

IRH

Installation, Operation, and Service Manual



Installer

Please take the time to read and understand these instructions prior to any installation. Installer must give a copy of this manual to the owner.

Owner

Keep this manual in a safe place in order to provide your service technician with necessary information.





A WARNING

Installation must be done by a contractor qualified in the installation and service of gas-fired heating equipment or your gas supplier.

Improper installation, adjustment, alteration, service, or maintenance can result in death, injury, or property damage. Read the Installation, Operation, and Service Manual thoroughly before installing or servicing this equipment.

FOR YOUR SAFETY

If you smell gas:

- 1. Open windows.
- 2. DO NOT try to light any appliance.
- 3. DO NOT use electrical switches.
- 4. DO NOT use any telephone in your building.
- 5. Extinguish any open flame.
- 6. Leave the building.
- 7. Immediately call your local gas supplier after leaving the building. Follow the gas supplier's instructions.
- 8. If you cannot reach your gas supplier, call the Fire Department.



Fire Hazard

Keep all flammable objects, liquids, and vapors the minimum required clearances to combustibles away from heater.

Some objects will catch fire or explode when placed close to heater.

Failure to follow these instructions can result in death, injury, or property damage.

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SECTION 1: HEATER SAFETY



Your Safety is Important to Us! This symbol is used throughout the manual to notify you of possible fire, electrical, or burn hazards. Please pay special attention when reading and following the warnings in these sections.

Installation, service, and annual inspection of heater must be done by a contractor qualified in the installation and service of gas-fired heating equipment. Read this manual carefully before installation, operation, or service of this equipment.

For Indoor Installation Only. Not for use in residential dwellings.

This heater is not certified to meet the requirements of NFPA30A-2012 Section 7.6.6. (maximum tube temperature of 750 °F [399 °C]). Do not install this heater in facilities where compressed natural gas (CNG) or liquid natural gas (LNG) are present. These instructions, the layout drawing, local codes and ordinances, and applicable standards that apply to gas piping, electrical wiring, venting, etc. must be thoroughly understood before proceeding with the installation.

Protective gear is to be worn during installation, operation, and service in accordance to the Occupational Safety and Hazard Administration (OSHA). Gear must be in accordance to NFPA 70E, latest revision when working with electrical components. Thin sheet metal parts have sharp edges. To prevent injury, the use of work gloves is recommended. The use of gloves will also prevent the transfer of body oils from the hands to the surface of the reflector.

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

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

This appliance is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety. Children should be supervised to ensure that they do no play with the appliance.

For additional copies of the Installation, Operation, and Service Manual, visit www.bigassfans.com.

1.1 Manpower Requirements

To prevent personal injury and damage to the heater, two persons will be required for installation.

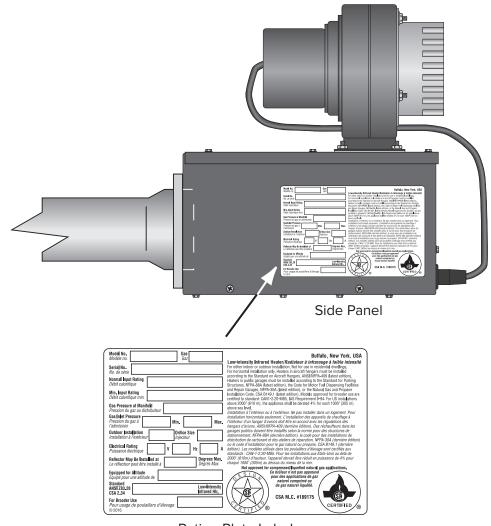
1.2 Safety Labels and Their Placement

Product safety signs or labels should be replaced by the product user when they are no longer legible.

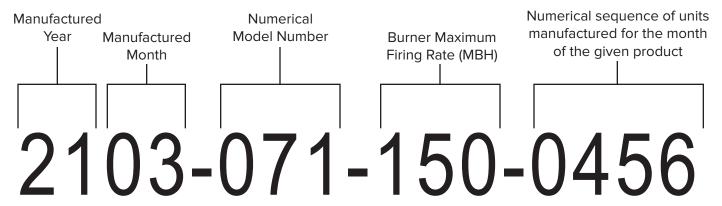
1.3 California Proposition 65

In accordance with California Proposition 65 requirements, a warning label must be placed in a highly visible location on the outside of the equipment (i.e., near equipment's serial plate). Avoid placing label on areas with extreme heat, cold, corrosive chemicals, or other elements.

FIGURE 1: Serial Number Identification Chart



Rating Plate Label



Serial numbers are located on both the burner shipping carton and the rating plate label. Each burner will have a unique 14-digit serial number used for identification purposes to allow the lookup of various items, such as manufacture test records, replacement part identification, and manufactured date.

SECTION 2: INSTALLER RESPONSIBILITY

The installer is responsible for the following:

- To install the heater, as well as the gas and electrical supplies, in accordance with applicable specifications and codes. Big Ass Fans recommends the installer contact a local Building Inspector or Fire Marshal for guidance.
- To use the information given in a layout drawing and in the manual together with the cited codes and regulations to perform the installation.
- To install the heater in accordance with the clearances to combustibles.
- To furnish all needed materials not furnished as standard equipment.
- To plan location of supports.
- To provide access on all sides for burner servicing and removal.
- To provide the owner with a copy of this Installation, Operation, and Service Manual.
- To never use heater as a support for a ladder or other access equipment and never hang or suspend anything from heater.
- To ensure there is adequate air circulation around the heater and to supply air for combustion, ventilation, and distribution in accordance with local codes.
- To safely and adequately install heater using materials with a minimal working load of 75 lb (33 kg).
- To ensure the heater is placed in an approved application.

2.1 Wall Tag

A wall tag is available for the heater as a permanent reminder of the safety instructions and the importance of the required clearances to combustibles. Affix the tag to a wall near the heater. Locate your the model number and install configuration located on the burner and noted in this manual. On the tag, write the proper clearance dimensions in permanent ink according to your model number and configuration in the open spaces.

A CAUTION



Product Damage Hazard

Do not use heater in area containing corrosive chemicals.

Refer to appropriate Material Safety Data Sheets (MSDS).

Failure to follow these instructions can result in product damage.

Big Ass Fans cannot be responsible for ensuring that all appropriate safety measures are undertaken prior to installation; this is entirely the responsibility of the installer. It is essential that the contractor, the sub-contractor, or the owner identifies the presence of combustible materials, corrosive chemicals, or halogenated hydrocarbons* anywhere in the premises.

* Halogenated Hydrocarbons are a family of chemical compounds characterized by the presence of halogen elements (fluorine, chlorine, bromine, etc.). These compounds are frequently used in refrigerants, cleaning agents, solvents, etc. If these compounds enter the air supply of the burner, the lifespan of the heater components will be greatly reduced. An outside air supply must be provided to the burners whenever the presence of these compounds is suspected. Warranty will be invalid if the heater is exposed to halogenated hydrocarbons.

2.3 National Standards and Applicable Codes

All appliances must be installed in accordance with the latest revision of the applicable standards and national codes. This refers also to the electric, gas, and venting installation. Note: Additional standards for installations in public garages, aircraft hangars, etc. may be applicable.

SECTION 3: CLEARANCES TO COMBUSTIBLES

3.1 Required Clearances to Combustibles

Clearances are the required distances that combustible objects must be away from the heater to prevent serious fire hazards. Combustibles are materials that may catch on fire and include common items such as wood, paper, rubber, fabric, etc.

Maintain clearances to combustibles at all times for safety.

Clearances for all heater models are located on the burner of the heater and on the following pages of this manual. Check the clearances on each burner for the model of heater being installed to make sure the product is suitable for your application and the clearances are maintained. Read and follow the safety guidelines below:

- Keep gasoline or other combustible materials including flammable objects, liquids, dust, or vapors away from this heater or any other appliance.
- The stated clearances to combustibles represents a surface temperature of 90 °F (32 °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.
- Maintain clearances from heat-sensitive equipment and workstations.
- Maintain clearances from vehicles parked below the heater.
- Maintain clearances from swinging and overhead doors, overhead cranes, vehicle lifts, partitions, storage racks, hoists, building construction, etc.
- In locations used for the storage of combustible materials, signs must be posted to specify the maximum permissible stacking height to maintain required clearances from the heater to the combustibles. Signs must be posted adjacent to the heater thermostat. In the absence of a thermostat, signs must be posted in a conspicuous location.
- Consult local Fire Marshal, Fire Insurance Carrier, or other authorities for approval of proposed installation when there is a possibility of exposure to combustible airborne materials or vapors.
- Hang heater in accordance to the minimum suspension requirements shown in "FIGURE 11: Critical Hanger Placement" on page 13.

WARNING



Fire Hazard

Keep all flammable objects, liquids, and vapors the minimum required clearances to combustibles away from heater.

Some objects will catch fire or explode when placed close to heater.

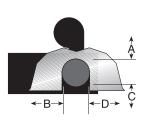
Failure to follow these instructions can result in death, injury, or property damage.

 If the radiant tubes must pass through the building structure, ensure that adequate sleeving and fire stop is installed to prevent scorching and/or fire hazard.

NOTE

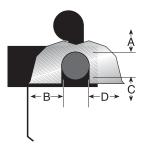
- 1. All dimensions are from the surfaces of all tubes and couplings.
- 2. Clearances B, C, and D can be reduced by 50% after 25 ft (7.5 m) of tubing downstream from where the burner and burner tube connect.

FIGURE 2: Level Reflector



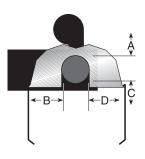
	IRH 80	IRH 125	IRH 150	IRH 200
Α	6" (16 cm)	6" (16 cm)	6" (16 cm)	8" (21 cm)
В	38" (97 cm)	46" (117 cm)	50" (127 cm)	52" (133 cm)
С	65" (166 cm)	76" (194 cm)	79" (201 cm)	96" (244 cm)
D	38" (97 cm)	46" (117 cm)	50" (127 cm)	52" (133 cm)

FIGURE 3: One Side Reflector



	IRH 80	IRH 125	IRH 150	IRH 200
Α	6" (16 cm)	6" (16 cm)	6" (16 cm)	8" (21 cm)
В	9" (23 cm)	9" (23 cm)	9" (23 cm)	18" (46 cm)
С	69" (176 cm)	82" (209 cm)	85" (216 cm)	102" (260 cm)
D	54" (138 cm)	65" (166 cm)	69" (176 cm)	73" (186 cm)

FIGURE 4: Two Side Reflectors

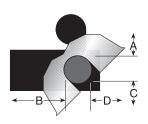


	IRH 80	IRH 125	IRH 150 IRH 200		
Α	6" (16 cm)	6" (16 cm)	6" (16 cm)	8" (21 cm)	
В	25" (64 cm)	32" (82 cm)	35" (89 cm)	40" (102 cm)	
С	71" (181 cm)	83" (211 cm)	87" (221 cm)	102" (260 cm)	
D	25" (64 cm)	32" (82 cm)	35" (89 cm)	40" (102 cm)	

NOTE

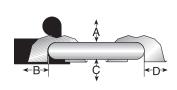
- 1. All dimensions are from the surfaces of all tubes and couplings.
- 2. Clearances B, C, and D can be reduced by 50% after 25 ft (7.5 m) of tubing downstream from where the burner and burner tube connect.

FIGURE 5: 45° Tilt Reflector



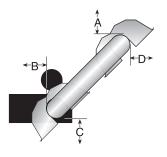
	IRH 80	IRH 125	IRH 150 IRH 200		
Α	8" (21 cm)	10" (26 cm)	12" (31 cm)	12" (31 cm)	
В	8" (21 cm)	8" (21 cm)	8" (21 cm)	10" (26 cm)	
С	65" (166 cm)	77" (196 cm)	83" (211 cm)	85" (216 cm)	
D	60" (153 cm)	69" (176 cm)	74" (188 cm)	79" (201 cm)	

FIGURE 6: U-Tube, Standard Reflector



	IRH 80	IRH 125	IRH 150 IRH 200		
Α	6" (16 cm)	6" (16 cm)	6" (16 cm)	8" (21 cm)	
В	38" (97 cm)	46" (117 cm)	50" (127 cm)	54" (138 cm)	
С	68" (173 cm)	78" (199 cm)	83" (211 cm)	102" (260 cm)	
D	37" (94 cm)	43" (110 cm)	47" (120 cm)	51" (130 cm)	

FIGURE 7: U-Tube, 45°

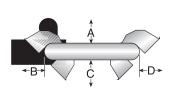


	IRH 80	IRH 125	IRH 150	IRH 200
Α	8" (21 cm)	8" (21 cm)	8" (21 cm)	8" (21 cm)
В	8" (21 cm)	8" (21 cm)	8" (21 cm)	8" (21 cm)
С	65" (166 cm)	77" (199 cm)	83" (211 cm)	85" (216 cm)
D	46" (117 cm)	61" (155 cm)	66" (168 cm)	70" (178 cm)

NOTE

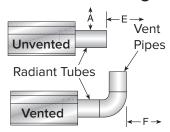
- 1. All dimensions are from the surfaces of all tubes and couplings.
- 2. Clearances B, C, and D can be reduced by 50% after 25 ft (7.5 m) of tubing downstream from where the burner and burner tube connect.

