

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. Leave the building.
6. Immediately call your local gas supplier after leaving the building. Follow the gas supplier's instructions.
7. If you cannot reach your gas supplier, call the Fire Department.

⚠ WARNING



Fire Hazard

Do not store or use gasoline or other flammable vapors and liquids in the vicinity of this or any other appliance.

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



HEATRITE™ VTF

Installation, Operation & Service Manual

VTF-160

VTF-200

VTF-250

⚠ 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 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 to provide your serviceman with information should it become necessary.



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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.

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.

►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 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 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 not use heater as support (i.e. ladder) or hanging device.

► SECTION 3: CRITICAL CONSIDERATIONS

3.1 Minimum 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, which may catch on fire and include common items such as wood, paper, rubber, fabric, etc. **Maintain clearances to combustibles at all times for your safety.**

Clearances for all heater models are located on the burner of the heater and on *Page 3, Section 3, Figures 1-4* 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 gasoline or other combustible materials including flammable objects, liquids, dust or vapors away from this heater or any other appliance.
- Maintain clearances from heat sensitive material, equipment and workstations.
- Maintain clearances from vehicles parked below the heater.
- Maintain clearances from swinging doors, overhead cranes, vehicle lifts, partitions, storage racks, hoists, 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 on *Page 9, Section 7, Step 7.1*.
- 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.

⚠ WARNING



Fire Hazard

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

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

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

- NOTE:** 1. All dimensions are from the surfaces of all tubes, combustion chambers, couplings, tees, elbows and crosses.
2. Clearances B, C and D can be reduced by 50% after 25' (7.5 m) of tubing downstream from the burner.
3. "-" indicates an unapproved application. Val Co. does not allow the installation of unapproved applications.

STANDARD REFLECTOR

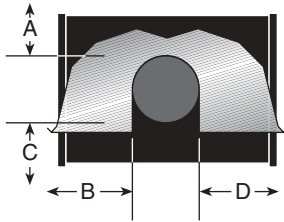


FIGURE 1

	(inches)			
Model	A	B	C	D
VTF-160	6	38	66	38
VTF-200	6	40	71	40
VTF-250	6	46	77	46

	(centimeters)			
Model	A	B	C	D
VTF-160	15	95	165	95
VTF-200	15	100	178	100
VTF-250	15	115	193	115

45° TILT REFLECTOR

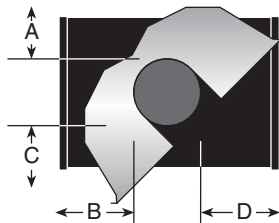


FIGURE 2

	(inches)			
Model	A	B	C	D
VTF-160	8	8	66	60
VTF-200	10	8	74	64
VTF-250	10	8	78	69

	(centimeters)			
Model	A	B	C	D
VTF-160	20	20	165	150
VTF-200	25	20	185	160
VTF-250	25	20	195	173

2 FOOT DECO GRILLE

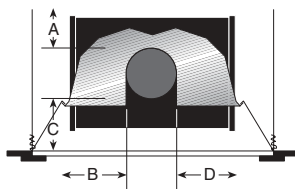


FIGURE 3

	(inches)			
Model	A	B	C	D
VTF-160	6	38	66	38
VTF-200	6	40	71	40
VTF-250	6	46	77	46

	(centimeters)			
Model	A	B	C	D
VTF-160	15	95	165	95
VTF-200	15	100	178	100
VTF-250	15	115	193	115

VENTING

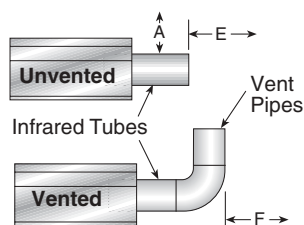


FIGURE 4

	(inches)		
Model	A	E	F
VTF-160	20	24	18
VTF-200	20	24	18
VTF-250	20	24	18

	(centimeters)		
Model	A	E	F
VTF-160	50	60	45
VTF-200	50	60	45
VTF-250	50	60	45

►SECTION 4: NATIONAL STANDARDS AND APPLICABLE CODES

4.1 Gas Codes

The 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, ANSI Z223.1 - latest revision, (same as NFPA Bulletin 54).

Canada: Refer to CAN/CGA B149.1 and B149.2: Installation Codes for Gas Burning Appliances.

4.2 Aircraft Hangars

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

United States: Refer to Standard for Aircraft Hangars, ANSI/NFPA-409 - latest revision.

Canada: Refer to Standard CAN/CGA B149.1 and B149.2.

- In aircraft storage and servicing areas, heaters shall be installed at least 10' (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' (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: Standard for Parking Structures NFPA-88A - latest revision or the Standard for Repair Garages, NFPA 88B - latest revision.

Canada: Refer to CAN/CGA B149.1 and B149.2: Installation Codes for Gas Burning Appliances.

- Heaters must not be installed less than 8' (2.4m) 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 upper most point of objects on the hoist.

4.4 Electrical

The heater must be electrically grounded in accordance with the following codes:

United States: Refer to *National Electrical Code*®, ANSI/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

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

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

Canada: Refer to CAN/CGA B149.1 and B149.2: Installation Codes for Gas Burning Appliances.


►SECTION 5: STANDARD PARTS LIST


Table 1. Contents of VAL-CO. Burner Carton

Part No.	Description	VTF-160	VTF-200	VTF-250
	VTF Burner Assembly (input and fuel varies)	1	1	1
02568200	Gaskets	2	2	2
VTF90100NA	Installation, Operation and Service Manual	1	1	1
94273914	Hex Head Bolts 5/16-18	8	8	8
96411600	Split Lockwashers	8	8	8
91412203	Flexible Gas Connector Assembly - 3/4" NPT	1	1	1
03051503	Turbulator Adapters	2	2	-
03051504	Turbulators 2.5' (76 cm) Aluminized	8	4	-
91412800	Flexible Boots	2	2	2
91901300	Boot Clamps	4	4	4
09080000	Vent Sleeve	2	2	2

Table 2. Contents of Core and Extension Packages

Part No.	Description	Core Packages (2 required per heater)			Extension Packages
		Aluminized with Aluminum Reflector			Aluminized with Aluminum Reflector
		20'(6m)	30'(9m)	40'(12m)	20'(6m)
91409408	Tube, HT Aluminized, 10' (3 m)	1	2	3	2
03051101	Burner Tube, Alum., 10' (3 m)	1	1	1	-
01312700	Coupling Assembly	1	2	3	2
02750303	Standard 8' Reflector	3	4	6	3
02750800	End Cap	2	2	2	-
03090100	Tube and Reflector Hanger	3	4	5	2
91907302	S Hook	6	8	10	4
03050010	Reflector Support Package (Strap, Wireform, Screws)	2	3	5	3
91107720	U-Clip Package	1	1	1	1
90502700	Vent Adapter (Not required for ST Models)	1	1	1	-
01318901	Tube Clamp Package	1	1	1	-
PART NUMBER		CP20ALUM	CP30ALUM	CP40ALUM	EXP20ALUM

 **WARNING**



Fire Hazard

Install heaters only within the parameters of minimum or maximum heat exchanger tube lengths listed in Table 3 (below) in this installation manual.

Shorter lengths are a serious fire hazard.

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

Table 3. VAL-CO. VTF Component Package Guide

Model	Tubing Length Each Side		Core Packages (2 Required)
	Minimum	Maximum	Aluminized with Aluminum Reflector
VTF-160	20' (6 m)	-	CP20ALUM
-	30' (9 m)		CP30ALUM
VTF-200	30' (9 m)	-	CP30ALUM
-	40' (12 m)		CP40ALUM
VTF-250	40' (12m)	-	CP40ALUM
-	50' (15m)		CP30ALUM + EXP20ALUM

SECTION 6: ASSEMBLY OVERVIEW

The figures in this section provide a general overview of component placement in a VAL-CO. VTF system. The location of some components such as supports and couplings is crucial for proper installation. Assemble the heater components as shown on *Page 8, Section 6, Figure 6*.

Optional reflector configurations are shown on *Page 3, Section 3, Figures 1-4*. Install appropriate suspension hardware, beam clamps, chain or rod at predetermined locations. Adjustments of chain length will provide uniform pitch.

FIGURE 5 – Major Component Descriptions

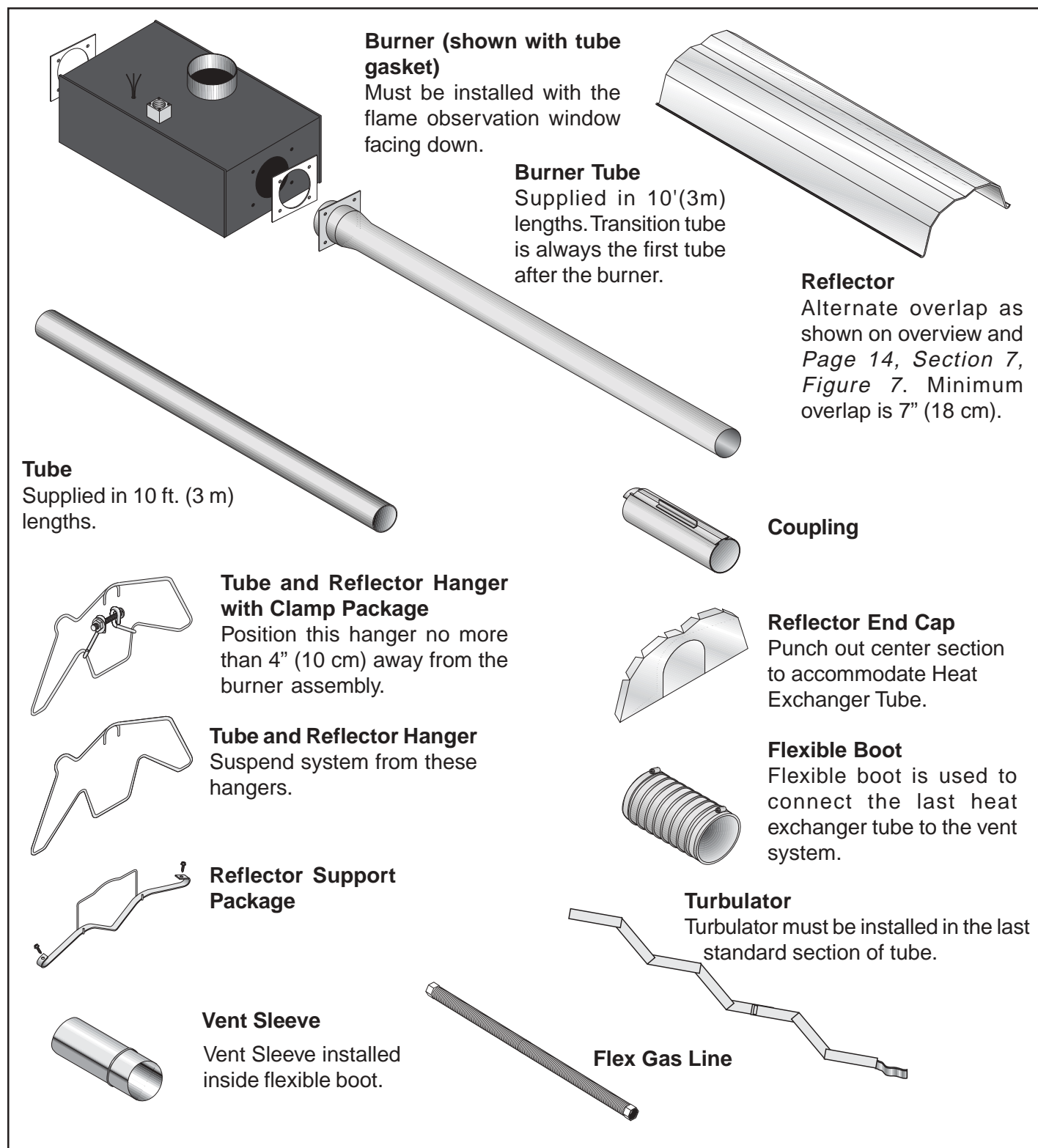
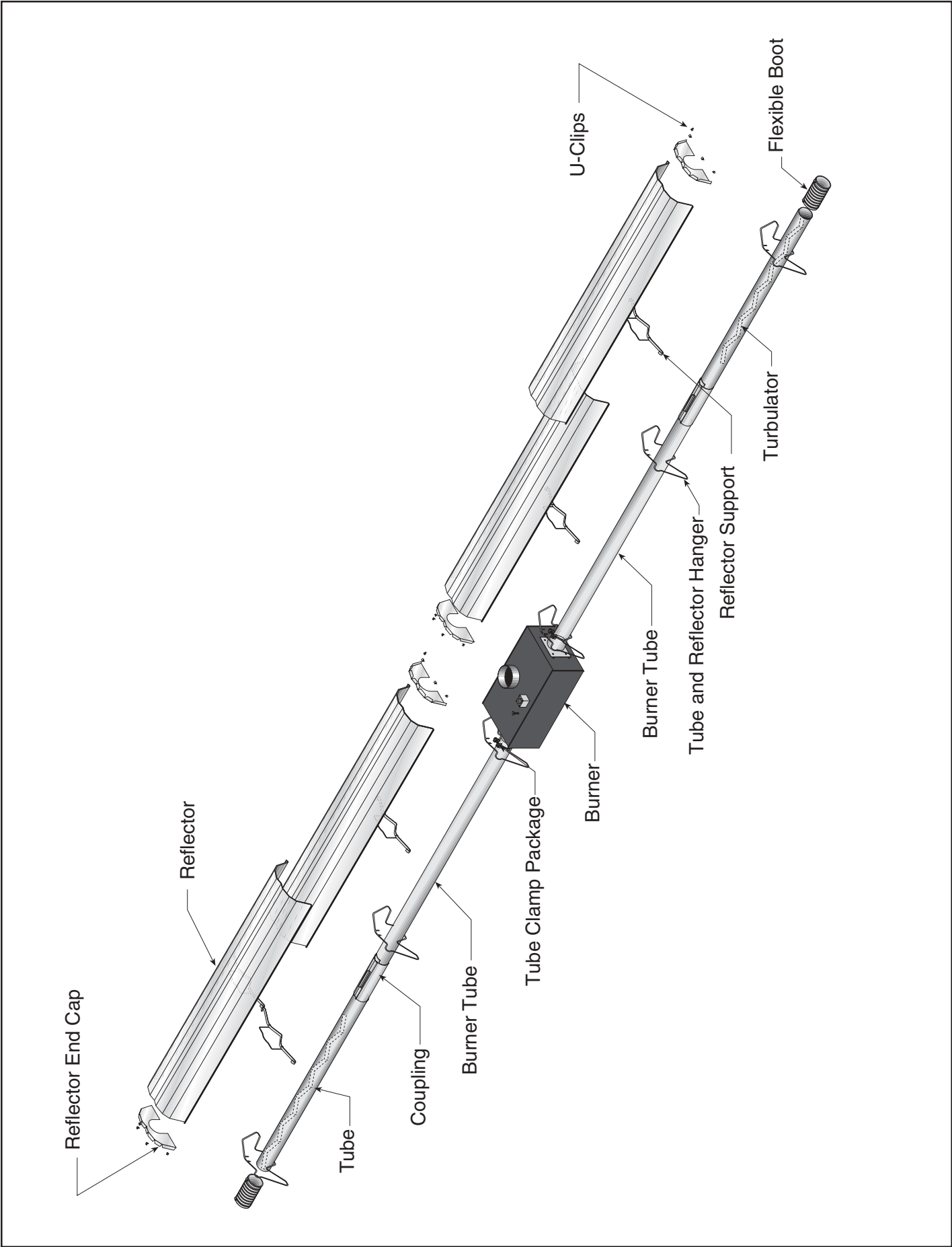
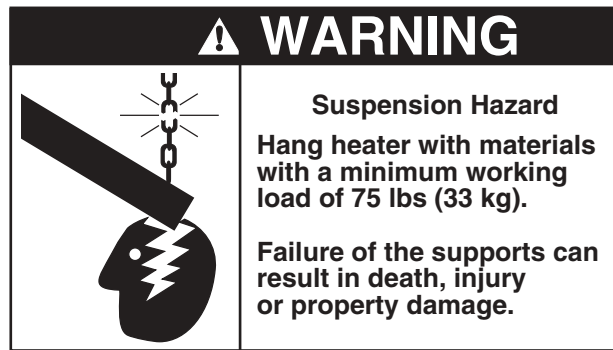


