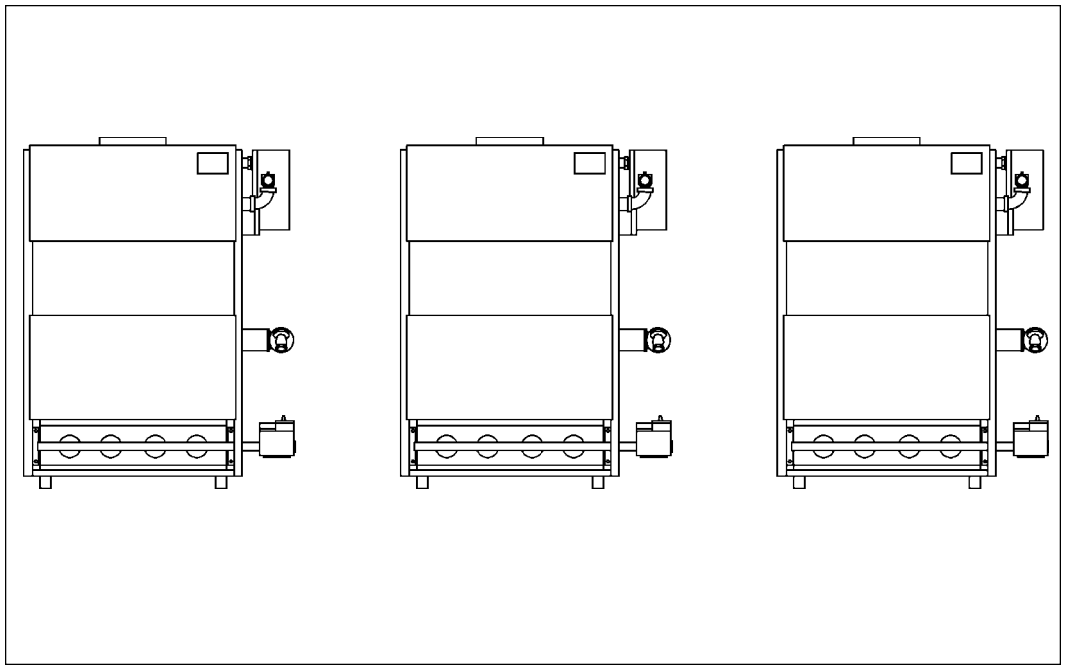
MAGB

MODULAR GAS FIRED BOILERS
FOR FORCED HOT WATER



INSTALLATION MANUAL AND OPERATING INSTRUCTIONS

UTICA BOILERS

Utica Boilers • P.O. Box 4729 • Utica, NY 13504

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KEEP THIS MANUAL NEAR BOILER
RETAIN FOR FUTURE REFERENCE

SERIES MAGB
CAST IRON
GAS FIRED BOILERS

INSTALLATION MANUAL AND OPERATION INSTRUCTIONS

Published February 1995
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Made In USA

Safety Symbols

The following defined symbols are used throughout this manual to notify the reader of potential hazards of varying risk levels.

⚠ DANGER

DANGER - Indicates an imminently hazardous situation which, if not avoided, WILL result in death or serious injury.

⚠ WARNING

WARNING - Indicates a potentially hazardous situation which, if not avoided, COULD result in death or serious injury

⚠ CAUTION

CAUTION - Indicates a potential hazardous situation which, if not avoided, MAY result in minor or moderate injury. It may also be used to alert against unsafe practices.

IMPORTANT!

1. **READ ALL INSTRUCTIONS BEFORE INSTALLING.**

2. To the owner: Installation and service of this boiler must be performed by a qualified installer.

3. To the installer: Leave all instructions with the boiler for future reference.

⚠ WARNING!

1. Keep boiler area clear and free from combustible materials, gasoline and other flammable vapors and liquids.

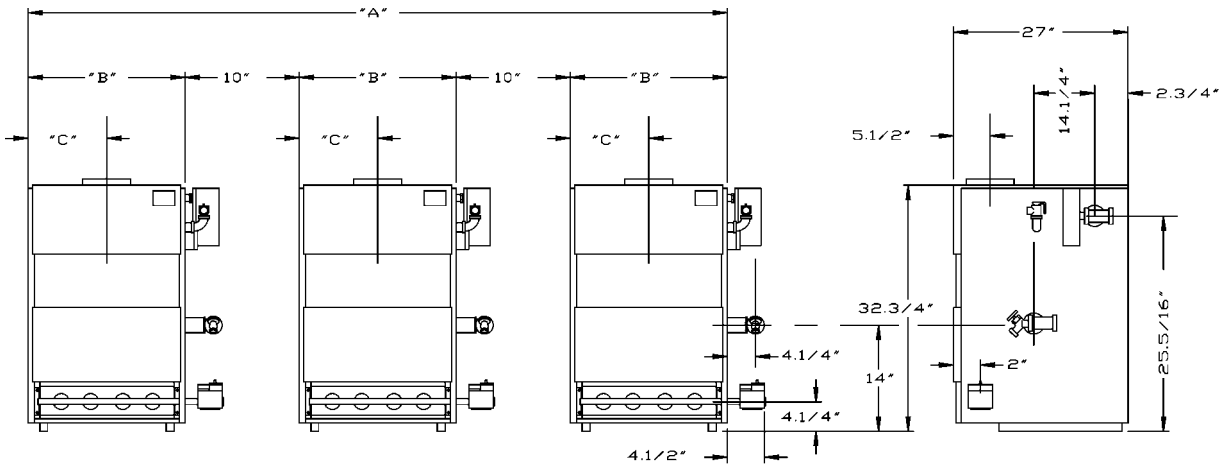
2. **DO NOT** obstruct air openings to the boiler room.

3. Modification, substitution or elimination of factory equipped, supplied or specified components may result in property damage, personal injury or the loss of life.

4. When this product is installed in the Commonwealth of Massachusetts the installation must be performed by a Licensed Plumber or Licensed Gas Fitter.

SERIES MAGB GAS FIRED BOILERS
ENGINEERING DIMENSIONAL DATA

MODEL NUMBER MAGB	NUMBER OF MODULES	SHIPPING WEIGHT (LBS.)	WATER CONTENT (GALLONS)	A INCHES	B INCHES	C INCHES
500	2	945	17.6	62.250"	26.625"	13.313"
600	2	1065	20.8	70.000"	30.500"	15.250"
750	3	1400	26.4	97.875"	26.625"	13.313"
900	3	1600	31.2	109.500"	30.500"	15.250"
1000	4	1890	35.2	133.500"	26.625"	13.313"
1200	4	2135	41.6	149.000"	30.500"	15.250"
1500	5	2665	52.0	188.000"	30.500"	15.250"
1800	6	3200	62.4	228.000"	30.500"	15.250"
2100	7	3730	72.8	267.500"	30.500"	15.250"
2400	8	4265	83.2	307.000"	30.500"	15.250"



FRONT VIEW

RIGHT SIDE VIEW

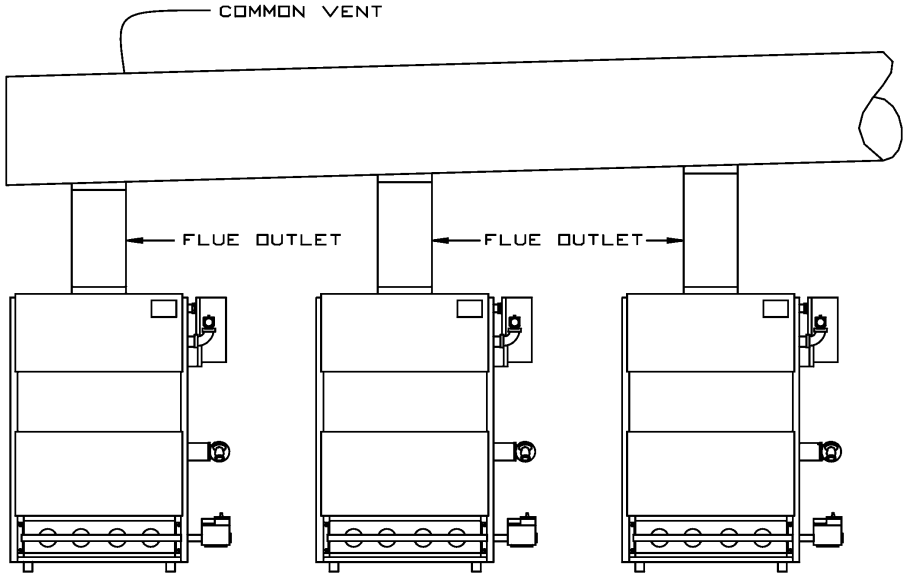
SERIES MAGB GAS FIRED BOILERS
ENGINEERING DIMENSIONAL DATA

MODEL NUMBER MAGB	AGA INPUT BTU/HR.	AGA OUTPUT BTU/HR.	NET I=B=R WATER RATINGS		FLUE OUTLET DIA.&NO.		COMMON VENT DIA.	CHIMNEY DIAMETER & HEIGHT
			BTU/HR. **	SQ. FT.	8"	9"		
500	500,000	*410,000	356,500	2,377	2		10"	12" X 15'
600	600,000	480,000	423,000	2,817		2	12"	14" X 15'
750	750,000	*615,000	533,000	3,553	3		12"	14" X 20'
900	900,000	720,000	634,000	4,226		3	14"	16" X 20'
1000	1,000,000	*820,000	713,000	4,753	4		14"	16" X 20'
1200	1,200,000	960,000	845,000	5,635		4	16"	18" X 20'
1500	1,500,000	1,200,000	1,057,000	7,043		5	16"	20" X 20'
1800	1,800,000	1,440,000	1,268,000	8,452		6	18"	20" X 30'
2100	2,100,000	1,680,000	1,479,000	9,861		7	20"	22" X 30'
2400	2,400,000	1,920,000	1,690,000	11,289		8	22"	24" X 30'

* DOE HEATING CAPACITY

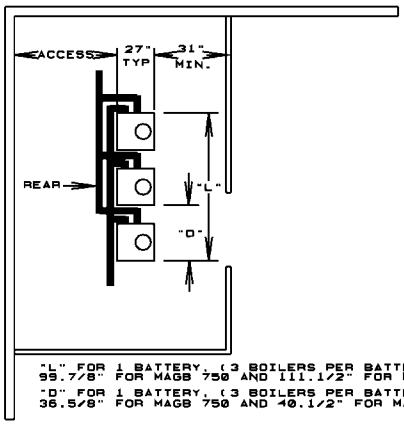
**For elevations above 2000 feet ratings should be reduced at a rate of 4% for each 1000 feet above sea level.

