PHP PARKING HEATER PRODUCTS®

PHP-23A AIR HEATER

Technical Description

Installation Instruction

Operating Instruction

Maintenance Instruction

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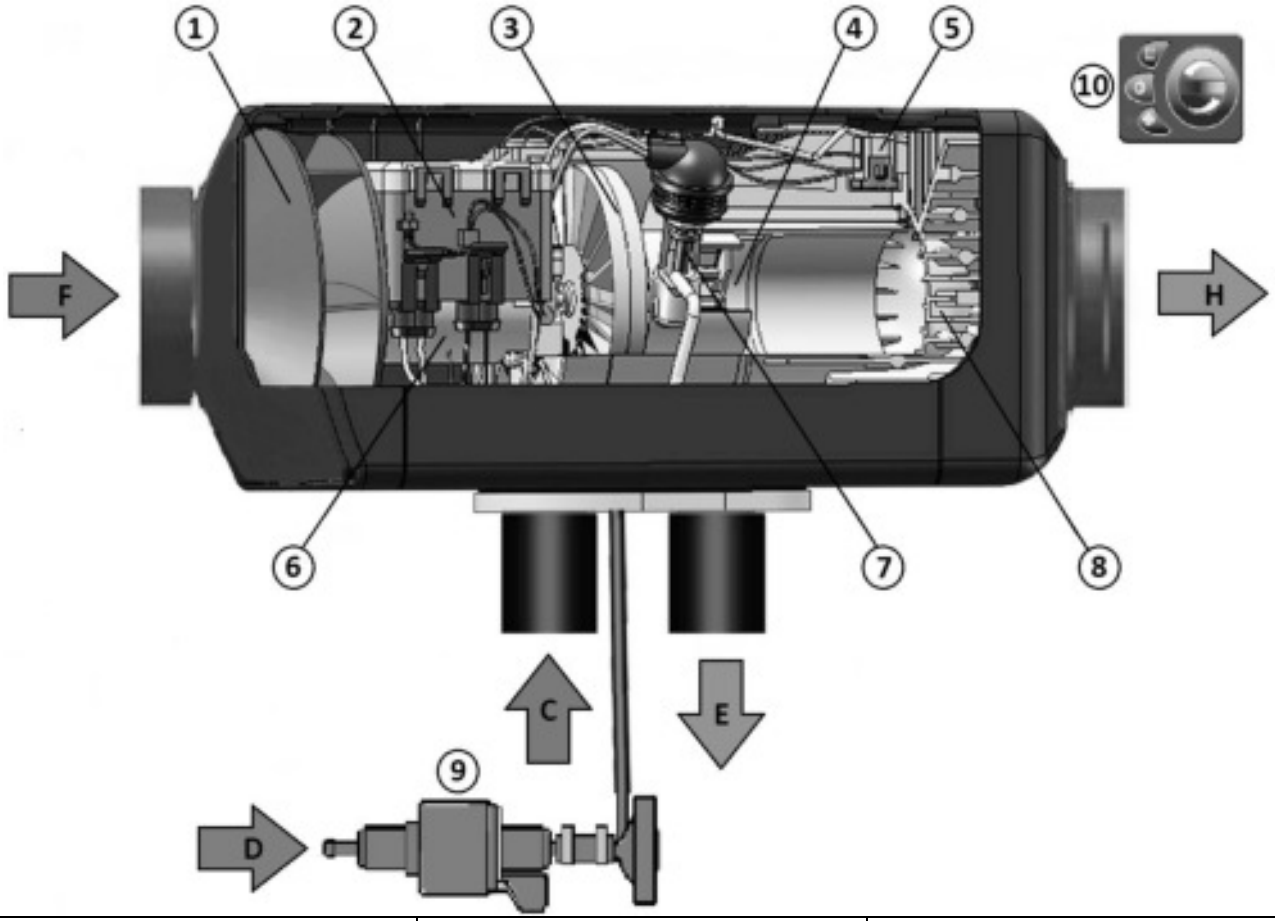
Application of the PHP-23A Air Heater

The PHP-23A Air Heater is designed to be used as an auxiliary and sometimes primary heater in car, trucks, RVs, boats, buses, construction and farm equipment. The heater provides heat using the vehicles fuel and battery power without the need for the vehicle engine to waste fuel by idling just to provide heat. The PHP-23A Heaters compact design, ease of use, low maintenance and low operating cost make it ideal for many mobile application where and efficient manner of providing heat is required.

Main Components of PHP-23A Air Heater



1) Process Air Blower Wheel	6) Blower Motor	C. Combustion Air
2) Electronic Control Unit	7) Glow Pin	E. Exhaust Gas
3) Combustion Air Blower Wheel	8) Heat Exchanger	F. Fresh / Process Air Intake
4) Combustion Chamber	9) Fuel Pump	H. Hot / Process Air Outlet
5) Overheat / Flame Sensor	10) Operating Unit / Controller	D. Fuel Intake

How the PHP-23A Air Heater Works

The external fuel pump delivers fuel to the combustion chamber, the blower motor delivers outside combustion air to the burner chamber and a glow pin is used to ignite the fuel-air mixture to create heat. The heat from the burner is transferred into the heat exchanger while the exhaust gases are expelled to the exterior of the vehicle. The process air from the area to be heated is circulated through the heater over the outside of the heat exchanger with the blower wheel which warms the interior of the vehicle. The heater automatically maintains the desired set temperature in the vehicle to keep the operator and or passengers comfortable.

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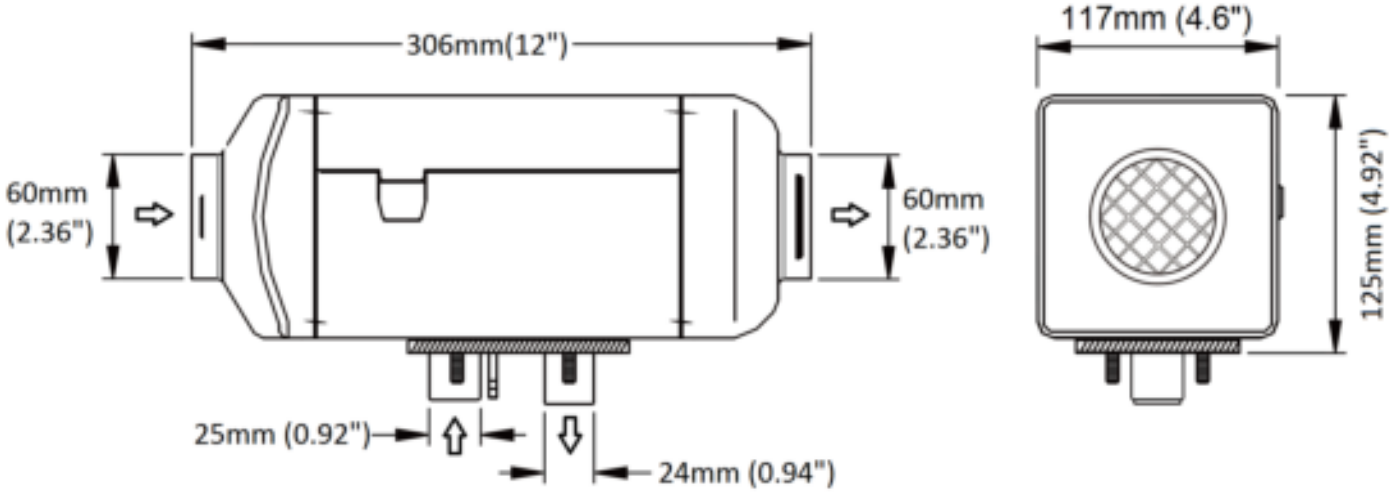
Technical Data and Specifications

Model	PHP-23A Diesel			
Heating Output Level	Super	High	Medium	Low
Heating Output Btu/hr (kW/hr)	2.3 (7850)	1.9 (6485)	1.3 (4437)	0.9 (3072)
Fuel consumption L/hr （U.S. Gal/hr)	0.28 (0.07)	0.24 (0.06)	0.15 (0.04)	0.1 (0.03)
Fuel type	Diesel			
Air flow CFM	49	41	28	20
Electric power consumption （watts) （12 and 24 V)	34	23	13	9
Start-up watts（12 and 24 V)	≤100 W			
Rated voltage	12 or 24 Volt			
Voltage lower limit	10.5 Volt or 21 Volt time-voltage protection: 20sec			
Voltage upper limit	16 Volt or 32 Volt time-voltage protection: 20sec			
Overheat Protection Temperature	115ºC (239ºF)			
Allowed ambient temperature	- 40ºC ~ 76ºC (-40ºF ~ 169ºF)			
Weight kg (lb)	2.7 kg (6lb)			

