

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 Emergency Services.

WARNING



Fire Hazard

Keep all flammable objects, liquids and vapours 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.

Vacuum Assisted Linear, Double Linear, U-Tube, and Multi-Burner Gas Fired Heating Systems

Installation, Operation & Service Manual

**VBH-25
VBH-30
VBH-35
VBH-40**

WARNING

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.

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

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.

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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 registered installer/contractor qualified in the installation and service of gas-fired heating equipment.

Read this manual carefully before installation, operation or service of this equipment.

This heater is designed for heating nonresidential indoor spaces. Do not install in residential spaces. 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. Thin sheet metal parts, such as the reflector portion of the heater and the various venting components, 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 the local distribution conditions, nature of gas and pressure, and adjustment of the appliance are compatible.

The 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 not play with the appliance.

For additional copies of the Installation, Operation and Service Manual, please contact Val-Co.

1.1 Manpower Requirements

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

SECTION 2: INSTALLER RESPONSIBILITY

- To install the heater, as well as the gas and electrical supplies, in accordance with applicable specifications and codes. Val-Co recommends the installer contact a local Building Inspector or Site safety officer for information relating to combustible materials and substances used in the environment where the equipment is to be installed for guidance when required.
- 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 to burners for servicing on all sides, for burner removal.
- To provide the owner with a copy of this installation, operation and service manual.
- To never use heater as 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 33 kg.
- To ensure the heater is placed in an approved application.

2.1 Low Level User Instructions

In all situations, clearances to combustibles must be maintained. Signs should be posted in storage areas to specify the maximum stacking height of items placed below heater to maintain required clearances to combustibles. Minimum clearances must be maintained from vehicles parked below the heater. Caution should be used when running the system near combustible materials such as wood, paper, rubber, etc. Consideration should be given to partitions, storage racks, hoists, building construction, etc.

2.2 Corrosive Chemicals


<p>Product Damage Hazard</p> <p>Do not use heater in area containing corrosive chemicals.</p> <p>Refer to appropriate Material Safety Data Sheets (MSDS).</p> <p>Failure to follow these instructions can result in product damage.</p>



Val-Co 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

 WARNING

<p style="text-align: center;">Fire Hazard</p> <p>Keep all flammable objects, liquids and vapors the minimum required clearances to combustibles away from heater.</p> <p>Some objects will catch fire or explode when placed close to heater.</p> <p>Failure to follow these instructions can result in death, injury or property damage.</p>

- Consult local Building Inspector, Insurance Provider or other authorities for approval of proposed installation when there is a possibility of exposure to combustible airborne materials or vapours.
- Hang heater in accordance to the minimum suspension requirements on *Page 52, Section 16.6 through Section 16.7*.
- If the radiant tubes must pass through the building structure, be sure that adequate sleeving and fire stop is installed to prevent scorching and/or fire hazard.

3.1 Required Clearances to Combustibles

Clearances are the required distances that combustible objects must be away from the heater to prevent fire hazards. Caution should be used when running the system near combustibles. Combustibles are materials, which 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 *Page 4, Figure 1 through Page 7, Figure 13* in this manual. Check the clearances on each burner for the model 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 petrol or other combustible materials including flammable objects, liquids, dust or vapours away from this heater or any other appliance.
- Do not spray aerosols in the vicinity of this appliance.
- The stated clearances to combustibles represents a surface temperature of 50° C (90° F) 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.

3.2 Clearance Data - Linear and Double Linear

- NOTE:**
1. All dimensions are from the surfaces of all tubes, couplings, tees, elbows and crosses.
 2. Clearances B, C and D can be reduced by 50% after 7500 mm of tubing downstream from the burner.
 3. All measurements are in millimeters.

FIGURE 1: LINEAR & DOUBLE LINEAR, HORIZONTAL MOUNTS

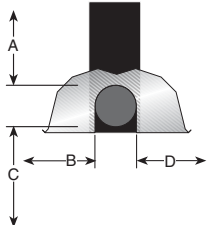
	Model	VBH15ST VBH30DL	VBH20ST VBH40DL	VBH25ST VBH50DL	VBH30ST VBH60DL	VBH35ST VBH70DL	VBH40ST	VBH45ST	VBH50ST & VBH55ST*
	A	150	150	150	150	150	150	200	200
	B	890	970	970	1020	1170	1220	1280	1330
	C	1570	1650	1650	1780	1930	1970	2010	2080
	D	890	970	970	1020	1170	1220	1280	1330

FIGURE 2: LINEAR & DOUBLE LINEAR, ONE SIDE REFLECTOR

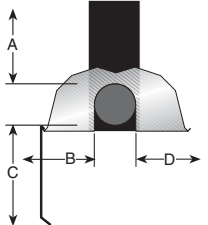
	Model	VBH15ST VBH30DL	VBH20ST VBH40DL	VBH25ST VBH50DL	VBH30ST VBH60DL	VBH35ST VBH70DL	VBH40ST	VBH45ST	VBH50ST & VBH55ST*
	A	150	150	150	150	150	150	200	200
	B	230	230	230	230	230	230	230	230
	C	1580	1760	1760	1930	2090	2130	2160	2240
	D	1200	1380	1380	1500	1660	1710	1760	1860

FIGURE 3: LINEAR & DOUBLE LINEAR, TWO SIDE REFLECTORS

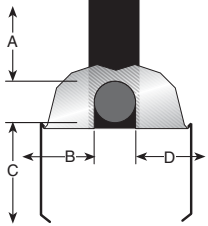
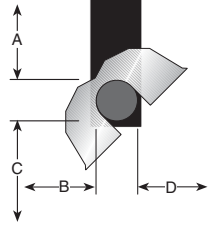
	Model	VBH15ST VBH30DL	VBH20ST VBH40DL	VBH25ST VBH50DL	VBH30ST VBH60DL	VBH35ST VBH70DL	VBH40ST	VBH45ST	VBH50ST & VBH55ST*
	A	150	150	150	150	150	150	200	200
	B	590	640	640	690	820	860	890	1020
	C	1660	1810	1810	1960	2110	2160	2210	2320
	D	590	640	640	690	820	860	890	1020

FIGURE 4: LINEAR & DOUBLE LINEAR, 45° MOUNT

	Model	VBH15ST VBH30DL	VBH20ST VBH40DL	VBH25ST VBH50DL	VBH30ST VBH60DL	VBH35ST VBH70DL	VBH40ST	VBH45ST	VBH50ST & VBH55ST*
	A	200	200	200	250	250	275	300	300
	B	200	200	200	200	200	200	200	200
	C	1500	1660	1660	1860	1960	2030	2110	2160
	D	1370	1520	1520	1630	1750	1820	1880	2000

* VBH55ST only available in multiburner.

- NOTE:**
1. All dimensions are from the surfaces of all tubes, couplings, tees, elbows and crosses.
 2. Clearances B, C and D can be reduced by 50% after 7500 mm of tubing downstream from the burner.
 3. All measurements are in millimeters.

FIGURE 5: UNDERSHIELD

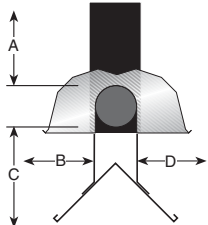
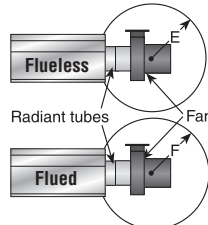
	Model	VBH15ST VBH30DL	VBH20ST VBH40DL	VBH25ST VBH50DL	VBH30ST VBH60DL	VBH35ST VBH70DL	VBH40ST	VBH45ST	VBH50ST & VBH55ST*
	A	150	150	150	150	150	150	-	-
	B	990	1020	1270	1270	1370	1400	-	-
	C	840	965	1120	1120	1220	1270	-	-
	D	990	1020	1270	1270	1370	1400	-	-

FIGURE 6: LINEAR & DOUBLE LINEAR, FLUED/FLUELESS CLEARANCE RADIUS REQUIREMENT FOR FLUE FAN

	Model	VBH15ST VBH30DL	VBH20ST VBH40DL	VBH25ST VBH50DL	VBH30ST VBH60DL	VBH35ST VBH70DL	VBH40ST	VBH45ST	VBH50ST & VBH55ST*
	E	1000	1000	1000	1000	1000	1000	1000	1000
	F	500	500	500	500	500	500	500	500

* VBH55ST only available in multiburner.

3.3 Clearance Data -U Tube

- NOTE:**
1. All dimensions are from the surfaces of all tubes, couplings, tees, elbows and crosses.
 2. Clearances B, C and D can be reduced by 50% after 7500 mm of tubing downstream from the burner.
 3. All measurements are in millimeters.
 4. Add 60 mm clearance to uncovered U-tube.

FIGURE 7: U-TUBE, HORIZONTAL MOUNT

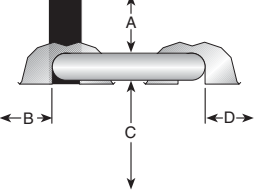
	Model	VBH15UT	VBH20UT	VBH25UT	VBH30UT	VBH35UT	VBH40UT	VBH45UT	VBH50UT
	A	150	150	150	150	150	150	200	200
	B	890	970	970	1020	1170	1220	1270	1380
	C	1580	1730	1730	1910	1980	2050	2110	2210
	D	760	940	940	1000	1090	1150	1200	1300

FIGURE 8: U-TUBE, ONE SIDE REFLECTOR

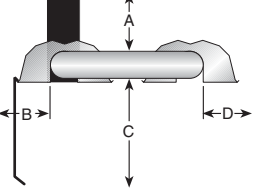
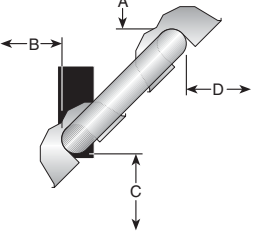
	Model	VBH15UT	VBH20UT	VBH25UT	VBH30UT	VBH35UT	VBH40UT	VBH45UT	VBH50UT
	A	150	150	150	150	150	150	200	200
	B	230	230	230	230	230	230	230	230
	C	1580	1760	1760	1930	2090	2130	2160	2240
	D	1200	1380	1380	1500	1660	1710	1760	1860

FIGURE 9: U-TUBE, TWO SIDE REFLECTORS

	Model	VBH15UT	VBH20UT	VBH25UT	VBH30UT	VBH35UT	VBH40UT	VBH45UT	VBH50UT
	A	150	150	150	150	150	150	200	200
	B	590	640	640	690	820	860	890	1020
	C	1660	1810	1810	1960	2110	2160	2210	2320
	D	590	640	640	690	820	860	890	1020

FIGURE 10: U-TUBE, FULL 45° MOUNT

	Model	VBH15UT	VBH20UT	VBH25UT	VBH30UT	VBH35UT	VBH40UT	VBH45UT	VBH50UT
	A	200	200	200	200	200	200	200	200
	B	200	200	200	200	200	200	200	200
	C	1500	1650	1650	1860	1960	2040	2110	2160
	D	1070	1170	1170	1320	1550	1620	1680	1780

- NOTE:**
1. All dimensions are from the surfaces of all tubes, couplings, tees, elbows and crosses.
 2. Clearances B, C and D can be reduced by 50% after 7500 mm of tubing downstream from the burner.
 3. All measurements are in millimeters.
 4. Add 60 mm clearance to uncovered U-tube.

FIGURE 11: U-TUBE, OPPOSITE 45° TILT

	Model	VBH15UT	VBH20UT	VBH25UT	VBH30UT	VBH35UT	VBH40UT	VBH45UT	VBH50UT
	A	200	200	200	250	250	275	300	300
	B	1370	1530	1530	1630	1780	1830	1880	1930
	C	1500	1650	1650	1860	1960	2040	2110	2160
	D	560	560	560	560	560	560	560	560

FIGURE 12: U-TUBE, PROTECTIVE GRILLE

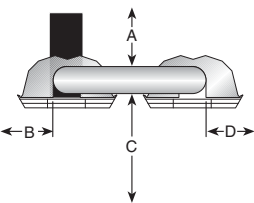
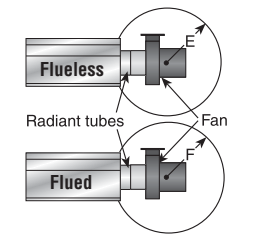
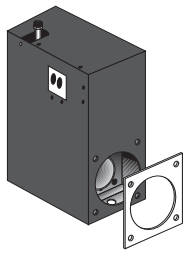
	Model	VBH15UT	VBH20UT	VBH25UT	VBH30UT	VBH35UT	VBH40UT	VBH45UT	VBH50UT
	A	150	150	150	150	150	150	200	200
	B	890	970	970	1020	1170	1220	1270	1380
	C	1580	1730	1730	1910	1980	2050	2110	2210
	D	760	940	940	1000	1090	1150	1200	1300

FIGURE 13: U-TUBE, FLUED/FLUELESS CLEARANCE RADIUS REQUIREMENT FOR FLUE FAN

	Model	VBH15UT	VBH20UT	VBH25UT	VBH30UT	VBH35UT	VBH40UT	VBH45UT	VBH50UT
	E	1000	1000	1000	1000	1000	1000	1000	1000
	F	500	500	500	500	500	500	500	500

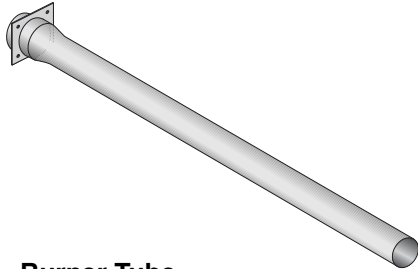
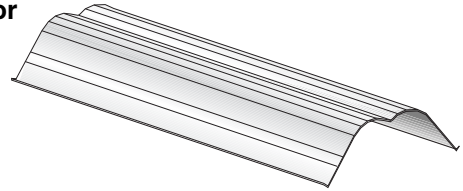
SECTION 4: MAJOR COMPONENT DESCRIPTIONS

**Burner (shown with Tube Gasket)**

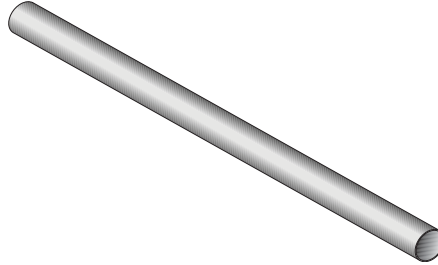
Must be installed with the flame observation window facing down.

Aluminum Reflector

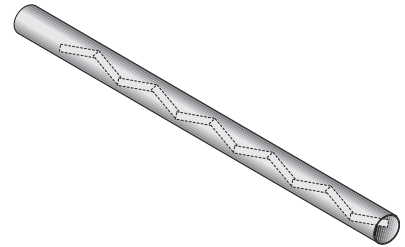
Alternate overlap as shown on overview. Minimum overlap is 160 mm.

**Burner Tube**

Supplied in 3,000 mm lengths. Burner tube is always the first tube after the burner.

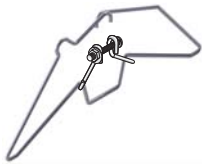
**Tube**

Heat treated aluminised tube supplied in 3,000 mm lengths.

**Fan Tube with Internal Swirler**

Supplied in 3,000 mm lengths. Fan tube is always the last tube on the heater where the fan is attached.

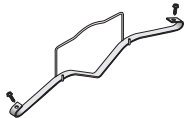
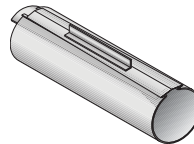
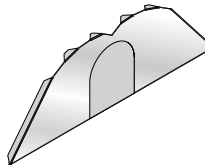
The swirler is welded to the inside of the tube end.

**Tube and Reflector Hanger with Clamp Package**

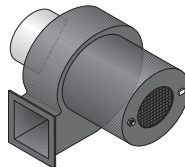
Position this hanger no more than 100 mm away from the burner assembly.

**Tube and Reflector Hanger**

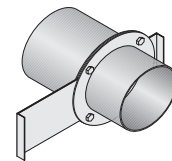
Suspend system from these hangers.

**Reflector Support Strap, Wire Form & #8 x 3/4 (3.9 x 19mm) Screw****Coupling Assembly with Lock****Reflector End Cap**

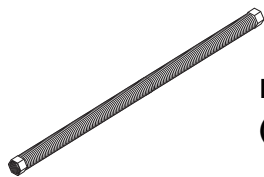
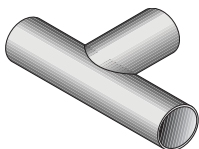
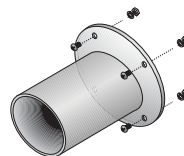
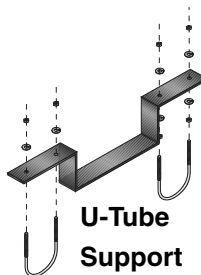
Punch out center section to accommodate tube.

**Fan Assembly (Includes Flange)**

Fan Assembly is attached to the last section of heat exchanger tubing (Fan Tube).

**Damper Flange Assembly**

For use on Multiburner Systems.

**Flex Gas Line (Sold Separately)****Tee Assembly****U-Tube****Fan Flange Assembly and Screws****U-Tube Support Bracket****Spring Hook****Height Adjuster****Bow Shackle**

SECTION 5: GENERAL SUSPENSION DETAILS

! WARNING**Severe Injury Hazard**

Secure burner to burner tube with nuts and lockwashers.

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

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

! 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.

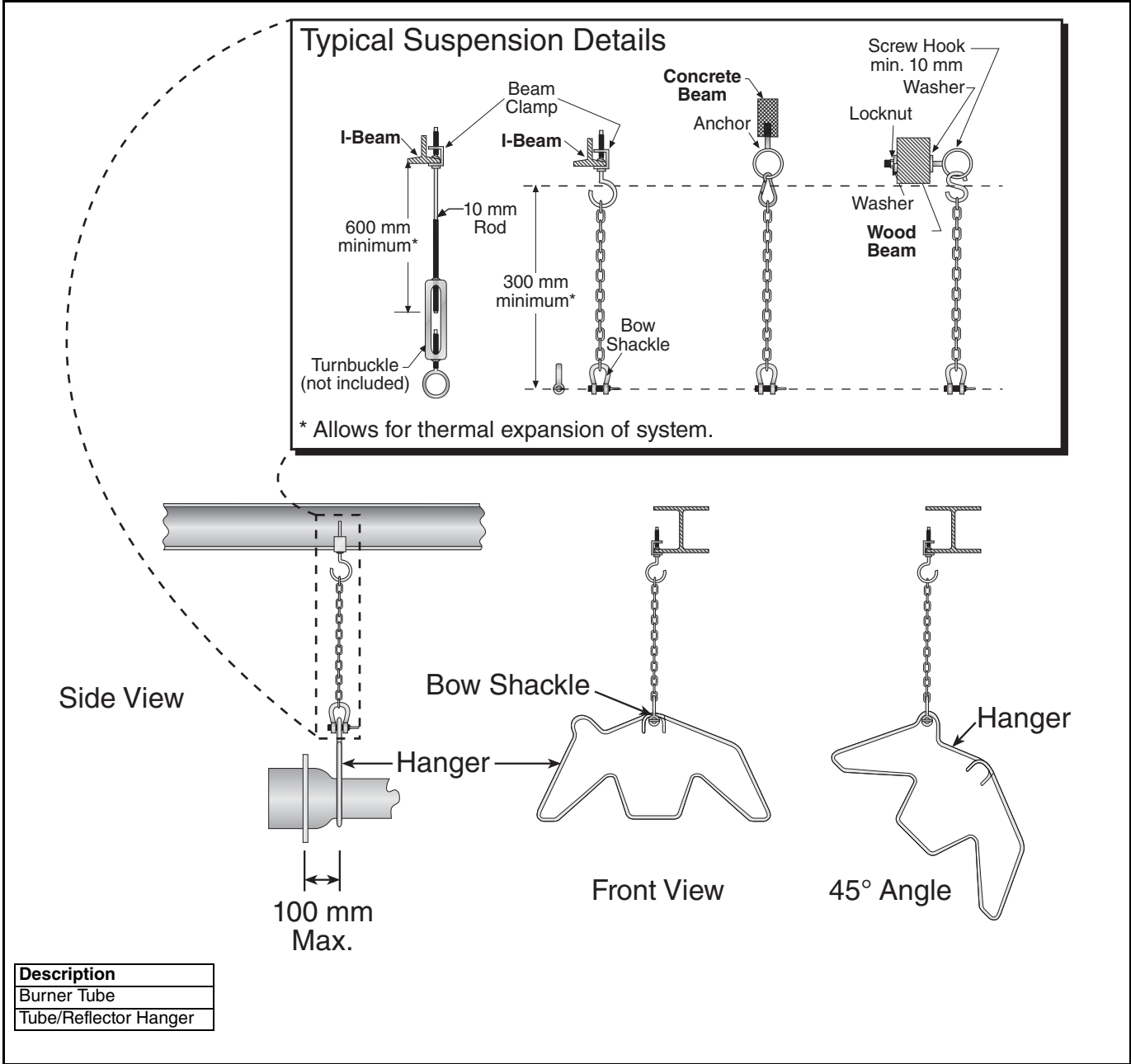
The heater must be installed in a location that it is readily accessible for servicing.

The heater must be installed in accordance with clearances to combustibles as indicated in this manual.

The minimum and maximum gas inlet pressures must be maintained as indicated on the rating plate. Typical installation configurations are shown on *Page 10, Figure 14*.

Suspension chain is not supplied as standard equipment.

Figure 14: Critical Hanger Placement



For suspension angles other than shown, additional chain supports may be required.

SECTION 6: LINEAR & DOUBLE LINEAR HEATER INSTALLATION

! WARNING**Cut/Pinch Hazard**

Wear protective gear during installation, operation and service.

Edges are sharp.

Failure to follow these instructions can result in injury.

