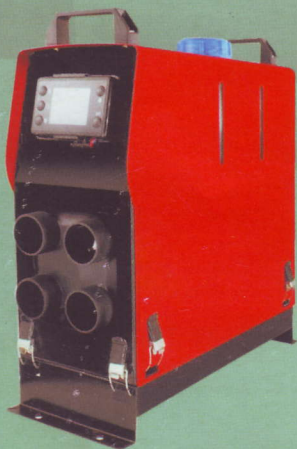


Air heater KW 2.0 5.0 8.0 Manual



Tips:

- 1). The fuel pipe should be 1.5 meter - 2 meters.
- 2). The voltage would be better, if 11.5 V - 12.8 volts.



Introduction

Application field of Air heater

The air heater is not affected by the engine, and it is supplied for the following vehicles with corresponding power.

- All kinds of auto and trailers.
- Construction machinery
- Agricultural machinery
- Boat, ship, yacht
- Caravan

Function

- Warm-up, defrost glass
- Heat and keep warm for the followed area:
 - Driving cab, cabin
 - Cargo hold
 - Interior of staff carrier
 - Caravan

The heater can not be used on followed place and situation

- Constant heating for long time:
 - Living room, garage
 - Residential purpose boat
- Heat and dry:
 - Life (people, animal), blowing hot air directly

---Articles and objects

---Blow hot air to container

Heater Safety instruction of installation and operation

- Installation

Prevent the substances around heater from being damaged and influenced by high temperature.

- Exhaust emission system

When put the exhaust vent, prevent the exhaust entering the heating space through ventilator, hot air inlet and window. Keep the exhaust pipe clear. The exhaust pipe outlet shall be kept away from anything flammable, and avoid heating and igniting the flammable goods and loading cargo on the ground.

- The air inlet of combustion-supporting air

The combustion-supporting air which is used for heater burning shall not be inhaled from passenger compartment. The air inlet shall not be blocked, and keep the inlet open and clear. If the air inlet equipped with filter, keep the filter clean regularly.

- The heating air inlet

The heater air shall be composed by fresh air or circulating air, which is inhaled from clean area. The air inlet pipe shall be protected by safety fence or other suitable tools, and keep the pipe clear and open.

- The heating air outlet

In order to prevent the people and goods from being damaged, the hot air pipe shall be installed in the place where it could not be accessed easily.

Safety instruction

- Following measures shall not be adopted
 - Change the important component of heater
 - Make use of the spare parts from other manufacturers without permission
 - Disobey the instruction and guide during installation or operation
- Only allow using original attachment and spare parts during installation and maintenance
- The heaters shall not be used in the places where may form flammable vapor or dust, for example:
 - Fuel depot
 - Carbon storehouse
 - Timber storehouse
 - Granary and similar sites
 - Diesel/petrol station
- The heaters shall be turned off when fill fuel
- If the fuel leak or discharge from the fuel system of heaters, please contact with the service provider to repair
- In the process of work, it is forbidden to cut off the electric

power directly to stop the heater working

Product

Survey

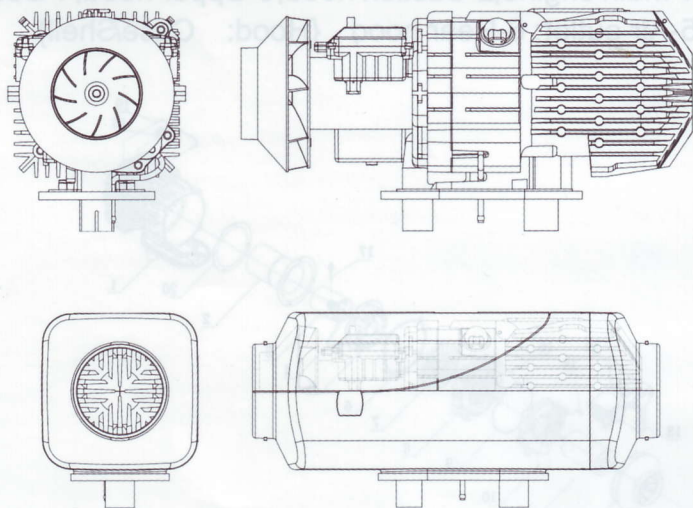
KW2.0 Air heater(hereinafter referred to as the heater) is independent to the original engine system, it makes use of 12V or 24V direct current to drive. There are two kinds of control mode of the heater: Automatic control mode and Manual control mode. The heater adopts light diesel and gasoline which corresponds to the environmental temperature as fuel, and it can be started and operated normally at the temperature of above -40°N . The inhaled fresh air is heated to hot air through heat exchanger by the energy which comes from fuel burning, then blown to where it is needed. This type of heater owns the advantage of compact structure, light weight, high thermal efficiency, economize on electricity and fuel, easy installation.

Technical specification

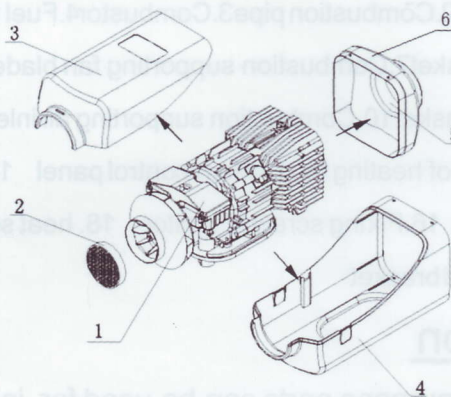
Power ZWH	2000	3000	5000	8000
Heating medium	Air		Air	
Fuel	Diesel		Diesel	
Fuel consumption Z l/hH	0.12-0.24	0.15-0.40	0.18-0.48	0.20-0.50
Rated voltage ZVH	12V / 24V		12V / 24V	
Working temperature ZNH	-50Ní	45N	-50Ní	45N
Weight ZKGH	3.6	5.0	5.0	5.0

Structural principle

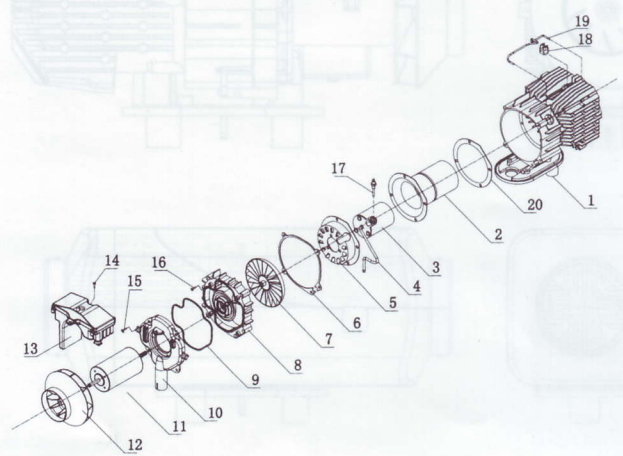
After the heater starts, the glow plug comes into operation, the magnetic pump begins to supply fuel, combustion-supporting fan inhales combustion-supporting air from outside of car. The fuel generates the heat by burning in combustion chamber, which is taken by aluminum heat exchanger. The inner air pushed by the heat exchange fan brings heat to where it is needed through the surface of heat exchanger. And the combustion emission is discharged through exhaust pipe.



