



NOTICE:

The information contained on the following page(s) was produced prior to May 1, 2014. On that date Reznor became part of Nortek, Inc.

References to any other company affiliations are no longer valid.



Sizes 45, 60 and 75 are certified to CSA Requirement 10-96 for RESIDENTIAL INSTALLATION

REZNOR

Thomas & Betts

Model SFT Gas-Fired, Separated-Combustion, Power-Vented Unit Heaters

INSTALLATION FORM RZ-I-SFT
Obsoletes Form RZ 432 (Version C)

APPLIES TO: Installation/Operation/Service

Models SFT 45, 60 and 75 are certified for both residential and commercial/industrial installations.
Models SFT 100-300 are certified for commercial/industrial installations only.

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REFERENCES: Replacement Parts, Form RZ-NA-P-FT/SFT
 Gas Conversion, Form RZ-NA-I-FT/SFT/GC

FOR YOUR SAFETY

What to do if you smell gas:

- Do not try to light any appliance.
- Do not touch any electrical switch; do not use any phone in your building.
- Immediately call your gas supplier from a neighbor's phone. Follow the gas supplier's instructions.
- If you cannot reach your gas supplier, call your fire department.


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

WARNING: Improper installation, adjustment, alteration, service, or maintenance can cause property damage, injury, or death. Refer to this manual. For assistance or additional information, consult a qualified installer, service agency, or the gas supplier.

WARNING: Gas-fired appliances are not designed for use in hazardous atmospheres containing flammable vapors or combustible dust. See Hazard Levels, page 2.

GENERAL

Installation should be done by a qualified agency in accordance with the instructions in this manual and in compliance with all codes and requirements of authorities having jurisdiction. The instructions in this manual apply to the separated-combustion unit heater model shown below.

Model	Description	
SFT	Separated-Combustion, Fan-Type, Suspended Unit Heater	

All sizes of Model SFT heaters are design-certified by the Canadian Standards Association (CSA) to ANSI Z83.8a and CGA 2.6a for industrial/commercial installations in the United States and Canada. Models SFT 45, 60 and 75 are approved by the Canadian Standards Association to CSA 10-96 for residential installations in both the United States and Canada. All heaters are available for use with either natural or propane gas. The type of gas, the firing rate, and the electrical characteristics are on the unit rating plate.

GENERAL (Cont'd)

These separated combustion units are designed and manufactured in accordance with the ANSI definition of separated combustion. That definition reads, "Separated Combustion System Appliance: A system consisting of an appliance and a vent cap(s) supplied by the manufacturer, and (1) combustion air connections between the appliance and the outside atmosphere, and (2) flue gas connections between the appliance and vent cap, of a type(s) specified by the manufacturer but supplied by the installer, constructed so that, when installed in accordance with the manufacturer's instructions, air for combustion is obtained from the outside atmosphere and flue gases are discharged to the outside atmosphere."

Separated combustion units are designed to separate the air for combustion and the flue products from the environment of the building in which the unit is installed. Separated combustion appliances are recommended for use in dust laden and some corrosive fume environments or in buildings with negative pressure (up to .15" w.c.). As the definition states, all separated combustion, power-vented equipment must be equipped with both combustion air and exhaust piping to the outdoors.

WARNING: Model SFT separated combustion units are not designed or approved for use in atmospheres containing flammable vapors or combustible dust. See Hazard Levels, below.

WARNING: Should overheating occur or the gas supply fail to shut off, shut off the manual gas valve to the appliance before shutting off the electrical supply.

WARNING: Do not use this appliance if any part has been under water. Immediately call a qualified service technician to inspect the appliance and replace any gas control which has been under water.

HAZARD INTENSITY LEVELS

- 1. DANGER: Failure to comply will result in severe personal injury or death and/or property damage.**
 - 2. WARNING: Failure to comply could result in severe personal injury or death and/or property damage.**
 - 3. CAUTION: Failure to comply could result in minor personal injury and/or property damage.**
-

1. Installation Codes

These units must be installed in accordance with local building codes. In the absence of local codes, in the United States, the unit must be installed in accordance with the National Fuel Gas Code ANSI Z223.1a (latest edition). A Canadian installation must be in accordance with the CAN/CGA B149.1 and B149.2 Installation Code for Gas Burning Appliances and Equipment. These codes are available from CSA Information Services, 1-800-463-6727. Local authorities having jurisdiction should be consulted before installation is made to verify local codes and installation procedure requirements.

Special Commercial Installations (Aircraft Hangars/Repair Garages/Parking Garages)

Installations in aircraft hangars should be in accordance with ANSI/NFPA No. 409 (latest edition), Standard for Aircraft Hangars; in public

garages in accordance with ANSI/NFPA No. 88A (latest edition), Standard for Parking Structures; and for repair garages in accordance with ANSI/NFPA No. 88B (latest edition), Standard for Repair Garages. ANSI/NFPA-88 (latest edition) specifies overhead heaters must be installed at least eight feet above the floor. In Canada, installations in aircraft hangars should be in accordance with the requirements of the enforcing authorities, and in public garages in accordance with CAN/CGA B149 codes.

ANSI/NFPA 409 (latest edition) specifies a clearance of ten feet to the bottom of the heater from the highest surface of the top of the wing or engine enclosure of whatever aircraft would be the highest to be housed in the hangar, and a minimum clearance of eight feet from the floor in other sections of aircraft hangars, such as the offices, and shops which communicate with areas used for servicing or storage. The heaters must be located so as to be protected from damage by aircraft or other objects such as cranes and movable scaffolding. In addition, the heaters must be located so as to be accessible for servicing, adjustment, etc.

2. Warranty

Refer to the limited warranty information on the warranty form in the "Owner's Envelope".

Warranty is void if ...

- Wiring is not in accordance with the diagram furnished with the heater.
 - The unit is installed without proper clearance to combustible materials.
 - The heater is connected to a duct system or if the air delivery system is modified.
-

3. Uncrating and Preparation

This unit was test operated and inspected at the factory prior to crating and was in operating condition. If the heater has incurred any damage in shipment, document the damage with the transporting agency and immediately contact your Reznor Distributor.

Check the rating plate for the gas specifications and electrical characteristics of the heater to be sure that they are compatible with the gas and electric supplies at the installation site.

Read this booklet and become familiar with the installation requirements of your particular heater. If you do not have knowledge of local requirements, check with the local gas company or any other local agencies who might have requirements concerning this installation.

Before beginning, make preparations for necessary supplies, tools, and manpower. If the installation includes optional vertical louvers or a downturn nozzle, install these options before the heater is suspended. Follow the instructions included in the option package; option packages are shipped separately.

If the heater is to be operated at an altitude above 2000 ft (610M), a pressure adjustment may be required. See Paragraph 4.

Concentric Adapter Kits for combustion air and venting (Option CC2 or Option CC6)

The concentric adapter is a *required* component in the installation of all Model SFT heaters. The kit is shipped in a separate carton. Be sure that the concentric adapter carton is at the installation site. A horizontal vent/combustion air kit including the concentric adapter is identified as Option CC6. A vertical vent/combustion air kit including the concentric adapter is identified as Option CC2. See the parts lists in Paragraph 9.

4. High Altitude Operation

If the heater is being installed in an altitude above 2000 ft (610M), check the rating plate to determine what must be done to prepare the heater for high altitude operation.

Check the rating plate, determine which circumstance below applies, and follow the instructions.

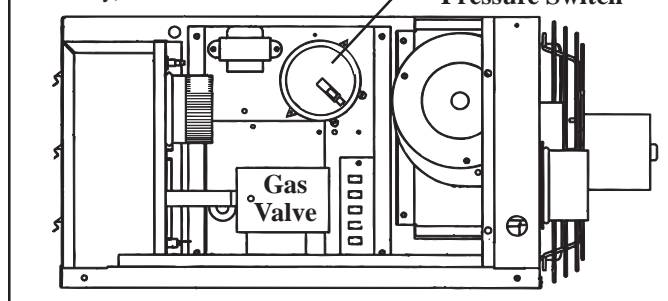
- If the altitude range on the rating plate **agrees with the altitude at the site**, no further action is required. Proceed with the installation.
- If the altitude range on the rating plate **reads "Sea Level" and the altitude at the site is between 2000 ft and 6000 ft (610M to 1830M)**, install the heater and follow the instructions in Paragraph 10 to derate by manifold gas pressure adjustment.
- If the altitude range on the rating plate **reads "Sea Level" and the altitude at the site is above 6000 ft (1830M)**, in addition to adjusting the manifold pressure, it will be necessary to replace the combustion air pressure switch. Order the appropriate switch from the list below and replace the switch before suspending the heater.

After the heater is installed, follow the instructions in Paragraph 10 to derate by adjusting the manifold gas pressure.

High Altitude (above 6000 ft) Combustion Air Pressure Switches		
SFT	P/N	Description
45-75	173316	Orange Label, -.55", #PPS10143-290
100-125	173315	Gray Label, -.35", #PPS10143-2907
150-300	173312	White Label, -.60", #PPS10143-2904



Figure 1 - Model SFT with Access Panel Open showing Combustion Air Pressure Switch
(flexible combustion air hose removed for clarity)



If the heater is going to be de-rated by adjusting the manifold pressure, find the label in the owner's envelope. When the adjustment is completed, fill-in the correct pressure setting with permanent marker and adhere the label to the heater in a conspicuous location close to the gas valve.

5. Unit Heater Location

For best results, the heater should be placed with certain rules in mind. In general, a unit should be located from 8 to 12 feet (2.4 to 3.6 M) above the floor. Units should always be arranged to blow toward or along exposed wall surfaces, if possible. Where two or more units are installed in the same room, a general scheme of air circulation should be maintained.

Suspended heaters are most effective when located as close to the working zone as possible, and this fact should be kept in mind when determining the mounting heights. However, avoid directing the discharged air directly on the room occupants.

Partitions, columns, counters, or other obstructions should be taken into consideration when locating the unit heater so that a minimum quantity of airflow will be deflected by such obstacles.

When units are located in the center of the space to be heated, the air should be discharged toward the exposed walls. In large areas, units should be located to discharge air along exposed walls with extra units provided to discharge air in toward the center of the area.

At those points where infiltration of cold air is excessive, such as entrance doors and shipping doors, it is desirable to locate the unit so that it will discharge directly toward the source of cold air from a distance of 15 to 20 feet (4.5 to 6 M).

CAUTION: Do not locate the heater where it may be exposed to water spray, rain, or dripping water.

6. Clearances

This heater **must** be installed so that the clearances in the table below are provided for required spacing from combustible construction and for service and inspection. Clearance to combustibles is defined as the minimum distance from the heater to a surface or object that is necessary to ensure that a surface temperature of 90°F above the surrounding ambient temperature is not exceeded.

Required Clearances - inches (mm)

Model SFT	45, 60, 75	100, 125, 150, 200	250, 300
Top	1 (25)	6 (152)	6 (152)
Flue Connector	6 (152)	6 (152)	6 (152)
Access Panel	20 (508)	24 (610)	24 (610)
Non-Access Side	1 (25)	6 (152)	6 (152)
Bottom*	1 (25)	1 (25)	1 (25)
Rear	18 (457)	18 (457)	24 (610)

*A Model SFT 45, 60, or 75 installed in a residential garage must be installed with a minimum clearance above the floor of 18 inches (457mm). Sizes 100-300 are not certified for residential installations.

7. Suspending the Heater

Before suspending the heater, check the supporting structure to be used to verify that it has sufficient load-carrying capacity to support the weight of the unit.

Net Weight - lbs and kg

Size	45	60	75	100	125	150	200	250	300
lbs	85	110	120	148	153	216	226	272	294
kg	39	50	54	67	69	98	103	123	133

When the heater is lifted for suspension, support the bottom of the heater with plywood or other appropriately placed material. If the bottom is not supported, damage could occur.

Determine type of suspension to be used:

- **All Sizes** - The heater is equipped with four-point suspension. Two 3/8"-16 threaded nut retainers are located on each side of the heater. See Dimensions in Paragraph 8 and illustration in Figure 2A.
- **Sizes 45, 60, and 75** may be installed with two-point suspension. Follow the illustrated instructions in Figure 2B, page 4.
- **Sizes 45, 60, and 75** may be suspended using an optional ceiling suspension kit. Refer to Figure 2C. Step-by-step instructions are included with the option kit.

WARNING: Suspend any size of Model SFT heater from the threaded nut retainers (Figure 2A). Or, suspend a Size 45, 60, or 75 as illustrated in Figure 2B or using the Ceiling Suspension Kit in Figure 2C.

DO NOT suspend any heater from the heater cabinet panels.

7. Suspending the Heater (cont'd)

WARNING: Unit must be level for proper operation. Do not place or add additional weight to the suspended heater. See Hazard Levels, page 2.

Figure 2A - Four-point Suspension
(applies to all sizes)

Be sure that the threaded hanger rods are locked to the heater as illustrated. Recommended maximum hanger rod length is 6 feet (1829mm).

