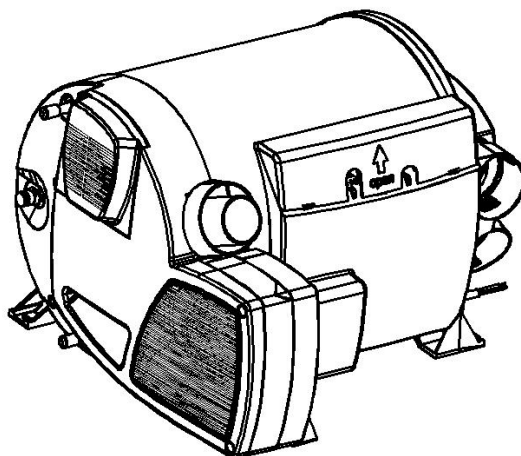


6KW LPG Hot Water & Warm Air Integrated Heater
Technical Description, Installation, Operation and Maintenance Instructions



Production Type

LPG electric heating DC12V/220VAC

LPG electric heating DC12V/110VAC

Order No.

4T3006 12R01

4T3006 12R02

Foreword

Thank you for using the 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!

1.Application

FJH-6E/1R Model gas 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	5.6A		
Average Power Consumption	1.3A		
Gas Heat Power (W)	2000	4000	6000
Fuel Consumption (g/h)	160	320	480
Gas Pressure	30mbar		
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	~220V/110V		
Electrical Heating Power	900W	1800W	
Electrical Power Dissipation	3.9A/7.8A	7.8A/15.6A	
Working (Environment) Temperature	-25℃~+80℃		
Working Altitude	≤1500m		
Weight (kg)	15.6kg		
Dimensions (mm)	510×450×300		

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℃, please empty the water in the water tank to prevent freezing of the water tank.

There are three energy options to choose from:

-- Gas 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.

--Hybrid Mode

When the power demand is low (for example, maintaining the room temperature stage), the electrical heating is preferred. Until the city electricity cannot meet, the gas heating is started, and the gas heating function is turned off first in the power adjustment phase.

In hot water working mode , gas mode or electrical mode is used to heat the tank 。 The tank temperature can be set to 40℃ or 60℃.

-- Gas 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

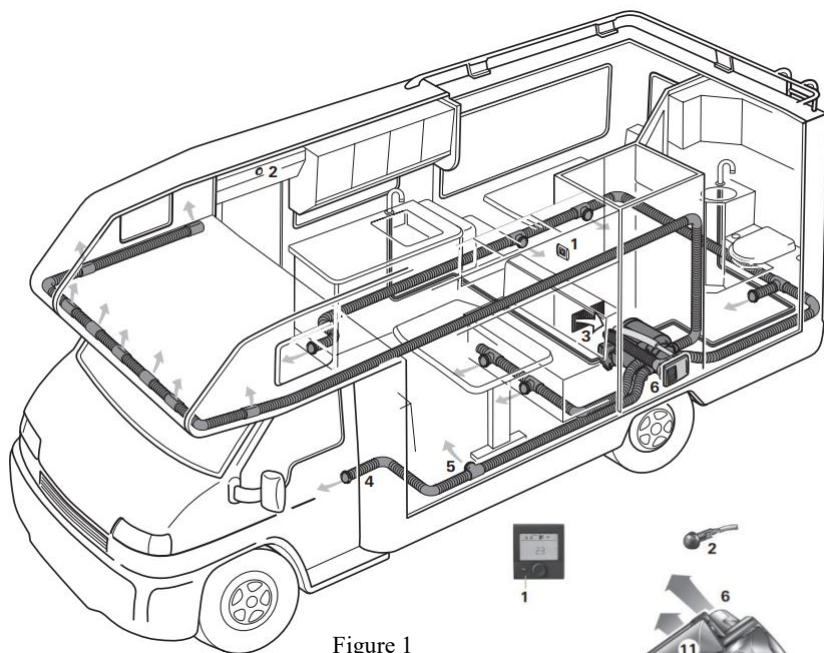
The gas obtained from the liquefied gas tank is mandatory to be in a gaseous state. Liquefied gas is not allowed to avoid danger.

If a gas leak occurs or smells of gas:

- Immediately extinguish the open flame
- Open doors and windows
- Close all valves, liquefied gas tanks
- No smoking
- Do not operate any electrical switches
- Ask the professional to thoroughly check the gas system

5.Heater Installation

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



- 1-LCD control switch
- 2-External temperature sensor
- 3-Recirculating air inlet (minimum 150cm²)
- 4-Heat pipe
- 5-Heat outlet

★ 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
- Do not use our company's special accessories

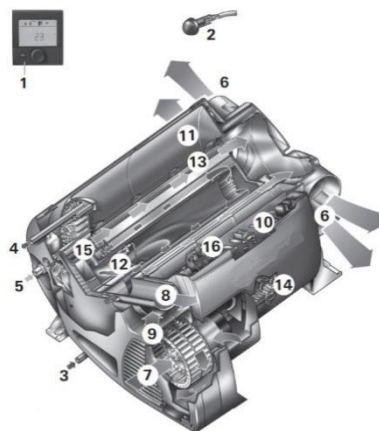


Figure 2

Heater installation Figure 3.

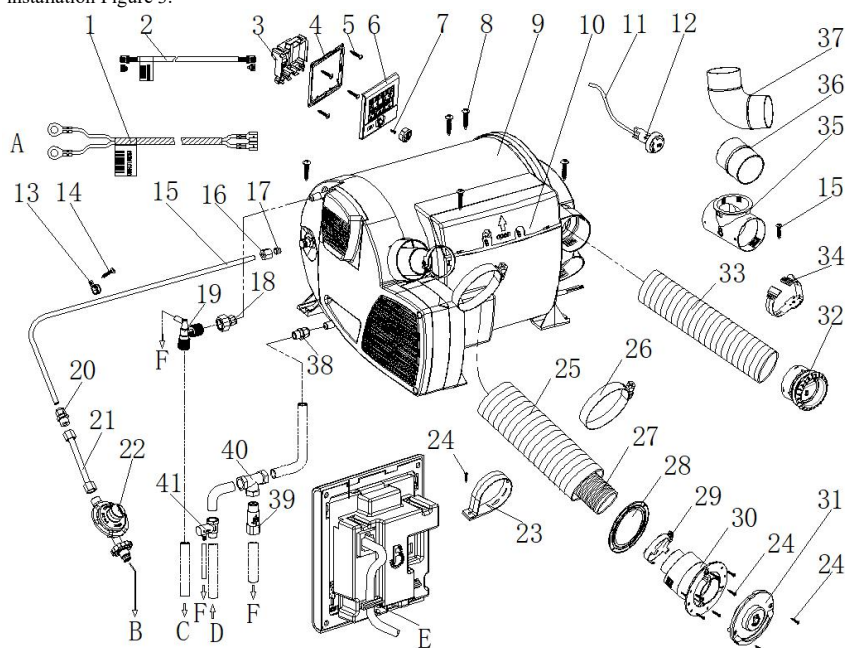


Figure 3.