The structure of hood-shape case



1-Main engine;2-Suction hood;3-Upper hood;4-Bottom-hood;
5-Air outlet; 6-Rear hood {Hood: Case/Shell}



1.Exhaust tube 2.Combustion pipe 3.Combustor 4.Fuel tube 5.Air inlet distributor 6.Gasket 7.Combustion supporting fan blades 8.Bracket of fan motor 9.Gasket 10.Combustion supporting air inlet 11.Fan motor 12. Bladewheel of heating fan 13.Main control panel 14.Fixing screw 15.Fixingscrew 16.Fixing screw 17.ignitor 18. heat sensor 19. Sensor Fixed bracket

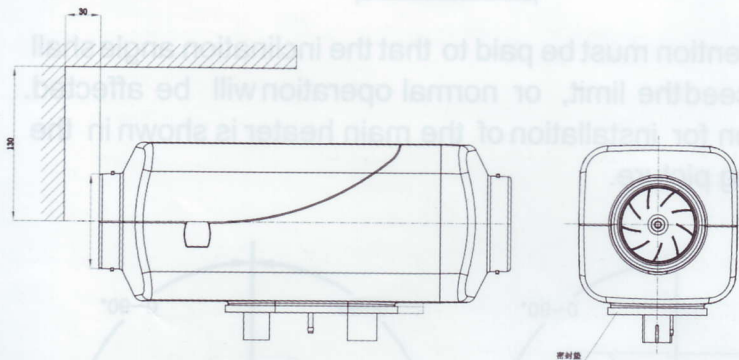
Installation

Only special-purpose parts can be used for installation of

the heater. Following picture is the diagram for installation. The positions and ways of fixing of various parts may vary from one automobile model to another, but the general principles must be followed in conformity with the requirements of this chapter. Otherwise the heater may not work normally or safety problems may occur.

Main heater installation

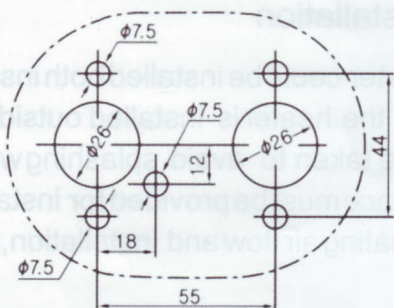
The main heater could be installed both inside and outside of the vehicle. If the heater is installed outside the vehicle, measures must be taken to avoid splashing water onto the heater. Enough space must be provided for installation for the convenience of heating air flow and installation, maintenance of the main heater.



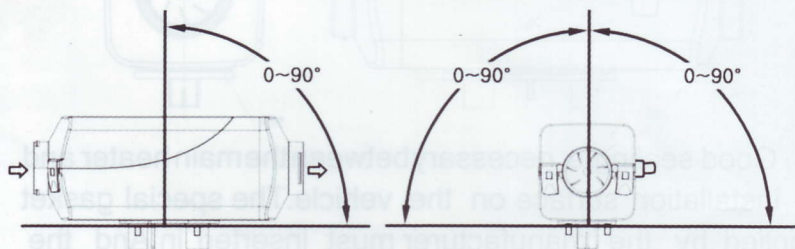
Good sealing is necessary between the main heater and the installation surface on the vehicle. The special gasket supplied by the manufacturer must be inserted in. And the installation surface must be even. Its parts at the installation

bases of the main heater should have unevenness less than 1mm. After drilling installation holes, evenness must be improved according to this requirement. At installation, please rotate the four M6 nuts tight, which are provided by the manufacturer.

For re-installation of the main heater, a new gasket must be used to replace the old one.



Attention must be paid to that the inclination angle shall not exceed the limit, or normal operation will be affected. Direction for installation of the main heater is shown in the following picture.



After installation of the main heater, please check and make sure that there is no contactor friction between the blade wheel of fan and other nearby parts to avoid unsmooth operation.

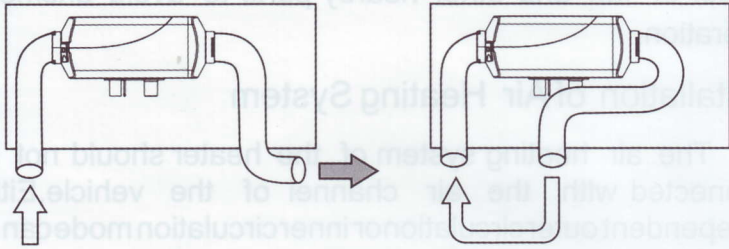
Installation of Air Heating System

The air heating system of the heater should not be connected with the air channel of the vehicle. Either independent outer circulation or inner circulation mode can be adopted.

When an external heating air tube is attached to the heater, the tube diameter should not be smaller than 85mm. Its material should be capable to resist temperature of 130NÉ. The maximum pressure drop between the air inlet side and outlet side of the air heating system should not be higher than 0.15kPa.

The hot air from the heating system should not erupt onto such parts which are unable to resist heat. In passenger vehicles, the hot air vent should not be blocked by passengers. A self-provided protective net can be installed if necessary. For heater working in external circulation mode, the position of air inlet port should be proper to guaranteed that under normal operation no splash of water can be sucked into the heater the no exhaust from the engine can be sucked in.

For heater working in internal circulation, measures should be taken to avoid re-entering of the supplied hot air into the air inlet port. If no air inlet tube is attached in this mode, a air inlet hood with grids must be installed at the air inlet port of the main heater. The inlet air should be drawn from the cold area of the compartment, such as under the seats or berths.



