3.0 Operation

⚠ WARNING!


Improper operation of the heater may result in explosion, fire, shock and carbon monoxide poisoning. Follow all guidelines and warnings in this manual and national, provincial and local codes. Always conduct safety checks before operating this heater. Do not operate the heater in unsafe conditions.

Important! Before operating this heater, conduct the following safety procedures:

- Check for any possible gas leaks.
- Alert all persons about the hazard of high surface temperature and to keep a safe distance away in order to avoid burns and possible clothing ignition.
- Provide supervision when young children are in the area of the heater.
- Check to make sure that clothing isn't hung from the heater and that flammable materials are not placed on or near the heater.
- Check that all guards or protective devices are in place and secure.
- Check the hose assembly for excessive abrasion, wear or damage. If necessary replace. The replacement hose **must** be that specified by Brant Radiant Heaters Limited.
- Check control compartment, burners and circulating air passages for debris. If necessary, remove the debris.

Sequence of Operation:

Starting Circuit:
When voltage is applied to L1 and L2, a circuit is completed from L1 via the blower motor to L2. The blower fan is mounted in the control box and rated to supply sufficient air for combustion. Air pressure generated by the blower fan will cause the normally open pressure switch to close. Another circuit is completed from L1 to the spark ignition module and back to L2. After a seven (7) second pre-purge, the spark electrode and gas valve energize simultaneously. The trial for ignition is fifteen seconds.

Running Circuit
After ignition, the flame rod monitors the flame. As long as a flame is present, the valve is held open. If the flame is lost, the control acts to close the valve within seconds, and a new trial sequence identical to that at start-up is initiated. If proof of flame is not established within the 15 second trial for ignition, the unit will retry two additional times before entering lockout mode. If lockout occurs, the control can be reset by briefly interrupting the power source.

Lighting Instructions:

1. Rotate heater's valve to "ON" position.
2. Close electrical circuit (usually thermostat).
3. If the heater fails to light, turn "OFF" gas, open electrical circuit and wait 5 minutes before repeating.

Shutdown Instructions

1. Open electrical circuit (usually thermostat).
2. Turn off electrical power if service is to be performed.
3. Rotate heater's valve knob to "OFF" postion.

