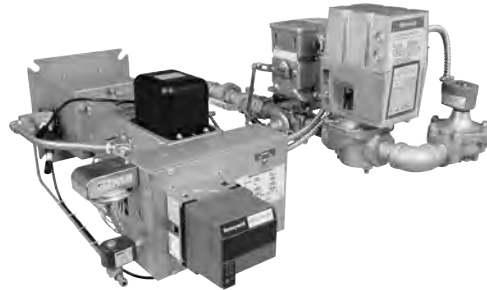


Installation and Service Instructions



Midco
INTERNATIONAL



Unipower A-Series Gas Burners

In the United States, installation must conform with local codes or in the absence of local codes, with the **National Fuel Gas Code, ANSI Z223.1-latest edition** available from American National Standard Institute. Further reference should be made to the recommendation of your fuel supplier.

In Canada, installation must conform with local codes or in the absence of local codes, with **Installation Codes for Gas Burning Appliances and Equipment, CGA Standard CAN/CGA 1-B-149.1 or 2**. When the conversion burner is used on a Forced Air Central Furnace, the two yellow and black warning labels in the literature envelope shall be attached in accordance with **Installation Code, CGA Standard CAN/CGA 1-B149, Clause 5.4.4.4**. Further reference should be made to the recommendation of your fuel supplier.

⚠ WARNING: Additions, changes, conversions and service must be performed by an authorized Midco representative, service agency or the fuel supplier. Use only MIDCO specified and approved parts.

INSTALLER: Inform and demonstrate to the user the correct operation and maintenance of the gas utilization equipment. Inform the user of the hazards of storing flammable liquids and vapors in the vicinity of this gas utilization equipment and remove such hazards. Affix this manual and associated literature to the conversion burner.

CODE COMPLIANCE IS THE SOLE RESPONSIBILITY OF THE INSTALLER.

USER: Retain this manual for future reference. If other than routine service or maintenance as described in this manual and associated literature is required, contact a qualified service agency. **DO NOT ATTEMPT REPAIRS.** An inadvertent service error could result in a dangerous condition.

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

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

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 the building.
- Immediately call your gas supplier from another building's phone. Follow the gas supplier's instructions.
- If you cannot reach your gas supplier, call the fire department.

BURNER
MODEL _____

BILL OF MAT'L
NUMBER _____

DATE CODE _____

WIRING DIAGRAM _____

PIPING DIAGRAM _____

START-UP INSTRUCTIONS _____

FOR SERVICE CONTACT:

name _____

address _____

phone _____

SAFETY INFORMATION TERMS: The following terms are used to identify hazards, safety precautions or special notations and have standard meanings throughout this manual. When you see the safety alert symbol and one of the safety information terms as shown below, be aware of the hazard potential.

⚠ WARNING: Signifies a hazard that **could** result in personal injury or death.

⚠ CAUTION: Identifies unsafe practices which would result in minor personal injury or product and property damage.



I Specifications

Burner Style	Power Type
Flame Safeguard	Instantaneous electronic type with flamerod detection (flame rectification).
<ul style="list-style-type: none"> Provides pre-purge and intermittent pilot operation on UL listed models up to 2500 MBH maximum input. Provides pre-purge and interrupted pilot operation on UL listed models over 2500 MBH max. 	
Pilot	Spark Ignited
Fuel	Natural or Propane Gas to 14" W.C. Pressure
Controls	120 Volt, 60 Hz., 1-Phase
Burner Capacity Chart	page 12

In **U.S.A.:** UL Listed, In **Canada:** ULC (A5 Series only)

Burner Model	Burner Input Capacity*		Motors 3450 RPM. 60 Hz.			
	Natural or Propane Gas MBH**	Minimum***	Maximum	H.P.	Volts	Phase
A50G	420		1,500	1/3	115	1
A52G	840		2,000	1/2	115	1
A53G	840		2,500	3/4	115/230	1
A55G	840		3,000	3/4	115/230	1
A73G	1,680		4,200	1 1/2	230/460	3
A75G	1,680		5,000	2	230/460	3
A77G	1,680		6,000	2	230/460	3

Table 1: Burner Specifications

- * Values given based on -0.1" W.C. to +0.1" W.C. firebox pressure, altitudes to 2,000 feet. Derate burner for altitudes over 2,000 feet by 4% for each 1,000 feet over sea level. (One gallon fuel oil=140 MBH).
- ** Refer to Burner Spec Plate for Inlet and Manifold gas pressure required.
- *** Modulating and High-Low-Off burners are limited to a 3 to 1 turndown ratio.

All models are capable of full input start. However, in some cases, (i.e. restricted draft or induced draft) optional low fire start may be necessary. Specify On-Off, Hi-Lo-Off or Full Mod as required.

II Ventilation

- A permanent means must be provided to supply an ample volume of fresh air for combustion and boiler room ventilation. A direct opening to the outside air for combustion and boiler room ventilation. A direct opening to the outside air should be provided sized on the basis of 1/2 square foot of free opening for each 1,000 MBH of burner input when the flue pipe is equipped with a barometric draft control, as is commonly used on burners of this size. If the ventilation opening is screened, it should be of 1 1/4" mesh. The opening should be located at least six feet over ground level to prevent accidental obstruction. If a direct opening to the outside air is not available, an amply sized air duct can be run to the nearest outside air source.
- While the Unipower A Series burner will perform successfully under moderate or momentary back draft conditions, it is not intended for operation under sustained reverse draft, as might be encountered in building with large ventilating fans but with insufficient make-up air. Even if burner operation is successful under these conditions, they must be corrected to prevent the hazard of drawing flue gases into the building.