FIGURE 8: U-Tube, Opposite 45° Reflector



	IRH 80	IRH 125	IRH 150	IRH 200
Α	8" (21 cm)	10" (26 cm)	12" (31 cm)	12" (31 cm)
В	60" (153 cm)	70" (178 cm)	74" (188 cm)	76" (194 cm)
С	65" (166 cm)	77" (196 cm)	83" (211 cm)	85" (216 cm)
D	22" (56 cm)	22" (56 cm)	22" (56 cm)	22" (56 cm)

FIGURE 9: Venting



	IRH 80	IRH 125	IRH 150	IRH 200
Α	20" (51 cm)	20" (51 cm)	20" (51 cm)	20" (51 cm)
E	24" (61 cm)	24" (61 cm)	30" (77 cm)	30" (77 cm)
F	18" (46 cm)	18" (46 cm)	18" (46 cm)	18" (46 cm)

SECTION 4: NATIONAL STANDARDS AND APPLICABLE CODES

4.1 Gas Codes

Type of gas appearing on the nameplate must be the type of gas used. Installation must comply with national and local codes and requirements of the local gas company.

United States: Refer to National Fuel Gas Code NFPA 54/ANSI Z223.1 – latest revision.

Canada: Refer to Natural Gas and Propane Installation Code CSA B149.1 – latest revision.

4.2 Aircraft Hangars

Installation in aircraft hangars must be in accordance with the following codes:

United States: Refer to Standard for Aircraft Hangars, NFPA 409 – latest revision.

Canada: Refer to Natural Gas and Propane Installation Code CSA B149.1 – latest revision.

In aircraft storage and servicing areas, heaters shall be installed at least 10 ft (3 m) above the upper surface of wings or of engine enclosures of the highest aircraft which may be housed in the hangar. The measurement shall be made from the wing or engine enclosure (whichever is higher from the floor) to the bottom of the heater.

- In shops, offices, and other sections of aircraft hangars communicating with aircraft storage or servicing areas, heaters shall be installed not less than 8 ft (2.4 m) above the floor.
- Suspended or elevated heaters shall be so located in all spaces of aircraft hangars that they shall not be subject to injury by aircraft, cranes, movable scaffolding, or other objects. Provisions shall be made to assure accessibility to suspended heaters for recurrent maintenance purposes.

4.3 Public Garages

Installation in garages must be in accordance with the following codes:

United States: Refer to Standard for Parking Structures NFPA 88A – latest revision or the Code for Motor Fuel Dispensing Facilities and Repair Garages, NFPA 30A – latest revision.

Canada: Refer to Natural Gas and Propane Installation Code CSA B149.1 – latest revision.

- Heaters must not be installed less than 8 ft
 (2.4 m) above the floor. Minimum clearances to
 combustibles must be maintained from vehicles
 parked below the heater.
- When installed over hoists, minimum clearances to combustibles must be maintained from the uppermost point of objects on the hoist.

4.4 Electrical

Heater must be electrically grounded in accordance with the following codes:

United States: Refer to National Electrical Code®, NFPA 70 – latest revision. Wiring must conform to the most current National Electrical Code, local ordinances, and any special diagrams furnished.

Canada: Refer to Canadian Electrical Code, CSA C22.1 Part 1 – latest revision.

4.5 Venting

Venting must be installed in accordance with the requirements within this manual and the following codes:

United States: Refer to National Fuel Gas Code NFPA 54/ANSI Z223.1 – latest revision.

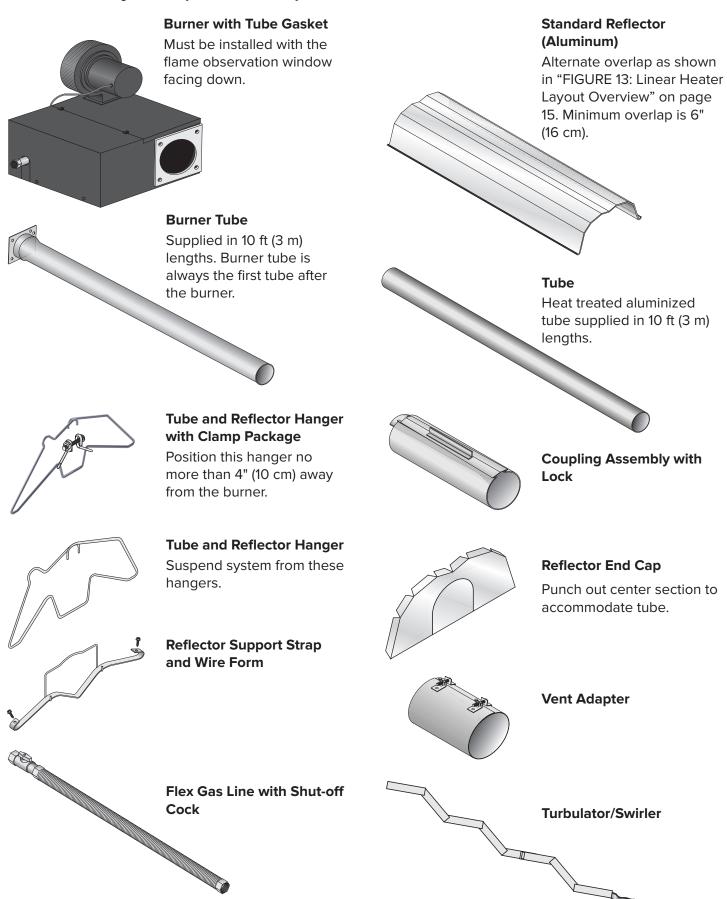
Canada: Refer to Natural Gas and Propane Installation Code CSA B149.1 – latest revision.

4.6 High Altitude

These heaters are approved for installations up to 2,000 ft (610 m) (US), 4,500 ft (1,370 m) (Canada) without modification. Consult Big Ass Fans if US installation is above 2,000 ft (610 m) or Canadian installation is above 4,500 ft (1,370 m).

SECTION 5: MAJOR COMPONENTS

FIGURE 10: Major Component Descriptions — Standard Reflector



5.1 Standard Parts List

Table 1: Contents of Burner Carton

Part No.	Description	IRH 80	IRH 125	IRH 150	IRH 200
BF71XXXXX	Burner (Rate and Fuel Varies)	1	1	1	1
90709700	Blower Assembly with Cord	1	1	1	1
02568200	Gasket (Burner to Burner Tube)	1	1	1	1
90709801	Gasket (Blower to Burner)	1	1	1	1
91201708	Pipe Nipple (Black) 1/2" NPT x 4"	1	1	1	1
94273914	Hex Head Bolts 5/16"-18 Rolok	4	4	4	4
96411600	Split Lock Washer	4	4	4	4
*91412200	Flexible Stainless Steel Gas Hose, 1/2" NPT (US Models Only)	1	1	-	-
*91412203	Flexible Stainless Steel Gas Hose, 3/4" NPT (US Models Only)	-	-	1	1
91907302	S-Hooks	2	2	2	2
91911700	Outside Air Flue Collar	1	1	1	1
94118106	#8 x 3/8 Hex Washer Head (for Outside Air Collar)	3	3	3	3
92311800	Lock Nuts #10-32	4	4	4	4
03051501	Turbulator Adapter	1	-	-	-
03051502	Turbulator 2.5 ft (76 cm), Aluminized Steel	4	-	-	-
**03051509K	Swirler Package — 10 ft (3 m) (Contains Qty 2 62" Swirlers)	-	-	1	1
**03051511K	Swirler Package — 20 ft (6 m) (Contains Qty 4 62" Swirlers)	-	1	-	-

 $^{^{\}ast}$ Canadian models: Rubber (Type 1) Gas Hoses available as an accessory.

Table 2: Contents of Standard Core and Extension Packages

		Core Packages (Aluminized)			Extension Packages (Aluminized)				
Part No.	Description	10 ft (3 m)	20 ft (6 m)	30 ft (9 m)	40 ft (12 m)	10 ft (3 m)	20 ft (6 m)	30 ft (9 m)	40 ft (12 m)
91409408	Tube, HT Aluminized, 10 ft (3 m)	-	1	2	3	1	2	3	4
03051101	Burner Tube, ALUMI-THERM® Steel, 10 ft (3 m)	-	-	1	1	-	-	-	-
03051601	Burner Tube, HT ALUMI-THERM® Steel, 10 ft (3 m)	1	1	-	-	-	-	-	-
01312700	Coupling Assembly	-	1	2	3	1	2	3	4
02750303	Standard Reflector, 8 ft (3.5 m)	2	3	4	6	2	3	4	6
02750800	End Cap	2	2	2	2	-	-	-	-
03090100	Tube and Reflector Hanger	2	3	4	5	1	2	3	4
91907302	S-Hook	2	3	4	5	1	2	3	4
03050010	Reflector Support Package (Strap, Wire Form, Screws)	1	2	3	5	2	3	4	6
91107720	U-Clip Package	1	1	1	1	1	1	1	1
90502701	Vent Adapter	1	1	1	1	-	-	-	-
01318901	Tube Clamp Package	1	1	1	1	-	-	-	-
	Part Number	CP10ALUM	CP20ALUM	CP30ALUM	CP40ALUM	EXP10ALUM	EXP20ALUM	EXP30ALUM	EXP40ALUM

^{**}Contents located in box separate from the burner.

Table 3: Component Package Guide — Standard Reflector

Model	Tubing Length	Aluminized Core Packages
IRH 80	20 ft (6 m)	CP20ALUM
IRH 125	30 ft (9 m)	CP30ALUM
IRH 150	40 ft (12 m)	CP40ALUM
IRH 200	50 ft (15 m)	CP30ALUM + EXP20ALUM

SECTION 6: HEATER INSTALLATION

A WARNING



Severe Injury Hazard

Secure burner to burner tube with nuts and lock washers.

Hang heater with materials with a minimum working load of 75 lb (33 kg).

Failure to follow these instructions can result in death, injury, or property damage.

A WARNING



Cut/Pinch Hazard

Wear protective gear during installation, operation, and service.

Edges are sharp.

Failure to follow these instructions can result in injury.

To ensure your safety and comply with the terms of the warranty, all units must be installed in accordance with these instructions.

The gas or the electrical supply lines must not be used to support the heater.

Do not locate the gas or electric supply lines directly over the path of the flue products from the heater.

The heater must be installed in a location that it is readily accessible for servicing.

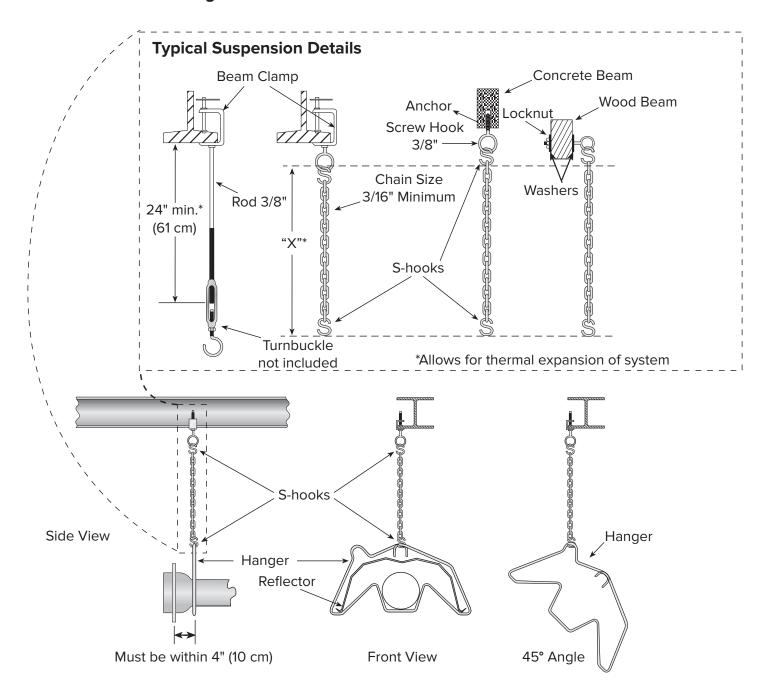
The heaters must be installed in accordance with clearances to combustibles as indicated on the rating plate and in this instruction manual.

The minimum and maximum gas inlet pressures must be maintained as indicated on the rating plate.

Typical installation configurations are shown in "FIGURE 11: Critical Hanger Placement" on page 13.

Expansion and contraction of the tube dictates that the minimum suspension lengths must be maintained. See table below "FIGURE 11: Critical Hanger Placement" on page 13.

FIGURE 11: Critical Hanger Placement



NOTE: Suspension material provided by others.

