

MAX SPEEDINGRODS
Since 2006

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Since 2006

PARKING AIR HEATER

FOCUS ON PERFORMANCE

Attention

- Information on the devices and accessories included in this manual is provided for reference only; actual products are subject to change without prior notice.
- After opening the product's packaging box for the first time, please ensure that the main device and spare parts are included in the packing list.
- Please read this manual carefully; if you have any questions, contact your dealer as soon as possible.

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Packing list

Packing list for All-in-one Heater

NO :	Name	Specification	Unit	Quantity
1	Main device	12V 5KW	set	1
2	LCD control panel		piece	1
3	Remote controller		piece	1
4	Air inlet pipe	ø 25 mm	piece	1
5	Exhaust pipe	ø 24 mm × 600 mm	piece	1
6	Hot air outlet tubing	ø 76 mm	piece	1
7	Exhaust silencer		piece	1
8	Repair tool		piece	3
9	Exhaust Wrap	2m	Roll	1
10	Installation Kit		set	1

Note : Please confirm these component counts as soon as you receive the package.



Model : MXR-2Y



Model : MXR-3M



Model : MXR-1F

Packing list for Split Heater

NO :	Name	Specification	Unit	Quantity
1	Main device	12V 5KW	set	1
2	Wire harness	3m	set	1
3	LCD control panel		piece	1
4	Remote controller		piece	1
5	Fuel pump	12V (22 ml/1000 times)	piece	1
6	Fuel filter		piece	1
7	Fuel pump rubber clip		piece	1
8	Air filter		piece	1
9	Air inlet pipe	ø 25 mm	piece	1
10	Exhaust pipe	ø 24 mm × 600 mm	piece	1
11	Hot air outlet tubing	ø 76 mm	piece	1
12	Air outlet grid		piece	1
13	Mounting plate		piece	1
14	T connector		piece	1
15	Fuel tank	9L	piece	1
16	Exhaust silencer		piece	1
17	Oil extractor		piece	1
18	Fuel hose	3.5m	piece	1
19	Exhaust wrap	2m	roll	1
20	Repair tool		piece	3
21	Installation Kit		Set	1

Note : Please confirm these component counts as soon as you receive the package.

01

INTRODUCTION

1.1 Overview

The main unit of this parking air heater (the "heater") is a small, microprocessor-controlled, fuel-burning furnace. Its heat exchanger is located in a hood-shaped case with a separate air passage. Cold air is sucked into this air passage by the fan, and hot air blown out, forming a heating system independent of the vehicle's original heating system. In this way, a vehicle's cab or passenger compartment can be heated whether or not the engine is running. A schematic diagram is shown in **Fig. 1**.

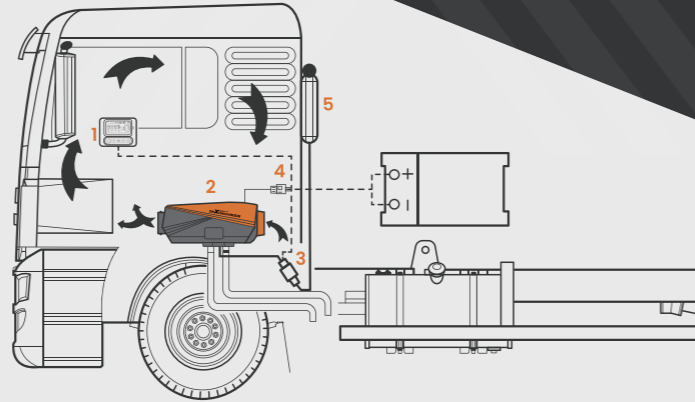


Fig. 1

1.2 Innovations

- Constant temperature & intelligent frequency conversion
- Flameout protection
- Anti-electrophore function
- Ignition tested in low temperature conditions, down to -40°C
- Smart Phone App control (iOS and Android)
- Automatic altitude adjustment

1.3 Purpose of Heater

- Pre-heating, de-misting windows
- Heating and keeping warm the following :
 - All kinds of automobiles and trailers
 - Construction machinery
 - Agricultural machinery
 - Camper vans
 - RVs
 - Boats, ships, yachts



Model : MXR-1F



Model : MXR-2Y



Model : MXR-3M

1.4 Unsuitable Situations and Places

The heater must not be used in the following situations and places:

For constant heating in enclosed spaces (to avoid risk of poisoning), such as :



Residential rooms



Garages



Work huts, weekend homes and hunting huts



Houseboats, etc.

For directly heating and drying (to avoid danger/damage) :



Living things (people, animals etc.)



Articles and objects



Blowing hot air into containers

In the presence of flammable vapor or dust :



Fuel depots



Carbon storehouses



Timber storehouses



Granaries and similar places



Diesel/Petrol/Gas stations

02

INSTALLATION NOTES



CAUTION

1. SWITCH OFF heater before refuelling!
2. DO NOT cut off electric power during operation.
3. DO NOT use heater in closed and/or unventilated places.
4. DO NOT start the heater with a cigarette lighter.
5. Place exhaust outlet outside to prevent ingress of exhaust fumes.
6. Seal all gaps between mounting plate and car body.
7. KEEP AWAY from fuel tanks, compression tanks, fire extinguisher, clothes, and other flammable objects.

Heater and component placement

- The part of any structure or any component near the heater must be protected from excessive heat exposure and possible fuel or oil contamination.
- The heater must not pose a fire hazard even if it overheats. This requirement is considered fulfilled if adequate clearances are allowed for all components during installation, sufficient ventilation is provided and fireproof materials or heat shields are used.
- All appropriate precautions must be taken when positioning the heater in order to minimize the risk of injury to persons or damage to property

Fuel supply

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

Combustion air intake

- The air for the heater's combustion chamber must not be sucked in from the vehicle's passenger compartment.
- The air intake must be arranged or protected in such a way that it cannot be blocked by other objects.

Cold air intake

- The heater's air supply must consist of fresh air or circulated air and must be sucked in from a clean area which cannot be contaminated by exhaust fumes from the engine, the combustion heater or any other source within the vehicle.
- The intake pipe must be protected using a grill or other suitable equipment.

Exhaust system and exhaust pipe layout

- The exhaust system and exhaust pipes shall be laid out or protected to minimize any danger to the load due to heating or ignition.
- Exhaust system components situated directly below the (diesel) fuel tank shall be protected by a thermal shield, or shall be installed with at least 3.93 inches (100mm) clearance from it.
- The exhaust outlet must be properly situated to prevent any ingress of exhaust fumes into the vehicle interior through the ventilation system, warm air intakes or open windows.

Avoid overheating and ignition

- Combustion heaters and their exhaust pipes must be designed, situated, protected and/or covered so that risk of overheating or ignition of the vehicle's load is minimized.

