



# SPACE-RAY



## INSTALLATION AND OPERATION INSTRUCTIONS INFRARED RADIANT PATIO HEATER



### COLD BLOCKER™

Models: WB10CE-N7 and L7

Two Stage (or Single stage)

UNVENTED - (For all Outdoor applications  
and Indoor Non-Residential Spaces)

**OWNER / INSTALLER:** For your safety this manual must be carefully and thoroughly read and understood before installing, operating or servicing this heater. This heater is intended for use with either Natural Gas or Propane Gas. It must be installed by a qualified service person or a licensed contractor in accordance with state and local codes.

**⚠ WARNING:** Improper installation, adjustment, alteration, service, or maintenance can cause property damage, injury or death. Read the installation, operation and maintenance instructions thoroughly before installing or servicing this heater. For assistance or additional information, consult a qualified installer, service agency or the gas supplier.

**For Indoor Installations INSPECT** all combustion air openings into the building and, if necessary, clear if they become blocked.

**FOR YOUR SAFETY:** If this heater is installed indoors, it must be in a sufficiently ventilated space. Exhaust fans **MUST** be operating on an appropriate cycle when heaters are operating to avoid a high concentration of carbon monoxide. When installed in insufficient ventilated spaces this heater may give off carbon monoxide, an odorless and poisonous gas. **CARBON MONOXIDE POISONING MAY LEAD TO DEATH.** Early signs of carbon monoxide poisoning resemble the flu with headaches, dizziness and nausea. If you experience these signs, **GET FRESH AIR IMMEDIATELY!** Have the heaters serviced as soon as possible and check the ventilation into the building.

**INSTALLER:** This manual is the property of the owner. Please present this manual to the owner when you leave the job site.

#### IF YOU SMELL GAS:

#### ⚠ DANGER

1. Shut off gas to the appliance.
2. Extinguish any open flame.
3. If odor continues, keep away from the appliance and immediately call your gas supplier.

DO NOT store or use petrol or other flammable vapors and liquids in the vicinity of this or any other appliance.

An LP-cylinder not connected for use shall not be stored in the vicinity of this or any other appliance.

**!IMPORTANT:** SAVE THIS MANUAL FOR FUTURE REFERENCE.

Gas Fired Products (UK) Ltd.  
Chapel Lane, Claydon, Ipswich, Suffolk IP6 0JL, England  
Phone 01473 830551 • Fax 01473 832055 • www.spaceray.co.uk • email: [info@spaceray.co.uk](mailto:info@spaceray.co.uk)

# Table of Contents

<b>1.0)</b>	<b>SAFETY</b> .....	<b>7</b>
<b>2.0)</b>	<b>INSTALLER RESPONSIBILITY</b> .....	<b>7</b>
<b>3.0)</b>	<b>GENERAL INFORMATION</b> .....	<b>7</b>
<b>4.0)</b>	<b>MINIMUM CLEARANCES TO COMBUSTIBLES</b> .....	<b>9</b>
<b>5.0)</b>	<b>SPECIFICATIONS</b> .....	<b>12</b>
<b>6.0)</b>	<b>PACKING LIST</b> .....	<b>13</b>
<b>7.0)</b>	<b>HEATER SIZING GUIDELINES</b> .....	<b>13</b>
<b>8.0)</b>	<b>TYPICAL HEATER LAYOUTS</b> .....	<b>14</b>
<b>9.0)</b>	<b>DIMENSIONS</b> .....	<b>15</b>
<b>10.0)</b>	<b>ACCESSORIES</b> .....	<b>15</b>
<b>11.0)</b>	<b>UNPACKING THE HEATER</b> .....	<b>16</b>
<b>12.0)</b>	<b>INSTALLATION</b> .....	<b>17</b>
12.1)	<i>HEATER MOUNTING ANGLE</i> .....	18
12.2)	<i>INDOOR INSTALLATION – HANGING METHODS</i> .....	19
12.3)	<i>INDOOR / OUTDOOR RIGID HANGING BRACKETS</i> .....	19
<b>13.0)</b>	<b>HEAT SHIELD INSTALLATION</b> .....	<b>22</b>
<b>14.0)</b>	<b>INSTALLATION OF THE CERAMIC GLASS</b> .....	<b>24</b>
<b>15.0)</b>	<b>GAS CONNECTIONS AND REGULATION</b> .....	<b>25</b>
15.1)	<i>INSTRUCTIONS FOR PRESSURE TEST GAUGE CONNECTION</i> .....	27
15.2)	<i>INLET GAS PRESSURE CHECK</i> .....	27
15.3)	<i>OUTLET GAS PRESSURE CHECK AND ADJUSTMENTS</i> .....	28
<b>16.0)</b>	<b>ELECTRICAL CONNECTIONS</b> .....	<b>29</b>
16.1)	<i>INTERNAL CONNECTION WIRING DIAGRAM</i> .....	30
16.2)	<i>FIELD CONNECTIONS AND WIRING DIAGRAMS – 2 STAGE</i> .....	30
16.3)	<i>FIELD CONNECTIONS AND WIRING DIAGRAMS – SINGLE STAGE</i> .....	32
<b>17.0)</b>	<b>VENTILATION</b> .....	<b>33</b>
<b>18.0)</b>	<b>LIGHTING AND SHUTDOWN INSTRUCTIONS</b> .....	<b>34</b>
18.1)	<i>SEQUENCE OF OPERATION</i> .....	35
<b>19.0)</b>	<b>SERVICING AND ANNUAL MAINTENANCE</b> .....	<b>35</b>
<b>20.0)</b>	<b>TROUBLE SHOOTING</b> .....	<b>37</b>
<b>21.0)</b>	<b>REPLACING PARTS</b> .....	<b>39</b>
21.1)	<i>REMOVAL OF GLASS PANEL</i> .....	39
21.2)	<i>REMOVAL OF SPARK ELECTRODE/FLAME SENSOR</i> .....	40
21.3)	<i>REMOVAL OF MAIN BURNER ORIFICE (injector)</i> .....	40
21.4)	<i>REMOVAL OF GAS VALVE/IGNITION CONTROL MODULE</i> .....	41
21.5)	<i>DISASSEMBLY OF GAS VALVE/IGNITION CONTROL MODULE</i> .....	42
21.6)	<i>REMOVAL OF MAIN BURNER/EMITTER ASSEMBLY</i> .....	42
<b>22.0)</b>	<b>CONVERSION INSTRUCTIONS</b> .....	<b>43</b>
<b>23.0)</b>	<b>INSTALLATION DATA</b> .....	<b>43</b>
<b>24.0)</b>	<b>REPLACEMENT PARTS GUIDE</b> .....	<b>44</b>

## 1.0) SAFETY

This heater is a self-contained infrared radiant ceramic heater. Safety information required during installation and operation of this heater is provided in this manual and the labels on the product. The installation, service and maintenance of this heater must be performed by a contractor qualified in the installation and service of gas fired heating equipment.

All personnel in contact with the heater must read and understand all safety information, instructions and labels before operation. The following symbols will be used in this manual to indicate important safety information.



**Warning** instructions must be followed to prevent or avoid hazards which may cause serious injury, property damage or death.



**Caution** instructions must be followed to prevent incorrect operation or installation of the heater which may cause minor injury or property damage.

## 2.0) INSTALLER RESPONSIBILITY

The installer is responsible for the following:

- The heater installation, electrical and gas supplies must be installed in accordance with these installation instructions and any applicable codes and regulations.
- Every heater shall be located with respect to building construction and other equipment so as to permit access to the heater.
- Each installer must follow the clearances to combustible materials for the heaters.
- It is important to read and understand section 4.0) where outdoor spaces are defined any space other than outdoors is an indoor installation.
- Install the heater so that the supports and hangers are correctly spaced in accordance with these instructions. The heater must be supported by materials having a working load limit of at least 52kg.
- To install the heater in an adequate free area to allow the products of combustion to freely escape from the heater. The heater must not be installed in recessed spaces or enclosure and alcoves.
- Supply the owner with a copy of these Installation and Operation Instructions.
- If the heater is installed indoors, ventilation by gravity or mechanical means shall be provided to supply at least 10m<sup>3</sup>/h of exhaust air per kW operating heat input.
- Never use the heater as a support for a ladder or other access equipment. Do not hang anything from the heater.
- Supply all installation materials necessary that are not included with the heater.
- Check the nameplate to make sure that the burner is correct for the gas type in the building.
- Use the provided angle gauge (see Section 12.1) to ensure the heater is installed at the approved installation angles of 0°, 15°, 30°, 45° and 60° degrees with the heat shield installed.

## 3.0) GENERAL INFORMATION

This heater is a self-contained infrared radiant ceramic patio heater for use in locations where flammable gases or vapors are not generally present and is intended for space heating **non-residential spaces**.

This patio heater model is approved indoor and outdoor installation. Not for use in residential dwellings.

**Note:** A residential dwelling is a domicile intended for use by one or more persons and that includes one or more areas, such as those used for cooking, eating, living, sleeping, or a sanitary facility. A residential dwelling does not include a workshop, or outdoors.

## **⚠ WARNING**



### **POISONING AND FIRE HAZARD**

This heater is not approved to be installed in any residential indoor application. This includes (but is not limited to) the home, living quarters, attached garages, solariums, RV's, mobile homes, etc.

Installation in residential indoor spaces may result in property damage, asphyxiation, serious injury or death.

### **SAFETY REQUIREMENTS**

- The heater area must be kept clear and free from combustible materials, gasoline and other flammable vapors and liquids.
- This heater is designed for use with one type of gas (G20, G31, etc.). Make sure that the type of gas to be supplied to this heater matches that shown on the heater rating plate.
- **DO NOT** install this heater directly onto a propane container or propane cylinder. Propane containers or propane cylinders must not be stored indoors or in the vicinity of any gas-burning appliance.
- **DO NOT** Store flammable materials near the heater.
- **DO NOT** locate gas and electric supply lines directly above the heaters path of flue products. The path of flue products will change if an optional low clearance heat shield is installed.
- Children and adults should be alerted to the hazards of high surface temperatures and should stay away to avoid burns or clothing ignition.
- Young Children should be carefully supervised when they are in the area of the heater.
- **DO NOT** spray aerosols or flammable materials in the vicinity of this appliance while it is in operation.
- Clothing or other flammable materials should not be hung from the heater or placed on or near the heater.
- **NEVER** attempt to service the heater while it is plugged in, operating or hot.
- Any guard or other protective device removed for servicing a heater must be replaced prior to operating the heater.
- **DO NOT** Install the heater in a recess, alcove or enclosure.
- Installation and repair should be done by a licensed contractor qualified in the installation and service of gas heating equipment. The heater should be inspected before use and at least annually by a qualified service person. More frequent cleaning may be required as necessary. It is imperative that the control compartment, air passageways and burner of the heater be kept clean.
- If any changes are made to the patio or building structure after the heaters are installed such as adding plastic curtains to enclose the patio the modified design must be checked by a qualified person to ensure that the ventilation requirements are maintained.
- **DO NOT** paint any surface of the heater.
- **DO NOT** throw objects at the heater.
- Avoid inhaling fumes emitted from the heater's first use. Smoke and odor from the burning of oils used in manufacturing will appear. Both the smoke and odor will dissipate after approximately 30 minutes.

### **INSTALLATION REQUIREMENTS**

Installation of this heater must be in accordance with all applicable codes shown in the instructions and/or the local codes and authorities having jurisdiction. In the UK all equipment must be installed and maintained in accordance with the relevant provisions of the Gas Safety (Installations and Use) Regulations 1998 for gas fired products. Installation practices must take into account the Health and Safety at Works Act 1974 or relevant codes of practice. In addition the installation must be carried out in accordance with the current IEE wiring regulations BS 7671-latest revision, BS 6896-latest revision (Industrial & Commercial) and any other relevant British Standards and Codes of Practice by a qualified installer. All external wiring **MUST** comply with the current IEE wiring regulations. Heaters shall be installed by a licensed contractor or licensed installer.

**Clearances to combustibles as outlined in this manual should always be observed. In areas used for storage of combustible materials where they may be stacked below the heater, the installer must post signs that will "specify the maximum permissible stacking height to maintain the required clearances from the heater to combustibles."**

Every heater shall be located with respect to building construction and other equipment so as to permit access to the heater. Each installer shall use quality installation practices when locating the heater and must give consideration to clearances to combustible materials, vehicles parked below, lights, overhead doors, storage areas

with stacked materials, sprinkler heads, gas and electrical lines, and any other possible obstructions or hazards. Consideration also must be given to service accessibility.

Space-Ray will not recognize the warranty for any use other than space heating.

This heater is for Indoor and Outdoor Installation and is used in Unvented mode. The term Unvented actually means Indirect Vented. While the products of combustion are expelled into the building, codes require that ventilation by gravity or mechanical means shall be provided to supply at least 10m<sup>3</sup>/h of exhaust air per kW operating heat input to dilute these products of combustion.

This heater is not an explosion proof heater. Where the possibility of exposure to volatile and low flash point materials exists, it could result in property damage or death. This heater must not be installed in a spray booth where the heater can operate during the spraying process. Consult your local fire marshal or insurance company.

This heater must be applied and operated under the general concepts of reasonable use and installed using best building practices.

It is the responsibility of the qualified installer to supply the appropriate lifting equipment to safely install the radiant heater. Tools required for the safe installation, startup and maintenance are various screwdrivers, wrenches, pipe wrenches, voltmeter, air and gas manometer, level and required tools to safely install the chosen hanging materials.

**⚠ CAUTION** Do not install this heater indoors in a structure with no insulation in the roof—condensation will occur.

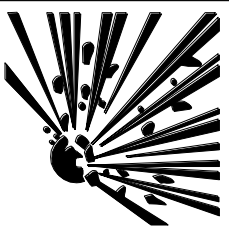

Before installation, check that the local distribution conditions, nature of gas and pressure, and adjustment of the appliance are compatible.

These instructions refer to appliances designed to operate in the European Union. Appliances designed for other countries (Non-European Union) are available on request.

This appliance can be used by children aged from 8 years and above and persons with reduced physical, sensory or mental capabilities or lack of experience and knowledge if they have been given supervision or instruction concerning use of the appliance in a safe way and understand the hazards involved. Children shall not play with the appliance. Cleaning and user maintenance shall not be made by children without supervision.

Children must be supervised not to play with the appliance.

#### 4.0) MINIMUM CLEARANCES TO COMBUSTIBLES

<b>⚠ WARNING</b>		
		<b>FIRE AND EXPLOSION HAZARD</b> Combustible material must be located outside the clearance dimensions listed. Failure to do so may result in death, serious injury or property damage.

A critical safety factor to consider before installation is the clearances to combustible materials. Clearance to combustibles is defined as the minimum distance you must have between the surfaces of the heater and the combustible item. Considerations must also be made for moving objects around the infrared heater.

**⚠ WARNING** This heater must not be installed where the products of combustion can build up and prevent them being exhausted to the atmosphere. This includes applications such as; enclosures, recessed ceilings and alcoves.

**⚠ WARNING** This heater can be equipped with a heat shield to reduce the clearances to combustibles towards the ceiling. Due to the variety of possible heater mounting angles the heat shield must be mounted in the correct location to match the heater mounting angle. See section 13.0 heat shield installation.

Approved installation angles are 0°, 15°, 30°, 45° and 60° degrees with the heat shield installed.

**⚠ WARNING** Certain materials or objects, when stored under the heater, will be subjected to radiant heat and could be seriously damaged. Observe the Minimum Clearances to Combustibles listed in the manual and on the heater at all times.

For maximum safety the building must be evaluated for hazards before installing the heater system.

Examples include, but are not limited to:

- Gas and electrical lines
- Combustible and explosive materials
- Chemical storage areas
- Areas of high chemical fume concentrations
- Provisions for accessibility to the heater
- Adequate clearances around the openings
- Combustion and ventilating air supply
- Vehicles parking areas
- Vehicles with lifts or cranes
- Storage areas with stacked materials
- Lights
- Sprinkler heads
- Overhead doors and tracks
- Dirty, contaminated environment

Clearances to combustibles are defined as a surface temperature of **50°C** above ambient temperature.

**⚠ WARNING** Minimum clearances shall be measured from the outer surfaces of the heater or heat shield if installed, as shown in the diagrams for the different installation positions.

**⚠ WARNING** Fire sprinkler heads must be located at an appropriate distance from the heater. This distance may exceed the published clearance to combustibles. Certain applications will require the use of high temperature sprinkler heads or relocation of the heaters.

Sprinkler systems containing propylene glycol or other flammable substances are not to be used in conjunction with this heater without careful consideration for and avoidance of potential fire or explosion hazards. For further information consult the authority having jurisdiction. Always observe applicable state and local codes.

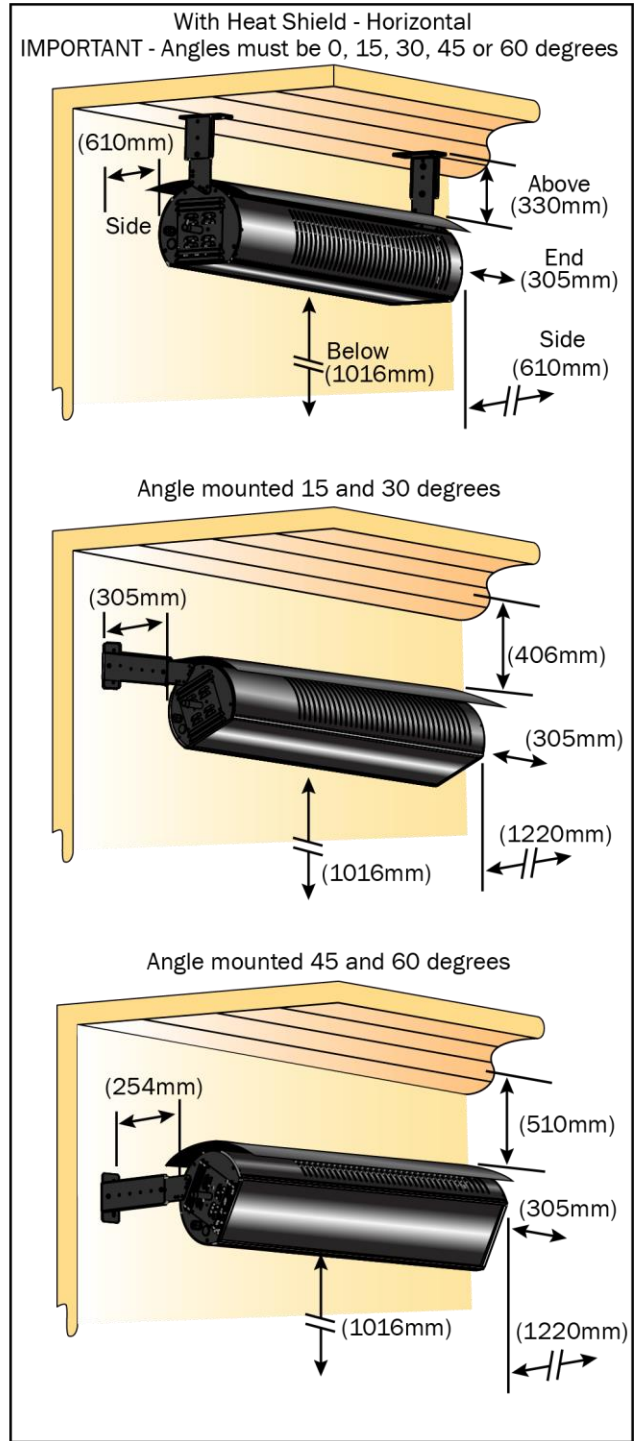
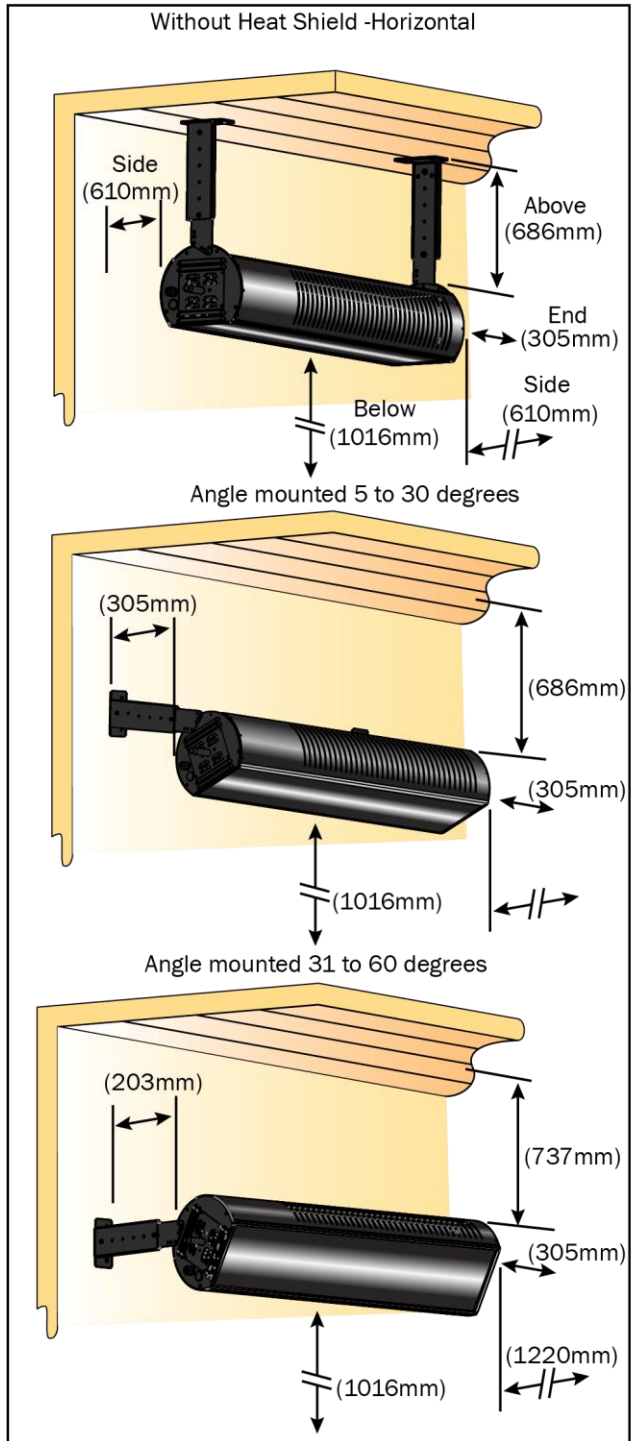
**⚠ WARNING** The stated clearance to combustibles represents a surface temperature of 50°C above room temperature. Building materials with a low heat tolerance (such as plastics, vinyl siding, canvas, tri-ply, etc.) may be subject to degradation at lower temperatures. It is the installer's responsibility to assure that adjacent materials are protected from degradation.