Description	
S-Hook	
Tube/Reflector Hanger	

Run Length	Typical Expansion	Minimum "X" Length
10-50 ft (3-15.2 m)	±1 in. (3 cm)	12 in. (30.5 cm)

FIGURE 12: Linear Heater Assembly Overview

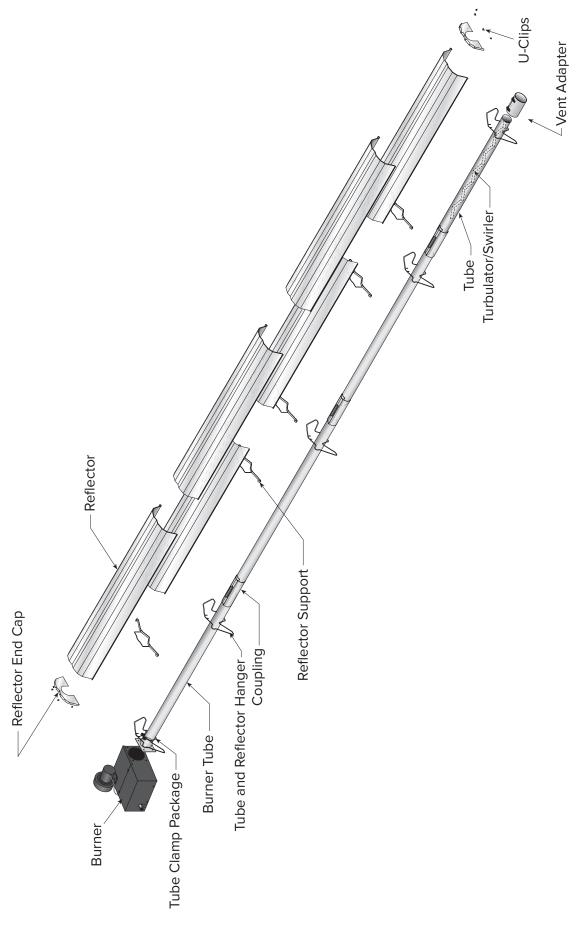
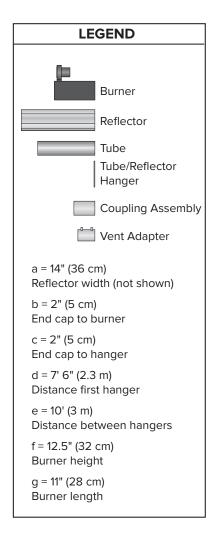
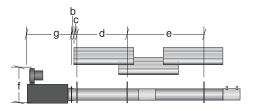
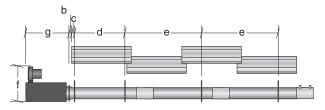


FIGURE 13: Linear Heater Layout Overview

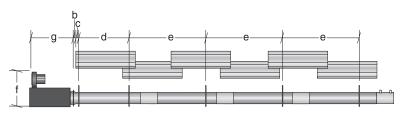




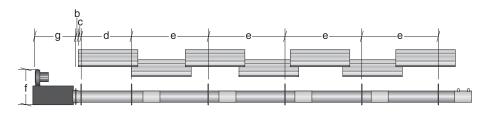
20 ft (6.1 m) Tube Length



30 ft (9.1 m) Tube Length



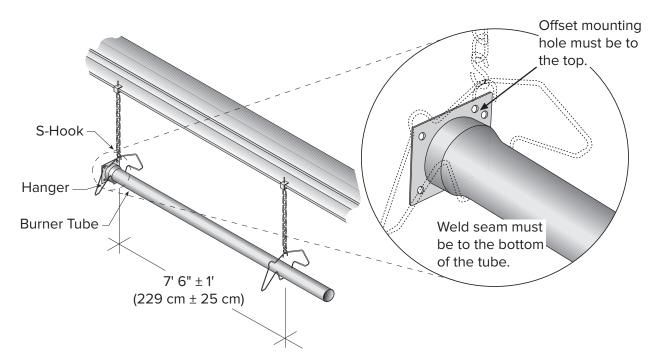
40 ft (12.2 m) Tube Length



50 ft (15.2 m) Tube Length

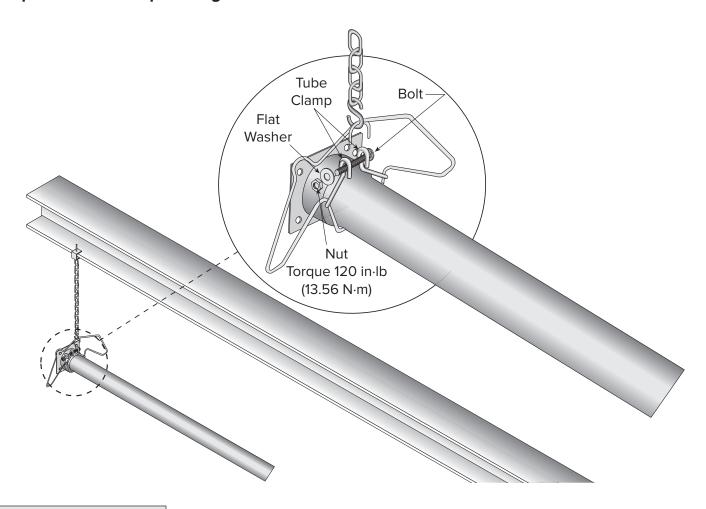
Step 6.1 Burner Tube Installation

Note: Tubing requires a downward slope of 1/2" (13 mm) per 20 ft (6 m) away from burner.



Description
Burner Tube
S-Hook
Tube/Reflector Hanger

Step 6.2 Tube Clamp Package Installation



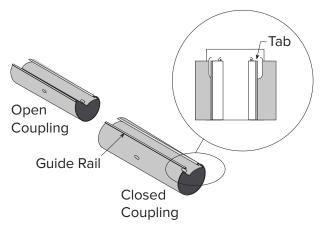
Description

Tube Clamp Package

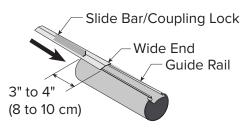
Step 6.3 Coupling and Tube Assembly

Note: Prior to coupling installation, review "Step 6.5 Swirler Installation" on page 21. Model IRH 125 requires swirler tab to be installed under coupling. Swirler installation for this model must be complete prior to coupling installation.

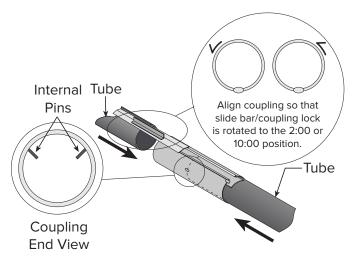
Close coupling and slide opposite end into tab. Position tab underneath guide rail.

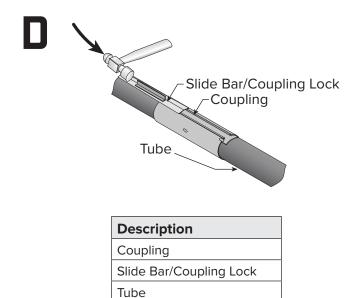


Insert wide end of slide bar/coupling lock into guide rail on opposite end of tabs. Slide the slide bar/coupling lock up the guide rail until snug (approximately 3" [8 cm] to 4" [10 cm]).



Insert tubes into coupling until end of each tube rests against internal pins.

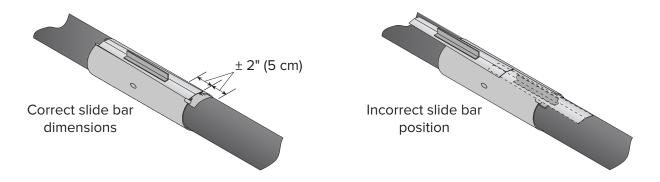




Step 6.3.1 Coupling and Tube Assembly

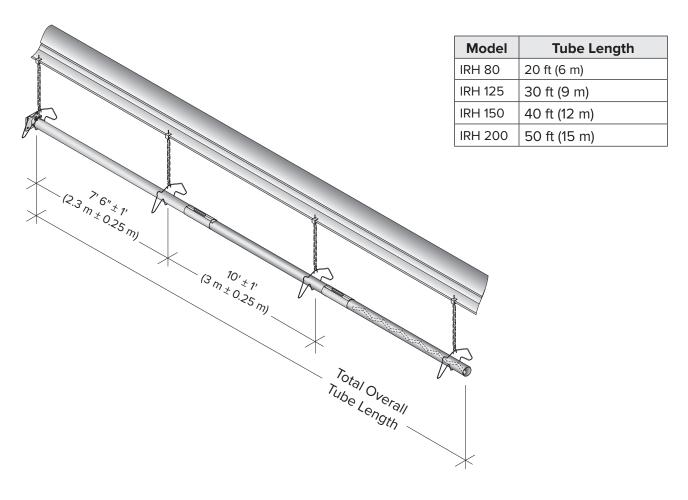
Tighten slide bar as shown below.

Be sure not to over-tighten slide bar/coupling lock. Slide bar/coupling lock should be within tolerance listed below.



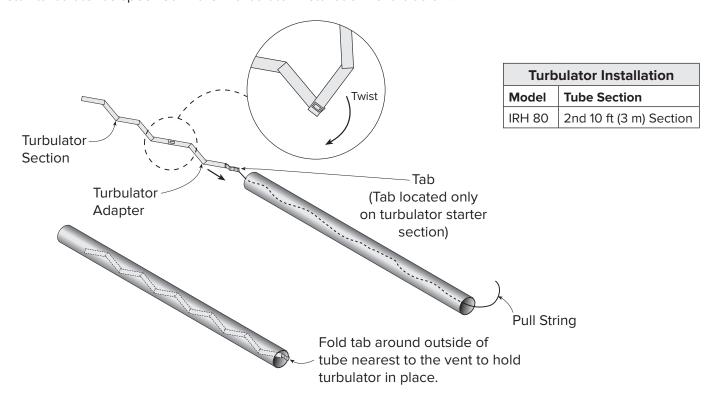
Repeat Steps 6.3 A through D until all tubes are assembled.

Step 6.3.2 Coupling and Tube Assembly



Step 6.4 Turbulator Installation

Install turbulator as specified in the "Turbulator Installation" chart below.



Description

Turbulator Adapter 2.5 ft (76.2 cm)

Turbulator Section 2 ft (61 cm)

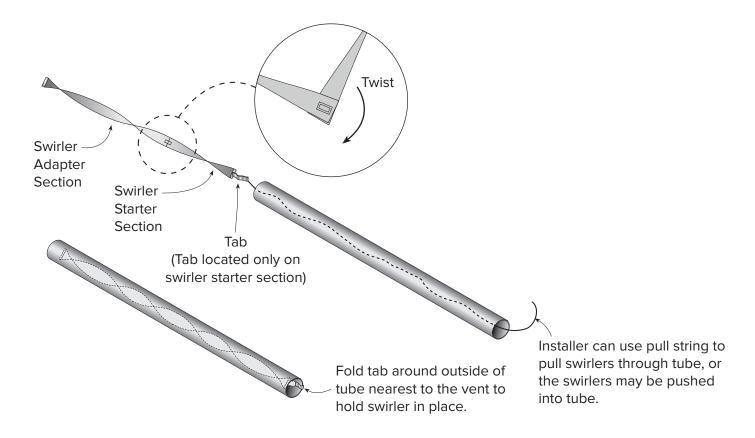
Tube

Step 6.5 Swirler Installation

Swirler installation required for models specified in chart below.

Begin installing swirler at end of tube section as described in the "Swirler Installation" chart below and continue towards burner.

Note: If heater length is extended 10 ft (3 m) beyond the specified minimum heat exchanger length, swirler can begin in either the specified tube section (according to the "Swirler Installation" chart) or the end of the 10 ft (3 m) extension and continue towards burner.



Swirler Installation			
Model	Tube Section	Swirler Qty	
IRH 125	3rd 10 ft (3 m) Section	2 Starters + 2 Adapters	
IRH 150	4th 10 ft (3 m) Section	1 Starter + 1 Adapter	
IRH 200	5th 10 ft (3 m) Section	1 Starter + 1 Adapter	

Description	
Swirler Starter 62 in. (1.6 m)	
Swirler Adapter 62 in. (1.6 m)	
Tube	

Swirlers should not to be installed through 180° "U" sections. For this reason, 15 ft and 20 ft long swirler packages each contain two swirler starter sections to allow for starter pieces to be installed before and after "U" sections. Swirler starter section identified as section with tab on end.

FIGURE 14: Swirler Installation Model: IRH 125, 30 ft Straight Tube; Swirler Package — 20 ft (6 m)

Note: Swirler installation for this model must be complete prior to coupling installation for proper swirler starter tab placement.

