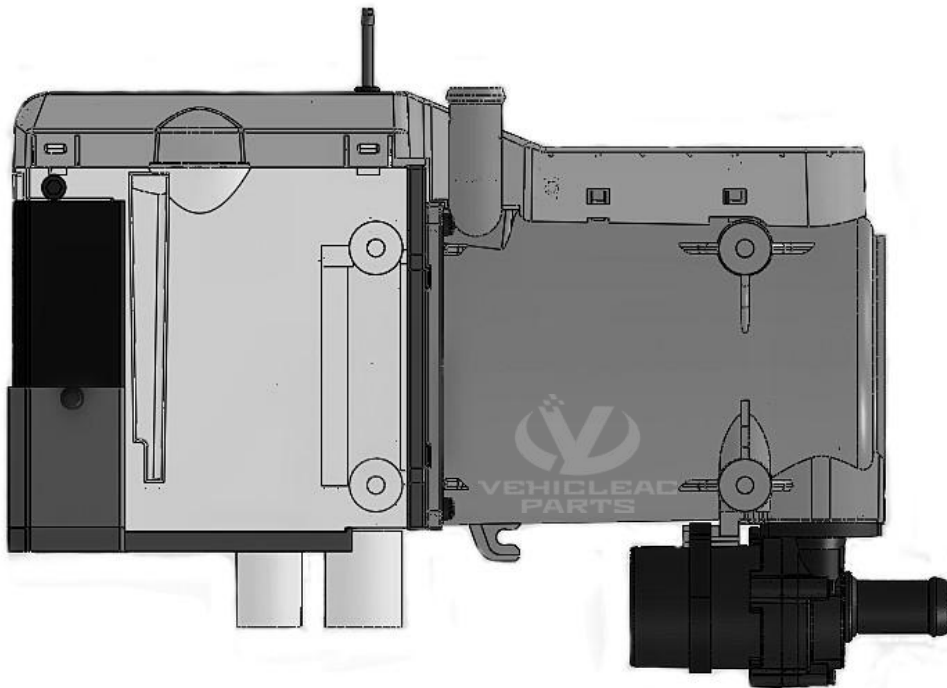


M-DW 8-12

PRODUCT MANUAL



SHANGHAI VEHICLEAC INDUSTRY CO., LTD



SHANGHAI VEHICLEAC INDUSTRY CO., LTD

ADD: NO. 8-1098, CHUANSHA ROAD, PUDONG NEW DISTRICT, SHANGHAI, CHINA
TEL: + 86 - 021 – 58581023 Website: <http://www.vehicleacparts.com>

Declare

Copyright © 2016-2018

Shanghai VehicleAC Industry Co., Ltd. copyright, all rights reserved.

Without the written permission of the company, any unit or individual shall not excerpt or copy part or all of the content of this book without authorization, and shall not spread it in any way.

Due to product version upgrades or other reasons, the content of this manual will be updated from time to time. In order to obtain the latest version of information, please visit the company's website public platform regularly. The functions of the specific product model are subject to the firmware version itself. This manual is only a manual for the installation and operation of parking heaters for general users. Shanghai VehicleAC Industry Co., Ltd. tries to provide accurate information in this document. We are not responsible for possible omissions. Unless otherwise agreed, this manual is only used as an installation guide, and all statements and suggestions in this manual do not constitute any express or implied warranty.

1. Application:

This heater is independent and can be installed in the following vehicles while complying with the heating power:

- Various Auto
- Construction machinery
- Agricultural machinery
- Boats, ships, yachts and marine

2. Purpose of The Heater (through the vehicle's own heat exchanger)

- Preheat, defrosting the glass
- Heat and keep warm for the following areas:
 - cab or studio
 - freight warehouse
 - cabin
 - Inside the staff lounge or van
 - vehicle engine and unit

Please be sure the heater must not be used in the following situations:

- Continuous heating for a long time:
 - Living room
 - Garage
 - Small workshops, weekend holiday homes and hunting lodges
 - Residential boats, etc.