See below the possible surface temperature at the clearance to combustible distance for different ambient temperatures within the heated space.

Ambient Temperature	20.0 °C	17.5 °C	15.0 °C
Surface Temperature	70.0 °C	67.5 °C	65.0 °C

**⚠ WARNING** Clearances to combustibles are posted on the heater. In areas used for storage of combustible materials where they may be stacked below the heater the installer must post signs that will “specify the maximum permissible stacking height to maintain the required clearances from the heater to combustibles.” Space-Ray recommends posting these signs adjacent to the heater thermostat or other suitable location that will provide enhanced visibility.

Clearance to combustibles dimensions are shown below.



## 5.0) SPECIFICATIONS

MODEL	WB10CE-N7	WB10CE-L7
Heat Input	10.25 kW Hs / 9.23 kW Hi (minimum 7.0 kW Hs / 6.3 kW Hi)	10.25 kW Hs / 9.23 kW Hi (minimum 7.0 kW Hs / 6.3 kW Hi)
Appliance Type	A <sub>1</sub>	A <sub>1</sub>
Appliance Cat	I <sub>2H</sub>	I <sub>3P</sub>
Adjusted for	G20 20mbar	G31 37mbar
Gas supply	60mbar maximum / 20mbar minimum	60mbar maximum / 37mbar minimum
Setting Pressure	15.0 mbar (minimum 7.0 mbar)	26.7 mbar (minimum 12.5 mbar)
Injector (1 piece)	No. 41	No. 51
NOx Class	4	4
Electrical Supply	230V ~ 50Hz 25W	
Fuse Externally	3A	
Dimensions	L = 1219.2mm W = 300mm H = 243.8mm	
Weight	21.8kg	
Gas Connection	RP - ½ (BSPT)	
Protection	IP44	

### Model Identification:

Control Option Suffix	Gas Type	Description
N7	G20	Two Stage SIT 843 Gas Valve - High/Low Fire
L7	G31	Two Stage SIT 843 Gas Valve - High/Low Fire

Model No.	Recommended* Mounting Height		
	@ 0°	@ 5° to 30°	@ 30° to 60°
WB10CE-N7	2.4 to 3.4m	2.15 to 2.7m	2.15 to 2.44
WB10CE-L7			

\* For mounting heights outside the recommended distances consult your local Space-Ray Representative.

Ignition System (direct spark):
1.5 second pre-purge period 10 second trial for ignition period 15 second inter-purge period 3 tries for ignition separate flame sensor Flame Sensitivity: >0.7µA minimum

Approved installation angles are 0°, 15°, 30°, 45° and 60° degrees with heat shield installed.

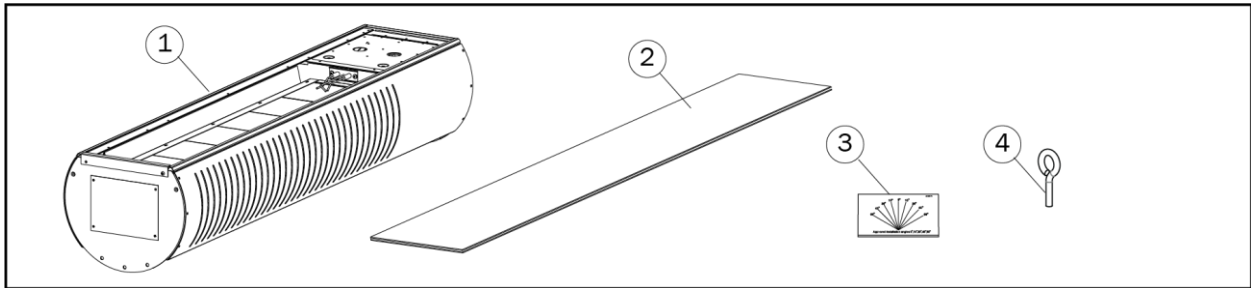


## 6.0) PACKING LIST

Package contents are listed below:

Model	Part Number	Gas Type
WB10CE-N7	44575000	G20 Natural
WB10CE-L7	44575010	G31 Propane

Number	Part Number	Description	Qty Per
1	See Above	Patio Heater	1
2	41373050	Ceramic Glass 4mm Black	1
3	44568039	Angle Mounting Gauge Plate	1
4	02309000	Eye Bolt 1/4-20x 2"	2



## 7.0) HEATER SIZING GUIDELINES

Radiant heaters work like the sun to emit radiant heat directly to the space to increase the comfort of the patio guests. Suitable applications include patios, porches, outdoor shopping areas and pathways.

The amount of temperature increase in outdoor patio spaces will be dependent on the following factors:

1. The number of heaters in the space is important to provide good coverage of the area to be heated.
2. Take care not to mount the heaters too low or too close together this can make people directly below the heaters uncomfortable.
3. It is recommended to use a suitable windbreak to reduce the effects of direct wind on the patio. If an area is going to be unprotected and is a breezy location then heaters may need to be located closer together. Wind breaks must be designed to allow fresh air for ventilation.
4. Angling the heaters greater than 30 degrees should be avoided unless the mounting height is low, when the heaters are angled more than 30 degrees the radiant intensity is lower and will reduce the amount of heat felt by the guests.
5. It is recommended to place the heaters in the area of greatest heat loss facing into the patio area.

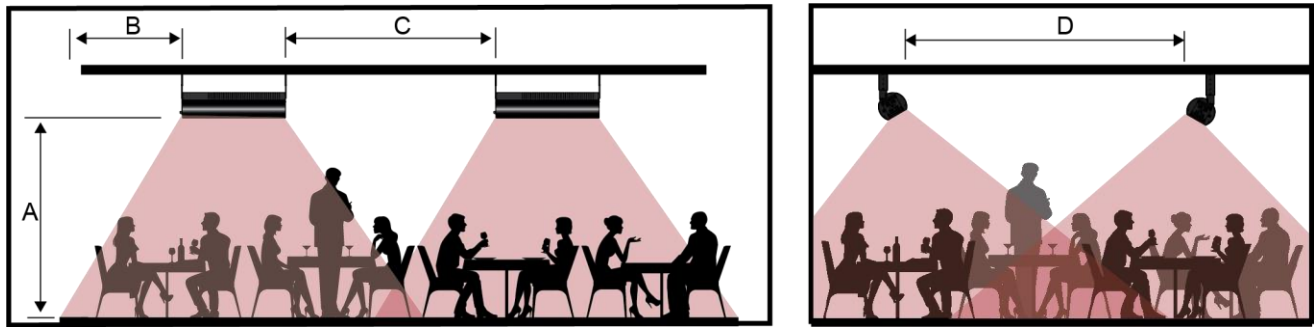
The table below shows minimum area coverage per heater for outdoor patio heating based on a 2.5 to 5.5°C temperature rise.

Mounting Angle	Mounting Height	Breezy Exposed Location	Moderately Protected	Well Protected
Horizontal	2.5 - 3.0m	2.5 x 2.5m	3.0 x 3.0m	3.7 x 3.7m
Up to 30 Degrees Angled	2.15 - 2.7m	2.5 x 2.5m	2.7 x 2.7m	3.3 x 3.3m
30 to 60 Degrees Angled	2.15 - 2.5m	Not Recommended		2.5 x 2.5m

Note: When sizing the number of heaters to warm the patio, the area coverage given above may not provide the stated temperature rise under all weather conditions and will be dependent on heater placement. Minimums are shown as a guideline for human comfort. For more assistance with patio heater sizing and layout please contact your local Space-Ray representative.

## 8.0) TYPICAL HEATER LAYOUTS

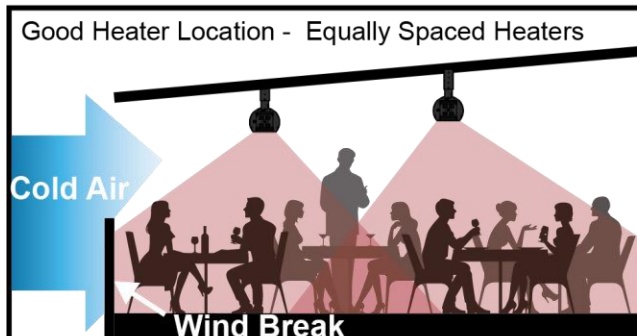
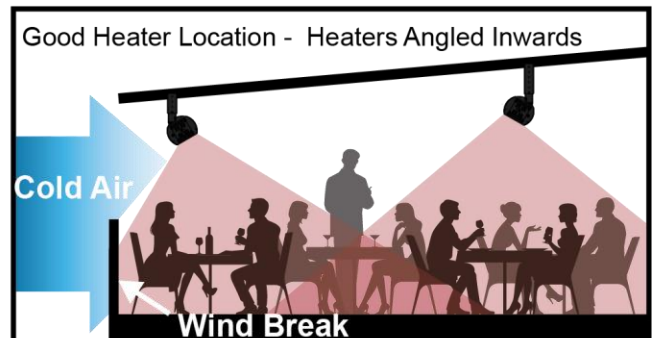
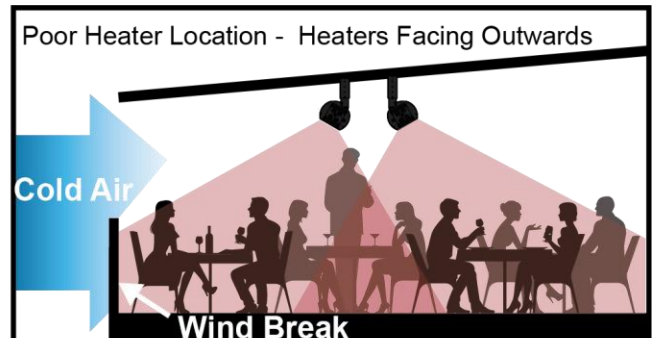
The diagram below shows the recommended spacing layout between heaters.



Dimension	Horizontal		15 to 30 degree angle		Above 30 degree angle	
	Min.	Max.	Min.	Max.	Min.	Max.
A. Mounting Height	2.5m	3.4m	2.15m	2.7m	2.15m	2.5m
B. Distance to the end of the patio	0m	1.8m	0m	1.8m	0m	1.8m
C. Distance between heaters.	2.5m	3.7m	2.15m	3.4m	1.8m	3.0m
D. Distance between heaters*	2.5m	4.9m	2.5m	5.5m	2.5m	4.9m

\*Note the distance D for angled heaters applies when they are facing towards each other.

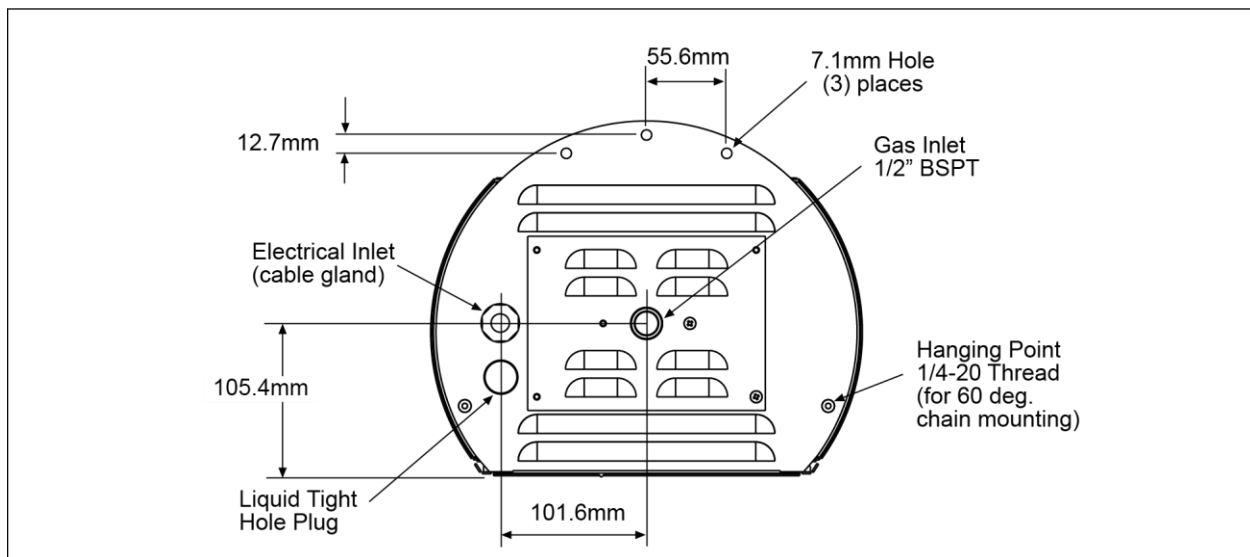
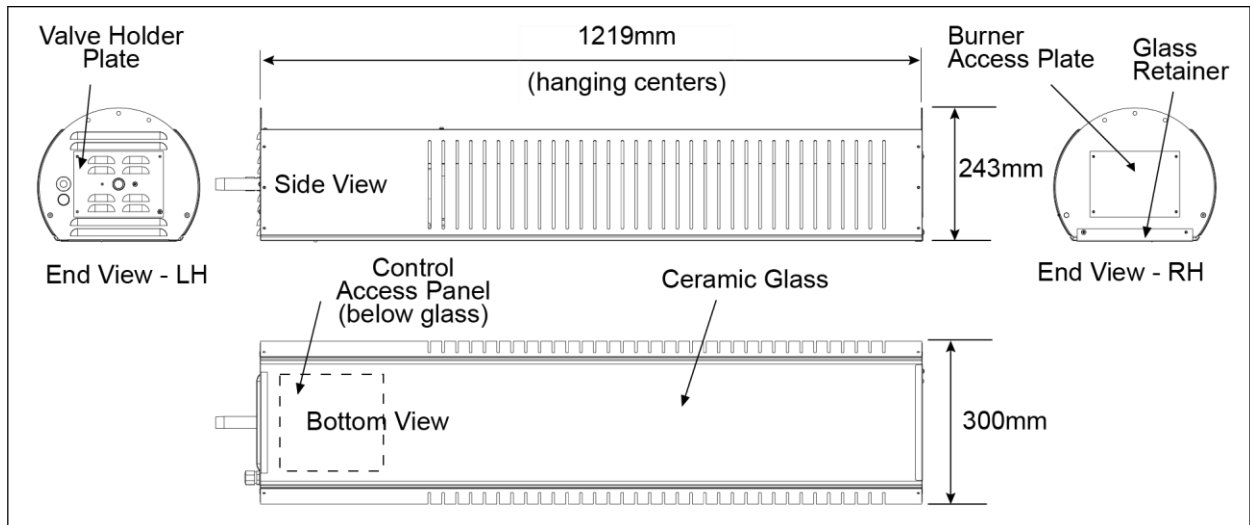
Below are examples of patio heating applications.



**Positioning Tips**

1. Avoid Direct wind, position wind breaks where possible. Wind breaks must not effect clearance to combustibles or ventilation.
2. Heaters mounted horizontally will radiate the most heat. The greater the mounting angle the lower the intensity.
3. Use mounting height and area coverage information to select the correct number of heaters.

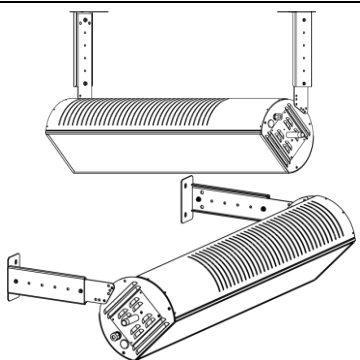
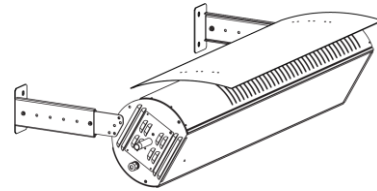
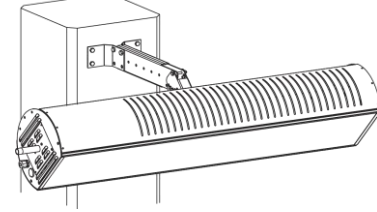
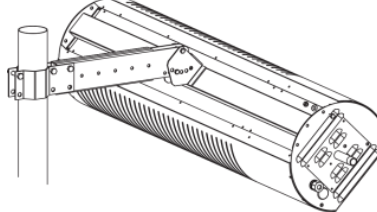
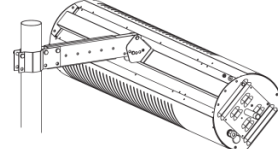
## 9.0) DIMENSIONS



## 10.0) ACCESSORIES

Below are the optional accessories available for the Wind Blocker Patio heater.

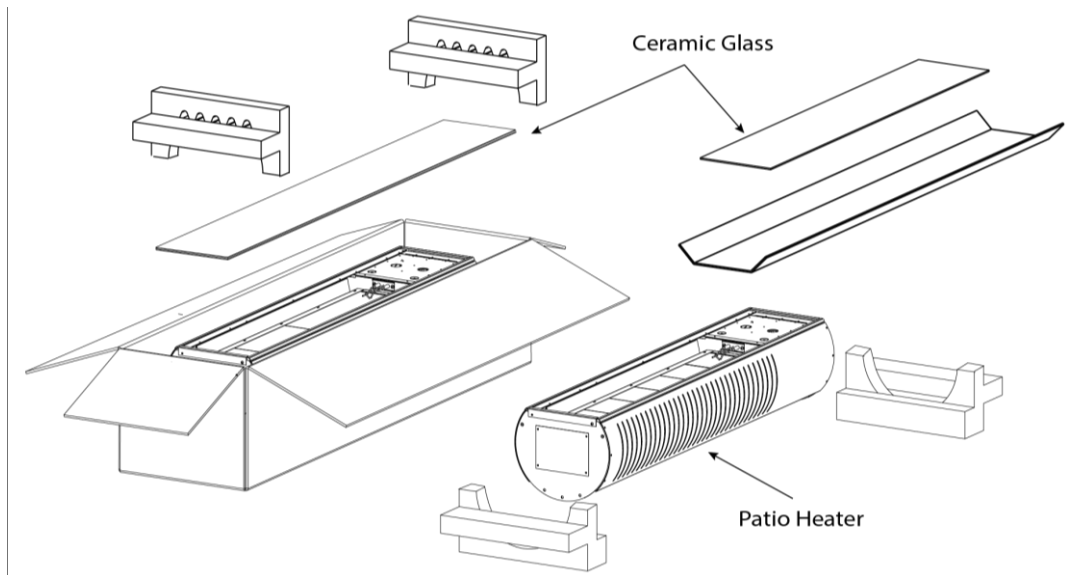
PN	Description	Picture
44560350	Wall / Ceiling Telescopic Mounting Bracket Kit- 380-560mm overhead space (check clearances to combustibles space above the heater before ordering)	
44560351	Ceiling Telescopic Mounting Bracket Kit- 560-760mm overhead space (check clearances to combustibles space above the heater before ordering)	

PN	Description	Picture
44560352	Wall / Ceiling Telescopic Mounting Bracket Kit- 15"-30" overhead space (check clearances to combustibles space above the heater before ordering) includes both the 380-560mm (15-22") and 560-760mm (22-30") extension legs.	
44566300	Heat Shield Kit - Reduced clearances to combustible option when installed. Mounting angles are restricted to 0°, 15°, 30°, 45° and 60°.	
44560599	Column Mounting Arm Kit - suitable for columns 200mm (8") and wider.	
44560607	75mm (3 ") Pole Mounting Bracket Kit	
44560608	100mm (4") Pole Mounting Bracket Kit	

## 11.0) UNPACKING THE HEATER

**⚠ CAUTION** The heater and ceramic glass are shipped separate but in the same box. Care must be taken when up-packing the heater. Carefully open the top of the heater as indicated on the labels at the side of the shipping box. An angle gauge is attached to the heater's control side with tape and is needed for installation (see Section 12.1).