Hot air outlet

- The hot air pipes within the vehicle must be arranged or protected such that they do not create risk of injury or damage through being touched.
- The air outlet must be arranged or protected in such a way that it cannot be blocked by objects.

Fuel tanks

- Fuel tanks for supplying the heater shall conform to the following regulations:
- In the event of any leakage, fuel shall drain to the ground without coming into contact with hot parts of the vehicle or its load;
 - Fuel tanks containing diesel shall be equipped with an effective flame trap at the filler opening, or with a closure allowing the opening to be kept hermetically sealed.



CAUTION

Technical data safety instructions!

Failure to comply with this technical data can result in malfunction.

Please note!

Where no limit values are given, the technical data listed is subject to the tolerances normally applicable to heaters of ±10% for nominal voltage, and at an ambient temperature of 20 °C

Serial No.	Model	MXR-1F (Split style)	MXR-2F MXR-3M
1	Fuel	Diesel ONLY	
2	Heating Capacity	1-5KW	1-5KW
3	Rated Voltage	12V	12V
4	Fuel Consumption	0.16-0.48L/H	0.16-0.48L/H
5	Operating ambient temperature	-40°C to +40°C	
6	Starting Power Consumption	9-11A	9-11A
7	Operating Power Consumption	1-3A	1-3A

04

HEATER STRUCTURE

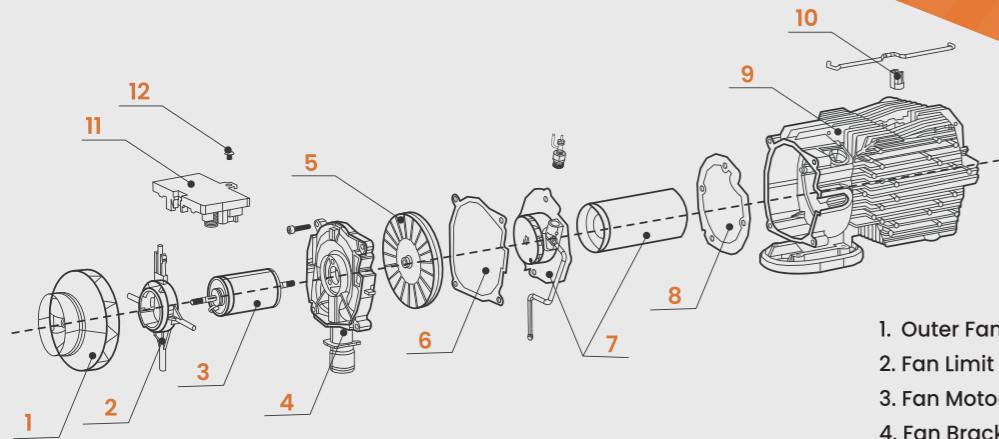


Fig. 2

- 1. Outer Fan Wheel
- 2. Fan Limit Bracket
- 3. Fan Motor
- 4. Fan Bracket
- 5. Inner Fan Wheel
- 6. Sealing Gasket
- 7. Combustion Chamber
- 8. Asbestos Gasket
- 9. Cylinder
- 10. Temperature Sensor
- 11. Controller Board
- 12. Controller Board Screw

Overheating Sensor

This temperature sensor is installed on the outer wall in the middle of the heater body. If the shell temperature exceeds 270°C, fault code E-5 is reported, and the heater will shut down.

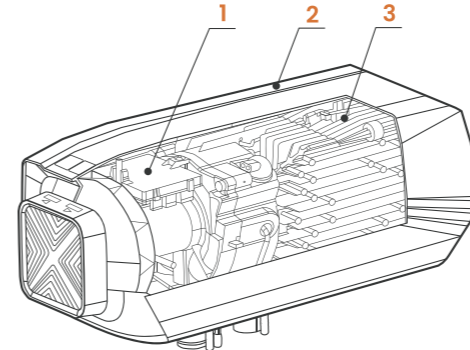


Fig.3 Heater Body

- 1.Controller board
- 2.Casing
- 3.Heat exchanger

Temperature Sensor

Located into the LCD controller, the temperature sensor measures the ambient temperature at the air inlet and provides the data for the mainboard which, based on this, will control the oil flow rate of the pump for temperature regulation.

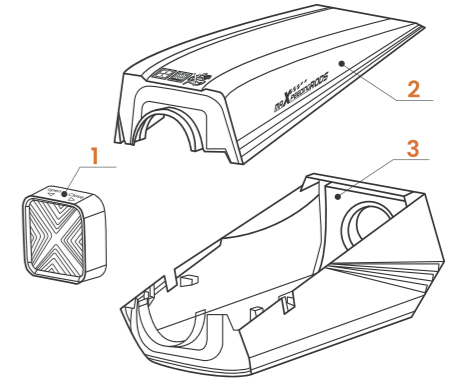
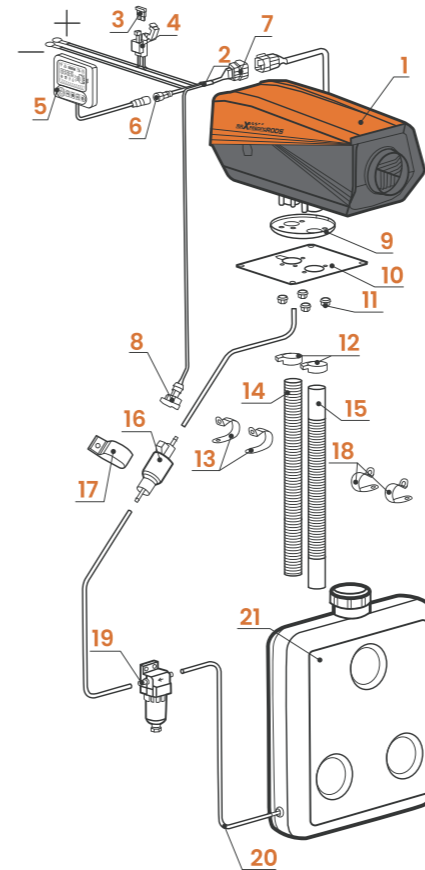


Fig.4 Casing Structure

- 1.Grill
- 2.Casing (upper half)
- 3.Casing (lower half)

05 INSTALLATION

The positions and methods of fixing the various components may vary according to the type of vehicle, but their general principles must conform with this chapter's requirements. Otherwise, the heater may not work normally, or safety problems may even occur.



