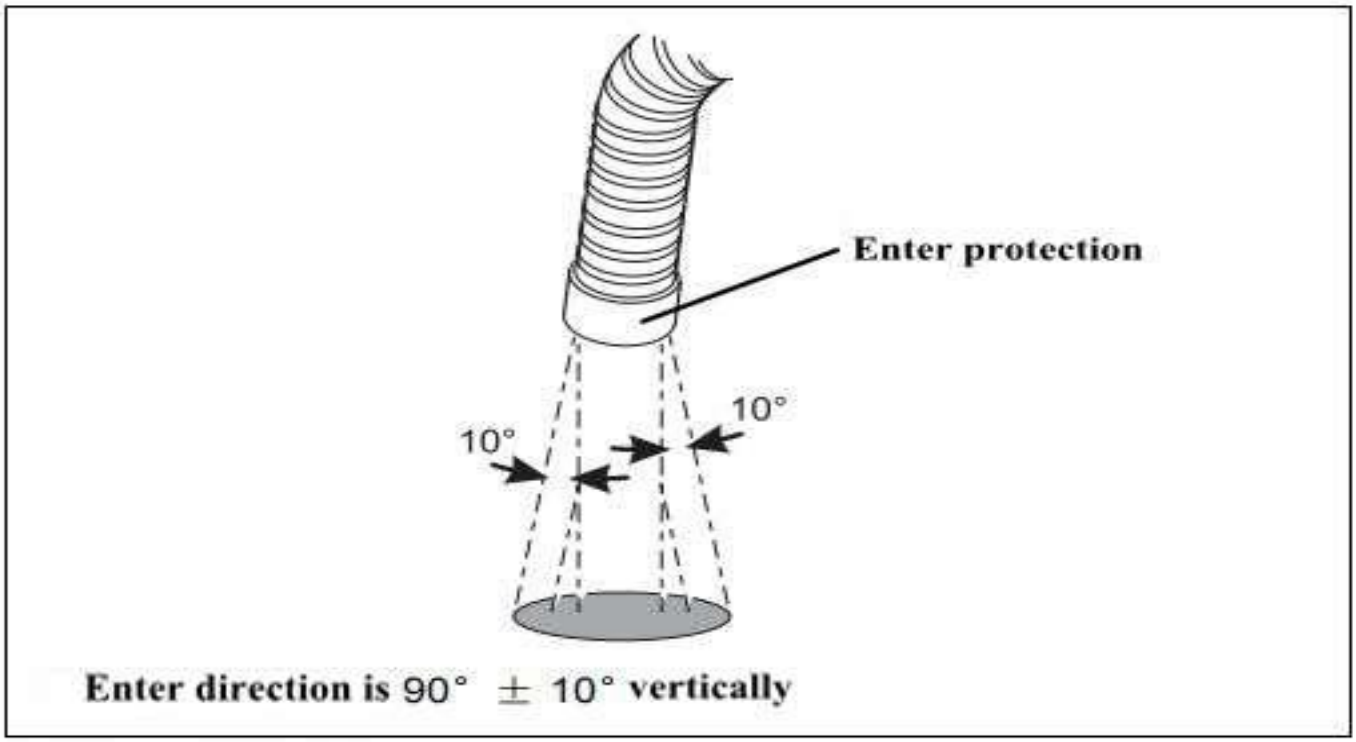


Figure 14: Installation location of the exhaust pipe's opening

- You need to use a non-alloy steel hard pipe or alloy steel flexible pipe with a thickness of 1.0 mm or more as the material for making the exhaust pipe.

Note:

Condensate water in the exhaust pipe must be discharged immediately. If necessary, a condensate drain hole can be provided.

11. Electrical connection

11.1 Control device/Connection of the parking heater

Please connect the parking heater's electrical wiring as shown in Figure 17.

11.2 The installation and connection of the timer

Please install the timer as shown in Figure 15. And a drilling template is attached to this device! The timer should be connected as shown in Figure 17.

