

SmartGen

MAKING CONTROL SMARTER

HT40MB

ENGINE WATER HEATER

USER MANUAL



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Table 1 – Software Version

Date	Version	Note
2024-11-13	1.0	Original release.
2025-07-11	1.1	Modify the inlet/outlet dimensions; Update the assembly structure drawing and overall dimension drawing.

Table 2 - Symbol Instruction

Symbol	Instruction
 NOTE	Highlights an essential element of a procedure to ensure correctness.
 CAUTION	Indicates a procedure or practice, which, if not strictly observed, could result in damage or destruction of equipment.
 WARNING	Indicates a procedure or practice, which could result in injury to personnel or loss of life if not followed correctly.

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1 OVERVIEW

HT40MB Water Heater enables wide application on various engine coolant pre-heating. It has fine cast aluminum enclosure and self-extinguishing engineering plastic end closure, easy and convenient to use.

If the ambient temperature is lower than 4°C during cranking, engine coolant and lubricant may condense into solid state and lose their lubricating and cooling properties, which can damage the engine. Therefore, engine heater should be installed to ensure normal starting and running of the engine when the ambient temperature is lower than 4°C.

The inner heating element and sealing end cover both adopt stainless steel with high corrosion resistance. The heater has light indication function, which can indicate power and heating status. Three kinds of heaters with different heating temperature are optional (Standard heater: 40°C; heaters of 50°C and 60°C type requires to be customized).

This product is suitable for various engines with (13~25) L displacement.

Please login our company's official website to select heaters.

2 PERFORMANCE AND CHARACTERISTICS

- Fine cast aluminum enclosure, stainless steel inner pipes and sealing end cover;
- Coolant temperature is controlled by thermostat which is installed inside the heater. It has simple structure and high reliability;
- Power, heating and overheat protection indicators make it easy to observe the heater status;
- There are two water inlets on both sides of the heater, and either one can be used during installation. Both water inlets are equipped with the check valve;
- Both of the two power line inlets utilize knockout hole, Users can choose either one according to the installation methods. Waterproof connectors are provided;
- There is a water drain valve with sealing ring on the bottom of the heater, that can be used when necessary;
- Overheating thermostat provides the protection of overheating;
- Press Test key to perform the commissioning operation when ambient temperature is too high;
- This product can work normally in environments as cold as -40°C.

3 TECHNICAL PARAMETERS

Table 3 – HT40MB Specifications

Items	Parameters
Model	HT40MB
Rated Power	4000W
Rated Voltage	AC240V
Operating Voltage	AC190V~AC277V
Rated Current	16.7A
Engine Displacement	(13~25)L
Thermostat Range	HT40MB & HT40MB-G3/4: Off: (40±3)°C Reset: (25±5)°C
	HT40MB-1 & HT40MB-1-G3/4: Off: (50±3)°C Reset: (35±5)°C
	HT40MB-2 & HT40MB-2-G3/4: Off: (60±3)°C Reset: (45±5)°C
Overheating Thermostat Range	Off: (95±4)°C Auto Reset: (temperature below 80°C)
Insulation Resistance	≥50MΩ
Electrical Strength	AC 1.5kV, 1min, ≤2.5mA
Inlet/Outlet Size	G3/4" (φ25.5mm)
Max. Water Pressure	0.5MPa
Protection Level	IP54
Vibration Test	(5~8)Hz; Amplitude=±7.5mm; Triaxial (8~500)Hz; a=2g; Triaxial
Shock Test	Half-sine wave; a _{peak} =50g; Triaxial
Working Temperature	-40°C~+70°C
Storage Temperature	-40°C~+70°C
Case Dimensions	464mm×304mm×223mm
Weight (include accessories)	5.6kg
Models of HT40MB, HT40MB-1 and HT40MB-2 are equipped with φ25.5mm barbed fittings as standard.	
Models of HT40MB-G3/4, HT40MB-1-G3/4 and HT40MB-2-G3/4 are equipped with G3/4 male thread adapters as standard.	