Wiring Diagrams

Figure 3.1 • PH Series 120V

Amp draw:
120V- .25 starting, .24 running

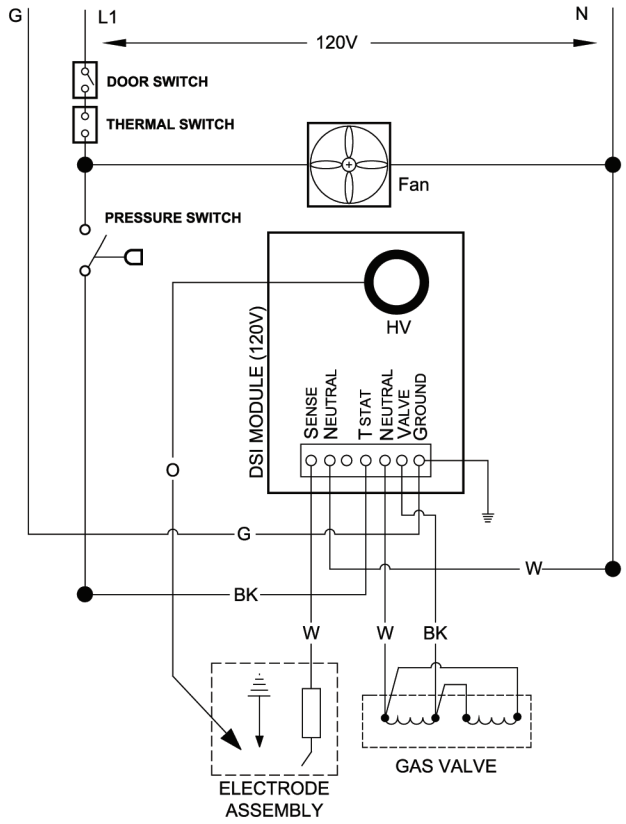
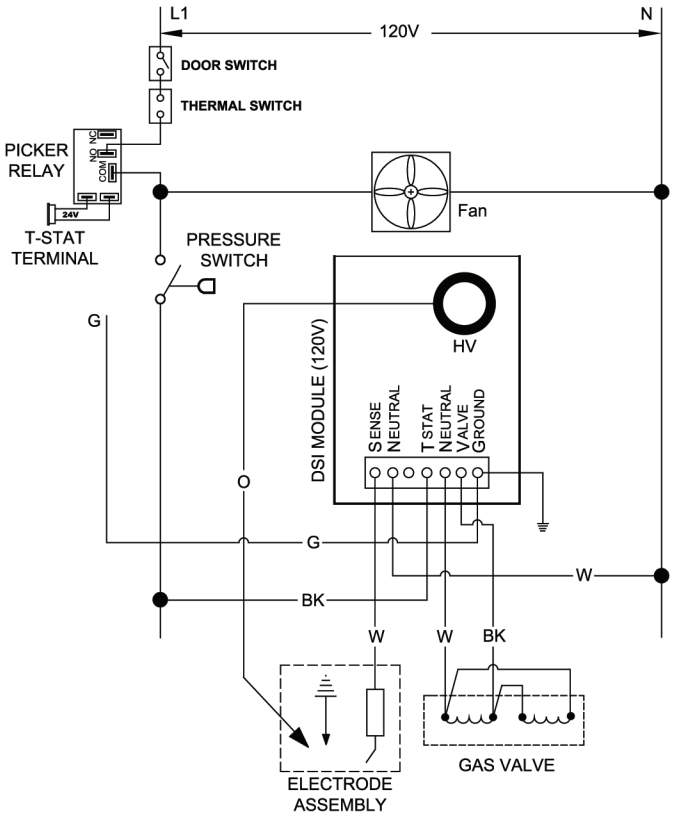


Figure 3.2 • PH Series 120V with 24V control

Amp draw:
24V- .10 starting
120V- .25 starting, .24 running



4.0 Maintenance

⚠ WARNING!

Always wear clothing that protects the body and use protective glasses when maintaining the heater.

Electrical shock or explosion may occur when conducting maintenance while the heater is connected to the power source and gas supply. Disconnect power and gas supply to heater before servicing.

Burner malfunction may result in explosion or fire. Never operate the heater if there are any signs of malfunction, excessive wear or damage. Call a professional for assistance.

NOTICE

Cleaning the heater elements with high pressure air may cause damage to the elements and equipment failure. Do not blow out heating elements with high pressure air.

Before each use:

- Check the gas supply line and hose assembly for any possible gas leaks or damage.
- Check heater elements for debris. Visually check burner flames.
- Keep the heated area clear and free of combustible materials, gasoline and flammable vapours and liquids. Ensure there is no obstruction of the flow of combustion and ventilation.

Periodic maintenance:

- Clean the heater with cleaning agent suitable for the unit's construction material (i.e. stainless steel cleaner).
- Lubricate moving parts.
- Inspect the gas supply piping system for any signs of corrosion or failure. Replace if necessary.

Before conducting maintenance on the heater disconnect the power and gas supply. When pressure testing the gas supply piping system, follow these guidelines:

- At a test pressure in excess of 1/2 psig (3.5 kPa) the heater and ball shutoff valve must be disconnected from the gas supply piping system during any pressure testing of the system.
- At a test pressure equal or less than 1/2 psig (3.5 kPa) the heater must be isolated from the gas supply piping system by closing it's individual manual shutoff valve during any pressure testing of the gas supply piping system.

Cleaning the main burner:

Gently use an air hose to blow any accumulated dust and/or dirt off the heater. **Air hose pressure should not exceed 30 psig.**

Gently, pass an air hose over entire exposed area of the ceramic. **A distance of 2' to 4' from unit is recommended.**

Gently place the air hose outlet into the venturi tube and allow the air to flow for approximately one minute.

