

GAS BOILER

by

AMERICAN-Standard

INSTALLATION-OPERATION AND MAINTENANCE MANUAL

APPROVED BY AMERICAN GAS ASSOCIATION

NOTICE TO INSTALLER AND OPERATOR
THIS BOOKLET MUST BE AFFIXED ON
OR ADJACENT TO THE HEATING EQUIPMENT

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G-2 GAS BOILER

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INSTALLATION-OPERATION

AND

MAINTENANCE MANUAL

FOR PACKAGED BOILERS WITH

V-600 SERIES GAS VALVES

FLUSH OR DELUXE JACKETS

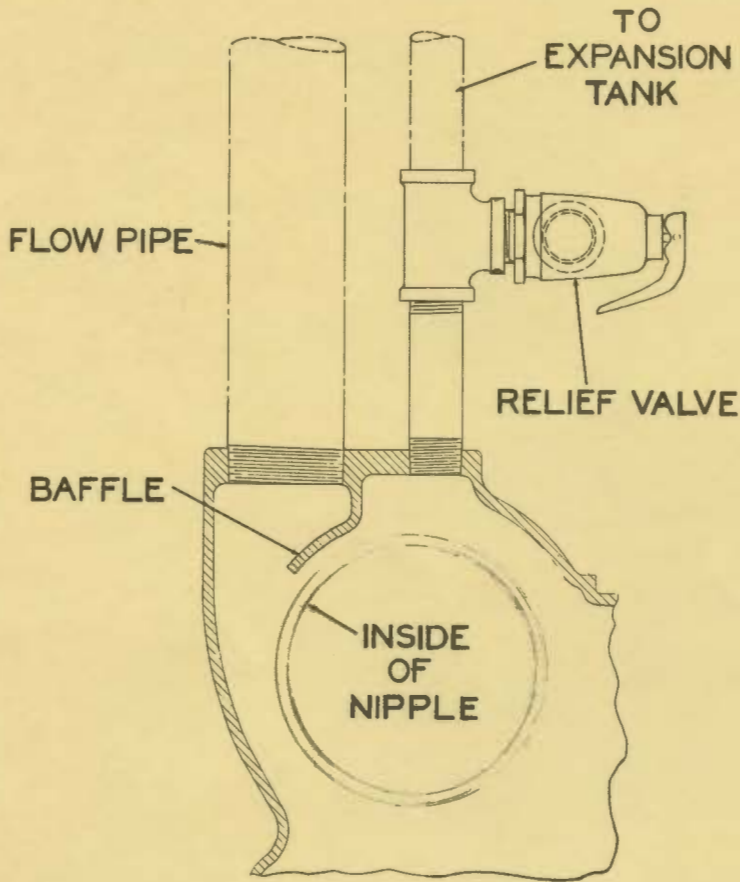
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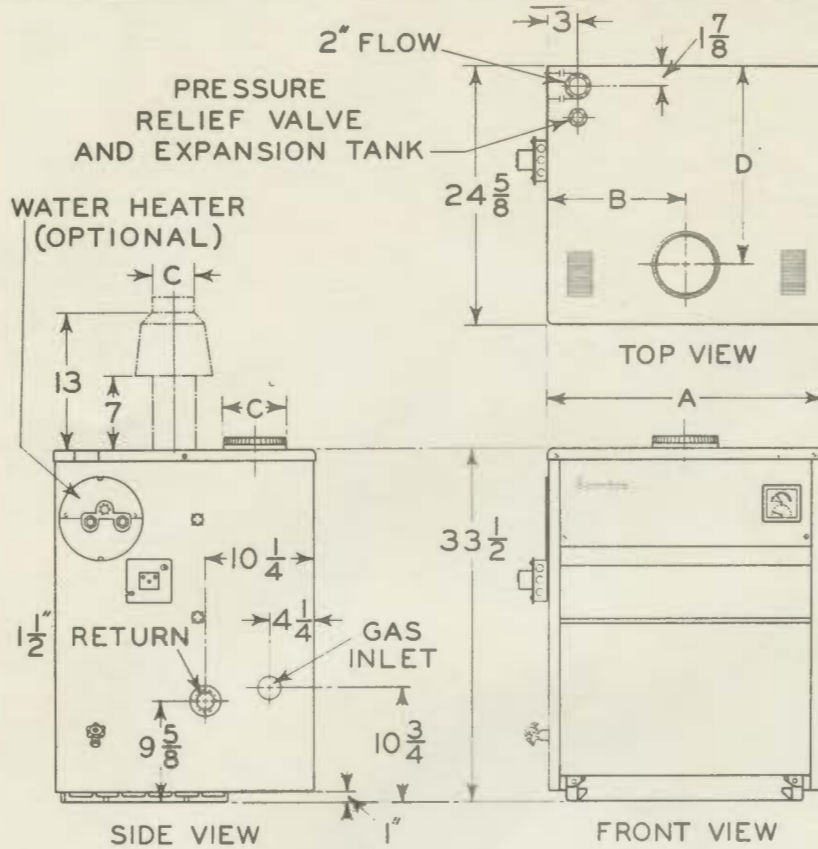
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G-2 GAS BOILER WITH ELIMINAIRE



The Eliminaire is a unique built-in air separator which prevents air from being transmitted to the system and directs the air to the compression tank. External air separators such as dip tube or inlined accessories are not required. This important feature on the boiler also allows for considerable simplification of the near boiler piping (See Figure) and assures positive air separation essential to proper system performance. The Eliminaire plus the recommended piping provides for a substantial saving in material and installation cost.

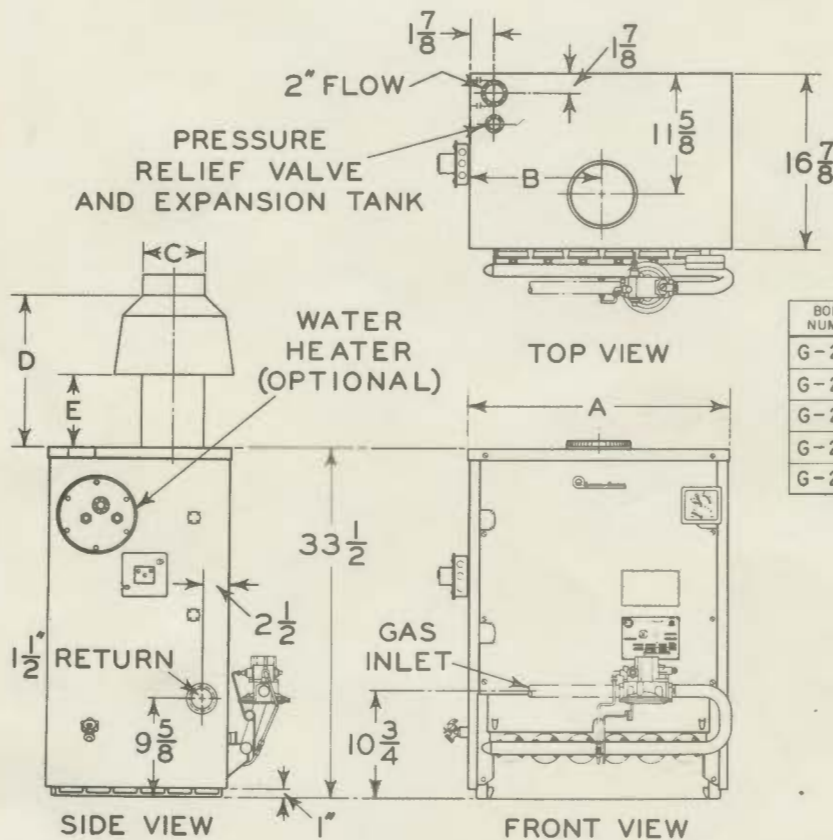
PIPING FOR FLOW PIPE & RELIEF VALVE



BOILER NUMBER	No. OF SECTIONS	No. OF BURNERS	A	B	C	D
G-23D	3	2	13 1/8	6 9/16	4	11 5/8
G-24D	4	3	16 3/8	8 3/16	5	19 1/2
G-25D	5	4	19 5/8	9 13/16	5	19 1/2
G-26D	6	5	22 7/8	11 7/16	6	19
G-27D	7	6	26 1/8	13 1/16	6	19

NOTE:-EXTERNAL DRAFTHOOD IS ONLY PROVIDED FOR G-23-D BOILER

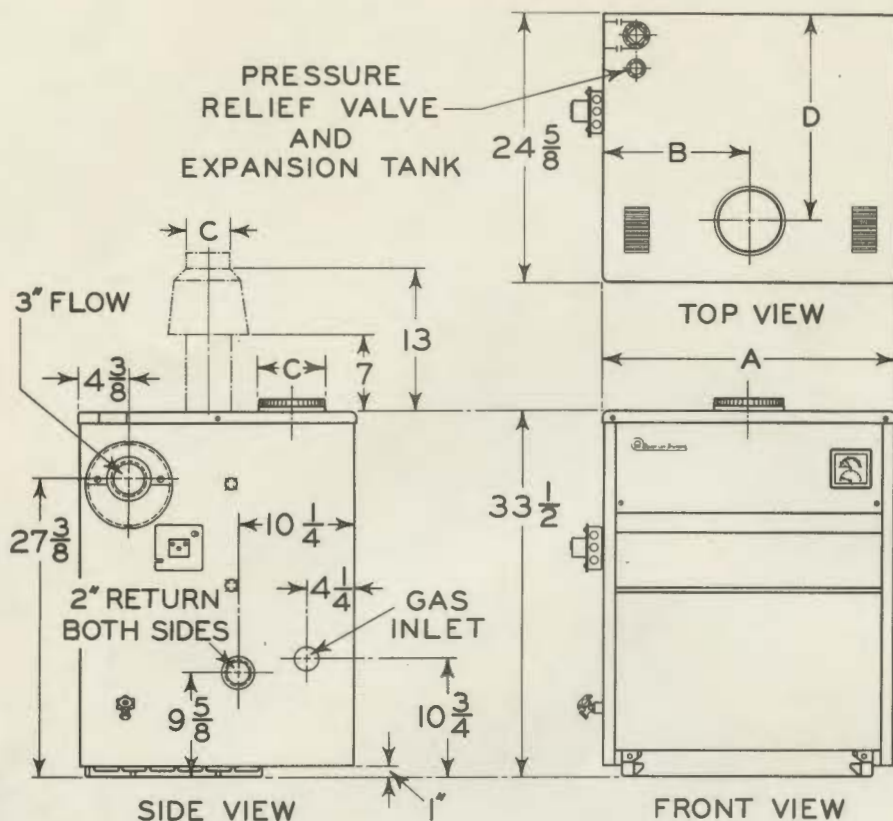
Fig. 1 - Boiler with Deluxe Jacket (Forced Circulation)



BOILER NUMBER	No. OF SECTIONS	No. OF BURNERS	A	B	C	D	E
G-23F	3	2	11	5 1/2	4	13	7
G-24F	4	3	14 1/4	7 1/8	5	13 3/4	7
G-25F	5	4	17 1/2	8 3/4	5	13 3/4	7
G-26F	6	5	20 3/4	10 3/8	6	16 1/2	9
G-27F	7	6	24	12	6	16 1/2	9

Fig. 2 - Boiler with Flush Jacket (Forced Circulation)

BP-1-G2 - 600 Packaged



BOILER NUMBER	No. OF SECTIONS	No. OF BURNERS	A	B	C	D
G-23D	3	2	13 1/8	6 9/16	4	11 5/8
G-24D	4	3	16 3/8	8 3/16	5	19 1/2
G-25D	5	4	19 5/8	9 13/16	5	19 1/2
G-26D	6	5	22 7/8	11 7/16	6	19
G-27D	7	6	26 1/8	13 1/16	6	19

NOTE: EXTERNAL DRAFTHOOD IS ONLY PROVIDED FOR G-23-D BOILER

Fig. 3 - All-Purpose Boiler with Deluxe Jacket (Gravity and Forced Circulation)

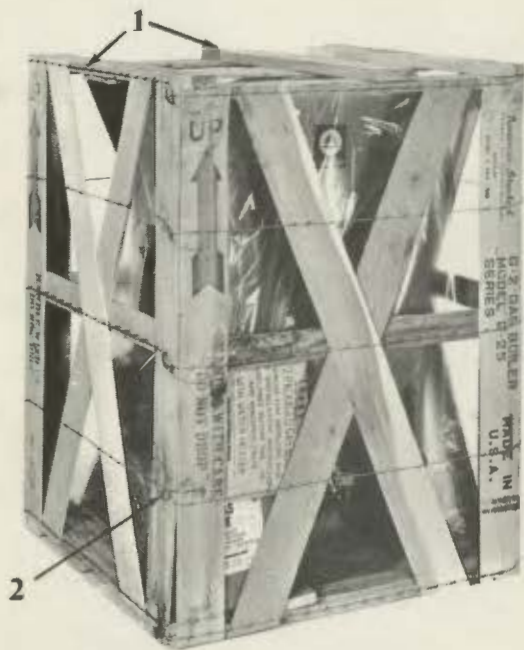


Fig. 4 - Crated Boiler

1. Nails
2. Side Fasteners

Place boiler in approximate final location, if possible, before removing the shipping crate.

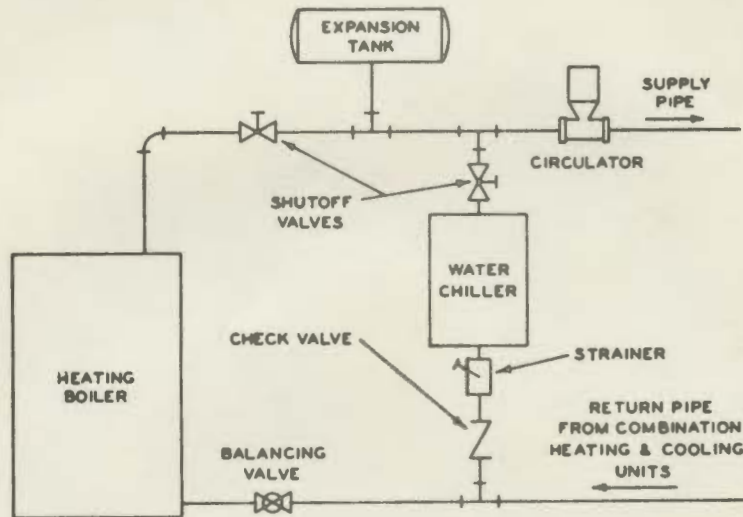
1. Unfasten all crating wire at the corner of the crate.
2. Remove nails fastening crate sides to top and bottom of crate. Lift off the crate top and unwrap crate side from crate base. Remove the plastic bag.
3. Loosen four cap screws that hold boiler to the crate base, one at either side of end sections, just under the jacket. Remove both screws at one end section so that the two remaining screws can be slid out of the slots in the other end section. Move the boiler off the crate base to the final location.
4. Remove blocking which holds burners in place.

Floor should be level where the boiler is installed.

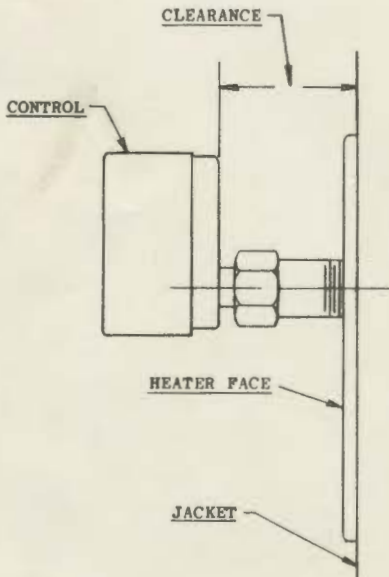
CAUTION

If and when this boiler is used in connection with refrigeration systems, boiler should be so installed that chilled medium is piped parallel with the heating boiler using appropriate valves to prevent the chilled medium from entering the heating boiler.

When hot water heating boilers are connected to heating coils located in air handling units, where they may be exposed to refrigerated air circulation, such boiler piping system shall be equipped with flow control valves or other automatic means to prevent gravity circulation of the boiler water during the cooling cycle.



