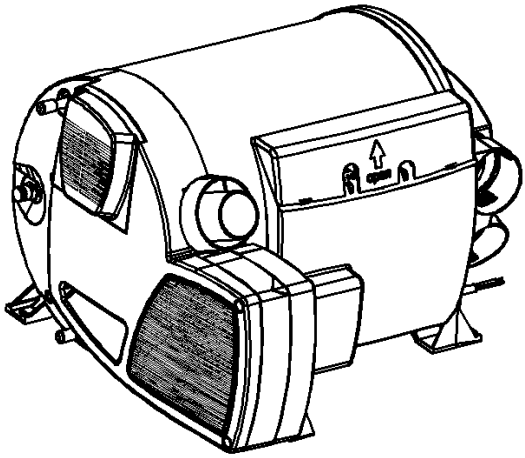
**6KW Diesel Air & Water Integrated Heater**

**Technical Description, Installation, Operation and Maintenance Instructions**



| Production Type | | Order No. |
| --- | --- | --- |
| Diesel Air & Water Integrated Heater | DC12V/220VAC | 4W200512C11 |

Version: June 14, 2019

**Foreword**

**Thank you for using the JP parking heater**

This manual describes the technical description, installation, operation and maintenance instructions for the parking heater. To ensure the correct use of the heater please read this manual carefully before installation and use. Please keep it properly after reading it. For review.

**Note:**

- The contents of this manual are subject to change without prior notice, but the instructions are guaranteed to be consistent with the products purchased.
- we try our best to express the problems that users should know through the instructions. If you have questions or find something wrong, please contact us directly.
- When the user unpacks for the first time, check the main unit and accessories against the packing list. If you find any problems, please contact the dealer immediately.
- If there is a problem in use, please contact the company's marketing department or our authorized customer service station. We will be happy to help you.

**Please carefully save the after-sales service warranty sheet and provide feedback as required. This sheet is the only valid proof of after-sales service.**

**Note:**

**Must be installed and used in accordance with the requirements of the manual to ensure long-term use of the product!**

**2019 06 14 Edition Subject to Change**

**1.Application**

FJH-4/1C-E Model Air & Water Integrated heater (hereinafter referred to as heater) is a special heater for caravan that integrates hot water and warm air. This heater cannot be used in bus or dangerous goods carriers.

**2. Main Technical Data**

| | | |
|---|---|---|
| **Rated Voltage** | DC12V | |
| **Operating Voltage Range** | DC10.5V～16V | |
| **Short-term Maximum Power Consumption** | 8-10A | |
| **Average Power Consumption** | 1.8-4A | |
| **Fuel** | Diesel | |
| **Diesel Heat Power (W)** | 2000 | 4000 |
| **Fuel Consumption (g/H)** | 240 | 510 |
| **Quiescent Current** | 1mA | |
| **Warm Air Delivery Volume m3/H** | 287max | |
| **Water Tank Capacity** | 10L | |
| **Maximum Pressure of Water Pump** | 2.8bar | |
| **Maximum Pressure of System** | 4.5bar | |
| **Rated Electric Supply Voltage** | ～240V | |
| **Electrical Heating Power** | 900W | 1800W |
| **Electrical Power Dissipation** | 3.9A | 7.8A |
| **Working (Environment) Temperature** | -25℃～+80℃ | |
| **Working Altitude** | ≤1500m | |
| **Weight (Kg)** | 15.6Kg | |
| **Dimensions (mm)** | 510×450×300 | |
| **Protection Level** | IP21 | |

Table 1

**3. Function**

The heater is a hot water and warm air integrated machine, which can provide domestic hot water while heating the occupants. This heater allows use during driving. This heater also has the function of using local electricity heating.

In **hot water warm air work mode**, this heater can be used to heat both the room and the hot water. If only hot water is needed, please choose **hot water working mode**.

**When the ambient temperature is below 3°C, please empty the water in the water tank to prevent freezing of the water tank.**

There are three energy options to choose from:

**-- Diesel Mode**

Heater automatic adjust the power。

**--Electrical Mode**

Manually select the 900W or 1800W heating mode according to the power supply capacity of the RV camp.

**--Mixed Mode**

When the power demand is low (for example, maintaining the room temperature stage), the electrical mode is preferred. Diesel Mode is not initiated until the mains supply is not met, and the diesel mode function is turned off first during the power adjustment phase.

**In hot water working mode**，diesel mode or electrical mode is used to heat the tank。The tank temperature can be set to 40°C or 60°C.

**-- Diesel Mode**

The heater operates at the lowest power. Stop heating immediately after reaching the set temperature.

**--Electrical Mode**

Manually select the 900W or 1800W heating mode according to the power supply capacity of the camp site.

**4. Safety Instructions**

**Safe working environment**

-- The unit can only be operated with the appropriate control panel and accessories.

- The danger of toxic waste gas. If the vehicle is parked in a closed room, the exhaust of the heater may be toxic in an enclosed space (eg garage, repair shop). Therefore, in the enclosed space, the fuel supply of the water heater is turned off, the time switch is turned off, and the heater is turned off through the control panel.

-- If installing an exhaust hood near or under the open window. The device must be equipped with an automatic closing device to prevent the operation of opening the window.

-- Thermal objects (such as spray cans) or flammable materials/liquids should not be stored in the same compartment as the equipment, as in some cases this area may be affected by high temperatures.

-- Keep away from flammable materials near the heater outlet and do not block the heater outlet.

-- The opening of the circulating air intake, the space around the installation room and the mounting unit must be free from obstacles so that the equipment does not overheat.

- Keep exhaust ducts and exhaust hats (inlet and exhaust) and combustion air inlets free of contamination (snow, ice, leaves, etc.) at all times.

-- The danger comes from the heated wall surface and exhaust gases around the exhaust cap. Do not touch the area around the wall of the exhaust cap. Do not lean anything against the smoke cap or vehicle on the wall.

**Operator/Car owner's obligations**

-- The owner is responsible for filling the heater's container with water and maintaining and maintaining it.

-- The owner is responsible for operating the equipment correctly.

-- Liquid fuel systems must comply with national technical and administrative regulations. National legislation and regulations must be observed.

-- Check the water line regularly. If the water pipe breaks, please replace it.

-- If the water heater is not in use, in order to avoid the danger of frost, drain the water from the water heater. The company will not provide maintenance and compensation for damage caused by frost.

**Safe operation**

-- Ensure that the car is well ventilated. When the heater is turned on, there may be some smoke or odor which is due to dust or dirt. Especially if the device is not used for a long time.