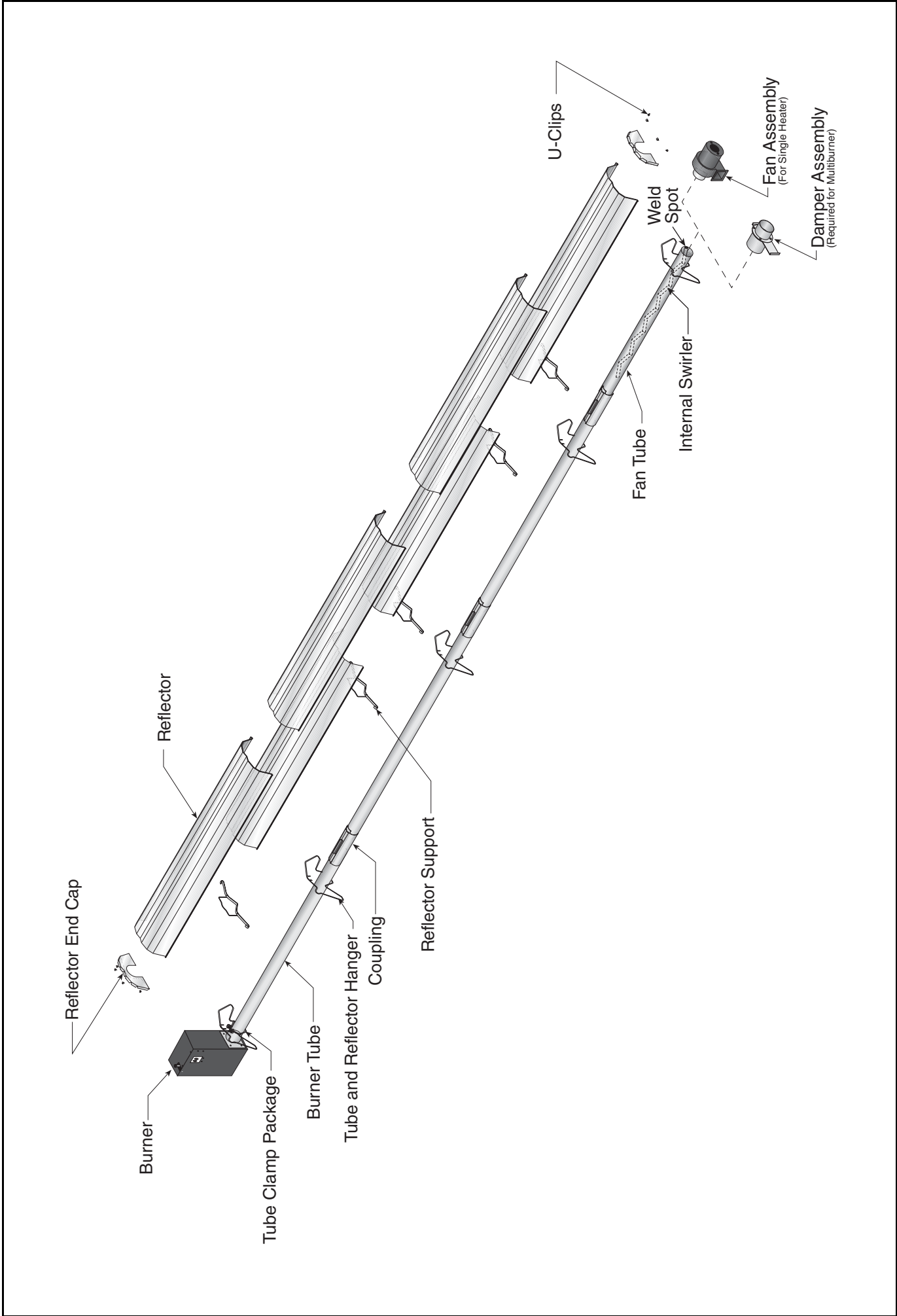
The figures in this section provide a general overview of component placement in a Linear and Double Linear system. The location of some components such as supports and couplings is crucial for proper installation. Assemble the heater components as shown on Page 12, Figure 15.

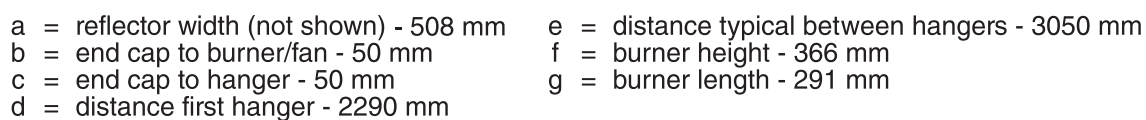
For optional reflector configurations for linear heaters see Page 4, Figure 1 through Page 5, Figure 6. Install appropriate suspension hardware, beam clamps, chain or rod at predetermined locations. Adjustments of chain length will provide uniform pitch.

6.1 Linear Standard Parts List

Description		VBH15ST	VBH20ST	VBH25ST	VBH30ST	VBH35ST	VBH40ST	VBH45ST	VBH50ST	VBH55ST
072XXXX	Burner Assembly (Input and Fuel Varies)	1	1	1	1	1	1	1	1	1
474586	Fan Package XP2	-	-	1	1	1	-	-	-	-
474889	Linear Package	1	1	1	1	1	1	1	1	1
474890	Burner Tube, 100 mm x 3048 mm	1	1	1	1	1	1	1	1	1
91409408	Tube, 100 mm x 3048 mm	-	1	1	2	2	2	3	3	4
474891	Fan Tube, 100 mm x 3048 mm, with 3048 mm Swirler	-	1	1	1	1	1	1	1	1
01312700	Coupling Assembly	1	2	2	3	3	3	4	4	5
02750303	Reflector, Aluminium, 2439 mm	3	4	4	6	6	6	7	7	8
02750800	Reflector End Cap, Aluminium	2	2	2	2	2	2	2	2	2
03090100	Tube and Reflector Hanger	3	4	4	5	5	5	6	6	7
01318901	Tube Clamp Package (including Nut, Washer & Bolt)	1	1	1	1	1	1	1	1	1
91908004	Wire Form	2	3	3	5	5	5	6	6	7
94320812	Screw #8 x 3/4 (3.9 mm x 19 mm), (goes with 03050002)	4	6	6	10	10	10	12	12	14
474892	Reflector Support Strap	2	3	3	5	5	5	6	6	7
91107720	U-Clip Package (20 Pieces)	1	1	1	1	1	1	1	1	1

Figure 15: Linear General Assembly Overview



13

Step 6.2 Burner Tube Installation

Note:
Tubing requires a downward
slope of 13 mm per 6000 mm
away from burner.

Offset mounting
hole must be to the top.

Weld seam
must be to the
bottom of the tube.

Bow Shackle

Hanger

Burner Tube

2290 mm ± 250 mm

Description
Burner Tube
Bow Shackle
Tube/Reflector Hanger

Step 6.3 Coupling and Tube Assembly

A Close coupling with tab.

Open

Closed

Tab

B Start slide bar/coupling lock onto coupling.

Slide Bar

Wide End Coupling

76 mm to 101 mm

C Insert tubes into coupling.

Tube

Tube

Orient coupling so that the impact block is in the 2:00 or 10:00 o'clock positions

D Tighten coupling to join tubes.

Slide Bar

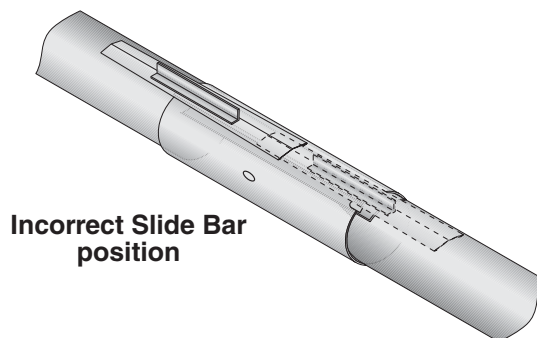
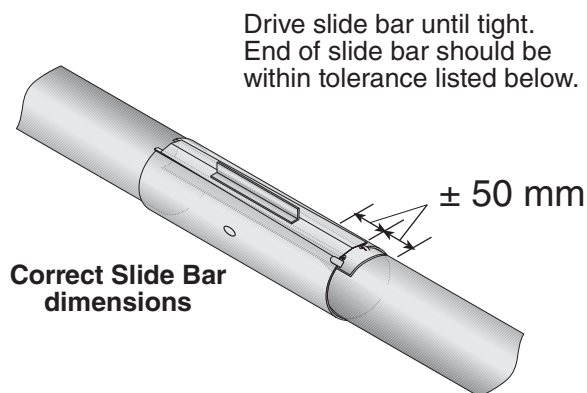
Coupling

Tube

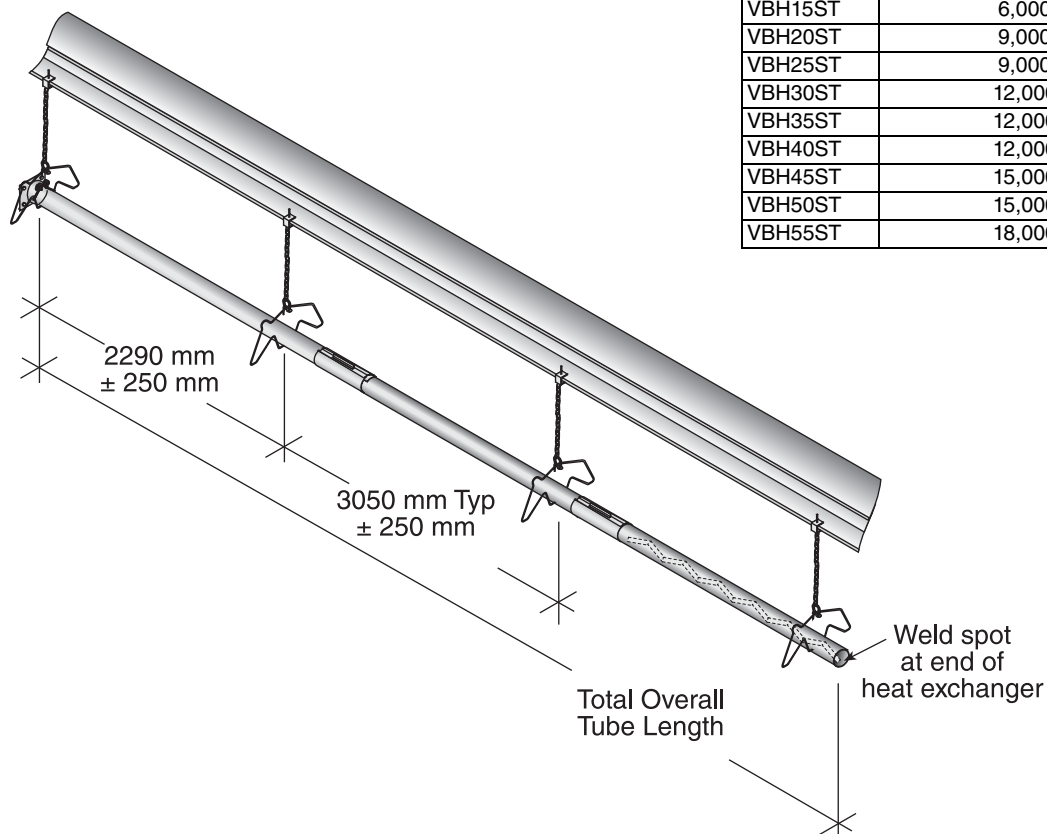
Description
Coupling
Slide Bar/Coupling Lock
Tube

Step 6.3.1 Coupling and Tube Assembly (Continued)

Tighten slide bar as shown below.

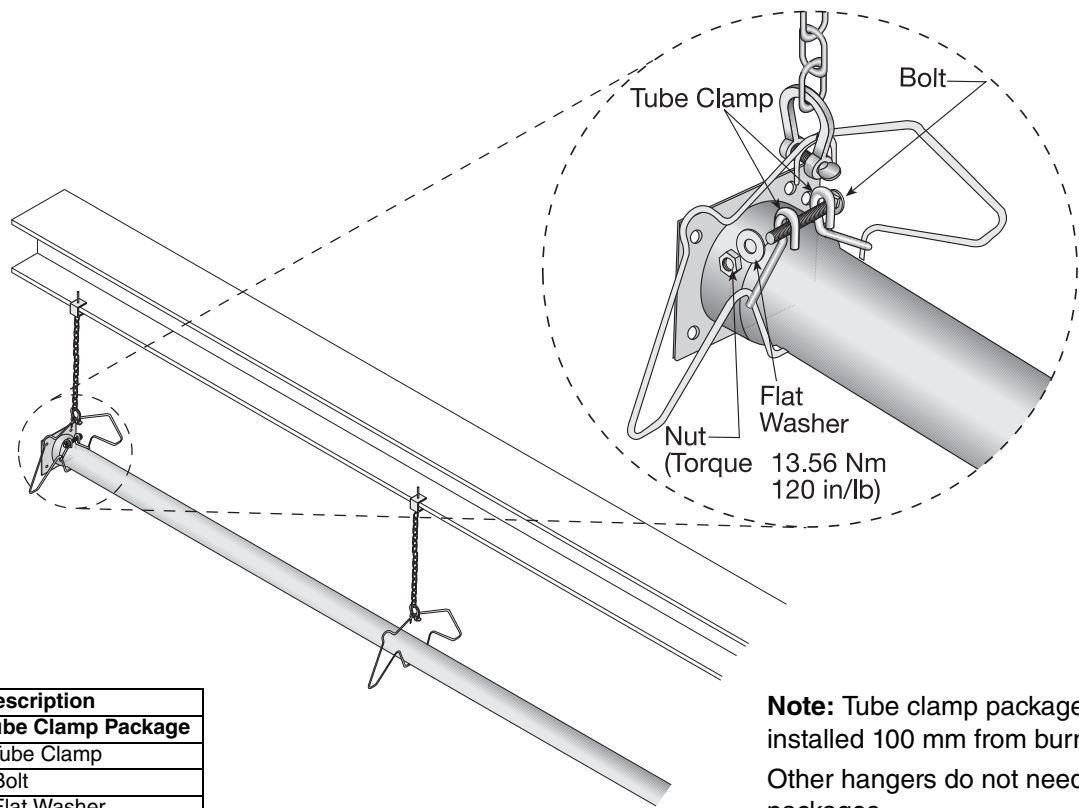


- Repeat Step 6.3 A - D until all tubes are assembled. See Page 15, Section 6.3.2 shown below.

Step 6.3.2 Coupling and Tube Assembly (Continued)

Model	Overall Tube Length (mm)	Number of Tubes
VBH15ST	6,000	2
VBH20ST	9,000	3
VBH25ST	9,000	3
VBH30ST	12,000	4
VBH35ST	12,000	4
VBH40ST	12,000	4
VBH45ST	15,000	5
VBH50ST	15,000	5
VBH55ST	18,000	6

Step 6.4 Tube Clamp Package Installation



Description
Tube Clamp Package
Tube Clamp
Bolt
Flat Washer
Nut
Lockwasher

Note: Tube clamp package should be installed 100 mm from burner tube plate. Other hangers do not need tube clamp packages.

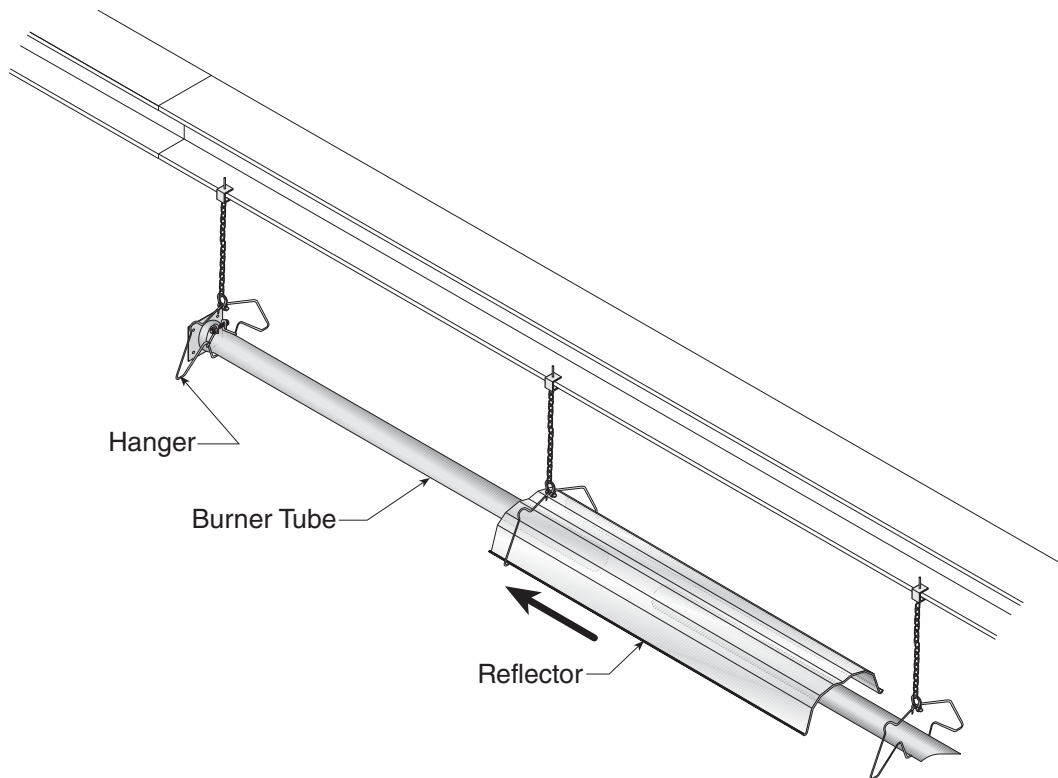
Step 6.5 Reflector Installation

⚠ 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.

**Description**

Tube/Reflector Hanger

Burner Tube

Reflector

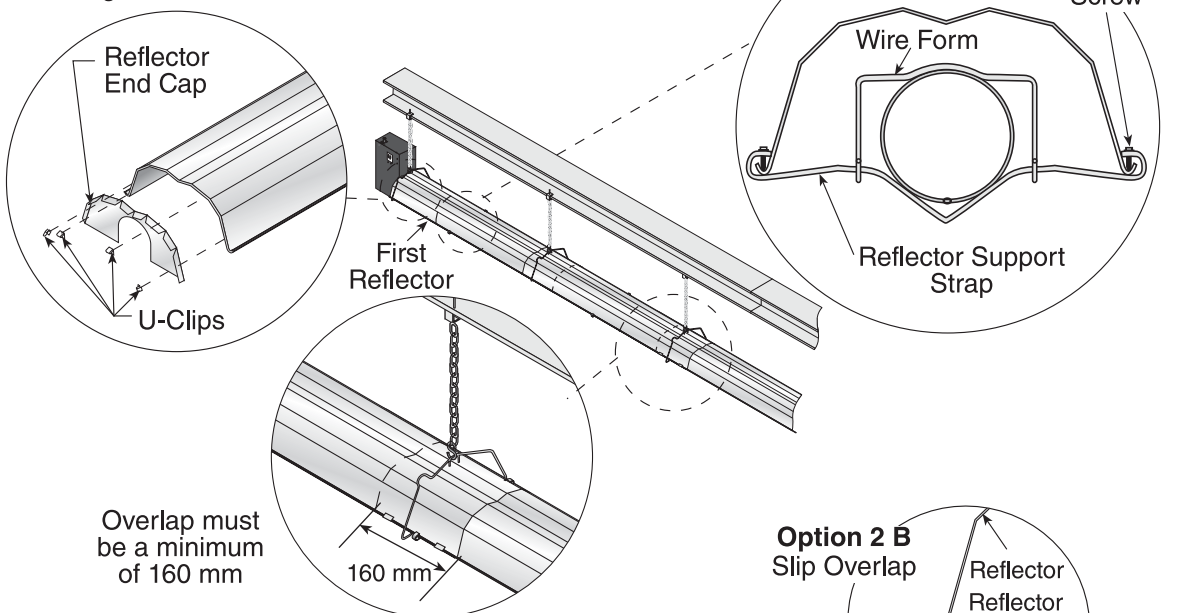
Step 6.5.1 Reflector, U-Clip and Reflector Support Installation

The pictorial drawings of the heater construction in *Section 6* are schematic only and provide a general guideline of where hangers, reflector supports and U-clips are to be installed.

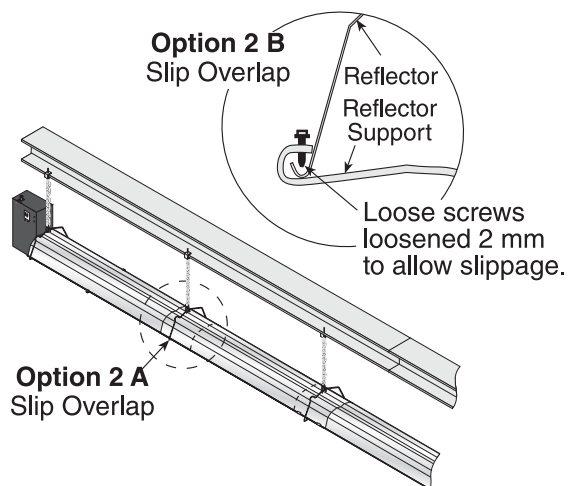
To ensure proper expansion and contraction movement of the reflectors, a combination of U-clips and reflector

supports are used. The positioning of reflector supports and U-clips depend 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. The first reflector after the burner must be affixed in the middle of the reflector with a reflector support and tight screws.

