Y9 L1

Parking Heater

Installation Instructions and Manual

D3/D5 Diesel Oil 12V
D3/D5 Diesel Oil 24V

Technical Specification and Installation
Operation and Security Maintenance Instructions

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I. Introduction

Application fields of heater

The air heater will not be affected by the engine and will be installed in the following vehicles on the premise of following the heating power.

- Various natures of automobile and trailer
- Construction machinery
- Agricultural machinery
- Ships and boats
- Limousine

Purpose of heater

- Preheating and defrosting the glass
- Heating and insulating the following areas

- Driving cab, working cabin, ship cabin
- Cargo warehouse
- Within the personnel or team carrier
- Limousine

The heater cannot the applied in the following occasions regarding the regulations for functions:

- Long-time and continuous heating:

- Living room, garage
- Home ship, etc.

- Heating or drying:

- Life (people or animals), 1V direct heating mode will be used.
- Item
- Blow hot air to the container

Installation and operation safety instructions

- Setting of heater

Prevent the heater from high temperature or damages.

- **exhaust gas system**

When the discharge outlet of exhaust gas is placed, it should prevent the waste gas entering the automobile through the ventilation device, inlet of hot air or window.

- **Air inlet of combustion air**

Do not breathe the combustion air used in heater combustion from the passenger compartment.

When installing the air inlet, note that it should not be blocked by other materials.

- **Inlet of heating air**

The heating air which is supplied should be composed by the fresh air or cycled air and be drawn from a clean area.

The inlet pipeline should be protected with safety fence or other proper tools.

- Outlet of heating air

When the hot air pipeline is placed in the automobile, it should ensure that it is difficult to be contacted and prevent the personnel or materials from damages.

- **Exhaust system**

When placing the exhaust pipe, we should note that the outlet of exhaust pipe should avoid the combustibles and prevent heating or burning the ground combustibles or loading cargos.

Safety instructions for installation and operation

The following measures should not be taken.

- Change key parts on heater
- Use the parts of other manufacturers without the company's permission
- Go against the specifications specified in the instructions during the installation or operation.

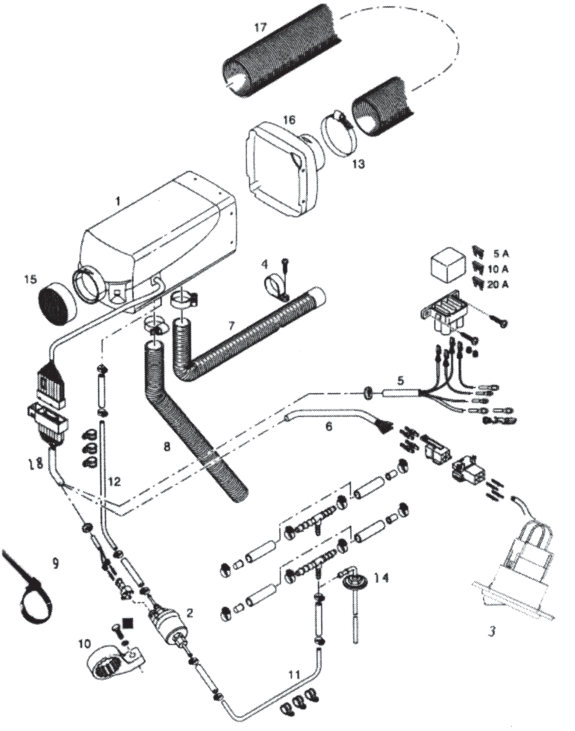
- It is only allowed to use the original accessories and fittings during the installation or maintenance.
- It is not allowed to use heaters in the place where the Flammable vapor or dust may produce.

- Fuel depot
- Carbon storage warehouse
- Water material warehouse
- granary and similar points

- **The heater should be closed when fueling.**
- If the fuels flow (disclose) out of the fuel system of the heating equipment, it should be immediately returned to the service provider for maintenance.
- In the working process off heater, it is not allowed to stop heater by powering off.

II. Product information

Complete sets of equipment and installation components of heater



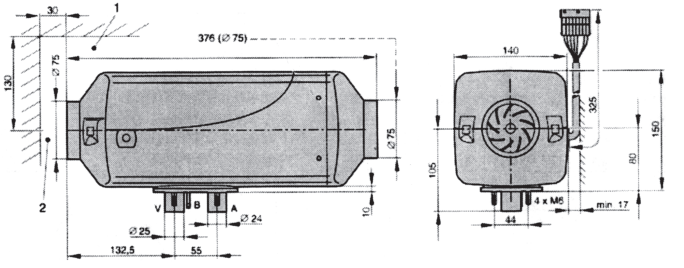
1. Heater; 2. Metering oil pump; 3. Control switch; 4. Fixed clamp of exhaust pipe; 5. Output line, positive/negative; 6. Control element transmission line; 7. Exhaust pipe: 8. Combustion air duct; 9. Belting; 10. Dose pump bracket; 11-12 Deoiling pipe; 13. Air outlet hose clamp; 14. Deoiler; 15. Air intake grille; 16. Outlet housing; 17. Air duct; 18. Heater harness

III. Product information

Technical parameters

Heater Model	ZM-AIR D5					ZM-AIR D3				
Heating media	Air					Air				
Heat rating	Level					Rating				
	Super	High-level	Middle-level	Low-level	Close	Super	High-level	Middle-level	Low-level	Close
Calorific value (w)	5000	3500	2000	900	-	3000	2200	1600	900	
Dielectric flux (kg / h)	185	150	110	60	24	150	120	90	60	24
Fuel consumption (L / h)	0.64	0.40	0.28	0.11	-	0.35	0.25	0.18	0.10	
Electric power consumption (W)	40	24	13	7	-	24	16	10	7	-
When starting:										
Rated voltage	12V or 24V					12V or 24V				
Lower limit of under-voltage protection	10.5V or 21V					10.5V or 21V				
Lower limit of overvoltage protection	16V or 32V					16V or 32V				
Environmental temperature, heater, dosage oil pump	When operating		Non operating			When operating		Non operating		
	-40℃ to +40℃		-40℃ to +85℃			-40°CM+40°C		-40℃ to +85℃		
	-40℃ to +50℃		-40℃ to +125℃			-40℃ to +50℃		-40℃ to +125℃		
Inlet temperature of hot air	+40℃(highest)					+40℃ (highest)				
Weight	About 4.5kg					About 3kg				

Product dimension



1. It is used in minimum installation space to open cover, dismantle ignition plug and controller.
2. It is used in the minimum installation distance to draw the heating air.