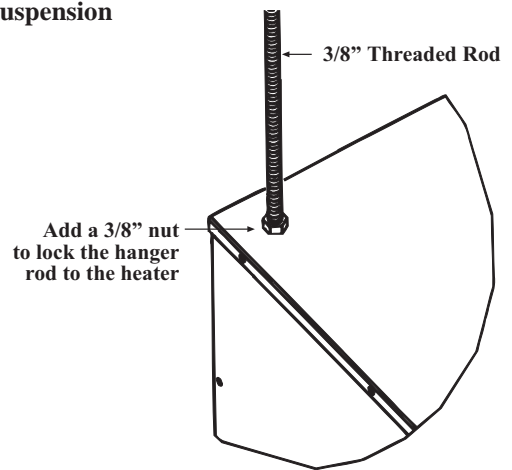


Figure 2B - Two-point Suspension - Applies to Sizes 45, 60, and 75 only

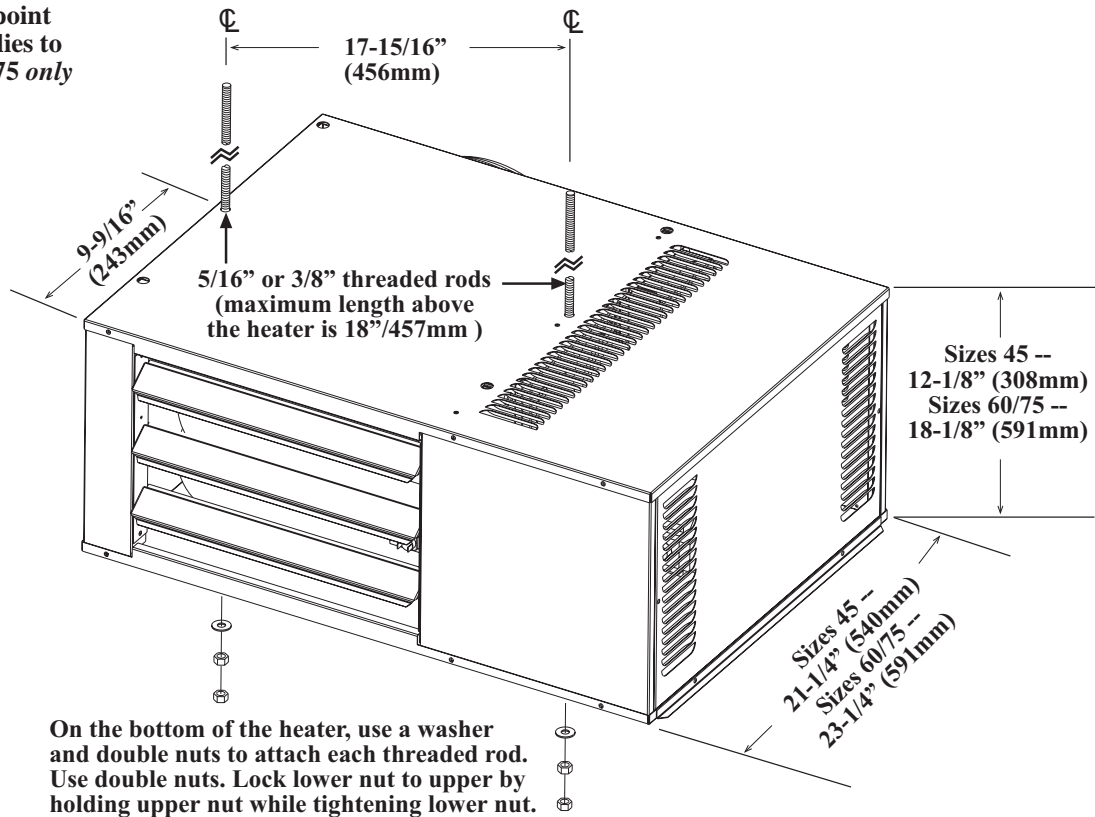
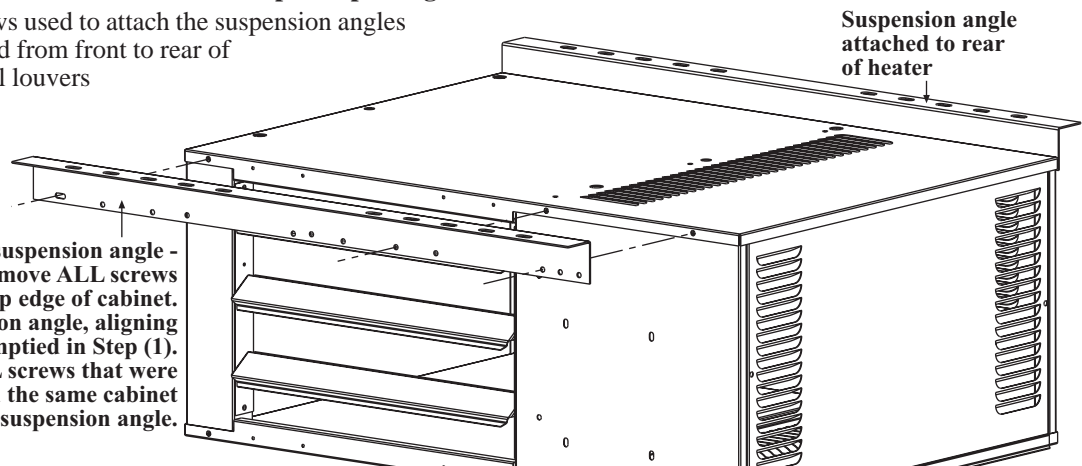


Figure 2C - Suspending with Ceiling Suspension Kit, Option CK22.
When suspending, use a minimum of two anchor points per angle.

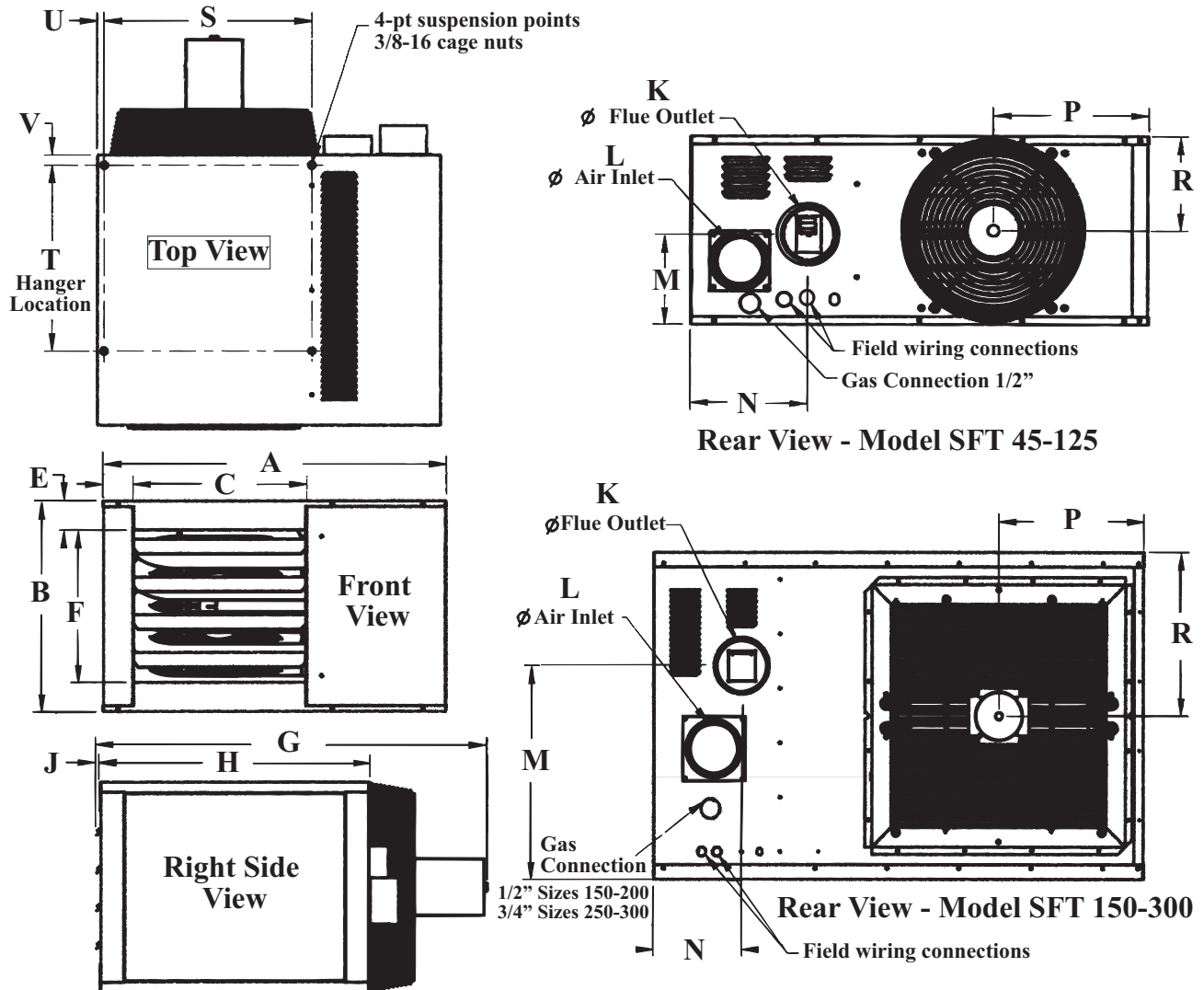
NOTES: Quantity of screws used to attach the suspension angles will vary by heater size and from front to rear of cabinet. If optional vertical louvers are being added, install louvers after suspension angles are attached.

- Attach suspension angle -
- (1) Remove ALL screws across top edge of cabinet.
 - (2) Position suspension angle, aligning holes with same holes emptied in Step (1).
 - (3) Using ALL screws that were removed and the same cabinet holes, attach suspension angle.



8. Dimensions

Figure 1



Dimensions (inches ± 1/8")

Size	A	B	C	D	E	F	G	H	J	K	L	M	N	P	R	S	T	U	V
45	29-5/8	12-1/8	15	2-5/8	1	10-1/8	26-1/4	21-1/4	3/8	4	3	5-3/4	7-5/8	10	6	18	16	1/2	3/4
60-75	29-5/8	18-1/8	15	2-5/8	2-1/2	16-1/8	31-3/8	23-1/4	3/8	5	4	10-1/2	8	10	9	18	16	1/2	3/4
100	38	22	20-5/8	2-1/4	5	12	33-1/2	25-3/8	1	5	4	11	9-1/2	13-1/4	11	24-1/4	16	1/2	4-5/8
125	38	22	20-5/8	2-1/4	3-5/8	14-3/4	33-1/2	25-3/8	1	5	4	11	9-1/2	13-1/4	11	24-1/4	16	1/2	4-5/8
150	38	33	20-5/8	2	6	21	34	25-3/8	1	5	5	21-3/4	9-1/4	13	16-1/2	24-1/4	16	1/2	4-5/8
200	38	33	20-5/8	2	4-1/2	24	34	25-3/8	1	5	5	21-3/4	9-1/4	13	16-1/2	24-1/4	16	1/2	4-5/8
250	51-1/4	33	34-1/2	2	4-1/2	21	35-3/8	25-3/8	1	5	5	21-1/2	9-1/4	15-1/8	16-1/2	29-3/8	16	8-1/2	4-5/8
300	51-1/4	33	34-1/2	2	4-1/2	24	35-3/8	25-3/8	1	6	6	22	9-1/4	15-1/8	16-1/2	29-3/8	16	8-1/2	4-5/8

Dimensions (mm ± 3)

Size	A	B	C	D	E	F	G	H	J	K	L	M	N	P	R	S	T	U	V
45	752	308	381	67	25	257	667	540	10	102	76	146	194	254	152	457	406	13	19
60-75	752	308	381	67	64	410	797	591	10	127	102	267	203	254	229	457	406	13	19
100	965	559	524	57	127	305	851	645	25	127	102	279	241	337	279	616	406	13	117
125	965	559	524	57	92	375	851	645	25	127	102	279	241	337	279	616	406	13	117
150	965	559	524	51	152	533	864	645	25	127	127	552	241	330	419	616	406	13	117
200	965	559	524	51	114	610	864	645	25	127	127	552	241	330	419	616	406	13	117
250	1302	559	876	51	114	533	899	645	25	127	127	546	241	384	419	746	406	216	117
300	1302	559	876	51	114	610	899	645	25	152	152	559	241	384	419	746	406	216	117

9. Venting and Combustion Air

All separated combustion, power vented units **MUST BE** equipped with both combustion air and exhaust piping to the outdoors. The unique concentric adapter assembly required with this heater allows for both combustion air and exhaust piping with only one horizontal or vertical penetration hole in the building.

Installation should be done by a qualified agency in accordance with these instructions. The qualified service agency installing this separated-combustion system is responsible for the installation.

The systems illustrated in this manual are the only venting/combustion air systems approved for a Model SFT heater.

Hazards of Chlorine - The presence of chlorine vapors in the combustion air of gas-fired heating equipment presents a potential corrosion hazard. Chlorine found usually in the form of freon or degreaser vapors, when exposed to flame will precipitate from the compound, and go into solution with any condensation that is present in the heat exchanger or associated parts. The result is hydrochloric acid which readily attacks all metals including 300 grade stainless steel. Care should be taken to separate these vapors from the combustion process. This may be done by wise location of unit vent terminals with regard to exhausters or prevailing wind directions. Remember, chlorine is heavier than air. This fact should be kept in mind when determining installation location of these heaters and building exhaust systems.

WARNING: Do not use an existing venting system. This heater requires installation of the combustion air/vent system ordered with the unit (either Option CC2 or Option CC6).

Specific Venting Requirements (*read all before installing*)

1. Concentric Adapter Kit (ordered with the heater as either Option CC2 or Option CC6)

All Model SFT installations *require* a concentric adapter kit. Each kit includes the concentric adapter box (See Figure 4), a vent terminal cap, and an inlet air guard or cap. Follow the instructions on pages 7 - 9 to install a horizontal vent/combustion air system (Option CC6). Follow the instructions on pages 10 - 11 to install a vertical vent/combustion air system (Option CC2).

The vent/combustion air systems illustrated in Figure 6D or 7E are the only venting/combustion air systems approved for this heater.

Figure 4A - Concentric Adapter Box Required with all Model SFT Installations (included in both Option CC2 and Option CC6)

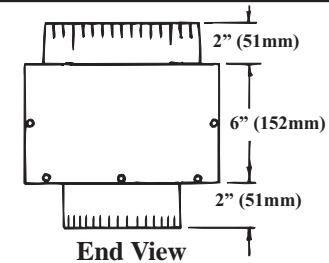
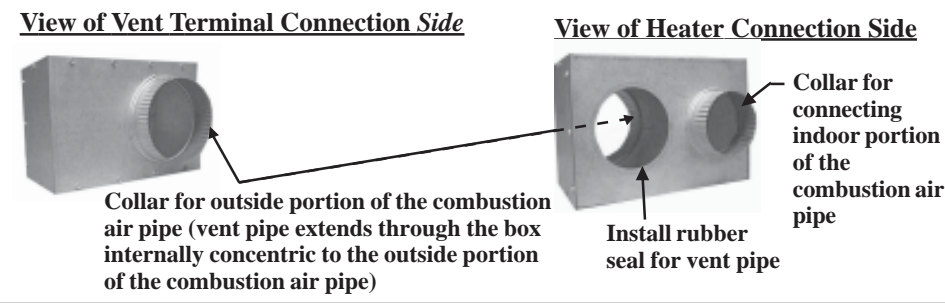
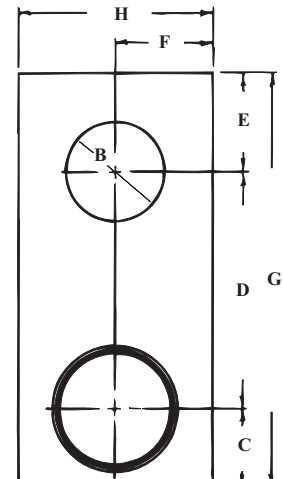
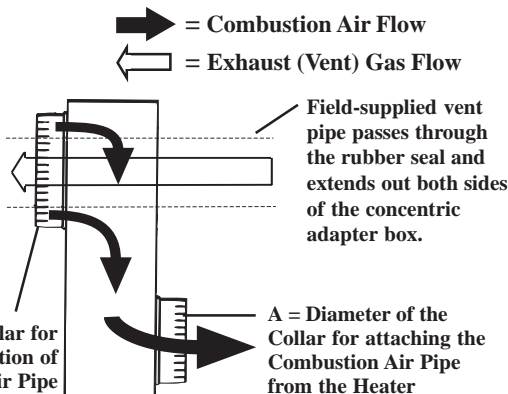


Figure 4B - Concentric Adapter Box Dimensions - inches (mm)

SFT	45-125	150-250	300
A	4 (102)	5 (127)	6 (152)
B	4 (102)	4 (102)	5 (127)
C	3 (76)	4 (102)	4 (102)
D	5-1/2 (140)	7-1/2 (191)	7-1/2 (191)
E	3-1/2 (89)	5 (127)	5 (127)
F	4 (102)	4 (102)	5 (127)
G	12 (305)	16-1/2 (419)	16-1/2 (419)
H	8 (203)	8 (203)	10 (254)
J	6 (152)	6 (152)	8 (203)

Top View of the Concentric Adapter Box Showing Air Flow



Side View - Side of the Adapter Box that Connects to the Heater

J = Diameter of the Collar for attaching the "Outside" Portion of the Combustion Air Pipe

2. Type of Pipe (field-supplied)

Vent Pipe - the type of vent pipe required depends on the type of installation.