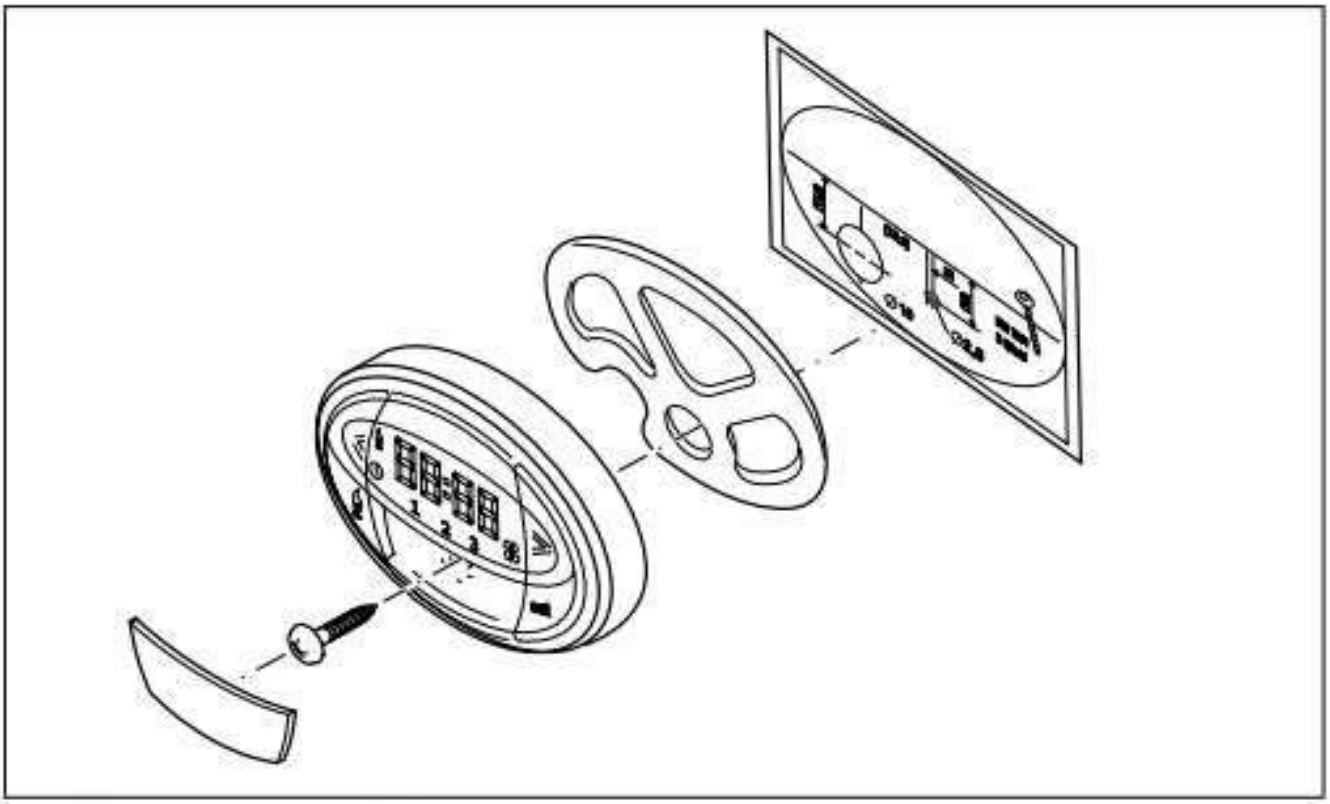


Figure 15: Installation location of timer

Note:

Do not push the display panel during installation! ! !

This can cause damage to the LCD screen.

11.3 The connection of summer/winter transfer switch

Note:

- Please connect the summer/winter transfer switch shown in Figure16 and Figure17.

The brown and purple wires must be inserted into the insulating bush!

