

INSTALLATION & OPERATING INSTRUCTIONS

ESSEX

gas controls

47-9500-45

SX242NS, SX242LS,
SX242NSR, SX242LSR

SPECIFICATIONS

Automatic Operator — 24 VAC, 60 Cyc., .60 Amps.

Pressure Rating — 0.5 PSIG

Pressure Regulator — 3.0"W.C. — 4.5"W.C. Nat.
— 9.0"W.C. — 12.0"W.C. LP

Ambient Temperature — -40°F Min. to +175°F Max.

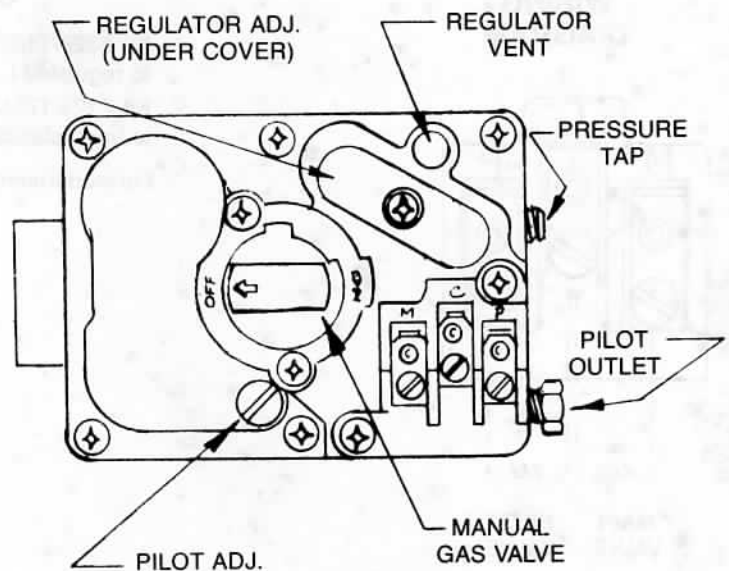
Mounting within 90° of vertical

Pressure Tap — 1/8 NPT

CAPACITIES: Based on 1000 BTU gas at 1.0" P.D.

1/2 x 1/2 & 1/2 x 3/4 = 260,000

3/4 x 1/2 & 3/4 x 3/4 = 280,000



OPERATION AND SERVICE

INSTALLATION

Use clean reamed pipe. Keep pipe grease away from first end thread.

LIGHTING INSTRUCTIONS

1. Turn off Manual Gas Valve.
2. Turn Thermostat off or to lowest setting.
3. Wait five (5) minutes.
4. Turn on Manual Gas Valve.
5. Set Thermostat to desired temp.

SHUT-DOWN INSTRUCTIONS

(To turn off Main Burner only)

1. Turn Thermostat off or to lowest setting.

COMPLETE SHUT-DOWN

1. Turn off Manual Gas Valve.
2. Turn Thermostat off or to lowest setting.

TO ADJUST PILOT

Remove the seal cap from the pilot adj. and adjust the set screw until desired pilot burner flame characteristics are obtained. Replace the seal cap and gasket.

PRESSURE REGULATOR

1. The Pressure Regulator is factory set to the furnace manufacturer's specifications.
2. **RESETTING** where necessary **SHOULD BE DONE BY A QUALIFIED SERVICE MAN.** Pressure must be set in accordance with the furnace manufacturer's specifications.
 - a. Before removing Pressure Tap Plug to check gas pressure be sure Manual Gas Valve is in the off position.
 - b. Do not attempt to adjust the regulator when the inlet pressure to the control is **LESS THAN** the specified manifold pressure plus 1.6" W.C. e.g. Manifold pressure 3.5" W.C. + 1.6" W.C. = 5.1" W.C.

ESSEX GROUP



Subsidiary of

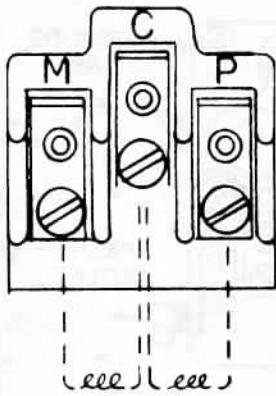
UNITED TECHNOLOGIES.