-- This device is available for children over the age of 8 and is taught by adults.

-- The integrity and tight fit of the exhaust manifold must be checked regularly, especially at the end of long trips. Also check the installation of the unit and the exhaust cap.

-- When cleaning the vehicle, do not spray water directly into the exhaust cap.

**5.Heater Installation**

**The typical installation of the heater is shown in Figure 1.**

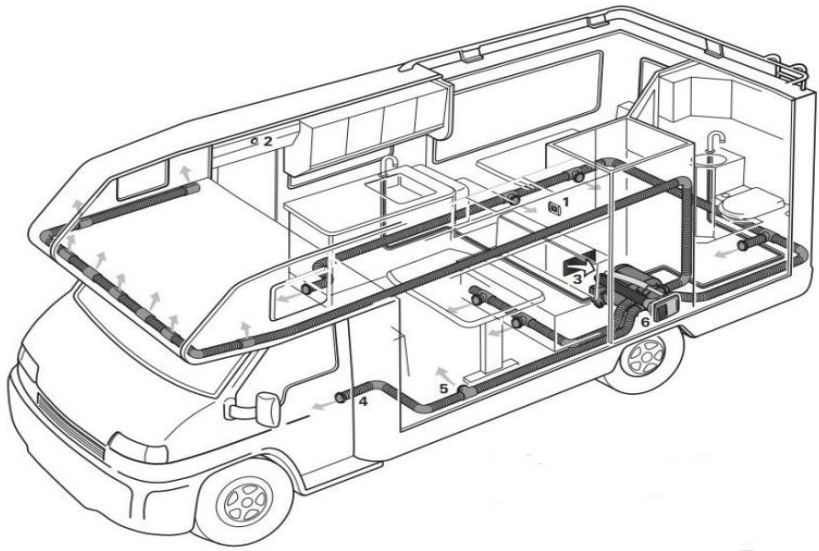



Figure 1

**★ Must be installed and repaired by professionals authorized by the company!**

The company does not bear any responsibility for the following acts:

--Modified heater and accessories

--Modification of exhaust lines and accessories

--Do not follow the operating installation instructions

Heater installation Figure 3.

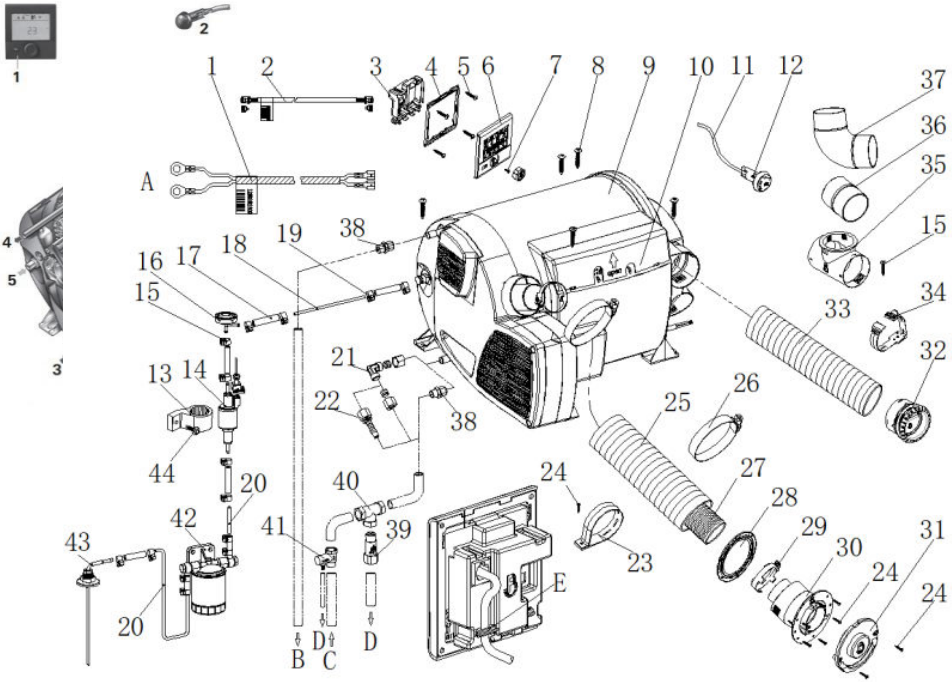



Figure 2

Figu

1. 12V Power cord **2.** LCD switch Lead wire **3.** LCD switch back cover **4.** LCD switch bracket **5.** Cross head self-tapping nail M3*10

**6.** LCD control switch **7.** Cross countersunk head flat tail self-tapping nail M3*6 **8.** Cross head self-tapping ST5*25

9. Heater **10.** Controller cover **11.** External temperature sensor lead wire **12.** External temperature sensor **13.** φ8 Elbow transition fitting **14. Fuel pump 15. Fuel pump** clamp **16. damper 17. Fuel connection clamp 18. Fuel lie(heater to pump, transparent)**

19. Fuel pump clamp ( φ8-10) 20. Nylon fuel line (Blue, from pump to tank) 21.φ10 Steel Hose(water) transition fitting

22. Soft Hose(water) transition fitting 23. Intake pipe mounting clamp 24. Cross pan head tapping screw ST3.5×25 **25.** Air intake pipe **26.** German type clamp **27.** Exhaust pipe **28.** Sealing rubber spacer **29.**(Exhaust pipe) clamp **30.**Intake and exhaust combine cowl **31.**Intake and exhaust combine cover **32.**Air outlet **33.**Hot air tube **34.** Bellows buckle **35.** φ60 T-fitting **36.**φ60 connecting pipe

37. φ60 elbow fitting 38. 38_G1/2-φ10 ferrule connector 39 antifreeze valve 40_G1/2 three links 41_pressure reducing valve

The heater installation location should be selected from load-bearing floor, double floor or underfloor.

If there is no suitable floor, you can first make a load bearing surface with plywood.

★The heater must be firmly fixed to the mounting surface with screws to prevent damage to the diesel pipeline during

and cause danger.

Depending on the actual installation, may only install three screws. Two die-cast aluminum fixing screws are fixed then choose a plastic right angle to fix it.

To ensure that the heater evenly distributes heat, the heater should be installed in the center as much as possible to ensure that the heating circuit is equal long as possible.

