



New Nanfeng Thermo & Comfort (Cangzhou) Co., Ltd.

Gas Liquid Heater Installation and Application Instructure

Description of the YJT-Q30 combustion heater:

YJT series of gas liquid heater with automatic program control, safe and reliable work, Exhaust emissions close to zero pollution.

Operating, maintenance and installation instructions

1. Preface

Thank you for using our company's YJT series of gas liquid heaters.

Please read the manual carefully before using it. It will guide you to the safe and correct installation, to correct use and maintenance of this product, the correct use, timely maintenance will ensure the reliability and economy of the heater and long service life.

Heater is independent of the engine heating equipment, the engine does not start, through the car radiator and defrost device the car gets heating, defrost equipment to provide adequate heat. And engine cooling system connection, you can preheat the engine in the cold winter ahead of time, significantly reducing the engine wear and exhaust pollution, extending the engine life..

2. Catalog

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YJT series liquid heater uses automatic control program, works safely and reliably. Comparing with the YJ series centrifugal atomizer heater, YJT series heater has the advantages of small ignition current, high speed, high combustion efficiency, and low emissions, all of that meet the environmental protection standard of Europe.

1 High-voltage electrode ignition, the current is only 1.5 A;

Fuel jet atomization, high combustion efficiency, and low emissions.

2 The key components are imported originally, the performance is reliable, and using life is longer.

3 It is controlled by automatic control program; the operation is simple, safe and reliable.

4 Downtime alarm functions, lights flashing codes show the fault of the heater, maintenance is convenient.

! Attention:

The fuel for this product is natural gas (CNG or LNG).

You must use coolant for the minimum ambient temperature.

Do not turn off the heater power supply before the power indicator goes off.

Do not replace the spare parts by yourselves, otherwise it is not covered by the warranty.

Usage environment:

Using temperature: -40 °C~+50 °C

Storage temperature: -40 °C~+80 °C

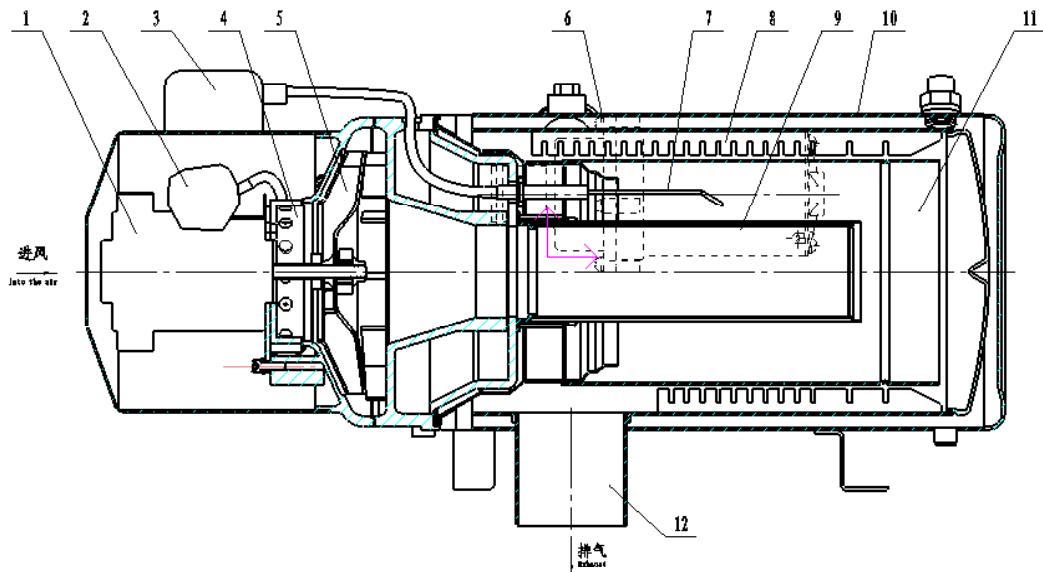
Altitude: ≤3000 m (>3000 m special order)