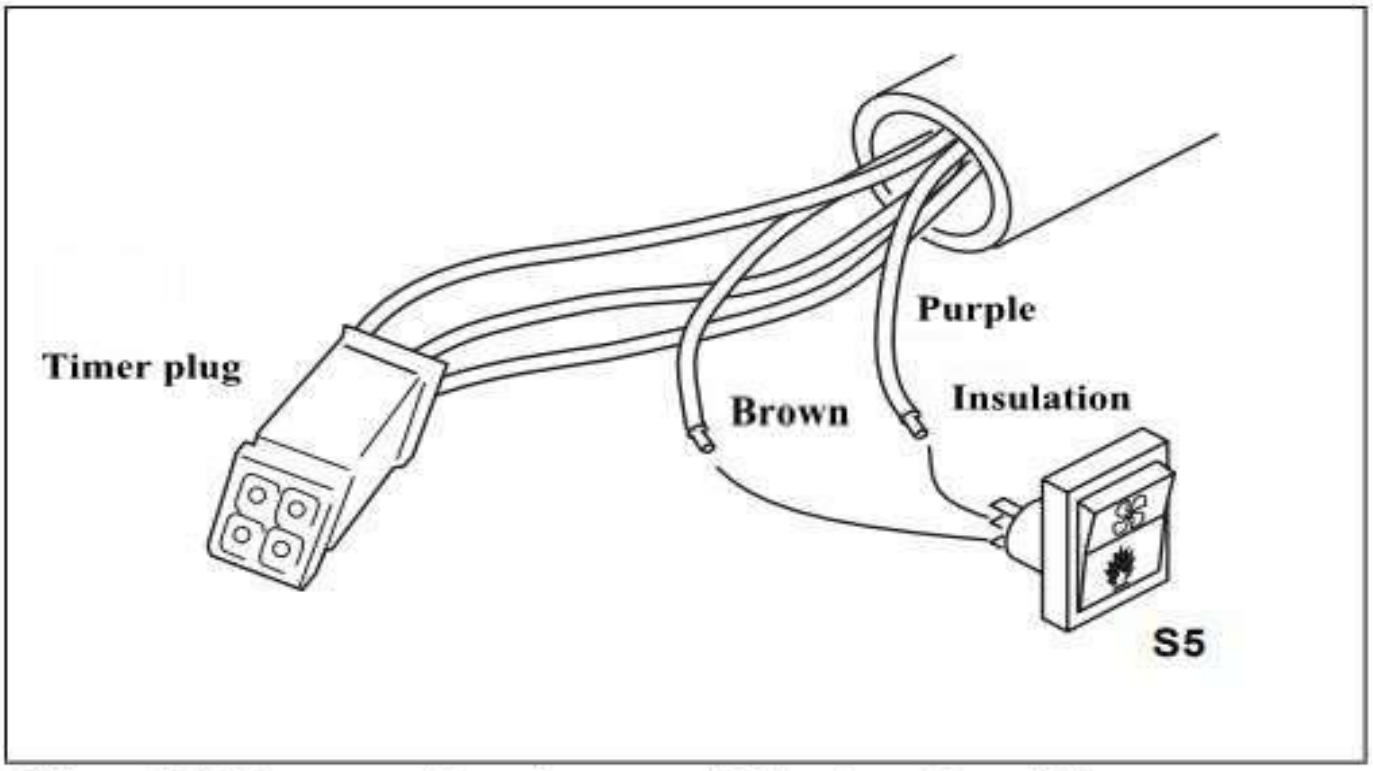


Figure 16: The connection of summer/winter transfer switch

11.4 Car blower

The car blower is controlled by the relay of car blower, shown in Figure 17.

Note:

Only one blower relay can be connected to the interface on the control unit (the parking heater) (Imax = 0.5 A)

12. Circuit diagram

12.1. Circuit diagram legend

- Diagnostic connection
- Outside temperature of vehicle
- The blower fuse of vehicle is installed in the car
- Optional ventilation function

Cross section of cable		
	< 7.5 m	7.5 - 15 m
	0.5 mm^2	0.75 mm^2
	0.75 mm^2	1.5 mm^2
	1.0 mm^2	1.5 mm^2
	1.5 mm^2	2.5 mm^2
	2.5 mm^2	4.0 mm^2
	4.0 mm^2	6.0 mm^2

Color	
bl	blue
br	brown
ge	yellow
gn	green
gr	gray
or	orange
rt	red
sw	black
vi	purple
ws	white

