



Installation Instructions



Pluto Range Gas Ducted Heater

(For internal installation only)

(P12, P20, P25)

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Important Notice to Agents, Installers and Purchasers

Although Eco Pacific endeavours to provide appliances of a high standard, it is important that you be aware that problems can occur if the equipment is not properly installed. There are standards covering installation, which has been stipulated by the Australian Gas Association, and the guidelines for installation as written in this booklet are in accordance with those standards. If an appropriately qualified person is not used to install the equipment or if the equipment is not installed according to the guidelines provided, then Eco Pacific will not be able to accept responsibility for any problems, which occur as a result.

Abbreviations

Abbreviation	Quantity	Units
A	Amperage	Amperes
Ph	Phases	
V	Voltage	Volts
kW	Heating Capacity	kiloWatts
MJ	Energy	MegaJoules
h	Time	Hours
Hz	Frequency	Hertz

Description

The Pluto class of heaters is a single packaged central heating unit. Throughout these installation instructions reference is made to the aspects of the heater given in Figures 1 & 2.

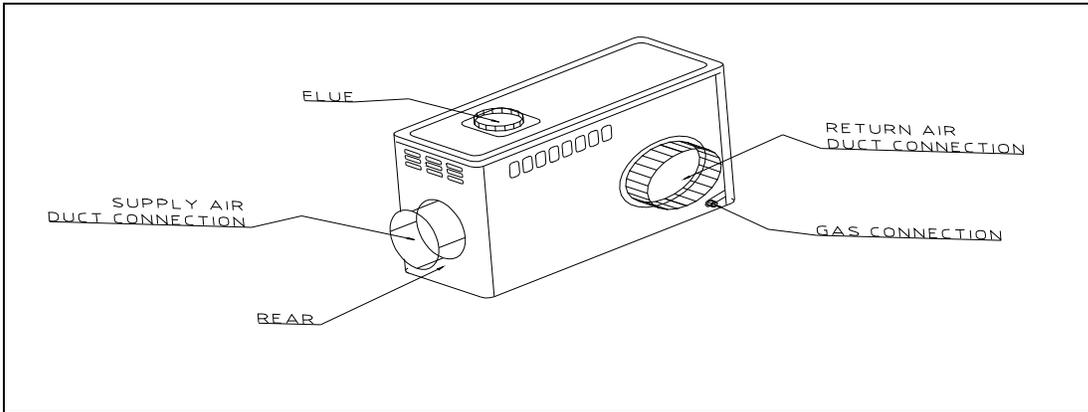


Figure 1: General aspects

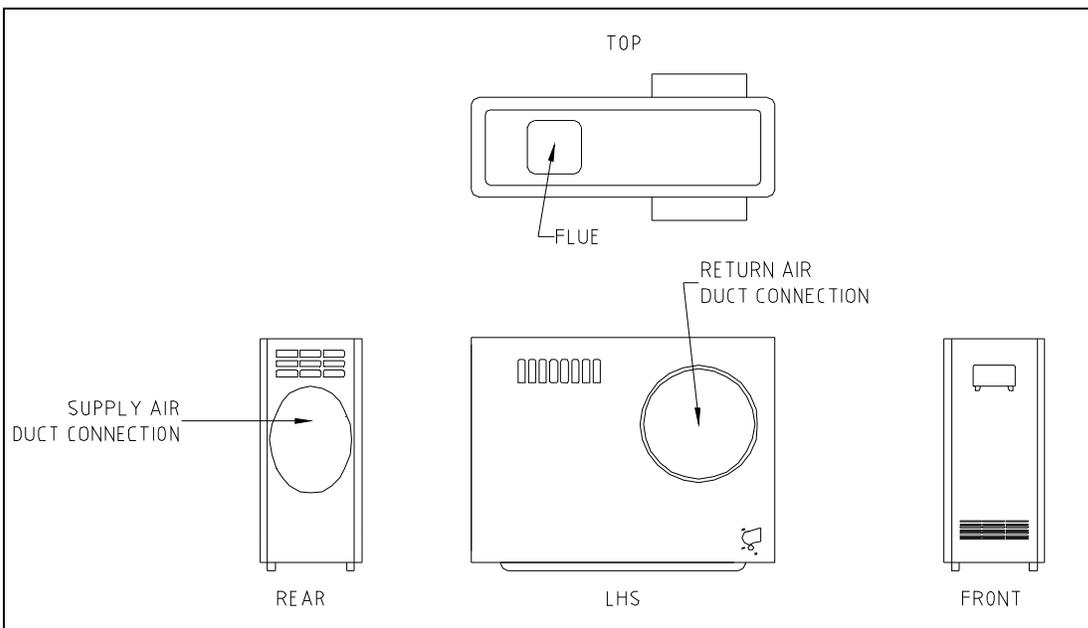


Figure 2: Different elevations

As shown in figure 2, the rear side of the unit is considered to be the end, which contains the supply air duct connection. Using the rear panel as an initial reference the front panel contains access to the Printed Circuit Board (PCB) controls, the gas burner and the gas valve. The gas connection is made towards the front on the lower section of the left hand side panel. Access to the fan wheel and motor is achieved on the right hand side.

General Requirements

The installation of this appliance must conform to the following requirements:

1. These installation instructions.
2. The Australian Gas Association Code, AG 601.
3. Local gas fitting regulations.
4. Local building regulations.
5. Local electrical supply authority regulations.