CONTROLS DIVISION

P.O. BOX 112, AUBURN DRIVE, AUBURN, IN 46706, (219) 925-2461

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WIRING DIAGRAM



MAIN VALVE PILOT VALVE

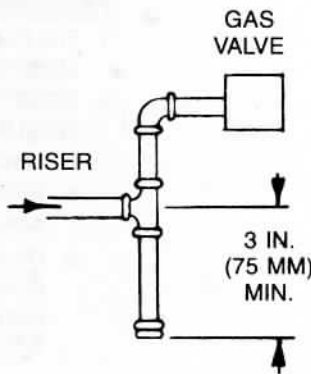
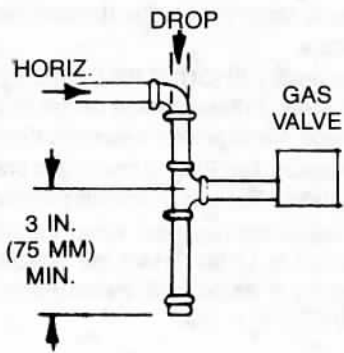
CONVERSION KITS

1. Kit #329-11054-101 for converting model SX242NS to regulated L.P.*
 2. Kit #329-17113-101 for converting model SX242NS to unregulated L.P.
- * For model numbers having "R" suffix consult factory.

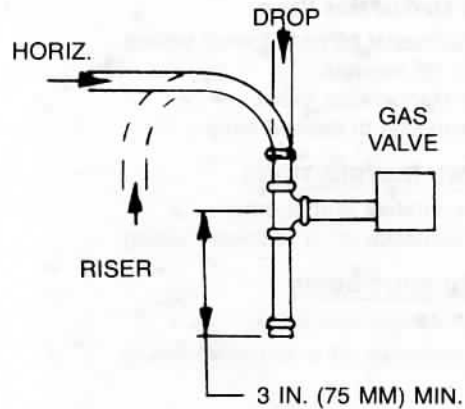
SEDIMENT TRAP

Sediment traps may be required by local code. A sediment trap such as those suggested below should always be used to prevent foreign material from entering the gas control.

PIPED GAS SUPPLY



TUBING GAS SUPPLY



GENERAL INFORMATION

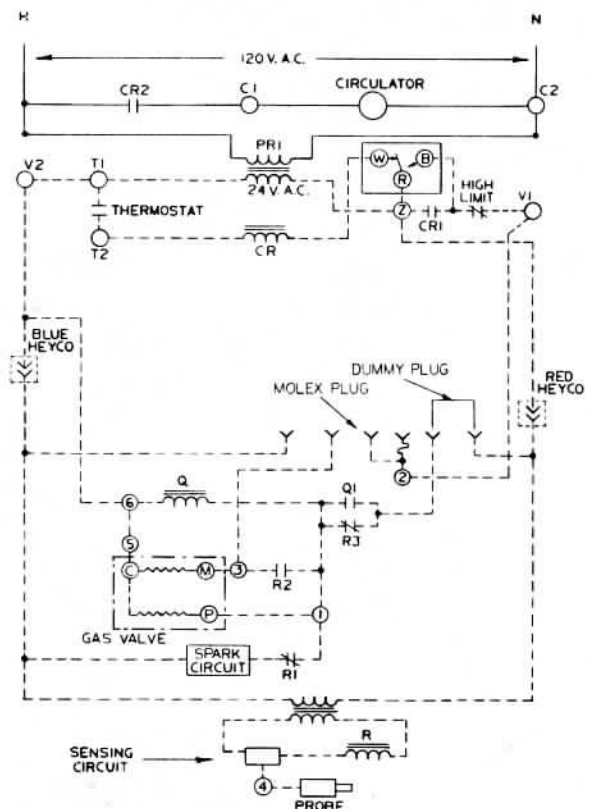
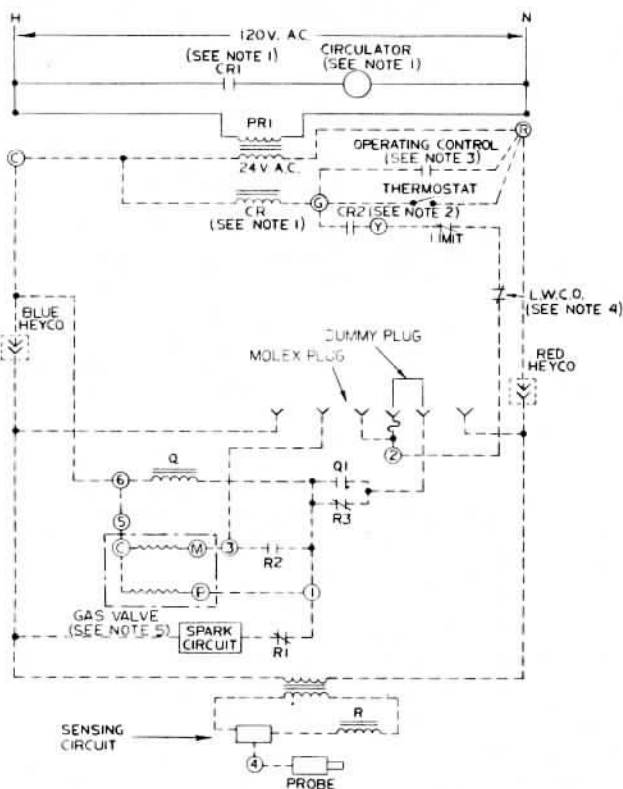
The Weil-McLain Type PI Intermittent Ignition Electronic Pilot System is designed for use with Types P-CG, CGM, and EG natural gas-fired boilers, with or without Automatic Vent Damper and only with system components shipped with the boiler from the factory.