**No cover is allowed to add to the heater surface.**

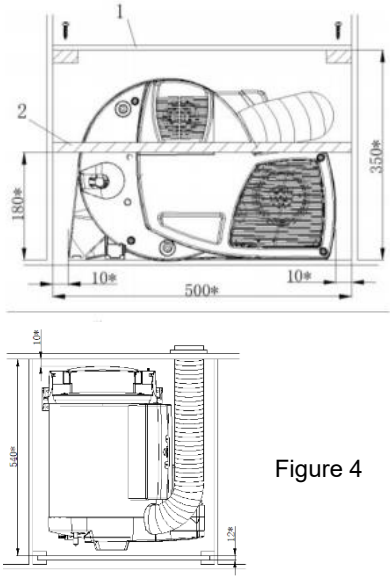



Figure 4

The size with* is the smallest size, leaving enough space to connect accessories such as diesel and water pipes.

To prevent the danger from heater accidentally loosening, the upper cover of the heater compartment is screwed to the upper cover (Figure 4-1). Next to the installation location it is necessary to install a strong partition strip in front of the heater, perpendicular to the direction of travel. Above the floor height180mm can be attached to a septum (minimum 30*50mm).

Heat sensitive objects and flammable objects should be placed away from the heater.

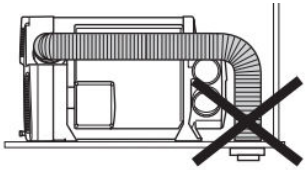


Figure 5

**★ The exhaı ı the side wall or ceiling.**

In the exhaust cowl installed area， there is no ventilation window in the range of 300mm, and there is no refueling port or tank respirator in the range of 500mm.

The exhaust cowl is mounted below the window that is close to or operable. A window switch should be installed to ensure that the heater is turned off automatically when the window is opened.

**Air Inlet Hose and exhaust hose Installation**

The exhaust pipe is pass through the intake pipe.

The length of the intake and exhaust pipe is as shown in Fig. 6, and the shortest is 60cm and the longest is 100cm. The exhaust cowl is only allowed under the exhaust outlet 20cm.

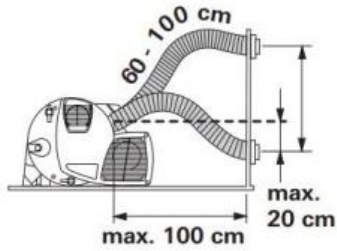



Figure 6

After the intake and exhaust pipes are pierced from the through holes, they must be cut short, and the exhaust pipes are slightly shorter than the intake pipes. Avoid excessive expansion or tension on the exhaust pipe.

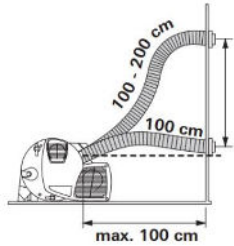



Figure 7

The length of th ›es is 100 cm to 200 cm, as shov ıg must be arranged in the ascending direction。

**The Exhaust Cowl （air inlet and outlet） Installation**

Select a flat mounting surface so that combustion air can enter from all sides. Drill one hole of φ83. Seal (Fig. 8-8), with the plane facing the exhaust cowl. Wear the fixing clip before installing the exhaust pipe (Figure 8-3). Pay attention to the installation of the smoke cap upwards。

20mm at the end of the exhaust pipe should be compressed, do not straighten. Insert the exhaust pipe into the exhaust cowl interface（Figure 8-10），as deep as possible. Try to fix the clips on the top, tighten.

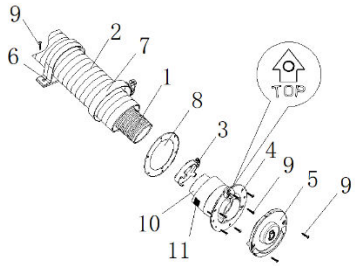



Figure 8

Place the air intake pipe (Figure 8-2) over the exhaust cowl tooth (Figure 8-11). Set on the fixed clip（Figure8-7）, tighten. Secure the exhaust cowl with 6 screws (Figure 8-9). Use 2 screws to fix the exhaust cowl.

Fix the exhaust pipe on the side wall with mounting clip （Figure8-7）.

**Connect Air Inlet and exhaust pipe to The Heater**

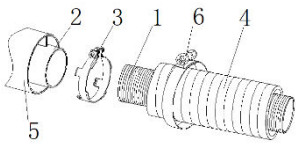



Figure 9

20mm at the end of the exhaust pipe (Figure 9-1)should be compressed, do not straighten.

Try to insert the exhaust pipe on exhaust port (Figure 9-2)as deep as possible. fix the clip on top, tighten.

Place the air intake pipe (Figure 9-3) over the air inlet port (Figure 9-5). Set on the fixed clip (Figure9-6），tighten.

**Warm Air Intake**

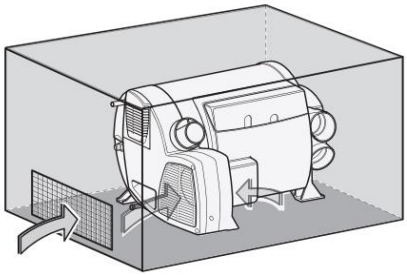


Figure 10

The warm air intake is drawn in by the heater. There must be a total area between the room and the heater not less than 150cm2 opening.

Ensure that the warm air intake is not contaminated by the engine or heater exhaust, if necessary, with structural isolation measures.

**Warm Air Distribution**

Most of the warm air is imported into the floor area of the living compartment through the bellows.

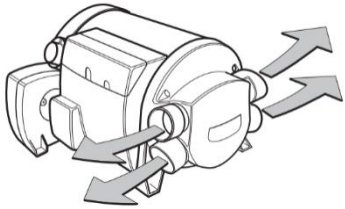


Figure 11

The four air outlets on the heater are connected to the φ65 bellows. Use only pressure piping that meets the quality requirements of the JP. Other pipes that do not meet our quality standards (especially wind resistance, pipe diameter and number of ripples) shall not be used. If the warm air duct must withstand a considerable amount of bending immediately after the hot air outlet of the heater in a limited space, we recommend using a 90° elbow (Figure 3-37). This elbow can be connected to a diameter of mm hot air duct.

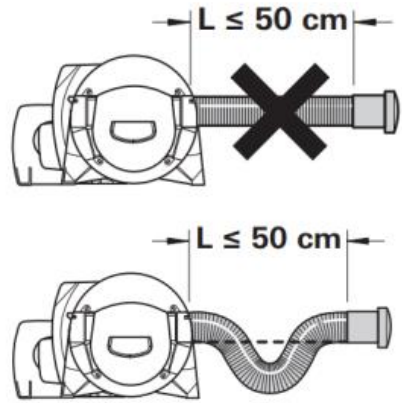



Figure 12

In the case where the length of the pipe is less than 2 meters, the air outlet cannot be installed at a height higher than the connection of the warm air duct. When the pipe length is less than 50cm, the pipe must be siphon between the connector and the outlet. These measures prevent the undesirable heating caused by (fairing effect) convection of the vehicle during summer operation.