Models

These installation instructions cover the Eco Pacific Pluto range of internal heaters. This range of heaters is intended for use with natural gas or LPG.

Performance

Information on the performance and overall dimensions of each model may be found in Table 1 and Table 2 respectively. The appliance data plate found on the front panel of each heater unit complements this information.

Important Notes

AUTHORIZED PERSONNEL must install this appliance and must carry out likewise servicing of this unit.

Inspection

As soon as a unit is received it should be inspected for any damage that may have occurred during transit. If any damage is evident it should be noted on the carrier's freight bill.

Location

The Pluto is an internal air heater, designed for installation in either a roof space or underneath a floor space, and for connection to a ducted warm air heating system. Refer to Table 2 for general dimensions. Although the location is usually predetermined please check with the owner's or dealer's installation plans. If a location has not been decided on, consideration must be given to the following:

1. The location must provide adequate structural support; space for service access; and clearances for return and supply air duct connections.
2. Care should be taken to locate the unit and ductwork so that the supply air does not short circuit to the return air.
3. Proper electrical supply must be available.
4. Proper gas supply must be available.
5. Clearances, as outlined in the next sub-section, must be provided.

Clearances

For servicing, a minimum clearance of 300 mm must be provided on all sides of the appliance, with 600 mm required at the front of the unit, as shown in Figure 3. A 300 mm wide walkway must be provided for servicing, in accordance with AG 601, Gas Installation Code.

NOTE: Ducting must not intrude on these clearances for servicing, except for connections.

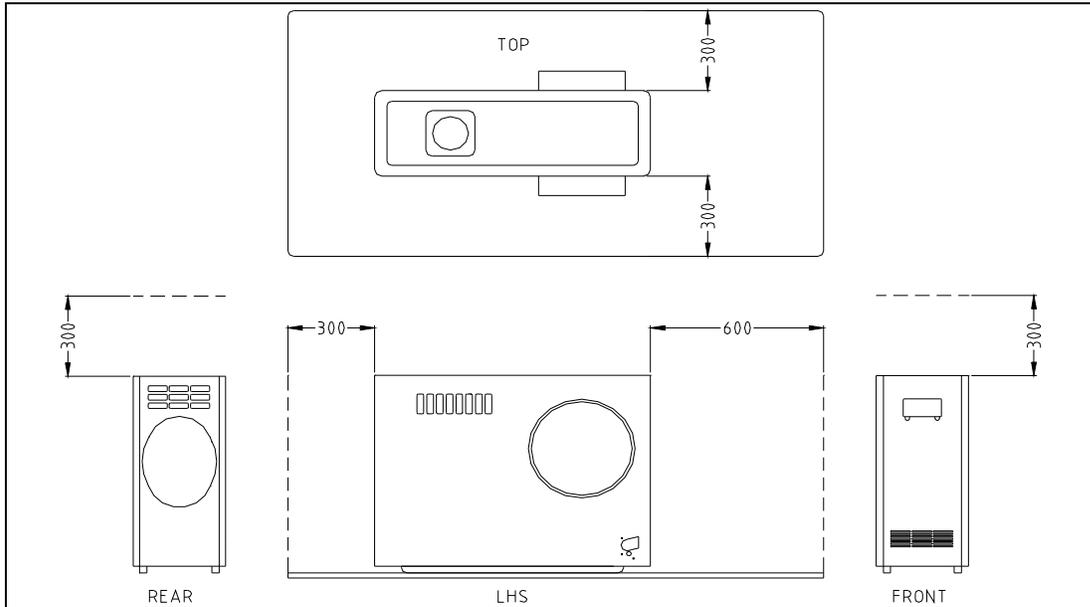


Figure 3: Required clearances

Installation

Procedure

The following sequence of installation steps is suggested. Reference is also made to the Final Checklist.

