HLN Air Heater User Manual

Aerolyn 2000 / Aerolyn 4000

HLN INTERNATIONAL

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1. Introduction

1.1. Warnings

Improper installation or repair of HLN heating systems can cause fire or the leakage of deadly carbon monoxide leading to serious injury or death.

To install and repair HLN heating systems you need to have completed a HLN training course and have the appropriate technical document, required tools and equipment.

NEVER try to install or repair HLN heating systems if you have not completed an HLN training course, do not have the necessary technical skills, or do not have the technical documentation, tools or equipment to ensure that you can complete the installation and repair work properly.

ALWAYS carefully follow HLN installation and repair instructions and heed all WARNINGS.

HLN rejects any liability for problems and damages caused by the system installed by untrained personnel.

ATTENTION

- It is prohibited to place any combustible, inflammable or explosive goods near the heater, or it may cause a fire.
- No obstruction shall be allowed within 300mm below the exhaust-gas outlet of the heater. The temperature of exhaust-gas outlet is high, and non-heat-resistant materials such as wire harness, rubber pipeline and hydraulic pipeline, etc. can cause fire.
- Turn off the heater before while refueling.
- Installation locations must not have combustible gas present.
- Please check if there is any fuel seepage in the lower part of the heater during routine vehicle maintenance. Fuel leakage from the heater may cause fire.
- Make sure there are no leaks in the fuel system.
- Use of fuel other than diesel is strictly prohibited.
- If the heater is installed indoors, all the waste gas must be led to the outside and no leakage is allowed. Failure to do so may result in the risk of exhaust poisoning or suffocation.
- Make sure that heating air comes from an area free of poisonous gas.
- Please turn off the heater at least 3 minutes before turning off the vehicle's main power switch. Otherwise, the heater will not be able to properly blow-cooled, which can lead to heater damage due to the continuous high body temperature.
- It is strictly prohibited to modify the heater or use none original parts to repair or replace; nor is it allowed to install or set-up the heater in a way contradictory to the company's guidance.
- Do not move the heater by dragging the harness.

HLN shall not be liable for any accident or damage resulted from the above causes.

1.2. Heater introduction

Aerolyn air heaters provide hot air to the vehicle compartment for the comfort of the passengers. The heaters operate on diesel fuel and are capable of providing space heating independent of the vehicle engines.

The Aerolyn 2000 is a quality-engineered product dedicated to the space heating of cabins and smaller vehicle compartment. The Aerolyn 4000 is an ideal heating solution for larger compartment.

Both lines of heaters are featured with:

- Low fuel consumption and high combustion efficiency.
- High elevation operation capability.
- Normal operation in extreme cold weathers.
- Compact size, quiet operations.

1.3. Product information

	Weight	Dimensions	Heat flow	Heater air flow rate	Power consumption	Fuel consumption
Unit	kg	mm	kW	kg/h	W	L/h
Aerolyn 2000	2.7	310×115×122	2	90	36	0.36
Aerolyn 4000	4.5	376×140×150	4	150	50	0.6

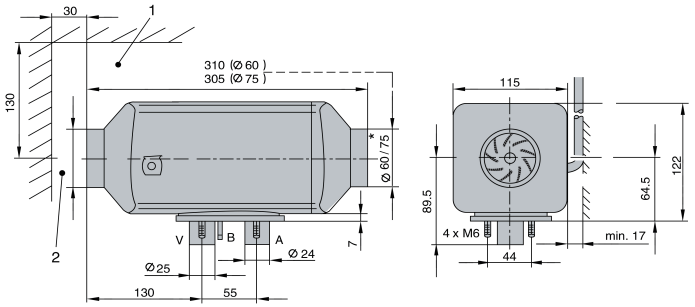
1.4. Operating conditions

- Storage temperature：-55℃ to +70℃.
- Operating temperature：-41℃ to +50℃.
- Please use low temperature diesel suitable for ambient temperature for the proper operation of the heater:

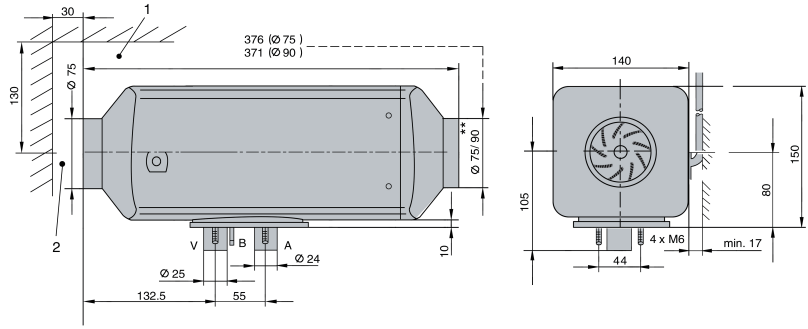
Above 5℃	Above -5℃	Above -15℃	Above -30℃	Above -40℃
0# diesel	-10# diesel	-20# diesel	-35# diesel	-50# diesel

1.5. Product dimension diagram

Aerolyn 2000 outline dimensional drawing:



Aerolyn 4000 outline dimensional drawing:



In both diagrams, the numbers and letters bear the following meanings:

1. Minimum clearance required to open the cover and dismantling the glow plug and the controller.
2. Minimum distance required for heater air intake.

A: Exhaust.
B: Fuel.
V: Combustion air.

M6: The diameter of the M6 thread is 6mm and the pitch is 1mm.

2. Installation guide

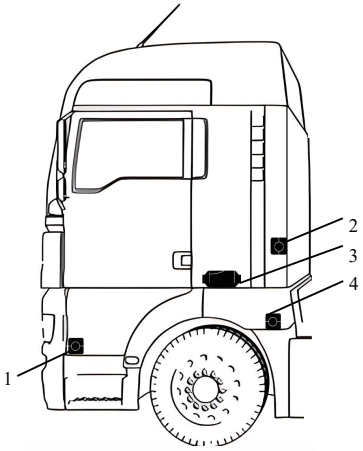
2.1. Select the right location

The heater should install in the protective cover or within the compartment. The best location for installing the heater may vary depends on vehicle type. However, when selecting the mounting location for the heater, it should meet the following conditions:

- Heater should be kept away from locations with strong shock or susceptible to wading.
- Heater should install on a flat horizontal surface.
- Consider the connections of fuel line, combustion air intake and exhaust, electrical components, and ducting.

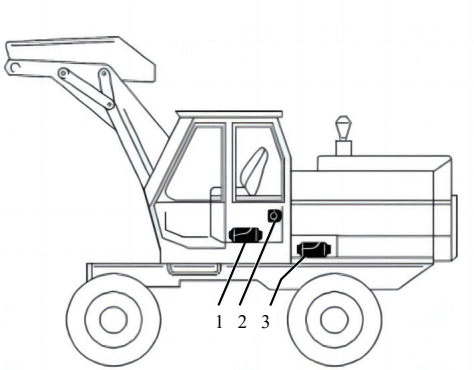
The following are samples of possible installation locations:

For a truck:



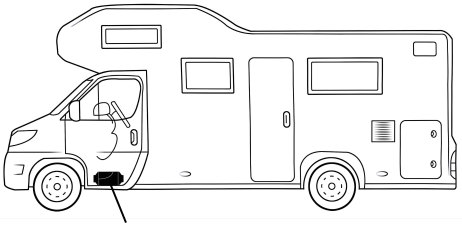
1. The heater is at the foot of the driver's auxiliary seat.
2. The heater is on the rear wall of the cab.
3. The heater is under the driver's seat.
4. The heater is in the toolbox.

For a construction vehicle:



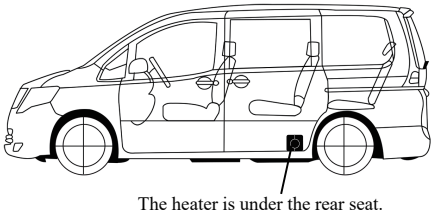
1. The heater is in the trunk of the driver's seat.
2. The heater is on the rear wall of the cab.
3. The heater is located in the protective case.

