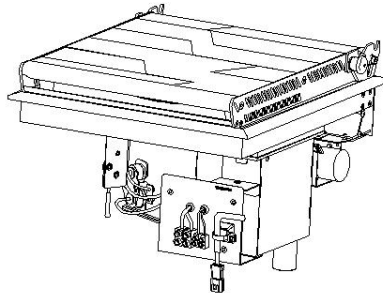
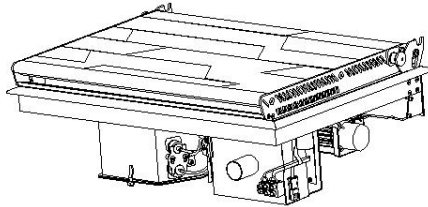


# Fuel stove and air integrated parking heater

Technical Description, Installation, Operation and Maintenance Instructions

**Idle cooking is forbidden**



**Production Type**

**Order No.**

**Double stoves Diesel DC12V**

**4F400212C01**

**Single stove Diesel DC12V**

**4F400212C21**

Version: April 24, 2021

## **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!**

**20210424 Edition Subject to Change**

## 1. Application

Air and stove heater (hereinafter referred to as the fuel stove) is an integrated stove, heating air as one of the special RV fuel stove. The stoves can also be used for cooking in the wild, such as on ships.

## 2. Main Technical Data

	Double stoves	Single stove
Type	FJH-2.2/1C SZ N	FJH-1.8/1C DZ N
Rated Voltage	DC12V	
Short-term Maximum Power Consumption	8-10A	
Average Power Consumption	0.55~0.85A	
Heat Power	900-2200W	900-1800W
Fuel type	diesel	
Fuel Consumption	110-264ml/h	110-192ml/h
Quiescent current	1mA	
Warm Air Delivery volumem3/H m <sup>3</sup> /h	148m <sup>3</sup> /h max	141m <sup>3</sup> /h max
Working Environment Temperature	-25℃~+35℃	
Working Altitude	≤5000m	
Heater Weight	11.8kg	8.8kg
Dimensions(mm)	492×359×200	326×359×250
Stove vent	≥100cm <sup>2</sup>	≥40cm <sup>2</sup>

Table1

## 3. Function

This fuel stove is a safe diesel stove with no open flame. The fuel stove is not allowed to be used during running.

--Cooking mode

Adjust the heating power by controlling the switch to cook and heat various kinds of food

-- Air conditioning mode

Close the upper cover and adjust the setting temperature by controlling the switch to heat the room temperature.

## 4. Safety instructions

Safe working environment

-- The danger of toxic fumes. If the vehicle is

parked in a closed room, in an enclosed space (such as a garage, repair shop), the exhaust gas from the fuel stove can be toxic. Therefore, in the enclosed space to turn off the fuel supply of the fuel stove, through the control switch to turn off the fuel stove.

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

-- At all times, keep exhaust pipe and combustion air inlet free from contamination (slush, ice, leaves, etc.).

Obligations of the operator/owner

It is the owner's responsibility to operate the equipment correctly.

The fuel system must comply with the technical and administrative regulations of the state. Must abide by national legislation and regulations.

Safe operation

-- Make sure the interior is well ventilated. When the burner is turned on, there may be some smoke or odor due to dust or dirt. Especially if the equipment has not been used for a long time.

-- The integrity and tight fit of the intake and exhaust pipes must be checked periodically, especially at the end of a long journey.

Do not spray water directly into the exhaust hood while cleaning the vehicle.

## 5. Installation

Typical installation diagram of fuel stoves figure 1.

★ Must be authorized by the company's professional installation, maintenance!

The Company shall not be liable for any of the following ACTS:

-- Refitting fuel stoves and accessories.

-- Modification of exhaust pipe path and accessories.

-- Do not follow the operation installation instructions.

-- Do not use our special accessories.

--Overheat damage caused by idle burning or

dry boiler burning.