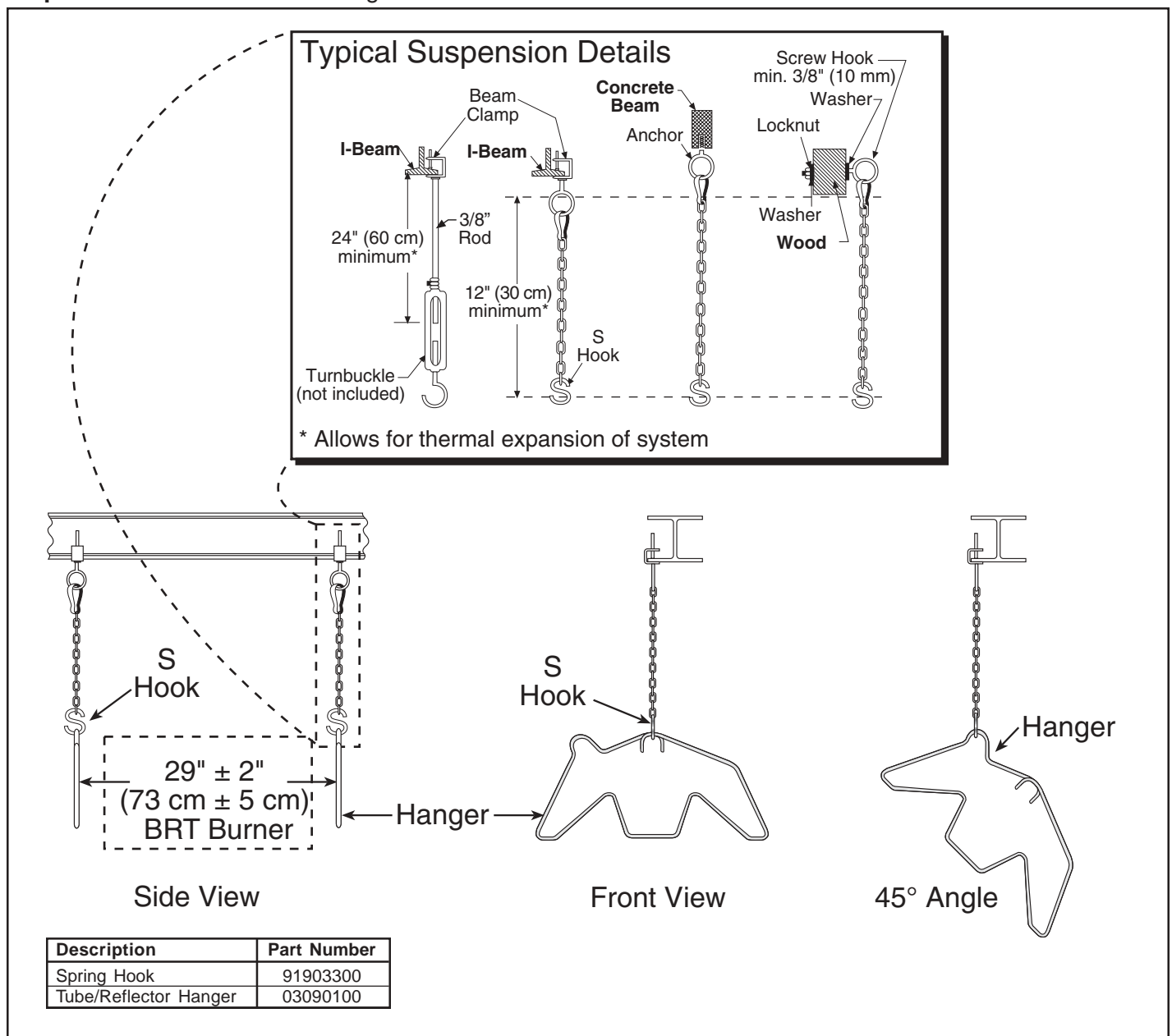
FIGURE 6 – VTF Assembly Overview



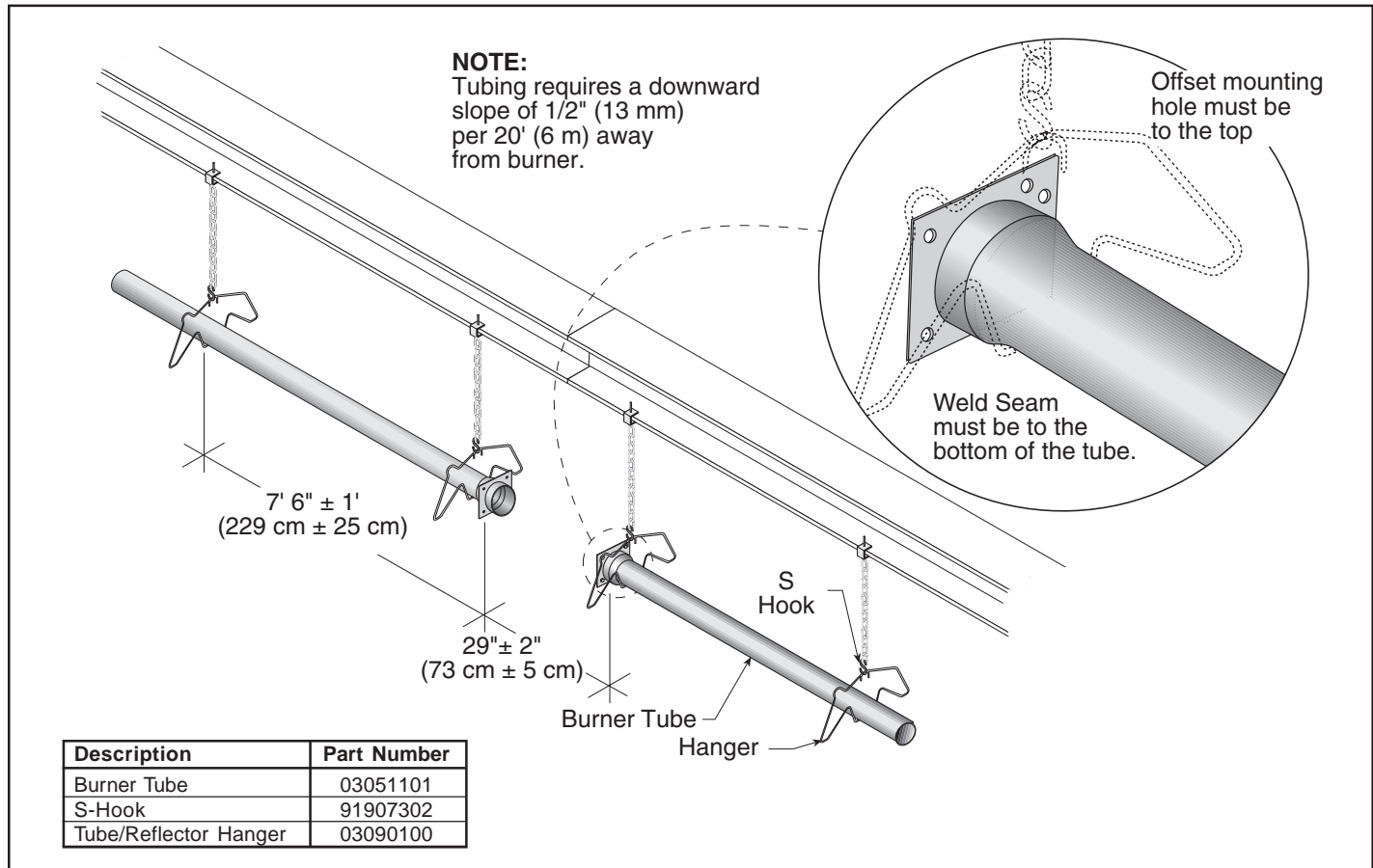
►SECTION 7: HEATER INSTALLATION



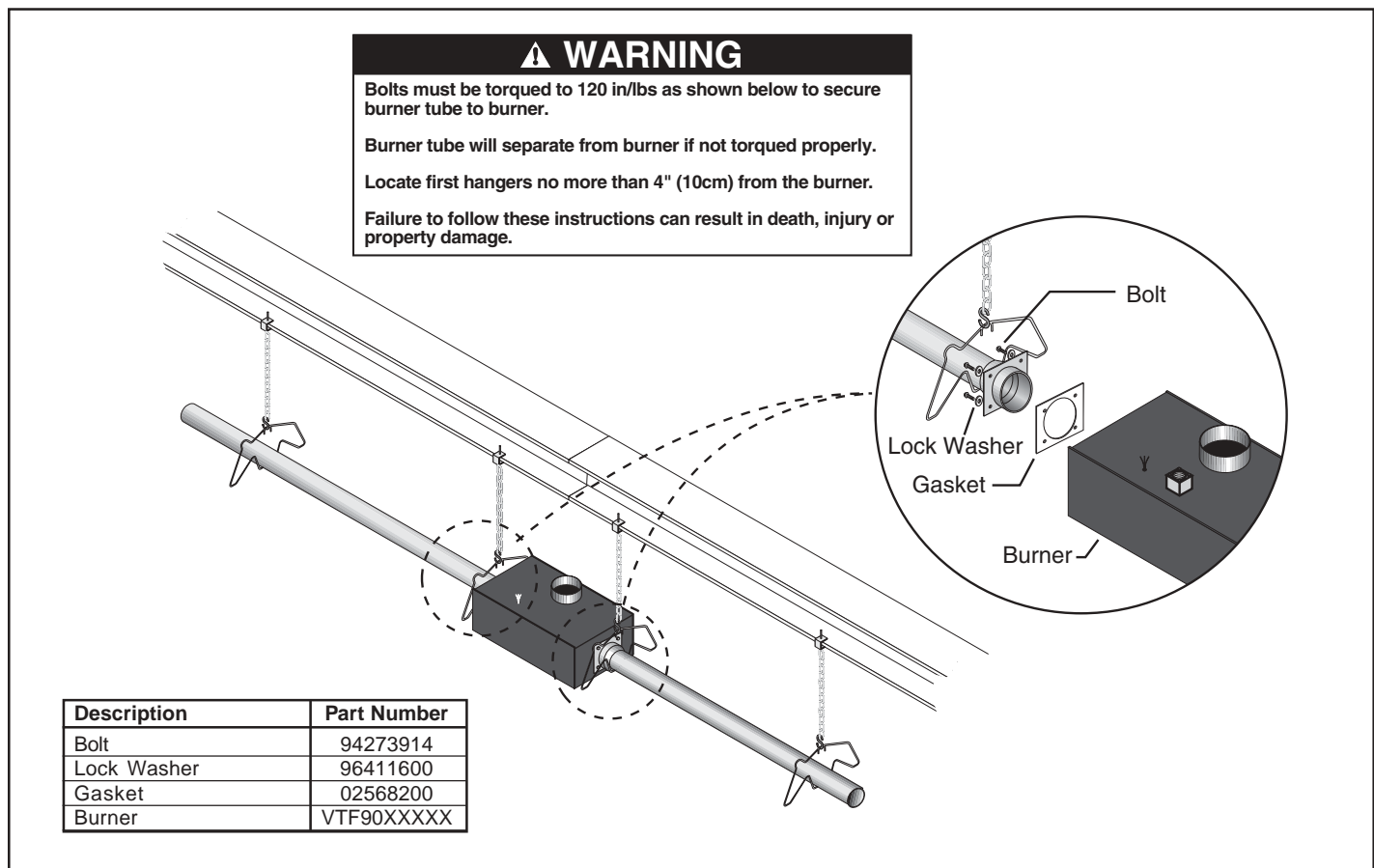
Sections 7 - 11 show the logical sequence of heater installation, pictorially. Follow these steps in order and if any questions arise, refer to the assembly overview (*Page 8, Section 6, Figure 6*) for guidance. If any step is unclear, please contact VAL-CO. at 800-998-2526 or at www.valcompanies.com.

Step 7.1 – Determine Critical Hanger Placement

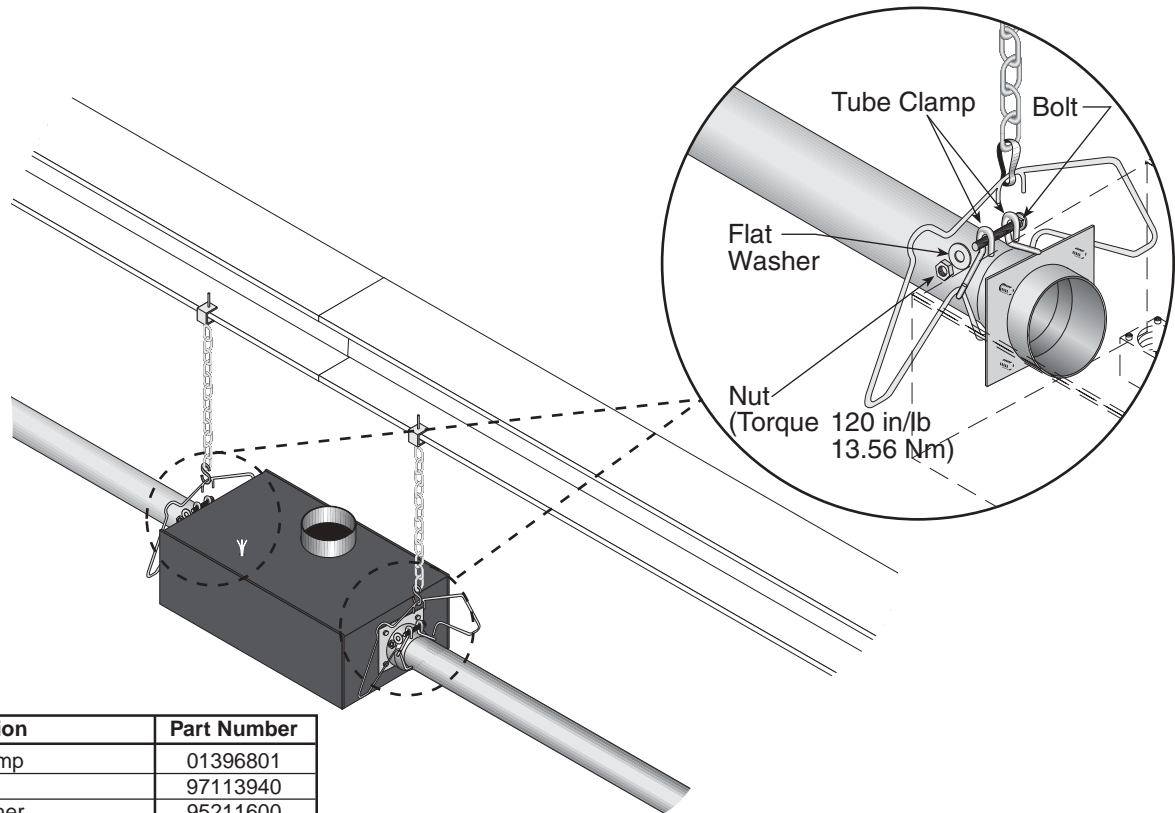
Step 7.2 – Burner Tube Installation



Step 7.3 – Burner Installation

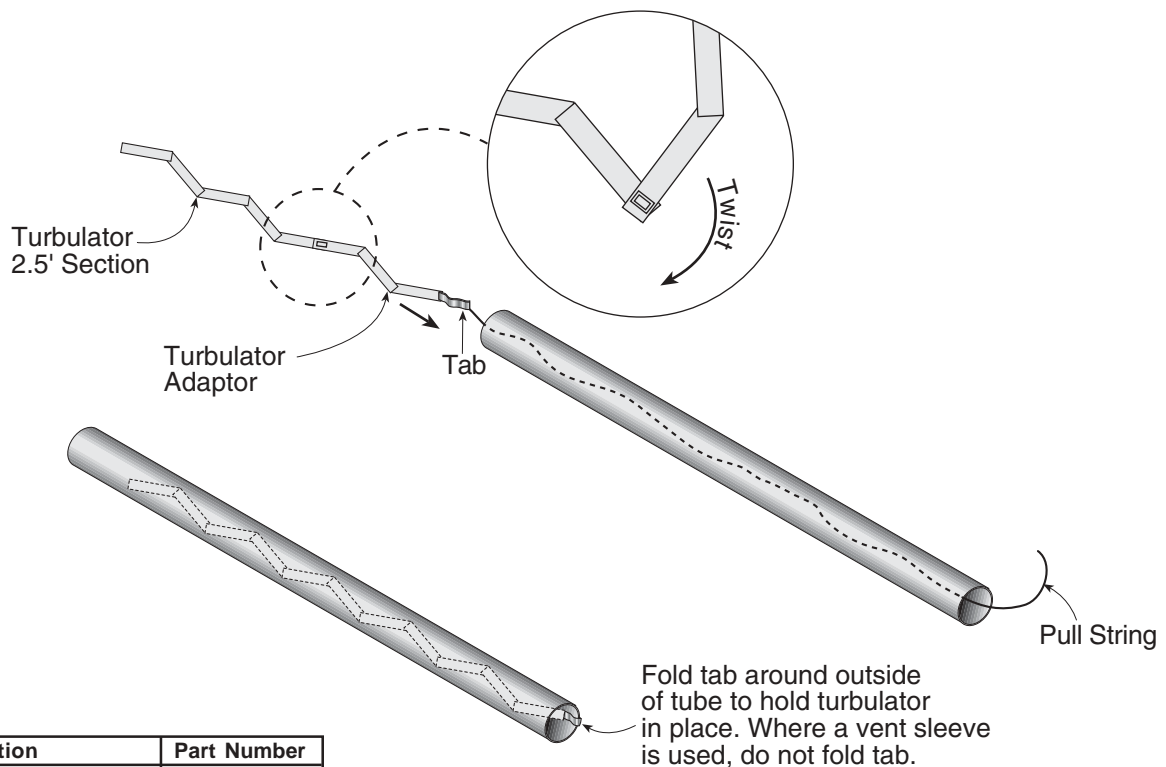


Step 7.4 – Tube Clamp Package Installation



Description	Part Number
Tube Clamp	01396801
Bolt	97113940
Flat Washer	95211600
Nut	92113900

Step 7.5 – Turbulator Installation



Description	Part Number
Turbulator Section 1	03051503
Turbulator Section 2	03051504
Tube	91409408

Step 7.6.1 – Coupling and Tube Assembly

A Close coupling with tab

B Start sidebar onto coupling

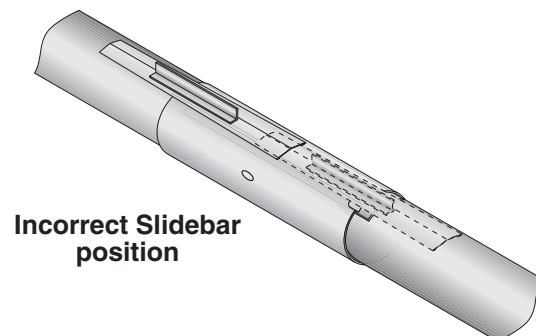
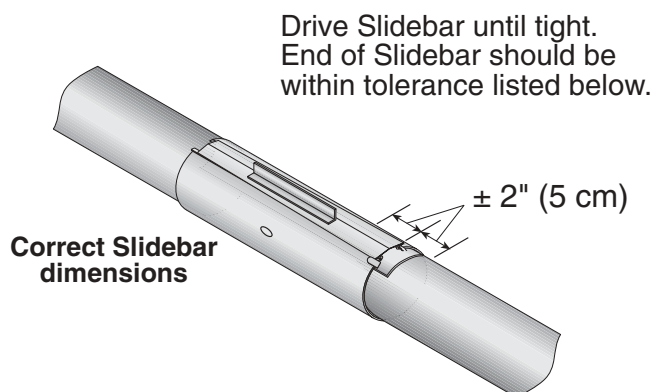
C Insert Tubes into coupling

D Tighten coupling to join Tubes

Description	Part Number
Coupling & Lock Assy.	01312700
Coupling	01329600
Slidebar	01329700
Tube	91409408

Step 7.6.2 – Coupling and Tube Assembly (Continued)

Tighten sidebar as shown below.