4 PANEL INDICATION

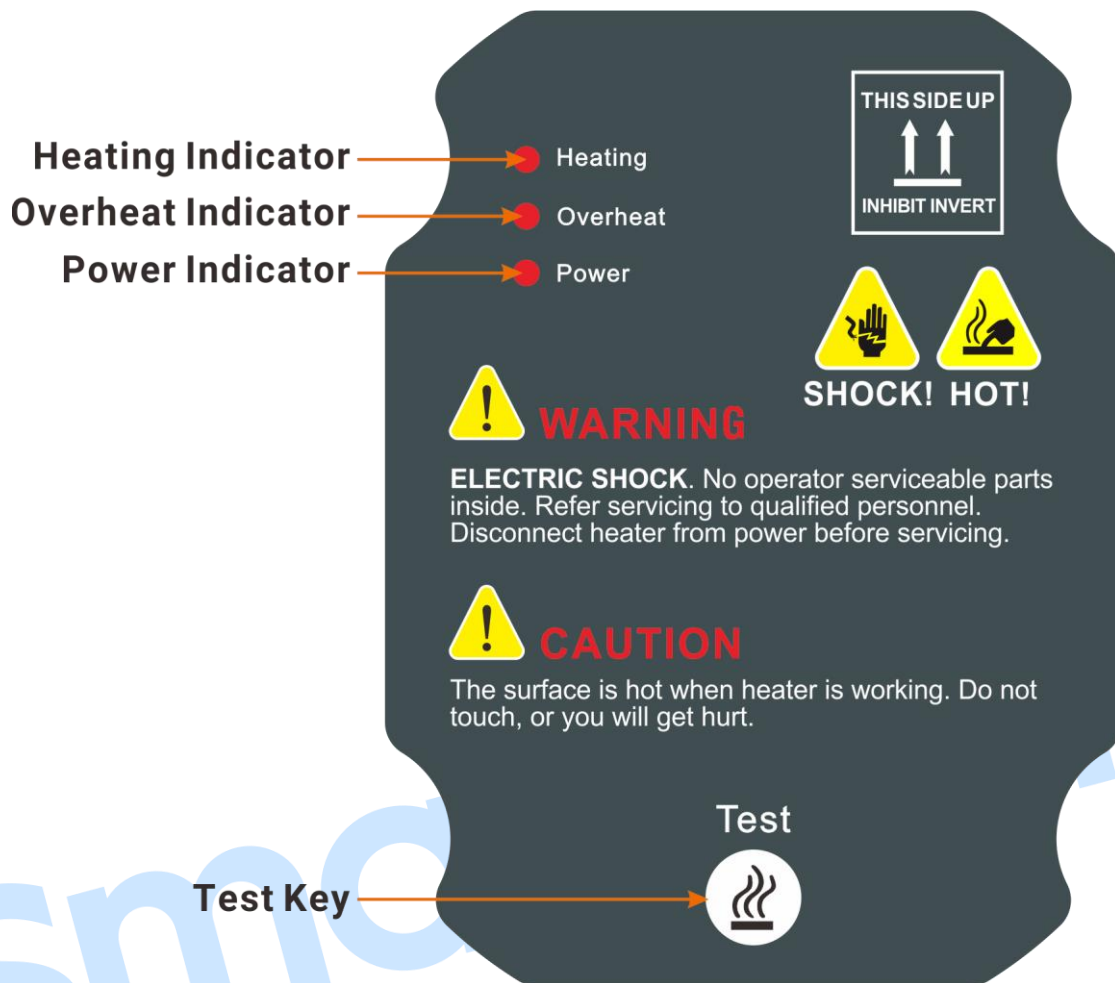


Fig.1 – Panel Indication



Fig.2 – Diagram of Knockout Hole

First, remove the knockout hole on the plastic rear shell, then install the waterproof connector on the hole. Use a 4mm² power cable for connection. Open the back shell, and insert the power cable through the connector. Finally, connect the wires to the L (Live), N (Neutral), and E (Earth) terminals respectively.

