WAYNE COMBUSTION SYSTEMS
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MODELS

ALL P250 AND P265 SERIES

GAS BURNERS

Manual 101220 | Revision C | Publication Date: 7/11/14

NOTE: Dimensions in () are informational only. English values take priority.

P250AF Gas Burner

P265F Gas Burner

SPECIFICATIONS

BURNER MODELS	MINIMUM INPUT	MAXIMUM INPUT	FUELS
P250AF & P250AF-EP & P250AFDI	50,000 Btu/hr (15 kW)	250,000 Btu/hr (73 kW)	Natural & L.P. Gas
P265 & P265EP & P265DI	65,000 Btu/hr (19 kW)	200,000 Btu/hr (59 kW)	Natural & L.P. Gas
P265F & P265FEP &P265FDI	65,000 Btu/hr (19 kW)	200,000 Btu/hr (59 kW)	Natural & L.P. Gas

ELECTRICAL Power Supply – 115V/60HZ 1 Ph. **MOUNTING:** Adjustable Flange is Standard; Pedestal Mount is Optional

⚠ WARNING **If the information in these instructions is not followed exactly, a fire or explosion may result causing property damage, personal injury or death.**

INSTALLATION OF BURNER

INSTALLATION OF THE BURNER MUST BE DONE BY A QUALIFIED INSTALLER IN ACCORDANCE WITH REGULATIONS OF THE NATIONAL FUEL GAS CODE ANSI Z223.1/NFPA 54, AND IN COMPLETE ACCORDANCE WITH ALL LOCAL CODES AND AUTHORITIES HAVING JURISDICTION.

INCORRECT INSTALLATION, ADJUSTMENT, OR MISUSE OF THIS BURNER WILL VOID THE WARRANTY AND COULD RESULT IN DEATH, SEVERE PERSONAL INJURY, OR SUBSTANTIAL PROPERTY DAMAGE.

A QUALIFIED INSTALLER IS THE PERSON WHO IS RESPONSIBLE FOR THE INSTALLATION AND ADJUSTMENT OF THE EQUIPMENT AND WHO IS LICENSED TO INSTALL GAS-BURNING EQUIPMENT IN ACCORDANCE WITH ALL CODES AND ORDINANCES.

BURNER IS SHIPPED AT MINIMUM RATE AND MAX AIR BURNER MAY NOT LIGHT IN THIS CONFIGURATION AND WILL NEED AIR ADJUSTMENT

CSA CERTIFICATE NUMBER: 1156769

INSTALLATION LOG

BURNER MODEL:	SPECIFICATION NUMBER:	FUEL (NATURAL OR PROPANE):	GAS ORIFICE DRILLED SIZE:
INLET GAS PRESSURE (in. w.c.):	CO_2 (%):	O_2(%):	CO (PPM):
INSTALLER'S NAME:	CONTRACTOR NAME:	CONTRACTOR ADDRESS:	CONTRACTOR PHONE NUMBER:
CONTRACTOR LICENSE #:	DATE OF INSTALLATION:		
COMMENTS ABOUT INSTALLATION/START UP:			

BURNER/APPLIANCE SERVICE LOG

SERVICE DATE	TECHNICIAN	COMPANY / ADDRESS	CONTRACTOR LICENSE #	WORK PERFORMED
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THESE INSTRUCTIONS SHOULD BE AFFIXED TO THE BURNER OR ADJACENT TO THE HEATING APPLIANCE.

FOR YOUR SAFTEY: **DO NOT STORE OR USE GASOLINE OR OTHER FLAMMABLE VAPORS AND LIQUIDS IN THE VINCINITY OF THIS OR ANY OTHER APPLIANCE.**

WHAT TO DO IF YOU SMELL GAS:

- **Open Windows.**
- **Do not try to light any appliances.**
- **Do not touch electrical switches; do not use any phone in your building.**
- **Extinguish any open flame.**
- **Immediately call your gas supplier from a neighbor's phone. Follow the gas supplier's instructions.**
- **If you cannot reach your gas supplier, call the fire department.**

⚠ WARNING

ELECTRIC SHOCK HAZARD

HIGH VOLTAGES ARE PRESENT IN THIS EQUIPMENT. FOLLOW THESE RULES TO AVOID ELECTRIC SHOCK.

- Use only a properly grounded circuit. A ground fault interrupter is recommended.
- Do not spray water directly on burner.
- Turn off power before servicing.
- Read the owner's manual before using.

⚠ WARNING

OVERHEATING HAZARD

SHOULD OVERHEATING OCCUR:

- Shut off the manual gas valve to the appliance.
- Do not shut off the control switch to the blower.

⚠ WARNING

CARBON MONOXIDE POISONING HAZARD

CARBON MONOXIDE IS A COLORLESS, ODORLESS GAS THAT CAN KILL. FOLLOW THESE RULES TO CONTROL CARBON MONOXIDE.

- Do not use this burner if in an unvented, enclosed area. Carbon monoxide may accumulate.
- Do not misadjust the pressure regulator. High pressures produce carbon monoxide.
- Check flue gases for carbon monoxide. This check requires specialized equipment.
- Allow only qualified burner service persons to adjust the burner. Special instruments and training are required.
- Read the owner's manual before using.

⚠ CAUTION For shipping purposes, the flame spreader is fully retracted. Flame spreader adjustment is mandatory and affects burner ignition and performance.

CONTENTS

SECTION I: INSTALLATION AND SETUP

These instructions were prepared for the guidance of those installing this particular gas conversion burner. While they apply in principle to all installations, they should not be interpreted as meaning the only safe and economical way to install a conversion burner. It may be necessary to deviate from these instructions in some instances in order to comply with local gas company rules or codes in effect in the area in which the installation is made. It is recommended that the installer confer with the local gas company and with the proper municipal officials regarding any specific code or regulation governing the installation of gas conversion burners.
The installation must conform with local codes or, in the absence of local codes, with the American National Standard ANSI Z21.8 Installation of Domestic Gas Conversion Burners and ANSI Z223.1 the National Fuel Gas Code, latest version.

Safe and economical operation of the burner throughout its service life is dependent to a large extent upon its proper installation in the heating appliance. Therefore, we may impress upon the installer that good clean workmanlike installations mean satisfied customers.

VISUAL INSPECTION OF THE HEATING SYSTEM

A conversion burner shall not be installed in an appliance located in a room or basement where facilities for normal air circulation or infiltration are so limited so as to interfere with ready obtainment of all air necessary for proper combustion and draft hood dilution, unless at the time of burner installation special provisions are made for combustion and draft hood dilution air.

a. In open basements of homes of normal construction (without basement storm windows or tight stair doors) infiltration of combustion air is usually sufficient to replace that drawn up the flue, so special provisions are seldom necessary.
b. When the heating appliance is installed in a tightly closed room without ventilating openings to outdoors or other rooms, provisions shall be made for supplying air for combustion through special openings, one near the floor line and the other near the ceiling, each to be sized on the basis of one square inch or more of free area for each 1,000 Btu/hr (0.2931 Kw) input but not less than 100 square inches. (See Figure 1).
c. When the house is of unusually tight construction, has a (kitchen) ventilating fan which may be used for exhausting air from indoors, or has a vented fireplace, it is recommended that combustion air be supplied to the furnace room through intakes extending to the outside of the building and terminating in down turned fittings, suitably arranged to prevent obstruction from snow or rain, and including a protecting screen not smaller than 1/4-inch (6.35 mm) mesh.

Ventilating Air Opening
1 Sq. in. (645.2 mm^2)
for each 1,000 Btu
(.29 kW) per hour
Input, 100 Sq. in. minimum.

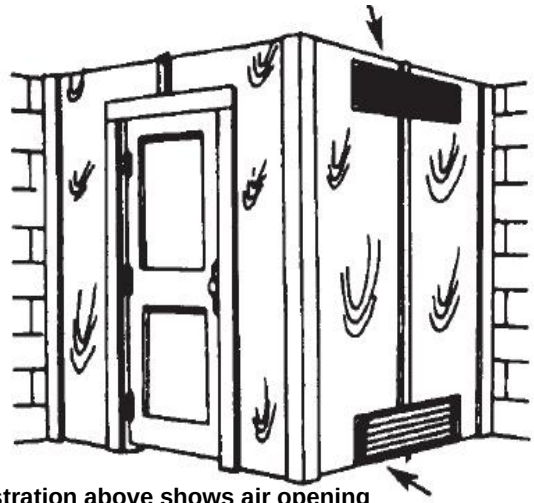


Illustration above shows air opening necessary to supply air for combustion when heating appliance is installed in an enclosed room.

Air Inlet Opening 1 Sq. in. (645.2 mm^2) for each 1,000 Btu (.29 kW) per hour input, 100 Sq. in. minimum.

FIGURE 1

Application below located in confined spaces. Ventilation air from inside building – combustion and draft hood dilution air from outside with ventilated attic or ventilated crawl space.

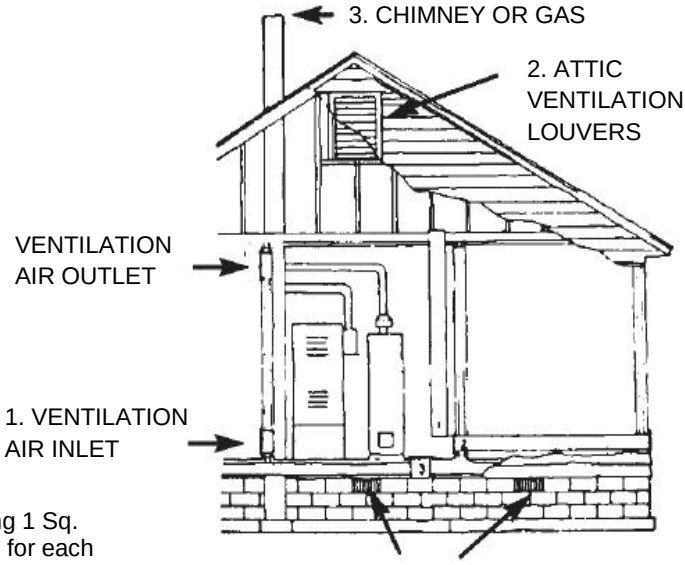


FIGURE 2

NOTE ON FIGURE 2: Ducts used for make-up air may be connected to the cold air return of the heating system only if they connect directly to outdoor air. Attic Ventilation Louvers are required at each end of attic with alternate air inlet No. 1.

1, 2, and 3 mark alternate locations for air from outdoors. Free area shall be not less than 1 Sq.in. (645.2 mm2) per 5,000 Btu (.1.465 kW) per hour of the total input rating of all appliances in the enclosure.

Crawl-space Ventilation Louvers for unheated crawl space are required with alternate air inlet No. 3.

Each Ventilation Air Opening from inside the building shall have a free area of not less than 1 Sq. in. (645.2 mm^2) per 5,000 Btu (.1.465 kW) per hour of the total input rating of all appliances in the enclosure.

The heating system (both the heat exchanger and distribution system) shall be of a size to properly heat the building. Through inquiry it shall be determined that all rooms have been heated adequately without wide variations in temperature, without objectionable drafts, and without excessive fuel costs in the past. If the heating system is deficient with respect to any of the above determinations, provisions shall be made to correct the deficiency, replace obsolete parts, or (by installing storm windows, insulation, etc.) to reduce the heat loss to a point where the existing system will provide the proper amount of heat.

a. Gravity Warm Air System
The supply and return ducts and registers should be sized and arranged so that the house can be heated without excessive furnace temperatures. Reference may be made to the American Society of Heating, Refrigerating and Air-Conditioning Engineers Guide and Data Book series and Handbook of Fundamentals.*

b. Forced Warm Air Systems
Inspection should also show whether the electrical characteristics of the fan and limit switch are satisfactory and whether the air filters and fan are in condition for continued proper service with the gas burner. Reference may be made to the American Society of Heating, Refrigerating and Air-Conditioning Engineers Guide and Data Book series and Handbook of Fundamentals.*

c. Hot Water Systems
The boiler thermometer and altitude gauge should be in good order. On a closed system, the feed and pressure relief valves shall be in proper operating condition. If there is an expansion tank on a closed system, inspection should show it to be substantially empty of water. When there is an existing water temperature limiting switch, its operating and electrical characteristics shall be checked to determine its suitability to the gas control circuit. For common piping systems reference can be made to the American Society of Heating, Refrigerating and Air-Conditioning Engineers Guide and Data Book series* and to the Hydronic Institute I=B=R Guides.**

d. Steam or Vapor System
The system shall be pressure tight, with pressure gauge and pop safety valve in good condition and with an existing water glass which permits clear observation of boiler water level. When there is a pressure limit switch or low-water cut-off, inspection shall determine whether either device can be utilized in the gas burner control circuit, reference should be made to the American Society of Heating, Refrigerating and Air-Conditioning Engineers and Institute of Boiler and Radiator Manufacturers guides. Traps and air vents shall be of adequate capacity, in good condition, and correctly placed in the system.

*Copies may be obtained from the http://www.ashrae.org

**Copies may be obtained from the Hydronic Institute, 35 Russo Place, Berkeley, NJ 07922.

INSPECTION OF FLUE PIPE AND CHIMNEY

- The flue pipe should be carefully inspected and replaced if necessary in connection with installation of a draft hood. A barometric damper may be used per Flue Pipe, Draft Hood, and Barometric Damper section of manual. All installations must operate with a negative draft overfire. Refer to your local gas company or codes for assistance or to the furnace and/or boiler manufacturer for recommendations.
- The flue pipe entrance into the chimney should be at least two feet (0.610m) above the clean-out opening in the chimney.
- The chimney should extend high enough above the dwelling or other neighboring obstructions so that wind from any direction will not strike the chimney from any angle above horizontal. Unless the obstruction is of greater magnitude, it is the usual experience that a chimney extending two feet above flat roofs or above fire wall parapets, and peaked roofs within 30 feet (9.144m) will be reasonably free of downdraft.
- Where the chimney is unlined or where local experience indicates that flue gas condensate might be a problem, the local gas company should be consulted.
- The chimney should be examined and thoroughly cleaned, if necessary, before installation is made to make sure it will freely conduct the flue gases to the outside.
- Flue pipe should extend through the chimney wall to the inner face of the chimney liner but not beyond, and should be firmly cemented to masonry. A thimble may be used to facilitate removal of flue pipe for cleaning, in which event the thimble should be permanently cemented in place with mortar or other fireproof material that will not crack or check the flue pipe or thimble, whichever is used, should be sealed into the chimney liner.
- Flue connections from two or more appliances should not enter opposing or adjacent sides of the chimney at the same level.
- Under no circumstances should the flue pipe be connected to a flue of an open fireplace.

INSPECTION OF HEATING APPLIANCE

Clean the appliance heat exchanger interior, combustion chamber and flue connections. Remove all adhering tars, scale, dirt, and soot. Inspect the heat exchanger for obvious and potential flue gas leaks. Cement all joints around the appliance base and access openings to prevent air and/or flue gas leakage into or out of the combustion chamber.

Warm Air Furnaces* - Make certain the electrical characteristics of the fan and limit switch correspond to those required by this burner and that they are in proper working order.

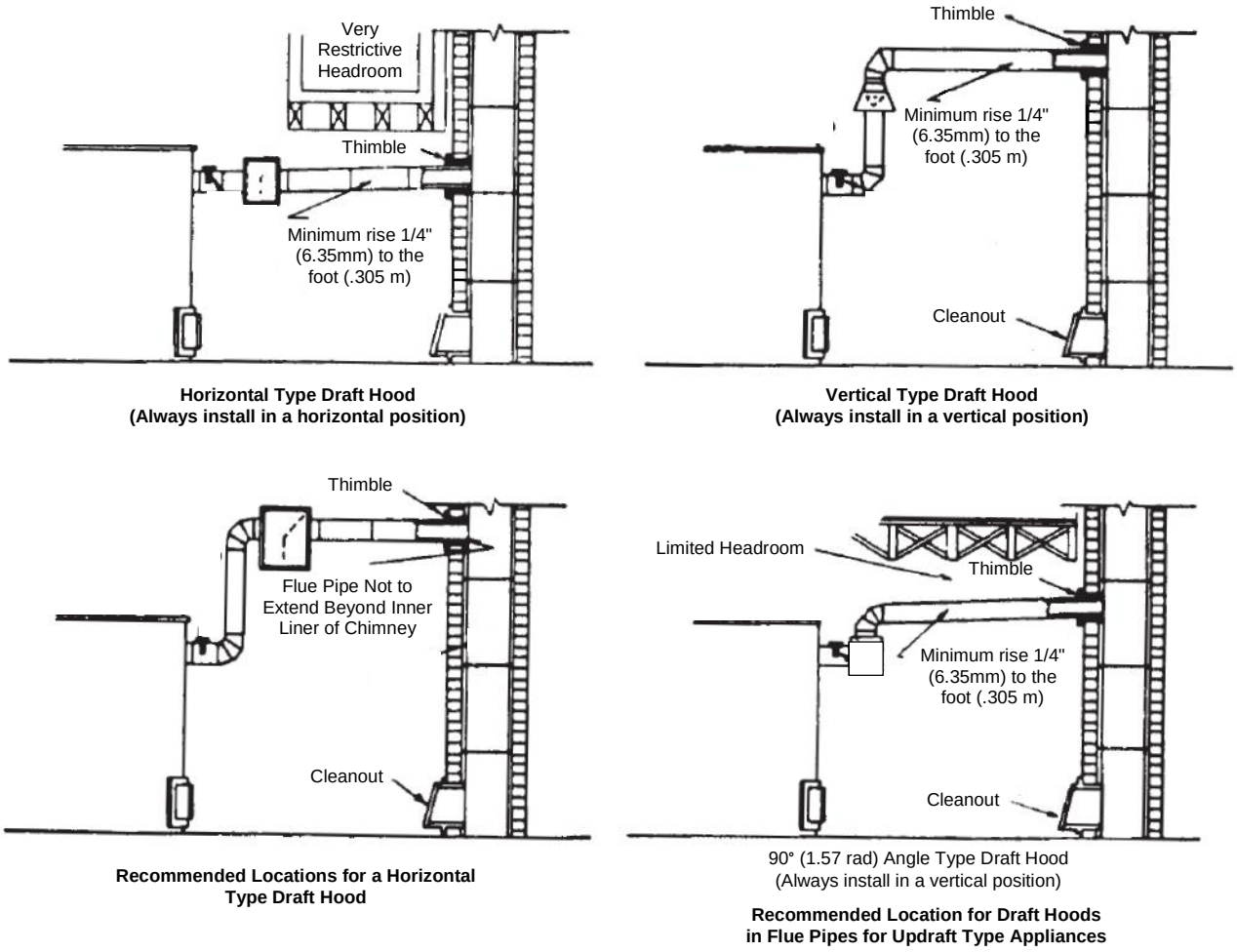
Hot Water Boilers* - Make certain water temperature and altitude gauges, pressure relief valves are in proper working order.

Steam Boilers* - Make certain the system is pressure tight and that the pressure gage and pop off safety valve are in proper working order. Verify existing water sight glass permits clear observation of boiler water level.

*Where applicable, existing temperature of pressure limit switch or low water cut-off switch operation and electrical characteristics shall be checked to determine their compatibility to the gas control circuitry of this burner.

NOTE: For oil fired conversions consult boiler or furnace manufacturer. Appliance must maintain negative draft over fire.

FLUE PIPE, DRAFT HOOD, AND BAROMETERIC DAMPER



Horizontal Type Draft Hood
(Always install in a horizontal position)

Vertical Type Draft Hood
(Always install in a vertical position)

Recommended Locations for a Horizontal Type Draft Hood

90° (1.57 rad) Angle Type Draft Hood
(Always install in a vertical position)

Recommended Location for Draft Hoods in Flue Pipes for Updraft Type Appliances

FIGURE 3: DRAFT HOOD LOCATIONS

A CSA type draft hood or its equivalent shall be placed in and made part of the flue pipe from the appliance. A barometric damper may be used in place of the draft hood where permitted by local building codes. If an oil barometric damper has been previously installed this may be used if it is in good condition and any and all weights and/or stops are removed. The flapper on a gas barometric damper must be free swinging in both directions. Check with local building codes and building inspectors. At no time should the draft hood be located at a point lower than the highest flue passage in the appliance. The draft hood should be installed in the position for which it was designed and in no case installed in a false ceiling, separate room from the heating appliance, or in any other manner that will permit a difference in pressure between the draft hood relief opening and the combustion air supply. On sealed type appliances where all combustion air is taken from the outside, a cap should be installed on end of flue pipe to prevent back drafts. In such cases no draft hood or diverter should be installed inside (See Figure 3).