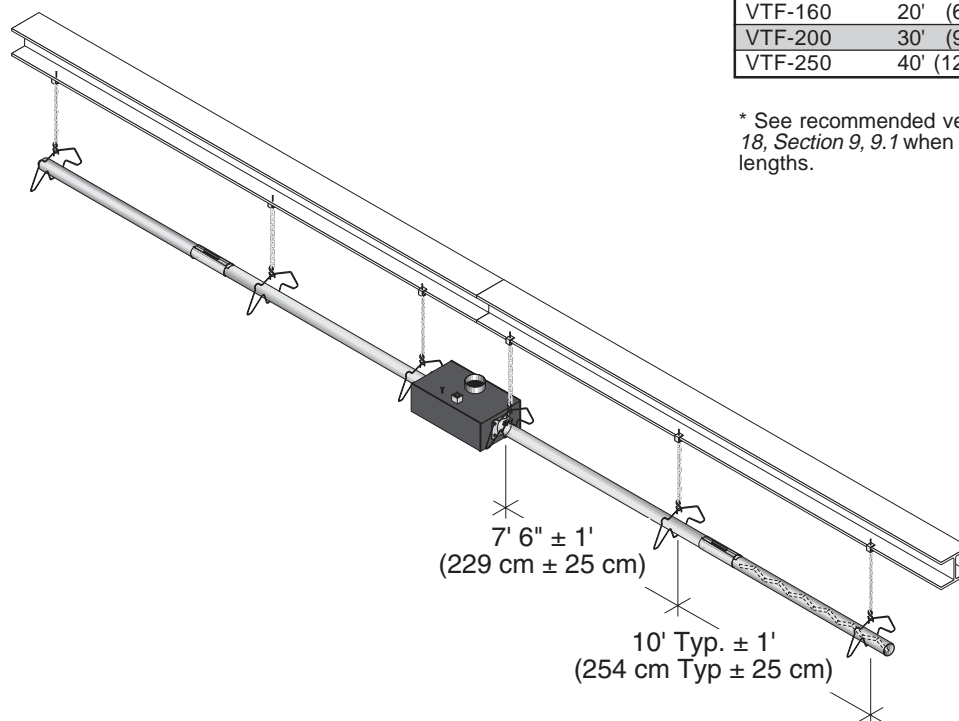


- Repeat steps 7.6.1 A-D, page 12 until all tubes are assembled, see Step 7.6.3 on page 13.

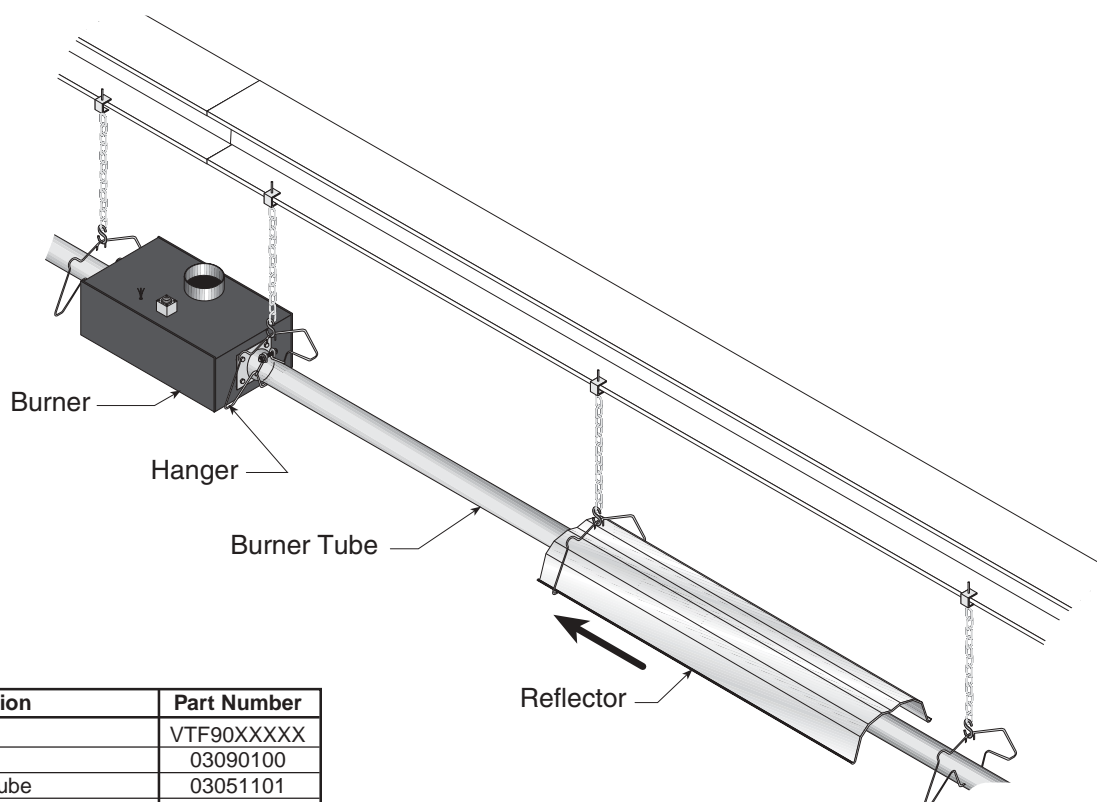
Step 7.6.3 – Coupling and Tube Assembly (Continued)

Model	Tubing Length Per Side	
	Minimum	Maximum*
VTF-160	20' (6 m)	30' (6 m)
VTF-200	30' (9 m)	40' (12 m)
VTF-250	40' (12 m)	50' (12 m)

* See recommended venting lengths, *Page 18, Section 9, 9.1* when using maximum tube lengths.



Step 7.7.1 – Reflector Installation



Description	Part Number
Burner	VTF90XXXXX
Hanger	03090100
Burner Tube	03051101
Reflector	02750303

Step 7.7.2 – Reflector Installation

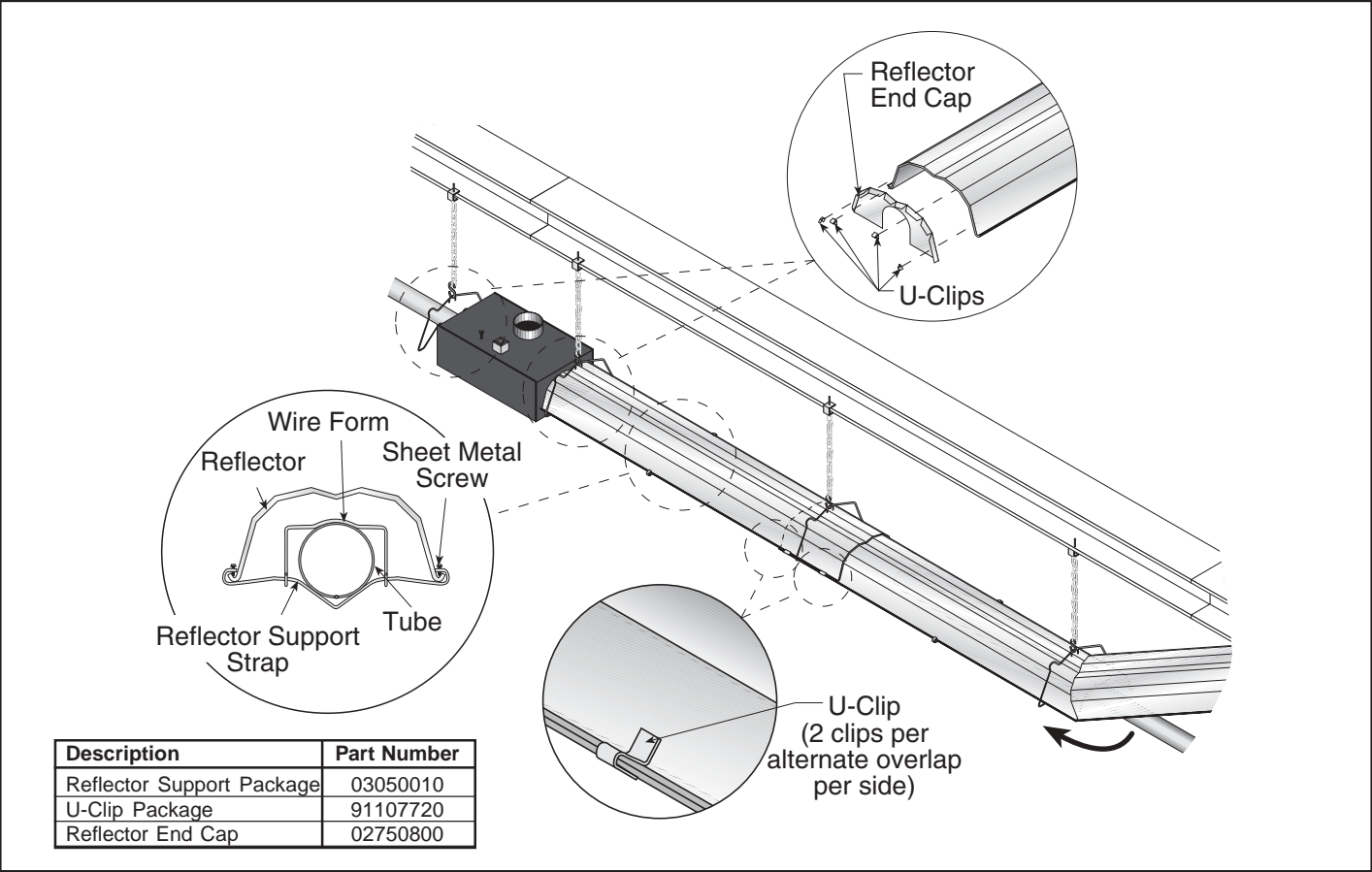
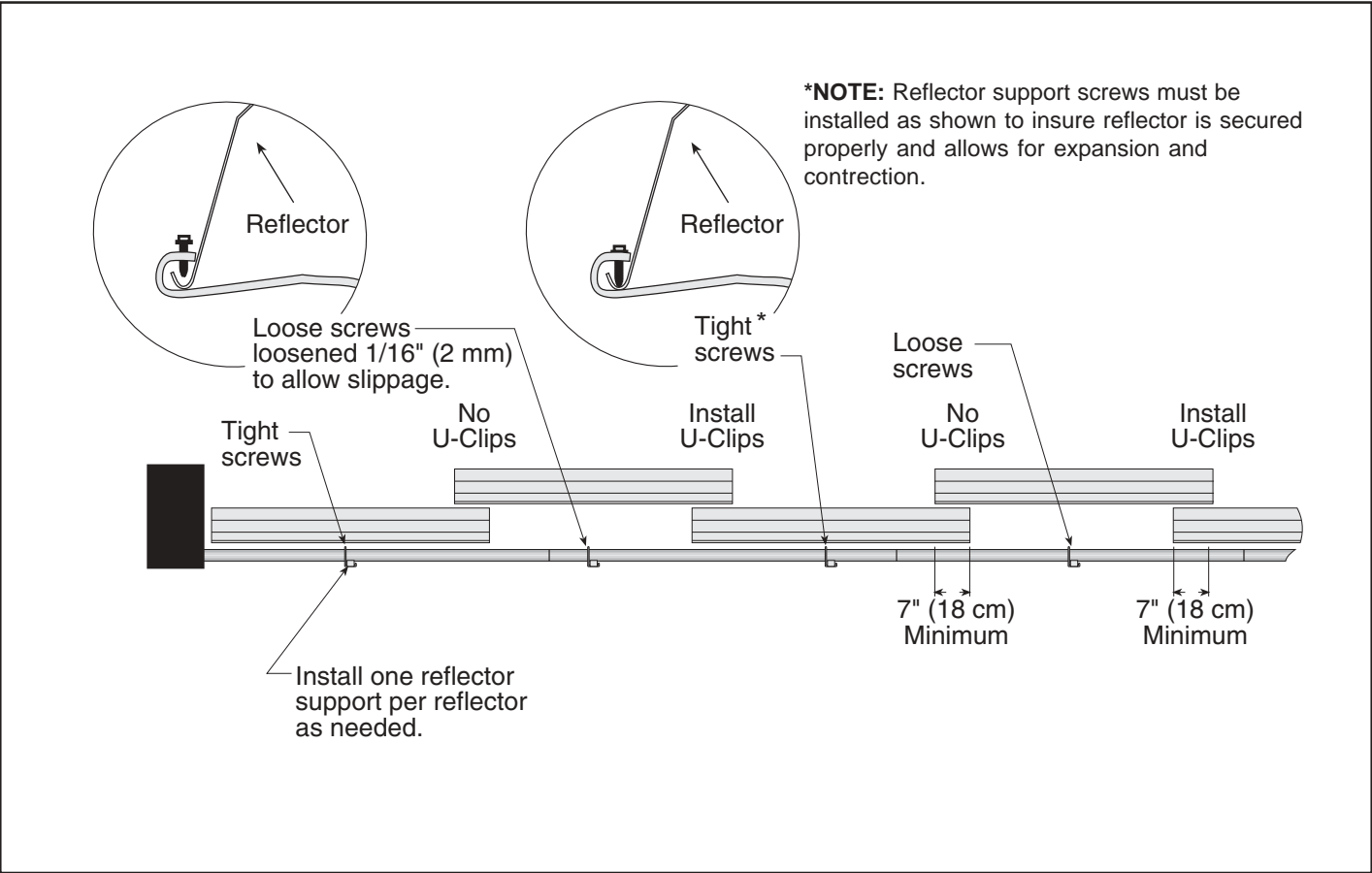