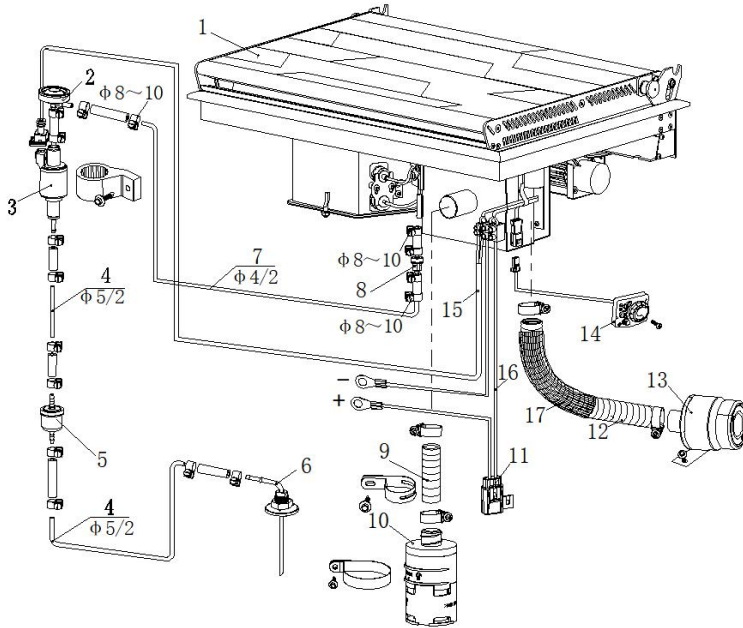


Fig. 1

1-Heater 2-Buffer 3-Fuel pump 4-Fuel pipe (blue: fuel tank to fuel pump) 5-Fuel filter 6-Fuel suction pipe 7-Fuel pipe (white: heater to fuel pump) 8-Check valve 9-Air inlet pipe 10-Air filter (optional) 11-Fuse holder 12-Exhaust pipe 13-Fireproof cap 14-Control switch 15-Fuel pump lead wire 16-Power cord 17-Insulated sleeve

Schematic diagram of fuel stove installation. As shown in figure 2.

Fuel stoves should be installed horizontally, with an inclination Angle of no more than 5° at an upright level. If the fuel range is tilted too much during operation (up to several hours), the equipment may not be damaged, but will affect the combustion effect, the burner is not up to optimal performance.

Below the fuel stove should retain enough space for installation accessories, this space should maintain enough air circulation channel with the outside, need more than 100cm<sup>2</sup> ventilation cross section, in order to achieve the equipment heat dissipation and air-conditioning mode when the need for warm airs.

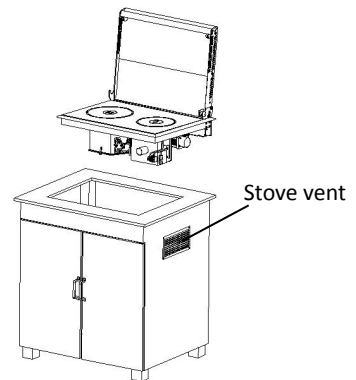


Fig. 2

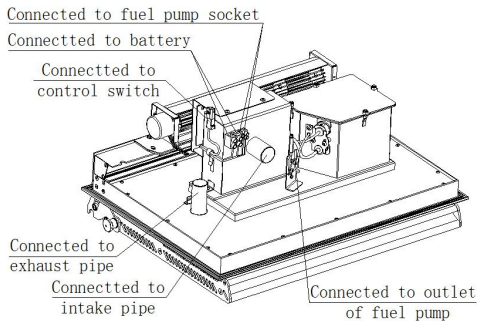
## Opening size of diesel cooking stove



**Fig. 3**

Between the fuel stove and the stove is fixed with glass glue. After fixing for one day, the fuel stove can be used. Open the doors and Windows after fixing the fuel stove to ventilate the smell.

Schematic diagram of fuel stove external connection line



**Fig. 4**

Installation of inlet and outlet pipes

The combustion air must be inhaled from the fresh air outside the vehicle; The exhaust gas from combustion must be discharged into the atmosphere through the exhaust pipe, and must not enter the car. Prevent the exhaust gas from burning to cause the danger of poisoning.

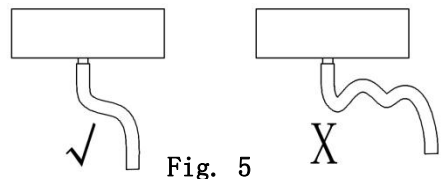
Pipe line through the vehicle's outer wall or bottom through hole, must be able to seal to prevent exhaust entry.

Inlet pipe and exhaust pipe must be equipped

with accessories of this machine.

The connection between the intake pipe and exhaust pipe and the main engine shall be fastened on the combustion inlet and exhaust pipe with matching clips. The outlet of the exhaust pipe should be positioned so that the discharged gas is not taken in by the intake pipe or the car heating fan (i.e. away from the intake pipe and car heating fan).

