



Easy Radiant Works

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Installation / Operating Instructions for **The Equator** “H.I.” Series Indoor/ Outdoor Infrared Patio Heaters

The Equator heaters are C.S.A. design certified as an unvented infrared heater for outdoor or indoor installation. All units are equipped with direct spark ignition and 100% safety shutoff for safety and economy.

The aluminized steel enclosures and aluminium face grill provides resistance to wind and rain. The slim design and horizontal or angle mounting option provides versatility to fit almost any patio situation.

The installation of Equator heaters must only be performed by licensed technicians, trained and educated in the installation of this type of gas appliance.

WARNING: Read this manual completely before first installing or servicing this equipment. Failure to read and fully understand this manual may result in an improper installation, which could cause faulty operation of the heater, property damage, serious injury or death. If you do not fully understand these instructions, contact your Equator representative or the manufacturer prior to the commencement of installation, servicing or maintenance. Easy Radiant Works accepts no responsibility for damages whatsoever resulting in improper installation of this heater. Improper installation voids all warranties. This manual must remain with the heater at all times.

DANGER

For indoor installations, the installation must comply with all local and governing codes. Minimum ventilation requirements as described on page 7 of this manual (or as governed by applicable codes) must be met. Improper ventilation may cause injury or death.

For Your Safety...IF YOU SMELL GAS

- 1. Open all windows.**
- 2. Do not try to light any appliance.**
- 3. Do not use any electrical switches**

Do not use any telephones in the building. Immediately call your local gas supplier from a neighbour's, and follow the gas supplier's instructions. If you are unable to reach the gas supplier, CALL THE FIRE DEPARTMENT!

Installations in Canada must conform to the National Standards of Canada CAN/CGA-B 149.1&2-M86, and all local codes.

In the United States the installation of this appliance must conform with ANSI standard Z223.1 entitled “National Fuel Gas Code” and any applicable local codes. Heaters installed in aircraft hangers must be installed in accordance with American National Standards for Aircraft Hangers, ANSI/NFPA no. 409. Heaters in public garages must be installed in accordance with NFPA No. 88A standards for parking structures.

Each heater must be electrically grounded in accordance with the CSA Canadian Electric Code C22.1 and in the U.S. the National Electrical Code ANSI/NFPA 70 when an external electrical source is utilized.

The gas inlet supply and normal operating manifold pressure for each heater are as follows. For gas supply line pressures in excess of ½ PSIG, consult with your representative from the factory.

Gas Inlet Pressure	Natural Gas	L.P. Gas
Maximum pressure	½ psig	½ psig*
Minimum pressure	7” w.c.	11” w.c.
Manifold pressure	6” w.c.	10” w.c.

For gas supply line pressure in excess of ½ PSIG, consult with your gas supplier.

Do not locate either the gas or electrical supply line directly above the flue outlet of the heater.

The heater must be installed in a location so that it is readily accessible for servicing and have no restriction of airflow to the air inlet of the heater’s casing.

Clearances & Safe Mounting Practices.

Each heater must be installed, so that the following “minimum clearances to combustibles” are maintained. Combustible materials are considered to be wood, compressed paper, plant fibres, or other materials capable of being ignited and burned. Such materials shall be considered combustible even though flame-proofed, fire retardant treated or plastered. Additional clearances may be required for glass, painted surfaces, plastics, vinyl’s and other materials which may be damaged or melted by radiant or convection heat. A minimum clearance of 24 inches (above the heater) must be maintained to plastics, vinyl’s or any other materials that may be adversely affected by radiant or convection heat.

Warning: The clearances below are also applicable to vehicles parked below heaters. Applicable to both natural gas or propane heaters.

Model	Input	Sides	Back	Above	Below	Mounting Angle
HI-30-40	30,000/40,000	24	8	17	48	Angle or Horizontal

Electrical Requirements

A 120/ 24VAC volt 20 VA NEC Class 2 transformer is provided with the heater. Should one transformer be used to supply multiple units, a transformer approved as having at least a rating for the number of units times 20 VA must be used for controlling the heaters..