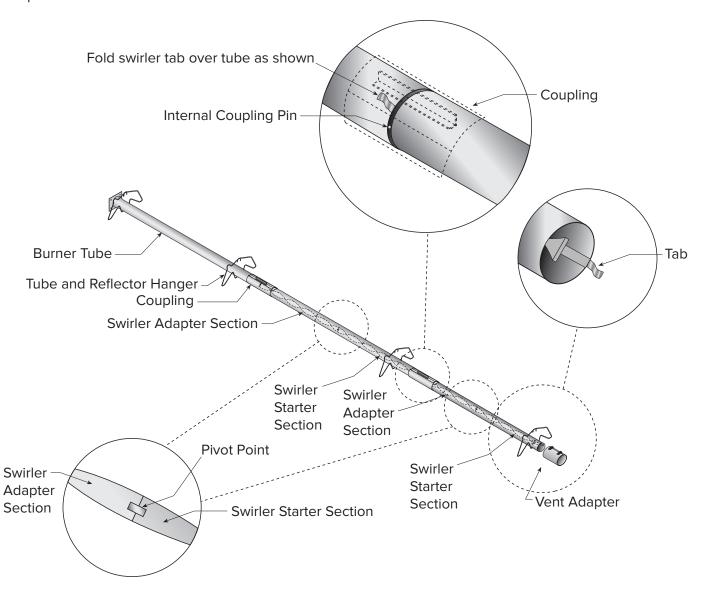
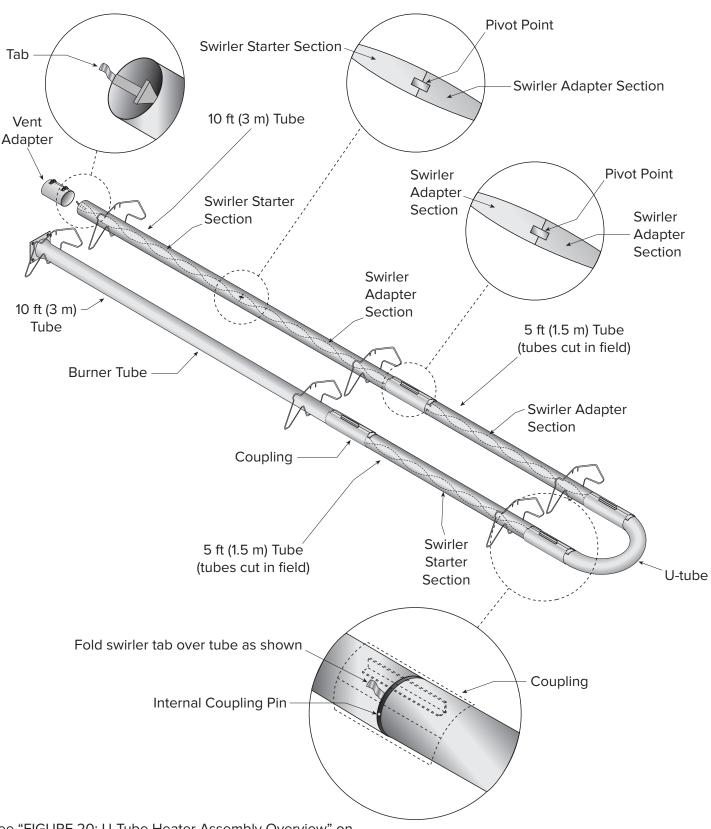


FIGURE 15: Swirler Installation Model: IRH 125, 30 ft U-Tube; Swirler Package — 20 ft (6 m)

Note: Swirler installation for this model must be complete prior to coupling installation for proper swirler starter tab placement.



See "FIGURE 20: U-Tube Heater Assembly Overview" on page 30 for U-Tube installation instructions.

FIGURE 16: Swirler Installation Model: IRH 150, 40 ft Straight Tube; Swirler Package — 10 ft

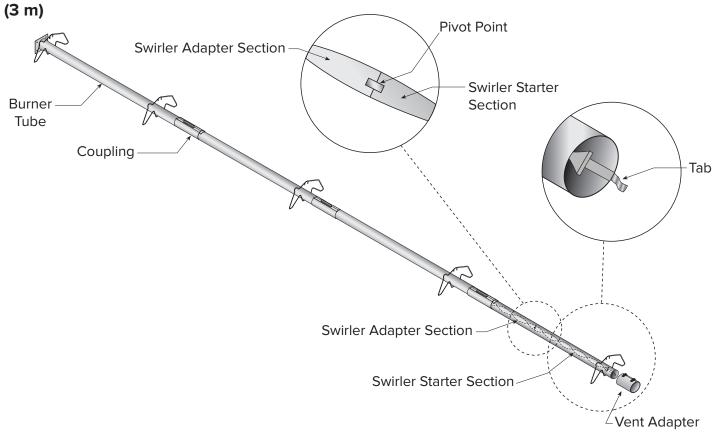


FIGURE 17: Swirler Installation Model: IRH 150, 40 ft U-Tube; Swirler Package — 10 ft (3 m)

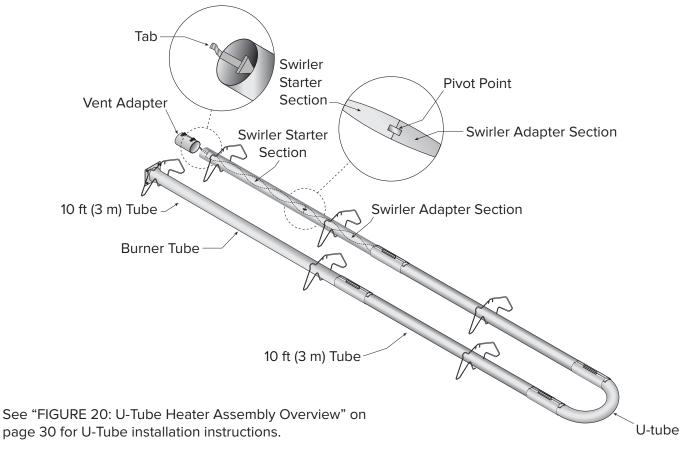


FIGURE 18: Swirler Installation Model: IRH 200, 50 ft Straight Tube; Swirler Package — 10 ft (3 m)

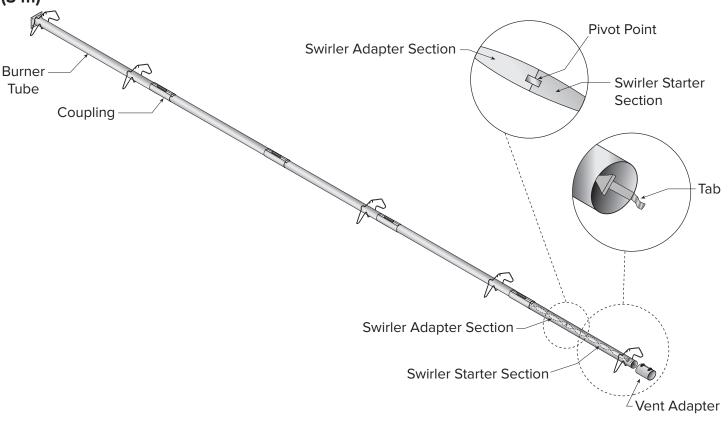
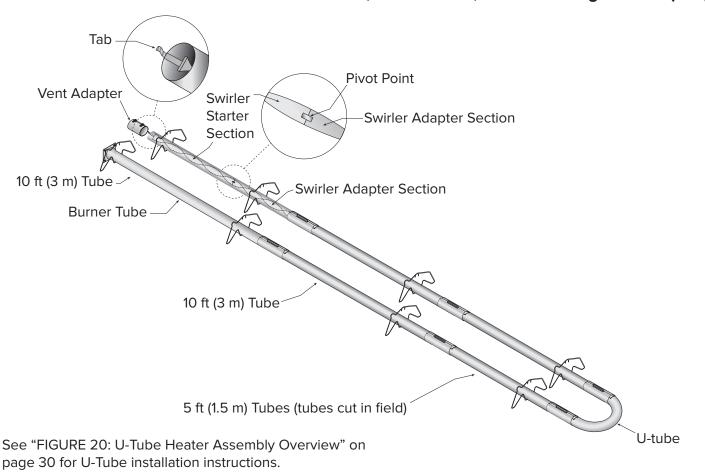


FIGURE 19: Swirler Installation Model: IRH 200, 50 ft U-Tube; Swirler Package — 10 ft (3 m)



Step 6.6 Reflector Installation

A WARNING



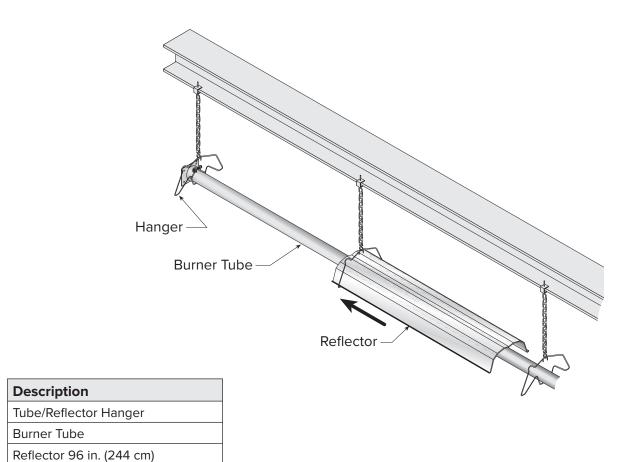
Fire Hazard

Support reflector with reflector hanger and support strap.

Reflector must not touch tube.

Failure to follow these instructions can result in death, injury, or property damage.

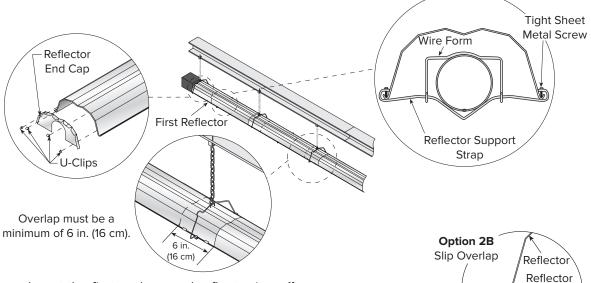
Note: All tube surfaces must be covered by a reflector, except for a U-tube.



Step 6.6.1 Reflector, U-Clip, and Reflector Support Installation

The drawings of the heater construction in "SECTION 6: HEATER INSTALLATION" on page 12 are schematic only and provide a general guideline of where hangers, reflector supports, and U-clips are to be installed. To ensure proper expansion and contraction movement of the reflectors, a combination of U-clips and reflector supports are used. The positioning of reflector supports and U-clips depends on the individual installation. Use either pop rivets or sheet metal screws instead of U-clips when installing end caps and joint pieces in areas where impact and high wind may be a factor. The following rules must be observed.

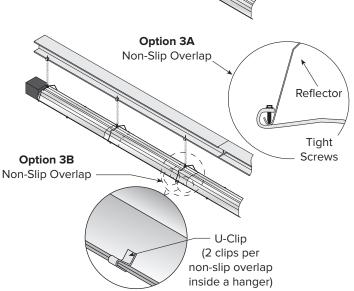
1. Slide first reflector after burner a minimum of 2 in. (4 cm) through first hanger and ensure reflector end cap is securely fastened via U-clips, pop rivets, or sheet metal screws. Position reflector support with tight screws in middle of first reflector.



- 2. The overlap at the first and second reflector is a **slip overlap**. Thereafter, every third reflector joint is a slip overlap. A slip overlap is achieved by either:
 - Both reflectors lay inside a hanger. (No reflector support needed.)
 - b. Using a reflector support with loose screws at the reflector overlap.
- 3. The remaining reflector overlaps require a **non-slip overlap** connection. To affix the reflectors together in a non-slip overlap, either:
 - a. Use reflector support and tight screws.
 - b. If both reflectors lay inside a hanger, U-Clips or sheet metal screws may be used.

This section of three reflectors joined together must be affixed to the tube with at least one reflector support with tight screws.

Description	
Reflector Support Package	
Wire Form	
Reflector Support Strap	
Screw #8 x 3/4	
U-Clip Package	
Reflector End Cap	



Option 2A

Slip Overlap

Support

slippage

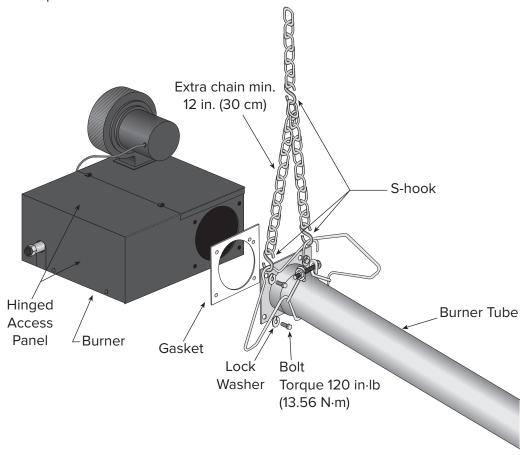
Loose screws loosened

1/16 in. (0.16 cm) to allow

Step 6.7 Burner Installation

Install combustion blower by placing blower gasket between blower and top of burner. Secure blower to top of burner using (4) supplied #10-32 lock nuts. Install flue collar if connecting an outside air inlet. Plug blower cord into receptacle on rear of burner.

Note: Do NOT face blower air inlet towards hinged access panel if connecting fresh air inlet. Doing so will interfere with access panel.



Note: To ensure proper orientation, attach burner tube with tube weld facing downward.

Description	
Bolt	
Lock Washer	
Blower	
Blower to Burner Gasket	
Lock Nuts # 10-32	
Outside Air Flue Collar	
#8 x 3/8 Hex Washer Head	
Burner to Burner Tube Gasket	

SECTION 7: OPTIONAL HEATER ACCESSORIES

A WARNING



Cut/Pinch Hazard

Wear protective gear during installation, operation, and service.

Edges are sharp.

Failure to follow these instructions can result in injury.

7.1 U-Tube Configuration

Heaters are approved for optional U-tube configurations.

The U-tube may be installed in either a standard horizontal position, a 45° position, or in an opposite 45° position as shown on page 6. When using a U-tube configuration, the following additional rules must be adhered to:

- A minimum of 10 ft (3 m) on IRH 80 and a minimum of 15 ft (4.5 m) on IRH 125/150/200 is required between the burner and the U-tube.
- The correct turbulator/swirler must be installed in the last standard section of the tube.
- The burner must never be operated in a tilted position.
- The heater must be properly supported at all locations. See "FIGURE 21: U-Tube Heater Layout Overview" on page 31.