When converting oil fired appliances, the flue pipe and draft hood or diverter used should be the same size as the furnace flue collar. It is recommended that a rise as great as possible or at least 1/4 inch (6.35mm) to the foot (0.305m) (horizontal length) be maintained in the flue pipe from the appliance to the chimney. The flue pipe should be relocated where possible to avoid sharp turns.

DRAFT – When installing Wayne power gas burners in oil fired boilers a minimum negative draft of .02" (5 Pa) w.c. over fire must be maintained. Refer to your local gas company and codes for assistance.

For gas fired equipment requiring a double acting barometric the preferred location of the barometric draft control is part of the bullhead tee shown in Figure 4. During normal operation, flue gases make a right angle turn behind the control, but do not infringe upon it. Should a downdraft occur, air flowing in the opposite direction strikes the control directly, causing it to open outwardly and vents the air into the room with a minimum of resistance. Entrained products of combustion are thus provided greater relief.

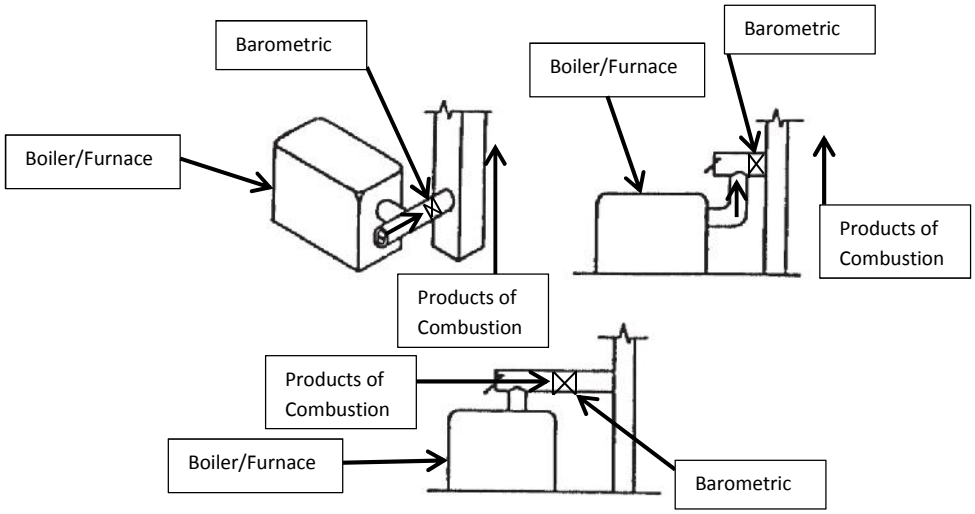


FIGURE 4: BEST LOCATIONS FOR BAROMETRIC DRAFT CONTROL

DRAFT HOOD & FLUE PIPE SIZES FOR GAS CONVERSION BURNERS IN FURNACES AND BOILERS

Not more than 6,500 Btu/hr (1.905 Kw) per square inch (645.2 mm^2) of the flue area	
Input – Btu/hr (Kw)	Draft Hood and Flue Pipe Size
Up to --- 120,000 (35) 120,000 (35.17) --- 180,000 (53) 180,000 (52.75) --- 250,000 (73)	5 inch (127 mm) 6 inch (152 mm) 7 inch (178 mm)

- NOTE: If the flue pipe exceeds 10 ft. (3.048m) in length, or contains more than two elbows, use next size larger pipe and draft hood.
- NOTE: All installations must operate with negative draft overfire. Refer to your local gas company and codes for assistance.

When installing the burner in revertible flue (down draft or diving flue type) furnaces or boilers, the draft hood (or draft diverter) should be located at least one foot higher than the top of the highest point of the appliance flue passage or combustion chamber. It is also recommended that a vent pipe, not less than one inch in diameter, be provided from the highest point in the flue passage, directly to the flue pipe. This is not necessary on the appliances with built in up draft bypass. The gas company serving the area should be consulted in regards to their recommendations for converting this type of furnace or boiler.

The flue pipe should be securely supported and the joints fastened with sheet metal screws or riveted to prevent sagging, and in no case should be located in a manner that will present a hazard to combustible building material. (Refer to local building code.)

PREPARATION OF COMBUSTION CHAMBER

Clean the combustion chamber thoroughly. Scrape and brush all heating surfaces and flue ways. Soot and fly ash are excellent insulators and unless removed, the efficiency of the heating appliance will be impaired. Plugged or restricted flue passages will prevent burner from operating properly.

Be sure water column and gauge on boiler are clean and water level is visible. In all cases make sure the pigtail to limit control is clear. Safety pop valves on steam boilers and automatic relief valves on closed water systems should be thoroughly checked to make sure they are in good working condition.

When converting oil designed boilers and furnaces, it is recommended that the existing combustion chamber be used with the gas burner, provided it is in good condition. If the blast tube opening into the combustion chamber is larger than the 4” (102 mm) diameter, high temperature cement should be used to reduce the opening to 4” (102 mm) diameter.

IN NO CASE SHOULD THE TUBE BE ALLOWED TO EXTEND INTO THE CHAMBER PROPER. IT MUST BE AT LEAST 1/8” (3.2mm) SHORT OF THE INSIDE SURFACE OF THE COMBUSTION CHAMBER. (SEE FIGURE 5)

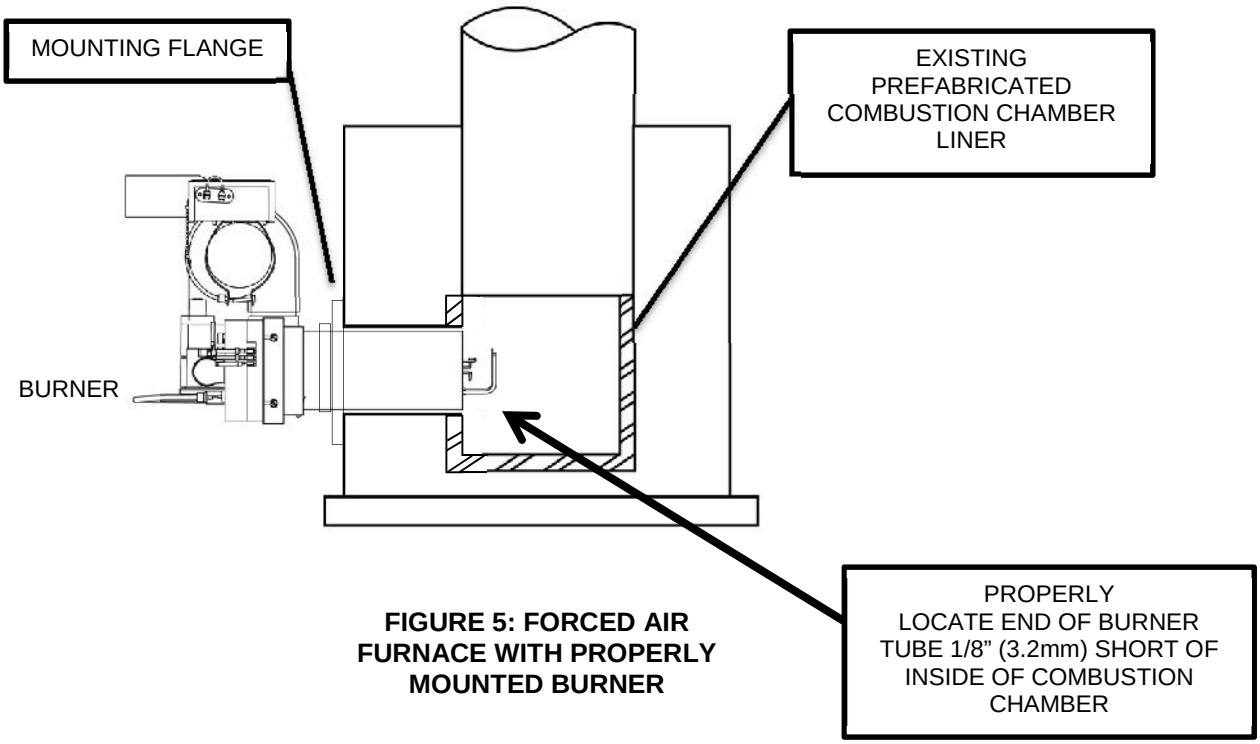


FIGURE 5: FORCED AIR FURNACE WITH PROPERLY MOUNTED BURNER

SIZING OF COMBUSTION CHAMBER

The following tables are provided as a guideline for determining combustion chamber size and corresponding firing rate when appliance rates are not available.

Table 1: Combustion Chamber for P250 Only

Input Btu/hr (kW)	Floor Area Sq. Inches (cm^2)	Preferred Width and Length Inches (cm)
50,000 (15)	49 (316)	7 (17.8) x 7 (17.8)
85,000 (25)	56 ¼ (363)	7 ½ (19.1) x 7 ½ (19.1)
100,000 (29)	64 (413)	8 (20.3) x 8 (20.3)
120,000 (35)	72 ¼ (466)	8 ½ (21.6) x 8 ½ (21.6)
140,000 (41)	81 (523)	9 (22.9) x 9 (22.9)
154,000 (45)	90 ¼ (582)	9 ½ (24.1) x 9 ½ (24.1)
175,000 (51)	100 (645)	10 (25.4) x 10 (25.4)
210,000 (62)	122 (787)	11 (27.9) x 11 (27.9)
240,000 (70)	144 (929)	12 (30.5) x12 (30.5)
250,000 (76)	156 ¼ (1008)	12 ½ (31.8) x 12 ½ (31.8)

Table 2: Combustion Chamber for P265 Only

Input Btu/hr (kW)	Floor Area Sq. Inches (cm^2)	Preferred Width and Length Inches (cm)
65,000 (19)	63 (407)	7 (17.8) x 9 (22.9)
75,000 (22)	71 ¼ (460)	7 ½ (19.1) x 9 ½ (24.1)
100,000 (29)	125 (807)	10 (25.4) x 12½ (31.8)
150,000 (44)	180 (1161)	12 (30.5) x 15 (38.1)
200,000 (59)	221 (1426)	13 (33.0) x 17 (43.2)

Table 3: Combustion Chamber for P265F Only

Input Btu/hr (kW)	Floor Area Sq. Inches (cm^2)	Preferred Width and Length Inches (cm)
65,000 (19)	63 (407)	7 (17.8) x 9 (22.9)
75,000 (22)	63 (407)	7 (17.8) x 9 (22.9)
100,000 (29)	71 ¼ (460)	7 ½ (19.1) x 9 ½ (24.1)
150,000 (44)	110 (710)	10 (25.4) x 11 (27.9)
200,000 (59)	165 (1065)	11 (27.9) x 15 (38.1)

BURNER INSTALLATION

The P250 and P265 power gas burners were designed for converting oil fired furnaces and boilers. Due consideration was given to making it as simple and easy to install and service as possible without weakening its durability or efficiency. The burner is supplied as a completely assembled package unit.

NOTE: The burner must be installed in such a manner that all controls will be readily accessible for inspection, cleaning, adjustment and repairs.

INSTALLATION OF MOUNTING FLANGE

Position the mounting flange on the furnace wall, adjusting orientation as necessary until the bolt pattern of the furnace allows the flange to sit flush. (See Figure 6 for flange dimensions.)

Note the orientation of the flange and remove it so that the flange gasket may be placed between the furnace wall and the flange. Tighten the flange to the furnace wall.

Insert the burner tube into the flange and position it per Figure 5. Tighten the flange onto the burner tube.

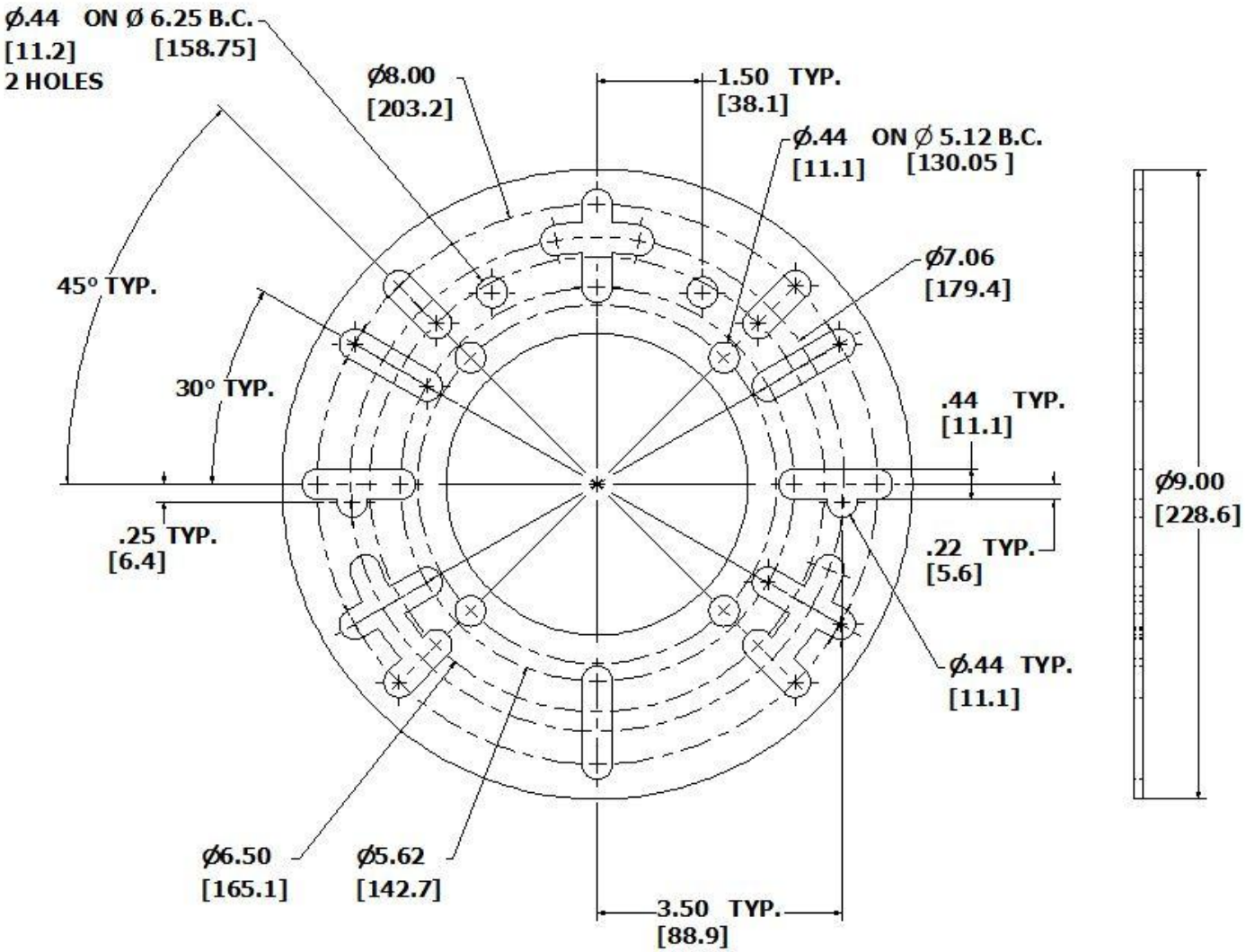


FIGURE 6: ADJUSTABLE MOUNTING FLANGE DIMENSIONS

DETERMINE ORIFICE SIZE AND RATE

The gas conversion burner needs to be set to deliver the same amount of heat to the appliance as the oil burner it is replacing. Determine the Btu/hr heat input rate for the appliance by locating the rating plate of the appliance and determine the firing rate of the oil burner. Typically the nozzle in the oil burner is stamped with the gallon per hour rate. Use the lesser of these two rates as the firing rate of the gas burner.

For calculating from gallon/hour of oil to Btu/hour of gas, One gallon of oil produces 140,000 Btu/gal (147700 kJ/L) of heat. For example: A furnace rating of 0.60 G.P.H. would be 0.60 x 140,000 = 84,000 Btu/hr. This is the input rate needed from the gas burner.

Once the desired heat output of the burner has been determined, the gas orifice must be properly sized. The gas orifice factory installed in all burners is sized to produce the minimum firing rate of the burner; 50,000 Btu/hr for the P250, 65,000 Btu/hr for the P265.

To determine the proper orifice size for the application, refer to Table 4 below. Locate the drill size by selecting the proper column based on the gas to be used. Example: To fire 80,000 Btu/hr on natural gas requires an orifice drilled with a #19 drill bit (0.166").

NOTE: Numbered and lettered drill bit sizes are valid bit sizes. They are machinist's drill bits. Decimal values have been provided in Table 4 as assistance in determining closest fractional drill bit size to the number/letter drill bit size.

The correct manifold pressure for natural gas is 3.5" w.c (872 Pa). Only minor adjustments in the input rate should be made by adjusting the pressure regulator. The minimum manifold pressure should be 3.0" w.c. (747 Pa) and the maximum pressure should be 3.5" w.c. (872 Pa). The next size larger or smaller orifice size should be used if the desired input rating cannot be obtained within the above manifold pressure adjustment range.

The correct manifold pressure for L.P. gas is 10" w.c. (2491 Pa). Only minor adjustments in the input rate should be made by adjusting the pressure regulator. The minimum manifold pressure should be 9.5" w.c. (2366 Pa), the maximum pressure 10.0" w.c. (2491 Pa). If the desired input rating cannot be obtained within the above manifold pressure and adjustment range then the next size larger or smaller orifice size should be used.

⚠ WARNING LP gas is heavier than air and will settle in low lying areas such as combustion chambers or heat exchangers. All connections should be checked for leaks using a soapy solution applied to gas connections.

Table 4: Orifice Size and Drill Bit Chart

Btu/hr(Kw) Input	**Natural Gas:** 3.5" w.c. (872 Pa)		**Propane Gas:** 10" w.c. (2491 Pa)	
	Number/ Letter/Fraction	Decimal (in)	Number/Fraction	Decimal (in)
50,000 (15)	29	0.136	45	0.082
60,000 (18)	28 (9/64)	0.1405	44	0.086
65,000 (19)	26	0.147	43	0.089
70,000 (21)	24	0.152	3/32	0.094
75,000 (22)	5/32	0.1562	40	0.098
80,000 (23)	19	0.166	37	0.104
100,000 (29)	17 (11/64)	0.173	35 (7/64)	0.110
110,000 (32)	14	0.182	31	0.120
115,000 (34)	3/16	0.187	3.1 mm	0.122
130,000 (38)	5 (13/64)	0.2055	1/8	0.125
140,000 (41)	4	0.209	30	0.1285
150,000 (44)	7/32	0.2188	29	0.136
160,000 (47)	1	0.228	28 (9/64)	0.1405
170,000 (50)	15/64	0.2344	27	0.144
175,000 (51)	B	0.238	26	0.147
185,000 (54)	1/4	0.250	25	0.150
200,000 (59)	G	0.261	22 (5/32)	0.157
210,000 (62)	17/64	0.266	20	0.161
220,000 (64)	I	0.272	19	0.166
235,000 (69)	9/32	0.281	11/64	0.172
250,000 (73)	M (19/64)	0.295	16	0.177

NOTE: The Btu/hr input values in Table 4 show the approximate hourly input of the burner for the various drill bit sizes shown. To determine the actual input of the burner by using the gas meter, follow these steps:

1) Turn off all other gas appliances.
2) The hand on the dial with the lowest cubic feet value (fastest revolving dial) should be clocked for one complete revolution.
3) Divide 3,600 by the time in seconds for one complete revolution and multiply by the dial value (1, 2, or 5 cubic feet depending on size of meter.)
4) Multiply this by the heating value of the gas to obtain the input to the burner in Btu per hour.

EXAMPLE: Time in seconds for one complete revolution of dial is 72. 3,600 divided by 72 is 50, 2 cubic foot was timed therefore 50 x 2 is 100. Multiply 100 by heating value of gas which is 1,075 for natural gas; and this will give you an input of 107,500 Btu/hr (31.51 Kw). Use a heating value of 2500 for LP gas.

IMPORTANT: The minimum gas supply pressure is 4.5" w.c. (1121Pa) for natural gas and 11.0" w.c. (2740Pa) for L.P. gas;
The maximum gas supply pressure is 10.5" w.c. (2615Pa) for natural gas and 13" w.c. (3238Pa) for L.P. gas.