**For equivalent square feet of radiation, divide I=B=R output by 150.



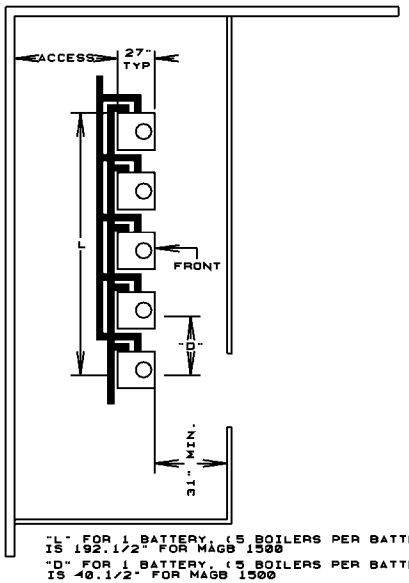
FRONT VIEW

TYPICAL LAY-OUTS FOR GAS FIRED SYSTEMS

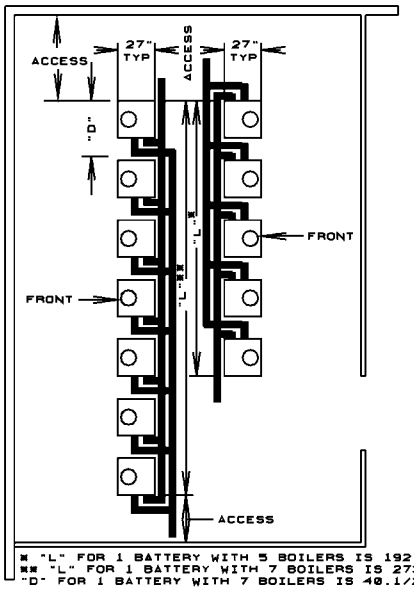


"L" FOR 1 BATTERY, (3 BOILERS PER BATTERY), IS 99.7/8" FOR MAGB 750 AND 111.1/2" FOR MAGB 900
"D" FOR 1 BATTERY, (3 BOILERS PER BATTERY), IS 36.5/8" FOR MAGB 750 AND 40.1/2" FOR MAGB 900

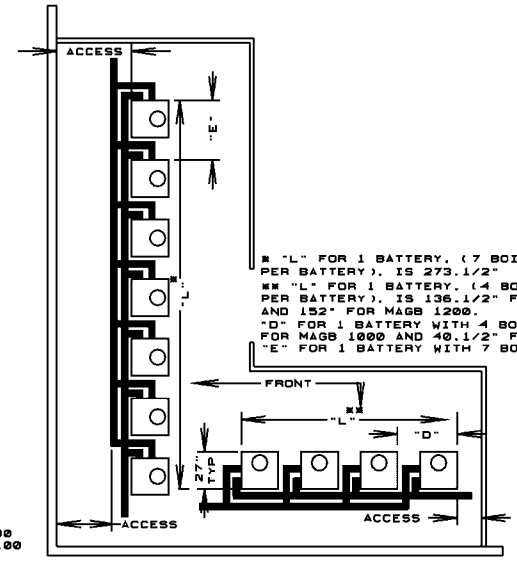
"L" FOR 1 BATTERY, (2 BOILERS PER BATTERY), IS 63.1/4" FOR MAGB 500 AND 71" FOR MAGB 600
"D" FOR 1 BATTERY, (2 BOILERS PER BATTERY), IS 36.5/8" FOR MAGB 500 AND 40.1/2" FOR MAGB 600



"L" FOR 1 BATTERY, (5 BOILERS PER BATTERY) IS 192.1/2" FOR MAGB 1500
"D" FOR 1 BATTERY, (5 BOILERS PER BATTERY) IS 40.1/2" FOR MAGB 1500



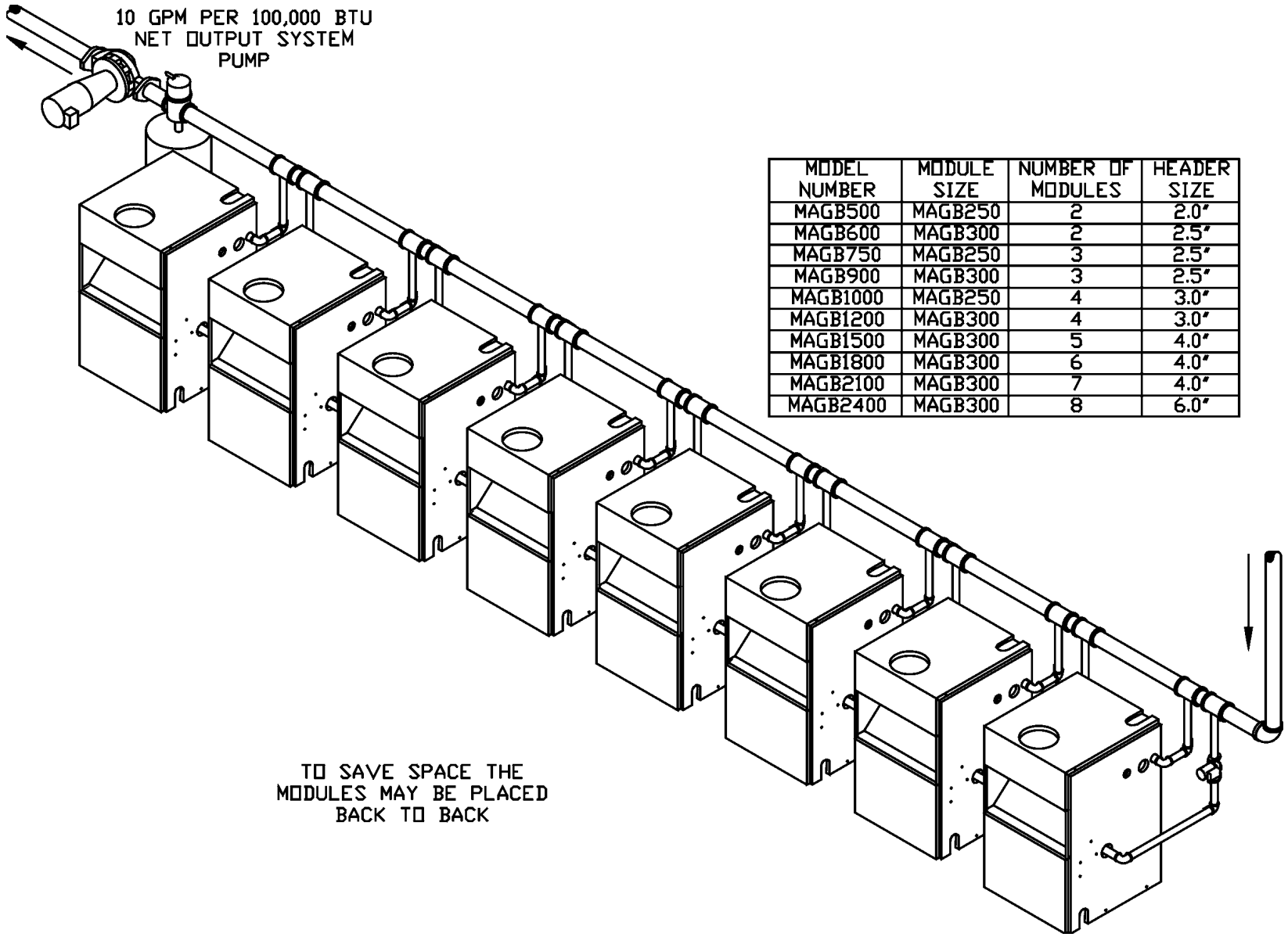
* "L" FOR 1 BATTERY WITH 5 BOILERS IS 192.1/2" FOR MAGB 1500
** "L" FOR 1 BATTERY WITH 7 BOILERS IS 273.1/2" FOR MAGB 2100
"D" FOR 1 BATTERY WITH 7 BOILERS IS 40.1/2".



* "L" FOR 1 BATTERY, (7 BOILERS PER BATTERY), IS 273.1/2"
** "L" FOR 1 BATTERY, (4 BOILERS PER BATTERY), IS 136.1/2" FOR MAGB 1000 AND 152" FOR MAGB 1200.
"D" FOR 1 BATTERY WITH 4 BOILERS IS 36.5/8" FOR MAGB 1000 AND 40.1/2" FOR MAGB 1200.
"E" FOR 1 BATTERY WITH 7 BOILERS IS 40.1/2".

NOTE: FOR ACCESS DIMENSION, REFER TO LOCAL CODES OR MAINTAIN NO LESS THAN 24".

SUPPLY AND RETURN PIPING



MODEL NUMBER	MODULE SIZE	NUMBER OF MODULES	HEADER SIZE
MAGB500	MAGB250	2	2.0"
MAGB600	MAGB300	2	2.5"
MAGB750	MAGB250	3	2.5"
MAGB900	MAGB300	3	2.5"
MAGB1000	MAGB250	4	3.0"
MAGB1200	MAGB300	4	3.0"
MAGB1500	MAGB300	5	4.0"
MAGB1800	MAGB300	6	4.0"
MAGB2100	MAGB300	7	4.0"
MAGB2400	MAGB300	8	6.0"

INSTALLATION PROCEDURE

⚠ WARNING: Improper installation, adjustment, alteration, service or maintenance can cause injury or property damage.

1. The installation must conform to the requirements of the authority having jurisdiction or, in the absence of such requirements, to the latest revision of the National Fuel Gas Code, ANSI Z223. (Available from the American Gas Association, 8501 E. Pleasant Valley Road, Cleveland, Ohio 44134). Reference should also be made to local gas utility regulations and other codes in effect in the area in which the installation is to be made.

2. Where required by the authority having jurisdiction, the installation must conform to American Society of Mechanical Engineers Safety Code for Controls and Safety Devices For Automatically Fired Boilers, No.CSD-1.

3. This boiler series is classified as a Category 1 and the vent installation shall be in accordance with Part 7 of the National Fuel Gas Code noted above or applicable provisions of the local building codes.

4. This boiler has met safe lighting and other performance criteria with the gas manifold and control assembly on the boiler per the latest revision of ANSI Z21.13.

5. The boiler shall be installed such that the gas ignition system components are protected from water (dripping, spraying, rain, etc.) during appliance operation and service, (circulator replacement, condensate trap, control replacement, etc.).

6. LOCATE BOILER on level, solid base as near the chimney as possible and centrally located with respect to the heat distribution system as practical.

7. Allow 24 inches at the front and right side for servicing and cleaning.

8. When installed in a utility room, the door should be wide enough to allow the largest boiler part to enter, or to permit replacement of another appliance such as a water heater.

9. **FOR INSTALLATION ON NON-COMBUSTIBLE FLOORS ONLY ***. The boiler must not be installed on carpeting. Minimum clearances to combustible construction are:

TOP	18 IN.
FRONT	ALCOVE
FLUE CONNECTOR	6 IN.
REAR	4 IN.
CONTROL SIDE	9 IN.
OTHER SIDE	3 IN.

NOTE: Greater clearances for access should supersede fire protection clearances.
* For installation on combustible flooring special base part no. 325-2-8.00 must be used.

10. The MEA number for this boiler series is 19-79 Vol. II.

VENTILATION AND COMBUSTION AIR

⚠ WARNING: AIR OPENINGS TO COMBUSTION AREA MUST NOT BE OBSTRUCTED. BY FOLLOWING THE CHART BELOW, ADEQUATE COMBUSTION AIR CAN BE MAINTAINED.

COMBUSTION AIR REQUIREMENTS

(MINIMUM SQUARE INCHES OPENING)

MODEL NUMBER MAGB	NUMBER OF MODULES	*UNCONFINED AREA		**CONFINED AREA OUTSIDE COMBUSTION AIR	
		OUTSIDE COMBUSTION AIR 1 SQ. IN /4000 BTU/HR (SEE FIG. 2)	INSIDE COMBUSTION AIR 1 SQ. IN. /1000 BTU/HR (SEE FIG. 1)	VERT. DUCTS 1 SQ. IN. /4000 BTU/HR	HORZ. DUCTS 1 SQ. IN. /2000 BTU/HR
500	2	125	500	125	250
600	2	150	600	150	300
750	3	188	750	188	375
900	3	225	900	225	450
1000	4	250	1000	250	500
1200	4	300	1200	300	600
1500	5	375	1500	375	750
1800	6	450	1800	450	900
2100	7	525	2100	525	1050
2400	8	600	2400	600	1200

*** Unconfined area:** A space whose volume is not less than 50 cubic feet per 1000 BTU per hour of all appliances installed in that space (cubic feet of space = height x width x length).