Only the components provided can be used for installation of the heater. Install in accordance with **Fig.5**, the installation diagram, below:

- | | |
|-------------------------------|---------------------------|
| 1. Main Device | 12. Inlet Air Pipe Clamp |
| 2. Main Harness | 13. Inlet Air Pipe Clip |
| 3. Fuse Block | 14. Inlet Air Pipe |
| 4. Fuse Box | 15. Exhaust Pipe |
| 5. Controller Panel | 16. Fuel Pump |
| 6. Controller Panel Connector | 17. Fuel Pump Rubber Clip |
| 7. Main Device Connector | 18. Exhaust Pipe Clip |
| 8. Fuel Pump Connector | 19. Fuel Filter |
| 9. Flange Gasket | 20. Fuel Hose |
| 10. Mounting plate | 21. Fuel Tank |
| 11. M6 Nut | |

Fig.5 Installation Diagram

Model MXR-2Y & MXR-3M (All-in-one style) have two power supply methods: car battery and DC 12V(AC/DC adaptor optional), pls refer **Fig.6**.

Please note!

Only one power supply method can be used at a time, CANNOT be used at the same time.

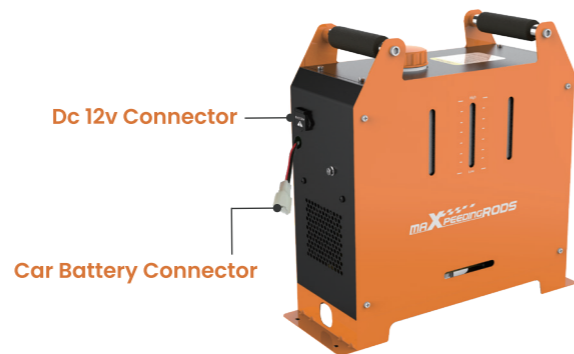


Fig.6

5.1 Installation of Main Device

5.1.1 Installation position

The main device can be installed inside or outside of the vehicle. However, when it is installed outside the vehicle, a shield (not included) to prevent damage due to external forces (eg stone damage) should be provided. The heater must not be immersed in water or exposed to rain. If the heater suffers corrosion due to rain or other water, immediately cease using it and have all of its components inspected by a qualified technician.



Model : MXR-1F

Installation position: truck

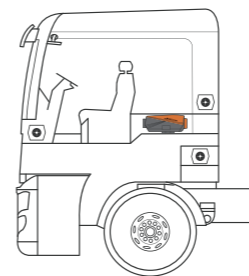


Fig.7

In a truck, the heater should preferably be installed inside the driver's cab. If this is not possible, it can also be mounted in the tool box or in a storage box. Please refer to **Fig.7**.

Installation position: RV

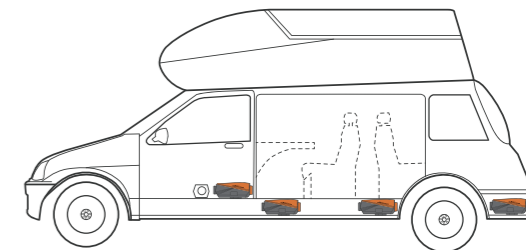


Fig.8

In an RV, the heater should preferably be installed in the inner compartment or luggage compartment. If this is not possible, the heater can also be mounted, protected against water splashes, under the vehicle floor. Please refer to **Fig.8**.

Installation position: car or people carrier

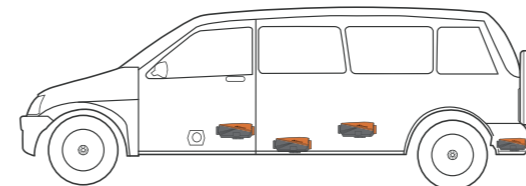


Fig.9

The heater should preferably be installed in the passenger compartment or boot (trunk). If this is not possible, it can also be mounted, protected against water splashes, under the vehicle floor. Please refer to **Fig.9**.

Installation position: excavator cab

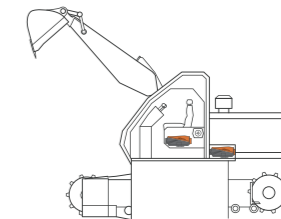


Fig.10

In an excavator, the heater should preferably installed in the cab. If this is not possible, the heater can also be installed in a storage box outside the cab. Please refer to **Fig.10**.

5.1.2 Space requirements

Adequate space for installation and maintenance must be provided. For installation space requirements, please refer to **Fig.11**. Ensure that there are no potentially interfering objects located in the gap between the bottom surface of the main device and the vehicle mounting surface.

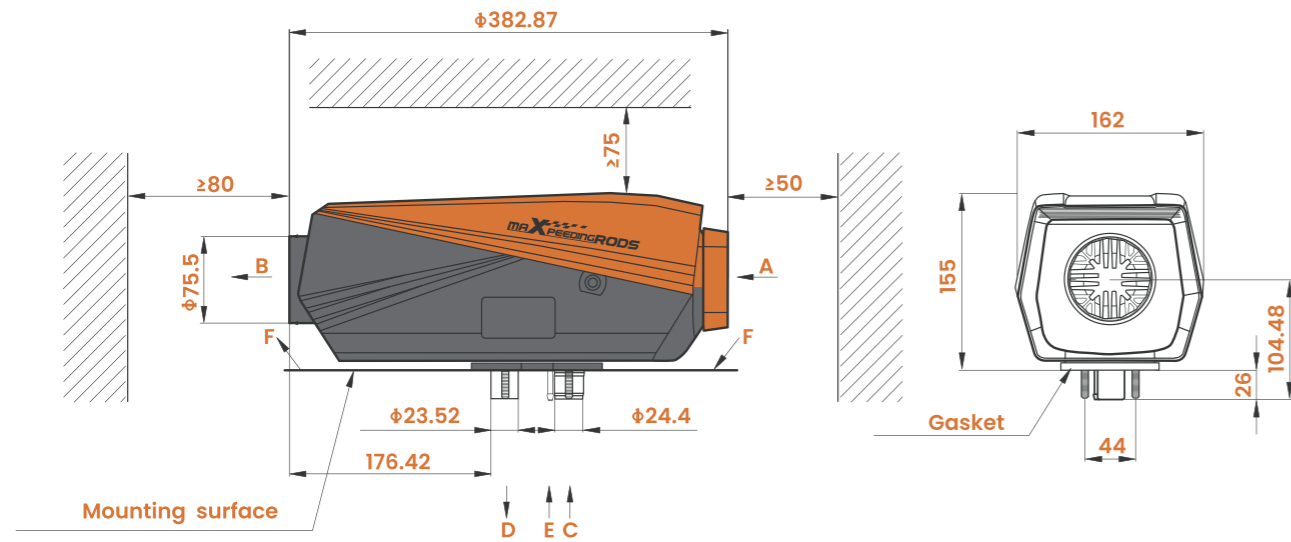


Fig.11

- A. Cold Air Inlet B. Hot Air Outlet C. Combustion Air Inlet
 D. Exhaust outlet E. Fuel Inlet F. No-interference Area

5.1.3 Sealing

A good seal between the main device and the vehicle mounting surface is necessary. A flange gasket (shown in **Fig. 12**) supplied by the manufacturer, must be installed between the device and the vehicle mounting surface. The installation surface must also be sufficiently flat, with unevenness of less than 1 mm across the base of the main device. After drilling installation holes, please confirm that the evenness meets this requirement, then rotate the four M6 nuts provided by the manufacturer until tightened to a tightening torque of 6Nm+1Nm. The position of installation holes is shown in the **Fig. 13**.