1. Inspect the unit and set in position.
2. Make electrical power connections.
3. Route the gas piping and connect to the unit.
4. Connect all ductwork.
5. Connect the flue.
6. Make electrical control connections.
7. Power up the heating unit.
8. Start and check the system for correct operation.
9. Instruct the owner on operation of the unit and advise on any servicing and maintenance aspects.

A) Roof Space Installation

1. The area in the roof space must be capable of supporting the additional load of the appliance.
2. Access must be available to the appliance, by means of fixed access, a normal ladder or steps.
3. A walkway must be provided between the access point to the roof space and the appliance. This walkway must be permanently fixed, capable of carrying the weight of a person, and extend all the way around the appliance.
4. Permanent lighting must be provided at the appliance, with the switch located at the point of entry to the roof space.
5. The unit must be installed on a solid base (fire retardant board exempt), extending 300mm in front of the unit. A minimum clearance of 200 mm between the top of the appliance and any combustible material must be maintained.
6. Ensure that any ceiling insulation material is kept clear of the appliance by a minimum of 300 mm.

B) Under Floor Installation

The Pluto may be installed under the floor, provided that:

1. A minimum clearance of 1200 mm exists between the underside of the floor joists and ground level. This clearance is to extend from the access opening to the appliance, and around the appliance.
2. Where minimum clearances exist as above, the appliance shall be located within 2 m of the access opening.
3. Where greater clearances than above exist, the appliance may be installed at any distance from the access opening.
4. A minimum clearance of 200 mm between the top of the appliance and the lowest part of the floor structure must be maintained.
5. The appliance is to stand on a level concrete base of at least 50 mm thickness, and provision must be made to drain away any seepage or ground water so that water cannot come into contact with the appliance.
6. Fixed artificial lighting must be provided at the appliance, with the switch located adjacent to the access opening.

Fluing

The appliance must be flued to the outside environment, in accordance with the Gas Installation Code, AG 601. The size of the circular flue required for each model Pluto is given in Table 2. Lateral flue runs shall not exceed half the total flue run and have a minimum rise of 20 mm per metre run. If the location does not permit this, provision shall be made for a duct to carry the flue vertically off the appliance through the building to terminate in the ambient atmosphere.

Gas Piping

A licensed gas fitter must install the gas piping. The connection at the appliance is to a 3/4" BSP male thread, located at the inlet of the gas control (found at the lower front left hand side of the unit). A single female 3/4" BSP flare nut is supplied with the unit for connection to the required gas piping. An AGA approved appliance isolating cock must be installed close to the unit. Gas piping

material and size must be in accordance with the Gas Installation Code, AG 601. The gas connection must be tested for any leakage. **Do not use an open flame or other source of ignition for leak testing.** The following diagram illustrates a typical gas valve showing the location of the gas inlet and outlet and the pressure testing point.