★The warm air pipe must be firmly inserted into the connection port.

★To get the best warm air distribution, JP recommends using 4 warm air outlets for the heater.

★ The cross section of the heater duct must not be reduced due to pipe connections or the analogue. That is to say, the number of warm air duct outlets (Fig. 3_32) is not less than four, ensuring that more than four warm air outlets are open.

**Diesel System Connection**

The fuel is taken from the fuel tank of the vehicle or supplied from a special 10L fuel tank. The fuel pump and fuel supply are adjusted by a special oil pump (provided by the manufacturer). It is not allowed to extract fuel from the return system of the vehicle engine or downstream of the vehicle internal transfer pump.

Use only fuel hoses and tubing within the scope of delivery for installation.

Fuel should meet national standards. GB19147-2013 Vehicle Diesel Standard.

**Winter fuel should be used in accordance with low temperature requirements, not allowed to use bio-fuels.**

**Diesel Fuel Lines System**

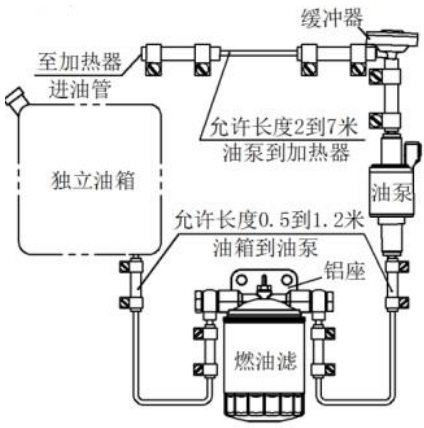



Figure 13

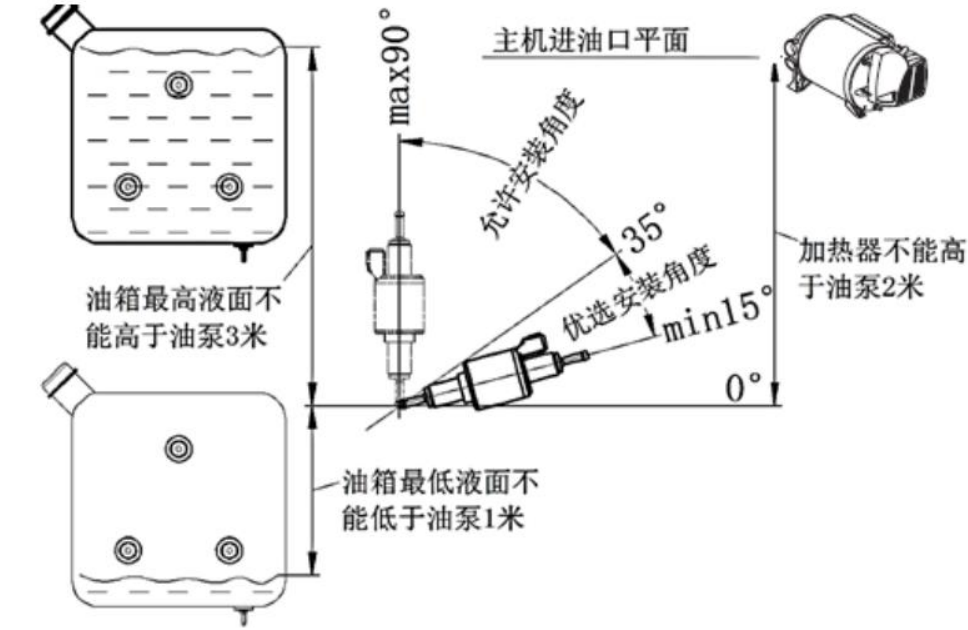
**Oil pipeline installation**

The tubing must use the kit's accessories, which are nylon hoses that are resistant to light and heat. Allowable fuel line length: The maximum fuel line length on the inlet side is 2 meters and the pressure side is max 6 meters. As Figure 13 shows.

**Safety regulations for fuel lines**

Always use a hose cutter or sharp tool to cut the fuel hose and tubing to length. The area being cut cannot be compressed and must be free of burrs. The fuel lines must be securely connected to prevent damage and/or noise due to vibration (the recommended distance between the joints is approximately 50 cm). Fuel piping must be protected from mechanical damage. The laying of the fuel line will not adversely affect the stability of the vehicle, engine operation and the like. Protect fuel-laden components from high temperatures that may affect operation (use a suitable fiberglass-lined aluminum heat protection hose). Never set or secure fuel lines near the exhaust pipe of the heater or vehicle engine.

If the lines are crossed, keep a sufficient distance from the hot parts - if necessary, provide a thermal radiation shield. The tubing installation should be able to prevent flying stones from hitting and away from the heating parts of the vehicle. If necessary, install protective devices.




**Fuel Pump Installation**

The oil pump should be fixed with the oil pump fixing ferrule (rubber). The oil pump outlet should be tilted upwards and its installation angle should be selected from 15° to 35° (Figure 14). When conditions permit, the tubing from the oil pump to the heater mainframe should gradually rise. To prevent the oil pump from being exposed to heat (maximum operating temperature)

40 ° C), so do not install near the exhaust pipe.

The difference in height between the fuel level and the oil pump and the height difference between the oil pump and the main engine inlet will create pressure (or suction) in the oil circuit, so these dimensions should meet the requirements of Figure 14.

**Heater and fuel pump connection**

The direction of the tubing from the fuel pump to the heater should be as far as possible. A hole for passing through the fuel line and the fuel pump connection cable is marked at a suitable location on the vehicle floor. Before drilling, be sure to check the hidden cables, fuel pipes, frame sections, etc.! Then use the under-body

protection to seal the edges of the openings in the vehicle floor. To prevent the tubing and oil pump cable from being broken, add a bushing or cross-section edge protection material.

The tubing should be bundled and secured at a suitable location with a bundling distance of no more than 50 cm.

The connection between the oil pipe and the oil pump, the main engine, and the fuel tank (the nozzle) should be made with the oil pipe joint of the machine and clamped with the oil pipe clamp. Prevent bubbles from forming at the joint (Figure 15).