RECOMMENDED BOILER PIPING FOR COMBINATION HEATING & COOLING UNITS

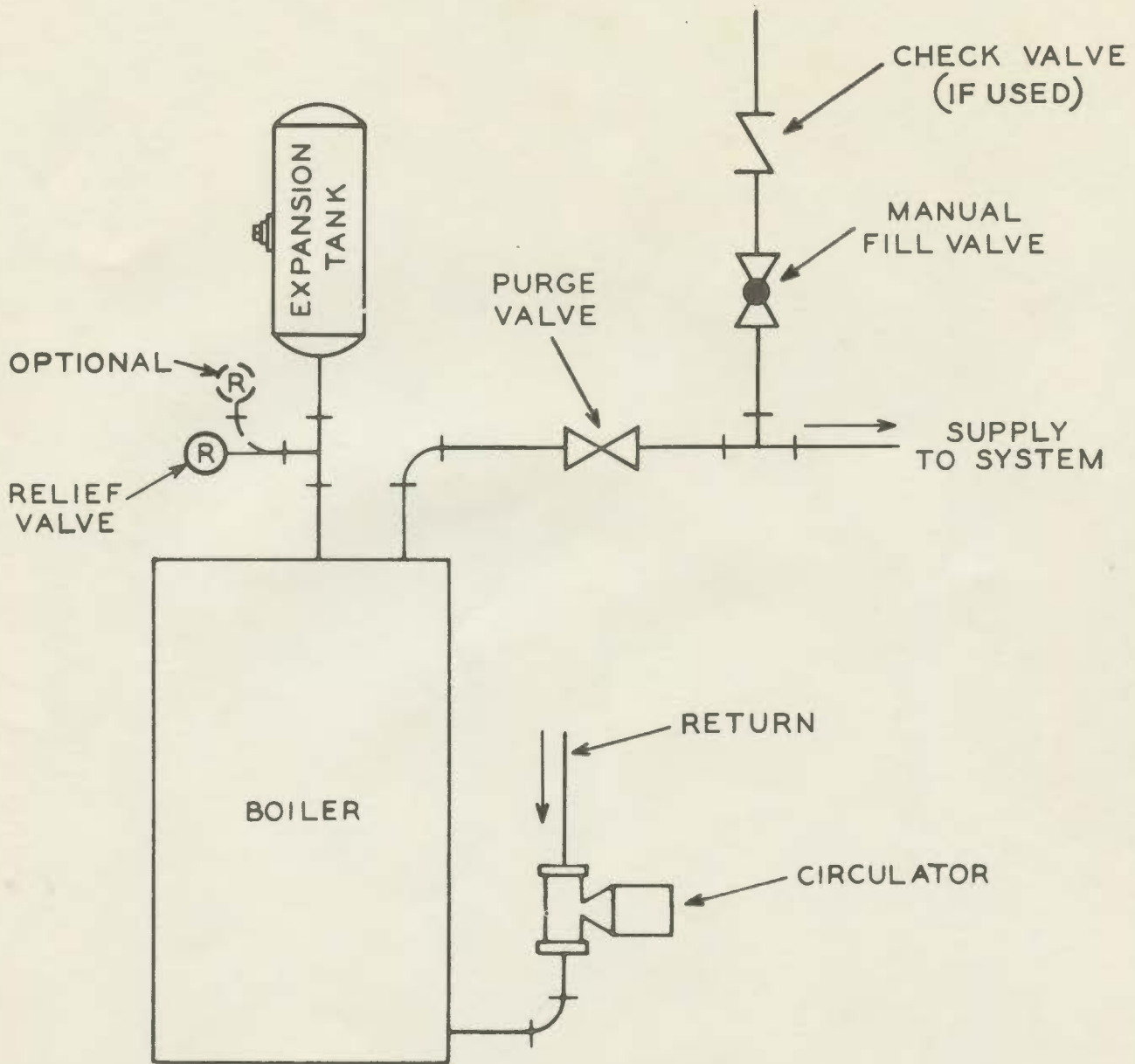


AVAILABLE CLEARANCES BETWEEN BACK OF CONTROL AND TANKLESS WATER HEATER FACE

<u>BOILER</u>	<u>CONTROL</u>	<u>CLEARANCE, IN.</u>
G-2 (Flush Jacket)	RS-116-F	2-11/16
G-2 (Deluxe Jacket)	RS-116-F	1-3/4

Water Heater Piping "Roughing In" Dimensions Must Not Be Greater Than The Clearance Dimension Listed Above.

BOILER PIPING RECOMMENDATIONS WITH THE ELIMINAIRE



PROCEDURE FOR FILLING SERIES LOOP HEATRIM SYSTEM

1. Open fill valve.
2. Close purge valve.
3. Vent air from boiler by manually opening relief valve.
4. When water appears at relief valve, release lever and allow to close.
5. Continue filling until pressure gauge reads approximately 12 pounds.
(Close fill valve)
6. Open purge valve.

Note:- For a single loop heatrim system no additional vents, cocks, valves, drains, or other accessories are required except: When tankless heater is used and heatrim is above the boiler outlet. install a flow check valve to prevent gravity circulation.

**INSTALLATION - OPERATION AND MAINTENANCE
INSTRUCTIONS FOR PACKAGED BOILERS**

BOILER NUMBER	SIZE OF GAS CONNECTION				
	NATURAL GAS	MFD. MIXED & 525-1400 LP-AIR	BUTANE & PROPANE	DUAL GASES	
				NATURAL	PROPANE
G-23	1/2	1/2	1/2	1/2	1/2
G-24	1/2	1/2	1/2	1/2	1/2
G-25	1/2	1/2	1/2	1/2	1/2
G-26	1/2	3/4	1/2	1/2	1/2
G-27	1/2	3/4	1/2	1/2	1/2

PIPE DELIVERY SCHEDULE

Capacity of Pipes in Cubic Feet of Gas per Hour.

Length of Pipe in Feet	Pipe Size		
	3/4"	1"	1-1/4"
10	212	425	725
20	150	300	510
30	122	252	425
40	105	218	370
50	95	195	330
75	77	160	270
100	66	134	232

Boilers are shipped assembled as completely packaged units. In case of boiler with flush jacket, the draft hood is shipped as a separate unit.

LOCATION

Locate the boiler near the chimney or flue and as centralized with respect to the heat distribution system as practicable.

If water condition exists in the basement, or if it has been necessary to waterproof the basement floor, the boiler should be mounted on a concrete or hollow tile base, preferably to a height of at least three inches.

SERVICE ACCESSIBILITY CLEARANCES

Boilers furnished with Deluxe jacket are approved for installation with minimum permissible clearance to combustible material as shown on the label attached to the boiler jacket. Necessary service accessibility clearances as indicated below take precedence over these clearances.

1. If boiler is provided with a water heater or circulator, clearance must be allowed at left side for the removal of the water heater or servicing the circulator.

Provide the following clearances for removal of water heaters; #218-15"; #222-18"; #226-24" and #232-31".

2. Minimum clearance of 6" must be maintained between the boiler, including projecting draft hood and vent connector, and any combustible material. A minimum front clearance of 18" must be provided for servicing burners and controls.

IMPORTANT: - Refer to label on the boiler jacket for the minimum permissible clearance to combustible material.

3. For utility room installations, the door shall be wide enough to allow the largest boiler part to enter or to permit the replacement of another appliance, such as a gas water heater.

AIR FOR COMBUSTION AND VENTILATION

Adequate facilities must be available for providing air for combustion and ventilation. Except for installations in large spaces (such as full basements) where infiltration can normally be assumed to provide sufficient air, this will usually necessitate:

- (a) Two openings, one near the floor, the other near the ceiling installed in the door or a single wall of the heater room.
- (b) Openings to interior space, minimum free area of one (1) square inch per 1000 Btu per hour of input rating with a minimum of 100 square inches. (This method should always be used where practicable.)
- (c) Openings to outdoors, minimum free area of one (1) square inch per (2500) to (3000) Btu per hour of input rating. (This method should only be used where openings to interior spaces are impracticable.)

CHIMNEY

1. Flue or vent connector to chimney shall not be smaller than the size of the outlet of the draft diverter.
2. Where two or more appliances vent into a common flue, the area of the common flue should at least equal the area of the largest flue or vent connector plus fifty percent of the areas of the additional flue or vent connectors.
3. Flue or vent connector must be inserted into but not beyond the inside wall of the chimney flue. Horizontal runs of flue pipe should be kept at a minimum and should be installed with a 1/4" pitch per foot maintained.

CAUTION

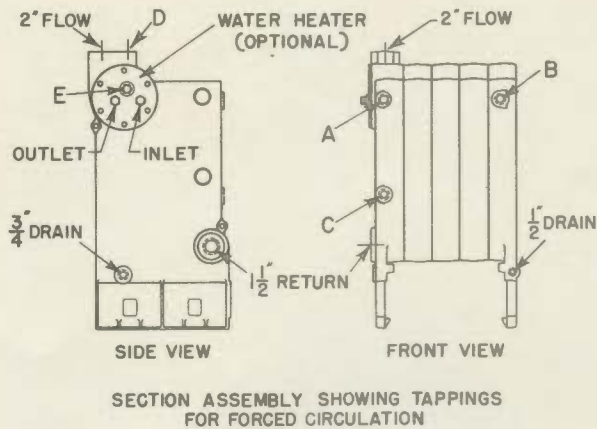
The expansion tank should not be set in a cold or an exposed place. If the pipe leading to or from the tank freezes, serious damage may result. If valve of any description is installed in the piping leading to or from the expansion tank BE SURE THAT IT IS OPEN WHILE THE BOILER IS IN OPERATION.

This appliance should be installed in accordance with the latest A.S.A. instructions for "Installation of Gas Appliances and Gas Piping". Reference should also be made to gas company regulations and local building, plumbing or other codes in effect in the area in which the installation is made.

Bottom Pan (Floor Shield) is provided for all closet and combustible floor installations also for all Steam Boilers.

Radiation Shield is provided for closet and combustible floor installations also for Dual and LP-Air Gas Boilers.

Refer to diagrams showing types of ignition for installation of Bottom Pan and Radiation Shield.



CONTROL APPLICATION		
LOCATION ON BOILER	SIZE OF TAPPING	CONTROLS
A	3/4"	IMMERSION LIMIT CONTROL
B	1/2"	TEMPERATURE AND ALTITUDE GAGE
C	3/4"	REVERSE ACTING CONTROL ON ALL-PURPOSE BOILERS ONLY
D	3/4"	PRESSURE RELIEF VALVE AND EXPANSION TANK
E	3/4"	COMBINATION OPERATING, HIGH LIMIT AND LOW VOLTAGE RELAY IMMERSION CONTROL

Fig. 5 - Section Assembly Showing Tappings.

NOTE: 4, 5, 6 and 7 Section Boilers for Gravity Circulation have 3" flow in "E" location, and two 2" return tappings in place of one 1-1/2" return tapping.

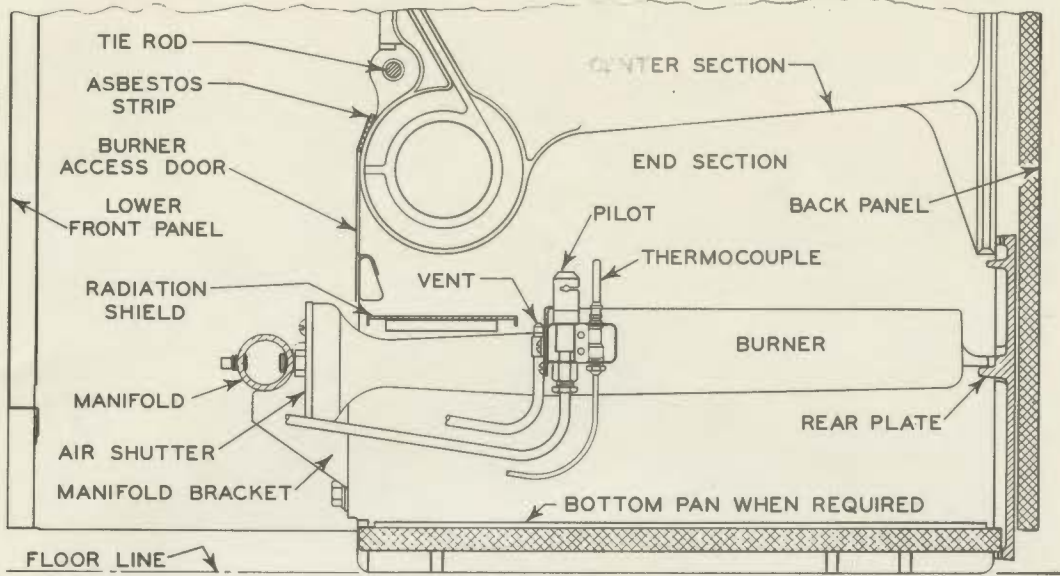
1. Make up drip leg piping (not supplied by AR & SS Corp.) of suitable height and install the manual shutoff valve assembly. See Figures on Page 7.
2. Make suitable connection between tee in the drip leg piping and the manifold piping. It is essential to install a Ground Joint Union when making this connection.
3. Connect the pilot line from the manual shutoff valve to the pilot for boilers with Non-100% Shutoff. The pilot line tubing should be run through the opening in the jacket along side of the piping in case of boiler with deluxe jacket.
4. **BOILERS WITH FORCED CIRCULATION** - Connect return piping to circulator. Be sure that the flange gasket is not damaged and that the bolts are properly tightened.

BOILERS WITH GRAVITY CIRCULATION - Connect return piping to R.H. End for 3, 4 and 5 section boilers and to both R.H. and L.H. Ends for 6 and 7 section boilers. Knockouts must be removed from jacket as required for flow and return tappings.

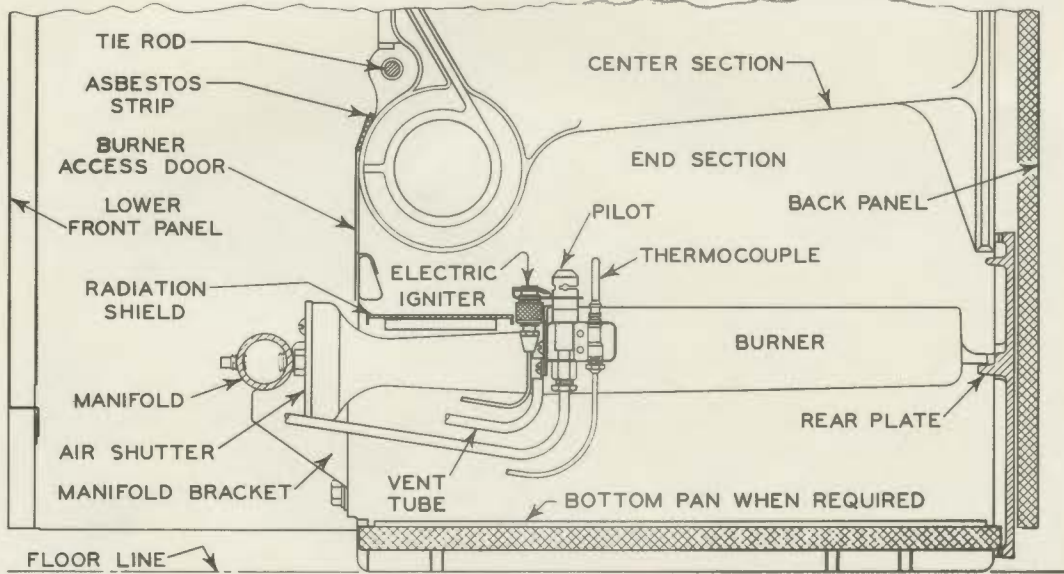
5. Install the safety relief valve in the 3/4" tapping on top of the boiler at left side using pipe nipple provided.

BOILER WITH FLUSH JACKET - Place drafthood firmly on the flue outlet collar of the canopy which projects above the jacket and connect to chimney.

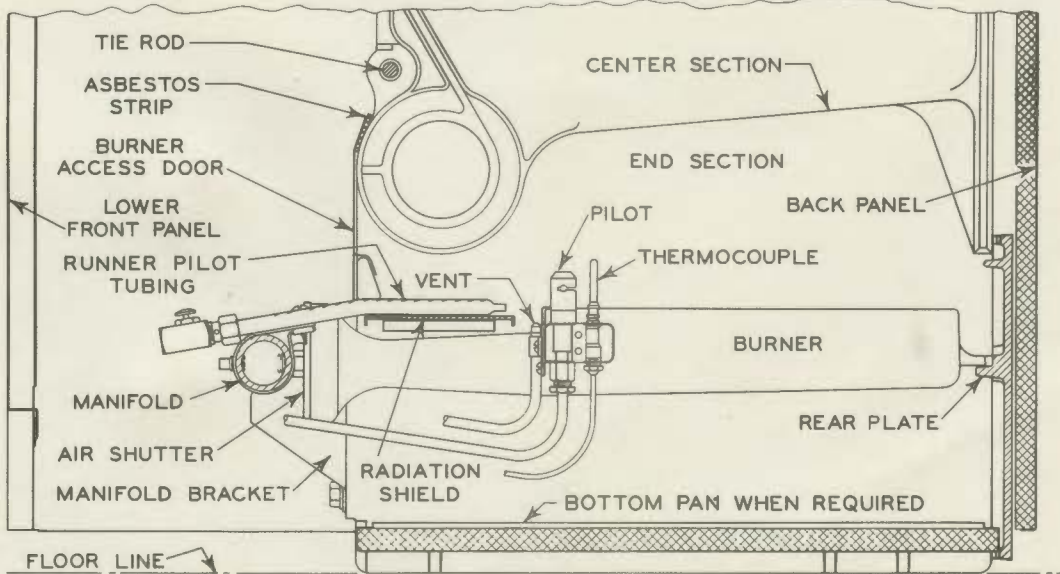
BOILER WITH DELUXE JACKET - Place flue pipe firmly on outlet collar of the canopy and connect to chimney. External drafthood is not required EXCEPT FOR 3 SECTION BOILER.