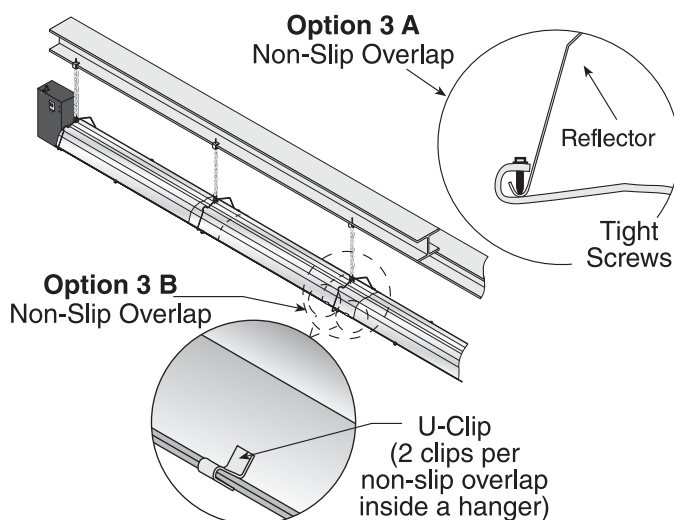


2. The overlap at the first and second reflector is a slip overlap. Thereafter, every third reflector joint is a slip overlap. A slip overlap is achieved by either:
 - a.) both reflectors lay inside a hanger. (no reflector support needed).
 - b.) using a reflector support with loose screws at the reflector 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

Figure 17: U-Tube Assembly Overview

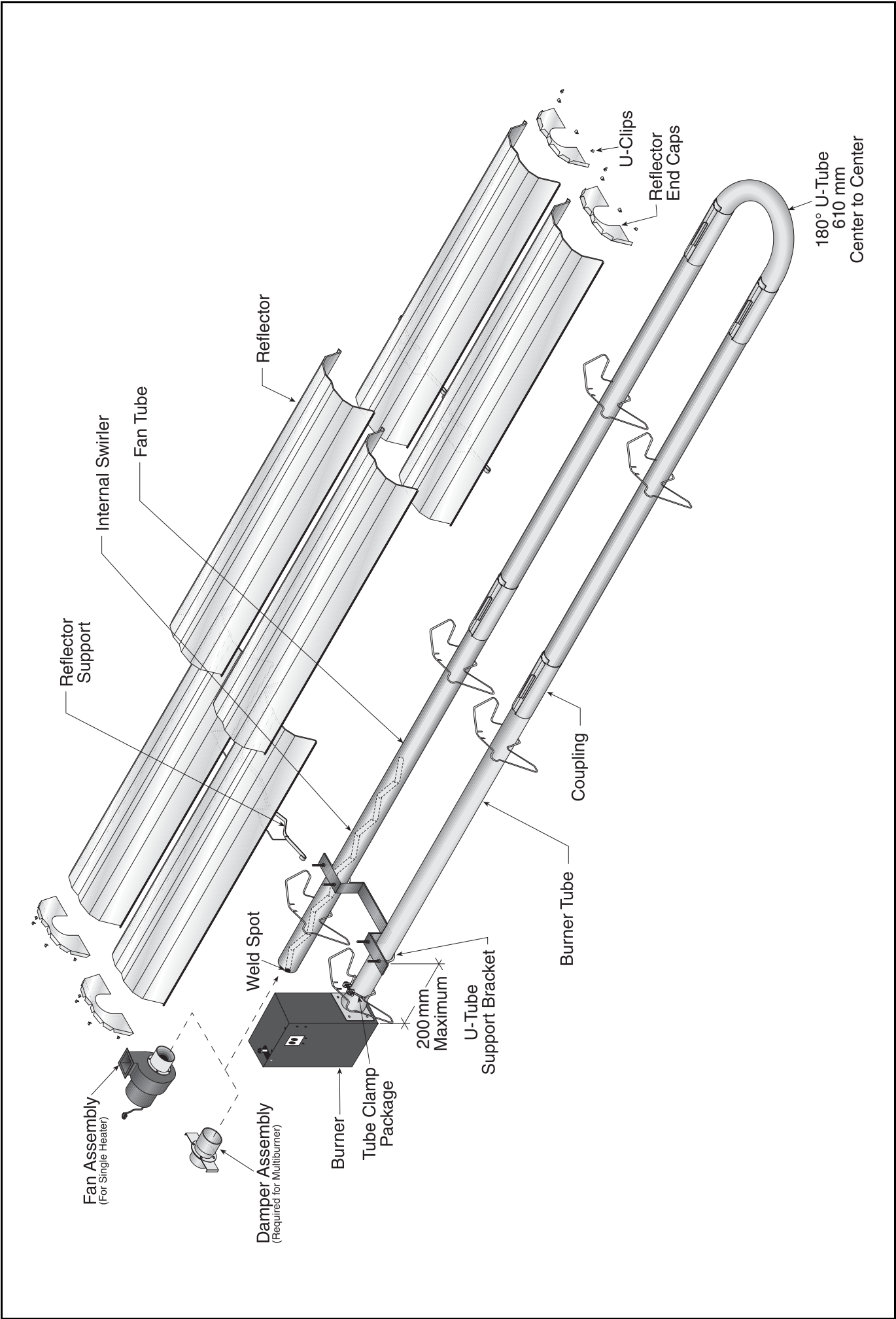
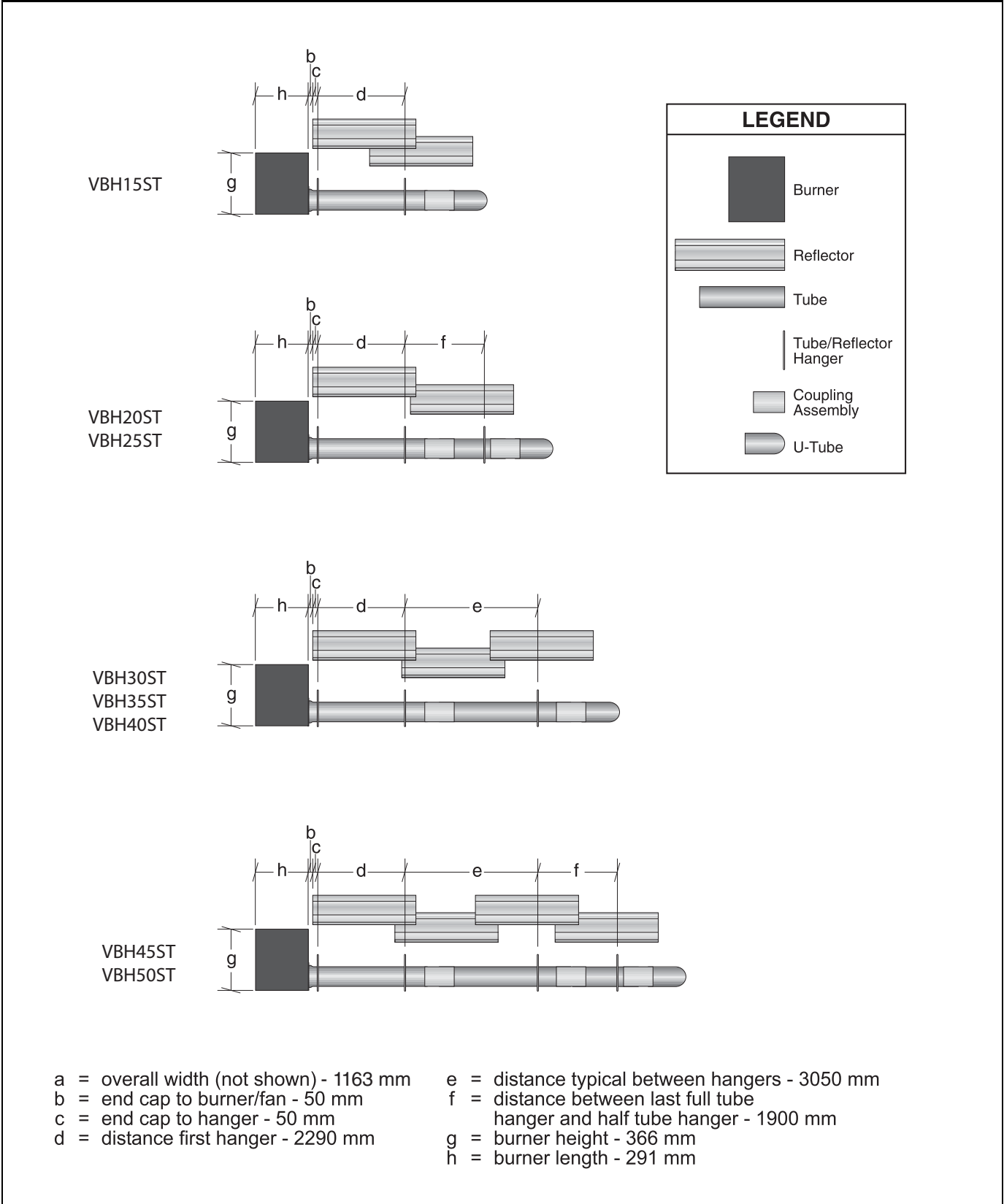
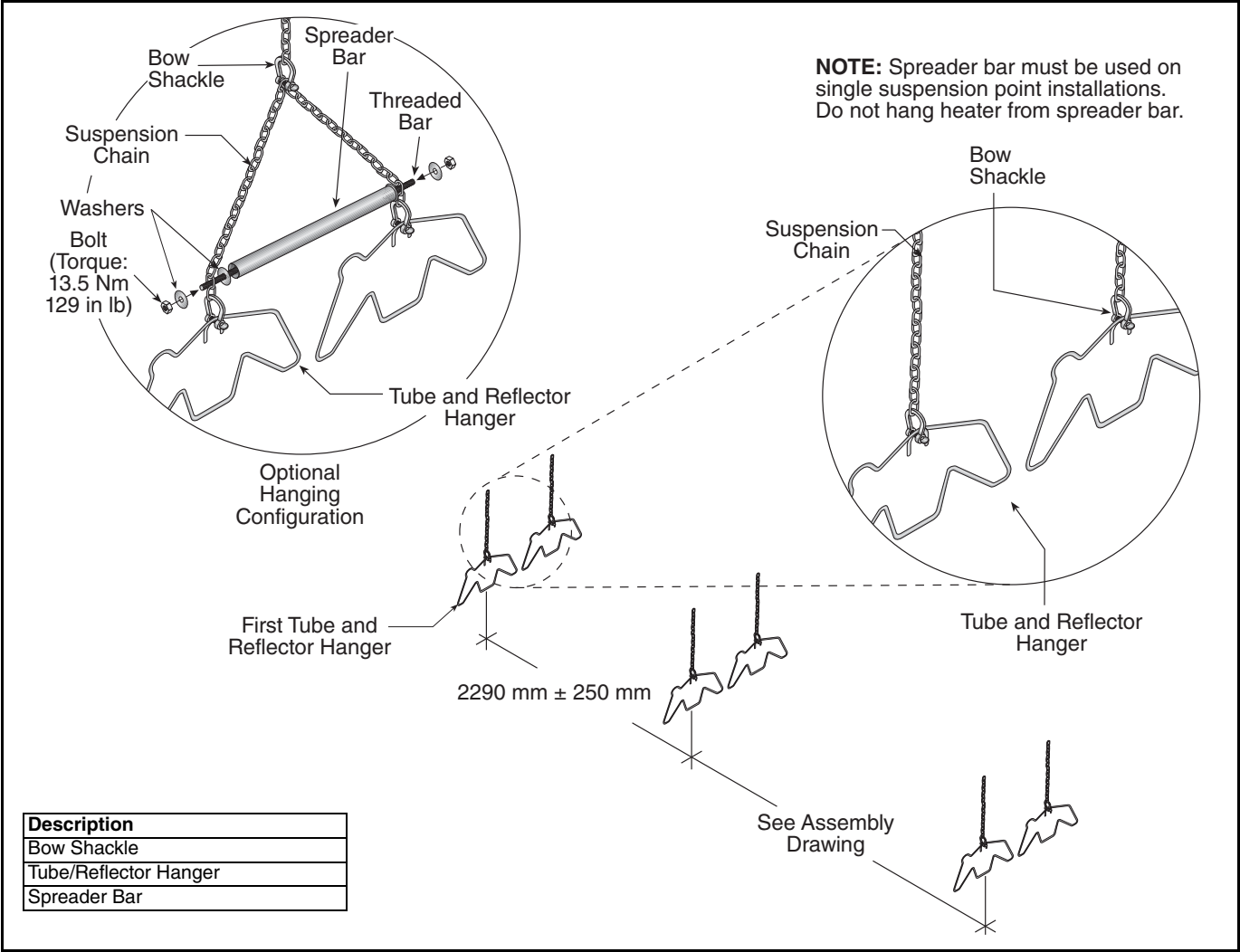


Figure 18: U-Tube Layout Overview

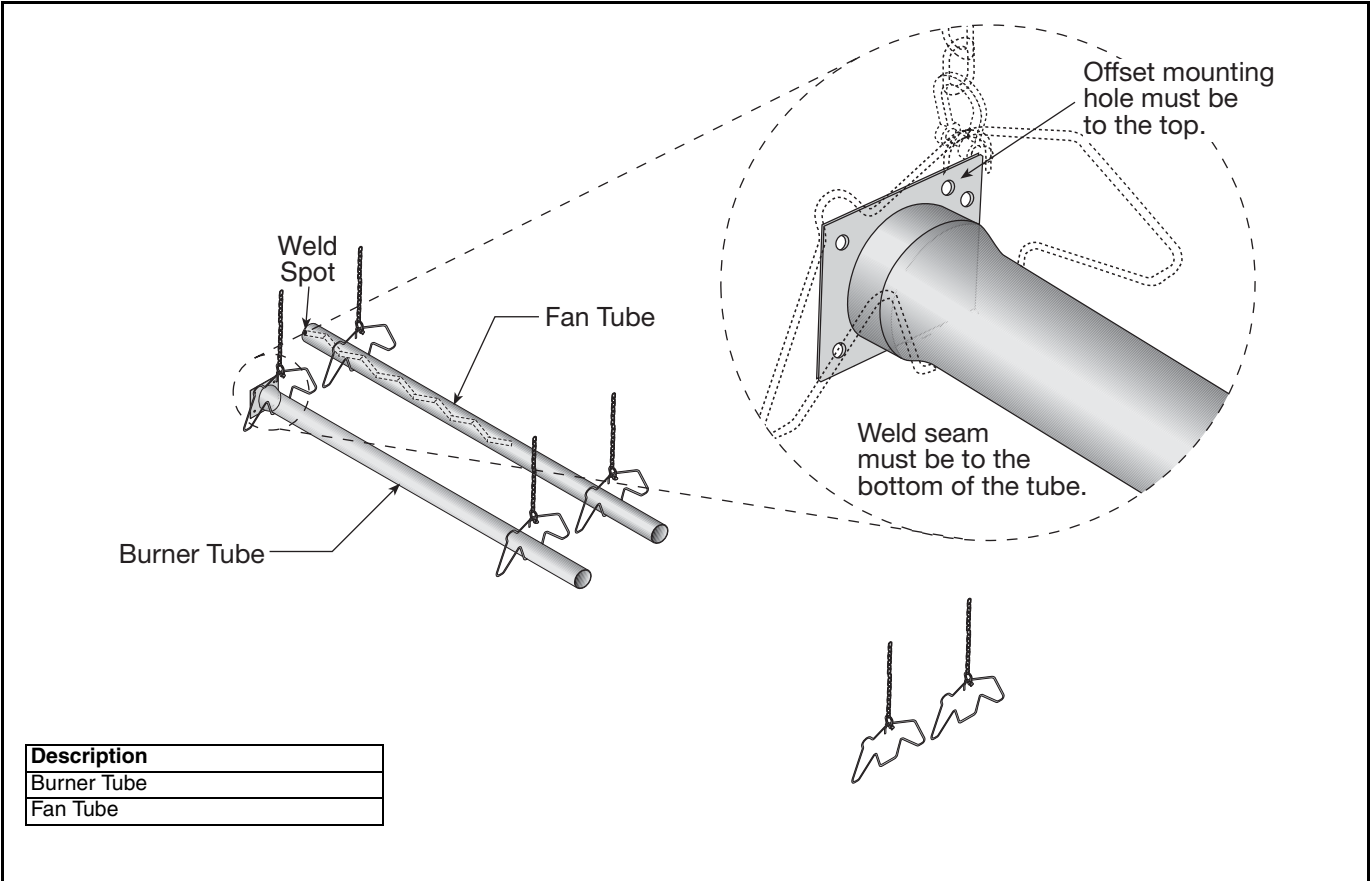


Model	VBH15U T	VBH20 UT	VBH25UT	VBH30UT	VBH35UT	VBH40UT	VBH45UT	VBH50UT
Reflector Overlap (approx.)	1780 mm	250 mm	250 mm	580 mm	580 mm	580 mm	690 mm	690 mm

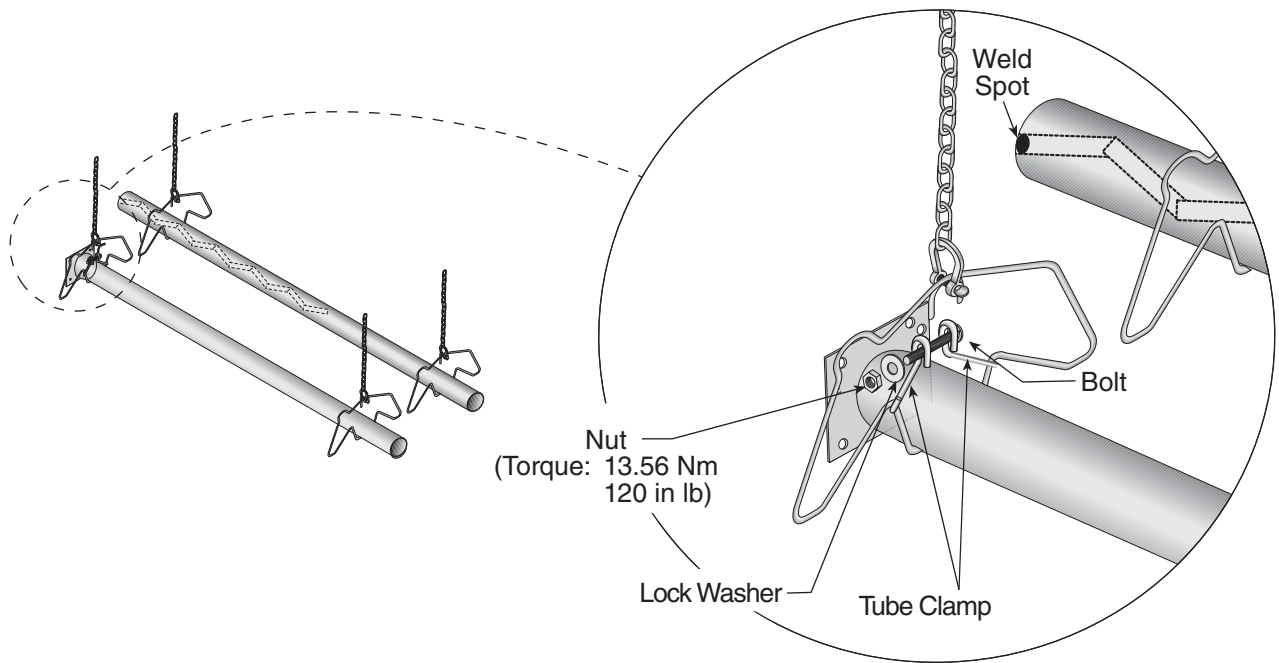
Step 6.6 U-Tube Hanger Placement



Step 6.7 Burner Tube and Fan Tube Installation



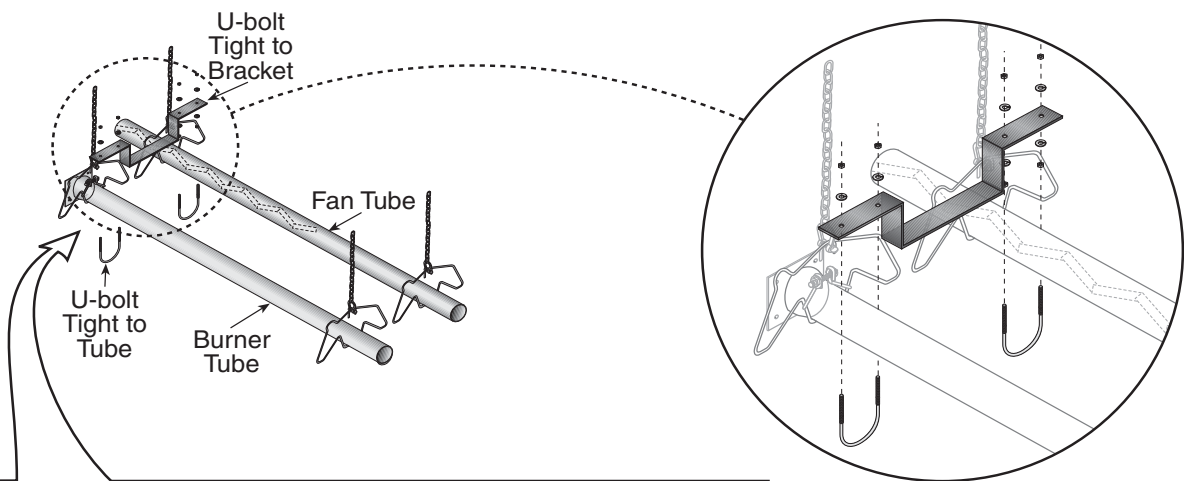
Step 6.7.1 Tube Clamp Package Installation



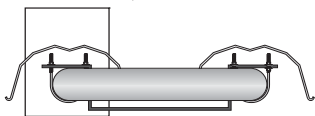
Description
Tube Clamp Package
Tube Clamp
Bolt
Flat Washer
Nut
Lockwasher

Note: Tube clamp package should be installed 100 mm from burner tube plate. Other hangers do not need tube clamp packages.

Step 6.8 U-Tube Support Bracket Assembly Installation



U-tube, Standard



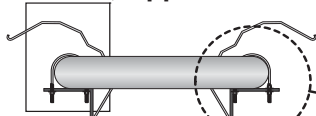
Tight U-bolt

100 mm u-bolt, secured to burner tube with M6 lockwashers and M6 nuts. TIGHT.

Loose U-bolt

100 mm u-bolt, secured to bracket with M6 lockwashers and M6 nuts on top and bottom to allow for tube expansion and contraction.

U-tube, Opposite 45°

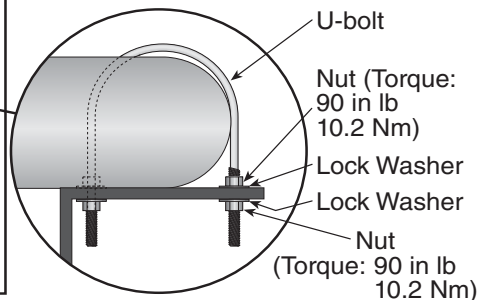


Tight U-bolt

100 mm u-bolt, secured to burner tube with M6 lockwashers and M6 nuts. TIGHT.