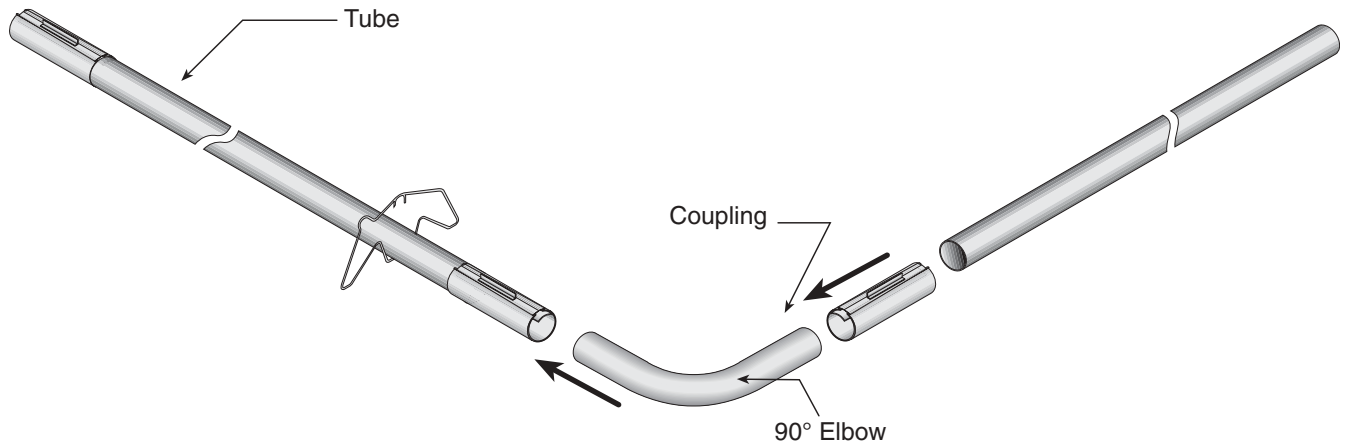
FIGURE 7 – Reflector Overlap Detail



►SECTION 8: OPTIONAL HEATER ACCESSORIES

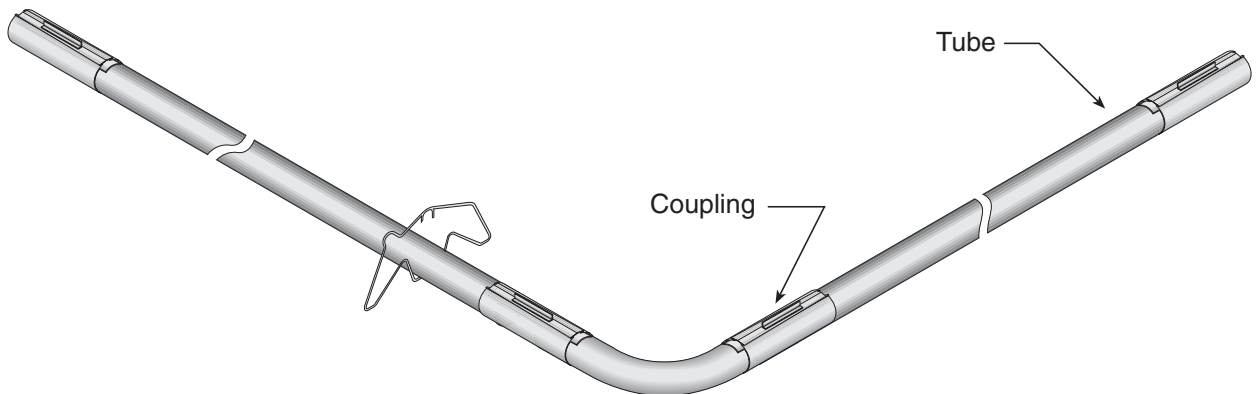
8.1 Elbow Package Configuration

Step 8.1.1 – Elbow Installation

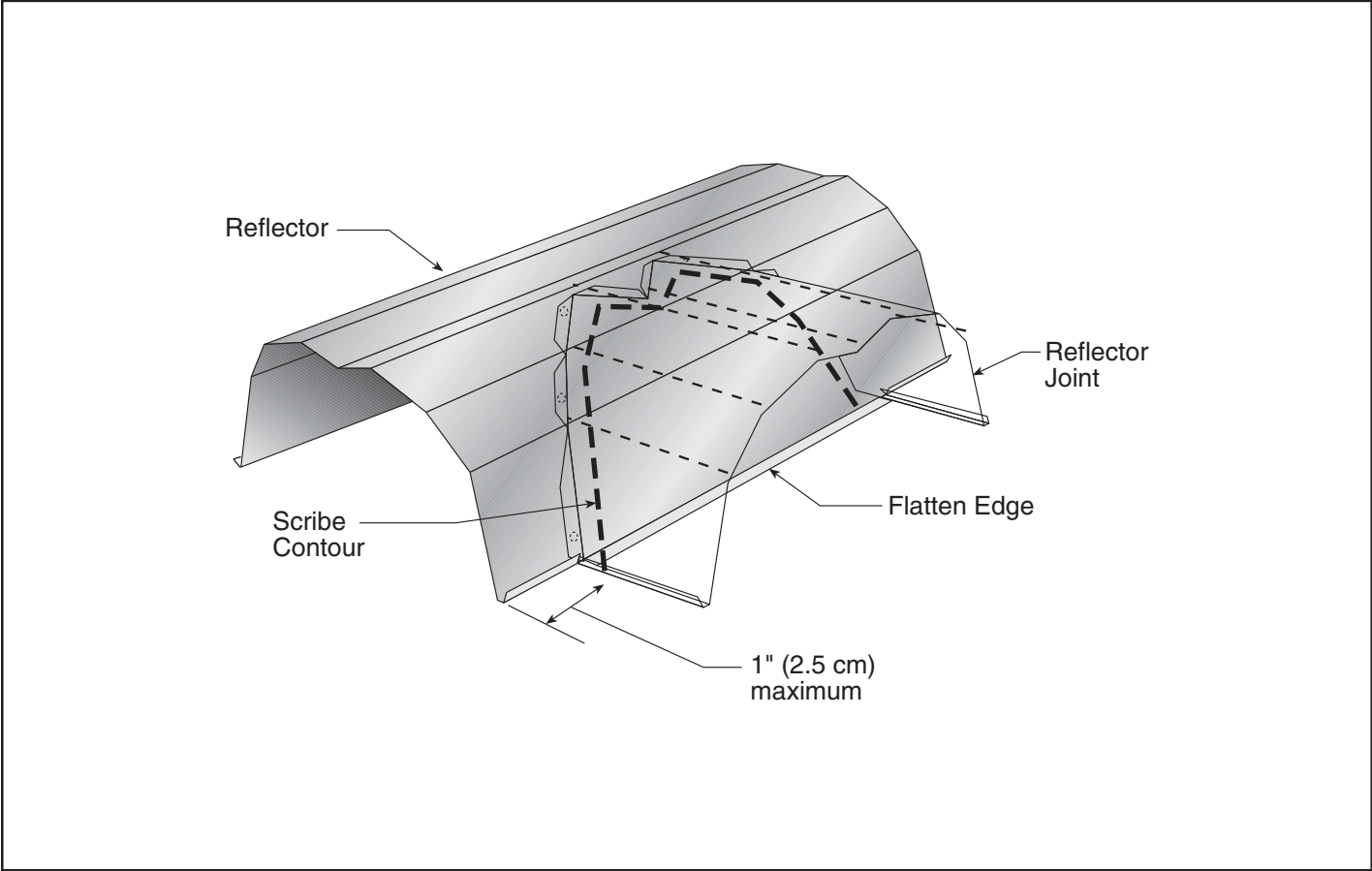


Description	Part Number
Elbow Package	02718702
90° Elbow	01335801
Coupling	01312700
Reflector End Cap	02750800
Reflector Joint	02750900
U-Clip Package	91107720

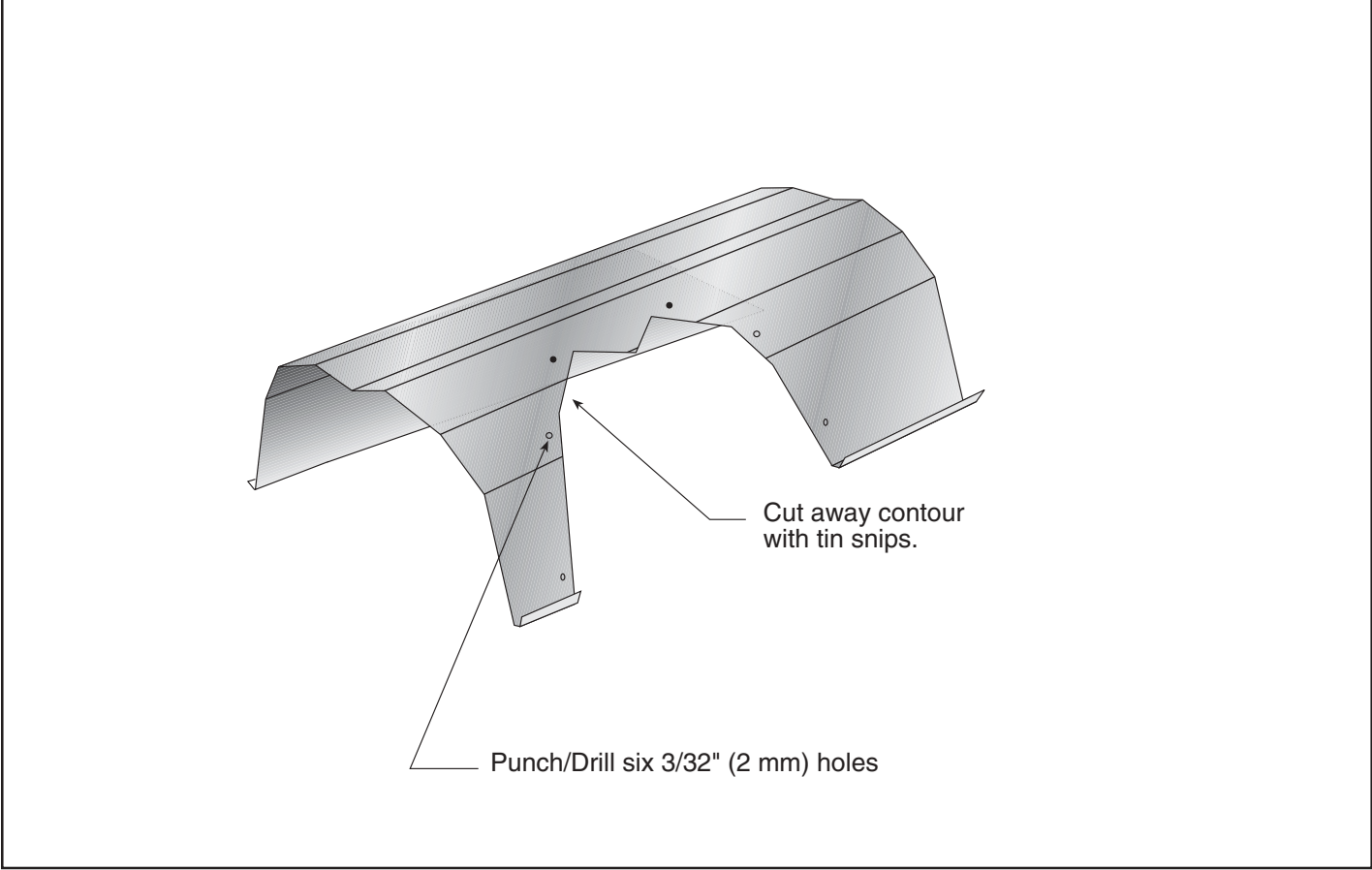
Step 8.1.2 – Elbow Installation

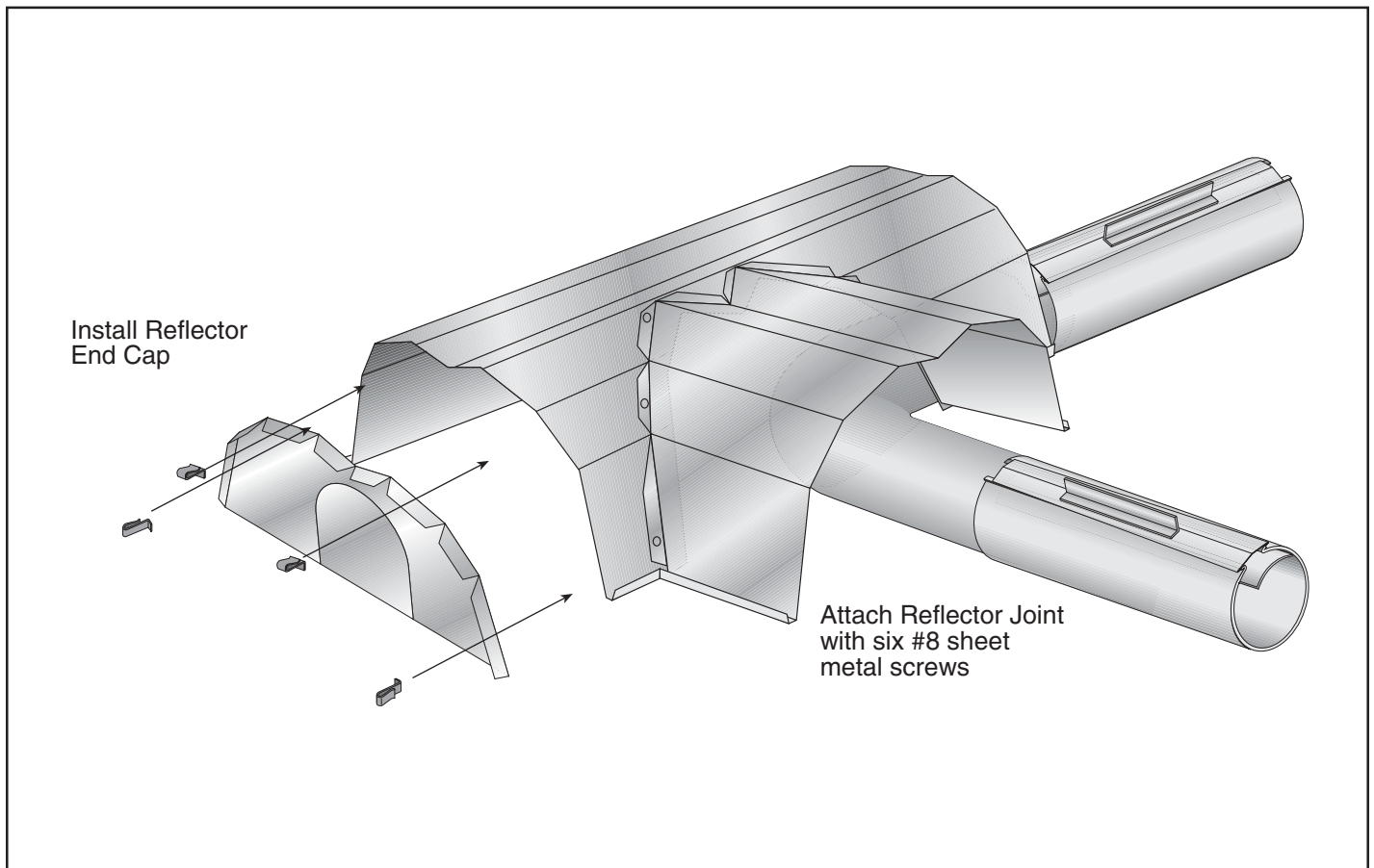
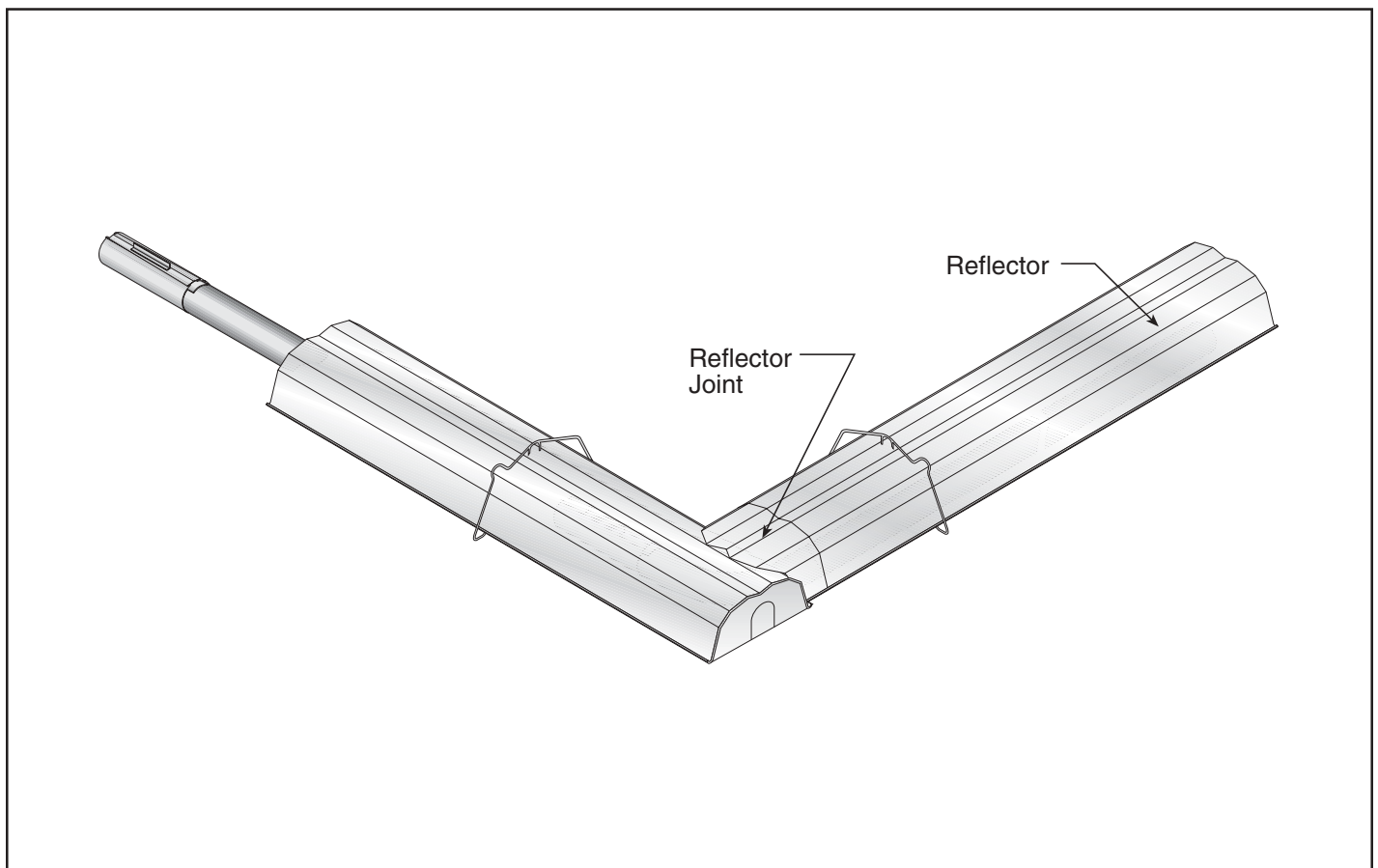


Step 8.1.3 – Reflector Joint Installation



Step 8.1.4 – Reflector Joint Installation



Step 8.1.5 – Reflector Joint Installation**FIGURE 8 – Reflector Joint Detail**

►SECTION 9: VENTING

9.1 GENERAL VENTING REQUIREMENTS

This heater must be vented in accordance with the following national codes and any local codes which may apply:

United States: Refer to ANSI Z223.1 - latest revision
Canada: Refer to CAN/CGA-B149.2 and B149.2

Any portion of vent pipe passing through a combustible wall must be dual insulated (Type B) vent pipe and have an approved thimble (P/N 90505600) to conform with the above listed codes.

Vent pipe must be sloped downward away from the burner, 1/2" (1 cm) in 20' (6 m).

The heater may also be installed unvented in certain circumstances according to building ventilation codes. Refer to the above codes for further information. Unvented operation also requires compliance with the clearances to combustibles given on *Page 3, Section 3, Figure 4*.

Both sides of the VAL-CO. VTF heater may be individually vented, or the two sides may be brought together into a common 6" (15 cm) vent.

Vent must be at least 6' (2 m) from the combustion air opening of this unit, or any other appliance.

Secure all joints with #8 x 3/8 sheet metal screws.

Seal all joints with high temperature silicone sealant.

Horizontal Venting

In noncombustible walls only, vent terminal (P/N 02537801-1P) may be used.

For 6" (15 cm) common vents in either combustible or noncombustible walls, use P/N 90502101 (Tjernlund VH1-6) or equivalent, insulated vent terminal. Follow the manufacturer's instructions for proper installation.

Vertical Venting

For 4" (10 cm), an approved vent cap (P/N 90502300) must be used.