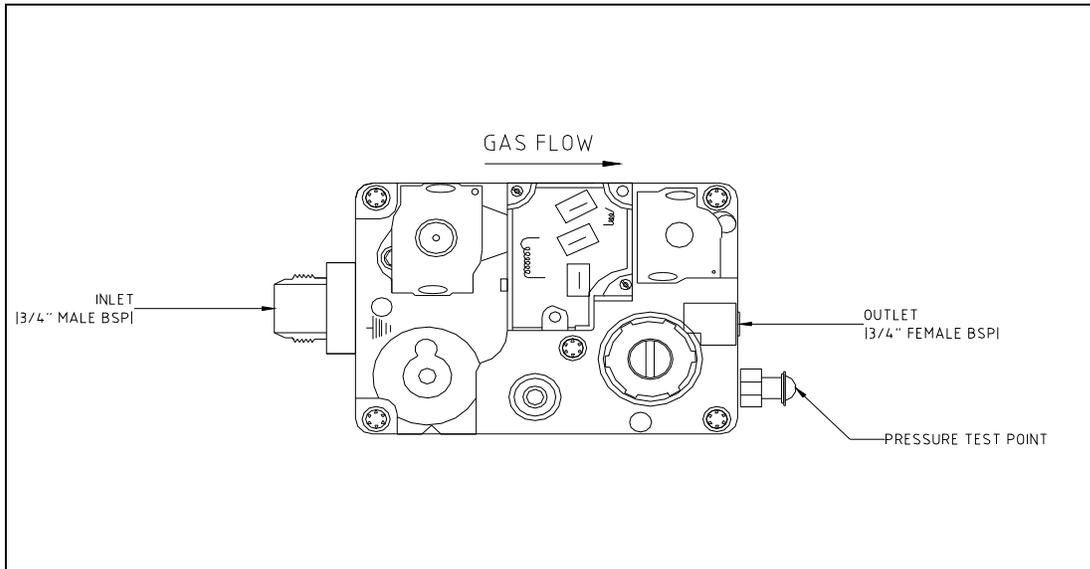


Figure 4: Gas valve connections (Note: the valve used may differ slightly from that shown)

Electrical Requirements

Power Connections

Check that the electrical supply meets the values specified on the nameplate and wiring diagram of the unit. The wiring diagram should be found on the front panel of the heater. A 10-ampere general-purpose outlet is required to be positioned within 1.5 m of the appliance. **Wiring shall be in accordance with the local supply authority regulations.** Ensure that the polarity of the power outlet is correct, as shown in Figure 5.

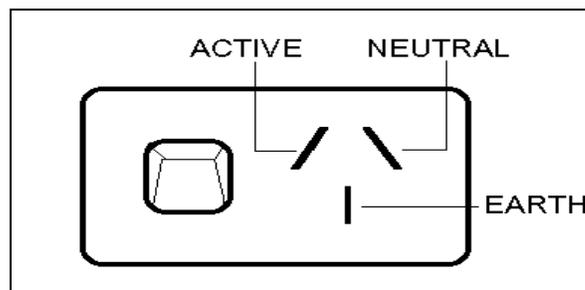


Figure 5: Power point connection polarity

A suitable artificial light is to be provided near the appliance to assist with servicing and the switch placed adjacent to the access opening.

Room Thermostat

The appliance is supplied with either a manual or a programmable electronic room thermostat. The thermostat should be installed on an internal wall, approximately 1.5 m above the floor where it will be exposed to normal room air circulation. It should not be installed on an outside wall or where it is exposed to direct sunlight, heat sources, draughts, or other conditions, which could adversely affect its operation. Generally, the living or dining room is a suitable location, provided there are no cooking facilities or refrigeration appliances on the opposite wall facing the thermostat. Mount the thermostat and route the 24-volt control wiring from the thermostat to the heater unit. Connect the terminals labelled “R” and “W” on the thermostat to the screw type terminals labelled “R” and “W”, respectively, on the PCB connection strip. The heat anticipator setting for the manual thermostat should be set at 0.6 Amps. Ensure that the hole through the wall for wiring to the thermostat is sealed to prevent draughts from affecting the thermostat. The control wiring that passes into the heater should use the supplied cable gland. This gland should be fixed in the hole located at the lower left hand side of the upper access door. For further information concerning the thermostat please refer to the separate thermostat instructions supplied with the unit.

Duct Connections

All return air duct connections are circular. On all models the supply air ducting is elliptical. Refer to Table 2 for dimensions. A single starting collar is provided with the unit. **It is very important to the success of the installation that the duct system be properly designed and installed.**

Warm Air Ducting

From the outlet/supply air duct connection of the unit, install adequately sized ductwork to the outlet/supply air registers. Flexible ducting should be used where noise transfer may be a problem particularly at the duct connection points. All ductwork, fittings and registers shall be sized to comply with AG 706, Design Manual for Indirect Gas Fired Ducted Warm Air Central Heating Systems. It is highly recommended that the ductwork be insulated, especially where it runs through an unheated space. The supply air connection should be transitioned to the proper duct size. All ducts should be suspended using flexible hangers. Ductwork should not be fastened directly to the structure. Care should be taken to ensure that all ducting is free of internal obstructions, free of leaks and adequately supported. Likewise ducting should not be crushed or slack in any manner.

Return Air Ducting

A return air duct must be provided and should draw air from a central location within the house. The recommended duct length is 6 meters. This ducting may be installed to either or both of the return air connections found on the left and right hand rear sides of the unit. In instances where the unit is drawing air from a building cavity make certain that it is fully sealed. This ensures that outside air is not drawn into the system, which will affect unit performance.