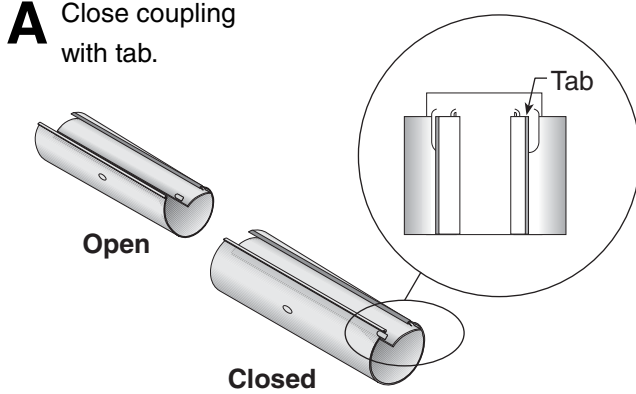
Loose U-bolt

100 mm u-bolt, secured to bracket with M6 lockwashers and M6 nuts on top and bottom to allow for tube expansion and contraction.

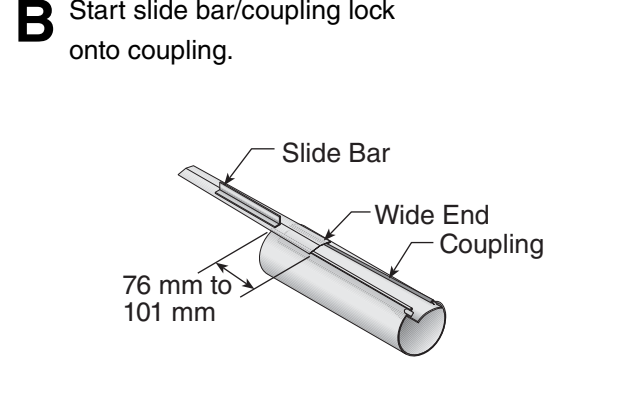


Step 6.9 Coupling and Tube Assembly

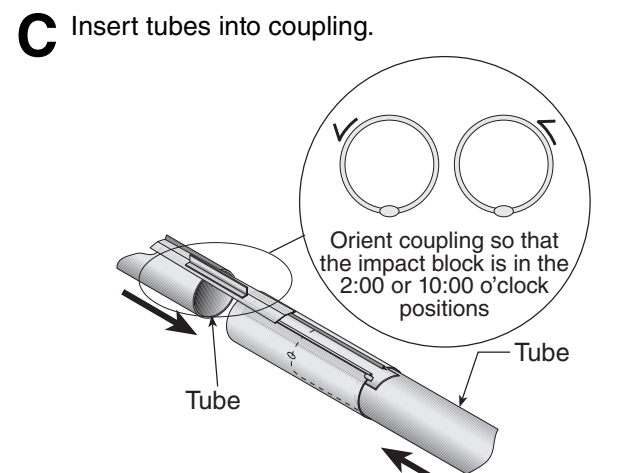
A Close coupling with tab.



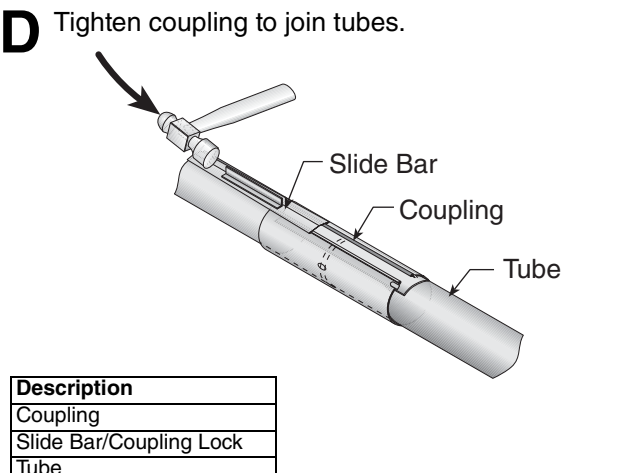
B Start slide bar/coupling lock onto coupling.



C Insert tubes into coupling.



D Tighten coupling to join tubes.



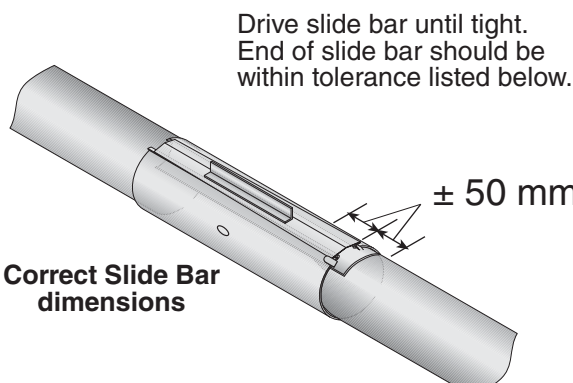
Description
Coupling
Slide Bar/Coupling Lock
Tube

Step 6.9.1 Coupling and Tube Assembly (Continued)

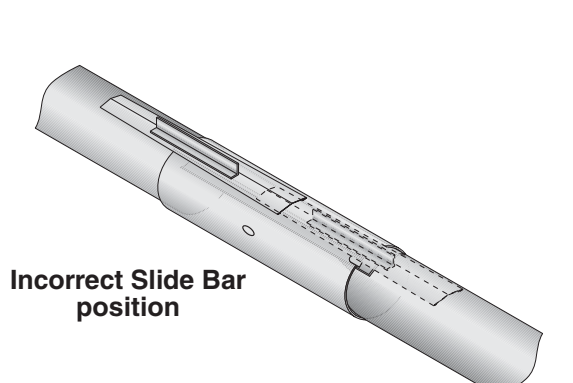
Tighten slide bar as shown below.

Drive slide bar until tight.
End of slide bar should be within tolerance listed below.

Correct Slide Bar dimensions

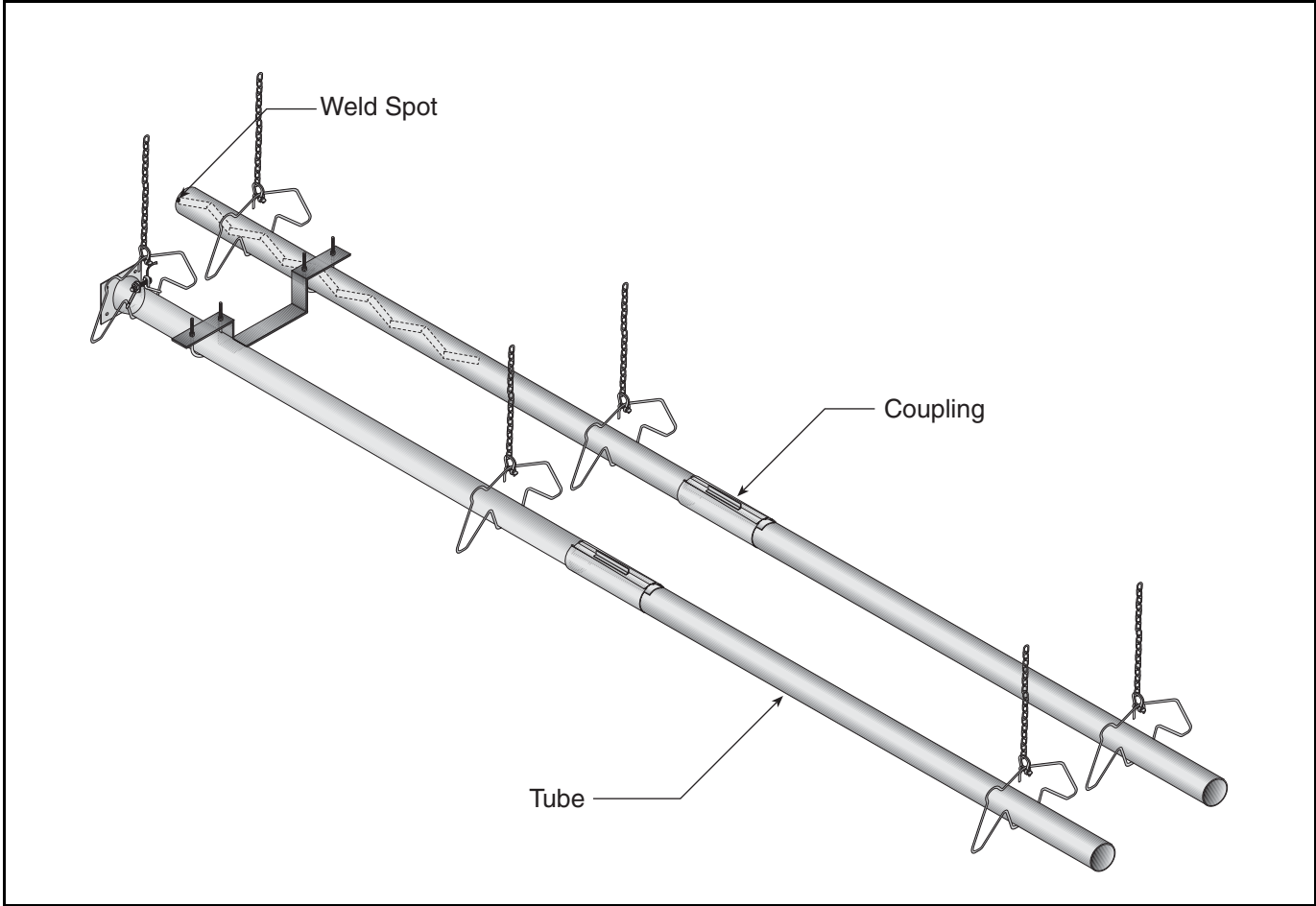


Incorrect Slide Bar position

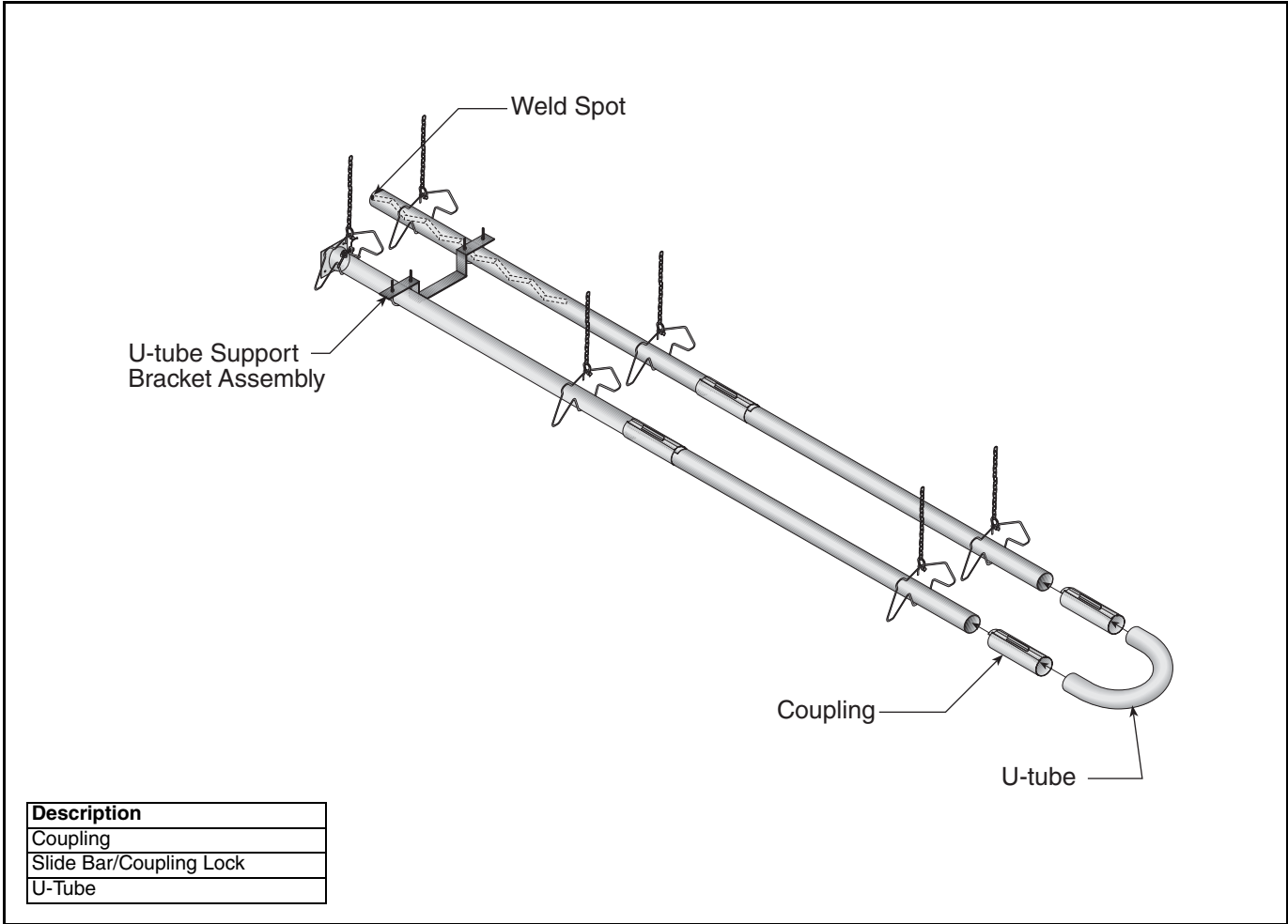


• Repeat Step 6.9 A - D until all tubes are assembled.

Step 6.10 Tube Installation



Step 6.11 U-Tube Installation



Description
Coupling
Slide Bar/Coupling Lock
U-Tube

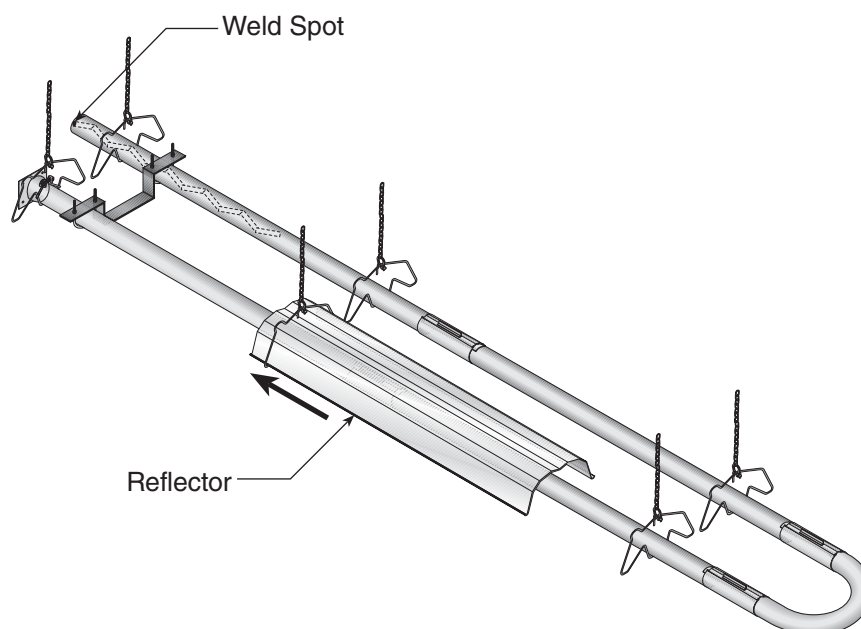
Step 6.12 Reflector Installation

⚠ 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.

**Description**

Reflector

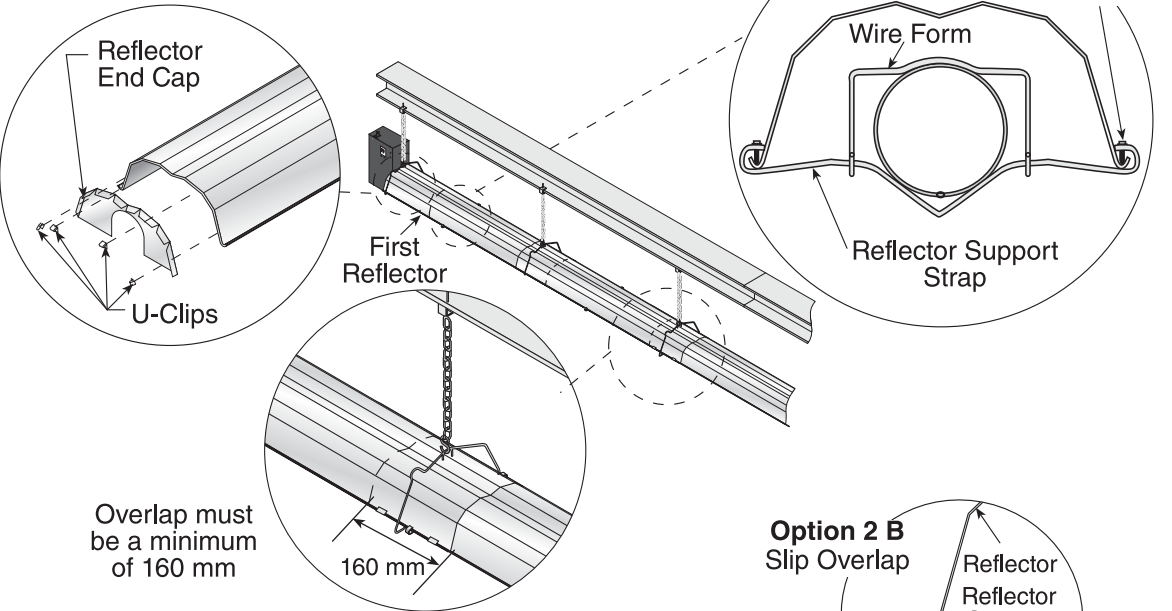
Step 6.12.1 Reflector, U-Clip and Reflector Support Installation

The pictorial drawings of the heater construction in Section 6 are schematic only and provide a general guideline of where hangers, reflector supports and U-clips are to be installed.

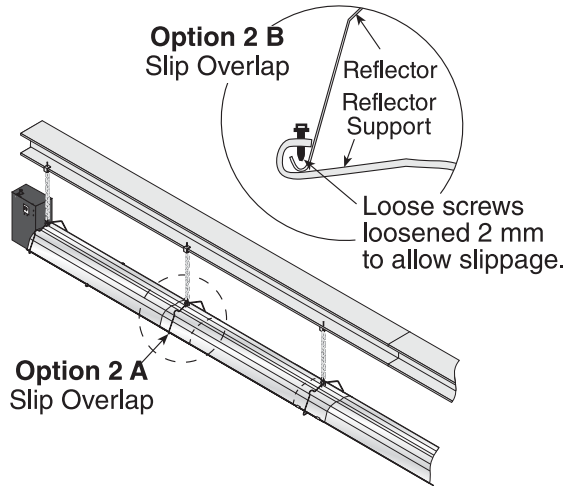
To ensure proper expansion and contraction movement of the reflectors, a combination of U-clips and reflector

supports are used. The positioning of reflector supports and U-clips depend 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. The first reflector after the burner must be affixed in the middle of the reflector with a reflector support and tight screws.

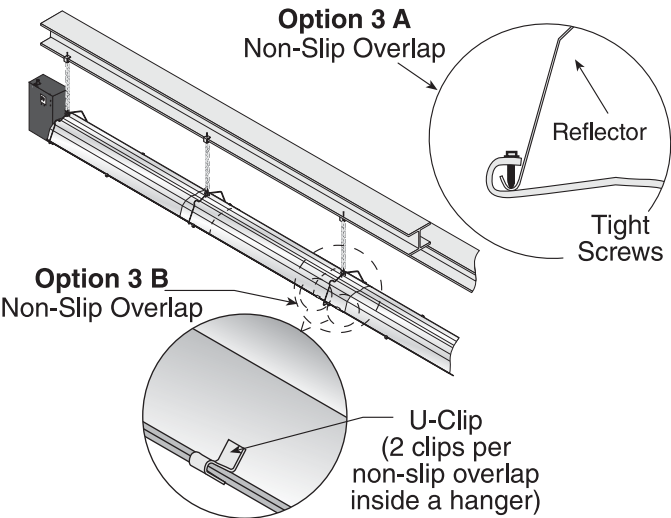


2. The overlap at the first and second reflector is a slip overlap. Thereafter, every third reflector joint is a slip overlap. A slip overlap is achieved by either:
- a.) both reflectors lay inside a hanger. (no reflector support needed).
 - b.) using a reflector support with loose screws at the reflector 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.

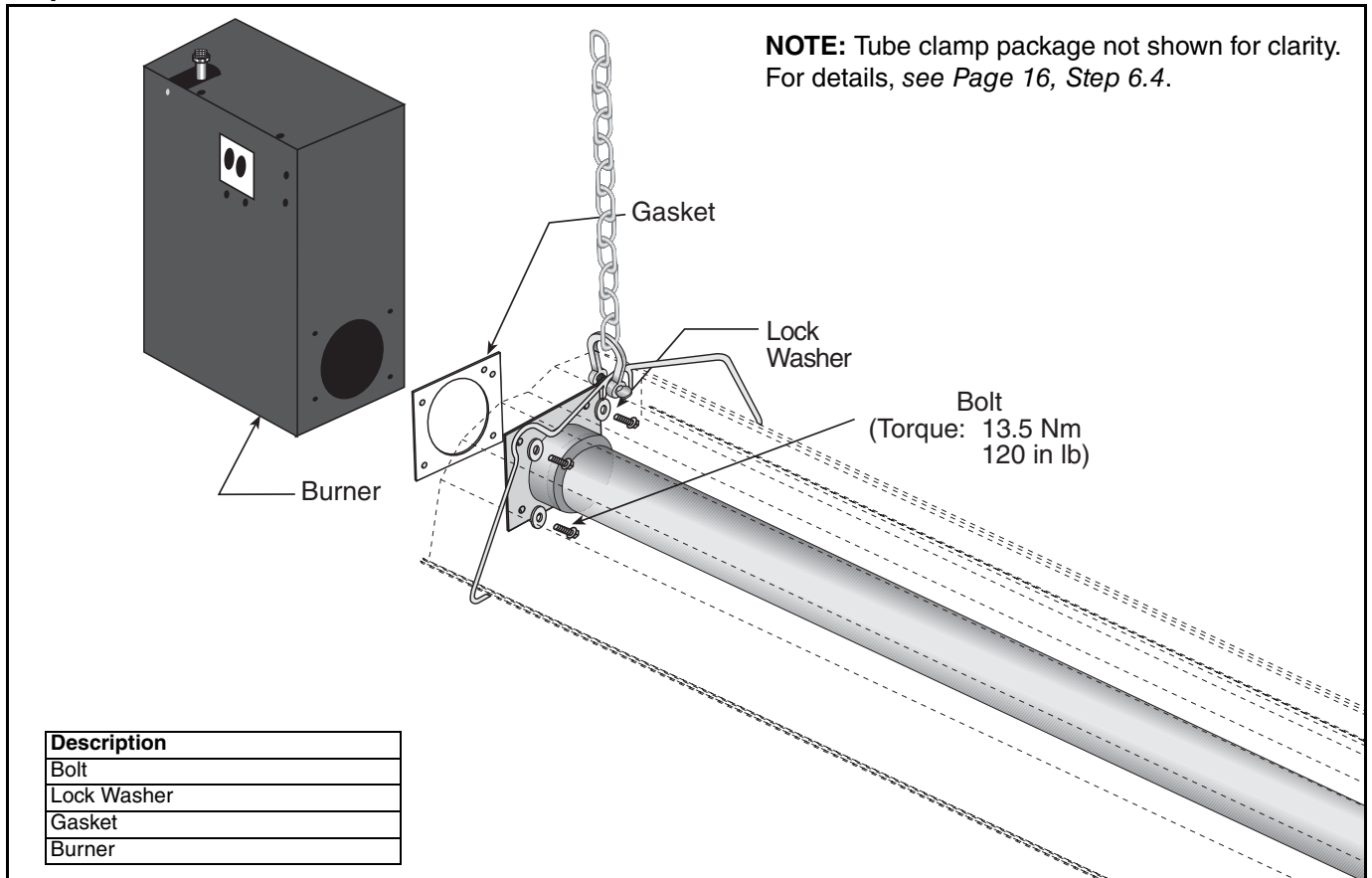
This section of three reflectors joined together must be affixed to the tube with at least one reflector support with tight screws.