III Preparation of the Heating Appliance

- The entire heating system should be inspected, cleaned and repaired as necessary to provide proper heating.
- Remove all grates and obstructions from the firebox, clean thoroughly, and seal all joints and cracks. Complete sealing of the firebox is required where the combustion chamber pressure will be positive during burner operation. It is also beneficial where the pressure is negative as it promotes combustion efficiency.
- Firing door catches should be filed off or otherwise arranged so that the door will open easily to relieve excess pressure. No positive catches should be used. The use of a spring-type door holder is recommended.
- If the appliance has been designed for automatic firing and contains no firing doors, an observation port should be provided that will allow inspection of the main flame and pilot.

III Preparation of the Heating Appliance Continued

□ Make sure that the boiler gauge glass is clean so that water level can be easily ascertained. The pop safety valve should be checked to see that it is in good operating condition. If an existing low water cut-off is to be used, make sure it is clean and functioning properly.

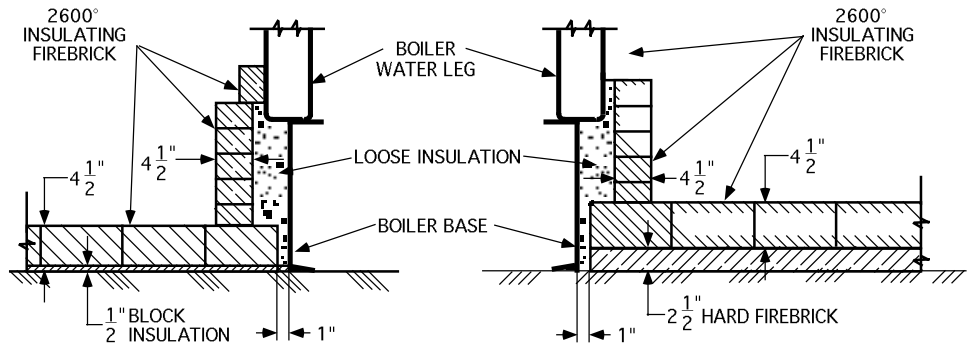


Figure 1: Typical Floor and Wall Construction
Standard Size Combustion Chamber up to 225 MBH per square foot

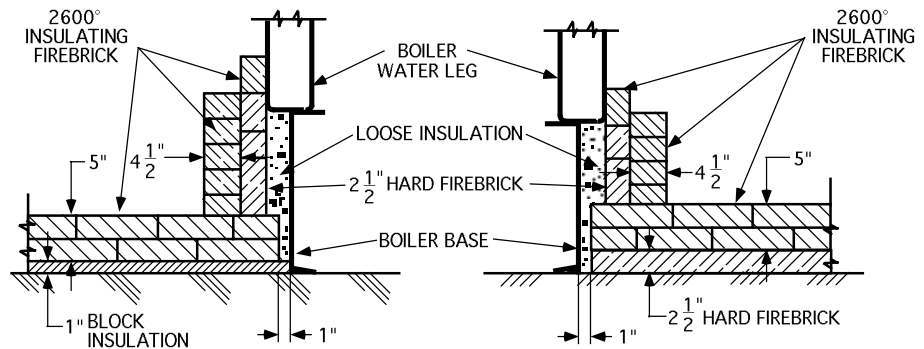


Figure 2: Typical Floor and Wall Construction
Alternate Size Combustion Chamber up to 275 MBH per square foot

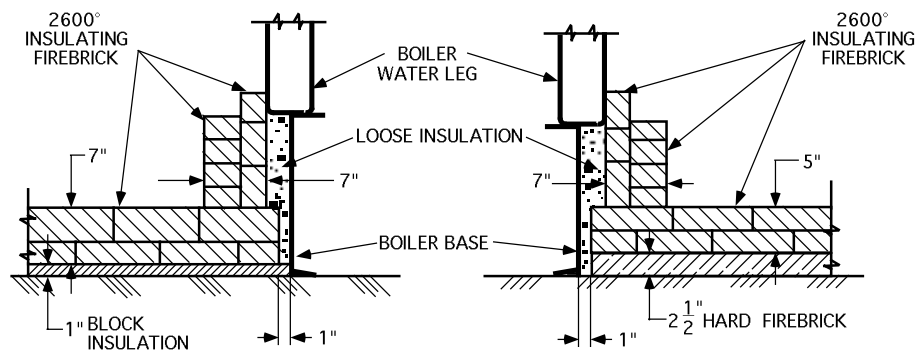


Figure 3: Typical Floor and Wall Construction
Alternate Size Combustion Chamber up to 350 MBH per square foot (Maximum)

IV Combustion Chamber

□ The Unipower gas burner is designed for "in-shot" firing. It can be fired into the ashpit of a boiler designed for solid fuels, or it can be fired into the primary heat exchanger of a boiler or warm-air furnace designed for liquid or gaseous fuels. The ashpit installation requires a refractory lining.

□ For conventional firebox boilers refer to Table 2 and Figure 1 for recommended combustion chamber dimension and typical floor and wall construction. If the recommended dimensions cannot be provided, make length as long as possible and increase the width to maintain the floor area. Where the floor area must be reduced, use the optional construction shown in Figures 2 or 3.

IV Combustion Chamber Continued

- For warm-air furnaces or Scotch Marine boilers with tubular combustion chambers, the combustion chamber length must be great enough to exceed the lengths given in Table 2 by at least 20%.
- Combustion chamber proportions may be changed if necessary to avoid flame impingement on critical parts such as drop sections in cast iron boilers or the heat exchanger surfaces of a warm-air furnace. If sustained flame contact cannot be avoided, protect the surfaces with 2 1/2" or firebrick.
- The burner nozzle must not extend into the combustion chamber. It should be sealed into the opening as shown in Figure 4. The burner mounting to the appliance front must be rigid and sealed with 1/4" soft refractory sheet or rope. See Figure 5 for mounting flange dimensions.
- Allow a space of about 1" between the edges of the floor brickwork and the appliance base to allow for expansion and creep. Where wall construction is such that both ends butt against rigid appliance parts such as the base of a water leg, allow 1/4" space between bricks every four feet or so for expansion joints, particularly when reduced size combustion chambers are used.