FIGURE 20: U-Tube Heater Assembly Overview

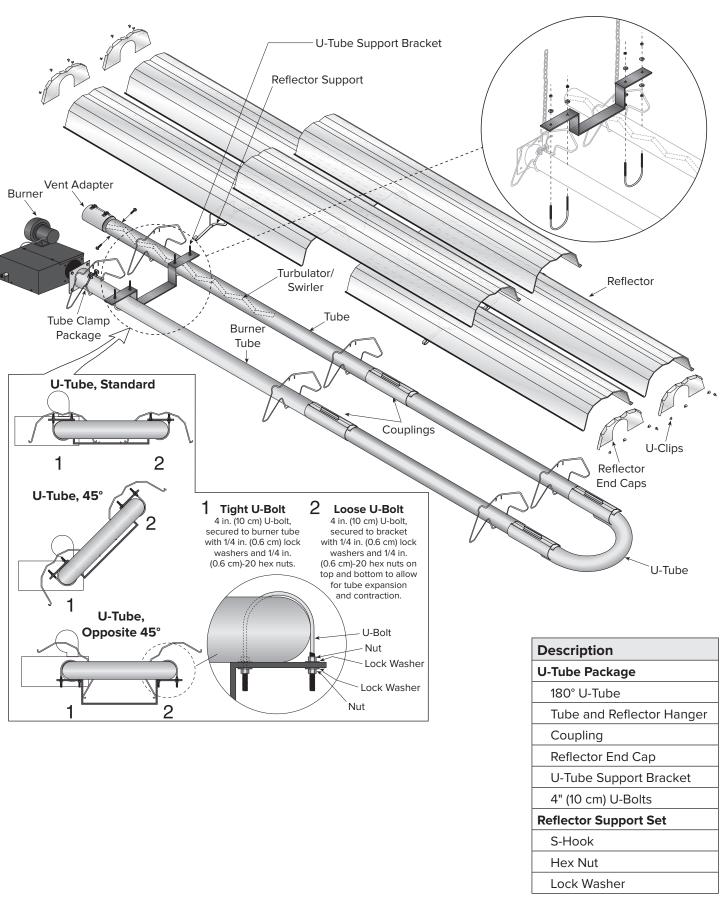
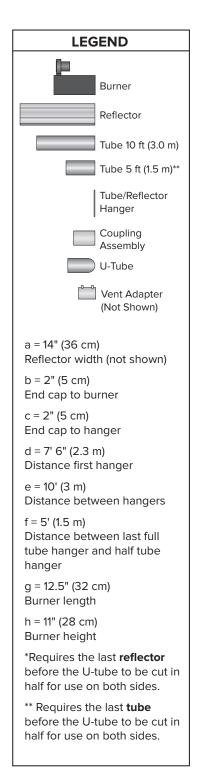
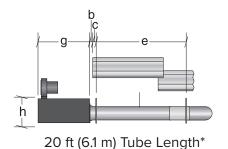
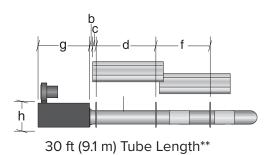
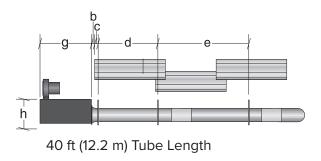


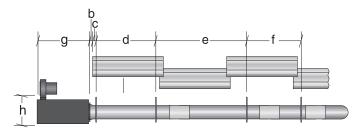
FIGURE 21: U-Tube Heater Layout Overview







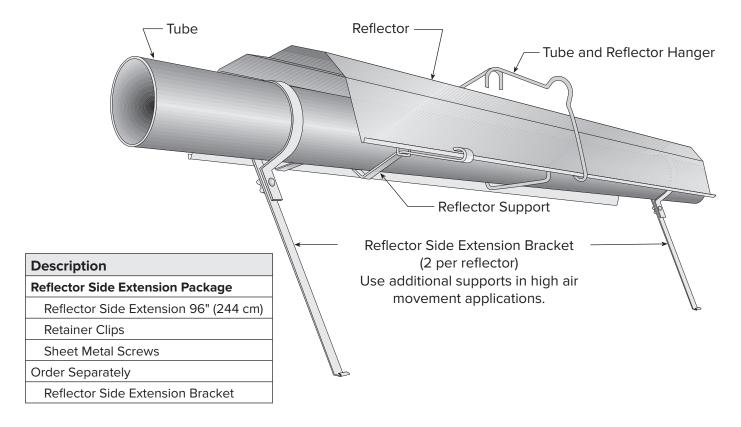




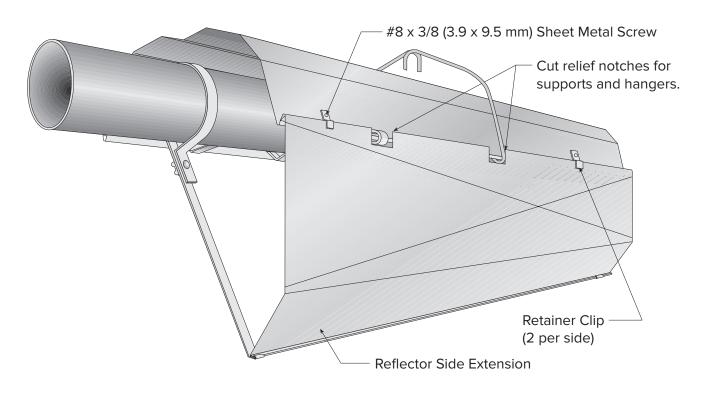
50 ft (15.2 m) Tube Length* **

7.2 Reflector Side Extension

Step 7.1.1 Bracket Installation



Step 7.2.2 Side Reflector Installation



SECTION 8: VENTING

A WARNING



Carbon Monoxide Hazard

Heaters installed unvented must be interlocked with sufficient building exhaust.

Heaters must be installed according to the installation manual.

Failure to follow these instructions can result in death or injury.

A WARNING



Cut/Pinch Hazard

Wear protective gear during installation, operation, and service.

Edges are sharp.

Failure to follow these instructions can result in injury.

8.1 Venting

This heater is considered a Category I or Category III vented appliance. The Serial plate on the heater will indicate vent Category and this manual will describe the installation requirements for each vent Category.

This heater must be vented in accordance with the rules contained in this manual and with the following national codes and any state, provincial, or local codes which may apply:

United States: Refer to National Fuel Gas Code NFPA 54/ANSI Z223.1 – latest revision.

Canada: Refer to Natural Gas and Propane Installation Code CSA B149.1 – latest revision.

Exhaust end of heater will accept a 4 in. (10 cm) vent pipe using the vent adapter. To prevent leakage of condensation, install the vent adapter with the seam on top and seal the joint using a high temperature silicone sealant.

Maintain a minimum of 6 in. (15 cm) clearance around all single wall flue pipe.

Any portion of vent pipe passing through a combustible wall must have an approved thimble to conform with the above listed codes.

Vent pipe must be sloped downward away from the heater 1/2 in. (1 cm) for every 20 ft (6 m).

The heater may be individually vented or common vented. When venting horizontally, a maximum of two heaters can be commonly vented. See "8.13 Common Side Wall Horizontal Venting (Category III)" on page 38. When venting vertically, a maximum of four heaters can be commonly vented. See "8.14 Common Vertical Venting (Category III)" on page 39.

The heater may also be installed unvented in certain circumstances according to building ventilation codes. Refer to the above codes and "8.2 Unvented Operation" on page 34 for further information. Unvented operation also requires compliance with the clearances to combustibles given under "FIGURE 9: Venting" on page 7.

The bottom of the vent or air intake terminal shall not be located less than 1 ft (0.3 m) above grade level.

The vent shall not terminate less than 7 ft (2.1 m) above grade where located adjacent to public walkways.

Vent terminal must be installed at a height sufficient to prevent blockage by snow, and building materials protected from degradation by flue gases.

Secure all joints with $\#8 \times 3/8$ sheet metal screws. Seal all joints with high temperature silicone sealant.

Vent terminal must be beyond any combustible overhang.

8.1.1 United States Requirements

Vent must terminate at least 3 ft (0.9 m) above any forced air inlet located within 10 ft (3.1 m).

Vent must terminate at least 4 ft (1.2 m) below, 4 ft (1.2 m) horizontally from, or 1 ft (0.3 m) above any door, operable window, or gravity air inlet into any building.

Canadian Requirements

The vent shall not terminate within 6 ft (1.8 m) of a mechanical air supply inlet to any building.

The vent shall not terminate within 3 ft (0.9 m) of a window or door that can be opened in any building, any non-mechanical air supply inlet to any building, or of the combustion air inlet of any other appliance.

8.1.2 Vent Category Definitions

Radiant tube heaters are divided into four categories based on the static pressure produced in the vent and the percentage flue loss.

Category I — A radiant tube heater that operates with a non-positive vent static pressure and with a vent gas temperature that avoids excessive condensate production in the vent.

Category II — A radiant tube heater that operates with a non-positive vent static pressure and with a vent gas temperature that can cause excessive condensate production in the vent.

Category III — A radiant tube heater that operates with a positive vent static pressure and with a vent gas temperature that avoids excessive condensate production in the vent.

Category IV — A radiant tube heater that operates with a positive vent static pressure and with a vent gas temperature that can cause excessive condensate production in the vent.

This heater is considered a Category I or Category III vented appliance. The Serial plate on the heater will indicate vent Category and this manual will describe the installation requirements for each vent Category.

8.2 Unvented Operation

Sufficient ventilation must be provided in the amount of 4 cfm per 1000 Btu/h firing rate (United States); 3 cfm per 1000 Btu/h firing rate (Canada).

Use of optional outside combustion air is not recommended with unvented heaters.

If exhaust fans are used to supply ventilation air, an interlock switch must be used to prevent the heater from coming on when the fans are off. This may be done using a pressure switch.

8.3 Horizontal Venting (Category III)

All horizontal venting configurations for this product are considered Category III.

In noncombustible walls only, vent terminal may be used.

For 4 in. (10 cm) vents in either combustible or noncombustible walls, use Tjernlund VH1-4 or equivalent, insulated vent terminal. Follow the manufacturer's instructions for proper installation.

For 6 in. (15 cm) common vents in either combustible or noncombustible walls, use Tjernlund VH1-6 or equivalent, insulated vent terminal.

Approved venting material for horizontal venting (Category III) must be single-wall corrosion resistant with a thickness of no less than 26 gauge. It is required that all vent pipes and connectors be fastened together with sheet metal screws and sealed with high temperature silicone sealant approved for at least 550 °F (288 °C) (supplied by others). The installer must perform a leak test on the complete venting system. A solution of soap and water should be used to test the venting system.

A continuous section of type B-vent may only be used to pass through the outside wall or outside of the building. Horizontal venting (Category III) does not allow the use of type B-vent inside of the space.

Follow the vent material manufacturer's instructions for proper installation.

8.4 Vertical Venting (Category III)

For 4 in. (10 cm) common or single heater vent, an approved vent cap must be used.

For 6 in. (15 cm) common vent, an approved vent cap must be used.

Approved venting material for vertical venting (Category III) must be single-wall corrosion resistant with a thickness of no less than 26 gauge. It is required that all vent pipes and connectors be fastened together with sheet metal screws and sealed with high temperature silicone sealant approved for at least 550 °F (288 °C) (supplied by others). The installer must perform a leak test on the complete venting system. A solution of soap and water should be used to test the venting system.

A continuous section of type B-vent may only be used to pass through the roof or outside of the building. Vertical venting (Category III) does not allow the use of type B-vent inside of the space.

For common vertical venting of more than two heaters, see "8.14 Common Vertical Venting (Category III)" on page 39.

A vent shall not extend less than 2 ft (0.6 m) above the highest point where it passes through a flat roof of a building.

Note: Category I venting is not a possible configuration with this product.

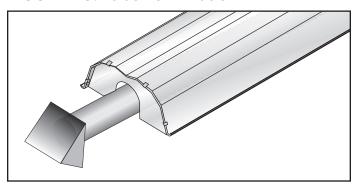
8.6 Venting Category Designation by Model

Model	Single Heater Horizontal Venting Category	Single Heater Vertical Venting Category	Common Venting Category (for both Vertical and Horizontal)
IRH 80	III	III	III
IRH 125	III	III	III
IRH 150	III	III	III
IRH 200	III	III	III

8.7 Unvented Operation Tube Termination

Turndown type vent terminal with a screen must be installed at the exhaust end of the tube. Vent terminal design shall not incorporate backdraft flap.

FIGURE 23: Tube Termination



8.8 Length Requirements

Minimum vent length allowed is 2 ft (0.6 m). Maximum vent length allowed is 45 ft (13.7 m). Maximum outside air supply duct length allowed is 45 ft (13.7 m).

The total vent length, plus outside air duct length, plus any extensions to minimum heat exchanger lengths, cannot exceed 65 ft (19.8 m).

Vent length should be limited to less than 20 ft (6 m). If using vent lengths greater than 20 ft (6 m), condensation will form in the vent pipe. Insulation and additional sealing measures (high temperature silicone at all seams) are required. Optional heat exchanger beyond minimum lengths is considered as vent length for length determination.

Subtract 15 ft (4.6 m) of maximum allowed vent or duct length per vent elbow if more than two are used.