The glass is located on top of the heater and is wrapped in cardboard cradled into the foam end pieces. Carefully remove the top foam pieces and remove the cardboard wrapped glass. Care must be taken that during handling the glass does not slide out of the cardboard wrap. Store the glass in a secure location for later assembly.



**⚠ CAUTION** It is recommended that two people lift the heater out of the carton. Do not remove from the remaining packaging until the heater is ready to be hung.

## 12.0) INSTALLATION

<b>⚠ WARNING</b>	
	<p style="text-align: center;"><b>CRUSH HAZARD</b></p> <p>All materials used to suspend the heater must have a minimum working load of 52kg. All “S” hooks must be crimped closed.</p> <p>Never use the heater to support a ladder or other access equipment.</p> <p>Always suspend from a permanent part of the building structure that can support the total force and weight of the heater.</p> <p>Never use chain to suspend the heater outdoors</p> <p>Failure to do so may result in death, serious injury or property damage.</p>

In order to protect the ceramic glass it is recommended to only insert the ceramic glass once all the other installation steps have been completed. The ceramic glass must be removed to wire the heater and for commissioning.

Various means of suspending the heater can be used.

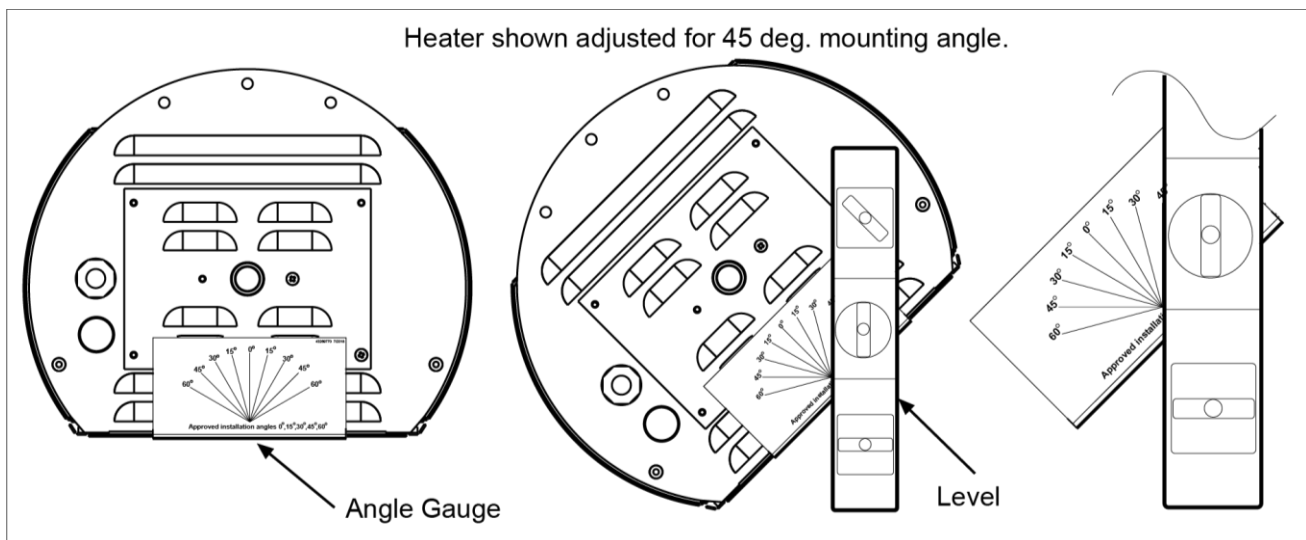
- a) Heaters installed outdoors or in areas subject to strong winds must be installed using the optional hanging brackets or suitable rigid mount hardware. Chain, cable and other flexible hanging methods are not recommended.
- b) Use only noncombustible materials for suspending hangers and brackets.
- c) Turnbuckles can be used with chains to allow leveling of the heater. All “S” hooks and eye bolts must be manually crimped closed by the installer.
- d) Heaters must not be supported by gas or electric supply lines and must be suspended from a permanent structure with adequate load capacity.
- e) Hanging points are a fixed length between centers. Secondary steel work may be required to span between supporting beams.
- f) The appliance should be located with respect to building construction and other equipment to permit access to the appliance for servicing etc.
- f) The heater must be installed in an adequate free area to allow the products of combustion to freely escape from the heater. The heater must not be installed in recessed spaces or enclosure and alcoves.

- g) The heater must be suspended with its longitudinal axis horizontal, but may have its lateral axis at an angle from 0° to 60° from the horizontal, as shown in the minimum clearances to combustibles section 4.0).
- h) An optional heat shield may be installed to reduce the top distance of clearance to combustibles. This heat shield should be installed prior to hanging the heater. When using the heat shield at the minimum clearance distance the angles of installation are restricted to 0°, 15°, 30°, 45° and 60°.
- i) Use the provided angle gauge to ensure that the heater is hung at the approved installation angles.
- j) The heater can be angle mounted on both sides of its lateral axis.
- k) Hanging brackets should first be fixed to the wall surface by means of 4 lag bolts – not supplied (M10 x 75mm minimum) through pre-formed holes in each of the brackets prior to installing heater.

## 12.1) HEATER MOUNTING ANGLE

<b>⚠ WARNING</b>		
		<b>FIRE AND EXPLOSION HAZARD</b>
		<p>Heat shield must be installed in the correct position for the installation angle. Failure to mount the shield correctly will result in higher surface temperatures and exceed the clearances to combustibles.</p> <p>Approved installation angles are 0, 15, 30, 45 and 60 degrees with the heat shield installed.</p> <p>Failure to do so may result in fire and/or explosion, property damage, serious injury or death.</p>

Every heater is supplied with an angle gauge. The gauge is attached with tape to the heater control side.



The angle gauge is used in combination with a level to ensure that the heater is installed at one of the mounting angles of 0°, 15°, 30°, 45° and 60°.

Hold the side of the angle gauge without label flush against the glass surface. Hold a level against the other side of the angle gauge and find the desired installation angle of the heater. Verify that the level is vertical, adjust heater angle if needed. This process must be repeated for both ends of the heater

**Note:** If a heat shield is installed its location must match the heaters angle (see Section 21.0).

## 12.2) INDOOR INSTALLATION – HANGING METHODS

When the heater is used for an Indoor Installation then the following hanging methods may be used.

The heater can be hung from the ceiling, secondary steel work, etc. using chains, threaded rods and other approved hanging materials. All hanging materials must have a minimum working load of 52kg. Any “S” hooks must be crimped closed after installation.

**Note:**

When hanging the heater hanging materials which allow the heater to move the gas connection must be established using an approved flexible gas hose of a minimum of 600mm length.

Diagram below shows Horizontal mounting with chain.

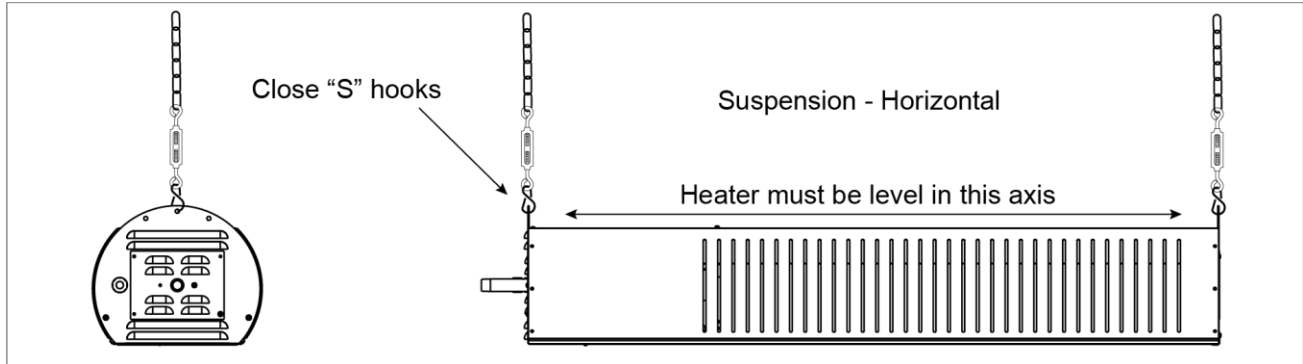
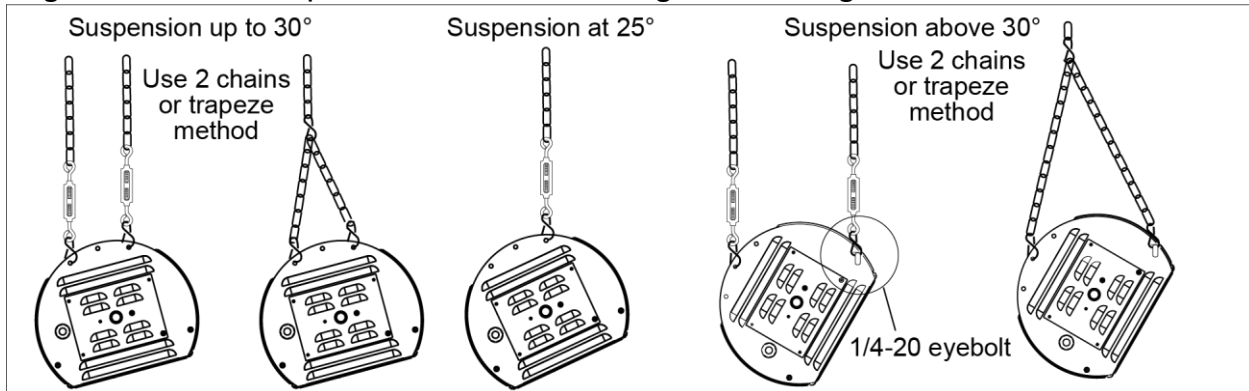


Diagram below shows the possible chain methods to hang at different angles.



Notes: When suspending at 25 degrees if the heat shield is installed use the 30-degree location for the heat shield.

## 12.3) INDOOR / OUTDOOR RIGID HANGING BRACKETS

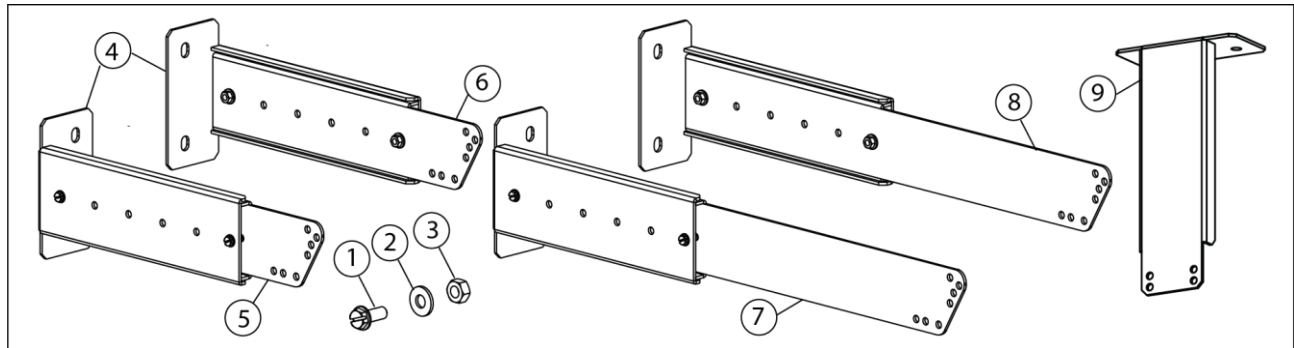
Fixed hanging methods which prevent the heater from swaying must be used for outdoor installations.

Below are the bracket kits which can be used for ceiling and wall mount for patio heaters installed indoors and outdoors, with and without heat shields. The brackets provide for a range of lengths and approved mounting angles of 15°, 30°, 45° and 60°.

- 44560350 KIT, BRACKET - WALL/CEILING 380-560mm CEILING - FOR USE **WITH** HEAT SHIELD (telescoping)
- 44560351 KIT, BRACKET - CEILING 560-760mm - FOR USE **WITHOUT** HEAT SHIELD (telescoping)
- 44560353 KIT, BRACKET - CEILING 10" – FIXED (For Horizontal mounting with a heat shield - non-combustible ceiling only)

The hanging brackets are supplied as an optional accessory item. Below are the kit contents.

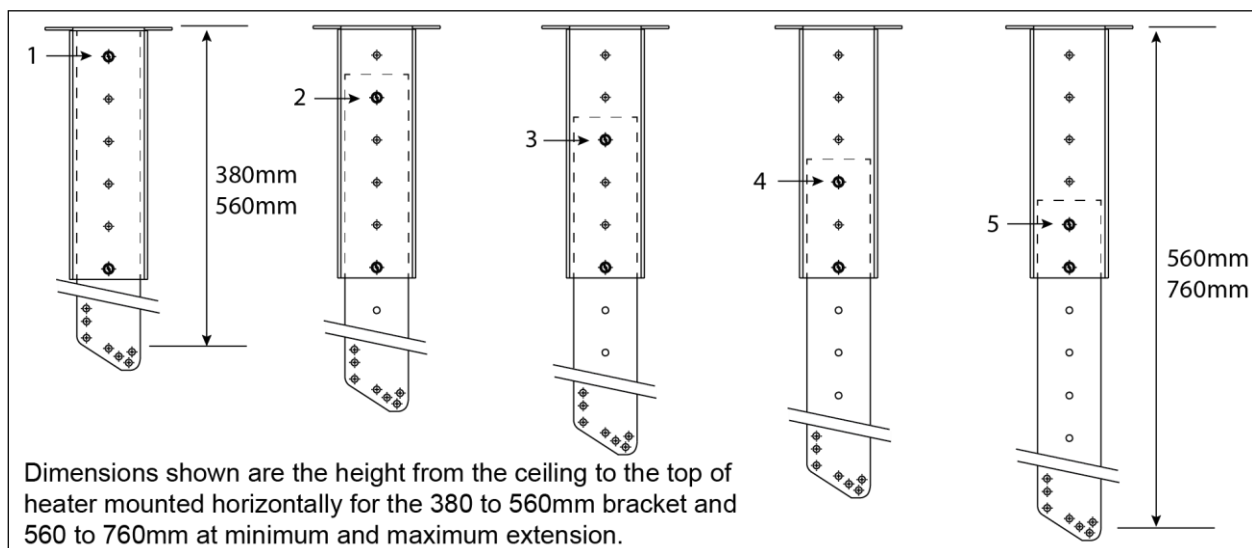
Item No.	Part No.	Description	44560350 Quantity	44560351 Quantity	44560353 Quantity
1	02140040	HHCS, 1/4-20 x 1/2" SS	6	6	4
2	02129100	WASHER, FLAT 1/4"N SS	6	6	4
3	02167019	LOCKNUT, 1/4-20 KEPS - SS	6	6	4
4	44560259	HANGER BRACKET - RECEIVER	2	2	
5	44560269	SLIDER ARM - LH	1		
6	44560279	SLIDER ARM - RH	1		
7	44560289	SLIDER ARM - LH		1	
8	44560299	SLIDER ARM - RH		1	
9	44560809	FIXED ARM			2



The tables below can be used to select the correct bracket to ensure that the heater is installed at the correct clearance to combustible distance from a combustible ceiling according to the mounting angle and whether a heat shield is installed.

Mounting Angle	380-560mm Bracket (With heat shield) telescope hole positions*	560-760mm Bracket (Without heat shield) telescope hole positions*
0	1 to 5	3 to 5
15 and 30	2 to 5	3 to 5
45 and 60	4 or 5	4 or 5

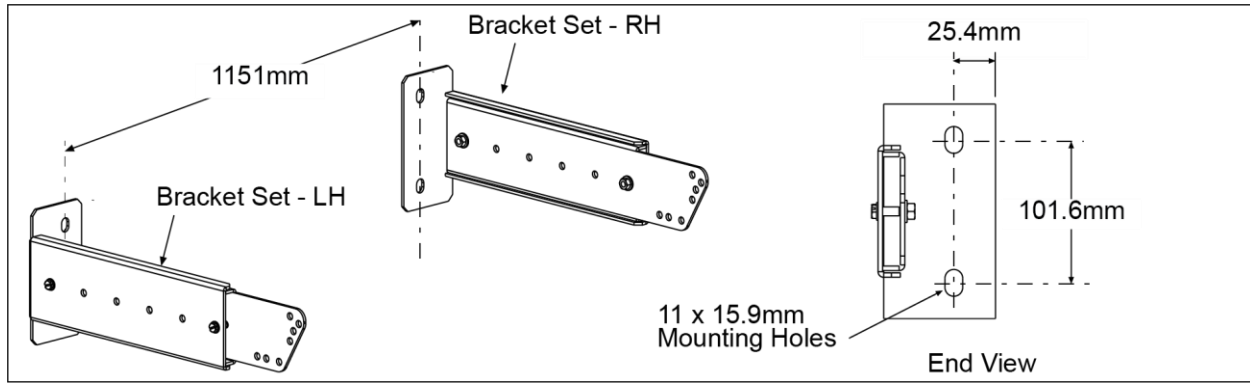
\* The above table relates to the holes positions as shown in the figure below for the two different length adjustable brackets.



Dimensions shown are the height from the ceiling to the top of heater mounted horizontally for the 380 to 560mm bracket and 560 to 760mm at minimum and maximum extension.



## 12.3.1) HANGING BRACKETS ASSEMBLY



A left-hand LH and right-hand RH bracket must be assembled. Torque screws and locknuts to 6.8Nm.

To mount the hanging brackets to the wall/ceiling:

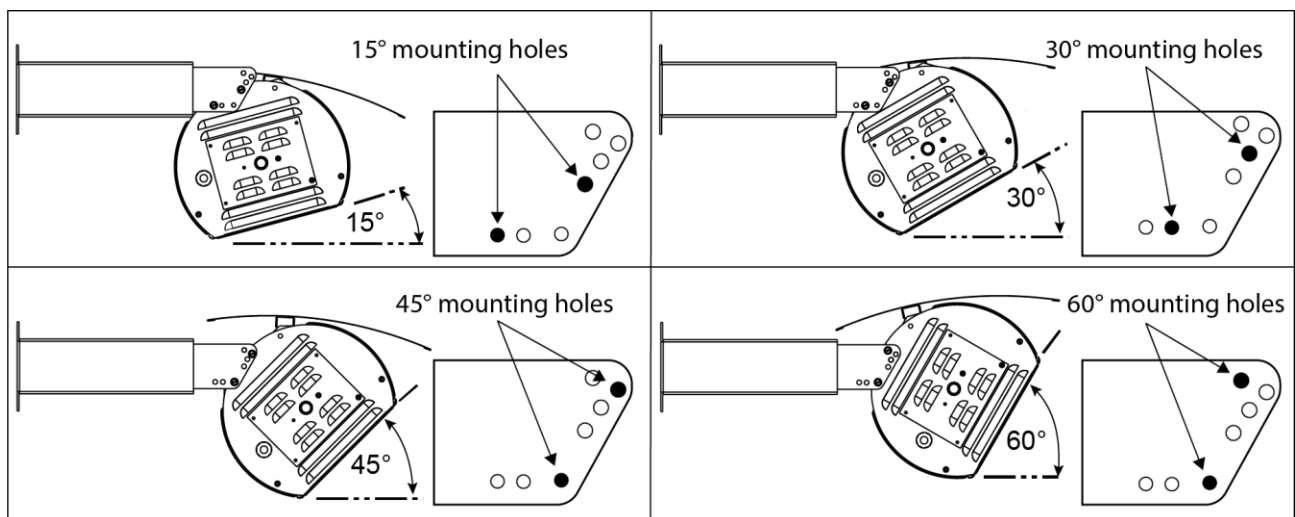
1. Measure and mark distances for the hanger bracket holes.
2. Hanging brackets should first be fixed to the wall or ceiling surface by means of 4 lag bolts – not supplied (M10 x 75mm (3/8" x 3") minimum) through pre-formed holes in each of the brackets prior to installing heater. All hanging materials must have a minimum working load of 52kg.