3. Exhaust System

Please must be sure taken to prevent exhaust gas from entering the interior of the vehicle through ventilation, hot air inlets or windows, when installing the exhaust gas outlets

4. Combustion Air Inlet

- Please do not suck air from the passenger compartment and use it as combustion air of the heater
- When installing the air inlet, make sure that it cannot be blocked by objects.
- When working on electric welding on a vehicle, please do cut off the positive wire of the battery and ground it, in order to protect the controller of heater.

5. Do Not Use Heaters Where Flammable Vapors or Dust Are Formed, Such As:

- Fuel warehouse
- Carbon storage
- Wood warehouse
- Granaries and similar locations

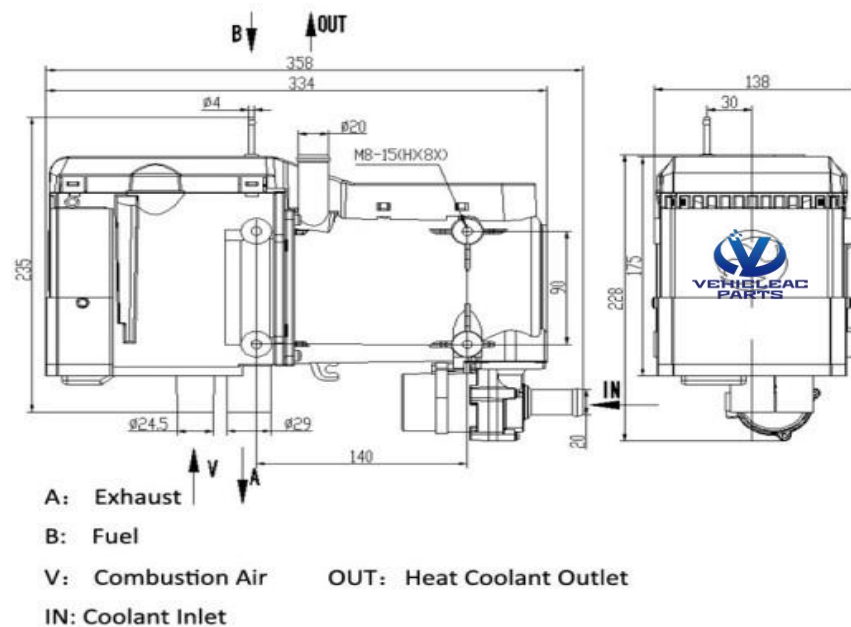
6. The Heater Must Be Turned Off When Refueling

• As long as the heater is installed in a protective case or the like, the installation space must be kept open. In particular, fuel storage tanks, oil tanks, spray cans, gas cylinders, fire extinguishers, foam cloth, clothing, paper, etc. should not be placed on or near the heater for storage or transportation.

- The damaged fuses must be replaced by a fuse with a specified insurance value.
- If the fuel flows (leakage) from the fuel system of the heating unit, it should be repaired immediately by the service provider.
- Please do not interrupt the heater's cooling operation in advance by operating the battery disconnect switch, etc., unless it must be turned off urgently.