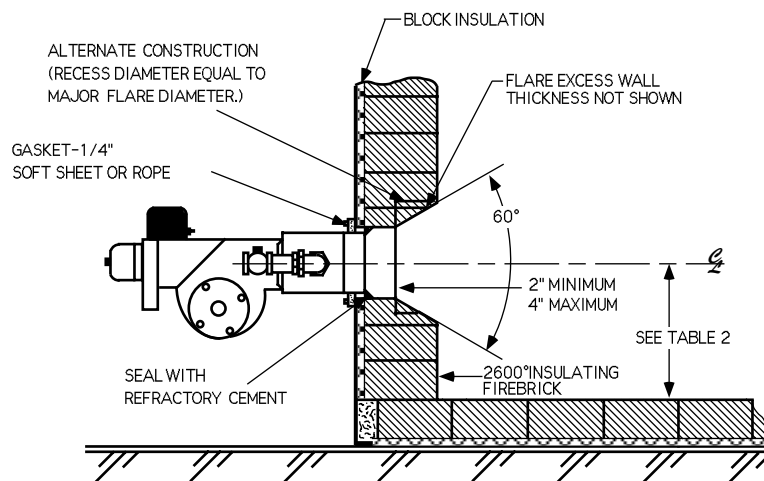
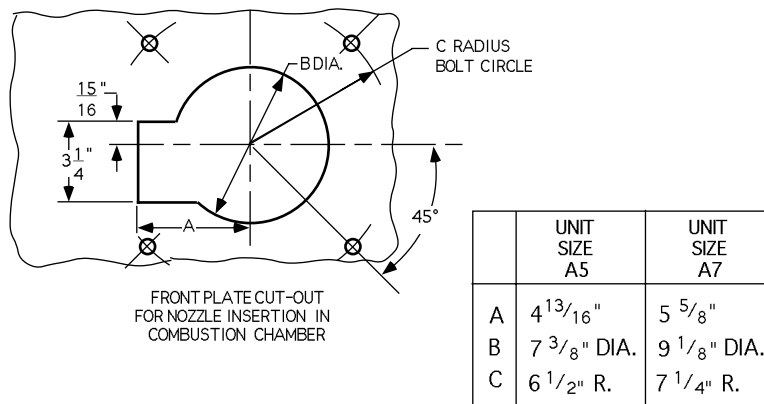


Figure 4: Construction at Burner Entrance

Firing Door Installations

- Greater care in planning will be required for firing door applications since flame impingement on heat exchange surfaces is more probable. Do not fire a boiler containing a drop section directly in the path of the flame, or over the water grate in a smokeless type boiler. The firebox length must be great enough to exceed the combustion chamber lengths given in Table 2 by at least 20%.
- When raising the floor, maintain sufficient firebox volume to limit the heat release per cubic foot to 50 MBH or less. Use the entire floor as a combustion chamber and cover any water leg base to 6" from the bottom to avoid firing areas filled with sediment. Floor construction should conform to Figures 1, 2 or 3.
- The burner mounting in the door must be rigid and refractory lined as shown in Figure 9. The burner nozzle must not protrude directly into the combustion chamber. The refractory liner must be flush with or extend beyond the burner face as shown in Figure 4. A sheet metal rim should encase the refractory up to the inside of the boiler wall. It should be intermittently bent inward to retain the refractory or other means of anchoring should be provided. A refractory felt blanket can be used in lieu of castable refractory, which will simplify construction at the burner entry.

IV Combustion Chamber Continued

Detailed information is available on request.

□ Since firing door installations will generally leave no openings for flame observation, a peep sight must be installed in the burner mounting plate.

Maximum Input MBH	Recommended Combustion Chamber Dimensions		
	Width	Length	C/L to Floor*
685	17"	33"	8"
1,125	21"	41"	10"
1,750	25"	50"	12"
2,250	27"	54"	12"
2,500	29"	58"	12"
3,000	32"	64"	12"
3,500	36"	72"	12"
4,000	39"	78"	12"
5,000	43"	86"	14"
6,000	45"	90"	14"

Table 2: Recommended Combustion Chamber Dimensions

* Dimension given is from centerline of burner nozzle to combustion chamber floor.