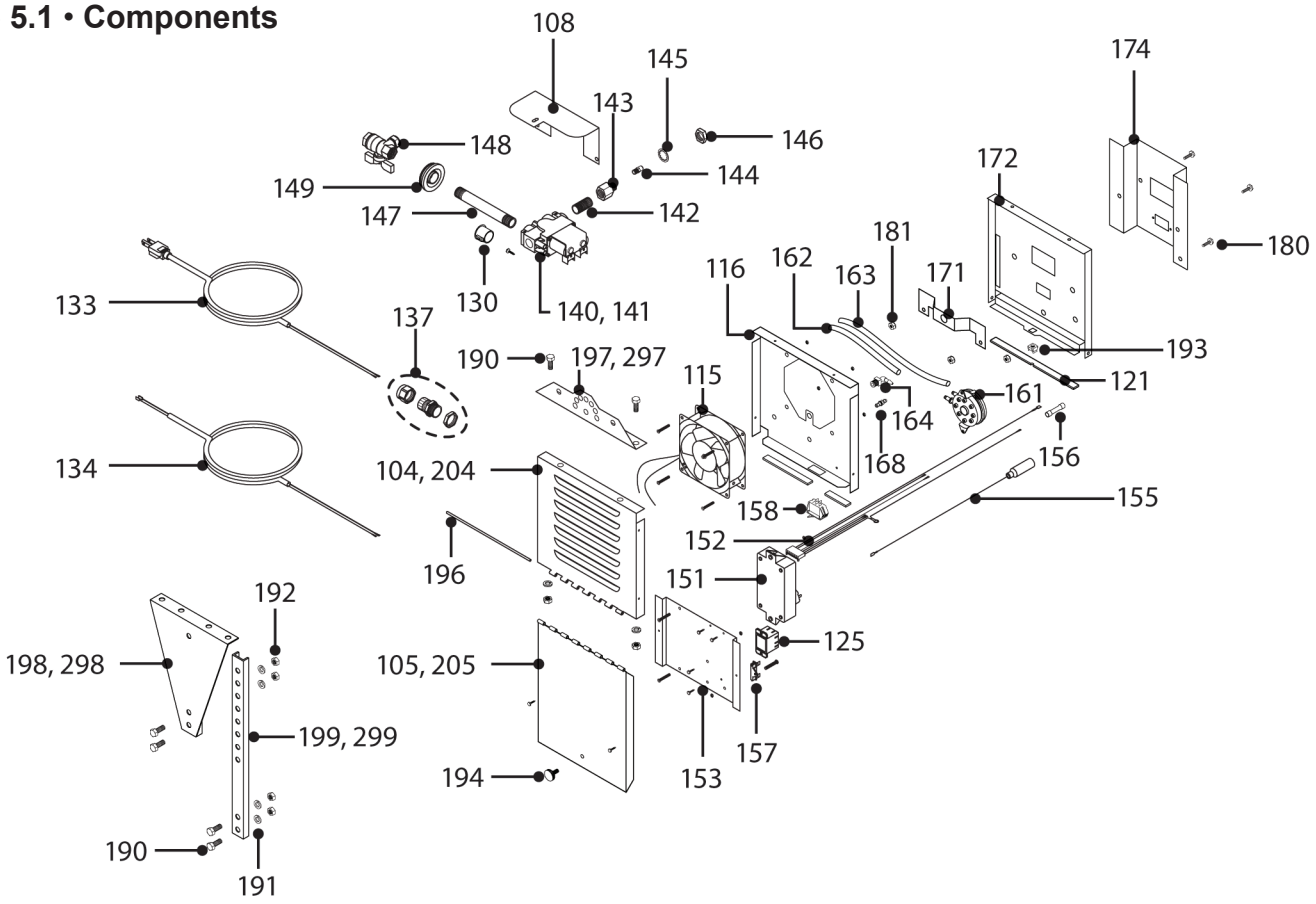
During long periods of non-usage, remove or cover heater with a polyethylene bag and shut off gas supply. If further service to the heater is desired, contact your representative or the factory.