CAUTION: The Weil-McLain Type PI System is not offered for retrofit or conversion installations. Any attempt to apply PI system components to boilers shipped for use with a different control system can void the boiler warranty.

**SCHEMATIC LADDER WIRING DIAGRAMS
WITHOUT VENT DAMPERS**

**FOR TYPES P-CG, CGM, AND EG BOILERS.
FORCED HOT WATER WITHOUT HEATER,
STEAM WITH OR WITHOUT HEATER,
GRAVITY HOT WATER.**

**FOR TYPE EG BOILERS.
FORCED HOT WATER
WITH TANKLESS HEATER.**



- NOTES:**
1. Use with forced water system.
 2. For gravity or steam system, limit switch is connected to Terminal "G".
 3. For steam system with tankless heater.
 4. Only standard control with steam system.

THERMOSTAT HEATER SETTING

Forced Water System 1.0 Amps
Gravity and/or Steam 0.6 Amps

THERMOSTAT HEATER SETTING

0.25 Amps

— HIGH VOLTAGE - - - - LOW VOLTAGE

Figure 1

The Type PI System is not available for use with Weil-McLain propane gas-fired boilers.

An automatic vent damper can be used only with the Type PI System. The automatic vent damper is not designed for and cannot be furnished without the PI option.

TROUBLESHOOTING PROCEDURE

A. Preparation.

Tables I, II, and III apply to PI Systems without vent damper. Tables IV, V and VI apply to PI Systems with the vent damper.

Before starting the trouble shooting procedure, be sure of the following:

1. You have a voltmeter capable of checking 120 Volts AC, 24 Volts AC and Microamperage with a minimum scale range of 0-25.
2. That 120 Volt AC power supply is available to the boiler (minimum 102 VAC, maximum 132 VAC).
3. That there is 24 Volt AC at the secondary side of the control transformer.

B. MEASURING FLAME SIGNAL

Set up microammeter to measure the output current in the flame sensor circuit as follows:

1. Detach the flame sensor lead from Terminal 4 on the G60 Control. Terminal 4

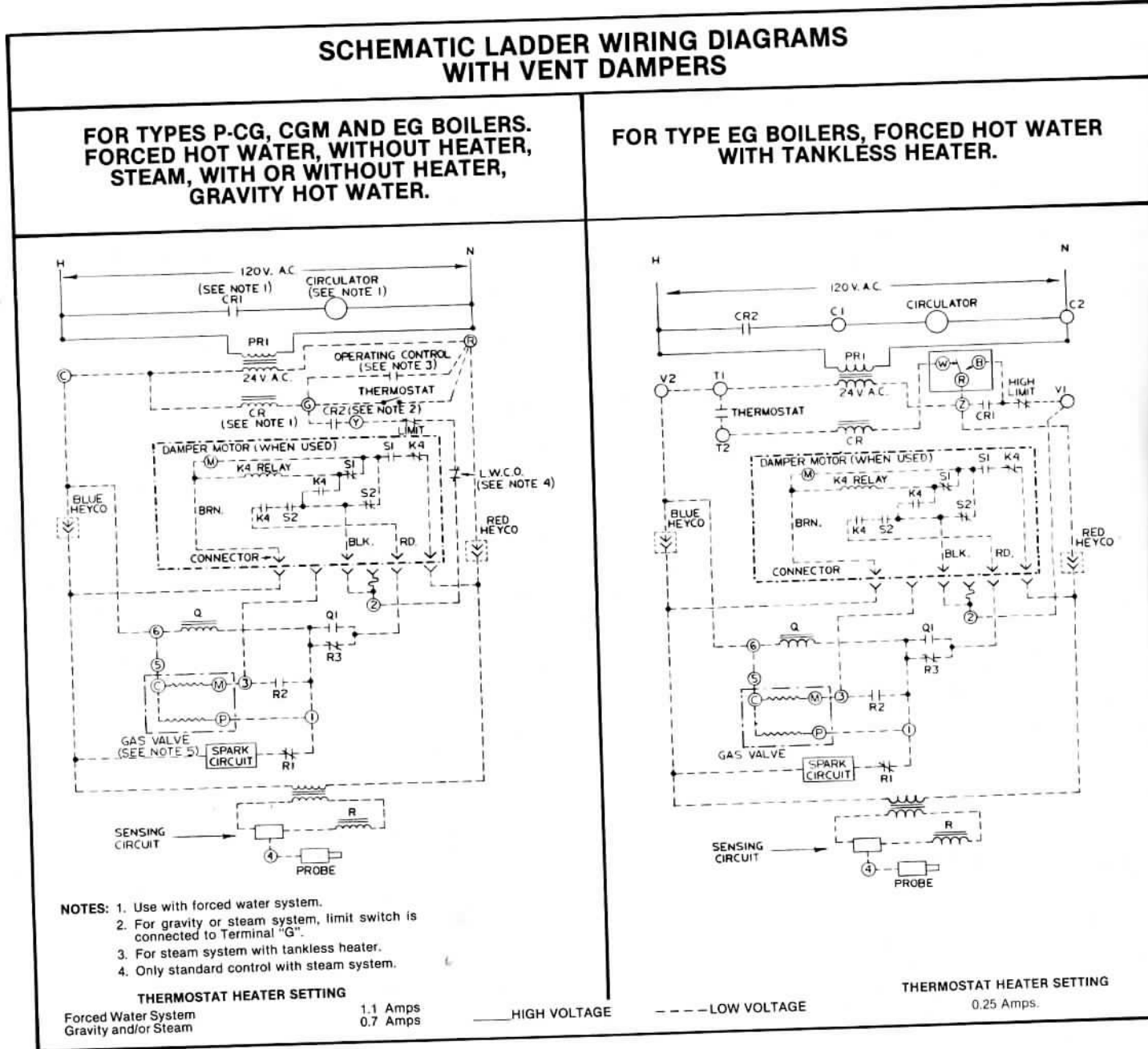


Figure 2

2. Attach the positive microammeter lead to Terminal 4 on the G60 Control.
3. Attach the negative microammeter lead to the spade receptacle at the end of the flame sensor lead.
4. Make sure the spade receptacle with microammeter lead attached does not connect any metallic surfaces. If this happens, a loss in flame signal will occur.
5. Energize the system. The spark should ignite the pilot. As soon as the pilot is burning, the

sensing probe should read 0.7 microamp or higher.

6. If the flame sensor produces a flame signal less than 0.7 microamp, increase or decrease the pilot flame size by adjusting the natural gas supply pressure.
7. After the proper flame signal of 0.7 microamps has been secured, de-energize the system and remove the meter test leads from the system components.
8. Reconnect the flame sensor space receptacle to Terminal 4 on the G60 Control.