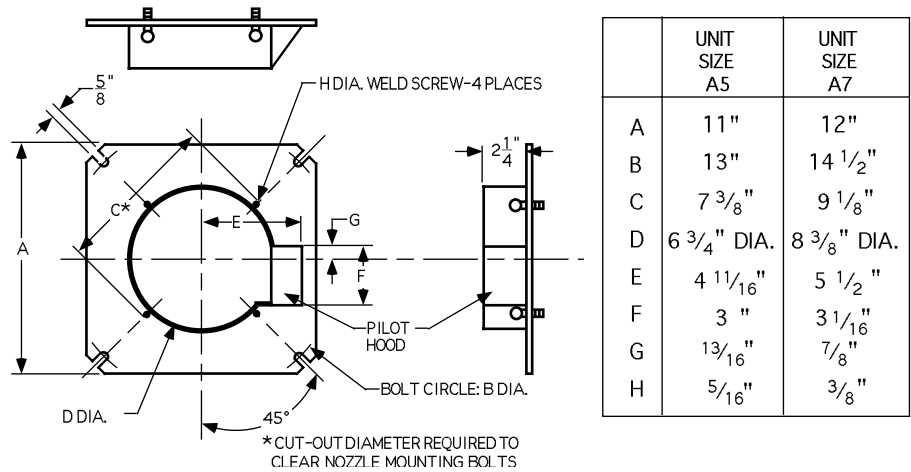


Figure 5: Mounting Flange and Burner Nozzle

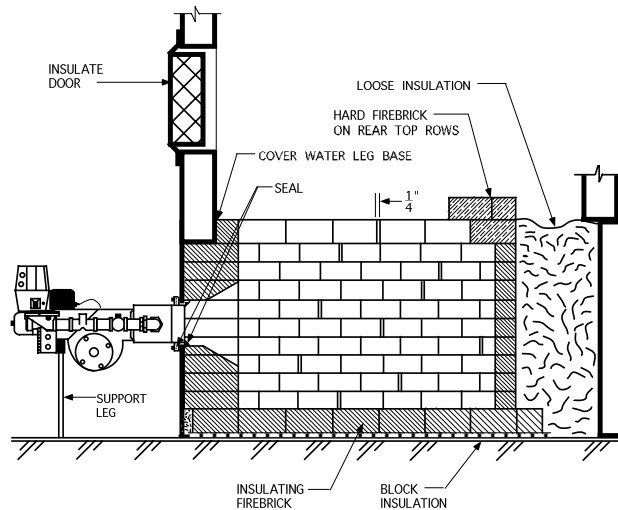


Figure 6: Conventional Boiler—Large Firebox

**IV Combustion Chamber
Continued**

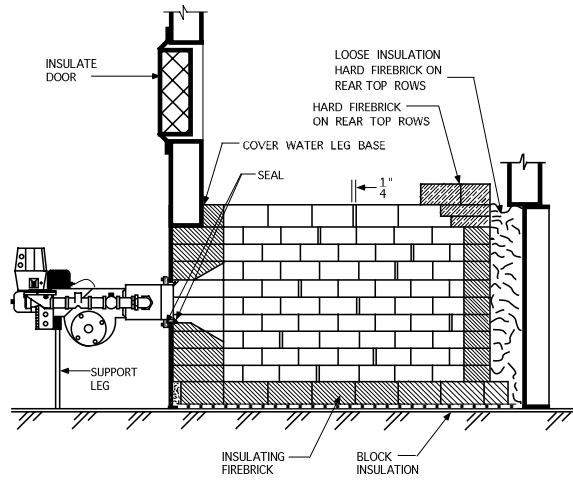


Figure 7: Conventional Boiler—Small Firebox

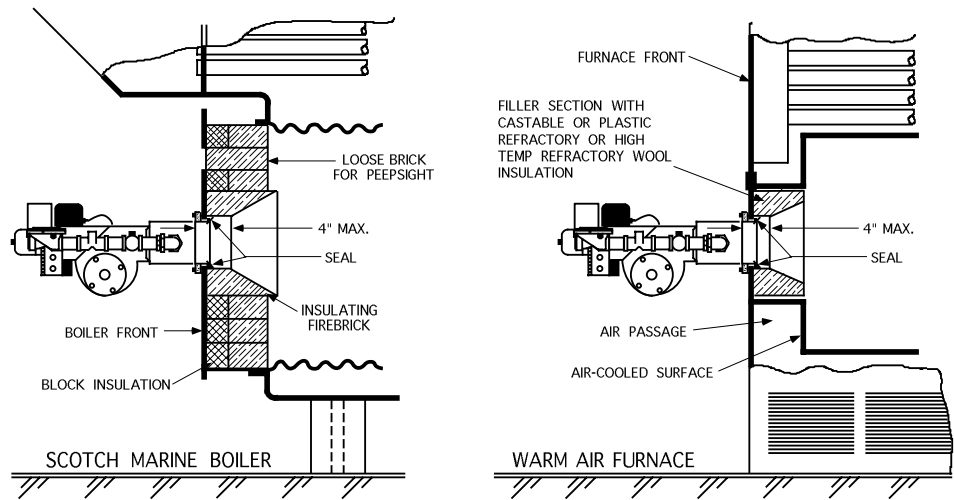


Figure 8: Tubular Combustion Chambers

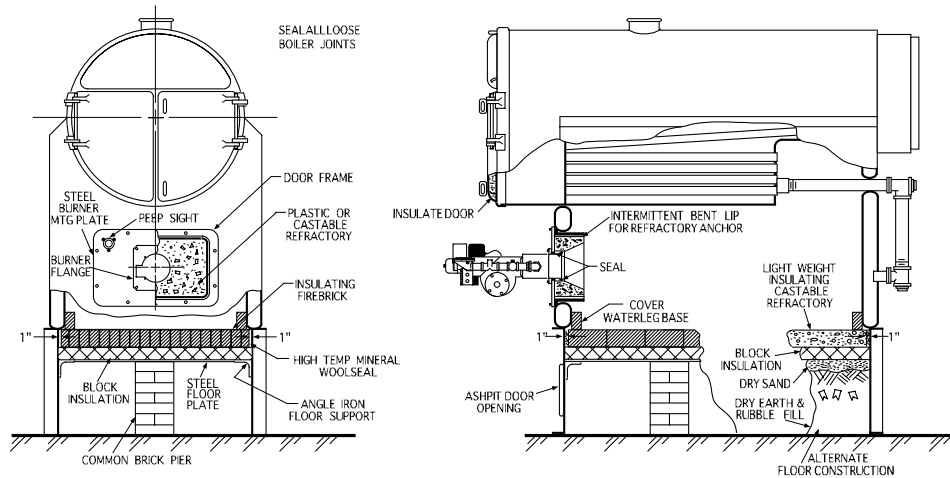


Figure 9: Firing Door Installation in Three Pass Boiler

V Chimney and Flue Pipe

The chimney should be inspected for unsafe conditions such as deteriorated masonry and excessive soot or other blockage or potential blockage.