Manual Ignition Fig. 6



Electric Ignition Fig. 7



Runner Pilot Ignition Fig. 8

BP-1-G2-600 PKGD.

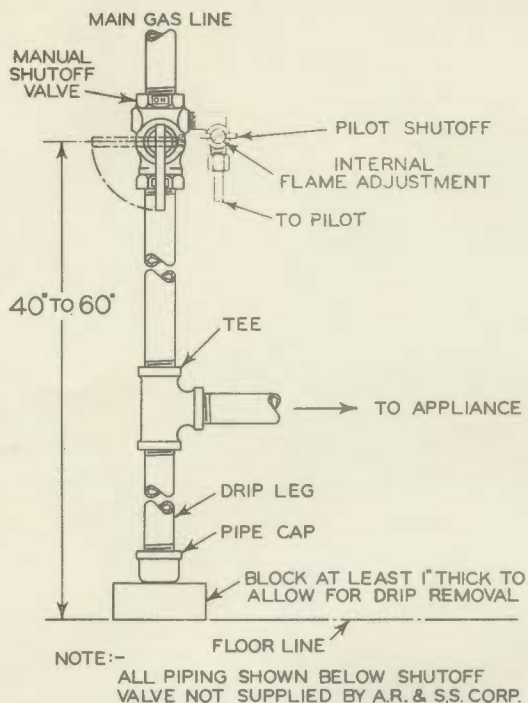
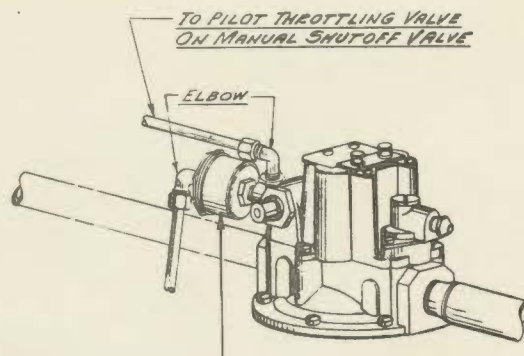


Fig. 9 - Supply Piping for Boiler with 100% and Non-100% Shutoff.



INSTALLATION OF PILOT FILTER FOR 100% SHUTOFF WHEN REQUIRED

FIG. 10

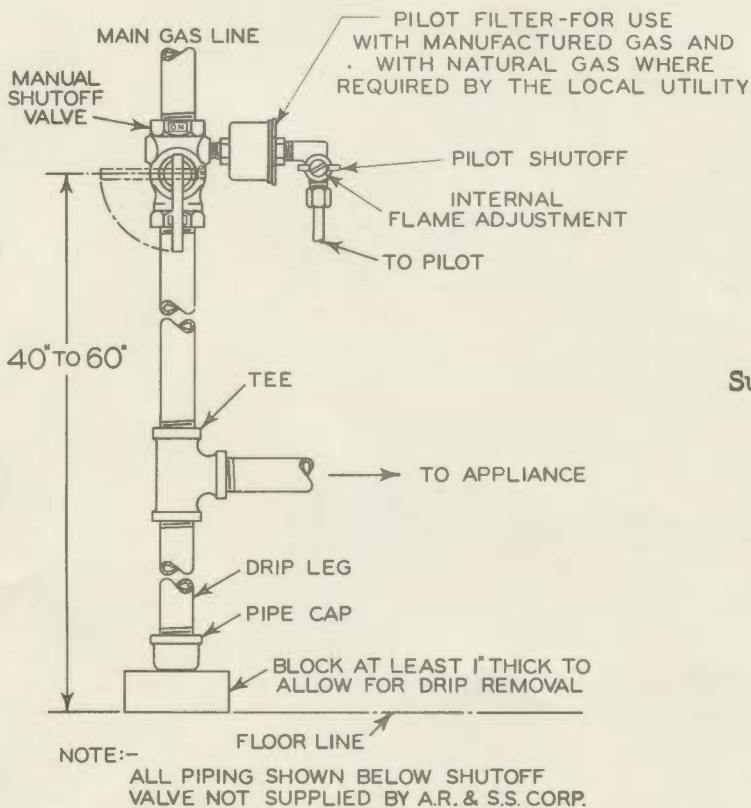
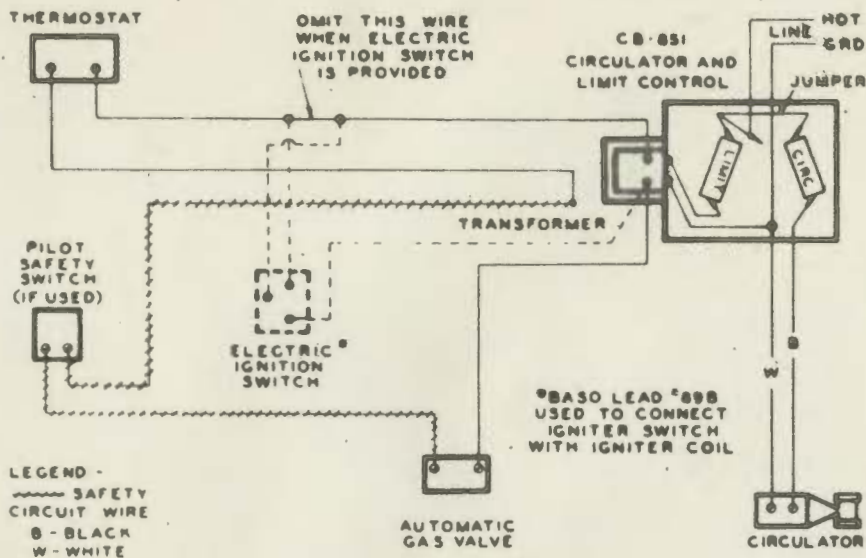


Fig. 11
Supply Piping For Use on Boiler With Manufactured Gas Non-100% Shutoff

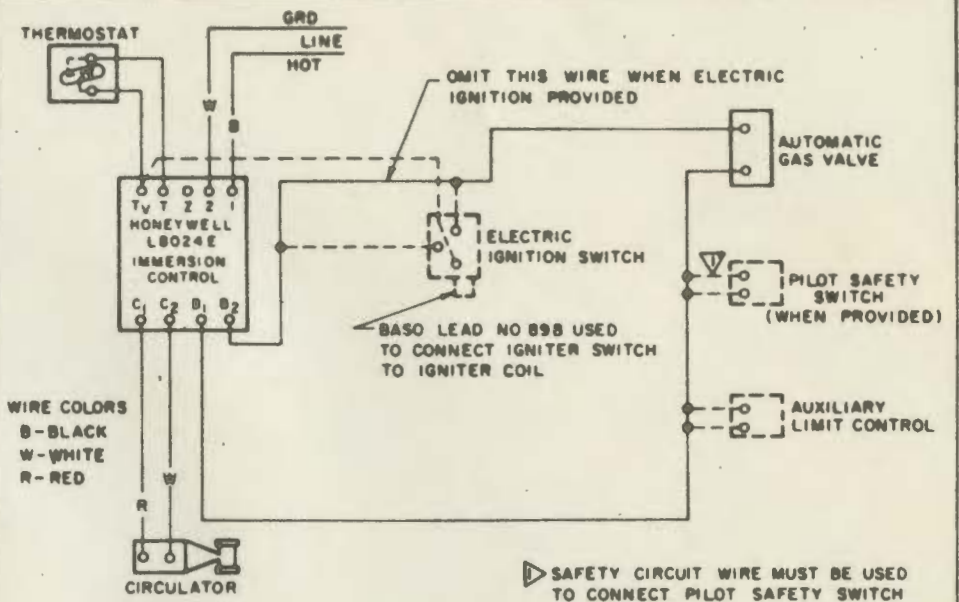
Electrical service should be brought to the boiler and connections made to accord with the wiring diagram furnished either for use with water heater or without water heater, whichever the case may be. Install and connect the room thermostat according to applicable wiring diagram.

BP-1-G2-600 PKGD.



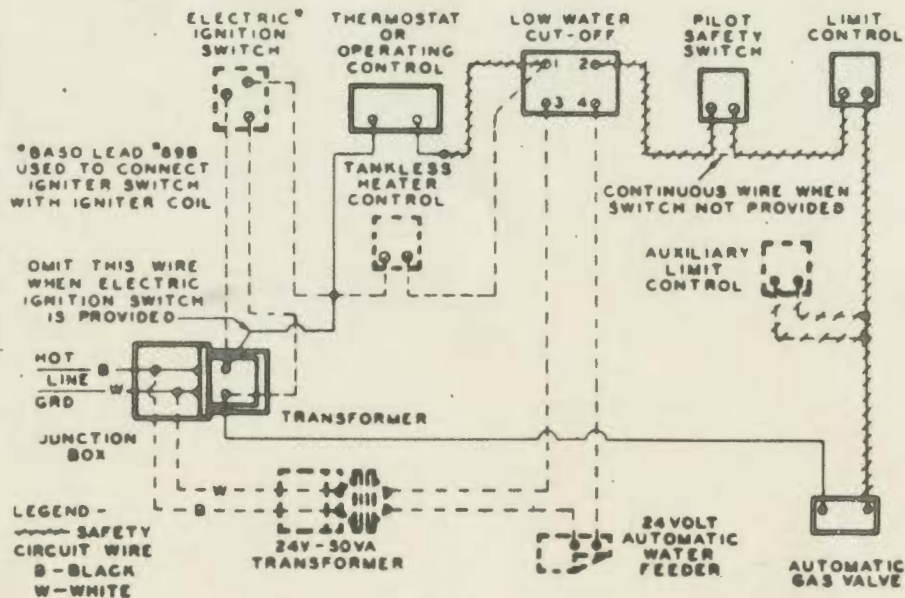
WIRING DIAGRAM FOR FORCED HOT WATER SYSTEM LESS TANKLESS WATER HEATER USING DETROIT CB-851 COMBINATION LIMIT & CIRCULATOR CONTROL

①



WIRING DIAGRAM FOR FORCED HOT WATER SYSTEM WITH DOMESTIC HOT WATER TANKLESS HEATER

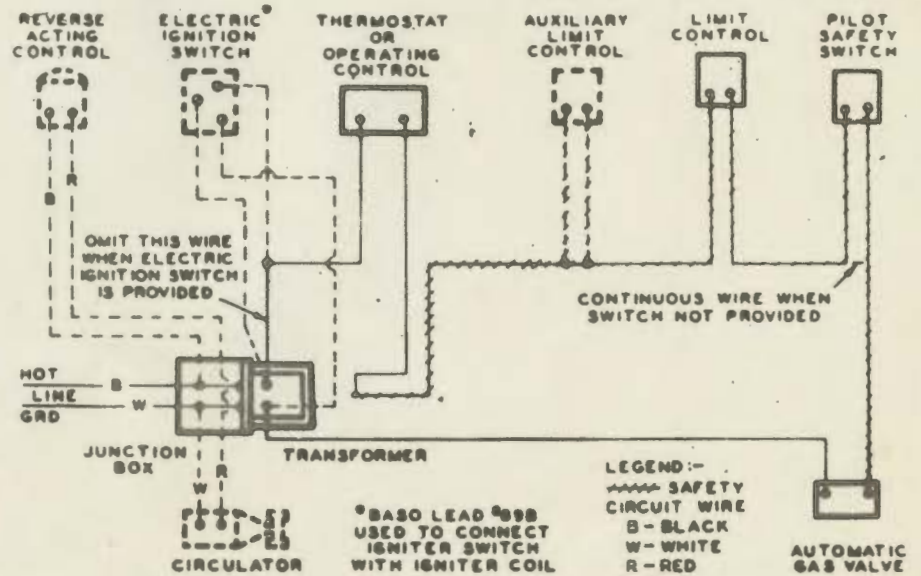
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WIRING DIAGRAM FOR STEAM SYSTEM WITH OR WITHOUT TANKLESS HEATER

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WIRING DIAGRAM FOR GRAVITY OR FORCED HOT WATER SYSTEMS GAS VALVE CONTROLLED BY THERMOSTAT CIRCULATOR CONTROLLED BY REVERSE ACTING CONTROL

④



Fig 13 - Boiler Less Water Heater, with Flush Jacket and Circulator Pump Hookup.

1. Automatic Gas Valve
2. Circulator Pump
3. Transformer
4. Combination Circulator and Limit Control
5. Temperature and Altitude Gauge

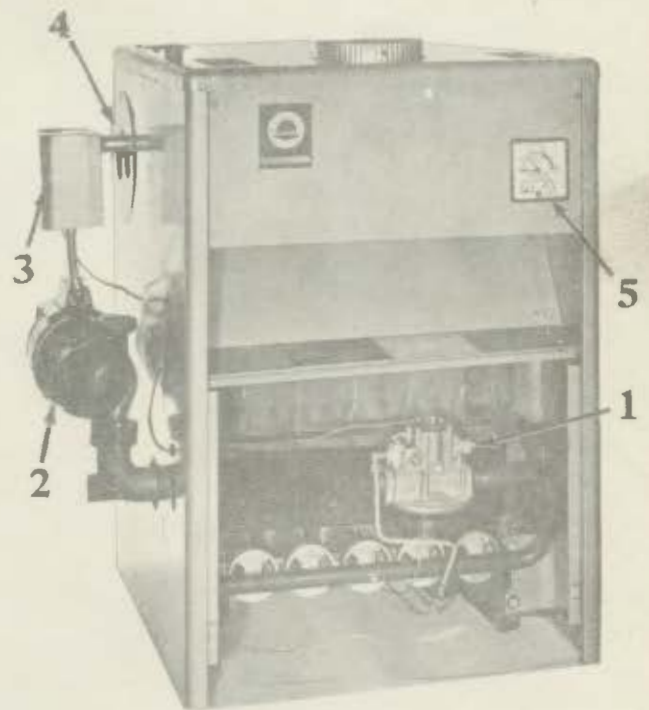


Fig. 14 - Boiler with Water Heater, Deluxe Jacket and Circulator Pump Hookup.

1. Automatic Gas Valve
2. Circulator Pump
3. Combination Immersion Control
4. Water Heater
5. Temperature and Altitude Gauge

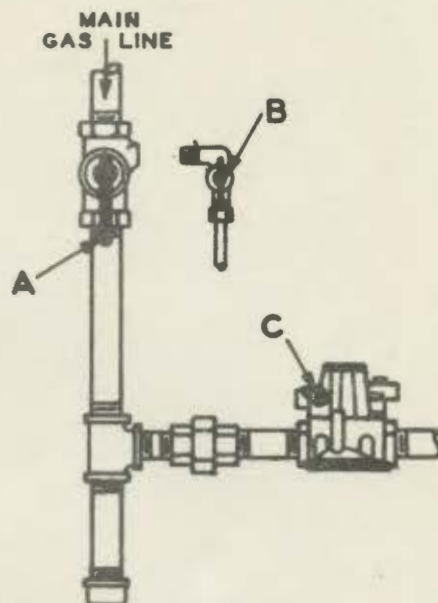
INSTRUCTIONS FOR SHUTTING OFF AND LIGHTING
MANUAL IGNITION — NON 100% SHUTOFF

TO SHUT OFF:

1. CLOSE MANUAL SHUTOFF VALVE "A" AND PILOT VALVE "B"
2. TURN OFF SWITCH IN ELECTRIC LINE TO APPLIANCE.

TO LIGHT:

1. SET THERMOSTAT TO LOWEST TEMPERATURE
2. BE SURE MANUAL SHUTOFF VALVE "A" AND PILOT VALVE "B" HAVE BEEN SHUT OFF FOR AT LEAST FIVE MINUTES BEFORE PROCEEDING.
3. OPEN PILOT VALVE "B".
4. LIGHT PILOT (S).
5. WAIT ONE MINUTE. PRESS PLUNGER "C" ON AUTOMATIC GAS VALVE.
6. OPEN MANUAL SHUTOFF VALVE "A".
7. TURN ON SWITCH IN ELECTRIC LINE TO APPLIANCE.
8. SET THERMOSTAT TO DESIRED TEMPERATURE.