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_Rubber strip clamp 14_Cross pan head self-tapping screws ST5*16 15_Precision tube 16_Fitting nut M14*1.5 17_Ferrule 18_G1/2-φ8 Inner ferrule connector 19_Vent valve 20_G1/2-φ8 Outer ferrule connector 21_Gas connection pipe 22_Gas regulator 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_T-fitting 36_φ60 connecting pipe 37_φ60 elbow fitting 38_G1/2-φ10 Ferrule connector 39_Antifreeze valve 40_G1/2 Tee joint(optional) 41_Pressure relief valve A-connect to 12V Battery B- connect to gas tank C- connect to water equipment D-connect to system water tank E-hook, clamp LCD switcher cord F_Discharge to the outside of the vehicle

Note:No.18.19.21.22.35.36.37.40 are optional parts.

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 gas pipeline during driving 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.

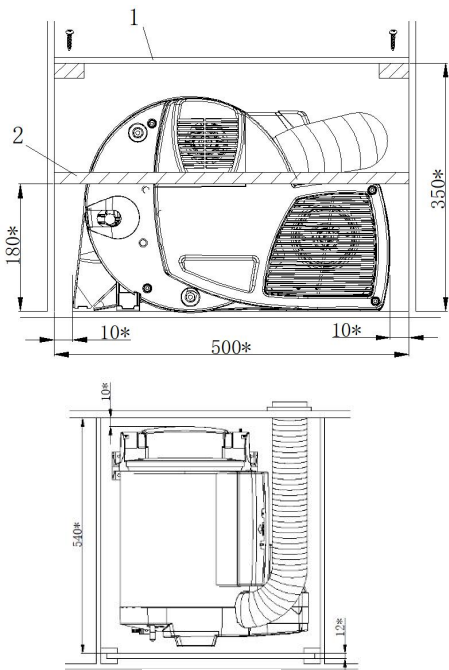


Figure 4

The size with* is the smallest size, leaving enough space to connect accessories such as gas 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 height 180mm can be attached to a septum (minimum 30*50mm). Heat sensitive objects and flammable objects should be placed away from the heater.

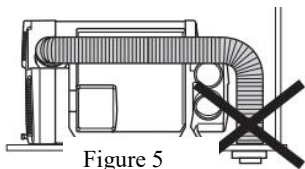


Figure 5

★ **The exhaust cowl must be on 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 openable. A window switch should be installed to ensure that the heater is turned off automatically when the window is opened.

Air Inlet 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.

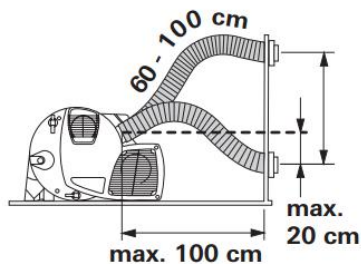


Figure 6

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.

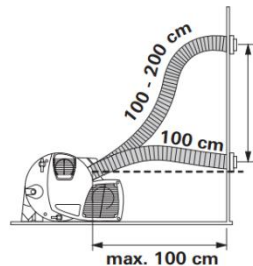


Figure 7

The length of the intake and exhaust pipes is 100 cm to 200 cm, as shown in Figure 7. The piping 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 $\phi 83$. 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.

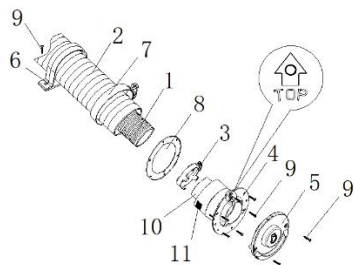


Figure 8

Place the air intake pipe (Figure 8-2) over the exhaust cowl tooth (Figure 8-11). Set on the fixed clip (Figure 8-7), 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.

Connect Air Inlet Pipe to The Heater

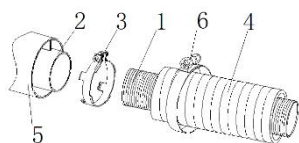


Figure 9

20mm at the end of the exhaust pipe should be compressed, do not straighten.

Try to insert the exhaust pipe on exhaust port 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 (Figure 9-6), tighten.

Warm Air Intake

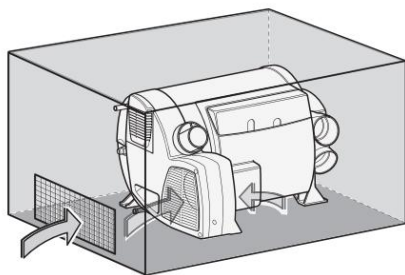


Figure 10

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.

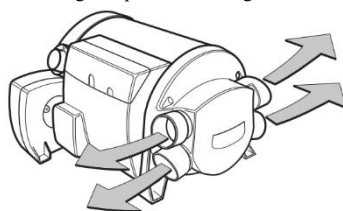


Figure 11

The four air outlets on the heater are connected to the $\phi 65$ bellows. Use only pressure piping that meets the quality requirements of the Belief. 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.

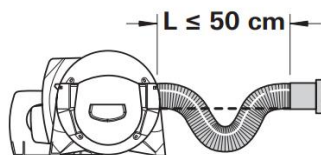


Figure 12

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, Belief recommends using 4 warm air outlets for the heater. If only three warm air outlets are required, then a lower warm air outlet must be selected to seal.

★ The cross section of the heater duct must not be reduced due to pipe connections or the analogue.

Gas Connection

The heater operating pressure must be in compliance with a 30 Mbar liquefied gas supply.

When the gas pipe is cut off, clean the port flash and burrs.

The paving of the pipe must make the heater easy to disassemble for maintenance work.

Use high-pressure air to purge internal debris before installing the gas pipe.

The turning radius of the gas pipe is not less than R50, and it is recommended to use elbow pipe to pass the joint of right angle.

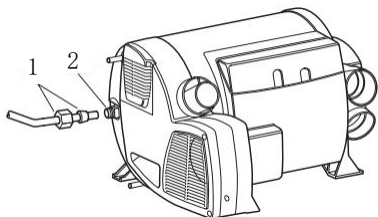


Figure 13

★ The gas interface (Figure 13-2) cannot be truncated or bent.

Before connecting to the heater, make sure that the gas line is free of dirt, shavings, etc.

The gas system must comply with the technical, administrative, and legal regulations of the country. Anti-collision safety valve (optional)

To ensure safety during driving, it is recommended to install a crash safety valve that must be installed after the liquefied gas tank regulator. When impact, tilting, the anti-collision safety valve automatically cuts off the gas line.