For 6" (15 cm) common vent, an approved vent cap (P/N 90502302) must be used.

United States Requirements

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

Vent must exit a building not less than 7' (2 m) above grade when located adjacent to public walkways.

Vent must terminate at least 3' (1 m) above any forced air inlet located within 3' (1 m).

Vent must terminate at least 4' (1.3 m) below, 4' (1.3 m) horizontally from, or 1' (.3 m) above any door, window, or gravity inlet into any building.

Vent terminal shall be located at least 1' (.3 m) from any opening through which vent gasses could enter a building.

Canadian Requirements

Vent terminal must not be installed less than 3' (1 m) from any building opening.

Vent terminal must be installed at least 3' (1 m) above grade.

Length Requirements

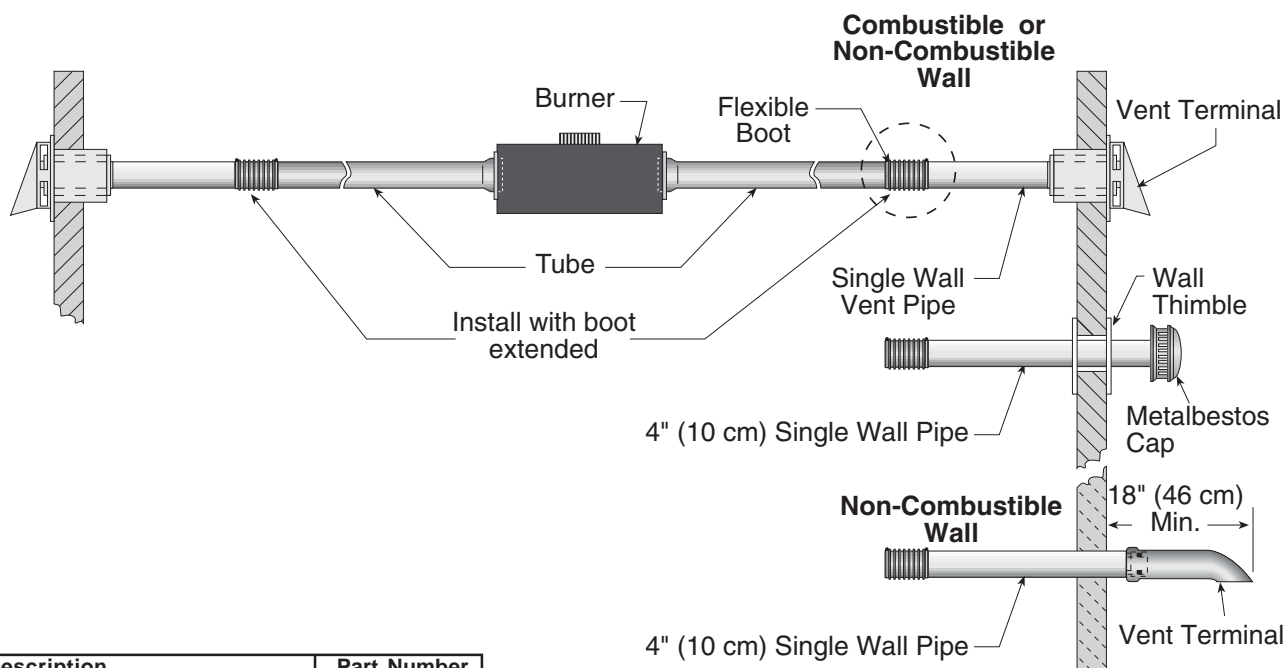
The maximum total vent length, where both heat exchangers are vented together is 45' (11 m) of 6" (15 cm) diameter duct. The maximum total vent length, where the heat exchangers are vented individually is 45' (11 m) of 4" (10 cm) duct, or 22.5' (7 m) on each heat exchanger.

It is recommended that vent length should be limited to less than 20' (6 m). If using vent lengths greater than 20' (6 m), condensation will form in the vent pipe. Insulation and additional sealing measures will be required. Optional heat exchanger lengths are considered as vent length for length determination.

The total vent length, plus outside air duct length, plus any extensions to minimum heat exchanger lengths, cannot exceed 65' (17 m).

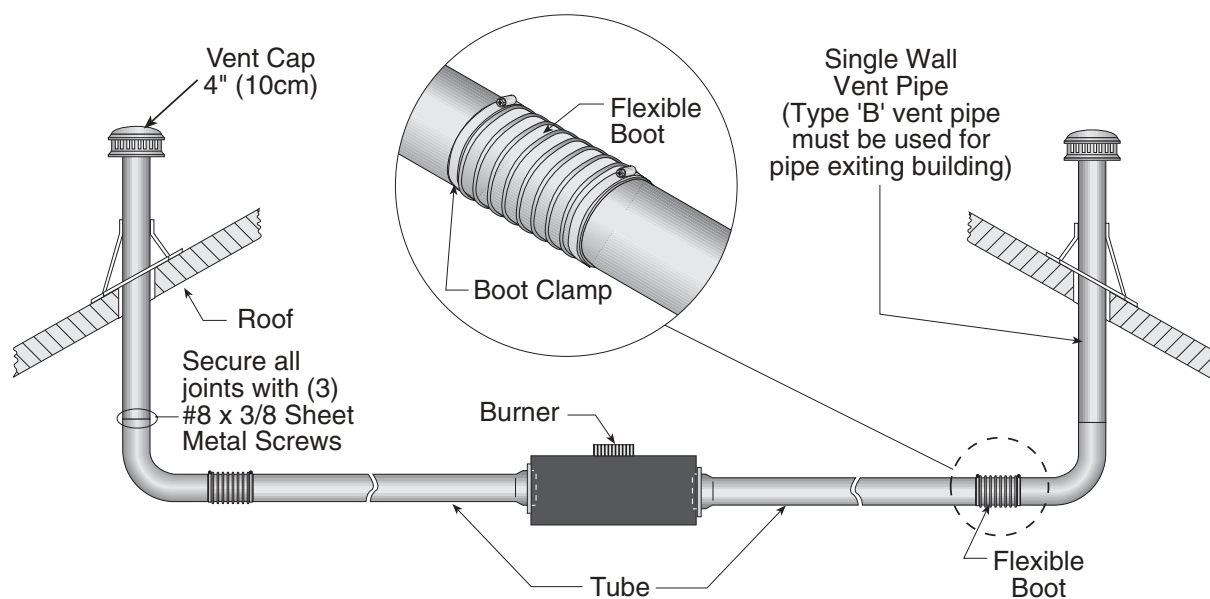
Subtract 15' (4 m) of maximum allowed vent or duct length per vent elbow if more than two are used.

9.2 – Horizontal Ventilation 4" (10 cm) Pipe



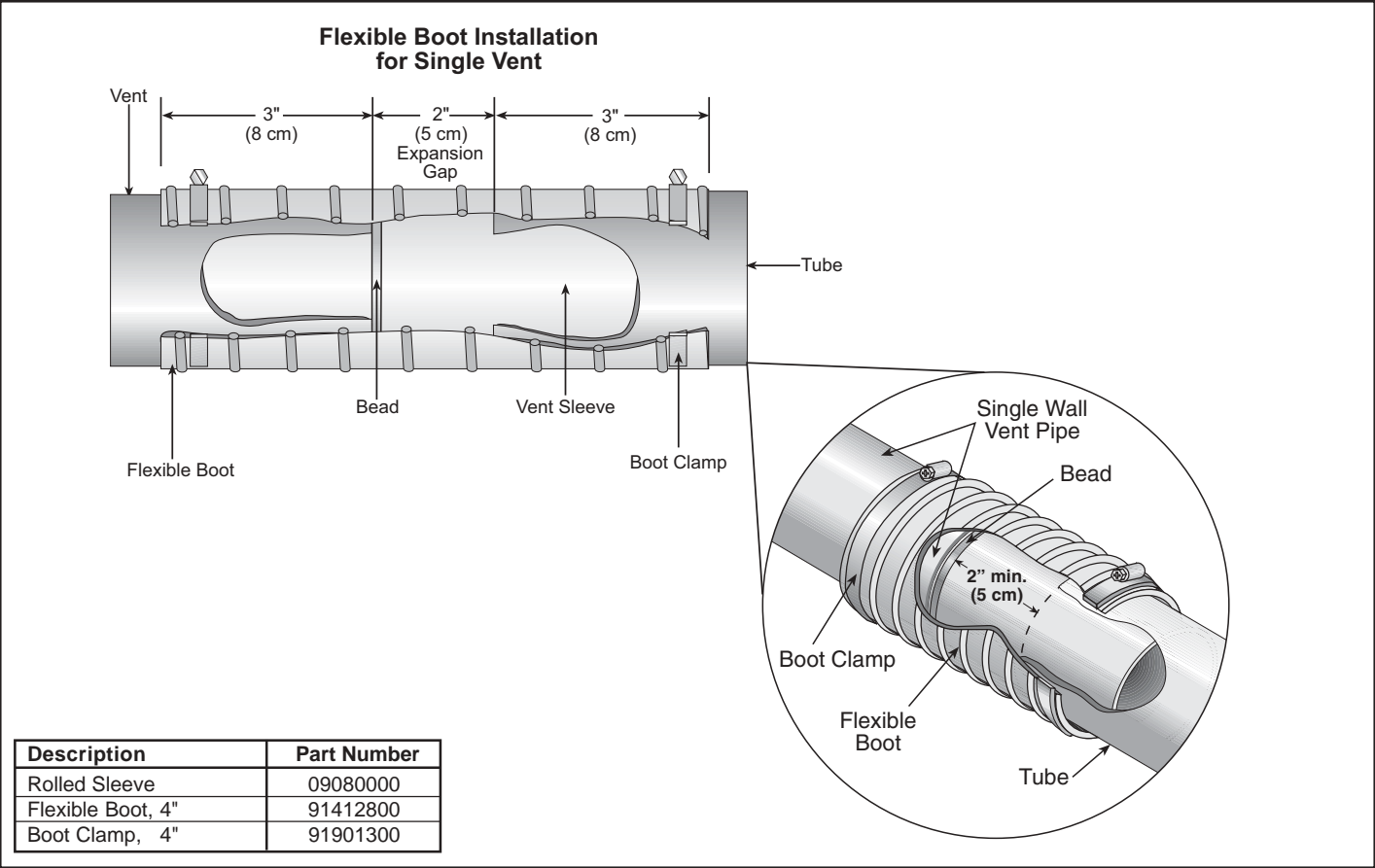
Description	Part Number
Flexible Boot	91412800
Boot Clamp	91901300
Vent Terminal (Comb. Wall)	90502100
Vent Terminal (Non. Comb. Wall)	02537801-1P
Wall Thimble	90505600
Vent Sleeve	09080000

9.3 – Vertical Ventilation 4" (10 cm) Pipe

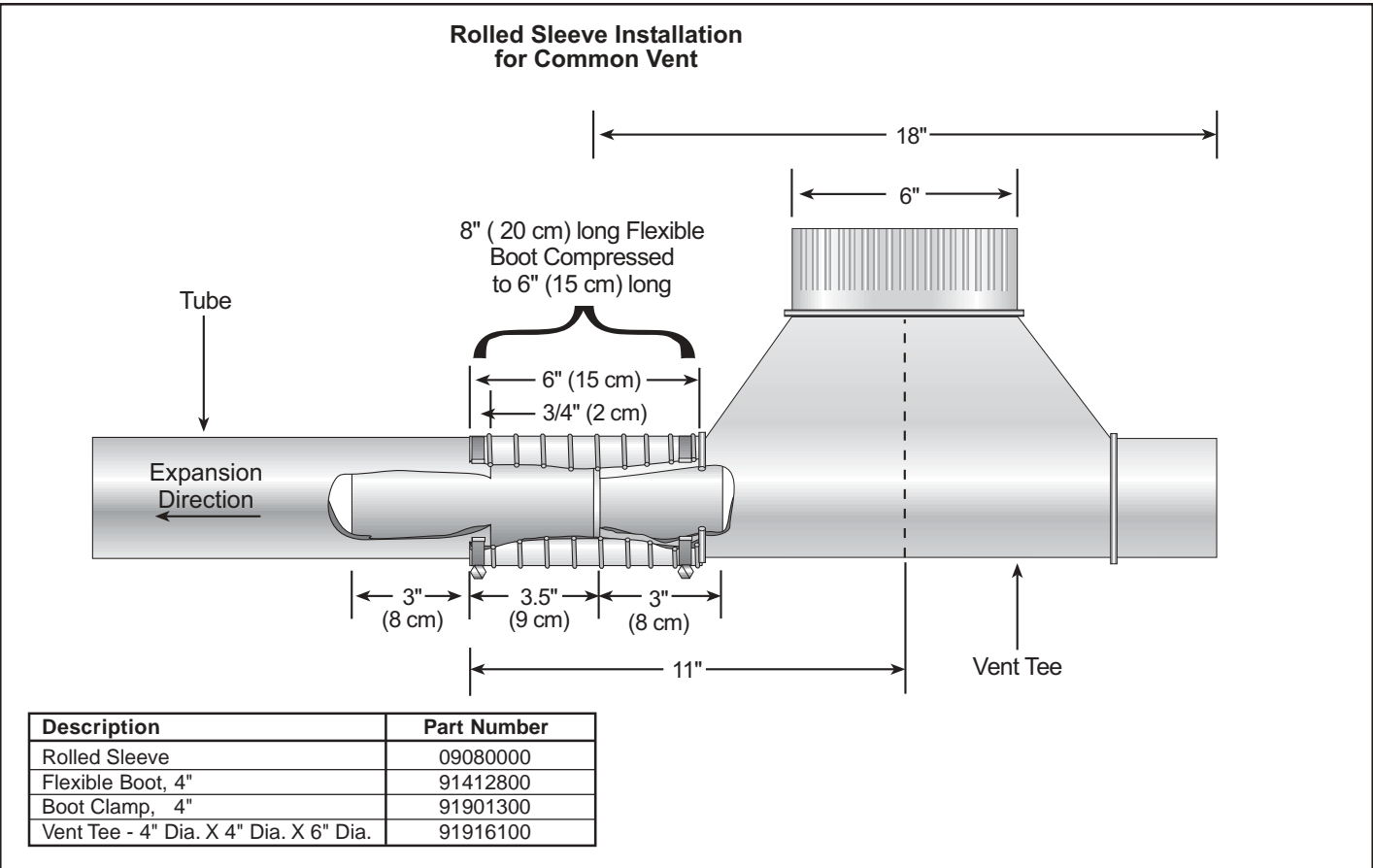


Description	Part Number
Vent Cap 4" (10 cm)	90502300

9.4 – Flexible Boot Installation (Single Vent)



9.5 – Flexible Boot Installation (Common Vent)



9.6 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.

It is recommended to vent heaters when utilizing the outside air option.

For VTF-160/200/250 5" (13 cm) single wall pipe, PVC pipe, aluminum flex duct, or equivalent may be used for outside air supply.

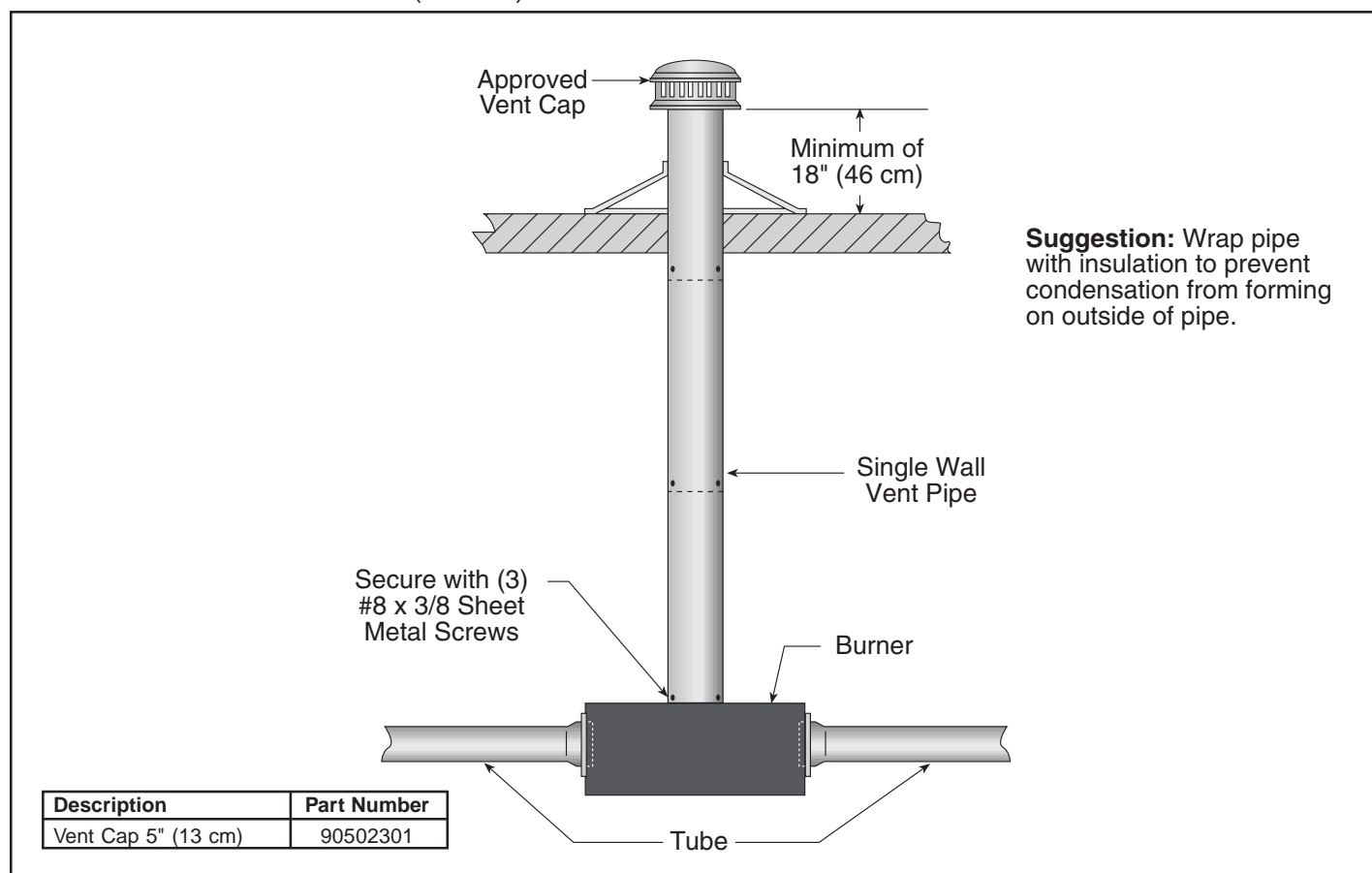
The air supply duct may have to be insulated to prevent condensation on the outer surface.