1-ST-13615

Fig. 15

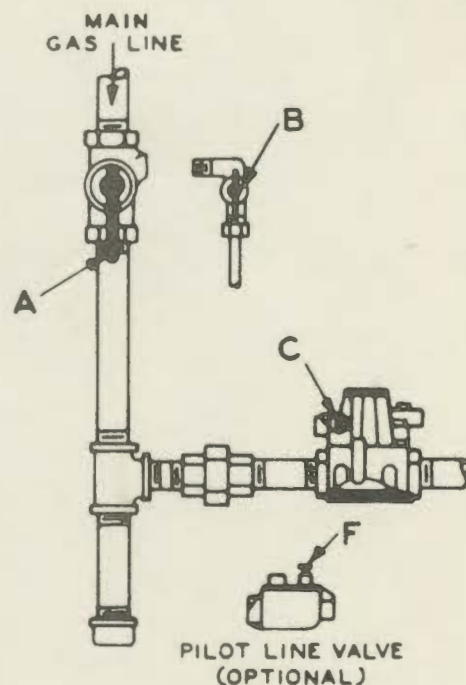
INSTRUCTIONS FOR SHUTTING OFF AND LIGHTING
MANUAL IGNITION — 100% SHUTOFF

TO SHUT OFF:

1. CLOSE MANUAL SHUTOFF VALVE "A" AND PILOT VALVE "B".
2. TURN OFF SWITCH IN ELECTRIC LINE TO APPLIANCE.

TO LIGHT:

1. SET THERMOSTAT TO LOWEST TEMPERATURE.
2. BE SURE MANUAL SHUTOFF VALVE "A" AND PILOT VALVE "B" HAVE BEEN SHUT OFF FOR AT LEAST FIVE MINUTES BEFORE PROCEEDING.
3. OPEN PILOT VALVE "B".
4. PRESS PLUNGER "C" ON AUTOMATIC GAS VALVE AND LIGHT PILOT (S). HOLD PLUNGER "C" FOR ONE MINUTE.
5. IF PILOT LINE VALVE IS SUPPLIED PRESS PLUNGER "F" AND LIGHT LEFT PILOT. HOLD PLUNGER "F" FOR ONE MINUTE.
6. OPEN MANUAL SHUTOFF VALVE "A".
7. TURN ON SWITCH IN ELECTRIC LINE TO APPLIANCE.
8. SET THERMOSTAT TO DESIRED TEMPERATURE.



1-ST-14408

Fig. 16

INSTRUCTIONS FOR SHUTTING OFF AND LIGHTING
ELECTRIC IGNITION—NON 100% SHUTOFF

TO SHUT OFF:

1. CLOSE MANUAL SHUTOFF VALVE "A" AND PILOT VALVE "B".
2. TURN OFF SWITCH IN ELECTRIC LINE TO APPLIANCE.

TO LIGHT:

1. SET THERMOSTAT TO LOWEST TEMPERATURE.
2. BE SURE MANUAL SHUTOFF VALVE "A" AND PILOT VALVE "B" HAVE BEEN SHUT OFF FOR AT LEAST FIVE MINUTES BEFORE PROCEEDING.
3. TURN ON SWITCH IN ELECTRIC LINE TO APPLIANCE.
4. OPEN PILOT VALVE "B".
5. PRESS RED ELECTRIC IGNITER BUTTON "D". PILOT SHOULD LIGHT.
6. WAIT ONE MINUTE.
7. PRESS PLUNGER "C" ON AUTOMATIC GAS VALVE.
8. OPEN MANUAL SHUTOFF VALVE "A".
9. SET THERMOSTAT TO DESIRED TEMPERATURE.

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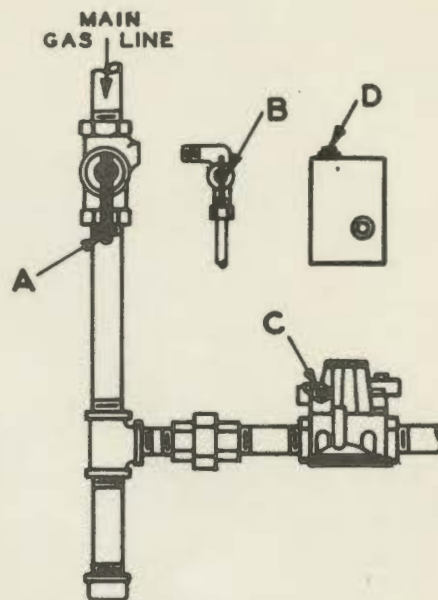


Fig. 17

INSTRUCTIONS FOR SHUTTING OFF AND LIGHTING
ELECTRIC IGNITION - 100% SHUTOFF

TO SHUT OFF:

1. CLOSE MANUAL SHUTOFF VALVE "A" AND PILOT VALVE "B".
2. TURN OFF SWITCH IN ELECTRIC LINE TO APPLIANCE.

TO LIGHT:

1. SET THERMOSTAT TO LOWEST TEMPERATURE.
2. BE SURE MANUAL SHUTOFF VALVE "A" AND PILOT VALVE "B" HAVE BEEN SHUT OFF FOR AT LEAST FIVE MINUTES BEFORE PROCEEDING.
3. TURN ON SWITCH IN ELECTRIC LINE TO APPLIANCE.
4. OPEN PILOT VALVE "B".
5. PRESS PLUNGER "C" ON AUTOMATIC GAS VALVE AND RED ELECTRIC IGNITER BUTTON "D". PILOT SHOULD LIGHT. HOLD PLUNGER "C" FOR ONE MINUTE.
6. OPEN MANUAL SHUTOFF VALVE "A".
7. SET THERMOSTAT TO DESIRED TEMPERATURE.

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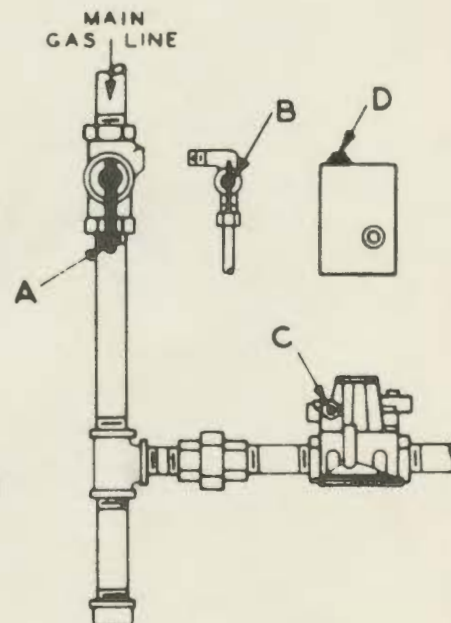


Fig. 18

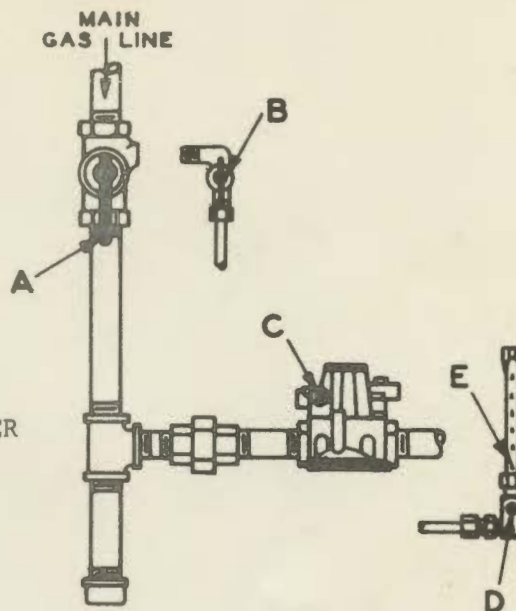
**INSTRUCTIONS FOR SHUTTING OFF AND LIGHTING
RUNNER PILOT IGNITION-NON 100% SHUTOFF**

TO SHUT OFF:

1. CLOSE MANUAL SHUTOFF VALVE "A" AND PILOT VALVE "B".
2. TURN OFF SWITCH IN ELECTRIC LINE TO APPLIANCE.

TO LIGHT:

1. SET THERMOSTAT TO LOWEST TEMPERATURE.
2. BE SURE MANUAL SHUTOFF VALVE "A" AND PILOT VALVE "B" HAVE BEEN SHUT OFF FOR AT LEAST FIVE MINUTES BEFORE PROCEEDING.
3. OPEN PILOT VALVE "B".
4. PUSH AND HOLD RED BUTTON "D", AND LIGHT RUNNER PILOT AT "E". PILOT SHOULD LIGHT.
5. WAIT ONE MINUTE.
6. PRESS PLUNGER "C" ON AUTOMATIC GAS VALVE.
7. OPEN MANUAL SHUTOFF VALVE "A".
8. TURN ON SWITCH IN ELECTRIC LINE TO APPLIANCE.
9. SET THERMOSTAT TO DESIRED TEMPERATURE.



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Fig. 19

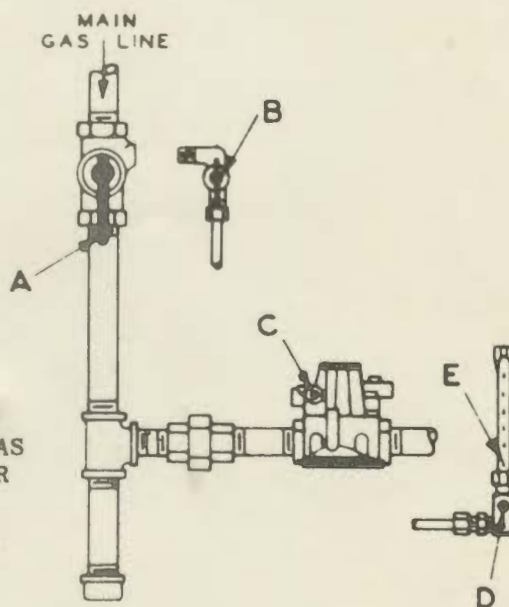
**INSTRUCTIONS FOR SHUTTING OFF AND LIGHTING
RUNNER PILOT IGNITION - 100% SHUTOFF**

TO SHUT OFF:

1. CLOSE MANUAL SHUTOFF VALVE "A" AND PILOT VALVE "B".
2. TURN OFF SWITCH IN ELECTRIC LINE TO APPLIANCE.

TO LIGHT:

1. SET THERMOSTAT TO LOWEST TEMPERATURE.
2. BE SURE MANUAL SHUTOFF VALVE "A" AND PILOT VALVE "B" HAVE BEEN SHUT OFF FOR AT LEAST FIVE MINUTES BEFORE PROCEEDING.
3. OPEN PILOT VALVE "B".
4. PUSH AND HOLD RED BUTTON "D" AND LIGHT RUNNER PILOT AT "E". PRESS PLUNGER "C" ON AUTOMATIC GAS VALVE. PILOT SHOULD LIGHT. HOLD PLUNGER "C" FOR ONE MINUTE.
5. OPEN MANUAL SHUTOFF VALVE "A".
6. TURN ON SWITCH IN ELECTRIC LINE TO APPLIANCE.
7. SET THERMOSTAT TO DESIRED TEMPERATURE.



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Fig. 20

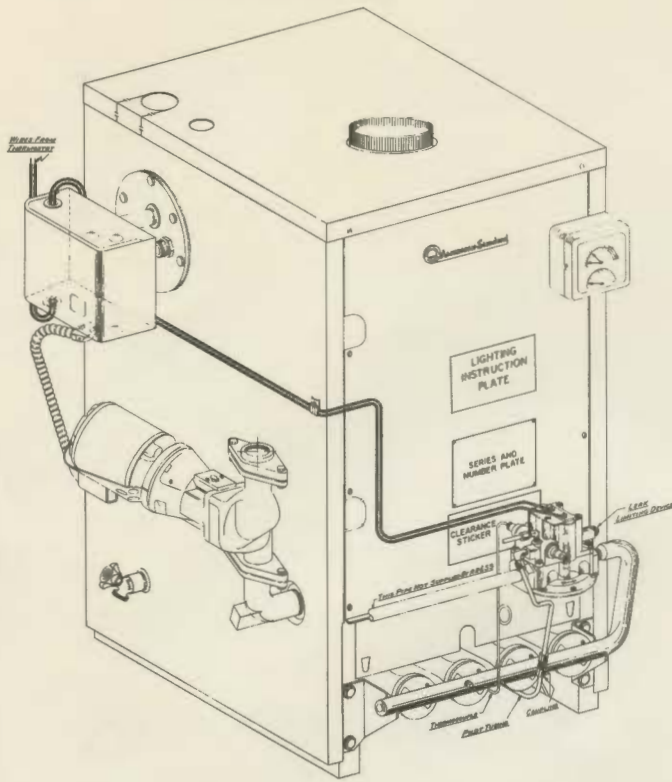


Fig. 21 - Boiler with Flush Jacket And Water Heater - 100% Shutoff

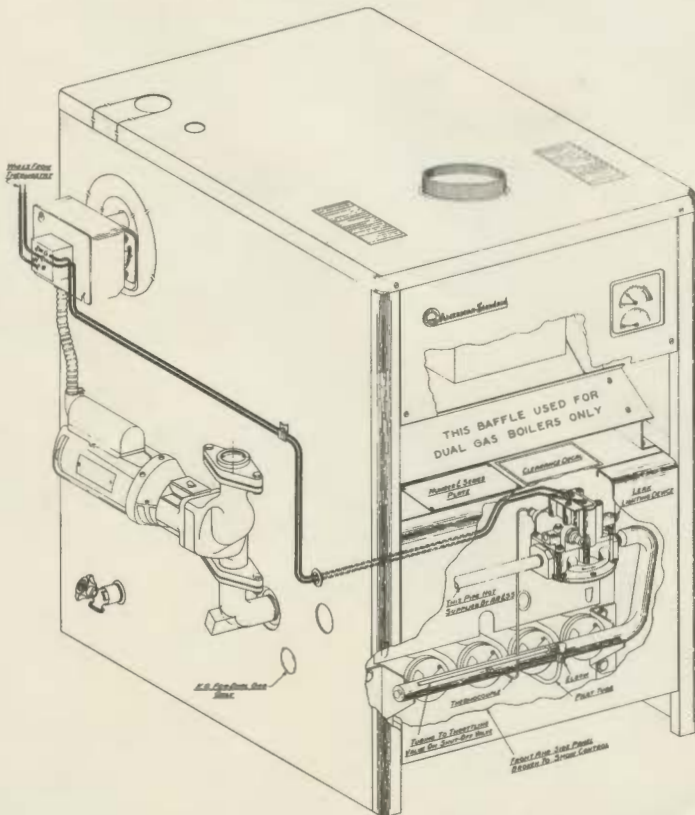


Fig. 22 - Boiler with Deluxe Jacket Non-100% Shutoff

V-600 PKGD.

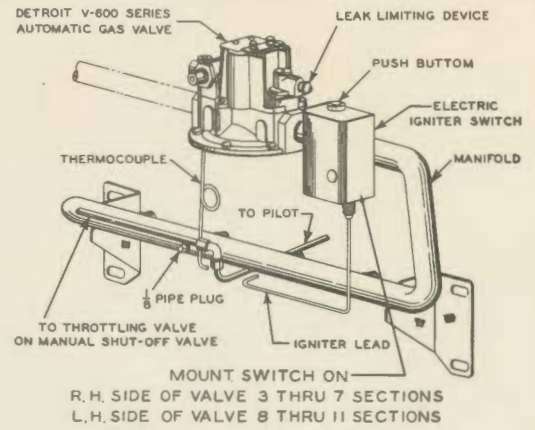


Fig. 23 - Piping Arrangement showing Connections for Electric Ignition

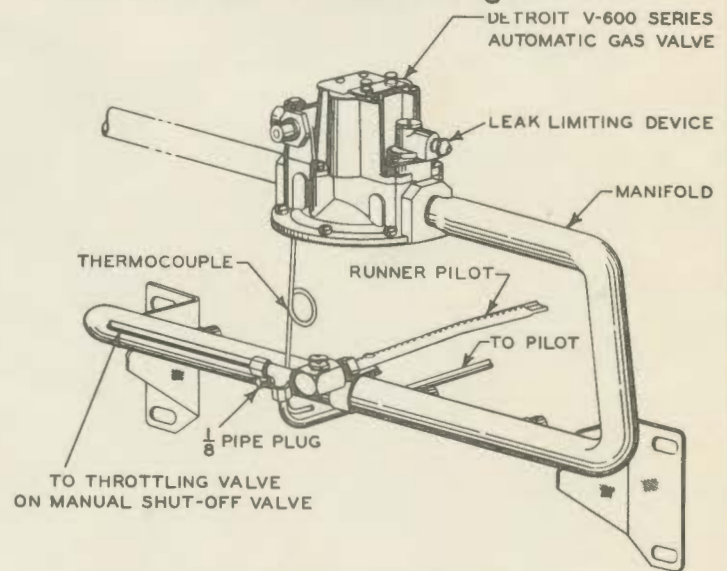


Fig. 24 - Assembly of Runner Pilot to Manifold for boiler with Non-100% Shutoff.