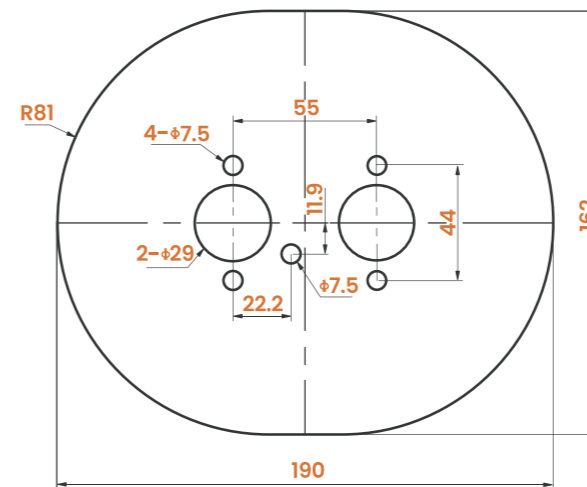


Fig.12

Recommendations:

Use of high temperature sealant to seal the installation gap after the heater has been mounted is recommended.

5.1.4 Mounting plate

A mounting plate is needed if the thickness of the installation panel is < 1.5 mm. The gap between the mounting plate and the car body must also be sealed (**Fig. 13**).

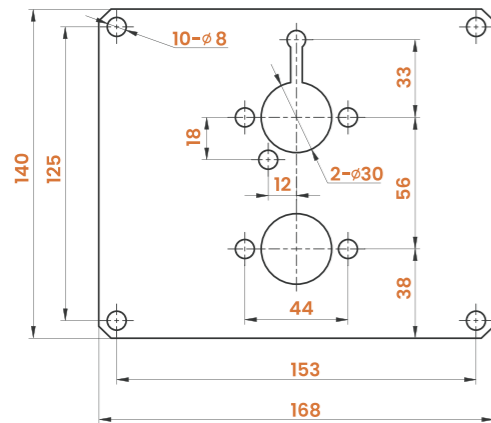


Fig.13

Please note!

The mounting gasket must be replaced with a new gasket when the main device is reinstalled.

5.1.5 Installation orientation

- Install the heater on the vehicle floor is preferred as **Fig. 14-1**.
- Install the heater on the vehicle wall as **Fig.14-2**.
Caution: If the heater must be installed on the vehicle wall, the fuel inlet (ignition plug) must be closer to the unit's top side, otherwise leakage will occur.

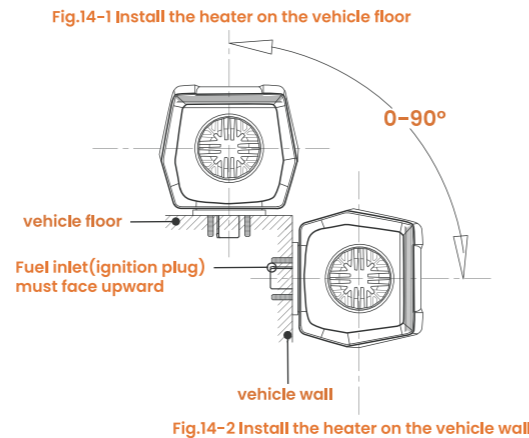


Fig.14

Please note!

- Allow sufficient clearance between the heater and the vehicle floor, and also ensure that the fan wheel runs freely.
- The mounting plate/vehicle wall surface must be flat and smooth.
- The flange seal must be mounted.

5.1.6 Check the fan wheel

After the installation, ensure that there is no contact or friction between the fan wheel and the surrounding components in order to prevent malfunction during operation.

5.2.2 Temperature resistance

If an external heating air pipe is attached to the heater, it shall be made of material capable of resisting a temperature of 150 °C.

5.2 Installation of Air Heating System

5.2.1 Air circulation modes

Selection of independent outer circulation or inner circulation mode for the heater's installation is recommended. If the heater's air heating system must be connected with the vehicle's air duct, in order to ensure that the air duct remains unobstructed, the method of connection should be determined by a professional.

5.2.3 Cold air intake

For a heater operating in internal circulation mode, measures shall be taken to prevent hot air re-entering the air inlet port (as shown in **Fig. 15**, below). Inlet air shall be drawn from a cold area of the compartment. If, in this mode, no air inlet pipe is attached, an air inlet hood with a grill must be installed directly onto the main device.

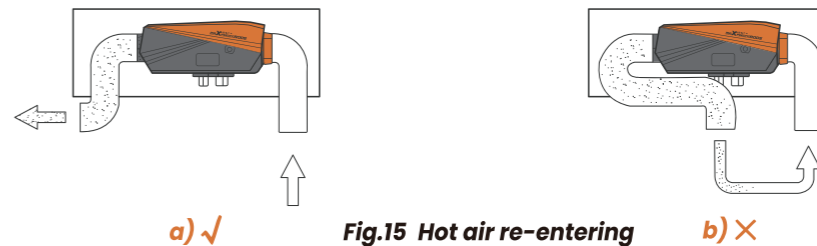


Fig.15 Hot air re-entering

5.3 Installation of Fuel Supply System

5.3.1 Fuel pump

The fuel pump shall be mounted in a protective rubber clamp to reduce vibration, with its outlet tilting upwards. For the preferred installation position see **Fig. 17**, above. When conditions permit, the fuel pipe between the fuel pump and the heater should run at a gradual upward slope.

Please note!

Please install in accordance with the arrow on the fuel pump. Do NOT install upside down.

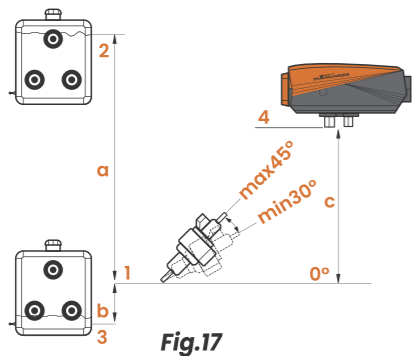


Fig.17

Pressure Height of Fuel Pump

1. Fuel Pump

-Preferred installation position in range 30° to 45°

2. Max. Fuel Level

3. Min. Fuel Level

4. Connection to Heater

5.3.2 Pressure height of fuel pump

The difference in elevation between the level of the fuel itself and the fuel pump, as well as that between the fuel pump and the fuel inlet, can create pressure (or suction) in the fuel pipeline (See **Fig. 16**). Therefore, these dimensions shall conform to the following requirements : $a \leq 3\text{m}$; $b \leq 0.5\text{m}$; $c \leq 2\text{m}$. Note: this is ONLY applicable for the split heater model (MXR-IF).