* The above figure shows the product dimensions of ZM-AIR D5. The overall length of ZM-AIR D3 is 326mm. Other dimensions are the same with the overall dimensions of ZM-AIR D5.

A=Waste gas

B=Fuel

V=Combustion air

III. Installation

Installation position

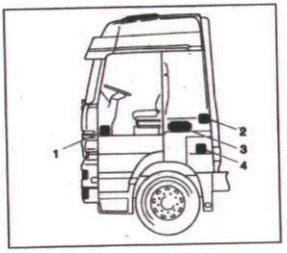
Fasten the heater on the bottom of vehicle or the vehicle wall with four screws on the stand bar of heater.

When installing the heater, enough operation space should be reserved in the air inlet and the place to dismantle ignition plug and controller. (The suggested installation position and methods are shown as follows).

Installation position within truck

Within the truck, the heater will be installed in the driving cab.

If it is impossible to install in the driving cab, the heater may be installed in the toolbox or container.

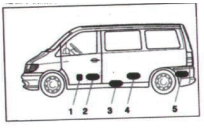


1. The heater is located at the foot of co-pilot.
2. The heater is located at the back wall of driving cab.
3. The heater is located at the back of driver's seat.
4. The heater is located in the toolkit.

Installation position in car/large car

In car/large car, the heater mainly is installed in the vehicle's passenger room or luggage.

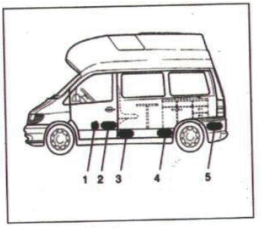
If unable, the heater may be fastened under the vehicle, but we should note the water spraying.



1. The heater is located in the front of co-pilot
2. The heater is located between driver's seat and co-pilot seat.
3. The heater is located under the undersurface.
4. The heater is located under the back seat.
5. The heater is located in the luggage.

Installation position within limousine

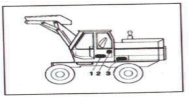
Within the limousine, the heater is mainly installed in the room or luggage. The heater may also be fastened on the vehicle bottom, but it should prevent the water spraying.



1. The heater is located in the front of co-pilot
2. The heater is located between driver's seat and co-pilot seat.
3. The heater is located in the bottom
4. The heater is located under the counter
5. The heater is located in the luggage.

Installation position in the driving cab of excavator

1. The heater is located in the box at the driver's seat
2. The heater is located at the back wall of driving cab.
3. The heater is located in the protection case

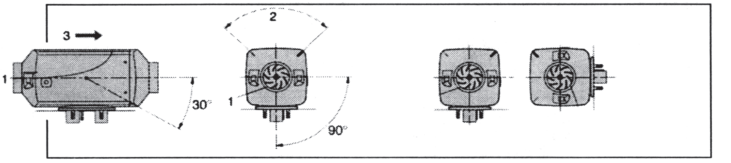


III. Installation

Installation angle and fastening

Allowable installation angle

As shown in the figure, the normal angle should be used to install the heater. According to different installation conditions, the heater may incline 30° (the flowing direction is downward) at most or rotate 90 around the long axis. (Exhaust pipe position, the ignition plug is upward).

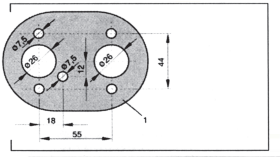


1. Inlet of heating air; 2. Position of ignition plug; 3. Flow directions.

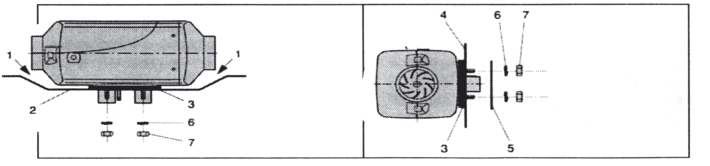
Assembly and fastening

The holes used to process waste gas, combustion air and fuel pipe.

The mounting face of heater legs should be flat.



Horizontally fasten the heater on vehicle wall.



1. Be sure to reserve a space between heater and vehicle bottom. In addition, check whether the ventilation wheels operate freely: 2. The assembly surface should be flat: 3. The sealing gasket should be assembled; 4. The vehicle wall should be flat; 5. Reinforcement plate (used when necessary); 6. Spring sheet 7. M6 hexagon nut

III. Installation

Installation of combustion air duct and exhausting device

Guiding device of combustion air

The installation components contain a Flexible combustion air hose and the inner diameter is 25mm.

According to the installation conditions, the length of combustion air duct may be shortened to 30cm or prolonged to 1m at most.

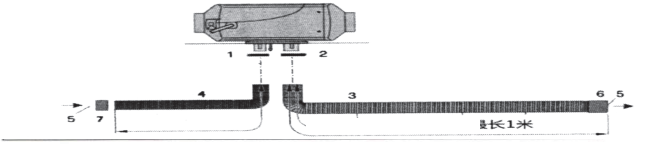
Fasten the combustion air duct on heater with hose clamp. Another end is fastened with ribbon to prevent shaking and falling.

Safety instructions for guiding device of combustion air

• The orifice of combustion air duct should keep unblocked.

• When installing the suction inlet of combustion air, note that the waste gas should not be taken as the combustion air.

• The suction inlet of combustion air should not align at the driving direction.



1and 2. Hose clamp: 3.Exhaust pipe:
4. Combustion air pipe: 5. Inlet and outlet; 6. Sleeve of waste gas pipe 7. Clip of inlet pipe

Exhausting device

The installation components should contain one exhaust pipe that the inner diamter is 24mm.

According to the installation conditions, the length of exhaust pipe may be shortened to 30cm or prolonged to 1m at most.

Fasten one end of exhaust pipe to heater with hose clamp and fasten another end on the vehicle with support.