Valve is rated for 0.5 PSI or 14" w.c. Over pressurizing valve may cause damage to the valve.

CHANGING THE ORIFICE

When leaving the factory each stock burner is sent out firing close to the minimum Btu/hr rating.

To increase the Btu/hr rating (increase the heating output) the orifice must either be changed or drilled out to the correct size. To determine drill bit size for required rate, see Table 4.

Each burner is sent out with two orifices. A blank orifice is hanging from the gas valve in a plastic bag. The second (minimum rate) orifice is installed in the burner in the orifice holder.

Before replacing the orifice, gas supply and power must be shut off. To replace the orifice locate and remove the two nuts that hold the orifice holder and gas pipe train to the back of the burner (Figure 7).

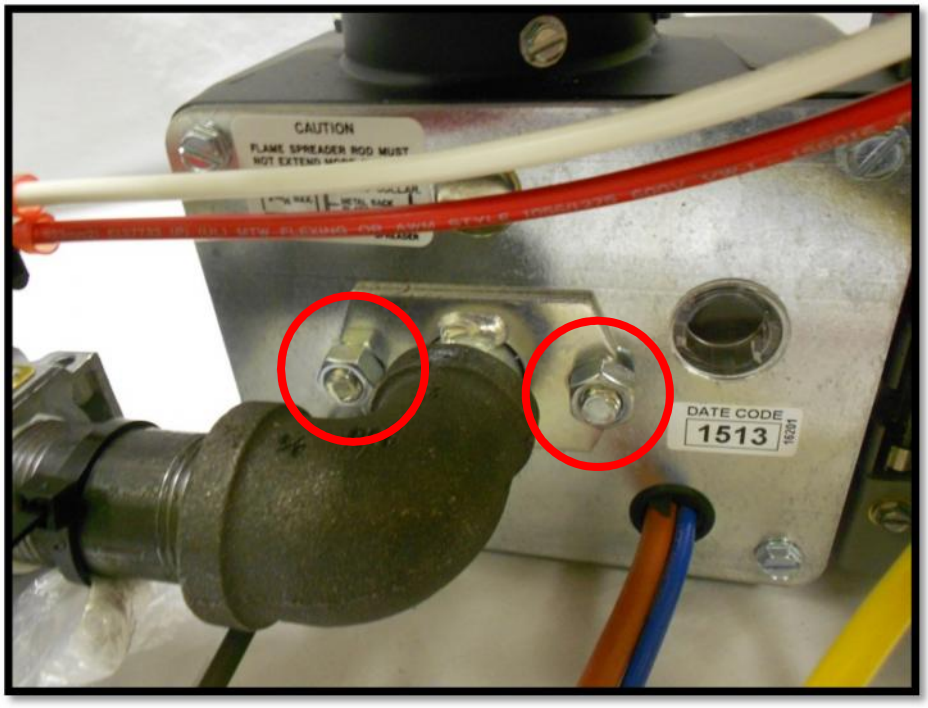


FIGURE 7: ORIFICE HOLDER/GAS PIPE TRAIN NUT LOCATION

TIP: Loosen the nut to the end of the stud and remove the second nut. This will help prevent the venturi from sliding down the air tube when reinstalling the gas train.

Pull the gas train out of the burner. The orifice is located on the end of the gas train and looks like a brass plug. Remove the orifice with a 11/16 inch wrench (Figure 8).

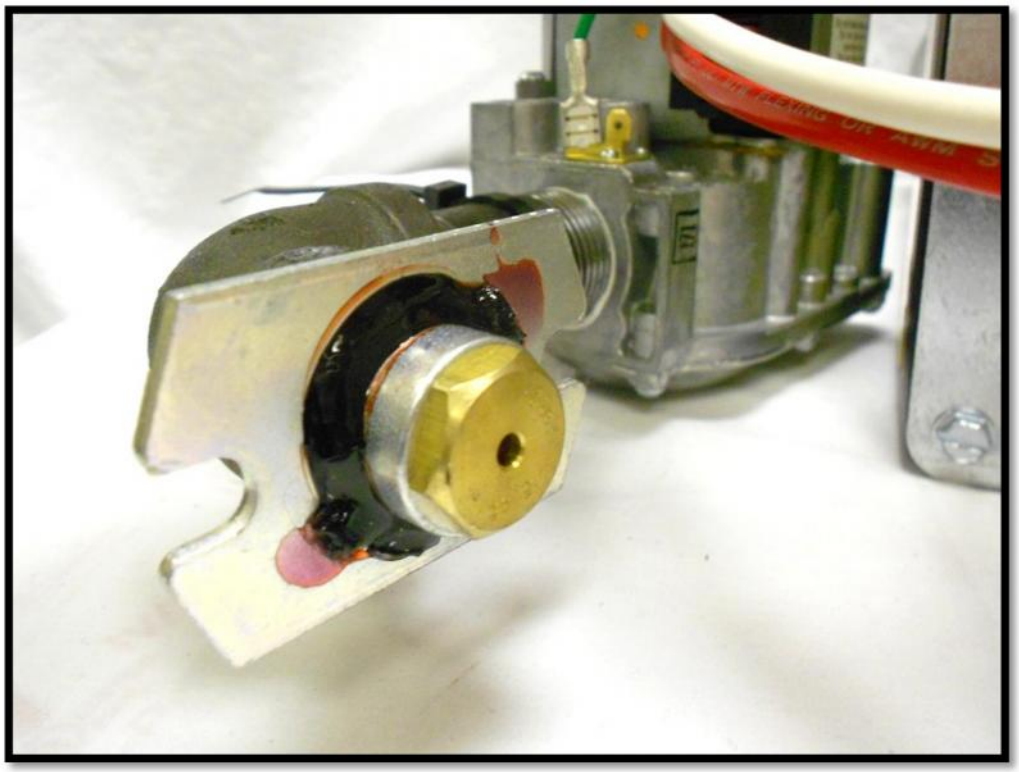


FIGURE 8: ORIFICE LOCATION

To drill the orifice, place it face down in a vice and drill through the back side. The back side is tapered and will make lining up the drill bit easier. Deburr the orifice and mark new size on orifice with permanent marker. Reinstall the orifice and secure the gas pipe train to the back of the burner using the nuts. **Record drilled orifice size in installation log in manual.**

NOTE: Numbered and lettered drill sizes are valid bit sizes. They are machinist's drill bits.

The burner is now ready to be connected to the gas supply piping; see instructions in next section.

INSPECTION AND SIZING OF GAS PIPING

All piping must comply with local codes and ordinances or the National Fuel Gas Code ANSI Z223.1/NFPA No. 54. A sediment trap or drip leg must be installed in the supply line to the burner. A union shall be installed in the gas line upstream from the control manifold and downstream from the sediment trap or drip leg (See Figure 10). A 1/8" NPT plugged tapping port accessible for test gauge connection shall be installed immediately upstream of the gas supply connection for the purpose of determining the gas supply pressure to the burner. A manual shutoff valve shall be installed in the gas supply line external to the appliance (See Figure 9).

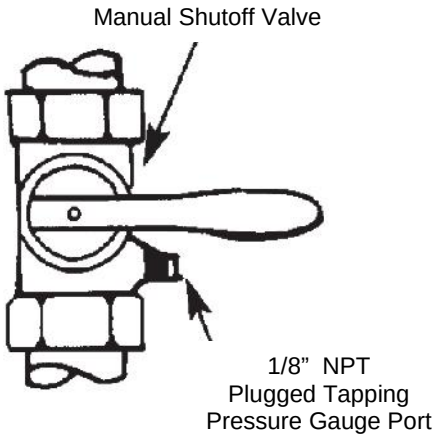
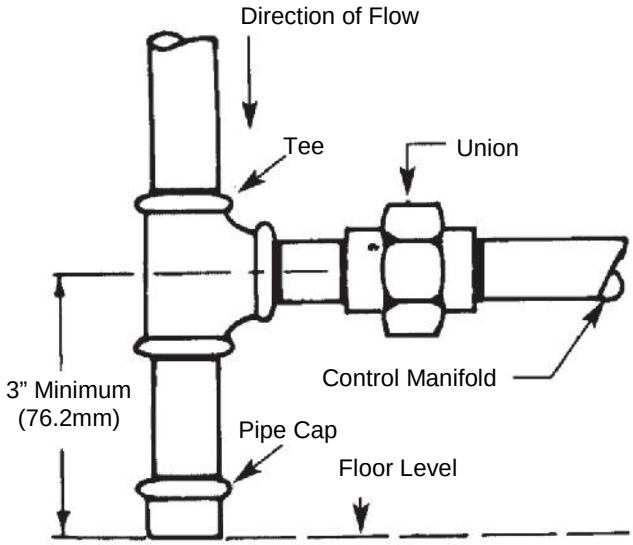


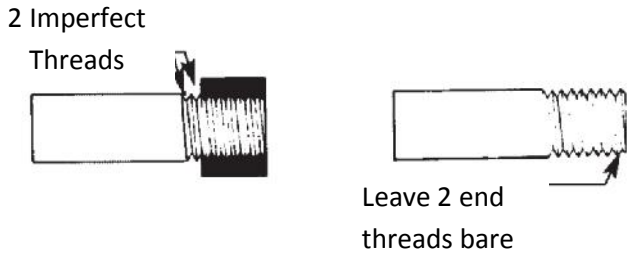
FIGURE 9: MANUAL SHUT OFF VALVE AND PRESSURE TAP



Location of union and drip leg for connecting conversion burner to house piping.

FIGURE 10: PIPE UNION AND FITTINGS

The gas line should be a separate supply direct from the meter to the burner. It is recommended that new pipe be used and located so that a minimum amount of work will be required in future servicing. The piping should be so installed as to be durable, substantial and gas tight. It should be clear and free from cutting burrs and defects in structure or threading. Aluminum tubing should not be used for the main gas supply. Joint compounds (pipe dope) should be used sparingly on male threads only and be approved for all gases.



Pipe Size Inch (mm)	Effective Length of Thread Inch (mm)	Overall Length of Thread Inch (mm)
3/8 (9.525)	3/8 (9.525)	9/16 (14.29)
1/2 (12.7)	1/2 (12.7)	3/4 (19.05)
3/4 (19.05)	1/2 – 9/16 (14.29)	13/16 (20.64)
1 (25.4)	9/16 (14.29)	1 (25.4)

FIGURE 11: PROPER PIPING PRACTICE

It is recommended that tables 5, 6, and 7 be used to determine the size pipe to use from the meter to the burner. The building structure should not be weakened by installation for the gas piping. The piping should not be supported by the other piping, but should be firmly supported with pipe hooks, straps, bands or hangers. Butt or lap welded pipe should not be bent. **Note: Each elbow, union, and tee adds approximately 2.5 feet of pipe.**

The gas piping should be so installed so as to prevent an accumulation of condensation and it must be protected against freezing. A horizontal pipe should be pitched so that it grades toward the meter and is free from sags. The pipe should not be run through or in an air duct or clothes chute. The appliance and its individual shutoff valve must be disconnected from the gas supply piping system during any pressure testing of the system at test pressure in excess of 1/2 psig (3447 PaG). The appliance must be isolated from the gas

supply piping system by closing its individual manual shutoff valve during any pressure testing of the gas supply piping system at test pressures equal to or less than 1/2 psig (3447 PaG).

Table 5: Pipe Sizing Chart for Natural Gas (0-0.5 psi) with Straight Schedule 40 Metal Pipe

The following chart is based on **0-0.5 psi** inlet pressure, specific gravity of **0.6**, and a pressure loss of **0.5" w.c..**

Maximum Capacity of Pipe Size in Btu per Hour

Length of Pipe (ft)	1/2"	3/4"	1"	1 1/4"	1 1/2"
10	175,000	360,000	680,000	1,400,000	2,100,000
20	120,000	250,000	465,000	950,000	1,460,000
30	97,000	200,000	375,000	770,000	1,180,000
40	82,000	170,000	320,000	660,000	990,000
50	73,000	151,000	285,000	580,000	900,000
60	66,000	138,000	260,000	530,000	810,000
70	61,000	125,000	240,000	490,000	750,000
80	57,000	118,000	220,000	460,000	690,000
90	53,000	110,000	205,000	430,000	650,000
100	50,000	103,000	195,000	400,000	620,000
150	40,000	84,000	160,000	325,000	500,000
200	35,000	72,000	135,000	280,000	430,000

Table 6: Pipe Sizing Chart for Liquid Propane (11" w.c.) with Straight Schedule 40 Metal Pipe

The following chart is based on **11" w.c.** inlet pressure and a pressure drop of **0.5" w.c..**

Special use: Piping sizing between single or second stage (low pressure regulator) and appliance.

Maximum Capacity of Pipe Size in Btu per Hour

Pipe Size	1/2"	3/4"	1"	1 1/4"	1 1/2"	2"	3"
Actual ID	**0.622**	**0.824**	**1.049**	**1.38**	**1.61**	**2.067**	**3.068**
Length of Pipe (feet)	**Maximum Capacity in Btu/hr**						
10	**291,000**	**608,000**	**1,145,000**	**2,352,000**	**3,523,000**	**6,786,000**	**19,119,000**
20	**200,000**	**418,000**	**787,000**	**1,616,000**	**2,422,000**	**4,664,000**	**13,141,000**
30	**160,000**	**336,000**	**632,000**	**1,298,000**	**1,945,000**	**3,745,000**	**10,552,000**
40	**137,000**	**287,000**	**541,000**	**1,111,000**	**1,664,000**	**3,205,000**	**9,031,000**
50	**122,000**	**255,000**	**480,000**	**984,000**	**1,475,000**	**2,841,000**	**8,004,000**
60	**110,000**	**231,000**	**434,000**	**892,000**	**1,337,000**	**2,574,000**	**7,253,000**
80	**94,000**	**197,000**	**372,000**	**763,000**	**1,144,000**	**2,203,000**	**6,207,000**
100	**84,000**	**175,000**	**330,000**	**677,000**	**1,014,000**	**1,952,000**	**5,501,000**
125	**74,000**	**155,000**	**292,000**	**600,000**	**899,000**	**1,730,000**	**4,876,000**
150	**67,000**	**140,000**	**265,000**	**543,000**	**814,000**	**1,568,000**	**4,418,000**
200	**58,000**	**120,000**	**227,000**	**465,000**	**697,000**	**1,342,000**	**3,781,000**
250	**51,000**	**107,000**	**201,000**	**412,000**	**618,000**	**1,189,000**	**3,351,000**
300	**46,000**	**97,000**	**182,000**	**373,000**	**560,000**	**1,078,000**	**3,036,000**
350	**42,000**	**89,000**	**167,000**	**344,000**	**515,000**	**991,000**	**2,793,000**
400	**40,000**	**83,000**	**136,000**	**320,000**	**479,000**	**922,000**	**2,599,000**

Table 7: Pipe Sizing Chart for Liquid Propane (11" w.c.) with Copper Tubing

The following chart is based on **11" w.c.** inlet pressure and a pressure drop of **0.5" w.c..**

Maximum Capacity of Tube Size in Btu per Hour

Pipe Size	1/2"	5/8"	3/4"	7/8"
Length (feet)	Maximum Capacity in Btu/hr			
10	110,000	206,000	348,000	536,000
20	76,000	141,000	239,000	368,000
30	61,000	114,000	192,000	296,000
40	52,000	97,000	164,000	253,000
50	46,000	86,000	146,000	224,000
60	42,000	78,000	132,000	203,000
70	38,000	71,000	120,000	185,000
80	36,000	67,000	113,000	174,000
90	33,000	62,000	105,000	161,000
100	32,000	59,000	100,000	154,000

NOTE: Copper tubing shall comply with standard type K or L of ASTM B 88 or ASTM B 280.

TESTING PIPING FOR LEAKS

Before turning gas under pressure into piping, all openings from which gas can escape should be closed. Immediately after turning on gas, the system should be checked for leaks. This can be done by watching the 1/2 cubic feet test dial and allowing 5 minutes to show any movement, or by soaping each pipe connection and watching for bubbles. If a leak is found, make the necessary repairs and repeat the above test. Defective pipes or fittings should be replaced and not repaired.
Never use a flame or fire in any form to locate gas leaks, use a soap solution.

After the piping and meter have been checked completely, purge the system of air. Do not bleed the air inside the furnace. Be sure to relight all the gas pilots on other appliances.

ELECTRICAL WIRING OF BURNER

The conversion burner is shipped completely wired. It is only necessary to supply the 115 volt circuit, thermostat and limit circuit. All wiring must conform with the National Electric Code or the code legally authorized in the locality where the installation is being made. The burner, when installed, must be electrically grounded in accordance with local codes or, in the absence of local codes, with the latest edition of the National Electrical Code, ANSI/NFPA No. 70. See wiring diagrams in Figure 22 through Figure 26 for reference on wiring, thermostat connection, and limit circuit. If an external electrical source is utilized, the conversion burner, when installed, must be electrically grounded in accordance with local codes or, in the absence of local codes, with the latest edition of the National Electrical Code ANSI/NFPA No. 70.

The burner ships with a jumper wire on the thermostat (T-T) terminals. Jumper needs to be removed for remote thermostat control and the thermostat needs to be connected per wiring diagrams. T-T terminal is an open/close switch for the burner and no voltage should be connected to it. For boilers it may be necessary to leave the T-T terminal jumped as the aquastat may be providing the voltage to the burner and controlling when voltage is sent to the burner. The burner is controlled by the appliance. Once wiring is complete between burner and appliance, verify appliance is controlling the burner's on/off operation. When connecting the burner to the 120 volt electrical supply, utilize the knockout provided on the burner's junction box.

INSPECTION OF LIMIT CONTROL SWITCHES

Warm air furnaces (gravity and forced air) should be equipped with an automatic temperature limit control switch. Hot water boilers (forced or gravity) should be equipped with an automatic temperature limit control switch. Steam or vapor boilers be provided with means to guard against firing a dry boiler or one in which the water is dangerously low.

IMPORTANT: On installations where an oil burner is being replaced with a gas burner, the controls on the boiler or furnace will have to be checked for compatibility with the gas burner. All controls should be checked to ensure that they operate properly and that they are in good condition. In no case should any limit or safety control be bypassed or wired in such a manner that it will result in unsafe operation of the burner or appliance. If the controls on the appliance are not compatible with the burner operation they should be replaced with the proper controls.

INSTALLATION OF THERMOSTAT

The thermostat should be installed on an inside wall and should be located in the natural circulating path of room air. Locations which would expose the thermostat to cold air, or drafts from windows, door, or openings leading to the outside, or to air currents from cold or warm air registers, or where the natural circulation of air is shut off such as behind doors, above or below mantels, shelves or in corners, should be avoided. The thermostat should not be exposed to heat from nearby radiators, lamps, rays of the sun or mounted on a wall near pipes, warm air ducts or chimney flue. Any hole in the plaster or panel through which the thermostat wires pass should be sealed to prevent drafts. The maximum comfort to be obtained from any automatic heating installation is dependent to a great extent upon the proper installation and adjustment of the room thermostat.