The control wire used to electrically connect one or more heaters together must have both adequate capacity and insulation temperature ratings for the total connected load. Minimum 18 gauge wire must be used for wiring distances less than 50 ft. from the heater to the transformer, and minimum 16 gauge wire for lengths greater than 50 ft.

If any factory wiring is to be replaced, it must be replaced with wiring material having a temperature rating of at least 105 degrees. C. Modifying factory wiring voids warranty.

Infrared Heat

The Equator heaters are effective in heating outdoor spaces because they utilize infrared or radiant heat. Infrared energy is the same type of energy we get from the sun. Infrared energy warms people and objects without heating the intervening air. Unlike the sun **Equator** heaters do not produce Ultraviolet (UV) rays that can be harmful. Infrared energy travels by line-of-sight so the designer must be aware that doors, panels or windows may obstruct the infrared energy from reaching the desired location. Overlapping infrared patterns from numerous heaters may be used effectively to provide even heat distribution.

Because infrared heaters heat people and objects, and thermostats measure air temperature, a thermostat may not be the best method for controlling outdoor heaters. Where multiple heaters are used, it is suggested that they be switched independently, so as to allow for flexibility in heating larger areas as the space becomes more occupied. A timer is a good method to ensure that all heaters are turned off when the patio is not being used.

Enclosed Patios

Enclosed patios must be large enough to meet the clearance, combustion air and ventilation requirements of **The Equator** heaters. For very small enclosed patios, **The Equator** heaters may not be suitable. Consult the local authority, for information on local codes prior to using the **Equator** in an enclosed area.

Patio Heating Design Considerations

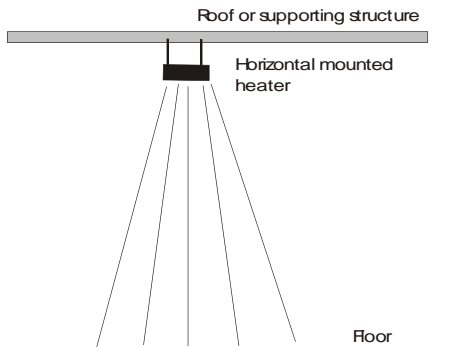
Heater placement is critical for effective and efficient patio heating. If heaters are placed too close together, or mounted too low, patrons of the patio may become uncomfortable. If heaters are placed too far apart, or too high, on a breezy or wind-swept patio, the area may never become comfortable.

Infrared heaters work best if placed in areas of greatest heat loss, such as the open side of a semi-protected patio. **The Equator** heaters may be mounted at up to a 45 degree angle so as to project inward to the centre of the area. Note clearances to combustibles on the chart on page 2.

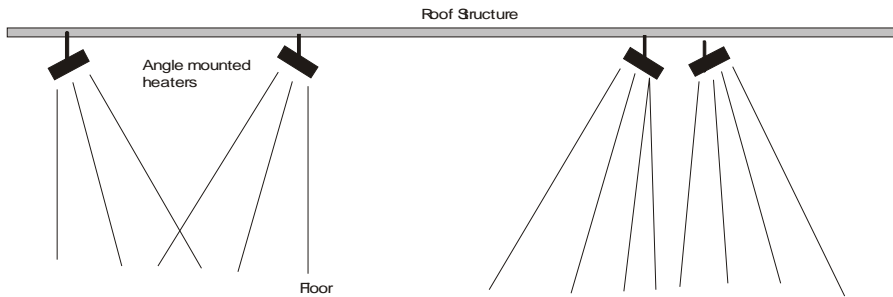
Windy conditions can be a problem when heating any patio. Windbreaks can be extremely effective in increasing comfort levels. The heating requirements of any patio depend greatly on local climatic conditions. It is recommended that you work with a local, and experienced supplier and installer who are familiar with the heating requirements of your area.

Typical Patio Layouts.

At a mounting height of 12 ft., each Equator heater will heat an area of approximately 12ft. x 14 ft. (168 sq. ft.) Conditions vary depending upon outdoor temperatures and wind conditions.



Individual heaters can be placed below a supporting structure without angle mounting.