Please note!

During installation, please check the vent hole on the fuel tank cap.

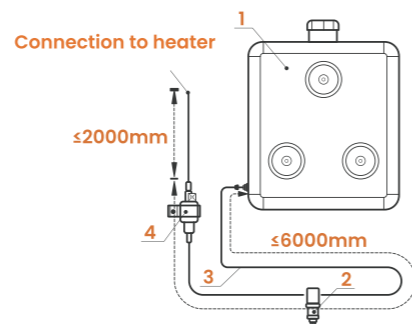


Fig.16

Fuel Supply System

1. Fuel Tank

2. Fuel Filter

3. Fuel Hose

4. Fuel Pump

5.3.3 Fuel line

- A sharp knife must be used to cut fuel hoses and pipes to length. Their interfaces must not be crushed and must be free of burrs.
- The fuel pipe from the fuel pump to the heater should be routed to rise continuously.
- Fuel pipes must be fastened safely to avoid damage and/or noise production due to vibrations (with a recommended clearance of approx. 50 cm).
- Fuel pipes must be protected from mechanical damage.
- Hose clips must be used to secure all fuel supply hose connections.
- Components carrying fuel must be protected from heat.
- Never route or fasten the fuel pipes to the heater or vehicle exhaust system. At crossings, always ensure adequate heat clearance.
- Dripping or evaporating fuel must not collect on hot components or be liable to ignition by electrical systems.
- When connecting fuel pipes with a fuel hose, always mount the fuel pipes in a butt joint to prevent the formation of any bubbles.

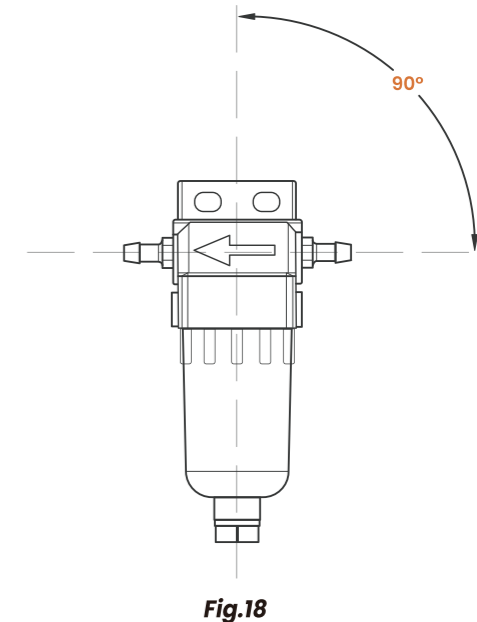


Fig.18

5.3.4 Installation of fuel filter

A fuel filter should be installed in front of the fuel pump's fuel inlet. Ensure that this correctly follows the fuel flow, positioned at an angle of exactly 90°, in conformity with **Fig.18**. The fuel filter should be replaced every 6 months, as should be the fuel pipe fittings and clamps.

5.4 Installation of Electrical Components

5.4.1 Main wire harness

The connection diagram for the main wire harness and heater as **Fig.19**. The wires of the main device that require connection to external circuits have been gathered into wire bundles, which can be laid to suit the positions of the various components, and fixed in appropriate locations. The distance between two fixing points shall not exceed 300 mm.

Please note!

Any wire bundle exposed outside the vehicle body or outside a wiring duct must be protected with corrugated piping.

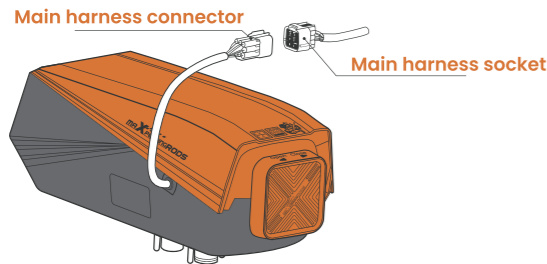


Fig.19

5.4.3 Fuel pump connection

Connect the fuel pump leads to the fuel pump.

5.4.2 Battery connection

Connect the RED wire on the fuse box to the PLUS terminal of the vehicle's battery; connect the BLACK wire to the MINUS terminal.

5.4.4 LCD control panel

Install the control panel in a position allowing convenient operation, arranging it to make observation of the indicator easy, thus permitting convenient identification of the heater's operating status (eg operating/stopped). The terminals of the control panel lead wires shall be inserted into the socket, then connected to the main harness connector using its self-locking mechanism.

5.4.5 Avoid short-circuit

The end of each wire shall be wrapped with insulating tape to prevent short circuits.

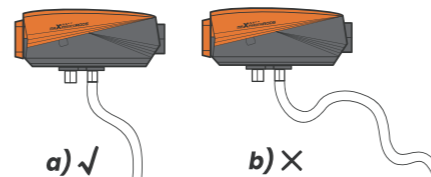
5.5 Installation of Combustion Air System

Please note!

- Air for combustion must be fresh air sucked in from outside the vehicle; fumes from combustion must be discharged to outside the vehicle via the exhaust pipe.
- The combustion air intake must remain free from any blockage at all times.
- The combustion air intake must be positioned to be sure that exhaust fumes cannot be sucked in mixed with the combustion air.
- The combustion air intake system shall be installed sloping slightly downwards.
- Where pipes pass through the vehicle's outer walls or underside, please take measures to prevent entry of water splash into these pipes.

5.5.1 Installing the pipes

Only the combustion air pipe and exhaust pipe provided with the heater may be used. The air inlet is an aluminum pipe bellows, the exhaust is a stainless steel pipe bellows. These must be installed correctly, and in particular CANNOT BE INTERCHANGED during installation (eg the aluminum pipe bellows is only suitable for use as the inlet, and cannot tolerate hot exhaust gasses.) Please use the clamps provided to mount them tightly.



5.5.2 Direction of pipes

Both the air inlet pipe and exhaust pipe shall exit the heater in an outwards and downwards direction. If either of these pipes must be bent, the sum of the angles of all its curves shall not exceed 270°. Please refer to **Fig.20**, below.

The pipes openings shall not face towards the direction of the running vehicle, or be positioned in way that allows blockage by slurry, snow or dirt.

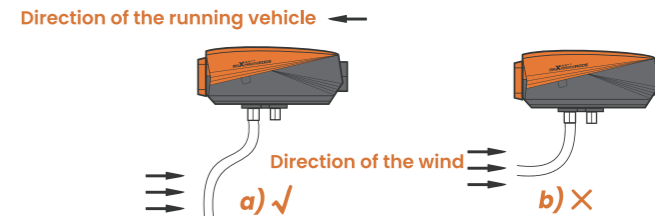


Fig.20

5.5.3 High temperature exhaust pipe

When the heater is running, the surface of the exhaust pipe will reach a high temperature. Ensure that this pipe is installed far away from plastic components or other objects with the poor thermal resistance on the vehicle body. The exhaust pipe shall be properly mounted, with its vent pointed downwards and perpendicular to the road, at an angle of $90^{\circ}\pm 10^{\circ}$ (see **Fig. 21**). To maintain the correct angle, the exhaust pipe fixing clamp shall be mounted within 150 mm of the pipe end.