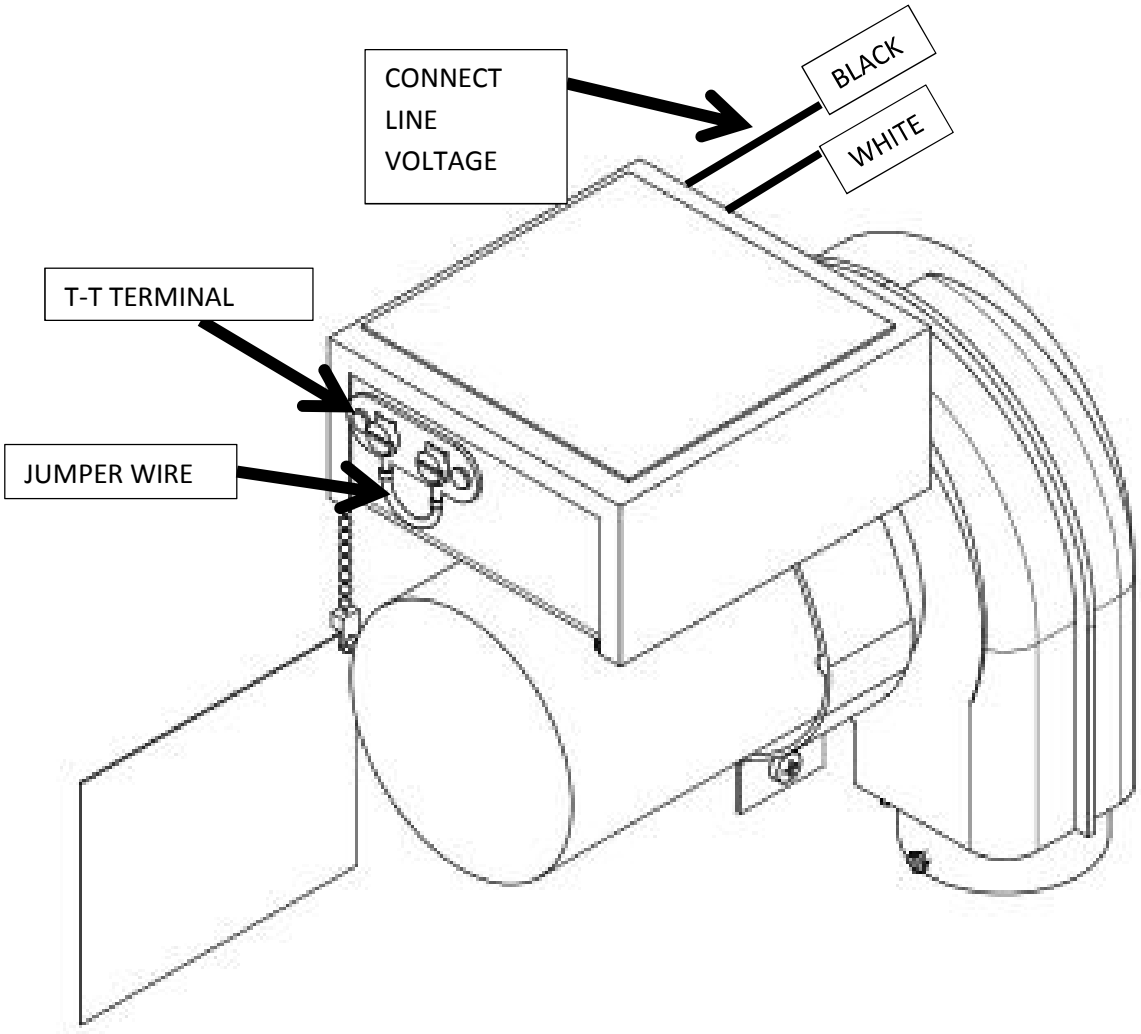


FIGURE 12: T-T TERMINAL LOCATION

SECTION II: INITIAL START UP

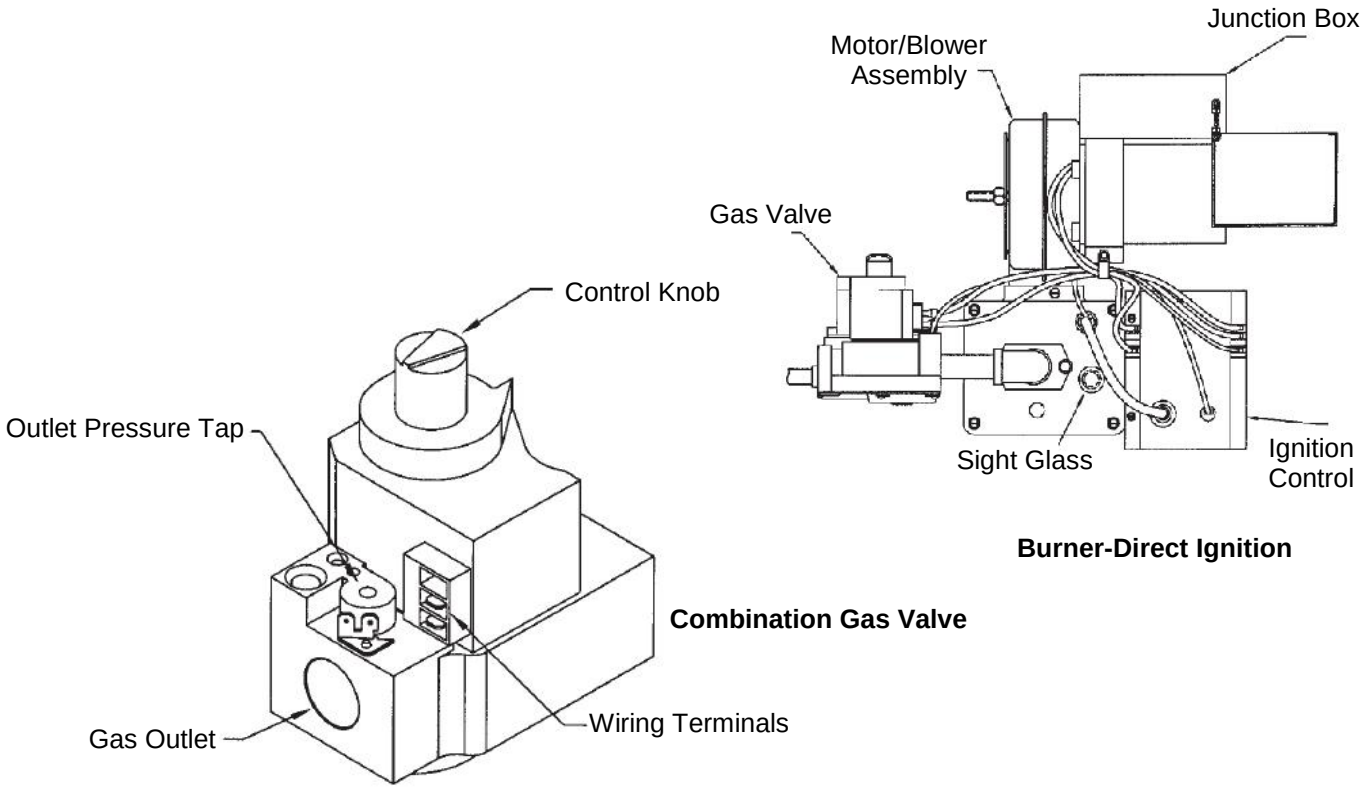
OPERATION OF BURNER (DIRECT SPARK IGNITION)

Starting the Burner:

1. Depress the gas valve control knob on the combination gas valve and turn to “OFF” (See Figure 13).
2. Set the room thermostat above room temperature and let the burner run five minutes to purge the appliance.
3. Set thermostat below room temperature.
4. Turn gas control valve knob to “ON”.
5. Set room thermostat higher than room temperature so that the burner will start.

To put burner out of operation

1. Depress the gas valve control knob on the combination gas valve and turn to “OFF”.
2. Turn off electrical supply.



Burner-Direct Ignition

Combination Gas Valve

FIGURE 13

BURNER OPERATION

On every call for heat (system start), the ignition control performs a 30 second pre-purge. Upon completion of the pre-purge, the ignition control opens the gas valve operator in the gas control. This allows gas to flow to the burner. Simultaneously, the electronic spark generator in the control produces a spark pulse output. This voltage produces a spark at the burner igniter-sensor rod, igniting the gas flowing around the electrode. If flame is not detected during the trial for ignition, the ignition control will go into a “lock-out” condition. If this occurs, proceed to the section titled SAFETY LOCK-OUT TIME.

SAFETY LOCK-OUT TIME

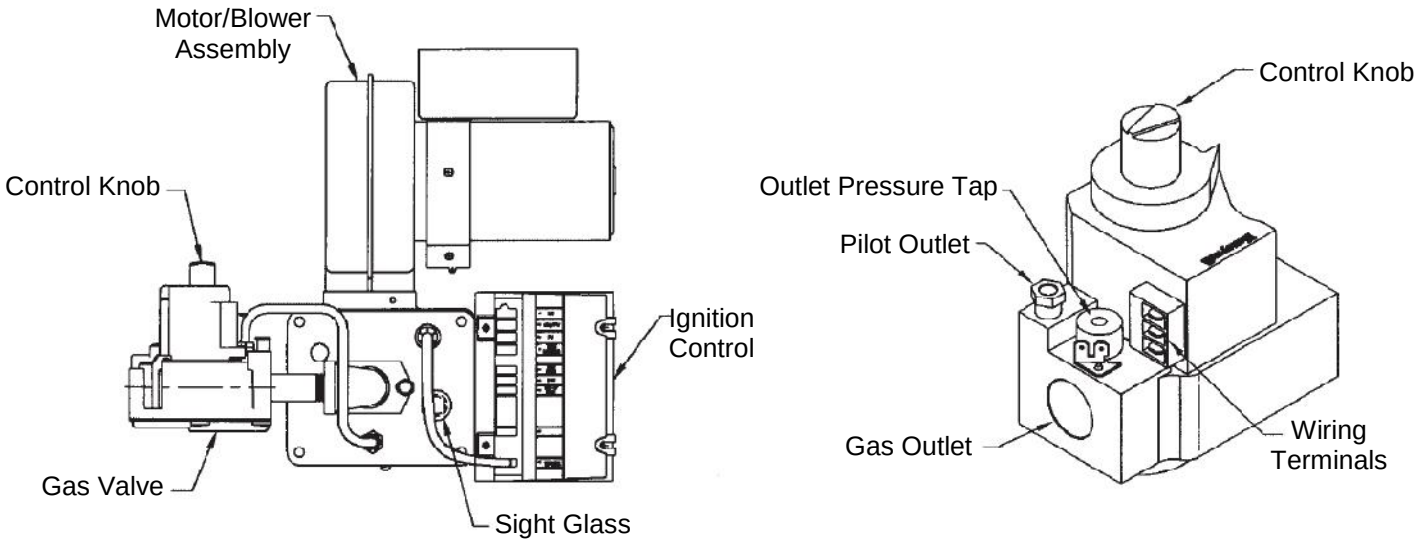
The trial for ignition timer circuit starts timing the moment the trial for ignition starts. If the designated trial for ignition time expires prior to the detection of a flame, the ignition control will go into a “lock-out” condition. Before another attempt to start the burner can be made, the ignition control must be reset. Reset by adjusting the thermostat or controller below room temperature, or to its “OFF” position. An alternate method is to shut the system power “OFF”. Wait at least one (1) minute and then turn the system “ON”.
If normal ignition does not occur, use Section V: Servicing and Troubleshooting to determine the problem.

OPERATION OF BURNER (ELECTRONIC PILOT)
(P265-EP, P265F-EP, P250AF-EP)

Starting the Burner:

1. Depress the gas valve control knob on the combination gas valve and turn to “OFF” (See Figure 14).
2. Set room thermostat above room temperature and let burner run five minutes to purge the appliance.
3. Set thermostat below room temperature.
4. Turn gas valve control to “ON”.
5. Set room thermostat higher than room temperature so that the burner will start.

To put burner out of operation
1. Depress the gas valve control knob on the combination gas valve and turn to “OFF”.
2. Turn off electrical supply.



Burner - Electrical Pilot **Combination Gas Valve**

FIGURE 14

FIRST STAGE – TRIAL FOR PILOT IGNITION
On every call for heat (system start), the ignition control performs a 30 second pre-purge. Upon completion of the pre-purge, the ignition control opens the pilot gas valve operator in the gas control. This allows gas to flow to the pilot burner. Simultaneously, the electronic spark generator in the S8600 produces a 15,000 volt spark pulse output. This voltage produces a spark at the pilot burner igniter-sensor rod, igniting the gas flowing around the electrode. If the pilot flame is not detected during the trial for pilot ignition, the ignition control will go into a “lock-out” condition. If this occurs, proceed to the section titled SAFETY LOCK-OUT TIME.

SECOND STAGE – MAIN BURNER OPERATION
When the pilot flame is established the ignition control’s flame sensing circuit detects the flame current and shuts the spark generator off. At the same time the main gas valve operator is opened in the gas control, allowing gas flow to the main burner. The pilot flame ignites the main burner conventionally.

SAFETY LOCK-OUT TIME
The trial for ignition timer circuit starts timing the moment the trial for pilot ignition starts. If the designated trial for ignition time expires prior to the detection of a pilot flame, the ignition control will go into a “lock-out” condition. Before another attempt to start the burner can be made, the ignition control must be reset. Reset by adjusting the thermostat or controller below room temperature, or to its “OFF” position. An alternate method is to shut the system power “OFF”. Wait at least one (1) minute and then turn the system “ON”.
If normal ignition does not occur, use Section V: Servicing and Troubleshooting to determine the problem.

OPERATION OF BURNER (STANDING PILOT)

Starting the Burner:

1. Depress the gas valve control knob on the combination gas valve and turn to “OFF” (See Figure 15).
2. Set room thermostat above room temperature and let burner run five minutes to purge the appliance.
3. Set thermostat below room temperature.
4. Turn gas valve control to “PILOT”.
5. Depress red button on valve to start pilot gas flow.
6. Push red button down on spark igniter until it snaps. Repeat this until the pilot lights. Note: this may take some time until all the air is “bled” out of the line. The pilot can be seen by looking through the sight glass.
7. Hold the red button on the valve for 60 seconds, then release.
8. Observe pilot – if not lit, SHUT OFF BURNER COMPLETELY AND WAIT 5 MINUTES. Repeat steps 1 through 7.
9. Turn gas control valves to “ON”.
10. Set room thermostat higher than room temperature so that the burner will start.

To put burner out of operation
1. Depress the gas valve control knob on the combination gas valve and turn to “OFF”.
2. Turn off electrical supply.

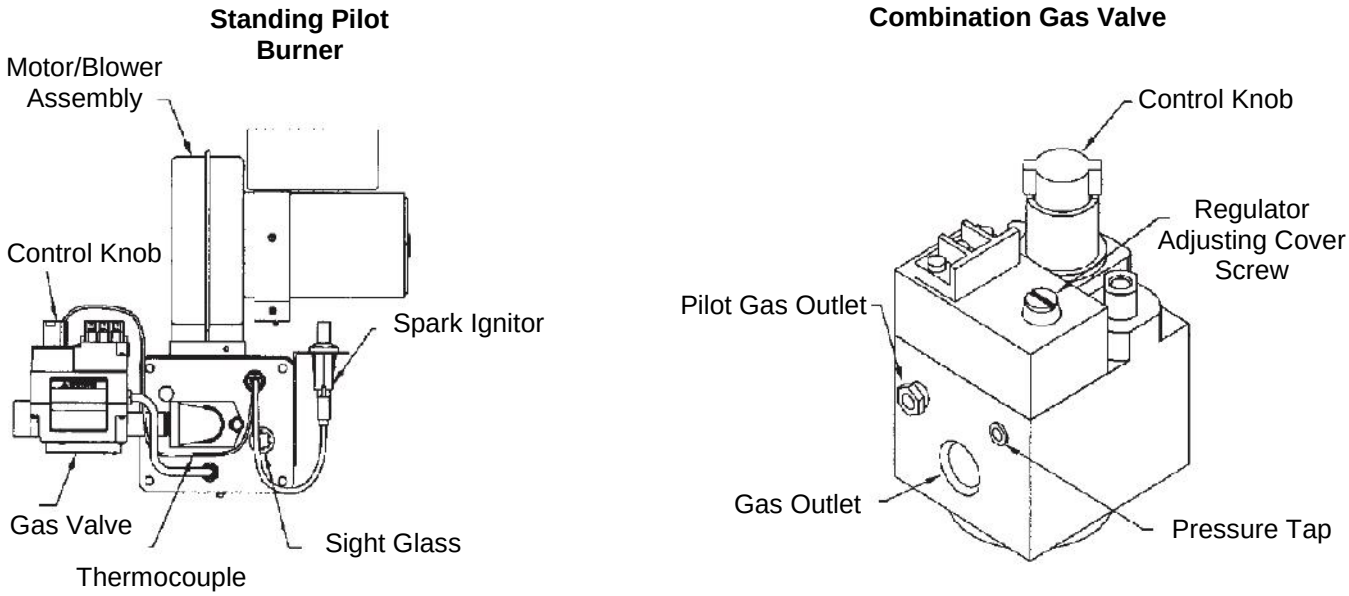


FIGURE 15

COMBUSTION ADJUSTMENT OF BURNER

All adjustments below must be made with the following equipment:

1. Draft Gauge
2. O_2 or CO_2 Analyzer
3. CO Tester
4. Water Column Gauge

Flame Spreader Adjustment (P250AF Only)

The flame spreader is used to shape the flame to best suit the firing chamber. Depending on the firing chamber, the flame spreader can be used to produce a long narrow flame or a short bushy flame.

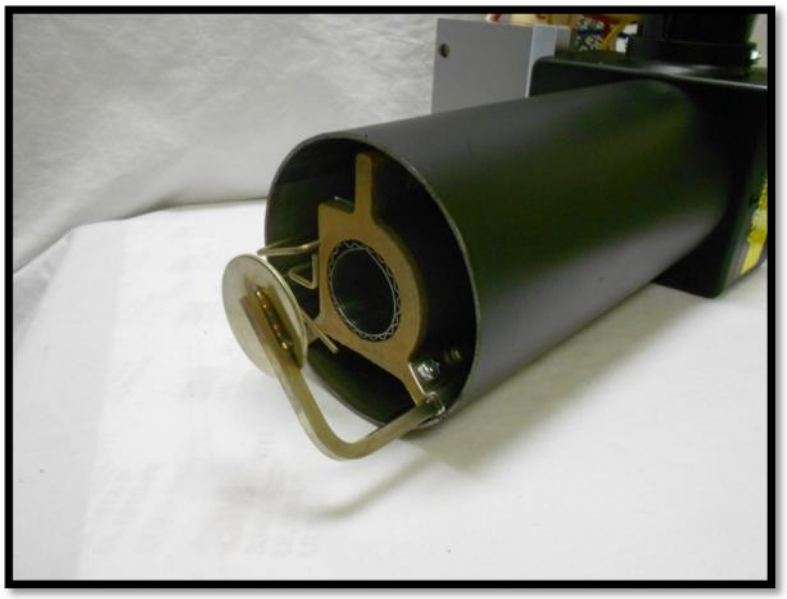


FIGURE 16: FLAME SPREADER LOCATION

To adjust the flame spreader on a P250AF burner, first loosen the set screw located on the back of burner near the bottom using a 3/32 inch Allen wrench.

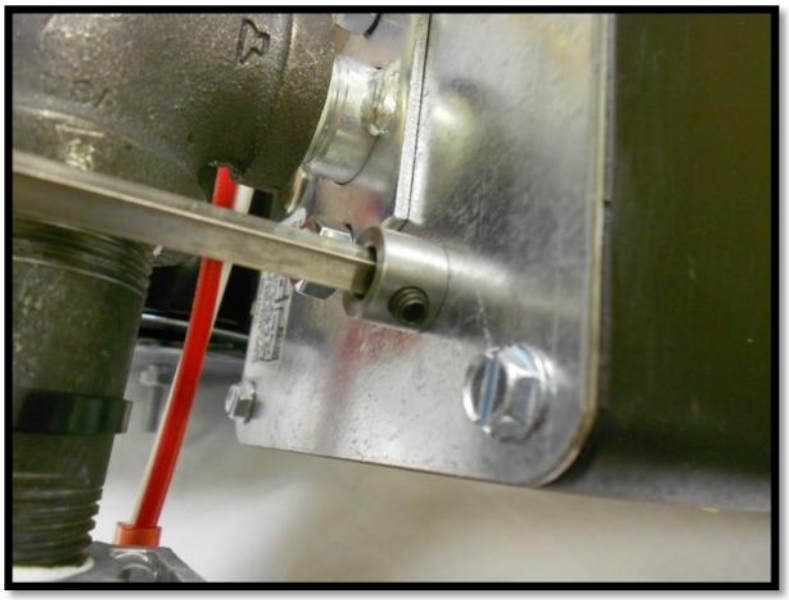


FIGURE 17: FLAME SPREADER SET SCREW LOCATION

With the flame spreader pulled all the way back, the flame spreader adjustment rod should measure approximately 3 1/4 inches from the back plate. With the flame spreader adjustment rod pushed all the way in it should measure approximately 1 inch from the burner back plate.

Adjust the flame so that it will fill the firebox without impinging on the back wall.

Once the flame is adjusted properly, retighten the set screw.

Air Shutter Adjustment

To adjust the disc air shutter, loosen the locking nut and then spin the disc either closer to or further from the fan housing. Increasing the air shutter opening will usually lower the CO_2 and CO readings. To determine the correct air shutter adjustment a combustion analyzer capable of measuring CO_2 (or O_2) and CO must be used.