Please Note:

Listed technical data is subject to a tolerance of ±10 %

Heater Dimensions



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Safety Instructions and Warnings

- Disconnect the vehicle battery connections before commencing any repairs or performing maintenance of the heater.
- Before beginning any work on the heater, switch the heater OFF and let all hot parts cool down.
- The heater shall NOT be used in: poorly ventilated rooms, garages, shops, multi-storage car park, etc. Use heater only in open, well ventilated areas.
- Installation and operation of the heater shall comply with statutory regulations, safety instructions and specifications as stated in the installation and operating instructions.
- Extreme precaution shall be taken when installing and maintaining electrical wiring, fuel supply, combustion air and exhaust system.
- The heater shall NOT be used in hazardous places such as but not limited to: fuel depots, carbon storage, timber warehouse, granaries and other places where combustible or flammable vapor or dust may be present.
- Heater must be switched OFF during refueling.
- The heater shall be installed in a spacious compartment. Fuel canisters, oil cans, spray cans, gas cartridges, fire extinguisher, cleaning rags, clothing, papers, or any combustible or flammable materials shall NOT be stored or transported on or next to the heater.
- Defective or burned fuses shall be replaced only with same type and same rating fuses.
- In the event of a fuel leak; turn OFF the heater immediately, disconnect and cap off fuel line. The leak is to be repaired by a professional, authorized technician.

Please Note:

Do NOT shut down the heater by disconnecting the power unless required to do so by an emergency.

WARNING!!!

Carbon monoxide monitoring sensor with alarm shall be installed in all passenger compartments, operator or driver cabins, and sleeper berths.

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Installation Instructions and Regulations

Please Note:

Failure to comply with the regulations, safety instructions, installation instructions or having repairs performed by unauthorized persons or use of aftermarket parts voids the heater warranty and relieves the manufacturer, distributors, dealers, and installation technicians from any and all liabilities.

The installer is responsible for all damages to the property or person that arises from faulty installation of the heater.

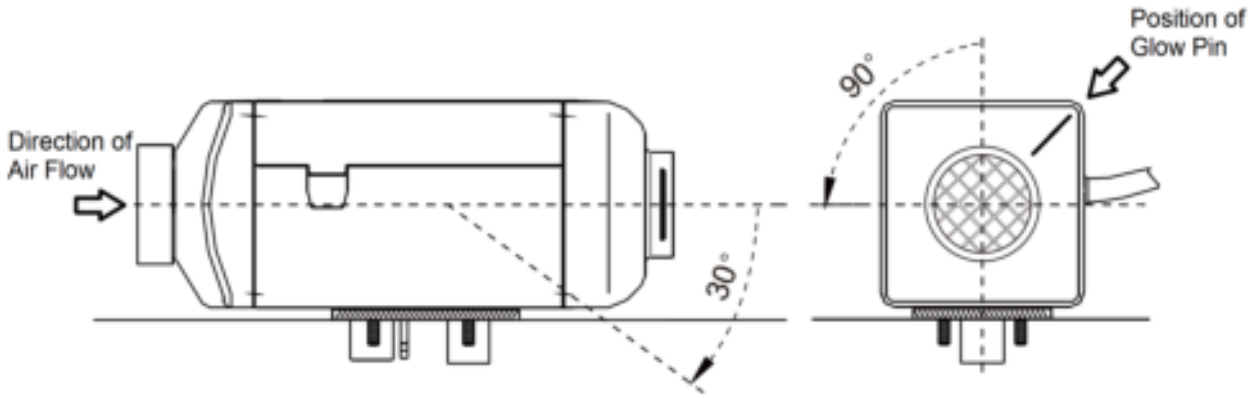
Choosing Heater Location and Position

The location to mount the heater in the vehicle will vary depending on the application. Typically the heater should be mounted on the floor in a protected area. Commonly they are mounted in the storage compartment under the bed in a transport truck cab or under the seat in a passenger vehicle. The heater can also be mounted on walls and or in protected compartments outside the operator / passenger cabin as long as all the installation instructions and regulations are followed. When considering the location to mount the heater you must take into account the following concerns.

- There must be enough clearance around the heater, heater ducting and the exhaust to avoid any damage to heat sensitive materials or vehicle components.
- The heater must not be exposed to the outside elements and in cases where it is mounted outside the vehicle cabin it must be properly enclosed and protected.
- The mounting surface must be such that it is possible to get a complete seal between the heater and the floor or the heater mounting plate and the floor.
- The heater must not be exposed to excessive heat and or any fuels, oils or other potentially hazardous chemicals or materials.

Tolerable swivel range

Depending on the installation conditions, swivel angles are allowed as shown below:



Please Note:

The glow pin must remain on the upper or top side position.

During use, the heater can deviate from the shown normal or maximum installations positions by up to 15° in all directions in order to accommodate the vehicle or boat movement.

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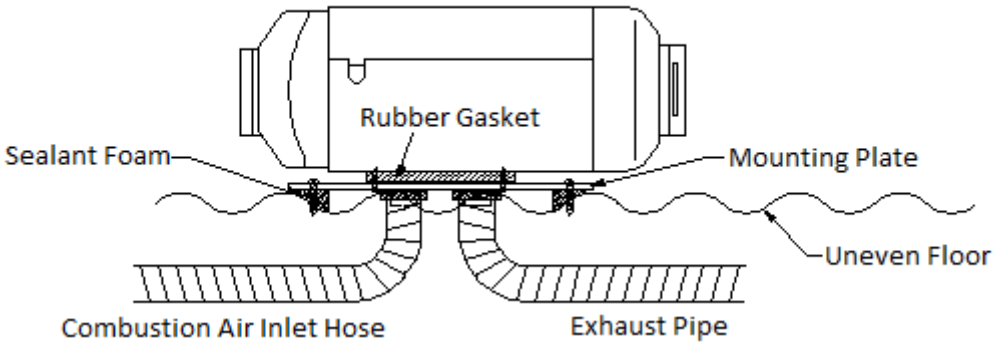
Mounting heater on the floor or wall using mounting plate

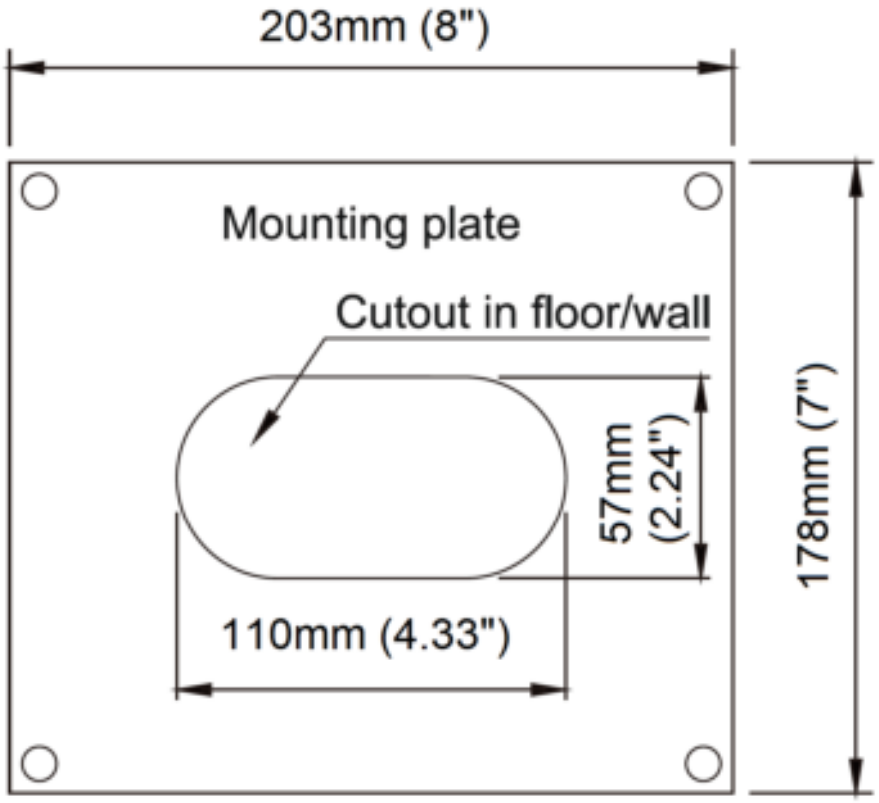
If the mounting surface is not smooth and even the mounting plate with the foam sealant must be used to insure a proper seal between the interior and exterior of the heated area. When using the mounting plate the sealant foam must always be used.