Inlet pipe and exhaust pipe, from the fuel stove to the car, should use downward direction (Figure 5), otherwise, in the lowest point of the pipeline should open a 4mm condensation water discharge hole. If bending is required, the bending radius of the pipe shall not be less than 50mm. Moreover, the sum of all bending angles of each tube must not exceed 270°.



**Fig. 5**

When the fuel stove is working, the temperature of exhaust pipe is very high. When installing, it must be kept away from hot objects such as plastic parts of the car body and properly fixed.

Inlet and exhaust pipes are easy to freeze in winter and should be checked frequently for patency.

Inlet pipe and exhaust pipe are stainless steel bellows. The connection between the engine and the combustion engine shall be fastened on the inlet and outlet of the exhaust pipe respectively with corresponding supporting clips.

No coating should be added to the surface of the fuel stove.

**Warning: Failure to comply with the above requirements may result in fire.**

**Fuel system connection**

The fuel is extracted from the vehicle fuel tank, and the fuel is transported and adjusted through a special fuel pump (provided by the manufacturer). Fuel is not allowed to be extracted from the vehicle engine's return system or downstream of the vehicle's internal delivery pump. Please install using fuel hoses and piping within the delivery range.

Fuel fuel shall conform to national standards Gb19147-2013 for vehicle diesel standard.

In winter, the fuel should meet the requirements of low temperature, and no biofuel should be used.

### Fuel line system

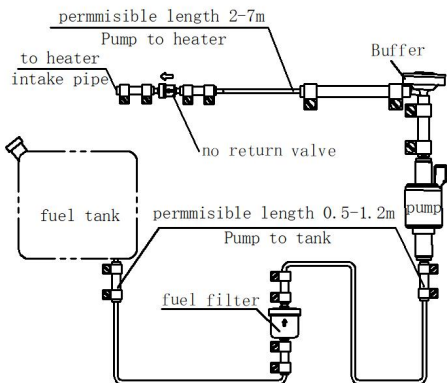


Fig. 6

### Installation of fuel line

The pipeline must be supplied with this machine fitting, namely nylon fuel pipe with good light resistance and thermal stability. Permissible length of fuel line: the maximum length of fuel line on the inlet side is 2m, and the maximum length of the pressure side is 6m. As shown in figure 6.

### Safety code for fuel lines

Be sure to use a hose cutter or a sharp tool to cut the fuel hose and piping to a certain length. The cut area cannot be compressed and must be free of burrs. Fuel lines must be firmly connected to prevent damage and/or noise due to vibration (approximately 50 cm is recommended between connection points). Fuel

lines must be protected against mechanical damage. The laying of fuel pipeline will not adversely affect the stability of vehicle rotation and engine operation. Protect fuel carrying parts from high temperatures that may affect operation (use suitable fiberglass lined aluminum thermal protective hoses). Do not install or fix fuel line near heater or exhaust line of vehicle engine. If the lines are crossed, keep sufficient distance from the hot parts -- if necessary, provide a thermal radiation shield. The tubing should be installed in a way that prevents flying stones from hitting, away from hot parts of the vehicle, and protective devices should be installed if necessary.

### Installation of fuel pump

The fuel pump shall be fixed with the fuel pump fixed jacket (rubber). The fuel outlet of the fuel pump should tilt upward, and its installation Angle should be selected within the range of 15° ~ 35° (As shown in Fig.7). When conditions permit, the tubing between the fuel pump and the heater should rise gradually. To prevent the fuel pump from heating (maximum operating temperature 40°C), do not install near the exhaust pipe.

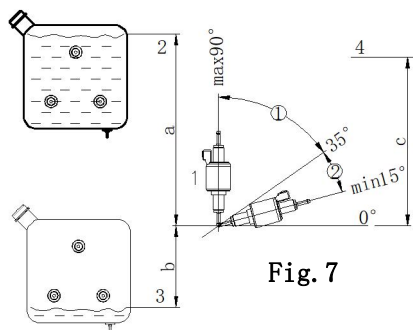


Fig. 7

$a \leq 3m$   $b \leq 0.5m$  (Avoid of negative pressure may be produced in sealed fuel tank.

In such case,  $b \leq 0.15m$ )  $c \leq 2m$ .