Figure 4.1 • Troubleshooting Guide

Symptom	Possible Cause	Corrective Action
Burning of gas-air mixture inside plenum (flashback).	• Heater mounted at incorrect angle. • Excessive drafts. • Gas leaking at orifice. • Separation of ceramic grids. • Ceramic grids cracked.	• Mounting angle 0° - 30°. • Relocate or shield from draft. • Check with leak detector solution. • Replace burner. • Replace burner.
Delayed ignition.	• Electrode out of specification. • Low gas pressure. • Partially blocked orifice. • Improper orifice size. • Incorrect gas.	• See ignition system insert. • See section 2.0, Gas Supply. • Clean or replace. • Consult dealer. • See unit nameplate.
Low ceramic surface temperature or excessive rollout.	• Dirty or plugged burner ceramics. • Partially blocked orifice. • Low inlet gas pressure. • High or low manifold gas pressure. • Foreign matter in venturi tube. • Excessive dark spots in burner. • Gas supply piping too small. • Incorrect gas.	• See periodic maintenance instructions. • Remove and clean. • See Section 2.0, Gas Supply. • Adjust main valve regulator as specified. • See periodic maintenance instructions. • See periodic maintenance instructions. • Increase inlet pressure or replace piping. • See unit nameplate.
Control system overheating.	• Heater not mounted correctly. • Heater mounted too close to ceiling.	• Mounting angle 0° - 30°. Level left to right. • Observe clearance to combustibles.
Gas odor.	• Loose pipe connection.	• Check connections. Tighten as necessary.
Heater cycles repeatedly.	• Heater located in drafty area. • Low gas pressure. • Thermostat located in drafty area. • Defective flame electrode or circuit board.	• Relocate or shield from draft. • See Section 2.0, Gas Supply. • Relocate thermostat. • Replace.
No spark; no ignition.	• Lack of 120V or 24V incoming voltage. • Open high voltage wire. • Fan not operating. • Improper electrode gap. • Loose or open wire connection. • Pressure switch not satisfied. • Poor or no equipment ground. • Unit in “safety lockout” mode. • Defective “gaslighter” control.	• Check power supply. • Isolate an ohm for resistance, replace if 0. • Locate source of electrical problem or replace faulty fan. • See Ignition System specifications. • Check all wires, tighten or replace. • Verify fan operation. Remove obstructions. • Check all connections, provide positive earth ground. • Interrupt power source, repeat trial for ignition. • Replace.
Heater lights and “locks out” after approximately 10 seconds.	• Poor or no equipment ground. • Polarity is reversed. • Low gas pressure. • Electrode not sensing. • Heater mounted at incorrect angle. • Defective “gaslighter” control.	• Check all connections, provide positive earth ground. • 120V to black, neutral to white. • See Section 2.0, Gas Supply. • Relocate or replace if defective. • Mounting angle 0° - 30°. • Replace.
Spark is present. No main gas operation. Unit “locks out”.	• Gas valve in “OFF” position. • Defective gas valve. • Defective “gaslighter” control.	• Turn to “ON” positon. • Isolate and check for resistance, replace if 0. • Replace.
Heater will not shut off.	• Defective thermostat or wiring. • Gas valve stuck or open. • High gas pressure.	• Replace or repair. • Replace. • See Section 2.0, Gas Supply.