1. The Dimensions and Parameters of the Heater

1. Main Dimensions (MM):



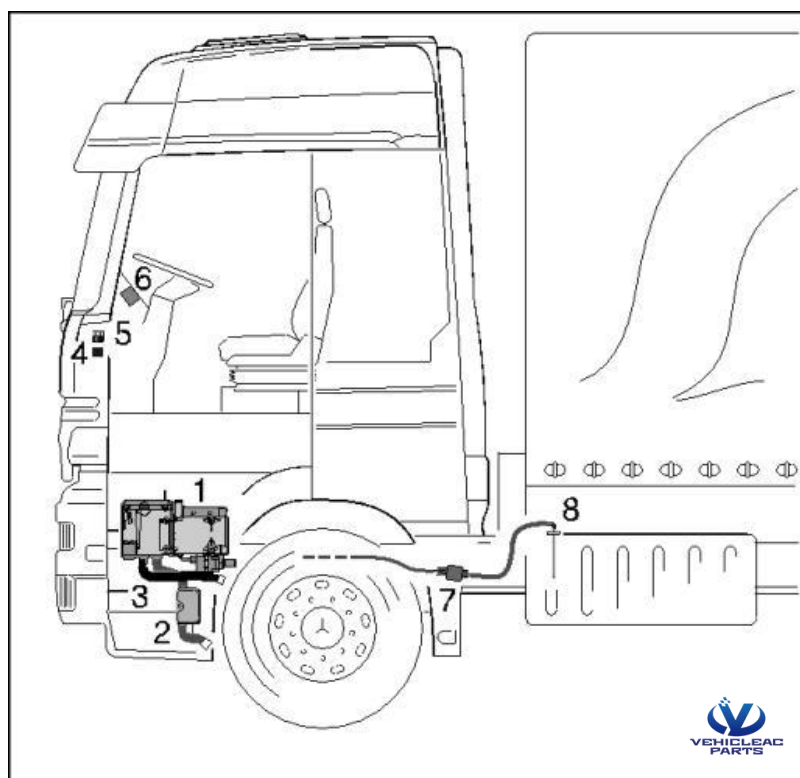
2. Parameter:

Technical Parameters	M-DW8				M-DW10				M-DW12					
Voltage (V)	12/24				12/24				12/24					
Heating medium	Water, Coolant													
Fuel	Diesel (suitable for ambient temperature)													
Heating Grade	I	II	III	IV	I	II	III	IV	I	II 1	II 2	II 3	III	IV
Heating Power (KW)	1.5	3.2	5	8	1.5	3.5	8	9.5	1.2	1.5	3.5	5	9.5	12
Water Flow Rate (L/H)	1400 about 0.14bar													
Power Consumption (W)	35	39	46	55	35	39	60	86	34	35	39	46	86	132
Fuel Consumption (L/H)	0.18	0.40	0.65	0.90	0.18	0.40	0.90	1.2	0.18	0.18	0.40	0.65	1.2	1.5
Power consumption at startup (W)	≤120													
Dimension (MM)	331*138*174													
Weight (KG)	6.2													

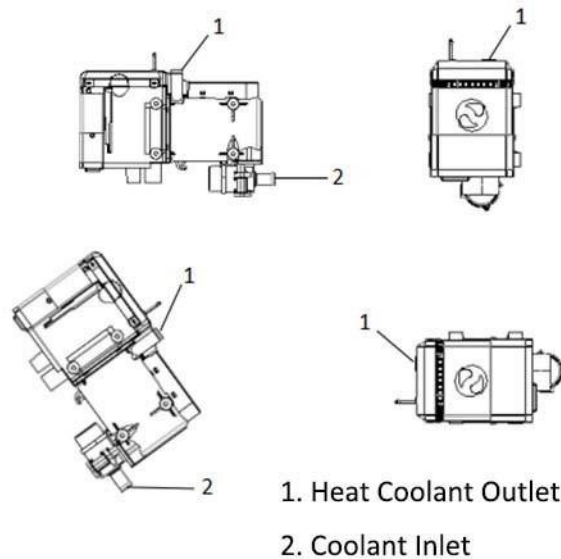
2. Installation Instruction

1. Example:

- 1 Coolant Heater
- 2 Exhaust Outlet
- 3 Combustion Air Inlet
- 4 Harness of Heater
- 5 Fuse
- 6 Digital Switch
- 7 Fuel Pump
- 8 Fuel Tube