**** Confined area:** A space whose volume is less than 50 cubic feet per 1000 BTU per hour of all appliances installed in that space (cubic feet of space = height x width x length).

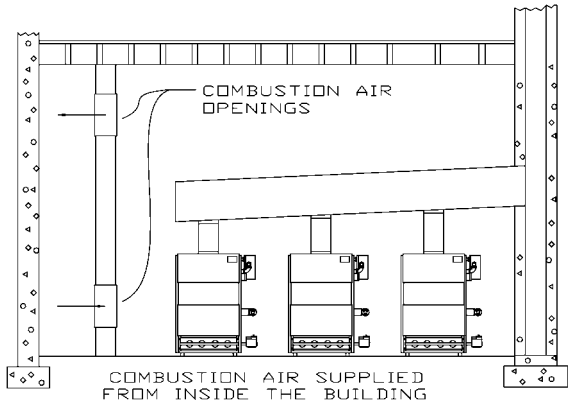


FIGURE 1

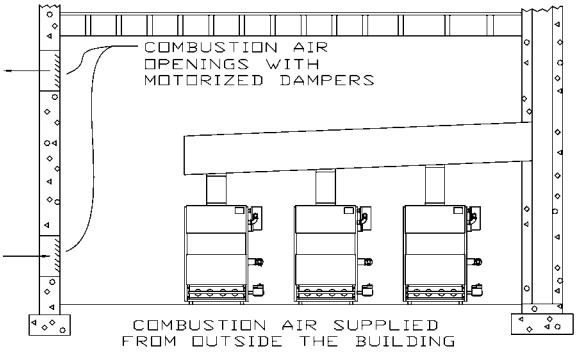


FIGURE 2

VENTILATION & COMBUSTION CONTINUED

1. Ventilation of the boiler room must be adequate to provide sufficient air to properly support combustion per the latest revision of the National Fuel Gas Code, ANSI Z223.1 section 5.3.

2. When a boiler is located in an unconfined space in a building or conventional construction frame, masonry or metal building, infiltration normally is adequate to provide air for combustion and ventilation. However, if the equipment is located in a building of unusually tight construction (See the national Fuel Gas Code, Ansi Z223.1 section 1.7), the boiler area should be considered as a confined space. In this case air for combustion and ventilation shall be provided according to part 5 on page 4. If there is any doubt, install air supply provisions in accordance with the latest revision of the National Fuel Gas Code.

3. When a boiler is installed in an unconfined space, in a building of unusually tight construction, air for combustion and ventilation must be obtained from outdoors or from spaces freely communicating with the outdoors. A permanent opening or openings having a total free area of not less than 1 square inch per 5,000 BTU per hour of total input rating of all appliances shall be provided. Ducts may be used to convey makeup air from the outdoors and shall have the same cross-sectional area of the openings to which they are connected.

4. When air for combustion and ventilation is from inside buildings, the confined space shall be provided with two permanent openings, one starting 12 inches from the top and one 12 inches from the bottom of the enclosed space. Each opening shall have a minimum free area of 1 square inch per one thousand (1000) BTU per hour of the total input rating of all appliances in the enclosed space, but must not be less than one hundred (100) square inches. These openings must freely communicate directly with other spaces of sufficient volume so that the combined volume of all spaces meets the criteria for an unconfined space. See figure 1 on page 8.

5. When the boiler is installed in a confined space and all air is provided from the outdoors the confined space shall be provided with one or two permanent openings according to methods A or B. When ducts are used, they shall be of the same cross sectional area as the free area of the area of the openings to which they connect. The minimum dimension of rectangular air ducts shall be not less than 3 x 3 inches or 9 square inches.

A. When installing two openings, one must commence within 12 inches from the top and the other within 12 inches from the bottom of the enclosure. The openings shall communicate directly, or by ducts, with the outdoors or spaces (crawl or attic) that freely communicate with the outdoors. One of the following methods must be used to provide adequate air for ventilation and combustion.

1. When directly communicating with the outdoors, each opening shall have a minimum free area of 1 square inch per 4,000 BTU per hour of total input rating of all equipment in the enclosure. See figure 2 on page 8.

2. When communicating with the outdoors by means of vertical ducts, each opening shall have a minimum free area 1 square inch per 4,000 BTU per hour of total input rating of all appliances in the enclosed space.

3. If horizontal ducts are used, each opening and duct shall have a minimum free

area 1 square inch per 2,000 BTU per hour of total input rating of all appliances in the enclosed space.

B. One permanent opening, commencing within 12 inches of the top of the enclosure, shall be permitted where the equipment has clearances of at least 1 inch from the sides, 1 inch from the back, and 6 inches from the front of the boiler. The opening shall directly communicate with the outdoors or shall communicate through a vertical or horizontal duct to the outdoors or spaces (crawl or attic) that freely communicate with the outdoors. The openings must have a minimum free area of 1 square inch per 3000 Btu per hour of the total input rating of all equipment located in the enclosure. The free area must be no less than the sum of the areas of all vent connectors in the confined space.

6. In calculating free area using louvers, grilles or screens for the above, consideration shall be given to their blocking effect. Screens used shall not be smaller than 1/4 inch mesh. If the free area through a design of louver or grill is known, it should be used in calculating the size opening required to provide the free area specified. If the design and free area is not known, it may be assumed that wood louvers will have 20-25% free area and metal louvers and grilles will have 60-75% free area. Louvers and grilles should be fixed in the open position or interlocked with the boiler so they are opened automatically during the boiler operation.

VENT INSTALLATION

⚠ WARNING: This boiler is to be vented by natural draft and shall not be connected to the mechanical draft system operating under positive pressure.

1. The vent pipe must slope upward from the boiler not less then 1/4 inch for every 1 foot to the vent terminal.

2. Horizontal portions of the venting system shall be supported rigidly every 5 feet and at the elbows. No portion of the vent pipe should have any dips or sags.

3. This boiler series is classified as a Category 1 and the vent installation shall be in accordance with Part 7 of the National Fuel Gas Code noted above or applicable provisions of the local building codes.

4. Inspect chimney to make certain it is constructed according to NFPA 211. The vent or vent collector shall be Type B or metal pipe having resistance to heat and corrosion not less than that of galvanized sheet steel or aluminum not less than 0.016 inch thick (No. 28 Ga).

5. Connect flue pipe from draft hood to chimney. Bolt or screw joints together to avoid sags. Flue pipe should not extend beyond inside wall of chimney. Do not install manual damper in flue pipe or reduce size of flue outlet except as provided by the latest revision of ANSIZ223.1. Protect combustible ceiling and walls near flue pip with fireproof insulation. Where two or more appliances vent into a common flue, the area of the common flue must be at least equal to the area of the largest flue plus 50 percent of the area of each additional flue.

VENT DAMPER INSTALLATION AND INSTRUCTIONS

INSTALLATION FOR OPTIONAL VENT DAMPER

NOTE: Refer to Figure 3 below for steps 1 - 7.

1. Place Vent Damper on or as close to vent outlet of boiler as possible.
2. Remove Vent Damper Motor cover.
3. Remove locknut from connector at the free end of the Damper wire harness.
4. Feed Damper and Damper wire harness connectors through bracket hole on Damper Motor frame.
5. Replace and tighten locknut onto Damper wire harness connector.
6. Plug Damper connector into socket on Damper Motor frame.
7. Replace Damper Motor cover.
8. Wire Damper in accordance with figure 3 below.

INSTRUCTIONS

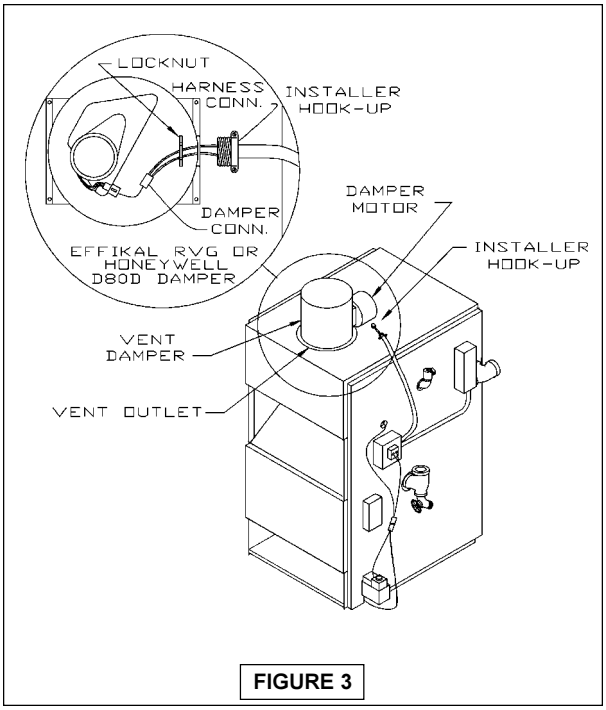


FIGURE 3

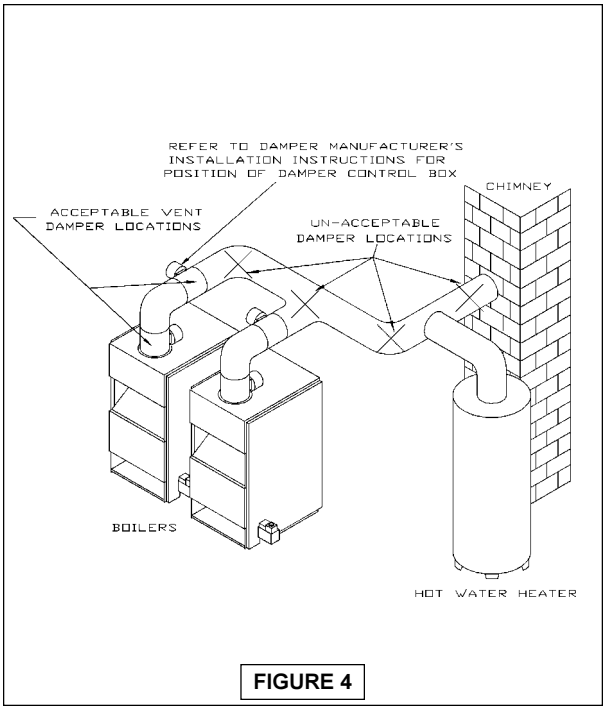


FIGURE 4

1. Ensure that only the boiler is serviced by the Vent Damper. See Figure 4, above.

2. Clearance of not less than 6 inches between Vent Damper and combustible material must be maintained. Additional clearance should be allowed for service of Vent Damper.

3. Vent Damper must be in the open position when appliance main burners are operating.

4. The Vent Damper position indicator must be in a visible location following installation.

5. The thermostat's heat anticipator must be adjusted to match the total current draw of all controls associated with the boiler during a heating cycle.

VENT SYSTEM MODIFICATION

When an existing boiler is removed from a common venting system, the common venting system is likely to be too large for the proper venting of the appliances remained connected to it. If this situation occurs, the following test procedure must be followed:

REMOVAL OF BOILER FROM VENTING SYSTEM

When removing an existing boiler, the following steps shall be followed with each appliance remaining connected to the common venting system placed in operation, while the other appliances remaining connected to the common venting system are not in operation.

A. Seal an unused opening in the common venting system.

B. Visually inspect the venting system for proper size and horizontal pitch and determine there is no blockage or restriction, leakage, corrosion and other deficiencies which could cause an unsafe condition.

C. Insofar as is practical, close all building doors and windows and all doors between the space in which the appliances remaining connected to the common venting system are located and other spaces of the building. Turn on clothes dryers and any other appliance not connected to the common venting system. Turn on any exhaust fans, such as range hoods and bathroom exhausts, so they operate at maximum speed. Do not operate a summer exhaust fan. Close fireplace dampers.