2.1. Main Technical Parameter

Items Type	Heating (kw)	Consumption gas the amount m ³ /h	Voltage (V)	Power (W)	Media circulation	Weight (kg)	Dimension L*W*H (mm)	Usage
YJT-Q30	30	3.8	DC24	160	Forced by Pump	24	623X361X266	Engine cold start and heating
YJT-Q20	20	2.6				22	583X361X266	

2.2. Principle

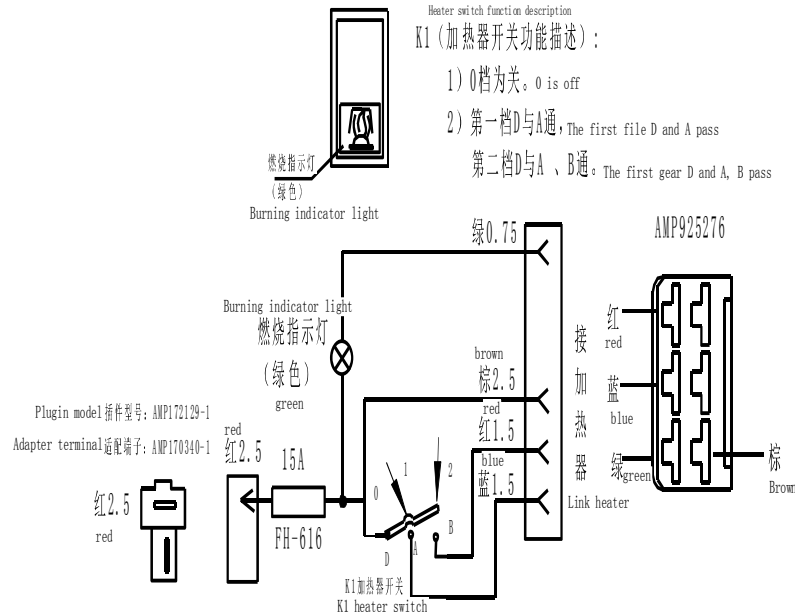


The motor (1) drives the fan (5) to rotate at high speed, the vacuum detector (2) detects the negative pressure, and the gas solenoid valve opens. The fan inhales the combustion air and the gas at the same time and air and gas are fully mixed in the air-fuel mixer (4) and then are discharged from the nozzle (9). The igniter (3) is discharged by the ignition electrode (7), ignites the combustion gas, the air-gas mixture is burned in the combustion chamber (11), heat generated passes through the lamella (8), and exhausts are discharged from the exhaust pipe to the atmosphere. The lamella (8) absorbs heat and heats the circulating liquid in the heat exchanger (10), and the liquid is discharged under the action of the circulation pump (6).



2.3. Control method

2.3.1 The shape and wiring diagram of heater switch



Heater Switch JK931-082 Note: Dimensions for the installation of the switch are 44.1mm × 22.1mm
The green indicator is negative.

2.3.2. Indicators and switches Description:

(1) Turn on the heater: press the "heating switch", pump under operation, gas leakage alarm on (warm-up after three minutes of operation), "heating switch" on the green light: press the second gear. The indicator flashes when the heater fails (see 6.1 for details).

(2) Turn off the heater: Turn off the heater switch and turn off the power supply until the indicator is off.

Note: When the heater is working, it is strictly forbidden to disconnect the power supply directly, otherwise it may cause damage to the heater.