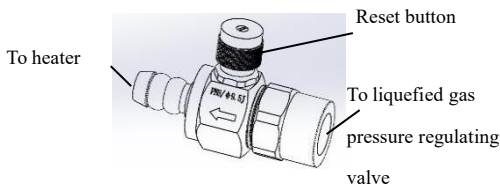


Figure 14

Connecting Water Pipe

The water tank can be supplied with a pressure pump or immersion pump with a pressure of 2.8 bar.

If the tank is connected to a centralized water 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 rises and expansion of the water before the pressure relief valve is triggered may result

in pressures up to 4.5 bar (may also occur with the immersion pump). Connected to the water tank and safe/the water pipe of the drain valve must be safe for drinking water, withstand pressure (up to 4.5 bar) and heat-resistant water up to 80 °C.

If an immersion pump is used, a check valve must be installed between the pump and the first branch (Figure 15-1). Observe the flow direction when installing the check valve.

Anti-freezing automatic waterproof device (Figure 15-4, optional), a mechanical safety / drain valve.

When there is a danger of frost it will automatically drain the water from the tank through the scupper. If there is excessive pressure in the system **the pressure will be automatically released intermittently through the pressure relief valve (Figure 15-8, optional).**

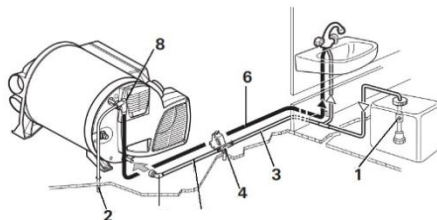


Figure 15

Install inside the vehicle 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 subjected to direct heat radiation.

For optimum room temperature control, an external temperature sensor is installed above the entrance door.

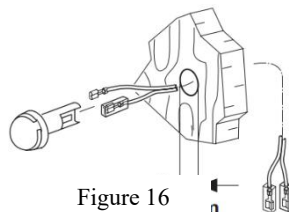


Figure 16

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 10 mm. Single wire terminal passes through the opening from the back and connect the end of the cable to the sensor with an insulated connector plug (no need to observe polarity). Slide into the external temperature sensor and connect

the two ends of the cable and the two insulated 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 malfunction.

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.

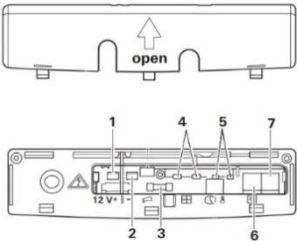


Figure 17

- 1-DC12V positive 2-DC12V negative
- 3-Fuse 4-Window Switch
- 5-External Temperature sensor
- 6, 7- Control switch

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.

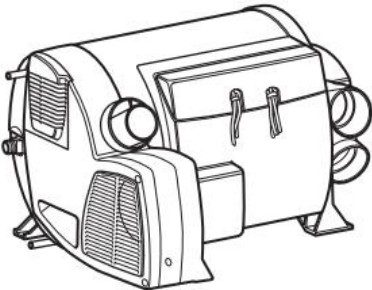


Figure 18

The connector cable and plug must be free of force.
 Bundling connector cable (See Figure 19), 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!

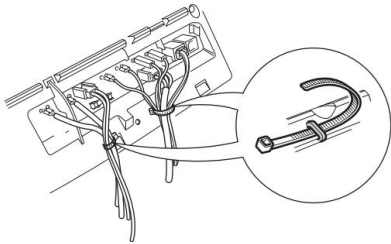


Figure 19

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.
 The length and cross-sectional area of the power line shall ensure that the allowable voltage drop is not greater than 0.5V and 1.0V when the voltage is 12V and 24V. It is recommended to configure the power cord according to the following table.