D. Place in operation the appliance being inspected. Follow the lighting instructions. Adjust thermostat so appliance will operate continuously.

E. Test for spillage at the draft hood relief opening after 5 minutes of main burner operation. Use the flame of a match or candle, or smoke from a cigarette, cigar or pipe.

F. After it has been determined that each appliance remaining connected to a common venting system properly vents when tested as outlined above, return doors, windows, exhaust fans, fireplace dampers and any other gas burning appliances to their previous condition of use.

G. Any improper operation of the common venting system should be corrected so the installation conforms with the latest revision of the National Fuel Gas Code, ANSI Z223.1. When resizing any portion of the common venting system, the common venting system should be resized to approach the minimum size as determined using the appropriate tables in appendix G in the latest revision of the National Fuel Gas Code, ANSI Z223.

CONNECTING BOILERS WITH REFRIGERATION SYSTEMS

Refer to data on page 4

1. Connect supply and return piping as suggested in figure 5 below, when the boiler is used in connection with refrigerated systems.

2. The chilled medium **MUST BE PIPED IN PARALLEL** with the boiler.

3. Use appropriate valves to prevent the chilled medium from entering the heating boiler.

A. During heating cycle open valves A and B, close valves C and D.

B. During cooling cycle, open valves C and D, close valves A and B.

C. Maintain a minimum clearance of one inch to hot water pipes.

D. When the boiler is connected to heating coils located in air handling units where they may be exposed to refrigerated air circulation, the boiler piping system MUST BE supplied with flow control valves or other automatic means to prevent gravity circulation of the boiler water during the cooling cycle.

4. For further information refer to the I=B=R Installation and Piping Guide.

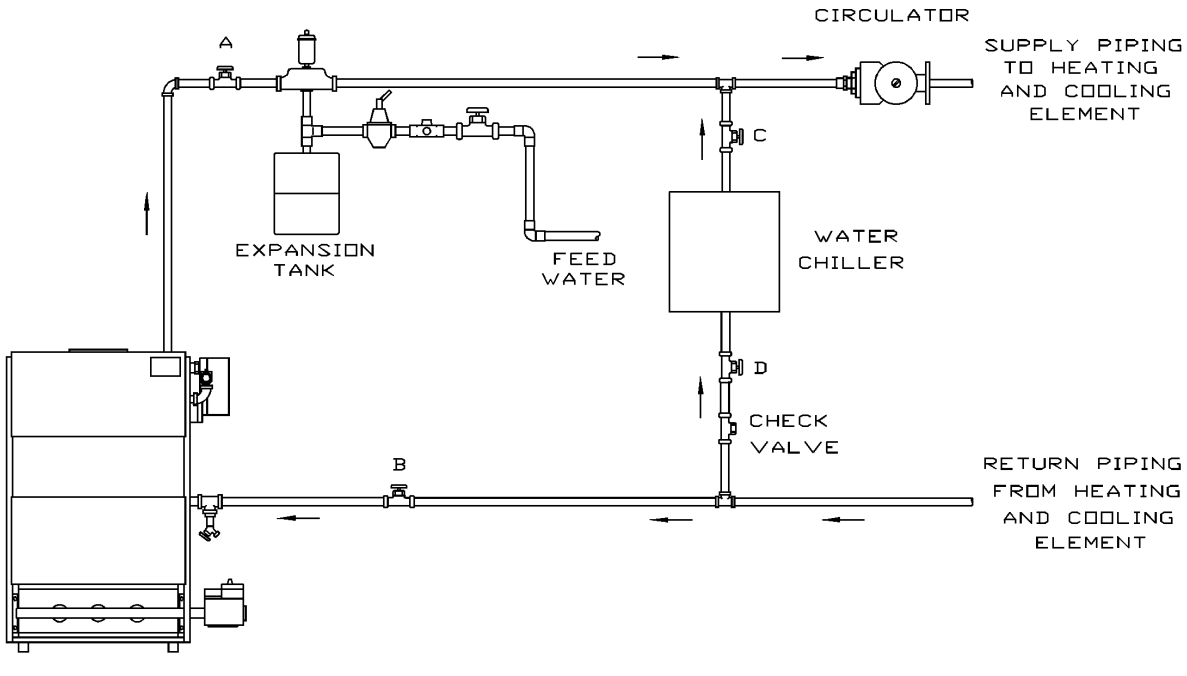


FIGURE 5

CONNECTING GAS SERVICE

1. Connect gas service from meter to control assembly in accordance with ANSI Z223.1 and local codes or utility. A ground joint union should be installed for easy removal of gas control for servicing. A drip leg or trap must be installed at the bottom of a vertical section of piping at the inlet to the boiler. A pipe compound resistant to the action of liquefied petroleum gases must be used on all threaded pipe connections. Check with the local utility for location of manual shutoff valve if required. See figure 7 below.

2. The gas line should be of adequate size to prevent undue pressure drop and never smaller than the pipe size of the main gas control valve. See chart below.

3. To check for leaks in gas piping, use a soap and water solution or other approved method. **⚠ WARNING: DO NOT USE AN OPEN FLAME**.

4. Disconnect the boiler from the gas supply piping system during any pressure testing of the gas piping. After reconnecting, leak test the gas connection and boiler piping before placing the boiler back into operation.

5. See figure 7 below for a typical gas line installation, and the table below for pipe sizes.

TABLE OF PIPE SIZES IN INCHES FOR NATURAL GAS MAIN

MODEL NUMBER	20'	30'	40'	50'	60'	80'	100'	125'
500	1.25"	1.25"	1.50”	1.50"	2.00"	2.00"	2.00"	2.00"
600	1.25"	1.25"	1.50"	1.50"	2.00"	2.00"	2.00"	2.00"
750	1.25"	1.50"	1.50"	2.00"	2.00"	2.00"	2.00"	2.00"
900	1.50"	2.00"	2.00"	2.00"	2.00"	2.00"	2.50"	2.50"
1000	1.50"	2.00"	2.00"	2.00"	2.00"	2.50"	2.50"	2.50"
1200	2.00"	2.00"	2.00"	2.00"	2.50"	2.50"	2.50"	2.50"
1500	2.00"	2.00"	2.50"	2.50"	2.50"	2.50"	3.00"	3.00"
1800	2.00"	2.00"	2.50"	2.50"	2.50"	3.00"	3.00"	3.00"
2100	2.50"	2.50"	2.50"	3.00"	3.00"	3.00"	3.00"	4.00"
2400	2.50"	2.50"	3.00"	3.00"	3.00"	3.00"	3.00"	4.00"

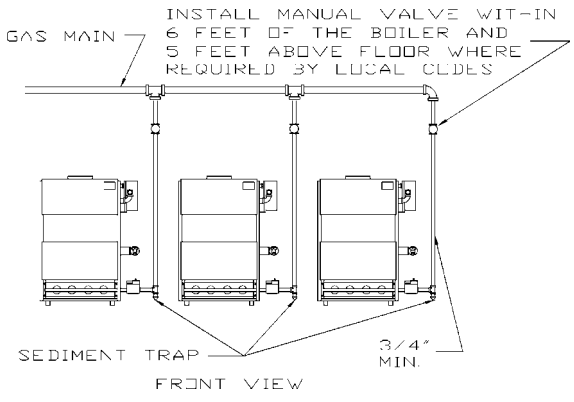


FIGURE 6

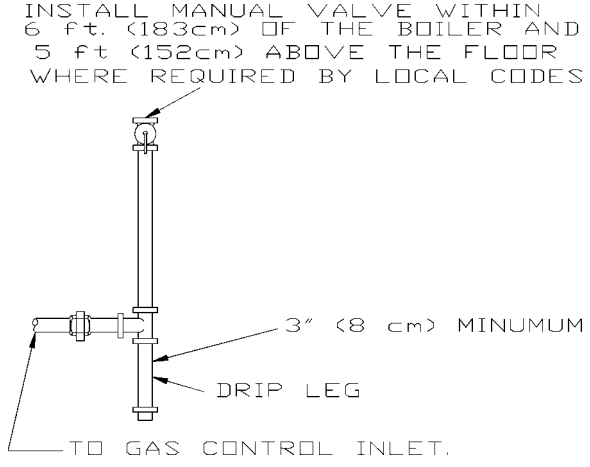


FIGURE 7

ELECTRICAL WIRING

See Addendum "A" for individual wiring diagrams and componant coding.
See figures 16-18, on pages 23-24, for multiple boiler wiring diagrams.

Electrical wiring must conform with the latest revision of the National Electrical Code, ANSI/ NFPA No. 70 and/or the local authority having jurisdiction.

⚠ WARNING: 1. When an external electrical source is utilized, the boiler, when installed MUST BE electrically grounded in accordance with these requirements.

2. Install a fused disconnect switch between boiler and meter at a convenient location.

3. The MAGB series requires 120 Volts to operate.

THERMOSTAT INSTALLATION

1. The thermostat should be installed on an inside wall about four feet above the floor.

2. NEVER install a thermostat on an outside wall.

3. Do not install a thermostat where it will be affected by:
   - A. Drafts
   - B. Hot or Cold Pipes
   - C. Sun Light
   - D. Lighting Fixture
   - E. Television
   - F. A Fireplace or Chimney

4. Check thermostat operation by raising and lowering thermostat setting as required to start and stop the burners.

5. Instructions for the final adjustment of the thermostat are packaged with the thermostat (adjusting heating anticipator, calibration, etc.)

LIGHTING INSTRUCTIONS

⚠ WARNING: IF YOU DO NOT FOLLOW THESE INSTRUCTIONS EXACTLY, A FIRE OR EXPLOSION MAY RESULT CAUSING PROPERTY DAMAGE, PERSONAL INJURY OR LOSS OF LIFE.

Before any procedures are attempted on this appliance, it is necessary to determine if the ignition system is electric or standing pilot. If you are uncertain, contact the manufacturer before proceeding.

⚠ CAUTION: Before lighting any type of pilot burner (standing or intermittent), make certain the hot water boiler and system are full of water to minimum pressure of 12 lbs. per square inch in the system, and also make certain that the system is vented of air. Set the operating control of thermostat to a "below" normal setting. Refer to the following appropriate lighting instruction.

LIGHTING PROCEDURE FOR BOILER WITH INTERMITTENT PILOT SYSTEMS.

FOR YOUR SAFETY READ BEFORE OPERATING.

A. This appliance is equipped with an ignition device which automatically lights the pilot. Do not try to light the appliance by hand.

B. Before operating, smell all around the appliance area for gas. Be sure to smell next to the floor because some gas is heavier than air and will settle on the floor.

WHAT TO DO IF YOU SMELL GAS:

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

C. Use only your hand to push in or turn the gas control knob. Never use tools. If the knob will not push in or turn by hand, don't try to repair it. Call a qualified service technician. Force or attempted repair may result in a fire or explosion.

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

OPERATING INSTRUCTIONS FOR INTERMITTENT PILOT SYSTEMS

1. **STOP!** Read the safety information in the User's Information Manual.
2. Set the thermostat to lowest setting.
3. Turn off all electric power to the appliance.
4. This appliance is equipped with an ignition device which automatically lights the pilot. Do not try to light the pilot by hand.
5. Remove control access panel, if present.
6. Turn gas control knob clockwise ↷ to "OFF". See figure 8.
7. Wait (5) minutes to clear out any gas. If you then smell gas, **STOP!** Follow "For Your Safety What To Do If You Smell Gas" in the safety information. If you don't smell gas, go on to the next step.
8. Turn gas control knob counterclockwise to ↶ "ON".
9. Replace control access panel (if present).
10. Turn on all electric power to the appliance.
11. Set thermostat to desired setting.
12. If the appliance will not operate, follow the instructions "To turn off gas to appliance", on page 18, and call a qualified service technician or your gas supplier.