2.3.3. Working schedule

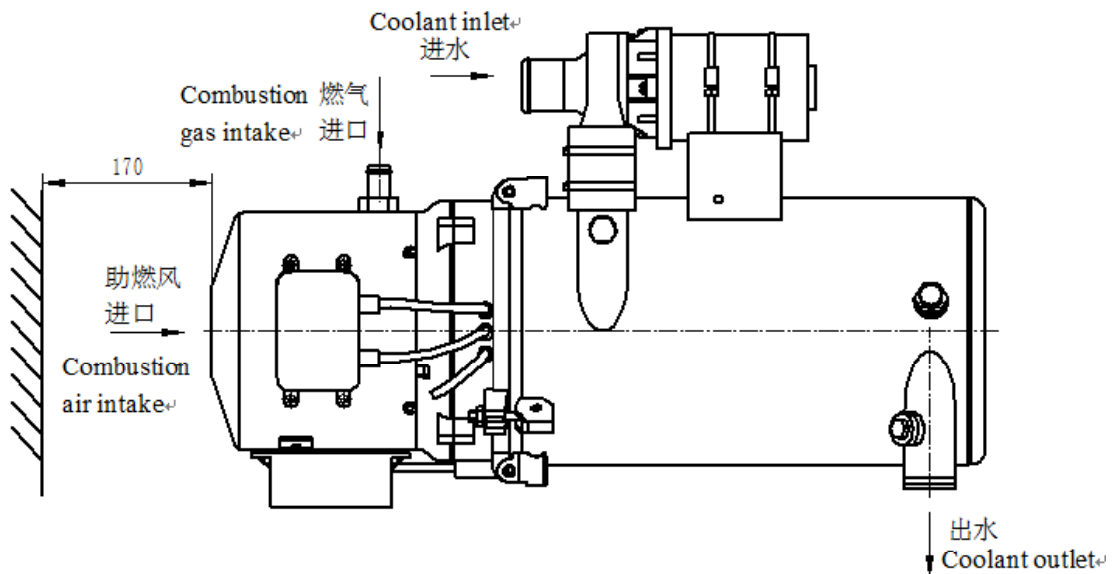
Turn on the heater power switch. When the water temperature is below 68 °C, the heater works: the motor pre-purge for 10 seconds, the ignition electrode is powered, and the power supply of the gas reducer solenoid valve works after 1 second. If flame probe detects successful ignition, the heater goes into the normal combustion state, the ignition electrode is powered off. When the water temperature rises to 81 °C, the heater is stopped and the combustion indicator is off. After stopping the combustion, the motor is delayed for 150 seconds. When the water temperature drops to the starting temperature (68 °C), the heater starts again.

2.4. Installation, usage

2.4.1. Installation

2.4.1.1.

Heaters must be horizontally and firmly installed. For the convenience of maintenance, a space of at least 170mm for combustion air intake side must be guaranteed (as shown in the picture above) and a space of at least 150mm for the upper side of the heater.

**2.4.1.2.**

To avoid false alarm on gas leakage resulting from combustion exhausts going inside vehicle compartment, an elbow must be installed at exhaust pipe.

2.4.1.3.

If the heater is installed in an enclosure, there must be no other devices or equipment in this enclosure. An air filter must be installed at combustion air intake to avoid small particles to go inside the heater. The area of combustion air intake must be at least 400cm². There must be no substances tending to be burnt around the heater. Combustion air intake and exhaust pipe must not be influenced by rain, snow or small particles to cause blocking.

2.4.1.4.

To guarantee good air fluidity inside the enclosure, there must a hole at the back of the enclosure to ventilate and the area of the ventilation must be at least 150cm².

2.4.1.5.

Pressure difference between combustion air intake and exhaust pipe should be minimized as much as possible. To avoid exhaust to be sucked inside the enclosure again, a hole at the bottom of the enclosure should be avoided.

2.4.1.6

To guarantee sufficient combustion gas supply, the diameter of combustion gas intake pipe must be at least 15mm, pipe length at most 2m. Layout of pipe must be reasonable and firmly fixed and there must be no heat sources or friction around the pipe.

2.4.1.7

Electric schematic must be used as a reference for connection of electrical components. Housing of the heater is negative, and a 15A fuse must be used.

2.4.1.8

Circulating layout for the complete heating system must be reasonable. To guarantee an expected heating performance of the heater, there should be a water tank to install at the highest position in the circuit, the heater to install at the lowest position. There must be no abrupt turns in the circuit.