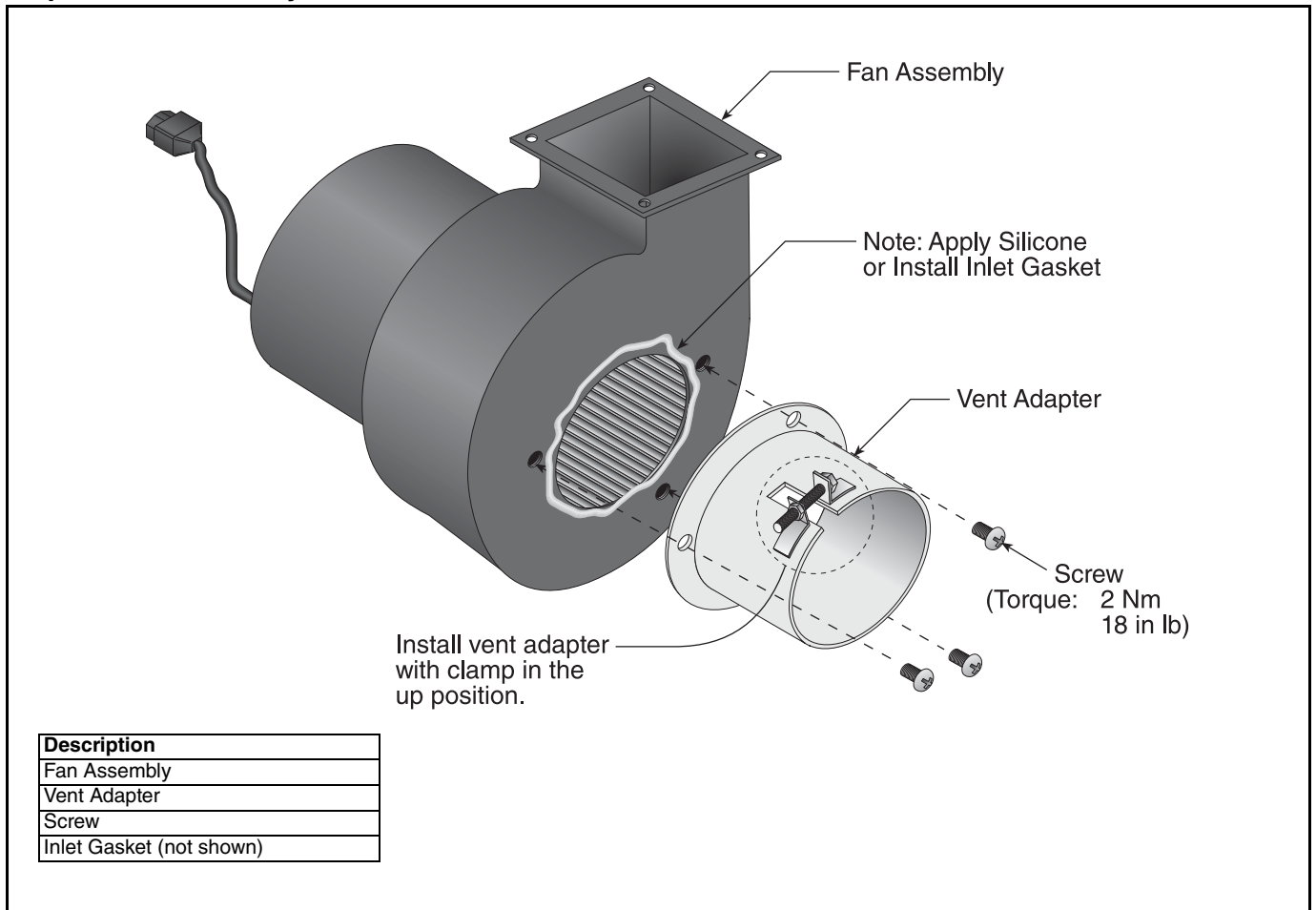
Description
Reflector Support Package
Wire Form
Reflector Support Strap
Screw #8 x 3/4 (3.9 x 19 mm)
U-Clip Package
Reflector End Cap

SECTION 7: BURNER & FAN INSTALLATION

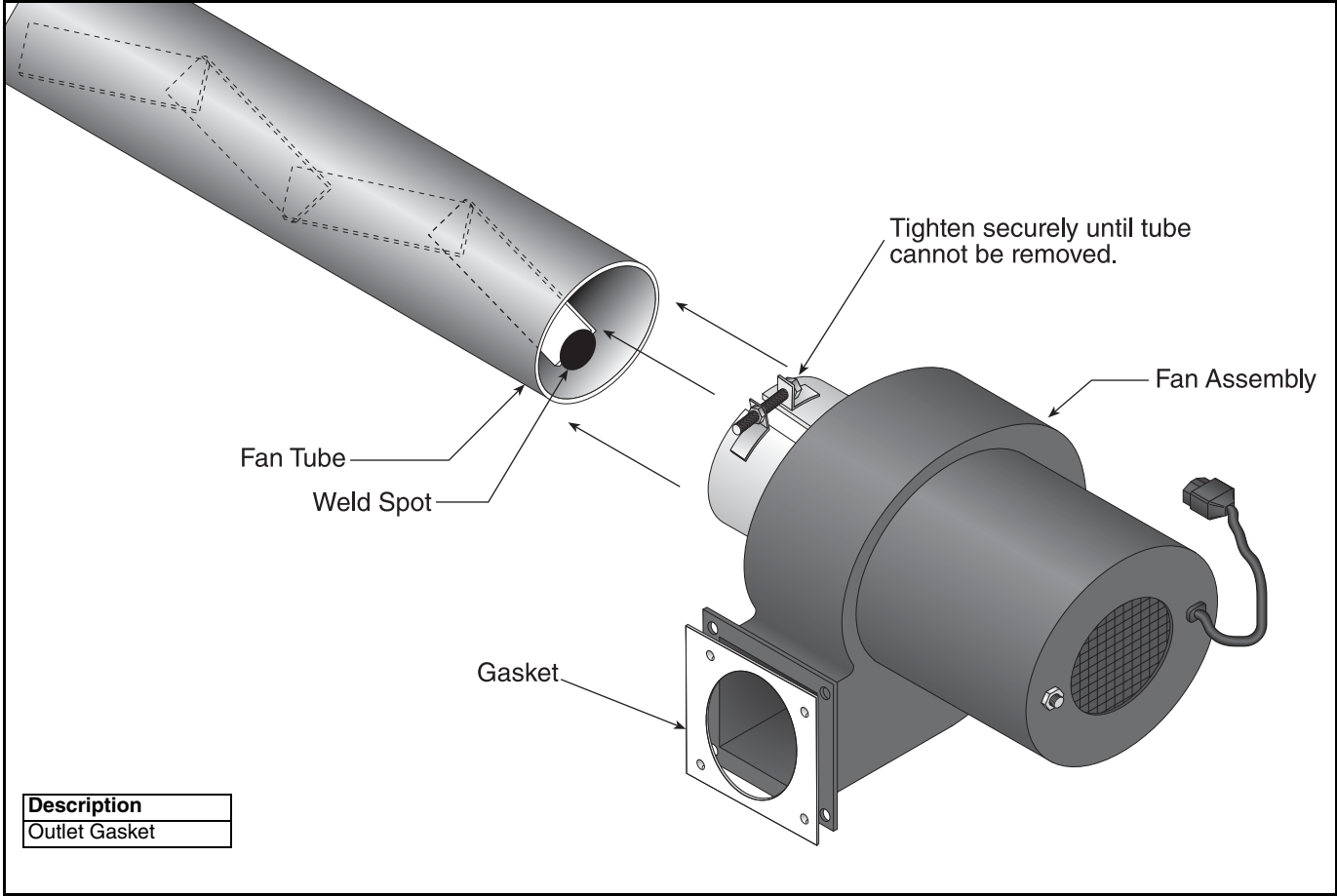
Step 7.1 Burner Installation



Step 7.2 Fan Assembly



7.3 Linear & U-Tube Fan Installation



SECTION 8: OPTIONAL HEATER ACCESSORIES

⚠ WARNING**Cut/Pinch Hazard**

Wear protective gear during installation, operation and service.

Edges are sharp.

Failure to follow these instructions can result in injury.

Figure 19: U-Tube (Horizontal)

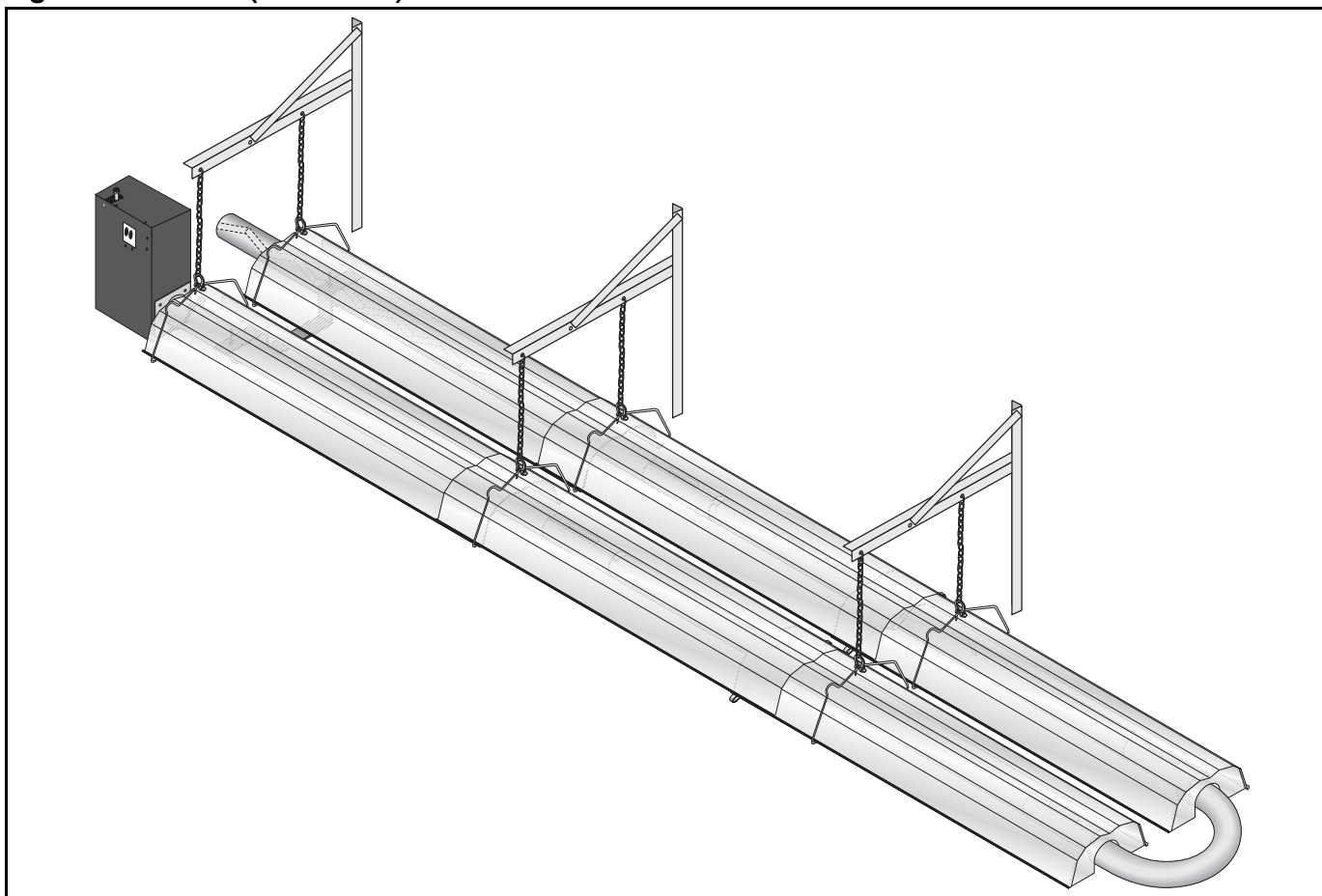


Figure 20: U-Tube (Angle Mounted)

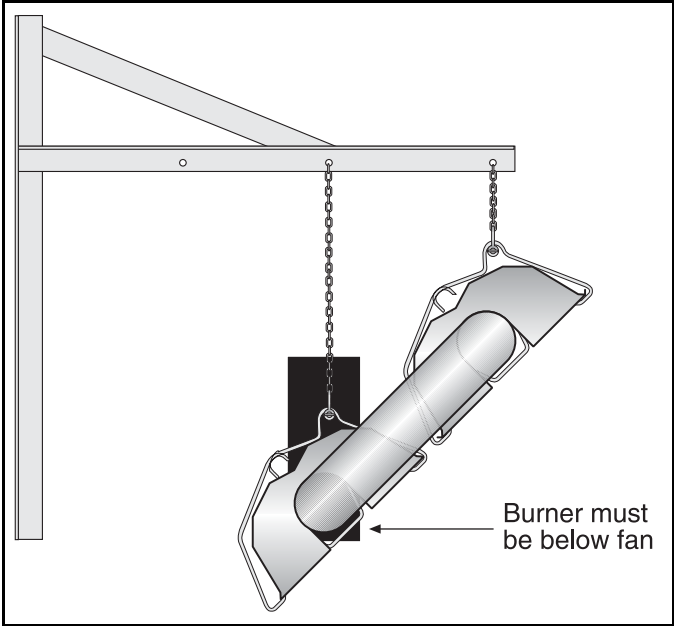
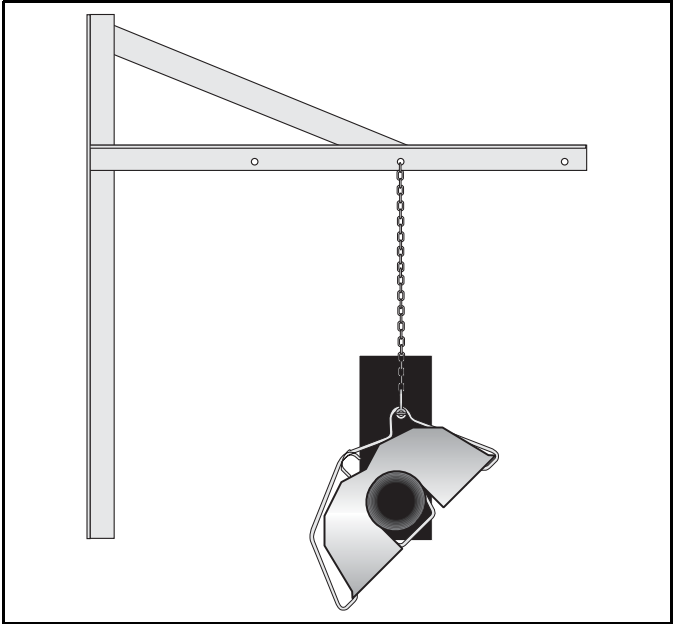


Figure 21: Linear



SECTION 9: FLUING

! WARNING**Carbon Monoxide Hazard**

Multiburner systems are not approved for flueless design use and must be vented outdoors.

Unitary heaters installed flueless design 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.

! WARNING**Cut/Pinch Hazard**

Wear protective gear during installation, operation and service.

Edges are sharp.

Failure to follow these instructions can result in injury.

9.1 General Venting Requirements

Flue materials are not included with the heater.

9.1.1 Type C₁₂ , C₃₂ & C₆₂ Appliance

Room Sealed

The heaters are designed to be installed as room sealed appliances. The flue and air intake are run as separate pipes to the special concentric wall or roof terminal. The dust arrest baffle plate on the heater must be removed prior to installation. See Page 33, Figure 25.

9.1.2 Type B₂₂ Appliance

The flue must be fitted with a low resistance terminal. See Page 33, Figure 25.

9.1.3 Flue Installation

The fan outlet may discharge vertically or horizontally. Connection should be made using 100 mm minimum diameter aluminium or stainless steel flue material to National Standard and must be adapted to insert into the 100 mm flue adapter. Both fresh air supply and flue duct shall not exceed 10,000 mm. VBH15 and VBH20 flue

must be insulated if longer than 5,000 mm. VBH25 flue must be insulated if longer than 8,000 mm. Contact the manufacturer if more than 2 x 45° offset bends are necessary. The flue must be self supporting.

Fans	Horizontal	Vertical
83 BWLG	190 x 75 (hole)	150 mm dia.
90 BWTL	190 x 75 (hole)	150 mm dia.

9.1.4 Flueless Installation

If the heater is being installed in an area where combustion products can be dissipated within the building, ensure that the fan outlet is horizontal and away from the burner. Where installation is close to a wall (perimeter system) or other obstruction close to the fan outlet or wall angle mounted, install the heater so that the fan tube is the furthest away from the wall or obstruction, i.e. the fan will always blow into the building or away from the obstruction.

9.2 Ventilation Requirements

Detailed recommendations for air supply are given in the relevant National Standards. There must be an adequate supply of air for both combustion and general ventilation. Air vents should have negligible resistance. Do not locate air vents where they can be easily blocked or flooded, or adjacent to any flues or extraction systems carrying flammable vapour.

9.2.1 Flue Installation

For design air changes less than 0.5/h following requirements apply.

Type B heaters

For natural ventilation low level openings must be provided of at least 2 cm²/kW input installed. For mechanical ventilation an air change rate of at least 0.5/h must be ensured.

Type C heaters

Room sealed heaters need no additional building ventilation.

9.2.2 Flueless Installation (EN 13410)

The installation room must have a volume of at least 10m³/kW of installed nominal heat input. A minimum of 10m³/h of exhaust air per kW of operating heat input must be ventilated out of the installation room by either thermal or mechanical evacuation. Appropriate exhaust and fresh air openings must be provided and exhaust fans interlocked with the operation of the heating equipment. Further no exhaust system is necessary if the building air change rate is greater than 1.5 per hour or the density of operating heat input is not greater than 5 W/m³.