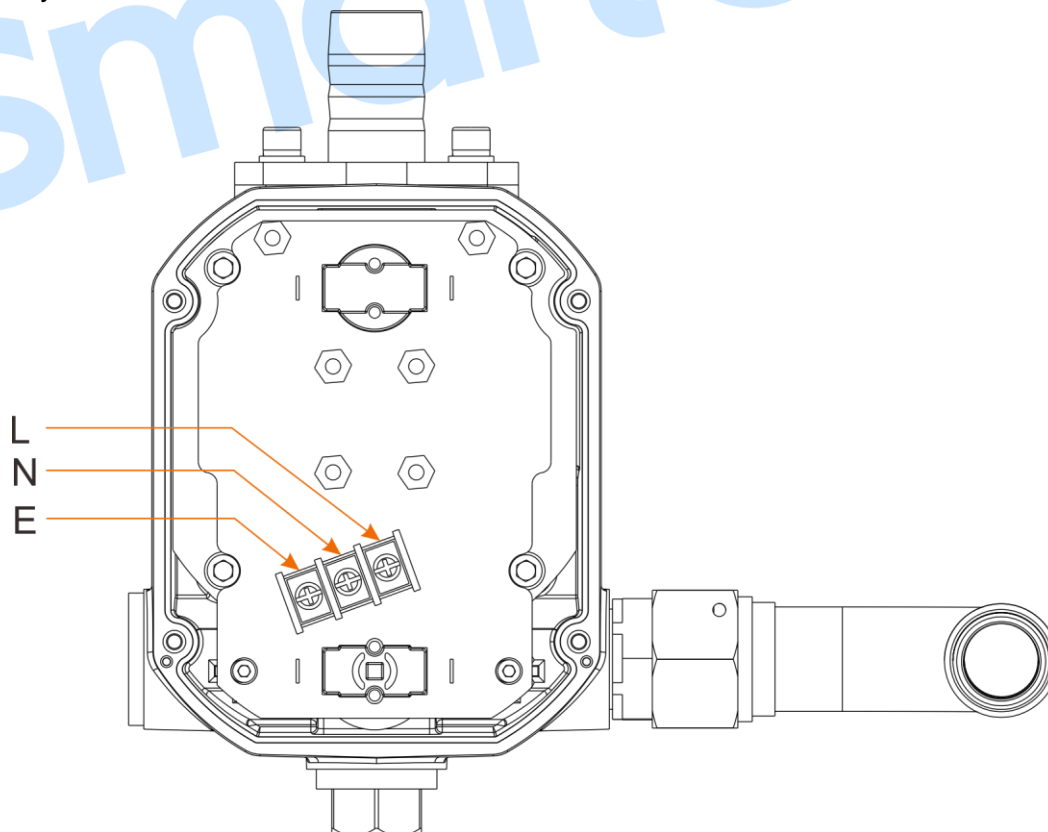


Fig.3 – Wiring Connections

6 INSTALLATION INSTRUCTION

Please install the heater vertically according to the diagram before use. Pay attention to the direction of heater inlet and outlet, and ensure that the heater position is below the lowest water level of the engine and that all the air is vented out of the heater and it is topped off with coolant.