2.4.1.9

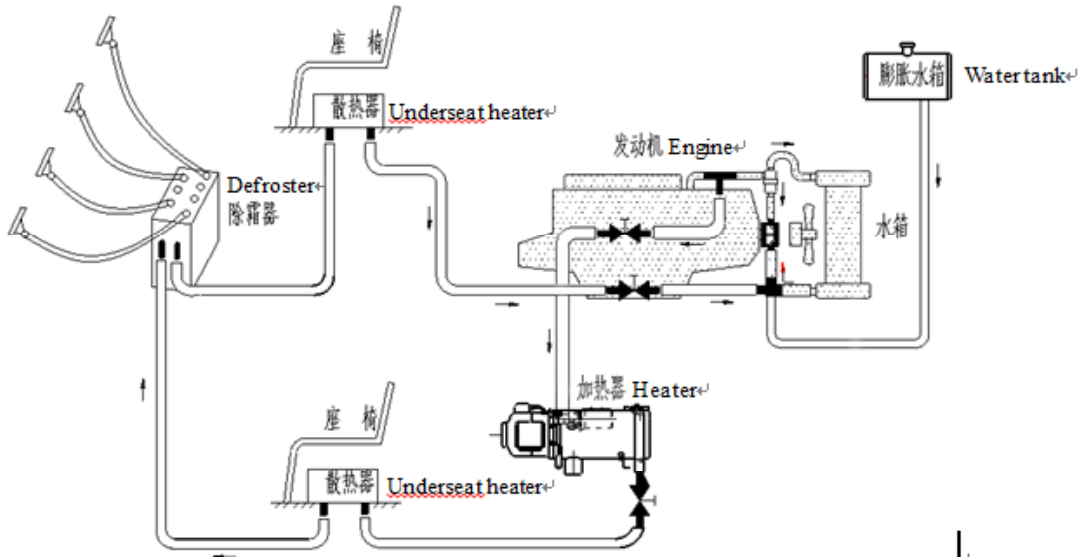
The heater and gas reducer should be installed inside the same enclosure and gas leakage alert (a set with the heater) must be installed. Installation of a gas leakage detector to monitor the overall condition is recommended.

2.4.1.10

LNG or CNG gas reducer must be used according to the fuel supplied to the vehicle.



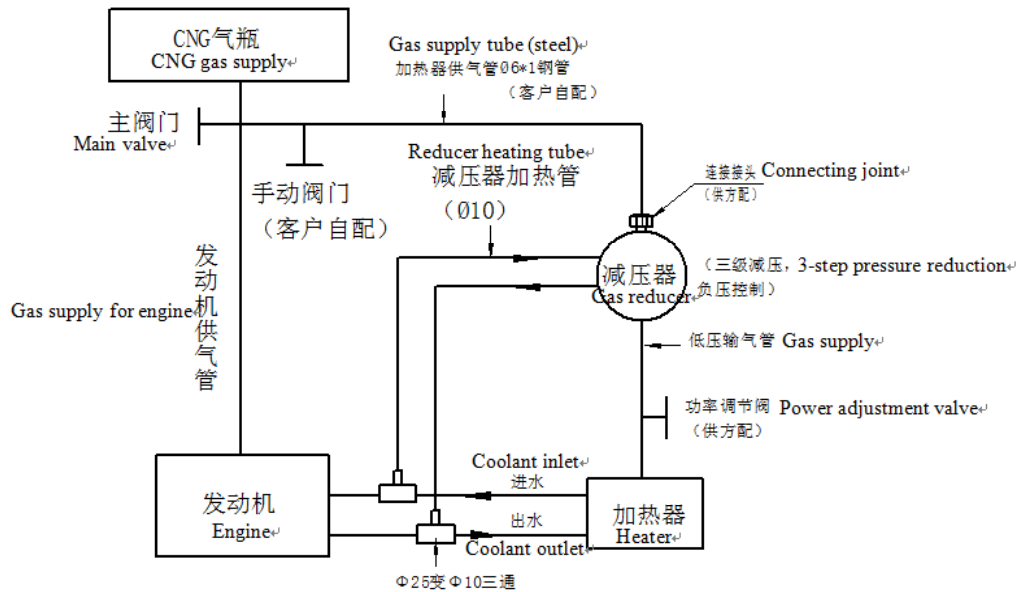
2.4.2. Schematic of circulating layout:

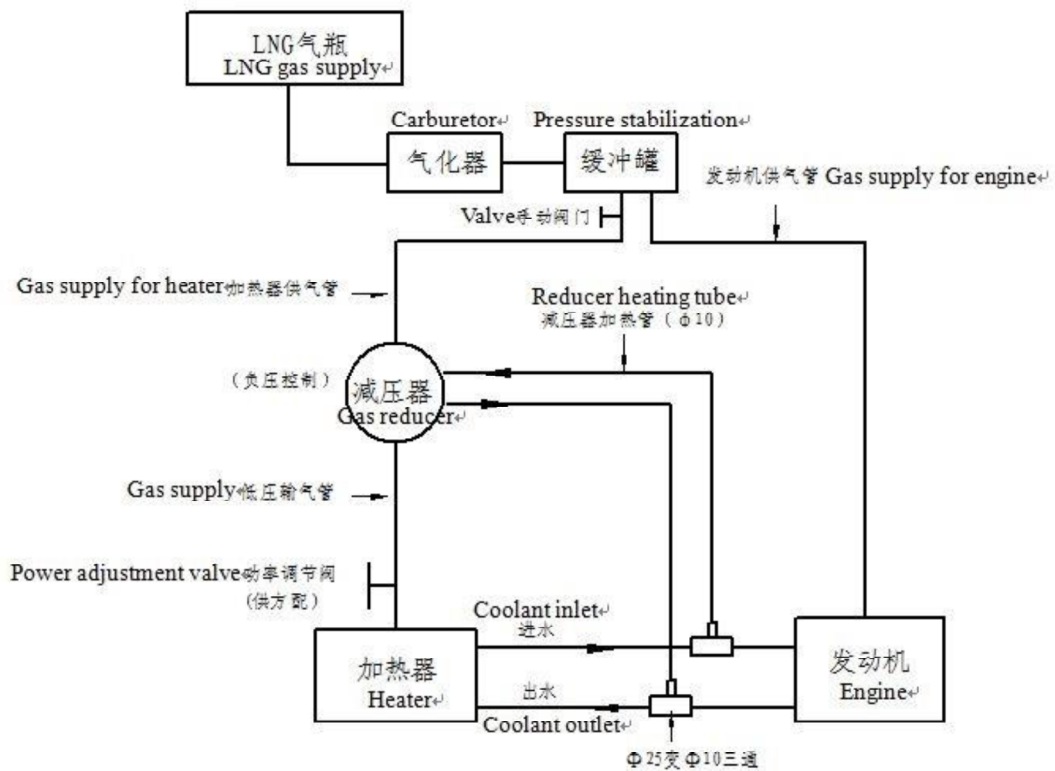


Serial circuit: commonly used one, but the number of defrosters and underseat heaters or circuit resistance must be controlled to avoid bad circuit fluidity leading to frequent switch-on and off of heater.

2.4.3. Schematic of gas supply and return:

Under the consideration of minimizing circuit resistance, defrosters and radiators should not be installed near the coolant outlet and inlet of heater to avoid bad circuit fluidity.





2.4.4. Debugging:

When installing the heater, in order to ensure the use of the effect, be sure to debug the heater, and every time after the water (antifreeze), repeat the following 4 steps:

- 1 open all the valves in the pipe and fill the engine tank with water (antifreeze), turn on the engine and turn on the heater pump.
- 2 open the vent valve in the line and continue to step on the gas while continuing to pump (antifreeze).
- 3 release valve closed after the water, continue to step on the accelerator, add water (antifreeze), and then open the vent valve.
- 4 several times after the above steps, the pipeline is unblocked in order to ensure the normal operation of the heater.