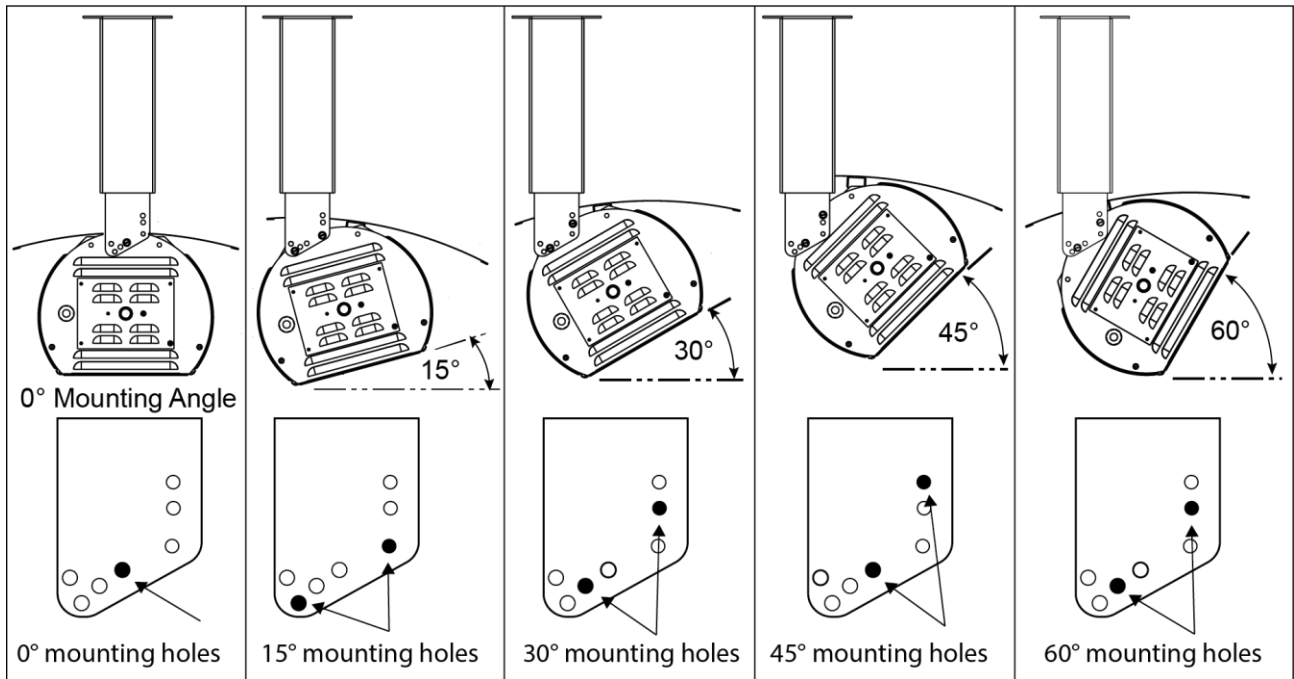
## 12.3.2) HEATER ATTACHMENT TO HANGING BRACKETS

The heater can be attached to the hanging brackets in angles of 15°, 30°, 45° and 60°. Choose the desired heater mounting angle and find the corresponding hole pattern as per the wall and ceiling mount figures below.

Attach the heater to the brackets using (2) cap screws, flat washers and locknuts provided in the kit. Torque screws and locknuts to 6.8Nm.

Minimum clearances to combustibles must be observed. See Section 4).





13.0) **HEAT SHIELD INSTALLATION**

**⚠ WARNING**



**FIRE AND EXPLOSION HAZARD**

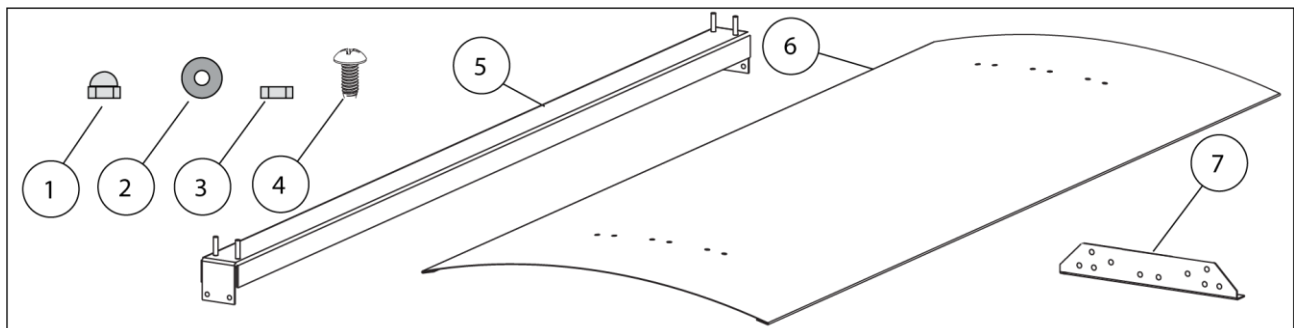
Heat shield must be installed in the correct position for the installation angle. Failure to mount the shield correctly will result in higher surface temperatures and exceed the clearances to combustibles.

Approved installation angles are 0, 15, 30, 45 and 60 degrees with the heat shield installed.

Failure to do so may result in fire and/or explosion, property damage, serious injury or death.

A heat shield can be used to reduce the clearance to combustible distances. Refer to Minimum Clearance to Combustibles in Section 4). The heat shield is available as an accessory Kit No. **44566300**.

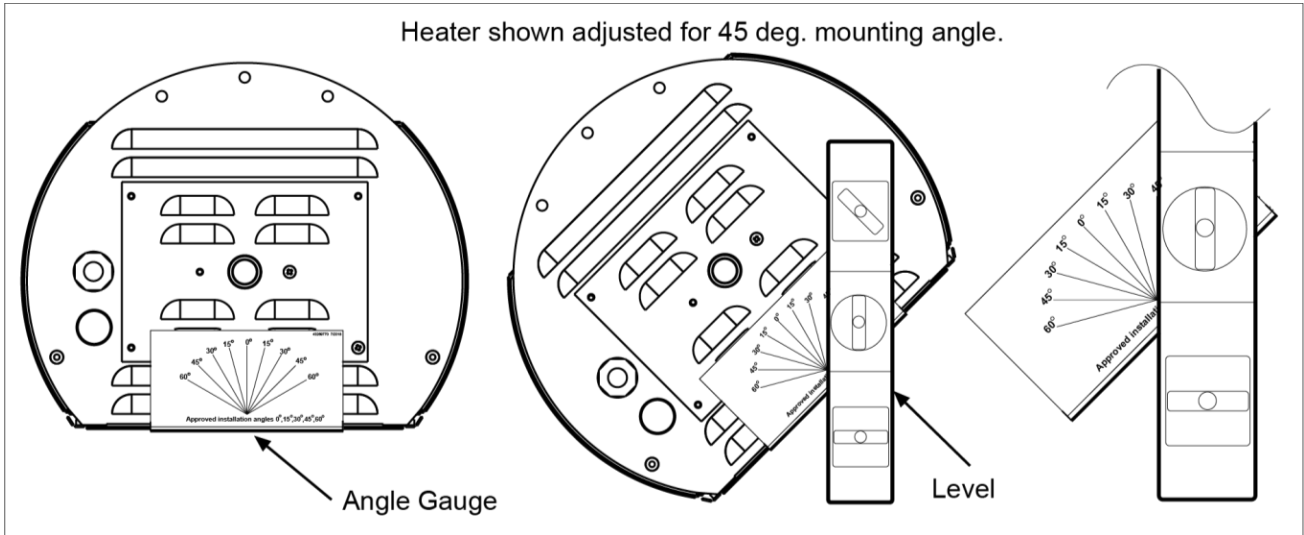
Item No.	Part No.	Description	Quantity
1	02359000	#10-24 DOME CAP NUT	2
2	02358000	TEFLON WASHER	4
3	02186010	#10-24 SS LOCKNUT NUT	2
4	02352000	PHSMS #8 x 1/2" AB POINT SS - BLK OXIDE	6
5	44568139	RAIL - HEAT SHIELD HANGER - PAINTED	1
6	44566189	HEAT SHIELD - ROLLED/PAINTED	1
7	44568149	HOLDER BRACKET - PAINTED	2



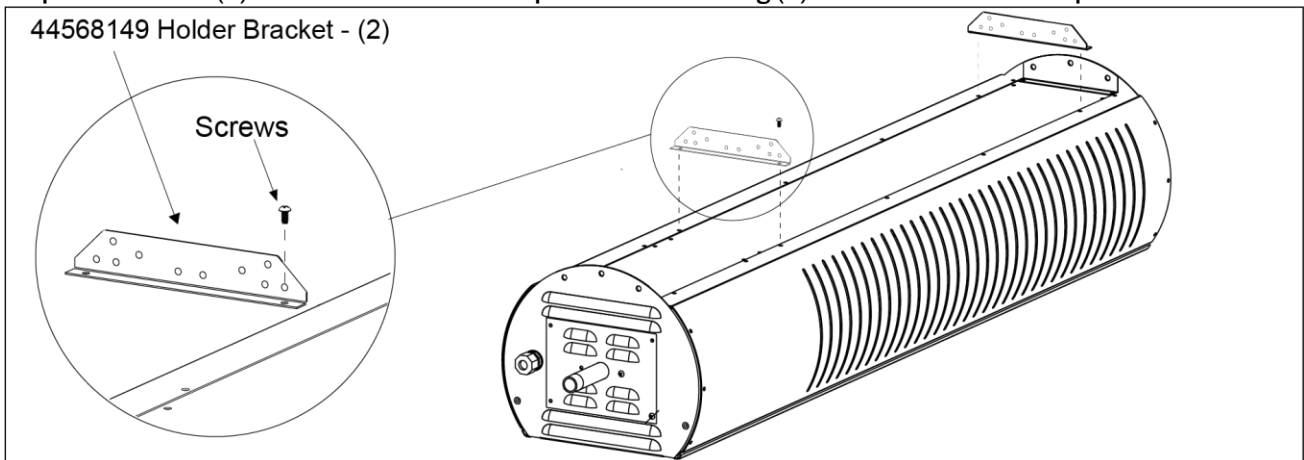
The heat shield position on the heater is dependent on the heater mounting angle. Use the angle gauge provided with the heater to determine the mounting angle before proceeding with the heat shield assembly. See Section 12.1

See below for installation steps.

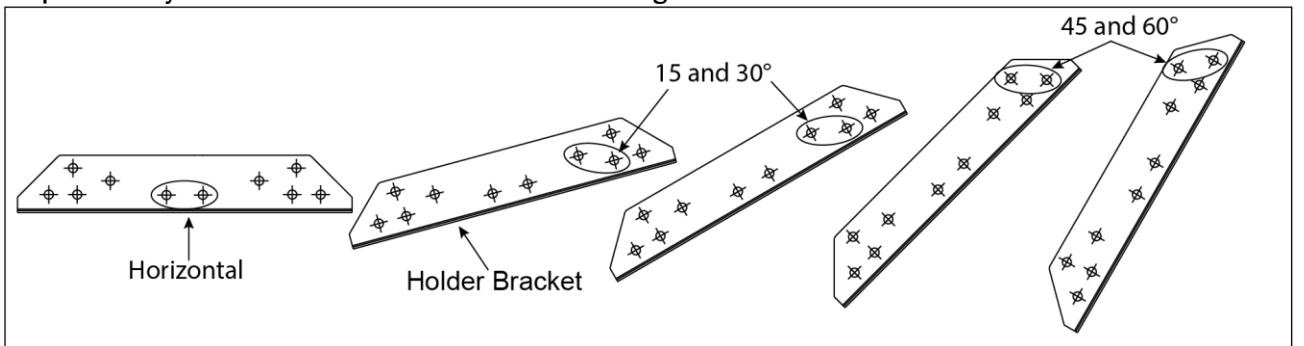
Step 1. Use the angle gauge shown below to determine the mounting angle of the heater.



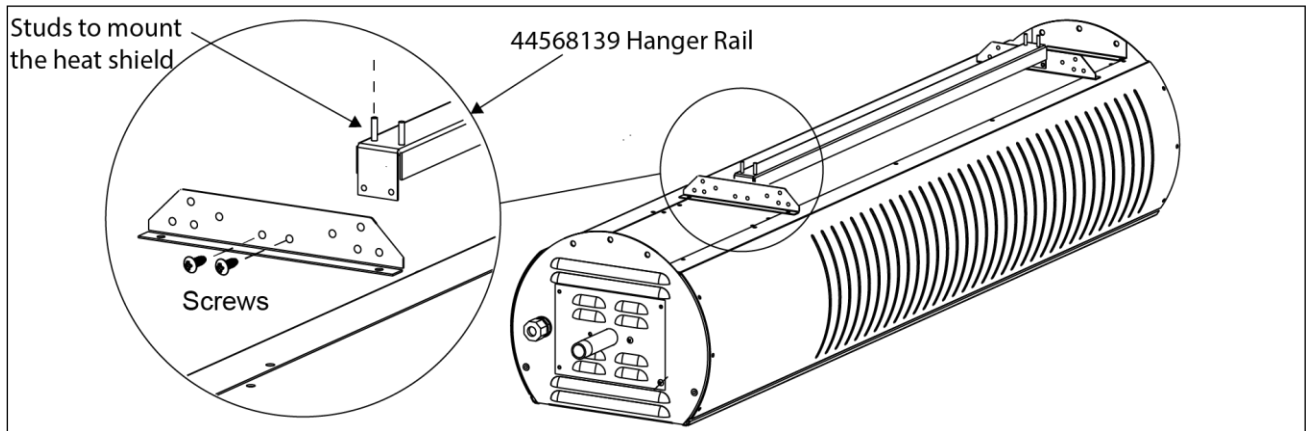
Step 2. Attach the (2) holder brackets to the top of the heater using (2) black oxide #8 screws per bracket.



Step 3. Identify the correct holes to mount the shield hanger rail from the illustration below.

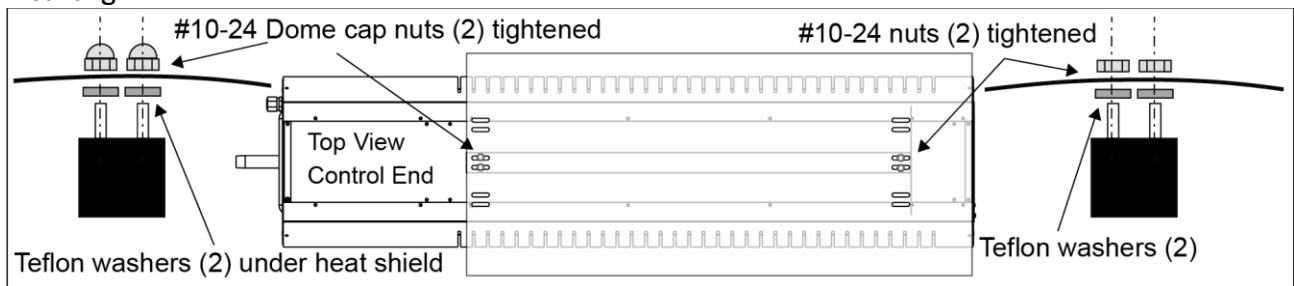


Step 4. Attach the heat shield hanger rail to the holder bracket using (2) black oxide #8 screws on each end. Horizontal position shown below.

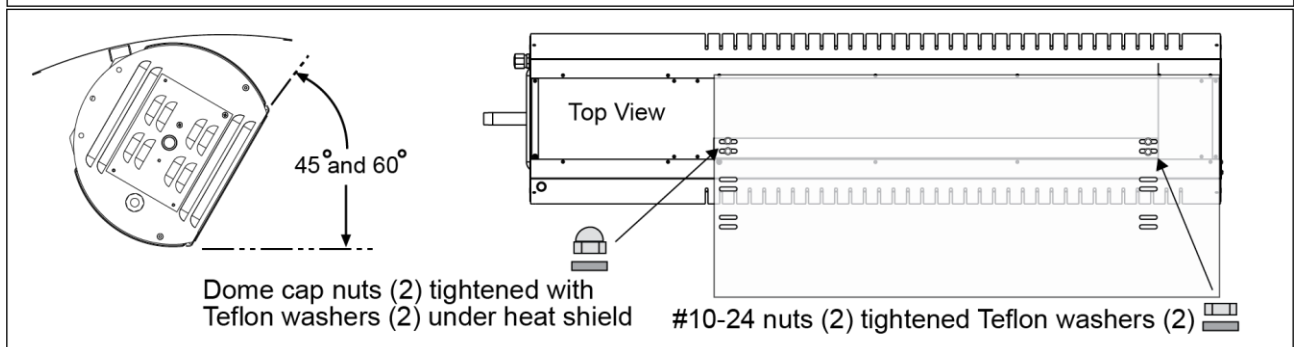
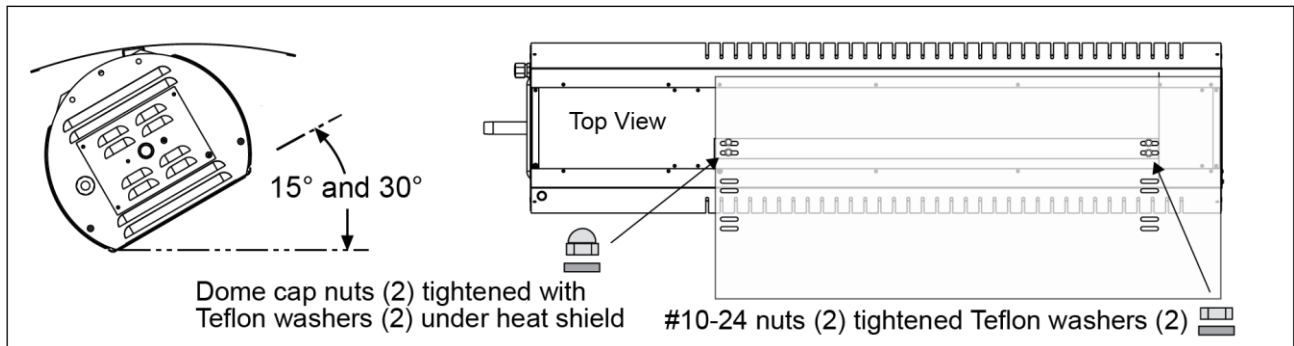


**CAUTION** IMPORTANT: Use the **Dome Cap nuts** at the control end of the heater as shown in the illustrations so that the heat shield can expand when the heater is turned on. Failure to do so may result in the heat shield distorting.

Step 5. Attach the heat shield to the hanger rail using the holes in the heat shield indicated below for horizontal mounting.



See below the correct holes to mount the heat shield to the hanger rail for other installation angles.



**14.0) INSTALLATION OF THE CERAMIC GLASS**

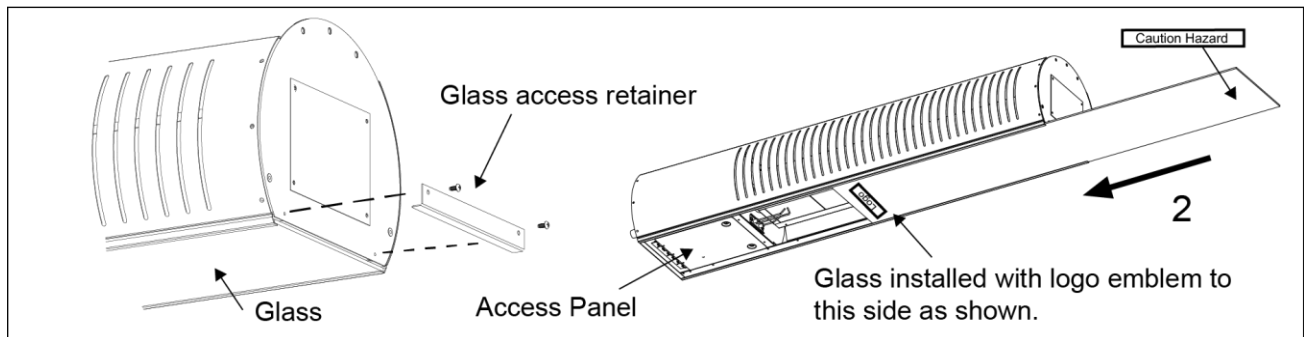
Only install the ceramic glass once the heater has been attached to a suitable gas (see Section 15.0) and electrical supply (see Section 16.0).