The rubber gasket on the bottom of the heater must always be used whether mounting the heater with or without the mounting plate.



When using mounting plate cut out a hole in the floor or wall with the dimensions below or use a hole saw and drill a 4.5 inch diameter hole instead.

To find the center point for cutting the hole use the mounting plate as a template and mark each of the corner mounting holes and then draw an X between them to mark the center.



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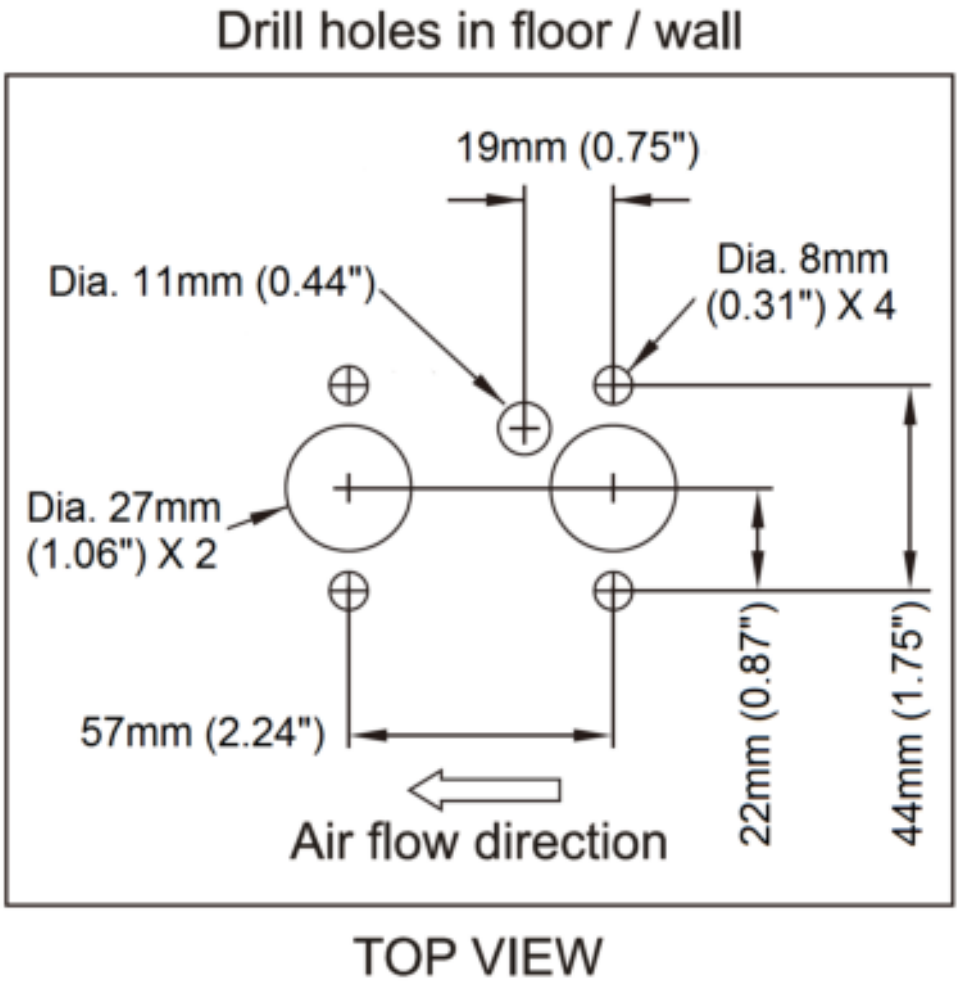
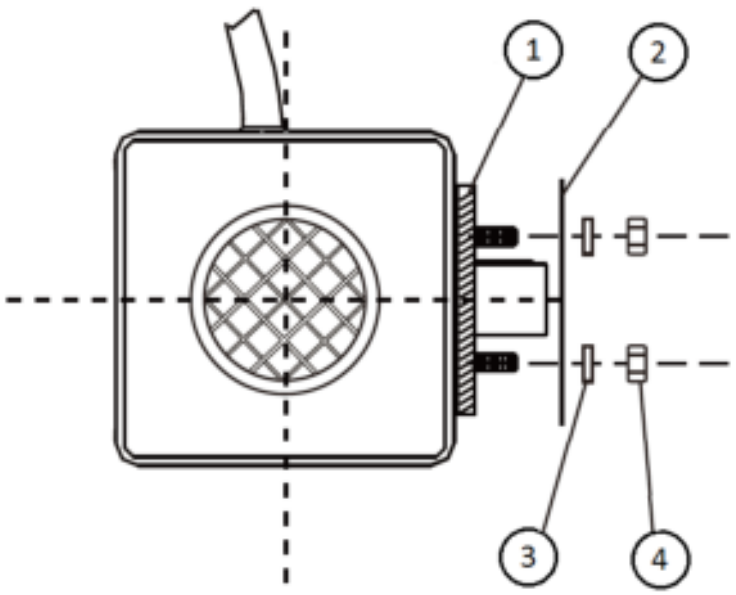
Mounting heater on the floor or wall without mounting plate

The heater can only be mounted without using the mounting plate when the floor or wall it is to be mounted to is smooth and even. If the floor or wall is not smooth or even it is not possible to get a proper seal with the rubber gasket on the bottom of the heater.





1. Rubber Gasket
2. Smooth Wall
3. Lock Washer X 4
4. Nut X 4

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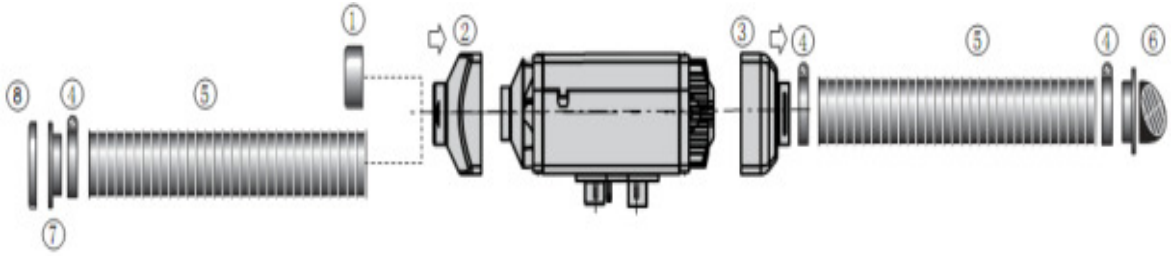
Installation of Heater Ducting



Item	Description	Item	Description
1	Safety Grill	5	Flexible Duct
2	Air Intake Hood	6	Adjustable Outlet Grill
3	Air Outlet Hood	7	Air Intake Connector
4	Hose Clamp	8	Air Intake Grill

Use only the temperature resistant flex-ducting that is included in the installation kit.

Install the heater air ducting in such a way that the hot outlet air will not be directed directly back to the air intake since this will cause short cycling and temperature swings.

When the heater is mounted in a separate compartment or area than the main area to be heated, return air ducting should be installed to maximize efficiency and allow for proper temperature control.

If not installing a return air duct and grill be sure to install the intake grill on the heater intake so that no debris or foreign objects can be drawn into the heater.

Safety Warnings for Heater Ducting

The heater and the heater outlet ducting will get hot during operation. The heater and ducting must be installed in such a way that they will not come in contact with any heat sensitive materials. Install shields and covers as required. Be aware of things moving around in storage compartment while driving.