INTERMITTENT PILOT GAS VALVE

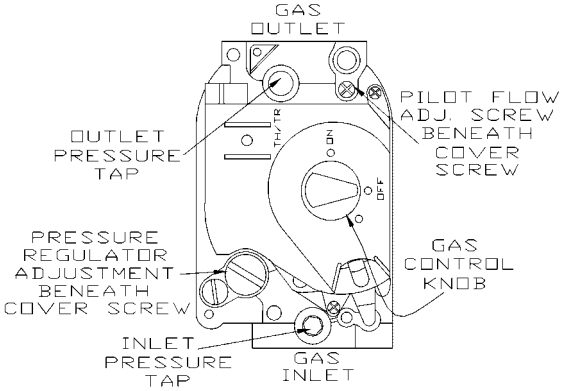


FIGURE 8

LIGHTING PROCEDURE FOR BOILER WITH CONTINUOUS PILOT

FOR YOUR SAFETY READ BEFORE LIGHTING

A. Read the warning at the beginning of the LIGHTING INSTRUCTIONS

B. This appliance has a pilot which must be lighted by hand. When lighting the pilot, follow these instructions exactly.

C. Before lighting, smell all around the appliance area for gas. Be sure to smell next to the floor because some gas is heavier than air and will settle on the floor. See the beginning of these instructions for **WHAT TO DO IF YOU SMELL GAS.**

D. Use only your hand to push in or turn gas control knob or reset button. Never use tools. If the knob or reset button will not push in or turn by hand, don't try to repair it, call a qualified service technician. Force or attempted repair may result in a fire or explosion.

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

LIGHTING INSTRUCTIONS FOR CONTINUOUS PILOT

1. **STOP!** Read the safety information at the beginning of these instructions.
2. Set the thermostat to the lowest setting.

3. Turn off all electric power to the appliance.

4. Remove access panel (if present) and burner door.

5. Turn gas control knob clockwise  to "OFF". See figure 9 below.

NOTE #1: Some gas control knobs cannot be turned from "PILOT" to "OFF" unless knob is pushed in slightly. **DO NOT FORCE.**

6. Wait (5) minutes to clear out any gas. If you then smell gas, **STOP!** Follow "for your safety what to do if you smell gas", at the beginning of these instructions. If you don't smell gas, go to the next step.

7. Find pilot. Follow metal tube from gas control. Depending on the model of the boiler, pilot is either mounted on the base or on one of the burner tubes.

8. Turn gas control knob counterclockwise  to "PILOT".

9. Push in gas control knob or reset button if so equipped, all the way in and hold. Immediately light the pilot with a match.

CONTINUOUS PILOT GAS VALVE

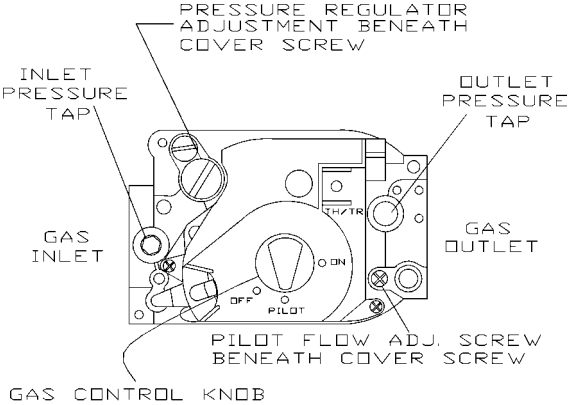


FIGURE 9

Continue to hold the gas control knob or reset button in for about 1 minute after the pilot is lit. Release knob or button, and it will pop back up. Pilot should remain lit. If it goes out, repeat steps 5 through 9.

* If knob or button does not pop up when released, stop and immediately call a qualified service technician or your gas supplier.

* If the pilot will not stay lit after several tries, turn the gas control knob clockwise to "OFF". (See note #1), and call a qualified service technician or your gas supplier.

10. Replace burner door.

11. Turn gas control knob counterclockwise  to "ON".

12. Replace access panel (if present).

13. Turn on all electric power to the appliance.

14. Set thermostat to desired setting.

TO TURN OFF GAS TO APPLIANCE

1. Set the thermostat to lowest setting.

2. Turn off all electric power to the appliance if service is to be performed.

3. Remove control access panel (if present).

4. Push in gas control knob slightly and turn clockwise  to "OFF", **DO NOT FORCE.**

5. Replace control access panel (if present).

6. Call a qualified service technician.

NORMAL SEQUENCE OF OPERATION

For a single module the thermostat will actuate, completing the circuit to the aquastat. The completed circuit to the aquastat will first activate the circulator and damper. When the damper is fully open it will complete the circuit to the ignition system and ignition will take place.

In the event the boiler water temperature exceeds the high limit setting on the boiler mounted aquastat, power will be interrupted between the aquastat and the ignition system. The power will remain off until the boiler water temperature drops below the high limit setting. The circulator will continue to operate under this condition until the thermostat is satisfied.

In the event the flow of combustion products through the boiler venting system becomes blocked, the blocked vent safety switch will shut the main burner gas off. See figure 11, page 19. Similarly, if the boiler flueway becomes blocked, a flame rollout safety switch will shut the main burner gas off. See figure 11, page 19. If either of these conditions occur, **do not attempt to place the boiler back into operation. Contact a qualified service agency.**

GENERAL INSTRUCTIONS

Before seasonal start-up, it as advisable to have a competent service agency check the boiler for soot and scale in the flues, clean the burners and check the gas input rate to maintain high operating efficiency.

The service agency or owner should make certain the system is filled with water to minimum pressure and open air vents, if used, to expel any air that may have accumulated in the system. Check the entire piping system and if any leaks appear, have them repaired.

Many circulators like the one pictured in figure 10 below, require periodic servicing. The motor usually has openings at each end to lubricate the bearings. Put about one half teaspoon of SAE 20 or 30 non-detergent motor oil in each opening twice a year.

⚠ CAUTION: DO NOT OVER OIL.

Many circulators have an oil opening for the shaft bearing. This should be oiled at the same time for quiet operation. Follow the manufacturer's instructions for oiling the shaft bearing.

The venting system should be inspected at the start of each heating season. Check the vent pipe from the boiler to the chimney for signs of deterioration by rust or sagging joints. Repair if necessary. Remove the vent pipe at the base of the chimney or flue and using a mirror, check for obstruction.

The boiler flue gas passageways may be inspected by a light and mirror. Remove the burner door, figure 11 below. Place a trouble lamp in the flue collector through the draft relief opening. With the mirror positioned above the burners, the flue gas passageways can be checked for soot or scale.

The following procedure should be followed to clean the flue gas passageways:

1. Remove the burners from the combustion chamber by raising the burners up from the manifold orifices and pulling toward the front of the boiler. See figure 11, below.
2. Disconnect the vent pipe from the draft hood.
3. Remove the top jacket panel.

FIGURE 10

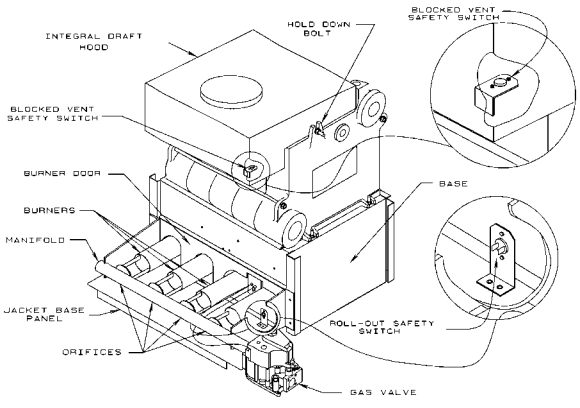


FIGURE 11

4. Remove the combination flue collector and draft hood from the boiler castings by loosening the nuts on the hold down bolts located on each side of the collector. See figure 11 on page 19.

5. Place a sheet of heavy paper or similar material over the bottom of the base and brush down the flue passageways. The soot and scale will collect on the paper and is easily removed with the paper.

With the paper still in place in the base, clean the top of the boiler castings of the boiler putty or silicone used to seal between the castings and flue collector. Make certain that chips are not lodged in the flue passageways.

When the cleaning process is complete, restore the boiler components to their original position. Use boiler putty or IS-808 GE silicone, available from a Utica Boilers distributor, to seal around the flue collector and boiler castings.

A visual check of the main burner and pilot flames should be made at the start of the heating season and again in mid-season. The main burner flame should have a well defined inner blue mantel with a lighter blue outer mantel. Check the burner throats and burner orifices for lint or dust obstruction. See figures 12 and 13 below.

The pilot flame should envelope 3/8 to 1/2 inch of the tip of the pilot thermocouple, ignition/sensing electrode or mercury sensor. See figure 14 on page 21 To adjust the pilot flame, remove the pilot adjustment cover screw (figures 8 and 9 on pages 16 and 17), and turn the inner adjustment screw counterclockwise to increase or clockwise to decrease pilot flame. Be sure to replace cover screw after adjustment to prevent possible gas leakage.

The burners and pilot should be checked for signs of corrosion, rust or scale buildup. The area around the boiler must be kept clear and free of combustible materials, gasoline and other flammable vapors and liquids.

The free flow of combustion and ventilating air to the boiler and boiler room must not be restricted or blocked.

It is recommended that a qualified service agency be employed to make an annual inspection of the boiler and heating system. They are experienced in making the inspections outlined above, and, in the event repairs or corrections are necessary, trained technicians can make the proper changes for safe operation of the boiler.

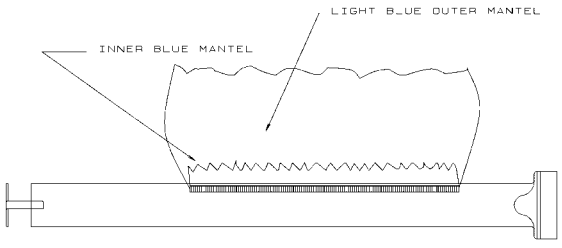


FIGURE 12

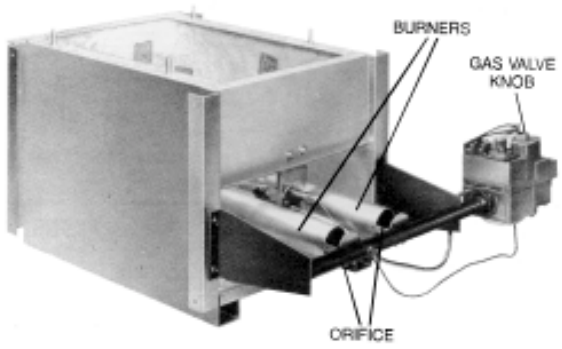


FIGURE 13

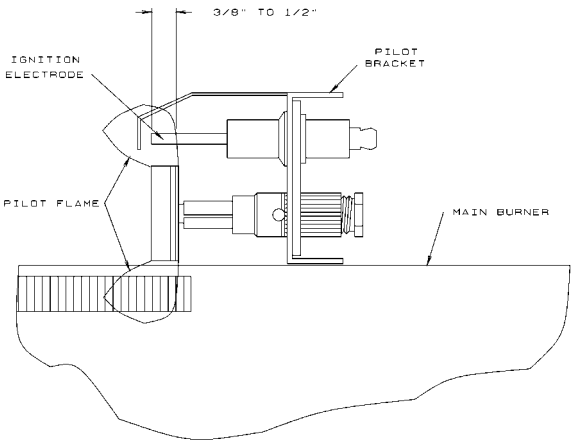


FIGURE 14

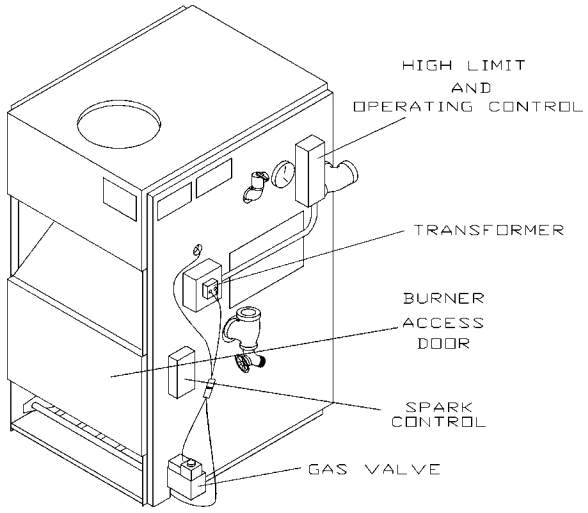


FIGURE 15

CHECKING GAS INPUT RATE TO BOILER

The check should be performed by a qualified technician

Gas input to the boiler can be adjusted by removing the protective cap on the pressure regulator, (See figures 8 and 9 on pages 16 and 17), and turning the screw clockwise to increase input and counterclockwise to decrease input. Natural gas manifold pressure should be set at approximately 3.5 inches water column. Propane gas manifold pressure should be set at approximately 11.0 inches water column. These manifold pressures are taken at the outlet side of the gas valve. See figures 8 and 9 on pages 16 and 17.