For a recreational vehicle:



The heater is on the lower left side of the driver's seat.

For a van:

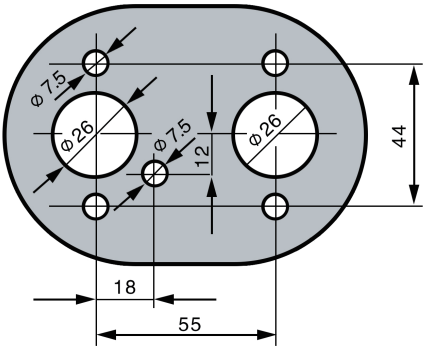


The heater is under the rear seat.

2.2. Mounting the heater

The mounting plate is provided with the installation kit.
To mount the heater, one should first select a proper location, then drill and cut holes based on the diagram below. The holes are for the combustion inlet, exhaust outlet and fuel intake to go through. Thereafter, mount the heater on mounting plate with nuts and bolts provided.

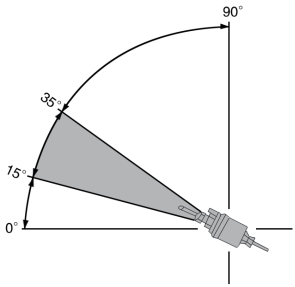
Installation hole diagram:



2.3. Fuel system installation

The fuel pump (electromagnetic pump) installation is the key to the success of heater operation.
The fuel can draw directly from the vehicle fuel tank, but the pipeline must be independent.
When the vehicle fuel tank is too far away from the heater (over 10 meters), a separated fuel tank should be used.
The height difference between the fuel surface level and the heater should be no more than ±500mm.

Electromagnetic pump suction tubing installation: use Φ4×1 nylon pipe (or hose) and dedicated joint. The tubing clamp must be tightened and protective casing should be used outside the tubing. Mount the pump with the pressure side rising upwards. Installation position of over 15° is required, and an installation position between 15° and 35° is preferable (as the figure below). The length of tubing between the electromagnetic pump and the fuel tank should be no more than 1m. The length of tubing from the fuel pump to the heater should be no more than 9m.



2.4. Combustion air inlet hose installation

Fasten the combustion air inlet hose to the heater with a pipe clip. The length of the hose should be between 0.2 m to 2 m, and lead to fresh air outside the vehicle. The turning angle of the hose should be no less than 90 °; and exhaust gas should be prevented from entering the air inlet. The air inlet should not directly face the vehicle movement direction; and there should be no blocking object within 300mm below.

2.5. Exhaust pipe installation

Fasten the flexible exhaust pipe to the heater with a pipe clip. The turning angle of the pipe should be no less than 90 ° to prevent exhaust gas from entering the air inlet or vehicle windows. The exhaust outlet must end in the open air; the ending of the pipe should not face the direction of vehicle movement, and must not exceed the side limit of the vehicle. Keep sufficient clearance between the exhaust pipe and the surrounding parts. There should be no obstructions within 300mm below. Snow or other objects must not block the ending of the pipe.

2.6. Heater air inlet pipe installation

The heater air inlet should draw circulating air from the cabin. However, if the pipe is too long or making sudden turns, the air volume will reduce, resulting in high heater body temperature and automatic shutdown. When the heater air inlet is not installed with air inlet pipe, the distance from the bulkhead should be more than 50mm to avoid insufficient air intake.

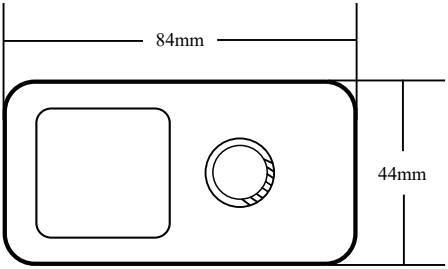
2.7. Air outlet pipe installation

Fasten a segment of corrugated aluminum pipe with clamp at hot air outlet, and lead the pipe into cabin for heating and defrosting. However, if the pipe is too long or making sudden turns, the air volume will reduce, resulting in high heater body temperature and automatic shutdown.