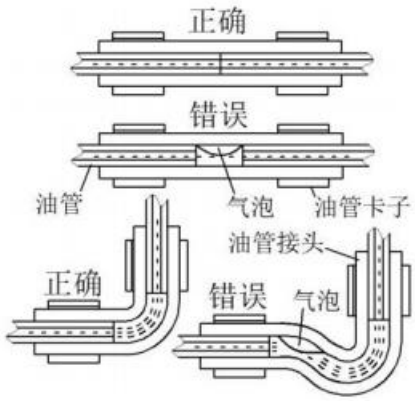



Figure 15

**Fuel Filter Installation**

Install the fuel filter in front of the fuel inlet of the fuel pump. When installing, be aware that the fuel filter must be vertically up (to ensure that the impurities are deposited downward).

The fuel filter replacement cycle is two years, and the tubing joints and clamps must be replaced at the same time.

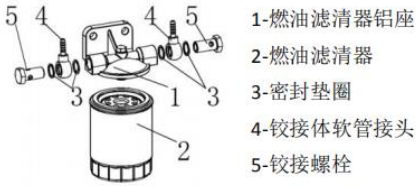



Figure 16

**Installation of the nozzle (Fig. 17)**

Put the nozzle on the O-ring first, and then pass it out from the inside of the tank through the bottom φ8 hole (can be processed by itself). Put a washer on the outside of the tank and tighten with a nut. The tightening torque is 6Nm+1Nm.

The O-ring must be sandwiched between the inner side wall of the tank and the nozzle to ensure a good seal between the nozzle and the tank. (The accessories such as the nozzle are included in the fuel tank)

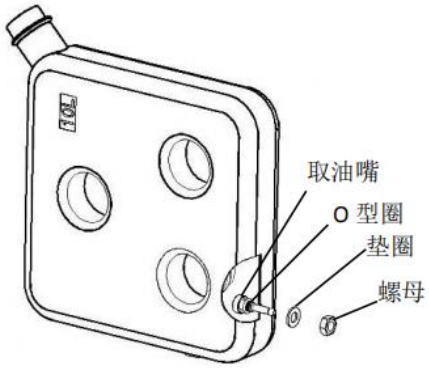



Figure 17

**Fuel Suction pipe installation (Figure 18)**

Use when drawing fuel from the vehicle's own fuel tank. When installing, please pay attention to the installation hole size on the fuel tank (or fuel tank cap) is φ25±0.2, the edges are neat, and the circumference is flat to ensure a good seal with the suction pipe socket. The distance between the lower mouth of the suction pipe and the bottom of the fuel tank should be 30-40mm, which can ensure the full absorption of fuel and prevent the inhalation of impurities deposited at the bottom of the tank.

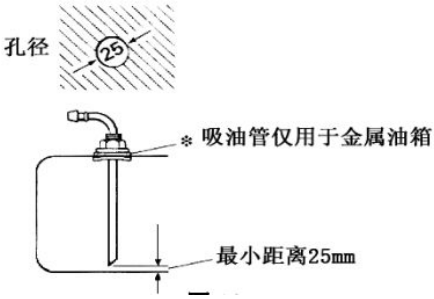



Figure 18

**Water pipe connection**

Water can be supplied to the tank using a pressure pump or immersion pump with a pressure of 2.8 bar.

If the tank is connected to a centralized supply (rural or urban connection), or if a high pressure pump is used, a pressure reducer must be used, which will prevent pressures above 2.8 bar.

★ The temperature rise and expansion of the water before the relief valve is triggered may result in pressures up to 4.5 bar (may also occur with the immersion pump). The water pipes connected to the water tank and the safety/drainage valve must be water pipes that are safe for drinking water, pressure resistant (up to 4.5 bar) and heat resistant water up to 80 °C.

Antifreeze valve (Figure 3-39, antifreeze automatic drainer), a mechanical safety/drain valve. When there is a danger of frost, it will automatically drain the water from the tank through the drain.

**A pressure relief valve must be installed** (Figure 3-41, 0.5 MPa). If there is excessive pressure in the system, the pressure will automatically be released intermittently through the pressure relief valve.

**External temperature sensor installation**

Install the car and measure the room temperature. The sensor installation location is determined by the RV manufacturer based on the specific conditions of the vehicle. When selecting the installation location, please note that the external temperature sensor should not be exposed to direct heat radiation.

For optimum room temperature control, install an external temperature sensor above the entrance door

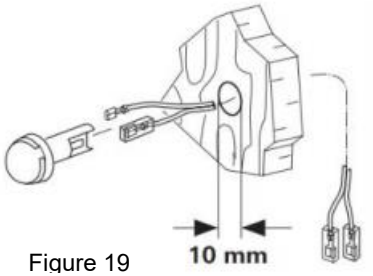



Figure 19

Make sure the external temperature sensor is always installed on the vertical wall. There must be free flowing air around it.

Drill a hole with a diameter of 10mm. The single-wire terminal passes through the opening from the back and connects the end of the cable to the sensor with an insulated connector plug (no polarity is required). Sliding into the outside temperature

Sensor and connect the two ends of the cable to the two insulation connectors to the heater electronics (if necessary, extend the cable to a maximum length of 10 meters, 2 x 0.5mm2

cable).

The external temperature sensor provided must always be connected or the heater will switch to fault.

**LCD Control Switch Installation**

The gas heater must be operated with a dedicated LCD switch. See the relevant instructions for details.

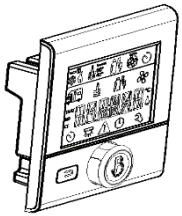


Figure 20

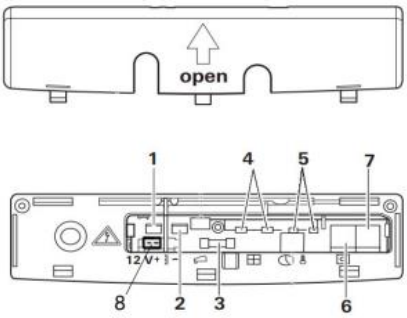
**Electrical Connection**

Lay the wires to avoid scratches. If there is a sharp edge, if the metal panel is threaded, use a lead bushing or edge protection accessory.

The connector cable must not be attached or in contact with metal surfaces, exhaust pipes or hot air ducts.

The electrical connector is located below the controller cover. The controller cover can be removed by pressing and simultaneously sliding in the direction of the arrow.