Type of Installation	COMMERCIAL/INDUSTRIAL (Harmonized ANSI Z83.8-1996 and Canadian Standard CAN/CGA A 2.6-M96) - Applies to all sizes of Model SFT Heaters	RESIDENTIAL (CSA Requirement 10-96) Applies to Model SFT 45, 60, and 75 ONLY
Type of VENT Pipe Required	Use either vent pipe approved for a Category III appliance OR single-wall, 26-gauge or heavier galvanized (or a material of equivalent durability and corrosion resistance) vent pipe.	Vent pipe approved for a Category III appliance is required .

2. Type of Pipe (field-supplied) (cont'd)

Combustion Air Inlet Pipe Between the Heater and the Concentric Adapter - Sealed, single-wall galvanized pipe is recommended.

Combustion Air Pipe Between the Adapter Box and the Combustion Air Inlet - The vent pipe is internally concentric to the combustion air pipe; use single-wall galvanized pipe for the combustion air pipe.

3. Pipe Diameter and Length - ft (M)

Maximum Pipe Length from Heater to Concentric Adapter - minimum length is five feet (1524 mm)					
Model SFT	Pipe Diameter		Maximum Length	90° Elbow Equals*	45° Elbow Equals*
	Vent	Inlet Air			
45	3" or 4"	3"	30 ft (9.1M)	5 ft (1.5M)	2.5 ft (.8M)
60, 75, 100, 125	4" or 5"	4"	40 ft (12.1M)	5 ft (1.5M)	2.5 ft (.8M)
150, 200	5"	5"	40 ft (12.1M)	5 ft (1.5M)	2.5 ft (.8M)
250	5"	5"	50 ft (15.2M)	5 ft (1.5M)	2.5 ft (.8M)
300	6"	6"	50 ft (15.2M)	5 ft (1.5M)	2.5 ft (.8M)

*Reduce maximum length by this amount for each elbow.

Concentric Pipes (the vent pipe runs through the concentric adapter extending internally concentric through the outdoor portion of the combustion air pipe) - Sizes 45 - 250 require 6" diameter combustion air pipe for the outdoor portion and a 4" vent pipe through the concentric adapter to the terminal; Size 300 requires an 8" diameter combustion air pipe for the outdoor portion and a 5" diameter vent pipe through the concentric adapter to the terminal. Refer to the installation instructions for the concentric adapter kit for length requirements.

4. Joints/Seals

In Pipe Runs - provide pipe as specified in Requirement No. 2 and make joints as follows:

- **If using single wall, 26-gauge or heavier galvanized pipe**, secure slip-fit pipe connections using sheetmetal screws or rivets. Seal all joints. **Seal combustion air pipe** with pressure sensitive tape ordinarily used for warm-air ductwork. Wrap two full turns around each joint. **Seal flue exhaust pipe** with either tape suitable for 550°F (such as Option FA1, P/N 98266) or high-temperature (450°F) silicone sealant.
- **If using Category III vent pipe**, follow the pipe manufacturer's instructions for joining and sealing vent pipe sections.

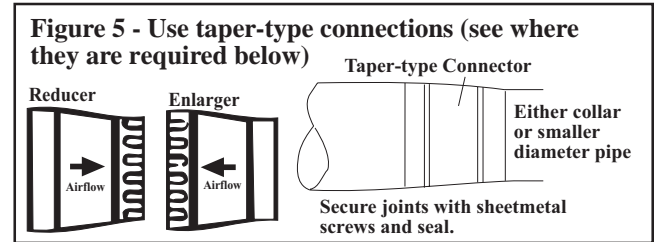
In Concentric Pipes (outdoor portion) from the Adapter Box to Air Inlet and Vent Terminal - Follow the instructions for concentric adapter kit (pages 7 - 9 for a horizontal system or pages 10 - 110 for a vertical system).

Joints Requiring Taper-type Connections (See Figure 5 and Tables that follow) - When the diameter of the pipe in the inlet air or vent pipe

run is different from the connections at either the heater or the concentric adapter box, the joint must be made with a taper-type pipe connector.

When the diameter change is at the heater, install the connector at the collar or no more than 6" (152mm) from the heater.

When the diameter change is at the concentric adapter box, install the connector no more than 6" (152mm) from the opening or collar on the concentric adapter box.



Taper-type connector(s) required in the VENT PIPE RUN					
SFT Size	Vent Pipe Run	Venter Collar on Heater	Reducer required to join venter collar and pipe	Taper-type connection required to join different diameter vent pipes	Vent Pipe through Adapter Box
45	3" dia	4" dia	4" to 3" Reducer	3" to 4" Enlarger	4" dia
	4" dia		None	None	
60-125	4" dia	5" dia	5" to 4" Reducer	None	4" dia
	5" dia		None	5" to 4" Reducer	
150-250	5" dia	5" dia	None	5" to 4" Reducer	4" dia
300	6" dia	6" dia	None	6" to 5" Reducer	5" dia

A taper-type connector is always *required* in the indoor portion of the **INLET AIR PIPE** on Model SFT 45. When using 3" pipe, install the reducer at the concentric adapter. When using 4" pipe, install the reducer at the heater. Other sizes do not require a taper-type connection in the inlet air pipe run.

Size SFT	Inlet Air Pipe	Air Inlet Collar on Concentric Adapter	Reducer required to join concentric adapter collar and pipe	Reducer required to join heater collar and pipe	Inlet Air Collar at Heater
45	3" dia	4" dia	4" to 3" Reducer	None	3" dia
	4" dia		None	4" to 3" Reducer	
60-125	4" dia	4" dia	None	None	4" dia
150-250	5" dia	5" dia	None	None	5" dia
300	6" dia	6" dia	None	None	6" dia

5. Support


Support horizontal runs every six feet (1829mm); do not rely on the heater or the adapter box for support of either horizontal or vertical pipes. Use non-combustible supports on vent pipe.



6. Clearance

Do not enclose the vent pipe or place pipe closer than 6" (152mm) to combustible material.

Instructions and Requirements for Installing a Horizontal Vent Terminal/Combustion Air Inlet (Requires Concentric Adapter Kit, Option CC6)

Horizontal Vent Terminal/Combustion Air Package (Option CC6) includes:

Qty	Size	P/N	Description
1	45-125	157157	Complete Horizontal Vent Kit (Same as Option CC6)
	150-250	157158	
	300	82131	
1	45-125	155118	Concentric Adapter Box Assembly (See Figure 3A)
	150-250	155392	
	300	68404	
1	45-250	155096	Screened Exhaust Assy 
	300	53316	

Qty	Size	P/N	Description
1	45-250	151755	Inlet 
	300	124940	Guard 
4	45-300	37661	#10-16 x 1/2" Ig Screws to attach the inlet guard
1	45-250	164492	4" I.D. Rubber Seal
1	300	164493	5" I.D. Rubber Seal
1	45-300	53335	Tube of High Temperature (450°F) Silicone Sealant

9. Venting and Combustion Air (cont'd)

Installation Requirements for Option CC6 (cont'd)

Field-supplied installation requirements:

- Thimble (a thimble is not required if wall is of non-combustible construction)
- Flashing
- Vent pipes (see requirements on pages 6-7)
- Combustion air pipes (see requirements on page 7)
- Mounting brackets for concentric adapter box (or box may be mounted flush, depending on building construction)
- Taper-type reducers and/or enlargers as required (see requirements on page 7)

Installation Instructions for Option CC6

1. Determine the location on the outside wall for the vent terminal.

In most applications, the terminal would be on a level with the heater mounting height as shown in Figure 6D. Allow 1/4" per foot downward pitch for condensate drain.

The distance of the termination of the horizontal vent from adjacent public walkways, adjacent buildings, openable windows, and building openings must be in accordance with local codes or, in the absence of local codes, must conform with National Fuel Gas Code Z223.2. Local codes supersede all provisions in these instructions and in the National Fuel Gas Code. Minimum clearances for the horizontal vent terminal are shown in the table below.

Structure	Minimum Clearances for Vent Termination Location (all directions unless specified)	
Forced air inlet within 10 ft (3.1m)	3 ft (0.9m) above	
Combustion air inlet of another appliance	6 ft (1.8m)	
Door, window, or gravity air inlet (any building opening)	4 ft (1.2m) horizontally	
	4 ft (1.2m) below	
	1 ft (30cm) above	
Electric meter, gas meter * and relief equipment	4 ft (1.2m) horizontally	
	*Do not terminate the vent directly above a gas meter or service regulator.	
Gas regulator *	3 ft (0.9m)	
Adjoining building or parapet	6 ft (1.8m)	
Adjacent public walkways	7 ft (2.1m) above	
Grade (ground level)	7 ft (2.1m) above	

Products of combustion can cause discoloring of some building finishes and deterioration of masonry materials. Applying a clear silicone sealant that is normally used to protect concrete driveways can protect masonry materials. If discoloration is an esthetic problem re-locate the vent or install a vertical vent.

WARNING: All vent terminals must be positioned or located away from fresh air intakes, doors and windows to preclude combustion products from entering occupied space. See Hazard Levels, page 2.

2. Prepare clearance hole through the outside wall for a 6" diameter pipe (Sizes 45-250) or an 8" diameter pipe (Size 300). Outside wall construction thickness should be between 1" (25mm) minimum and 30" (762mm) maximum. The larger diameter combustion air pipe serves as clearance for the vent pipe on non-combustible construction. A thimble may or may not be required depending on wall construction and/or local codes.

3. Prepare the concentric adapter box.

3a) **Determine whether field-supplied brackets are required.** The box must be positioned so that the distance from the outside of the wall to the box is a minimum of 12" (305mm). Maximum distance is 60" (1524mm). If brackets are used, box should be angled slightly to allow for downward pitch of pipes. If used, attach brackets securely; do not leave any unsealed holes in the adapter box. If brackets are not used, when the box is installed, it should be against the wall.

3b) **Install the rubber seal and the vent pipe.** Locate the vent pipe opening and place the rubber seal around and over the edge of the metal.

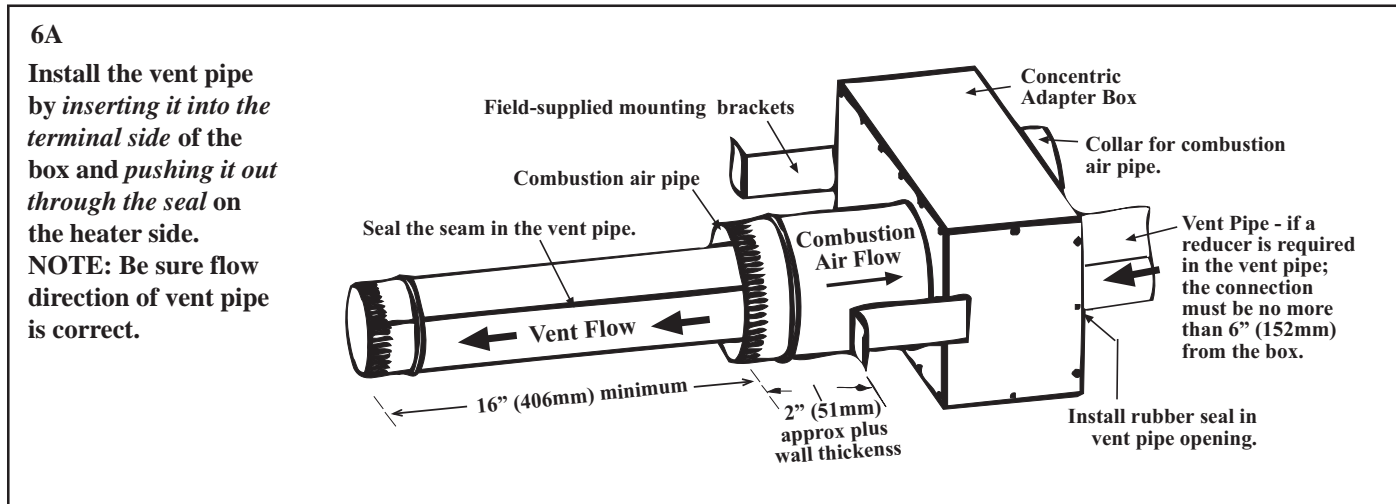
Worksheet - Determine Length of Vent Pipe through the Box

	inches	mm
Heater Side (max if different diameters)	+ 6	152
Width of Box	+ 6	152
Bracket Length	+ —	—
Width of Wall	+ —	—
Terminal Side (min)	+ 18	457
Length of Pipe	=	

Determine the length of the section of vent pipe by adding the requirements. The vent pipe must extend a maximum of 6" (152mm) on the heater side (if a reducer is required); plus 6" (152mm) through the box; plus bracket length; plus the width of the wall; plus a minimum of 18" (457) on the outside (if the inlet pipe extends 2" (51mm) beyond the wall).

Lubricate the seal and pipe with liquid soap or a rubber lubricant. (Installation Tip: Spray cooking oil works well as a lubricant for this task.)

Being sure the pipe is in the proper flow direction, slide the end through the box and push it *out through the rubber seal*. Push evenly using caution not to displace the seal from its position on the edge of the hole. If the rubber seal moves, slide the pipe back slightly, re-position the seal, and slide the pipe through again.

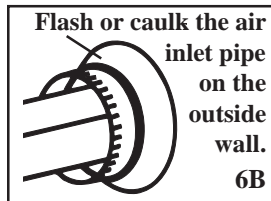


Position the vent pipe so that it will extend a minimum of 16" past the end of the combustion air pipe. See Figure 6A. If a reducer is required, a maximum of 6" (152mm) of vent pipe should extend out the heater side. Any time the pipe is re-positioned, re-check the seal to be sure that it has not rolled. Adjust the pipe and seal until the pipe is the correct length on each side of the box and the seal is over the edge of the hole and tight to the entire circumference of the pipe.

3c) Attach the outside portion of the combustion air pipe to the box. Determine the length by measuring the bracket length (if brackets are used), plus the wall thickness, plus 2" (51 mm). The inlet air pipe should extend beyond the outside wall approximately 2" (51mm).

Attach the inlet air pipe to the collar of the concentric adapter with sheetmetal screws, being careful not to penetrate the vent pipe.

4. Attach the concentric adapter box to the wall. Insert the vent pipe and combustion air pipe through the wall. Push the concentric adapter box flush against the inside wall or attach to the wall with the field-supplied brackets. Caulk or flash inlet air pipe on the outside wall. Flashing is field-supplied.