□ All combustion air is furnished by the Unipower burner, and therefore the only function of the chimney is to vent the flue products.

Maximum Input MBH	Flue Pipe Diameter
900	12"
1,250	14"
1,750	16"
2,250	18"
3,000	20"
3,750	22"
4,500	24"
6,000	26"

Table 3: Recommended Size of Flue Pipe and Chimney

□ For the conventional appliances where a slight negative pressure in the combustion chamber is desirable, the chimney and flue pipe sizes given in Table 3 are recommended. Where chimney height exceeds 15 feet, a draft control should be installed per Figure 10 and set to produce a draft of approximately .04" W.C.

□ The barometric draft control should be of the double swing type, which opens freely outward to afford downdraft protection regardless of the setting made to the balancing weights for updraft control. For a chimney of the recommended diameter in Table 3, the draft control should be sized from 80% to 100% of the flue pipe area, or per manufacturer's recommendations. It should be located in the same room as the heating appliance, clear of any obstruction which could interfere with its operation.

□ The flue pipe must be of durable construction, preferably galvanized steel of sufficient strength, and securely supported. When passing through a combustible wall or partition, ventilated metal thimbles or suitable insulation and clearances must be provided to

keep surface temperatures of exposed combustible material below 194° F.

□ Do not arbitrarily reduce the flue pipe size, since a back pressure can build up in the

combustion chamber, leading to possible leakage of flue products into the building. However, if an undersized flue pipe or chimney must be used and the appliance is carefully sealed, or if it is built for pressurized firing, the areas can be reduced to accommodate 14,000 BTU per square inch or more, particularly if the chimney is 30 feet high or more.

□ If the flue pipe must be extra long, the area of the pipe and chimney should be increased, or the chimney height should be increased, or both. Never allow the horizontal length of the flue pipe to exceed the height of the chimney.

□ If the chimney is of greatly excessive height, draft may be so great as to cause the barometric draft control to float in the wide open position all the time, destroying its effectiveness. The use of an adjustable non-floating damper in the flue pipe will prove useful in this instance by reducing the draft to a point where the barometric draft control can operate effectively. It should be placed in the flue pipe between the barometric draft control and the chimney. Its' area must be less than that of the flue pipe so that total blockage of the flue pipe is impossible. The construction of the flue pipe damper and its adjusting mechanism must be rugged, so that no flutter or vibration occurs. After final setting, the damper must be welded into position to prevent tampering.

□ In the case of a motorized flue pipe damper or mechanical flue exhauster, an electrical interlock must be provided—see Section VI **Electrical**.

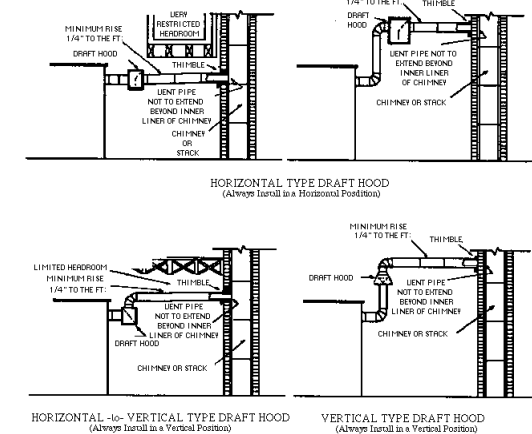


Figure 10: Draft Hoods

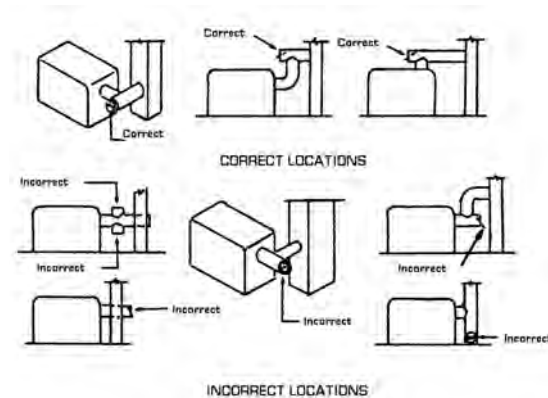


Figure 11: Barometric Dampers

□ The information given in this section is by necessity of a general nature. Special cases may require special treatment.

VI Electrical

□ The burner when installed, must be wired and grounded in accordance with local codes or in the absence of local codes, with the **National Electric Code ANSI/NFPA No. 70-latest edition**. In Canada, refer to **CSA Standard C22.1, "Canadian Electrical Code Part 1"** and/or local codes.

Refer to the separate wiring diagram included with this burner for specific wiring details. The wiring diagram number for your burner is listed on the front cover of this manual.

□ When wiring, be sure that the electrical power take-off is connected to a permanently live circuit and that the burner is electrically grounded. Use copper conductors not lighter than those given in Table 4.

Motor H.P.	115/1/60 Fuse	115/1/60 Wire	230/1/60 Fuse	230/1/60 Wire	230/3/60* Fuse	230/3/60* Wire
1/3	30A	#14	15A	#14	—	—
1/2	30A	#14	15A	#14	—	—
3/4	45A	#12	25A	#14	15A	#14
1 1/2	65A	#10	35A	#12	15A	#14
2	75A	#10	40A	#12	20A	#14

Table 3: Fuse and Wire Sizes

** When 3 phase motor is used, the 120V, 1 phase control circuit should be fused for 10A minimum and wired with #14 conductors.*

□ Standard Unipower A-Series burners are equipped with Honeywell Flame Safeguards.