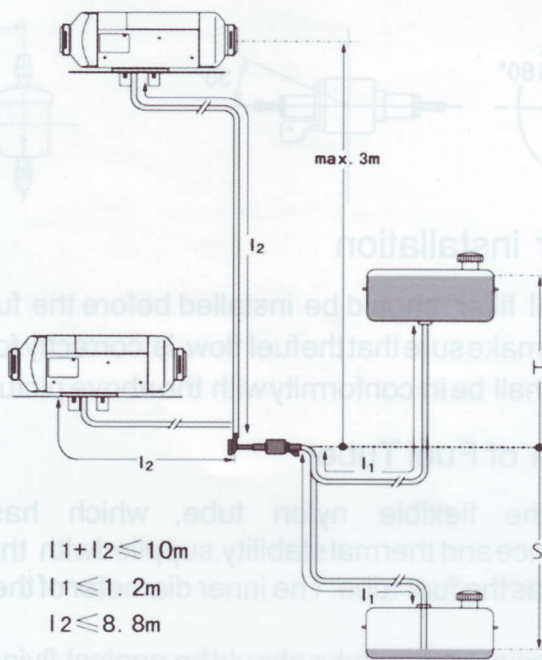
a) ✓

b) ✗

Installation of Fuel Supply System

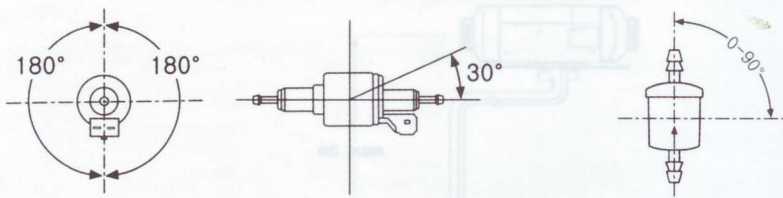
Fuel for the heater can be supplied from the fuel tank of the vehicle or an additional independent fuel tank. It is not allowed to install the fuel tank in the cab or passenger compartment or any region that is possibly to cause fire if an independent fuel tank is used.

The elevation difference between the heater and fuel pump, and between the fuel pump and the fuel pump produces pressure from fuel to the fuel pump. The inner diameter and length of the fuel tube is related to the resistance of the fuel route. Please consider such factors for installation.



Fuel pump installation

The fuel pump should be installed in places that can avoid heat radiant from the vehicle parts that can emit heat and in places with cool air. Its ambient temperature should not exceed 20°N . Directions of installation of the fuel pump are shown in the following picture. When installing the fuel pump, please use the fuel pump holder supplied with the heater to hold the pump tight. The pump is fixed with the shock-reducing tightening piece.



Fuel Filter installation

The fuel filter should be installed before the fuel inlet port. Please make sure that the fuel flow is correctly followed. Its position shall be in conformity with the above picture.

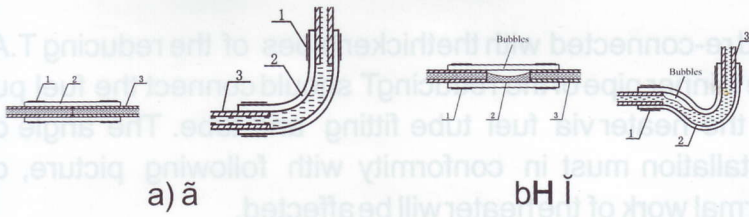
Installation of Fuel Tube

Only the flexible nylon tube, which has good light-resistance and thermal stability, supplied with the heater can be used as the fuel tube. The inner diameter of the tube is $\varnothing 2\text{mm}$.

The position of fuel tube should be against flying stones and be away from any heat emitting parts of the vehicle. Protective device can be installed if necessary.

The fuel tube from the fuel pump to the main heater should be in any directions other than downward direction. The fuel tube shall be tied in some proper location to make it fixed. The distance between two ties shall be less than 50cm.

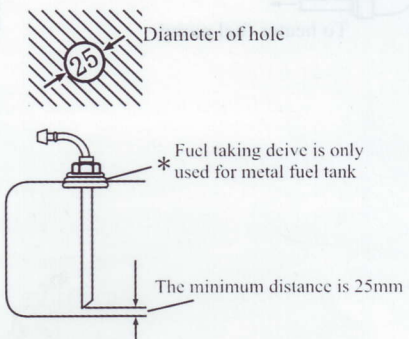
The fuel tube fittings supplied with the heater should be used for connections between fuel tube and fuel pump, fuel tube and heater, fuel tube and sucking tube of fuel tank and fuel tube and reducing T. The fuel tube should tie with fuel tube clamps. Bubbles should be eliminated from the connecting places.



1-Fuel tube clamp; 2-Fuel tube fitting; 3-Fuel tube

Installation of Fuel Taking Device

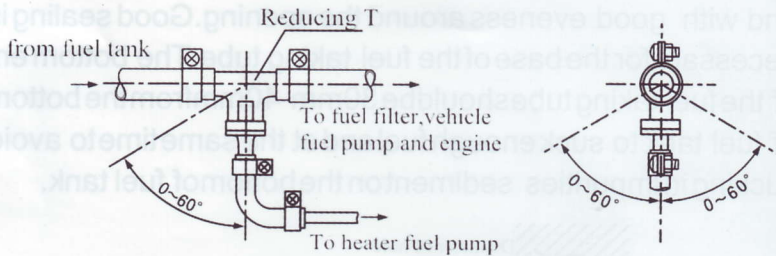
The openings on the fuel tank (or tank cover) for installation should be appropriate in size, with trimmed brim and with good evenness around the opening. Good sealing is necessary for the base of the fuel taking tube. The bottom end of the fuel taking tube should be 30mm-40mm from the bottom of fuel tank to suck enough fuel and at the same time to avoid sucking in impurities sediment on the bottom of fuel tank.



If fuel is taken from the fuel pipe to the engine, the fuel pipe from the fuel tank to the fuel filter should be disconnected

and re-connected with the thicker pipes of the reducing T. And the thinner pipe of the reducing T should connect the fuel pump of the heater via fuel tube fitting and tube. The angle of installation must in conformity with following picture, or normal work of the heater will be affected.

After installation, the vehicle engine shall be started and then turned off after one minute's work to eliminate air trapped in the fuel sucking pipe.



Пункты для внимания: После того, как все параметры установлены, необходимо нажать кнопку «подтверждения», чтобы выйти автоматически, если не сохранить параметры настройки. Нажмите кнопку «подтверждения», чтобы выйти автоматически, параметры не будут сохранены. Пожалуйста, проверьте каждый новый пароль и сохраните его, чтобы в следующий раз не жмет ввести для изменения параметров.