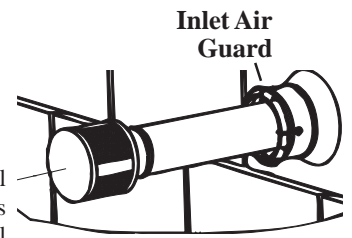


5. Slide the inlet guard over the end of the vent pipe and position it on the end of the combustion air pipe. See Figure 6C. Attach the guard to the inlet air pipe with the four 1/2" lg screws provided.

6. Position the vent cap on the end of the vent pipe. Align the cap so that its baffle strips are positioned on the horizontal and vertical centerlines (See Figure 6C). Attach the exhaust cap to the vent pipe with sheetmetal screws.

First, attach the inlet air guard;
Second, attach the exhaust cap

6C



IMPORTANT: Install exhaust cap with baffles positioned on horizontal and vertical centerlines as illustrated.

7. Horizontal vent terminal/combustion air inlet Option CC6 is installed and ready for connection to the heater. Refer to Figure 6D and verify compliance with all requirements illustrated.

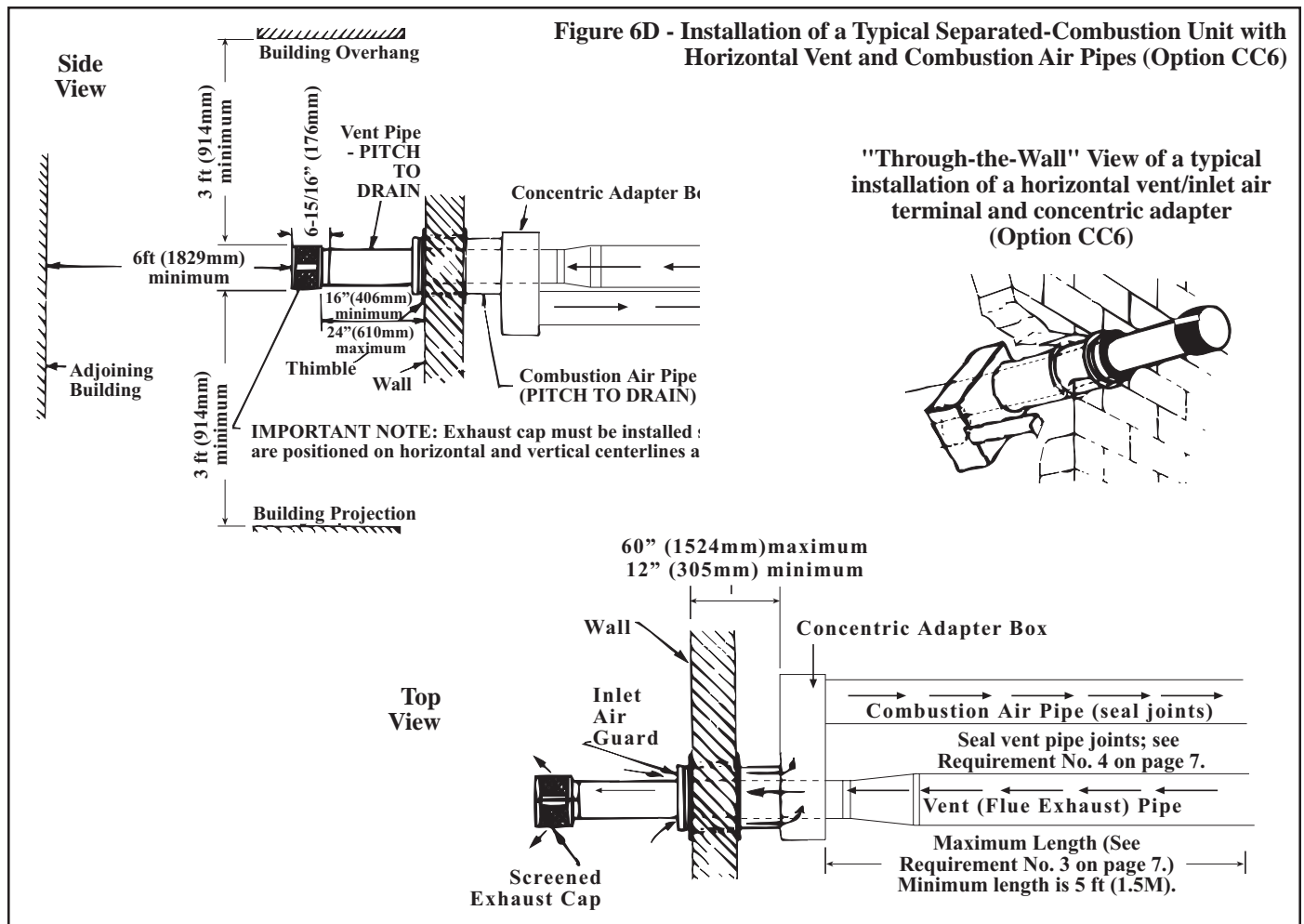
8. Connect the Concentric Adapter Box to the Heater - Use the pipe specified and joints required for type of pipe. If collar or opening at the heater or adapter are different diameters from the pipe (use only diameters allowed on page 7), make joint connection with field-supplied taper-type reducer or increaser.

A minimum of 12" (305 mm) of straight pipe is required at the venter outlet.

Due to the high temperature, do not enclose the exhaust pipe or place pipe closer than 6" (152 mm) to combustible material.

Installation of the horizontal vent and combustion air system on your separated-combustion unit is complete. Verify that all installation requirements are met. Continue to Paragraph 9.

Figure 6D - Installation of a Typical Separated-Combustion Unit with Horizontal Vent and Combustion Air Pipes (Option CC6)





9. Venting and Combustion Air (cont'd)

Installation Requirements for Option CC2

Instructions and Requirements for Installing a Vertical Vent Terminal/Combustion Air Inlet

(Requires Concentric Adapter Kit, Option CC2)

Qty	Size	P/N	Description
1	45-125	157155	Complete Vertical Vent Kit (Same as Option CC2)
	150-250	157156	
	300	54444	
1	45-125	155118	Concentric Adapter Box Assembly (See Figure 3A)
	150-250	155392	
	300	68404	
1	45-250	155631	Exhaust Terminal 
	300	53326	

Qty	Size	P/N	Description
1	45-250	155635	Combustion Air Inlet 
	300	53330	
1	45-250	164492	4" I.D. Rubber Seal
	300	164493	5" I.D. Rubber Seal
1	45-300	53335	Tube of High Temperature (450°F) Silicone Sealant

Field-supplied installation requirements:

- Thimble (a thimble is not required if roof is of non-combustible construction)
- Flashing
- Vent pipes (see requirements on pages 6-7)
- Combustion air pipes (see requirements on page 7)
- Mounting brackets for concentric adapter box (or box may be mounted flush, depending on construction)
- Joint connection reducers and/or enlargers (see requirements on page 7)

Installation Instructions for Option CC2

1. Determine the location for the vent terminal on the roof, allowing room for the concentric adapter box inside. A thimble may or may not be required depending on building construction and/or local codes. Prepare a hole through the roof for the combustion air pipe. The air inlet pipe must be flashed or sealed to the roof. Flashing is to be supplied by the installer as required by roof construction and/or codes.

WARNING: All vent terminals must be positioned or located away from fresh air intakes, doors and windows to preclude combustion products from entering occupied space. See Hazard Levels, page 2.

2. Prepare the concentric adapter box.

2a) Determine whether field-supplied brackets are required.

If used, attach brackets securely; do not leave any unsealed holes in the adapter box. If brackets are not used, when installed the box should be against the roof.

2b) Install the rubber seal and the vent pipe.

Locate the vent pipe opening and place the rubber seal around and over the edge of the metal.

Worksheet - Determine Length of Vent Pipe through the Box

	inches	mm
Heater Side (max if + different diameters)	6	152
Width of Box	+ 6	152
Bracket Length	+ —	—
Width of Roof	+ —	—
Inlet Pipe Height	+ —	—
Terminal Side (min)	+ 22	559
Length of Pipe	=	

Determine the length of the section of vent pipe by adding the requirements. The vent pipe must extend a maximum of 6" (152mm) on the heater side (if a reducer is required); plus 6" (152mm) through the box; plus bracket length; plus the width of the roof; plus the length of the outer inlet air pipe; plus a minimum of 22" (559mm).

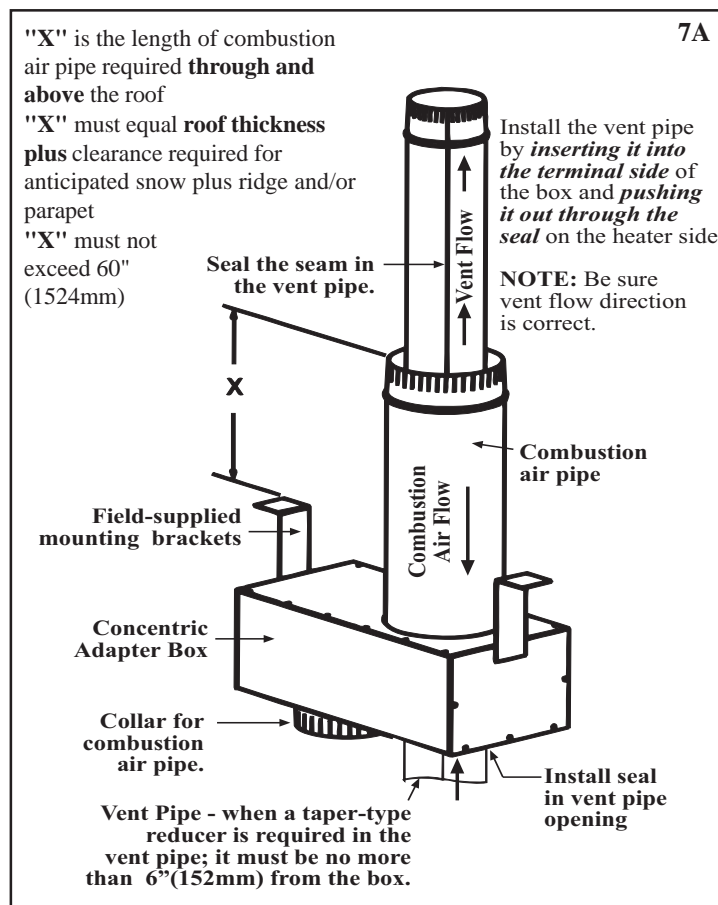
Lubricate the seal and pipe with liquid soap or a rubber lubricant. (Installation Tip: Spray cooking oil works well as a lubricant.)

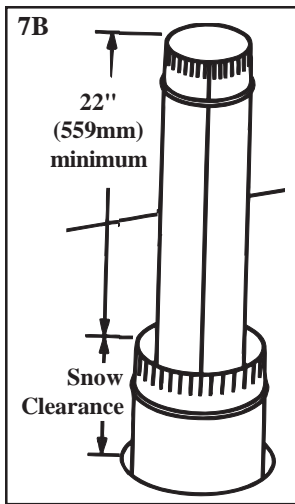
Being sure the pipe is in the proper flow direction, slide the end through the box and push it *out through the rubber seal*. Push evenly using caution not to displace the seal from its position on the edge of the hole. If the rubber seal moves, slide the pipe back slightly, re-position the seal, and slide the pipe through again. When the vent pipe is in its final position, re-check the seal to be sure that it has not rolled in. Adjust the pipe and seal until the seal is in the correct position on the edge of the hole and tight to the entire circumference of the pipe. Position the vent pipe so that it will protrude a minimum of 22" (559mm) past the end of the combustion air pipe. See Figure 7A.

If a taper type connection is required in the vent run, no more than 6" (152mm) of vent pipe should extend out the heater side of the adapter box.

2c) Attach the outside portion of the combustion air pipe to the box.

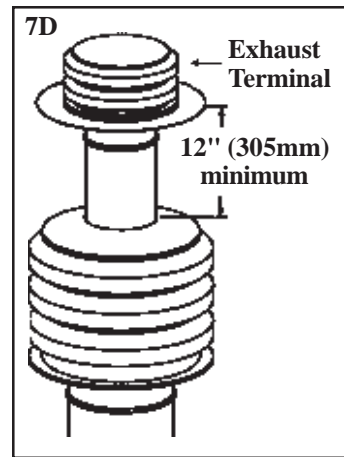
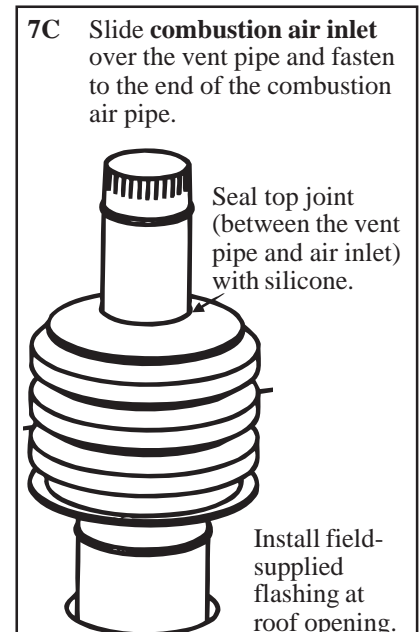
Determine the length of the combustion air pipe so that dimension "X" (Figure 7A) is equal to the roof thickness, plus snow depth and ridge or parapet clearance, but does not exceed 60" (1524 mm). Attach the combustion air pipe to the collar with sheetmetal screws being careful not to penetrate the vent pipe.





4. Slide the combustion air inlet over the vent pipe and fasten collar to the end of the combustion air pipe with sheetmetal screws (See Figure 7C). Seal joint at top between vent pipe and combustion air inlet with silicone sealant to prevent water leakage.

3. Attach the concentric adapter. Insert the vent pipe and combustion air pipe up through the roof and secure the adapter box. Flash the combustion air pipe to the outside of the roof as required.



5. Attach the exhaust terminal with sheetmetal screws (See Figure 7D).

6. Vertical vent terminal/combustion air inlet is installed and ready for connection to the heater.

Refer to Figure 7E and verify that all installation requirements are met.

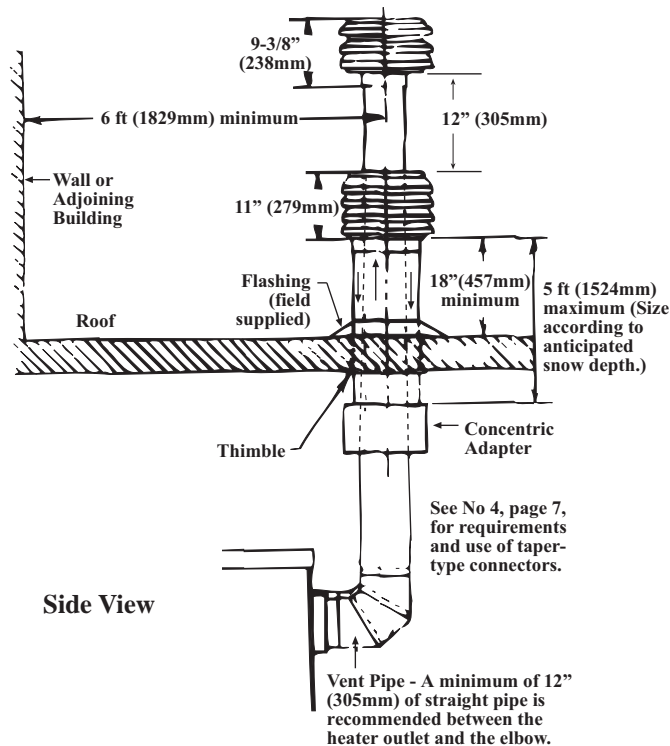
7) Connect Concentric Adapter to the Heater - Use the pipe specified and joints required for type of pipe. If collars at the heater or the collar or opening on the adapter are different diameters from the pipe (use only diameters listed on page 7), make joints with field-supplied taper-type reducer or increaser.