Outlet Registers

Suitable outlet registers must be provided in all areas being heated.

Filters

The use of filters is recommended in order to keep the duct system clean and to collect dust, lint and other debris from entering the heating unit. A filter is usually installed in the return air duct. It should be in a position where it is accessible for ease of cleaning. Where a filter is fitted, the return air grille dimensions should be increased by at least 30%.

Add-On Cooling

Where, either presently or in future, add-on cooling is to be installed the indoor coil section should be installed at least 3 metres downstream of the supply air duct connection.

System Balancing

Provision for system balancing by using dampers or other suitable means for adjusting airflows must be provided in the duct layout.

Fan Adjustment

The fan is preset at the factory to operate at high speed. The speed can be changed by changing the wiring to different step points on the socket of the fan scroll.

Notes

1. A minimum 30-second delay should be given to allow the fan to reach the selected speed.
2. It is important that the fan speed be set so that discharge air temperature does not exceed 60 °C.

Pre-commissioning Check List

- Have all the gas lines been checked for leaks?
- Is the blower correctly wired?
- Thermostat correctly wired with correct polarity?
- Thermostat anticipator set to 0.6 Amps?
- Filters clean and in place?
- Outlet registers and return air grille are open?
- Ductwork sized adequately and correctly installed?

Operating Instructions

The Pluto heater does not have a standing pilot. It is equipped with an energy saving electronic ignition device, which automatically lights the burner when the

thermostat calls for heat. Do not manually light burners with a match or other source flame.

Preliminary

Set the wall thermostat to the “OFF” position.

Open duct registers in rooms.

Check gas supply is turned on at gas cock.

Lighting Instructions

- Step 1. Check that the thermostat is set to “OFF”.
- Step 2. Turn 240 VAC power “ON” at unit.
- Step 3. Turn the thermostat to “ON” and to a temperature above ambient room temperature. Unit should ignite in approximately 30 seconds.
- Step 4. For natural gas and LPG units the heater will attempt ignition only once and should ignite, however, attempts ignition again if the flame is lost due to some reason. The PCB on the board rechecks ignition every hour then after.

Sequence of Events

- a. When the thermostat is turned up it calls for heat.
- b. The appliance control enters a pre purge period of 30 seconds.
- c. A direct spark ignitor will be energised to ignite the gas after the pre-purge period.
- d. Simultaneously the main gas valve opens.
- e. The burner will light and the flame sensor will detect the presence of the flame. The ignitor will de-energise after the flame is sensed. If the flame sensor does not detect the presence of the burner flame, the gas valve will close.
- f. The room fan will come on after 30 seconds.
- g. The furnace will remain in operation until the thermostat is satisfied.
- h. Once the thermostat is satisfied, the gas valve will close and the fan will turn off after approximately 50 seconds.

If the unit does not ignite-

- Step 5. Turn the thermostat to “OFF” for 3 seconds, then back on again.
- Step 6. Turn the thermostat to “ON”. Unit should ignite in approximately 30 seconds.

Often in new installations there is a period of time required to purge the gas line of any air, which may be present. If having proceeded through steps 1-6 and determined that the gas line has been purged of gas and the system still fails to ignite/operate correctly, refer to the Service Instructions and wiring diagram given in the end, or contact the Service Division of Eco Pacific on (03) 9706 6228.

Consideration should be given to the other possible causes for the equipment to fail to operate. The PCB LED flashing at varying rates as listed below indicates some of these other problems:

2 flash = system lock out- failed to detect or sustain flame. Check that the flame sensor is connected on to the board and positioned properly above the burner port.

4 flash = High limit or manual overheat switch opened, wait until the auto switch closes, or if manual cut off- see if there is obstruction in the duct, open more registers, manually reset the manual switch and try the ignition from the thermostat again.

5 flash = Flame sensed and Gas valve not energised, check the gas valve.

Steady light on = internal failure (microcontroller failure and power on self-check)

If the system still fails to operate, please contact Eco Pacific on (03) 9706 6228.

Once the unit is operating, set the thermostat to the temperature which satisfies your comfort requirements.