□ The RM7895 Flame Safeguard provides pre-purge and intermittent pilot operation. See Section I **Specifications** for application.

When mounting the chassis, be sure electrical power has been turned off. Check all plug-in components for security.

□ The RM7840M Flame Safeguard provides pre- and post-purge and interrupted pilot operation. See Section I **Specifications** for application. Burners over 2500 MBH are equipped with a high-low gas pressure switch which prevents operation if gas line pressure exceeds or falls below certain preset limits.

□ For further information on both flame safeguards, see Part 2 **Service**.

□ Where safe operation of the burner depends on factors external to the burner, an interlock must be included which will prevent or delay burner operation until safe conditions exist. For example, in the case of a motorized flue pipe damper or mechanical flue exhauster, the initial call for heat must first energize the damper or exhauster motor, with burner start-up following only when the above components are in effective operation as monitored by flow or draft pressure switches in the flue pipe. If burner operation is made dependent on damper or exhauster control relays, the system must "fail safe" so that malfunction or failure of these components will not result in unsafe operations of the burner. See wiring diagrams for proper location of auxiliary controls.

VII Gas Piping

□ For the usual low pressure gas supply system, i.e. 5" to 14" W.C., use Table 5 to find the recommended gas line size.

□ Piping follows normal practice and should be arranged as shown in Figure 12 with a drip leg at the end of the vertical drop. **The piping must be firmly supported independent of the burner.**

□ The burner is shipped with the main and pilot valve train completely assembled except for the manual gas valves and regulators which should be mounted in a location convenient to the burner. If the main gas train must be rearranged because of space limitations, maintain the relationship of the components.

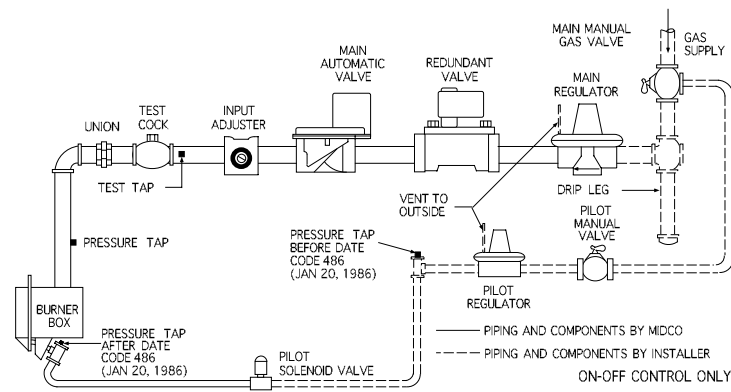


Figure 12: Gas Piping Schematic

□ The gas line pressure must be within the limits given in Section I **Specifications**. If higher than normal gas delivery pressure is encountered, as is the case in many industrial plants, the gas line size may be reduced to allow for a greater pressure drop (use the multipliers given in Table 5 for the allowable size

variations) however, the size must be sufficient to deliver burner rating pressure.

VII Gas Piping Cont.

In higher gas pressure systems (over 14" W.C.) it is very important to install the proper pressure reducing regulators at the burner. A high pressure regulator must be used in the line ahead of the burner main manual gas valve, but it must be of the tight shut-off type and must have a minimum flow regulating capacity suitable for the pilot (20,000 BTU/hr.)

⚠ CAUTION: If the gas supply pipeline is to be pressure tested, it should be done before the burner is connected in order to prevent damage to the burner pressure regulators and main gas valve. Use air or inert gas under pressure (DO NOT USE OXYGEN).

Feet From Meter	Pipe Size					
	1 1/4"	1 1/2"	2"	2 1/2"	3"	4"
	Maximum Capacity for Natural Gas*					
	MBTU/hr. Based on 0.5" W.C. Pressure Drop**					
25	760	1175	2375	3900	6000	
40	660	1000	1900	3000	5300	
60		810	1520	2400	4300	
80		690	1300	2050	3700	
100		620	1150	1850	3250	
125			1020	1650	2950	
150			950	1500	2650	5500
175			850	1370	2450	5000
200			800	1280	2280	4600

Table 5: Recommended Gas Piping

* Multiplier for Propane: 1.57

** Multiplier for alternate pressure drops: 0.3" W.C.-.77,
1.0" W.C.-1.40, 2.0" W.C.-2.00, 4.0" W.C.-2.80.

Before gas is turned into the system, a check must be made to see that there are no open fittings and to make sure the burner main manual valve and pilot manual valve are closed. Purge the gas line up to the burner inlet. Discharge purged gas outside of the building, do not purge into the combustion chamber.

VIII Burner Start-Up

Each burner is supplied with an individual initial start-up procedure. The start-up instructions number for your burner is listed on the front cover of this manual.

After the initial start-up procedure the following steps can be followed for routine start-up and shut-down on a seasonal basis.

Extended Burner Shut-Down

1. Turn off burner switch.
2. Close main manual valve.
3. Close pilot manual valve.
4. Turn off line switch.

Burner Start-Up

1. Make sure line switch and burner switch are off.
2. Set controller to call for heat.
3. Open firing door.
4. Open main and pilot manual gas valves.
5. Depress flame safeguard reset button.
6. Reset low gas pressure switch (if used).
7. Turn on line switch.
8. Turn on burner switch and allow burner to run through firing cycle.
9. Close firing door.
10. Reset controller to desired setting.

IX Burner Box and Nozzle Assembly

⚠ CAUTION: Do not tamper with the unit or controls. If trouble occurs contact your serviceman.