A minimum of 12" (305 mm) of straight pipe is required at the venter outlet.

Due to the high temperature, do not enclose the exhaust pipe or place pipe closer than 6" (152 mm) to combustible material.

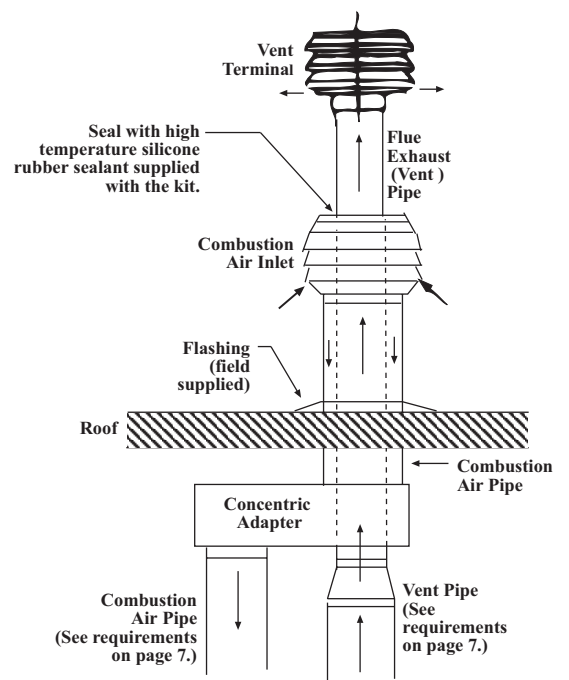
Installation of the vertical vent and combustion air system on your separated-combustion unit is complete.

Figure 7E - Installation of Separated-Combustion Unit with Vertical Vent and Combustion Air Pipes (Option CC2)

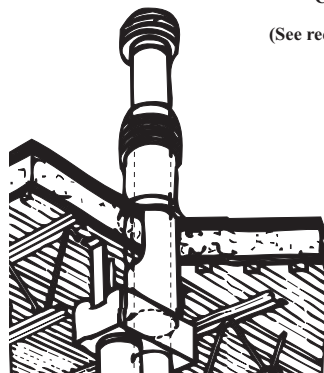


Side View

Rear View



"Through-the-Roof" View of a typical installation of a vertical vent/inlet air terminal and concentric adapter (Option CC2)



9. Gas Piping and Pressures

WARNING: This appliance is equipped for a maximum gas supply pressure of 1/2 pound, 8 ounces, or 14 inches water column. Supply pressure higher than 1/2 pound requires installation of an additional lockup-type service regulator external to the unit.

PRESSURE TESTING SUPPLY PIPING

Test Pressures Above 1/2 PSI: Disconnect the heater and manual valve from the gas supply line which is to be tested. Cap or plug the supply line.

Test Pressures Below 1/2 PSI: Before testing, close the manual valve on the heater.

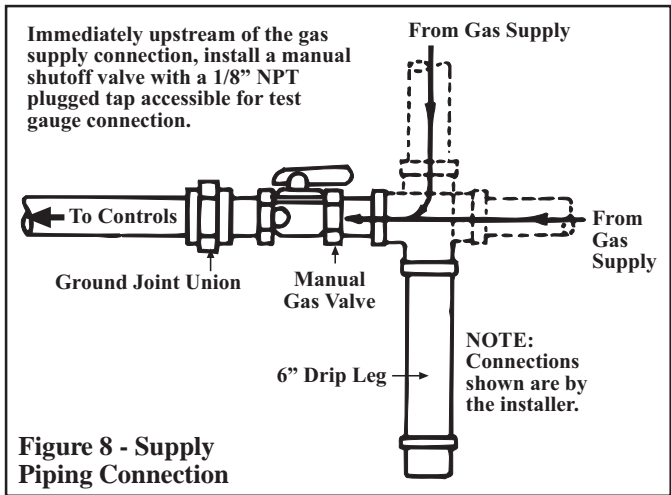
All piping must be in accordance with requirements outlined in the National Fuel Gas Code ANSI/Z223.1a (latest edition), or CAN/CGA-B149.1 and B149.2 (See Paragraph 1). Gas supply piping installation should conform with good practice and must comply with local codes. Unit heaters are orificed for operation with natural gas having a heating value of 1000 (± 50) BTUH per cubic ft or propane gas with a heating value of 2550 BTUH per cubic ft. If the gas at the installation does not meet these specifications, consult the factory for proper orificing.

Pipe joint compounds (pipe dope) shall be resistant to the action of liquefied petroleum gas or any other chemical constituents of the gas being supplied.

Install a ground joint union and manual shut-off valve upstream of the unit control system, as shown in Figure 8. The 1/8" plugged tapping in the shut-off valve provides connection for a supply line pressure test gauge. The National Fuel Gas Code requires the installation of a trap with a minimum 3" drip leg. Local codes may require a minimum drip leg longer than 3" (typically 6").

Gas connection is 1/2" for Sizes 45-200 and 3/4" for Sizes 250-300. Leak-test all connections by brushing on a leak-detecting solution.

WARNING: All components of a gas supply system must be leak tested prior to placing equipment in service. NEVER TEST FOR LEAKS WITH AN OPEN FLAME. Failure to comply could result in personal injury, property damage or death.



Manifold Gas Pressure Setting

Measuring or derating manifold gas pressure cannot be done until the heater is in operation. It is included in the steps of the "Check-Test-Start" procedure in Paragraph 18. The following instructions and warnings apply.

WARNING: Manifold gas pressure must never exceed 3.5" w.c. for natural gas and 10" w.c. for propane gas.

For Natural Gas: When the heater leaves the factory, the combination gas valve is set so that the manifold gas pressure is regulated to 3.5" w.c. Inlet supply pressure to the valve for natural gas must be a minimum of 5" w.c. or as noted on the rating plate and a maximum of 14" w.c.

For Propane Gas: When the heater leaves the factory, the combination gas valve is set so that the manifold gas pressure is regulated to 10" w.c. Inlet supply pressure to the valve for propane gas must be a minimum of 11" w.c. and a maximum of 14" w.c.

Before attempting to measure or adjust manifold gas pressure, the inlet supply pressure *must* be within the specified range both when the heater is in operation and on standby. Incorrect inlet pressure could cause excessive manifold gas pressure immediately or at some future time. If natural gas supply pressure is too high, install a regulator in the supply line before it reaches the heater. If natural gas supply pressure is too low, contact your gas supplier.

Sizing a Gas Supply Line

Capacity of Piping												
Cubic Feet per Hour based on 0.3" w.c. Pressure Drop												
Specific Gravity for Natural Gas -- 0.6 (Natural Gas -- 1000 BTU/Cubic Ft)												
Specific Gravity for Propane Gas -- 1.6 (Propane Gas -- 2550 BTU/Cubic Ft)												
Length of Pipe	Diameter of Pipe											
	1/2"		3/4"		1"		1-1/4"		1-1/2"		2"	
	Natural	Propane	Natural	Propane	Natural	Propane	Natural	Propane	Natural	Propane	Natural	Propane
20'	92	56	190	116	350	214	730	445	1100	671	2100	1281
30'	73	45	152	93	285	174	590	360	890	543	1650	1007
40'	63	38	130	79	245	149	500	305	760	464	1450	885
50'	56	34	115	70	215	131	440	268	670	409	1270	775
60'	50	31	105	64	195	119	400	244	610	372	1105	674
70'	46	28	96	59	180	110	370	226	560	342	1050	641
80'	43	26	90	55	170	104	350	214	530	323	990	604
90'	40	24	84	51	160	98	320	195	490	299	930	567
100'	38	23	79	48	150	92	305	186	460	281	870	531
125'	34	21	72	44	130	79	275	168	410	250	780	476
150'	31	19	64	39	120	73	250	153	380	232	710	433
175'	28	17	59	36	110	67	225	137	350	214	650	397
200'	26	16	55	34	100	61	210	128	320	195	610	372

Note: When sizing supply lines, consider possibilities of future expansion and increased requirements. Refer to National Fuel Gas Code for additional information on line sizing.

Instructions on How to Check Manifold Pressure (can only be done after heater is installed):

1) With the manual valve positioned to prevent flow to the main burners, connect a manometer to the 1/8" pipe outlet pressure tap in the valve. NOTE: A manometer (fluid-filled gauge) is recommended rather than a spring type gauge due to the difficulty of maintaining calibration of a spring type gauge.

2) Open the valve and operate the heater. Measure the gas pressure to the manifold. Normally adjustments should not be necessary to the factory preset regulator.

If adjustment is necessary, set pressure to correct settings by turning the regulator screw IN (clockwise) to increase pressure. Turn regulator screw OUT (counterclockwise) to decrease pressure.

Derating by Manifold Pressure Adjustment for High Altitude Operation

If the heater is being installed above 2000 ft (610M) and it was determined in Paragraph 5 that derating by manifold pressure adjustment is permissible, follow the instructions below.

Instructions for Derating a Heater by Adjusting Manifold Pressure (The heater *must* be factory-equipped for sea level operation.)

1. Check the rating plate to be certain that the heater is equipped for sea level operation. **Do not attempt to derate by manifold gas pressure adjustment if the heater is factory equipped for high altitude.**
2. Determine the required manifold pressure for the elevation where the heater will be operating. If unsure of the elevation, contact the local gas supplier.

Manifold Pressure Settings by Elevation

Altitude		Natural Gas (inches W.C.)	Propane Gas (inches W.C.)
Feet	Meters		
0- 2000	1-610	3.5	10.0
2001-3000	911-915	2.8	7.7
3001-4000	916-1220	2.5	7.1
4001-5000	1221-1525	2.3	6.4
5001-6000	1526-1830	2.1	5.8
6001-7000	1831-2135	1.9	5.2
7001-8000	2136-2440	1.7	4.6
8001-9000	2441-2745	1.5	4.1

3. With the manual valve positioned to prevent flow to the main burners, connect a manometer to the 1/8" pipe outlet pressure tap in the valve. Use a fluid-filled manometer that is readable to the nearest tenth of an inch w.c.
4. Remove the cap from the pressure adjusting screw and adjust the manifold pressure to the pressure setting selected from the table. Cycle the main burners once or twice to properly seat the adjustment spring in the valve.

Re-check the pressure. If necessary, re-adjust the pressure. When the pressure is correct, remove the manometer and replace the cap. Check for leaks at the pressure tap fitting.

5. With the heater operating determine that the inlet pressure to the heater for natural gas is between 5 and 14 inches. w.c. and for propane between 10 and 14 inches w.c. Take this reading as close as possible to heater (Most heaters are now equipped with gas valves that have an inlet pressure tap.) **If the inlet pressure is not within the specified range, the inlet pressure must be corrected and Steps 3 and 4 repeated.**
6. If altitude is above 6000 ft (1830M), verify that the pressure switch has been changed.

High Altitude Combustion Air Pressure Switches

SFT	P/N	Description
45-75	173316	Orange Label, -.55", #PPS10143-2908
100-125	173315	Gray Label, -.35", #PPS10143-2907
150-300	173312	White Label, -.60", #PPS10143-2904

7. Find the Manifold Pressure Adjustment label in the plastic bag that contained these instructions. Using a permanent marker, fill-in the pressure setting. Adhere the label on the heater near the gas valve so that it is conspicuous to someone servicing the valve and/or the heater.

11. Electrical Supply and Connections

All electrical wiring and connections, including electrical grounding MUST be made in accordance with the National Electric Code ANSI/NFPA No. 70 (latest edition) or, in Canada, the Canadian Electrical Code, Part I-C.S.A. Standard C22.1. In addition, the installer should be aware of and comply with any local ordinances or gas company requirements.

Check the rating plate on the heater for the supply voltage and current requirements. A separate line voltage supply should be run directly from the main electrical panel to a fused disconnect switch located near the heater. All external wiring must be within approved conduit and have a minimum temperature rise of 60°C. Conduit from the disconnect switch to the heater must be run so as not to interfere with the service panels of the heater.

The electrical supply and control wiring enter at the rear of the heater and connect to the terminal board or the integrated ignition control module. The 115 volt supply wiring connects to pigtails on the lower portion of the terminal board. The terminal strip for 24 volt thermostat connections is located on the upper portion of the ignition control module. See Figure 9.

Consult the wiring diagram supplied with your heater. A typical wiring diagram is on page 15.

CAUTION: If any of the original wire as supplied with the appliance must be replaced, it must be replaced with wiring material having a temperature rating of at least 105°C, except for limit control and sensor lead wires which must be 150°C. See Hazard Levels, page 2.

12. Thermostat and Connections

A thermostat is not standard equipment but is an installation requirement. Use either an optional thermostat available with the heater or a field-supplied 24-volt thermostat. Install according to the thermostat manufacturer's instructions.

Make sure that the heat anticipator setting on the thermostat is in accordance with the amperage value noted on the wiring diagram of your heater.

13. Fan Motor

The fan motor is equipped with thermal overload protection of the automatic reset type. Should the motor refuse to run, it may be because of improper current characteristics. Make certain that the correct voltage is available at the motor.

14. Combustion Air Proving Switch

The combustion air proving switch is a pressure sensitive switch that monitors air pressure to ensure that proper combustion air flow is available. The switch is single pole/double throw with the normally open contacts closing when a decreasing pressure is sensed in the system.

On start-up when the heater is cold, the sensing pressure is at the most negative level, and as the heater and flue system warm up, the sensing pressure becomes less negative. After the system has reached equilibrium (about 20 minutes), the sensing pressure levels off.

If a restriction or excessive flue length or turns cause the sensing pressure to be outside the switch setpoint, the pressure switch will function to shut off the main burners. The main burners will remain off until the system has cooled and/or the flue system resistance is reduced. The Table below lists the approximate water column negative pressure readings and switch setpoints for sea level operating conditions.

Model Sizes	Start-Up Cold	Equilibrium	Set Point "OFF"	Set Point "ON"
45, 60, 75	-1.20	-0.75	-0.60	-0.70
100, 125	-1.10	-0.70	-0.40	-0.50
150, 200	-1.50	-0.90	-0.65	-0.75
250, 300				

DANGER: Safe operation of this unit requires proper venting flow. NEVER bypass combustion air proving switch or attempt to operate the unit without the venter running and the proper flow in the vent system. Hazardous conditions could result. See Hazard Levels, page 2.