- 1-Fuel pump 2-Max.fuel level
- 3-Min.fuel level 4-Fuel inlet level
- ① Allowable installation angle
- ② Optimum installation angle

The height difference between the fuel level and the pump, and the height difference between the pump and the main engine inlet, will generate pressure (or suction) in the fuel path, so these dimensions should be in accordance with the requirements in Figure 7 (in a closed tank, negative pressure will be generated, in which case, the minimum fluid level maximum diagram of the tank should not exceed 0.4m).

### Connection between heater and fuel pump

The tubing direction from the fuel pump to the main engine should be as upward as possible. Mark a suitable place on the floor of the vehicle for crossing

The hole where the fuel line and fuel pump are connected to the cable. Before drilling, be sure to check for hidden cables, fuel lines, frame sections, etc. Then seal with underbody protection

The edge of an opening in the floor of a vehicle. In order to prevent the cable between fuel pipe and fuel pump being cut, please add the inlet bushing or the section edge protection material.

Tubing should be tied in an appropriate place for fixation, and the binding spacing should not be greater than 50cm.

The connection between fuel pipe and fuel pump, main engine and fuel tank (fuel extractor) should use the fuel pipe joint provided by this machine and tighten with the fuel pipe clip. Prevent bubbles from forming at the junction (Figure 8).

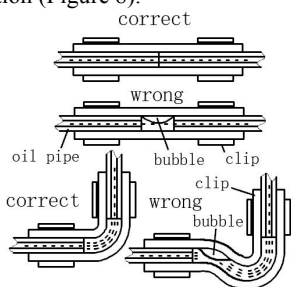


Fig. 8

### Installation of fuel suction pipe (Fig9)

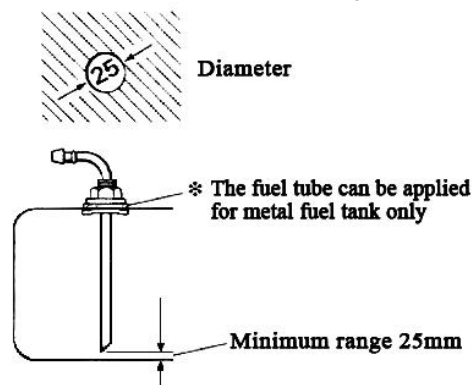


Fig. 9

Used when drawing fuel from the vehicle's own tank. During installation, the  $25\pm 0.2$  hole size of the installation hole on the fuel tank (or fuel tank cover) shall be noted, with neat edges and smooth surroundings to ensure a good seal between the fuel suction tubing seat. The distance between the lower mouth of the suction pipe and the bottom of the fuel tank should be 30-40mm, which can not only ensure the full absorption of fuel, but also prevent the impurities deposited at the bottom of the fuel tank from being inhaled.

### Mounting control switch

The fuel stoves must be operated by special rotary switches. See related instructions for details.

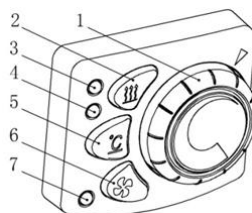


Fig.10

- 1- Control knob
- 2- Cooking button
- 3- Cooking indicator (red)
- 4- Air conditioning indicator (yellow)
- 5- Air conditioning button
- 6- Ventilation button
- 7- Ventilation indicator (green)

## Wiring diagram

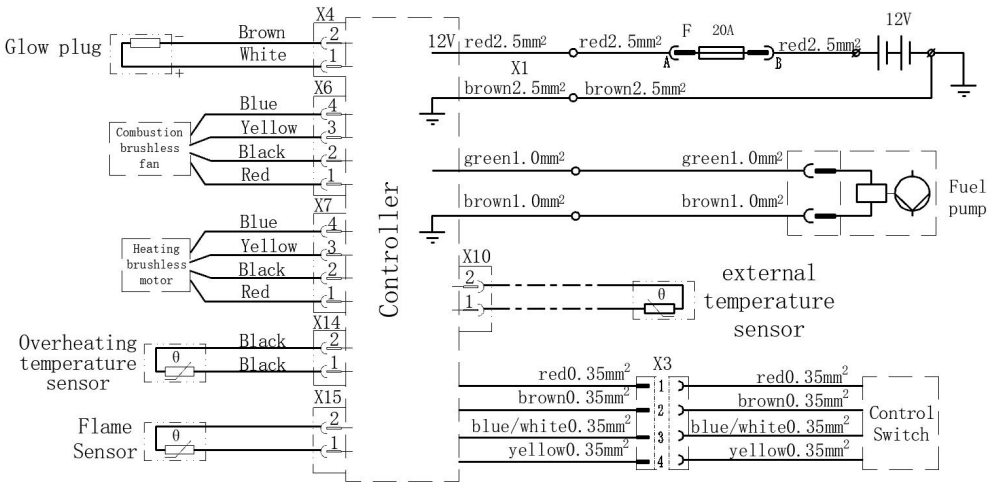


Fig11

Insert the control switch cable plug into the corresponding position as shown in Figure 4.