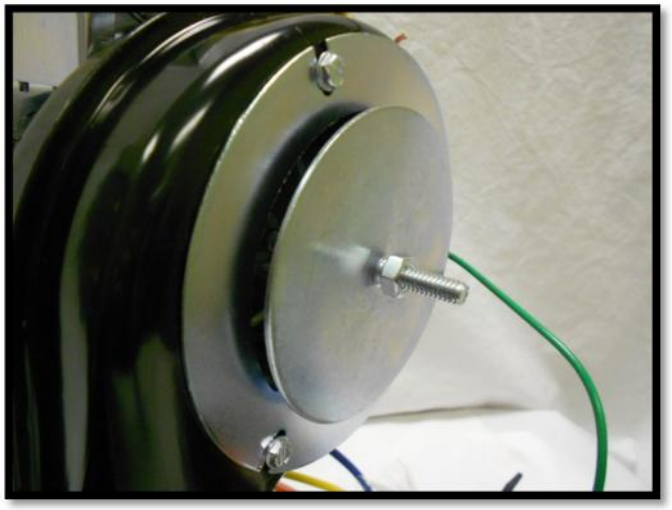


FIGURE 18: AIR SHUTTER LOCK NUT LOCATION

For natural gas applications, best performance will be achieved with a CO_2 setting of 8% to 10% (3% to 6.5% O_2) and CO should be minimized with a goal of 100 ppm or less. **In no case should CO be above 400 ppm.**

For propane gas applications, best performance will be achieved with a CO_2 setting of 9.5% to 11.8% (3% to 6.5% O_2) and CO should be minimized with a goal of 100 ppm or less. **In no case should CO be above 400 ppm.**

Stack temperatures for furnaces and boilers are recommended to be between 350 and 400 degrees Fahrenheit. Tighten the lock nut to secure the air shutter. After the air is adjusted and the burner is running properly, be sure to record all set up information and leave it with the burner.

FINAL INSTALLATION INSTRUCTIONS

Once adjustments to the burner are complete and burner is set up per the manual, record combustion numbers measured during setup, burner model number, model specification number, inlet gas pressure, date of installation, and contractor contact information in Installation Log. Leave the manual with appliance.

SECTION III: GAS CONVERSION

NATURAL GAS AND LP CONVERSION INSTRUCTIONS FOR P250 AND P265 BURNERS

In order to allow P250 and P265 burners to be converted from natural gas to LP gas operation, or from LP to natural gas operation, Wayne Combustion Systems has created gas conversion kits that contain all the parts necessary for any burner model regardless of the type of ignition system utilized; Direct Ignition, Electronic Pilot Ignition, Standing Pilot Ignition. The part numbers for these kits are as follows:

62955-001 Kit for converting natural gas burners to LP gas.
62956-001 Kit for converting LP gas burners to natural gas.

In addition to the necessary parts to complete the gas conversion, each kit contains detailed instructions for the conversion. To order the appropriate gas conversion kit, please contact a local wholesaler. The Wayne Combustion Customer Service Department can assist in locating the nearest wholesaler.

The conversion will require drilling a new gas orifice, changing the regulator spring in the gas valve and properly adjusting the gas pressure, applying new labels to the burner, and in the case of burners with either Electronic Pilot (EP) or Standing Pilot Ignition systems, a change to the pilot orifice. In order to assist with the planning of a conversion from natural to LP gas, or LP gas to natural, a list of necessary tools/equipment is shown below:

Equipment (Both Kits):

1. Slack tube manometer
2. ¼" Flat head screw driver
3. 3/16" Allen wrench
4. 1/2" Open end wrench
5. 11/16" Open end wrench
6. 1/8" NPT brass barbed fitting
7. 1/8" Diameter clear or rubber tubing
8. An Instrument to measure CO_2-%
9. An Instrument to measure CO-ppm
10. Orifice chart *****
11. Stop watch
12. Burner manual
13. Drill Index (drill bits)
14. Drill
15. Conversion kit.
16. Soapy water bottle
17. Two 10" pipe wrenches
18. 7/16" Open end wrench

To complete the conversion, follow the directions provided with the kit.

SECTION IV: CONSUMER INSTRUCTIONS

GENERAL INSTRUCTIONS FOR SERVICING BURNER

Gas burners require the services of an experienced technician for proper setting and adjustment. If the burner does not appear to be operating properly, DO NOT ATTEMPT TO ADJUST THE BURNER YOURSELF, but call in a competent serviceman. A homeowner should be able to check several possible causes of shutdown before calling in a serviceman. The following check list may eliminate the need for a service call or at least provide information for the serviceman.

1. Check thermostat. Make sure that it is set at the desired room temperature. If the thermostat is damaged or loose on the wall, have it replaced or repaired.
2. Check fuses in service box for the burner circuit. Replaceable type fuses should not be loose in the socket. If a fuse is blown out or if in doubt, replace with the same size and type. If circuit breaker is in the service box, check position of indicator. If tripped, reset.
3. Check on-off switch for the burner circuit, it may have been accidentally turned off.
4. With the thermostat set 10 degrees above room temperature, the burner should start automatically. If it does not start, check pilot. If no flame is visible, relight pilot following lighting instructions. Burners with the letters DI (Direct Ignition) and EP (Electrical Pilot) do not have continuously burning pilots.

It is advisable, periodically, to visually inspect the burner. Check air inlet blower to make sure it is not clogged or blocked. Check air shutter to make sure that it has not been tampered with, make sure that it is in the same position as when final adjustments were made. Check blower wheel to see if it is dirty or full of lint. Open observation door and check pilot flame. If the flame does not appear normal or if in doubt, call a serviceman. The areas around the conversion burner should be kept clear and free of combustible materials, gasoline and other flammable vapors and liquids. The flow of combustion and ventilating air to the burner must not be blocked or obstructed in any manner.

CLEANING OF BURNERS (BY SERVICEMAN ONLY): Remove the burner from the appliance and visually inspect the blast tube for any deterioration. On burners equipped with standing pilot or electronically ignited pilots, inspect pilot burner for dust or corrosion and clean if necessary. Check pilots, thermo-couples, electrodes, etc. with illustrations in the owner's manual for proper locations. Check flame spreaders if applicable for any deterioration and replace if necessary. Remove corrugated flame ring from the end of the venturi and clean. Visually inspect the inside of the venturi for any excessive rust or corrosion and clean if necessary. Replace corrugated flame ring and reinstall burner.

SECTION V: SERVICE AND TROUBLESHOOTING

NORMAL OPERATION CHECK OF BURNER (DIRECT IGNITION)

1. APPLIANCE CALLS FOR HEAT BY RAISING THE THERMOSTAT TO THE DESIRED SETTING: Note the transformer is always energized with 110 volts.
2. When the thermostat circuit is complete, this allows 24 volts to coil side of the fan relay which are the bottom terminals.
3. Now that 24 volts (yellow wires) are applied to the coil, this in turn allows the 115 volt contacts to close thus allowing 115 volts to flow to the fan across terminals #2 and #4 which are in series with the fan motor.
4. The combustion fan motor should now be energized.
5. With the fan energized, there will be a 30 second pre-purge.
6. The fan motor will develop 3400 rpm quickly causing the centrifugal endswitch to close. The endswitch can be identified by the two red wires coming from the end cap of the fan motor.
7. After the endswitch makes, this allows 24 volts to the direct ignition control.
8. Now the ignition process will follow.
9. The direct ignition control will generate a high frequency spark at the same time the gas valve opens. The S87K has a 4 second trial for ignition period. If after four seconds the control does not sense a minimum flame signal of 0.8 microamps then the control will go into lockout. To reset the control simply cycle the thermostat off and then set it to the desired room temperature.
10. After the burner is operational, the control shifts into a rectification mode constantly monitoring the flame signal.
11. The burner will now cycle off and on based on the thermostat setting.

NORMAL OPERATION CHECK OF BURNER (ELECTRONIC PILOT)

PRELIMINARY CHECK

The following visual checks should be made before troubleshooting an after installation or maintenance.

1. Check the power to the appliance and S8600.
2. Manual shutoff cocks in gas line to appliance must be open.
3. Make certain all wiring connections are clean and tight.
4. S86G, H module must not be in safety lockout. First de-energize the system and wait at least one (1) minute. This resets the module, allowing a return to start condition.
5. Review the S8600 system normal sequence of operation in Figure 19 below.

SEQUENCE OF OPERATION

START

THERMOSTAT (CONTROLLER) CALLS FOR HEAT

SPARK GENERATOR
Powered by First Valve (pilot) operator opens

STAGE 1
TRIAL FOR IGNITION

PILOT BURNER OPERATION

Pilot burner lights. Module senses flame current. **OR** Pilot burner does not light

Module	Response
S8900A,F S8610A,F	Ignition spark continues, pilot valve remains open until system is reset
S8600B,H S8610B,H	After 15 or 90 seconds a system locks out; must be manually reset
S8600M	After one second a system shuts off; after 5 minutes (6 minutes nom.), module restarts trial for ignition; ignition trial, shut off, wait sequence repeats until pilot lights or call for heat ends.

A shutoff/lockout timing is stamped on module

FLAME CURRENT SENSED
- Spark generator off
- Second valve operator (main) opens

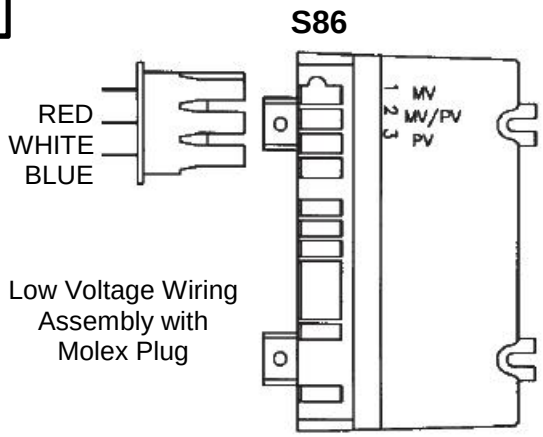
STAGE 2
MAIN BURNER OPERATION

MAIN BURNER OPERATION
Module monitors pilot flame current.

POWER INTERRUPTION
System shuts off, restarts when power is restored.
PILOT FLAME FAILURE
Main valve closes
Module starts trial for ignition.

THERMOSTAT (CONTROLLED) SATISFIED
Valves close, pilot and main burners are off.

END



Low Voltage Wiring Assembly with Molex Plug

FIGURE 19

TROUBLESHOOTING GUIDE DIRECT IGNITION

NOTE 1: BURNERS ARE NOT PRESET FROM THE FACTORY AND MUST BE ADJUSTED AT THE SITE.

NOTE 2: NEW GAS LINE INSTALLATIONS WILL HAVE AIR IN THE LINES AND REQUIRE SEVERAL IGNITION ATTEMPTS TO PURGE ALL THE AIR FROME THE LINES.

NOTE 3: DO NOT ATTEMPT TO PERFORM ANY WORK ON THIS BURNER UNLESS THE FOLLOWING TOOLS ARE AVAILABLE AND YOU ARE A CERTIFIED INSTALLER:

1. VOLT METER-VOLTS, OHMS, CONTINUITY
2. AMP METER-CLAMP TYPE
3. BURNER MANUAL
4. MANOMETER
5. O_2 OR CO_2 ANALYZER
6. CO TESTER
7. BLADE SCREW DRIVERS
8. NUT DRIVERS
9. OPEN END WRENCHS
10. TAPE MEASURE

The Wayne Burner that you are attempting to troubleshoot has the following electrical single phase components:

1. 115 Volt Combustion Fan Motor with End Switch
2. Fan Relay-24 volt coil side and 110 volt fan side
3. Honeywell Gas Primary Control (24 volt)
4. Honeywell Gas Valve (24 volt)
5. Transformer- 115 volt side and 24 volt side
6. Ignition Rod/Sensing Rod
7. Ignition Lead
8. T-T (24 volt) terminal

TROUBLESHOOTING GUIDE ELECTRONIC PILOT (FOR BURNERS UTILIZING HONEYWELL S8600 IGNITION CONTROL)

Start the system by setting the thermostat or controller above required temperature. Observe system response. Establish type of malfunction or deviation from normal operation. Use Figure 20 to check for normal system operation by following instruction question in box. If the condition is true or okay (answers yes), go down to next box underneath, if the condition is not true or not okay (answers no), go right to the next box alongside. Continue checking and answering conditions in each box encountered, until a problem and/or the repair are explained. After any maintenance or repair, the troubleshooting sequence should be repeated until the troubleshooting procedure ends with normal system operation.

IMPORTANT: The electronic Control Module cannot be repaired. If troubleshooting procedure indicates a malfunction in the Control Module, it must be replaced. Intermittent pilot systems should be serviced only by trained and experienced personnel.

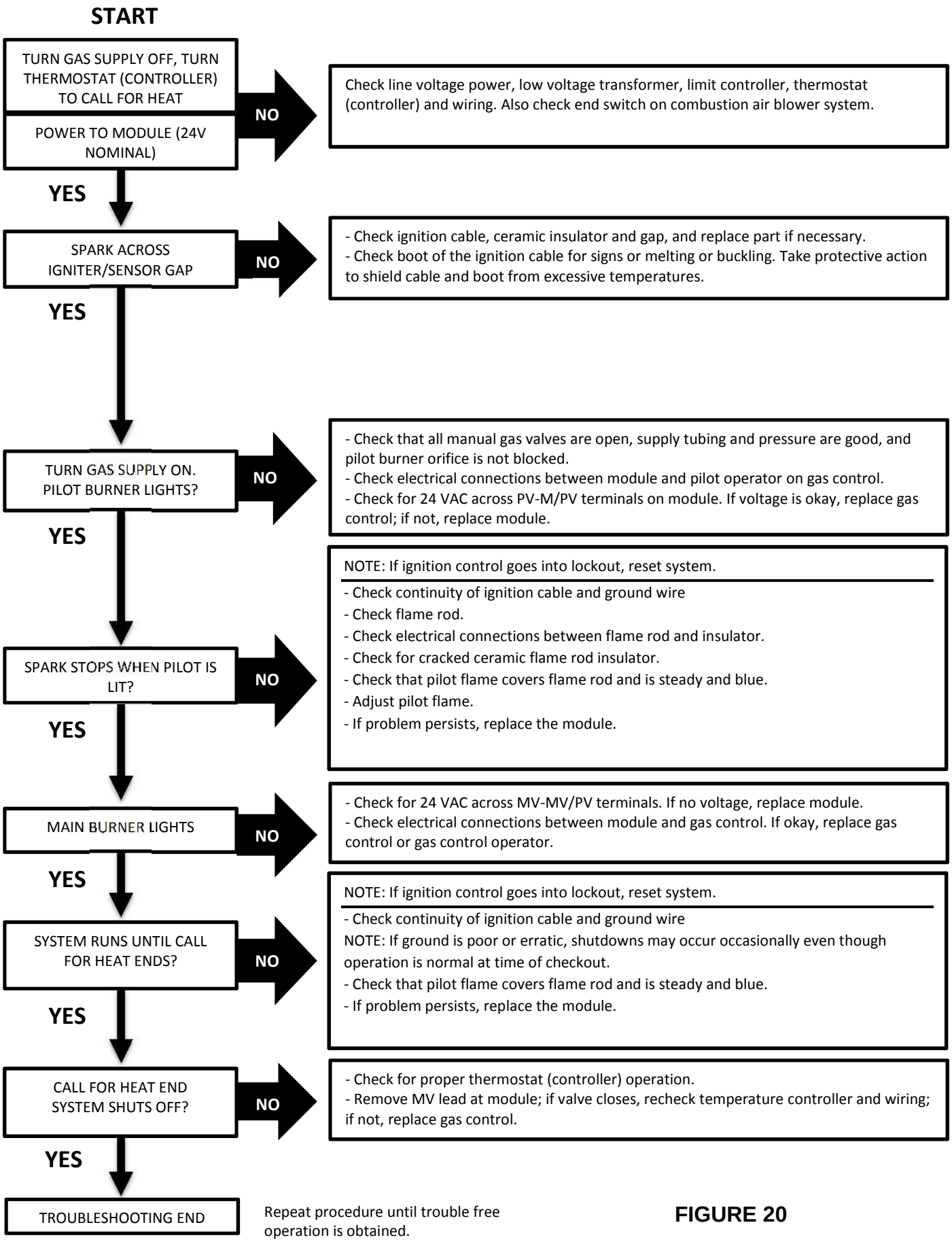

START
TURN GAS SUPPLY OFF, TURN THERMOSTAT (CONTROLLER) TO CALL FOR HEAT
POWER TO MODULE (24V NOMINAL)
NO
Check line voltage power, low voltage transformer, limit controller, thermostat (controller) and wiring. Also check end switch on combustion air blower system.
YES
SPARK ACROSS IGNITER/SENSOR GAP
NO
- Check ignition cable, ceramic insulator and gap, and replace part if necessary.
- Check boot of the ignition cable for signs or melting or buckling. Take protective action to shield cable and boot from excessive temperatures.
YES
TURN GAS SUPPLY ON. PILOT BURNER LIGHTS?
NO
- Check that all manual gas valves are open, supply tubing and pressure are good, and pilot burner orifice is not blocked.
- Check electrical connections between module and pilot operator on gas control.
- Check for 24 VAC across PV-M/PV terminals on module. If voltage is okay, replace gas control; if not, replace module.
YES
SPARK STOPS WHEN PILOT IS LIT?
NO
NOTE: If ignition control goes into lockout, reset system.
- Check continuity of ignition cable and ground wire
- Check flame rod.
- Check electrical connections between flame rod and insulator.
- Check for cracked ceramic flame rod insulator.
- Check that pilot flame covers flame rod and is steady and blue.
- Adjust pilot flame.
- If problem persists, replace the module.
YES
MAIN BURNER LIGHTS
NO
- Check for 24 VAC across MV-MV/PV terminals. If no voltage, replace module.
- Check electrical connections between module and gas control. If okay, replace gas control or gas control operator.
YES
SYSTEM RUNS UNTIL CALL FOR HEAT ENDS?
NO
NOTE: If ignition control goes into lockout, reset system.
- Check continuity of ignition cable and ground wire
NOTE: If ground is poor or erratic, shutdowns may occur occasionally even though operation is normal at time of checkout.
- Check that pilot flame covers flame rod and is steady and blue.
- If problem persists, replace the module.
YES
CALL FOR HEAT END SYSTEM SHUTS OFF?
NO
- Check for proper thermostat (controller) operation.
- Remove MV lead at module; if valve closes, recheck temperature controller and wiring; if not, replace gas control.
YES
TROUBLESHOOTING END
Repeat procedure until trouble free operation is obtained.

FIGURE 20

Table 8: Troubleshooting Chart Electronic Pilot Ignition
(For Burners Utilizing Fenwal Control)

Symptoms	Possible Causes
1. PILOT DOES NOT LIGHT.	a. Air in gas line. b. High or low gas pressure. c. Blocked pilot orifice. d. Broken or damaged ignition cable.
2. MOTOR DOES NOT RUN.	a. Thermostat or limit defective or improperly set. b. Relay or transformer defective. c. Motor burned out. d. Improper wiring.
3. MOTOR RUNNING BUT NO FLAME.	a. Very low or no gas pressure to pilot. b. High gas pressure to pilot. c. Defective regulator.

PRELIMINARY CHECKS, DIAGNOSIS AND SERVICE HINTS (ELECTRONIC PILOT IGNITION)

Although the following tests can be made using standard volt meter, it is quicker and more convenient to use a Fenwal Model 05-125539-001 Test Adapters.

1. Input Polarity
   If a spark is present and the gas valve opens for the flame establishing period but the control locks without sensing flame, check the input voltage at terminals 1 and 6 for the proper polarity. Terminal TH or 24V should be “hot”; 24VAC (05-16) with respect to ground. Terminal GND is neutral, or zero voltage, with respect to ground.

2. Improper Grounding
   If a flame is present during the Trial for Ignition period but the system shuts down, ensure that the burner is properly grounded. If the burner is not grounded, the flame monitoring signal will not function and the system will go into lockout. Check for loose or corroded terminals and replace if necessary. Ensure good electric connection by scraping paint or any other foreign matter off the area where ground connection is made.

   It is equally important to be certain that the electrode bracket assembly is properly grounded. The bracket should be common with the ground lead on the input connector (ground terminal 6). If the bracket is not properly grounded, damage to the ignitor can result.

3. Inoperative High Voltage
   If there is no spark or sparking is intermittent, check the following after disconnecting voltage to the system.
   a. Check spark gap. Gap should be 1/8 (3.2mm) +/- 1/32”(.8mm) form H.V. to ground.