Plus cable + minus cable	cross section
<8m	2. 5mm2
8~12m	4mm2
12~16m	6mm2

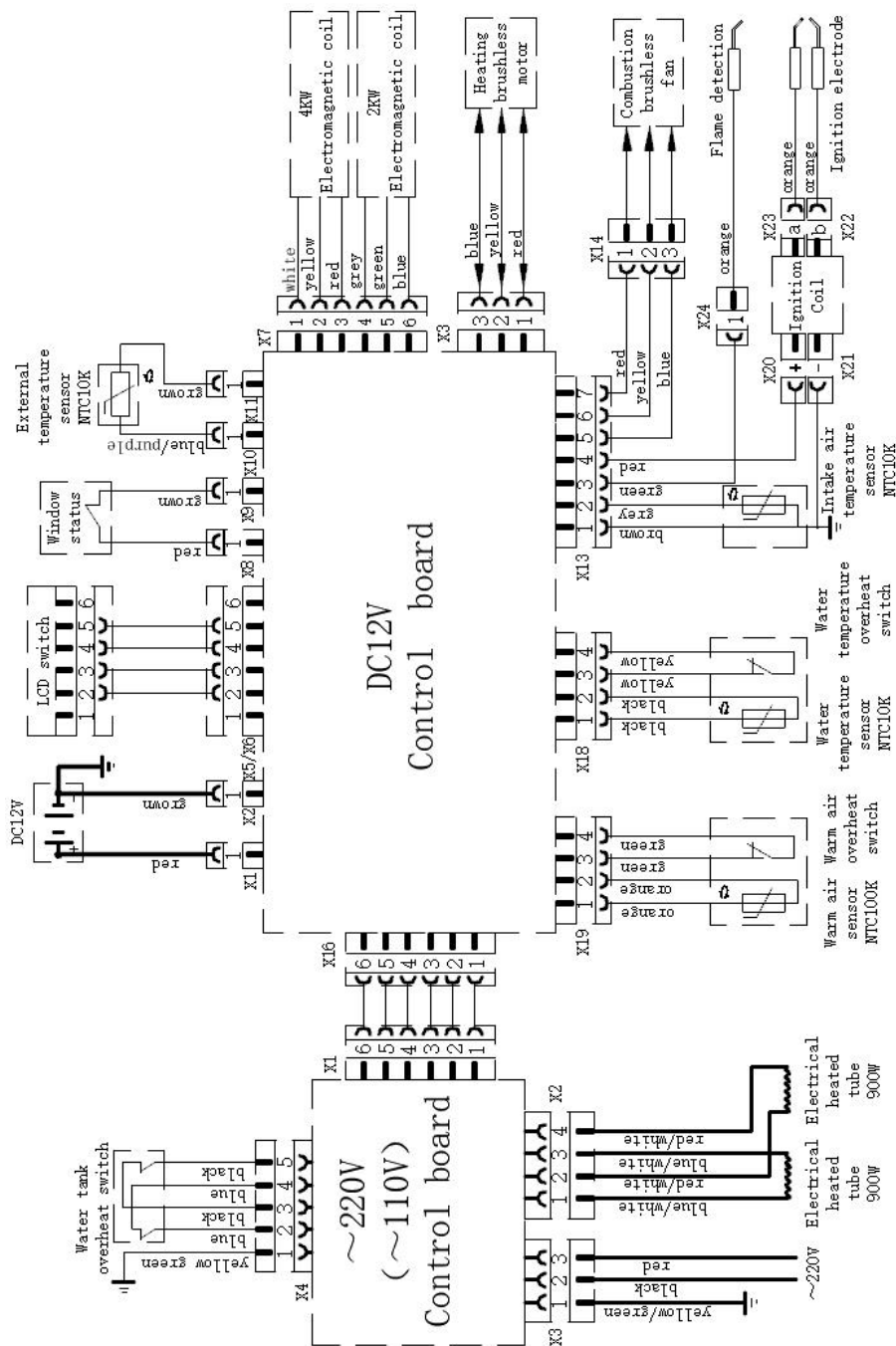


Figure 20

6. Operational Precautions

Gas 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, must be inspected and repaired by professionals authorized by the company! Make sure that the exhaust pipe at the exhaust cowl and intake pipe are 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 gas supply.

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

★ If without a safety shut-off device, the liquefied gas tank valve must be shut off before the driving.

12V Fuse

replace only with the exact same fuse T10A.

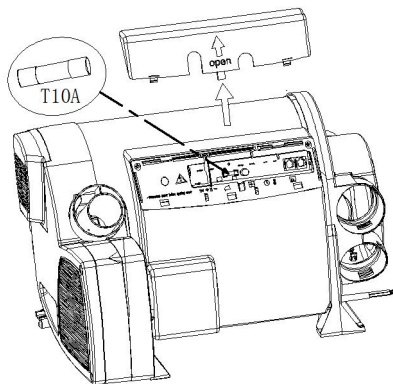


Figure 21

~220V/~110V 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: T10A/220V slow fusing

T20A/110V slow fusing

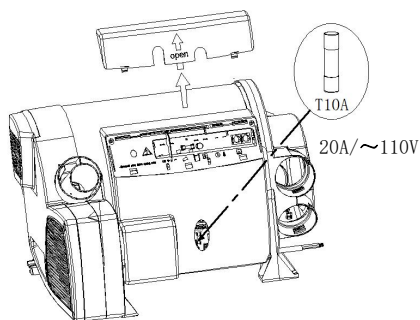


Figure 22

~220V/~110V Overheat Protection

The electrical heating 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.

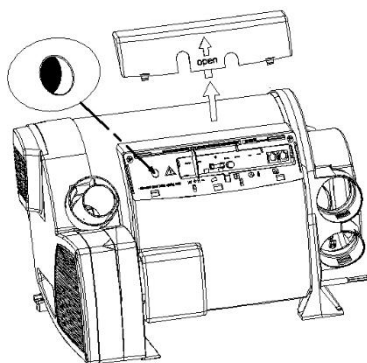


Figure 23

7. Operating Instructions

methods listed in Table 2.

Please read the operating instructions carefully before proceeding.

Start the Heater

Use a dedicated LCD switch to operate.

the main unit heating uses gas, electric, hybrid 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

--Opening liquefied gas tank valve

-- Water tank filled with water when needed

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.

8. Failure

8.1 General Failure Handling

8.1.1 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.

8.1.2 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. handled and eliminated by the user:

●The heater does not start after the power is turned on and the LCD switch screen does not light. The reason is that the fuse is open, or the wiring is wrong. In addition, check whether the plug on the LED switch lead wire is properly connected to the host.

8.2 Fault Lock Status

8.2.1 The fault generated by the heater is indicated by the fault code on the LED switch.

8.2.2 The faults can be eliminated according to the

Fault Lock Status Debug Method		
Fault Code	Fault Name	Fault Debug Method
10	Overvoltage fault	Check vehicle power supply system
11	Under voltage fault	Check vehicle power supply system
21	Warm air outlet temperature sensor disconnection	Check if the sensor is in good condition
22	Warm air outlet temperature sensor short circuit	Check if the sensor is in good condition
23	Water temperature sensor disconnection	Check if the sensor is in good condition
24	Water temperature sensor short circuit	Check if the sensor is in good condition
25	External temperature sensor disconnection	Check if the sensor is in good condition
26	External temperature sensor short circuit	Check if the sensor is in good condition
27	Combustion support temperature sensor disconnection	Check if the sensor is in good condition
28	Combustion support temperature sensor short circuit	Check if the sensor is in good condition
31	Combustion failure	a.Check gas supply system b.Check whether combustion inlet and outlet are blocked c.Check the Ignition coil, ignition electrode, flame sensor
32	Combustion failure	a.Check gas supply system b.Check whether combustion inlet and outlet are blocked c.Check the flame sensor
33	Flame sensor fault	a.Check the flame sensor lead wire b.Check the flame sensor
41	Warm air outlet overheats	Check whether air outlet is blocked
42	Warm air overheats switch protection.	a.Check whether air outlet is blocked Check warm air overheat switch

Table 2

Fault Lock Status Debug Method		
Fault Code	Fault Name	Fault Debug Method
43	Water overheat	a.Check whether water depletion in the tank b.Check if the sensor is in good condition c.Check whether air outlet is blocked
44	Water overheat switch protection.	a.Check whether air outlet is blocked b.Check water overheat switch
45	Overheating fault	a.Check whether air outlet is blocked b.Check water temperature sensor c.Check warm air sensor
51	Communication fault	Check interconnecting cable
71	Gas valve failure	Check gas valve coil and lead wire
72	Gas valve power failure	Replacement motherboard
81	Combustion support fan disconnection	Check combustion air blower
82	Combustion support blower boot failure	a.Check the blower motor lead wire b.Check combustion air blower
83	Combustion support blower spindle speed too low	Check combustion air blower motor
84	Warm air blower motor disconnection	Check warm air blower motor
85	Warm air blower motor boot failure	Check the blower motor lead wire Check warm air blower motor
86	Warm air blower spindle speed too low	Check warm air blower motor
91	Ignition coil fault	Check ignition coil and lead wire
92	High voltage power supply fault	Replacement motherboard
93	High voltage power supply fault	Replacement motherboard
94	Gas valve power failure	Replacement motherboard
110	Window alarm	Check window switch interconnecting cable
120	Low voltage alarm	Recommended charging
220	~220V/110V No connection	Check alternating 220V/110V power supply system

Table 2 to continue

9. 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, outgoing 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 $-40^{\circ}\text{C} \sim 85^{\circ}\text{C}$ 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