The red and green light at the same time on and off after power on .

If the red and green lights do not respond when power on, the knob switch may not be connected or the main power supply is not connected. The communication between the heater and the knob switch is defective if the red and green light flickers 10s when the power is on.

The cooking mode is adjusted by turning the control knob. The power range is between 900W and 2200W.

The air conditioning mode is controlled by a knob to set the temperature. The temperature setting range is 5°C ~ 35°C.

### Electrical connection

Lay electric wire to avoid chafing. If there are sharp edges, such as metal panels for threading, use lead bushing or edge protection.

Connector cables shall not attach to or touch metal surfaces, exhaust pipes or hot air pipes.

### DC12V power supply

The electrical wiring, switches and control equipment for the fuel stoves must be located in a location that will not adversely affect their operation under normal operating conditions. The fuel stove circuit has reverse polarity protection. If the controller is not connected with the correct polarity, the LED indicator will not work.

To ensure optimal power supply, the fuel stove must be connected to a fusible (20A) -protected vehicle power supply (or battery) using a 2×4.0mm<sup>2</sup> cable.

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

## 6. Operation instructions

Start fuel stove

Operate with a special control switch.

If you need cooking function, press the cooking button and the red light will be on



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In a few seconds, the burner is on, ready to ignite and burn steadily

After adjusting the control knob non-polar adjustment power.

If air conditioning is needed, press the air conditioning button. A few seconds after the yellow light is on, the fuel oven will start to work. It will be ignited and burn stably

After that, adjust the control knob to set the required room temperature, and the fuel oven will automatically follow the ratio of the actual room temperature to the set temperature.

Automatic regulation of combustion power.

It takes more than 5min for the fuel stove to start and burn steadily.

If you need to convert to air conditioning mode when cooking mode, you must press the air conditioning button and button the upper cover for conversion. Don't just buckle the top cover.

Switch from combustion to ventilation

When the fuel stove is in the burning state, press the ventilation button, the fuel stove will stop fuel, and turn to the ventilation mode after cooling down for a period of time.

In the ventilation mode, adjust the control knob to adjust the wind speed.

If ventilation function is needed, press the ventilation button, the fuel pump does not work, only the blower works. The function of circulating air to the room or sending waste heat to the fuel stove.

Turn off fuel stoves

When the fuel stove is working normally, which state it is working, press which key to turn off the fuel stove. For example, if you are working in cooking mode, press the "cook" button and the fuel stove stops heating fuel.

After the burner is turned off, the combustion fan and heating fan will continue to operate for several minutes to reduce the temperature of the furnace and body.

## 7. Fault

General fault handling

During the use of the fuel stove, it may not

start normally or shut off by itself after starting and be in the state of failure lock. At this point, you can turn off the fuel stove more than 5S to restart.

Fuel stoves may cause circuit faults due to the following reasons: joint corrosion, poor contact, wrong insertion, wire or fuse corrosion, battery pile corrosion, etc., pay attention to the use of inspection, maintenance, prevent these phenomena occur.

When the following situations occur, they can be handled and eliminated by the user:

- The fuel stove does not start and the control switch indicator light does not light after starting up, the reason is open fuse or wiring error; In addition, check whether the plug on the control switch lead is properly connected to the host.

Fail-lock status

The fault of the fuel stove is shown by the corresponding cycle flicker on the control switch. Each cycle includes a 3s long snuff and several flashes at intervals of 0.5s. The number of flickers that occur between two long extinguishment intervals indicates the type of fault.

The troubleshooting methods can be listed in Table 2.