Safety instructions for exhausting device

In the whole operation process from the heating operation, all parts of waste gas exhaust device will be burnt.

Therefore, be sure to install the exhausting device according to the installation instructions.

• The outlet of exhaust air should be placed outside the vehicle.

• The waste pipe should not go beyond the boundary on the vehicle side.

• The exhaust pipe should be placed downward to facilitate the discharge of condensate water.

• It should not affect the functions of parts which are important for the vehicle operation (note to keep enough spacing).

• When installing, note to keep enough spacing between the exhaust pipe and heat sensitive components. We should pay particular attention to the fuel pipe, wire and brake hose.

• To prevent the exhaust pipe from vibration and damages, it should be fastened stably (the recommended reference spacing is 50cm).

• When paving exhaust pipe, note that the waste gas which is discharged should not be used as the combustion air.

• The opening of exhaust pipe should not be blocked by the dirt and snow.

• The opening of exhaust pipe should not direct to the driving direction.

Protection instructions

It will produce heat and toxic gas in burning time. Please install the exhausting device according to the installation instructions.

• In the heating period, it should not operate in the area where the exhaust guiding device locates in.

• When operating on the waste gas discharge device, firstly close the heater until all parts are cooled. Wear the protective gloves when necessary.

• Do not take the waste gas.

III. Installation

Installation notes for heating air duct

Heating air duct

• The installation components contain one flexible pipe that the diameter is Φ75mm.

Safety instructions

• When paving and fastening the heating air guide tube or hot air outlet, we should not touch it directly due to high thermal radiation or directly blow the humans, animals or thermal sensitive materials with hot air, or it will cause unnecessary damages and injuries.

• In the whole operation process starting from heating, the thermal air conduit will be in high temperature. Therefore, the operation in the thermal air conduit should be avoided in the whole heating process. If the operation in the area is required, firstly close the heater. When all parts are completely cooled, wear the protective gloves when necessary.

Notes

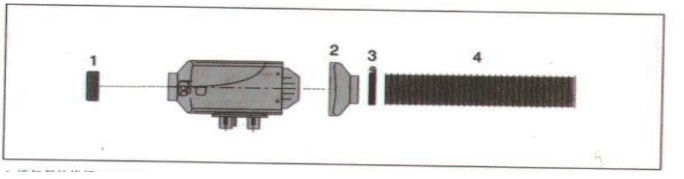
• When placing the suction inlet of heating air, note that the waste gas from vehicle engine and heater should not be taken and the heating air should not permeate the dust and salt fog under the normal operation conditions.

• When heating with circulating air and placing the suction inlet of circulating air, note that the heating air cannot be directly taken in.

• In case of fault caused by heating, the local thermal air temperature may reach 15℃ and the surface temperature may reach 90 ℃ before shutdown. Therefore, it is allowed to guide the heat air with the high temperature air hose in the company's installation components.

• When checking the functions, after operating about 10 minutes, the average temperature of discharged heat air which is measured at about 30cm from the outlet should not exceed 110℃(the air suction temperature is about 20℃).

• The heater and air conduit and other components should not be trampled, covered and pressed, Or it will injure the personnel, burn the inflammables or damage the heater.



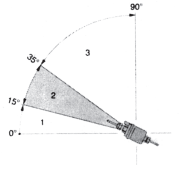
1. Intake grille protection
2. Outlet housing
3. Hose clamp
4. Soft air duct

III. Installation

Fuel supply

Installation angle of dose oil

When installing dose oil, note that the nozzle should be upward. The installation angle should be larger than - 15°. The installation angle between 15° and 35° should be given priority. As shown in the figure below:



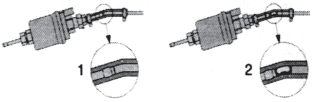
1. It is not allowed to select the installation angle between 0°-15°.

2. Give priority to the installation angle between 15°-35°.

3. It is allowed to select the installation angle between 35°-90°.

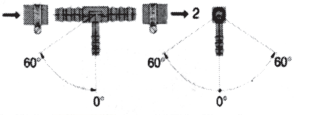
Connection of oil pipe

When connecting the oil pipe, after inserting heater oil nozzle, pump oil nozzle, oil taker and T-shaped TEE oil nozzle into the rubber house, it should be connected to the oil pipe in next end to prevent bubbles in the oil channel, or it will produce noise and influence the combustion effect.



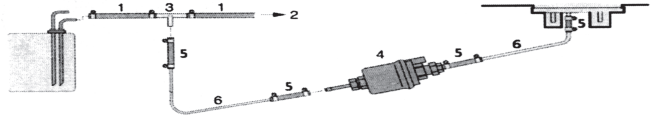
1. Correct connection; 2. Wrong connection - forming bubbles

Installation angle of T-shaped TEE parts



From oil tank; 2. Lead to auto engine

Take oil from oil tank near to the oil channel of auto engine with T-shaped TEE parts



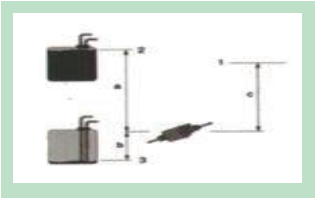
1. Deoiling pipe 3. T-shaped TEE parts 5. Connecting hose

2. Lead to auto engine oil pump 4. Dose oil pump 6. Oil pipe

III. Product information

Deoiling Installation Diagram of Deoiler

1. Deoiler
2. Connecting hoses
3. Dosage oil pump
4. Deoiling pipe



1. Joint on the heater
2. Maximum oil pressure height
3. Minimum fuel contents

Notes:

a. The vertical height a when the oil pump is installed below the oil tank shall be 3m maximally.

b . The vertical height b when the oil pump is installed above the oil tank shall be 1m or 0.5m at the most in case of diesel oil or gasoline.

c. The vertical height c from the oil pump to the heater (the oil pump shall be installed below the heater) shall be 2m maximally.