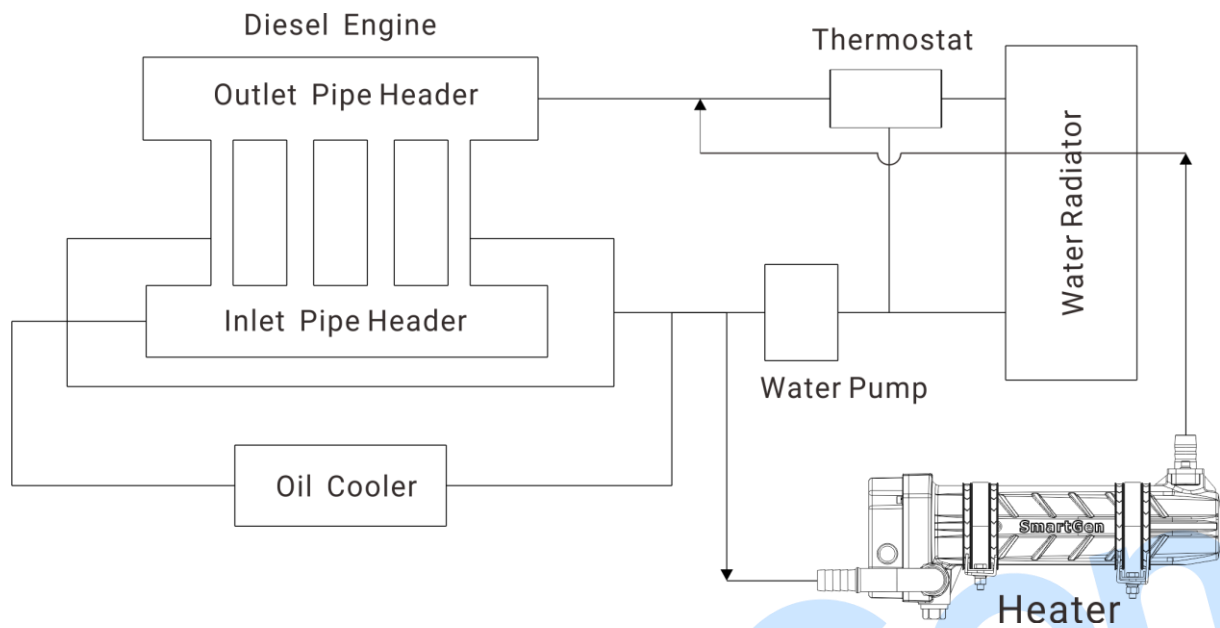


Fig.4 – Operation Diagram

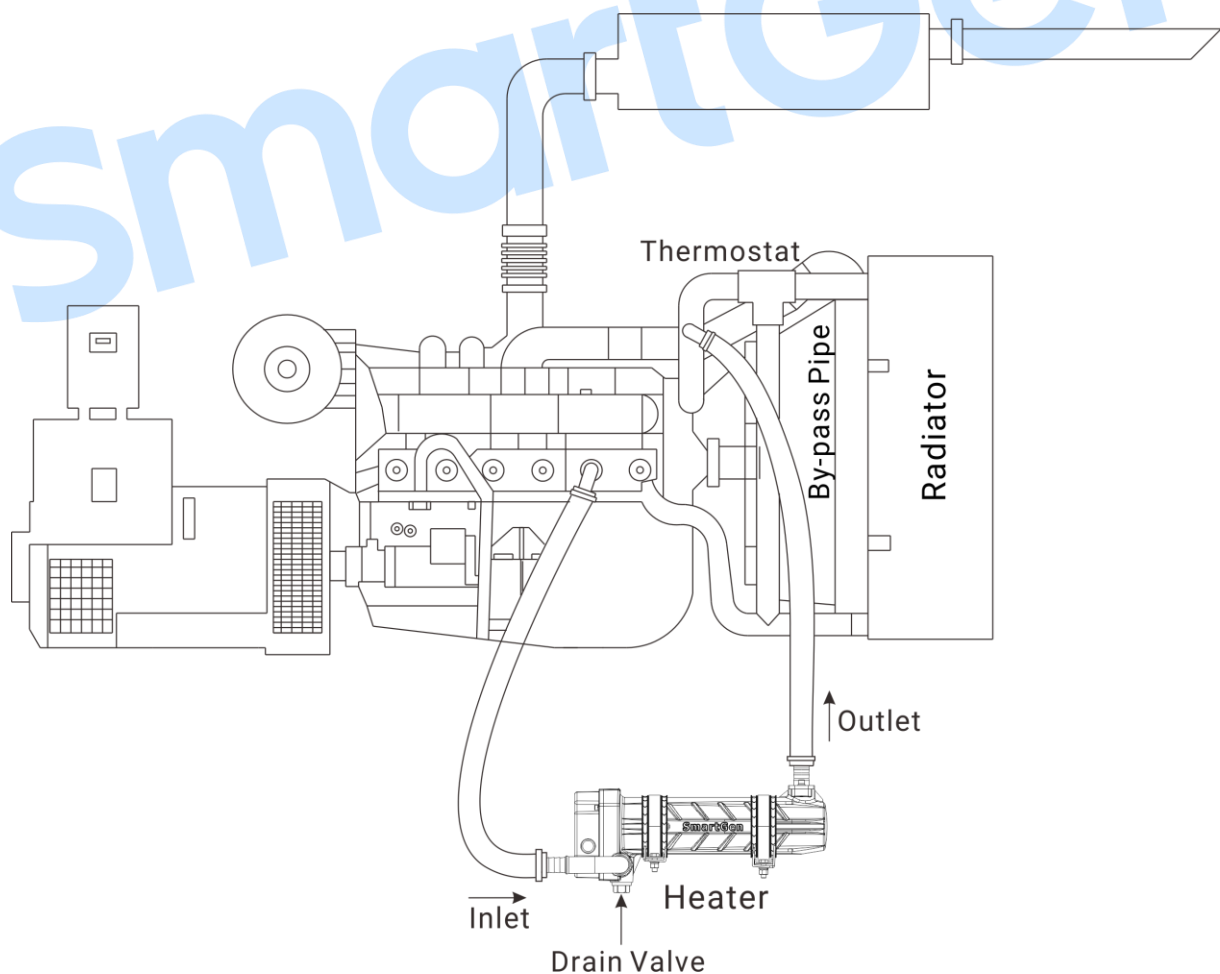


Fig.5 – Installation Diagram



Fig.6 – Incorrect Pipe Connection

NOTE: If there is a W-shaped or reverse U-shaped bend during pipe connection, the air remained in the pipe cannot be removed entirely, which affects the normal circulation of liquid. The air dissolved in the liquid will escape during heating and remain in the bend. If there are too many bends, even if vent the trapped air manually, air gathering will appear again in the next heating process. To ensure the smooth liquid circulation, the hosepipe with an inner diameter over 25mm and pipe connectors with an inner diameter over 20mm are recommended.