Read this section to the end to avoid glass breakage.

1. Locate the "Glass Access Retainer" and carefully remove with a suitable Phillips screw driver the two (2) black oxide sheet metal screws holding it in place. Retain screws and Glass Access Retainer for later.
2. The side of the glass where the logo is attached must be slid in first for the logo's final position to be at the control side of the heater.
3. Slide the glass into the "Glass Retainer Rails". The glass must be held parallel to the Glass Retainer Rails during assembly. The glass will slide in easy with ample clearance. Slide the glass until it is positioned under the Glass Retainer at the heaters control enclosure side. At this point the glass will be flush with the heater at the insertion point.

Note: If the ceramic glass does not slide in easily review position of ceramic glass to glass retainers and adjust if needed. Do not force the ceramic glass into the glass retainers!

4. Reinstall the Glass Access Retainer removed in 1. with the two (2) sheet metal screws.



## 15.0) GAS CONNECTIONS AND REGULATION

### ⚠ WARNING



#### FIRE AND EXPLOSION HAZARD

An approved connector, suitable for the environment of equipment usage, is required. Visible or excessive swaying, flexing and vibration of the gas connections **must** be avoided to prevent failure. Neither the gas pipe nor the connector shall be placed in the "flue discharge area". In no case shall the gas supply support the weight of the heater.

Leak test all components of gas pipe work before operation.

Failure to do so may result in death, serious injury or property damage.

### ⚠ WARNING



#### FIRE AND EXPLOSION HAZARD

Tighten the flexible gas hose, gas piping and components securely.

Improperly connected gas lines may result in fire, explosion, poisonous fumes, toxic gases, asphyxiation or death. Connect gas lines in accordance to national, state, provincial and local codes.

Failure to do so may result in death, serious injury or property damage.

**⚠ WARNING** Use an approved flexible gas connector of 600mm minimum length when installing the heater with flexible hanging methods as described in Section 12.0).

**IMPORTANT BEFORE CONNECTING THE GAS TO THE HEATER**

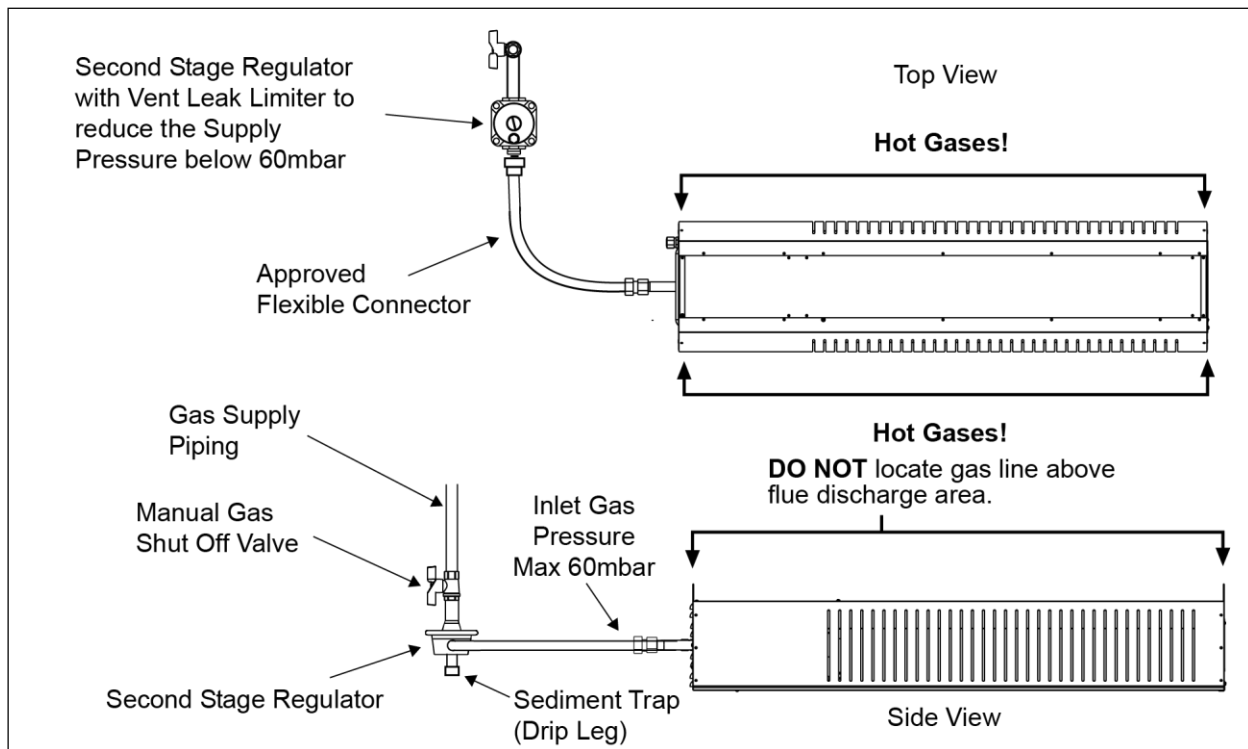
- a) Connect to the supply tank or manifold in accordance with National or local building codes. Authorities having jurisdiction should be consulted before the installation is made.
- b) Check that the gas fuel on the burner rating plate matches the fuel for the application.
- c) Check that the gas supply piping has the capacity for the total gas consumption of the heaters and any other equipment connected to the line.
- d) Check that the calculated supply pressure with all gas appliances and heaters operating will not drop below the minimum supply pressure required for these heaters. See table below.

GAS PRESSURE TABLE				
GAS TYPE	MANIFOLD PRESSURE		SUPPLY PRESSURE	
	High	Low (2-stage only)	Minimum*	Maximum
Natural Gas N7	15.0 mbar	7.0 mbar	20.0 mbar	60.0 mbar
Propane Gas L7	26.7 mbar	12.5 mbar	37.0 mbar	60.0 mbar

- e) All gas supply lines must be located in accordance with the required clearances to combustibles from the heater as listed on the clearances label of the heater and Section 4.0) of this manual.
- f) Pipe joint compounds must be resistant to the action of liquefied petroleum gases.
- g) The heater will move when installed with flexible hanging methods, see Section 12.0). Use an approved flexible connector for connections between the rigid piping and the heater. An approved shut off valve should be installed within 1.8m (6ft) of the heater.
- h) The gas pipe, flexible hose and connections must be self-supporting. The gas pipe work must not bear any of the weight of the heater or any other suspended assembly.
- i) This appliance is equipped with a fast-opening, combination gas valve. **The maximum supply pressure to the appliance is 60 mbar.** If the line pressure is more than the maximum supply pressure, then a second stage regulator which corresponds to the supply pressure must be used
- j) After all gas connections have been made, make sure the heater and all gas outlets are turned off before the main gas supply is turned on slowly. Turn the gas supply pressure on and check for leaks.
- k) If a 2nd stage regulator is used, the ball valve before the heater in the supply line must be closed when purging the gas lines to prevent gas seeping through it. If initial gas pressure is higher than 60 mbar the redundant combination gas valve is designed to lock out. Pressure build-up in the supply lines prior to the heater must be released before proper heater operation.
- l) High gas pressure regulators need to be installed upstream of flexible gas lines.

**⚠ WARNING** The entire gas supply system must be checked for leaks prior to heater operation. **Do not use an open flame of any kind to test for leaks.**

## Flexible Hose Connections



### 15.1) INSTRUCTIONS FOR PRESSURE TEST GAUGE CONNECTION

<b>⚠ WARNING</b>		
<b>ELECTRIC SHOCK HAZARD</b>	<b>FIRE AND EXPLOSION HAZARD</b>	<b>BURN HAZARD</b>
Disconnect electric before service. Heater must be connected to a properly grounded electrical source.	Turn off gas supply to heater before service.	Allow heater to cool 30 minutes before service. Glass and heater surfaces will still be hot after operation.
Failure to follow these instructions can result in death, serious injury or property damage.		

### 15.2) INLET GAS PRESSURE CHECK

1. Turn off all electrical power and manual gas shutoff valve to the system to connect manometer hoses.
2. Turn the pressure test screw in the center of the gas valve test boss (see Figure 1 below) not more than one turn **counterclockwise**. Attach a 9 mm hose and manometer over the inlet pressure boss on the valve.
3. Open the gas shutoff valve and Ignite the appliance burner by switching on the electricity supply to the appliance and check that the manometer reading is as shown in the chart below (see also the Data Label affixed to the Burner Control Box).

- Switch off the electricity supply to the appliance and close the gas shutoff valve. Remove the manometer tube from the gas valve test boss. After testing, carefully seal test point with the provided screw by turning clockwise. Recommended torque = 1.0 Nm.

### 15.3) OUTLET GAS PRESSURE CHECK AND ADJUSTMENTS

All adjustments must be made on the basis of the specific characteristics of the appliance. Check inlet and outlet pressure using the pressure test points provided. After testing, carefully seal test points with the provided screws. Recommended torque = 1.0 Nm.

- Turn off all electrical power to the system to connect manometer hoses.
- Turn the pressure test screw in the center of the gas valve test boss not more than one turn **counterclockwise**. Attach a 9 mm hose and manometer over the outlet pressure test boss on the valve (see Figure 1 below). If regulator needs to be adjusted, see instructions below.

#### TO ADJUST REGULATOR (step opening Hi/Lo two stage gas valves – SIT No. 843):

Remove the modulator plastic cap A (see Figure 1 below).

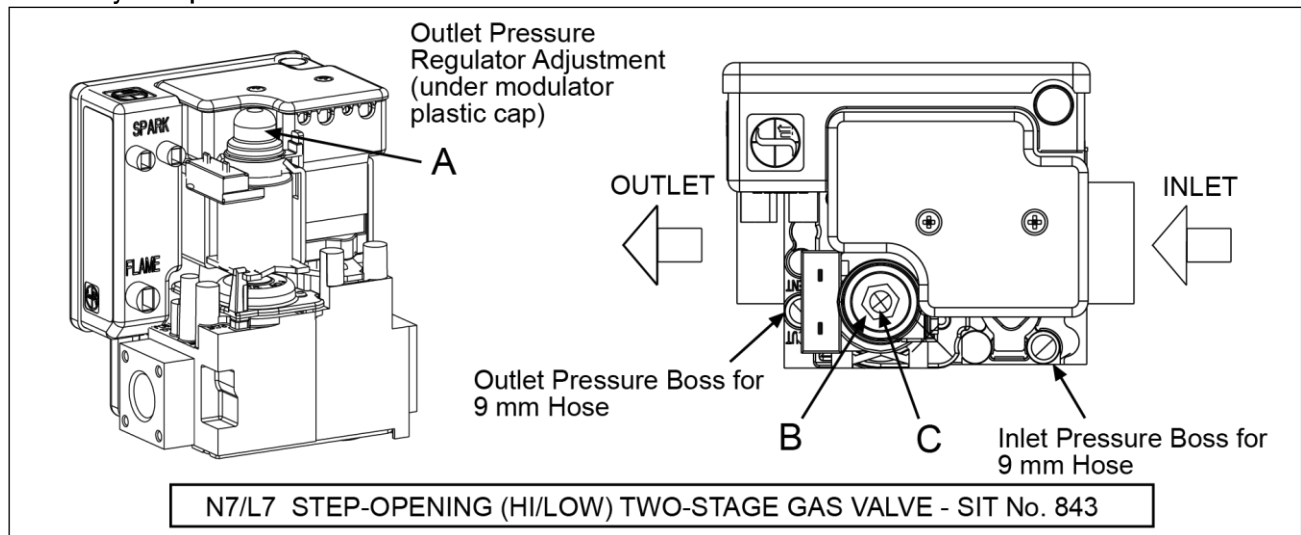
**MAXIMUM PRESSURE:** Power the modulator in the maximum condition – high fire. Keeping the screw C stationary, turn regulator adjustment hex nut B **clockwise** ↻ to increase pressure, or **counterclockwise** ↺ to decrease pressure. Use a 10 mm spanner. After setting put back the modulator plastic cap.

**MINIMUM PRESSURE:** Turn off the power supply to the modulator – low fire. Keeping the hex nut B stationary, turn the screw C **clockwise** ↻ to increase pressure, or **counterclockwise** ↺ to decrease pressure. Use a 6 x 1 blade. After setting put back the modulator plastic cap. Reconnect pressure regulator connection (if used).

**WARNING:** To ensure the correct operation of the modulator it is necessary that the plastic cap A is returned to its original location.

#### DO NOT EXCEED THE PRESSURES SHOWN IN THE GAS PRESSURE TABLE.

After testing pressure and adjusting the regulator, turn off all electrical power to the system, remove manometer hoses, turn outlet test screw clockwise to seal pressure port. Tighten to 1.0 Nm torque minimum. Turn on system power.

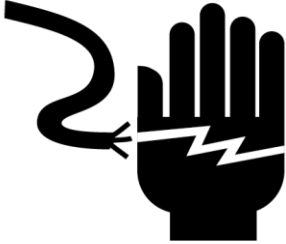


GAS PRESSURE TABLE				
GAS TYPE	MANIFOLD PRESSURE		SUPPLY PRESSURE	
	High	Low (2-stage only)	Minimum*	Maximum
Natural Gas N7	15.0 mbar	7.0 mbar	20.0 mbar	60.0 mbar
Propane Gas L7	26.7 mbar	12.5 mbar	37.0 mbar	60.0 mbar

Minimum permissible gas supply pressure for purpose of input adjustment.



## 16.0) ELECTRICAL CONNECTIONS

<b>⚠ WARNING</b>	
	<b>ELECTRIC SHOCK HAZARD</b>
	Disconnect electrical power and gas supply before servicing. This appliance must be connected to a properly grounded electrical source. Failure to do so may result in death or serious injury.

1. All electric wiring shall conform to the latest edition of the current National Regulations and any Local Regulations which apply or the code legally authorized in the locality where the installation is made.
2. The unit must be electrically grounded. All external wiring **MUST** comply with the current IEE wiring regulations.
3. The power supply to the unit should be protected with a fused disconnect switch or circuit breaker. The disconnect switch must facilitate complete isolation and should preferably be via a fused double pole isolator having a constant separation of at least 3mm in all poles and supplying the appliance **ONLY**. A service switch, as required by local codes, shall be located in the vicinity of the heater (check local codes for allowable distances) and should be identified as Heater Service Switch. All electrical wiring must be located in accordance with the required Clearances to Combustibles below the heater (See section 4).

Electrical supply      230V ~ 50/60Hz 25W  
Current rating        0.11A  
Fuse externally        3A

4. Using flexible international harmonized 3-wire PVC (thermoplastic jacket) supply cable with earth (0.50 mm<sup>2</sup> to National or Local standard specifications) connect the power supply leads to the terminal block and earth connection located inside the control housing as follows:

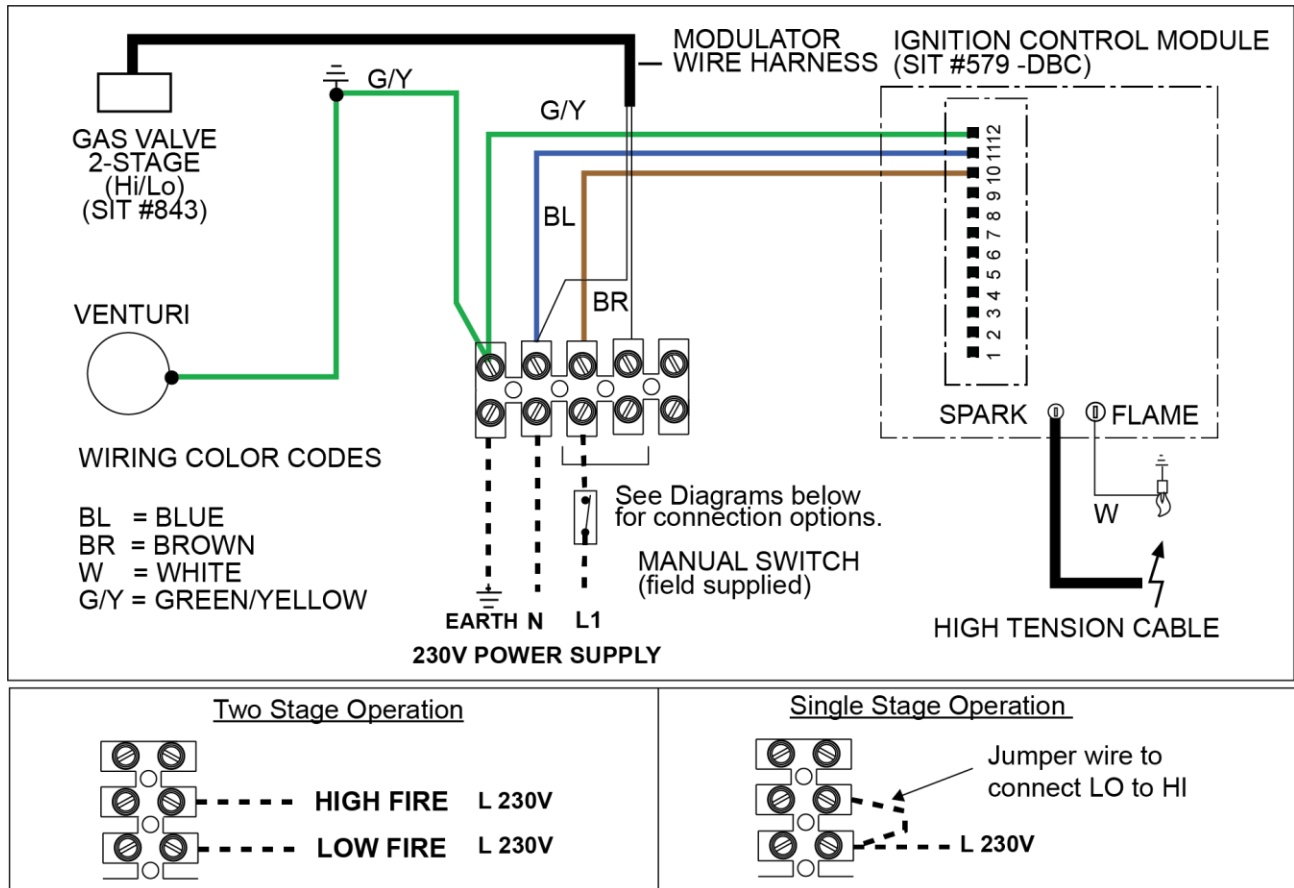
Brown (red) -        to terminal marked L  
Blue (Black) -      to terminal marked N  
Green/Yellow -     to terminal marked  $\equiv$

Refer to the external connection wiring diagram shown below.

**NOTE:** It is important for the correct function of the appliance for the polarity of the electrical supply to be correct.

## 16.1) INTERNAL CONNECTION WIRING DIAGRAM

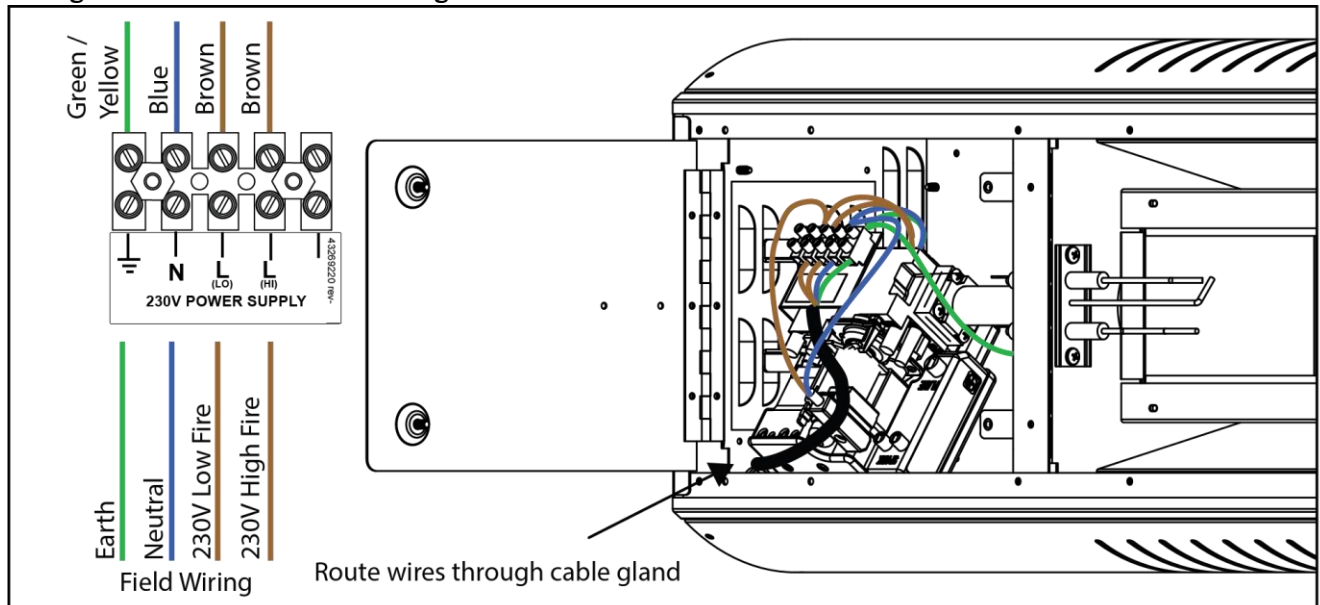
The figure below shows the internal wiring diagram of the heater and the optional external connections depending on how the heater will be controlled.