To check for proper flow of natural gas to the boiler, divide the input rate shown on the rating plate by the heating value of the gas obtained from the local gas company. This will determine the number of cubic feet of gas required per hour. With all other gas appliances off, determine the flow of gas through the meter for two minutes and multiply by 30 to get the hourly rate. Make minor adjustments to the gas input as described above. If the proper rate cannot be obtained, contact the manufacturer.

CHECK SAFETY CONTROL CIRCUIT, after burner adjustments are made, for satisfactory operation.

1. Pilot: With main burner operating, turn the pilot gas adjusting screw clockwise until pilot gas is turned off. See figures 8 and 9 on pages 16 and 17. Within 90 seconds the main gas control should close, shutting off the gas to the main burner.

2. High limit control (figure 15 above). Remove cover and note temperature setting. Decrease this setting to the minimum and operate boiler. When the boiler water temperature exceeds the control temperature setting, the control will open the circuit, closing the automatic main gas valve.

OPTIONAL CONTROLS & WIRING

The following descriptions outline control options for MAGB modular systems.

PHASE #2 CONTROLS

Consists of multiple outdoor thermostats, (T6031A), with different settings to actuate the number of heating modules necessary to match the heat load based on the outdoor temperature. The heating modules are cycled as a group by an indoor-outdoor reset controller, (T475A), with temperature bulbs connected by capillary tubes. This system provides low cost control for small and medium heating systems of 2 to 5 modules where it is desired to control the supply water temperature in relation to outdoor temperature. Ratio and temperature range are adjustable. Aquastat capillary tube length puts some restriction on this system.

OPERATION: When the outdoor temperature drops below the set point of the outdoor thermostat, (T6013A), the circulator is turned on. The indoor-outdoor control, (T475A), regulates the supply water temperature. Individual outdoor thermostats, (T6031A), turn on more modules as the outdoor temperature falls below their settings.

PHASE #6 & #10 CONTROLS

Consist of a microprocessor control (W100J) capable of sequentially step firing up to 6 heating modules necessary to match the heat load based on outdoor and/or indoor air temperature. The C7031G outdoor air sensor and C7170A discharge water temperature sensor work in unison to adjust the system water temperature corresponding to the heat load demand. This system utilizes lead lag operation to equalize the on time of each module. Separate control band, reset ratio, and setpoint control settings allow customizing of any modular heating system.

OPERATION:

When the indoor air temperature drops below the thermostat setpoint, the system is engerized. The first module will fire and the remaining ones will follow at one minute increments. Once the setpoint limits plus the control band setting is reached, the first module will cut out. If the system water temperature remains above the control band setting the remaining modules will begin to cut out. If the system water temperature drops below the lower control band setting, the next module in sequence will fire. This process of sequencing will continue until the heat load is satisfied.

PHASE 2 CONTROL LOCATIONS AND WIRING

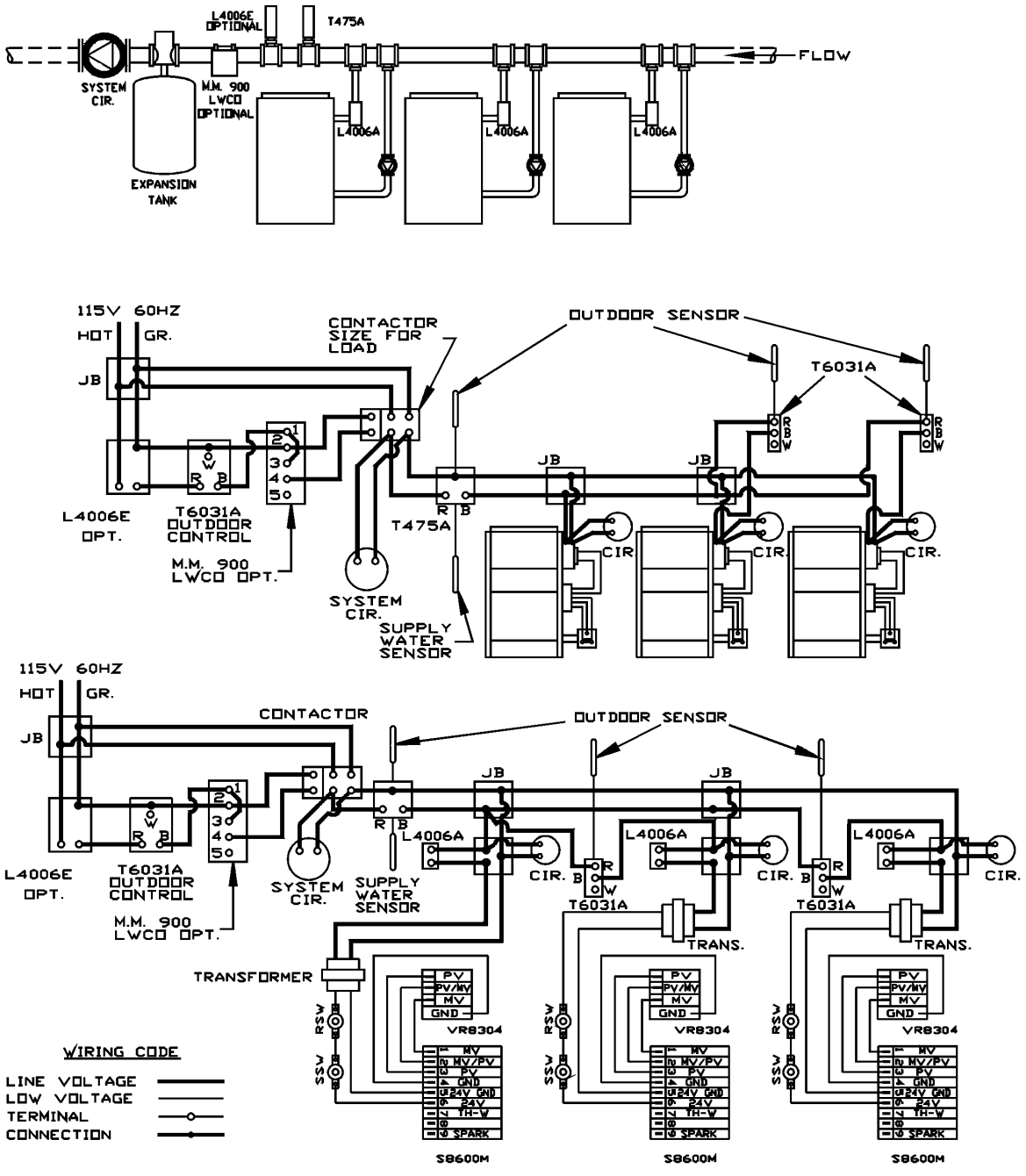
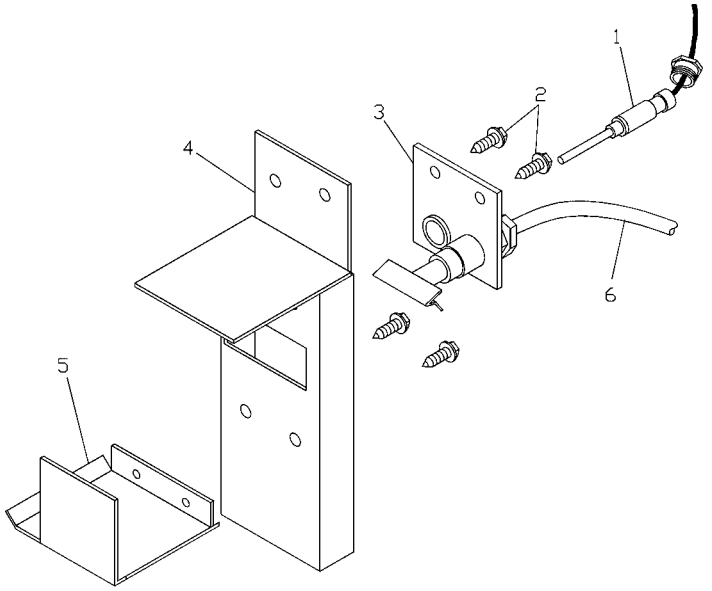


FIGURE 16

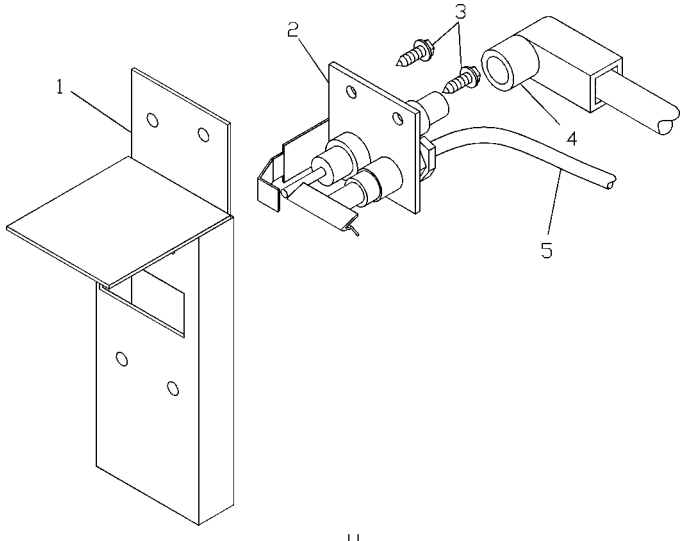
MAGB SERIES REPLACEMENT PARTS - PILOTS

(Note: Quantities are per module)



ITEM #	PART NUMBER	DESCRIPTION	QTY.
1	1520001	THERMOCOUPLE Q309A	1
2	HW-009.01	SCREW #8-18X1/2	4
3	PB-011.03	PILOT STDG Q380 NAT	1
	PB-011.04	PILOT STDG Q380 LP	
4	32622001	PILOT BRACKET ASSY 24V (THIS INCLUDES #5 & 2 SCREWS)	1
5	3261401	PILOT SHIELD	1
6	MS-003.03	PILOT TUBE 1/4"X20.1/2" AL.	1