2.8. Wire harness and switch installation

Open a hole in the instrument panel. Insert the switchboard into the hole and tighten the wire harness plug. Use rubber cover to protect the control cable when it passes through the body. Alternatively, the switch panel can tape onto a location of easy reach for the user.

Switch operating panel:

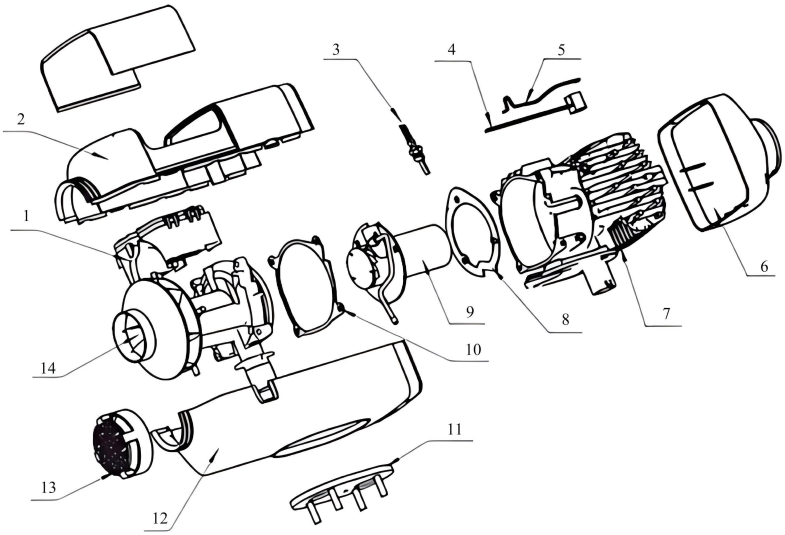


- Installation size for the operating panel should be 84mm×44mm.
- Notes: Before starting the heater, check whether the fuel duct and circuit connection are correct, whether the air inlet and outlet pipe and exhaust pipe are arranged normally, and whether there is foreign body entry. No inflammable or explosive goods should be placed near the heater.

2.9. Heater diagrams and cable connection tutorial

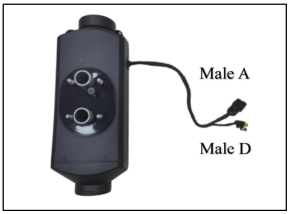
The structure and major accessories information are provided in the diagrams bellow:

Heater structure:

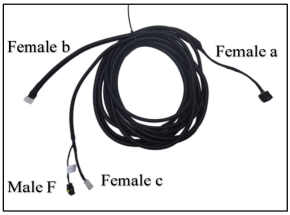


Item No	Description
1	Control Box 2kW Control Box 4kW
2	Upper Enclosure 2kW Upper Enclosure 4kW
3	Ceramic Ignition Plug
4	Temp Sensor Assembly
5	Compressed Spring for Sensor 2kW Compressed Spring for Sensor 4kW
6	Air Outlet Cap 2kW Air Outlet Cap 4kW
7	Heater Exchanger 2kW Heater Exchanger 4kW
8	Combustion Chamber Gasket 2kW Combustion Chamber Gasket 4kW
9	Combustion Chamber Assembly 2kW Combustion Chamber Assembly 4kW
10	Heater Exchanger Gasket 2kW Heater Exchanger Gasket 4kW
11	Rubber Gasket For Vibration
12	Lower Enclosure 2kW Lower Enclosure 4kW
13	Mesh Enclosure For AirInlet 2kW Mesh Enclosure For Air Inlet 4kW
14	Combustion Head Assembly 2kW Combustion Head Assembly 4kW

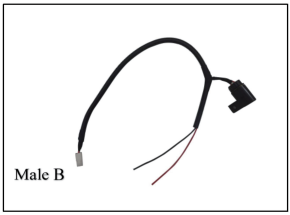
Heater and cables bellow:



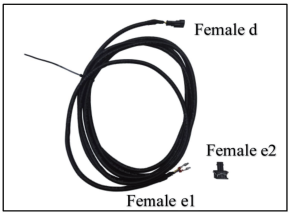
Heater



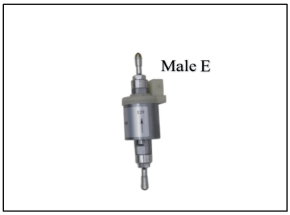
Control cable



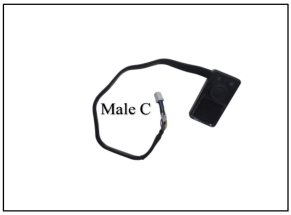
Power cable



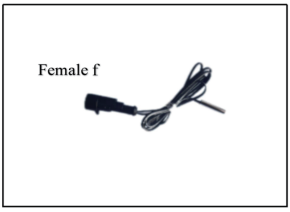
Fuel pump cable



Fuel pump



WiFi controller



External sensor

Heater cables connection steps:

Step 1: Connect the "Heater" male part A to the "Control cable" female part a.

Step 2: Connect the "Power cable" male part B to the "Control cable" female part b.

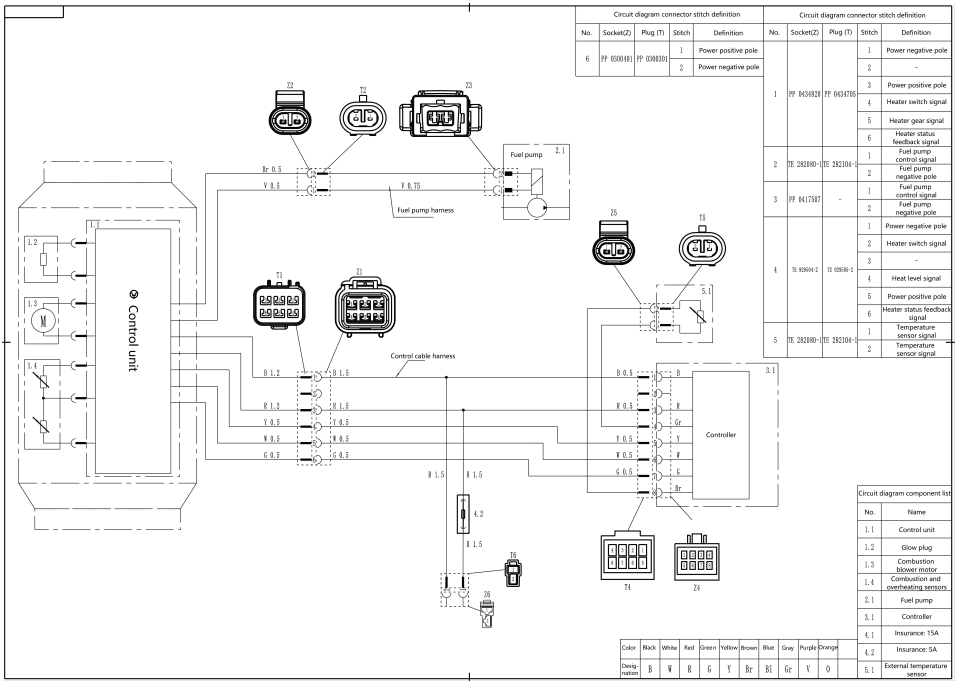
Step 3: Connect the "WiFi controller" male part C to the "Control cable" female part c.

Step 4: Connect the "Heater" male part D to the "Fuel pump cable" female part d.

Step 5: After connecting the "Fuel pump cable" female part e1 and female part e2, connect with the "Fuel pump" male part E.

Step 6: If the controller sensor is an external temperature sensor, connect the "Control cable" male part F to the "External sensor" female part f.
If the controller sensor is an internal temperature sensor, skip this step.