2. Allowed Installation Angle:

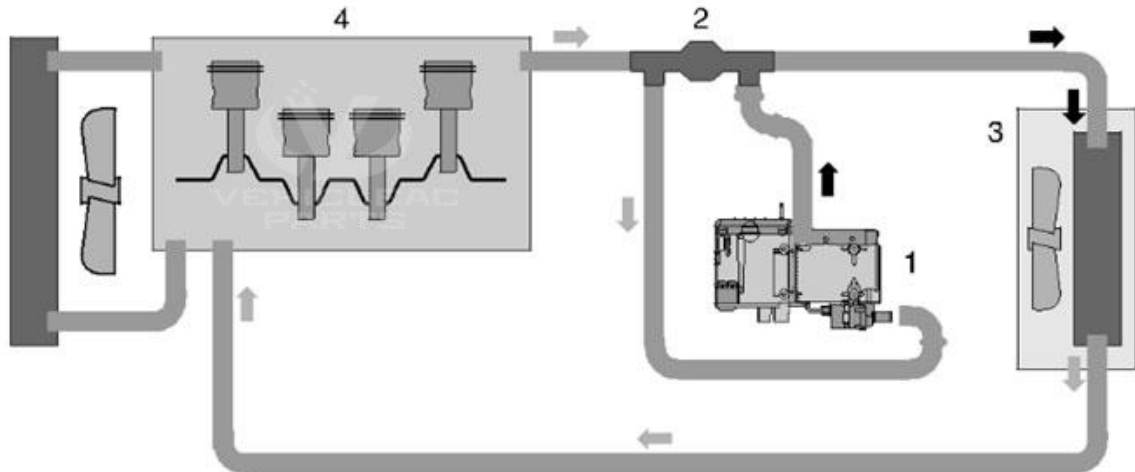


3. Installation Precautions:

- The temperature of the coolant and components in the coolant circulation system can be high.
- When laying and fixing the water conduit, please do not cause injury or damage to humans, animals or temperature sensitive materials due to thermal radiation / contact with heat.
- Before working on the heater's coolant circulation system, turn off the heater first until all parts are completely cooled. Please wear protective gloves if necessary.
- Pay attention to the direction of water flow in the coolant circulation system when installing the heater.
- Inject coolant into the heater and water pipe first, before connecting them to the cooling water circulation system.
- Be careful not to bend when laying the pipe, and should point up as far as possible.
- When connecting the water pipe, be aware that it should be kept at a sufficient distance from the hot auto parts.
- All water pipes/water pipes should be protected from being scratched and exposed to high temperatures.
- Minimum water flow can be guaranteed only when the heater runs, as well as the temperature difference between the heating medium of water inlet and water outlet does not exceed 15K
- When encountering cold, the coolant must contain enough antifreeze.

4. Instruction of connection to the cooling water circulation system:

The heater is connected to the water (coolant) outlet pipe from the auto engine to the heat exchanger. Cut off the water outlet from the car engine to the heat exchanger, then the heater is connected to the water outlet pipe of the cooling water circulation system through the connector and water pipe. Please note that there is a flow direction mark at the water inlet and outlet of the heater.



1. Coolant Heater 2. Check Valve
 3. Heat Exchanger 4. Auto Engine

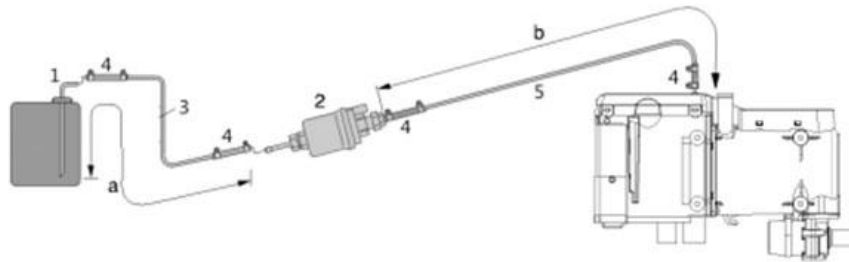
5. Installation of fuel circuit system:

Please observe the following safety instructions when installing the fuel pump, connecting the fuel pipe, and installing the fuel tank. It is not allowed to violate this description. Failure to follow these instructions may cause malfunctions and care should be taken when using fuel.