The heater and the heater outlet ducting must be installed in such a way that passengers or operators cannot accidentally touch the hot heater or the hot air ducting. If required, protective covers or shields must be installed.

The heater ducting outlet and inlet must be installed in such a way that they cannot be blocked or obstructed and do the outlet does not direct the hot air too closely to anything heat sensitive.

Combustion Air Intake System Installation

The air intake must be installed in such a way that it cannot draw in water, debris, snow or ice into the combustion chamber and so that it cannot be blocked at any time. The air intake should be pointed away from the vehicle direction of travel.

The Combustion Air Hose inner Diameter is 25mm (1"). Be sure to install it on the air intake port on the heater and not on the exhaust port. The minimum allowable length of the combustion air intake hose is 0.2m (8") and the Maximum is 1.5m (55").

Safety Warnings for Combustion Air Intake

The heater combustion air must NOT be taken from the passenger compartment, cargo space or operator (driver) cabin.

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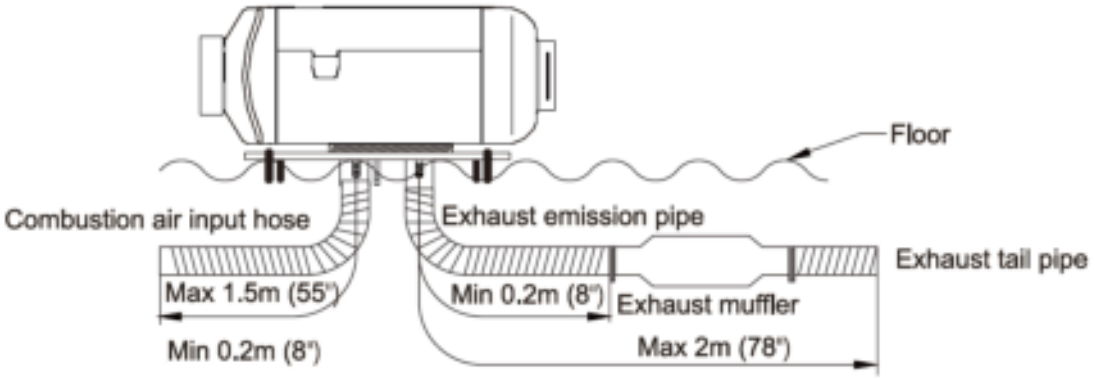

Exhaust System Installation

Fasten the exhaust silencer (muffler) at a suitable position near the heater. Route the exhaust pipe from the heater to the exhaust silencer and fasten with exhaust pipe clamps. Route the exhaust pipe from the outlet of the muffler to an appropriate place for the exhaust to exit at the edge of the vehicle. Secure the exhaust pipe using the brackets and clamps provided in the installation kit.

The Exhaust Pipe has an inner diameter of approximately 24mm (0.94") and will only fit on the Exhaust Port of the Heater. The Exhaust System can have a minimum length of 0.2m (8") and a Maximum length of 2m (78"). If using the exhaust silencer (muffler) there must be a minimum of 0.2m (8") between the heater and silencer.

Safety Warnings for Exhaust System

The exhaust outlet must be arranged in such a way that the exhaust fumes go directly to the outside of the vehicle and have no way to enter the vehicle.

Prevent penetration of exhaust fumes into the vehicle interior through the ventilation system or open windows.

The entire exhaust system gets very hot during heater operation and will stay hot for some time after the heater has been operating.

Keep the exhaust system parts away from any flammable or heat sensitive materials; wires, hoses, fuel lines, plastics, brake lines, air lines etc. Use heat shields whenever necessary.

Maintain at least a 0.5" air gap between the exhaust pipe and sheet metal walls in order to prevent the heat transferring through the metal and damaging materials on the other side of the wall.

Point the outlet of the exhaust pipe slightly downward, in open air, away from the direction of travel and away from any heat sensitive or flammable materials.

The exhaust pipe should not protrude beyond the sides of the vehicle.

Do not perform any work on the exhaust system while the heater is in operation. Before working on the exhaust system, first turn OFF the heater and wait until all the exhaust parts have cooled down completely. Always wear safety gloves and eye protection.

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Fuel System Installation

The following safety instructions must be observed when mounting the fuel pump routing fuel lines and installing fuel tank pick-up tube.

Turn OFF vehicle engine and heater before working on the fuel supply or before refueling. Do not use “naked” lights, open flames, do not smoke, do not inhale fuel vapors and avoid fuel contact with skin. Work only in well ventilated area.

When installing fuel lines, use only a sharp knife to cut fuel hoses and pipes. Interfaces shall not be crushed and must be free of burrs.

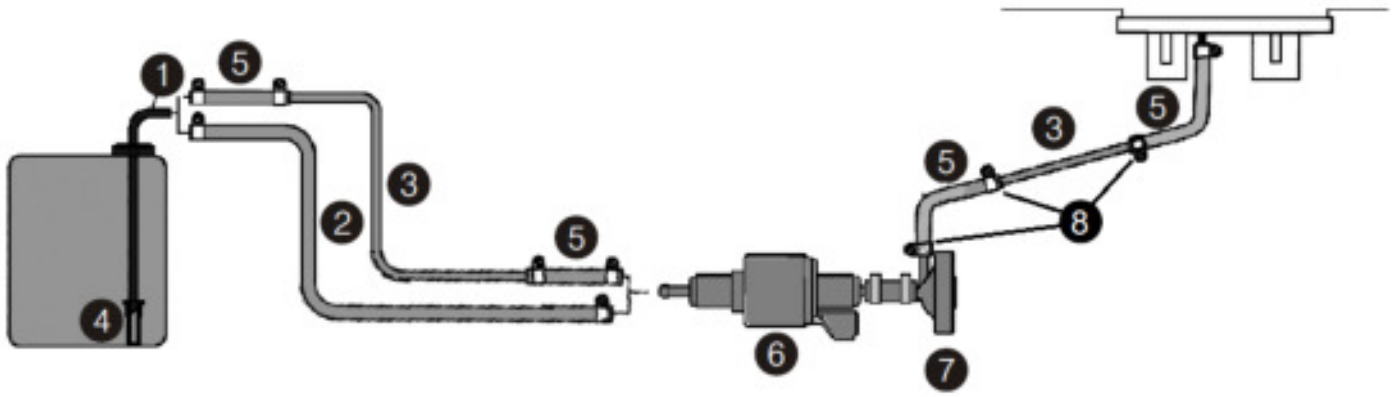
The fuel line from the pump to the heater should be installed at a continuous rise.

Fuel lines must be fastened to avoid damage from vibrations.

Route the fuel lines in a way that they are protected from vehicle distortion, movement, etc.

Never route or fasten fuel lines to the heater or vehicle exhaust system.

When the fuel line crosses a hot element, always ensure there is sufficient clearance. If necessary, install heat deflection plates.



Item	Description	Item	Description
1	Fuel intake pipe	5	Rubber Fuel Line Connector
2	Rubber Fuel Hose	6	Fuel Pump
3	Plastic Fuel Hose	7	Fuel Pump Damper
4	Fuel Filter	8	Fuel Hose Clamps

Safety Warnings for Fuel Lines and Tanks

In a passenger bus, van or any other passenger vehicle the fuel lines and fuel tanks shall NOT be routed through the passenger compartment or operator/driver’s cab.

Fuel tanks in passenger vehicles must be positioned in such a way that the exits are NOT in direct danger from a possible fire.

In vehicles where a separate fuel tank is used for the heater, the fuel tank, fuel lines and intake connections must be clearly identified.

A warning sign must be permanently attached or installed to the fuel tank filler nozzle area indicating that the heater must be switched off before refueling the tank.