   CAUTION: NEVER REPLACE THE COMPONENT BOARD WITHOUT FIRST CHECKING TO ENSURE THAT THE ELECTRODE HAS THE PROPER GAP. IF THE GAP IS TOO WIDE, DAMAGE TO THE IGNITOR CAN RESULT.

   b. Check electrode leads and determine there is no corrosion at the terminals. If there is corrosion, clean it off. **DO NOT USE LIQUIDS TO CLEAN TERMINALS.** Use steel wool or emery cloth to clean.

   c. Check ceramic insulators for cracks, foreign matter, and carbon. If there are cracks, replace electrodes. If there is carbon or foreign matter, clean it off. **DO NOT USE LIQUIDS TO CLEAN.** Use steel wool or emery cloth to clean.

   d. Check high voltage lead wire for cracks or breaks. If there are cracks, breaks or chafing, replace high voltage wire.

   e. Check to ensure that the high voltage terminal is clear of dust, moisture or any foreign matter that could create high voltage leakage to ground.

4. Valve Malfunction
   With power applied to the ignitor, sparking should occur and the solenoid valve should open simultaneously. If sparking occurs but the valve does not open, place a volt meter between Terminal PV1 and ground (or across valve). If valve does not function with

voltage, it should be replaced. If the voltage is not present at Terminals PV1 and ground (or across valve), the control should be replaced.

5. Electrode Placement
   a. Electrode should be placed so optimum flame current is achieved for proper application.
   b. Flame should not impinge on any portion of ceramic insulator.

6. Flame Current
   The flame detector circuit uses the ionized gas flame to conduct the flame signal. This signal is a small DC current which can be measured directly with a 0 to 50 microamp meter.

   Although the minimum flame current necessary to keep the control from going into lockout is 0.8 ,microamps, the lowest recommended is 1.5 microamps.

   To measure flame current, first shut off the power to the system and then connect a DC micro amp meter to the FC+ and FC- terminals. Energize the ignitor. If the meter reads below zero, shut the system off and reverse the meter leads.

Once the flame is established, assure that the flame current is above the minimum specified. If not, assure that the system has the proper input voltage, and then adjust the pilot line gas pressure until flame current is increased.

Once the flame is has been established and the system is in its heat cycle, occasional sparking may occur. This is common in some installations and is not significant. Sparking will not damage the ignitor.

Table 9: Service Hints

What's Wrong	Why	What To Do
1. Lockout occurs 3-10 seconds after ignition.	1. Reverse polarity. 2. System improperly grounded. 3. Gas pressure too high, causing flame to lift off burner.	See Input Polarity (See 1) See Improperly Grounding (See 2) Check to ensure input pressure as specified on manufacturer's data plate. See Flame Current (See 6)
2. Flame not established. Arcing to ground. 3. No spark. 4. Arcing other than across gap.	1. Sensor probe incorrectly positioned in flame pattern. Spark gap too small. Spark too large. Corroded connector. 2. Cracked or dirty insulator.	See Inoperative High Voltage (See 3a)
5. Weak spark.	1. Broken high voltage lead. High voltage lead too close to metal surface. Valve malfunction. Electrode improperly placed.	See Valve Malfunction (See 4) See Electrode Placement (See 5) See Flame Current (See 6) Check to ensure that manifold pressure meets manufacturer's specifications
No flame. Low flame current and/or nuisance lockouts.	1. Flame current falls below 0.8 µa. 2. Low gas pressure.	

COMPONENT TROUBLESHOOTING AND DIAGNOSIS

24 VOLT TRANSFORMER MALFUNCTION

The 24 volt transformer has a 115 volt primary side with a 24 volt secondary circuit. To check the transformer, simply apply 115 volts to the black and white leads. If the transformer is working correctly, 24 volts will be present across the two yellow leads. If the multimeter does not register 24 volts then the transformer needs to be replaced. The transformer will not function unless 115 volts are present across L1 and neutral.

COMBUSTION FAN ENDSWITCH

The 115 volt motor is equipped with a centrifugal endswitch. The purpose of the endswitch is to ensure that the combustion fan motor has reached the proper operating RPM which is generally about 3400 rpm. If the endswitch fails to close then the 24 volt circuit to the gas primary is interrupted and the gas valve will not open. If the blower motor has 115 volts applied but is not rotating then the motor assembly must be replaced. Lastly if the motor is not rotating, the centrifugal switch will not make and 24 volts will not be present at the gas primary control.

IGNITER ROD

The igniter rod is responsible for conveying the spark to a grounding rod in an appropriate location to ignite the gas and air mix. The igniter rod gap should be 1/8", larger gaps will create ignition problems. If the igniter rod is cracked, sparking sound will be heard inside the burner air tube but ignition will not occur and lockout will occur.

MORE SERVICE HINTS

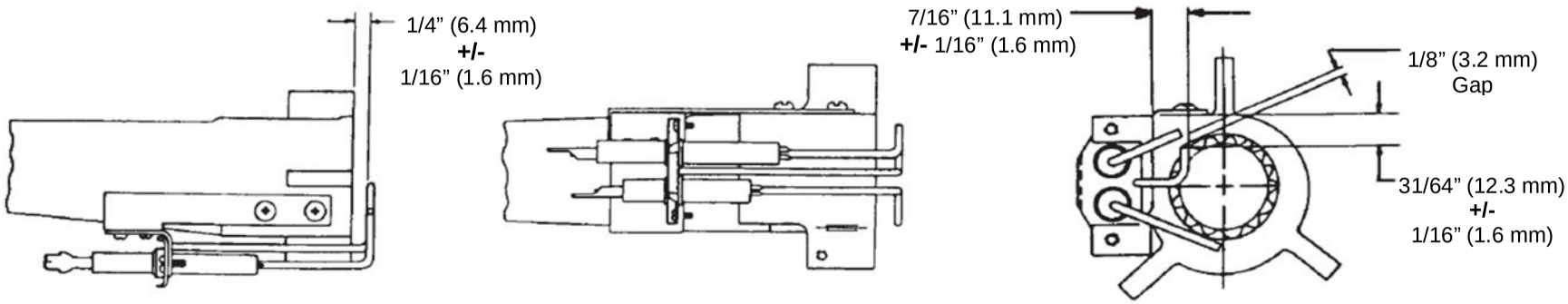
THERMOSTAT CALLS FOR HEAT AND THE FOLLOWING CONDITIONS OCCUR:

1. PROBLEM: The combustion fan motor is not operating.
   Possible Reasons:
   a. Power is not on.
   b. Circuit breaker tripped.
   c. Thermostat in the off position.
   d. Thermostat connections to T-T terminals on junction box have shorted to the junction box.
   e. Bad thermostat.
   f. Blower wheel jammed
   g. Debris stuck in blower wheel blades.
   h. 24 volt transformer is not functioning properly.
   i. Thermostat leads not connected to the T-T terminals.
   j. Motor shorted out due to over voltage.
   k. Motor start relay not functioning properly.

2. PROBLEM: Combustion fan motor runs but ignition sequence does not occur.
   Possible Reasons:
   a. Blower motor endswitch not closed which completes the 24 volt circuit to the gas primary.
   b. The blower motor is not reaching full rpm due to debris on wheel.
   c. Low voltage to the blower motor.
   d. Loose connections on the 24 volt circuit after the endswitch or between fan relay and the 24 volt side of the gas primary.
   e. The gas primary control is defective and must be replaced.

3. PROBLEM: Combustion fan motor runs and ignition sequence initiated but goes into lockout.
   Possible Reasons:
   a. Spark electrode rod is cracked shorting spark to ground.
   b. Loose connection on spark electrode rod.
   c. Gas primary control not allowing 24 volts to gas valve.
   d. Gas valve shorted out or defective.
   e. No ground between burner and appliance.
   f. Spark electrode location shifted.
   g. Gas primary control not generating spark.
   h. Ignition wire insulation melted and is grounding out on burner.
   i. Gas supply is not turned on.
   j. Gas manifold pressure is too high.
   k. Gas manifold pressure is too low.
   l. High negative draft conditions.
   m. Gas supply line is undersized.
   n. Multiple appliances operating on undersized line.
   o. Insufficient combustion air flow.
   p. Incorrect air shutter adjustment allowing too much combustion air to enter burner.

P250 DIRECT IGNITION
IGNITOR POSITION



P265 DIRECT IGNITION
IGNITOR POSITION

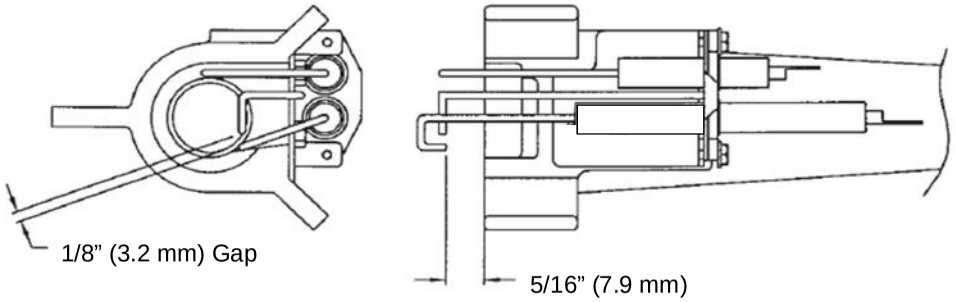
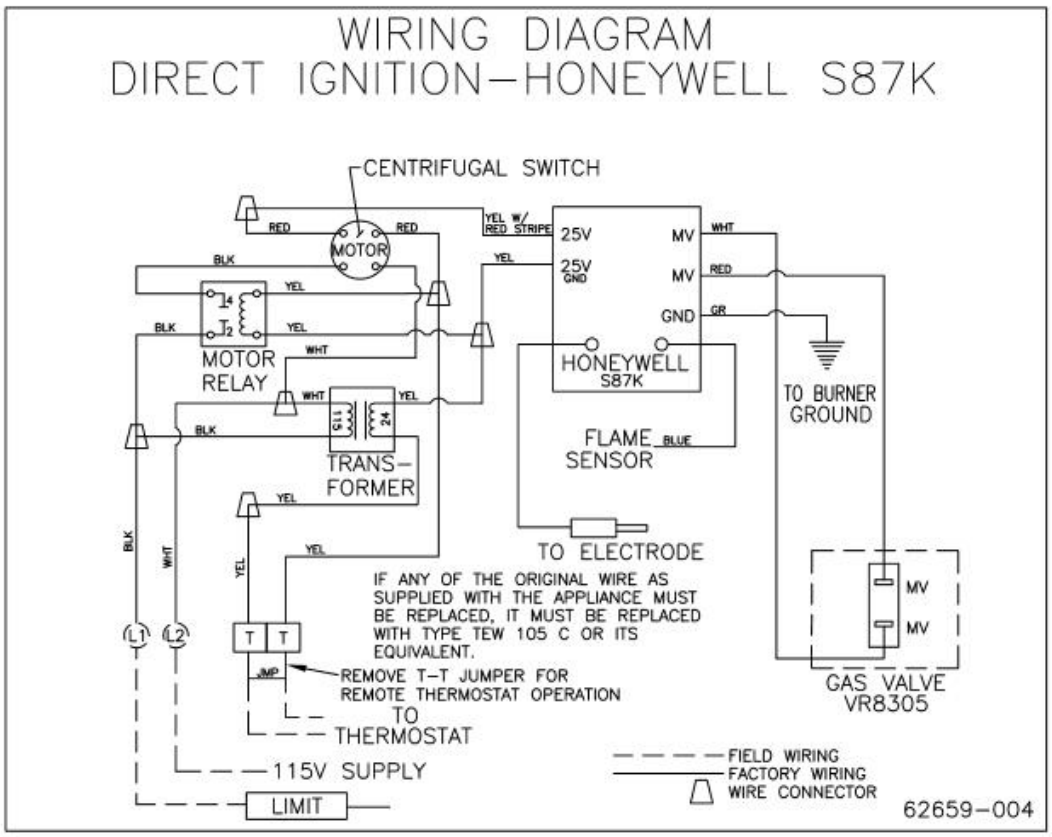
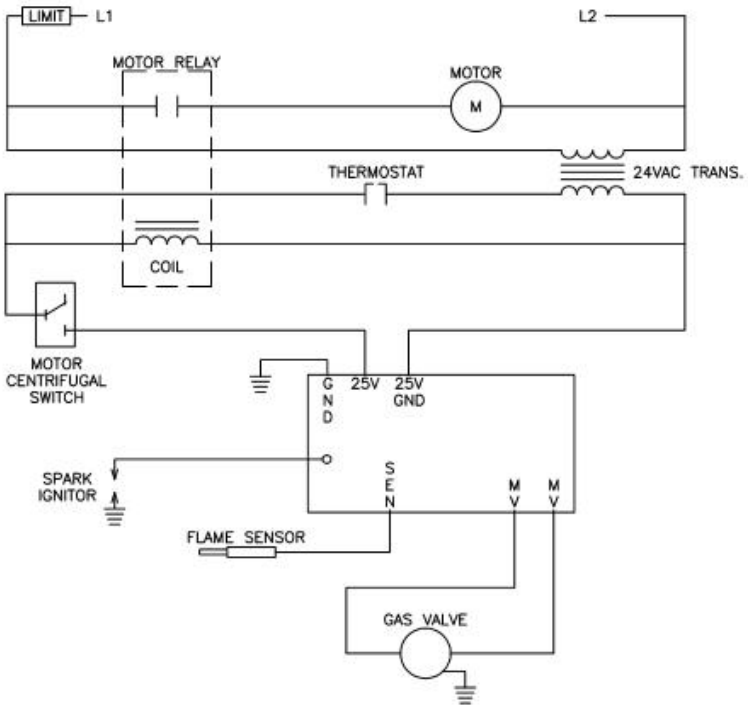


FIGURE 21

WIRING DIAGRAMS

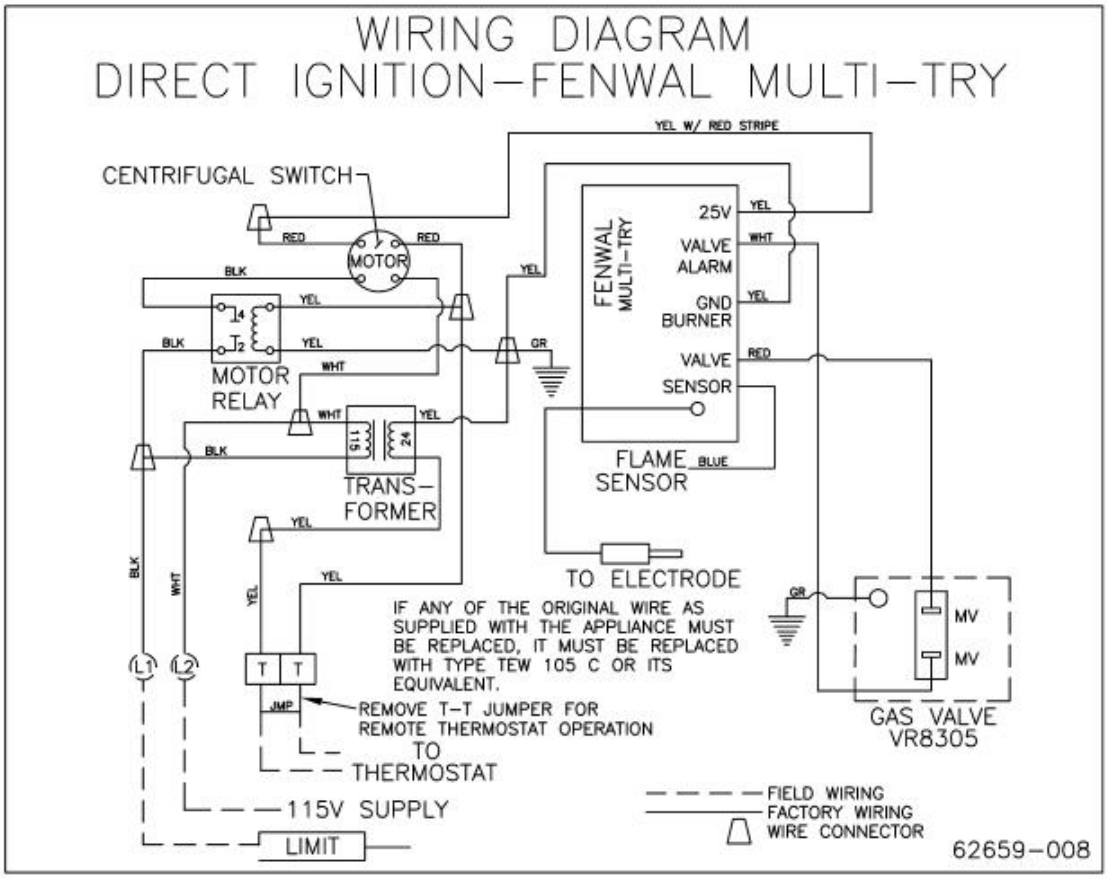
CAUTION: Label all wires prior to disconnection when servicing controls. Wiring errors can cause improper and dangerous operation. Verify proper operation after servicing.