15. Gas Valve

The main operating gas valve is powered by the 24-volt control circuit through the thermostat and safety controls. The main control valve is of the diaphragm type providing regulated gas flow preset at the factory.

WARNING: The operating valve is the prime safety shutoff. All gas supply lines must be free of dirt or scale before connecting the unit to ensure positive closure. See Hazard Levels, page 2.

16. Ignition System

This heater is equipped with a direct spark integrated control system. The system monitors the safety devices and controls the operation of the fan and venter motors and the gas valve between heat cycles.

Ignition System Operating Sequence -- On a call for heat from the thermostat, the system energizes the venter motor and goes through a 10-second prepurge. The system verifies that the pressure switch has changed states closing the normally open contactor and that the high limit is in the closed state. The gas valve is then energized and the ignition system provides the high voltage spark to the electrode to ignite the main burner gas. Burner flame is electronically sensed by the control upon carryover of all burners. (A separate solid metal probe is used as the flame sensing function. A low voltage electrical signal is imposed on the metal probe which is electrically isolated from ground. When the flame impinges on the flame sensing probe, the flame acts as a conduction path to ground. The flame rectifies and completes the DC circuit, and the ignition system acknowledges the flame.) The fan motor is energized by the system after 30 seconds of flame sensing.

After the thermostat has been satisfied, the system de-energizes the gas valve, the venter motor goes through a 45-second post-purge, and the fan motor remains energized for an additional 120 seconds.

NOTE: This is a three trial system, should the unit not sense burner flame, the unit will lockout for one hour before initiating another trial for ignition. To initiate another trial for ignition before the one hour, requires that either the thermostat be reset or the power to the unit be interrupted for 30 seconds.

17. Burners

This unit heater has inshot burners designed to provide controlled flame stability without lifting or flashback with either natural or propane gas. The burners are lightweight and factory mounted in an assembly which permits them to be removed as a unit for inspection or service.

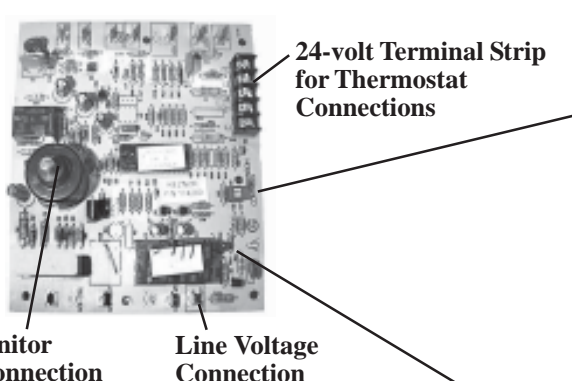


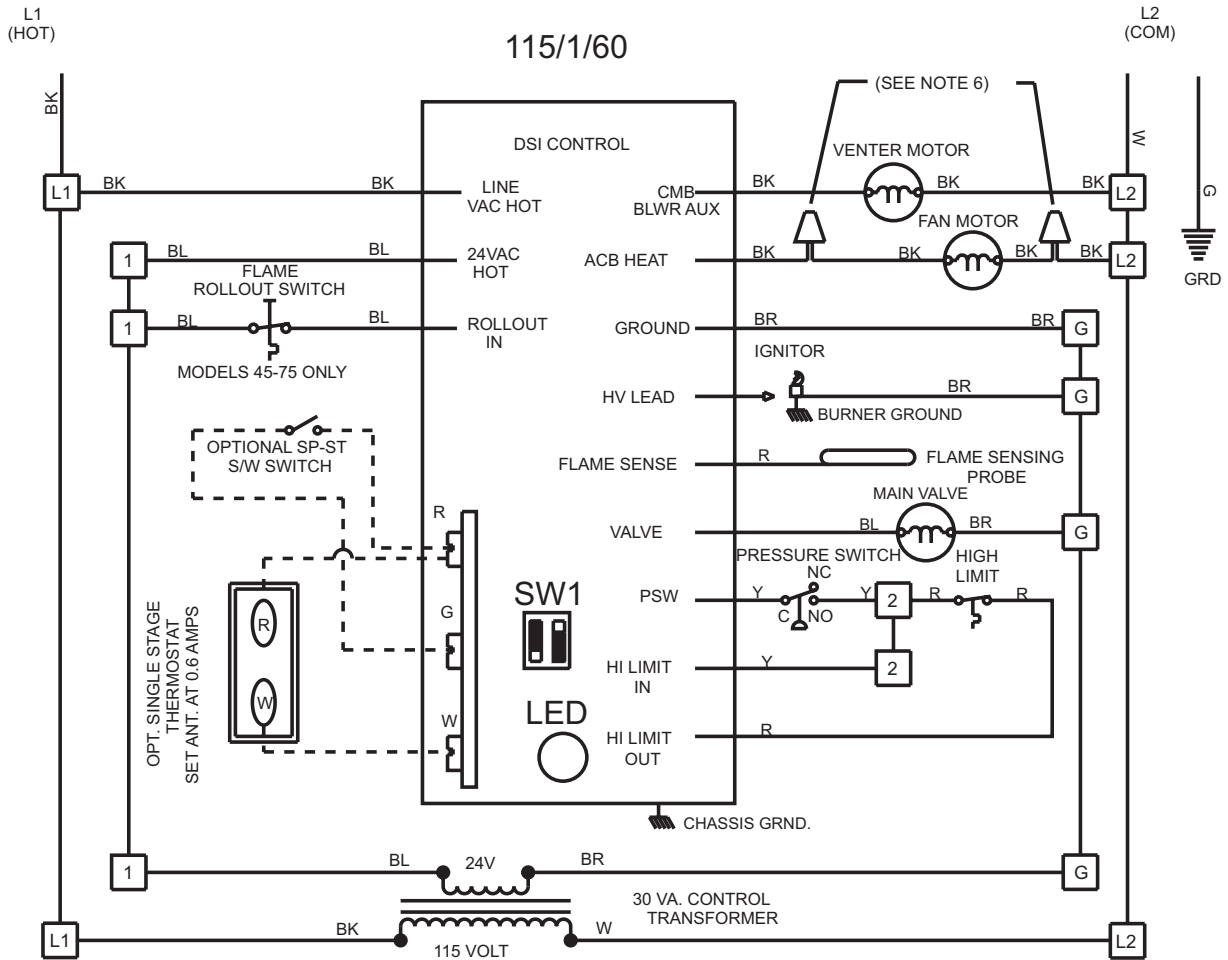
Figure 9 - Electrical Connections on the Integrated Ignition Control Module in the Control Compartment

SW1		Fan Delay
1	2	To OFF (seconds)
OFF	OFF	90
OFF	ON	120 (Factory Preset)
ON	OFF	180
ON	ON	240

Ignition Control Module LED Codes

- Slow Flash** Normal Operation, No call for heat
- Fast Flash** Normal Operation, Call for heat
- 2 Flashes** System Lockout, Failed to detect or sustain flame
- 3 Flashes** Pressure Switch Open or Closed
- 4 Flashes** High Limit or Flame Rollout Switch Open
- 5 Flashes** Flame Sensed and Gas Valve not energized
- Steady On** Internal Failure - Replace the ignition control module

Typical Wiring Diagram



OPERATING SEQUENCE

1. SET THERMOSTAT AT LOWEST SETTING.
2. TURN ON MANUAL GAS VALVE.
3. TURN ON POWER TO UNIT.
4. SET THERMOSTAT AT DESIRED SETTING.
5. THERMOSTAT CALLS FOR HEAT, ENERGIZING THE VENTER MOTOR.
6. VENTER PRESSURE SWITCH CLOSSES, FIRING UNIT.
7. BURNER FLAME IS SENSED, AND IN 30 SECONDS THE FAN MOTOR IS ENERGIZED.
8. IF THE FLAME IS EXTINGUISHED DURING MAIN BURNER OPERATION, THE INTEGRATED CONTROL SYSTEM CLOSSES THE MAIN VALVE AND MUST BE RESET BY INTERRUPTING POWER TO THE CONTROL CIRCUIT (SEE LIGHTING INSTRUCTIONS).

NOTES

1. THE FOLLOWING CONTROLS ARE FIELD INSTALLED OPTIONS: THERMOSTAT THERMOSTAT AND S/W SWITCH
2. DOTTED WIRING INSTALLED BY OTHERS.
3. CAUTION: IF ANY OF THE ORIGINAL WIRING AS SUPPLIED WITH THE APPLIANCE MUST BE REPLACED, IT MUST BE REPLACED WITH WIRING MATERIAL HAVING A TEMPERATURE RATING OF AT LEAST 105 C. EXCEPT FOR SENSOR LEAD WIRE AND LIMIT WIRING WHICH MUST BE 150 C.
4. USE 18 GA. WIRE FOR ALL WIRING ON THE UNIT.
5. LINE AND FAN MOTOR BRANCH WIRE SIZES SHOULD BE OF A SIZE TO PREVENT VOLTAGE DROPS BEYOND 5% OF SUPPLY LINE VOLTAGE.
6. THESE WIRE NUTS ARE NOT USED ON ALL MODELS.

LED CODES

- SLOW FLASH NORMAL OPERATION - NO CALL FOR HEAT
- FAST FLASH NORMAL OPERATION - CALL FOR HEAT
- 2 FLASHES SYSTEM LOCKOUT - FAILED TO DETECT OR SUSTAIN FLAME
- 3 FLASHES PRESSURE SWITCH OPEN OR CLOSED
- 4 FLASHES OPEN CIRCUIT TO HIGH LIMIT OR FLAME ROLLOUT TERMINAL
- 5 FLASHES FLAME SENSED AND GAS VALVE NOT ENERGIZED
- STEADY ON INTERNAL FAILURE (MICRO-CONTROLLER FAILURE: SELF CHECK)

DIP SWITCH SETTINGS

SW1		FAN DELAY TO OFF	
1	2	OFF	ON
OFF	OFF	90 SECONDS	
OFF	ON	120 SECONDS (FACTORY SETTING)	
ON	OFF	180 SECONDS	
ON	ON	240 SECONDS	

- FACTORY WIRING
- FIELD WIRING
- OPTIONAL FACTORY WIRING

WIRING CODE

- BLACK - BK
- BROWN - BR
- RED - R
- ORANGE - O
- YELLOW - Y
- GREEN - G
- BLUE - BL
- PURPLE - PR
- WHITE - W

FIELD CONTROL WIRING

TOTAL WIRE LENGTH	DISTANCE FROM UNIT TO CONTROL	MIN. RECOMMENDED WIRE SIZE
150'	75'	#18 GA. WIRE
250'	125'	#16 GA. WIRE
350'	175'	#14 GA. WIRE

Figure 10 - Wiring Diagram
No. 155142 Revision 3

CHECK/TEST/START-UP

18. Check Installation and Start-Up

Check the installation prior to start-up:

- Check suspension. Unit must be secure and level.
- Check clearances from combustibles. Requirements are shown in Paragraph 6.
- Check vent/combustion air system to be sure that it is installed according to the instructions in Paragraph 9.
- Check piping for leaks and proper gas line pressure. Bleed gas lines of trapped air. See Paragraph 10.
- Check electrical wiring. Be sure all wire gauges are as recommended. A service disconnect switch should be used. Verify that fusing or circuit breakers are adequate for the load use.

Start-Up

Operating Instructions and Operating Sequence

WARNINGS: For your safety, read before operating. If you do not follow these instructions exactly, a fire or explosion may result causing property damage, personal injury, or loss of life.

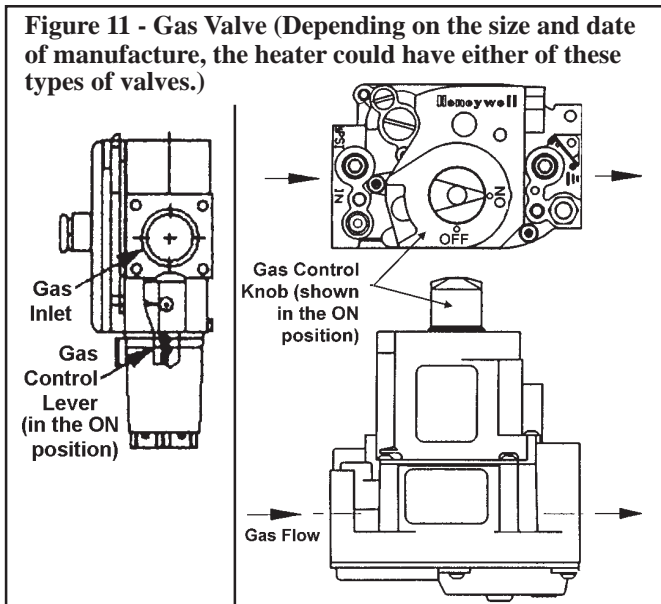
- This appliance does not have a pilot. It is equipped with an ignition device which automatically lights the burner. Do not try to light the burner by hand.
- Before operating, smell all around the appliance area for gas. Be sure to smell next to the floor because some gas is heavier than air and will settle on the floor.

WHAT TO DO IF YOU SMELL GAS

- Do not try to light any appliance.
- Do not touch any electrical switch; do not use any phone in your building.
- Immediately call your gas supplier from a neighbor's phone. Follow the gas supplier's instructions.
- If you cannot reach your gas supplier, call your fire department.
- Use only your hand to turn the gas control ON/OFF knob or lever on the gas valve. Never use tools. If the valve ON/OFF knob or lever will not turn by hand, do not try to repair it. Call a qualified service technician. Force or attempted repair may result in a fire or explosion.
- Do not use this appliance if any part has been under water. Immediately call a qualified service technician to inspect the appliance and to replace any part of the control system and any gas control which has been under water.

Instructions

1. Set thermostat at lowest setting.
2. Turn off all electric power to the appliance.
3. This appliance is equipped with an ignition device which automatically lights the burner. Do not try to light the burner by hand. Open the access door and locate the gas control (ON/OFF) knob or lever on the gas valve.



4. Turn the gas control knob or lever clockwise to "OFF".
 5. Wait five (5) minutes to clear out any gas. Then smell for gas, including near the floor. **If you smell gas, STOP!** and follow the steps in the **WARNINGS** printed above or on the Operating Label on the heater. If you do not smell gas, proceed to the next step.
 6. Turn the gas control knob or lever counterclockwise to "ON".
 7. Close the access door.
 8. Turn on the electric power to the heater.
 9. Set the thermostat to the desired setting.
- NOTE:** If the appliance does not operate, follow the instructions "To Turn Off Gas to Appliance" printed below (and on the Operating Label on the heater) and call your service technician.
10. Thermostat calls for heat, energizing the venter motor.
 11. Venter pressure switch closes, firing the unit.
 12. Burner flame is sensed and in 30 seconds, the fan motor is energized.
 13. If the flame is extinguished during the main burner operation, the integrated control system closes the main valve and must be reset by interrupting power to the control circuit. (See lighting instructions on the heater.)