Commissioning Procedure

1. Check the burner pressure setting. The pressure test point is as shown in Figure 4 and is a 3/8" gland type fitting. The correct pressure for Natural Gas is 0.87 kPa. The correct pressure for LPG is 2.7 kPa.
2. Have the appliance ignite by setting the room thermostat to call for heat by raising the set point above the current room temperature.
3. Having successfully achieved ignition, after a period of 5 minutes, check the airflow at all the registers and adjust the dampers to achieve design air quantities. Maximum air delivery temperature at the outlets should not exceed an average of 50 °C. Maximum air delivery temperature at the supply air connection should not exceed 60 °C, or 55 °C for Extra Air models. If this requirement is not met the blower speed must be increased.
4. Check the operation of the over temperature switch by restricting the airflow (the over temperature switch will automatically reset on cooling down). Restricting the airflow can be achieved by blocking the area of the return air grille.
5. Turn the room thermostat to "OFF". The fan should stop after a period of approximately 50 seconds.
6. Check the flue for leaks and spillage. Spillage may occur if the flue installation is faulty. If so this situation must be corrected.

The user must be instructed on how to correctly operate the system

All units are fitted with automatically resetting high temperature limit switches. It is important to leave a minimum number of registers open otherwise the unit will cut out on the high temperature limit (a typical number is approximately 3, 6 & 8 for P12, P20, & P25 respectively).

In the case of power failure, the unit will go to lockout and the high temperature limit switch may be activated. When power is restored the high temperature limit will automatically reset but the thermostat will have to be turned down and up again to start up the system.

Abnormal Operation

Should any of the following characteristics occur, advise the user to contact their local Eco Pacific service agent or the local gas authority immediately:

- Smell of gas.
- Unusual odours from outlet registers.
- Smoke or fumes from outlet registers.
- Excessive or unusual noises emanating from the appliance.

Warnings

Advise the user of the following issues:

- Do not place articles on or against the heater.
- Do not use or store flammable materials near the heater.
- Do not spray aerosols in the vicinity of the heater while it is in operation.
- The front cover of the heater must be fitted while the unit is in operation.

Maintenance

Advise the owner/operator of the need to clean any filters if fitted. Never turn a dirty filter around to allow air to flow in the opposite direction. Cleaning or replacing filters regularly keeps the system operating at peak efficiency levels. The frequency at which cleaning or replacement occurs depends upon the hours of operation and the local environment.

Final Checks

Have all parts of the heater been inspected for damage due to transport?

Has a suitable location been selected?

Have electrical power connections been made **according to all relevant standards**?

Has the gas piping been connected **according to the relevant standards**?

Has the electrical control wiring been connected to the unit in accordance with the enclosed instructions?

- Has the inlet gas pressure to the heater been set correctly?
- Has all the required ductwork been installed properly?
- Has the correct operation of the unit been tested?
- Have all the relevant regulatory bodies been advised of the installation?
- Has the warranty card been completed and returned to Eco Pacific?
- Has the Installer's Declaration been signed off in the Operating Instructions provided with the heater?
- Has the consumer been given a copy of the Operating Instructions and instructed on how the system operates?
- Has the consumer been advised of the system's servicing requirements?

General Information

Table 1: Specifications data

Item	Model				
	Pluto 12	Pluto 20	Pluto 20 EA	Pluto 25	Pluto 25 EA
Heat Input (MJ/h)	55	85	85	110	110
Heat Output (kW)	12	19	19	25	25
Air Flow (L/s at 75 Pa ESP)	325	520	630	690	880
Weight (kg)	35	52	53	65	66
Electrical Power(V/Ph/Hz)	240/1/50	"	"	"	"
Control (V)	24	"	"	"	"
Total Current (A)	3	4	4	5	4
Maximum Add-On Cooling (kW)	-	7-10	10	14	16

Table 2: Dimensions (mm), refer Figure 6 below

Dimensions / Model → ↓	Pluto 12	Pluto 20	Pluto 20 EA	Pluto 25	Pluto 25 EA
A Width	760	955	955	960	955
B Depth	280	320	320	380	320
C Height	555	740	740	740	740
D Flue Collar	100	125	125	125	125
E Duct Connection	250	300	350	350	400