8.9 Vent Material Recommendations

Vent recommendations:

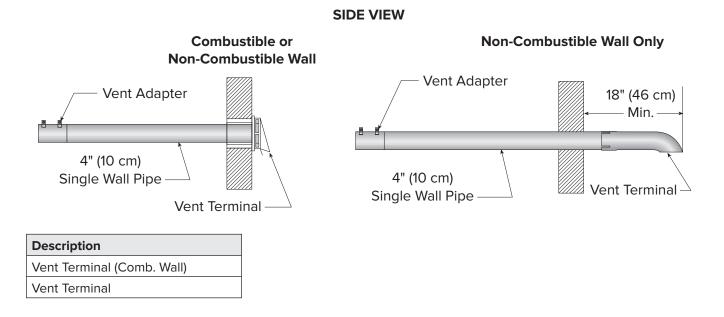
- Heat treated aluminized tubing 4 in. (10 cm) O.D. Heat treated aluminized tubing 6 in. (15 cm) O.D.
- 2. Single wall pipe (Type-C) that is corrosion resistant galvanized steel, minimum 26 ga. (Supplied by others)
- Double wall vent (Type-B). For Category I venting only or used as a continuous section passing through the outside wall, roof, or outside of the building.

Note: 4 in. (10 cm) O.D. heat treated aluminized tubing and 6 in. (15 cm) O.D. heat treated aluminized

tubing are equivalent to single wall corrosion resistant flue pipe.

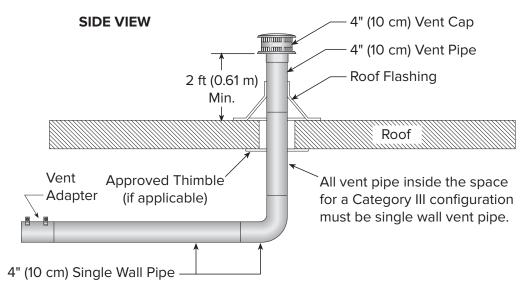
8.10 Horizontal Venting (Category III) 4 in. (10 cm) Pipe

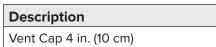
Note: A continuous section of type B-vent may only be used to pass through the outside wall or outside of the building. Horizontal venting (Category III) does not allow the use of type B-vent inside of the space.



8.11 Vertical Venting (Category III) 4 in. (10 cm) Pipe

Note: A continuous section of type B-vent may only be used to pass through the roof or outside of the building. Vertical venting (Category III) does not allow the use of type B-vent inside of the space.



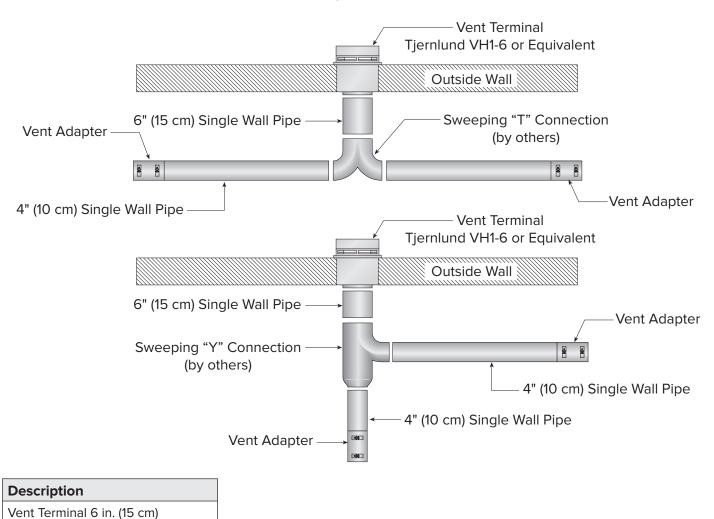


Note: It is required that all vent pipes and connectors be fastened together with sheet metal screws and sealed with high temperature silicone sealant approved for at least 550 °F (288 °C) (supplied by others). The installer must perform a leak test on the complete venting system. A solution of soap and water should be used to test the venting system.

8.13 Common Side Wall Horizontal Venting (Category III)

Note: A continuous section of type B-vent may only be used to pass through the outside wall or outside of the building. Horizontal venting (Category III) does not allow the use of type B-vent inside of the space.

TOP VIEW



Requirements:

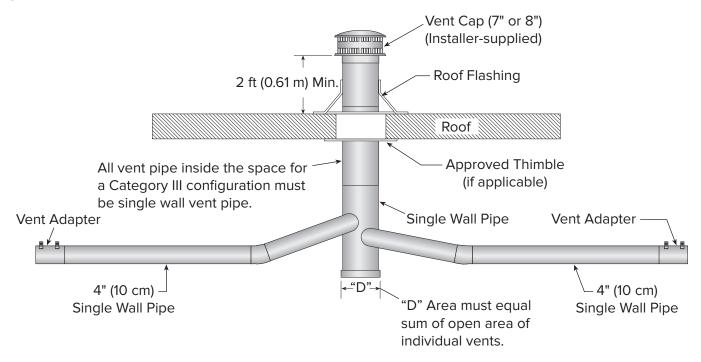
- Maximum of two heaters can be commonly vented through a side wall.
- Heaters must be of the same BTU output.
- Heaters must be controlled by a common thermostat.

Note: It is required that all vent pipes and connectors be fastened together with sheet metal screws and sealed with high temperature silicone sealant approved for at least 550 °F (288 °C) (supplied by others). The installer must perform a leak test on the complete venting system. A solution of soap and water should be used to test the venting system.

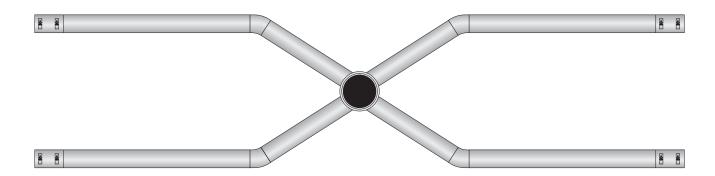
8.14 Common Vertical Venting (Category III)

Note: A continuous section of type B-vent may only be used to pass through the roof or outside of the building. Vertical venting (Category III) does not allow the use of type B-vent inside of the space.

SIDE VIEW



TOP VIEW



Requirements:

- Maximum of four heaters can be commonly vented through the roof.
- · Heaters must be of the same BTU output.
- Heaters must be controlled by a common thermostat.
- Connections to a common stack must be positioned to avoid direct opposition between streams of combustion gases.

Note: It is required that all vent pipes and connectors be fastened together with sheet metal screws and sealed with high temperature silicone sealant approved for at least 550 °F (288 °C) (supplied by others). The installer must perform a leak test on the complete venting system. A solution of soap and water should be used to test the venting system.

8.15 Outside Combustion Air Supply

IMPORTANT: If the building has a slight negative pressure or corrosive contaminants such as halogenated hydrocarbons are present in the air, an outside combustion air supply to the heater is required. Seal all combustion air pipe joints.

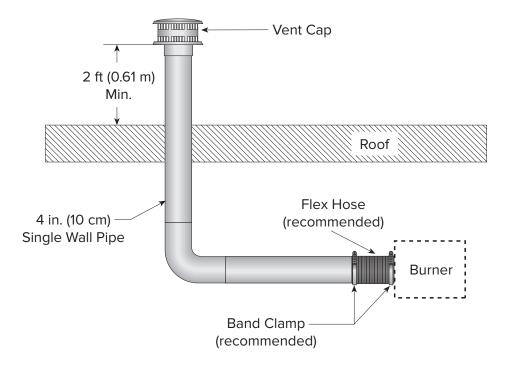
Use of optional outside combustion air is not recommended with unvented heaters.

The air supply duct may have to be insulated to prevent condensation on the outer surface. The outside air terminal must not be more than 1 ft (31 cm) above the vent termination while maintaining a minimum distance of 3 ft (93 cm) for both vertical and horizontal venting.

8.15.1 Length Requirements

Follow the constraints listed under "8.8 Length Requirements" on page 36.

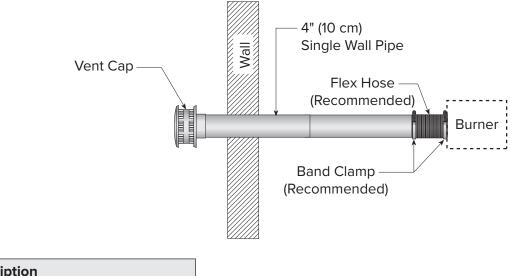
8.15.2 Vertical Outside Air Supply for Single Heater Installation



Description

Vent Cap, Metalbestos — 4 in. (10 cm)

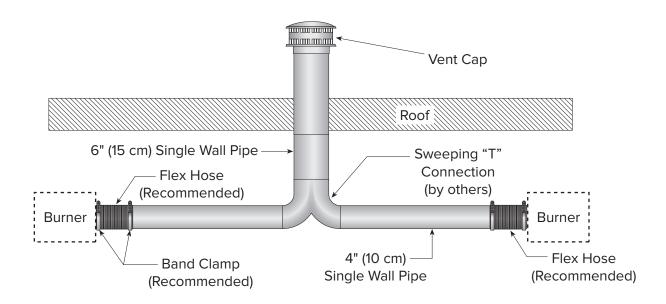
8.15.3 Horizontal Outside Air Supply for Single Heater Installation



Description

Vent Cap, Metalbestos — 4 in. (10 cm)

8.15.4 Vertical Outside Air Supply for Double Heater Installation



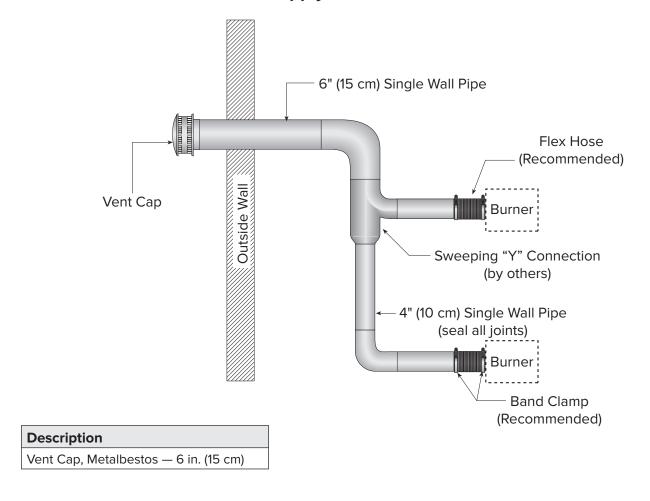
Description

Vent Cap, Metalbestos — 6 in. (15 cm)

Requirements:

- · Heaters must be controlled by a common thermostat.
- All joints must be sealed.

8.15.5 Horizontal Outside Air Supply for Double Heater Installation



Requirements:

- Heaters must be controlled by a common thermostat.
- All joints must be sealed.

SECTION 9: GAS PIPING

A WARNING



Fire Hazard

Tighten gas hose fittings to connect gas supply according to "FIGURE 24: Gas Connection with Flexible Gas Hose" on page 44.

Gas hose can crack when twisted.

Gas hose moves during normal operation.

Use only 36" (91 cm) long connector of 1/2" or 3/4" nominal ID.

Connector supplied with heater for U.S. models (not with Canadian models).

Failure to follow these instructions can result in death, injury, or property damage.

▲ WARNING



Explosion Hazard

Leak test all components of gas piping before operation.

Gas can leak if piping is not installed properly.

Do not high pressure test gas piping with heater connected.

Failure to follow these instructions can result in death, injury, or property damage.

Install the gas hose as shown on "FIGURE 24: Gas Connection with Flexible Gas Hose" on page 44. The gas hose accommodates expansion of the

heating system and allows for easy installation and service of the burner. Before connecting the burners to the supply system, verify that all high pressure testing of the gas piping has been completed.

There is an expansion of the tube with each firing cycle; this will cause the burner to move with respect to the gas hose. This can cause a gas leak resulting in an unsafe condition if the gas connection is not made strictly in accordance with "FIGURE 24: Gas Connection with Flexible Gas Hose" on page 44.

Meter and service must be large enough to handle all the burners being installed plus any other connected load. The gas hose which feeds the system must be large enough to supply the required gas with a maximum pressure drop of 1/2" wc. When gas piping is not included in the layout drawing, the local gas supplier will usually help in planning the gas piping.

Gas lines must meet applicable codes:

United States: The Flexible Stainless Steel Gas Hose (US models) supplied with the heater is certified per the Standard for Connectors for Gas Appliances, ANSI 721.24/CSA 6.10 — latest revision.

Canada: The Rubber Type 1 Gas Hose (Canadian models) optional with the heater is certified as being in compliance with the Standard for Elastomeric Composite Hose and Hose Couplings for Conducting Propane and Natural Gas, CAN/CGA 8.1 — Latest revision.

 Check the pipe and tubing ends for leaks before placing heating equipment into service. When checking for gas leaks, use a soap and water solution; never use an open flame.

FIGURE 24: Gas Connection with Flexible Gas Hose

CORRECT POSITIONS

Shut-Off Valve (included with gas hose) must be parallel to burner gas inlet. The 3" (8 cm) displacement shown is for the cold condition. This displacement may reduce when the system is fired.