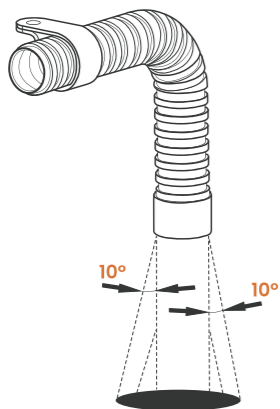


Fig.21



CAUTION

Risk of injuries and burns!

All types of combustion produce high temperatures and toxic exhaust fumes; this is the reason the exhaust system must be installed strictly according to these instructions.

- Do not perform any work on the exhaust system while the heater is working.
- Before working on the exhaust system, first switch the heater off, wait until all parts have cooled down completely, and wear safety gloves if necessary.
- Do not inhale the exhaust fumes.
- The manufacture disclaims any liability for consequences resulting from failure to install the device in accordance with the requirements of this manual.

5.5.4 Protective cover

If the exhaust pipe section installed within the vehicle may be touched by an occupant, a protective cover must be installed to prevent human contact and skin burns. The exhaust wrap tape provided can withstand high temperatures, up to about 500 °C.

Please note!

please wear safety gloves while wrapping the exhaust pipe.

06 USAGE

6.1 Functions

6.1.1 LCD control panel

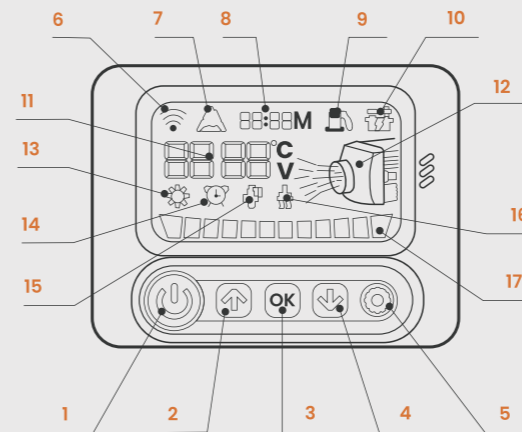


Fig.22

The LCD display shows altitude, voltage, fan mode, fan in operation, fuel pump and glow plug icons (during operation), fan speed, fuel pump speed, housing temperature, etc.

- | | |
|------------------------------|--------------------------|
| 1. On/off key | 10. Under-voltage symbol |
| 2. Up key | 11. Parameter display |
| 3. OK key | 12. Device operating |
| 4. Down key | 13. Settings Symbol |
| 5. Settings key | 14. Time symbol |
| 6. Bluetooth® symbol | 15. Fuel pump symbol |
| 7. Plateau symbol | 16. Glow plug symbol |
| 8. Altitude display | 17. Power level display |
| 9. Low oil symbol (Optional) | |

6.1.2 Wireless remote control

Wireless 433M transmitter operating characteristics :

- Operating Frequency: 300 – 480 MHz
- Data Rate: 1 – 5 kbps
- Sensitivity: -108 dBm(3 kbps), 0.1% BER
- Receiver Bandwidth: 510 kHz @ 433.92 MHz
- Image Rejection Ratio: 33 dB
- Maximum Input Signal: 10 dBm

6.1.3 App control (Bluetooth® wireless technology)

Bluetooth® RF Characteristics :

- BLE 4.2/5.0
- RF data rates up to 2Mbps
- TX Transmit Power: +10dBm
- RX Receive sensitivity: -94.5dBm@BLE 1Mbps
- Embedded hardware AES encryption
- 2.5dBi -PCB antenna, 2.5dBi antenna gain
- Operating temperature: -40°C to +85°C
- Supports App operation

6.1.4 Automatic altitude adjustment supported

Automatically adjusts fuel supply to heater based on altitude.

6.2 Electrical Parameters

Electrical data table	
Parameter name	Specification
Input Voltage	DC 12V
Operating consumption	12V/3A @4400rpm
Startup consumption	12V/10A @1800rpm
Display	LCD display
Temperature regulation	Temperature Mode/Power Mode
Glow plug power	80W Constant power control
Fan Speed Range	1800-4400rpm
Pump fuel Frequency Range	1.7-5.2HZ
Remote control methods	RF433M (default) / Bluetooth®App operation (optional)
Factory undervoltage default	10.5V
Plateau Mode	Supported