- Turn off the car engine and heater before refueling and entering fuel.
- Avoid fire when using fuel.
- No smoking.
- Do not breathe fuel vapors.
- Avoid connecting with skin.
- Only use sharp knives to cut off fuel supply hoses and fittings. The incision must not be crushed and must be free of burrs.
- When laying the fuel tube, keep the fuel pump to the heater as high as possible.
- To prevent damage to the fuel pipe due to vibration and/or noise, please secure it (reference spacing: 50 cm).
- The fuel pipe must be protected from mechanical damage.
- When installing the fuel tube, it must be noted that the torsion of the vehicle, the movement of the engine, etc. must not have long-term adverse effects on its durability.
- The fuel circuit components should be protected from the heat that interferes with the

operation.

- Do not install or secure the fuel pipe at a close distance along the exhaust pipe of the heater or car engine. When crossing these pipes, always pay attention to maintain sufficient insulation spacing and install thermal radiation shields if necessary.
- Do not collect dripping or vaporized fuel or use it to ignite hot parts or electrical devices.
- When connecting the fuel tube to the fuel supply hose, pay attention to the connection between the fuel tube and the oil pump nozzle to avoid the formation of air bubbles.



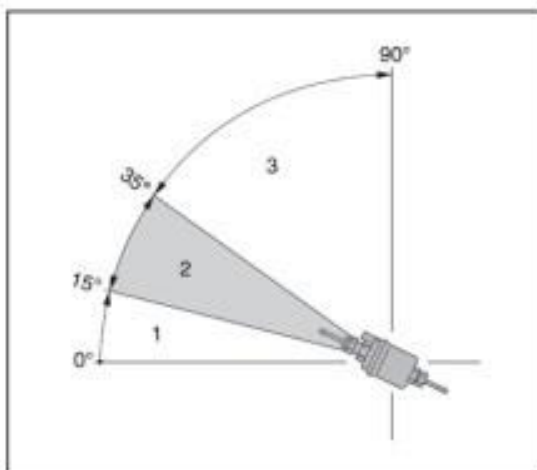
1. Fuel Tube 2. Fuel Pump 3. Nylon Fuel Pipe 4. Rubber Fuel Pipe
 5. Nylon Fuel Pipe

Allowed pipe length: a: Inhalation end ≤ 2m b: Pressure end ≤ 6m

6. the installation of the oil pump:

Fuel pump installation angle

Always install the oil pump with the pressure side facing up. Allowed each mounting angle should be more than 15°, and advised installation angle is 15° and 35°



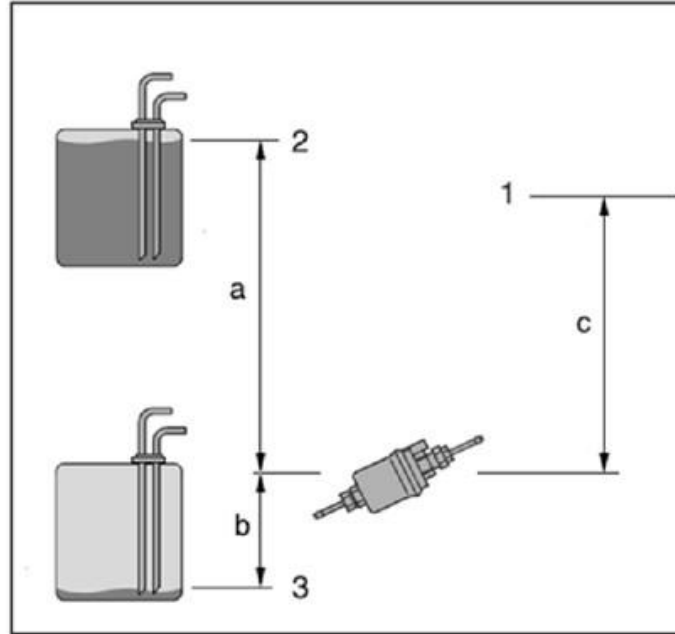
1. 0° to 15° is not allowed
2. 15° to 35° is advised
3. 35° to 90° is allowed