Note: the heater pump has only lift head and no suction stroke. That is to say, only the water in the waterway system is filled with water. The water pump can work normally. Lack of water can cause damage to the pump by dry grinding, which prevents the heating system from functioning properly. Severe heat can cause major heater failures. Expect users to pay special attention!

2.5. Maintenance

2.5.1. Maintenance before using in winter

2.5.1.1.

Check the tightness of the gas path from the gas cylinder to the heater and repair (the cylinder to the pressure reducer line) and check the leakage by smearing the leak detection fluid. Pressure reducer to heater line, make sure the connection is firm.

2.5.1.2.

Check the reliability of the connecting parts of the heater system and check the heater for mechanical damage.

2.5.1.3.

Open the water circuit valve and check the system tightness.

2.5.1.4.

Check the reliability of the electrical connection, whether there is short circuit, open circuit, the voltage is normal.

2.5.1.5.

Check the heater air inlet, exhaust pipe.

2.5.1.6.

No flammable and explosive materials in the heater installation space.

2.5.1.7.

Starts the heater in the case of monitoring. A cycle is fine and the service is complete.



2.5.2. Maintenance in using

2.5.2.1.

Check the mechanical damage of the air circuit system before use.

2.5.2.2.

Check to see if the water is leaking before use.

2.5.2.3.

No flammable and explosive materials in the heater installation space.

2.5.2.4.

Vehicles must turn off the heater 5 minutes ahead of time before they enter flammable gas particles such as fueling stations and oil depots.

2.5.3. Seal maintenance

When the heater is not used for a long time, the following protection is required:

2.5.3.1.

Close the line valve.

2.5.3.2.

Seal the heater inlet and exhaust port.

2.5.3.3.

Disconnect the heater main wire harness connector and seal it separately with waterproof tape.

2.6. Repair of heater

2.6.1. The meaning of fault code

Fault code	Reason of the fault
flash 1	ignition failed
flash 2	combustion interrupted
flash 3	vacuum switch fault
flash 4	Sensor damage
flash 5	ignition unit open circuit or short circuit
flash 6	solenoid valve open circuit
flash 7	overheating sensor open circuit
flash 8	main motor open circuit
flash 9	pump open circuit
flash 10	power failure (below 18V or above 30V)
flash 11	flame detector short circuit (internal connector disappeared)
flash 12	flame after shutdown
flash 13	gas leak alarm