TO TURN OFF GAS TO THE APPLIANCE

- 1) Set thermostat to lowest setting
- 2) If service is to be performed, turn off all electric power to the appliance.
- 3) Open the access door.
- 4) Turn the gas control knob or lever clockwise to "OFF". Do not force.
- 5) Close the access door.

Check installation after start-up:

- If the heater is being derated for high altitude operation (See Paragraph 5), follow the instructions in Paragraph 10 to adjust the manifold pressure. Be sure to complete the "change pressure" tag and adhere it on the heater close to the gas valve.
- If unit is not being derated, measure to verify manifold gas pressure. Follow instructions in Paragraph 10.
- Turn the unit off and on, pausing two minutes between each cycle. Observe for smooth ignition.
- Place the "Owner's Envelope" containing the Limited Warranty, this booklet, and any control or optional information in an accessible location near the heater. Follow the instructions on the envelope.

DANGER: The gas burner in this gas-fired equipment is designed and equipped to provide safe and economically controlled complete combustion. However, if the installation does not permit the burner to receive the proper supply of combustion air, complete combustion may not occur. The result is incomplete combustion which produces carbon monoxide, a poisonous gas that can cause death. Safe operation of separated-combustion, indirect-fired gas burning equipment requires a sealed, properly operating vent system which vents all flue products to the outside atmosphere. FAILURE TO PROVIDE PROPER VENTING WILL RESULT IN A HEALTH HAZARD WHICH COULD CAUSE SERIOUS PERSONAL INJURY OR DEATH.

Install either the horizontal or vertical combustion air/vent system illustrated in Paragraph 9 using the concentric adapter supplied. Always comply with the combustion air requirements in the installation codes and instructions. Combustion air at the burner should be regulated only by manufacturer-provided equipment. NEVER RESTRICT OR OTHERWISE ALTER THE SUPPLY OF COMBUSTION AIR TO ANY HEATER. CHECK THE COMBUSTION AIR/VENT SYSTEM FOR SOUNDNESS AND FUNCTION; MAINTAIN IT IN PROPER OPERATING CONDITION.

SERVICE AND MAINTENANCE

WARNING: Should overheating occur, or the gas supply fail to shut off, shut off the manual gas valve to the appliance before shutting off the electrical supply.

WARNING: Do not use this appliance if any part has been under water. Immediately call a qualified service technician to inspect the appliance and replace any gas control which has been under water.

WARNING: If you turn off the power supply, turn off the gas. See Hazard Levels, page 2.

This unit will operate with a minimum of maintenance. To ensure long life and satisfactory performance, a heater that is operated under normal conditions should be inspected and cleaned at the start of each heating season. If the heater is operating in an area where an unusual amount of dust or soot or other impurities are present in the air, more frequent maintenance is recommended.

When any service is completed, be careful to reassemble correctly to ensure that no unsafe conditions are created. When re-lighting, always follow the lighting instructions on the heater.

WARNING: Excessive dirt buildup on and inside the burner ports could cause fuel gas to spill out of the back of the burner tube causing gas odor inside the building. If uncorrected, fuel spilling out of the back of the burner tube could cause a fire or explosion. To prevent fuel gas from spilling from the back of the burners, check the burner ports at least annually and clean if necessary.

Maintenance Schedule

The following procedures should be carried out at least annually (See Paragraphs 19-28.):

- Clean the fan blade, fan guard, and motor.
- Clean the heat exchanger both internally and externally.

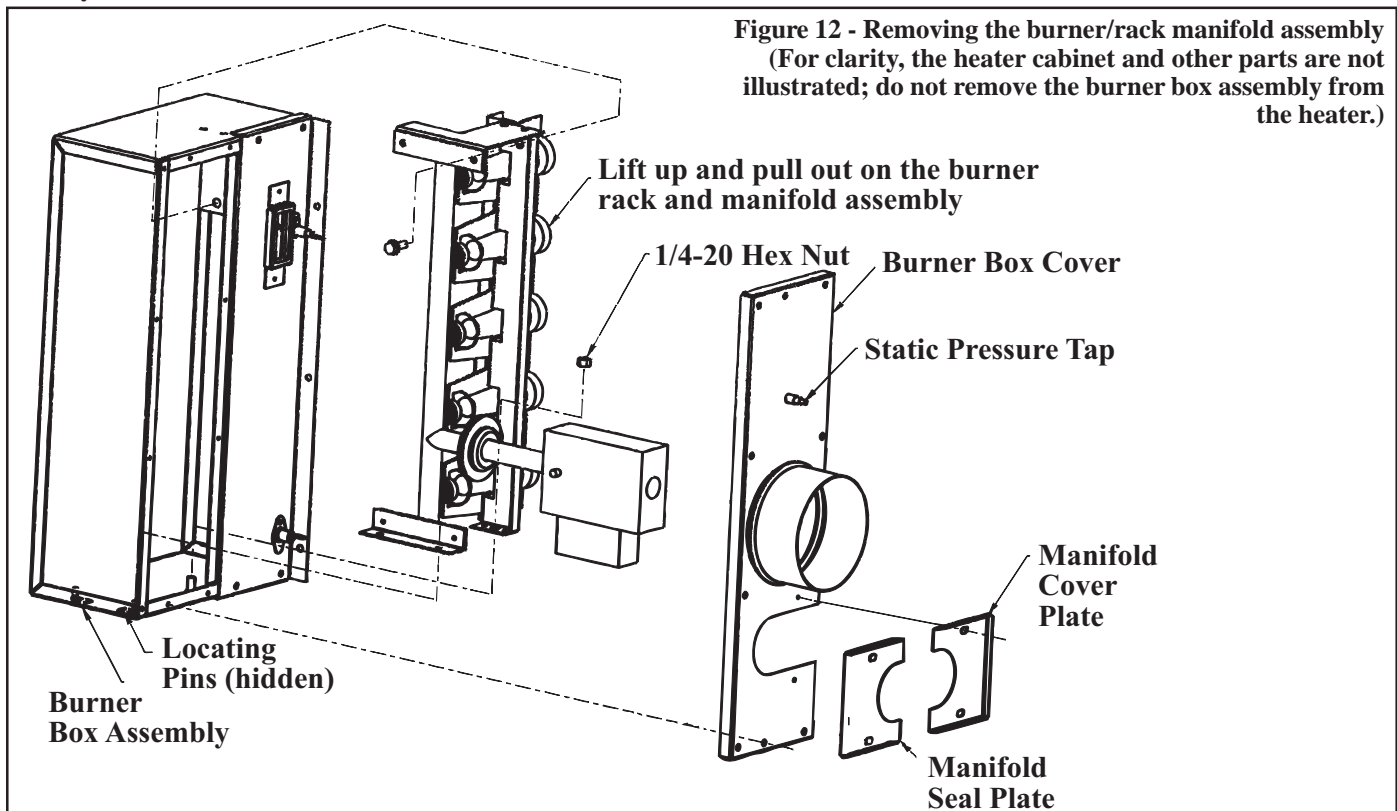
- Check the burners for scale, dust, or lint accumulation.
- Check the vent/combustion air system for soundness. Clean the screen in the vent terminal cap. Replace any parts that do not appear sound.
- Check the wiring for any damaged wire. Replace damaged wiring. (See Paragraph 11 for replacement wiring requirements.)

NOTE: Use only factory-authorized replacement parts.

19. Burner Removal

Instructions for Burner Removal (See Figure 12)

1. Shut the gas supply off ahead of the combination valve.
2. Turn off electric supply.
3. Open the access panel.
4. Disconnect the union on the outside of the unit and remove the gas pipe from the inlet of the gas valve.
5. On the burner box end of the flexible hose, loosen the hose clamp. Slide the hose off the collar.
6. Disconnect the silicone tubing from the static tap on the burner box cover.



7. Remove the small manifold seal plate and cover plate. Remove the burner box cover. The burner rack assembly is visible.
8. At the bottom of the burner rack assembly, remove the nut that secures the burner rack to the bolt welded to the burner box bottom. At the top of the burner rack assembly, remove the bolt that attaches the burner rack assembly to the bracket. Lift the burner rack/manifold assembly upward (to clear the locating weldpins) and pull the assembly out of the heater.

Clean the Burners (requires a wire brush, cleaning cloth, and an automotive type aerosol degreaser or refrigerant coil cleaner)

CAUTION: Use of eye protection is recommended.

Excessive dirt buildup on and inside the ports on the burner could cause fuel gas to spill out of the back of the burner tube. Fuel gas spilling out of the back of the burner tube will cause gas odor inside the building, and if not corrected, could eventually cause a fire/explosion hazard. To prevent fuel gas spilling from the back of the burners, check the burner ports at least annually and clean if necessary. Remove any soot deposits from the burner with a wire brush. Clean the ports with an aerosol degreaser and/or compressed air. Wipe the inside of the burner tube clean. (Cleaning the burner with an aerosol degreaser is highly recommended as the degreaser will retard future buildup of dirt.) Inspect the cleaned burner for any damage or deterioration. If the burner has any damage or signs of deterioration, replace it. Re-assemble the heater and test for proper operation.

20. Burner Orifices

Heaters are shipped with orifices of proper size and type for gas and altitude specified on the order. When ordering replacement orifices, give BTUH content, specific gravity of gas, and altitude, as well as the model and serial number of the heater.

21. Heat Exchanger

The outside of the tubular heat exchanger can be cleaned from the front of the heater with an air hose and/or a brush. Remove all accumulated dust and grease deposits.

CAUTION: Eye protection is recommended.

The inner surfaces of the heat exchanger can be reached for cleaning with the burner, turbulators and venter assembly removed (See Paragraph 18 and Figures 13 and 14). Turbulators are "wavy" strips of metal that extend into the heat exchanger tubes. Remove and clean the turbulators (save the screws). Clean the inside of the tubes with a long furnace brush or a heavy wire to which steel wool has been attached. Brush inside each heat exchanger tube until all foreign material is removed. A flashlight is helpful in examining the inside of the tubes. Slide the clean turbulator strips back into the tubes and re-attach using the screws removed.

22. Ignition System

To access the ignition system, follow Steps 1-3 in Paragraph 19.

Ignitor - Refer to Figure 14 and locate the ignitor (on the side of the burner rack). Disconnect the wire; remove the screw and the ignitor. Clean the ignitor assembly with an emery cloth.

Spark gap must be maintained to 1/8". See Figure 13.

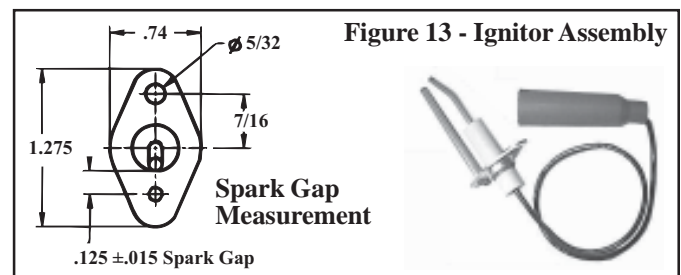
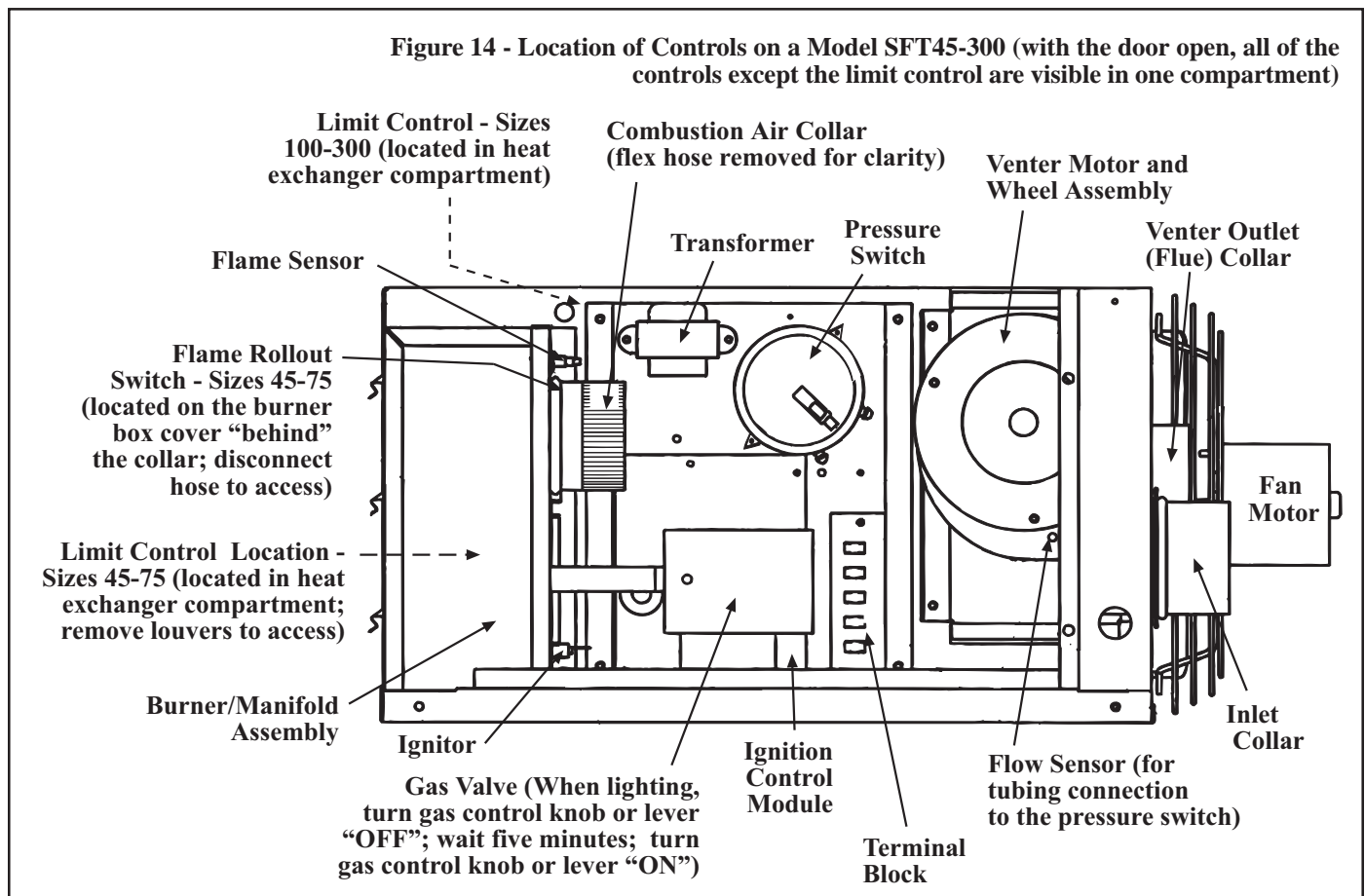


Figure 14 - Location of Controls on a Model SFT45-300 (with the door open, all of the controls except the limit control are visible in one compartment)



22. Ignition System (cont'd)

IMPORTANT: When re-assembling, the brown ground wire must remain attached to the ignitor.