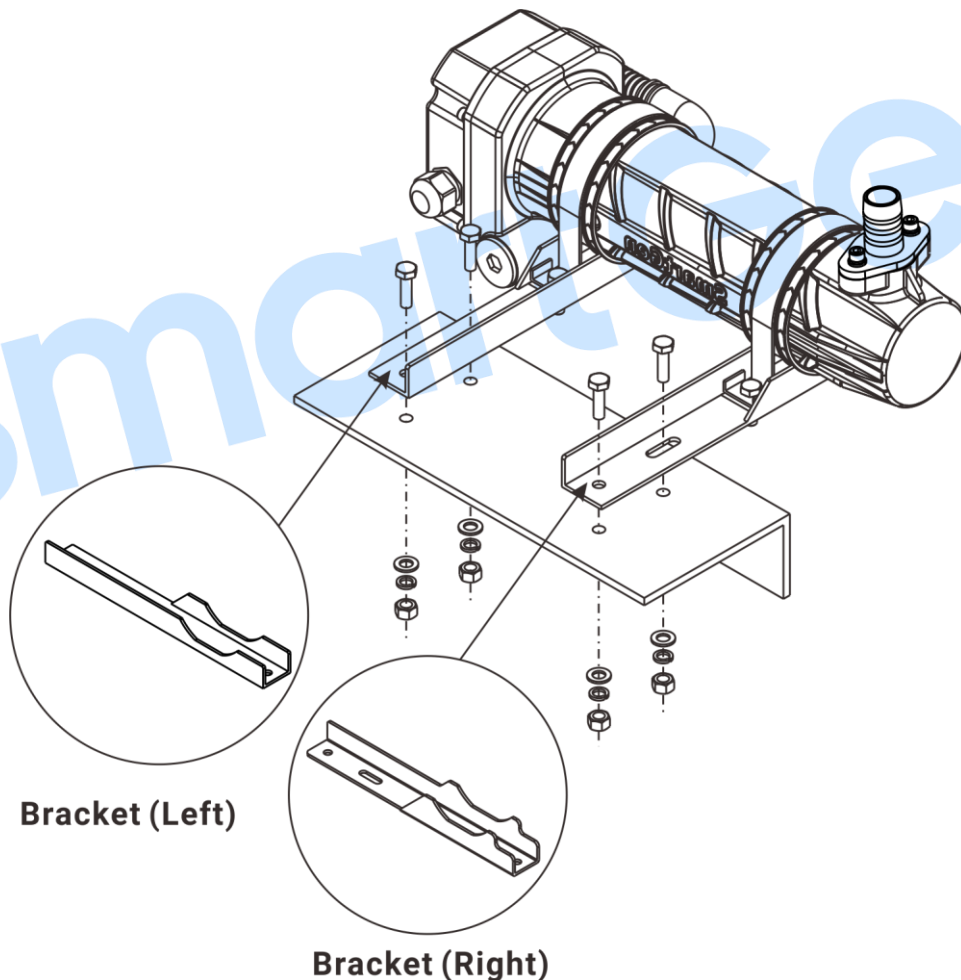


Fig.7 – Installation Instruction Diagram

As shown in Fig.7, the bracket (Right) must be installed on the water outlet side of the heater, and the mounting surface should ideally be a level plane.

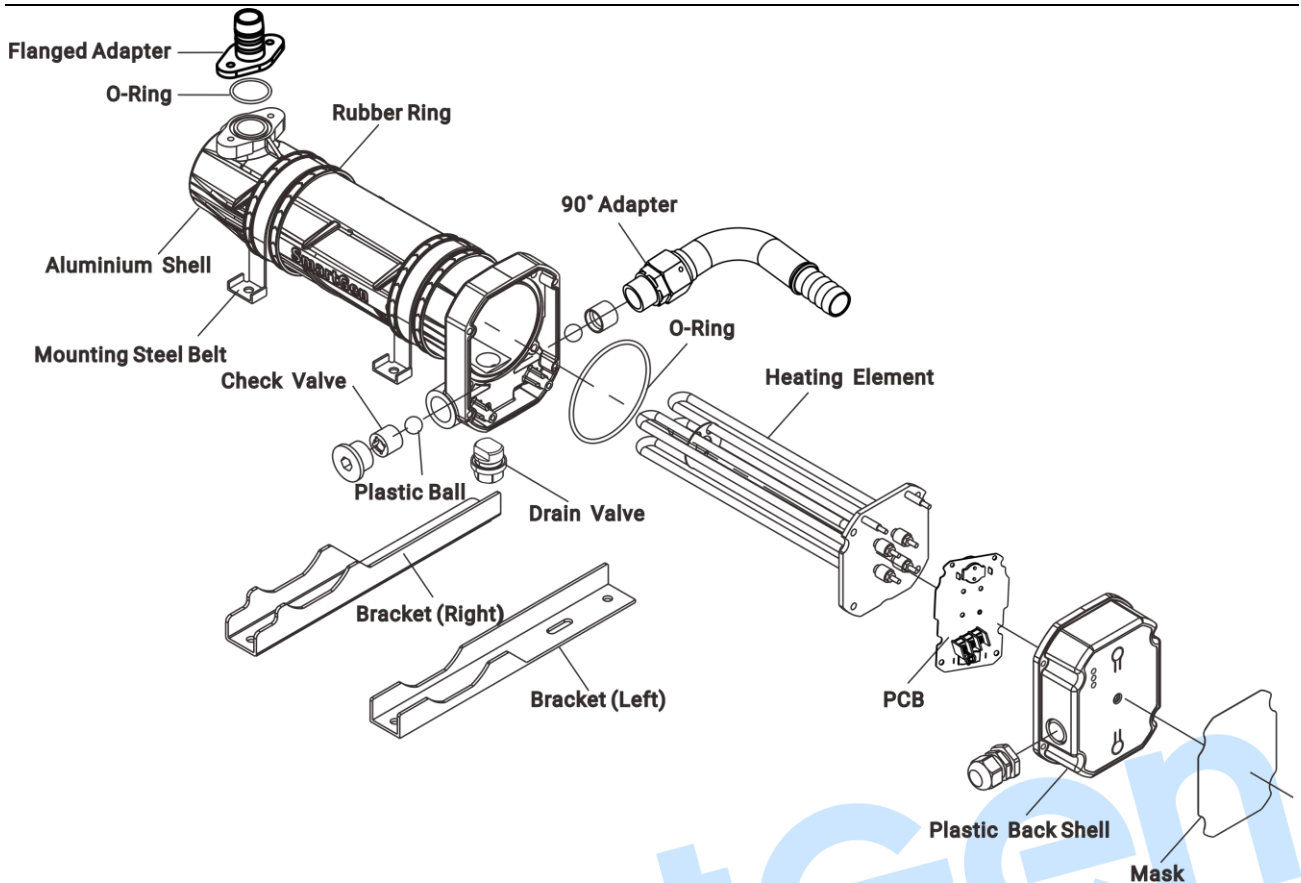


Fig.8 – Assembly Structure

7 OPERATION

7.1 COMMISSIONING

If the heater is not working and the overheat indicator is off, users can press the Test key to perform the commissioning operation.

7.2 OVERHEAT PROTECTION RESET

When the overheat indicator lights up, the heater will enter into overheat protection status and stop heating. If the temperature of heater falls below the reset temperature of overheat protection thermostat (80°C), the heater enters into auto mode again.