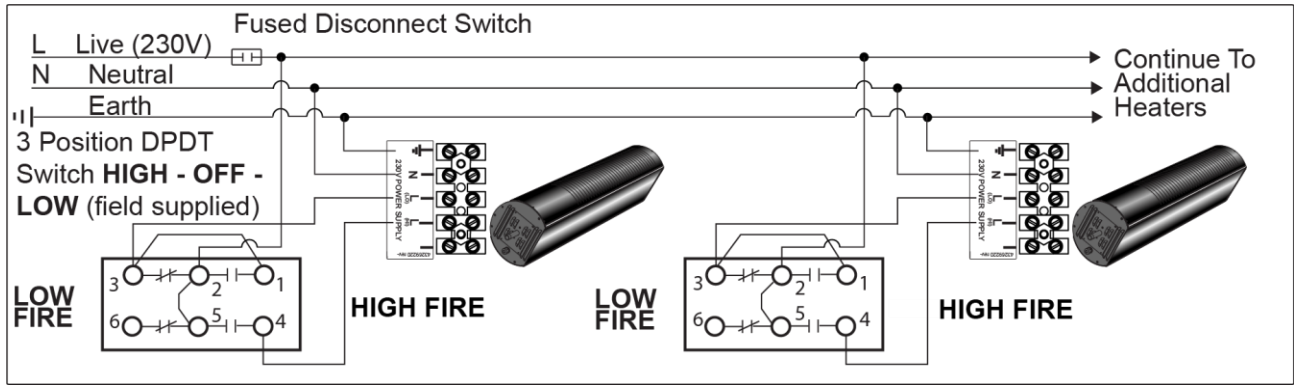
**NOTE:** In the event of an electrical fault after installation of the appliance, preliminary system checks are required to be carried out i.e. earth continuity, polarity and resistance to earth.

## 16.2) FIELD CONNECTIONS AND WIRING DIAGRAMS – 2 STAGE

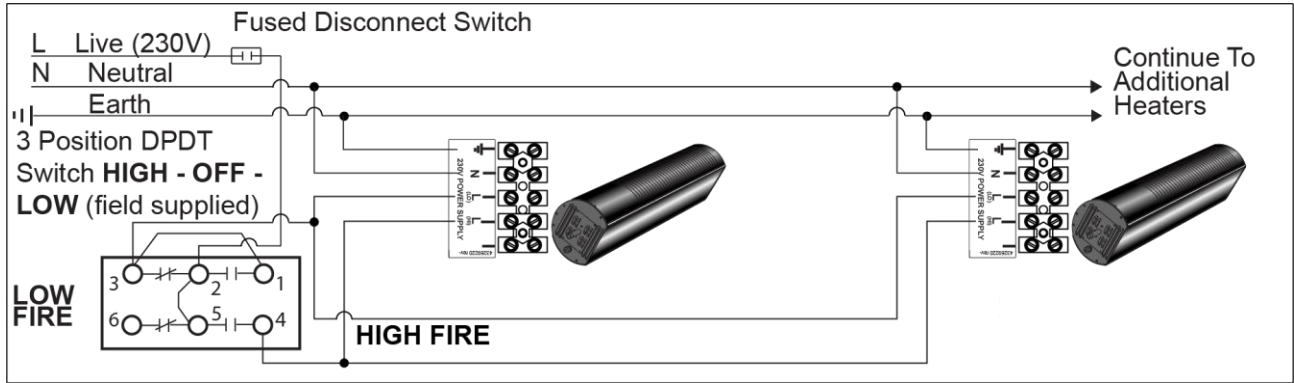
The figure below shows the field wiring connections to the heater terminal block.



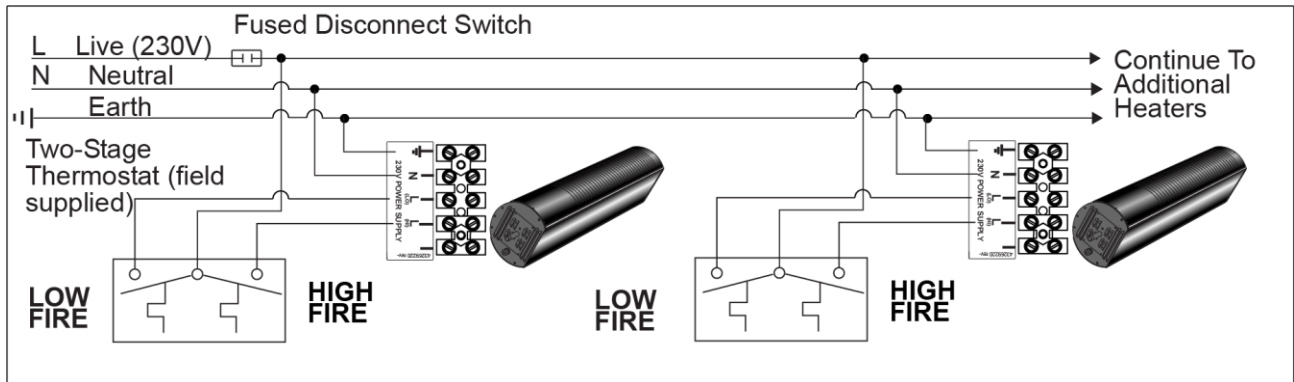
**A. 3 POSITION SWITCH CONNECTIONS - SINGLE HEATERS**



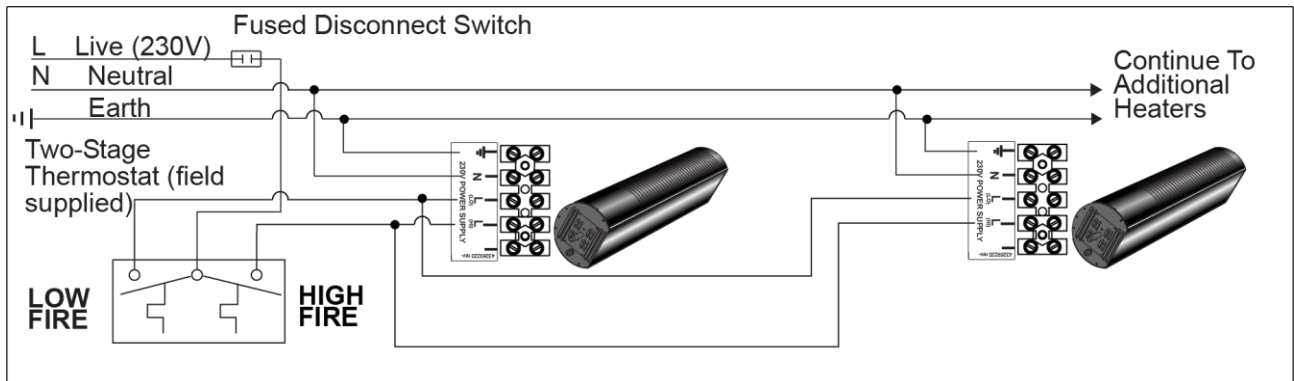
**B. 3 POSITION SWITCH CONNECTIONS - MULTIPLE HEATERS**



**C. THERMOSTAT CONNECTIONS - SINGLE HEATERS**

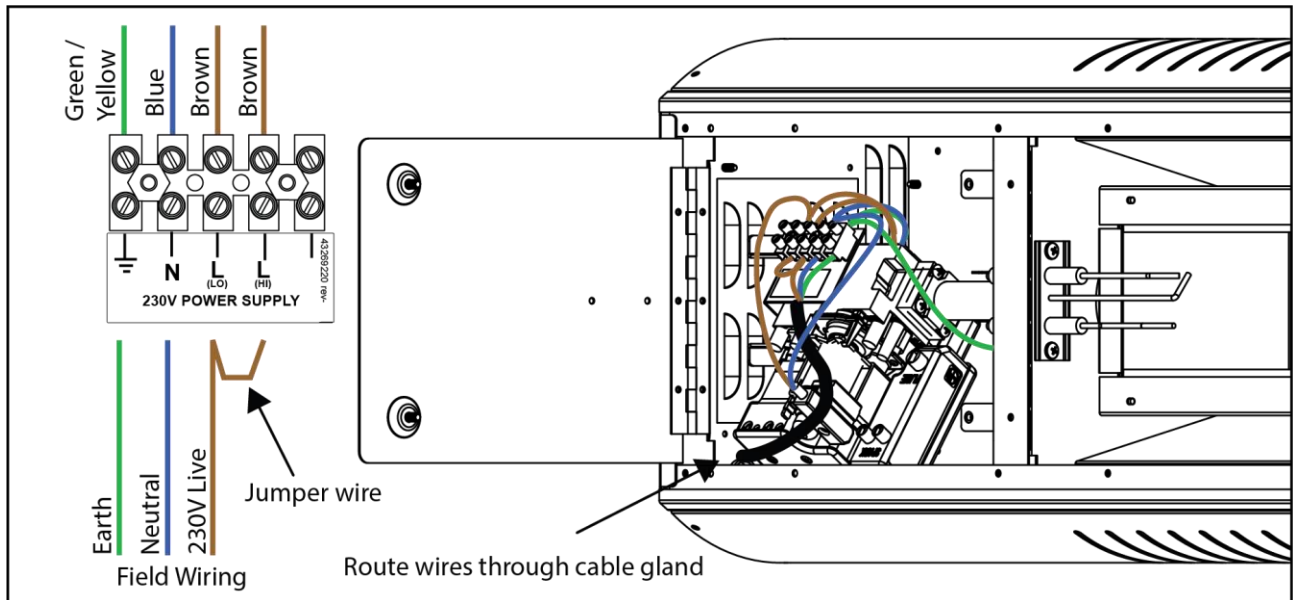


**D. THERMOSTAT CONNECTIONS - MULTIPLE HEATERS**

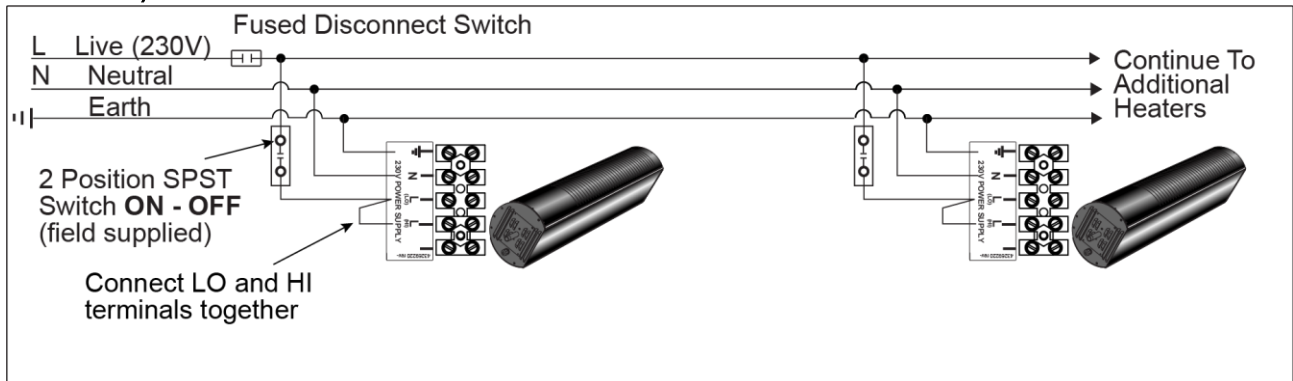


## 16.3) FIELD CONNECTIONS AND WIRING DIAGRAMS – SINGLE STAGE

The figure below shows the internal connection to operate the heater turning on and off 230V power to the heater. Important: To operate the heater as single stage a jumper wire must be installed across the LO and HI terminals as shown below. The heater will not operate with only 230V power to the HI terminal.

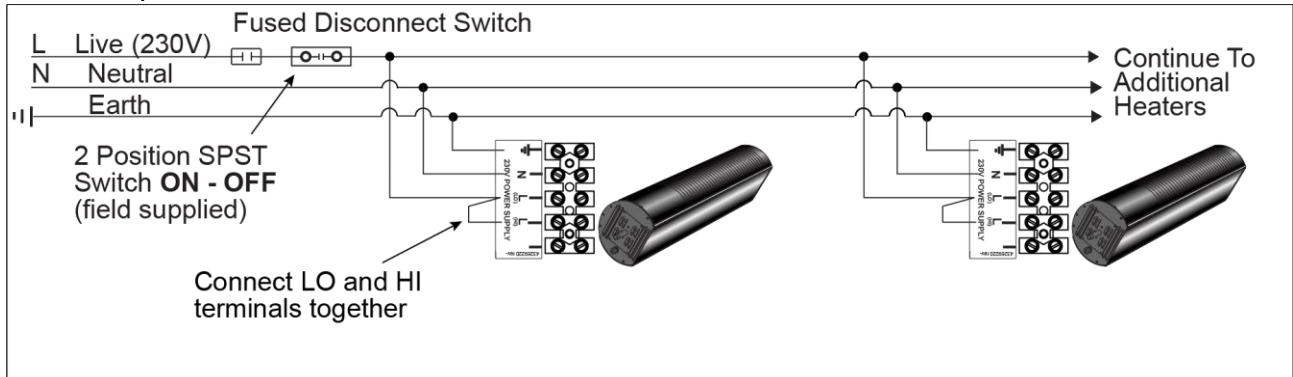


### A. ON / OFF SWITCH CONNECTION - SINGLE HEATERS



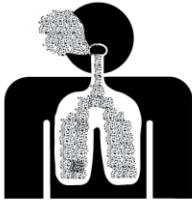
To operate the heater with an individual thermostat use the same connections as above for the switch.

### B. ON / OFF SWITCH CONNECTION - MULTIPLE HEATERS



## 17.0) VENTILATION

### ⚠ WARNING



#### CARBON MONOXIDE HAZARD

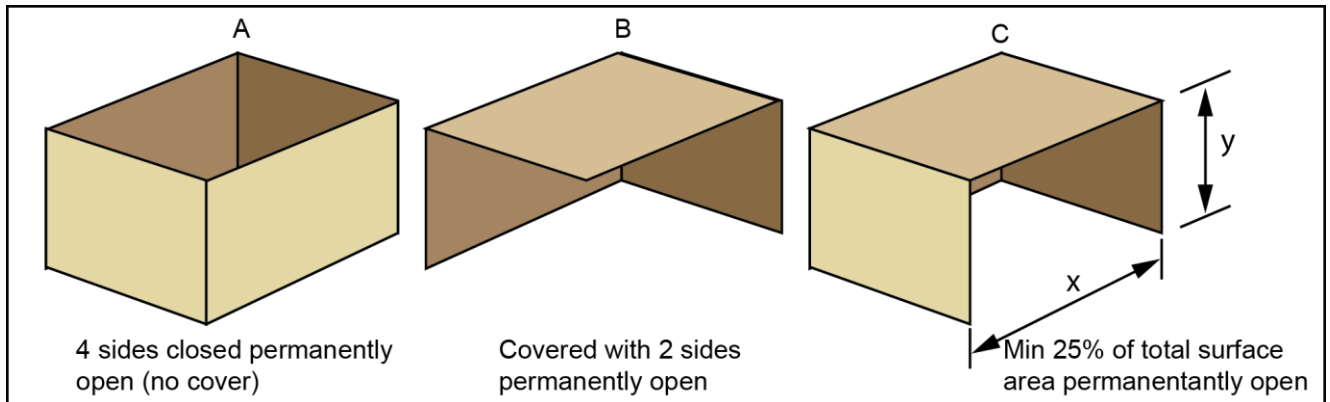
Heaters installed indoors require a minimum ventilation of 10m<sup>3</sup>/hr per kW of operating heat input.

Failure to do so may result in death, serious injury, property damage or illness from Carbon Monoxide poisoning.

This heater is approved for both **INDOOR** and **OUTDOOR** installation. Both installation options have different ventilation requirements as described below. These must be observed.

**OUTDOOR** space is defined as an amply ventilated area that must have a minimum of 25% of the surface area open. The surface area is the sum of the area of the walls, where the area of  $x$  multiplied by  $y$  is the open area.

**INDOOR** space is defined as all other spaces that do not conform with the requirements of an outdoor space



**A. Heaters installed INDOOR** must be ventilated in accordance with the requirements of EN13410. The installation room should have a volume of at least 10m<sup>3</sup>/kW of installed nominal heat input of the radiant heater.

The ventilation requirements and calculation methods for unflued appliances are set out in the European Standards **EN 13410:2001** and must be applied. The following is guidance to the standard:

Ventilation may be achieved by any of the three following different means:

- 1) thermal evacuation of the products of combustion/air mixture
- 2) mechanical evacuation of the products of combustion/air mixture
- 3) natural air change

#### 1) Ventilation by Thermal Evacuation

Ventilation by thermal evacuation is sufficient if 10 m<sup>3</sup>/h of exhaust air per kW of operating heat input are ventilated out of the installation room.

- The air/products of combustion mixture must be evacuated above the radiant heaters, if possible near the ridge, by means of exhaust mixture opening(s), (vents).
- Where the exhaust mixture opening(s) can be closed, it shall only possible to operate the radiant heaters when they are open.
- The maximum horizontal distance between a radiant heater and a vent opening shall be:  
6 (six) times the vent height in the case of **wall** openings  
3 (three) times the vent height in the case of **roof** openings

## 2) Ventilation by Mechanical Evacuation

Ventilation by mechanical evacuation is sufficient if **10 m<sup>3</sup>/h of exhaust air per kW of operating heat input** are ventilated out of the installation room.

The air/products of combustion mixture must be evacuated above the radiant heaters using fan(s). It shall only be possible to operate the radiant heaters whilst the exhaust airflow is proven.

The maximum horizontal distance between a radiant heater and a fan shall be:

- 6 (six) times the fan mounting height in the case of **wall** openings
- 3 (three) times the fan mounting height in the case of **roof** openings

**Note:** Mechanical exhaust air openings must be positioned such that the burner stability of the nearest appliance is unaffected.

## 3) Ventilation by Natural Air Change

Gas-Fired radiant patio heaters may be operated without any special exhaust system if the exhaust gases are discharged to the outside atmosphere by a sufficient natural air change in the installation room.

Furthermore, no provision for thermal or mechanical ventilation is required in the following particular cases:

- Buildings with natural air change greater than 1.5 volumes per hour
- Buildings with a density of operating heat input not greater than 5W/ m<sup>3</sup>

## 4) Air Supply

Air supply openings are required to admit air and shall be located below the radiant heaters.

The total area of the unobstructed cross-sections of all the air supply openings shall not be smaller than the total area of the unobstructed cross-sections of all the exhaust openings.

Slits and gaps of **fixed** cross-section can also be used as air supply openings.

Where the air supply openings can be closed, it shall only be possible to operate the radiant heaters when they are open.

**B. Heaters installed OUTDOOR** must be used in amply ventilated areas. An amply ventilated area must have a minimum of 25% of the surface area open. The surface area is the sum of the walls surface.

# 18.0) LIGHTING AND SHUTDOWN INSTRUCTIONS

## ⚠ WARNING



### ELECTRIC SHOCK AND FIRE HAZARD

Disconnect power to heater before servicing.

Do not operate unit if repairs are necessary. Do not operate unit showing any signs of burner malfunction. Call a professional for assistance.

Failure to do so may result in death, serious injury or property damage.

## ⚠ WARNING



### CUT HAZARD

DO NOT operate the heater if the ceramic glass appears to cracked or broken.