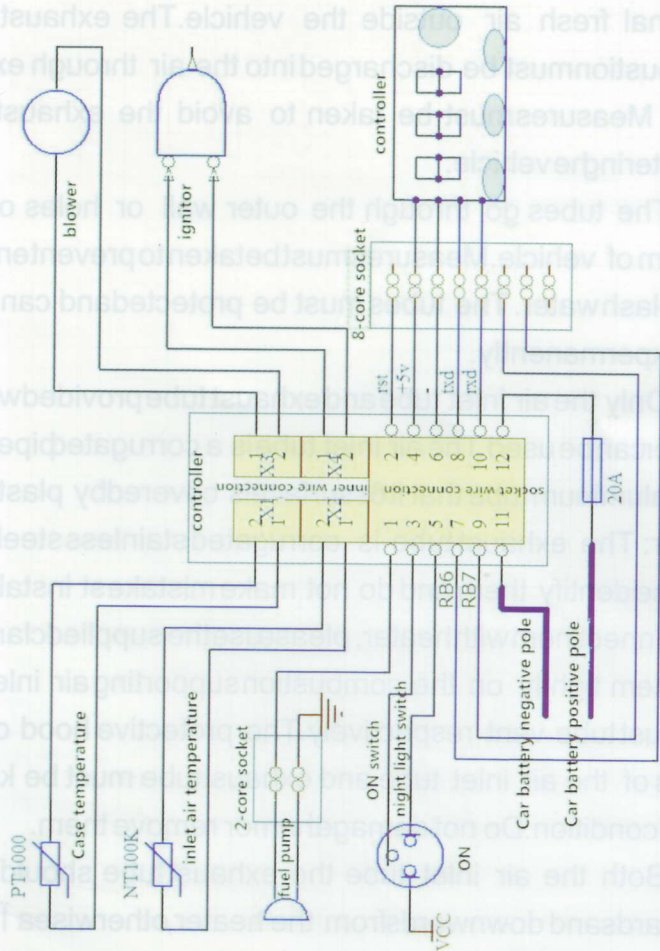
7 Управление изменением пароля → Сначала отображается состояние **off**, необходимо изменить пароль, нажмите кнопку «подтверждения», чтобы пропустить изменение пароля, после сохранения вышедших параметров, нажмите кнопку «подтверждения», чтобы войти в меню параметров выйти автоматически, нажмите кнопку «подтверждения», чтобы войти в меню параметров, нажмите кнопку «подтверждения», чтобы сохранить новый пароль и настройки параметров, выйти автоматически.

6 Выбор сигнала скорости оборотов → нажмите кнопку «ретулировки вперед» и «ретулировки назад», чтобы установить сигнал скорости оборотов, если полярность магнита отличается или имеется только один магнит, выберите параметр 2, если у вас магнит работает, коlesa имеют одинаковую полярность, выберите параметр 1, если разные параметры, выберите параметр, выберите параметр 1, скорость будет отличаться в 1 раз.

5 Настройка рабочего направления → Рабочее направление магнетической платы можно выбрать в меню «состояния», нажмите кнопку «ретулировки вперед» и «ретулировки назад», чтобы переключить направление работы направления, настройте систему 24 В для отображения U-12, чтобы завершить выбор. (Перед выбором магнитной проверьте, совпадают ли магнитный полюс, магнетизм и сфера вращения, чтобы избежать «подвержения».)

6 Ходимого знака
 Ченнан нажмите
 нопку «подтвер
 ждения», чтобы
 выйти в следующ
 и шаг.

Installation of Electrical System



Installation of Combustion Supporting Air Sucking Tube and Exhaust Discharge Tube

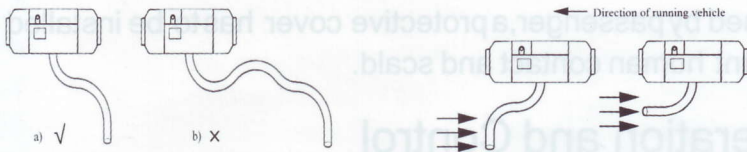
The combustion supporting air must be sucked in from external fresh air outside the vehicle. The exhaust from combustion must be discharged into the air through exhaust tube. Measures must be taken to avoid the exhaust from re-entering the vehicle.

The tubes go through the outer wall or holes on the bottom of vehicle. Measures must be taken to prevent entering of splash water. The tubes must be protected and can resist shock permanently.

Only the air inlet tube and exhaust tube provided with the heater can be used. The air inlet tube is a corrugated pipe made of an aluminum tube that its surface is covered by plastic and paper: The exhaust tube is a corrugated stainless steel tube. Please identify them and do not make mistakes in installation. To connect them with heater, please use the supplied clamps to fix them tightly on the combustion supporting air inlet and exhaust tube vent respectively. The protective hood on the vents of the air inlet tube and exhaust tube must be kept in good condition. Do not damage them or remove them.

Both the air inlet tube and the exhaust tube should come outwards and downwards from the heater, otherwise a $\varnothing 4$ mm hole shall be prepared at the bottom of the tube for discharge of condensation water. If the tube needs a curve, the radius cannot be

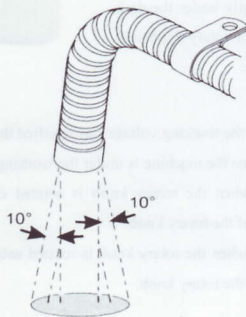
smaller than 50mm. Also, the sum of all curve angles for each tube shall not exceed 270°.



The opening of the tubes should not be opposite to the direction of the running vehicle.

The tube openings should not be blocked by slurry, rain and snow or other dirt.

The exhaust tube should be installed in far distance from the plastic parts or other objects with poor thermal resistance of the vehicle body. The exhaust tube should be properly fixed. The exhaust vent should be downwards, perpendicular to road surface with angle of $90^\circ \pm 10^\circ$. To ensure such an angle, the fixing clip for the exhaust tube should be within 150mm from the tube end.



Warning: Violation against the above requirements may cause fire.

If the section of the exhaust tube inside the vehicle may be touched by passenger, a protective cover has to be installed to prevent human contact and scald.

Operation and Control

After the installation, the heater shall be turned on repeatedly for a few times to make the fuel tube full-filled, so as to avoid starting failure due to lacking fuel.

Controller

Rotary Knob Panel Instructions

Introduction of keys:

ON->startup

OFF-> shutdown

Rotary knob->temperature adjustment and wind speed control

Lighting instructions:

Considering that there is lighting below the ON/OFF key, the operators will find out the rotary knob easily under the dark environment. The lighting on the outside of rotary knob will show the temperature value and failure state.

Key function introduction

ON->Please press the ON key gently when the working voltage has satisfied the related conditions.

OFF-> Please press the OFF key gently when the machine is under the working state.

Rotary knob->the temperature will rise when the rotary knob is rotated clockwise, at this moment, the red indicators will be increased on the outside of the rotary knob.

The temperature will down when the rotary knob is rotated anti-clockwise, at this moment, the red indicators will be reduced on the outside of the rotary knob.