Safety Instructions of Deoiling Pipe Laying

- In order to avoid the oil pipe destroy or give rise to noise due to the vibration, the oil pipe shall be fixed firmly.
- During the laying, please avoid the oil pipe stretching, friction or vibration caused by the vehicle reversing or engine movement.
- The oil circuit shall keep away from the heat source, instead of being laid under the high-temperature environment. Please don't lay the exhaust pipe or fix the oil pipe along with the heater or vehicle engine at close range. When it is necessary to cross over these pipelines, please keep the enough heat insulation distance and put the protective hose when necessary.
- Please install all oil supply equipment, then, check the adapting pieces and the oil leakage phenomenon after heater has been started and operated for a certain period of time.
- The oil pump which is installed on the vehicle will be prohibited to provide oil for the heater.

Operating Requirements of T-shaped Triple Valve Body:

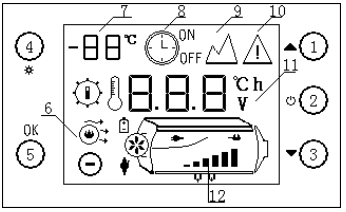
In order to avoid the fuel oil injection in the heater and the huge risks under the high pressure of vehicle oil pump, the triple valve body shall be installed between the vehicle oil pump and oil tank, instead of between the vehicle oil pump and engine. The vehicles of which the vehicle oil pump is installed in the oil tank shall apply the deoiler, instead of T-shaped triple valve body, to extract the oil.

Oil Circuit Maintenance and Overhaul Precautions

- Please check whether the adapting pieces of oil circuits have become flexible before using the heater in winter. Check whether the connecting hose and oil pipe have become aging. Check whether the connection between the oil circuits have suffered from electric leakage when the heater has been operated for a certain period of time. Any problems found should be solved promptly.
- When the heater is used for the first time, the heater is likely to be unable to be started during the early several launching due to the long-term unused behaviors. This is the normal phenomenon, at this moment, please start it for several times until the oil pump can suck up the fuel oil.

Operation instructions for parking heate

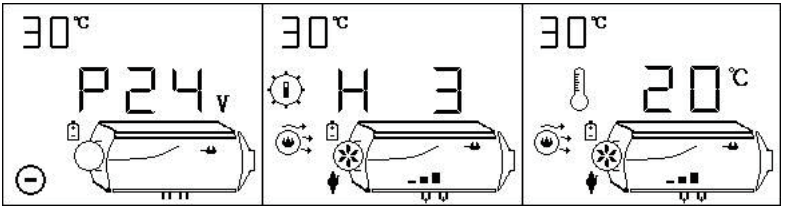
Ⅰ.the control panel is shown below



1、overshift key 2、on/off key 3、downshift key 4、setting key 5、deterministic key 6、work status symbol 7、display ambient temperature 8、timing symbol 9、plateau symbol 10、fault symbol 11、display data parameters 12、host schematic

Ⅱ.use operation

1、 switching operation



shutdown status　　boot mode（manual mode）　boot mode（automatic mode）

1）boot-up operation

In shutdown state，long press “⏻” key for 2 seconds，equipment start-up，display boot status as shown above.

2）shutdown operation

On-state,long press “⏻” key for 2 seconds，equipment entering blow-off cooling process,display “” .turn off the equipment after cooling.

At this time,do not force the power off for the cooling block. Direct power failure can damage parts because the body temperature is too high to dissipate heat,only when the machine is turned off can the power be cut off.

3） manual mode operation

Manual mode has six gears(H1-H6)H6 represents maximum power,as shown above,boot status,add or subtract gears by “▲” or “▼” ,main engine schematic diagram and bar chart to show the current gear.

4） automatic mode operation

automatic mode ,the figure above shows the setting of 20 degrees Celsius.add or subtract temperature values by “▲” or “▼” ,setting range 5-30 degrees Celsius,switching manual/automatic mode by long pressing “☼” keyboard.

2、manual oiling operation

In shutdown state,press the “▲” and “▼” key at the same time or press the “” key alone for 2S,manual control of pumping,stop oiling after releasing the key.please use cautiously!

3、plateau model operation

At the same time ,press the button for 2 seconds to enter the plateau mode. “▲▲” display start plateau mode,press the “☼” and “ok” key for two seconds to exit the plateau mode at the same time.please use cautiously!

4、setting timing switch time operation

Two seconds after pressing the “ok” and “▼” key at the same time,enter the timing setup time interface,the following figure is shown.tab “🕒” flicker,display shows 10.1hours on time.if it display OFF,it means setting a timed shutdown time.

1）Press “▲” or “▼” key to adjust time value,time range:1–24 hours.
2）Short press “⏻” key,switch to adjust digital bits.
3）Short press “⏻” key,switching the Timed Start–up and Timed Shut–down Time value.
4）Short press “ok” key,save the settings and exit the interface.
5）Press “☼” key for 2 seconds, do not save the settings,exit this interface.
6） Starting Timing Function

At the same time,long press the “☼” and “▲” key to start the timing function,start the timing boot in the shutdown state,start the timing shutdown in the boot state,press the C key short to see the remaining time.

6、remote control code–matching operation

In shutdown state,simultaneous long press “⏻” and “▼” for two seconds,enter remote control code as follows.

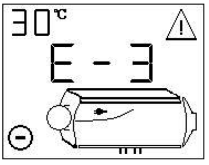
1）Press “▲” or “▼” key to adjust the third digit value for remote control coding,the numerical range is 1–5,corresponding five remote controls.
2）Choose the Code of Remote Controller， arbitrarily press a key of the remote control,Machine Coding Successfully and Exit Coding State.

3）Short press “☼” key to exit remote control code.

*Remote Control Requirements:433mhz,24–bit code.remote control function is optional function,please specify if you need to place an order.

7、fault alarm

Show the following figure,corresponding to the failure symbol flicker,and corresponding to the failure device icon flicker,display data as fault code,its meaning please refer to the fault table.