Heaters can be installed with up to 45 degree angle to face inward toward each other or outward & away from each other.

Heater Clearance

Equator heaters must be installed with adequate space around each unit. When placed near wood or other flammable materials, appropriate clearances from combustible materials must be maintained. Even if materials surrounding the heater are non-combustible, adequate space around the heater is required to provide sufficient combustion air, ventilation of exhaust gases, and the general safe operation of the heater. They must NEVER be installed inside building recesses or inside a soffit. Fire sprinkler heads must be located an appropriate distance from the heater, or a sprinkler head with a high enough temperature rating, that normal operation of the heater will not activate, must be used. Please refer to local fire codes for guidelines for locating sprinkler heads near heaters.

Lighting Instructions:

To Start Heater:

1. Turn Manual gas valve to “ON” position.
2. Turn electrical supply “ON”

To Shut Down:

1. Turn manual gas valve to “OFF” position.
2. Turn electrical supply “OFF”.

CAUTION: If burner fails to ignite, shut down electrical power and wait five (5) minutes before turning power “ON”.

Servicing Instructions:

Turn off gas and electrical before attempting any service to this appliance. Heater may be serviced by opening door to control compartment. . Cover of control compartment must be removed for servicing by removing six screws holding cover in place. The cover must be removed if the gas controls, burner or burner orifice is to be replaced.

1. Removal of Burner

- a. Remove grille by removing two (2) screws at one end of grill near control door. Pull downward at the end and grill will be loose. The far end of the grill is supported by two (2) pins that enter two (2) holes in the reflector’s far end.
- b. Remove top of heater by removing screws holding top in place.
- c. The burner can be removed without removing the pilot-electrode assembly. However, extreme care should be taken to prevent the burner from contacting the fragile electrode when removing or reinstalling the burner. To remove the pilot-electrode assembly, pull loose the wire connected to the electrode. Detach the pilot tubing. Remove the two screws holding the pilot-electrode in place.
- d. Remove 3/8” hex locknut located inside burner orifice bracket holding piping assembly to burner. A 7/8” 12-point wrench will be handy to loosen the 3/8” locknut from the top of the heater.

- e. Remove two (2) screws holding the end of the burner. Carefully slide burner down and out. When reinstalling, be sure both ends of the burner are beneath the reflector and flanges.
- f. To reinstall burner. Reverse procedure.

2. Removal of Direct Spark Ignition Control.

Disconnect 24VAC volt wiring from electronic control.

Remove two (2) 8-32 x 1-1/4 screws and nuts holding control in place
Remove control

Trouble Shooting

1. If no spark from electrode; or if gas valve doesn't work then:
 - a. Check your power supply. Should have 24 volts between power wires. Use volt meter between inlet 24 volts wire and ground terminal at electrode plate to measure 24 volts.
 - b. Check continuity. Use ohmmeter. For example, check resistance between valve wire and ground. Should show almost no resistance. (0 ohms) through valve. If high resistance, check wire connectors.
 - c. Check spark gap. Should be 7/64" (.109") between electrode tip and pilot hood. If gap is too large, spark will occur at wrong location. If gap is too small, spark may not be hot enough to light pilot burner.
 - d. Be sure connectors are fully inserted into ignition control. (See Wiring Diagram on rating plate).
2. If sufficient gas flow then:
 - a. Gas manual valve not full "ON". Turn valve handle to full "ON" position.
 - b. Burner orifice plugged. Remove heater top, remove burner orifice (use 1/2" hex wrench) and thoroughly clean. Spiders often crawl into orifice hole and make a web, blocking the orifice.