Fuel filling by hands

Please rotate the rotary knob clockwise under the OFF state until the red indicators are on, then, please press the OFF button for more than 3 seconds, at this moment, the manual oil pumping will be started. Please press the OFF



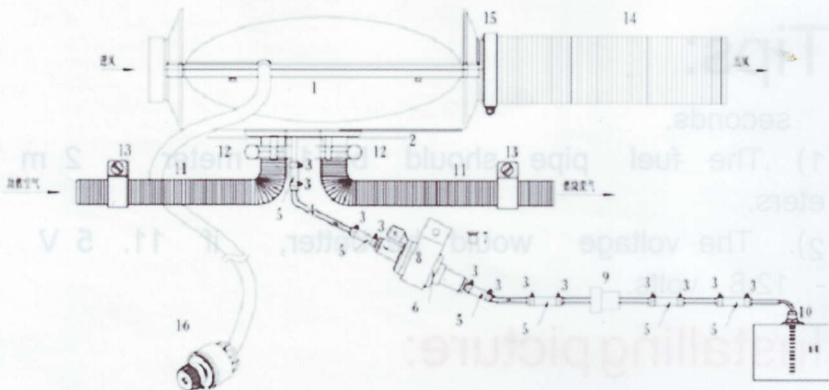
Tips:

seconds.

- 1) .The fuel pipe should be 1.5 meter - 2 meters.
- 2). The voltage would be better, if 11.5 V - 12.8 volts.

Installing picture:



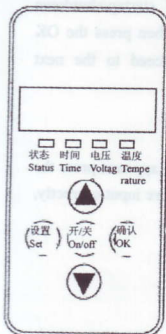


Maintenance

During the running of heater, it tests and checks the operating state and fault in the whole course, and the controller shows fault codes on the LCD / LED constantly.

The fault code of LCD screen

12V-24V Common Digital Panel Operation Instruction



1. Indicators

Status-> Permanently on upon startup, blinking upon the initialization of shutdown, off upon the completion of shutdown

Time-> Permanently on when displaying the time or setting the timed startup or shutdown, and off under other statuses.

Voltage-> Permanently on when displaying voltage or setting the parameters in relation to voltage, and off under other statuses

Temperature-> Permanently on when displaying the ambient temperature or setting the operating temperature, and off under other statuses.

2. Key Function

▲-> Under the setting status, press it to raise the parameter to be set; under the non-setting status, press it to raise the operating temperature to be set

Set-> Enter the setting status to adjust parameters and change the machine's operating status

On/off -> Promptly press it to start up the machine, and the status indicator becomes permanently on; press and hold the key for 2 sec to shut down the machine, and the status indicator becomes blinking

OK-> Under the setting status, press it to confirm the current setting value and proceed to the next parameter to be set; under the non-setting status, press it to view the machine's status

▼-> Under the setting status, press it to reduce the parameter to be set; under the non-setting status, press it to reduce the operating temperature to be set

Description of Setting Parameters (Press the Set Key to Enter)

1. Time setting Use the up/down keys to adjust the parameter ➔ Press the OK key, and consecutively set the Hour (24-hour system) and the Minute, and press the OK key to proceed to the next parameter



2. Timed startup and shutdown setting



It is off by default, displaying 1-OF; press the up arrow key to activate it, displaying 1-on



Press the OK key to consecutively set the first group of startup/shutdown time values and the second group of startup/shutdown time values, and then press the OK key again to proceed to the next parameter



Admin password input



Press the up/down arrow keys, and when the correct value appears, press the OK key to proceed to the next digit. After all four digits are input correctly, press the OK key again to proceed to the next parameter



3. Pump oil volume setting



Press the up/down keys to modify the minimum pump volume, and press the OK key when the required value is set



For the maximum pump oil volume setting, use the up/down arrow keys to modify it as required, and then press the OK key to proceed to the next parameter



4. Fan revolution speed setting



Press the up/down arrow keys to modify the minimum fan revolution speed, and press the OK key when the required value is set



For the maximum fan revolution speed setting, use the up/down arrow keys to modify it as required, and then press the OK key to proceed to the next parameter



5. Operating voltage setting



The main board's operating voltage can only be adjusted under the shutdown status. Press the up/down arrow keys to switch the operating voltage to the 12V system (displaying U-12) or to the 24V system (displaying U-24). (Before startup, please check whether the oil pump, the motor and the ignition plug are suitable to each other, to avoid damage)



6. Revolution speed signal selection

Press the up/down arrow keys to set the revolution speed signal. Select 1 if the vane wheel has two magnets with the opposite polarity or has only one magnet. Please select 2 if the vane wheel has two magnets with the same polarity. If the parameter is incorrect, 1-fold speed error will occur.

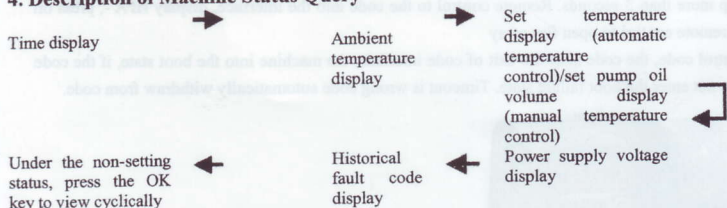


7. Admin password modification

By default, the OFF status is displayed. Press the OK key if no modification is needed, to skip the password modification and automatically quit after saving the parameters. Press the up arrow key, and when the ON status is displayed, press the OK key to enter the modification status, and input a 4-digit new password, and press the OK key again to save the new password and the adjusted parameters for automatic quit.

Note: after all parameters are set, you must press the OK key to quit and save the set parameters. If you quit by pressing the Set key, the parameters will not be saved. Please carefully check each digit of the new password, and keep it in mind so that you can use it to change parameters next time.

4. Description of Machine Status Query



5. Manual Fuel Filling Description

Under the non-setting status, first press and hold the down arrow key, and then press the OK key simultaneously to enter the manual oil pumping interface. When H-OF is displayed, first release the OK key, and then release the down arrow key. Press the up arrow key to activate manual oil pumping, H-ON will be displayed and you will hear the oil pumping noise. Simply press the down arrow key or the Set key to deactivate it and quit the manual oil pumping.

6. Timed Startup/Shutdown Description

After setting the run time, press the OK key to enter the timed startup/shutdown setting function. By default, OF indicates the off status, and please press the up arrow key to activate the ON status, then you can press the OK key to set the first group of values, with the hour and minute values for the startup to be set first, and secondly enter and set the hour and minute values for the shutdown if the values for the startup are set. Then, press the OK key to enter the second group of values, with similar setting measures as those of the first group. You may specify an interval between the two groups of values. The timing function can only be performed once upon each setting, i.e. if the set timing values are performed, they will be invalid, and you need to reactivate the timing function and set new values for the timing.