**When removing or installing the controller cover, make sure that the connecting cable is not pulled out or squeezed.**



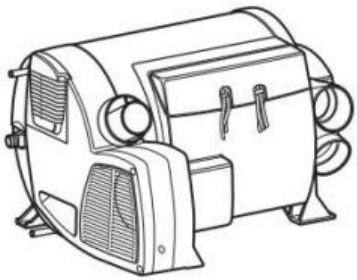



Figure 22

1-DC12V positive 2-DC12V negative

3-Fuse 4-Window Switch

5-External Temperature sensor

6 , 7- Control switch 8. fuel pump

When the window switch is not installed, the short connecting wire cannot be removed.

All cables connected to the heater must be hung in the direction of sagging. This will prevent condensate water slipping off from the connector cable and into the heater.

The connector cable and plug must be free of force. Bundling connector cable (See Figure 23), attach it to the housing with a cable tie to eliminate tension.

All cables must be securely connected and must not be loose or disconnected due to vibrations, causing a fire hazard!

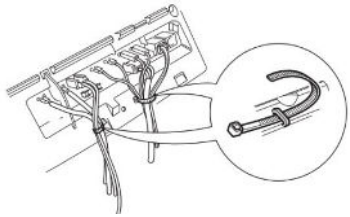


Figure 23

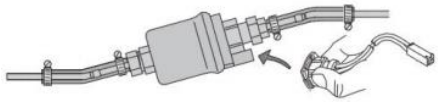


Figure 24

**DC12V Power Supply**

the heater's electrical wiring, switches, and control equipment must be in locations that would not adversely affect its operation under normal operating conditions.

The heater has reverse polarity protection. If the controller is not connected correctly, the LED indicator will not work.

To ensure the best power supply, the heater must be connected to the vehicle power supply (or battery) protected by the fuse (10A) with a 2 x 2.5 mm2 cable (2 x 4 mm2 for lengths over 6 meters).

If necessary, the voltage drop of the power supply line must be considered. Connect the negative line to the main ground line.

If the heater is directly connected to the battery, the positive and negative lines must be protected.

Do not connect other power consuming devices.

Make sure the plug is securely connected.

**Fuel Pump Electrical Connection**

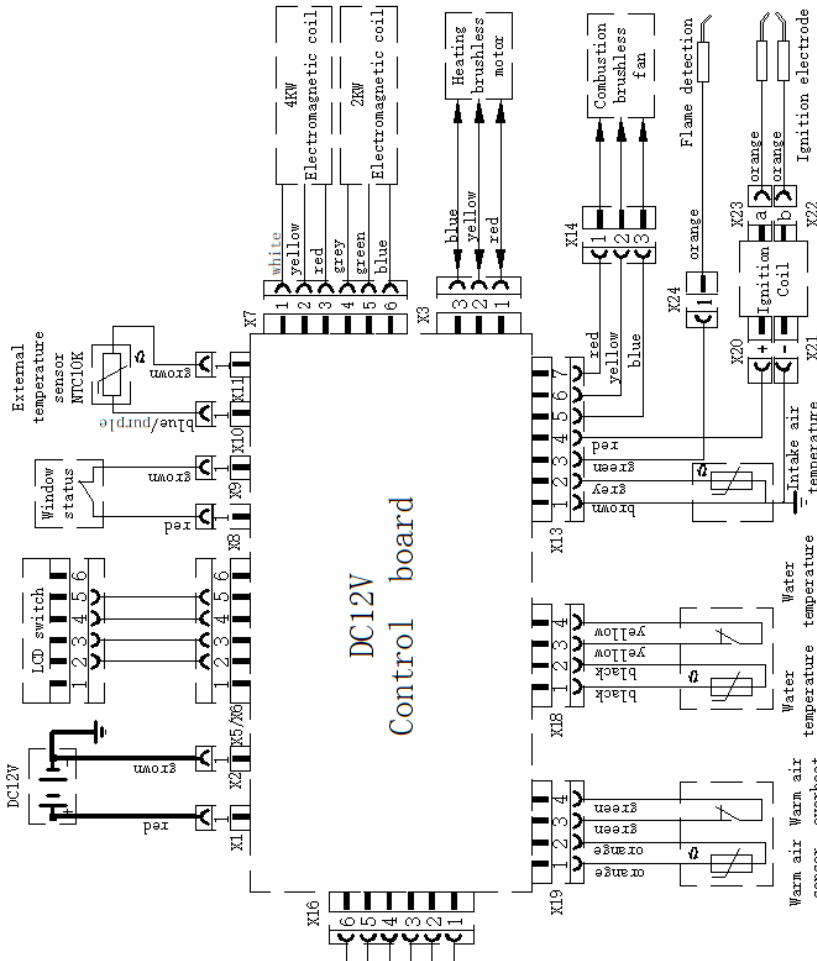

DC12V
Control board
X16
X19
X18
X13
X14
X24
X20
X21
X23
X22
X7
X3
X1
X2
X5/X6
X8
X9
X10
X11
DC12V
red
brown
LCD switch
Window status
External temperature sensor NTC10K
blue/purple
brown
red
brown
brown
white
yellow
red
grey
green
blue
4KW Electromagnetic coil
2KW Electromagnetic coil
blue
yellow
red
Heating brushless motor
red
yellow
blue
Combustion brushless fan
orange
Flame detection
orange
orange
Ignition
Coil
Ignition electrode
orange
green
green
orange
Warm air overheat switch
Warm air sensor NTC100K
black
yellow
yellow
black
Water temperature sensor NTC10K
Water temperature overheat switch
brown
grey
green
red
Intake air temperature sensor NTC10K

Figure 25

**6. Operational Precautions**

Heating is not permitted during refueling or in confined spaces (closed parking lots, workshops or ferry cabin).

Regularly check that the intake and exhaust pipes are in good condition and that the fixing is reliable, especially after a trip. Also check the fixing of the intake and exhaust pipes and the exhaust cowl.

When a black smoke occurs, the heater must be inspected and repaired by professionals authorized by the company!

Make sure that the exhaust pipe at the exhaust cowl and intake pipe is unobstructed, and there are no obstructions such as snow mud, ice accretion, and leaves.

The warm air outlet and the circulating air inlet are unobstructed to prevent the heater from overheating. Under overheating the overheat switch will immediately cut off the fuel supply.

**If the diesel heater is to meet the heating need during driving, a safety shut-off device should be installed.**

★If without a safety shut-off device，the heater must be shut off before driving.