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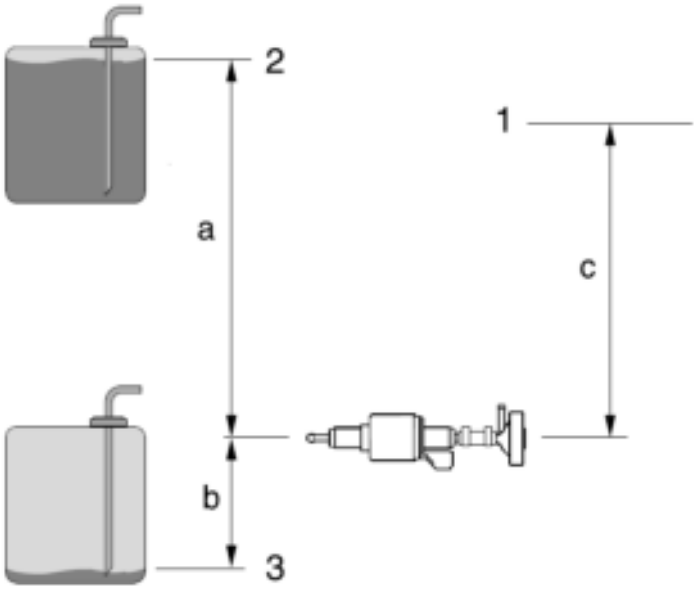
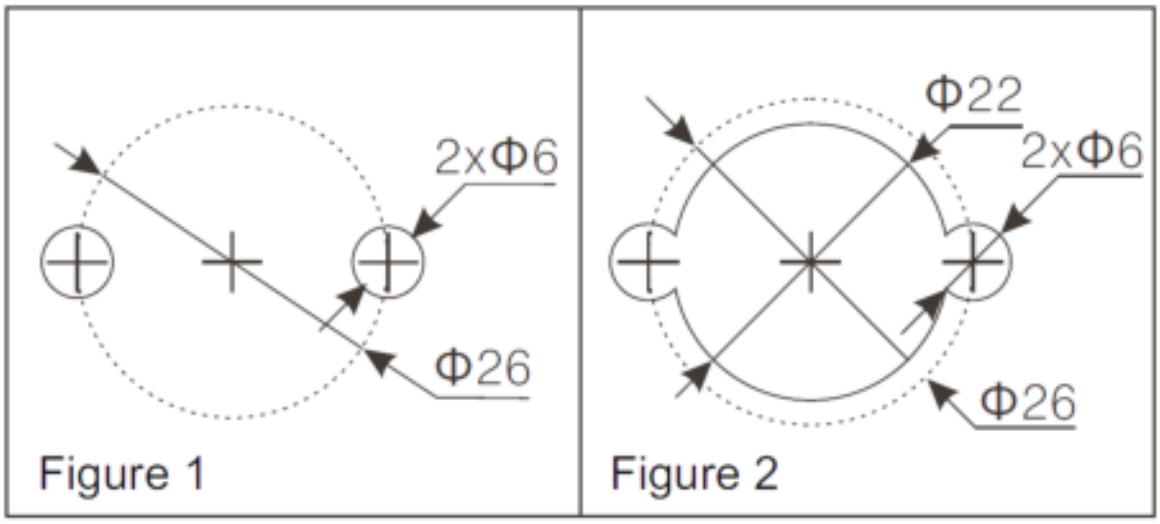
Maximum suction and pressure height



Maximum height from fuel pump to maximum fuel level – **a** = 3.6m (12')
Maximum suction height from bottom of fuel pick up pipe – **b** = 1.2m (3.9')
Maximum heater height – **c** = 3m (10')
1 - Connection to heater, **2** - Maximum fuel level, **3** - Minimum fuel level

Fuel Pickup Pipe Installation

First, drill 2 - 6mm (0.25") at 26mm (1.02") O.C. holes in appropriate location in top of fuel tank as shown in Figure 1 below. Then Drill a 22mm (0.87") hole as shown in Figure 2 below.



Please Note:

Prevent shavings and any other debris from falling into the fuel tank.

Safety Warning

When drilling into the fuel tank, take precautions to prevent possible sparks from electric tools (ground all tools).

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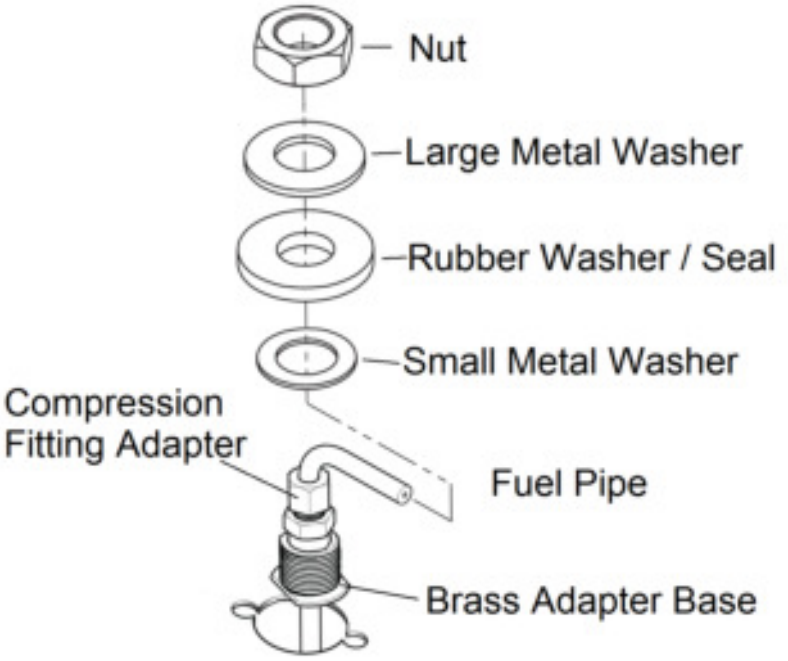
Mount the Fuel Pick Up Pipe into the tank in the order shown below.



Please Note:

To avoid dropping the compression fitting and base into the fuel tank, make sure it is tightened onto the pipe before putting pipe into tank.

Be careful not to let go of the fuel pipe and drop it into the fuel tank while assembling components onto fuel pipe.

Electrical System Installation

The heater harness that comes with the heater has all the electrical connections preassembled for easy installation. Secure any excessive length of cables in a protected spot.

To route the cables to the fuel pump and the batteries use either an existing cable passage or drill a hole near the heater to route the cables outside. Make sure to seal the hole around the cables and make sure they are protected from chaffing or damage during vehicle movement.

When installing the controller it may be necessary to remove the terminals from the connector in order to route them through the small hole in the mounting surface. Be extremely careful not to damage the terminals or connector and make sure the wires are reinstalled in the correct positions.

Safety Warnings for Electrical Wiring

Before installing the harness remove the main 15 or 20 Amp fuse until the wiring is completely installed to avoid accidentally shorting the wiring during assembly. Remember to reinstall when starting heater.

Ensure that the electric cables or insulation and connectors are not damaged prior to installation and be careful not to pinch or damage cables and connectors during installation.

Be sure to consider the movements of the vehicle cab when installing and securing the harness to the fuel pump and batteries and leave enough excess play in the harness to avoid pulling on or damage to the harness.

Lubricate all outside connections with contact grease to avoid corrosion.