7. Temperature Control Mode Switchover Description

Under the non-setting status, first press and hold the up arrow key, and then press the Set key

simultaneously, if the panel displays P-xx (xx indicates pump oil volume), it indicates that you have entered the manual temperature control mode and the pump oil volume for operation is restrained within a range between the current pump oil volume and the initial pump oil volume. When you press the above mentioned keys simultaneously and the panel displays xx °C (xx indicates temperature value), it indicates that you have entered the automatic temperature control mode and the pump oil volume for operation is restrained within a range between the maximum pump oil volume and the initial pump oil volume. Under the two modes, the automatic changes of pump oil volume both depend on the variation of the temperature, but the difference between the two modes is that, under the automatic mode, the pump oil volume can reach the maximum value set for the parameter, which leads to higher temperature of the machine; under the manual mode, the pump oil volume is limited to the current setting value and can not reach the maximum value set for the parameter, thus the equipment's temperature is limited to the selected range, which is more adaptable to certain old-fashioned drivers.

8. The instructions on the LCD panel

In the condition of not setting, press raised first, press the confirmation key at the same time, to keep more than 3 seconds. Remote control to the code into the interface, display HFA -, press on the remote control to open fire away

Control code, the code after the exit of code interface, the machine into the boot state, if the code does not enter the boot failure state. Timeout is wrong code automatically withdraw from code.



LCD panel using the above method

Strive for the Perfect Vehicle Life Xinmaizhong will serve you wholeheartedly



Warnings

1. The fixed backboard shall be sealed and separated from the vehicle sheet metal during installation to avoid the physical injury to the driver when the combustion gas flows in the driving cab from the gap.
2. The exhaust pipe length shall be 30cm at least.
3. The exhaust gas outlet shall be firmly placed in the empty space.
4. The exhaust pipe outlet shall not look at the driving direction.

Recommendations: It is suggested to apply the sealant to block off the installation gap when the heater has been fixed.

Xinmaizhong

Instructions for Use of 12V - 24V General LCD Panel



1. Button function

◀ -> In the setting state, increase the setting parameter, non-setting state, increase the working temperature or oil mass.

ON/OFF -> Short press start-up button, LCD screen displays **on**, and long press shutdown button for 3 seconds, LCD screen displays **off**.

▶ -> In setting state, decrease the setting parameters, in non-setting state, decrease working temperature or oil mass. The basic operation can be referred to above state, and the following operation descriptions can be used for settings.

Setting -> Enter the setting state, adjust setting parameters, and change the working status of the machine

Confirm -> Under the setting state, confirm the current setting value and enter the next parameter setting. View the machine state in the non-setting state.

2. Query machine status (keep short press of the **confirm** button to switch one state at a time to make it display cyclically)

Time display → Ambient temperature display → Setting temperature display (automatic temperature control)/setting oil mass display (Manual temperature control)

↑ Press confirm button to view cyclically ← History fault code display ← Altitude display

← Supply voltage display

3. Description of fuel filling in manual mode

Under the shutdown state, press the **down-regulation button** and **setting button** simultaneously to conduct fuel filling manually, which displays **H of**, and after releasing, press up-regulation button and it displays **H on**, the oil pump starts to work. You can hear the sound of the oil pump working and the oil pump icon lights up. Press down-regulation button to display **H of**, exit fuel filling, the oil pump icon disappears. The process of line air evacuation shall be done under watch, when the oil reaches the position of the oil inlet of the machine, it can be stopped. If there is too much oil enters the machine, there will be black smoke when igniting.

4. Description of temperature control mode switching

Press the **up-regulation button** and **confirm button** simultaneously to conduct temperature control mode switch. There are manual temperature control mode (oil mass adjustment t shows **P-15**, number represents the oil mass) and automatic temperature control mode (temperature adjustment shows **25°C**, number represents the temperature). The difference between two modes is that: in automatic mode, pump oil amount can reach the maximum upon parameter setting and the machine heat is higher, the manual pump oil amount is limited to the current setting value and will not reach the maximum oil value set by the parameter, which makes gears clearly shown and is very convenient for the part old hands.

5. Description of remote control code matching

In the shutdown state, press **power button** and **confirm button** simultaneously in the remote control first, then text of **waiting for matching** appears on the remote control, then keep long press up-regulation and **down-regulation buttons** of LCD panel. When showing **HFA-** it enters the remote control code matching interface, upon success, it

will automatically exit the interface, then, it shows normal working parameter. If the code matching failed, it would not enter the normal state of displaying working parameters. The code matching state will be automatically exited when it does not receive remote control code over time.

6. Description of parameter setting procedure (press setting button to enter setting state)

1 Time setting → Press the up-regulation button or down-regulation button to adjust parameters
 → setting parameters of hour (24-hour system) and minute successively, and press confirm button to confirm the parameters to enter the next item.

2 Timed start-up setting → Closed by default, it shows **1 of**, press up-regulation button to start up, it shows **1 of**, press confirm button to enter → Setting of hours, minutes in turn. Timing is the countdown, maximum is 99 minutes and 59 seconds.

3 Timed shutdown setting → Closed by default, it shows **2 of**, press up-regulation button to start up, it shows **2 of**, press confirm button to enter → Setting of hours, minutes in turn. Timing is the countdown, maximum is 99 minutes and 59 seconds.

Inputting of administrative password → Press up - down buttons to adjust, when the correct number appears, press confirm button to enter the next digit, after the 4-digit password is entered correctly, press confirm button to enter the next item, input error will lead to returning to the step of waiting the first number to enter. There is no need to modify subsequent data, press setting button until it exits, or wait for 10 seconds, it will exit automatically for overtime.

4 Setting of pump oil amount → Press up-regulation button or down-regulation button to modify minimum pump oil amount, after it reaches the required number, press confirm button to enter maximum oil mass setting. → Press up-regulation button or down-regulation button to modify maximum pump oil amount, after it reaches the required number, press confirm button to enter the next item.

5 Fan speed setting → Press up-regulation button or down-regulation button to modify minimum fan speed, after it reaches the required number, press confirm → Press the up-regulation button or down-regulation button to modify the maximum fan speed to reach the required value, and then press

button to enter maximum speed confirm button to enter the next setting. item.

6 Operating voltage setting → Main board operating voltage can only be selected under the shutdown state. Press up-regulation button or down-regulation button to switch the setting of the operating voltage, adjust the 12V system to $U-2$ 24V system to $U-24$ to complete the selection. Before start-up, check whether the oil pump, motor and ignition plug of the machine are matched, thus avoiding damage.

7 Selection of speed signal → When it displays $57-1$ to press up-regulation button or down-regulation button to set the speed signal. Select $57-2$ with the same polarity of two magnets of the impeller, and select $57-1$ (default value) with different polarity of the magnets or only one magnet. This parameter is incorrectly selected, which will lead to the speed difference of 1 time.