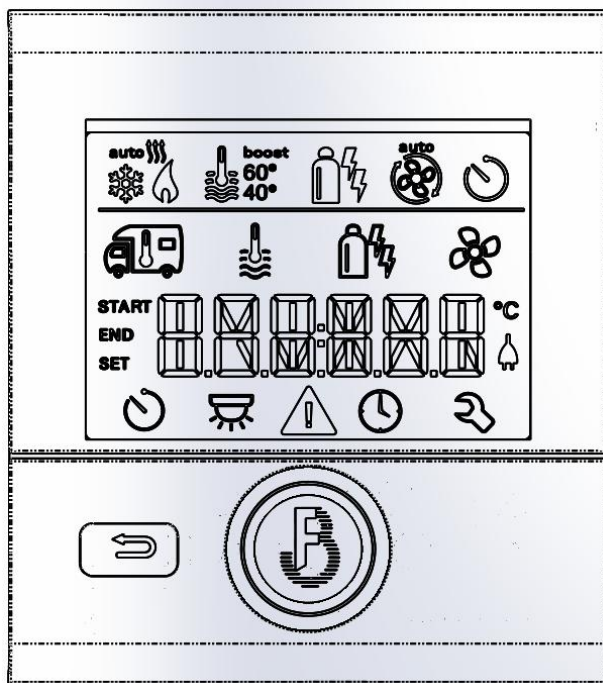
– When performing electric welding on a car, first remove the positive line of the heater from the battery and ground it to prevent damage to the controller.

10. Packing List

Packing List				
No.	Name	Specification	Quantit	Order Code
1	Instruction book	YFY30-6E/1	1	22020202400
2	Heater	E-Gas Hot Water/Warm Air Integrated Heater	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

Note: Items 20 to 34 are additionally included in the accessory

LCD Switch Instruction Manual



This product can be used with both commercial and LPG or fuel for heating water or a RV or both, making your trip more convenient and comfortable.

This manual describes the use method, installation instructions, technical parameters, fault inquiry, etc. of the LCD switch (referred to as LCD switch) of the Belief hot water & air integrated heater. Please read this manual carefully before use. Please keep it in a safe place after reading it.

Safety Warning:

1. If the information in the manual cannot be read or executed accurately, it may cause fire or explosion, resulting in property damage, personal injury or death.

2. Do not store near the heater with flammable, explosive or volatile gas or liquid holding equipment.

If you smell the gas:

- Evacuate everyone from the vehicle.
- Turn off the gas supply to the gas container or gas source.
- Do not touch any electrical switches or use any phone or radio in the car.
- Do not start the engine or generator of the vehicle.
- Do not open the gas supply until a gas leak is detected.

Installation and service must be performed by a certified service technician, service organization, or gas supplier.

3. The heater must be installed in a motorhome or trailer.

4. The LCD switch can only be used when the whole machine is installed properly.

5. Please correct any malfunctions immediately. The remedy specified in the troubleshooting table in these operating instructions can only be repaired by itself.

6. Do not perform any repair work or modification on the LCD switch! Any changes to the device or its controls can be dangerous and will void the warranty.

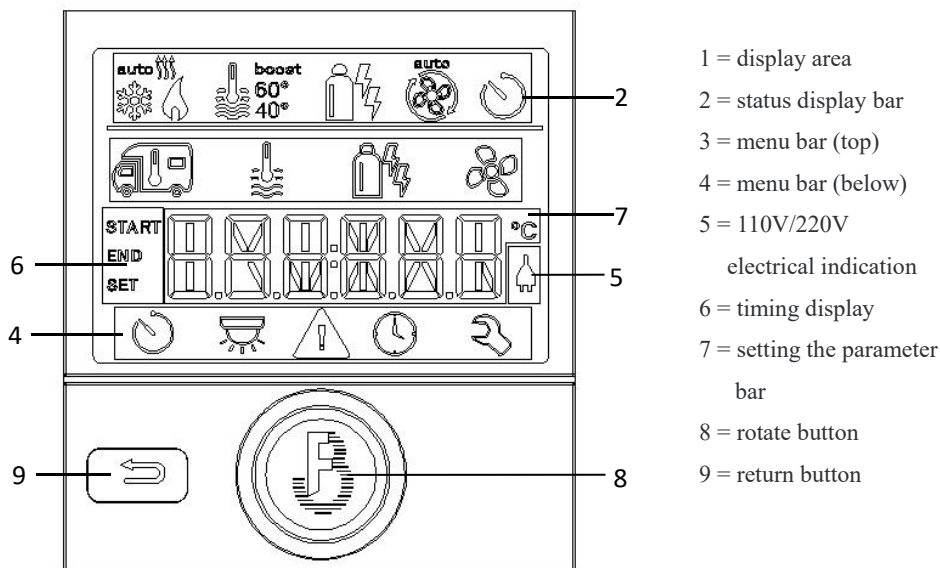
7. Defective LCD switches can only be repaired by the manufacturer or the service department of the manufacturer.

8. Do not use heaters in garages, multi-storey car parks or ferries, when refueling. Turn off the heater on the LCD switch to ensure that the heater cannot be turned on by remote control.

Important Information:

If a new or replacement heater is connected to the LCD switch, the process described in “Power on Start” must be repeated.

I. Display and control section



-- Information is displayed on an LCD with backlight.

-- In the menu bar (3, 4), the function of the LCD switch can be arbitrarily selected. The operating parameters are displayed on the status bar (2) and display (5, 6).

-- After the 220V is turned on, the 220V mains power supply indication column (5) displays the power supply sign.

-- During operation, set the parameter bar (7) to display the change between time and set room temperature.

-- Press the return button, the selected parameters are invalid and return to the previous interface.

Rotary Button

Select, modify, and save icons for menu bars 3 and 4 by rotating the button.

The selected icon flashes.

Clockwise rotation indicates:

--Options scroll from left to right of a menu bar, to the end and to the front of another menu bar.

-- Add one to the value.

Counterclockwise rotation indicates:

--Options scroll from right to left on one menu bar, to the front end and then to the end of another menu bar.

-- The value is reduced by one.

Tap the rotary button to indicate:

--Select to confirm saving and return to the main menu.

Pressing the rotary button for a long time (more than 3s) indicates:

-- The heater heating function or other function is turned off and the LCD switch is turned off to enter the sleep state.

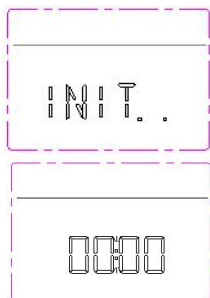
Return Button

-- Discard the current selection and return to the previous option.

II. Switch Setting

1. Power On

After a few seconds, the time is displayed at 00:00.



Click the rotary button to display the initial interface options in the display area.