2.10. Circuit diagram



Circuit diagram connector stitch definition

No.	Socket(Z)	Plug (T)	Stitch	Definition
6	PF 0300401	PF 0300301	1	Power positive pole
			2	Power negative pole

Circuit diagram connector stitch definition

No.	Socket(Z)	Plug (T)	Stitch	Definition
1	PF 0434820	PF 0434705	1	Power negative pole
			2	-
			3	Power positive pole
			4	Heater switch signal
			5	Heater gear signal
			6	Heater status feedback signal
2	TE 282080-1	TE 282104-1	1	Fuel pump control signal
			2	Fuel pump negative pole
3	PF 0417307	-	1	Fuel pump control signal
			2	Fuel pump negative pole
4	TE 928694-2	TE 928696-2	1	Power negative pole
			2	Heater switch signal
			3	-
			4	Heat level signal
			5	Power positive pole
			6	Heater status feedback signal
5	TE 282080-1	TE 282104-1	1	Temperature sensor signal
			2	Temperature sensor signal

Circuit diagram component list

No.	Name
1.1	Control unit
1.2	Glow plug
1.3	Combustion blower motor
1.4	Combustion and overheating sensors
2.1	Fuel pump
3.1	Controller
4.1	Insurance: 15A
4.2	Insurance: 5A
5.1	External temperature sensor

Color	Black	White	Red	Green	Yellow	Brown	Blue	Gray	Purple	Orange
Designation	B	W	R	G	Y	Br	Bl	Gr	V	O

3. Operating notice

3.1. Turn on

Follow the switch operation instructions to turn the switch on, the status indicator light is on, and the heater starts.
After the indicator light is on, turn the knob for the comfort level.

3.2. Turn off

Control switch to turn off heater, the light is off and the heater stops operating. At this point, the heater fan will continue to operate for 3 minutes, blowing cool air to the body, and then shut down.

Notes
Turn off the heater 3 minutes before turning off the main power to prevent damages to the heater from lack of delaying cooling.

4. Maintenance and repair

4.1. Maintenance

- When using the heater for the first time every year, please check the heater status first to ensure smooth heater air inlet and outlet, in addition to smooth combustion air inlet and exhaust. Clean it when necessary, and check if the operation is abnormal.
- Please turn on the heater for 15 minutes every month to keep the heater in good condition in the seasons when the heater is not used.

4.2. Repair

When the switch power indicator is not on, please check:

- Please check whether the main power is turned on.
- Whether the heater fuse is blown.
- Whether the wire harness plug contacts well and firmly.

When switch status indicator lamp flickers, please check:

- Whether the power supply is stable.
- Whether the stabilized voltage supply capacity is sufficient.
- Whether the control box is damaged.

After starting, the indicator light is on but the heater does not start,

- Start again; check if the fuel line is filled in the first start.
- Check the tank to make sure there is sufficient fuel.
- Check the fuel line for lair leakage.
- Check whether the combustion air inlet and outlet are blocked.
- Check the ignition plug for carbon deposition or burn-off.
- Check the sensor and controller for damage.

When burning and smoking:

- Check to see if last failed start-up left excess fuel.
- Check whether the voltage is normal.

When the combustion is unstable:

- Check the vent for fuel dripping and smoking.
- Check whether the fuel line is blocked and loose.

When the combustion stops:

- Re-start and check whether the electric circuit and fuel line are normal.
- Check the sensor and controller for failures.

When automatic cooling stops:

- Check whether the inlet and outlet are obstructed.
- Check whether the heater air inlet temperature is too high.

4.3. Fault code

In case of fault, the switch indicator will flash to indicate fault. The light flashes 5 times at a time, divided into two types: long light for 1 second (slow flash) represents 1; short light for 0.2 seconds (fast flash) represents 0. Interval is 0.5 seconds. Each set of flashes repeat after an interval of 3 seconds. For example, five fast flashes indicate the fault code 00000.

00000：Combustion sensor broken
00010：Power supply voltage is too high
00011：Power supply voltage is too low
00100：Combustion sensor short circuit (resistance too small)
00101：Overheat sensor broken
00110：Overheat sensor short circuit
01000：Self-checking current is too high when electromagnetic pump starts
01101：Misfire
10011：Self-checking current is too high when ignition plug starts
10101：Self-checking current is too high when main motor starts
11011：Heater overheating (excessive heater air outlet temperature)
11101：Hall sensor cannot detect the magnet (the motor does not turn, locked-rotor or the controller is not properly positioned)

Service

Please contact our service department if you have any question.
Email: info@hlnind.com