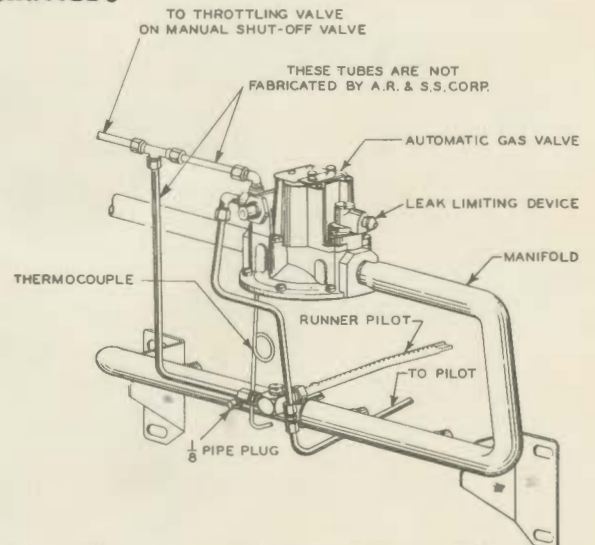


Fig. 25 - Assembly of Runner Pilot to Manifold for boiler with 100% Shutoff

TESTING

Before any system of gas piping is finally put into service, it shall be carefully tested to assure that it is gas tight. Soap and water solution, or other material acceptable for the purpose, shall be used in locating gas leaks.

FILLING SYSTEM

CAUTION: Never start boiler unless it is properly filled. After boiler is in operation, makeup water should be added slowly.

Fill open system to 1/3 height of expansion tank, remove rim and glass from gauge and set movable point under automatic pointer. Replace rim and glass.

Fill closed system until relief valve relieves. This must be less than 30 Lbs. pressure. Remove rim and glass from gauge and set movable pointer under automatic pointer. Replace rim and glass.

Keep system filled. Pointers on gauge should be even. If pressure exceeds 30 Lbs., relieve at once by opening relief valve or drain cock.

NORMAL PILOT INPUT FOR BASO PILOT BURNERS

	MFD.	NAT.	MIXED	LP	LP-AIR
Input per Burner Btu/Hr.	1000	1400	1200	1000	1000

MANIFOLD PRESSURE ADJUSTMENT FOR MAIN BURNER INPUT

After boiler is warmed up, shut off all other gas appliances connected to gas meter and time consumption. Boiler input should be adjusted at rated input as indicated on nameplate in accordance with procedure outlined below.

$$\text{Gas Consumption (Cubic Feet per Hr.)} = \frac{\text{INPUT RATING (Btu per Hr.)}}{\text{Heating Value of Gas (Btu per Cu. Ft.)}}$$

1/8" pipe plug is placed in the top of the manifold to provide for checking the gas pressure in the manifold with a manometer or small pressure gauge. The manifold pressure should be set at 3.5 inches of water for natural and mixed gases or 2.5 inches of water for manufactured gas. To adjust the pressure, remove the cap on the gas pressure regulator and screw in the adjusting screw to raise pressure or screw out the adjusting screw to lower pressure. Only small variations in gas flow should be made by means of the gas pressure regulator adjustment. In no case should the final manifold pressure vary more than plus or minus 0.3 inches water column from the above specified pressures. Any necessary major changes in the flow should be made by changing the size of the burner orifice. Refer to V-600 valve instruction sheet for making regulator adjustments.

MAIN BURNER PRIMARY AIR ADJUSTMENT

Adjust burner flame by opening or closing primary shutter. Flame should burn quietly, show no yellow and should have a noticeable inner blue cone. After adjustment, tighten screw to lock shutter in position.

PILOT GOES OUT

If the pilot flame is extinguished the automatic gas valve will shutoff the gas. If boiler is operating correctly, relight as directed in applicable instructions on previous pages. If boiler is not operating correctly, call heating contractor or gas company service man.

GENERAL CARE OF HEATING SYSTEM

1. Keep radiators and convectors clean.
2. Keep system in good repair. It is advisable to have it inspected by your heating contractor at least once a year.
3. If a hot water radiator is hot at the bottom but not at the top, it indicates that air has accumulated inside and should be vented. To vent radiator; hold small cup under air vent (located near top of radiator), open vent until water escapes and then close.
4. Fill hot water systems as follows:

Open all radiator valves, but keep vents at top of radiator closed. Fill open systems till hands on altitude gauge are even. If it is a closed system the water filling will stop automatically when proper pressure is reached. (Pressure should not exceed 30 pounds). Then beginning with ground floor, vent each radiator as directed above. It may be necessary to add water during this operation to expel air from higher radiators.

5. If much water is added to system, it is advisable to heat system to a high temperature and vent again. This will make less venting necessary during the winter.
6. Where an expansion tank is used, make sure that neither the tank nor its drain pipe is exposed to freezing temperature. If valve of any description is installed in piping leading to or from the expansion tank. BE SURE THAT IT IS OPEN WHILE THE BOILER IS IN OPERATION.

CARE OF BOILER WHILE IN OPERATION

Check water level regularly and add water slowly when needed.

This boiler is fired automatically.

IN WINTER WHILE NOT IN OPERATION

Drain entire system to prevent damage from freezing. Drain boiler through drain cock, located at left side. Also remove drain plug located on front edge of right end section. Be sure boiler is completely drained.

IN SUMMER WHILE NOT IN OPERATION

Fill system as during heating season. Have boiler inspected by service man before the start of the heating season. The surface between the boiler sections can be cleaned from the top of the boiler. If the top jacket panel is to be removed, it is advisable to place blocks or strips under the sides of the jacket to facilitate re-assembly of the panel.

CLEANING BOILER - To clean boiler remove parts in the following order.

Boiler with Deluxe Jacket

1. Flue Pipe
2. Top Jacket Panel
3. Canopy and Draft Hood Assembly

Boiler with Flush Jacket

1. Flue Pipe and Draft Hood
2. Top Jacket Panel
3. Canopy

IMPORTANT - After cleaning, carefully seal all around canopy with asbestos packing also remove all dirt from main burners and pilot to insure proper operation when service is resumed.

CANOPY INSTALLATION



Lay the asbestos packing provided against the front edge and across the left end of the recess on top of the sections. Carefully place the canopy so that it holds the packing against the front and end of the recess. Do not PLACE THE CANOPY ON TOP OF THE PACKING.

Hold the canopy firmly in place and lay the remainder of the packing along the rear and right end under the hold-down clip. Insert the canopy screws and tighten to hold the canopy in final position. Tuck the packing in place around the canopy using a putty knife or piece of material about 1/16" thick and 1" wide. Be careful not to push the packing under the canopy into the flue ways.

FOR BOILER EQUIPPED WITH V-531 or V-603 VALVE.

**EMERGENCY INSTRUCTIONS FOR OPERATION
DURING FAILURE OF ELECTRIC POWER SUPPLY**

In the event of failure of electric power supply the gas burner operating this boiler will automatically shut off. It is possible to operate this burner manually by following the directions given below.

CAUTION -- THE BURNER SHOULD BE OPERATED MANUALLY ONLY AS AN EMERGENCY MEASURE. THE AUTOMATIC SAFETY CONTROLS WHICH PROTECT THE BOILER DURING NORMAL OPERATION ARE NOT OPERATIVE. CONSTANT SUPERVISION IS REQUIRED TO PREVENT THE POSSIBILITY OF DAMAGE TO THE BOILER BECAUSE OF LOW WATER OR OVERHEATING. NEVER LEAVE THE BURNER OPERATING MANUALLY IF IT IS TO BE UNSUPERVISED FOR ANY LENGTH OF TIME.

IN SUPPLYING THESE BRIEF DIRECTIONS FOR MANUAL OPERATION OF THE BURNER, THE MANUFACTURER CAN ASSUME NO RESPONSIBILITY FOR THE SAFE OPERATION OF THE BURNER, BOILER AND OTHER EQUIPMENT. SAFETY DEPENDS UPON THE CARE AND JUDGMENT EXERCISED BY THE OPERATOR. ALL POSSIBILITIES CANNOT BE COVERED IN THESE BRIEF DIRECTIONS.

BASIC STEPS IN MANUAL OPERATION

1. Be sure the burner pilot is burning properly. If so, then: -
2. Turn off electric power switch controlling the burner. LEAVE THIS SWITCH OFF UNTIL POWER HAS BEEN RESTORED.
3. Burner may now be operated manually by opening the automatic gas control valve in accordance with instructions printed on the valve cover.
4. If the boiler operated by the gas burner is installed on a forced circulation hot water heating system (incorporating electric circulating pump) OPEN FLOW CONTROL VALVE OR VALVES IF PROVIDED IN THE WATER LINES. (Note: - It is suggested that the original position of these valves be carefully observed and these observations recorded, to permit restoring these valves to their original position when automatic operation is resumed.)

Also, REDUCE THE MAIN BURNER FLAME TO A MINIMUM ADJUSTMENT (approximately 1/3 or 1/4 normal size) BY PARTIALLY CLOSING THE MANUAL GAS SHUT OFF VALVE.

**TO RESTORE BURNER TO AUTOMATIC OPERATION
UPON RESUMPTION OF SUPPLY OF ELECTRIC CURRENT**

1. Return automatic gas control valve to its original "automatic" setting, in accordance with instructions on valve cover.
2. Turn on electric power supply switch.
3. On forced circulation hot water heating systems, return flow control valves, if provided, to their normal operating positions.
4. Turn manual gas shut off valve to its wide open position.

CARL Cherundolo
115 S. MAIN STREET
OLD FORGE, PA



Plumbing and Heating Division
AMERICAN RADIATOR & STANDARD SANITARY CORPORATION
40 WEST 40TH STREET, NEW YORK 18, N.Y.

G-2 GAS BOILER

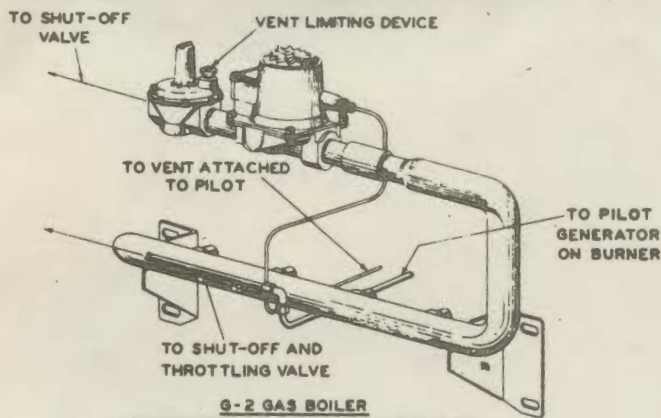
SUPPLEMENT TO INSTALLATION, OPERATION AND MAINTENANCE MANUAL FOR BOILERS EQUIPPED WITH SELF ENERGIZING CONTROLS 100% AND NON-100% SHUTOFF

Assemble main burners and manifold piping for boilers equipped with self energizing controls as directed in installation manual for all boilers.

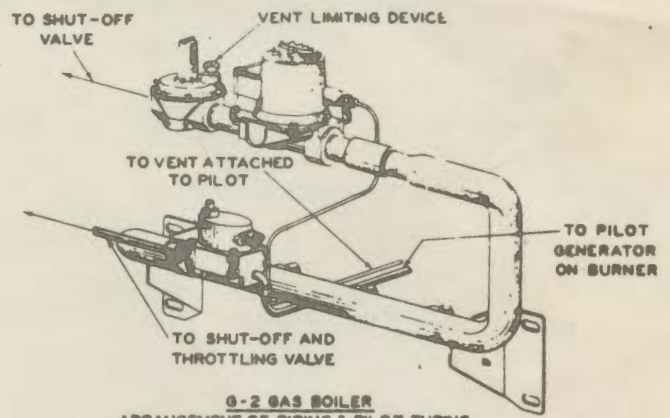
Attach the pilot generator assembly to the main burner with #10-24 stainless steel screw provided. See Chart in the installation manual for location of single pilot.

In case of boilers equipped with ribbon burners, the installer is to remove and discard the top clamp piece on the front end of the burner so that the pilot generator sub-assembly can be installed.

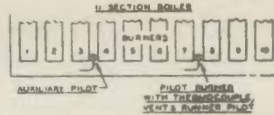
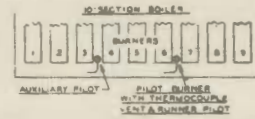
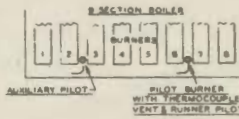
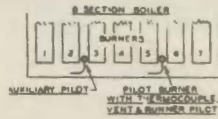
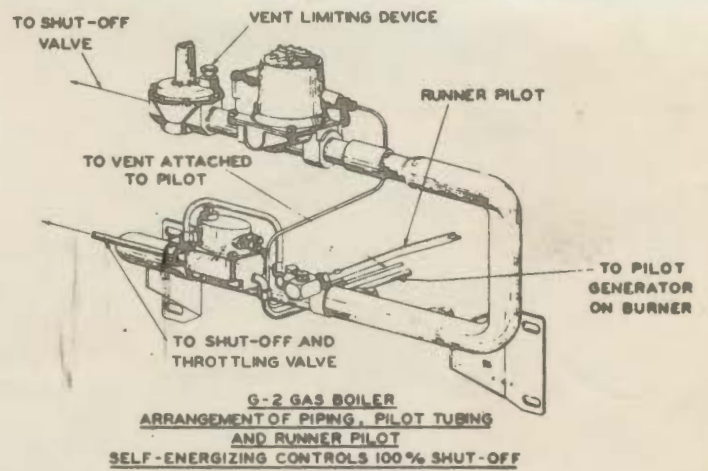
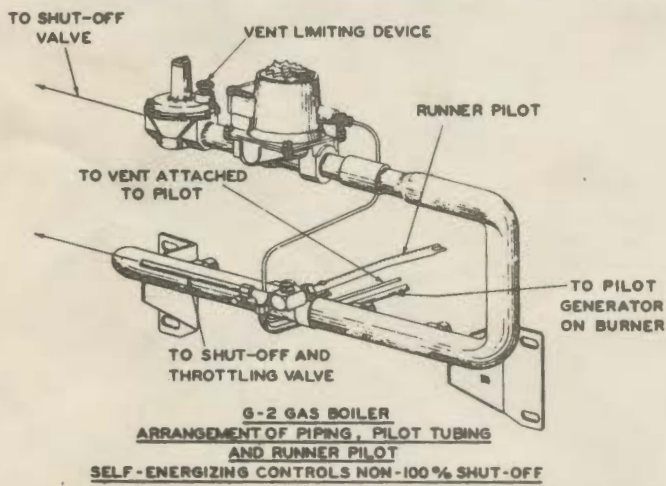
Connect one end of the vent tube to the automatic gas valve with tubing connector assembled in valve. Attach the other end of the vent tube to the pilot generator assembly, so that top of vent tube is approximately in line with top of sheet metal pilot bracket.