Stainless Steel Heater

Stainless steel does not “rust”, however, air pollution can leave brown deposits on the heater. We recommend washing the outer stainless steel casing only with a mild detergent solution and wiping it dry with a soft cloth to bring back the original shine. The stainless steel may be expected to permanently darken around the flue outlet at the top of the heater over time with extended use

Gas Piping

1. A minimum pipe size of ½” is required for inlet piping. A ½” lever handled shut-off gas cock should be installed within 6 feet of the appliance for servicing the unit.
2. Check with local and provincial plumbing and heating codes regarding sizing of the gas lines.
3. All gas pipe connections to the heater(s) must be sealed with a gas pipe compound resistant to liquefied petroleum gases.
4. Installation of a drip leg in the gas supply line going to each heater is required to minimize the possibility of any loose scale or dirt within the gas supply line from entering the heater’s control system.
5. When checking for gas leaks, do not use an open flame. Use a soap and water solution.
6. For gas supply line pressures in excess of ½ psig, consult the factory or your local representative.
7. Installation of 1/8” N.P.T. plugged tapping, accessible for test gage connections, is required upstream of the gas supply connection to the heater.

Ventilation

1. It is recommended that a minimum building ventilation rate of four (4) CFM per 1000 BTUH of installed heater input be provided. This rate of ventilation may be obtained through either gravity or mechanical ventilation of the building.
2. In conjunction with building ventilation system, adequate fresh air into the building must be provided through fresh air inlets and/or building openings
3. Local authorities must be contacted to assure the ventilating system and heater installation are in compliance with any and all applicable codes.

Heater Operation

Upon installation of the heater and completion of the gas and electrical supply line to each heater, follow the steps outlined on the “Lighting Instruction” plate located on the inside of the control door.

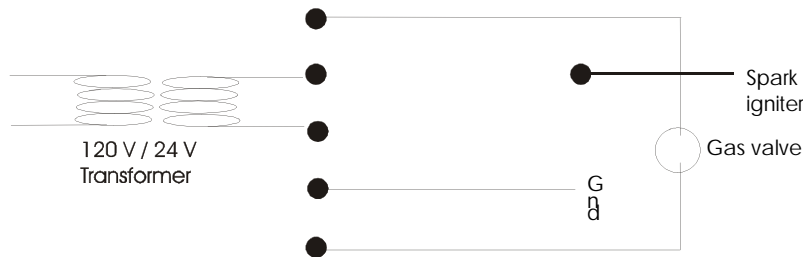
Maintenance

In order to get the maximum performance from your heater, we recommend the following be performed at least annually. More frequent service and maintenance may be required if heater is located within 2,000 feet of a waterfront.

1. With an air hose regulated to 30 psig, blow off any dust and dirt that has accumulated around the burner and inside the control compartment of the heater. Proper eye protection required.
2. From the front of the heater, direct the air hose from a distance of approximately twelve (12) inches over the entire exposed area of each burner’s ceramics.
3. Do not insert air hose into the inlet of the burner.
4. Remove main burner orifice, clean and reinstall.
5. Check to insure heater is securely mounted and the clearance from combustible material is maintained.
6. If additional service to the heater is required, contact your local representative of the factory.

Sequence of Operation

Turn gas and power “ON”. The pilot and burner should light within 4 seconds. A heat sensor will shut off the spark. If the burner does not light within 15 seconds, the heat sensor will shut “OFF” the gas valve. To relight the pilot and burner, shut “OFF” power. Wait 5 minutes. Turn power back “ON”.



Field & factory wiring ignition module
EQUATOR patio heater

Trouble Shooting

Problem	Possible Causes
No Spark to Pilot	<ul style="list-style-type: none">• Voltage under 24VAC• Bad Fuse• Improper spark gap (7/64" or .109)• Loose ground wire• Broken electrode• Faulty electronic module
Burner Won't Light	<ul style="list-style-type: none">• Air in gas line• Low gas pressure• Bad gas valve• Blockage in gas line• Manual gas valve turned "OFF"
Inconsistent Operation	<ul style="list-style-type: none">• Variable gas pressure (improperly sized gas line)• Variable voltage• Wind exceeding 15 mph• Tip angle exceeding 30 degrees• Debris inside burner• Erratic winds
Deterioration of the Front Grill	<p>The heater must be installed in such a manner as to allow the products of combustion or hot gases to vent out the top portion of the heaters. When operating normally, only radiant heat passes through the front grill. If conditions exist which force hot gases through the front grill of heater, the installation must be altered to correct the condition.</p>