⚠ CAUTION: Be sure that the main and pilot manual valves are closed and the burner power supply is turned off before removing any parts for service. Do not push relay contacts in manually.

- Maintenance of the burner box and nozzle is minimal, due to the simplicity of the parts and the absence of small air or gas passages. An occasional inspection of the parts in contact with the flame will suffice. The burner nozzle parts should show no severe loss of metal or warping.
- If the burner mounting flange shows evidence of overheating, check the tightness of the burner mounting. The burner is intended to be sealed into the appliance face as shown in Figure 4 to prevent blow-back of hot flue products around the nozzle and flange.

Pilot Orifice Sizing

Model	A50G	A52-A55G	A73-A77G
Air Orifice	5/16" (Brass)	9/32" (Aluminum)	
Natural	#47 (.078)		#45 (.082)
Propane	#50 (.070)		

X Pilot and Flame Sensor

The pilot is of the premix, blast type. Undampened blower air is brought into the pilot body through the air orifice where the proper amount of gas is added through the pilot gas orifice. The mixture is discharged through the alloy flame retention pilot tip. The pilot is rated for an approximate capacity of 20 MBH and a normal operating pressure of 2.5" to 4" W.C. for both Natural Gas and Propane.

The pilot regulator is factory set for an outlet pressure of about 3 1/2" W.C. which will be suitable for average conditions. Do not indiscriminately increase orifice sizes. Pilot troubles are rarely cured in this manner. Adjust the pilot as described in the start-up instructions included with the burner.

The spark rod is located on the center line of the pilot and is arranged to arc to the inside of the central port. Spark current is supplied by a 6000V, 20 milliamper (minimum) end point grounded ignition transformer.

Service of the pilot will generally consist only of inspection and cleaning. Check that the air tube, pilot body and the tip ports are free of lint and dirt and that the pilot tip is free of serious corrosion. The spark rod insulator must be clean, dry and free of cracks. See Figure 13.

The high tension cable for the spark electrode should be checked for cracks and abrasions.

Proper operation of the flame safeguard depends on a reliable current flow through the flamerod, pilot flame and the burner frame. The flamerod must be free of any contact with conductive burner parts. The

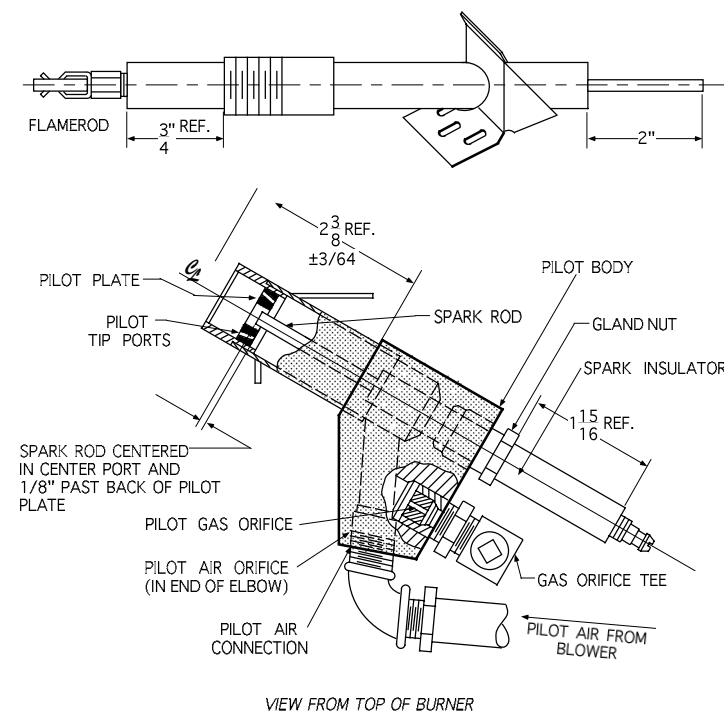


Figure 13: Pilot Assembly

insulator must be clean, dry and free of cracks. While the rod is made of heat resistant alloy, it may eventually deteriorate at the point of flame contact and should be replaced if it is seriously corroded.

XI Blower and Motor

- No routine service is necessary on the blower system other than cleaning the blower wheel when necessary.
- Blowers using three-phase motors will run in either direction depending on the connection of the power supply. On new installations, motor replacement or power supply disturbance, the rotation must be checked. Corrections can be made by interchanging any 2 wires of the three-phase power supply.
- If replacement motors for standard burners are procured from a source other than Midco, they should conform to the following specifications: 3450 RPM, Frame 56C, end mounted open motor with ball bearings. Capacitor start and thermal overload protection if single phase.
- Proof of blower operation is provided by the diaphragm type blower air switch, which must close its normally open contacts and maintain them closed when the blower is running. A check for proper operation can be made by disconnecting the air pressure tube during burner operation, which should result in burner shut-down. In case of malfunction, it is recommended that the air switch be completely replaced.
- A three wire self-testing hookup of the air switch is used on burners equipped with flame safeguards, such as the RM7840, which have a 120V air proving interlock circuit. The N.C. contacts of the air switch are wired into the start interlock circuit, which prevents burner start-up unless the air switch proves operational by returning to its normally off position after every burner run. Failure of the burner to start may be caused by a faulty air switch.

XII Gas Pressure Regulator

- The gas pressure regulator is used to automatically reduce and maintain constant gas pressure at the burner.
- To adjust the outlet pressure, remove the seal cap for access to the adjusting screw. Turning the screw clockwise will increase outlet pressure, counter-clockwise will decrease outlet pressure.
- The vent in the upper diaphragm case normally breathes only air and must be connected to the outside air to prevent escape of gas into the building in case of a ruptured diaphragm. The vent line must be of sufficient diameter, otherwise the restriction of air flow may cause sluggish opening of the regulator. The effect can be checked by comparing main flame start-up time with the vent line connected and unconnected.