Failure to do so may result in death, serious injury or property damage.

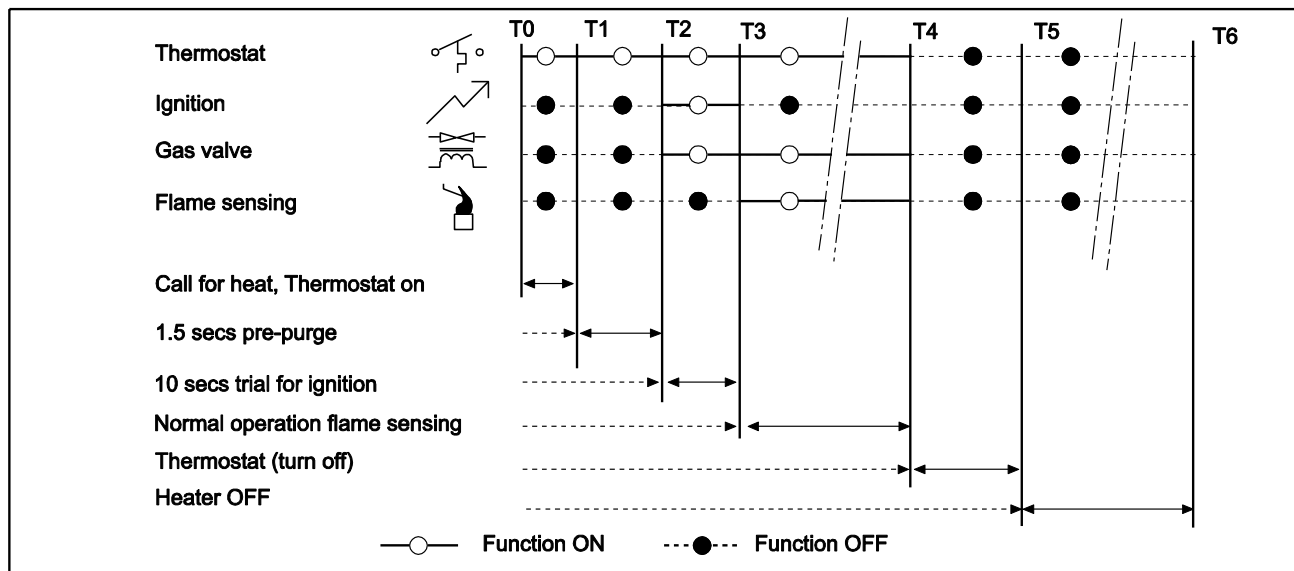
**Direct Burner Spark Ignition Modules.**

1. Turn on the gas supply to the appliance.
2. Set any time switch or thermostats to demand heat.
3. Switch on the electrical supply to the appliance.
4. Following a 1.5 second pre-purge the burner should ignite within 10 seconds.
5. If the burner fails to light, or flame is not detected during the first trial for ignition (a period of 10 seconds) the gas valve is de-energized and the control goes through an inter-purge delay of 15 seconds before another ignition attempt. The control will attempt two additional ignition trials before going into lockout.
6. If 'Lockout' occurs, switch off the electrical supply to the appliance, wait for 5 minutes before switching on the electrical supply to the appliance to repeat the ignition sequence.
7. If the appliance fails to ignite after a second sequence, switch off the electricity supply to the appliance and call the service engineer.
8. If gas failure occurs after successful ignition, the appliance will attempt one re-ignition before going to "Lockout" conditions.
9. To shut down the appliance for short periods of time, switch off the electrical supply to the appliance.
10. To shut down the appliance for longer periods of time switch off the electrical supply to the appliance and turn off the gas supply at the gas isolation valve.


**18.1) SEQUENCE OF OPERATION**




Normal operation:

The chart below shows the sequence of operation for the normal operating cycle of the heater turned on and off by a remote 230V thermostat.



**19.0) SERVICING AND ANNUAL MAINTENANCE**

<b>! CAUTION</b>	
	<p style="text-align: center;"><b>EQUIPMENT FAILURE HAZARD</b></p> <p>Do not blow out heating elements with high pressure air. Failure to do so may result in property damage.</p>

<b>⚠ WARNING</b>		
<b>ELECTRIC SHOCK HAZARD</b>	<b>FIRE AND EXPLOSION HAZARD</b>	<b>BURN HAZARD</b>
		
Disconnect electric before service. Heater must be connected to a properly grounded electrical source.	Turn off gas supply to heater before service.	Allow heater to cool 30 minutes before service. Glass and heater surfaces will still be hot after operation.
Failure to follow these instructions can result in death, serious injury or property damage.		

This heater must be cleaned and serviced annually by a qualified contractor before the start of each heating season and at any time excessive accumulation of dust and dirt is observed. Maximum heating efficiency and clean combustion will be maintained by keeping the heater clean. Detailed instructions for component removal are given in Section 21.0) Replacing Parts. Consult manufacturer when parts need replacement that are not listed.

After any maintenance and/or replacement of components the heater must be re-commissioned to ensure proper operation. After working on gas carrying components the appliance must be checked for gas leaks and pressure settings verified.




The contractor shall check the following during periodic maintenance.

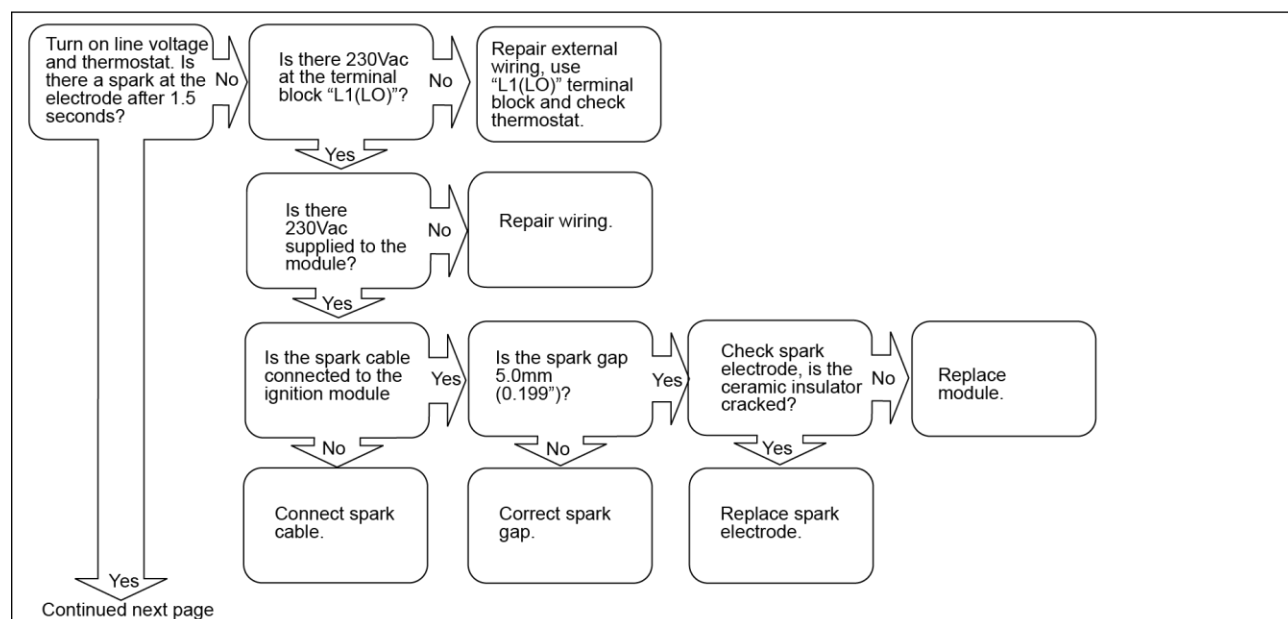
- **Clearances to combustibles:** Check that clearances are being maintained. Make sure there are no flammable objects, liquids or vapors near the heater. See also Section 4.0). Ensure heater mounting angle and heat shield installation position correspond to each other. See also Sections 12.1).
- **If the heater was installed using the outdoor ventilation requirements:** Check that the area has not been closed in making it an Indoor installation. If any changes have been made then the ventilation requirements for Indoor installations apply.
- **Heat Shield:** The Heat Shield must be kept clean, at a minimum blow off the Heat Shield and wipe down with a damp cloth. Ensure Heat Shield is properly attached to heater. See Section 13.0). Review that the heat shield installation location matches the heater mounting angle.
- **Heater ventilation openings:** Make sure no foreign material has collected inside the heater through the ventilation openings. Remove any foreign materials.
- **Venting System:** Ensure heater has adequate ventilation. See also Section 17.0).
- **Gas lines:** Make sure that the gas lines are not leaking. Check the gas connection to the heater for any signs of damage, fatigue or corrosion. If there are any signs of damage to the gas connection or leaks found in the gas piping, immediately stop using the heater and turn off the gas until the gas pipe and connections have been repaired or replaced. Check that the gas lines are not bearing the weight of the heater. See also Section 15.0)
- **Heater:** In order to extend the longevity of the heater it must be suspended level. See also Section 12.0).
- **Heater mounting angle and heat shield:** Ensure the heat shield position matches the heater mounting angle. See also Section 13.0).
- **Electrode condition:** Visually check that the electrode gap is maintained at 5mm (0.199”) and that the tips of the flame sensor and spark electrode are free from deposits. Clean off any deposits. Check that the electrode ceramic is free from cracks. See Section 21.2)
- **Suspension system:** Check that the suspension system is holding the heater level. Make sure that the heater is hanging securely, look for any evidence where the heater may have been hit accidentally and tighten any loose hanging points. Check that S hooks are closed. Check that there is no evidence of wear on the chain at the connection to the heater and at the ceiling.

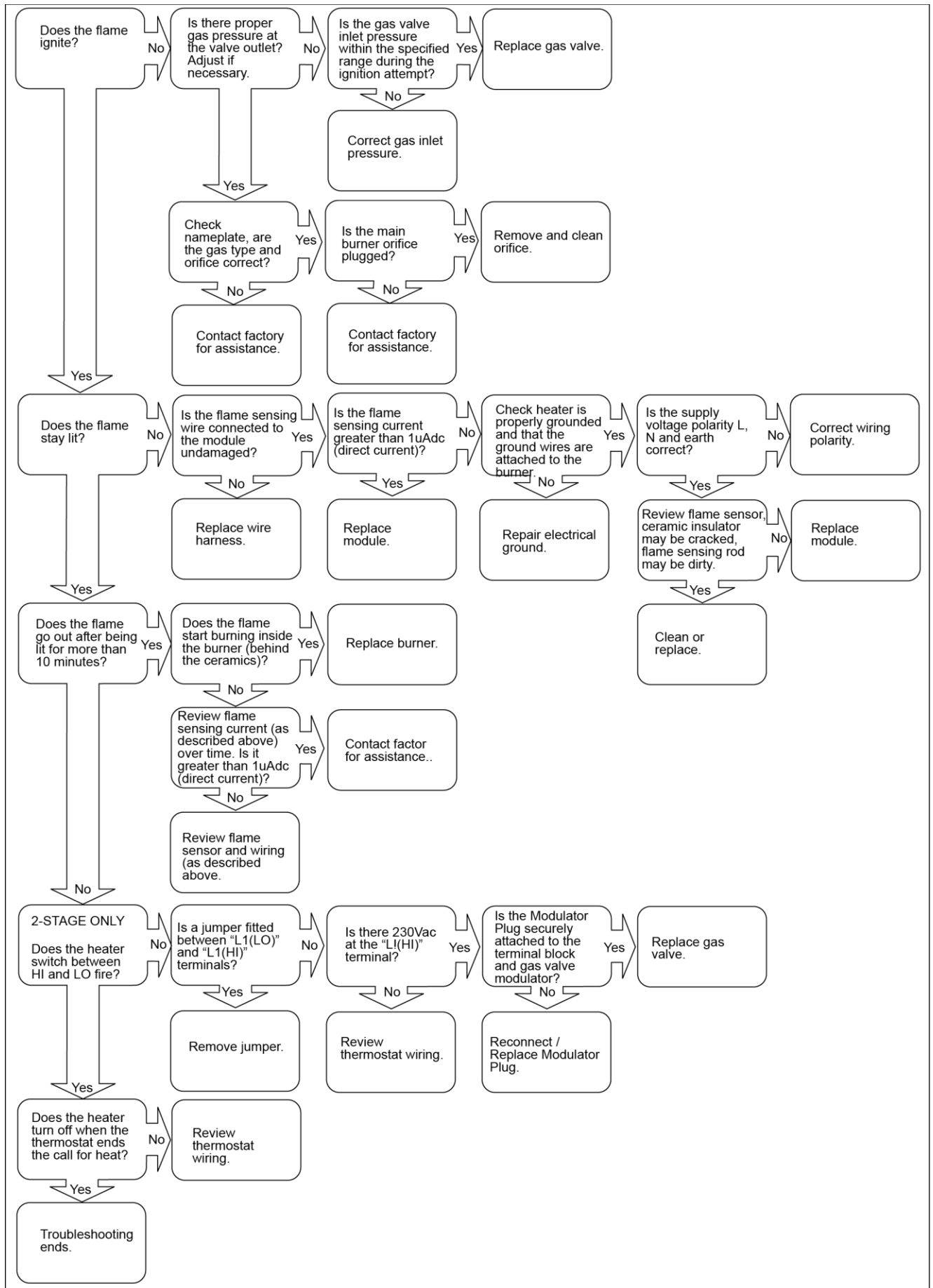


- **Main Burner and Orifice:** Check the Main burner and orifice; remove any dirt or debris including spider webs.
- **Foreign Objects:** Check and remove any foreign objects that are logged between the heat shield and the heater.
- **Ceramic Glass:** Clean the glass from the inside and outside using a damp cloth. See also Section 21.1) for safe removal of glass.
- **Burner Assembly:** The burner assembly is not serviceable. The metal back may be cleaned with a damp cloth, the ceramic and gaskets must not be disturbed.
- **IMPORTANT:** DO NOT DIRECT AN AIR LINE AT THE CERAMIC PLAQUE SURFACE AS IT MAY DAMAGE THE CERAMIC TILES OR DISLODGE THE HIGH TEMPERATURE GASKET MATERIAL FROM AROUND THE TILES.
- **Safety Labels:** Replace safety and all other labels if they are no longer visible. See section 24.0) for replacements.
- **Wall Tag:** Ensure a wall tag has been placed near the heater's thermostat or in a conspicuous area near the heater. Review the information for accuracy, replace if the information is no longer visible.

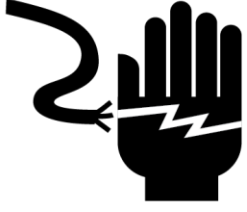


## 20.0) TROUBLE SHOOTING

<b>⚠ WARNING</b>		
<b>ELECTRIC SHOCK HAZARD</b>	<b>FIRE AND EXPLOSION HAZARD</b>	<b>BURN HAZARD</b>
		
Disconnect electric before service. Heater must be connected to a properly grounded electrical source.	Turn off gas supply to heater before service.	Allow heater to cool 30 minutes before service.  Glass and heater surfaces will still be hot after operation.
Failure to follow these instructions can result in death, serious injury or property damage.		






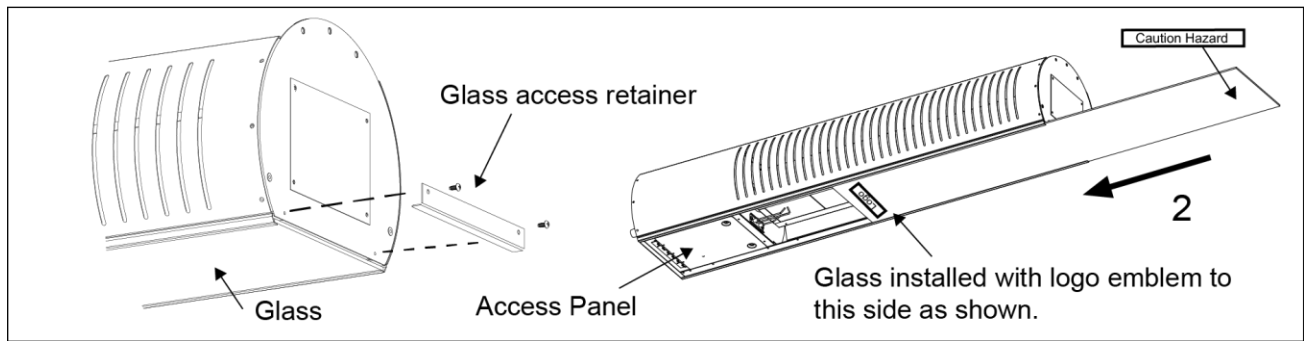
## 21.0) REPLACING PARTS

<b>⚠ WARNING</b>		
<b>ELECTRIC SHOCK HAZARD</b>	<b>FIRE AND EXPLOSION HAZARD</b>	<b>BURN HAZARD</b>
		
Disconnect electric before service. Heater must be connected to a properly grounded electrical source.	Turn off gas supply to heater before service.	Allow heater to cool 30 minutes before service. Glass and heater surfaces will still be hot after operation.
Failure to follow these instructions can result in death, serious injury or property damage.		

## 21.1) REMOVAL OF GLASS PANEL

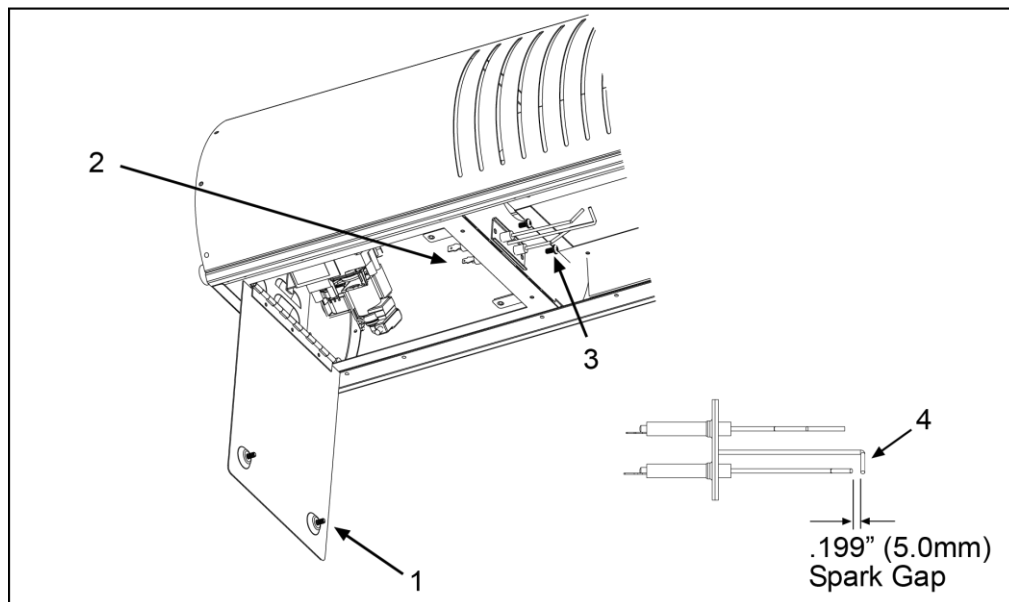
<b>⚠ WARNING</b>	
	<b>BURN HAZARD</b> Hot surfaces! <b>DO NOT</b> remove glass while heater is in operation. Allow heater to cool for at least 10 minutes before touching any surfaces. Failure to do so may result in serious injury.

1. Remove the glass retainer 1.
  2. Carefully slide the glass panel 2 from the retainer rails and away from heater. Access to the gas control valve and ignition module can now be made by loosening the screws from the access panel assembly.
  3. Clean the glass with a glass cleaning solvent. Inspect for any cracks.
  4. Inserting the glass:
    - 4.1. The side of the glass where the logo emblem is attached must be slid in first for the logo emblem's final position to be at the control side of the heater.
    - 4.2. Slide the glass into the "Glass Retainer Rails". The glass must be held parallel to the Glass Retainer Rails during assembly. The glass will slide in easy with ample clearance. Slide the glass until it is positioned under the Glass Retainer at the heaters control enclosure side. At this point the glass will be flush with the heater at the insertion point.
- Note: If the ceramic glass does not slide in easily review position of ceramic glass to glass retainers and adjust if needed. Do not force the ceramic glass into the glass retainers!
5. Reinstall the Glass Access Retainer 1 removed in 1 with the two (2) sheet metal screws.