**12V Fuse**

**Replace only with the exact same fuse T20A.**

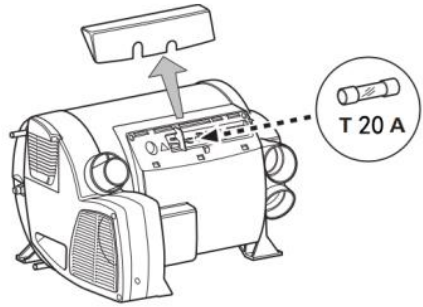



Figure 27

**～220V Fuse**

**★ Fuse and Wire harness must be replaced by professionals authorized by the company.**

**★ All power must be disconnected before opening the control enclosure.**

**Fuse specification: T20A slow fusing**

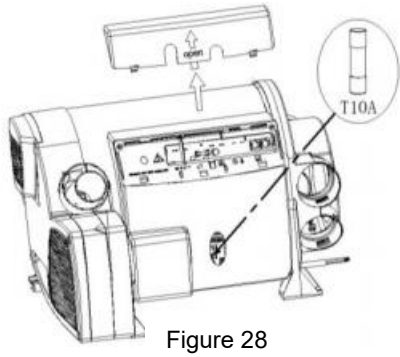



Figure 28

**~220V Overheat Protection**

The Electrical Mode function has a mechanical overheat protection switch.

If the 12V power supply is interrupted during heating or after the heating process, the heater residual heat triggers the overheat protection switch.

After the water tank temperature has dropped, remove the controller cover and press the reset button to reset the overheat protection switch.

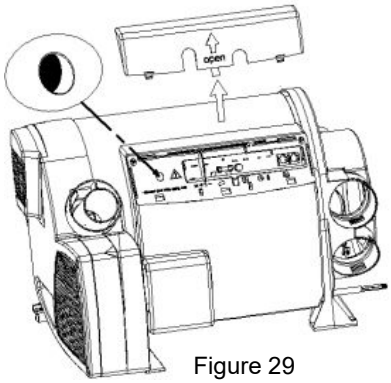



Figure 29

**7. Operating Instructions**

Please read the operating instructions carefully before proceeding.

**Start the Heater**

Use a dedicated LCD switch to operate.

the main unit heating uses diesel, electric, mixed mode, heating water tank or not heating water tank are set as needed.

Check the power supply capacity of the RV camp and select the 900W (3.9A) or 1800W (7.8A) working mode.

--Check if the exhaust cowl is unobstructed

-- Water tank filled with water when needed

**Water filling**

Check if the safety/drain valve is closed.

- Turn on the power of the pump (total electrical gate or pump switch)

- Open the hot water tap in the kitchen or washroom, keep the valve open until the air in the container is discharged and the water is uninterrupted.

- In the absence of water heater heating, if only the cold water system is running, the water heater will be filled with water. To avoid frost damage, the water heater must be drained through a safety/drain valve, even if it is not operating.

- In the case of frost, the frozen residual water can prevent filling. The water heater can be thawed (within 2 minutes) as long as it is turned on. The icing portion can be thawed by heating the interior of the water heater.

- If the heater is connected to a central water supply (rural or urban water supply), a pressure reducer must be used to prevent pressures from exceeding 2.8 bar (0.28 MPa).

-- Turn on the circulating water pump

- Turn on the hot water taps in the kitchen and bathroom until the air is exhausted and the water tank is filled. The water is no longer interrupted.

**Switch Off the Heater**

--Use a dedicated LCD switch to operate.

- After the heater is turned off, the combustion-supporting fan and the heating fan will continue to operate for a few minutes depending on the temperature of the furnace.

**In case of freezing hazard, the water tank must be emptied.**

**--Close the circulating water pump**

**-- Turn on the hot water tap in the kitchen and bathroom**

**★ Check the water with a 10L bucket to ensure that the tank is empty.**

the liquefied gas tank valve must be shut off when the heater is not in use for long time or before driving.

**6. Failure**

**6.1 General Failure Handling**

6.1.1 During the use of the heater, it may appear that it cannot start normally or turn off itself after starting and is in the fault lock state. At this time, the heater can be turned off for more than 5S and restart.

6.1.2 The heater may cause circuit failure due to the following reasons: the connector is rusted, the poor contact, the plug is incorrect, the wire or fuse is rusted, the battery pile is rusted, etc.

Pay attention to inspection, maintenance and prevent these phenomena from occurring during use.

**Table 2**

| Fault Lock Status Debug Method | | |
|---|---|---|
| **Fault Code** | **Fault Name** | **Fault Debug Method** |
| 10 | Over-voltage fault | a. Check vehicle power supply system |
| 11 | Under voltage fault | a. Check vehicle power supply system |
| 21 | Warm air outlet temperature sensor disconnection | a. Check if the sensor is in good condition |
| 22 | Warm air outlet temperature sensor short circuit | a. Check if the sensor is in good condition |
| 23 | Water temperature sensor disconnection | a. Check if the sensor is in good condition |
| 24 | Water temperature sensor short circuit | a. Check if the sensor is in good condition |
| 25 | External temperature sensor disconnection | a. Check if the sensor is in good condition |
| 26 | External temperature sensor short circuit | a. Check if the sensor is in good condition |

| Fault Lock Status Debug Method | | |
|---|---|---|
| **Fault Code** | **Fault Name** | **Fault Debug Method** |
| 32 | Combustion failure | a. Check gas supply system<br>b. Check whether combustion inlet and outlet are blocked<br>c. Check the flame sensor |
| 33 | Flame sensor fault | a. Check the flame sensor lead wire<br>b. Check the flame sensor |
| 41 | Warm air outlet overheats | a. Check whether air outlet is blocked |
| 42 | Warm air overheats switch protection. | a. Check whether air outlet is blocked<br>b. Check warm air overheat switch |
| 43 | Water overheat | a. Check whether water depletion in the tank<br>b. Check if the sensor is in good condition<br>c. Check whether air outlet is blocked |
| 44 | Water overheat switch protection. | a. Check whether air outlet is blocked<br>b. Check water overheat switch |
| 45 | Overheating fault | a. Check whether air outlet is blocked<br>b. Check water temperature sensor<br>c. Check warm air sensor |
| 51 | Communication fault | a. Check interconnecting cable |
| 71 | Gas valve failure | a. Check gas valve coil and lead wire |
| 72 | Gas valve power failure | a. Replacement motherboard |
| 81 | Combustion support fan disconnection | a. Check combustion air blower |

| Fault Lock Status Debug Method | | |
|---|---|---|
| **Fault Code** | **Fault Name** | **Fault Debug Method** |
| 91 | Ignition coil fault | a. Check ignition coil and lead wire |
| 92 | High voltage power supply fault | a. Replacement motherboard |
| 93 | High voltage power supply fault | a. Replacement motherboard |
| 94 | Gas valve power failure | a. Replacement motherboard |
| 110 | Window alarm | a. Check window switch interconnecting cable |
| 120 | Low voltage alarm | a. Recommended charging |
| 220 | 220V No connection | a. Check alternating 220V power supply system |

**Table 2 to continue**

**7. Operational Precautions**

**●Initial Installation**

– Flush the water tank with clean water before the heater is first installed. When the heater is not in use, please vent the water tank to avoid freezing the water tank. The company is not responsible for damage to the water tank caused by freezing.