Project	Name	Annotation
A1	Heater	YJH-Q5A
A2	Controller	
A3	Connection box	
B2	Temperature Sensor	
E	Glow plug/Flame sensor	
F1	Fuse 20A	Fuse
F2	Fuse 1A	Fuse
F3	Fuse 25A	Fuse
H1	LED (To project P)	Operation instructions
K3	Relay	Blower
M1	Motor	Intake fan
M2	Motor	Water pump
M3	Motor	Blower
P	Digital timer	Used for timing opetation mode
S1	Blower switch	S1 or S2, depends on the vehicle
S2	Blower switch	S1 or S2, depends on the vehicle
S5	Switch	Summer/winter transfer switch
X1	Connector(six-pin)	Waterproof
X2	Connector(two-pin)	Waterproof
X3	Connector(two-pin)	Waterproof
X4	Connector(two-pin)	Waterproof
X5	Connector(two-pin)	Waterproof
X6	Connector(two-pin)	Waterproof
X9	Connector(four-pin)	
Y1	Oil pump	

YJH-Q5A

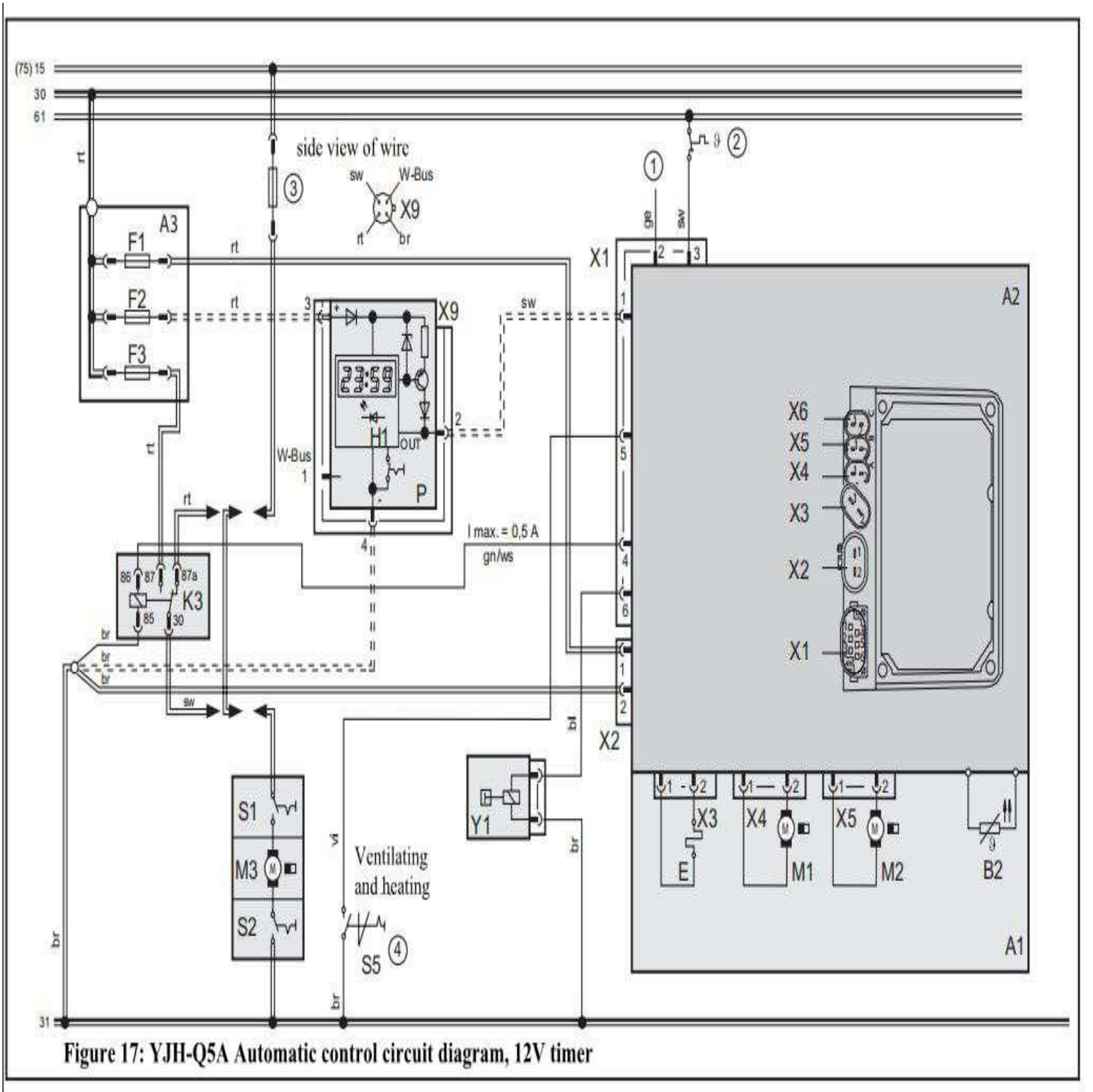


Figure 17: YJH-Q5A Automatic control circuit diagram, 12V timer

13. Start for the first time

Notes:

- Please pay attention to the safety instructions in the operation and maintenance instructions!
- Please read the operating and maintenance instructions before starting the parking heater for the first time.
- Please exhaust the water circulation loop and the fuel supply system carefully after installing the parking heater. In this process, please pay attention to the regulations of the car manufacturer
- Please check the sealing and fixing of each connection of water and oil during commissioning of the parking heater. In addition, if the parking heater goes wrong during operation, you must make a fault detection.

14. Common fault

14.1. Fault locking due to the parking heater failure

- If no flame is formed, the maximum oil supply time is 180 seconds.
- If the flame is extinguished during operation, the oil supply time is up to 85 seconds.
- If overheating occurs (the thermostat is triggered), the oil supply stops immediately.

In each condition, the parking heater will continue to run for 120 seconds after the fault is locked. In addition, affected by the software version in the control device, the time will be different.

Attention:

There is no information is displayed in the condition of a fault shutdown due to the overheating of parking heater.

14.2. Fault unlocking of parking heater after the fault locking

Please unlock the fault according to the operation and maintenance instructions.

15. Technical parameter

15.1. Technical parameter of YJH-Q5A

If there is no limit value, the data shown in the table is generally allowable tolerance of ±10% at ambient temperature +20°C and rated voltage.

15.1.1. The oil of YJH-Q5A(Gasoline)

You can use the gasoline specified by the automotive manufacturer as the oil for the parking heater.

15.1.2. The oil of YJH-Q5A(Diesel)

You can use the diesel specified by the automotive manufacturer as the oil for the parking heater. Moreover, the parking heater must be operated for approximately 15 minutes when you want to replace antifreeze oil so that the oil pipe and the oil pump are filled with new oil. And the negative impacts caused by additives are not clear.

YJH-Q5A

Water pump	**4847**
Flow rate with flow resistance close to 0.1 bar	**About** 900 l/h
Rated voltage	12 V
Operating Voltage	10.5 ... 15 V
Rated power consumption	14 W
Size of water pump	Length 95 mm Width 61 mm Height 61 mm
Weight	0.3 kg

YJH-Q5A Technical Parameters

Parking Heater	**Operation**	**YJH-Q5A-B**	**YJH-Q5A-D**	**YJH-Q5A-D**
Structure type		Liquid parking heater with evaporative burner		
Heating capacity	Full load Partial load	5.2 kW 2.5 kW		
Fuel		Gasoline	Diesel	Diesel/PME
Fuel consumption	Full load Partial load	0.70 l/h 0.34 l/h	0.61 l/h 0.30 l/h	
Rated voltage		12 V		
Operating Voltage		10. 5 ... 15 V		
Rated power consumption (Without water pump, car blower)	Full load Partial load	28 W 18 W		
Allowed ambient temperature: Heater: --- Run --- Storage Fuel pump --- Run		-40°... +60°C -40°... +120°C -40°... +20°C		-40°... +60°C -40°... +120°C -20°... +20°C
Allowed operating pressure (Cooling water)		0. 4 ... 2.5 bar		
Capacity of heat exchanger		0.15 L		
The minimum amount of cooling water in the water route		4.00 L		
The minimum water flow in heater		250 l/h		
CO2 content in exhaust gas (Allowable range of function)		8 ... 12.0 % (Volume percentage)		
Size of heater (Allowance is ± 3 mm)		Length 214 mm Width 106 mm Height 168 mm		
Weight		2.9 kg		

* If you only use diesel/PME blended fuel, the ratio of PME must be less than 50%.

II. Working voltage and temperature: DC24V (or DC12V), -41℃ — 50℃

III. Control Panel

Fig. 1

From Fig. 1, we can see that there are four buttons on the control panel (⏻, OK, SET, ↑) and one displayer. All the buttons are touch switches with indicating lights. Here below are the functions of the buttons:

"⏻", On / Off and log-out.