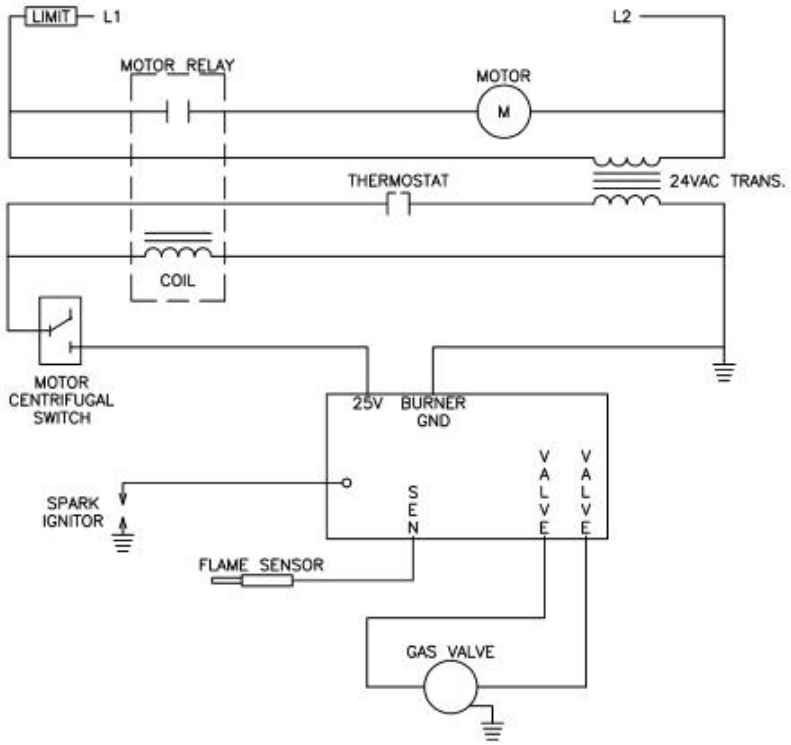




LADDER WIRING DIAGRAM

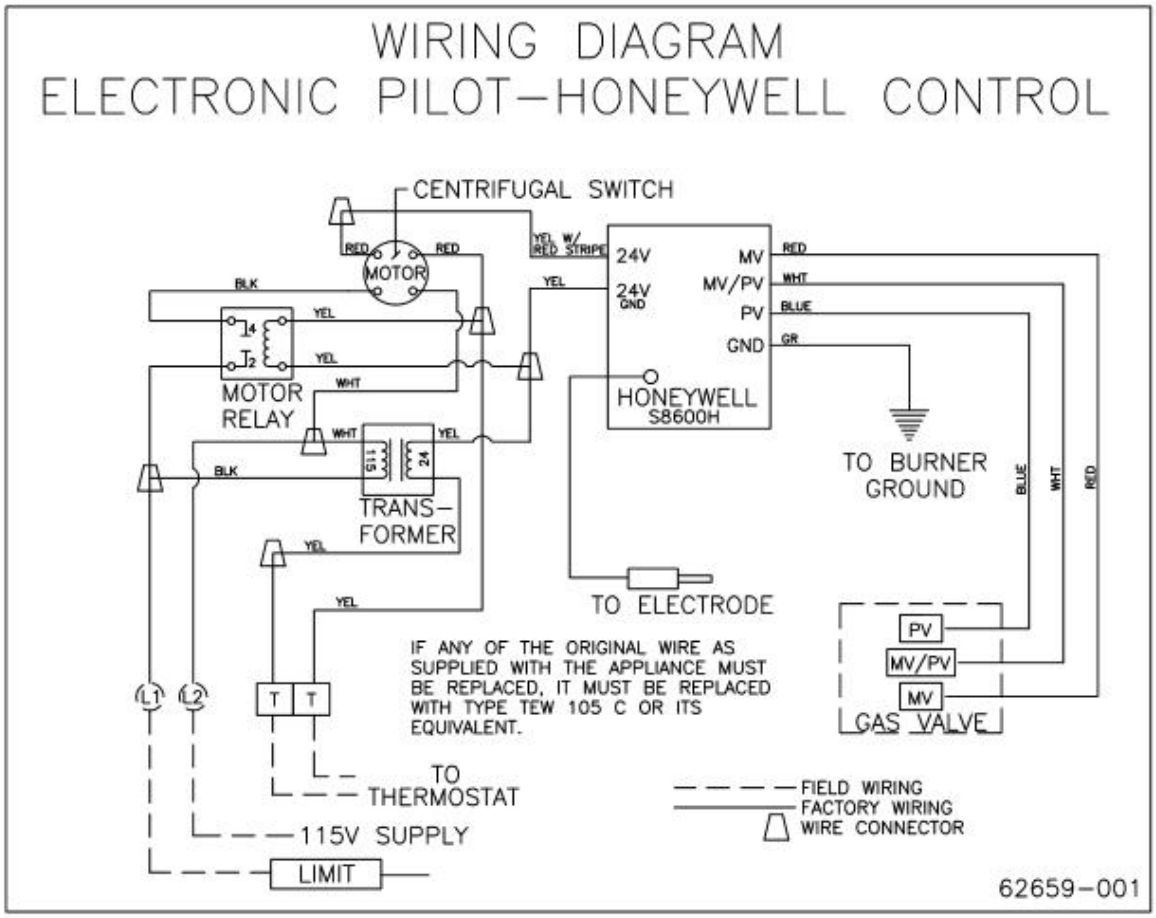
FIGURE 22: WIRING DIAGRAMS FOR GAS BURNER WITH DIRECT IGNITION-HONEYWELL

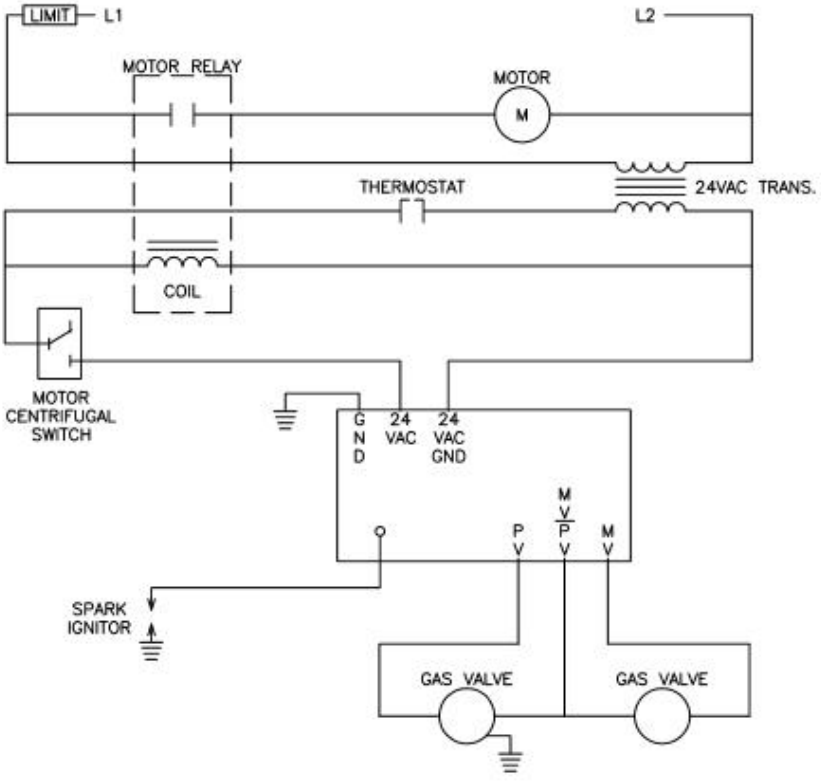




LADDER WIRING DIAGRAM

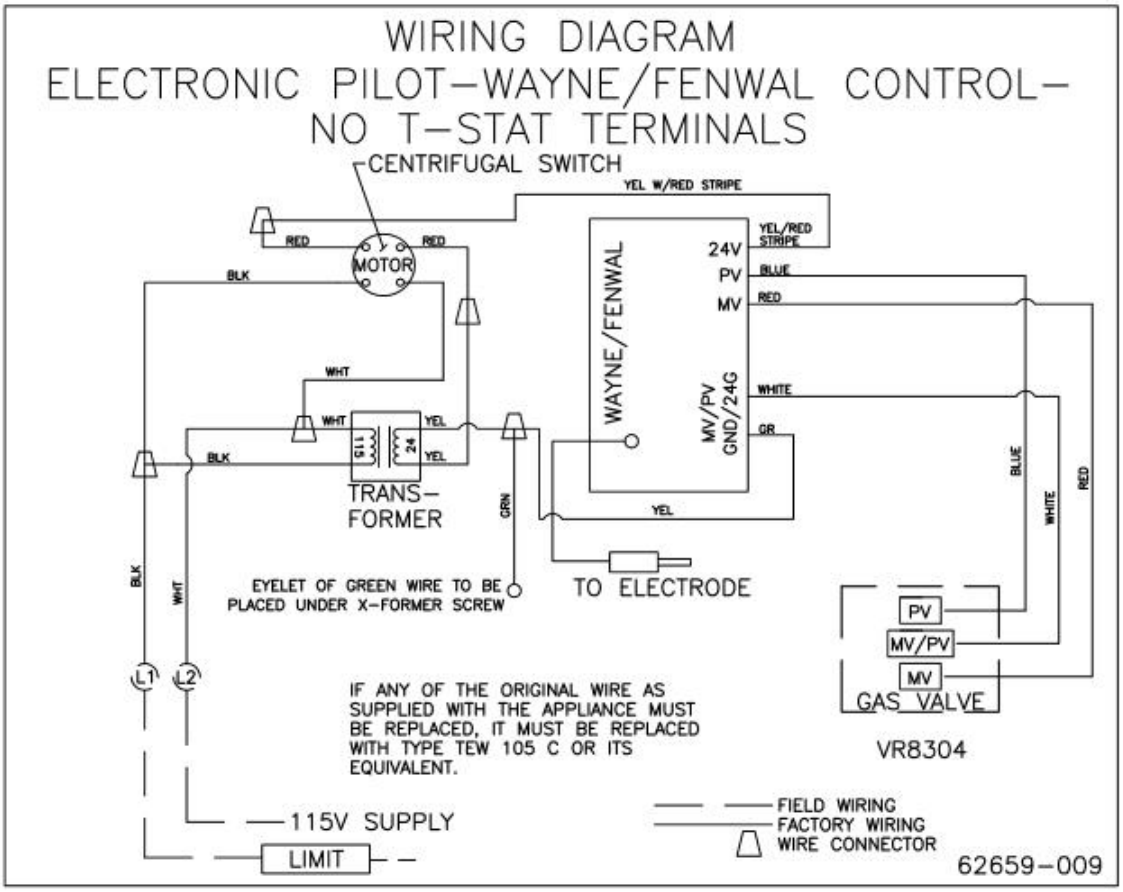
FIGURE 23: WIRING DIAGRAMS FOR GAS BURNER WITH DIRECT IGNITION-FENWAL

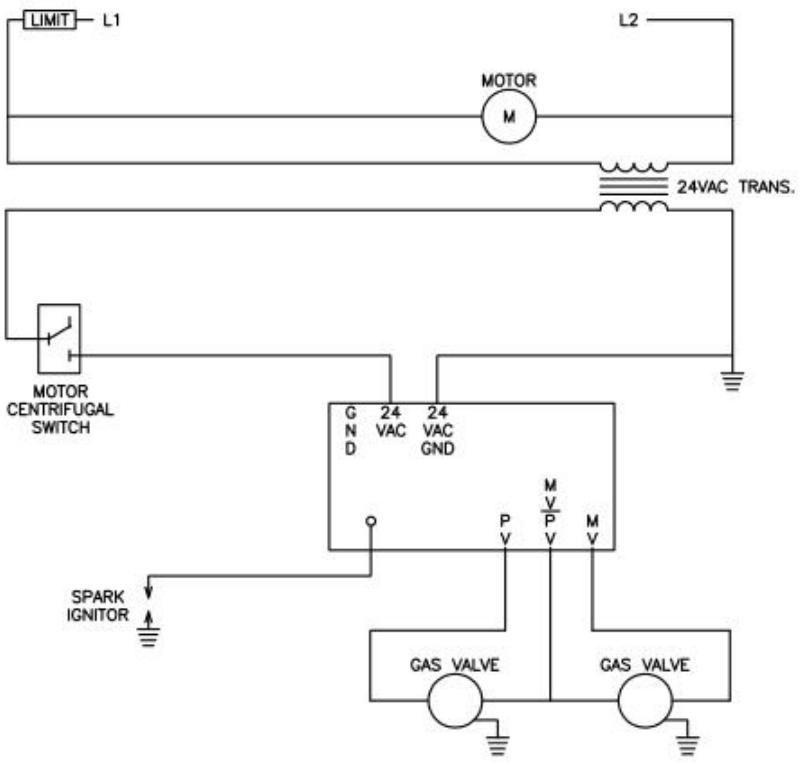




LADDER WIRING DIAGRAM

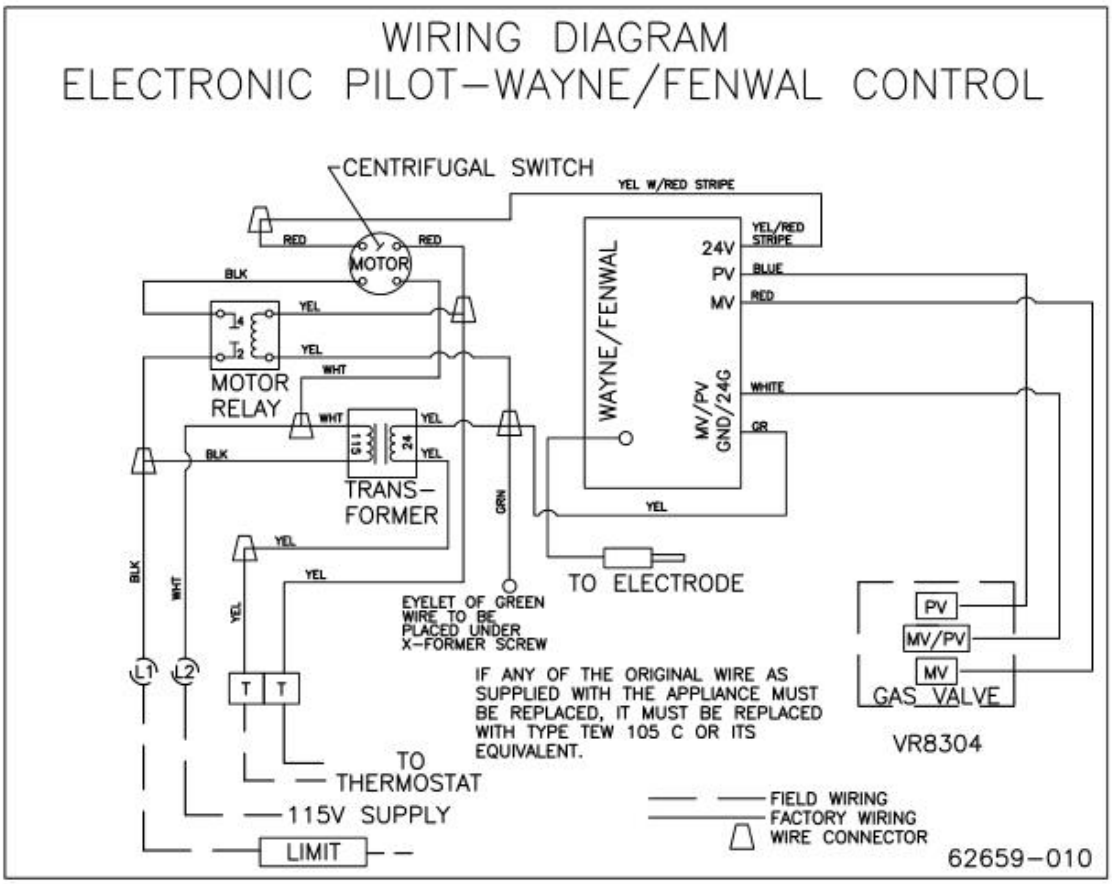
FIGURE 24: WIRING DIAGRAMS FOR GAS BURNER WITH ELECTRONIC PILOT-HONEYWELL

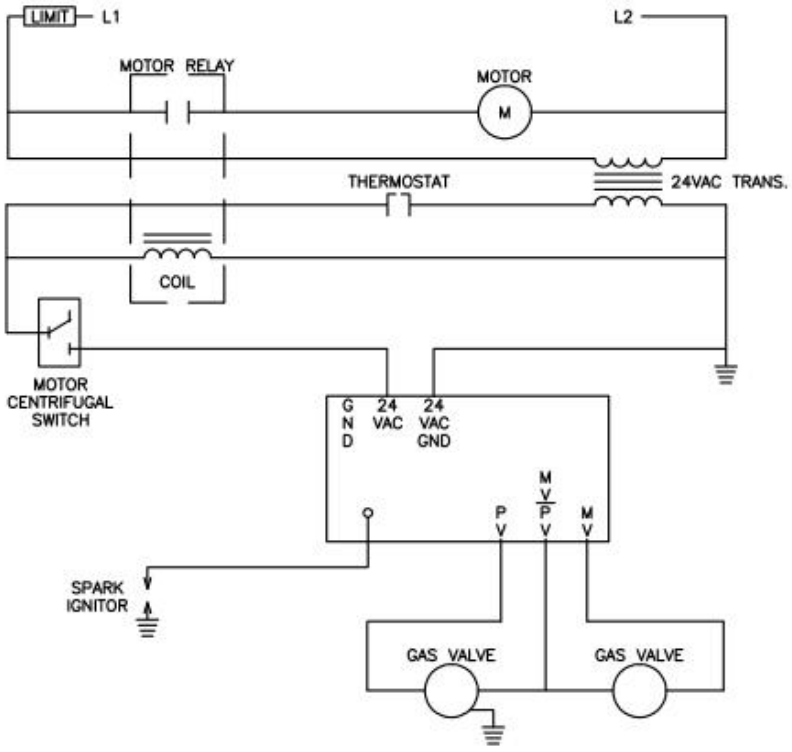




LADDER WIRING DIAGRAM

FIGURE 25: WIRING DIAGRAMS FOR GAS BURNER WITH ELECTRONIC PILOT-NO T-STAT

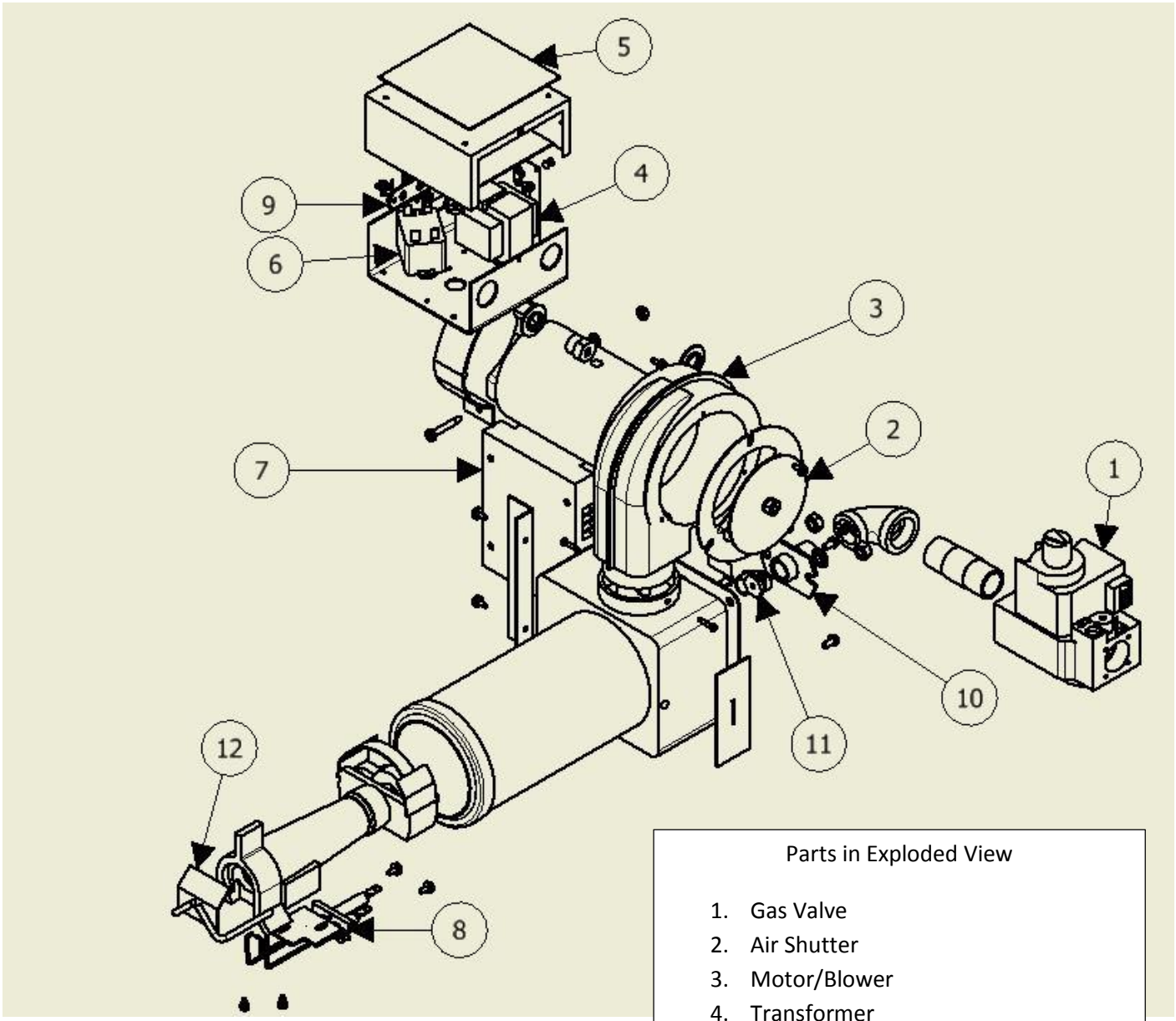




LADDER WIRING DIAGRAM

FIGURE 26: WIRING DIAGRAMS FOR GAS BURNER WITH ELECTRONIC PILOT-FENWAL

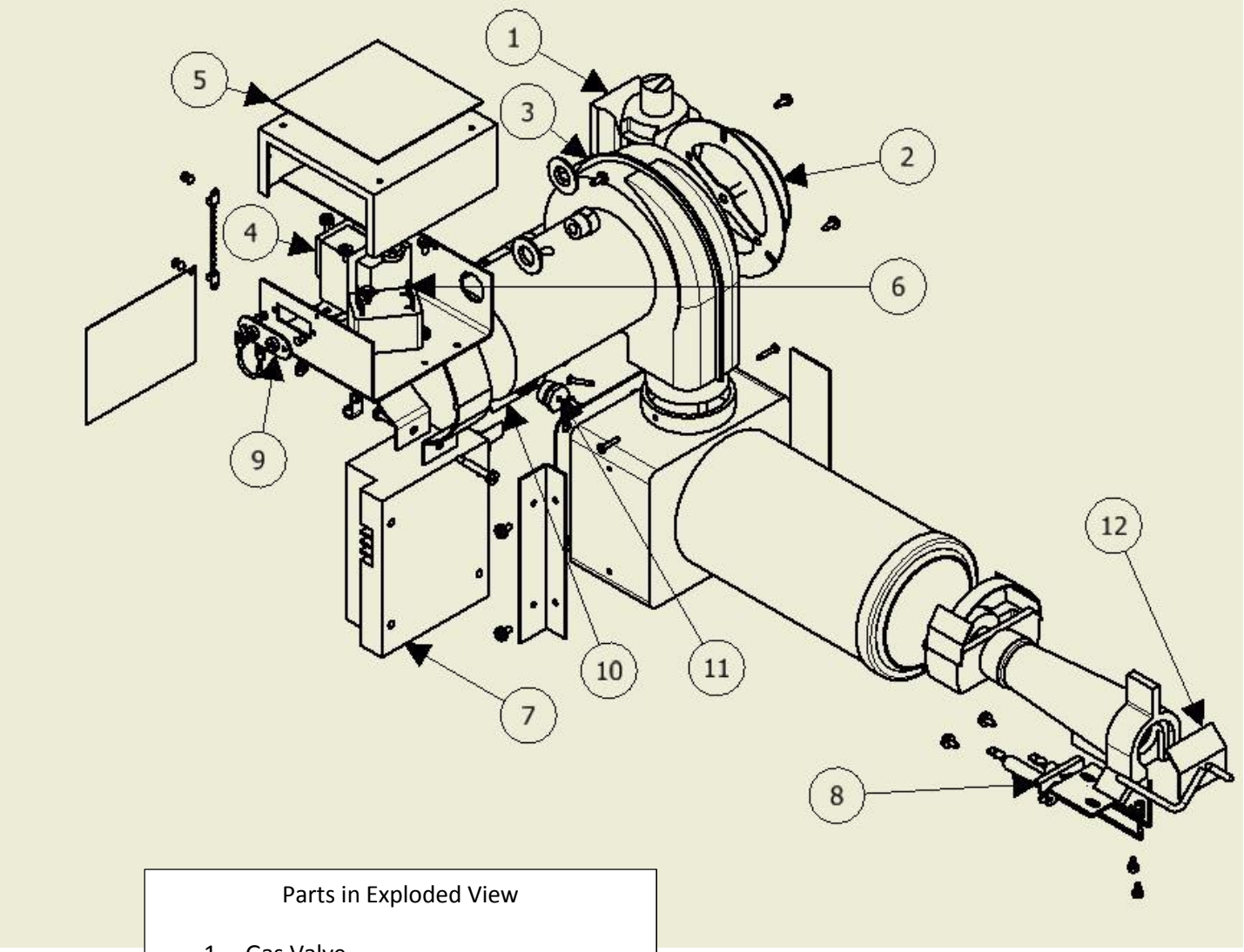
SECTION VI: PARTS LIST AND EXPLODED VIEWS