Figure 22: Individual Flue Connection Detail

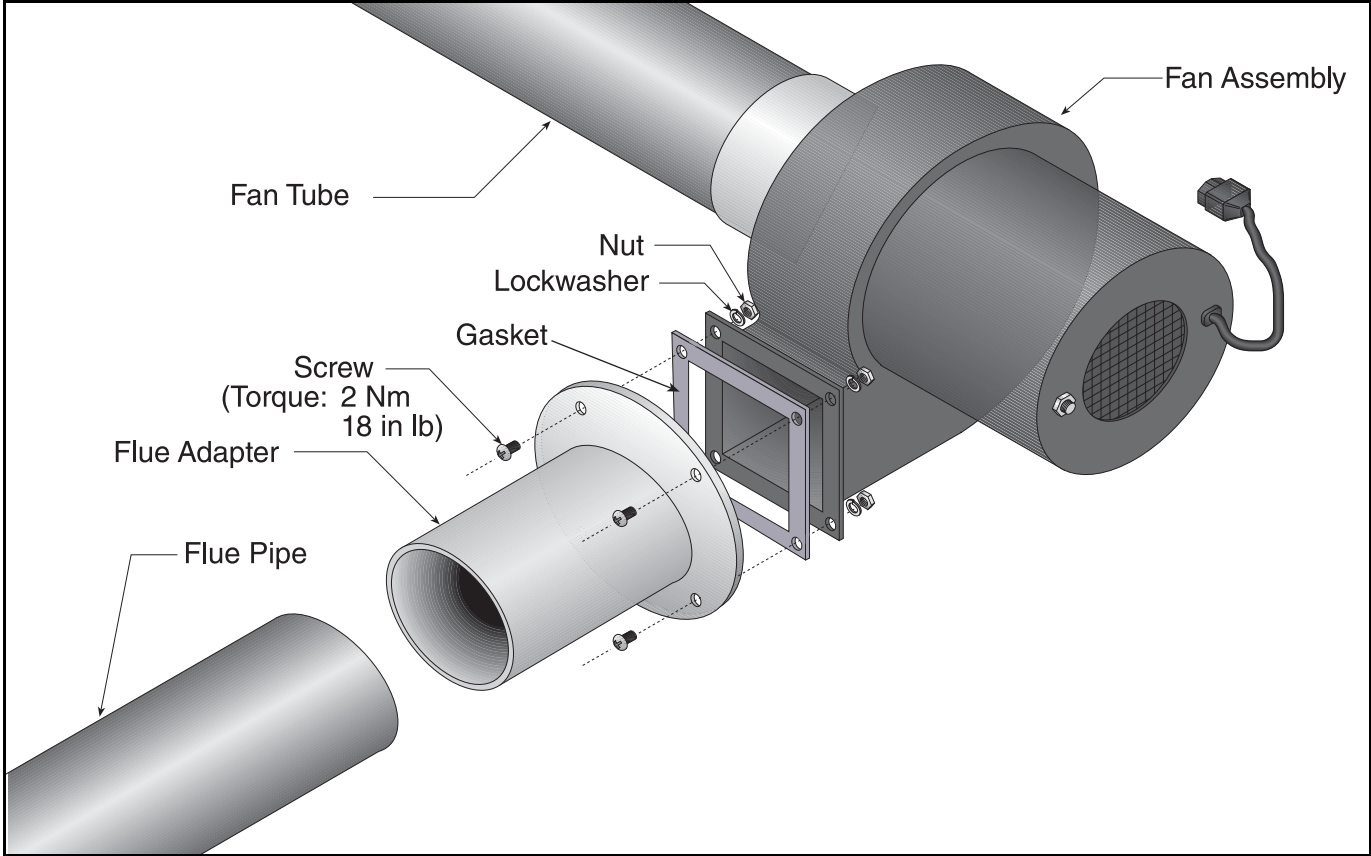
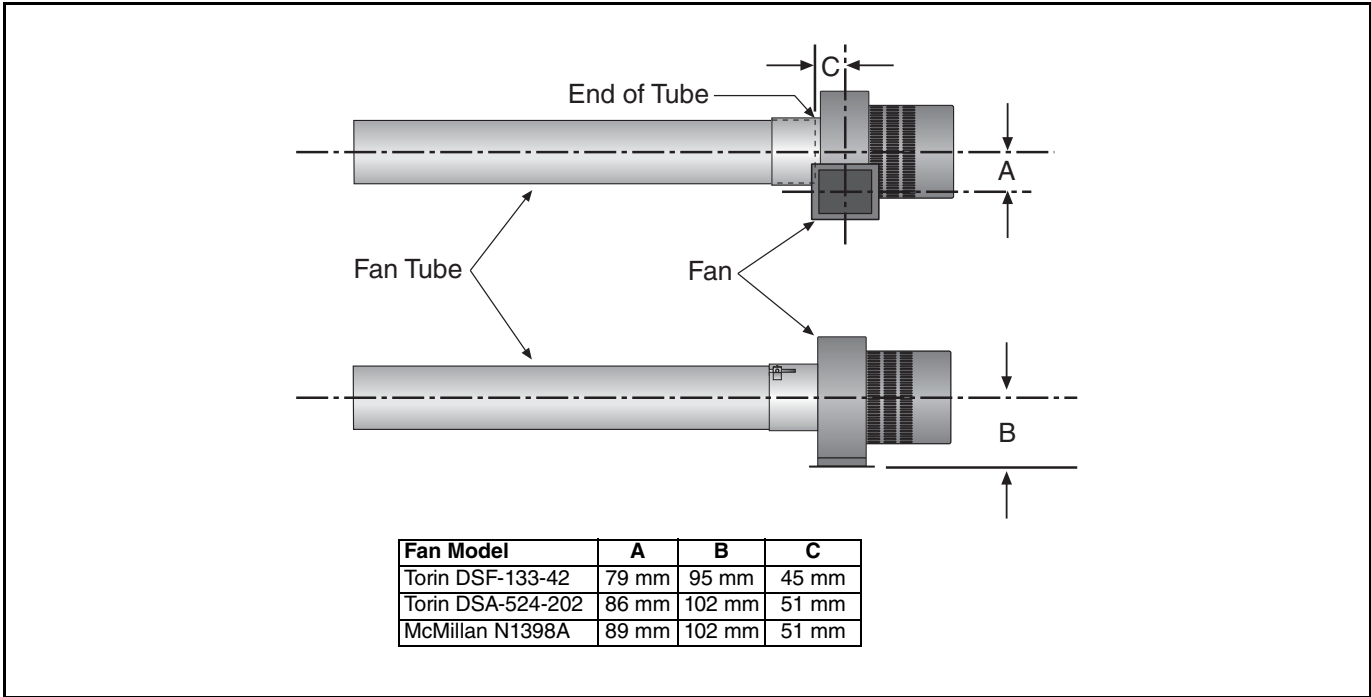


Figure 23: Flue Connection Dimensions



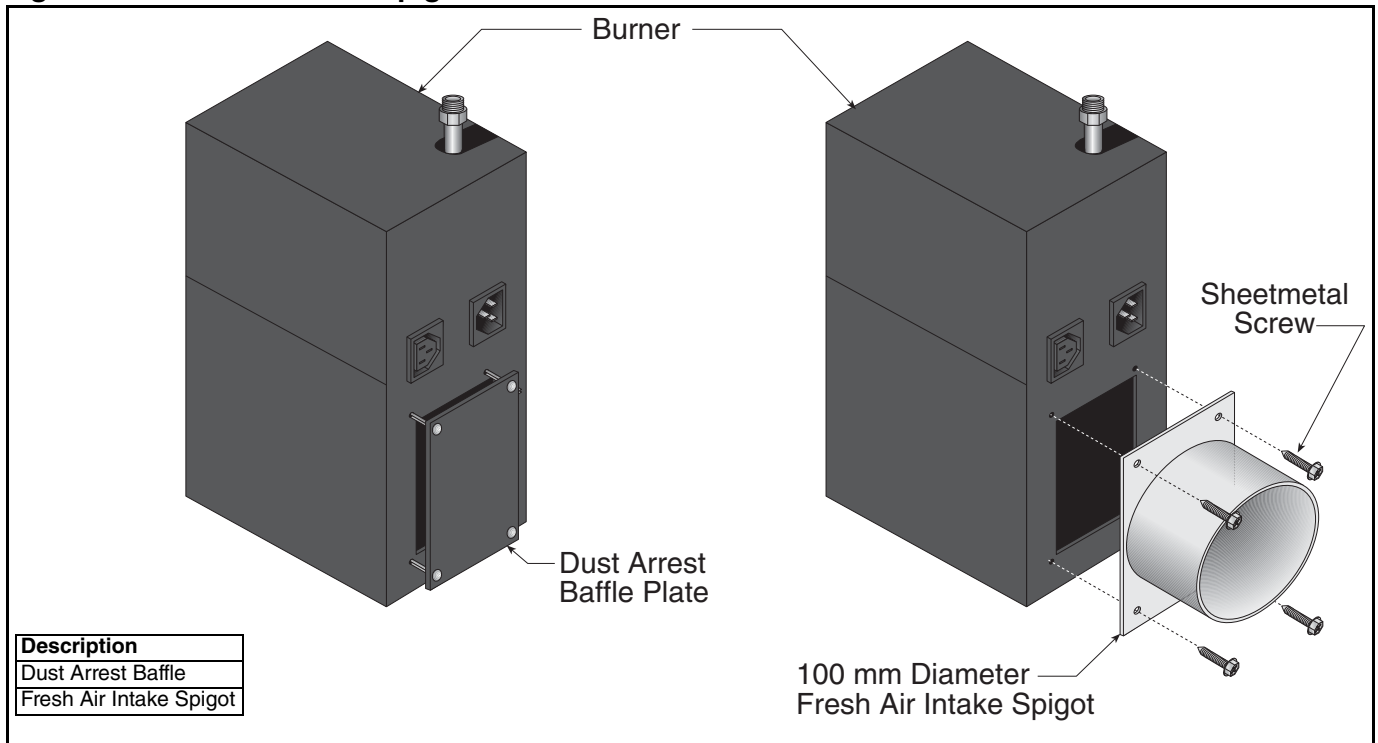
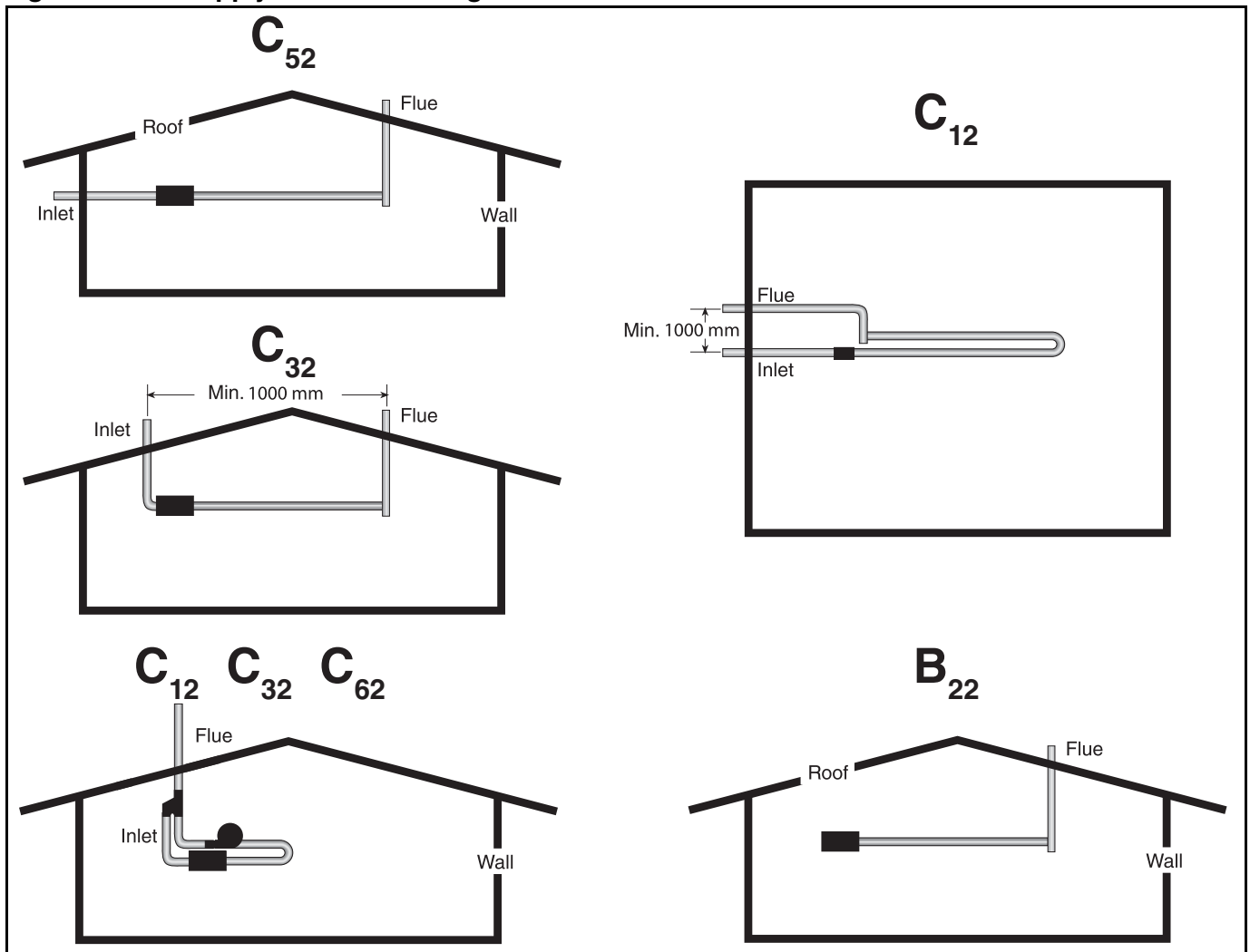
9.3 Outside Combustion Air Supply

Where necessary, clean air may be ducted into the burner box through an added spigot on the back of the burner box replacing the existing dust arrest baffle plate.

See Page 31, Section 9.1.3 for recommendations on duct length. Air duct should be as straight as possible. Do not use bends in excess of 45°. Consult the manufacturer if more than 2 x 45° offset bends are necessary. The fresh air duct must be self supporting.

9.3.1 Air Supply Requirements

- When fresh air duct is used, follow one of these rules:
- The flue must penetrate the roof while fresh air can penetrate any wall. (See Page 33, Figure 25)
 - The flue and fresh air supply must penetrate the same roof, at a minimum of 1 m apart. (See Page 33, Figure 25)
 - The flue must penetrate 1 m higher than the fresh air inlet on the same wall. (See Page 33, Figure 25)

Figure 24: Fresh Air Intake Spigot**Figure 25: Air Supply with Flue Configurations**

9.4 Common Duct

When using a common air inlet duct, always ensure that the area of the common air inlet duct represents the area of all air ducts.

SECTION 10: GAS PIPING**! WARNING****Fire Hazard**

Tighten gas line fittings to connect gas supply according to Figure 34.

Flex gas line can crack when twisted.

Gas line moves during normal operation.

Use only 1000 mm long connector of 1/2" or 3/4" nominal ID.

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

hose. This can cause a gas leak resulting in an unsafe condition if the gas connection is not made in strict accordance with *Figure 26*.

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 13 mm wc. When gas piping is not included in the layout drawing, the local gas supplier will usually help in planning the gas piping.

IMPORTANT - the complete installation must be tested for gas soundness and be purged in accordance with local and national codes.

- **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.**
- **An additional gas regulator will be required, at the gas input connection point for each burner when LP gas types are required to facilitate required burner pressure see Page 72 Ref 18.10.1**

! WARNING**Explosion Hazard**

Leak test all components of gas pipe work before operation.

Gas can leak if pipe work is not installed properly.

Do not high pressure test gas pipe work with heater connected.

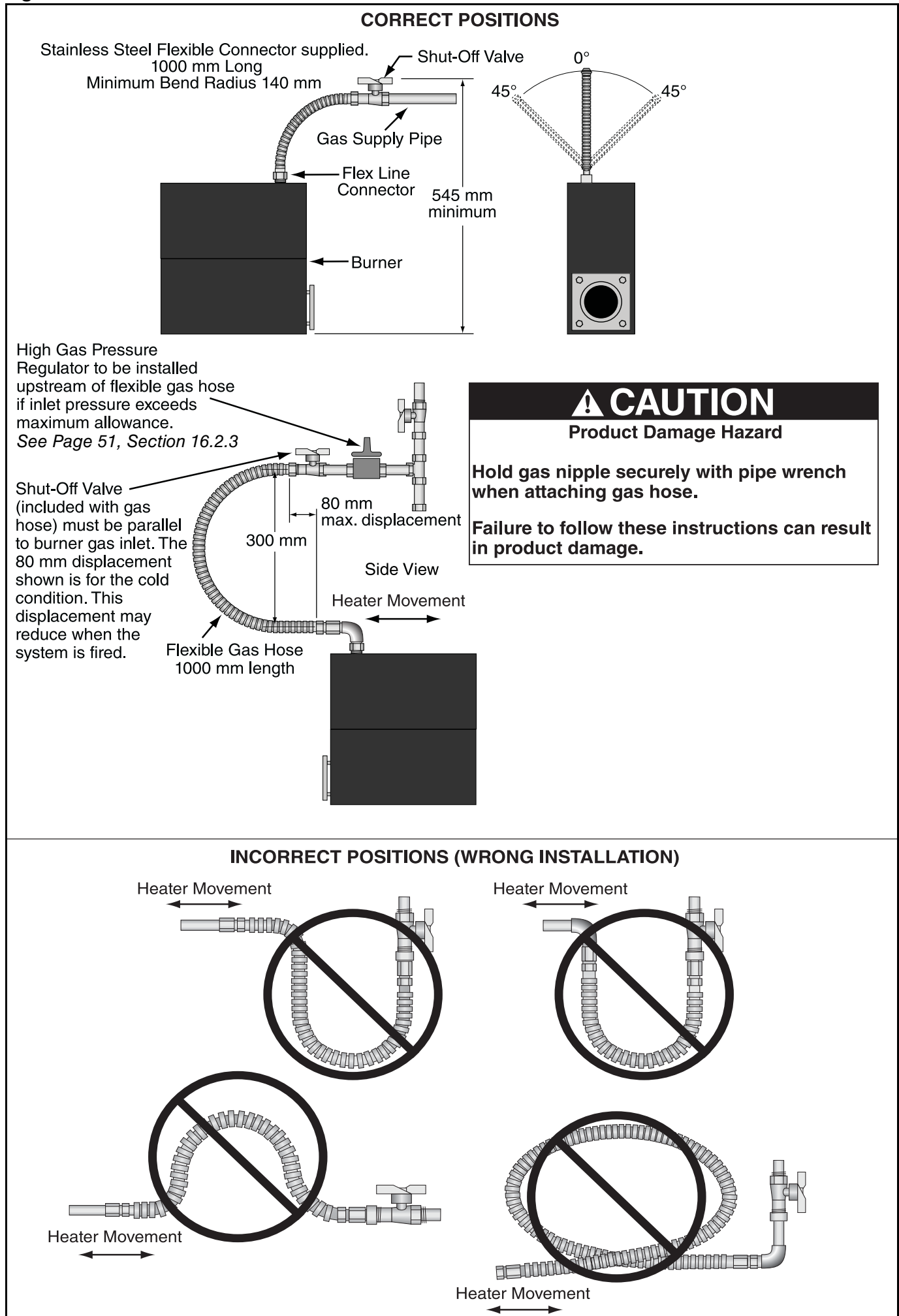
Failure to follow these instructions can result in death, injury or property damage.

It is important that the gas supply pipe and electrical connections do not support any of the heater's weight.

Installation pipes should be fitted in accordance with National Standards. Pipe work from the meter to the heater(s) must be of adequate size. Pipes of smaller size than the heater inlet gas connection should not be used.

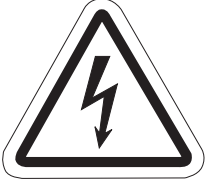
Install the gas hose as shown on *Page 35, Figure 26*. The gas hose accommodates expansion of the heating system and allows for easy installation and service of the burner. Before connecting the burners to the supply system, verify that all high pressure testing of the gas piping has been completed.

There is an expansion of the tube with each firing cycle. This will cause the burner to move with respect to the gas

Figure 26: Gas Connection with Stainless Steel Flex Connector

SECTION 11: WIRING

⚠ DANGER



Electrical Shock Hazard

Disconnect electric before service.

Heater must be properly earthed.

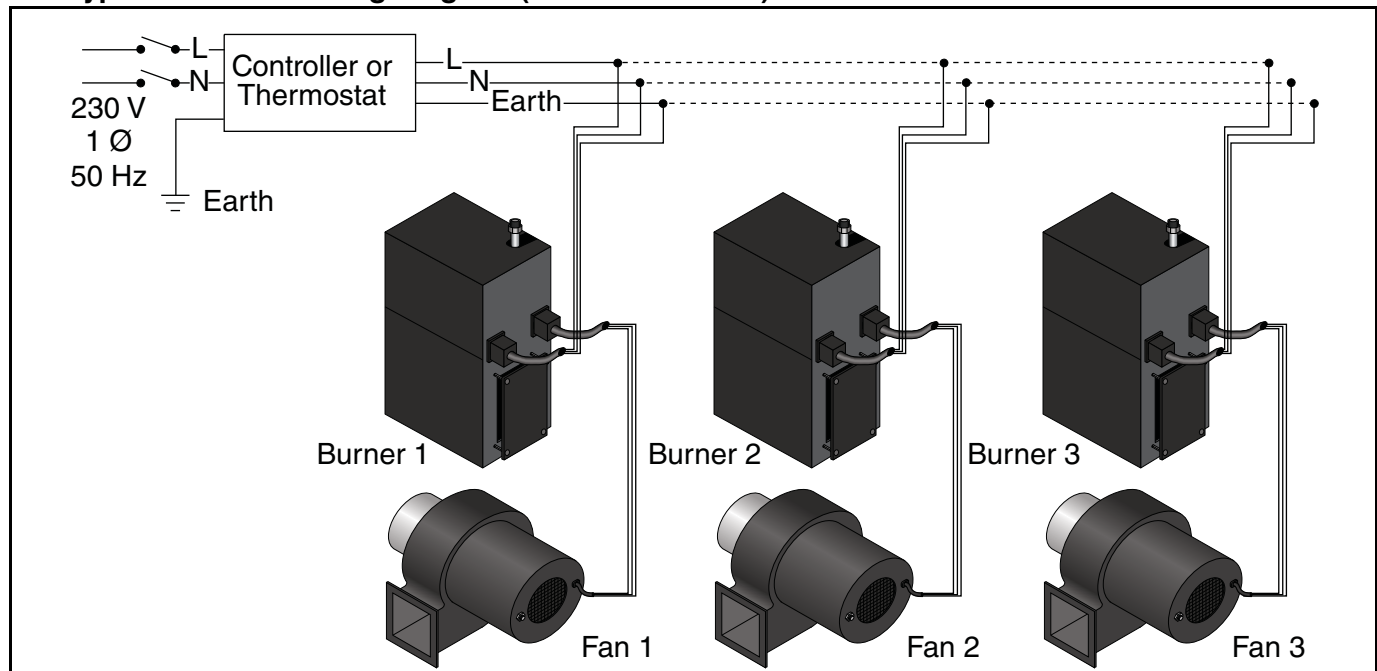
Failure to follow these instructions can result in death or electrical shock.

Connect to the electrical supply using a 3 pin plug via a locally mounted double pole fused switch having a minimum disconnection of 3 mm on each pole. This switch should be fused to 3 amps. The burner is fused at 2 amps. There are no control connections in the standard burner. Control is affected by interruption of the main power inlet. See Page 36, Section 11.1 through Page 37, Section 11.2 for the external wiring details for the single-burner, double linear and multiburner heater systems.