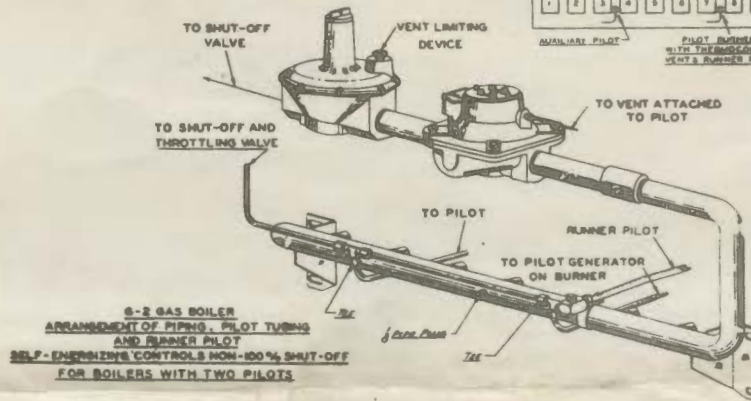
G-2 GAS BOILER
ARRANGEMENT OF PIPING & PILOT TUBING
MANUAL IGNITION
SELF-ENERGIZING CONTROLS NON-100% SHUT-OFF



G-2 GAS BOILER
ARRANGEMENT OF PIPING & PILOT TUBING
SELF-ENERGIZING CONTROLS 100% SHUT-OFF
MANUAL IGNITION



PILOT BURNER LOCATIONS



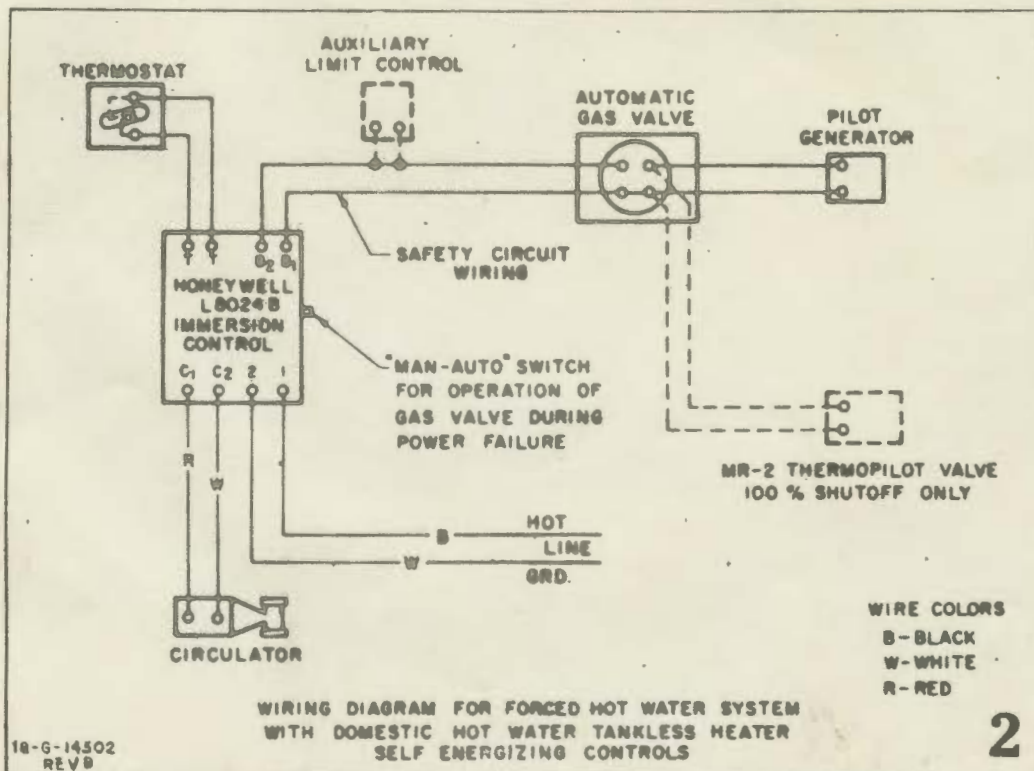
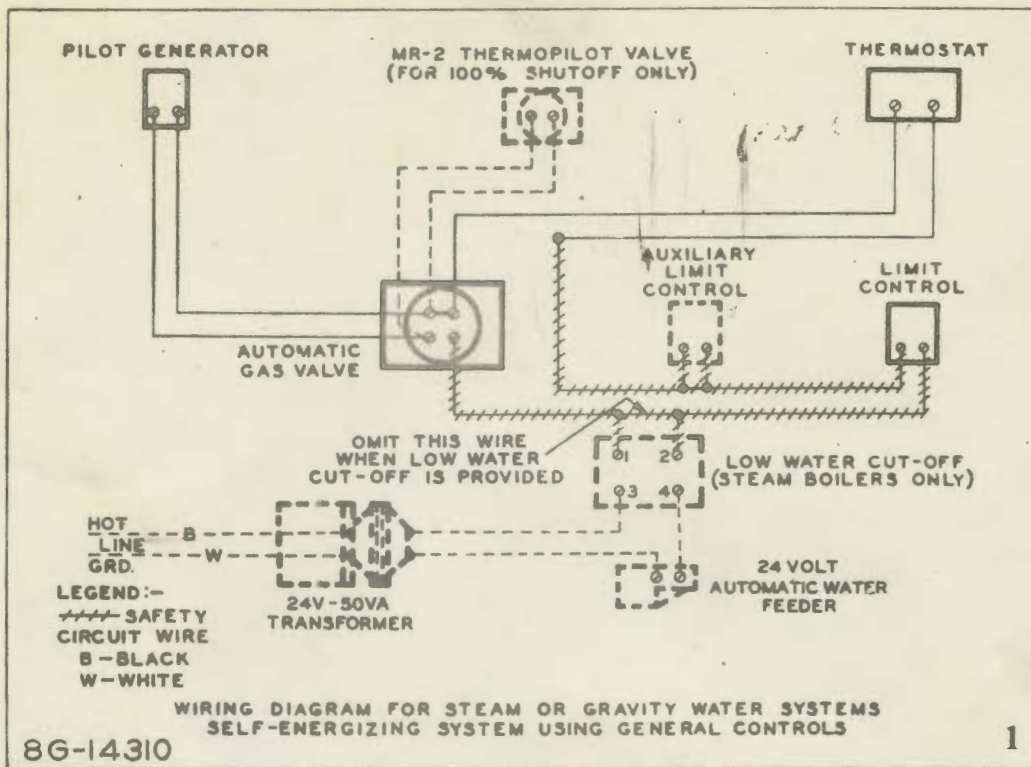
Connect wire leads from thermopilot valve to the automatic gas valve. Complete remainder of wiring for either 100% shutoff or Non-100% shutoff as shown on wiring diagram furnished for self energizing controls. The CA-655-SE Limit control must be connected to the terminals on the automatic gas valve marked "AUX. CONTROL".

Plumbing and Heating Division

FORM BP-5400-62
2-60

AMERICAN RADIATOR AND STANDARD SANITARY CORPORATION

WIRING DIAGRAMS FOR G-2 and G-40 GAS BOILERS WITH SELF ENERGIZING CONTROLS



NOTE: All Wiring Inside Boiler Jacket must be 105° C approved wire. This wire is furnished with Boiler.

AMERICAN RADIATOR AND STANDARD SANITARY CORPORATION



SERVICE AND INSTALLATION

B-62 SELF-OPERATED GAS VALVE

Combination Type
Includes Self-Operating B-60 & Pressure Regulator

DESCRIPTION

The B-62 (Millivoltage) Self Operated Combination valve incorporates in one body pressure regulator and main line automatic valve.

Combining these proven components in one compact control cuts installation and service costs to a minimum. This valve completely bridges from input "A" valve to burner manifold providing control functions.

These valves provide dependable, automatic gas control for: forced or gravity warm air furnaces, hot water or steam boilers, unit heaters, booster type water heaters and other domestic and commercial applications. All valves are multipoised and can be mounted in any position.

REGULATOR: The pressure regulator has a standard outlet setting of 3 1/2 or 4" pressure with limited adjustment for manufactured or natural gases. An 11" outlet pressure setting is available.

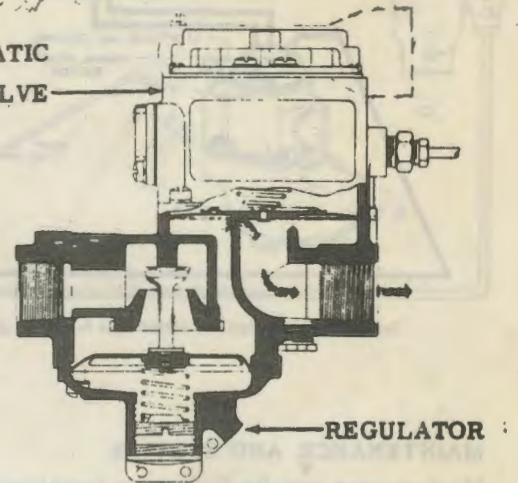
MAIN LINE AUTOMATIC VALVE: This quiet operating diaphragm valve (B-60 type) is powered by electrical current (millivolts) produced by a PG-9 Pilot Generator. Wiring terminals are provided for thermostat, pilot generator and limit control. If a limit control is not used, limit terminals must be jumpered. No external electrical power is needed for this combination Self-Operated Gas Valve. Conduit cover can be installed over "limit" terminals when required.

PILOT SAFETY: Since the B-62 Control operates from electrical energy produced by the pilot generator, low pilot or pilot outage condition automatically closes main gas valve.

OPERATION

Pilot Gas flow is controlled by pilot gas "B" valve. With main line "A" valve closed, open "B" valve and light pilot. The PG-9 Pilot Generator provides stable blue flame pilot for main burner ignition and also heats the thermocouple which produces electricity for automatic valve operation. After pilot is lit, open main gas "A" valve. This allows gas to pass through the pressure regulator and up to the main line automatic valve. When the thermostat or operating control completes the electrical circuit, the main line automatic valve opens to allow gas to pass to main burner. In case the pilot flame becomes dangerously low or on pilot outage, the automatic gas valve closes off gas to main burner. On recovery of pilot flame the valve automatically opens gas to main burner.

AUTOMATIC
GAS VALVE

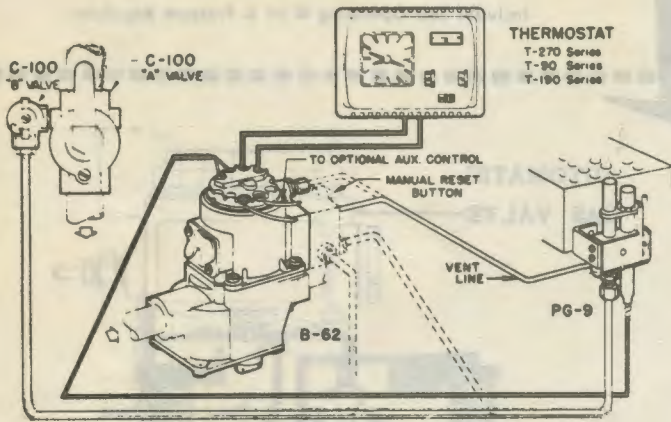


INSTALLATION

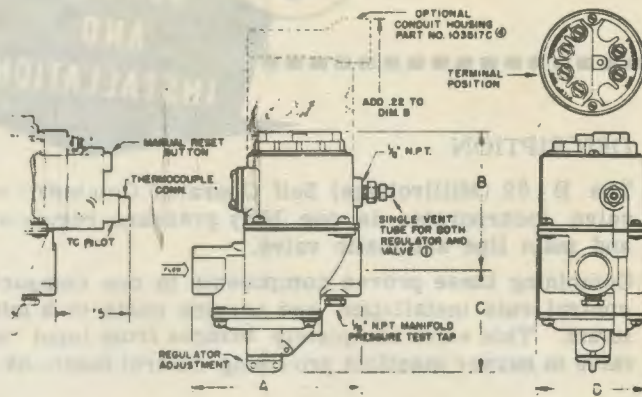
The B-62 Combination control is a precision unit. Careful attention to the following installation steps will insure long, efficient operation.

Mount pilot generator rigidly to main burner. Ignition flame must ignite the main burner with pilot turned down to the smallest flame that will generate enough current to hold main line automatic valve open. The main burner flame must not touch the generator body or cartridge. The use of General Controls Snorkel Type Pilot is suggested to eliminate linting problems which may exist.

1. Locate valve so that pilot generator leads can be connected to proper terminals.
2. Blow out dirt or foreign matter from all pipe lines and tubing.
3. Use thread seal sparingly on male threads only.
4. Install so flow of gas is in direction of arrow on body.
5. Use wrench on body flats provided only. Use wrench at end being connected only.
6. Connect 1/8" vent line tubing to valve. Position open end of vent line just under pilot flame. Anchor securely. Vent must not be in pilot or main burner flame.
7. Connect 1/4" tubing for pilot generator to 1/4" tube compression fitting provided on "B" valve.
8. Make certain all wiring connections are scraped clean and are well tightened.
9. Check all pipe connections for leakage using soap and water solution.
10. Check B-62 system with millivoltmeter.



Typical B-62 installation—dotted lines for 100% shutoff



Optional 100% Shutoff

Standard Model

MAINTENANCE AND SERVICE

Most service results from poor installation or lack of maintenance. For efficient operation, pilot generator must burn with stable blue flame surrounding thermocouples or cartridge. Clogged generator orifice or clogged primary air holes of pilot cause reduced electrical generation. Loose, poor, dirty, or otherwise bad wiring connections in wiring system cause loss of voltage. Make all connections clean and tight and clean out orifice and primary air holes regularly. Test system with millivolt meter to quickly locate trouble and determine efficiency of each part of system.

SERVICE SUGGESTIONS

TROUBLE	POSSIBLE CAUSE	REMEDY
	Drafts deflecting pilot flame away from Pilot Generator.	Eliminate source of draft.
	Pilot flame too small or yellow in color due to restricted pilot line or dirt in primary air holes.	Clean pilot line primary air opening and burner head and change pilot orifice, if required.
	Vent tubing clogged by soot or dirt.	Remove, clean, reinstall. Keep tip out of flame.
Thermostat set above room temperature, pilot flame lighted, but valve will not open.	Room thermostat not making contact due to dirty contact points.	Clean thermostat contacts with bond paper.
	Open circuit due to loose connection at valve, thermostat or splice.	Check circuit using millivoltmeter. Clean splices, tighten terminals.
	Pilot Generator producing insufficient voltage.	Check voltage with millivoltmeter. See above.
	Valve operator damaged by improper handling.	Replace with new valve. Do not attempt to adjust.
	Thermostat too close to floor or in cold draft.	Mount thermostat according to instructions.
Valve will not close.	Electrical circuit shorted or nails driven through thermostat cable.	Check electrical circuit and repair.
	Dirt or foreign matter on valve seat ring.	Disassemble and clean.
	Valve operator mechanism damaged.	Check with meter. Replace operator assembly.

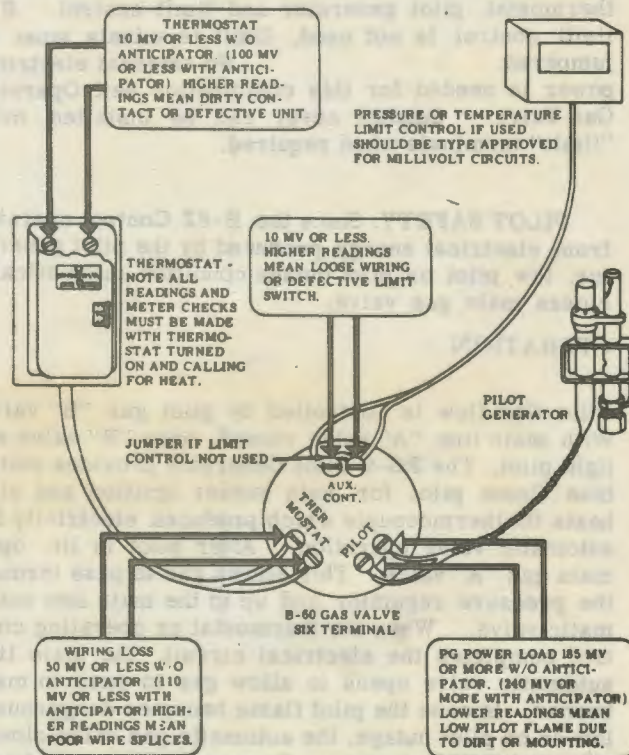
DISASSEMBLY FOR SERVICE AND CLEANING

If operator is damaged, the entire operator assembly should be replaced. FURTHER DISASSEMBLY OF OPERATOR OTHER THAN REMOVAL WILL RESULT IN DAMAGE TO ASSEMBLY.

CLEANING VALVE SEAT AND DISC - If necessary, valve seat and disc may be cleaned. Shut off gas at point upstream of valve. Remove four screws holding operator to body. Do not damage gasket when removing operator. Inspect and carefully clean valve seat and disc. Replace gasket and operator.

After re-assembling any part of valve, check all gaskets for leaks with soap and water solution.