Electrical Connection Diagram

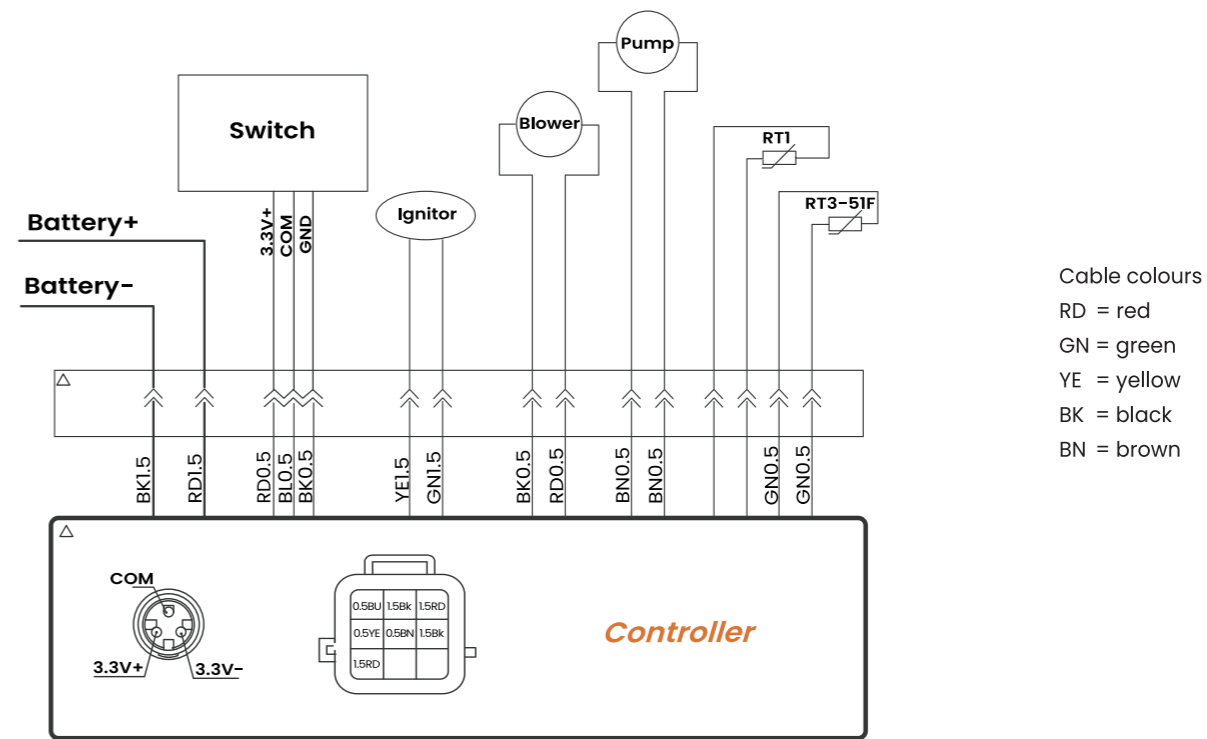


Fig.23

6.3 LCD Panel Switch Functions

6.3.1 Manual pump operation(Pump_oil)

- In shut-down state, long press the "↑" + "↓" keys at the same time for 2 seconds. The LCD will show "OIL" as **Fig.24**, and after pumping fuel successfully the device will automatically switch into operating state.
- In manual pump mode, long press "↑" + "↓" for 2 seconds to exit.

Please note!

When operating the device for the first time, it is recommended to pump fuel using manual pump mode, thereby quickly filling the entire fuel pipeline.



Fig.24



Fig.25

6.3.2 Start-up operation

In shut-down state, press the "⏻" key to start the device, which will display its start-up status as **Fig.25**.

About 3 seconds after the heater starts up, its glow plug will start to operate; its fuel pump will start operating after about 1.5 minutes. After successful ignition, the heater will start to operate normally after about 5 minutes.

Please note!

Settings cannot be adjusted until the startup process is complete. After startup, switching between power and temperature modes or shutting the heater down becomes possible.

6.3.3 Shut down operation

After pressing the "⏻" key, the fuel pump will stop immediately, but the fan will remain running to cool down the heat exchanger case for 3-5 minutes, displaying "OFF", as **Fig.26**.



Fig.26



Fig.27

It will then display "U-12V" as **Fig.27**, which means that the heater has shut down completely.

Please note!

DO NOT cut off the power supply to the heater during the cooling process, or its internal temperature will remain too high, causing deformation of the combustion chamber. This deformation may result in insufficient air entering the combustion chamber, causing carbon deposits, white smoke or failure to ignite, or even damaging the glow plug.

6.3.4 Power mode operation

Long press the "⚙️" key to enter power mode/temperature mode, and select the power mode. "P1" will be displayed, as **Fig.28**.



Fig.28

The power mode has 5 levels (P1-P5), "P1" is the minimum power level (lowest fuel consumption), P5 is the maximum power level (highest fuel consumption). Press the "↑" or "↓" key to adjust the power level, which will be displayed on a bar graph.

6.3.5 Temperature (thermostat) mode operation (Auto)

Long press the "⚙️" key to enter power mode/temperature mode, select the temperature mode to show the Celsius symbol, and press the "↑" or "↓" keys to adjust the temperature, which can be set in the range of 5°C - 30°C.

6.3.6 Setting time

Press the "OK" + "↓" keys at the same time for 2 seconds to enter the timing setup interface. The display will show "ON" and a flickering "⌚" icon, which means that the start-up time is being set. If the display shows "OFF", it means the shut-down time is being set.

- 1) Press the "↑" or "↓" key to select whether to set the start-up time or shut-down time. (Displaying "ON" signifies start-up, "OFF" signifies shut-down.)
- 2) Press the "OK" key to enter the selected mode.
- 3) Press the "↑" or "↓" keys to adjust the time value. The time range is 1-24 hours and minimum adjustment is 10 minutes.
- 4) Press the "OK" key to save the settings.
- 5) Long press the "OK" + "↓" keys for 2 seconds to exit the timing setup interface.

6) Starting the timing function:
Long press the "⚙️" and "↑" keys to start the timing function. This will start the timed start-up in the shut-down state, or the timed shut-down in the operating state.

7) Canceling the timing function:
Long press the "⚙️" and "↑" to cancel the timing function.

6.3.7 Settings menus

In the shut-down state, long press the "⚙️" key to enter the menu interface, then press "⬆️" or "⬇️" to display VOL, PO, FAN, ru in turn, which respectively represent the voltage setting, power setting, fan speed setting and language setting modes. Press "OK" to choose the selected option, press the "⚙️" to exit.

• Fan speed setting (Fan mode)

Enter the fan speed setting mode, and press "⬆️" or "⬇️" to adjust the fan speed, which can be set to 5 speeds, FAN1, FAN2, FAN3, FAN4, or FAN5; press the "OK" key to complete the selection. After setting is completed, the corresponding fan speed will be displayed. Exit the fan speed mode; the device will return to the shut-down state.

• Voltage setting

Enter the voltage setting mode; the system will display U-12v or U-24V. (This has been set before leaving the factory and does not need to be adjusted again).

Note:

Before starting up the device, ensure that the fuel pump, motor and glow plug are matched to avoid damage.

• Language setting

Enter the language setting mode, press "⬆️" or "⬇️" to display the 3 languages available, CN (Chinese), EN (English), or RU (Russian); press the "OK" key to complete the selection. Exit the menu interface; the device will return to the shut-down state.

6.3.8 Remote control pairing / App control(optional)

• Remote control pairing

In the shut-down state, long press "⏻" + "⬇️" for 2 seconds to enter the remote control pairing mode; "OC 1" will be displayed as **Fig.29**. Press any button on the remote control to complete the pairing; you will hear a voice confirmation.

• App control

- 1) App download
Search for **Parking Electric App** on the mobile app store, follow the prompts to download, install and complete the registration. It's applicable to Android system and IOS system.
- 2) For the first Bluetooth® pairing, click "Add Device" on the mobile App,select "Heater" (it will scan the Bluetooth® module automatically), and then click "Add".
- 3) If you want to bind it on another mobile phone, you will need to cancel the previous binding. Long press the "OK" button on the panel in the shutdown state. If the heater can be scanned when you add it to the APP, it means the pairing is successful.

Disclaimer

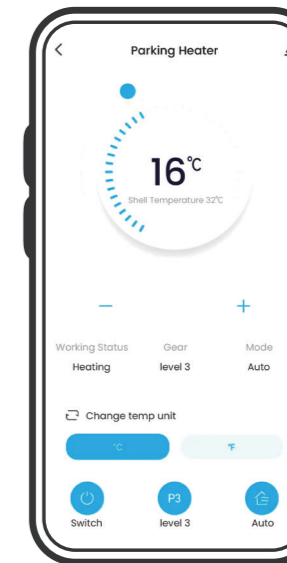
The Bluetooth® word mark and logos are registered trademarks owned by Bluetooth SIG,Inc. And any use of such marks by Hangzhou Tuya is under license.