The outside air terminal must not be more than 1' (3 cm) above the vent terminal.

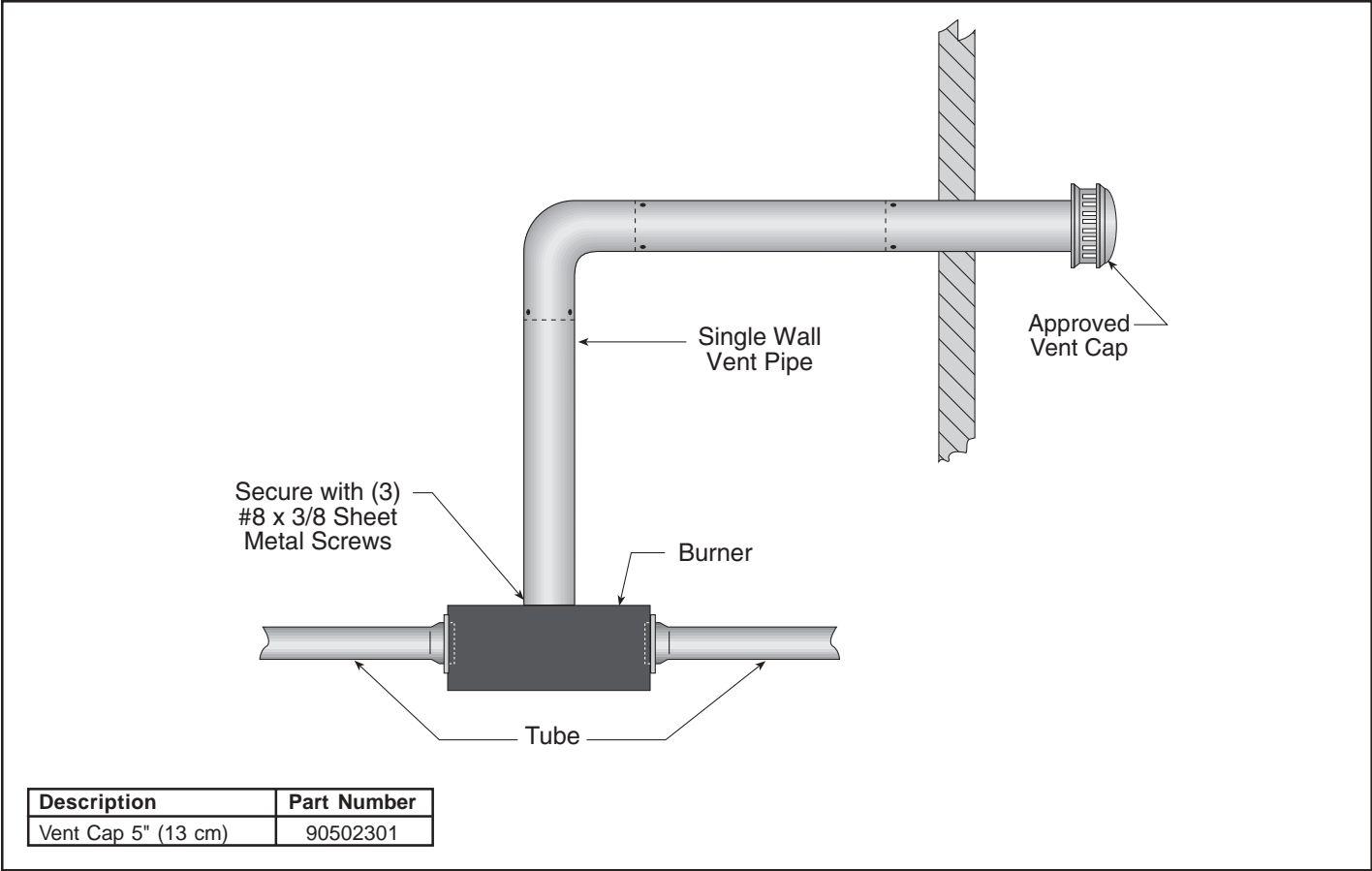
9.6.1 – Length Requirements

The maximum length of outside air supply duct is 45' (11 m) of either 4" (10 cm) or 5" (13 cm) diameter however, the maximum length does depend on the venting arrangement used. Follow the constraints listed on *Page 18, Section 9.1*.

9.6.1 – Outside Combustion Air (Vertical)



9.6.2 – Outside Combustion Air (Horizontal)



►SECTION 10: GAS PIPING

⚠ WARNING



Fire Hazard

Tighten gas line fittings to connect gas supply according to *Figure 9*.

Flex gas line can crack when twisted.

Gas line moves during normal operation.

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

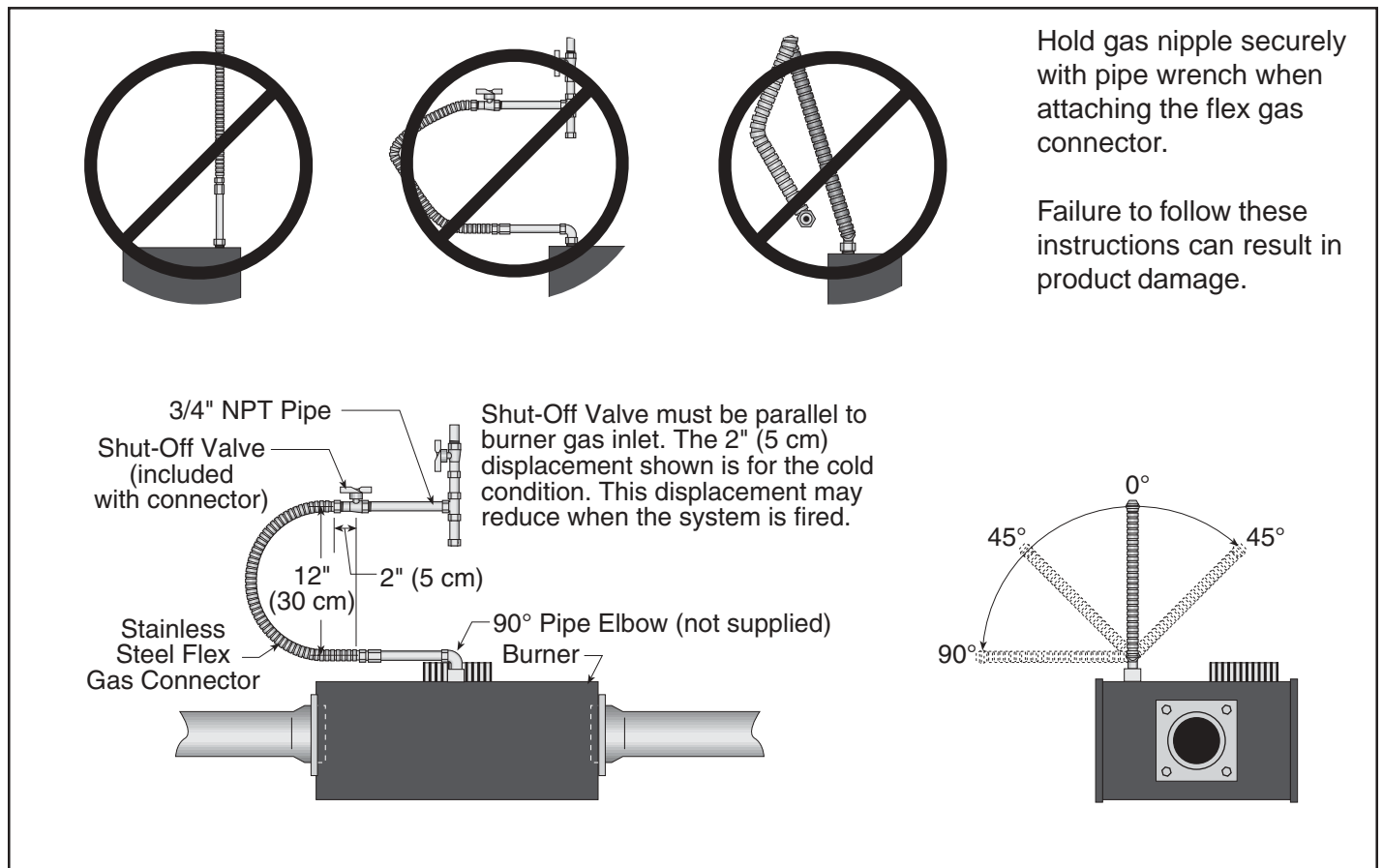
Install the flex gas connector as shown. The flex gas connector accommodates expansion of the heating system and allows for easy installation and service of the burner. A 90° pipe elbow (not supplied) must be installed into the gas valve to ensure proper orientation of the flex gas connector. Before 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 line. This can cause a gas leak resulting in an unsafe condition if the gas connection is not made strictly in accordance with Figure 9 on this page of these instructions.

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

- 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 9 – Gas Connection with Stainless Steel Flex Gas Connector



► SECTION 11: WIRING

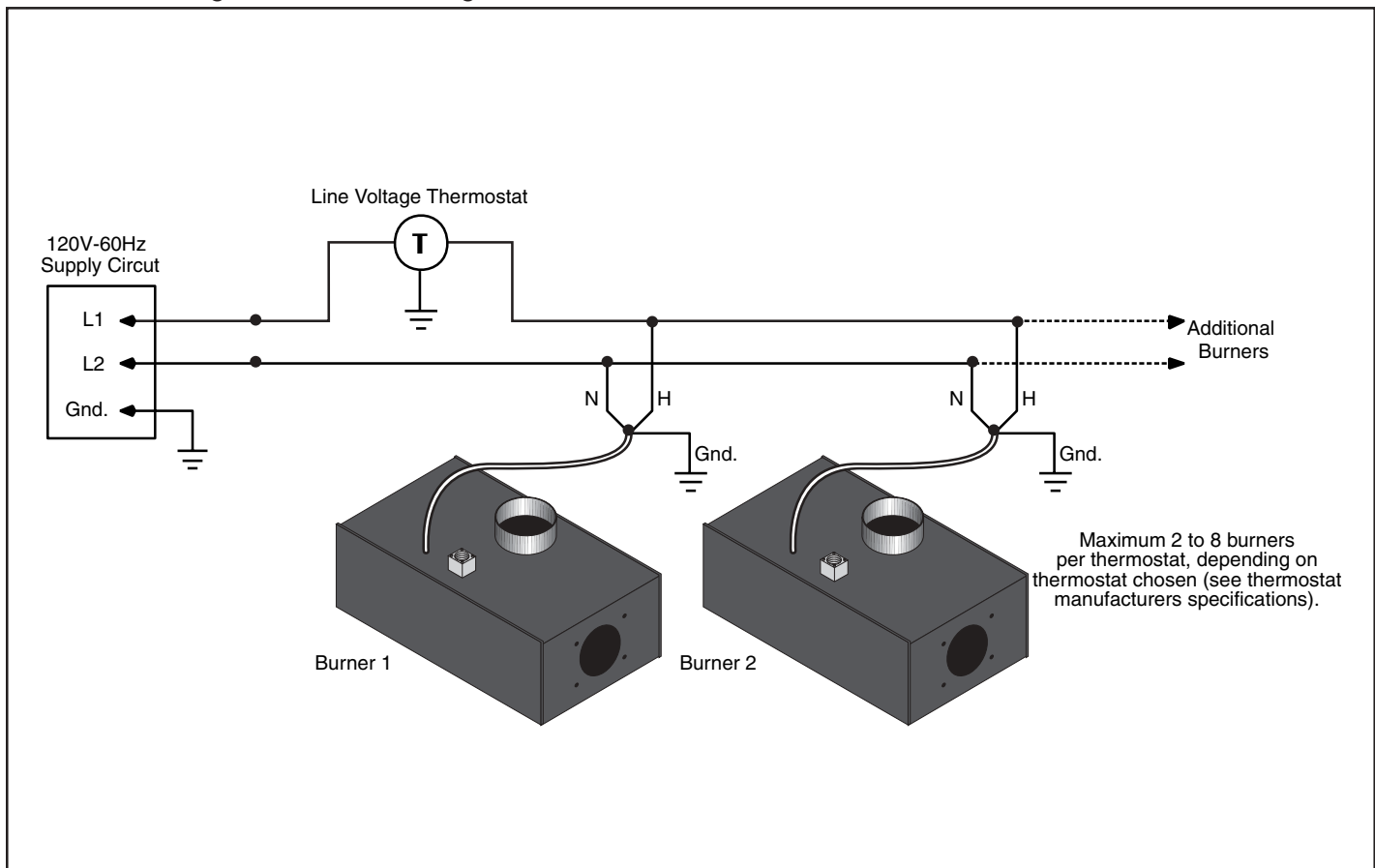
⚠ WARNING**Electrical Shock Hazard**

Disconnect electrical power before servicing.

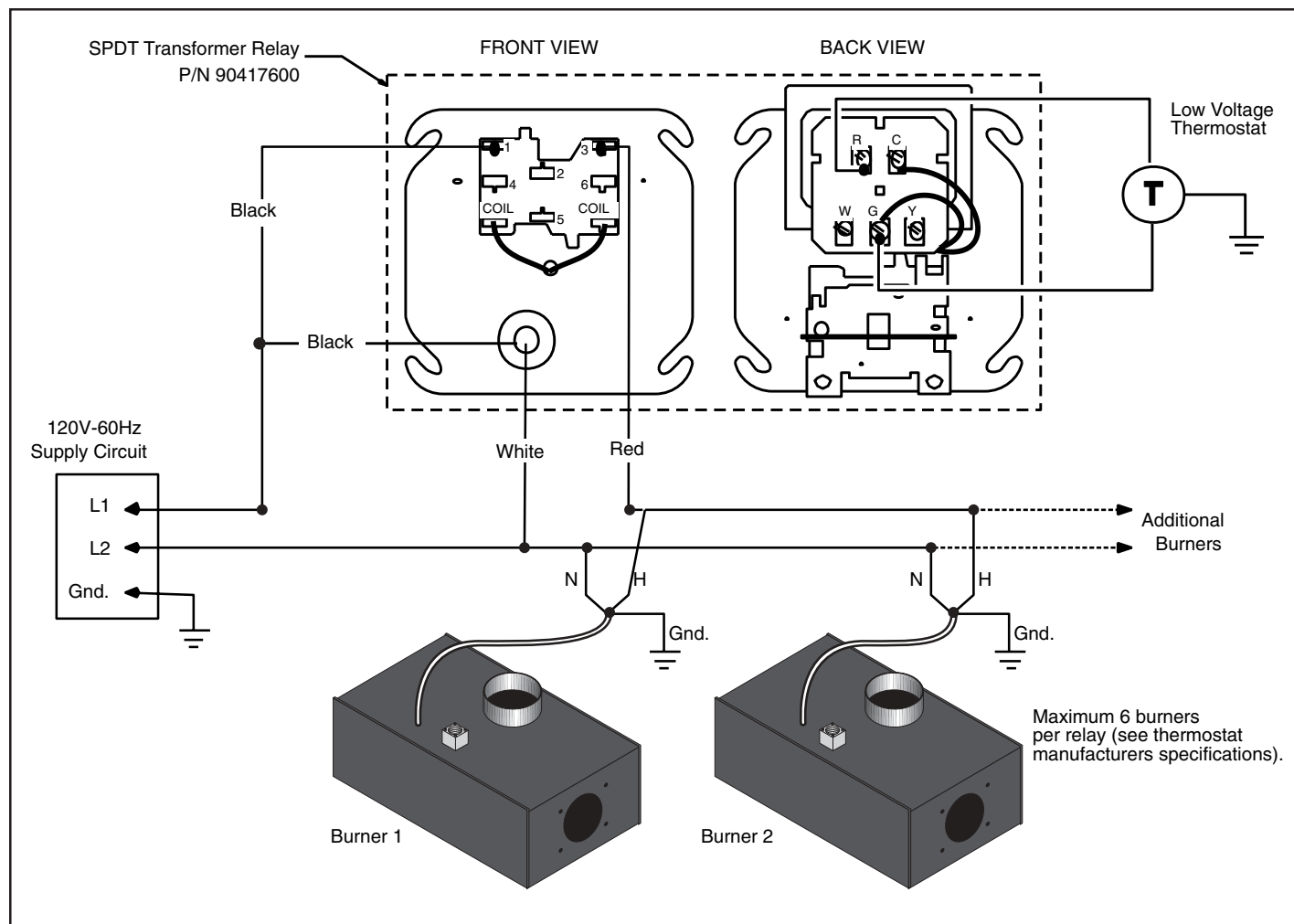
This appliance must be connected to a properly grounded electrical source.