"OK", to confirm the settings (a switch-over button for manual-control caloric value and auto control of caloric value)

"SET", to set parameters and switch over the settings.

"↑" Adjust the set parameters

"⏻", the red light is to indicate the power, which will be on once the controller is connected with the power.

"OK" "SET" "↑", the green light is to indicate the "on" or "off", if it is on, it means that the controller is started up and begins to work.

"OK" "SET", the indicating light in the middle (in the shape of fame, in blue); if the light is on, it means that the heater is being working normally; if the light is flashing, it means that the heater suffers a default.

IV. On/Off

Once the heater is powered on, press " " then the heater is started. Under normal situation, the interfaces are shown in a good order like this:

Fig. 2

Fig. 3

When Fig. 3 is available, the heater is being working normally. If there is a default, you can see the interface as follows:

Fig. 4

If Fig. 4 is available, the "fame-shape" light (the blue light) will flash, which means that the heater suffers a default. (The default is not suffered by the controller).

After start-up, press "⏻" long for shut-down. On the display screen, you can see "Being shut down, please wait." and "Do not turn off the main power". Since the shut-down needs to have the heater cooled down, it is not allowed to turn off the main power. Once the heater is shut down, the fame-shape light (the blue light) will be off and the displayer closes automatically.

V. Settings

1. Time setting

Power on the controller and long press "⏻" to start the controller. On the display, you can see "Being powered on or standby" or "the heater is being working normally". Then press "SET" to set the time. See Fig. 5.

Fig. 5

Press "↑" to select the value for the flashing items, (press "SET" to switch over the flashing items, once the expected value is selected, press "OK" to confirm the setting.

2. Set timing start-up

The same as the operation mentioned above, press "SET" to switch over to "set timing start-up", see Fig. 6.

(When leaving the factory, the timing start-up is at 06:30).

Fig. 6

Press "↑" to select the value for the flashing items, (press "SET" to switch over the flashing items, once the expected value is selected, press "OK" to confirm the setting.

3. Set constant temperature (for your option)

For FJH series heaters, constant temperature control is for your option.

The same as the operation mentioned above, press "SET" to switch over to "set constant temperature", press "↑" to get the value that you want and then press "OK" to confirm. After this, the controller will adjust the caloric value automatically according to the set temperature, which will keep the temperature constant.

Note: When setting the parameters, each parameter shall have its set value confirmed respectively by pressing "OK".

Once the setting is confirmed by pressing "OK", there will be a reminder like "the time has been set" or "the timing start-up has been set". That is the button "OK" can only confirm the set parameters one by one.

For example, if two parameters, the time setting and timing start-up setting, are to be set, it is mandatory to:

1. Press "SET" and "↑" to set the time, then press "OK" to confirm the time;

2. Press "SET" and "↑" to set the start-up time, then press "OK" to confirm the start-up time.

The parameters can not be set in one go, which can not be confirmed by "OK" in one go either.

VI. Timing start-up

When the heater is on, set the start-up time. (If there is no need to change the time after setting, a second setting is not required. That is the controller has a function of "power-off memory" --- after being powered off, the parameters will be saved). When heater is under "standby", long press "↑" to access to timing start-up. See the interface shown in Fig. 7.

Fig. 7

The first time (06:30) is the timing start-up while the second time (07:01:45) is the current time. When start-up time is available, the heater will be started automatically, which will be shut down automatically after working for 55 minutes in total. (The shut-down will happen when the total working time is 55 minutes, if the heater has a standby because of high temperature, the standby period will not be included in the 55 minutes) .

VII. Manually control caloric value of the heater (for your option)

For FJH series heater, the function "manually control caloric value of the heater" can be for your option.

Press "OK" to access to the interface "manually control caloric value of the heater", press "↑" to adjust the caloric value. There are four different grades of caloric value, which are shown via the icon "▂▄▆".

"▂" is the first grade (the lowest)

"▂▄" is the second grade.