*Spark plug,oil pump,fan,sensor,power supply and other symbols,flicker indicates that the corresponding device failure.

fault table

Fault code	Cause of failure	solutions
E–2	Power supply voltage range	Normal range: 24V (18–32V), 12V (9–16V).Check whether the battery or generator is normal and whether the fuse is aging
E–3	Ignition plug failure	1)Check whether the ignition plug connector is loose or the wire is short–circuited to the housing 2)Detect whether the ignition plug is damaged
E–5	High temperature alarm (intake>50C;case>230C)	1)Check whether the heating duct is unobstructed 2)Check whether the fan is working properly 3)Check whether the temperature sensor is normal
E–6	Fault of Fan	1)Check whether the impeller is stuck 2)Check if the connection plug–in is loose 3)Excessive gap between magnet on wind turbine and Hall sensor on controller 4)Whether the line is short–circuit or open–circuit; leakage of motor

E–4	Oil Pump Failure	Check for damage, loosening, oxidation, short circuit and breaking of oil pump connections and connectors
E–9	Flameout	1)Check for oil shortage, low temperature solidification of oil, blockage of oil pipeline and blockage of oil pump 2)Check whether the intake and exhaust ducts are unblocked 3)Check whether the housing temperature sensor is in full contact with the housing and whether the pressure spring is strong
	Unsuccessful start up	1)The shell temperature is too high to blow the cooling shell for 3 minutes after starting. 2)There is a lot of white smoke in the exhaust gas 2.1)Check that the filter beside the ignition plug is Clean and not cleaned or replaced 2.2) Check whether the fuel injection is effective 2.3) Check whether the ignition plug is aging 2.4)Is the clearance of the internal wind turbine too large? 2)A small amount of white smoke or no smoke in the exhaust gas 3.1)Check for oil shortage, frozen or blocked oil pipelines 3.2) Check whether the pump is jammed or damaged and the pump is powerless to pump. 3.3) Check whether the intake and exhaust passages of combustion are unobstructed 3.4) Check whether the ignition plug is damaged 4)The ignition is normal but the failure of ignition is still reported. Check whether the housing temperature sensor is in full contact with the housing, whether the pressure spring is strong, whether the sensor is normal.
	Sensor failure	Whether the temperature sensor connectors and connectors are damaged or loosened, whether the sensor is damaged or not

code of use

1.It is prohibited to use in high humidity, conductive dust, flammable and explosive gases, dust, materials, corrosive media, strong light, strong magnetic, high voltage and high current equipment nearby.

2.Voltage range of power supply: DC24V controller is suitable for (18–32) V;DC12V controller is suitable for (9–16) V; different voltage controllers are not universal, and it is forbidden to use beyond the applicable voltage range.

3.The 5KW controller must be used on the 5KW organism; the 2KW controller must be used on the 2KW organism.

4.If the controller or external device is damaged, it must be replaced by the prototype device and professionals.

5.It is forbidden to open the controller shell privately

6.Equipment must be installed strictly and must be used under safe conditions.

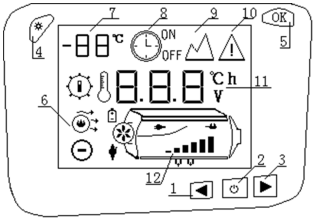
7.The company is not responsible for the loss and liability of the controller due to the misconnection short circuit and damage of the external devices and lines.

8.At the high temperature of the body, the fan can not operate, so it must be cooled quickly for the body to make its temperature. Cooling air is injected from the combustion inlet to make the body temperature less than 100 ℃. Prevent high temperature from burning parts or causing fire.

* Our company is not responsible for any loss or liability caused by the failure to install and use according to Article 1 to 6.

Operation instructions for parking heater

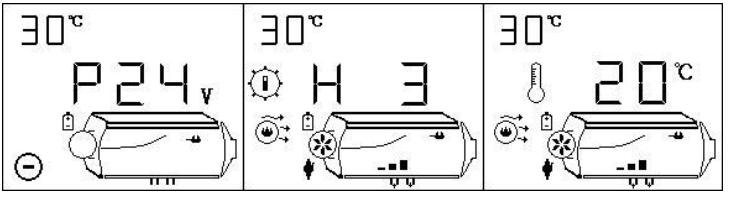
I. the control panel is shown below



1、overshift key 2、on/off key 3、downshift key 4、setting key 5、deterministic key 6、work status symbol 7、display ambient temperature 8、timing symbol 9、plateau symbol 10、fault symbol 11、display data parameters 12、host schematic

II、use operation

1、 switching operation



shutdown status　　boot mode（manual mode）　　boot mode（automatic mode）

1）boot-up operation

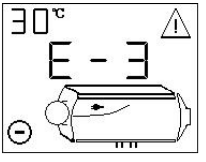
In shutdown state，long press “⏻” key for 2 seconds，equipment start-up，display boot status as shown above.

2）shutdown operation

On-state,long press “⏻” key for 2 seconds，equipment entering blow-off cooling process,display “” .turn off the equipment after cooling.

At this time,do not force the power off for the cooling block. Direct power failure can damage parts because the body temperature is too high to dissipate heat,only when the machine is turned off can the power be cut off.

3） manual mode operation



Manual mode has six gears(H1-H6)H6 represents maximum power,as shown above,boot status,add or subtract gears by “◀” or “▶” ,main engine schematic diagram and bar chart to show the current gear.

4） automatic mode operation

Automatic mode, the figure above shows the setting of 20 ℃. Press the "◀" or "▶ " key to increase or decrease the temperature value and set the range of 5 ~ 30 ℃. Press and hold the "@" key to switch the manual / automatic mode. Panel display temperature range: – 20 ~ 40 ℃.2、Switch on display data.

2. Switch on display data

In the startup state, briefly press the “OK” key to switch the display data. The switching sequence is: gear (or set temperature) – > casing temperature – > working voltage.

3. Manual oiling operation

In the shutdown state, press and hold the “◀” + “▶” key for 2 seconds at the same time, manually control the oil pump for oil injection, and stop oil injection after releasing the key. Please use with caution!

4、plateau model operation

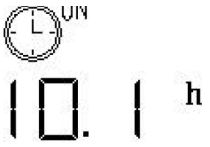
At the same time ,press the button for 2 seconds to enter the plateau mode. “” display start plateau mode,press the “” and “ok” key for two seconds to exit the plateau mode at the same time.please use cautiously!

5、setting timing switch time operation

Two seconds after pressing the “ok” and “▶” key at the same time,enter the timing setup time interface,the following figure is shown.tab “” flicker,display shows 10.1hours on time.

ON：Indicates to set the scheduled startup time；

OFF：Indicates that the scheduled shutdown time is set；



1）Press “◀” or “▶” key to adjust time value,time range:0.1–24.0 hours.