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

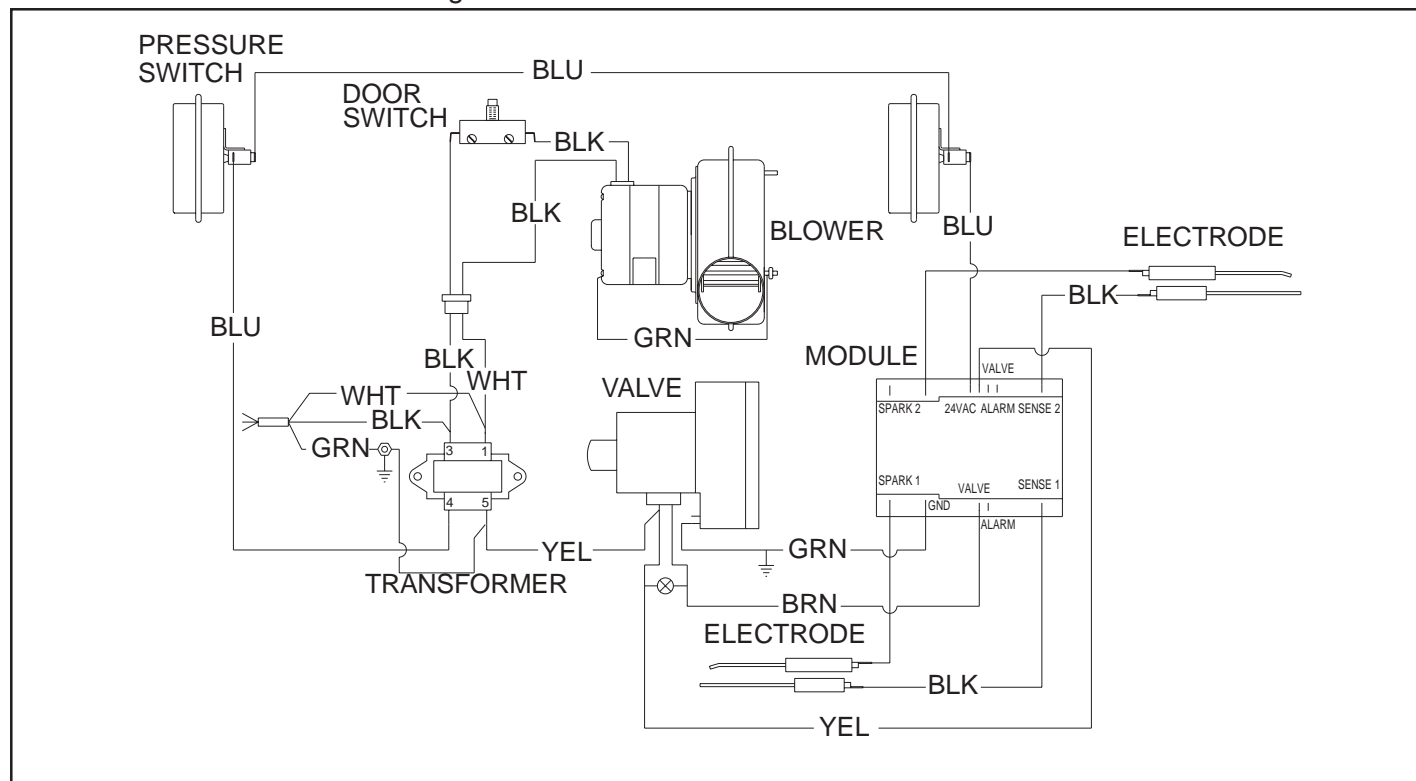
Heaters are normally controlled by thermostats. Line voltage thermostats are wired directly (see *Section 11.1* shown below); the recommended 24V thermostats use a relay (see *Page 25, Section 11.2*). Heaters may also be controlled with a manual line voltage switch or timer switch in place of the thermostat. Heaters must be grounded in accordance with applicable codes: **United States:** refer to *National Electrical Code®* ANSI/NFPA 70 - latest revision **Canada:** refer to Canadian Electrical Code CSA C22.1 Part I - latest revision.

11.1 – Line Voltage Thermostat Wiring

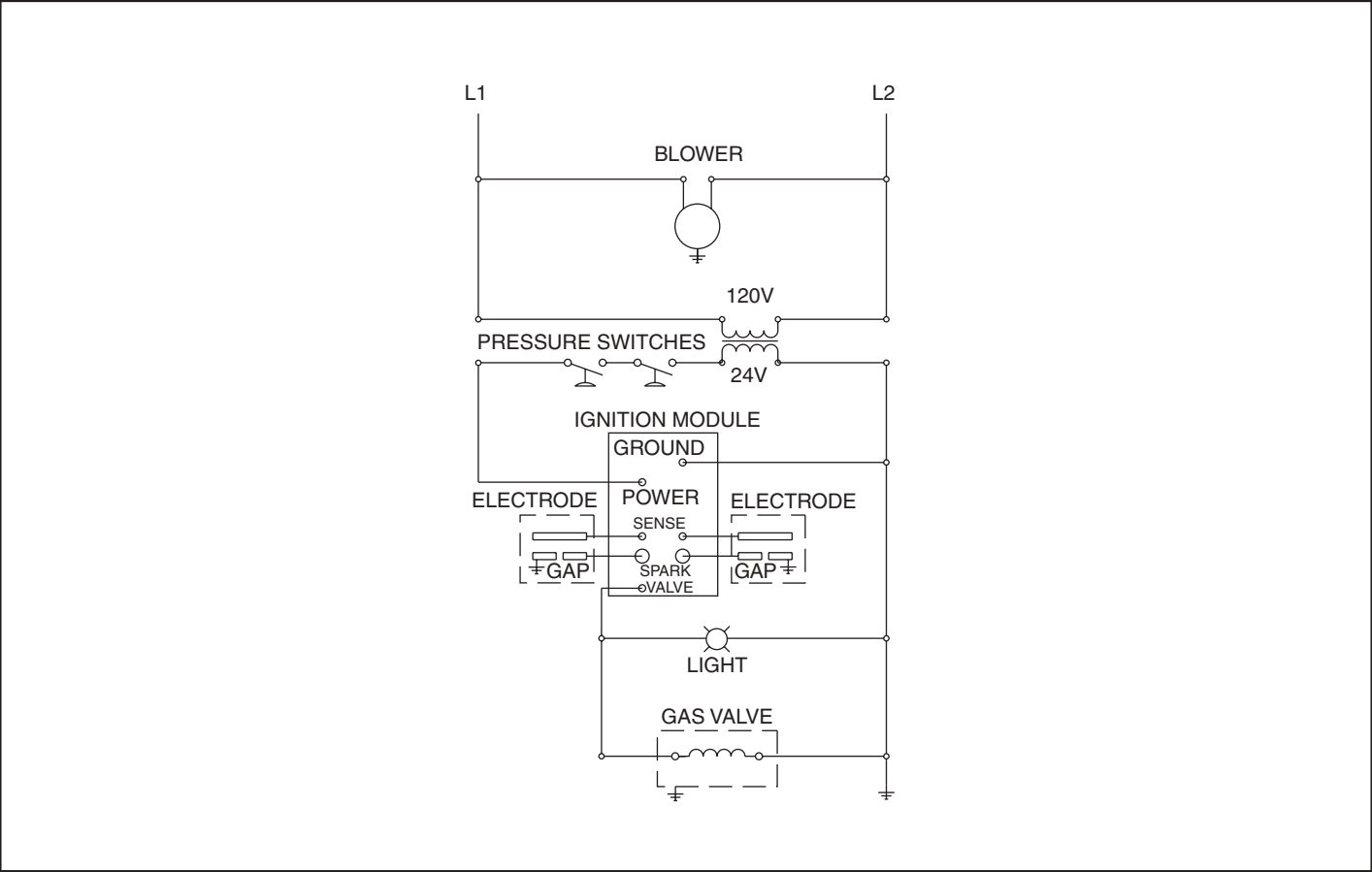
11.2 – Low Voltage Thermostat and Relay Wiring



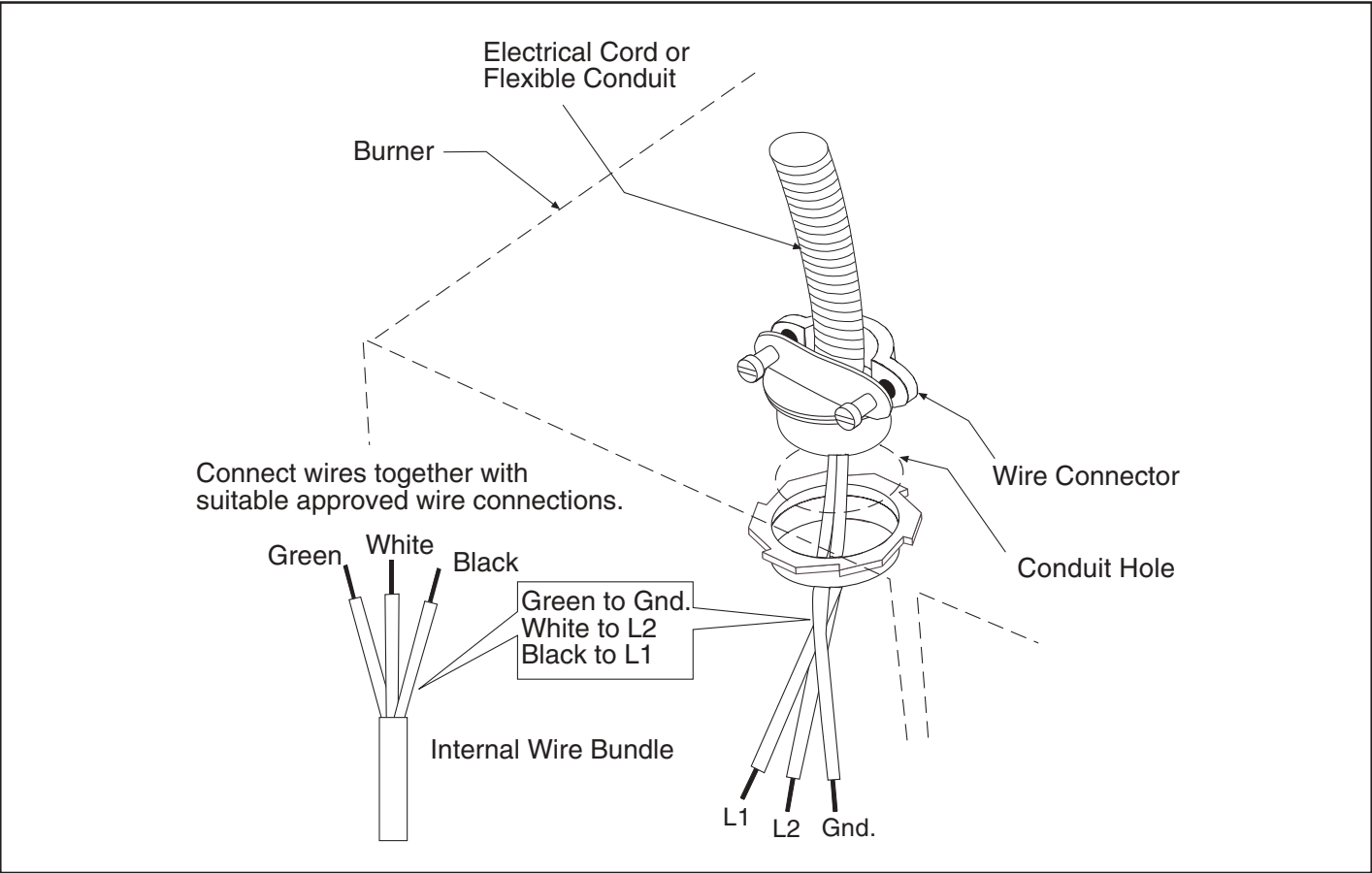
11.3 – VAL-CO. VTF Internal Wiring



11.4 – VAL-CO. VTF Ladder Diagram



11.5 – Electrical Connection to the Burner



►SECTION 12: OPERATION AND MAINTENANCE

The VAL-CO.VTF series heater is equipped with a dual direct spark ignition system.

12.1 Sequence of Operation

Turn the thermostat up, the blower motor will energize.

When the motor reaches nominal operating RPM, the pressure switches will close and activate the ignition module.

After a 45 second purge period, the ignition module then opens the gas valve and energizes both spark igniters. The light will be illuminated at any time the gas valve is energized.

When both flames are established, the sparking sequence ceases.

If both flames are not established during the ignition sequence, the ignition module closes the gas valve and purge begins. The module will try two additional times for ignition with purge between trials. If ignition is not established during either of these trials, the module will lock out.

After lock out has occurred, the ignition module must be re-set by turning down the thermostat (disconnecting power) for five seconds, and raising it again to the desired temperature.

When the thermostat is satisfied, all power to the heater is shut off.

12.2 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.

Disconnect gas and electric supplies before performing service or maintenance.

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 safety and best performance, the gas, electrical, thermostat connections, tubing, venting, suspensions and overall heating system condition are some of the areas requiring inspection.

Please see the chart on *Pages 28 and 29, Section 12* for suggested items to inspect.

REMEMBER TO CHECK:

Installation, Service and Annual Inspection of the 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.

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. <i>See Page 2, Section 3.</i>
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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, in between the heat exchanger tubes or in the decorative or protective grilles (included with select models). Immediately remove objects in violation of the clearances to combustibles. <i>See Page 2, Section 3.</i>
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Reflector	Make sure there is no dirt, sagging, cracking or distortion. Make sure reflectors are correctly overlapped. <i>See Page 14, Figure 7.</i> Clean outside surface with a damp cloth.
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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. <i>See Pages 18-22, Section 9.</i>
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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. <i>See Pages 9-14, Section 7.</i> Make sure there is no sagging, bending or distortion.
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Gas Line	Check for gas leaks according to <i>Page 23, Section 10.</i>
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Burner Observation Window	Make sure it is clean and free of cracks or holes. Clean and replace as required.
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Blower Scroll, Wheel and Motor	Compressed air or a vacuum cleaner may be used to clean dust and dirt.
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Burner Cup and Orifice	Clear of obstructions (even spider webs will cause problems). Carefully remove any dust and debris from the burner.
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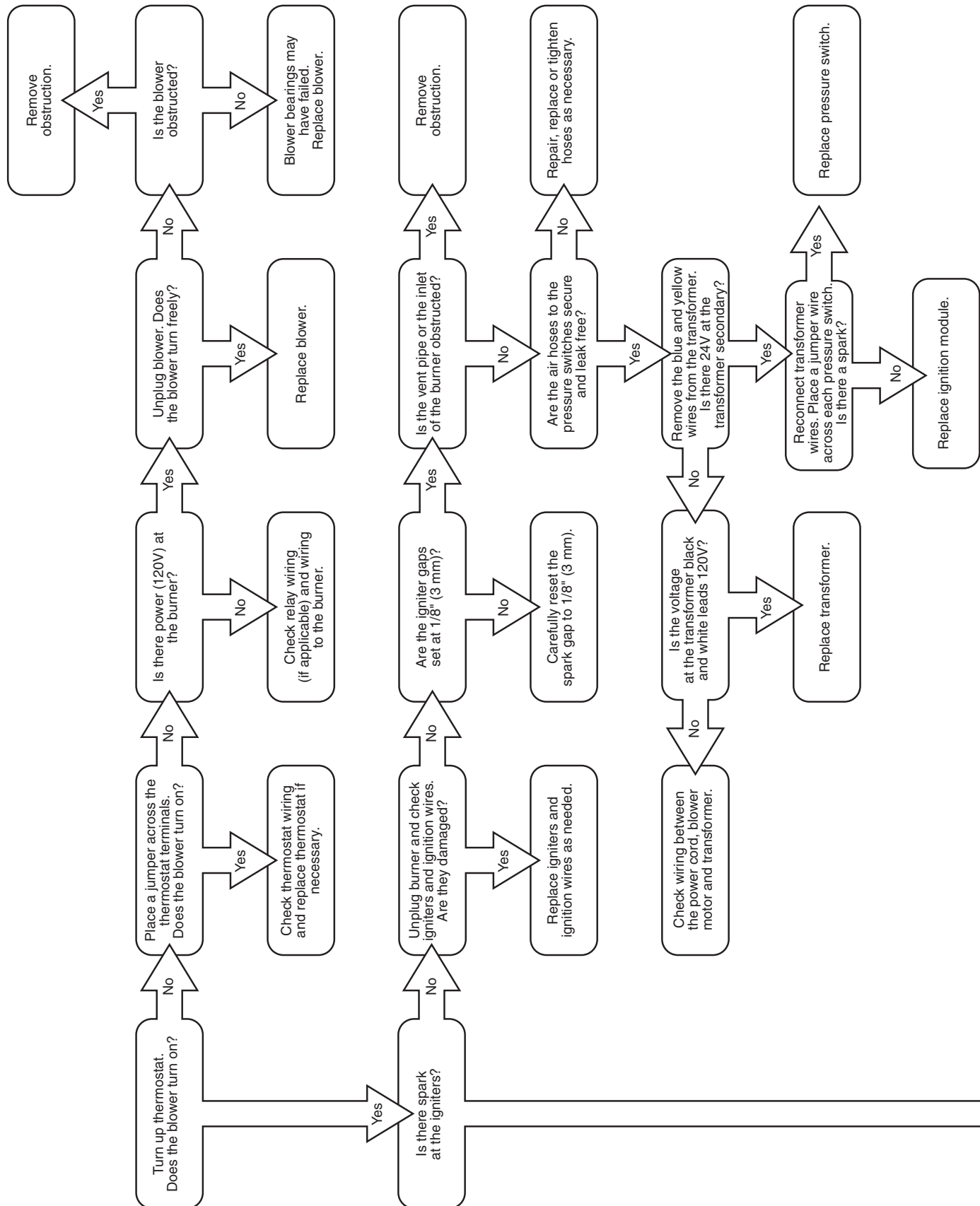
Electrodes	Replace if there are cracked ceramics, excessive carbon residue, or erosion of the electrodes. The electrode gap should be .125" (32 mm).
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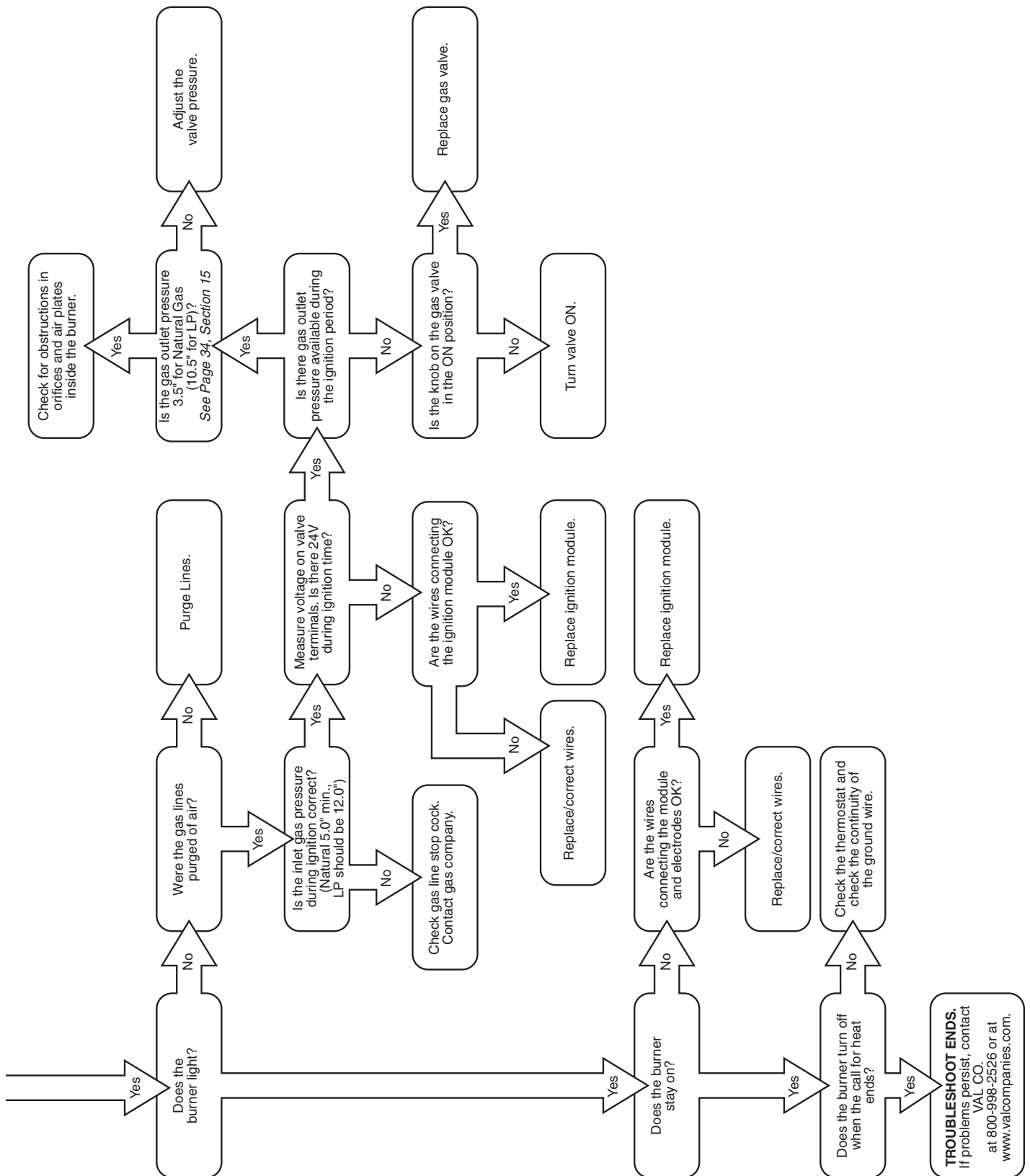
Thermostat	There should be no exposed wire or damage to the thermostat. <i>See Pages 24-26, Section 11.</i>
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Suspension Points	Make sure the heater is hanging securely. Look for signs of wear on the chain or ceiling. <i>See Page 9, Section 7.</i>
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► SECTION 13: TROUBLESHOOTING