6.3.9 Parameter display

In operating state, press the "ok" key; the battery voltage, housing temperature, ambient temperature, fan speed, and fuel pump speed will be displayed in turn.



Fig.29



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TROUBLESHOOTING

7.1 Solutions for Common Problems

During usage, the heater may be unable to start normally, or may flame-out soon after startup, leading to a locked malfunction state. In such cases, try to restart the heater: turn it off, keep it shut down for at least 3 seconds, then start it again.

Circuit malfunction can occur for various reasons, such as: corrosion (of connectors, wires, fuse, battery poles), poor connector contact, incorrectly connected wires, etc. Users must pay attention to inspection and maintenance to prevent such problems.

7.2 Fault Codes

In case of a fault, a fault code and corresponding faulty component icon will flash on the LCD panel. Please refer to the following fault code and solutions table to resolve the problem.

A flashing glow plug, oil pump, fan, sensor, or power supply icon indicates a fault in the corresponding device.

Fault code	Cause of failure	Solutions
E-1	Undervoltage	<ol style="list-style-type: none"> confirm that power supply voltage matches heater voltage, normal ranges: 12V (9-16V) or 24V (18-32V); confirm that power cord is properly installed; confirm that additional non-compliant power cord is not in use; confirm that power converter can provide sufficient current; confirm that power converter output voltage is stable; confirm that fuse has not deteriorated.
E-2	Overvoltage	<ol style="list-style-type: none"> confirm that voltage of the power supply matches the voltage of the heater, normal range: 12V (9-16V)/24V (18-32V); confirm that power cord is properly installed; confirm that additional non-compliant power cord is not in use; confirm that power converter can provide sufficient current; confirm that power converter output voltage is stable; confirm that fuse has not deteriorated.
E-3	Glow plug failure	<ol style="list-style-type: none"> confirm that ignition plug connector is not loose and that wire has not short-circuited to housing; confirm that ignition plug is not damaged; appearance of this code immediately after start-up represents a mainboard fault; the mainboard will need to be replaced; appearance of this code after start-up and about 15 seconds of fan operation represents a glow plug fault; the glow plug will need to be replaced; appearance of this code about 50 seconds after start-up represents an installation problem; please check the power supply voltage.
E-5	High temperature Alarm : intake > 50°C case > 270°C	<ol style="list-style-type: none"> confirm that the heating duct is not blocked; confirm that the fan is working properly; confirm that the temperature sensor is operating normally.

Fault code	Cause of failure	Solutions
E-6	Fan motor fault	<ol style="list-style-type: none"> confirm that the fan wheel is not stuck; confirm that the connector is plugged in securely; confirm that gap between the wheel magnet and controller's Hall sensor is not excessive; confirm that the power line is not in a short-circuit or open-circuit state; Electric leakage.
E-8	Flameout	<ol style="list-style-type: none"> confirm adequate fuel, and absence of low temperature solidification of fuel or other blockage in fuel pipeline and fuel pump; Confirm that intake and exhaust ducts are not blocked; confirm that housing temperature sensor is in complete contact with the housing, and the pressure spring is applying adequate pressure.
	Unsuccessful start up	<ol style="list-style-type: none"> large amount of white smoke in exhaust gasses: <ol style="list-style-type: none"> confirm that filter net beside plug glow is clean, if not, clean or replace it; confirm that fuel injection is effective; confirm that glow plug has not deteriorated; confirm that fan wheel blows normally; blow some fresh air into the heater via air inlet pipe. small amount of white smoke in exhaust gasses, or no smoke: <ol style="list-style-type: none"> confirm that fuel has not run out; confirm that fuel pipelines are not frozen or blocked; confirm that pump is not blocked or damaged; confirm that intake and exhaust pipe are not blocked; confirm that glow plug is not damaged; ignition is normal but ignition failure fault is reported: <ol style="list-style-type: none"> confirm that housing temperature sensor is in full contact with housing, that pressure spring is strong, and that sensor is operating normally; confirm that excessive carbon deposition has not occurred, if so this must be cleaned.
E-10	Flameout twice	<ol style="list-style-type: none"> confirm that the fuel has not run out; confirm that the fuel pipelines are not frozen or blocked; confirm that the fuel pump is operating normally: <ol style="list-style-type: none"> confirm that there is no air trapped in the fuel line causing discontinuous fuel supply; confirm that the fuel is of adequate quality; refer to fault code E-8 for other pointers.
E-11	Sensor fault	<ol style="list-style-type: none"> sensor connectors are damaged or have loosened; sensor is damaged.

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PRECAUTIONS & MAINTENANCE

8.1 Check Before Use

The heater must be checked carefully before use, ensuring that there are no leaks and that all connections are in safe conditions. If dense smoke, fuel smells or irregular noise become apparent, the heater must be shut down and the fuse removed. The heater must only be put back into use after repair by a qualified professional.

8.2 Inspect Before Each Cold Season

Before the start each of cold (heating use) season, careful inspection for maintenance purposes shall be performed by qualified professionals, as follows :

1. Confirm that there is no contamination or foreign matter in the air inlet or outlet.
2. Clean the exterior of the heater.
3. Confirm that there is no corrosion on the electric contacts, and that they are connected tightly.
4. Confirm that there are no blockages in or/and damage to the air inlet pipe and exhaust pipe.
5. Confirm that there are no leaks from the fuel line.

8.3 Use Regularly to Prevent Deterioration

If the heater is not being used for long periods, run it for at least 10 minutes once every four weeks in order to prevent malfunction of its mechanical parts.

8.4 Keep Pipes Clean and Clear

The heater's air inlet port and air outlet vent must be kept clean and unblocked to allow smooth air flow and prevent overheating.

8.5 Refueling

After switching to low-temperature fuel, run the heater for at least 15 minutes to allow the new fuel to fill the fuel line and fuel pump.

8.6 Performing Welding on the Vehicle

If electric welding is performed on the vehicle, the heater's positive power supply wire must be detached from the battery and connected to earth, in order to protect the controller from damage.

8.7 Transportation and Storage

During transportation and storage of the heater, the ambient temperature should remain within $-40\text{ }^{\circ}\text{C}$ to $+80\text{ }^{\circ}\text{C}$, in order to prevent damage to electronic components.

8.8 Installation and Repair

Only authorized customer service stations are permitted to install and repair the heater. Use of non-original parts is prohibited for safety reasons.

8.9 Responsibility for Damage

The manufacturer shall not bear responsibility for any damage to the heater due to its unauthorized disassembly, or caused by installation or operation in violation of the instructions in this manual.

PACKHEIZUNG



Modell : MXR-1F



Modell : MXR-2Y



Modell : MXR-3M