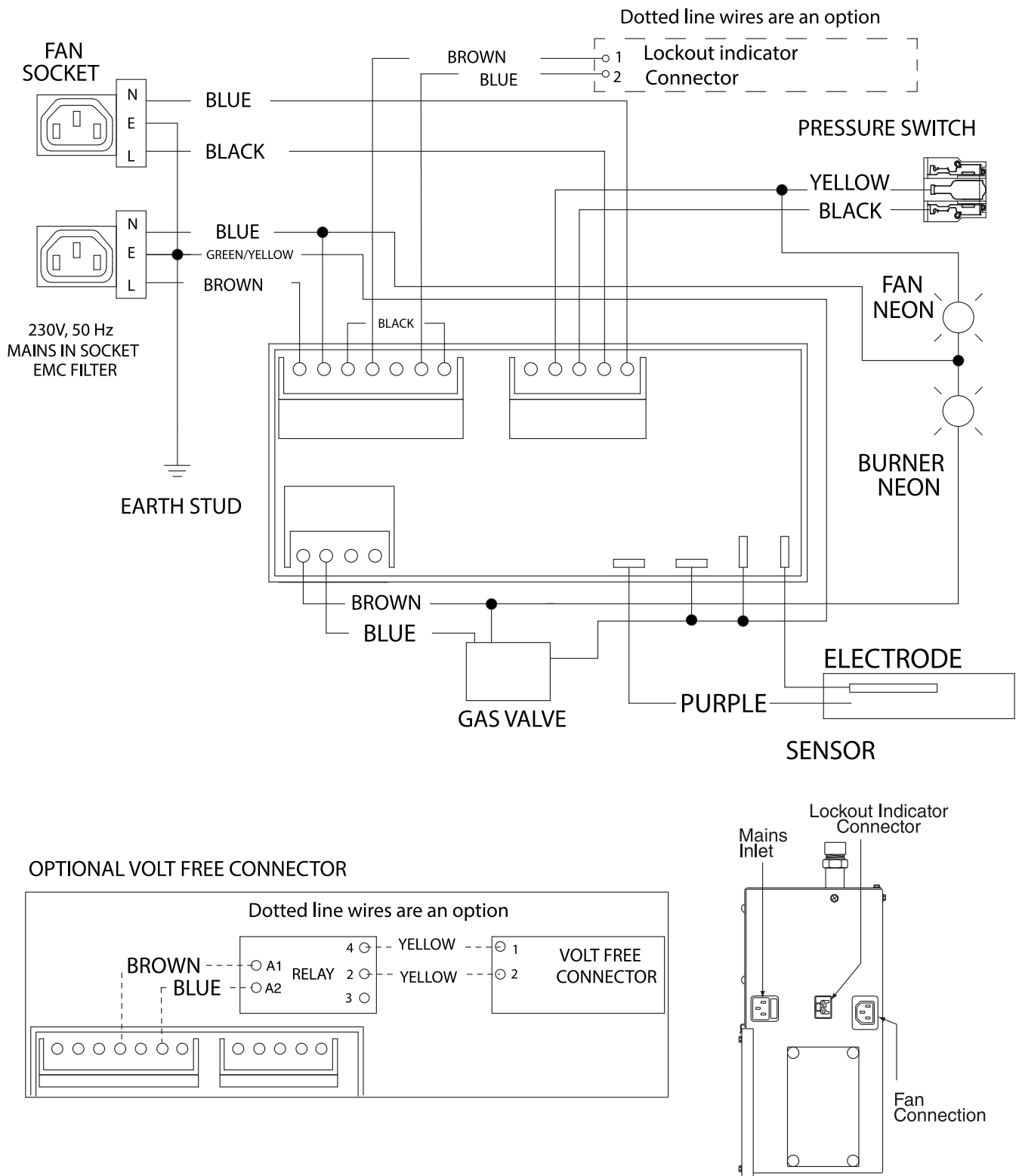
All wiring must comply with current wiring regulations and any local regulations which may apply. Always switch off the supply to the burner and disconnect by removing the plug before removing the burner side panel.

For lockout indication, establish connection inside burner with grey wire and ignition module connection (CON 5 Pin 4).

11.1 Typical External Wiring Diagram (Linear or U-Tube)

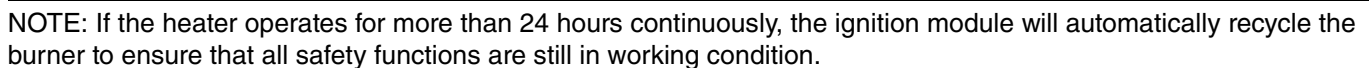


11.2 Internal Wiring Diagram



If any of the original wire as supplied with the heater must be replaced, it must be replaced with wiring material having a temperature rating of at least 105°C and 600 V.

Figure 27: Sequence of Operation Chart



12.1 Testing

Establish that a satisfactory purged gas supply and an electrical supply is available to the heater. Ensure that all time clocks and thermostats are set to call for heat.

With the gas supply cut off at the appliance isolating cock and the electrical supply isolated by switching off at the local switch and removing the appliance inlet plug, open the control chamber secured by the two screws. Loosen the sealing screw from the pressure test point and remove the cover cap from the governor.

Turn on the gas supply and connect appliance electrical plug. Ensure that the timer or thermostat, if fitted, are set to call for full gas rate. Switch on at the local switch. The sequence as described should take place. If not, refer to detailed fault finding sequence. When flame is established, check the gas pressure reading and adjust if necessary. Refer to burner data label.

Check the gas pressure at the outlet of the gas valve. See *Page 53, Section 16.8.1* for pressure settings or refer to the data plate.

Switch off the electrical supply (shutting down the heater), remove pressure gauge - tighten pressure test point screw, ensuring a tight gas seal. Replace governor cover cap. Close burner side cover.

12.2 System Checks

Switch on again at the local switch to ensure smooth ignition. Carry out the following system checks:

When running, turn off the gas supply at the appliance. The heater will immediately shut down followed by three ignition attempts followed by lockout.

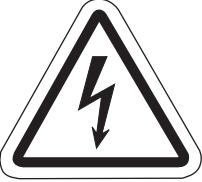



Linear and Double Linear only:

When running, disconnect the fan plug from the burner. The unit should shut down within three seconds, proving operation of the pressure switch.

12.3 User Instructions

After satisfactory testing, ensure that the client is fully aware of the operation of the system. Bring this manual to the attention of the user or purchaser; instruct them in the safe operation of the heater(s). Advise the user that if the system is unflued, any reduction in the natural ventilation of the building may require a flue to be fitted, or additional ventilation grilles will be required.

SECTION 13: SERVICING INSTRUCTIONS

⚠ DANGER		⚠ WARNING	
			
Electrical Shock Hazard Disconnect electric before service. More than one disconnect switch may be required to disconnect electric from heater. Heater must be connected to a properly earthed electrical source.	Explosion Hazard Turn off gas supply to heater before service.	Burn Hazard Allow heater to cool before service. Tubing may still be hot after operation.	Cut/Pinch Hazard Wear protective gear during installation, operation and service. Edges are sharp.
Failure to follow these instructions can result in death, electric shock, injury or property damage.			

IMPORTANT: Never use the heater as a support for ladders or other access equipment. Always test for gas soundness with a suitable detection fluid after completing any servicing or exchange of gas carrying component. On completion of any service/fault finding tasks which require the breaking and remaking of electrical connections, the checks:- A:Earth Continuity, B:Polarity and C:Resistance to Earth must then be repeated.

13.1 Annual Procedure

Carry out the following procedure annually. The preferred time would be immediately before the winter heating period. If very dirty conditions arise, it may be necessary to carry out this procedure more often. If the unit takes in air through an air duct or filter assembly, more frequent service may be necessary.

13.1.1 Burner and Fan Removal

Isolate the heater from the gas and electrical supplies. Remove the fan plug from the burner. Unscrew the securing screws on the burner flange. The burner can now be removed. Take care not to disturb the gasket on the flanged burner tube. Unscrew the securing screw on the fan flange spigot. The fan can now be removed.

13.1.2 Burner and Fan Removal Maintenance

Remove the fan and burner independently to floor level and clean both items internally using a soft brush and compressed air, if available. Take care not to damage the internal parts of the burner. Check fan impeller for cleanliness and free rotation.

The electrodes are an integral part of the burner. To check spark gap, remove the securing screws on the electrode and withdraw it ensuring the gasket is not damaged. Spark gap on electrode should be approximately 3 mm.

13.1.3 Tube and Reflector Maintenance

With burner and fan removed, clean the outer surfaces of the tubes using a brush and wipe the inner surface of the reflector with a soft damp cloth - use a household detergent if necessary. Never use abrasive cleaners on the reflectors. Reassemble the burner and fan in reverse

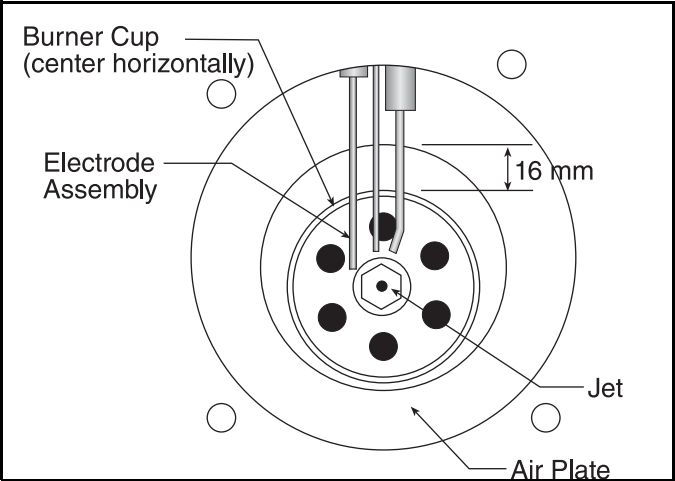
order. Carry out the Testing Procedure. See Page 39, Section 12.1.

13.2 Component Removal

First, isolate the heater from the gas and electrical supplies. Entry to the burner assembly is gained by removing the door screws and opening the hinged side cover. Entry to the combustion chamber is gained by removing the combustion chamber cover.

13.2.1 Electrode

Figure 28: Burner Cup Position



13.2.2 Burner Head/Injector Jet

When the cover is removed completely, the burner assembly is exposed. Unscrew the burner cup. Remove brass injector jet (orifice). Replace in reverse sequence.

13.2.3 Solenoid Valve/Governor

Remove burner head. Remove screws securing the solenoid/governor body bracket. Disconnect the control wiring to the valve solenoids, along with the earth wire to the valve body. The solenoid/governor and fittings can now be withdrawn from the compartment. The new valve and reassemble in reverse order back into burner compartment. Replace in reverse sequence. Note: Earth is green/yellow.

13.2.4 Automatic Flame Control Unit

Remove black ignition lead. Withdraw the connectors.
Remove two screws from the cover. Replace if faulty.
Refit in reverse sequence.

13.2.5 Pressure Switch

Disconnect the two silicone tubes. Remove wires from the two blades. Remove two screws which secure the pressure switch to the burner. Remove pressure switch. Replace pressure switch, if faulty, and refit in reverse sequence ensuring that the rubber tubes are reconnected to the switch correctly.

Note: Wires fitted as follows:

- NO - Yellow
- Common - Black

13.2.6 Neons

Remove the two push on connectors and remove the neons by pushing downwards. Replace in reverse sequence.

13.3 Maintenance Checklist


Installation Code and Annual Inspections:

The Vicinity of the Heater	<p>Do not store or use flammable objects, liquids or vapours near the heater. Immediately remove these items if they are present.</p> <p><i>See Page 3, Section 3.</i></p>
Vehicles and Other Objects	<p>Maintain the clearances to combustibles.</p> <p>Do not hang anything from, or place anything on, the heater.</p> <p>Make sure nothing is lodged underneath the reflector, in between the tubes or in the decorative or protective grilles (included with select models).</p> <p>Immediately remove objects in violation of the clearances to combustibles.</p> <p><i>See Page 3, Section 3.</i></p>
Reflector	<p>Support reflector with hanger and support strap.</p> <p>Reflector must not touch tube.</p> <p>Make sure there is no dirt, sagging, cracking or distortion.</p> <p>Do not operate if there is sagging, cracking or distortion.</p> <p>Make sure reflectors are correctly overlapped. <i>See Page 18, Section 6.5.1. or Page 26, Section 6.12.1.</i></p> <p>Clean outside surface with a damp cloth.</p>
Flue	<p>Flue must be intact. Using a flashlight, look for obstructions, cracks on the pipe, gaps in the sealed areas or corrosion.</p> <p>The area must be free of dirt and dust.</p> <p>Remove any carbon deposits or scale using a wire brush.</p>
Outside Air Inlet	<p>Inlet must be intact. Look for obstructions, cracks on the pipe, gaps in the sealed areas or corrosion.</p> <p>The area must be free of dirt and dust. Clean and reinstall as required.</p>

Tubes	Make sure there are no cracks. Make sure tubes are connected and suspended securely. <i>See Page 9, Section 5.</i> Make sure there is no sagging, bending or distortion.
Gas Line	Check for gas leaks. <i>See Page 34, Section 10.</i>
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 3 mm.
Thermostat	There should be no exposed wire or damage to the thermostat. <i>See Page 36, Section 11.</i>
Suspension Points	Make sure the heater is hanging securely. Look for signs of wear on the chain or ceiling. <i>See Page 9, Section 5.</i>

SECTION 14: TROUBLESHOOTING

⚠️ 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.


⚠️ 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.



Explosion Hazard


Turn off gas supply to heater before service.



Burn Hazard

Allow heater to cool before service.

Tubing may still be hot after operation.



Cut/Pinch Hazard

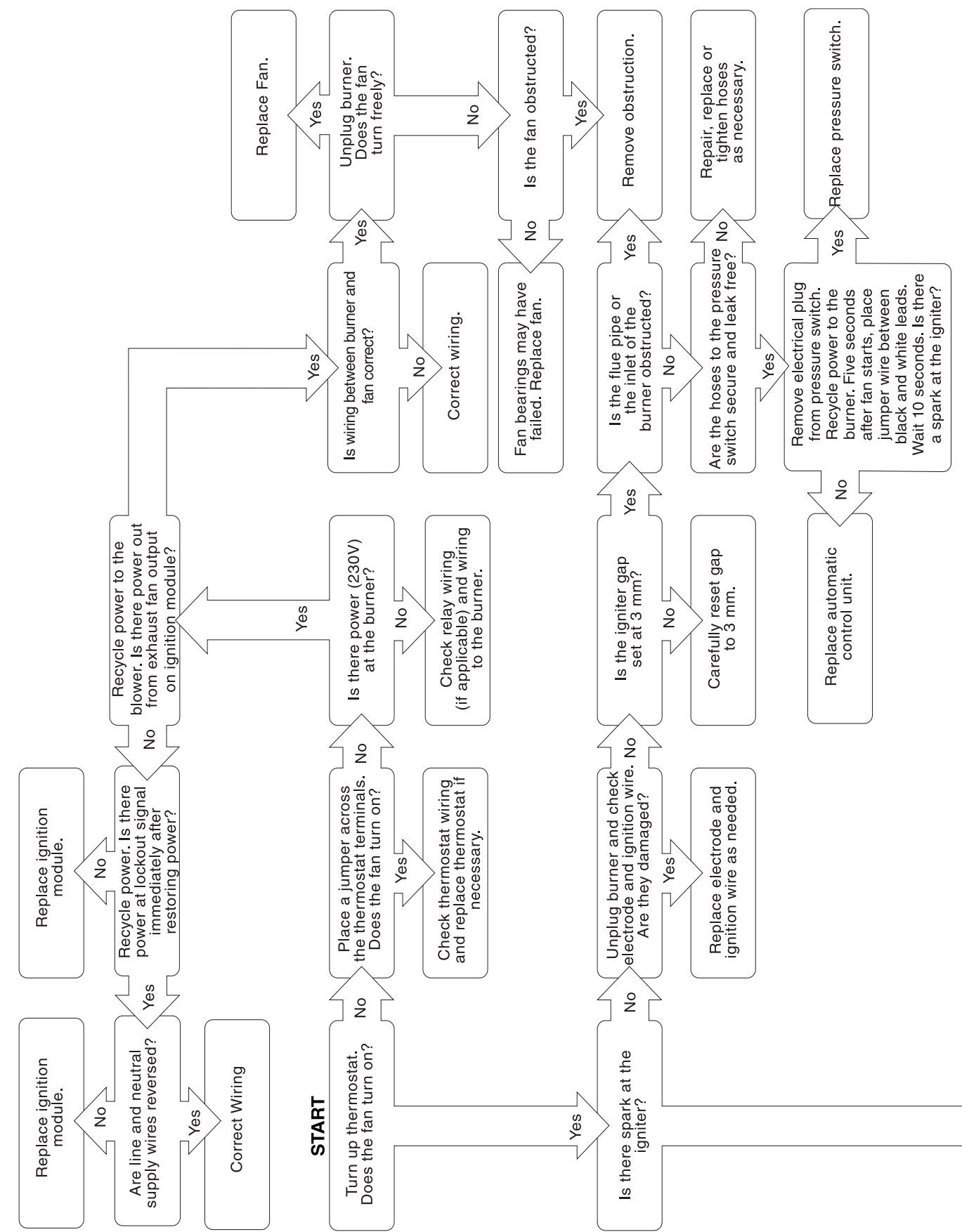
Wear protective gear during installation, operation and service.

Edges are sharp.

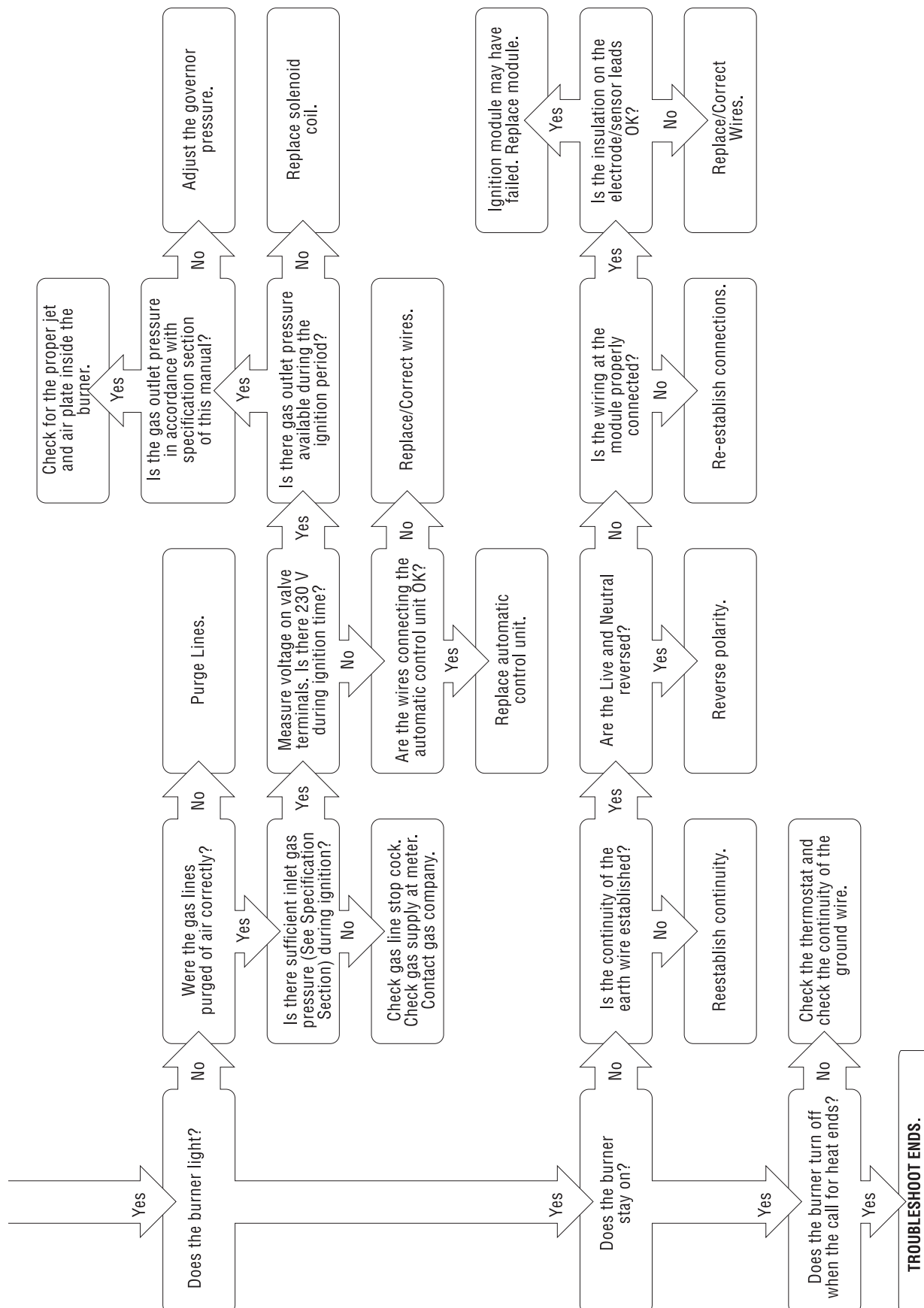
Failure to follow these instructions can result in death, injury or property damage.