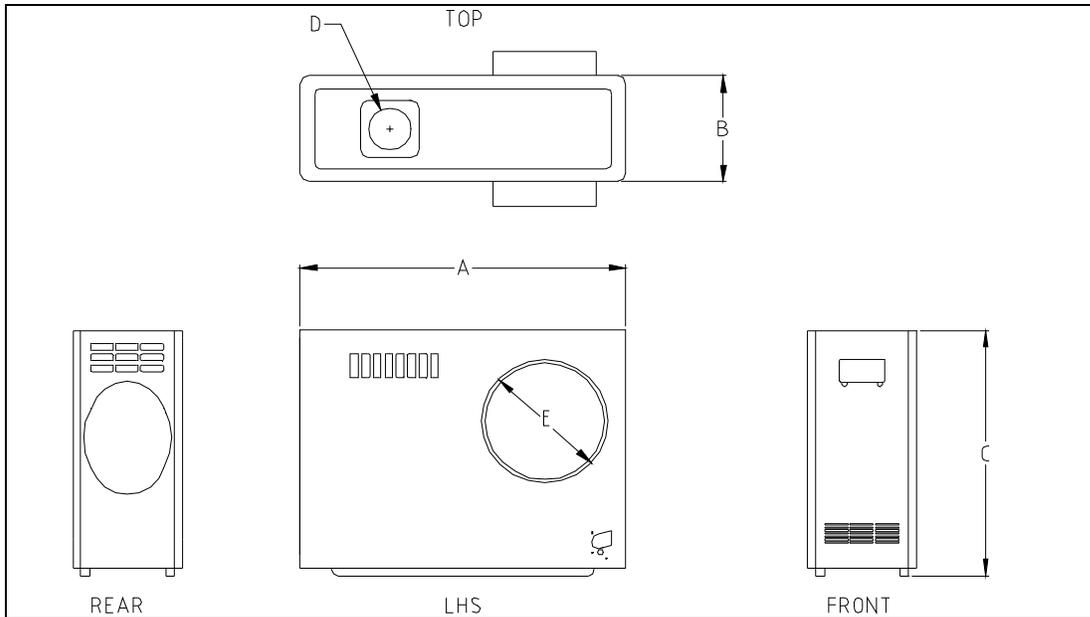


Figure 6: Dimension locations

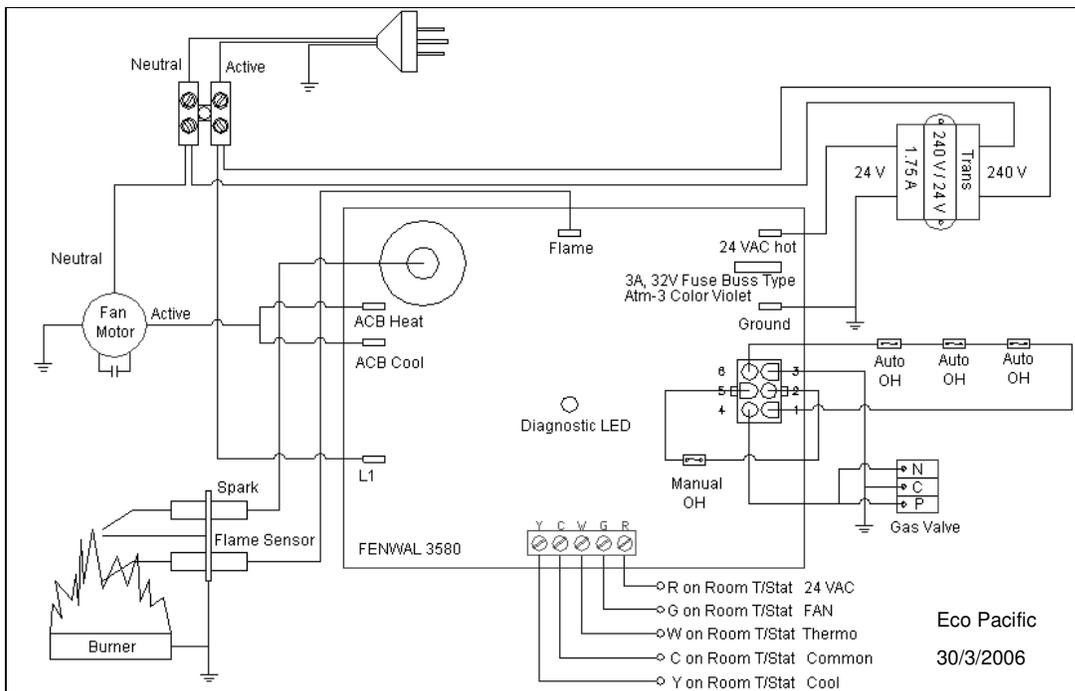


Figure 7: Wiring Diagram



P L U T O
CENTRAL HEATING RANGE