2）Short press “⏻” key,switch to adjust digital bits.

3）Short press “☼” key,switching the Timed Start–up and Timed Shut–down Time value.

4）Short press “ok” key,save the settings and exit the interface.

5）Press “☼” key for 2 seconds, do not save the settings,exit this interface.

6. Start timing on–off operation

At the same time, long press the "☼ " + "◀ " key to start the timing function, start the timing startup in the shutdown state, start the timing shutdown in the startup state, on or off flashes, ON indicates the timing startup, and OFF indicates the timing startup. Briefly press the "☼" key to view the remaining time.

7、remote control code–matching operation

In shutdown state,simultaneous long press “⏻” and “▶” for two seconds,enter remote control code as follows.

1）Press “◀” or “▶” key to adjust the third digit value for remote control coding,the numerical range is 1–5,corresponding five remote controls.

2）Choose the Code of Remote Controller，arbitrarily press a key of the remote control,Machine Coding Successfully and Exit Coding State.

3）Short press “☼” key to exit remote control code.

*Remote Control Requirements:433mhz,24–bit code.remote control function is optional function,please specify if you need to place an order.

8、fault alarm

Show the following figure,corresponding to the failure symbol flicker,and corresponding to the failure device icon flicker,display data as fault code,its meaning please refer to the fault table.

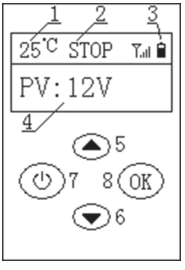
*Spark plug,oil pump,fan,sensor,power supply and other symbols,flicker indicates that the corresponding device failure..

fault table

Fault code	Cause of failure	solutions
E–2	Power supply voltage range	Normal range: 24V (18–32V), 12V (9–16V).Check whether the battery or generator is normal and whether the fuse is aging
E–3	Ignition plug failure	1)Check whether the ignition plug connector is loose or the wire is short–circuited to the housing 2)Detect whether the ignition plug is damaged
E–4	Oil Pump Failure	Check for damage, loosening, oxidation, short circuit and breaking of oil pump connections and connectors
E–5	High temperature alarm (intake>50C;case>230C)	1)Check whether the heating duct is unobstructed 2)Check whether the fan is working properly 3)Check whether the temperature sensor is normal
E–6	Fault of Fan	1)Check whether the impeller is stuck 2)Check if the connection plug–in is loose 3)Excessive gap between magnet on wind turbine and Hall sensor on controller 4)Whether the line is short–circuit or open–circuit; leakage of motor

Fault code	Cause of failure	solutions
E–8	Flame–out Unsuccessful start up	1)Check for oil shortage, low temperature solidification of oil, blockage of oil pipeline and blockage of oil pump 2)Check whether the intake and exhaust ducts are unblocked 3)Check whether the housing temperature sensor is in full contact with the housing and whether the pressure spring is strong 1)The shell temperature is too high to blow the cooling shell for 3 minutes after starting. 2)There is a lot of white smoke in the exhaust gas 2.1)Check that the filter beside the ignition plug is Clean and not cleaned or replaced 2.2) Check whether the fuel injection is effective 2.3) Check whether the ignition plug is aging 2.4)Is the clearance of the internal wind turbine too large? 2)A small amount of white smoke or no smoke in the exhaust gas 3.1)Check for oil shortage, frozen or blocked oil pipelines 3.2) Check whether the pump is jammed or damaged and the pump is powerless to pump. 3.3) Check whether the intake and exhaust passages of combustion are unobstructed 3.4) Check whether the ignition plug is damaged 4)The ignition is normal but the failure of ignition is still reported. Check whether the housing temperature sensor is in full contact with the housing, whether the pressure spring is strong, whether the sensor is normal.
E–9	Sensor failure	Whether the temperature sensor connectors and connectors are damaged or loosened, whether the sensor is damaged or not

Remote control operation instructions

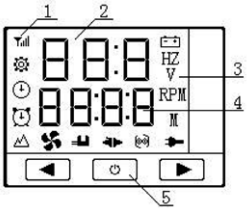


1、The panel is shown in the figure below
1. Display ambient temperature; 2、Equipment status; 3、Battery voltage symbol;
4、Equipment operation data and parameters; 5、Upshift key; 6、Downshift key;
7、On / off key; 8、OK key;
Equipment status: HEAT: heating; COOL :blowing cooling; STOP : shutdown operation data and parameters: PV :power supply voltage; SG:gear; ST :set temperature; FT : casing temperature; ALM :fault

2、Use operation
1) Press and hold the "" key for 2 seconds to turn on / off
2)In the startup state, press the " ▲" or " ▼" key to increase / decrease the gear or set the temperature, and long press the "OK" key to switch to manual / automatic mode
3)In the startup state, press the "OK" key to switch the display: gear (or set temperature) – > casing temperature – > working voltage.
4) In the shutdown state, press and hold the " ▲" + " ▼" key at the same time to pump oil. After releasing the key, stop oiling.
* Indicates that the battery is out of power. Please replace the battery.
*In order to reduce power consumption and increase battery service time, press the key for 30 seconds, and the remote controller will shut down automatically; Press any key to start the machine.

Operating instructions for parking heater

一、the control panel is shown below



1、Indicator

Power symbol; Fan symbol; Symbol of temperature sensor; Oil pump symbol;

Communication symbol; Ignition plug symbol;

Wireless symbol; Set symbol; Clock symbol; Timing symbol; Plateau symbol;

2、Display running data parameters.

3、Unit symbol.

4、Display ambient temperature or time.

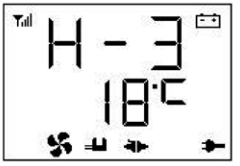
5、Key

Shift key; On off key; Downshift key;

二、use operation

1、On /off operation

shutdown status



Power on status（manual mode）

Power on statu（automatic mode）

1）boot-up operation

In shutdown state, long press " ⏻ "key for 2 seconds, equipment start-up, display boot status as shown above.

2）Shutdown operation

In the power on state, long press the " ⏻ " key for 2 seconds, the device will enter the shutdown and cooling process, and "off" will be displayed. The device is shut down after cooling, and the "shutdown status" is displayed as shown in the figure above.Do not force power off when blowing the body cold. "Direct power off will damage the parts because the body temperature is too high to dissipate heat!", Wait for the machine to display in the off state to power off!