13.1 Troubleshooting Flow Chart

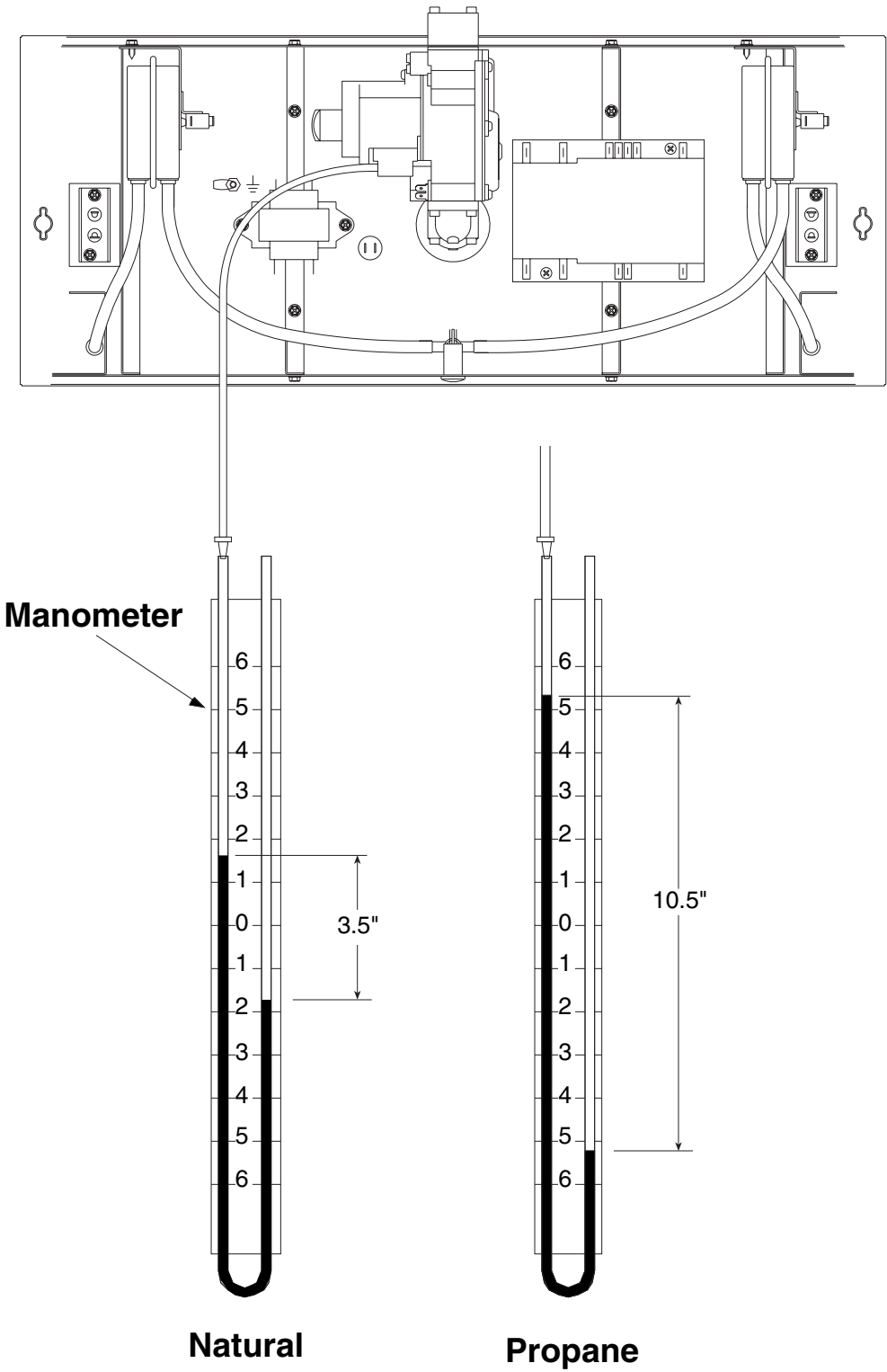




TROUBLESHOOT ENDS.
If problems persist, contact
VAL CO.
at 800-998-2526 or at
www.valcompanies.com.

13.2 Manifold Gas Pressure Setting

Control Side View of Heater

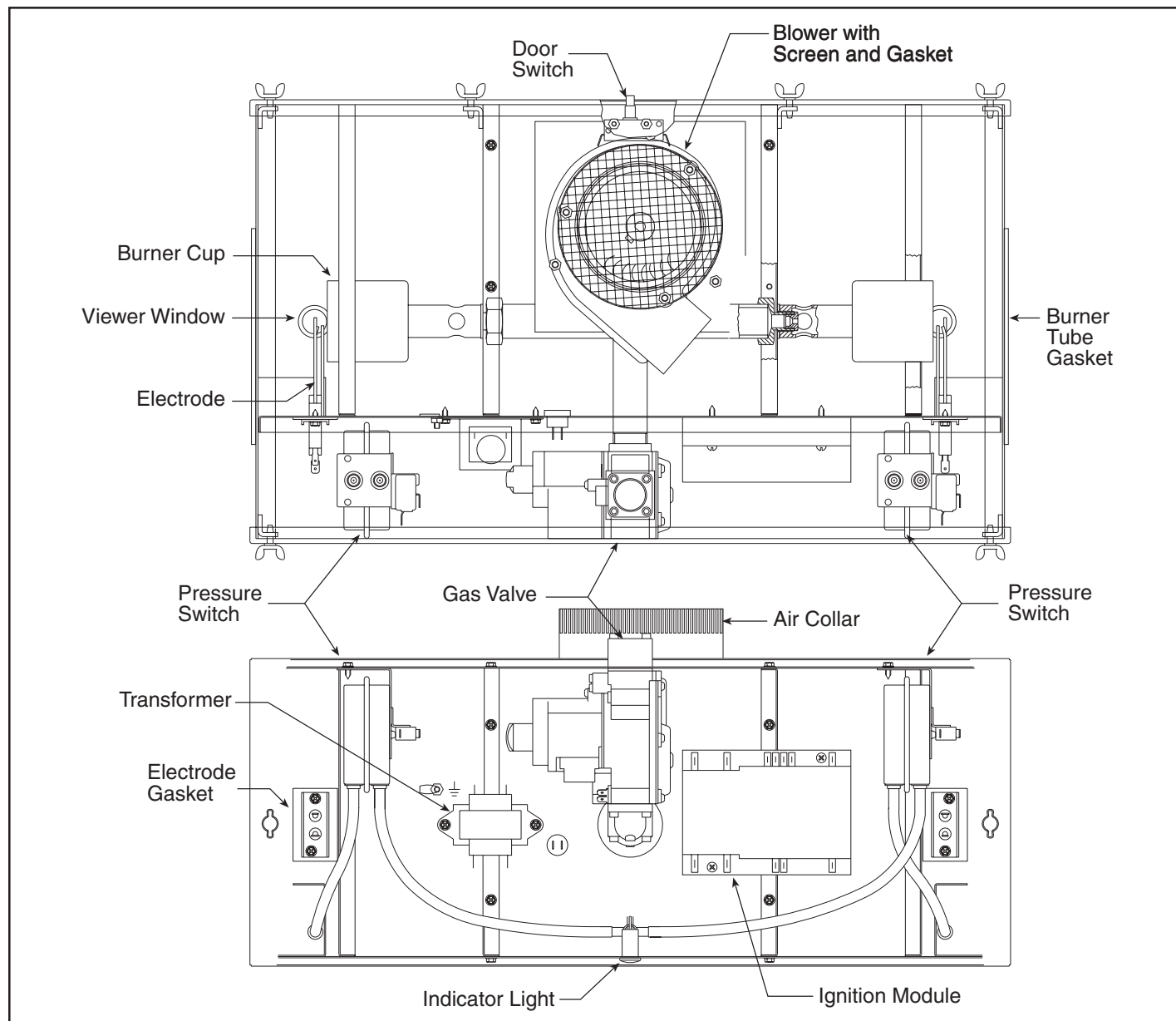


►SECTION 14: REPLACEMENT PARTS

Use only genuine VAL-CO. replacement parts.

Use of parts not specified by VAL-CO. voids warranty.

Failure to follow these instructions can result in property damage.

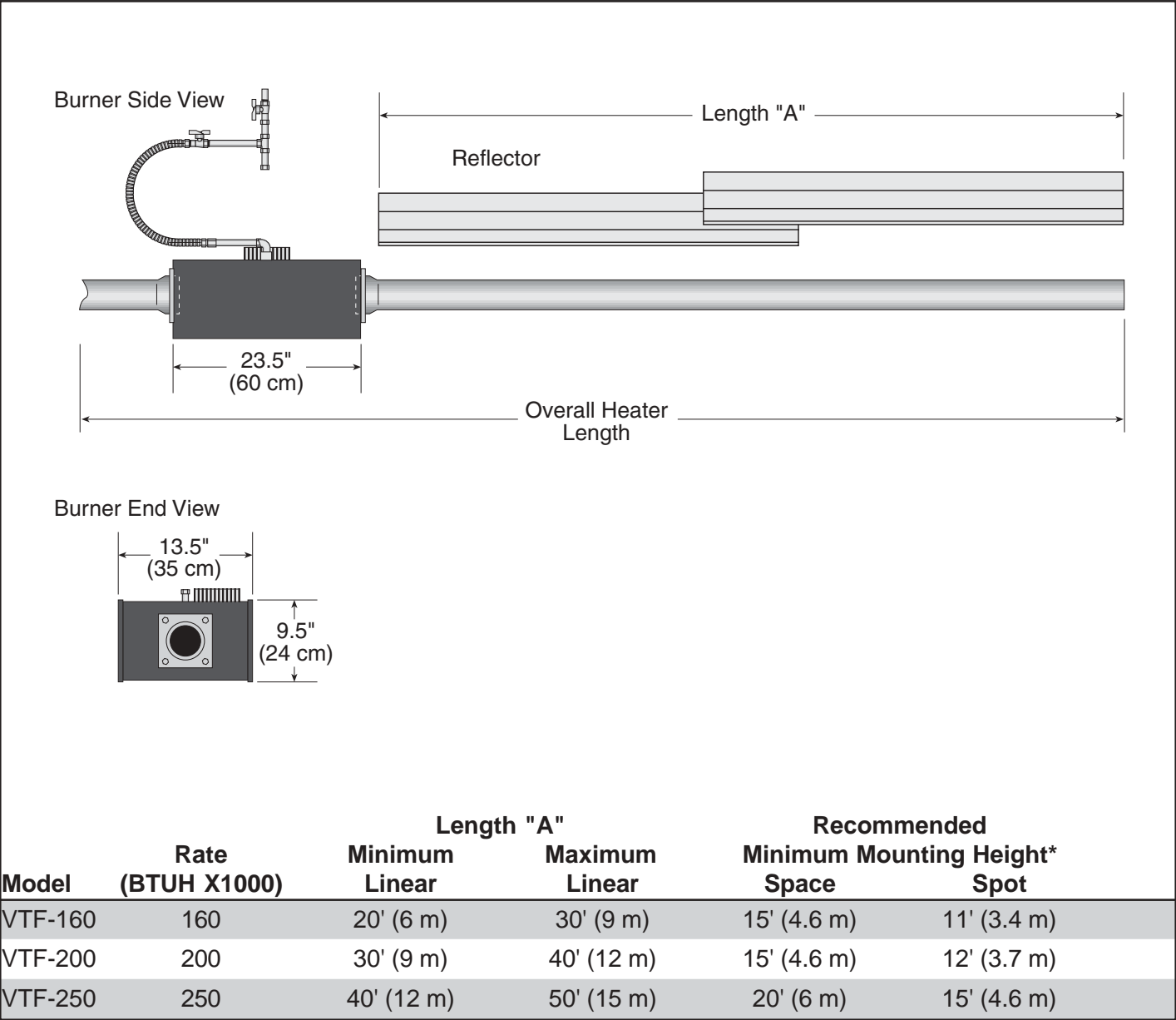


Description	Part Number
Gas Valve (Natural)	90033700
Gas Valve (LP)	90033701
Gasket	
VTF-160/200/250	09060000
Screen	
VTF-160/200/250	09050000
Blower	
VTF-160/200/250	90710400
Burner Cup	03020100
Viewer Window	02553203
Electrode	90427403

Description	Part Number
Ignition Module	90434007
Electrode Gasket	02558501
Indicator Light	91316102
Transformer	90436900K
Snap Switch	90436800
Air Collar	
VTF-200/250	91911701
Burner Tube Gasket	02568200
Pressure Switch	
VTF-160/200	90439806K
VTF-250	90436719

►SECTION 15: GENERAL SPECIFICATIONS

General Specifications for VAL-CO. VTF heaters are as follows



* See Page 3, Section 3 for clearances to combustibles.

GAS PRESSURE AT MANIFOLD:

Natural Gas: 3.5" w.c.
LP Gas: 10.5" w.c.

GAS INLET PRESSURE:

Natural Gas: 5.0" w.c. Minimum 16.0" w.c. Maximum
LP Gas: 12.0" w.c. Minimum 16.0" w.c. Maximum

PIPE CONNECTION:

3/4" NPT

ELECTRICAL RATING:

120V - 60 Hz., 1.0 Amp

DIMENSIONS:

Vent Connection Size: 4" or 6" (10 or 15 cm)
Outside Air Connection Size: 4" or 5" (10 or 13 cm)
Refer to figure above for dimensional information.