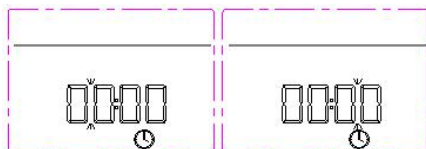
Clock setting (current time setting)

Click the rotary button to display the icon in the menu bar (3).



-- Use the rotary button to select the "Set Clock" icon in the menu bar (4).

-- Click the rotary button to enter the clock settings.



-- Use the rotary button to set the time. "A--" is displayed in the morning and "P--" is displayed in the afternoon, and it is automatically switched.

-- Click the rotary button again to determine the time, then the minute display flashes.

-- Set the minute with the rotary button.

-- Click the rotary button to confirm the value and exit the clock setting.

2. Rotate button to start

-- Press the rotary button for a long time (more than 3s), the LCD will start.

3. Shutdown

Press the rotary button for more than 3s at the initial interface to shut down. When the LCD switch is turned off, the heating process and any connected equipment are also automatically turned off. The parameters before shutdown are retained.



Downtime Process

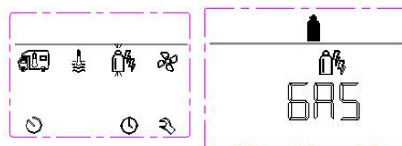
Since the heater has a higher residual heat after heating and a post-cleaning need (combustor after combustion), the fan typically runs for a few minutes for cooling.

III. Heating Function Setting

The heating function setting should first set the energy, and then select water heating or room heating or simultaneous heating, and finally set the circulating wind speed. The default heating function settings is the energy setting gas and the circulating wind speed setting eco.

1. Energy Setting

Rotate the button to select the energy icon in the menu bar (3).



- Click on the selected icon.
- Use the rotary button to select the desired energy mode.
- Click the rotary button to confirm.

Working Mode	Energy Mode
GAS	LPG Diesel
MIX 1	electrical 900 W+GAS
MIX 2	electrical 1800 W+GAS
EL 1	electrical 900 W
EL 2	electrical 1800 W

If the energy type is not selected, once the heater starts to operate (room temperature, hot water icon is activated), the status bar shows the type of energy selected during the previous heating process or the energy type gas set at the factory.

2. Adjustment of Indoor Temperature

Click the rotary button to display the icon in the menu bar (3).



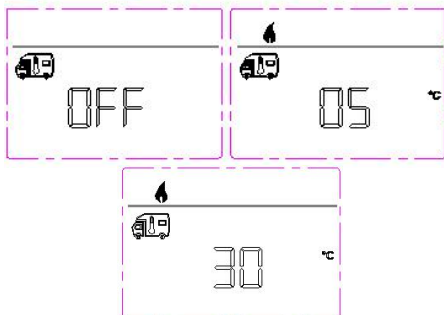
- Select the room temperature heating system with the rotary button according to the connected device.
- Confirm the selection by clicking the rotary button on the selected room temperature icon.
- Use the rotary button to select the desired temperature.
- Click the rotary button to confirm its value.

Temperature Display: °C degrees

Celsius

Adjustment Range : 5~30°C

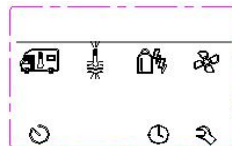
Stepping: 1°C



Flame icon = room temperature heating start, this icon will flash until the predetermined room temperature is reached.

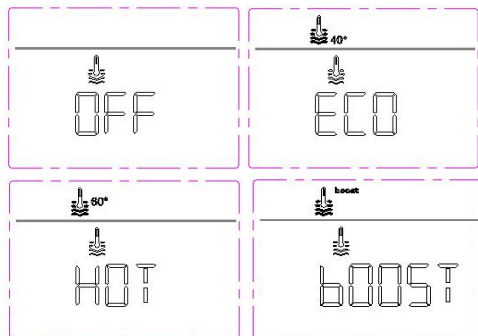
3. Adjustment of Water Heating

Click the rotary button to display the icon in the menu bar (3).



- Use the rotary button to select an icon in the menu bar (3).
- Click the rotary button to confirm and enter the setting level.
- Use the rotary button to select the desired water temperature setting level.
- Click the rotary button to confirm the value.

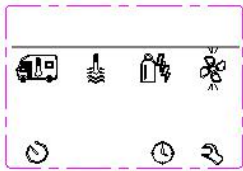
Work Mode	Description
OFF	Water heat is turned off.
ECO	Water heating icon disappear
target 40°C	scheduled water temperature
HOT	scheduled water temperature
target 60°C	
BOOST	preferentially heats the water for 40 minutes or the water temperature reaches 60°C.



This icon will flash until the predetermined water temperature is reached. In the "heating and hot water mode" the water temperature of 40°C can only be stored for a limited time (room heating priority).

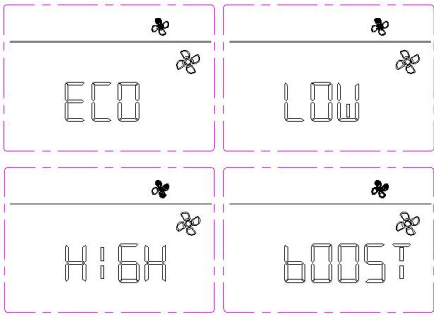
4. Choice of Wind Speed

Click the rotary button to display the icon in the menu bar (3).



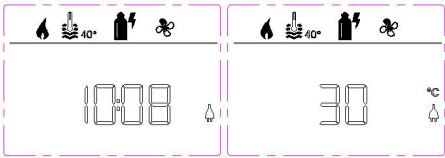
- Rotate the button to select an icon in the menu bar (3).
- Click the rotary button to confirm and enter the setting level.
- Use the rotary button to select the desired fan speed.
- Press the rotary button to confirm and save.

Work Mode	Description
OFF	Turn off the fan.
VENT	Circulation ventilation, you can choose 10 levels Wind speed. May increase the abrasion of the motor, depends on how often it is used.
ECO	Low wind speed
LOW	Mid-speed
HIGH	High wind speed results in higher power consumption, higher noise levels and increased motor abrasion.
BOOST	Room heats up quickly



5. Start Heating

After the setting is finished, press the return key or wait for 10s to enter the clock interface, and the heating starts. The clock and set temperature are displayed alternately.

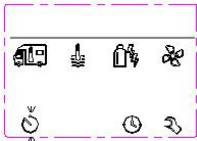


6. End Heating

Press the rotary button for more than 3 seconds to shut down.

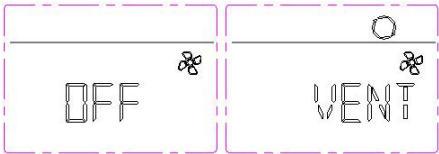
IV. Timing Heating Settings

Click the rotary button to display the icon in the menu bar (3). Click the rotary button to enter the timing settings.