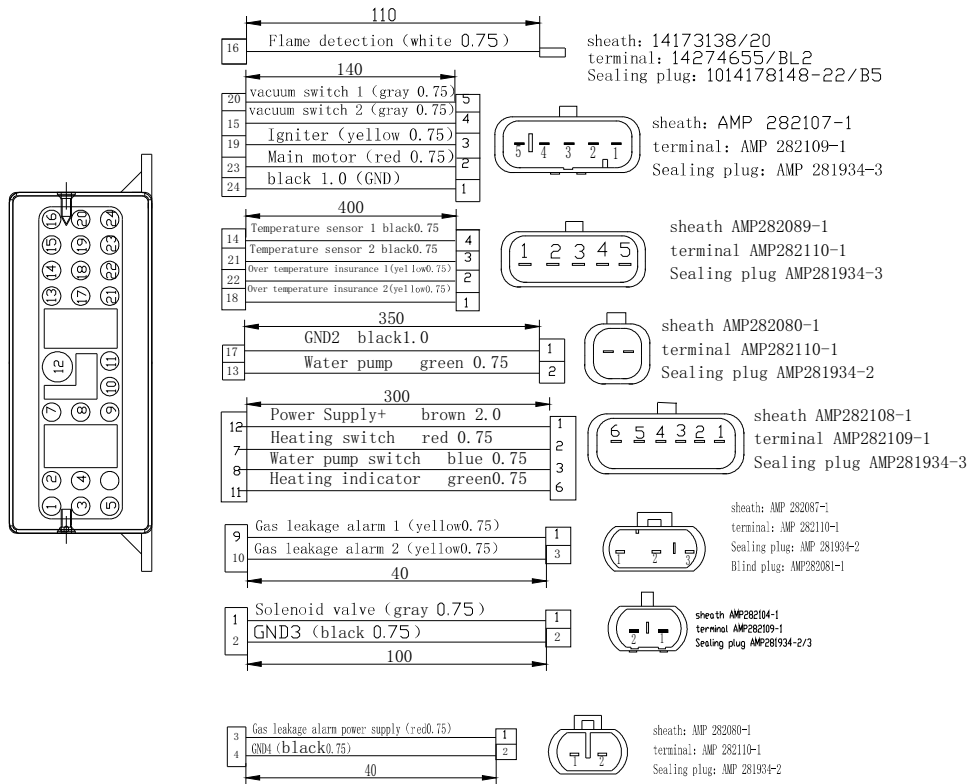
2.6.3. Common fault and solutions

Fault phenomenon	Possible causes	Implementing measures
Ignition failure	There is no gas supply	Check gas line connections
	Ignition unit damage	Replace the ignition unit
	The ignition electrode is seriously oxidized and not discharged at certain voltage	Replace the ignition electrode
	High voltage line shedding	Reinstall
Combustion interruption	Gas supply interruption (gas cylinder pressure is small, not normal gas supply)	Gas filling
Overheating sensor activated	The water system does not circulate or circulate too slowly	Find pipeline problems
	No water in the pipe,	Add water
There is still flame after the switch is switched off or stopped	The solenoid valve cannot be turned off	Replace gas pressure reducer

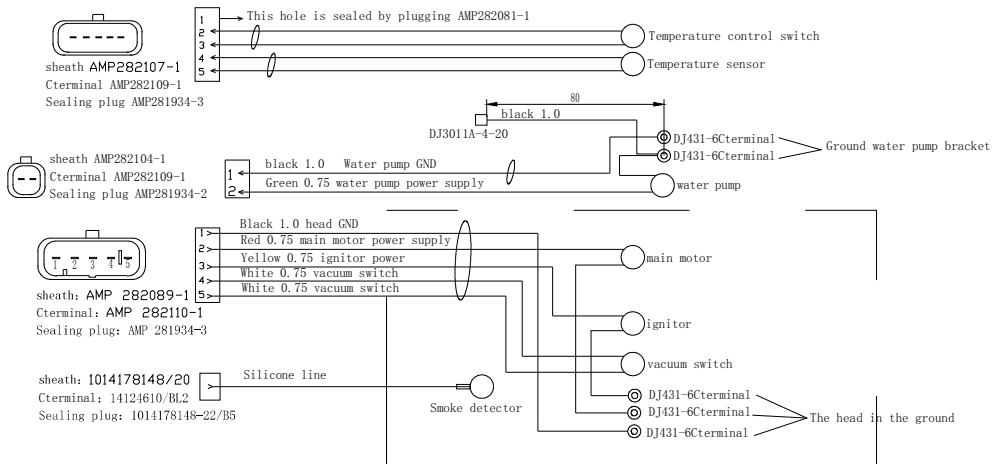


Appendix 1 heater circuit drawing:

1.1 ECU wiring diagram:

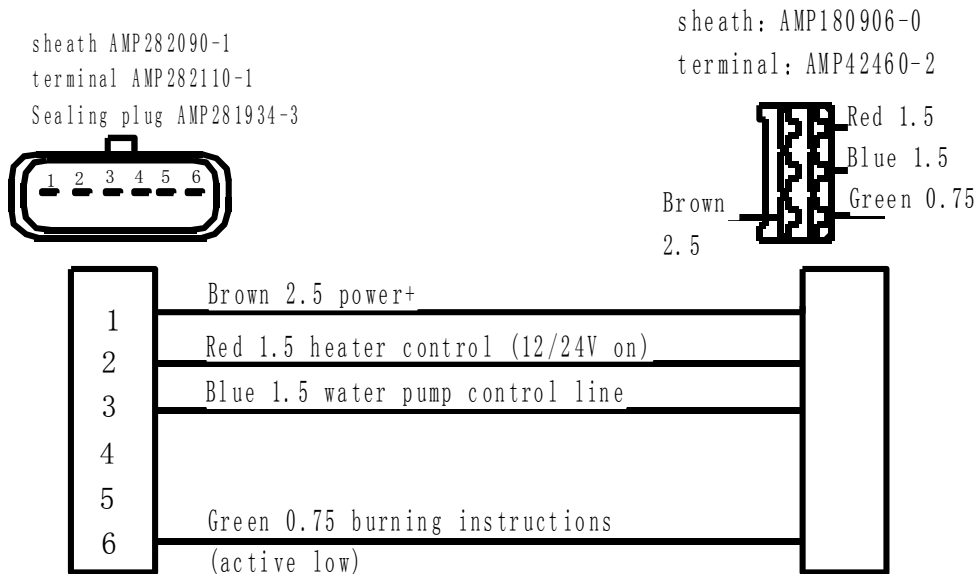


1.2 heater whole wiring diagram:

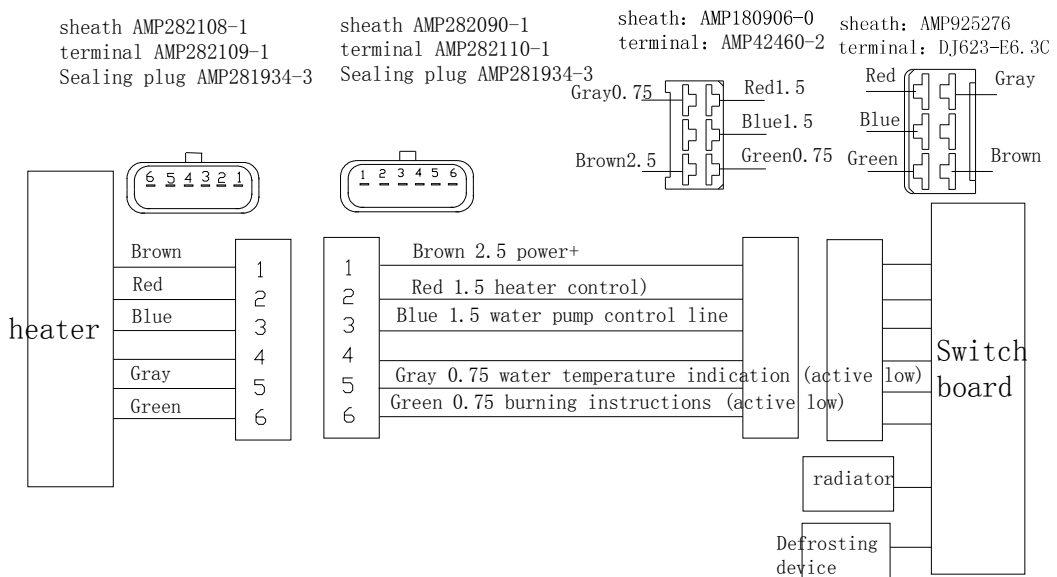




1.3 wiring diagram of heater master to control panel:



1.4 connection diagram of wire harness:





Appendix 2 Heater dimension:

Size Model	A	B	C	D	E	F	G	J	K	M	N	P	Q	R	Outline size		
															L	W	H
YJT-Q20	240	61	247	Φ70	36	160	10	Φ 38	41	19	18	219	Φ18	97	583	361	266
YJT-Q30	280														623		