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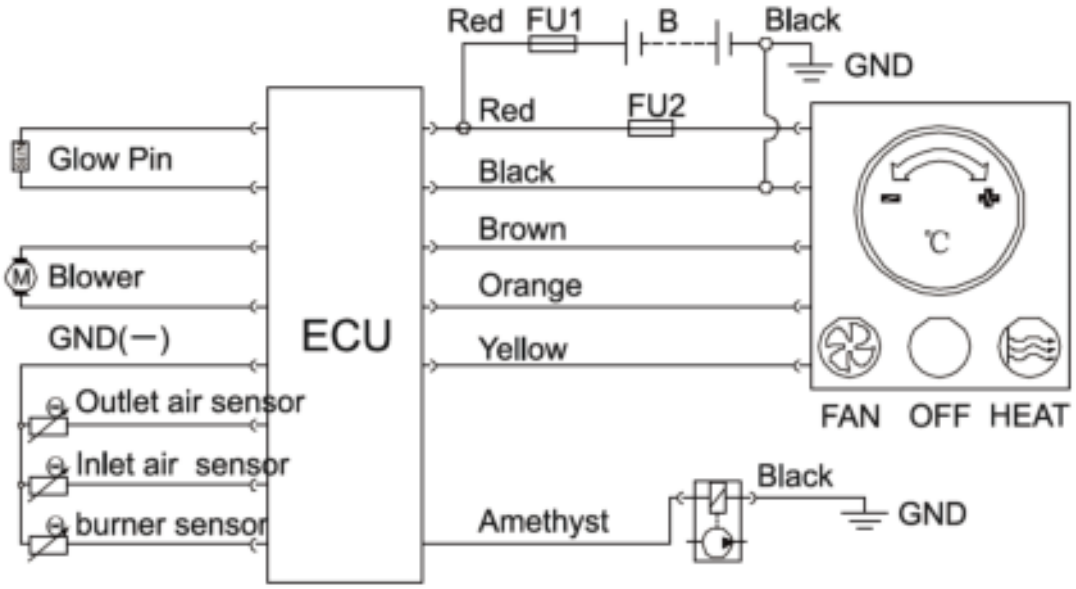
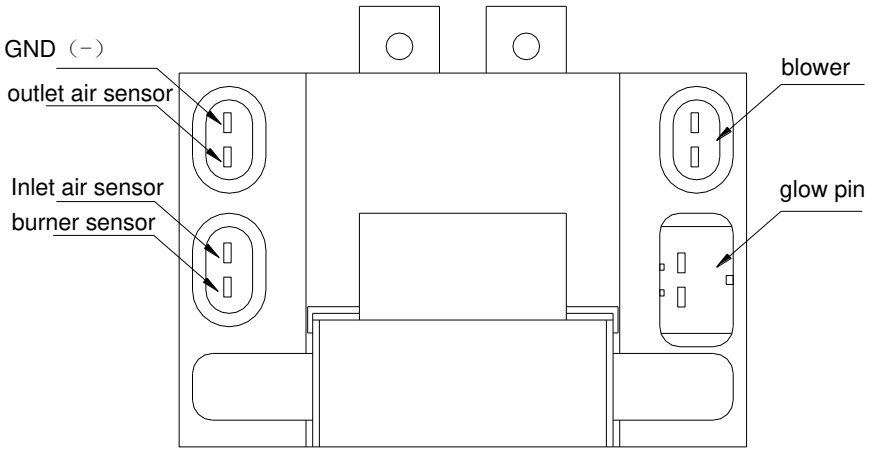
Electrical Diagram



Wire color	Function	Wire color	Function
Red	DC 12V/24V (+)	Brown	line of communication A
Black	GND (—)	Orange	line of communication B
Yellow	Starting line	Amethyst	Fuel pump line (+)

Control Unit



Operating Instructions

Before starting the heater, perform a safety check: all components must be firmly fastened, check for fuel leaks.

To start the heater; turn the control knob to “high” (turn the knob clockwise), push heat button, the blower motor will start running. After about 1 minute the fuel pump will start pumping the fuel. If the fuel is not ignited in a short period of time the glow pin will turn off for about 1 minute and then it will start the process again. Upon initial startup the heater may require several start attempts to bleed air out of the fuel lines.

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Description of Heater Function and Operation

Operation

When the heater is turned ON, the control lamp (Red) comes ON. The combustion air blower starts running, the glow pin will start heating up, and fuel pump will start pumping fuel. Once the flame is stable, the glow pin will turn OFF.

Heating mode

Once the air reaches the desired temperature the fuel pump will turn OFF, the combustion fan and air fan will keep operating on the low speed and the heat light will stay ON. The heater will restart after the air temperature drops below the setpoint. After the heater is turned OFF the air fan and combustion air fan will operate for approximately 2 minutes on the low speed in order to evacuate exhaust fumes and cool down the combustion chamber.

Controls and Safety

If the heater does not ignite on the first start attempt, it will shut off the fuel pump and the start sequence will repeat. After several unsuccessful starting attempts the controller will turn the heater off in order to prevent fuel flooding the burner chamber. You can restart the process by switching the heater OFF and then ON again.

The heater will not attempt to start if one of the components is detected by the control unit to be defective.

If the heater detects a problem during operation it will shut down and depending on the fault it will either restart automatically or it will turn off completely.

If the flame goes out during operation, the heater will cycle down and then attempt to restart automatically. If the heater does not ignite after several attempts, the heater will shut down and it will need to be turned OFF and ON manually.

If the lower or upper voltage limit is reached, the heater will turn OFF after a 20 second delay.

The fan speed is continuously monitored. If the fan motor does not start or if the speed deviates by more than 40%, the heater will turn OFF after 60 seconds.

Please Note:

- The controller can be enabled again and it will flash a fault code:
- Refer to the Fault Code List to determine corrective action.
- Do not switch the heater OFF and ON again more than twice.

Emergency shut down

In event of an emergency, shut down the heater as follows:

1) **Try to turn the heater OFF with the control panel.**
2) **Pull the fuse out.**
3) **Disconnect battery power.**

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Troubleshooting

Depending on what is discovered upon initial troubleshooting of the heater system please refer to the correct section to diagnose and correct the problem.

Heater does not attempt to start and is NOT displaying Error Codes

If the heater does not attempt to start when turned on; turn the heater OFF and back on again. Make sure that the heat button with the 3 arrows is pressed and not the ventilation mode button.

If the heater still does not attempt start and there is not a blinking error code on the controller check the following in this order.

1) Check that all the electrical connections are intact and not damaged or corroded.
2) Check the fuses to make sure they are not burned out.
3) Check to make sure the voltage going to the heater is not too low or high.
4) Remove power to the heater for 5 minutes or more by removing the main fuse at the battery and then reinstall the fuse and turn the heater on to test.
5) Install and test the heater with a new controller.
6) Install a new electronic control unit into the heater and test.

Heater does attempt start but does NOT Heat or display Error Codes

If the heater does attempt to start after turning on and you have waited long enough for the heater to complete the start attempt sequence and there is still no heat or a flashing error code check the following.

1) Determine if temperature setpoint is too low or the room temperature is too high.
   - Turn the temperature to the highest setpoint and turn heater on.
   - If the area you are working in is too hot, move the heater to a cooler place and try again.
2) Remove power to the heater for 5 minutes or more by removing the main fuse at the battery and then reinstall the fuse and turn the heater on to test.
3) Install and test the heater with a new controller.
4) Install a new electronic control unit into heater and test.

Error Flash Codes

The PHP-23A has an automatic built in error code detection system. When the heater detects a fault it will either display it using a flashing error code on the controller or it will present a numeric fault code if the controller has a screen. The number of flashes and the numeric value are the same. Two Flashes of the LED on the Controller is the equivalent of getting an Error Code 02. After the error code is determined, refer to the Error Code List and Diagnostic Chart.

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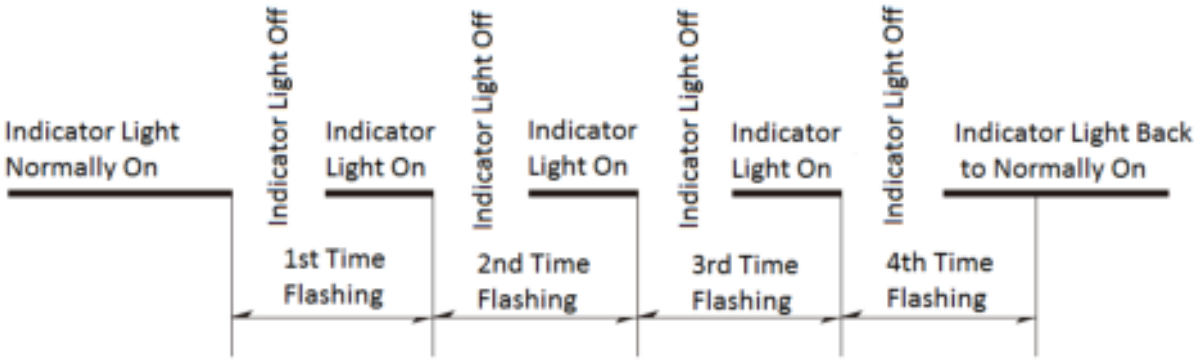
Mini Controller Error Code

On the mini controller the light noted below will start flashing if there is an error.

How to Read Flash Error Codes

To understand how to read the flashing error codes refer to the below diagram and instructions.



Since the indicator light that will flash an error code is normally on, every time the light goes out and comes back on is counted as one flash. The error code is actually counted by the amount of times the light goes out for a very short period of time. The above diagram would read as a Error Code 4. After the fourth time the light comes back on it will stay on for a short period of time and then start over and repeat the flash code.