"▂▄▆ " is the third grade (the highest)

VIII. Wireless remote control (for your option)

Wireless remote control can be for your option according to actual demands. That is the heater can be under wireless remote control. The controller and the wireless receiving module shall be encrypted so that they will not be wrongly triggered. The remote control distance can be customized according to actual demands (the default distance is 100m at an open field).

Remote control: the heater shall be powered on, press the "ON" of the controller so the heater will be started; press "Off" of the controller or "standby" on HX-2, the heater will be stopped.

Note: If the remote controller is on, the heater can be stopped via remote control or pressing "standby" on HX-2; if the heater is started via HX-2 (press "standby" on HX-2), the heater shall be stopped by HX-2 (press "standby" on HX-2).

IX. Tips and troubleshooting

1. If "timing start-up" is required, the power of heater can not be turned off after the timing start-up is available; **therefore, the heater's power can not be controlled by the vehicle key. It is suggested that the heater shall have its power supplied independently so that the power of other parts can be turned off when the driver leaves.**

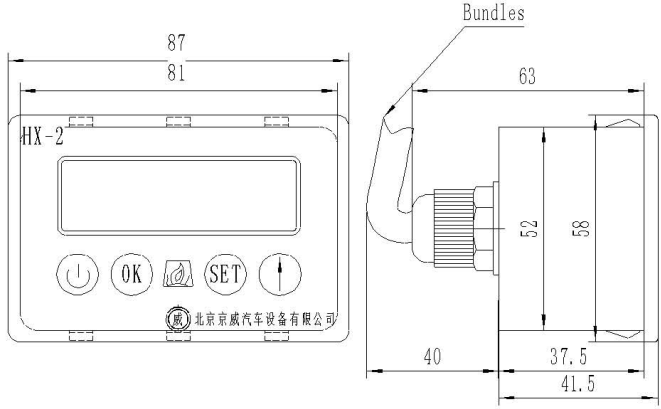
2. Water-proof shall be highly cared about. Do not put a water cup near the display panel, otherwise, the controller will be damaged by water.

3. In order not get the buttons wrongly touched and triggered (like they are triggered when mopping the panel), **please long press "⏻" to power on or power off. When start the timing start-up, it is required to long press "↑".**

4. If the power indicating light is not on after power-on, please check that whether the power is well connected. Besides, on the power positive wire, there is an inserted **insurance** for vehicle use. If the fuse is broken, there will be a short circuit or an over current.

5. The controller has a button-type battery CR2032, which will keep the time going when the storage battery is not available.

X. Installation Drawing



Note: 1. It is suggested that the reserved height under the instrument platform shall be more than 85 so that the installation will be more convenient.

2. It is suggested that the opening of the instrument platform shall be 81.5*52.5.

HX-2 Display Fault Code Table (The indicator light flashes in a binary code to indicate the type of fault. The indicator light flashes 5 times each time, the flashing time is divided into two kinds of time: long time and short time, a long time is 1s which represents 1, and a short time is 0.2s which represents 0, the interval time is 0.5s, the interval time of each group is 3s.)		
Fault Type	Fault Code	Fault Description
FAULT 00	00000	Open circuit of the combustion sensor
FAULT 01	00001	Load short circuit
FAULT 02	00010	The voltage of the power supply is too high
FAULT 03	00011	The voltage of the power supply is too low
FAULT 04	00100	Short circuit of the combustion sensor
FAULT 05	00101	Open circuit of the overheating sensor
FAULT 06	00110	Short circuit of the overheating sensor
FAULT 08	01000	The self-checking current for the electromagnetic pump is too large
FAULT 11	01011	Short circuit of the water temp. sensor
FAULT 12	01100	Open circuit of the water temp. sensor
FAULT 13	01101	Fail to ignite
FAULT 14	01110	Disruption in combustion
FAULT 18	10010	Open circuit of the ignition plug
FAULT 19	10011	The self-checking current for the ignition plug is too large
FAULT 21	10101	The self-checking current for the main motor is too large
FAULT 22	10110	The loop current for the water pump is too large
FAULT 25	11001	The air pressure value is too low
FAULT 26	11010	The air pressure value is too high
FAULT 27	11011	The heater is overheated
FAULT 29	11101	Motor rotation is not detected
FAULT 30	11110	Heater burns without cooling
FAULT 32	11111	Feedback signal is not detected