Warning: Danger of toxic exhaust gases.
Even if the vehicle is stopped, unmanned, the activated time switch will turn on the heater. Exhaust gases from heaters may be toxic in confined spaces such as garages, workshops, and repair shops.

If the vehicle is parked in a closed room:

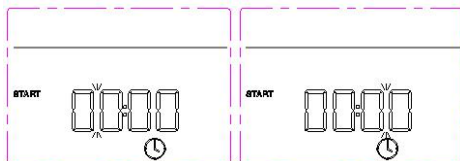


- Turn off the fuel supply to the heater.
- Turn off the timer switch of the LCD switch.

- Turn off the heater on the LCD switch. Press the rotary button for 3 seconds to turn it off.

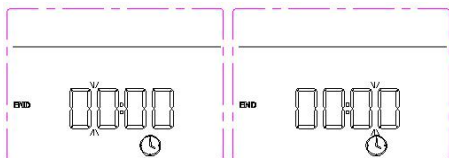
1. Enter the Startup Time

Use the rotary button to set the start time. Click the rotary button to confirm and proceed to the next setting.



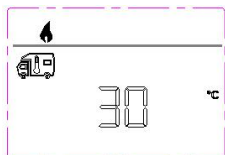
2. Enter the End Time

Use the rotary button to set the heating end time. Click the rotary button to confirm and proceed to the next setting.



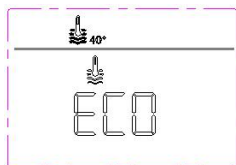
3. Set the Room Temperature

Use the rotary button to select the desired room temperature. Click the rotary button to confirm the value.



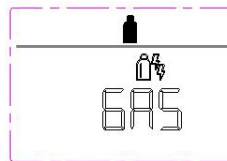
4. Set the Water Temperature

Use the rotary buttons to select the desired hot water level. Click the rotary button to confirm.



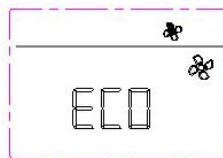
5. Energy Mode Selection

Use the rotary buttons to select the desired energy mode. Click the rotary button to confirm the value.



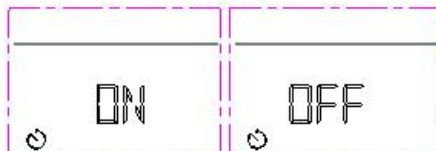
6. Select Fan Speed Grade

Use the rotary buttons to select the desired fan speed level. The fan speed rating is selected only after the room temperature heating mode is set. Click the rotary button to confirm.



7. Timing Enabled

Use the rotary button to select Enable Timing (ON). If OFF is selected, the timing is canceled, but the settings are saved. Click the rotary button to confirm that the timing is valid.



The time switch is only enabled once until it is disabled (turned off) or powered down. If the time switch is programmed and enabled, the time switch icon is displayed in the status line (2). The timing icon flashes if the time switch is enabled and activated.

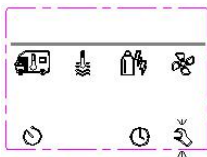
8. Cancel Timing

With the timing set, use the rotary button to select the timing setting. Click the rotary button to enter the settings.

Use the rotary button to select the cancel timing (OFF). If you select ON, continue to use timing. Click the rotary button to confirm that the cancellation timing is valid. But the previous settings are still saved.

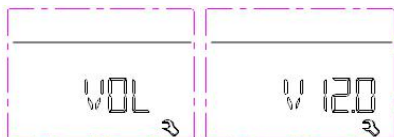
V. Parameter Settings

The content after the parameter setting is maintained after the power is turned off. Use the rotary button to select the "Settings" icon in the menu bar (4). Click the button to enter the settings.



1. Voltage inquiry

Click the rotation button to display the voltage: 12.0V.

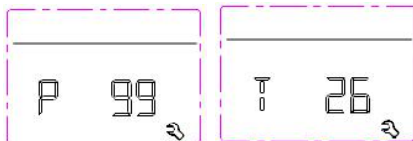


2. Air pressure and temperature inquiry

Use the rotate button to select the atmos icon.



Click the rotation button to enter the query.



Use the rotary button to switch between atmospheric pressure and ambient temperature.

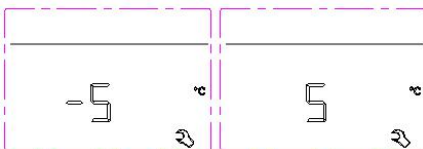
Atmospheric pressure: 99KPa

Ambient temperature: 26 °C

3. Offset Setting

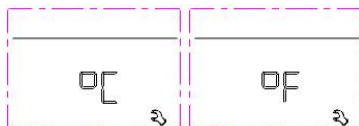
The external temperature sensor of the heater can be adjusted separately depending on the installation of the sensor. The offset setting can be in the range of -5°C to 5°C. The deviation is 1°C. Use the rotary button to select the OFFSET icon

and click the rotary button to enter the settings. Use the rotary button to select the offset value. Click the rotary button to confirm and save.



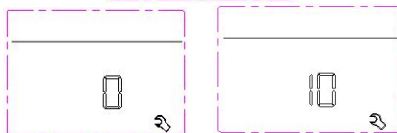
4. Switching temperature units

Use the knob to switch between centigrade and Fahrenheit, and click OK.



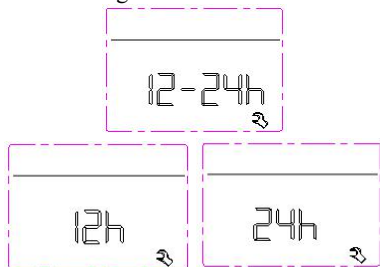
5. LCD Backlight Adjustment

The LCD backlight has 10 levels of incremental adjustment. Use the rotary button to select the BRIGHT icon and click the rotate button to enter the settings. The brightness of the LCD changes as the rotary button rotates. After confirming by clicking the rotary button, return to the previous operation. The backlight brightness is set to 6 by default.



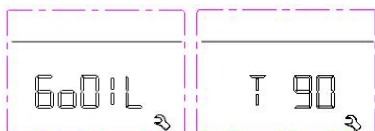
6. Set the Time Format

Use the rotary button to select the time format setting icon and click the rotary button to enter the settings. Use the rotary button to select the 12h or 24h icon and click the rotary button to confirm. The default setting is 24h.



7. Fast Pump Oil Settings

Select pump oil icon GoOil with rotary button.

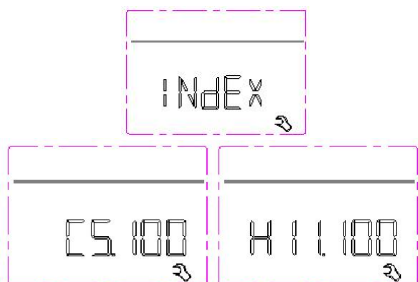


Click on the rotary button to enter the fast pump oil. The default fast pump time is 90 seconds. The remaining time can be adjusted with a knob.