## 21.2) REMOVAL OF SPARK ELECTRODE/FLAME SENSOR

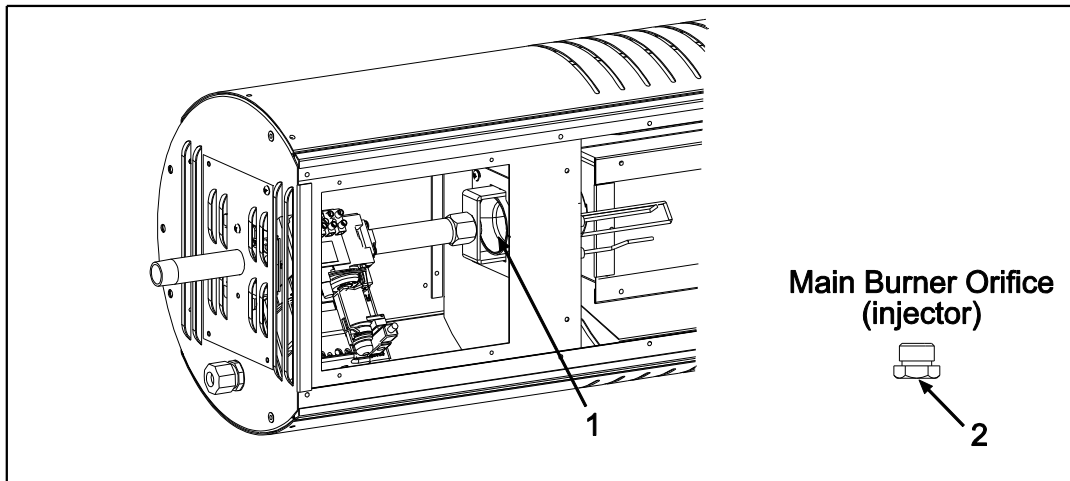
1. Remove the glass panel as shown in Section 21.1). Open the access panel assembly by loosening the screws.
2. Disconnect the ignition cable and flame sensor wires (not shown) from the spark electrode/flame sensor.
3. Remove the screws holding the assembly and slide the spark electrode/flame sensor away from the heater.
4. Inspect the ceramic portion of the electrode/flame sensors for any cracks. Remove any foreign matter from the electrode tips and check that the spark gap is 5.0mm (.199"). If the electrode/flame sensor rods are badly oxidized, replace the electrode/flame sensor in the reverse order.



## 21.3) REMOVAL OF MAIN BURNER ORIFICE (INJECTOR)

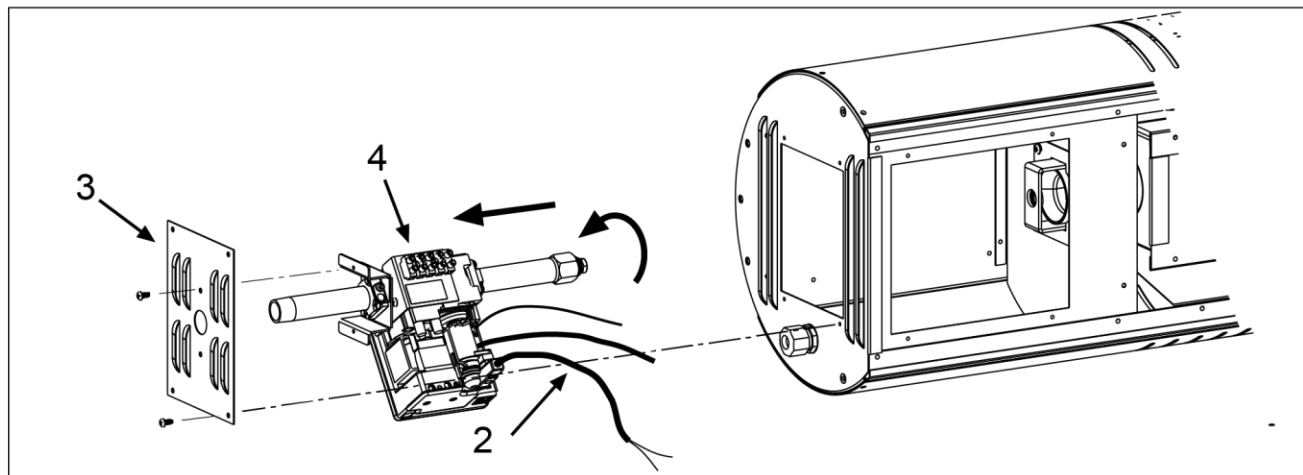
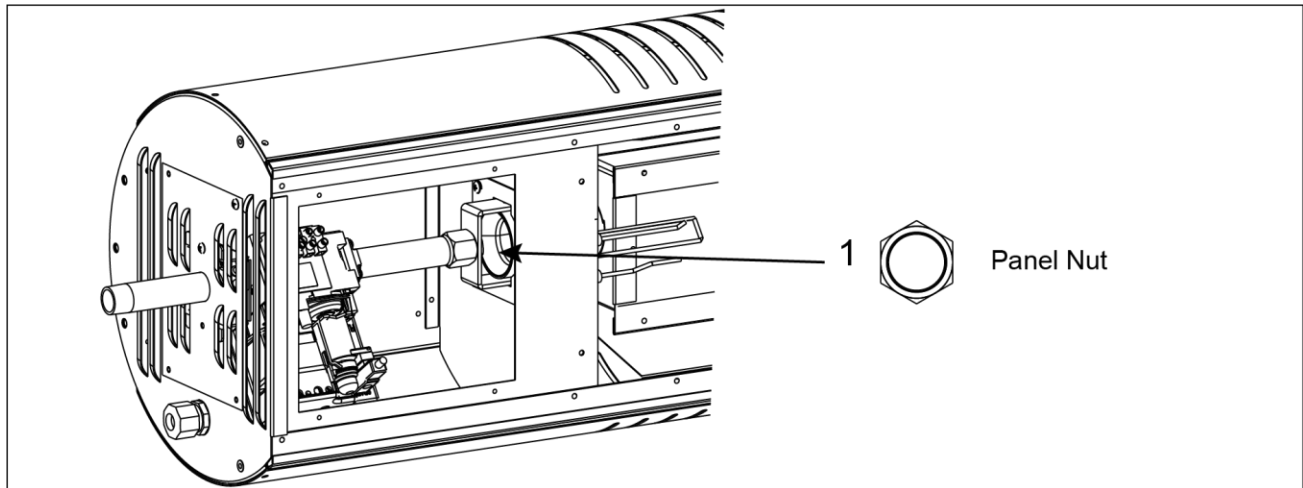
1. Open the access panel assembly as shown in Section 21.2). **Note: This is removed from the illustration for clarity.** Unscrew the main burner orifice from the gas valve manifold using a 13mm ( $\frac{1}{2}$ ") end wrench.
2. Inspect the orifice and clean as necessary with a soft bristle brush.

**DO NOT DAMAGE ORIFICE OPENING BY USE OF SOLID OBJECTS.**



## 21.4) REMOVAL OF GAS VALVE/IGNITION CONTROL MODULE

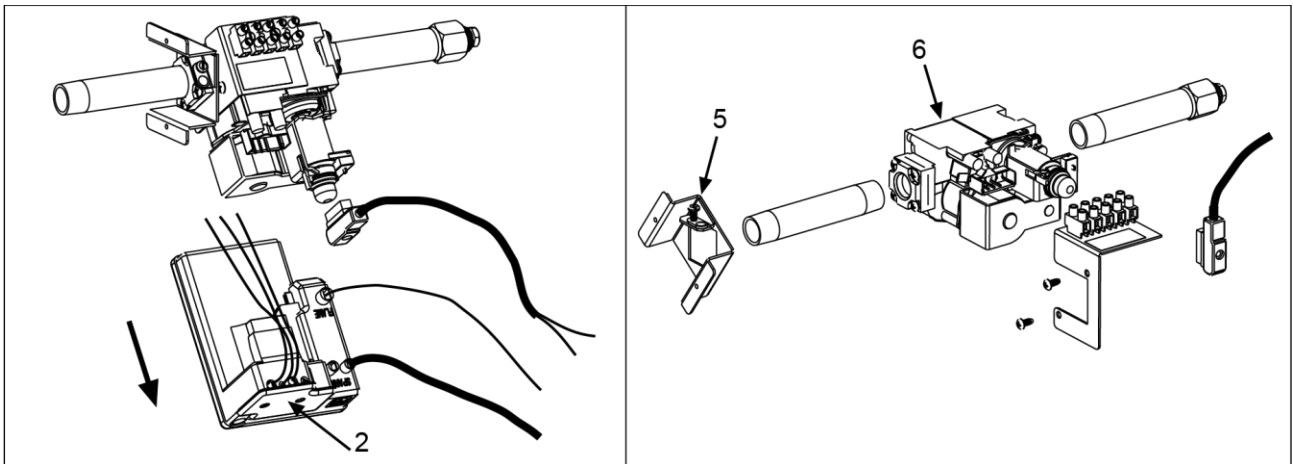
1. Open the access panel assembly as shown in Section 21.2). **Note: This is removed from the illustration for clarity.** Loosen the panel nut 1 using a 19mm ( $\frac{3}{4}$ " ) end wrench and remove from the gas valve manifold.
2. Disconnect the ignition cable, flame sensor wire and modulator plug cable (if equipped) from the gas valve and ignition module. Disconnect power supply wires.
3. Remove the (4) screws from the louvered valve holder plate 3.
4. Rotate the gas valve/ignition control module assembly and slide away from the heater.



## 21.5) DISASSEMBLY OF GAS VALVE/IGNITION CONTROL MODULE

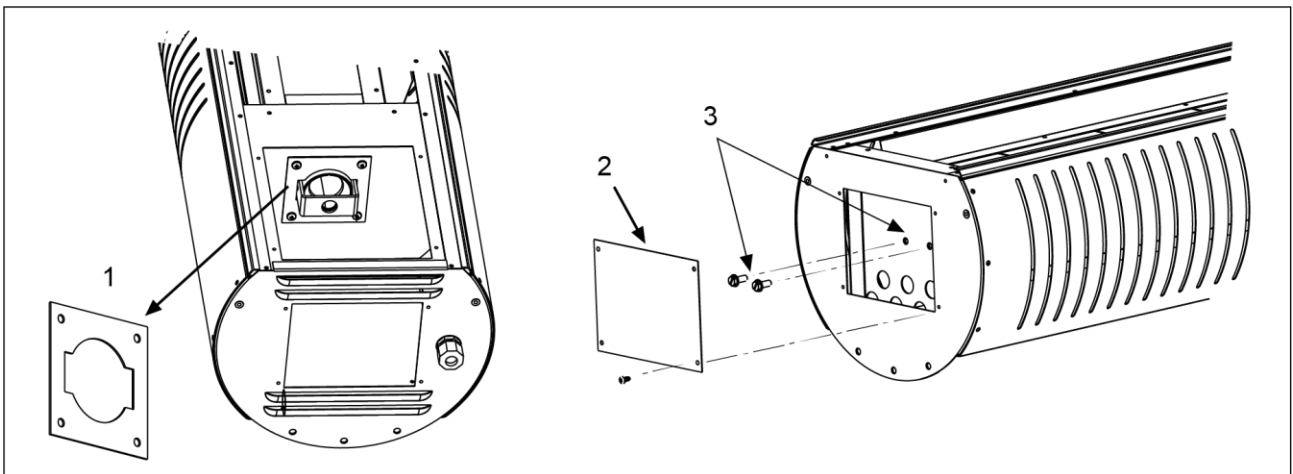
1. Open the access panel assembly as shown in Section 21.2) **Note: This is removed from the illustration for clarity.**
2. Remove the gas valve/ignition control module assembly as shown in 21.4).
3. Remove 12 way Molex connector (not shown) from ignition module.
4. Remove the screw 2 holding the ignition control module onto the gas valve. Slide the ignition control module away from the gas valve and replace if necessary.
5. Remove the screws 5 and slide the valve holder bracket assembly away from the gas valve.
6. Disassemble the remaining gas valve components as shown.

After replacing the gas valve, check the gas pressures in accordance with the Section 15.0) of this manual.  
**IMPORTANT: TEST FOR GAS SOUNDNESS USING A SUITABLE LEAK DETECTION FLUID.**

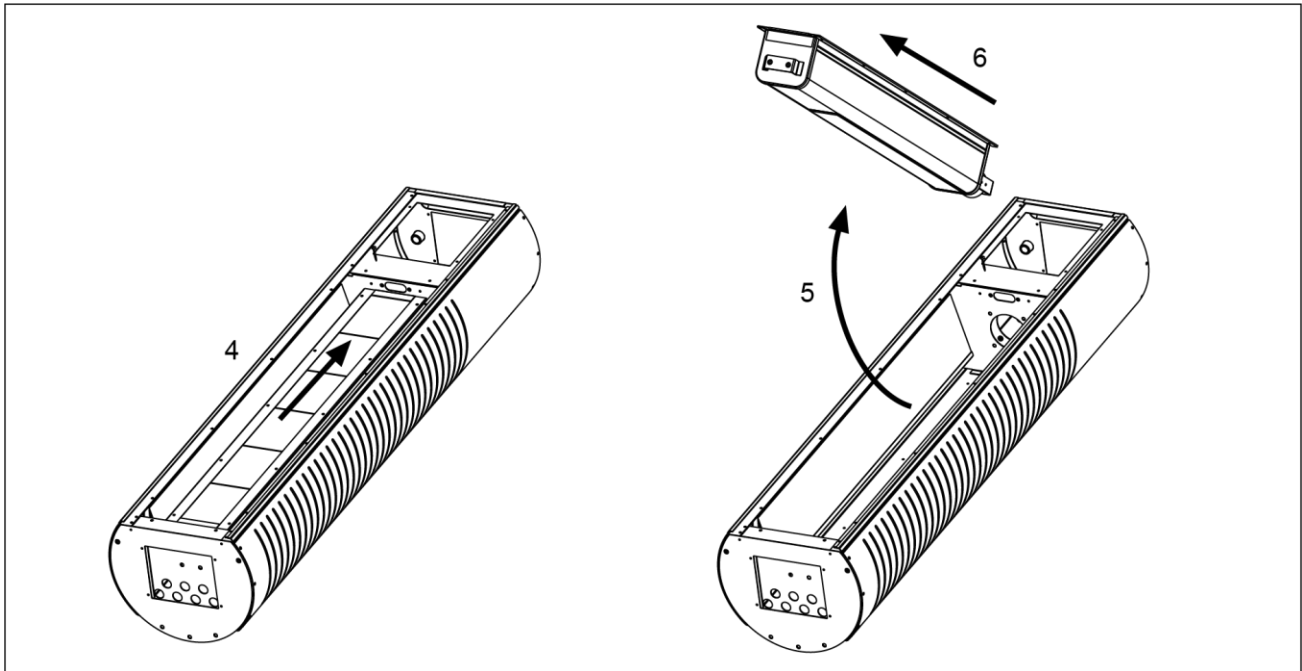


## 21.6) REMOVAL OF MAIN BURNER/EMITTER ASSEMBLY

- A. Remove the ceramic glass and open the access panel assembly as shown in Section 21.1)
  - B. Remove the gas valve as shown in Section 21.4)
1. Remove the burner access panel 2 from the opposite side of the heater.
  2. Remove the (2) locknuts 3 holding the main burner.



3. Slide the burner slightly toward the front of the heater.
4. Rotate the burner away from the heater.
5. Slide the burner out from the heater. Replace the burner in reverse order.



## 22.0) CONVERSION INSTRUCTIONS

- a) Remove the Injector from the Injector Fitting (see Section 21.3) and replace it with the alternative Injector supplied with conversion kit. Check that the size reference marked on the Injector agrees with that listed in the Specifications table Section 5.0) for the appliance model in question.
- b) Remove the pressure governor cap from the integral pressure governor of the Control Valve and screw the adjuster (both adjuster for 2-stage heaters) clockwise to increase the gas pressure, check supply and manifold pressure in accordance with Section 15.1) Replace the pressure governor cap.
- c) Affix the gas adjustment label supplied with conversion kit onto the Data Label, adjacent to the headings "Adjusted For" and "Setting Pressure", to cover the original gas adjustment label.
- d) Carry out checks in accordance with Section 15.0) of this manual to ensure correct supply pressure relative to the gas type being used.

## 23.0) INSTALLATION DATA

Date of Installation: \_\_\_\_\_ Number of Heaters in System: \_\_\_\_\_

Heater Serial Number: \_\_\_\_\_

Heater Model: WB10CE - \_\_\_\_\_

N=Natural Gas  
L=Propane Gas

## 24.0) REPLACEMENT PARTS GUIDE

Item No.	Part No.	Description	Qty.
<b>Main Heater Components</b>			
1	02352000	Screw, Pan Head Thread #8 x 1/2" Type AB SS Black Oxide	32
1a	02261030	Ground Screw #8-32 x 3/8" (Green Coated - Type F)	1
1b	02132089	Rivet 1/8" x .337" SS (grip range .126 - .187) - not shown -	26
1c	02168050	Screw, Pan Head Machine #10-24 x 3/8"	2
1d	02336010	O-Ring Retainer	2
2	44561099	Access Panel (painted)	1
3	02201070	Hinge - 6" (152mm)	1
4	44555169	Plate - Rear Burner Access (painted)	1
5	44555159	Plate - Valve Holder - w/Louvers (painted)	1
6	02353000	Panel Nut - 5/8-27 UNS x 1/8" Thick	1
7	30635050	Cord Connector 1/2" Heyco #M4521 (gray) .180-.400	1
8	30635049	Nut 1/2" Heyco #8463 (black)	1
9	41373050	Glass - 4mm x 8.94" x 48" Black	1
10	30701120	Ignition Cable - not shown -	1
11	44563050	Manifold Assembly (Gas Valve/Module/Terminal Block)	1

<b>Burner and Frame Components</b>			
1e	02132060	Rivet 1/8" x .294" SS (grip range .188 - .250) - not shown -	10
1c	02168050	PHMS #10-24 x 3/8" SS	6
12	44555100	Support Plate - Venturi	1
13	44570000	Burner Assembly (complete with tile)	1
14	30295050	Electrode/Flame Sensor - #PSE-GF36	1
15	02167019	Locknut 1/4-20 KEPS - SS	2

<b>Gas Valve and Module Components (manifold assembly)</b>			
16	42767021	Screw, M4 x 8mm Pozi Pan	2
17	n/a	Screw, M4 x 20mm Pozi Pan (included with flange kit)	8
18	02242030	Screw, Pan Head #6-32 x 5/8" Type F	2
19	44146170	Manifold Extension Bracket	1
20	42605020	Pipe Nipple - 1/2 BSPT x 110mm Long	2
21	03259410	Main Burner Orifice (injector) - 7/16-27 No. 41 - NAT Gas (G20)	1
21a	03259510	Main Burner Orifice (injector) - 7/16-27 No. 51 - LP Gas (G31)	1
22	42701500	Orifice Fitting 7/16-27 x 1/2 Female BSPT	1
23	30797751	Digital Burner Control - SIT #0.579.019	1
24	30797970	Flange Kit - SIT #0.906.266 (includes flange/gasket/M4 screws)	2
25	30797990	Modulator Plug - SIT #0.960.458	1
26	43849150	Holder Bracket - Terminal Block	1
27	30739040	Terminal Block - 5 Pole (included on wire harness)	1
28	44450109	Kit, Wire Harness - not shown -	1
29	30797520	Gas Valve - SIT #0.843.008 - HI/LO (2 stage - 230V CE	1

<b>Labels/Manual</b>			
30	43269200	Label, Power Supply and Thermostat Connections	1
31	42052060	Label, Wiring Connections - HI/LO (2 stage) - 230V CE	1
31a	42052069	Label, Wiring Connections - ON/OFF (1 stage) - 230V CE	1
32	42604200	Label, Warning - GB/IE	1
33	42604600	Label, Instructions	1
34	42849050	Label, Nameplate	1
35	43247090	Label, Clearances to Combustibles	1
36	43269730	Label, Voltage Hazard - 230V	1
37	43269740	Label, Earth Symbol	1
38	42013500	Logo, Raised Emblem - Space Ray (private label)	1
39	44201360	Manual, Installation and Operation Instructions	1



**IMPORTANT:**

- Please order by Part Number, not by Item Number.
- Refer to complete Model Number when ordering.
- All replacement parts prices are available when ordering.

**MODEL NUMBER SUFFIXES:**

**N7** = Natural Gas

**L7** = Propane Gas

**ALL ILLUSTRATIONS ARE INTENDED TO GIVE THE GENERAL IMPRESSION OF UNITS ONLY. WE RESERVE THE RIGHT TO ALTER ANY SPECIFICATION WITHOUT NOTICE**