8 Selection of ignition plug power → When it displays $66-5$, press up-regulation button or down-regulation button to modify the numbers (1 = 35W, 2 = 40W, 3 = 45W, 4 = 80W, 5 = 85W, 6 = 90W), and default value is 5. It is recommended to adopt default values, or make modification after verification.











9 Administrative password modification → It initially displays 66 , press confirm button to skip the password modification and save above modified parameters. Press the up-regulation button when modifying, then press confirm button to enter password modification state when it displays 66 . Press up-regulation button or down-regulation button to adjust. And after entering the 4-digit password correctly, press the confirm button to enter the next digit, then save the new password and adjust the settings parameters to exit automatically.

Precautions: For clock time, set the timing of start-up and shutdown, and it will take effect immediately after setting. After setting all parameters after the administrator's password, you must press confirm button until to the item 9 to exit, through which we could save the set parameters. If quitting in the midway, previous adjustment data will be lost and invalid. Please check each new digit of password carefully and save it, through which you can enter to the parameter modification next time.

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2018 Main Board Fault Code Description

Machine fault	LCD panel display	Digital panel display	Knob panel display	Handling method
Power supply under voltage		E-01	1 indicator light flash.	Boost supply voltage
Power supply with over pressure		E-02	2 indicator lights flash.	Reduce supply voltage
Ignition plug fault		E-03	3 indicator lights flash.	Check whether the ignition plug is in open circuit or short circuit.
Oil pump fault		E-04	4 indicator lights flash.	Check whether the oil pump is disconnected.
The machine is overheating.		E-05	5 indicator lights flash.	Check the temperature sensor on the shell or whether the fan has the abnormal rotation speed.
Motor fault		E-06	6 indicator lights flash.	Check the magnet polarity, the Hall sensor location or the looseness conditions of wiring terminal.
Broken connection fault		E-07	7 indicator lights flash.	Check the connecting plug of the panel, and whether the blue harness connection has become loose or disconnected.
The flame is extinguished.		E-08	8 indicator lights flash.	Check whether the oil circuit has air or wax blockage, resulting in poor oil supply.
Sensor fault		E-09	9 indicator lights flash.	Check whether the sensor plug is loose, broken, or in short circuit.
Failure in ignition		E-10	10 indicator lights flash.	Check whether the oil circuit is blocked, or the oil transportation is not smooth, the oil pump is stuck, the volatilization net is blocked due to the oil product problem, and other reasons that cause that 2 ignition fails to burn normally.

The LCD panel fault display is that graphics and numbers are displayed at the same time, the numeral number is same as the digital panel class content.





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Bi-directional Remote Control Operation Instructions



1. Operation instruction of buttons

-  Start-up/shutdown Press and hold for 2 seconds to turn on, or turn off
-  Confirm button View host working status
-  Up-regulation button Increase the oil mass or temperature according to the temperature control method.
-  Down-regulation button Increase the oil mass or temperature according to the temperature control method.

2. Remote control pairing operation

In the shutdown state, first long press **down-regulation button** on the LCD panel that needs to be paired first. Showing **FR** means it enters the remote control code matching interface.

Then press the **power button** and **confirm button** on the remote control at the same time, the text of **waiting matching** remote control appears on the remote control, the remote control and switch enter the automatic matching process, and after successful code matching, it will automatically exits the code interface and displays the normal working parameters. If the code matching failed, it would not enter the normal state of displaying working parameters. The code matching state will be automatically exited when it does not receive remote control code over time.

3. Temperature control mode switching

When the temperature control mode is selected by remote control, only press the **up-regulation button** and **down-regulation button** at the same time to display the temperature when switching to automatic temperature control, and it will display the oil mass if the temperature is controlled manually.

4. Working status adjustment

The working status of the heater can be adjusted at any time by remote control. The methods are as follows:

Up-regulation button Increase the pump oil amount (manual temperature control mode) or raise the setting temperature to increase the output temperature of the heater.

Down-regulation button Decrease the pump oil amount (manual temperature control mode) or reduce the setting temperature to decrease the output temperature of the heater.

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Instructions for use of bi-directional remote control receiving



Introduction of buttons:

On/Off->long press On/Off

Lighting instructions

There is the light under the switch button, long lighting indicates the start-up and flashing indicates that there is a fault.

Introduction of button functions

Start-up -> When the operating voltage meets the conditions, press ON/OFF for a long time.

Fuel filling in manual mode

In shutdown state, start the manual oil pumping by pressing On/off button 5 times continuously and quickly. Please press the On/Off button gently to stop the oil pumping when the air has been removed from the oil circuit. This process requires observation of specially-assigned person to avoid excessive fuel entering the machine and black smoke at start-up.

Remote control pairing

In the start-up state, press On/Off button 5 times continuously and quickly, the indicator light flashing means it has entered the remote control pairing waiting state. At the same time, press the power button + setting button on the remote control for a long time to start the remote control pairing. Wait for auto-completion of pairing to exit.

Fault state description

Machine fault	State display	Handling method
Power supply under voltage	The indicator light flashes 1 time.	Boost supply voltage
Power supply with over pressure	The indicator light flashes 2 times.	Reduce supply voltage
Ignition plug fault	The indicator light flashes 3 times.	Check whether the ignition plug is in open circuit or short circuit.
Oil pump fault	The indicator light flashes 4 times.	Check whether the oil pump has suffered from broken line or short circuit.
The machine is overheating.	The indicator light flashes 5 times.	Check the temperature sensor on the shell or whether the fan has the abnormal rotation speed.
Motor fault	The indicator light flashes 6 times.	Check the magnet polarity, the Hall sensor location or the looseness conditions of wiring terminal.
Broken connection fault	The indicator light flashes 7 times.	Check the connecting plug of the panel, and whether the blue harness connection has become loose or disconnected.
The flame is extinguished.	The indicator light flashes 8 times.	Check whether the oil circuit has air or blockage, check whether there is fault on temperature sensor on the shell or whether the connector terminal has become loose.
Sensor fault	The indicator light flashes 9 times.	Check whether the sensor plug is loose, broken, or in short circuit.
Failure in ignition	The indicator light flashes 10 times.	Check whether the oil circuit is blocked, or the oil transportation is not smooth, the oil pump is stuck, the volatilization net is blocked due to the oil product problem, and other reasons that cause that 2 ignition fails to burn normally.

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Bi-directional Remote Control Operation Instructions



1. Operation instruction of buttons

- On/Off button Press and hold for 2 seconds to turn on, or turn off
- Confirm button View host working status
- Up-regulation button Increase the oil mass or temperature according to the temperature control method.
- Down-regulation button Increase the oil mass or temperature according to the temperature control method.