Permissible suction and pressure height of the fuel pump

- Pressure level from auto tank to fuel pump: a = maximum suction height of 1000 mm pressure-free

car tank b = maximum 750 mm

- The suction height in the fuel tank of the under pressure that is formed during extraction (the valve in the fuel tank cap has a pressure of 0.03 bar): b = up to 400 mm
- Pressure from fuel pump to heater: c = up to 2000 mm







1. Connector of Coolant Heater
2. Maximum Oil Pressure Height
3. Lowest Fuel Volume Left

3. Operation Instruction of Parking Heater


1. Function of Digital Switch:



2. Mode of Manual: Start the parking heater by manual


Press "ON" for 1 second or less, heating logo  and water pump logo  appears, then fire symbol  appears after ignition success in some seconds.  means the current temperature of water.

3. Mode of water pump: only start water pump

Repress "ON" in the heating state of parking heater, it will be mode of water pump. And only  displays.




4. Timer Function: turn on the parking heater in set time.

Press "SET" in the off state of parking heater, timer logo  will display. Then press

“Option” to set the time (the unit is 0.5 hour). You can choose 0.5hour, 1hours, 1.5 hours etc.



Take 0.5hour for example, the parking heater will start automatically after 0.5 hour.



 means the timer function is on,  means the timer function is off.

5. Fault Mode:



 means the parking heater comes across fault, and  shows the fault code.

6. Turn off the parking heater by manual:

Press “OFF” for 3 seconds or more, F0 will display, and the parking heater stop heating and begin to turn off.

However, it will take some time to turn off, because the fan will run to cool the parking heater. Please be patient.

The screen of digital switch will be off, when the parking heater turns off.

4. Operation and Operation of Heater

1. Operation instructions:

- The 1st gear (water pump) switch is turned on and the water pump works (the 1st gear only controls the water pump, and this switch can be used to use the engine's waste heat for car interior heating and windshield defrosting).
- The 2nd gear (host) switch is turned on, the switch indicator light is on, and the water pump works; after about 3 seconds, the heater starts to work.
- The heater inlet and outlet water temperature sensor (85°C, stop running; 75°C re-ignition) automatically controls the constant temperature of the coolant medium in the circulation system. If the operation is stopped at 85°C, and it cannot be ignited at 75°C, the main engine will stop and the water pump will continue to work.
- Shutdown: Turn off the second switch, the host will automatically turn off after a delay of 3 minutes, and the water pump will stop working after 5 seconds.

2. Description of heater working status

- After pressing the switch, the running indicator will light up and the pump will start. After the program starts for a certain period of time, the combustion-supporting fan, ignition plug and oil pump start the combustion process. Once the flame stabilizes, the ignition plug is closed after a certain period of time.
- According to the demand for heat, the heater will be adjusted to the following levels: high-low-off (adjust rest).

Here, the temperature limit value is fixed into the electronic controller program. At the "low level", if the heat demand is so small that the cooling water reaches 85 °C, the heater is adjusted to the pause position. Then start cooling operation for about 120 seconds, after which the heater is turned off (regulation rest). The control light is on and the pump continues to run in the pause position.

- If the heater does not ignite within 90 seconds after starting to deliver fuel, the starting process will be repeated. If the heater does not ignite within the second 90 seconds after starting to deliver fuel, it will malfunction and shut down. After exceeding the allowed number of startup attempts and repeated failures, the controller is locked.
- If the flame is automatically extinguished during operation, it will restart. If the heater does not ignite within 90 seconds after restarting fuel delivery, it will malfunction and shut down. The faulty shutdown phenomenon can be eliminated by briefly shutting down and restarting.
- When overheating occurs (such as water shortage, poor cooling water circulation and ventilation), the overheating sensor responds, the fuel supply is interrupted, and the shutdown occurs due to failure. After eliminating the cause of overheating, the heater can be restarted by shutting down and restarting. (Prerequisite: the heater has sufficient cooling, and the cooling water temperature is <70 °C).
- After reaching the lower limit or upper limit of the voltage, it will shut down due to a fault.
- Once the ignition plug is damaged or the circuit to the oil pump is interrupted, the heater cannot be started.
- The speed of the fan motor will be constantly monitored. If the fan motor does not start, it will jam, or if the speed drops below 40% of its rated value, it will shut down after 60 seconds.
- After the heater is turned off, the oil pump stops working, the combustion stops, and the fan and water pump continue to run for about 120 seconds before stopping.
- During heater operation, it is prohibited to interrupt heater operation by turning off the main power supply.