8 CAUTIONS AND FAULT SOLUTIONS

CAUTIONS: Before starting the heater, ensure that all the trapped air is exhausted out of the heater and it is topped off with coolant. If water is used as coolant, please drain it off when the ambient temperature is below 0°C. The heater will be damaged if the water in the heater is frozen. If tap water or river water is used, it will cause scaling on the surface of the heating element and shorten the life of the heater.

Corresponding antifreeze with the correct specification is recommended.

high-temperature-resistant power cable is recommended.

Earth wire must be properly grounded.

Drain valve: Use a hex key (Allen wrench) to open or close it.

Unit: mm

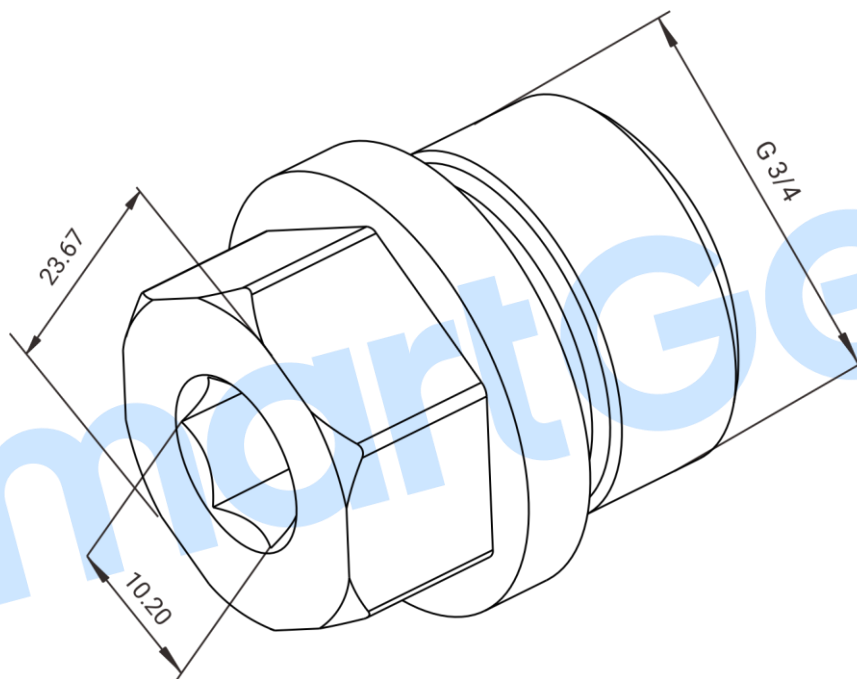


Fig.9 – Water Drain Valve

Table 4 – Common Faults and Solutions

No.	Faults	Possible Causes	Solution
1	Overheating protection	Check the valves are opened and the heater is full of water	Shorten the hosepipe length and optimize the hosepipe trend.
		Check whether the hosepipe has an obvious W-shaped or reverse U-shaped bends.	
		Check whether there are any distinct areas where hot and cold transitions are evident.	
2	High water outlet temperature	The outlet temperature is normally about 70°C. It occurs when the hosepipe is too long, both the inner diameter of the hosepipe and hose adapters are too small, the water flow is not smooth so that the heat cannot be transferred properly.	Shorten the hosepipe length, use the hosepipe with an inner diameter of more than 25mm, and the adapters with an inner diameter of more than 20mm.
3	Unable to reach the preheating temperature	The power of heater is insufficient	Replace the heater whose power matches the genset
		The power cable is too long and cable resistance results in voltage division	Shorten the cable as possible and use proper size of cable that matches the power of heater