3）manual mode operation

There are 6 gears in manual mode (H1-H6). H6 represents the maximum power, as shown in the figure above "power on state (manual mode)", and gears can be increased or decreased by " ◀ " or " ▶ ".

4）automatic mode operation

In the automatic mode, the "power on status (automatic mode)" in the figure above indicates that the setting temperature is 20 ℃ . Through the " ◀ " or " ▶ " key, increase / decrease the temperature value, set the range of 5 ~ 30 ℃ , and switch the manual / automatic mode by long pressing the "" and "" keys for 2 seconds in the start up

state.

2、manual oiling operation

In the off state, press and hold the " ◀ " and " ▶ " keys for 2 seconds to manually control the pump to pump oil, and release the key to stop pumping oil. This function is convenient for oil-free use, please use with caution!

4、plateau model operation

press and hold the "◀" + " ▶ " + "" keys for 2 seconds to enter plateau mode, and the icon " ⛰ " shows to start plateau mode. In plateau mode, the wind oil ratio is reduced to adapt to plateau hypoxia, and thenpress and hold the" ⏻ "+ " ◀ " + " ▶ " keys for 2 seconds to exit plateau mode. please use with caution!

5、setting timing switch time operation

Long press " ⏻ " and " ◀ " for 2 seconds at the same time to enter the timing setting and Starting Timing interface, and the indicator " 🕒 " shows,Indicates that the time status can be set, as shown in the figure below. In shutdown state, the machine will be started after 10 hours and 20 minutes; In the power on state, Contrary to above。

1)Press the " ◀ " or " ▶ " key to adjust the time value, the time adjustment range: 1minutes-24 hours

2）Short press "⏻" key,switch to adjust digital bits,The corresponding position number flashes

3) Long press the " ⏻ " key for 2 seconds to save the set value and Start timing.

4) Long press " ⏻ " and " ◀ " for 2 seconds to exit this interface without saving the set value.

A[illegible]hent, there is no key operation. After 15s, it will be automatically saved and start timing,and the icon " 🕒 " snows.

6、Remote control code operation

In the off state, long press " ⏻ " + " ▶ " key for 2 Seconds at the same time to enter the remote control code matching, as shown in the figure below.

1) Press the " ▲ " or " ▼ " key to adjust the third digit value as the number of the remote controller. The value range is 1-5, corresponding to 5 remote controllers.

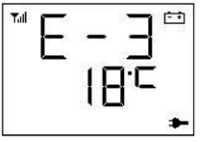
2) Select the number of the remote control, press a key of the remote control at will, the machine code successfully and exit the code state.

3) Short press the " ⏻ " key to exit the remote control code matching.

*Remote control requirements: frequency band 433MHz, 24 bit code. Remote control function is optional function, please indicate if you need to order.

7、Fault alarm

The display is as shown in the figure below. The corresponding fault symbol flashes, and the corresponding icon of the faulty device flashes. The displayed data is the fault code. Please refer to the fault table for its meaning.



*Symbols of spark plug, oil pump, fan, sensor, power supply, etc,

Flashing indicates that the corresponding device is faulty.

Fault table

Fault code	Cause of failure	solutions
E–2	Power supply voltage range	Normal range: 24V (18–32V), 12V (9–16V). Check whether the battery or generator is normal and whether the fuse is aging.
E–3	Ignition plug failure	1)Check whether the ignition plug connector is loose or the wire is short–circuited to the housing. 2)Detect whether the ignition plug is damaged.
E–4	Oil Pump Failure	Check for damage, loosening, oxidation, short circuit and breaking of oil pump connections and connectors.
E–5	High temperature alarm (intake > 50 C; case > 230 C)	1)Check whether the heating duct is unobstructed. 2)Check whether the fan is working properly. 3)Check whether the temperature sensor is normal.
E–6	Fault of Fan	1)Check whether the impeller is stuck. 2)Check if the connection plug–in is loose. 3)Excessive gap between magnet on wind turbine and Hall sensor on Controller. 4)Whether the line is short–circuit or open–circuit leakage of motor.
	Flameout	1)Check for oil shortage, low temperature solidification of oil, blockage of oil pipeline and blockage of oil pump. 2)Check whether the intake and exhaust ducts are unblocked. 3)Check whether the housing temperature sensor is in full contact with the housing and whether the pressure spring is strong.
	Unsuccessful start up	1)The shell temperature is too high to blow the cooling shell for 3 minutes after starting. 2)There is a lot of white smoke in the exhaust gas. 2.1)Check that the filter beside the ignition plug is clean and not cleaned or replaced. 2.2)Check whether the fuel injection is effective. 2.3)Check whether the ignition plug is aging. 2.4)Is the clearance of the internal wind turbine too large? 3)A small amount of white smoke or no smoke in the exhaust gas. 3.1)Check for oil shortage, frozen or blocked oil pipelines. 3.2)Check whether the pump is jammed or damaged and the pump is powerless to pump. 3.3)Check whether the intake and exhaust passages of combustion are unobstructed. 3.4)Check whether the ignition plug is damaged. 3.5)Is the clearance of the inner wind wheel too large. 4) The ignition is normal but the failure of ignition is still reported. Check whether the housing temperature sensor is in full contact with the housing, whether the pressure spring is strong, whether the sensor is nor mal.
E–9	Sensor failure	Whether the temperature sensor connectors and connectors are damage d or loosened, whether the sensor is damaged or not.

Common liquid crystal 12V−24V panel operating instruction

Ⅰ.Key function

◀ −>up adjust the setting parameters under setting status, up adjust the working temperature or oil volume on/off under non setting status−>short press to power on, liquid crystal display ON, 3s long time press to power off, liquid crystal screen display **OFF**.

► −>down adjust the setting parameters under setting status, down adjust the working temperature or oil volume basic operating use above status under non setting status then ok, setting use the below operation description.

Setting−> enter into setting status can adjust the setting parameters and change the working status of machine.

Confirm−> confirm current setting value under setting status and enter into next one item parameter setting, can check the running status of machine under non setting status.