3. Heater failure

The following items should be checked in case of failure

The heater does not start after starting:

- Shut down, then restart.

If the heater still does not start, check:

- Is there fuel in the tank?
- Is the fuse normal?
- Are the circuits, connections, and connectors normal?
- Is the heater water circulation system, combustion air system, and exhaust system blocked?

If the above items are normal, but the heater still has faults or functions abnormally, please contact the service provider approved by VehicleAC for repair.

When the heater fails, the heater combustion indicator will flash and alarm. The indicator flashes different times, representing different fault codes. The fault codes and troubleshooting measures are as follows:

Error Code	Description	Flicker Frequency
1	Five short and one long flashes, flashing recyclically	■■■■■ ■■■■■■
2	Five short and two long flashes, flashing recyclically	■■■■■ ■■■■■■■■■■
3	Five short and three long flashes, flashing recyclically	■■■■■ ■■■■■■■■■■■■
4	Five short and four long flashes, flashing recyclically	■■■■■ ■■■■■■■■■■■■■■
5	Five short and five long flashes, flashing recyclically	■■■■■ ■■■■■■■■■■■■■■■■
6	Five short and six long flashes, flashing recyclically	■■■■■ ■■■■■■■■■■■■■■■■■■
7	Five short and seven long flashes, flashing recyclically	■■■■■ ■■■■■■■■■■■■■■■■■■■■
8	Five short and eight long flashes, flashing recyclically	■■■■■ ■■■■■■■■■■■■■■■■■■■■■■
9	Five short and nine long flashes, flashing recyclically	■■■■■ ■■■■■■■■■■■■■■■■■■■■■■■■
10	Five short and ten long flashes, flashing recyclically	■■■■■ ■■■■■■■■■■■■■■■■■■■■■■■■■■

Error Code	Failure Category	Cause of Issue	Troubleshooting
1	Overvoltage or undervoltage	The power supply exceeds the range of DC20V -30V	Use a multimeter to check the power supply voltage, if it is lower than DC20V, please charge the battery or replace with a new battery; if the voltage is higher than DC30V, please replace the power supply
2	Overheating failure	The air inlet and outlet are blocked or the air inlet and outlet are not smooth	Check if the air inlet and outlet are blocked, and if the air inlet and outlet are unobstructed, if so, please clean up
		The exhaust pipe is blocked or the exhaust is not smooth	Check whether the smoke exhaust pipe is blocked and whether the smoke exhaust is unobstructed, if so, please clean it
3	Flame sensor failure	The flame sensor is not connected properly	Check whether the plug-in is properly connected and the lead is loose, if so, please re-plug it
		The lead wire of the flame sensor is short-circuited or open	Use a multimeter to check whether the lead wire of the flame sensor is short-circuited or open, if so, please repair or replace it
		Flame sensor damage	Use a multimeter to check whether the flame sensor is damaged, if damaged, please replace it
4	Motor failure	The motor is not connected properly	Check whether the plug-in is properly connected and the lead is loose, if so, please re-plug it
		The leads of the motor are short-circuited or open	Use a multimeter to check whether the motor is short-circuited or open, if so, please repair or replace
		Motor damage	Perform power-on detection on the motor to check whether the motor is rotating normally, if it does not rotate normally, please replace it
5	Ignition plug failure	The ignition plug is not connected properly	Check whether the plug-in is properly connected and the lead is loose, if so, please re-plug it
		The lead wire of the ignition plug is shorted or open	Use a multimeter to check whether the ignition plug is short-circuited or open, if so, please repair or replace it