CAUTION: Due to high voltage on the spark wire and electrode, do not touch when energized. See Hazard Levels, page 2.

Flame Sensor - Refer to Figure 13 and locate the flame sensor. Disconnect the wire; remove the screw and the flame sensor. Clean with an emery cloth.

Ignition Control - The integrated ignition control module monitors the operation of the heater including ignition. Do not attempt to disassemble the ignition control module. However, each heating season the lead wires should be checked for insulation deterioration and good connections.

Proper operation of the direct spark ignition system requires a minimum flame signal of 1.0 microamps as measured by a microampmeter.

For further information and check out procedure on the direct spark ignition system, refer to the manufacturer's control operating instructions supplied with the heater.

23. Fan

Remove dirt and grease from the motor. Remove dirt and grease from the fan guard and blades. Use care when cleaning the fan blades to prevent causing misalignment or imbalance. Check that the hub of the fan blades is secure to the shaft.

Follow these instructions for replacement of the fan guard, fan motor and/or fan blades.

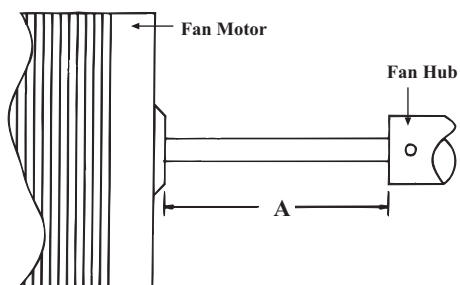
1. If the heater is installed, turn off the gas and disconnect the electric power.
2. Open the hinged access door and disconnect the fan motor wires.
3. Remove the assembled parts (the fan guard, the motor and the fan blade).
4. Disassemble and replace whatever parts are needed and reassemble using whatever part(s) are being replaced and the original parts. Be sure the fan blade is in the proper position on the shaft; refer to the illustration and table in Figure 15.

Position the assembly on the heater. Attach the fan guard.

Rotate the fan blade to check for adequate clearance. If adjustment is required, loosen the mounting screws, re-position the fan guard, and tighten the screws. Rotate the fan blade and re-check for adequate clearance. Repeat this procedure until the assembly is positioned properly.

5. Reconnect the fan motor wires and close the access panel.
6. Restore power to the heater and turn on the gas. Light, following the instructions on the lighting instruction plate. Check for proper operation.

Figure 15 - Proper Position of the Fan Blade on the Motor Shaft



Model Size	Set Screw Torque (In-Lbs)	"A" Hub to Motor
45	80 ± 10	1-1/8"
60, 75, 100, 125	120 ± 10	2"
150, 200	150 ± 10	2"
250, 300	150 ± 10	3-1/4"

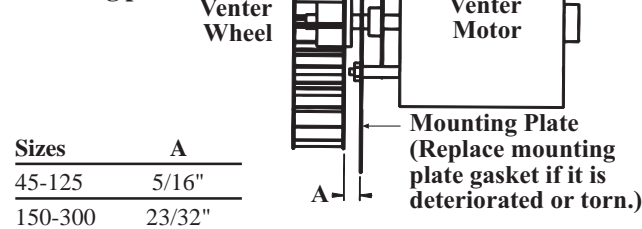
24. Venter Motor

Remove dirt and grease from the motor housing. Power venter motor is permanently lubricated.

The integrated ignition control module controls and monitors operation of the venter motor. If the contacts fail to close, the venter motor will not run. If the contacts fail to open, the venter motor will not shut off, preventing the combustion air pressure switch from opening.

Follow these instructions for replacement of the venter motor (Refer to Figure 16). Keep all hardware removed to be used in re-assembling and installing the replacement parts.

Figure 16 - Proper spacing between the venter wheel and the motor mounting plate



1. If the heater is installed, turn off the gas and disconnect the electric power.
2. Open the access panel. At the burner end, loosen the clamp on the combustion air flex hose. Let the hose "hang down" so that it is out of the way of the venter motor.
3. Disconnect the three venter motor wires at their terminal block connections.
4. Holding the motor, remove the screws (3 or 4) that attach the venter motor mounting plate to the venter housing. Remove the motor and wheel assembly from the heater.
5. Disassemble the motor and wheel assembly:
 - (a) With a hex head allen wrench, loosen the venter wheel set screw. Slide the venter wheel off the shaft.
 - (b) Remove the four nuts holding the motor mounting plate. Remove the mounting plate.
 - (c) Slid over each bolt is a cylindrical spacer; remove the four spacers.
 - (d) Loosen the set screw and remove the small fan blade.
6. Re-assemble with the replacement venter motor (NOTE: Check the gasket on the motor mounting plate; if the gasket is deteriorated or torn, replace it - Size 45, P/N 155651; Sizes 60-300, P/N 155652):
 - (a) With the blade side closest to the motor, slide the small fan blade on to the shaft. Position the blade so that it does not hit the motor and tighten the set screw to the flat side of the motor shaft.
 - (b) Slide the spacers over the bolts. Position the mounting plate with the side with the gasket away from the motor; secure with the nuts (hand tighten with a nut driver; do not use a power tool). Rotate the fan to check for clearance. If required, loosen the set screw and adjust the position of the fan blade.
 - (c) With the "closed" side toward the motor, slide the venter wheel over the end of the shaft. Position the wheel with the spacing shown in Figure 16. Tighten the set screw to the flat side of the motor shaft.
7. Install the assembled venter motor and wheel. Follow the wiring diagram to connect the venter wires. Re-attach the flex hose and close the access panel.
8. Restore power to the heater and turn on the gas. Light, following the instructions on the lighting instruction plate. Check for proper operation.

25. Limit Controls

If it is determined that a limit control needs replacing, use only the factory-authorized replacement part that is designed for the size of heater. To access the limit control on Sizes 45-75, remove the louver assembly from the front of the heater. On Sizes 100-300, the limit control is accessible in the control compartment.

For approximate limit locations, see Figure 14 on page 19.

26. Gas Valve

The gas valve requires no field maintenance except careful removal of external dirt accumulation and checking of wiring connections. Instructions for testing pressure settings are in Paragraph 10.

WARNING: The operating valve is the primary safety shutoff. All gas supply lines must be free of dirt or scale before connecting to the unit to ensure positive closure. See Hazard Levels, page 2.

27. Combustion Air Pressure Switch

If it is determined that the pressure switch needs replacing, use only the factory-authorized replacement part that is designed for this heater.

28. Vent/Combustion Air System

Check at least once a year. Inspection should include all joints, seams, and the terminal caps. Clean the screen in the vent terminal cap.

Replace any defective parts.

29. Flame Rollout Switch (Applies to Models SFT 45-75 only)

If it is determined that the flame rollout switch needs replacing, use only the factory-authorized replacement part that is designed for the size of heater. To access the flame rollout switch, disconnect the flexible hose from the burner box (See Figure 14 on page 17).

30. Troubleshooting

		<u>Ignition Control Module LED Codes</u>
		Slow Flash . Normal Operation, No call for heat
		Fast Flash .. Normal Operation, Call for heat
		2 Flashes System Lockout, Failed to detect or sustain flame
		3 Flashes Pressure Switch Open or Closed
		4 Flashes High Limit or Flame Rollout Switch Open
		5 Flashes Flame Sensed and Gas Valve not energized
		Steady On .. Internal Failure - Replace the ignition control module
PROBLEM	PROBABLE CAUSE	REMEDY
Venter motor will not start	1. No power to unit. 2. No 24 volt power to venter relay. 3. Integrated ignition control module defective.	1. Turn on power, check supply fuses or circuit breaker. 2. Turn up thermostat; check control transformer output. 3. Replace integrated ignition control module. DO NOT ATTEMPT TO REPAIR IGNITION CONTROL MODULE; IT HAS NO FIELD REPLACEABLE COMPONENTS.
	4. Defective motor.	4. Replace motor.
Burners will not light	1. Manual valve not open. 2. Air in the gas line. 3. Gas pressure too high or too low.	1. Open manual valve. 2. Bleed gas line. 3. Set supply pressure at 5" w.c. to 14" w.c. for natural gas and 11" w.c. to 14" w.c. for propane gas.
	4. No Spark: a) Loose wire connections b) Transformer failure c) Incorrect spark gap. d) Spark cable shorted to ground. e) Spark electrode shorted to ground	4. a) Be certain all wire connections are solid. b) Be sure 24 volts is available. c) Maintain spark gap at 1/8". d) Replace worn or grounded spark cable. e) Replace if ceramic spark electrode is cracked or grounded.
	f) Burners not grounded g) Ignition control module not grounded.	f) Make certain integrated ignition control module is grounded to igniter. g) Make certain integrated ignition control module is grounded to furnace chassis.
	h) Faulty integrated ignition control module	h) If 24 volt is available to the integrated ignition control module and all other causes have been eliminated, replace module. DO NOT ATTEMPT TO REPAIR IGNITION CONTROL MODULE; IT HAS NO FIELD REPLACEABLE COMPONENTS.
	5. Lockout device interrupting control circuit by above causes.	5. Reset lockout by interrupting control at the thermostat or main power.
	6. Faulty combustion air proving switch.	6. Replace combustion air proving switch.
	7. Main valve not operating. a) Defective valve b) Loose wire connections	7. a) If 24 volt is measured at the valve connections and valve remains closed, replace valve. b) Check and tighten all wiring connections.

30. Troubleshooting (cont'd)

PROBLEM (cont'd)	PROBABLE CAUSE (cont'd)	REMEDY (cont'd)
Burners will not light (cont'd)	<p>8. Integrated ignition control module does not power main valve.</p> <p>a) Loose wire connections</p> <p>b) Flame sensor grounded</p> <p>c) Incorrect gas pressure</p> <p>d) Cracked ceramic at sensor</p> <p>9. Flame rollout switch open</p> <p>a) Air blockage through the unit</p> <p>b) Faulty flame rollout switch</p>	<p>8.</p> <p>a) Check and tighten all wiring connections.</p> <p>b) Be certain flame sensor lead is not grounded or insulation or ceramic is not cracked. Replace as required.</p> <p>c) Set supply pressure at 5" w.c. to 14" w.c. for natural gas and 11" w.c. to 14" w.c. for propane gas.</p> <p>d) Replace sensor.</p> <p>a) Check for heat exchanger or vent pipe blockage.</p> <p>b) Replace flame roll out switch.</p>
Burners cycle on and off	<p>1. Gas pressure too high or too low.</p> <p>2. Burners not grounded</p> <p>3. Ignition control module not grounded.</p> <p>4. Faulty integrated ignition control module</p> <p>5. Faulty combustion air proving switch.</p> <p>6. Flame sensor grounded</p> <p>7. Cracked ceramic at sensor</p> <p>8. Incorrect polarity.</p>	<p>1. Set supply pressure at 5" w.c. to 14" w.c. for natural gas and 11" w.c. to 14" w.c. for propane gas.</p> <p>2. Make certain integrated ignition control module is grounded to igniter.</p> <p>3. Make certain integrated ignition control module is grounded to furnace chassis.</p> <p>4. If 24 volt is available to the integrated ignition control module and all other causes have been eliminated, replace module. DO NOT ATTEMPT TO REPAIR IGNITION CONTROL MODULE; IT HAS NO FIELD REPLACEABLE COMPONENTS.</p> <p>5. Replace combustion air proving switch.</p> <p>6. Be certain flame sensor lead is not grounded or insulation or ceramic is not cracked. Replace as required.</p> <p>7. Replace sensor</p> <p>8. Reverse 115V line connections at ignition control module.</p>
No heat (Heater Operating)	<p>1. Incorrect manifold pressure or orifices.</p> <p>2. Cycling on limit control.</p> <p>3. Improper thermostat location or adjustment.</p>	<p>1. Check manifold pressure (See Paragraph 9).</p> <p>2. Check air throughput.</p> <p>3. See thermostat manufacturer's instructions.</p>
Cold air delivered	<p>1. Incorrect manifold pressure.</p>	<p>1. Check manifold pressure (See Paragraph 9).</p>
Fan motor will not run	<p>1. Circuit open.</p> <p>2. Defective integrated ignition control module.</p> <p>3. Defective motor.</p>	<p>1. Check wiring and connections..</p> <p>2. Replace module. DO NOT ATTEMPT TO REPAIR IGNITION CONTROL MODULE; IT HAS NO FIELD REPLACEABLE</p> <p>3. Replace motor.</p>
Fan motor turns on and off while burner is operating (See below)	<p>1. Motor overload device cycling on and off.</p>	<p>1.</p> <p>a) Check motor load against motor rating plate. Replace motor if needed.</p> <p>b) Check to be certain that an unauthorized air distribution device has not been added.</p>
Fan motor cuts out on overload	<p>1. Low or high voltage supply .</p> <p>2. Defective motor.</p> <p>3. Poor air flow.</p> <p>4. Defective bearing.</p>	<p>1. Correct electric supply.</p> <p>2. Replace motor.</p> <p>3. Clean motor, fan and fan guard.</p> <p>4. Replace motor.</p>

31. Heater Rating Plate

The heater rating plate is a quick reference for information about a heater and its installation requirements. In addition, the Serial No. on the rating plate identifies components used in manufacturing that specific heater. The serial number is coded to identify the gas valve and ignition type that was installed on the heater at the time of manufacture. This information is required if service and/or replacement parts are required.

Follow the example below to decode the heater Serial No.

Example: Heater Serial No. AWH75T9N12345X

AWH	75	T9	N	12345	X
Month & Year of Manufacture	Safety Pilot Code (Type of Ignition)	Type of Valve	Type of Gas*	Consecutive Number	Plant Designation

* N = Natural Gas; L = Propane Gas

IMPORTANT: The serial number code can only identify the original equipment. Before installing or servicing, check for a gas conversion label.

When inquiring about replacement parts, always provide the complete Model No. and Serial No. Each heater has a "Replacement Parts Label" attached that identifies parts specific to that heater, as well as the Model and Serial No. of the heater.

Identification of Serial No. Valve Codes for Valves Used on Model SFT Heaters			
Code	P/N	Manufacturer	*Gas
T9	147133	Robertshaw #7222DER	N
U1	147134	Robertshaw #7222DERLP	L
U2	147830	Honeywell #VR8205M1130	N
U3	147560	Honeywell #VR8205M1148	L
U6	150839	Honeywell #VR8305M4009	N
U7	150840	Honeywell #VR8305M4017	L
W6	172552	Honeywell #VR8105M2187	N
W7	172553	Honeywell #VR8105M2825	L

FOR SERVICE OR REPAIR, FOLLOW THESE STEPS IN ORDER:

FIRST:	Contact the Installer
	Name _____
	Address _____

	Phone _____
SECOND:	Contact the nearest distributor (See Yellow Pages). If no listing, contact Authorized Factory Representative, 1-800-695-1901 (Press 1).
THIRD:	Contact REZNOR®/ Thomas & Betts Corporation 150 McKinley Avenue Mercer, PA 16137 Phone: (724) 662-4400
Model No.	_____
Unit Serial No.	_____
Date of Installation	_____



(800) 695-1901

www.ReznorOnLine.com

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