9 CASE AND INSTALLATION DIMENSIONS

Unit: mm

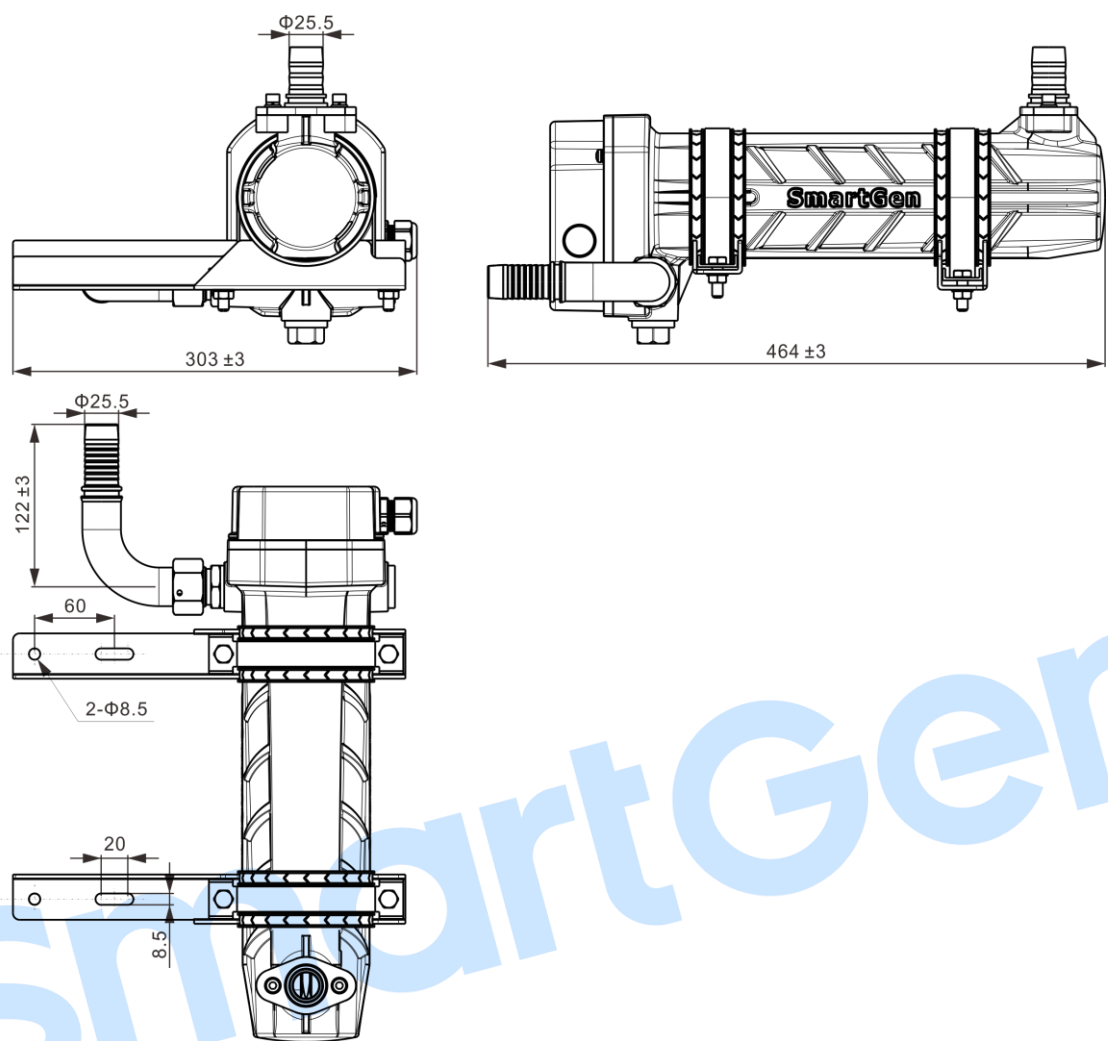


Fig.10 – Overall Dimensions

10 PACKING LIST

Table 5 – Packing List

No.	Name	Model	Quantity
1	Heater		1
2	Bracket (Left)	ZJ-HT40-01	1
3	Bracket (Right)	ZJ-HT40-02	1
4	U-Shape Steel Belt (Outlet)	UB-HT40-1	1
5	U-Shape Steel Belt	UB-HT40	1
6	Flat Gasket (Stainless Steel)	GB/T 95 8	8
7	Spring Washer	GB/T 93 8	8
8	Hexagonal Nut (Stainless Steel)	GB/T 6170 M8	8
9	Hexagonal Head Bolt (Full Thread Stainless Steel)	GB/T 5783 M8×25	6
10	Hexagonal Head Bolt (Stainless Steel)	GB/T 5783 M8x40	2
11	Waterproof Cable Connector		1
12	User Manual		1

Table 6 – Accessories List of HT40MB & HT40MB-1 & HT40MB-2

No.	Name	Model	Quantity
1	Water Inlet Adapter (Barbed Type)	20491-30-16W	1
2	Water Outlet Adapter (Barbed Type)	FL-HT40-φ25	1

Table 7 – Accessories List of HT40MB-G3/4 & HT40MB-1-G3/4 & HT40MB-2-G3/4

No.	Name	Model	Quantity
1	Water Inlet Adapter (Male Thread)	20491-30-12B-X1	1
2	Water Outlet Adapter (Male Thread)	FL-HT40-G3/4WD	1

Instructions for Accessories:

Barbed adapters are suitable for connection between rubber hosepipe and hydraulic pipe. Each heater requires two barbed adapters: the model of inlet adapter is 20491-30-16W and the model of outlet adapter is FL-HT40-φ25.

Unit: mm

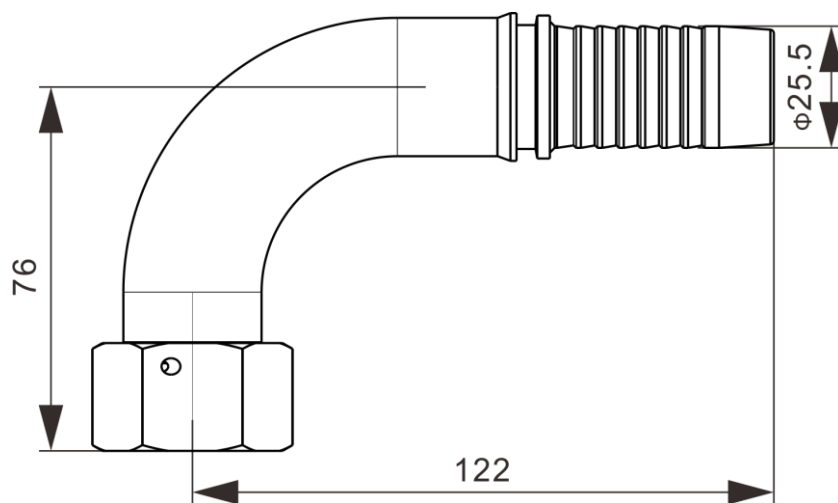


Fig.11 – Water Inlet Adapter (Barbed Type)