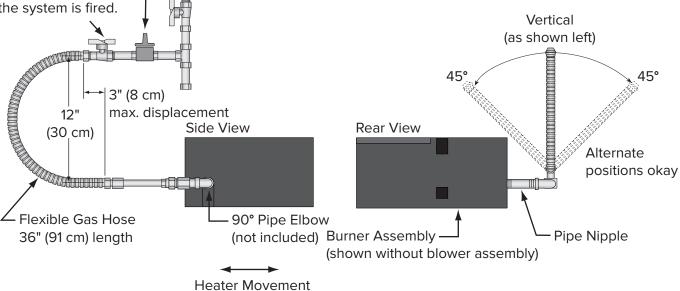
High Gas Pressure Regulator to be installed upstream of flexible gas hose if inlet pressure exceeds maximum allowance.

A CAUTION

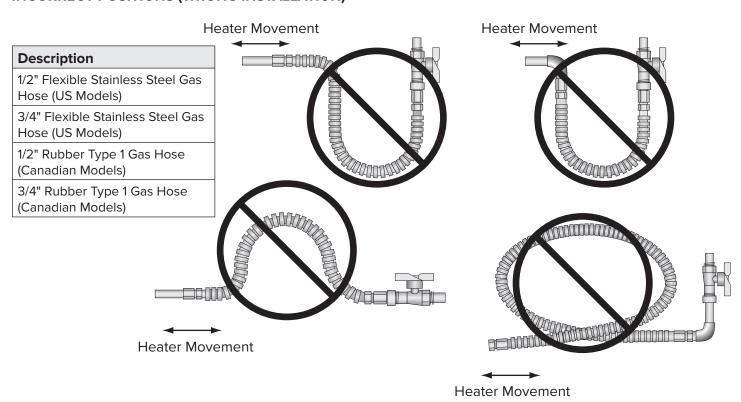
Product Damage Hazard

Hold gas nipple securely with pipe wrench when attaching gas hose.

Failure to follow these instructions can result in product damage.



INCORRECT POSITIONS (WRONG INSTALLATION)



44

SECTION 10: WIRING

A DANGER



Electrical Shock Hazard

Disconnect electric before service.

Heater must be properly earthed.

Failure to follow these instructions can result in death or electrical shock.

Heaters can be controlled using several methods. Normally thermostats are used to control the heaters, but they can also be controlled by an energy management system. "10.1 Line Voltage Thermostat Wiring" illustrates the connection for heaters controlled by a line voltage thermostat.

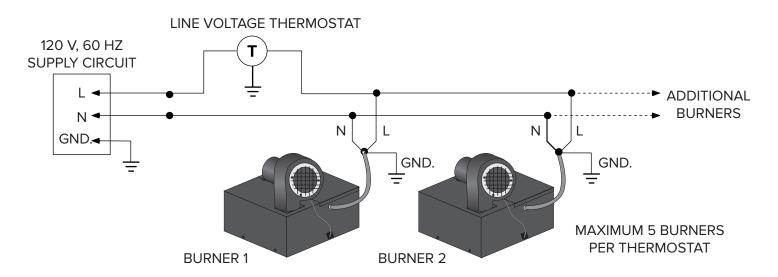
For heaters on a low voltage thermostat, see "10.2 Low Voltage Thermostat Wiring" on page 46. Heaters must be grounded in accordance with applicable codes:

United States: Refer to National Electrical Code® NFPA 70 — latest revision.

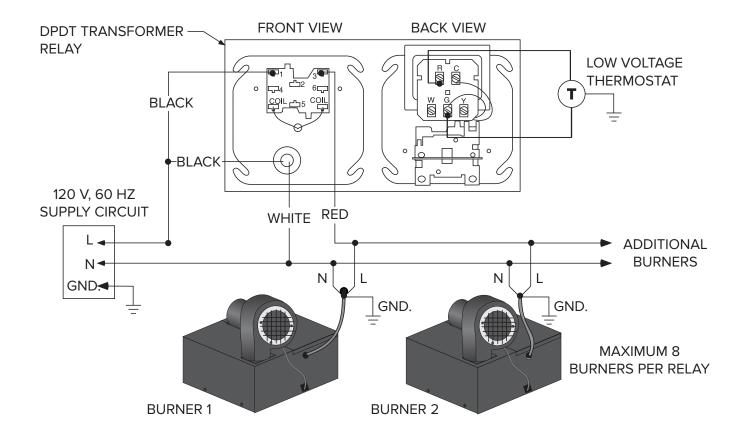
Canada: Refer to Canadian Electrical Code CSA C22.1 Part I — latest revision.

If any of the original internal wiring must be replaced, it must be replaced with wiring materials having a temperature rating of at least 105 °C and 600 volts.

10.1 Line Voltage Thermostat Wiring

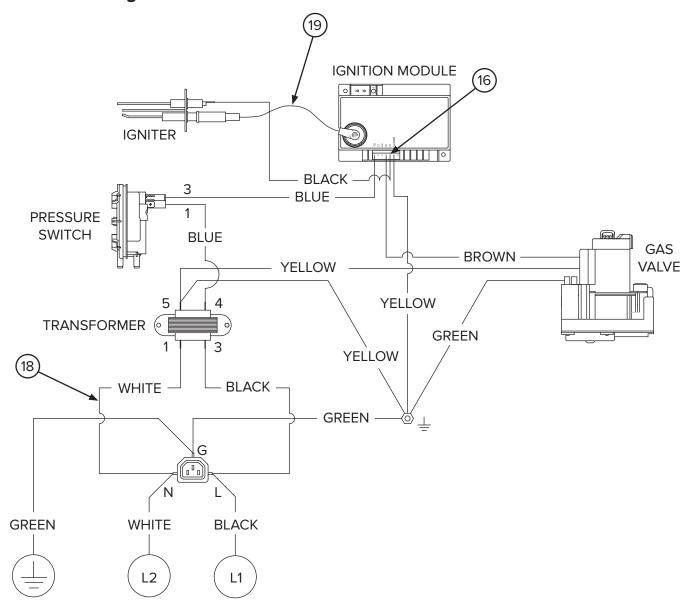


10.2 Low Voltage Thermostat Wiring

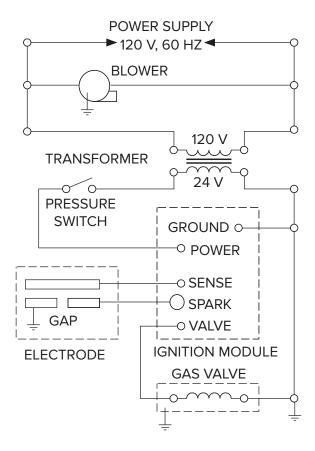


Description		
DPDT Transformer Relay		
Low Voltage Thermostat		

10.3 Internal Wiring

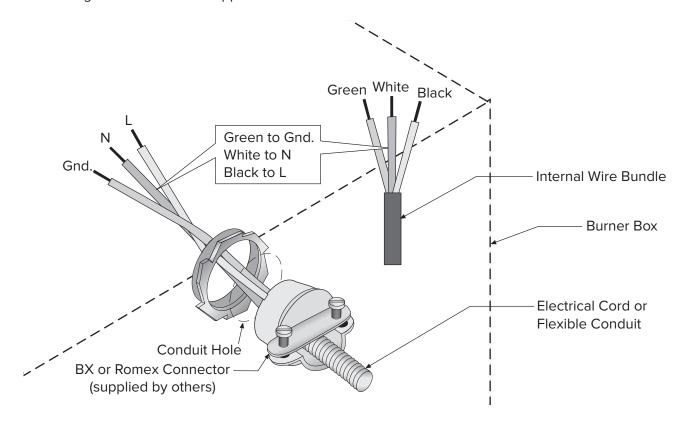


10.4 Ladder Diagram



10.5 Electrical Connection to the Burner

Connect wires together with suitable approved wire connections.



SECTION 11: OPERATION AND MAINTENANCE

A DANGER ▲ WARNING Explosion Hazard Electrical Shock Burn Hazard Cut/Pinch Hazard Hazard Turn off gas supply to Allow heater to cool Wear protective gear heater before service. before service. during installation, Disconnect electric operation, and service. before service. Tubing may still be hot after operation. Edges are sharp. Heater must be connected to a properly grounded electrical source.

Failure to follow these instructions can result in death, electric shock, injury, or property damage.

This heater is equipped with a direct spark ignition system.

11.1 Sequence of Operation

- 1. Turn the thermostat up. When the thermostat calls for heat, the blower motor will energize.
- 2. When the motor approaches nominal running RPM, the pressure switch closes and activates the ignition module.
- 3. After a 45 second pre-purge, the ignition module then opens the gas valve and energizes the spark igniter.
- 4. When the flame is established, the sparking sequence ceases.
- 5. If the flame is not established during the ignition sequence, the ignition module closes the gas valve and purge begins. Module will try 2 additional times for ignition (with purges in between trials). If ignition is not established, the module will lockout.
- If the flame extinguishes during operation, the ignition module will attempt the multiple trial sequence described in step 5. If ignition is not reestablished, the module will lockout for one hour or until reset.
- 7. After lockout, the control can be reset by turning down thermostat for five seconds and then raising it again to desired temperature, or by disconnecting power and then reconnecting.
- 8. When thermostat is satisfied, all power to the unit is shut off.

11.2 To Shut Off Heater

- 1. Set thermostat to lowest setting.
- 2. Turn OFF electric power to heater.
- 3. Turn OFF manual gas valve in the heater supply line.

11.3 To Start Heater

- 1. Turn gas valve and electric power OFF and wait five minutes for unburned gases to vent from heater.
- 2. Turn ON main gas valve.
- 3. Turn ON electric power.
- 4. Set thermostat to desired temperature.
- 5. Burner should light automatically.

11.4 Pre-Season Maintenance and Annual Inspection

To ensure your safety and years of trouble-free operation of the heating system, service and annual inspections must be done by a contractor qualified in the installation and service of gas-fired heating equipment.

Turn off gas and electric supplies before performing service or maintenance. Allow heater to cool before servicing.

Before every heating season, a contractor qualified in the installation and service of gas-fired heating equipment must perform a thorough safety inspection of the heater.

For best performance, the gas, electrical, thermostat connections, tubing, venting, suspensions, and overall heater condition should be thoroughly inspected.

Note: Gas flow and burner ignition are among the first things that should be throughly inspected.

11.5 Maintenance Checklist

Installation Code and Annual Inspections:

All installation and service of Big Ass Fans equipment must be performed by a contractor qualified in the installation and service of equipment sold and supplied by Big Ass Fans and conform to all requirements set forth in the Big Ass Fans manuals and all applicable governmental authorities pertaining to the installation, service, operation, and labeling of the equipment.

To help facilitate optimum performance and safety, Big Ass Fans recommends that a qualified contractor conduct, at a minimum, annual inspections of your Big Ass Fans equipment and perform service where necessary, using only replacement parts sold and supplied by Big Ass Fans.

The Vicinity of the Heater	Do not store or use flammable objects, liquids, or vapors near the heater. Immediately remove these items if they are present.	
	See "SECTION 3: CLEARANCES TO COMBUSTIBLES" on page 4.	
Vehicles and Other Objects	Maintain the clearances to combustibles.	
	Do not hang anything from or place anything on the heater.	
	Make sure nothing is lodged underneath the reflector or in between the tubes.	
	Immediately remove objects in violation of the clearances to combustibles.	
	See "SECTION 3: CLEARANCES TO COMBUSTIBLES" on page 4.	
Reflector	Support reflector with reflector hanger and support strap.	
	Reflector must not touch tube.	
	Make sure there is no dirt, sagging, cracking, or distortion.	
	Do not operate if there is sagging, cracking, or distortion.	
	Make sure reflectors are correctly overlapped. See "Step 6.6.1 Reflector, U-Clip, and Reflector Support Installation" on page 27.	
	Clean outside surface with a damp cloth.	
Vent Pipe	Venting must be intact. Using a flashlight, look for obstructions, cracks on the pipe, gaps in the sealed areas, or corrosion.	
	The area must be free of dirt and dust.	
	Remove any carbon deposits or scale using a wire brush.	
	See "SECTION 8: VENTING" on page 33.	
Outside Air Inlet	Inlet must be intact. Look for obstructions, cracks on the pipe, gaps in the sealed areas, or corrosion.	
	The area must be free of dirt and dust. Clean and reinstall as required.	
Tubes	Make sure there are no cracks.	
	Make sure tubes are connected and suspended securely.	
	See "SECTION 6: HEATER INSTALLATION" on page 12.	
	Make sure there is no sagging, bending, or distortion.	
	Clean or replace as required.	
Gas Line	eck for gas leaks. See "SECTION 9: GAS PIPING" on page 43.	
Burner Observation Window	Make sure it is clean and free of cracks or holes.	
	Clean and replace as required.	

Blower Scroll, Wheel, and Motor	Compressed air or a vacuum cleaner may be used to clean dust and dirt.		
Burner Cup and Orifice	Clear of obstructions (even spider webs will cause problems).		
	Carefully remove any dust and debris from the burner.		
Electrode	Replace if there are cracked ceramics, excessive carbon residue, or erosion of the electrode.		
	The electrode gap should be 1/8" (3.2 mm).		
Thermostat	There should be no exposed wire or damage to the thermostat.		
	See "SECTION 10: WIRING" on page 45.		
Suspension Points	Make sure the heater is hanging securely. Look for signs of wear on the chain or ceiling.		
	See "FIGURE 11: Critical Hanger Placement" on page 13.		
Wall Tag	If wall tag is present, make sure it is legible and accurate. See "2.1 Wall Tag on page 3.		
Safety Labels Product safety signs or labels should be replaced by the product safety are no longer legible.			