--Turn the circulating water pump on

-- Turn on the hot water tap in the

Kitchen and bathroom, until the air is vented, and water tank is full, outcoming water is not discontinued

-- Test run before the heater is used. Carefully check the leaks and safety conditions of all connections during the test run. If there is heavy smoke, abnormal combustion noise or gas odor, turn off the heater and unplug the fuse to make it inoperable. It can be used after being repaired by professionals.

– The odor may be emitted for a short time when the heater is used for the first time. This is normal for the first few minutes of the start of the run, it does not indicate that the heater is malfunctioning.

**●Seasonal Maintenance**

– Before each heating season, a special inspection must be carried out by a professional to carry out the following maintenance work:

Check the inlet and outlet of air for contamination and foreign matter.

Clean the external of heater

Check the circuit connections for rust and looseness.

Check whether the inlet and outlet of air is blocked or damaged.

Check if a gas leak occurs or smells of gas:

**●Long-term halt** – When the heater is not used for a long time, it should be run every 4 weeks for about 10 minutes each time to prevent the mechanical components such as solenoid valves and combustion air fans from malfunctioning (get stuck).

– The air inlet and outlet of the heater must be kept free from clogging and dirt, so that the warm air duct is unobstructed to prevent overheating.

**●Heater Lifetime**

– The heat exchanger of heater should not be used for more than 10 years. After expiration, it must be replaced with genuine parts and replaced by the heater manufacturer or its authorized agent.

– The exhaust pipe from which the heater emits exhaust gas must be renewed with genuine parts when the usage time reaches 10 years.

- It is the responsibility of the operator to replace the gas pressure regulator and gas line on a regular basis (by expiration date).

**Other Operational Precautions**

**– The tank must be descaled regularly, at least twice a year.**

– During the transportation and storage process, the ambient temperature of the heater should not exceed -40°C ~ 85°C to prevent damage to electronic components.

– Only authorized customer service stations are allowed to install and repair heaters, and non-original parts are prohibited from danger.

– The heater is damaged due to installation and operation not according to the instruction, and the manufacturer is not responsible for the warranty.

Must shut-off the heater before refueling

– When performing electric welding on a car, first remove the positive line of the heater from the battery and ground it to prevent damage to the controller.

**8. Packing List**

| Packing List | | | | |
|---|---|---|---|---|
| **No.** | **Name** | **Specification** | **Quantity** | **Order Code** |
| 1 | Instruction book | YFY30-6E/1 | 1 | 22020202400 |
| 2 | Heater | E-Gas Hot Water/Warm Air Integrated | 1 | 22020202700 |
| 3 | Cross head self-tapping screw | ST5*25 | 5 | 12050016100 |
| 4 | 12V Power cord | 4m | 1 | 12031101600 |
| 5 | External temperature sensor | NTC10K | 1 | 31011102100 |
| 6 | LCD control switch | MNB-V-FY | 1 | 31011104400 |
| 7 | LCD control switch lead wire | 6m | 1 | 12031101500 |
| 8 | Controller cover | 260×75×22 | 1 | 12021100900 |
| 9 | Precision tube (black coating on the outside) | 8.00×1.00×2500 | 1 | 13012200100 |
| 10 | Ferrule | φ8 Pipe transition piece | 1 | 12050301300 |
| 11 | Fitting nut M14*1.5 | φ8 Pipe transition piece | 1 | 12050301200 |
| 12 | Rubber strip clamp | φ8 | 8 | 12050200800 |
| 13 | Cross pan head self-tapping screws | ST5×16 | 12 | 12050007300 |
| 14 | φ8 Straight transition fitting | 1C-14RN | 1 | 12011103100 |
| 15 | φ8 Elbow transition fitting | 1C9-14RN | 1 | 12011103200 |
| 16 | φ10 Hose transition fitting | φ10 | 1 | 12011103000 |
| 17 | Hose(water) transition fitting | 20411-16-06T | 2 | 12011103300 |
| 18 | φ10 Steel (water) pipe elbow transition fitting | 1C9-16RN | 2 | 12011103400 |
| 19 | Nylon cable tie | 4×200 | 10 | 21990000000 |
| 20 | Intake and exhaust combine cowl | φ110×108 | 1 | 12011101900 |
| 21 | Intake and exhaust combine cover | φ110×34 | 1 | 12021102000 |
| 22 | Sealing rubber spacer | φ104.5×φ73×2.4 | 1 | 12041101800 |
| 23 | (Exhaust pipe) clamp | φ55 | 2 | 31011102700 |
| 24 | German type clamp | 70-90 | 2 | 12050200700 |
| 25 | Intake pipe mounting clamp | φ80 | 1 | 12021102700 |
| 26 | Cross pan head tapping screw | ST3.5×25 | 9 | 12050015600 |
| 27 | Exhaust pipe | φ55/φ50×950 | 1 | 12060007700 |
| 28 | Air intake pipe | φ80/φ76×1000 | 1 | 12060007800 |
| 29 | Air Outlet | CFK-φ60-III Elastic adjustable | 5 | 31011104700 |
| 30 | T-fitting | ST-φ60-II with screw | 1 | 12021102500 |
| 31 | connecting pipe | φ60 ZT-φ60- Ⅰ | 1 | 12020002900 |
| 32 | Elbow fitting | φ60 WT-φ60- Ⅰ | 1 | 12020003100 |
| 33 | German type clamp | φ50-φ70 | 4 | 12010005100 |
| 34 | Bellows buckle | φ60 | 4 | 12021102600 |
| 35 | | | | |
| 36 | | | | |
| 37 | | | | |
| 38 | | | | |

| Date | Repaired Items and Reason |
|---|---|
| Month Day Year | |
| Month Day Year | |
| Month Day Year | |
| Month Day Year | |
| Month Day Year | |
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