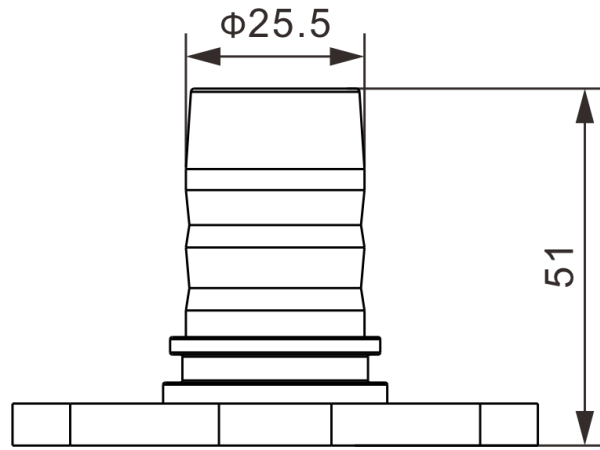


Fig.12 – Water Outlet Adapter (Barbed Type)

Male thread adapters are suitable for G3/4 pipe fittings. Each heater requires two male thread adapters: the model of inlet adapter 20491-30-12B-X1 and the model of outlet adapter FL-HT40-G3/4WD.

Unit: mm

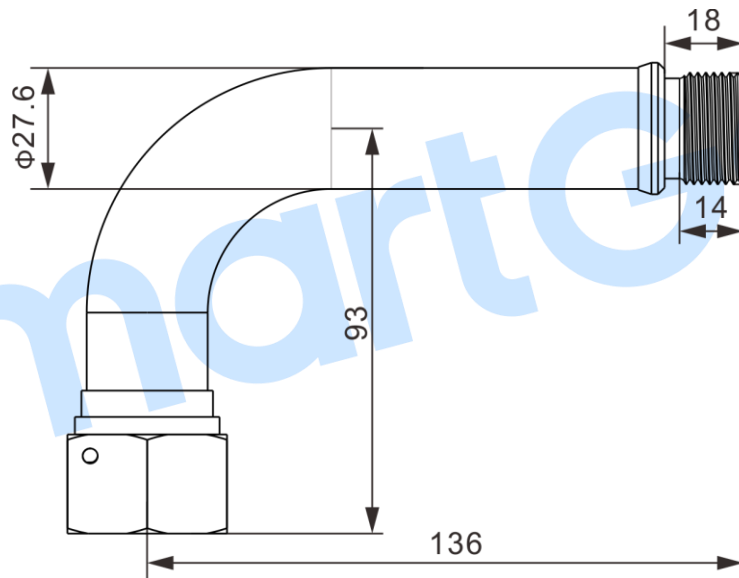


Fig.13 – Water Inlet Adapter (G3/4)

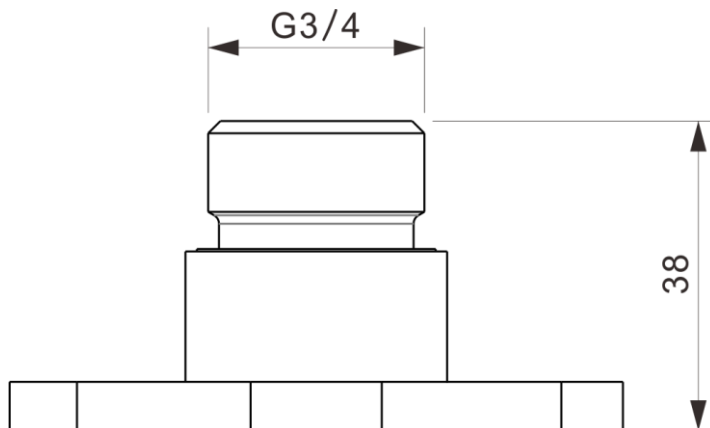


Fig.14 – Water Outlet Adapter (G3/4)

11 DISCLAIMER

The manufacturer shall not be responsible for the damage to the heater and other related problems caused by the following reasons during the user's operation:

1. Add antifreeze that is not suitable for the ambient temperature as the circulation medium, which results in the freezing and damage of the heater.
2. Unauthorized disassembly, repair or modification of the heater, which causes heater damage or fault.
3. Improper installation during use, which results in heating without water, and causes damage to the pump impeller and the heater.
4. Failure to open the inlet and outlet water valves or pipeline blockage, which results in poor water flow and heater damage or fault.
5. Damage to the pump and the heater caused by not qualified antifreeze which contains sand or other impurities.
6. Irreversible damage to the product caused by overvoltage use.

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