SECTION 12: TROUBLESHOOTING





Electrical Shock Hazard

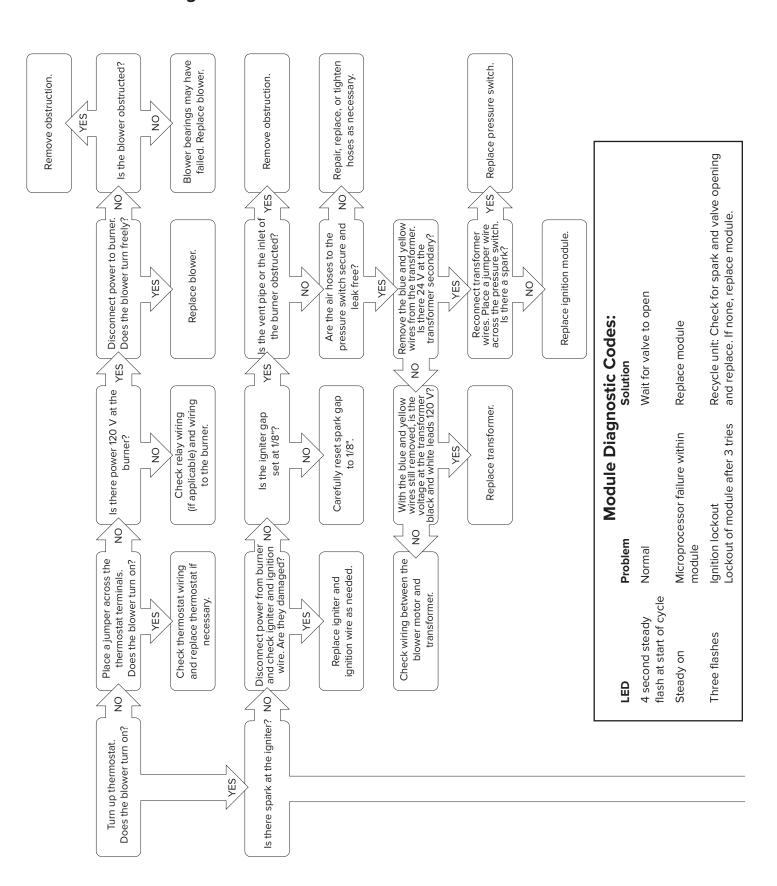
Disconnect electric before service.

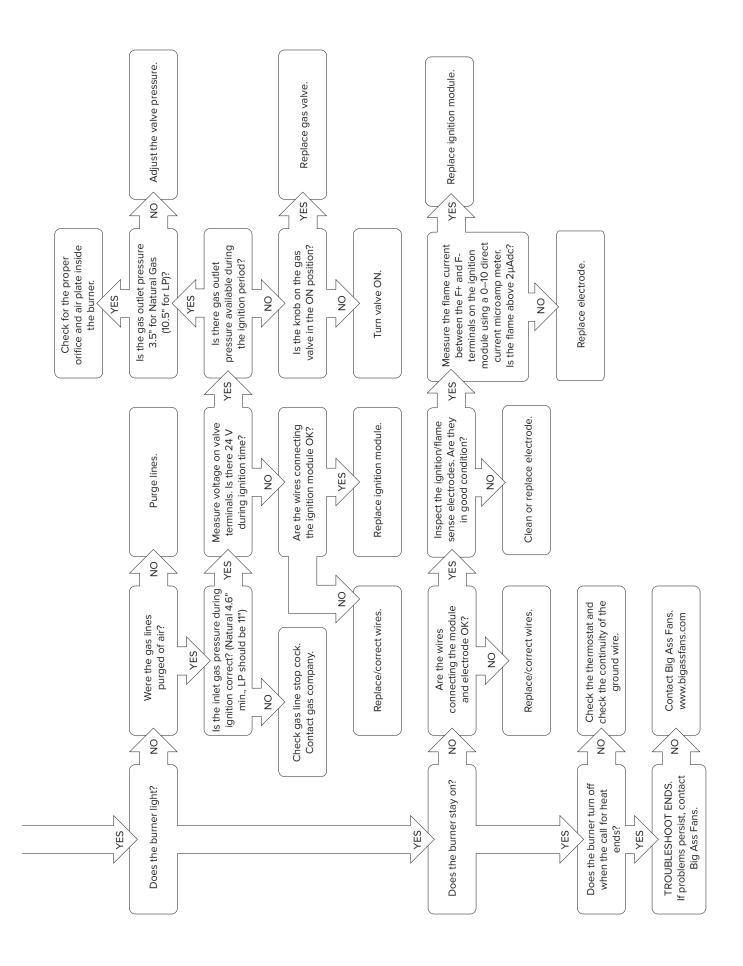
Heater must be properly earthed.

Failure to follow these instructions can result in death or electrical shock.

A WARNING Explosion Hazard Fire Hazard **Burn Hazard Cut/Pinch Hazard** Allow heater to cool Keep all flammable Turn off gas supply to Wear protective gear heater before service. objects, liquids, and before service. during installation, vapors the minimum operation, and service. Tubing may still be hot required clearances to after operation. Edges are sharp. combustibles away from heater. Some objects will catch fire or explode when placed close to heater. Failure to follow these instructions can result in death, injury, or property damage.

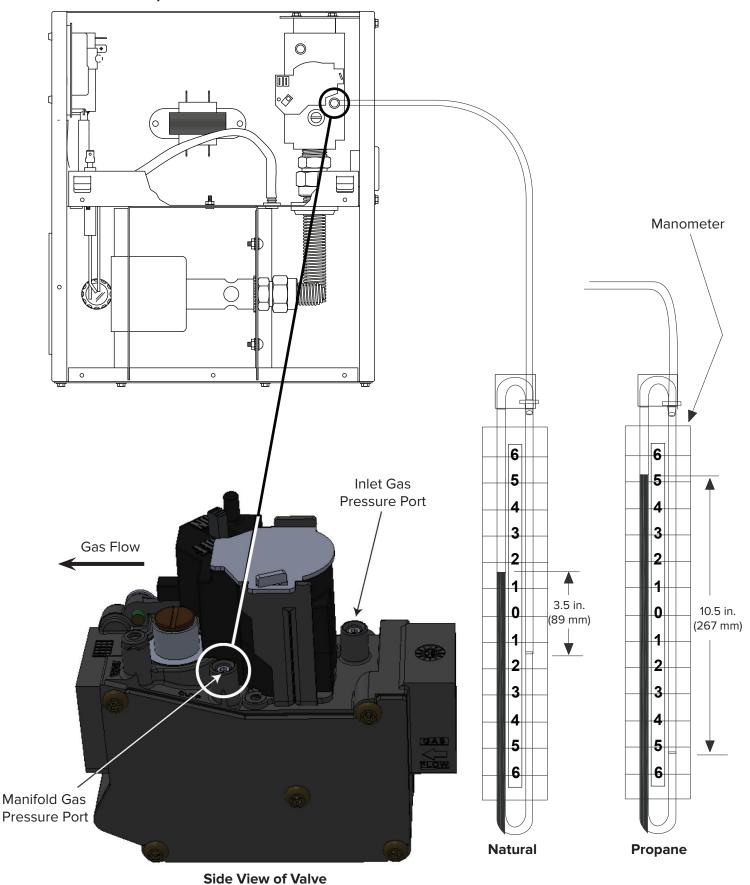
12.1 Troubleshooting Flow Chart





12.2 Manifold Gas Pressure Setting

Top View of Heater



SECTION 13: REPLACEMENT PARTS

A DANGER

A WARNING









Electrical Shock Hazard

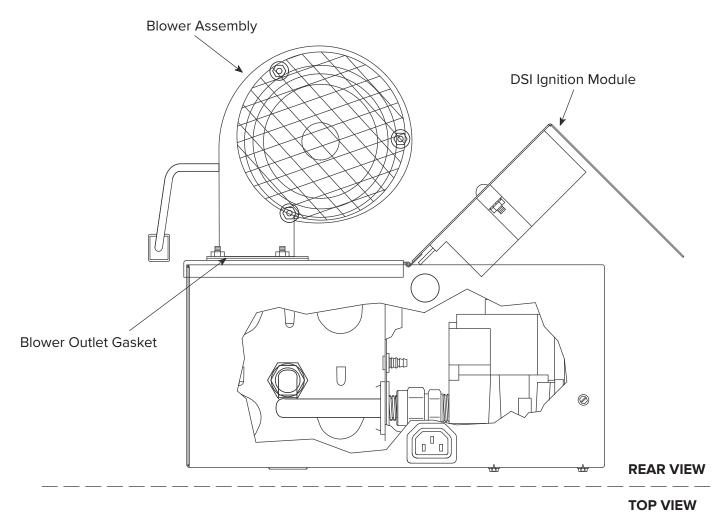
Explosion Hazard

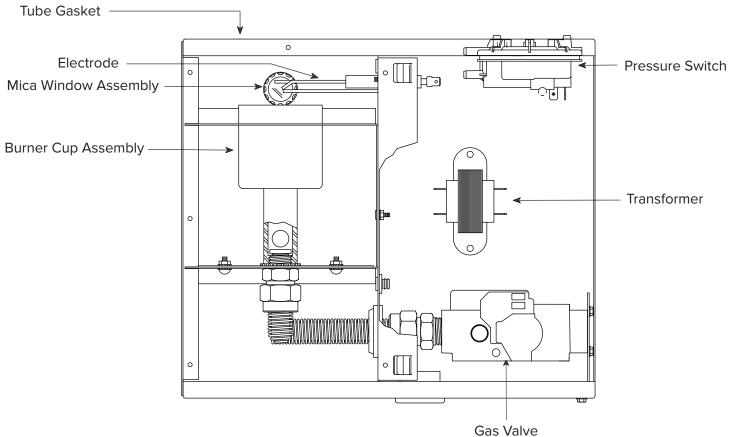
Fire Hazard

Carbon Monoxide
Hazard

Use only genuine Big Ass Fans replacement parts per this installation, operation, and service manual. Failure to follow these instructions can result in death, electric shock, injury, or property damage.

See warnings and important information before removing or replacing parts. After any maintenance or repair work, always test fire the heater in accordance with the startup instructions on page 49 to help ensure all safety systems are in working order before leaving the heater to operate. Minor faults may be traced by using the troubleshooting charts under "SECTION 12: TROUBLESHOOTING" on page 52.





Description	Part Number	
Mica Window Assembly	02553203	
Electrode Gasket	02558501	
Tube Gasket	02568200	
Burner Cup Assembly	03020100	
Gas Valve (Natural)	90032510	
Gas Valve (LP)	90032512	
Electrode	90427400	
DSI Ignition Module	90439500K	
Transformer	90436900K	
Pressure Switch		
(150)	90439802K	
(80)	90439805K	
(125)	90439810K	
(200)	90439801K	
Motor/Blower Assembly	90709700-P	
Blower Outlet Gasket	90709801	

SECTION 14: GENERAL SPECIFICATIONS

14.1 Material Specifications

14.1.1 Reflectors

0.024 Aluminum

14.2 Heater Specifications

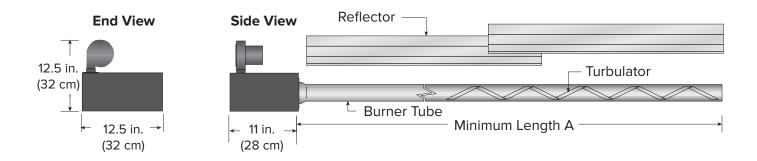
14.2.1 Ignition Fully automatic, three-try, direct spark, electronic ignition control, 100% safety shut-off

14.3 Suspension Specifications

Hang heater using materials with a minimum working load of 75 lb (33 kg). See "FIGURE 11: Critical Hanger Placement" on page 13.

14.4 Controls Specifications

Time switches, thermostats, etc. can be wired into the electrical supply. External controls supplied as an optional extra.



Model	Heat Input Rate	Minimum Length (A)	Recommended Minimum Mounting Height*	
			Space	Spot
IRH 80	80,000 BTU/h	20 ft (6 m)	12–15 ft (3.6–4.5 m)	11 ft (3.3 m)
IRH 125	125,000 BTU/h	30 ft (9 m)	15–20 ft (4.5–6 m)	15 ft (4.6 m)
IRH 150	150,000 BTU/h	40 ft (12 m)	20-25 ft (6-7.6 m)	20 ft (6.1 m)
IRH 200	200,000 BTU/h	50 ft (15 m)	25 ft (7.6 m)	25 ft (7.6 m)

^{*} See "SECTION 3: CLEARANCES TO COMBUSTIBLES" on page 4.

GAS PRESSURE AT MANIFOLD:

Natural Gas: 3.5" wc LP Gas: 10.5" wc

PIPE CONNECTION:

1/2" NPT

DIMENSIONS:

Vent Connection Size: 4" (10 cm) Outside Air Connection Size: 4" (10 cm)

Refer to figure above for dimensional information.

ELECTRICAL RATING (ALL MODELS):

120 V, 60 Hz, 1 A (run)

GAS INLET PRESSURE:

Natural Gas:

IRH 80, 125, and 150: 4.6" wc Minimum

IRH 200: 5.0" wc Minimum

14.0" wc Maximum

LP Gas:

11.0" wc Minimum 14.0" wc Maximum

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