**Troubleshooting methods of fault lock**

Flash frequency	Fault code	fault handling	Method of troubleshooting
1	31	Start failure	A Check the fuel supply system B. Check whether the combustibles inlet and outlet are blocked C Check the electric plug and flame sensor
2	32	Burner failure	A Check the fuel supply system B. Check whether the combustibles inlet and outlet are blocked C Check the flame sensor
3	10	Overvoltage fault	A Check the vehicle power supply system
	11	Low voltage fault	A Check the vehicle power supply system
4	33	Flame sensor failure	A Check the flame sensor lead B Check the flame sensor
5	51	Communication failure	A Check the connection cable
6	25	Outside temperature sensor broken circuit	A Check whether the sensor is in goo condition
	26	Outside temperature sensor short circuit	A Check whether the sensor is in good condition
7	61	Fuel pump broken circuit	A Check whether the fuel pump lead is damaged B Check whether the fuel pump lead connection is reliable C repair fuel pump D Replace the main board
	62	Fuel pump short circuit	A Check whether the fuel pump lead is damaged B Check whether the fuel pump lead connection is reliable C repair fuel pump D Replace the main board

**Table 2**

<b>Troubleshooting methods of fault lock</b>			
<b>Flash frequency</b>	<b>Fault code</b>	<b>fault handling</b>	<b>Method of troubleshooting</b>
8	81	Combustion fan broken circuit	A Check the combustion fan
	82	Combustion fan failed to start	A. Check the motor lead connection B Check the combustion fan
	83	Fan speed is too low	A Check the combustion fan
9	63	Glow plug broken circuit	A Check the supply voltage B check the glow plug temperature resistance (0.2 $\Omega$ / 12 v) C. Clean the heating plug for carbon deposition D Replace the main board
	65	Glow plug is not actuate	A Replace the main board
10	84	Fan broken circuit	A Check warm air fan
	85	The warm air fan failed to start.	A Check the warm air fan B Check warm air fan
	86	speed of the warm air fan over low	A Check warm air fan
11		Heater cover overheat	A Check whether the sensor is in good condition
12		Short circuit of heater cover temperature sensor	A Check whether the sensor is in good condition
		Broken circuit of heater cover temperature sensor	A Check whether the sensor is in good condition B Check the cable
13		Heater cover temperature overheat	A Incorrect control mode
14		Pneumatic sensor failure	A Replace control switch

**Table 2 continued**

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## 8. Notes

### ● First installation

- The first installation of the fuel stove, in order to completely remove the air in the fuel supply system, so that the fuel pipeline filled with fuel, we set a special **pump fuel function**. You can use the function of quick fuel pump by holding down the ventilation key and not letting go.

First, press the air conditioner lamp when it is lit, and then press the warm air button. The warm air lamp is also lit. If any key is pressed during the fast fuel pumping, the fast fuel pumping stops.

-- The fuel stoves should be tested before use. Carefully check all connections for leaks and safety during the trial run. In case of smoke emission, abnormal combustion noise or fuel odor, turn off the heater and unplug the fuse so that it cannot operate. After professional maintenance can be used.

The first time you use a fuel stove, it may take a short time

Smell. This is normal in the first few minutes of operation, and it does not mean that the fuel stoves are not functioning properly.

### Maintenance

- During maintenance, an inspection must be conducted by a professional to carry out the following maintenance work:

Check inlet and outlet for contamination and foreign matter.

Clean the outside of the fuel stove.

Check the circuit connector for rust and looseness.

Check the intake and exhaust pipes for obstruction or damage.

Check the fuel line for leaks.

### ● Long-term shutdown

-- When the fuel stove is not in use for a long time, it should be operated once every 4 weeks for about 10 minutes each time to prevent failure of mechanical parts such as combustion air fan (fixed).

- When replacing low-temperature fuel, make the fuel stove run for at least 15 minutes and fill the fuel system with new fuel.

### ● Fuel stove use life

-- The heat exchanger for the fuel range shall not be used for more than 10 years. After expiration, it must be replaced by genuine parts and replaced by the fuel stove manufacturer or its authorized agent.

The exhaust pipes from the fuel stoves that discharge combustion gases must be replaced with genuine parts when they have been in use for 10 years.

### ● Other precautions

-- In the process of transportation and storage, the ambient temperature 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 the heater, and the use of non-original parts is prohibited to avoid risks.

The manufacturer is not responsible for the warranty of heater damage caused by improper installation and operation.

You must turn off the fuel range before refueling.

- When welding the car, first remove the positive power line of the fuel stove from the battery and ground it to prevent damage to the controller.