Press the return key or stop the fast pump if the pump oil time exceeds the set value.

8. Software Version Number

Use the rotary button to select the INdEx icon and click the rotary button to enter the query item. Use the rotary button to view the information of the LCD switch or the information of the main controller. Click the rotary button or want to go back to return to the previous operation.



C5.100-- LCD switch version

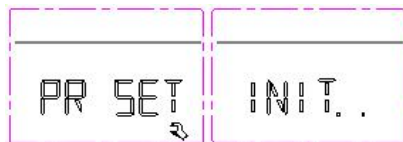
H11.100-- master controller version

9. Factory Setting

The reset function resets the LCD switch to factory settings. All previous settings will be deleted. All devices used before RESET is installed and powered.

Use the rotary button to select the RESET icon and click the rotary button to display the factory setting PR SET.

After confirming, the initialization "INIT...." is displayed.



VI. Fault Display

How to Read the Warning Code:

-- Use the rotary button to select the icon  and click the rotary button to display the current warning code (for troubleshooting, please refer to the relevant heater instruction manual).

There are faults in the fault that are automatically recovered and manually recovered after repair.

An automatic recovery fault is a warning fault in which an operating parameter has exceeded a defined normal working range and reached an undefined state. In this case, the device will continue to run and the warning symbol (!) will be displayed in the menu bar (4) without warning code. After the fault is repaired, the warning symbol disappears automatically (it can also be manually restored), and the device continues to work according to the original settings. For example: warning fault code W 120 H.



A manually recovered fault means that the fault code is displayed in the parameter setting field (7) when the fault occurs. The cause of the fault can be determined and remedied by the help of the troubleshooting guide. The fault code disappears after a few seconds, and the warning disappears, and the warning symbol is displayed in the menu bar (4).

Select Reheat after the fault is identified and resolved, first remove the fault code. Press the rotary button to display the fault code, then press the rotary button, the displayed fault code disappears and return to the initial time interface. Re-enter the heating parameters to initiate heating. If the fault is removed, the heating will be normal or the fault will occur again. The LCD switch will jump to the "Fault" menu again, the warning symbol will be displayed again, and the affected device will still be in the warning state. Since the fault has not been eliminated, if you want to return to the set level, press the back button (9). For example: fault code E 31 H. Shutdown and power off can also eliminate faults.



The fault code table and troubleshooting methods can be found in the tenth fault code table at the end of the manual.

VII. Technical Parameters

Display: LCD, black and white, with backlight.

Dimensions: 92×103×40mm

Working temperature: -25°C~60°C

Storage temperature: -25°C~70°C

Power supply: DC10.5~16V

Power consumption: Max.65mA (100% backlight)

Standard current: 10mA

Quiescent current: 3mA

The above parameters are subject to change without notice.

Maintain:

The LCD switch is maintenance-free. To clean the front panel, use a damp cloth or use a neutral soap solution.

VIII. Installation Instructions

Installation in vehicles must comply with applicable technical and administrative regulations.

Safety Information:

Installation and services must be performed by an authorized installer, service agent. Improper installation, alteration, repair will result in property damage, personal injury or loss of life and will void the warranty.

Don't try to install it yourself. Do not use high voltage equipment unless the electronic circuit (board) is disconnected. Do not use a battery charger to power the heater, even while testing. If the vehicle requires soldering, do not connect a 12-volt DC power supply to the unit. Electric welding can cause serious damage to the equipment. Do not shorten the electrical connection cable or remove the label indicating polarity. Turn off the vehicle's onboard power supply during installation and turn off the power when the device is connected. The device can only be installed in the specified location. When the gas heater is not used, it is best to turn off the gas valve.

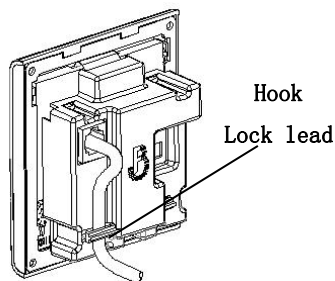


Figure24

Installation location:

Install the LCD switch in a waterproof and moisture-proof position.

Install the LCD switch at the height of your eyes for easy reading and operation.

Prepare a mounting opening for the LCD switch, as shown in Figure 2.

Route the connector cable connecting the cables in a tension-free circuit. It must be possible to pull the liquid crystal switch out of the mounting hole by 20 cm so that no tensile stress is applied to the plug connection. Never drawing the connector cable when connecting to the LCD switch.

Assembly:

Install as shown in Figure 3.

Install the LCD switch holder to the wall with 4 M3×10 screws.

- ① Hang the front panel of the LCD switch on the holder
- ② Fasten the LCD switch to the holder
- ③ Secure with M3×6 screws.
- ④ Install the rotary button (Figure 3-4) onto the shaft.

LCD Switch Installation Opening Diagram

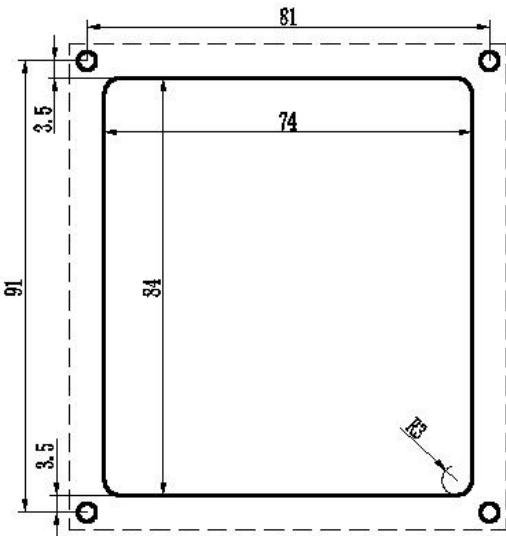


Figure25

IX. Accessories

Name

Quantities A

·LCD switch	1
·Cross countersunk head flat tail self-tapping nail M3×6 (fastening the switch panel)	1
·Cross head self-tapping nail M3×10 (installed on the wall)	4
·Operation and installation instructions	1
·Connecting cable, length 6m	1

Installation Method of LCD Switch

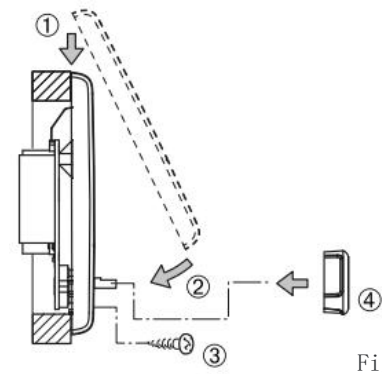


Figure3