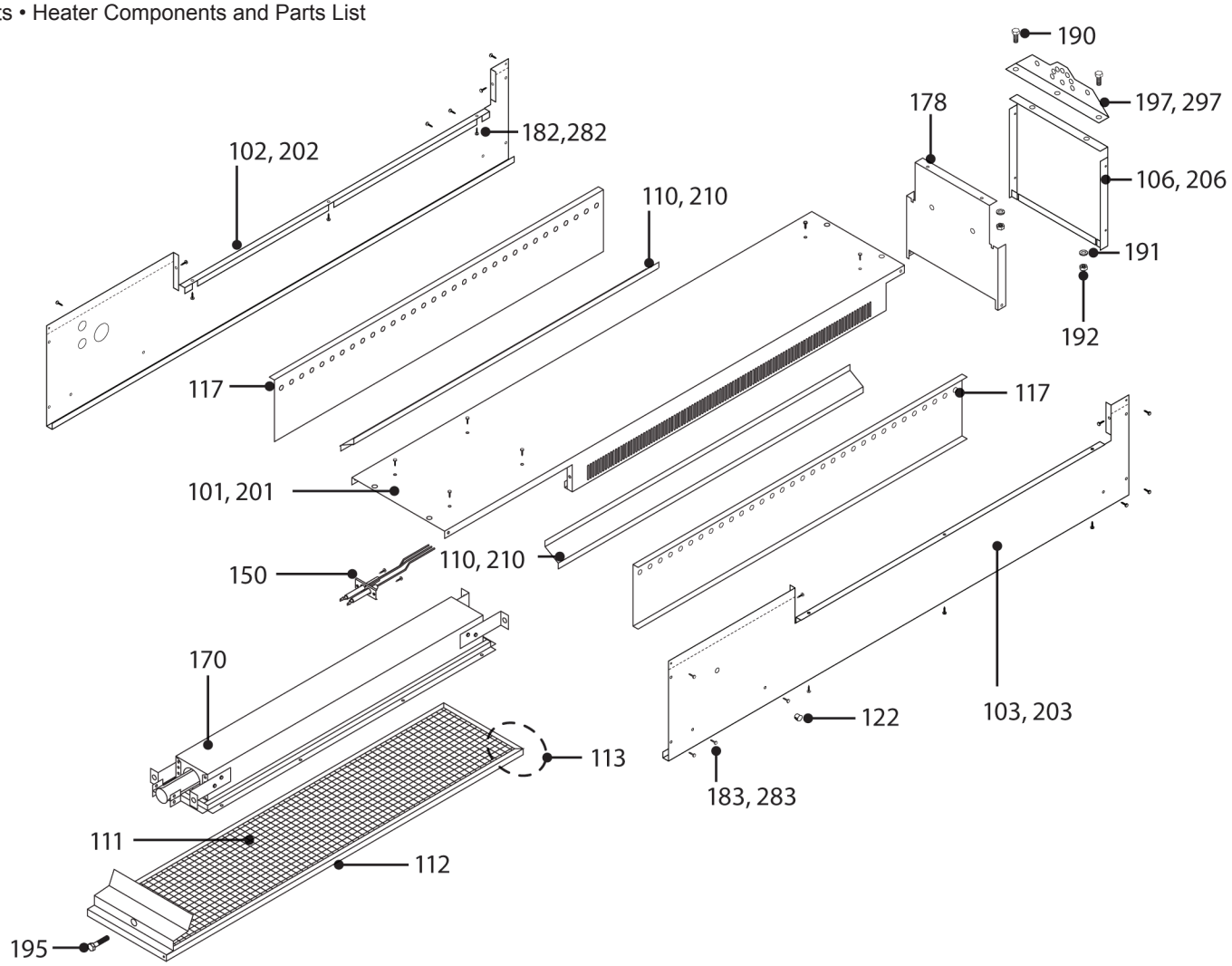
5.0 Parts

Figure 5.1 • Components



PART #	DESCRIPTION	PART#	DESCRIPTION
PH-101	Top Panel	PH-134	Optional 24C Cord Set
PH-102	Left Frame Side Panel (Gas & Electric)	PH-137	Strain Relief (TP-68B)
PH-103	Right Frame Side Pane	PH-140	Gas Valve - Natural Gas
PH-104	Control End Panel w/ Louvers & Hinge	PH-141	Gas Valve - Propane
PH-105	Control Box Cover w/ Hinge	PH-142	3/8” Closed Pipe Nipple
PH-106	End Panel	PH-143	3/8” Reducer Fitting (TP-56)
PH-108	Valve Mounting Base	PH-144	Gas Orifice (Specify Model)
PH-110	Rain Guard	PH-145	9/16” Ext. Lock Washer
PH-111	8” x 35” Egg Crate (PH-EC)	PH-146	9/16”-18 Hex Jam Nut
PH-112	Egg Crate Frame w/ Flashfield	PH-147	3/8” x 5” Inlet Pipe Nipple
PH-113	Egg Crate Assembly w/ Frame & Nutset	PH-148	3/8” Ball Valve/Inlet Tap
PH-115	120 Volt Fan	PH-149	Rubber Inlet Gromet
PH-116	Fan Mounting Panel	PH-150	Ignitor Electrode
PH-117	Air Distribution Panel	PH-151	Circuit Board (MARK 10DX-117)
PH-121	Weather Stripping	PH-152	100-900 Harness (DRWH-120)
PH-122	3/4” Black Inlet Pressure Tap Gromet	PH-153	Controls Mounting Panel
PH-125	Optional Picker Relay	PH-155	12” Orange High Voltage Wire w/ Boot
PH-130	3/4” Black Plastic Inlet Cap	PH-156	2-Way Red Crimp Connector
PH-133	120V Cord - 3 ft.	PH-157	Thermal Switch

To order replacement parts call Brant Radiant Heaters Ltd. at Tel: 1-519-442-7823 or Fax: 519-442-7321