7 Day Timer Error Code - Number Error Code

On the 7 Day Timer the error code will show up on the screen as a number.

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Error Code List and Diagnostic Chart

Refer to the following chart after determining the error code.

Error Code Number of Flashes	Description of Error	Diagnostic Instructions / Corrective Action / Repair
1	High Voltage	Check Voltage Supply to Heater. Check vehicle charging system / voltage regulator.
2	Low Voltage	Check the Power Lines going from the heater to the battery and all the connections to make sure they are not damaged, corroded or loose. Check Voltage Supply to Heater. Check vehicle charging system / voltage regulator.
3	Flame Sensor Error	Check the Flame Sensor Connections and Wires for Damage or Short Circuit. Check the Resistance Value of the Flame Sensor. Should be 1050 Ω to 1100 Ω at 20°C (68°F).
4	Air Inlet Temperature Sensor Error	Check the Inlet Air Sensor Connection and Wires for Damage or Short Circuit. Check Resistance Value of the Air Inlet Temperature Sensor. Should be 11 kΩ to 12 kΩ at 20°C (68°F).
5	Outlet Air / Overheat Temperature Sensor Error	Check the Outlet Air Sensor Connection and Wires for Damage or Short Circuit. Check the Resistance Value of the Outlet Air Temperature Sensor. Should be 59 kΩ to 66 kΩ at 20°C (68°F).
6	Glow Pin Error	Check the glow pin connection and wires for damage or short circuit. Check the resistance value of the glow pin. Should be 0.5 Ω to 0.8 Ω at 20°C (68°F).
7	Fuel Pump Error	Check the fuel pump connections and wires for damage or short circuit. Check the resistance values between the terminals of the fuel pump. Should be 4.5 Ω ± 0.5 Ω at 20°C (68°F).
8	Blower Motor Error	Check the Blower Motor connections and wires for damage or short circuit. Check to see if the blower motor is turning freely and or has any interference which may have jammed it. Check to make sure that both the speed sensor detection inserts on the process air fan are not missing or loose.
10	Failed Ignition	Check to make sure there is enough fuel in the tank Check to make sure there are no fuel line leaks and connections are all intact. Check to make sure the air intake and the exhaust are not crushed or plugged.

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Error Code List and Diagnostic Chart continued

11	Burner Overheating	Check to make sure the air ducting is not restricted. Check to make sure the combustion air intake pipe and the exhaust are not crushed or plugged. Check the Glow Pin Screen and Replace if Dirty.
12	Outlet Air Temperature Overheat	Check to make sure the inlet and outlet air ducting of the heater is not restricted. Remove restrictions.
13	Flame extinguished or Burner Overheating	Disconnect the power to the heater for 5 minutes or more by removing the main heater fuse at the battery and reconnect it.
14	Communication Error	Check all the wires and connectors connected to the heater and the controller to make sure they are not loose, damaged or corroded.

To reset the system：press the “OFF” button → wait for 15 minutes, this should clear the error codes, then turn ON the system. If the system does not clear the code, disconnect battery power by removing the main heater fuse at the battery for 5 minutes or more, then reinsert the main fuse and turn the system ON.

Maintenance Instructions

Switch the heater ON at least once a month for about 10 minutes, even if there is no need for heat.

Check the opening of the combustion air supply and the exhaust system after longer standstill periods; clean if necessary.

Before the heating period starts the heater should undergo a trial run. If persistent extreme smoke, unusual burning noises or unburned fuels smell develop or if electric / electronic parts heat up, the heater shall be switched off immediately. Remove fuse or disconnect battery power.

At least once a year the heater should be inspected and maintained as follows;

- Remove the glow pin using the special socket tool. Inspect the glow pin for any damage to wires or wire connections and scratches or buildup on the heating element. Wipe the glow pin clean with a soft cloth only, do not use anything abrasive to clean the glow pin. If the glow pin shows any signs of wear or damage it must be replaced.
- Remove the atomizer screen with a hook-pick or pick and needle nose pliers. The atomizer screen cannot be reused and must be replaced annually.
- Inspect the atomizer screen chamber for buildup and clean with a small wire brush and vacuum out debris if required. Confirm the small air inlet hole on the side of the atomizer screen chamber is not obstructed with debris or buildup.

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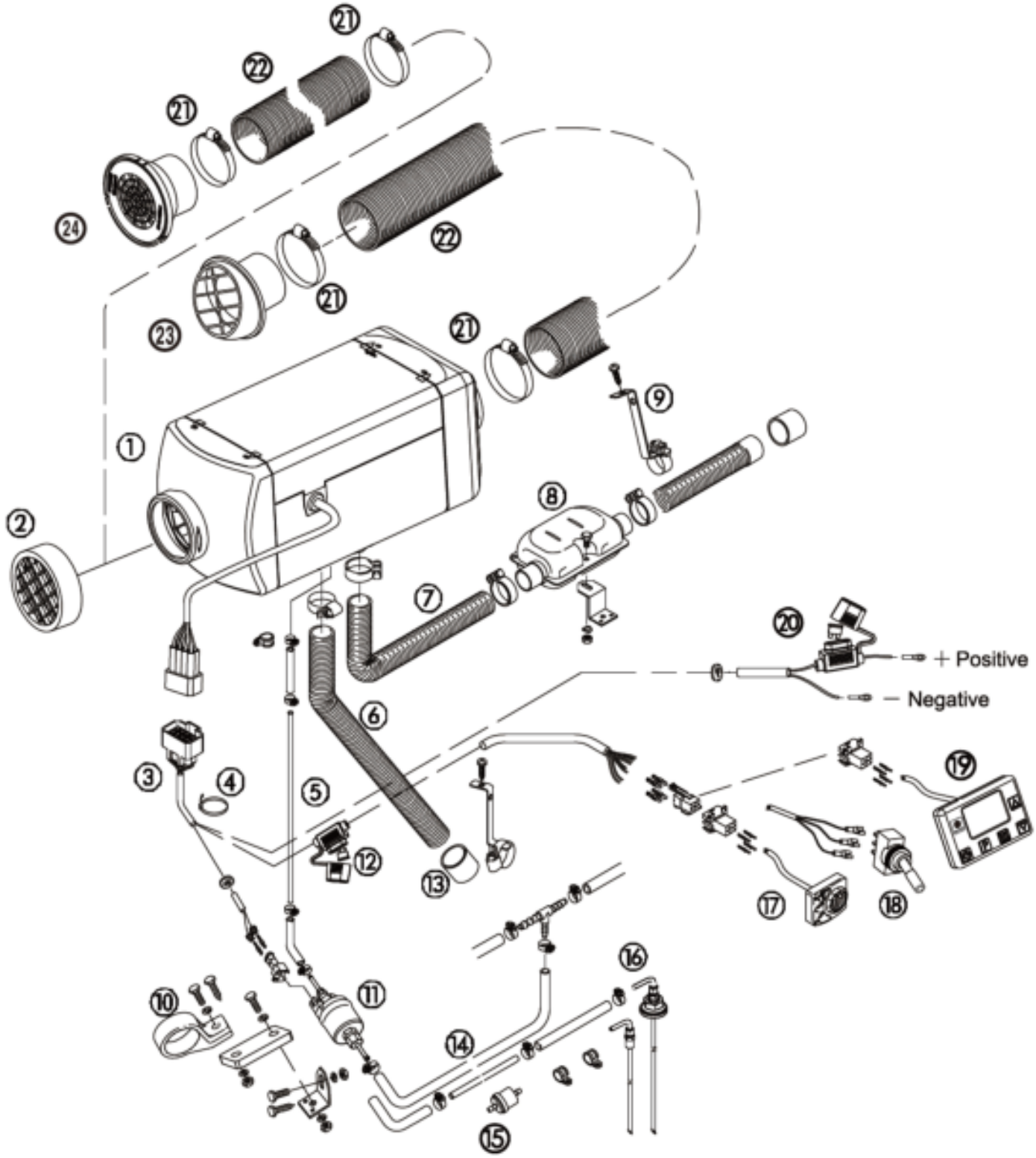
Installation Components Diagram for PHP-23A Air Heater



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Parts List of PHP-23A Installation Components