Ⅱ.Inquiry machine status (short press confirm key, shift one status when each one time press, circulating display)

Time display ⟶ Environment temperature display ⟶ Setting temperature display (automatic tempeAe control mode)/set oil volume display (manual temperature control mode)

Press confirm key to circulating check under non setting status ⟵ Historic failure code display ⟵ Supply power voltage display ⟵

Ⅲ.Manual fuel filling description

same time under the power off status then enter into manual fuel filling display **H OF** , press up adjust display **H on** again after loosen then oil pump start working, now can heard the oil pump working voice, oil pump icon lighting. Press down adjust then display **H OF** and withdraw fuel filling, oil pump icon disappeared. The process that evacuation the pipeline air need manually observed, stop when oil arrived the position of machine oil inlet, too much fuel enter into machine, it will generate black smoke when ignite.

Ⅳ.Temperature control mode shift description

Press the up adjust and confirm key at the same time can shift temperature control method, manually control temperature (adjust oil volume display P- 16 number represent the oil volume), automatically control temperature (adjust temperature display 25°C number represent temperature), the difference at two temperature control methods are, oil pump volume able to achieve the max value of parameters setting at the automatic method, more higher temperature of machine, manual oil pump volume been limited at the current setting value, not achieve the max oil volume value of parameter setting, clear gears combine partial senior driver’s operating habits.

Ⅴ.Remote coding description

Long time press the up adjust key on the liquid crystal panel under power off status. Enter into remote coding interface and display ‘HFA-’, then press the up open key on the remoter, launch remote control

code, it will withdraw the coding interface after coded successfully. It will not enter into start machine status if coding failed. If over time and not received the remote control code then automatically withdraw the remote control coding.

Ⅵ.Parameters setting process description(press setting key and enter into setting status)

1.Time setting → Press up adjust or down adjust key to adjust parameters → Set the parameters like hour (24 hours standard) and minute in sequence, press confirm key to confirm parameters and enter into next one item

2.Fix time start machine setting → Default close and display **I OF**, press up adjust key to start display **I on**, press confirm key and enter into → Set the parameters like hour and minute in sequence. Fix time is counter down method, the max is 99 hours and 59 minutes

3.Fix time power off setting → Default close and display **2 OF**, press up adjust key to start display **2 on**, press confirm key and enter into → Set the parameters like hour and minute in sequence. Fix time is counter down method, the max is 99 hours and 59 minutes

Manage password input → Press up and down keys to adjust, press confirm key and enter into next one byte when occur correct numerical value, press confirm key enter into next one item after correctly input 4 bytes passwords, it will return to waiting for input the first byte number if input error. Needn't modified the follow data, press the set key till withdraw, or waiting 10s and over time automatically withdraw.

4.Pump oil volume setting → adjust or down adjust key to modify the min oil pump volume, press confirm key and enter into the max oil volume setting after achieved the required value → Press up adjust or down adjust key to modify the max oil pump volume, press confirm key and enter into the max oil volume setting after achieved the required value

5.Fan speed setting → Press up adjust or down adjust key to modify the min fan speed, press confirm key and enter into the max speed setting after achieved the required value → Press up adjust or down adjust key to modify the max fan speed, press confirm key and enter into the next one item after achieved the required value

6.Working voltage setting → Only can select main board working voltage under power off status. Press up adjust or down adjust key to shift setting working voltage, 12V system adjust to display **U–12**, 24V system adjust to display **U–24** and finish selection. Attention to check whether machine oil pump, motor and ignite plug matched before start machine, avoid damages

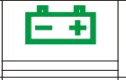
7.Speed signal selection → Display **5n–1** and press up adjust or down adjust key to set speed signal, vane's two pieces magnet polarity are same then select **5n–2**, select **5n–I** (default value) when different magnet polarity or only one magnet, this item parameters selection error will caused one time speed difference

8.Ignite plug power selection → Display **PF–5** then press up adjust or down adjust key to modify the numerical value (1=35W, 2=40W, 3=45W, 4=80W, 5=85W, 6=90W), default value 5. Recommend to use default value, or modified after verified.

9.Manage password modification → Initial display status **OF** status, needn't modify, press confirm key and jump password modify and save the above modified parameters. Press up adjust key when modifying, press confirm to enter into password modify status after displayed **on**, press up adjust or down adjust key to adjust, press confirm key and enter into next one byte after correctly input 4 bytes password, automatically withdraw after saved new password and adjusted the setting parameters well.

Notices: clock time, fix time power on/power off time, valid immediately once set. Must press down confirm till 9th item after all parameters setting after management password finished, then can save the setting parameters, the early adjusted data will loss and invalid if withdraw at middle time. Please check each byte newly input password carefully, save convenient for next time able to modify the parameters at next time.

Description of Fault Codes

Machine Malfunction	LCD Panel Display	Digital Panel Display	Knob Panel Display	Approaches
Power Undervoltage		Display E-01	One Indicator Flashes	Increase supply voltage
Power Overvoltage		Display E-02	Two Indicators Flash	Reduce supply voltage
Ignition Plug Failure		Display E-03	Three Indicators Flash	Check whether the ignition plug is open or short circuited.
Oil Pump Failure		Display E-04	Four Indicators Flash	Check whether the oil pump is disconnected
Machine Overheating		Display E-05	Five Indicators Flash	Check whether the temperature sensor on the housing or the fan speed is working abnormally
Motor Failure		Display E-06	Six Indicators Flash	Check magnet polarity, Hall sensor position or loose terminals
Disconnection Fault		Display E-07	Seven Indicators Flash	Check whether the panel connection plug or the blue wiring harness connection is loose or broken
Flame Extinguished		Display E-08	Eight Indicators Flash	Check whether the oil line is blocked by air or wax, which leads to poor supply
Sensor Failure		Display E-09	Nine Indicators Flash	Check whether the sensor plug is loose or disconnected or short circuited.
Ignition Failed		Display E-10	Ten Indicators Flash	Check whether the oil line is blocked, or the oil inlet is not smooth, the oil pump is stuck, or the problems in oil product cause the evaporation net to be blocked, and whether there is any other reason that leads to the failure of two ignitions to burn properly