PART #	DESCRIPTION	PART#	DESCRIPTION
PH-158	Door Switch	PH-194	Control Cover Thumbscrew
PH-161	Pressure Switch (TP-264B)	PH-195	#5/16-18 x 1/2” Gold Nutsert Bolt
PH-162	Short Vinyl Hose - 4.5”	PH-196	Control Cover Hinge Rod
PH-163	Long Vinyl Hose - 9.0”	PH-197	Hanging Bracket (Black)
PH-164	Plastic Gas Valve 90° Vent (TP-245)	PH-198	Wall Bracket Assembly (Black) - Optional
PH-168	Brass Fitting (TP-97)	PH-199	Support Channel (Black) - Optional
PH-170	Burner Assembly w/ Hold-Downs & Footings	**STAINLESS STEEL PARTS**	
PH-171	Valve Mounting Bracket	PH-201	Top Panel (SS)
PH-172	Valve Mounting Panel	PH-202	Left Frame Side Panel (Gas & Electric) (SS)
PH-174	Burner & Electrode Mounting Panel	PH-203	Right Frame Side Panel (SS)
PH-178	Burner End Mounting Panel	PH-204	Control End Panel w/ Louvers & Hinge (SS)
PH-180	#1/4-20 x 1/2” Machine Bolt (DR-20MB)	PH-205	Control Box Cover w/ Hinge (SS)
PH-181	#1/4-20 Hex Nut (DR-20HN)	PH-206	End Panel (SS)
PH-182	#8 x 1/2” SLTD HW Screw (Standard)	PH-210	Rain Guard (SS)
PH-183	#8 x 1/2” SLTD HW Screw (Black)	PH-282	#8 x 1/2” SLTD HW Screw (SS)
PH-190	5/16” x 3/4” Hex HD Bolt	PH-283	#8 x 1/2” SLTD HW Screw (Black or Plated Stainless)
PH-191	5/16” Split Washer Zinc	PH-297	Hanging Bracket (SS)
PH-192	5/16” Hex Nut	PH-298	Wall Bracket Assembly (SS)
PH-193	#1/4-20 Square Cagenut	PH-299	Support Channel (SS)

Note: (SS) denotes parts available in stainless steel.