MILLIVOLT METER CHECK



GENERAL CONTROLS

GLENDALE 1, CALIFORNIA
IRON MOUNTAIN, MICH.
BURBANK, CALIFORNIA
SKOKIE, ILLINOIS
WARWICK, RHODE ISLAND
GUELPH, ONTARIO, CANADA
DÜSSELDORF, W. GERMANY



FACTORY BRANCHES

- ATLANTA
- CINCINNATI 2
- GLENDALE 1
- MIAMI 44
- PITTSBURGH 22
- SYRACUSE 2
- BALTIMORE 24
- CLEVELAND 3
- HARTFORD
- MILWAUKEE 15
- PORTLAND 6
- BOSTON 59
- COLUMBUS 12
- HOUSTON 5
- MINNEAPOLIS 28
- ST. LOUIS 10
- BUFFALO 23
- DALLAS 7
- INDIANAPOLIS 22
- NEW ORLEANS
- SALT LAKE CITY
- CHARLOTTE
- DENVER 4
- IRON MOUNTAIN
- NEW YORK 17
- SAN FRANCISCO 7
- CHATTANOOGA 3
- DETROIT 27
- BARKES CITY 8
- OMAHA 2
- SEATTLE 9
- CHICAGO
- FORT WASHINGTON
- LOS ANGELES
- PHOENIX
- SKOKIE

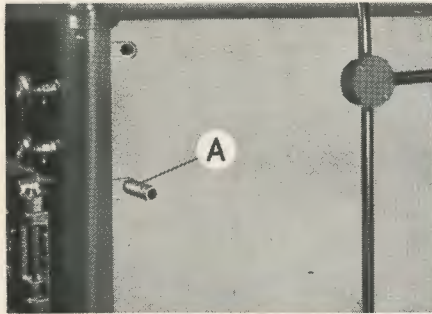
- Canada**
- GUELPH
 - MONTREAL
 - TORONTO
 - WINNIPEG
 - VANCOUVER 5

Distributors in principal cities

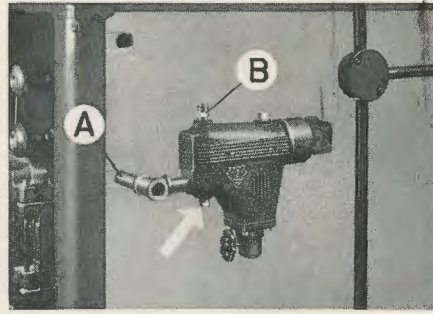
How to install the McDONNELL No. 67G LOW WATER CUT-OFF

For Use on Millivolt or 24 Volt Circuits

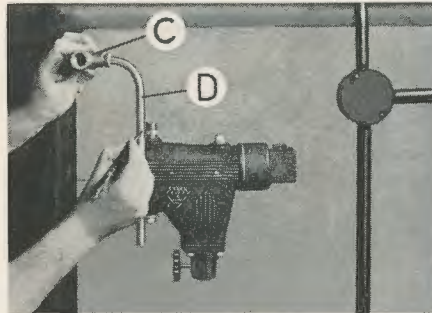
Follow these steps—



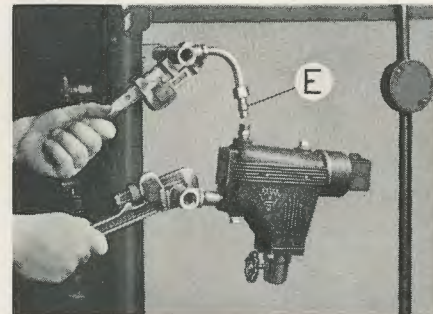
1 Remove the gauge glass and gauge-cocks from the boiler, and install the nipple (A), in the lower water glass tapping as shown above.



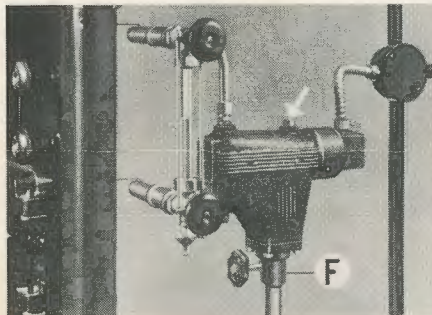
2 Trim the Cut-off with compression fitting (B). Then swing it onto the nipple (A), as shown above. Remove shipping plug, indicated by arrow, replace with solid plug.



3 Install the remaining nipple to the upper gauge tapping. Hold the assembly (C) in position and mark the pipe bend (D) at the proper point for cutting as shown above.



4 Having cut the pipe-bend to proper length, screw the assembly onto the upper nipple, finally bringing the pipe and cut-off together as shown above. In doing this be sure that the compression ring (E) is in place.



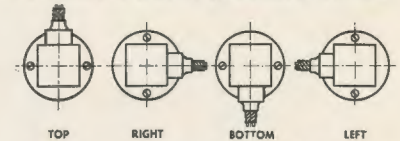
5 Tighten up the compression fitting and install the water glass as shown above. Now wire the switch following the correct suggested wiring diagram. Arrow indicates convenient tapping for pressure control.

NOTE—Before leaving job test operation of cut-off by opening the large area spring-closing blow-off valve (F). This will drain water quickly from cut-off float body and will break circuit to burner. Instruct owner to blow off control at least once per month during heating season.

McDONNELL & MILLER, Inc., 3500 N. Spaulding Ave. Chicago, Illinois 60618



Service range:
Maximum boiler pressure 20 lbs.

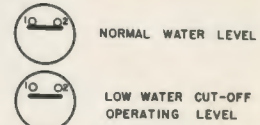


BX Outlet is movable into any one of four positions illustrated above by simply removing two black headed screws and swinging housing.



Low Water Cut-off Switch (For Millivolt or 24 Volt Service)

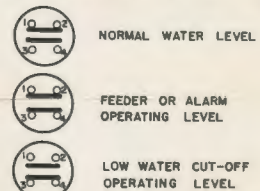
The low water cut-off switch is between terminals marked (1) and (2). It should be wired in series with pressure control or thermostat as a limit switch. Some millivolt systems have terminals right on gas valve labeled "L1" and "L2" which can be utilized for wiring a limit switch like this cut-off. Others have both thermostat and pressure control in series; if so simply wire this cut-off in series with them.



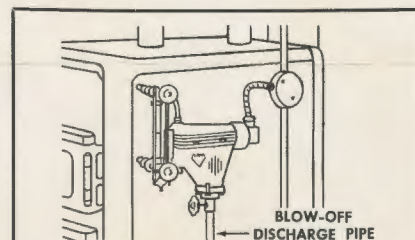
SCHEMATIC OF SWITCH OPERATION FOR LOW WATER CUT-OFF SERVICE—BOTH MILLIVOLT AND 24 VOLT CIRCUITS

Water Feeder or Alarm Switch (For 24 Volt Service only)

A second switch is provided between terminals marked (3) and (4). This can be used, on 24 Volt circuits only, to operate McDonnell No. 101-24V Electric Water Feeder or low water alarm.

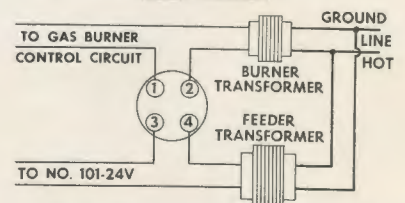
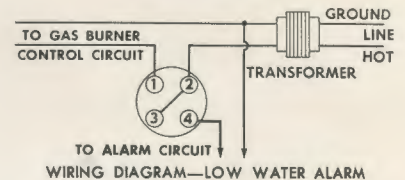


SCHEMATIC OF SWITCH OPERATION, USING SECOND SWITCH TO CONTROL ELECTRIC WATER FEEDER OR LOW WATER ALARM—FOR 24 VOLT CIRCUITS ONLY.



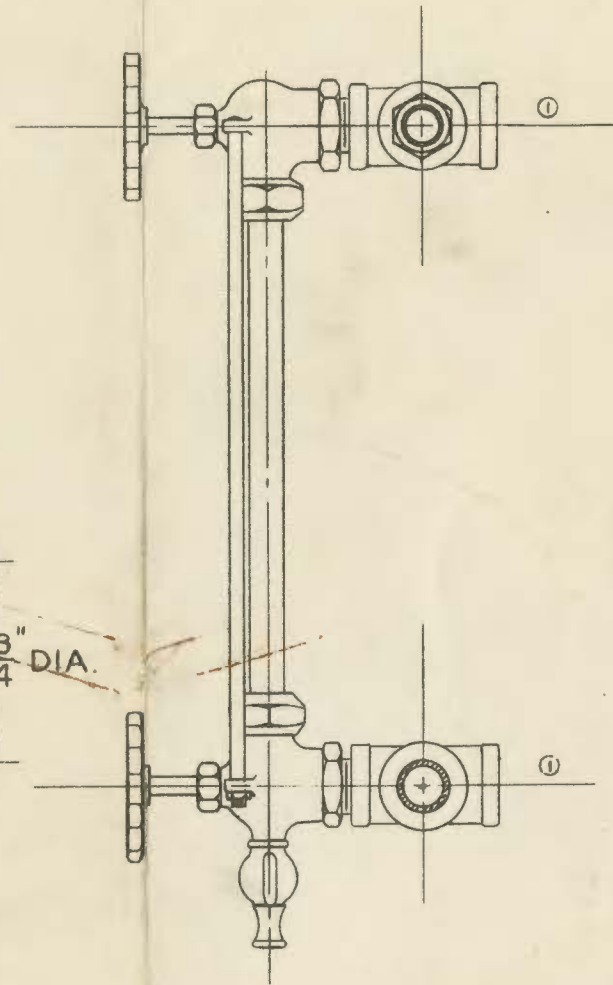
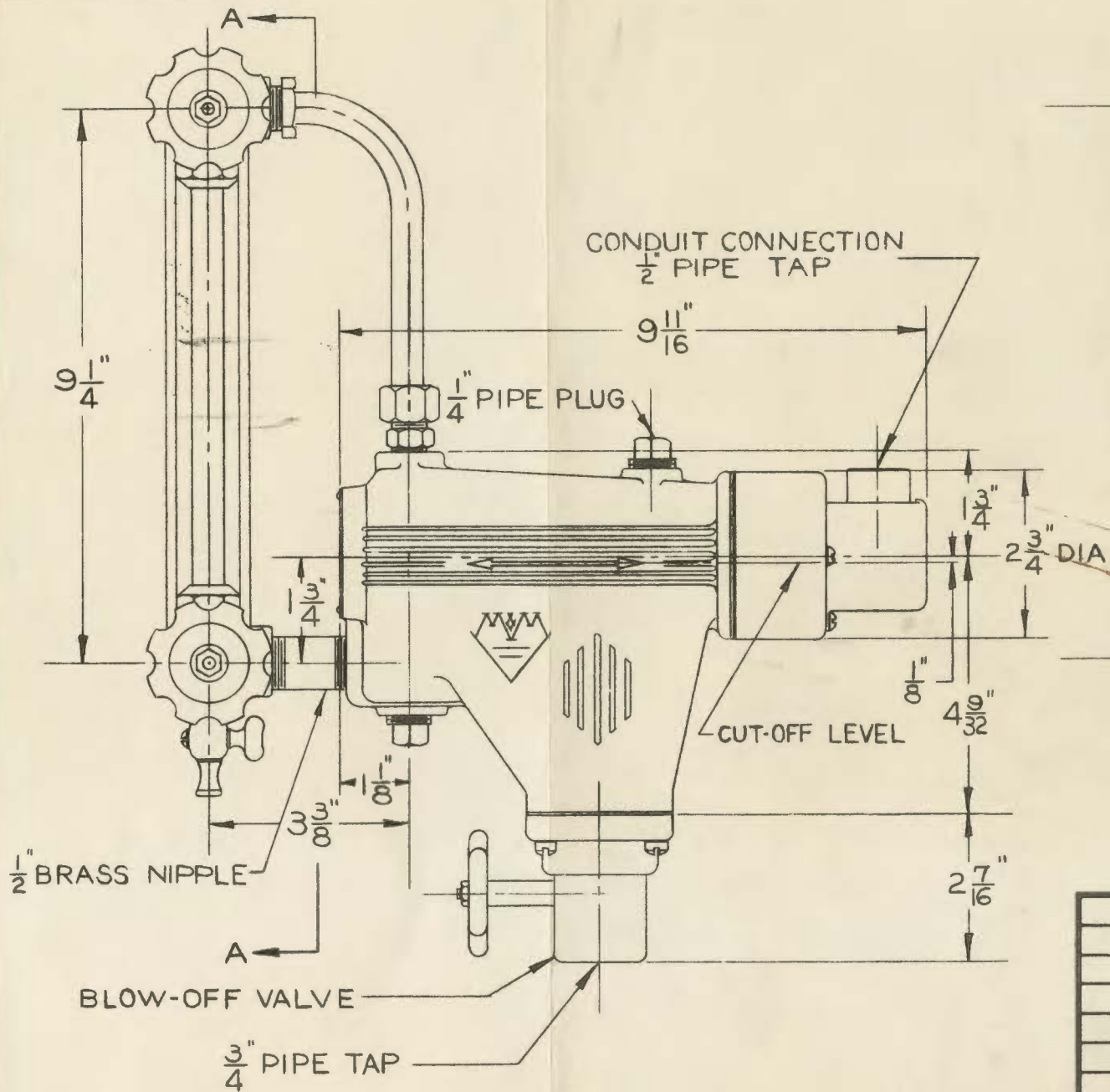
IMPORTANT

To guard against possible burning or scalding, pipe-blow-off discharge to floor. This pipe must be same 3/4" size as blow-off connection; do not reduce. Do not thread end of pipe, to eliminate possibility of capping or plugging.



WIRING DIAGRAM—NO. 101-24V WATER FEEDER WITH TRANSFORMER

67AR



SECTION A-A

McDONNELL & MILLER Inc.
CHICAGO, ILL.

No. 67AR LOW WATER CUT-OFF

MAT'L

No. REQ'D

SCALE 3/8" = 1"

DATE 4-18-56

DR. BY

APPR. BY

EHS

No. 67AR

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No. DATE

REVISIONS

① WAS 1/2" x 2" NIPPLES



INSTALLATION INSTRUCTIONS

TS822A HEATING THERMOSTAT

APPLICATION

The TS822 is a bimetal operated, mercury-switch thermostat which provides temperature control for a self-powered gas heating system. The TS822A is used with a 750mv system. These thermostats must not be used with a line-voltage or 24 volt heating system.

INSTALLATION

Locate thermostat five feet above the floor on an inside wall where there is good natural air circulation.

Run two wires from the heating system to the thermostat location (Fig. 1). Wiring must agree with local code.

Wire Size	Max. Length 2-Wire Cable	Max. Combined Length 2-Single Wires
No. 18	30 feet	60 feet
No. 16	50 feet	100 feet
No. 14	80 feet	160 feet

MOUNTING THE THERMOSTAT

The TS822 may be mounted directly on the wall or on a vertical outlet box, see (A). A backplate (Accessory No. 120935) is available for wiring connections if desired, see (B).

(A) MOUNTING THERMOSTAT DIRECTLY ON WALL OR OUTLET BOX

1. Attach thermostat cable to terminals behind thermostat base (See Fig. 1 and 3). Push wires into wall and plug hole to prevent drafts from affecting thermostat.
2. Pull off thermostat cover (held on by mounting posts and scaleplate spring tension).
3. Fasten thermostat to wall or vertical outlet box with a screw through the top mounting hole.
4. Place a spirit level against the thermostat to find vertical position and start other screw.
5. Recheck vertical position and firmly tighten both mounting screws. THERMOSTAT MUST BE LEVEL TO OPERATE PROPERLY.
6. Replace thermostat cover.

(B) WHEN BACKPLATE IS USED

NOTE: The backplate is an accessory which must be ordered separately if backplate mounting is desired.

1. Pull off cover (held by mounting posts and scaleplate spring tension).
2. Pull thermostat cable through hole in backplate.
3. Fasten backplate directly to the wall or vertical outlet box with a screw through the top mounting hole (See Fig. 2).
4. Place a spirit level against the backplate to find vertical position and start a screw in the center of the bottom mounting hole.
5. Recheck vertical position and firmly tighten both mounting screws. BACKPLATE AND THERMOSTAT MUST BE LEVEL TO OPERATE PROPERLY.
6. Connect wires to backplate terminals (See Figs. 1 and 2).
7. Push excess wire back into the hole in wall or outlet box. Plug hole in wall to eliminate drafts.
8. Place the thermostat on backplate so that the aligning keys on the bottom and top fit into the holes provided (See Fig. 2). Tighten the two captive mounting screws—they complete the electrical connections to the thermostat.
9. Replace thermostat cover.