FIGURE 17

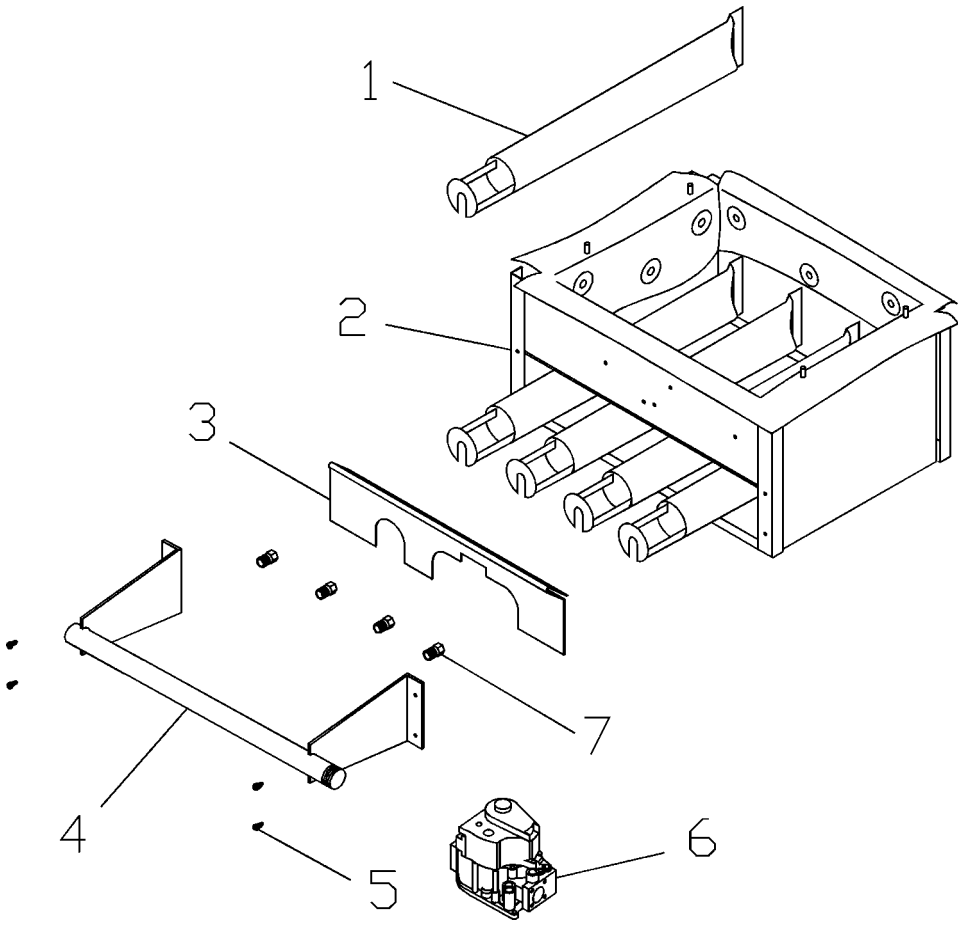


ITEM #	PART NUMBER	DESCRIPTION	QTY.
1	32623601	PILOT BRACKET ASSY SPARK	1
2	PB-011.01	PILOT SPARK Q381 NAT	1
	PB-011.02	PILOT SPARK Q381 LP	
3	HW-009.01	SCREWS #8-18X1/2	2
4	PB00702	PILOT IGNITION CABLE 30"	1
5	MS-003.03	PILOT TUBE 1/4"X20.1/2" AL.	1

FIGURE 18

MAGB SERIES REPLACEMENT PARTS - BASE

(Note: quantities are per module)
Models MAGB500, 750, & 1000 USE MGB250 PARTS
Models MAGB600, 900, 1200, 1500, 1800, 2100, &2400 USE MGB300 PARTS

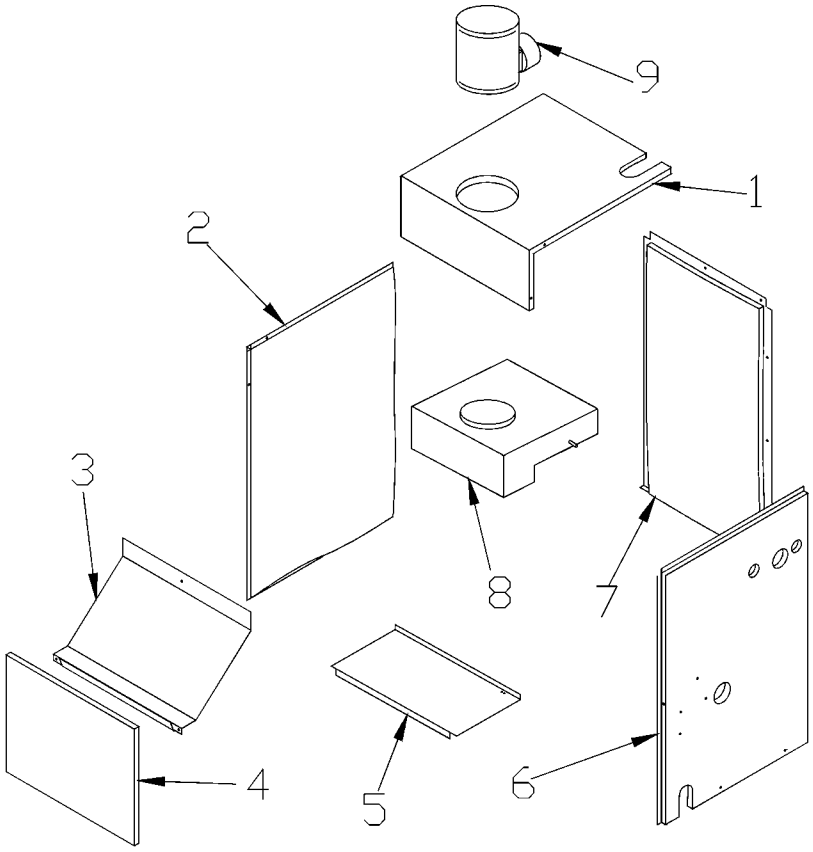


ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	3352401	BURNER TUBE 1.3/4" MGB250	5
		BURNER TUBE 1.3/4” MGB300	6
2	5611605	BASE W/INSUL MGB250	1
	5611606	BASE W/INSUL MGB300	
3	32621002	BURNER DOOR MGB250	1
	32621003	BURNER DOOR MGB300	
4	356-2-1.05	MANIFOLD MGB250	1
	356-2-1.0\6	MANIFOLD MGB300	
5	HW-005.01	SCREW 1/4-20X1/2 SELF TAP	4
6	VG00307	GAS VALVE VR8200H 24V LP	1
	VG01103	GAS VALVE VR8304H4 SPARK NAT	
	VG01104	GAS VALVE VR8304 SPARK LP	
	VG01201	GAS VALVE VR8300H4 24V NAT	
7	355-1-5.01	ORIFICE #30 24V	1
	355-1-5.04	ORIFICE #47 LP	

FIGURE 19

MAGB SERIES REPLACEMENT PARTS - JACKETS

(Note: quantities are per module)
Models MAGB500, 750, & 1000 USE MGB250 PARTS
Models MAGB600, 900, 1200, 1500, 1800, 2100, &2400 USE MGB300 PARTS

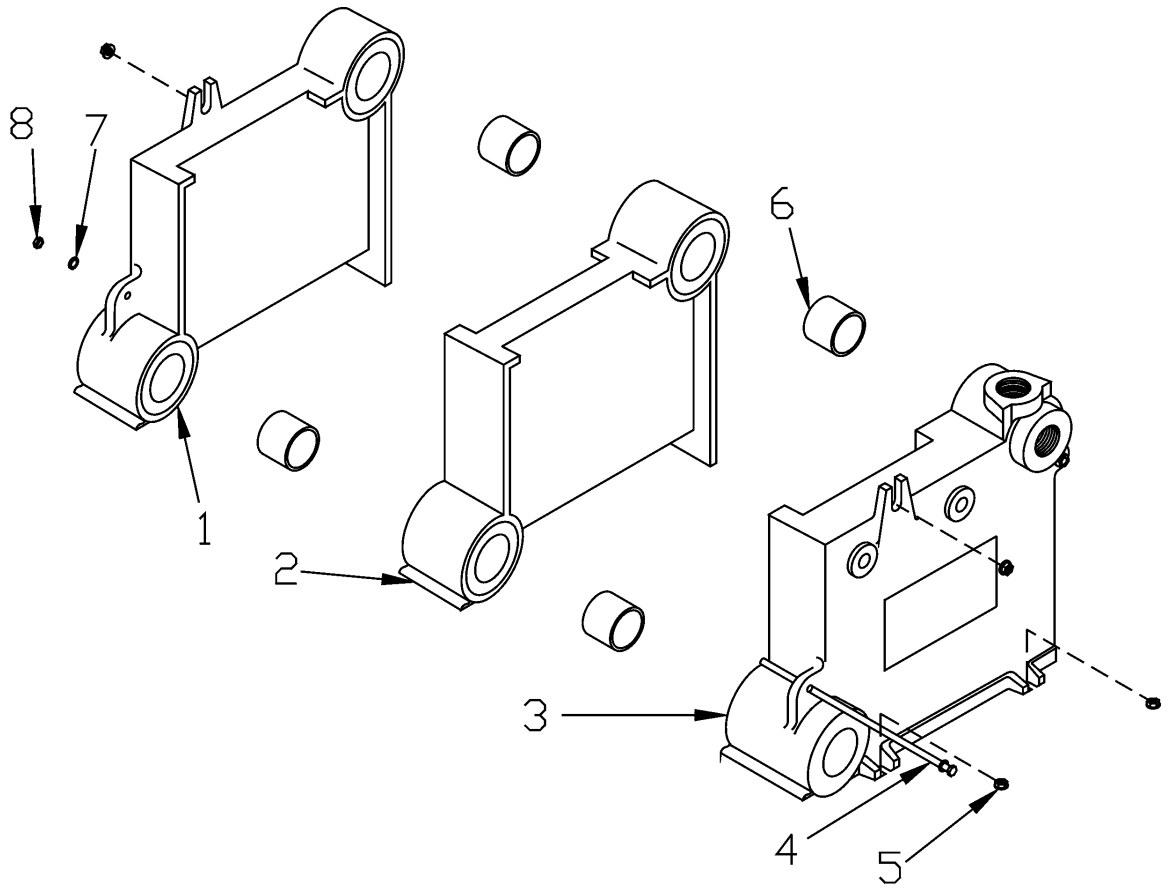


ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	3162805	PANEL - TOP MGB250	1
	3162806	PANEL - TOP MGB300	
2	3162704	PANEL - LEFT	1
3	3162505	DRAFT DEFLECTOR MGB250	1
	3162506	DRAFT DEFLECTOR MGB300	
4	3161105	PNL LWR ACCES MGB250	1
	3161106	PNL LWR ACCES MGB300	
5	3161205	PANEL - BASE MGB250	1
	3161206	PANEL - BASE MGB300	
6	3162703	PANEL - RIGHT MGB	1
7	3162605	PANEL - REAR MGB250	1
	3162606	PANEL - REAR MGB300	
8	3462105	FLUE COL MGB250	1
	3462106	FLUE COL MGB300	
9	1182008	DAMPER MGB250 8”	1
	1182009	DAMPER MGB300 9”	

FIGURE 20

MAGB SERIES REPLACEMENT PARTS
HEAT EXCHANGER

(Note: quantities are per module)
Models MAGB500, 750, & 1000 USE MGB250 PARTS
Models MAGB600, 900, 1200, 1500, 1800, 2100, &2400 USE MGB300 PARTS