The vent must never be connected to the burner or combustion chamber

- Although regulators seldom require servicing, the most vulnerable part is the diaphragm. Periodic service should be limited to a diaphragm inspection, which should be checked for punctures or stiffness.

XIII Main Automatic Safety Shut-Off Valve V48 Diaphragm Gas Valve (Not for use in Canada)

- The Honeywell V48A diaphragm gas valve is of the slow opening type with a maximum closing time of 5 seconds. It requires a bleed tube which discharges into the combustion chamber adjacent to the pilot. Closing force combines a gas pressure differential, diaphragm weight and spring.
- For general service a check for gas tightness will suffice. Start the burner and observe through at least one cycle to be sure the valve functions properly and that the main flame has extinguished completely.
- Leak test per Section XVI **Special Equipment**. If leakage is observed, turn off the electrical power and the main manual gas valve, remove the diaphragm case and make the following checks: (1) the diaphragm must be pliable, free of holes and must have sufficient slack when set in position; (2) the valve seat must be free of gum, tar or other dirt and must be free of cuts, nicks and worn spots.
- If the valve fails to close, make sure power is off at the terminals and gas flow is in the direction of the arrow on the valve body. When malfunction is determined to be caused by the valve operator head, the operator head should be completely replaced.
- If the valve will not open, make sure normal gas pressure is available at the valve, the bleed line is unobstructed, and power is available at the terminals.

V5055 Valve Body with Motorized Actuator

- The Honeywell V5055 main valve body is of the slow opening, fast closing type and does not require venting. It is powered by a motorized valve actuator which supplies the motive power for opening and closing the valve. The V4055 Actuator is used for On-Off and Full Modulating operation. The V4062 Actuator is used for both the On-Off control and to provide High-Low firing rate control. The full open position should be reached in 26 seconds after energization, the closed position in one second or less.
- For general service, the valve should be checked for gas tightness and proper operation. If leakage is detected, the valve seat should be examined for dirt, damage or obstruction.
- For access to the valve for inspection and cleaning, turn off the electrical power and the main manual gas valve, then loosen the two Allen setscrews in the actuator collar and remove the actuator. Remove the valve bonnet assembly by removing the bolts holding it to the valve body. Inspect the valve seat for dirt, cuts, nicks and other defects. Do not disassemble the valve bonnet. The valve seat is not replaceable; if defective, the entire valve body should be replaced.

V5055 Valve Body with Motorized Actuator Cont.

Do not disassemble the valve actuator, it is not field repairable. If malfunction occurs, replace the entire actuator.

XIV Automatic Gas Valve Leak Test

1. Turn off power to burner.
2. Fully close the manual test cock (located downstream of the gas input adjuster).
3. Remove the 1/8" pipe plug from the test tap located:
 - a. with diaphragm valve (in one of the pipes nipples between the valve and test cocks, or
 - b. with motorized valve (in the bottom of the valve body on its downstream side, or in the tee connecting the high gas pressure switch tube to the valve train.
4. Install a pet cock in the test tap and attach a short length of 1/4" flexible tubing. The open end of the tubing should be cut at a 45° angle.
5. Immerse the open end of the tubing to a depth of 1/2" in a container of water.
6. Open the pet cock. If bubbles appear, wait until the rate stabilizes, then count the number appearing in ten seconds. An excess of 23 bubbles over a ten second period (approximately .023 CFH of gas) indicates that the valve should be repaired or replaced.
7. If there are two automatic gas valves in the valve train, check the downstream valve first and then the upstream valve. Use the appropriate tap in one of the motorized valve bodies, or when a diaphragm and solenoid valve are furnished, in the pipe nipple between the valves.
8. After the test is completed, be sure to replug the test taps and fully open the test cock.

XV Flame Safeguard

Standard Unipower burners are equipped with a Honeywell RM7895 microprocessor based burner control, employing a flame rectification system of flame detection. Burner construction for special codes and/or insurance requirements such as Factory Mutual or Industrial Risk Insurers (IRI) may require alternate controls. Refer to Section XV **Special Equipment**. A safe start and run control sequence is provided with instantaneous response to presence or loss of flame signal. Flame failure response time is 3 seconds. Pilot Flame Establishing Period (PFEP) is field selectable from 4 or 10 seconds. The RM7895 features a pre-purge time (30 seconds for On-Off, 90 seconds for 2-Step or Modulating burners) and a plug-in amplifier. An airflow circuit is also field selectable to allow either lockout or recycle upon loss of airflow. Five LED's (light emitting diodes) are provided to display sequence information. Refer to the Honeywell RM7895 literature for detailed operating information, configuration requirements, testing and service.

XVI Special Equipment

Special Equipment, such as high-low gas pressure switches, main valve, proof of closure switches etc., can affect the start-up and operation of the burner. Refer to your burner wiring diagram and specific start-up instructions, as well as equipment manufacturer's literature included with the burner for further information.

If any doubt exists concerning burner operation when special equipment is involved, contact the installing contractor or Midco International Inc.

Burner Model	Combustion Chamber Back Pressure				
	0" W.C.	.25" W.C.	.50" W.C.	.75" W.C.	1.0" W.C.
A50G	1500	—	1300	—	*
A52G	2000	—	1700	—	1525
A53G	2500	—	2500	—	2500
A55G	3000	—	2800	—	2575
A73G	4200	4200	4000	3850	3650
A75G	5000	5000	5000	5000	5000
A77G	6000	5800	5600	5400	5200

Table 6: Maximum Capacities at Specified Back Pressures