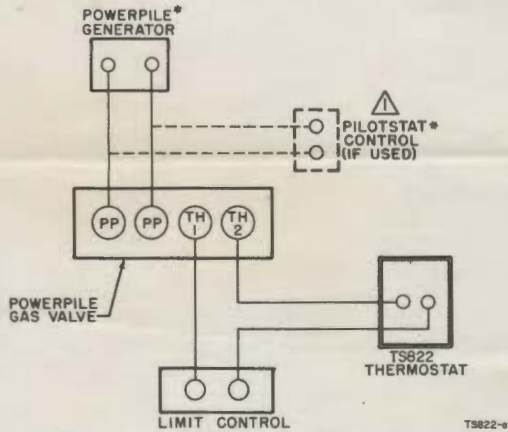


Fig. 1—Typical hookup for TS822 Thermostat.
1 A Pilotstat* control must be used with L. P. gas.

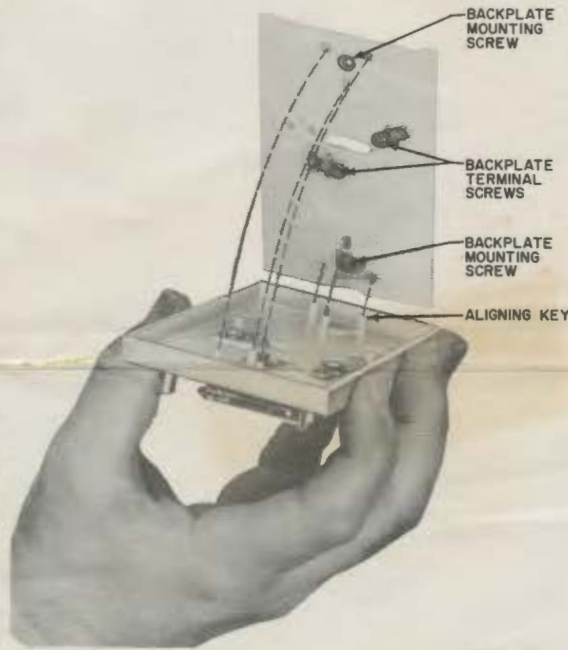
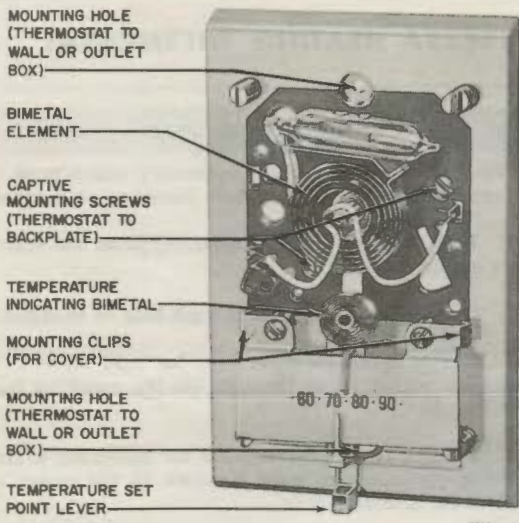
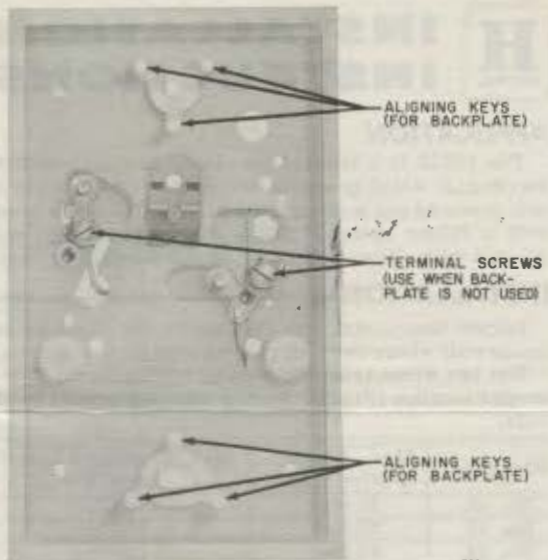


Fig. 2—Mounting thermostat to backplate (accessory).

*Trademark
12-64 O. C.



Front



Back

Fig. 3—Internal view of TS822 Thermostat.

SETTING AND CHECKOUT

TEMPERATURE SELECTION

Move temperature set point lever to desired point on temperature scale. On positive off models, system will be shut off completely when indicator lever is moved to extreme left end of scale.

CHECKING THERMOSTAT OPERATION

Move temperature set point lever above room temperature until the burner starts. Lower the setting 1-2 degrees, the burner should stop.



INSTALLATION INSTRUCTIONS

PA404A & B PRESSURETROL* CONTROLLER

APPLICATION

The PA404A is a high limit, pressure safety control for domestic steam heating boilers; it breaks an electrical circuit to shut down the burner on a pressure rise to set point. The PA404B is used with suspension-type unit heaters; it makes the fan circuit when a pressure rise to set point indicates the presence of steam.

Both models may be used in 24-, 120-, or 240-volt control circuits, or in self-powered (millivoltage) applications.

INSTALLATION

Where local code requirements differ from these instructions, the local code shall apply.

LOCATION:

The PA404A must be located above the water line in a steam boiler. It mounts in the fitting provided by the boiler manufacturer, alongside the pressure gage. See Fig. 1.

The PA404B must be mounted in the steam line ahead of the unit heater when used to control the heater fan. See Fig. 2.

IMPORTANT: If there is no pressure gage or fitting on which to mount the Pressuretrol, consult your local boiler representative for correct location.

MOUNTING:

The Pressuretrol is provided with a 1/4 inch female fitting.

A siphon must always be connected between the Pressuretrol and the boiler or steam line. The siphon acts as a trap to prevent corrosive vapors or scale, resulting from the use of boiler compounds, from damaging the control.

When making pipe connections, use pipe dope or white lead to seal the joints, but use it sparingly as any excess pipe dope may clog the small hole in the Pressuretrol fitting and prevent it from operating properly.

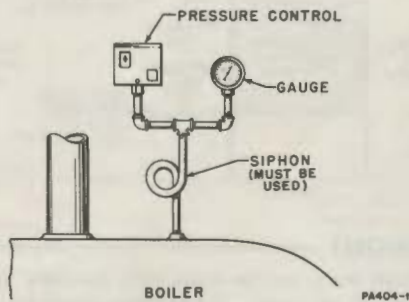


Fig. 1—Typical installation of the PA404A, mounted with a gage on a boiler.

*Trademark

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R. T.

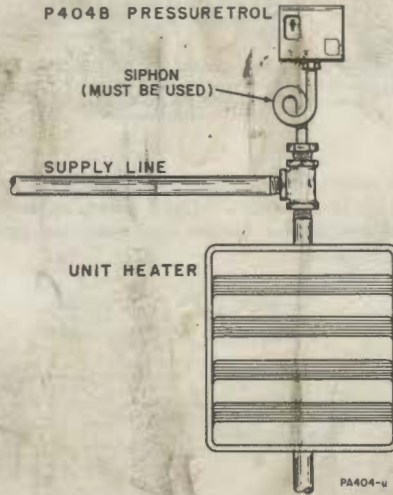


Fig. 2—Typical installation of the PA404B on the supply line of a unit heater.

PRESSURE GAGE MOUNTING (For PA404A):

To mount the Pressuretrol beside a pressure gage, ~~remove the pressure gage~~, install a siphon on the boiler with a tee on top, and mount the Pressuretrol and pressure gage using nipples and elbows. See Fig. 1.

BOILER MOUNTING (For PA404A):

If it is not convenient to mount the PA404A adjacent to the pressure gage, mount it at one of the other locations recommended by the boiler manufacturer. Screw a siphon into the boiler (Fig. 1) and screw the PA404A onto the siphon.

REMOTE MOUNTING:

On all installations where vibration is encountered, the Pressuretrol should be mounted away from the boiler or unit heater, on a solid mounting with a suitable piping connection between. When the Pressuretrol is located remotely from the boiler or unit heater, it must be installed at a slightly higher level than when mounted as shown in Figs. 1 and 2, and the piping must be properly pitched to drain all condensation back into the boiler or supply line.

CAUTION: A siphon must be used.

WIRING

All wiring must comply with local electrical codes.

CAUTION: Disconnect power supply.

All models are equipped with a terminal block located inside the cover. A wiring hole is provided for 1/2 inch rigid or flexible conduit.

See Figs. 3, 4, and 5 for typical connections.

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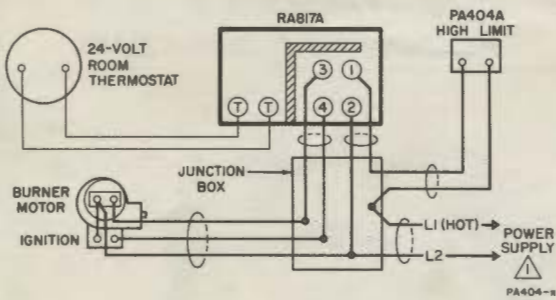


Fig. 3—Typical connections for a PA404A used as a high limit in an oil fired steam system.

⚠ Add disconnect means and overload protection as required.

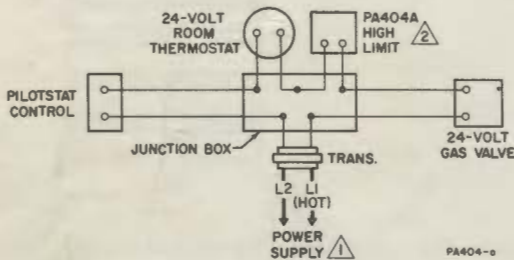


Fig. 4—Typical connections for a PA404A used as a high limit in a gas fired steam system. See note after Fig. 3.

⚠ Use approved safety circuit wiring.

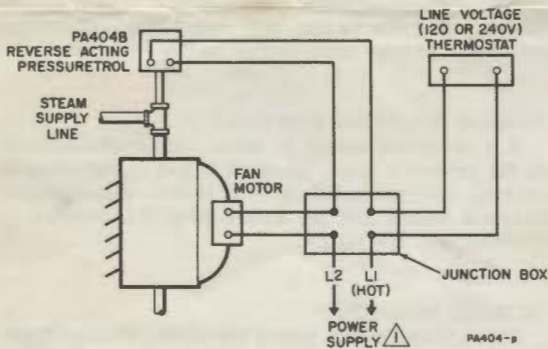


Fig. 5—Typical connections for a PA404B used in a unit heater installation. See note after Fig. 3.

SETTINGS

The PA404 differential is above the main scale set point. For example: With the main scale set point at 5 psi and the differential set at 2 psi—

The PA404A switch contacts break the electric circuit when pressure rises to 7 psi (set point plus differential); the pressure must then fall to 5 psi (main scale set point) before the switch contacts make the electrical circuit.

The PA404B switch contacts make the electrical circuit when pressure rises to 7 psi (main scale set point plus differential); the switch contacts break the electric circuit when pressure falls to 5 psi (main scale set point).

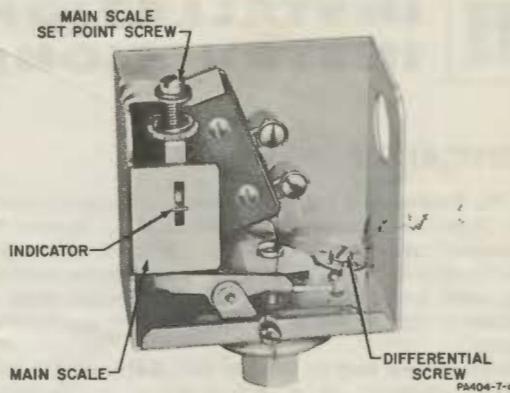
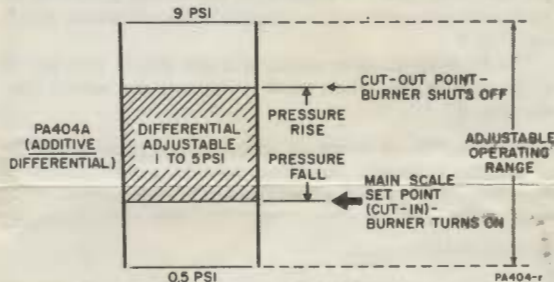


Fig. 6—Cover-off view of PA404, showing adjustment screws.

TO SET THE PA404A—

1. Set main scale indicator at desired cut-in point by turning main scale set point screw until indicator (See Fig. 6) corresponds to pressure at which electric circuit should make.

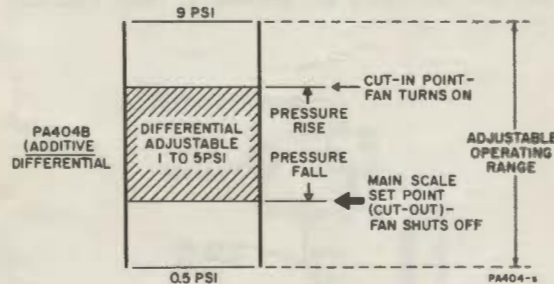
2. Set differential adjustment screw to number of pounds that pressure should rise above main scale cut-in point before the electric circuit breaks.



TO SET THE PA404B—

1. Set main scale indicator at desired cut-out point by turning main scale set point screw until indicator (See Fig. 6) corresponds to pressure at which electric circuit should break.

2. Set differential adjustment screw to number of pounds that pressure should rise above main scale cut-out point before electric circuit makes.



CHECKOUT

To make sure that the controller has been installed and adjusted properly, the system should be put into operation and the control action observed through at least one cycle. Further adjustments can then be made to provide for more exact requirements.

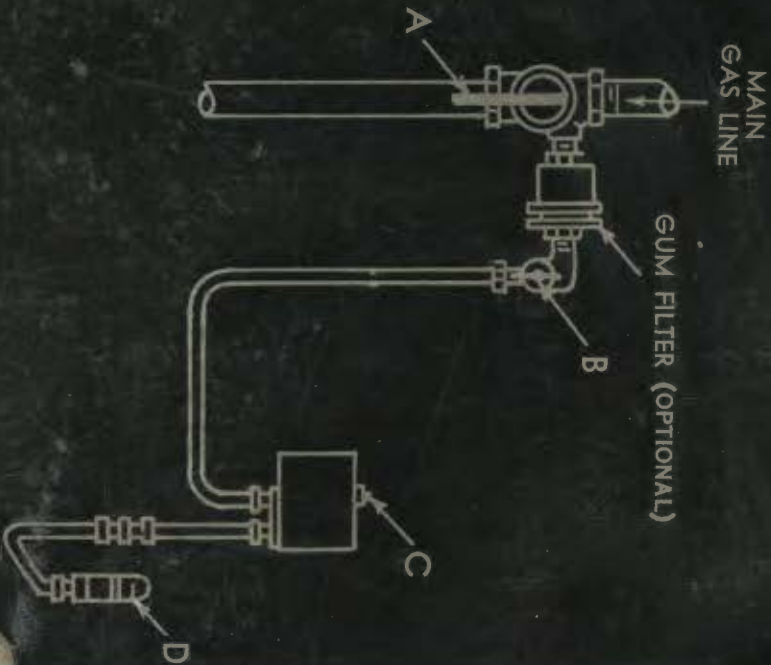
INSTRUCTIONS FOR SHUTTING OFF AND LIGHTING MANUAL IGNITION — 100% SHUTOFF

TO SHUT OFF:

1. CLOSE MANUAL SHUTOFF VALVE "A" AND PILOT VALVE "B".
2. TURN OFF SWITCH IN ELECTRIC LINE TO APPLIANCE.

TO LIGHT:

1. SET THERMOSTAT TO LOWEST TEMPERATURE.
2. BE SURE MANUAL SHUTOFF VALVE "A" AND PILOT VALVE "B" HAVE BEEN SHUT OFF FOR AT LEAST FIVE MINUTES BEFORE PROCEEDING.
3. OPEN PILOT VALVE "B".
4. PRESS PLUNGER "C" ON BASO AUTOMATIC PILOT SWITCH AND LIGHT PILOT "D". HOLD PLUNGER "C" FOR ONE MINUTE.
5. OPEN MANUAL SHUTOFF VALVE "A".
6. TURN ON SWITCH IN ELECTRIC LINE TO APPLIANCE.
7. SET THERMOSTAT TO DESIRED TEMPERATURE.





American-Standard

GAS BOILER



MAXIMUM W.P.
STEAM 15 LBS.
WATER 50 LBS.



REG. U.S. PAT. OFF.

MIN. RELIEF
VALVE CAP.

SERIES

BOILER

360 LBS/HR 33-42 6-407

A. G. A. RATINGS Btuh

NET I=B=R RATING

INPUT

OUTPUT

STEAM SQ. FT.

WATER Mbh

450000

360000

2125

313.0

EQUIPPED FOR

NAT

GAS

ELEC. CURRENT

115V. 60 CY.

INPUT LESS
THAN 12 AMPS.

PLUMBING AND HEATING DIVISION

AMERICAN RADIATOR & STANDARD SANITARY CORP. NEW YORK 18, N.Y.