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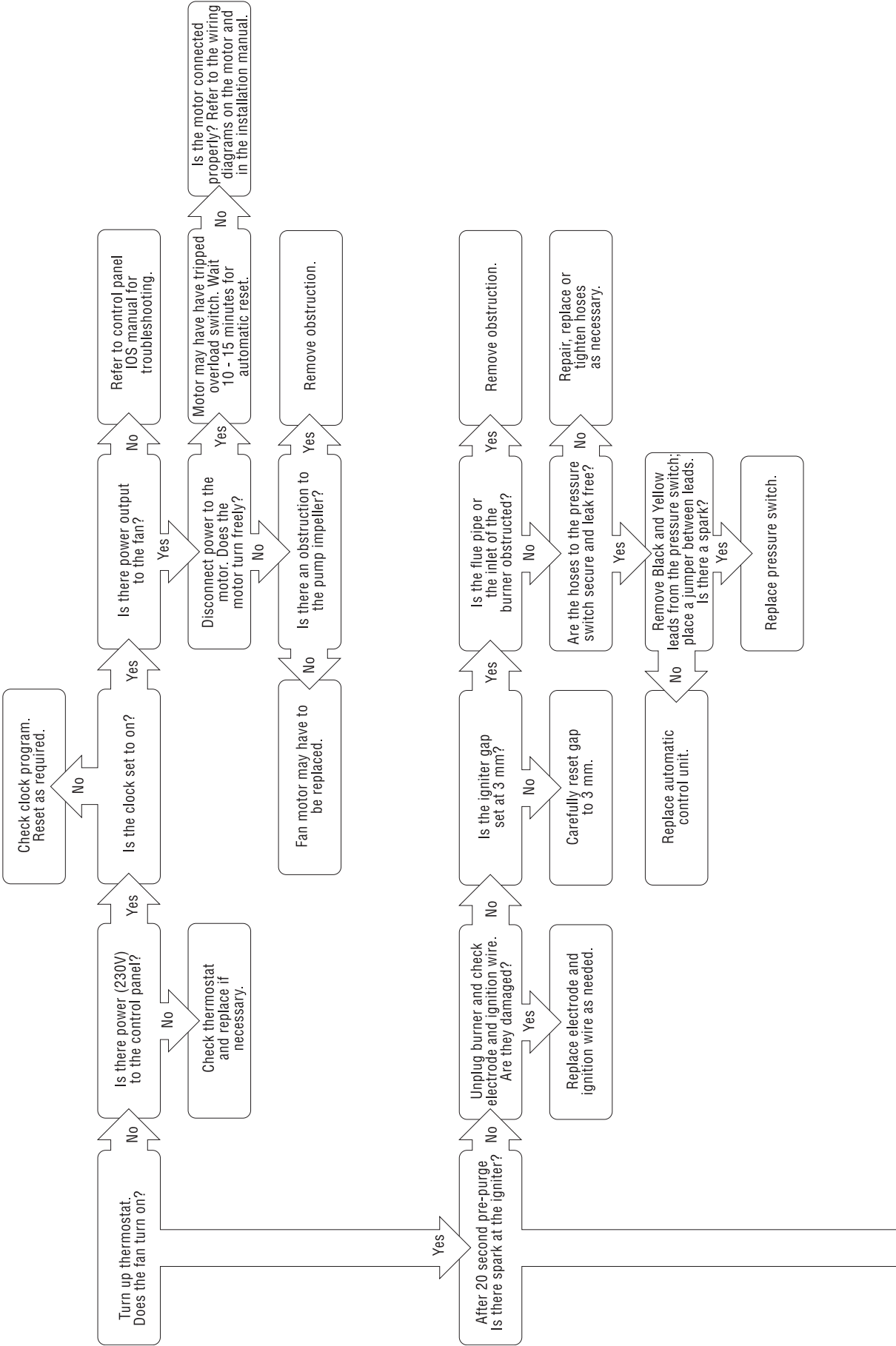
14.1 Troubleshooting Flow Chart (Linear, Double Linear and U-Tube)



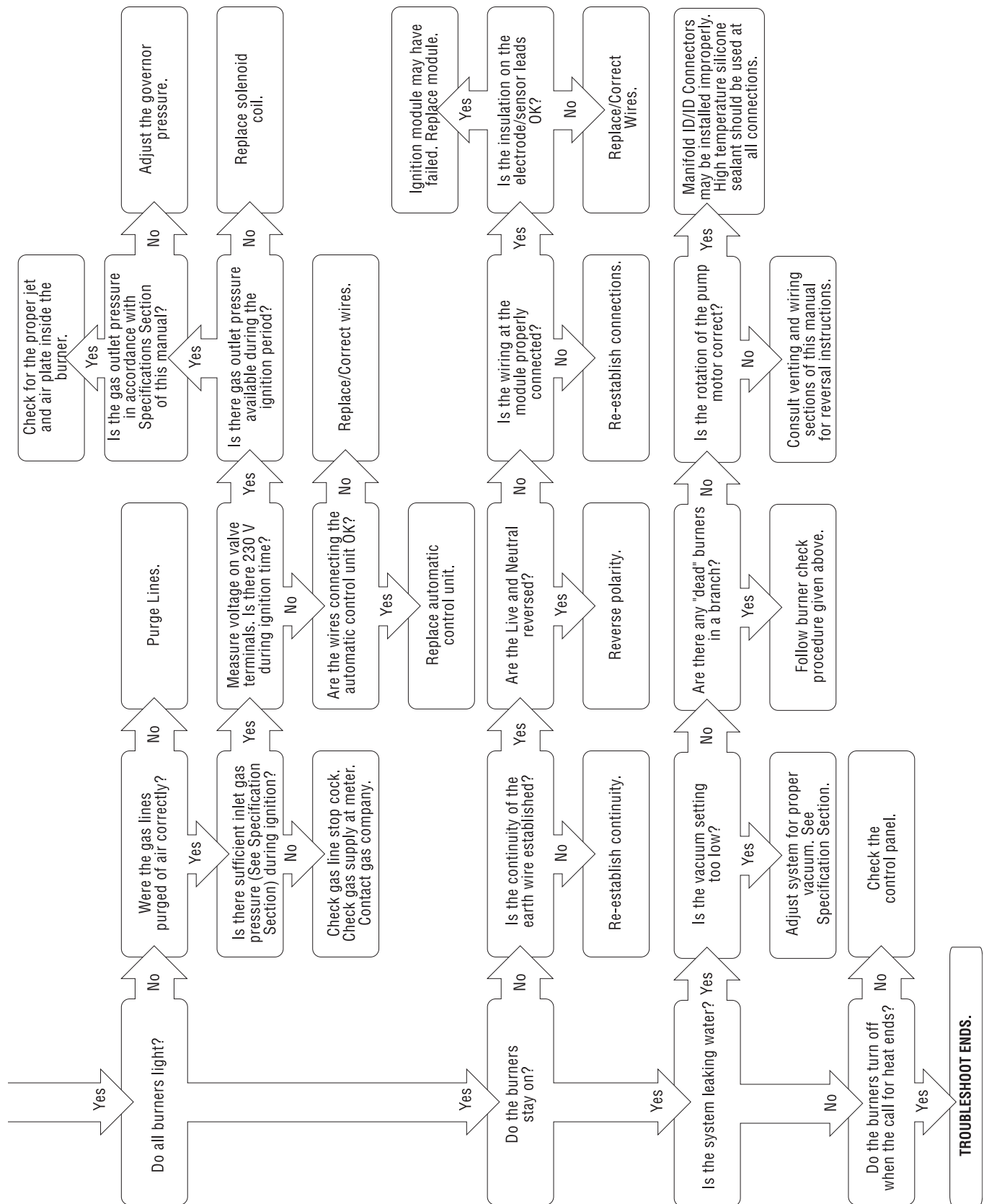
Troubleshooting Flow Chart (Linear, Double Linear and U-Tube)



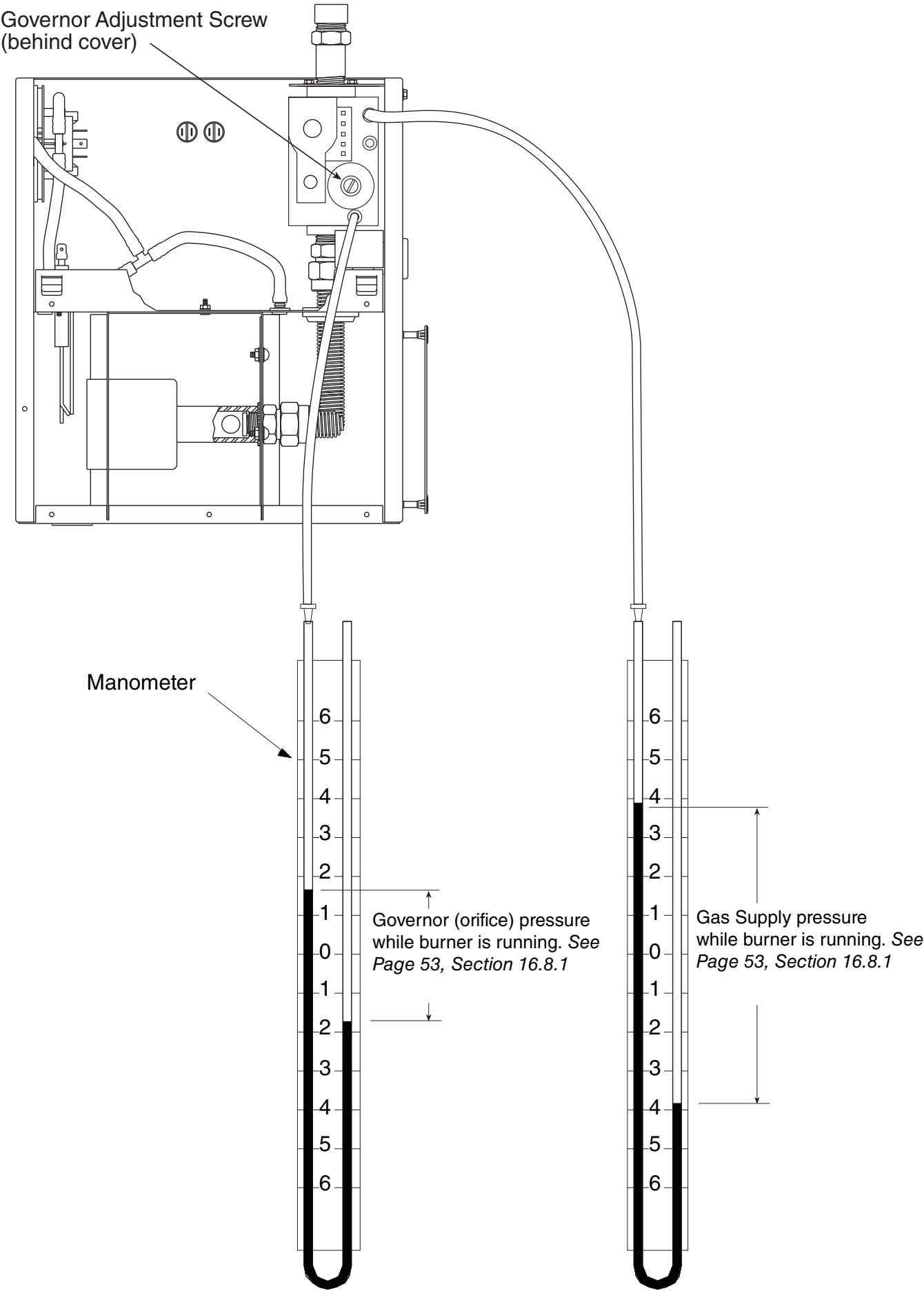
14.2 Troubleshooting Flow Chart (Multiburner)



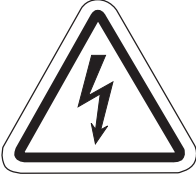



Troubleshooting Flow Chart (Multiburner)



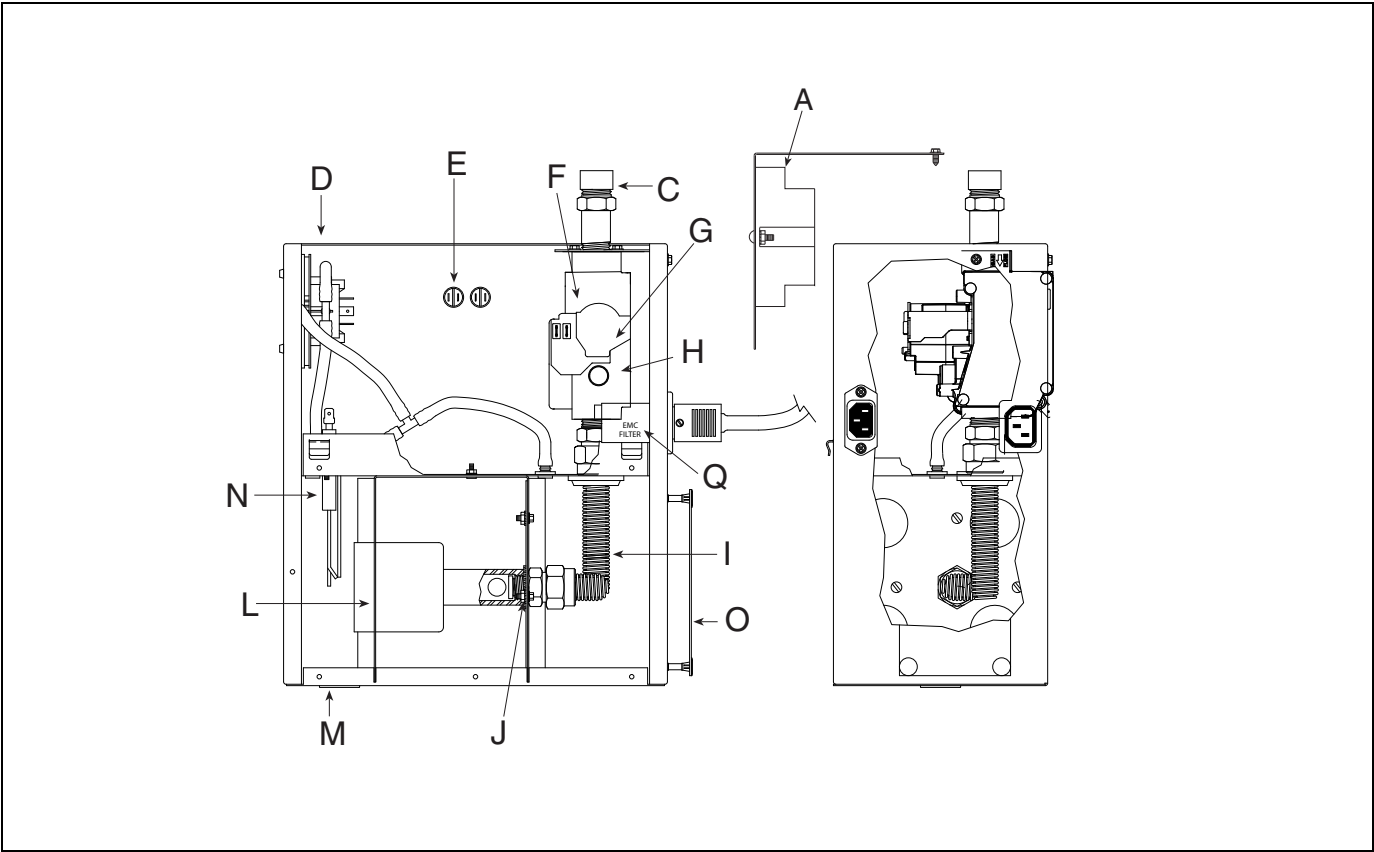
14.3 Manifold Gas Pressure Setting



SECTION 15: REPLACEMENT PARTS

⚠ DANGER		⚠ WARNING	
			
Electrical Shock Hazard	Explosion Hazard	Fire Hazard	Carbon Monoxide Hazard
Use only genuine VAL-CO 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 start-up instructions on *Page 38, Section 12* 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 on *Page 43, Section 14 through Page 48, Section 14.3*.



Item	Description	Part Number
A	Automatic Control Unit	474848
C	Flex Line Adapter	474894
D	Pressure Switch for VBH25, 30, 35, 40 (G31)	90439801
	VBH30 and VBH35 (G20)	90439803
	VBH45 (G20)	90439804
	VBH40 (G20)	90439808
	VBH25 (G20)	90439809
E	Amber Neon Lamp	474895
F	Gas Valve	474896
G	Governor Screw	N/A
H	Outlet Pressure Tap	N/A
I	Flex Manifold	474897
J	Star Washer	474898
L	Burner Cup Assembly	03020100
M	Mica Window Assembly	474899
N	Electrode Assembly	90427403
N/S	Electrode Gasket	02558501

Notes:

Item	Description	Part Number
O	Dust Arrest Baffle Plate	474900
Q	Mains in socket with EMC Filter	474901
N/S	Ignition Wire	474902
N/S	Outside Air Kit	474903
N/S	Flue Collar 100 mm	91911700
N/S	Outside Air Mounting Plate	474904
N/S	#8 x 3/8 Washer Head Screw	474905
N/S	Burner Tube Gasket	02568200

SECTION 16: SPECIFICATIONS

16.1 Material Specifications

16.1.1 Combustion and Tubes

100 mm dia. 16 gauge heat treated aluminised mild steel.

16.1.2 Reflectors

NS3 H14 aluminium

16.2 Heater Specifications

16.2.1 Sequence Controller

Fully automatic, three try, direct spark, 100% shut off ignition flame rectification module.

16.2.2 Electrical

Rating: 230V, 50 Hz, 1 Ø, 1 A

Connection: 3 pin moulded plug

16.2.3 Gas Supply

Connection: Rc1/2 (1/2" BSP int)

Natural G20:

Minimum - Inlet 15 mbar (6 in wg)

Maximum - Inlet 50 mbar (20 in wg)

Natural G25:

Minimum - Inlet 17.5 mbar (7 in wg)

Maximum - Inlet 50 mbar (20 in wg)

LP Gas (Propane or Butane):

Minimum - Inlet 32.5 mbar (13 in wg)

Maximum - Inlet 50 mbar (20 in wg)

An additional gas regulator will be required, at the gas input connection point for each burner when LP gas types are required to facilitate required burner pressure

Consult the manufacturer for availability of alternate fans.

16.2.4 Flue

When fitted, the flue must be 100 mm, or greater in diameter, and must conform to National Codes. The flue must be self supporting. Inlet must be 100 mm diameter.

Multiburner: Flue will be 100mm or 150mm diameter and sized to suit the arrangement. Connection to the fan inlet cone would be 150mm diameter only. Refer to Figure 26 for a typical arrangement. Flue material must conform to National Codes. The flue must be self supporting.

16.3 Suspension Specifications

Hang heater with materials with a minimum working load of 33 kg.

16.4 Controls Specifications

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

16.5 Environment

The heater is limited to operate in an ambient temperature range of 0° C – 32° C (32° F – 86° F) with a maximum relative humidity of 95%.

16.6 Linear Heater

	VBH25ST	VBH30ST	VBH35ST	VBH40ST
Input - Gross (kW)	25	30	35	40
Input - Net (kW)	22.5	27	31.5	36
Tube Length (mm)	9144	12192	12192	12192
Overall Heater Length (mm)	9709	12757	12767	12767
Weight (kg)	57	75	75	75
Heated Area (m ²)	40-265	50-315	55-370	65-420
Minimum Installation Height(mm)	3500	3500	4600	5000
Recommended Installation Height (mm)	3900	4200	4800	5500

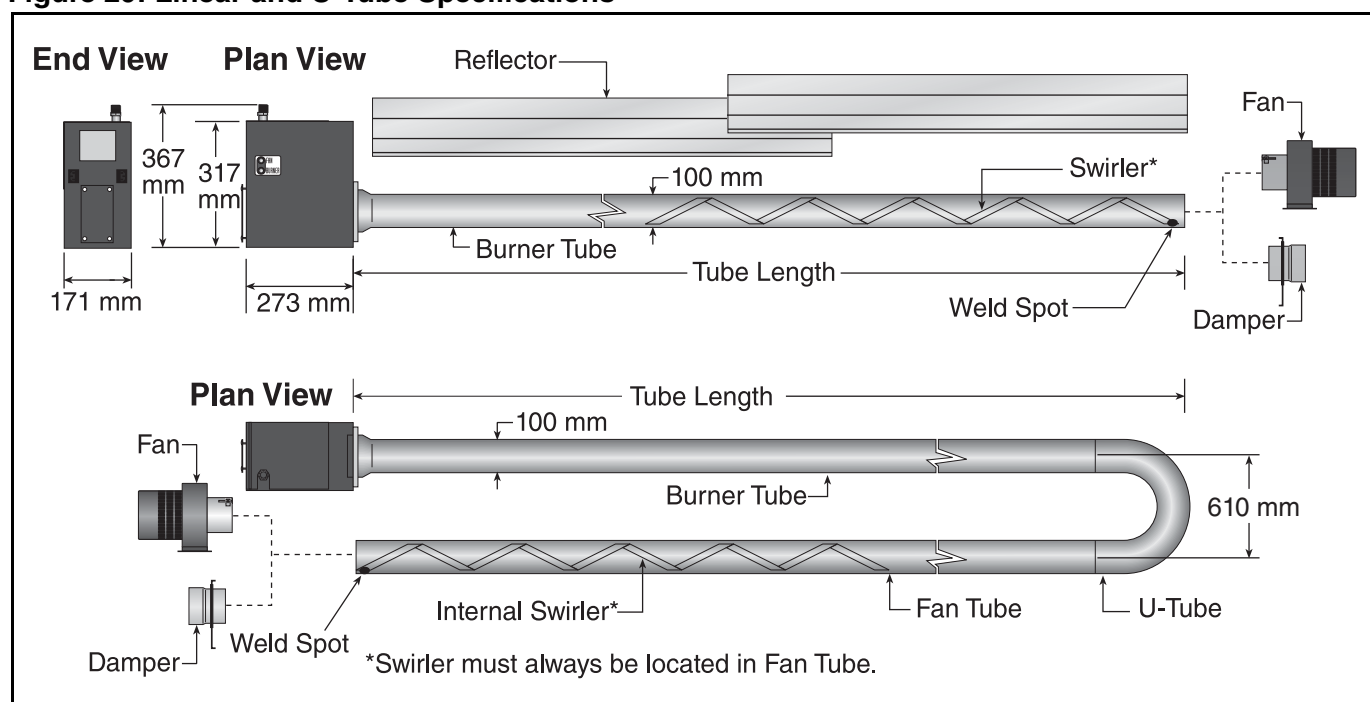
* Only available in Multiburner.

16.7 U-Tube Heater

	VBH25UT	VBH30UT	VBH35UT	VBH40UT
Input - Gross (kW)	25	30	35	40
Input - Net (kW)	22.5	27	31.5	36
Tube Length (mm)	5055	6579	6579	6579
Overall Heater Length (mm)	5346	6870	6870	6870
Weight (kg)	65	81	81	81
Heated Area (m ²)	40-265	50-315	55-370	65-420
Minimum Installation Height (mm)	4000	4700	5000	5000
Recommended Installation Height (mm)	4000	4700	5000	5500

16.8 Burner Specifications

Figure 29: Linear and U-Tube Specifications



16.8.1 Standard Burner Specifications

	VBH25	VBH30	VBH35	VBH40
Burner Airplate ID Number- Natural G20&25	14	5	6	5
Burner Airplate ID Number- Propane/Butane	12	6	7	9
Jet Numbers - Natural G20 & 25	#20	#16	#9	#5
Jet Numbers - Propane/Butane	#37	#33	3.1 mm	3.3 mm
Jet Numbers - Pressure Couple	2.5 mm	2.7 mm	2.9 mm	3.2 mm
Gas Consumption** Natural G20 (m³/h)	2.38	2.86	3.36	3.81
Gas Consumption** Natural G25 (m³/h)	2.77	3.32	3.91	4.43
Gas Consumption** Propane (m³/h) [kg/h]	0.94 [1.80]	1.13 [2.16]	1.32 [2.52]	1.51 [2.88]
Gas Consumption** Butane (m³/h)	0.72	0.86	1.00	1.15
Governor Pressure Butane (mbar)	19.2	17.4	18.2	17.9
Governor Pressure Butane (in wg)	7.7	7.0	7.3	7.2
Governor Pressure Propane (mbar)	26.1	27.4	26.1	28.6
Governor Pressure Propane (in wg)	10.5	11.0	10.5	11.5

*Only available in Multiburner. **Based on Gross Caloric Value.

Natural G20: 8.7 mbar 3.5 in wg
 Natural G25: 11.1 mbar 4.5 in wg