2. Remote control pairing operation

First, the receiving part which needs to be paired is put into the waiting pairing state. Then press the power button and confirm button on the remote control at the same time, and the interface of waiting pairing appears on the remote control.

The remote control and the switch enter the automatic pairing process, and the code matching interface will be automatically exited after the successful code matching and the normal working parameters will be displayed. If the code matching failed, it would not enter the normal state of displaying working parameters. The code matching state will be automatically exited when it does not receive remote control code over time.

3. Temperature control mode switching

When the temperature control mode is selected by remote control, only press the up-regulation button and down-regulation button at the same time to display the temperature when switching to automatic temperature control, and it will display the oil mass if the temperature is controlled manually.

4. Working status adjustment

The working status of the heater can be adjusted at any time by remote control. The methods are as follows:
Increase the pump oil amount (manual temperature control mode) by up-regulation button or raise the setting temperature to increase the output temperature of the heater.

Decrease the of pump oil amount (manual temperature control mode) by down-regulation button or reduce the setting temperature to decrease the output temperature of the heater.

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Instructions for Use of 12V - 24V General LCD Panel

1. Button function



Setting -> Enter the setting state, adjust setting parameters, and change the working status of the machine

Confirm -> OK -> Under the setting state, confirm the current setting value and enter the next parameter setting. View the machine state in the non-setting state.

▲-> In the setting state, increase the setting parameter, and in the non-setting state, increase the set working temperature.


On/Off-> Short press the button to turn on, and the status indicator light will always be on. Long press the button to turn off for 2 seconds, and the status indicator light will flash.


▼-> In the setting state, decrease the setting parameter, and in the non-setting state, decrease the set working temperature.


2. Description of remote control code matching


In non-setting state, press the up-regulation button first and press confirm button at the same time for more than 3 seconds. Entering the remote control code matching interface, it displays HFA-. Press the open button on the remote control to transmit the remote control code, exit the code interface after code matching, and the machine enters the start-up state. If the code matching fails, the machine will not enter the start-up state. It will exit the code matching state after overtime code matching work.

3. Description of setting parameters (press the setting button to enter and the status icon corresponding to the display screen lit)

1 Time setting  → Up-regulation button and down-regulation button of adjusting parameters → Press confirm button to set the hours (24-hour system) and minutes in turn, and press confirm button to enter the next item.


2 Timing switch setting  → It is closed by default, showing no 1-of. Press the up-regulation button to start, showing no 1-on to enter → Press confirm button to set the start-up and shutdown time of the first group and the start-up and shutdown time of the second group in turn. After the adjustment, press confirm button to enter the next item.

Inputting of administrative password  → Press up-regulation button and down-regulation button. When the correct value appears, press confirm button to enter the next digit. After the 4-digit input is correct, press confirm button to enter the next item.


3 Setting of pump oil  → Press up-regulation button and down-regulation button to → Modify setting with up-regulation button and down-regulation button to meet the

amount modify the minimum pump oil requirements of maximum pump oil amount to reach the required value, and then press confirm button. amount, and then press confirm button to enter the next item.


↓

4 Fan speed setting  → Press up-regulation button and down-regulation button to modify the minimum fan speed to reach the required value, and then press confirm button. → Modify setting with up-regulation button and down-regulation button to meet the requirements of maximum fan speed, and then press confirm button to enter the next item.


↓

5 Operating voltage setting  → **Only in the shutdown state can the main board operating voltage be selected.** Press the up-regulation button and down-regulation button to select the switching work voltage 12V system to be adjusted to display U-12, and 24V system to be adjusted to display U-24 to complete the selection. **Before start-up, check whether the oil pump, motor and ignition plug of the machine are matched, thus avoiding damage.**

↓

6 Selection of speed signal  → Press up-regulation button and down-regulation button to set the speed signal. The polarity of the two magnets of the impeller is opposite or only one magnet is selected as 1. The polarity of the two magnets of the impeller is the same. Please select parameter 2. If this parameter is incorrectly selected, the speed difference will be about 1 times.

↓

7 Administrative password modification  → After entering, OFF status will be displayed. If there is no need of modification, just press confirm button to skip the password modification, saving parameters and exiting automatically. Press up-regulation button and it will display "on", and then press confirm button to enter modification status. Input 4-digit new password and press confirm button to save the password and the adjusted setting parameters, exiting automatically.

Precautions: After all the parameters are set, you must press confirm button to exit before saving the setting parameters. If you press confirm button to exit, the parameters will not be stored. Please check each new digit of password carefully and save it, through which you can enter to the parameter modification next time.

4. Query machine status description

Time display → Ambient temperature display → Setting temperature display (automatic temperature control)/setting pump oil amount display (Manual temperature control)

↑ in non-setting state, press the confirm button to view it cyclically. ← Display of history fault code ← Display of supply voltage

5. Description of fuel filling in manual mode

In the non-setting state, press the down-regulation button first and then press confirm button to enter the manual pump interface. When it displays H-oF, release confirm button first and then release the down-regulation button. Press up-regulation button to start the manual pump oil and it displays the H-on. You can hear the working sound of the oil pump and the oil pump icon lit. Press down-regulation button or setting button to close and exit manual pump, and oil pump icon disappears.

6. Timing switch description

After the running time is set, press confirm button to enter the timing switch function setting, which defaults to "oF" off state, press up-regulation button to start "on" state, press confirm button to set the first group about the hours and minutes of start-up time, and then enter the setting of hours and minutes of shutdown time after confirmation. Press confirm button to enter the second group. The setting method is the same as above. Set the hours and minutes of start-up time, and then the hours and minutes of shutdown time. A time interval may be set between the two sets of timings. The timing function is only run once. After this time, the current timing will be turned off. Please turn it on again and set the time for the next time. The alarm clock icon lit up after the timing setting and disappear at the end of the timing.

7. Description of temperature control mode switching

In the non-setting state, press and hold the up-regulation button first and then press the setting button to display P-x.x (xx represents the pump oil amount), i.e., entering the manual temperature control mode. The pump oil amount is limited to the current setting - the initial pump oil amount. When you press the 2 button above, XX is displayed. C (xx stands for temperature value), that is, the automatic temperature control mode is entered, and the pump oil amount is controlled to run between the maximum pump oil amount - the initial pump oil amount. The automatic change of pump oil amount in two modes depends on the change of temperature. The difference between the two modes is that the pump oil amount in automatic mode can reach the maximum value in the parameter setting and the machine heat is high. The pump oil amount in manual mode is limited to the current setting value and will not reach the maximum value in the parameter setting. The machine heat is limited to the range of choice, taking into account the usage habits of some old drivers.

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