		Damaged ignition plug	Use a multimeter to check the resistance between the two leads of the ignition plug. The resistance should be between 1-4 ohms. If it is not in this range, please replace it.
6	Overheat sensor failure	The overheat sensor is not connected properly	Check whether the plug-in is properly connected and the lead is loose, if so, please re-plug it
		The lead wire of the overheat sensor is short-circuited or open	Use a multimeter to check whether the lead wire of the overheat sensor is short-circuited or open, if so, please repair or replace it
		Damaged overheating sensor	Use to check whether the overheat sensor is damaged, if damaged, please replace it
7	Electromagnetic oil pump failure	The oil pump is not connected properly	Check whether the plug-in is properly connected and the lead is loose, if so, please re-plug it
		Short circuit or open circuit of oil pump lead	Use a multimeter to check whether the oil pump is short-circuited or open, if yes, please repair or replace it
		Oil pump is damaged	Use a multimeter to check the resistance value at both ends of the oil pump plug-in. The resistance value should be 15-25 ohms. If it exceeds the range, please replace it.
8	Inlet water temperature sensor failure	The lead wire of the temperature sensor is short-circuited or open	Use a multimeter to check whether the lead wire of the temperature sensor is short-circuited or open, if yes, please repair it
		Temperature sensor is damaged	Use a multimeter to check whether the temperature sensor is damaged, if it is damaged, please replace it
9	Ignition failure	No fuel in the tank	Check whether the fuel in the fuel tank is filled, if there is a shortage of fuel, please add fuel
		Blocked or damaged oil tubing	Check whether the oil tubing is blocked by impurities and whether the connections are intact, if any, please repair or replace
		Condensation of fuel blocked the fuel pipe	Check if the fuel is condensed, if so, please change to a low-temperature fuel suitable for the environment
		The exhaust pipe is not smooth or blocked	Check whether the smoke exhaust pipe is blocked and whether the smoke exhaust is unobstructed, if so, please clean it
		Controller failure	Replace the controller
10	Flame interruption	Less oil in the tank	Check whether the fuel in the fuel tank is sufficient, if there is no fuel, please add fuel
		Ignition sensor failure	Troubleshoot or replace

(Please note: the fault prompt only indicates the reason for the shutdown of the heater failure. It does not mean that the component is damaged. You can try to restart the heater again. After the heater has a fault, the fault should be eliminated before starting.)



SHANGHAI VEHICLEAC INDUSTRY CO., LTD

ADD: NO. 8-1098, CHUANSHA ROAD, PUDONG NEW DISTRICT, SHANGHAI, CHINA
TEL: + 86 - 021 – 58581023 Website: <http://www.vehicleacparts.com>

5. Maintenance Instructions and Disclaimer

1. Outside the heater service period, the heater should be turned on for about 10 minutes every month.
2. After a long period of inactivity, check whether the heater circulation system, combustion air system, and exhaust system are normal, and clean if necessary. Before the heating period comes, the heater should be tested for operation. If thick smoke appears for a long time or emits If there is abnormal burning sound, turn off the heater and remove the fuse. In this case, the inspection will be carried out by a service provider approved by Yusheng.
3. Diesel fuel suitable for the ambient temperature should be added as the heater's fuel. Diesel heaters are prohibited from adding gasoline. The manufacturer is not responsible for damage to the machine and other associated problems caused by incorrect fuel.
4. An antifreeze suitable for the ambient temperature should be added as a circulating medium to avoid damage to the body caused by freezing. The manufacturer is not responsible for machine damage and other associated problems caused by the freezing of the circulating medium.
5. Unauthorized disassembly and repair of the machine is prohibited, and the manufacturer is not responsible for the machine failure caused by this.

SHANGHAI VEHICLEAC INDUSTRY CO.,LTD

ADD: No. 8-1098,ChuanSha Road,Pudong New District,ShangHai,China
TEL: +86 - 021 - 58581023 +86-15137118132
<http://www.vehicleacparts.com>
Nichol@vehicleacparts.com