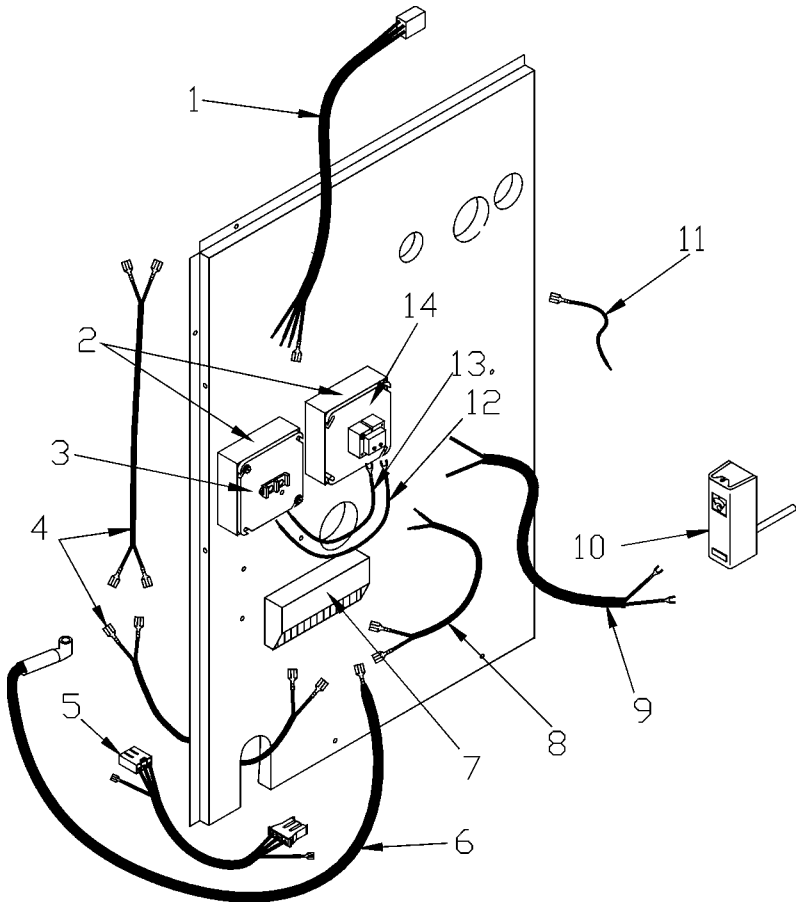


ITEM NO.	P/N	DESCRIPTION	QTY.
1	100-2-2.01	B-LEFT HAND SECTION	1
2	100-2-1.01	B-CENTER SECTION MGB250	5
		B-CENTER SECTION MGB300	6
3	100-2-3.02	B-RIGHT SECTION MODU PAK	1
4	HW-011.07	TIE ROD 1/4X23 MGB250	1
	HW-011.09	TIE ROD 1/4X27 MGB300	
5	HW06901	NUT 5/16-18 WISLOCK	6
6	100-1-1.01	PUSH NIPPLE #3 MACH.	
	MAGB250 (10)	MAGB300 (12)	
7	HW-008.01	WASH-5/16 FLAT STL ZP	4
8	HW-003.02	NUT-1/4-20 HEX-STL ZP	2
		FULLY ASSEMBLED HEAT EXCHANGERS	
	100-2-5.04	HEAT EXCHANGER 6 SECTION (MAGB250)	
	100-2-5.05	HEAT EXCHANGER 7 SECTION (MAGB300)	

FIGURE 21

MAGB SERIES REPLACEMENT PARTS
ELECTRICAL

(Note: quantities are per module)

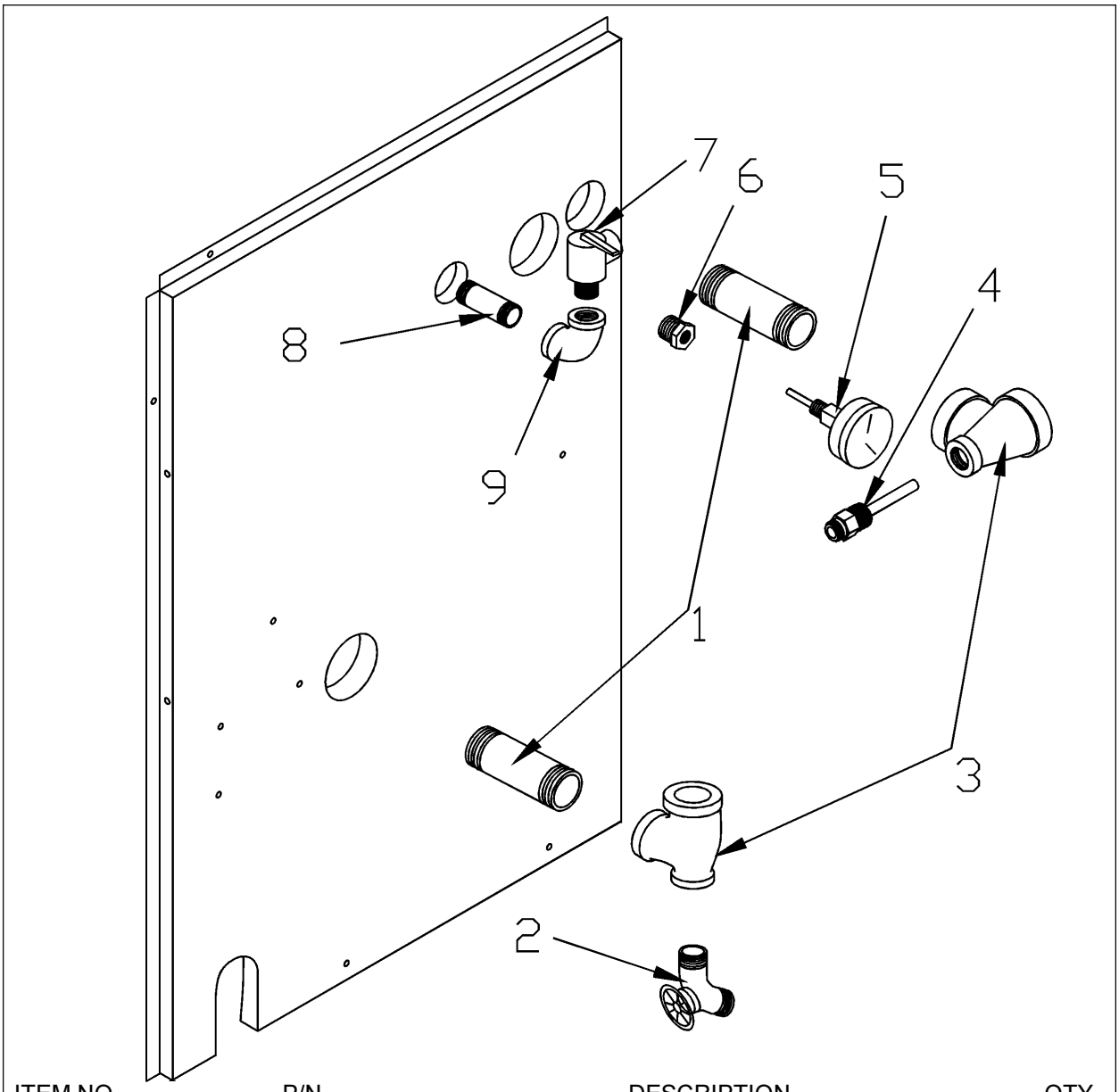


ITEM NO.	P/N	DESCRIPTION	QTY.
1	37413101	CABLE - DAMPER 60”	1
2	EF-013.01	JCT BOX 4X4X1-1/2	2
3	3641501	ELEC 4”X4” COVER/TERM STRIP	1
4	37513301	WIRE ASSY ROLLOUT/SPILL SWITCH 28”	2
5	37413602	HARNESS IGNITION TO GAS VALVE	1
6	PB00702	PILOT IGNITION CABLE 30” (FOR SPARK ONLY)	1
7	PB00604	PLT SPARK CTRL S8600M1013 HW (FOR SPARK ONLY)	1
8	37413801	WIRE - J-BOX TO CONTROLS 27”	1
9	272-1-3.00	HARNESS TRANSFOMER 30”	1
10	AQ-008.00	CONTROL L4006-1827 HW	1
11	37519001	WIRE JUMPER TO “TT”, 8” (LOCATED UNDER TERM STRIP)	1
12	37413001	WIRE TRANSFORMER BROWN 15”	1
13	37413002	WIRE TRANSFORMER WHITE 15”	1
14	EF05101	TRANSFOMER 125V-24V 50VA	1
	EF05201	J-BOX TRANSFORMER COVER	1

FIGURE 22

MAGB SERIES REPLACEMENT PARTS - PIPING

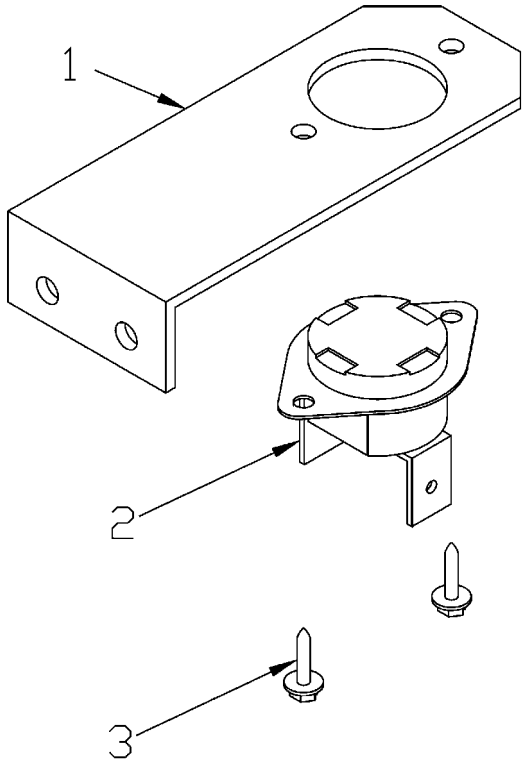
(Note: quantities are per module)



ITEM NO.	P/N	DESCRIPTION	QTY.
1	PF-006.07	PIPE - NPL 1.1/2X4.1/2 NPT	2
2	HW-016.03	DRAIN - SHORT	1
3	PF-008.04	PIPE - TEE 1.1/2X3/4X1.1/2	2
4	AQ-020.03	WELL 3/4"X1.1/2"	1
5	GA-001.00	GAUGE - THERALTIMETER	1
6	PF-004.13	PIPE - BUSHING 3/4” X 1/4”	1
7	VR-001.01	RELIEF VALVE 30#	1
8	PF-005.11	PIPE - NPL 3/4"X4"	1
9	PF-002.04	PIPE - ELBOW 3/4" 90°	1

FIGURE 23

MAGB SERIES REPLACEMENT PARTS
ROLLOUT & SPILL SWITCH



ITEM NO.	PART NO.	DESCRIPTION	QTY.
1	HW06501	SCREW - #6 X1/4 HEX HD	2
2	3262001	TEMP. SENSOR BRACKET	1
3	AQ02101	CONTROL-FIXED TEMPERATURE THERMO (ROLLOUT/BLOCKED VENT SWITCH)	1

THE ROLLOUT SWITCH IS LOCATED ON THE BASE AND FLUE COLLECTOR

NOTE:THE QUANTITIES ABOVE ARE FOR EACH SWITCH. THERE ARE 2 SWITCHES PER MODULE.

FIGURE 24

Utica Boilers
P.O. Box 4729 Utica, NY 13504

Date of Installation: _____

Boiler Model #: _____

Installed By: _____