Item	Part #	Description	Qty
1	P20A-T801	Heater Unit, PHP, 2 kW, Air	1
2	U20A-X201	Safety Screen 60mm, Universal, 2 kW, Air	1
3	P65A-X301	Wiring Harness, PHP, All Wattages, Air	1
4	U65D-X705	Cable Ties 20cm	30
5	U65D-X403	Fuel Line (8m, ID 1.5mm, OD 5mm), Universal, All Wattages, All Modes	8m
6	U65D-X507	Combustion Inlet Hose 25mmX1M..	1
7	U65D-X508	Exhaust Pipe Flexible 1 Layer with End Cap 24mmX1M	1
8	U65D-X501	Exhaust Muffler 24mm, Universal, All Wattages, All Modes	1
9	U65D-X701	Pipe Mounting Bracket, Universal, All Wattages, All Modes	2
10	U65D-X407	Holder for Fuel Pump (Rubber)	1
11	P65D-T401	Fuel Pump Assembly, PHP, All Wattages, All Modes	1
12	U65D-X302	Fuse 5 Amp, Universal, All Wattages, All Modes	1
13	U65A-X501	Combustion Air Intake hose end cap 25mm, Universal, All Wattages, Air	1
14	U65D-X404	Fuel Hose Rubber (1m, ID 4.5mm, OD 10.5mm) , Universal, All Wattages, All Modes	1m
15	U65D-X402	Fuel Filter Inline, Universal, All Wattages, All Modes	1
16	U65D-X405	Fuel Pickup Pipe Assembly, Universal, All Wattages, All Modes	1
17	P65D-X302	Mini Control Panel Thermostat, PHP, All Wattages, All Modes	1
18	U65D-X301	Toggle Switch On Off, Universal, All Wattages, All Modes	1
19	P65D-X301	7 Day Digital Controller, PHP, All Wattages, All Modes	1
20	U65D-X303	Fuse 20 Amp, Universal, All Wattages, All Modes	1
21	U20A-X604	Clamp for Ducting 46-70mm, Universal, 2 kW, Air	4
22	U20A-X603	Ducting Hose 60mm 1.2M, Universal, 2 kW, Air	1
23	U20A-X602	Air Outlet Adjustable Vent 60mm, Universal, 2 kW, Air	1
24	U20A-X601	Return Air Inlet Assembly 60mm, Universal, 2 kW, Air	1

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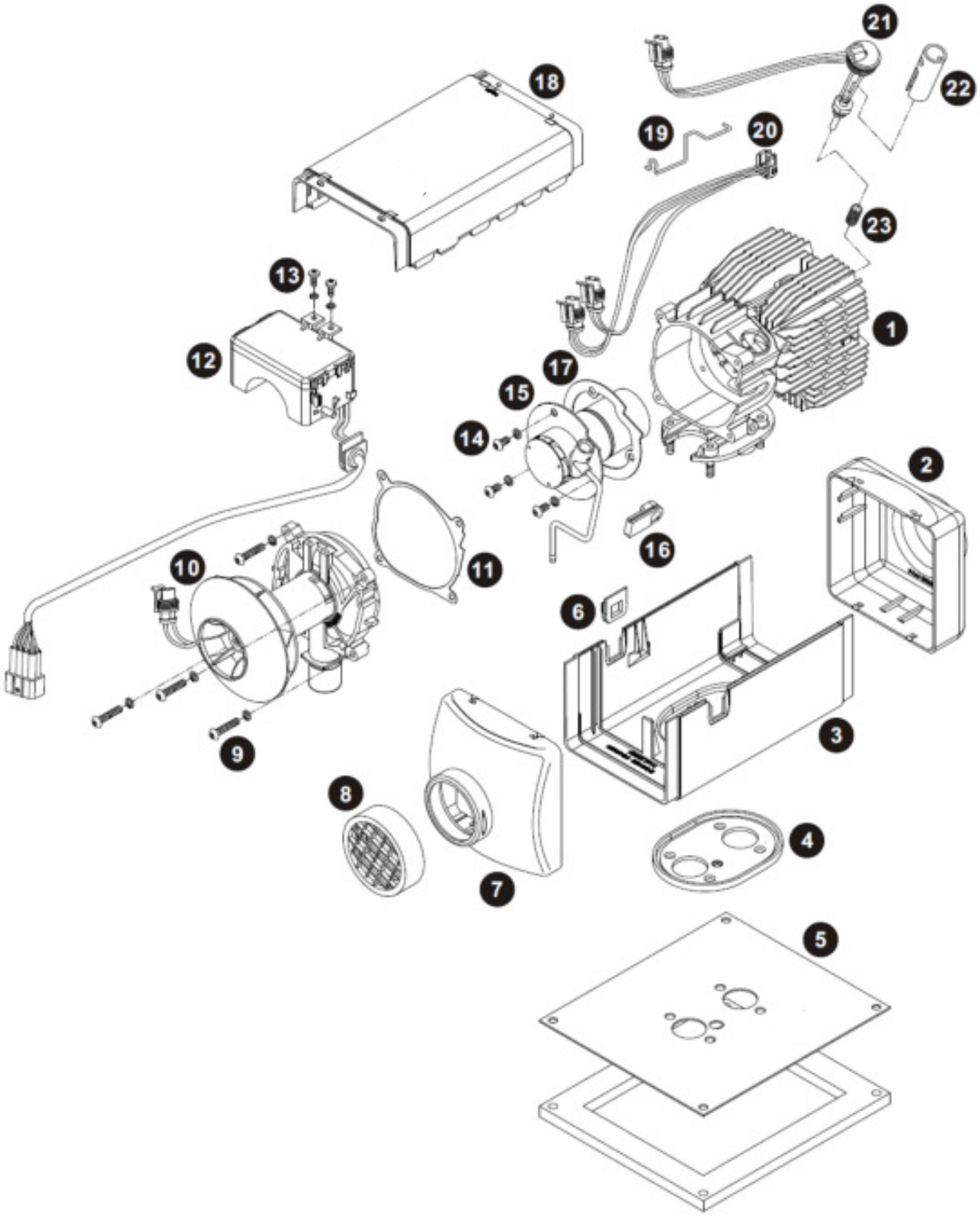
Parts Diagram of PHP-23A Air Heater



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Parts List of PHP-23A Air Heater

Item	Parts #	Description	Qty
1	P20A-X101	Heat Exchanger, PHP, 2 kW, Air	1
2	P20A-X204	Air Outlet Hood 60mm, PHP, 2 kW, Air	1
3	P20A-X201	Bottom cover, PHP, 2 kW, Air	1
4	U65A-X101	Gasket for Heater Mounting Rubber, Universal, All Wattages, Air	1
5	U65A-X702	Mounting Plate & Seal, Universal, All Wattages, Air	1
			1
7	P20A-X203	Air Inlet Hood 60mm, PHP, 2 kW, Air	1
8	U20A-X201	Safety Screen 60mm, Universal, 2 kW, Air	1
9	P65A-X702	Pan Head Screw M5X25, PHP, All Wattages, Air	4
10	P20A-T101	Blower Motor Assembly, PHP, 2 kW, Air	1
11	P20A-X102	Gasket for Blower Motor Housing, PHP, 2 kW, Air	1
12	P20A-T301	ECU, PHP, 2 kW, Air	1
13	P65A-X701	Pan Head Screw M4X10, PHP, All Wattages, Air	2
14	P65A-X703	Pan Head Screw M5X10, PHP, All Wattages, Air	3
15	P20A-X105	Burner, PHP, 2 kW, Air	1
16	P65A-X101	Grommet Burner Fuel Pipe, PHP, All Wattages, Air	1
17	P20A-X103	Burner Gasket, PHP, 2 kW, Air	1
18	P20A-X202	Top cover, PHP, 2 kW, Air	1
19	P20A-X104	Clamp spring for overheat and flame sensor, PHP, 2 kW, Air	1
20	P65A-X103	Overheat and Flame Sensor, PHP, All Wattages, Air	1
21	P65A-T101	Glow Pin 12V, PHP, All Wattages, Air	1
22	U65D-X901	Socket for Glow Pin (Split, 12mm), Universal, All Wattages, All Modes	1
23	P65A-X102	Glow Pin Screen, PHP, All Wattages, Air	1

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