Parts in Exploded View

1. Gas Valve
2. Air Shutter
3. Motor/Blower
4. Transformer
5. Model/Specification Label
6. Motor Relay
7. Ignition Control
8. Electrode/Sensor/Ground Rod Asm
9. T-T Terminal
10. Orifice Holder
11. Orifice
12. Flame spreader

FIGURE 27: Right Side Exploded View of P265F



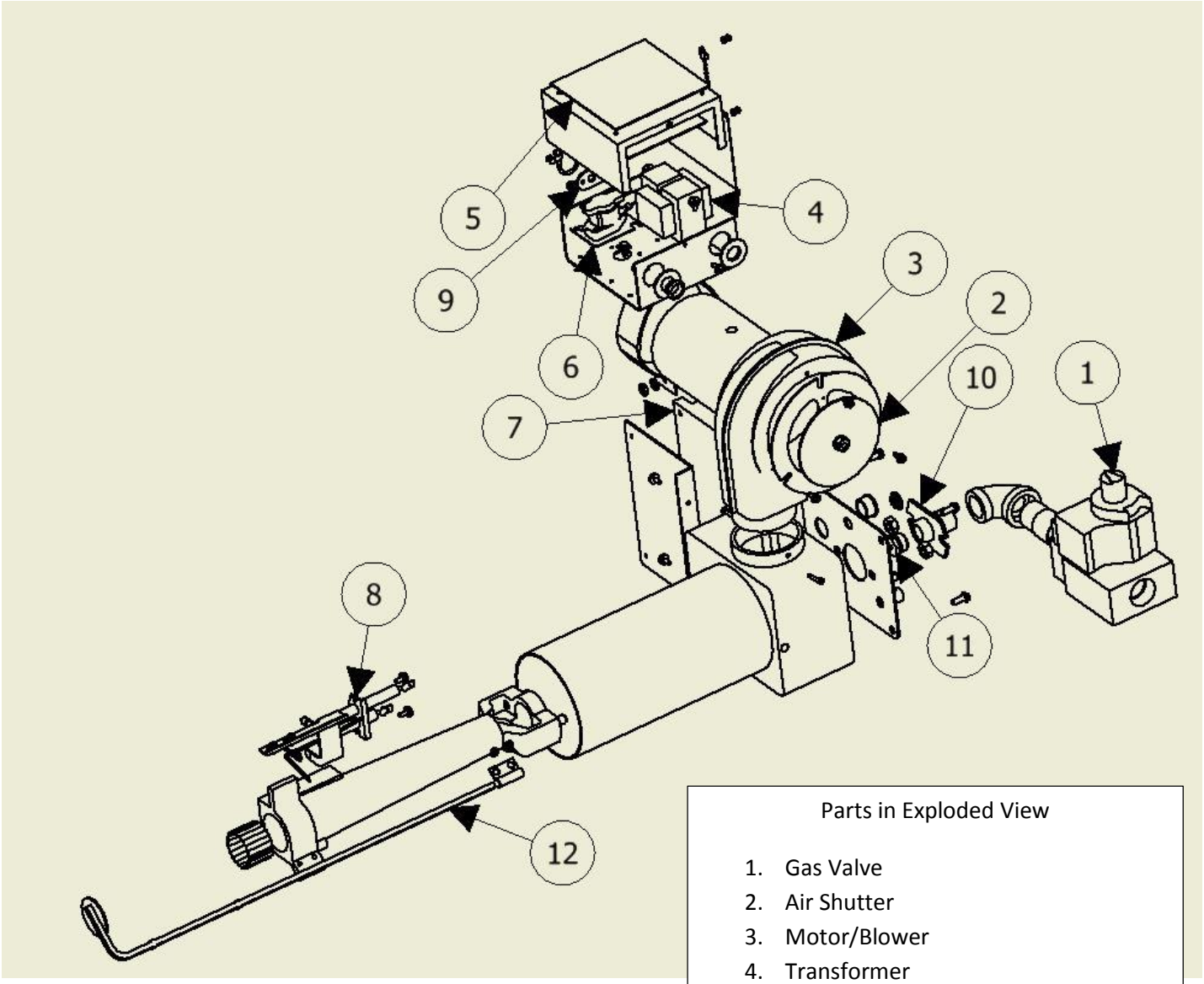
Parts in Exploded View

1. Gas Valve
2. Air Shutter
3. Motor/Blower
4. Transformer
5. Model/Specification Label
6. Motor Relay
7. Ignition Control
8. Electrode/Sensor/Ground Rod Asm
9. T-T Terminal
10. Orifice Holder
11. Orifice
12. Flame spreader

FIGURE 28: Left Side Exploded View of P265F

P265F PARTS LIST

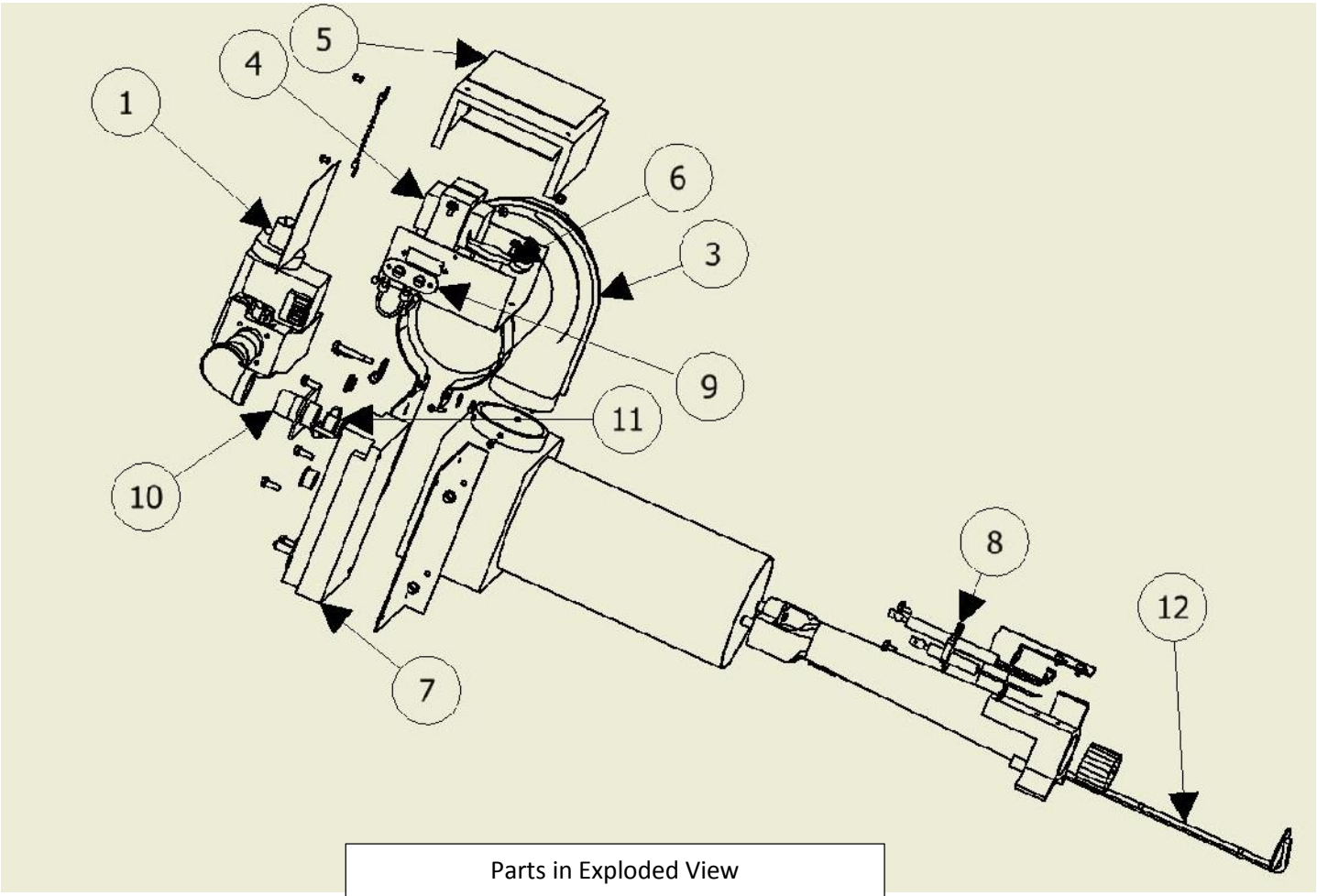
Part No.	Item Description *NOTE: Only for firing rate of 160,000 Btu/hr or less when finer adjustment at low rate is required.	Qty Req'd	P265F EPN	P265F EPLP	P265F DIN	P265F DILP	P265F DIN BOILER BURNER
60172-002	Motor/Blower Asm (w/o Control Box)	1	●	●	●	●	●
61803	Control Box Asm (Incl. Trans. & Relay)	1	●	●	●	●	●
61875	Motor/Blower & Control Box Pkg.	1	●	●	●	●	●
62406-002	Motor Relay	1	●	●	●	●	●
60186-004	Transformer-24V	1	●	●	●	●	●
60178-002	Terminal Strip	1	●	●	●	●	●
62510-SER	Air Shutter Asm (Btu/hr)	1	●	●	●	●	●
60353-SER	*Air Shutter Asm (≤160,000 Btu/hr)	1	●	●	●	●	●
62715-001	Air Tube/Housing Asm	1		5"			
62715-002	Air Tube/Housing Asm	1	5"		5"	5"	
62715-004	Air Tube/Housing Asm	1	8"	8"	8"	8"	
62715-006	Air Tube/Housing Asm	1	11"	11"	11"	11"	
62715-007	Air Tube/Housing Asm	1					●
21724-011	Adjustable Flange & Gasket Pkg.	1	●	●	●	●	●
100428-002	Flange Gasket	1	●	●	●	●	●
21760-011	Base (Pedestal) Pkg.	1	●	●	●	●	●
62246-004	Gas Valve-"EP" Models (Nat.)	1	●				
62256-004	Gas Valve-"EP" Models (LP)	1		●			
62374-004	Gas Valve-"DI" Models (Nat.)	1			●		●
62374-PRO	Gas Valve-"DI" Models (LP)	1				●	
62898-001	Orifice Holder Asm	1	●	●	●	●	●
60249	Nipple, Orifice Holder Extension	1	8"	8"	8"	8"	
60250	Nipple, Orifice Holder Extension	1	11"	11"	11"	11"	
Varies	Main Burner Orifice-Nat.	1	**Refer to Orifice Chart**				
Varies	Main Burner Orifice-LP	1	**Refer to Orifice Chart**				
60533	Main Burner Orifice Blank (field drilled)	1	●	●	●	●	●
60944	Venturi Asm	1		●			
61403	Venturi Asm	1	●				
61637-004	Venturi Asm	1			5"		
61403-002	Venturi Asm	1				8" and 11"	
61637-004	Venturi Asm	1					●
61455	Bulkhead Union	1	●	●			
63062-001	Pilot Burner-.024" Pilot Orifice	1	●				
64008-SER	Pilot Burner-.018" Pilot Orifice	1		●			
62653-001	Pilot Shield	1	●	●			
62261-002	Electrode/Sensor/Ground Rod Asm	1			●	●	●
62947-003	Ignitor Lead Wire	1	●	●	●	●	●
62243-003	Ignition Control-Hon. S8600H3002	1	●	●			
101243-001	Ignition Control-Hon. S87K1008	1			●	●	●
62245-001	Wire Harness (5 wire)	1	●	●			
63375-001	Wire Harness (3 wire)				●	●	●
63103-001	Window Plug (Sight Glass)	1	●	●	●	●	●



Parts in Exploded View

1. Gas Valve
2. Air Shutter
3. Motor/Blower
4. Transformer
5. Model/Specification Label
6. Motor Relay
7. Ignition Control
8. Electrode/Sensor/Ground Rod Asm
9. T-T Terminal
10. Orifice Holder
11. Orifice
12. Flame spreader

FIGURE 29: Right Side Exploded View of P250AF



Parts in Exploded View

1. Gas Valve
2. Air Shutter
3. Motor/Blower
4. Transformer
5. Model/Specification Label
6. Motor Relay
7. Ignition Control
8. Electrode/Sensor/Ground Rod Asm
9. T-T Terminal
10. Orifice Holder
11. Orifice
12. Flame spreader

FIGURE 30: Left Side Exploded View of P250AF

P250AF PARTS LIST

Part No.	Item Description *NOTE: Only for firing rate of 160,000 Btu/hr or less when finer adjustment at low rate is required.	Qty Req'd	P250AF EPN	P250AF EPLP	P250AF DIN	P250AF DILP
60172-002	Motor/Blower Asm (w/o Control Box)	1	●	●	●	●
61803	Control Box Asm (Incl. Trans. & Relay)	1	●	●	●	●
61875	Motor/Blower & Control Box Pkg.	1	●	●	●	●
62406-002	Motor Relay	1	●	●	●	●
60186-004	Transformer-24V	1	●	●	●	●
60178-002	Terminal Strip		●	●	●	●
62510-SER	Air Shutter Asm	1	●	●	●	●
63566-SER	*Air Shutter Asm (≤160,000 Btu/hour)	1	●	●	●	●
62715-003	Air Tube/Housing Asm	1	●	●	●	●
21724-011	Adjustable Flange & Gasket Pkg.	1	●	●	●	●
100428-002	Flange Gasket	1	●	●	●	●
21760-011	Base (Pedestal) Pkg.	1	●	●	●	●
62246-004	Gas Valve-"EP" Models (Nat.)	1	●	●		
62256-004	Gas Valve-"EP" Models (LP)	1	●	●		
62374-004	Gas Valve-"DI" Models (Nat.)	1			●	●
62374-PRO	Gas Valve-"DI" Models (LP)	1			●	●
62898-001	Orifice Holder Asm	1	●	●	●	●
Varies	Main Burner Orifice-Nat.	1	**Refer to Orifice Chart**			
Varies	Main Burner Orifice-LP	1	**Refer to Orifice Chart**			
60533	Main Burner Orifice Blank (field drilled)	1	●	●	●	●
61817	Venturi Asm	1	●	●	●	●
60748	Flame Retention Ring Asm	1	●	●	●	●
61818	Flamespreader Asm	1	●	●	●	●
63062-001	Pilot Burner Asm-Nat.	1	●			
64008-SER	Pilot Burner Asm-LP	1		●		
60375-002	Pilot Shield	1	●	●		
62261	Electrode/Sensor/Ground Rod Asm	1			●	●
62947-003	Ignitor Lead Wire				●	●
61455	Bulkhead Union	1	●	●		
80274-SER	Ignition Control-Fen. 35-630902-007	1	●	●		
101243-001	Ignition Control-Hon. S87K1008				●	●
62245-007	Wire Harness (6 wire)		●	●		
63375-001	Wire Harness (3 wire)				●	●
63103-001	Window Plug (Sight Glass)		●	●	●	●

LIMITED WARRANTIES FOR OIL AND GAS BURNERS, MADE BY WAYNE AND USED IN RESIDENTIAL INSTALLATIONS

WAYNE COMBUSTION SYSTEMS ("WAYNE") warrants to those who purchase its **Oil Burner Models** for resale or for incorporation into a product of resale, that its burner is free from defects in material and workmanship under normal use and service for thirty-six (36) months from the date of manufacture. **ALL GAS BURNERS** manufactured by "WAYNE" will be similarly warranted for eighteen(18) months from date of manufacture except where original manufacture offers a greater warranty. (Reference #6 below) THESE LIMITED WARRANTIES DO NOT APPLY UNLESS THE BURNER COVERED BY IT **IS PROPERLY INSTALLED BY A QUALIFIED, COMPETENT TECHNICIAN**, WHO IS LICENSED WHERE STATE AND/OR LOCAL CODES PREVAIL, AND **WHO IS EXPERIENCED IN MAKING SUCH INSTALLATIONS**, in accordance with NFPA #31 of the national fire protection association and in accordance with all local, state and national codes.

Any **IN-WARRANTY** burner component which is defective in material or workmanship will be either repaired or replaced as follows:

1. Fuel pumps, motors, transformers, gas valves, and controls should be returned to an authorized service station or distributor of WAYNE for determination of applicability of this LIMITED WARRANTY as to either repair or replacement, where said service station or distributor is reasonably available in the customer's locality. The manufacturers of burner components regularly publish and distribute listings showing the locations of their network of service stations. Where such local service is NOT available for the burner components described above or other burner parts are involved, these items should be returned, freight prepaid, to WAYNE Service Department, 801 Glasgow Ave, Fort Wayne, Indiana 46803.
2. Burners and/or component(s) determined to be covered under this LIMITED WARRANTY by WAYNE shall be repaired or replaced at WAYNE's sole option.
3. WAYNE is not responsible for any labor cost for the removal and replacement of said burner or burner components and equipment associated therewith.
4. A burner so repaired will then carry the LIMITED WARRANTY equal to the unexpired portion of the original burner LIMITED WARRANTY.
5. If inspection by WAYNE does **NOT** disclose any defect covered by this LIMITED WARRANTY, the burner or burner component(s) will be either repaired or replaced at the expense of the customer and WAYNE"S regular charges will apply.
6. If the original manufacturer of a burner component offers a warranty greater than either of our LIMITED WARRANTIES described above, then this portion will be added to our LIMITED WARRANTY.

This LIMITED WARRANTY does **NOT** cover products which have been damaged as the result of accident, abuse, misuse, neglect, improper installations, improper maintenance or failure to operate in accordance with WAYNE's written instructions.

These LIMITED WARRANTIES do not extend to anyone except the first purchaser at retail and only when the burner is in the original installation site.

IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE SHALL BE LIMITED TO THE DURATION OF THE LIMITED EXPRESS WARRANTIES CONTAINED HEREIN. WAYNE EXPRESSLY DISCLAIMS AND EXCLUDES ANY LIABILITY FOR CONSEQUENTIAL OR INCIDENTAL DAMAGES OF ANY NATURE FOR BREACH OF ANY EXPRESS OR IMPLIED WARRANTY.

Some states do not allow limitation on how long an implied warranty lasts, so the above limitation may not apply to you. Also, some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you. WAYNE neither assumes or authorizes any person to assume for WAYNE any other liability or obligation in connection with the sale of these products. This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

NOTES