TABLE I, Without Vent Damper

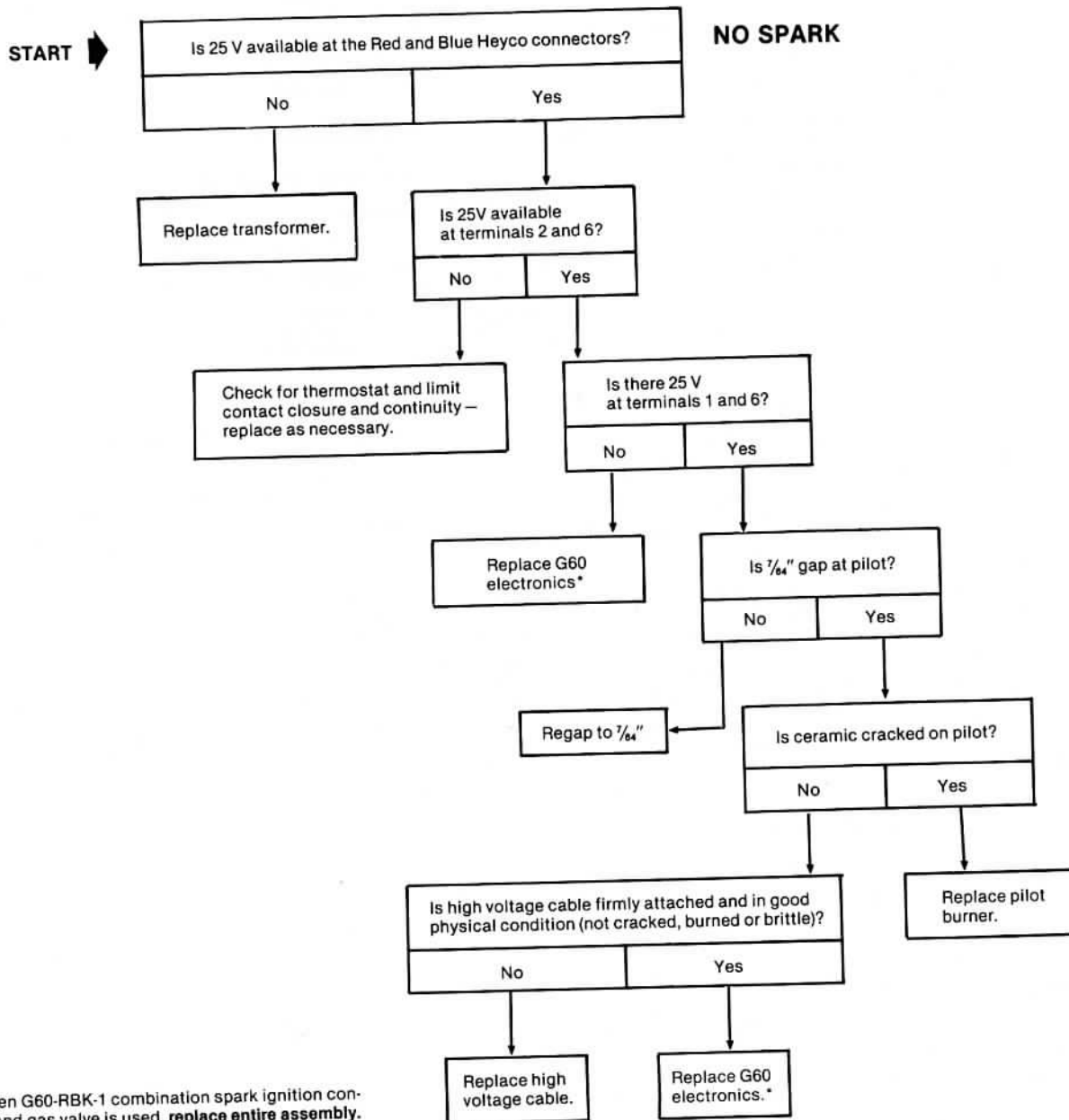


TABLE II, Without Vent Damper

SPARK IS PRESENT, PILOT WILL NOT LIGHT

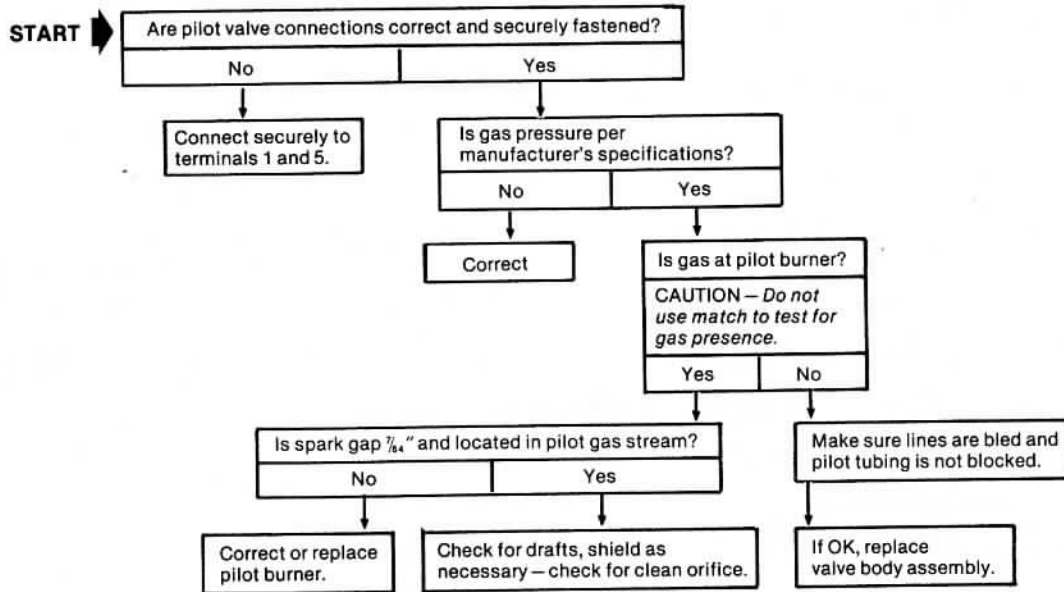
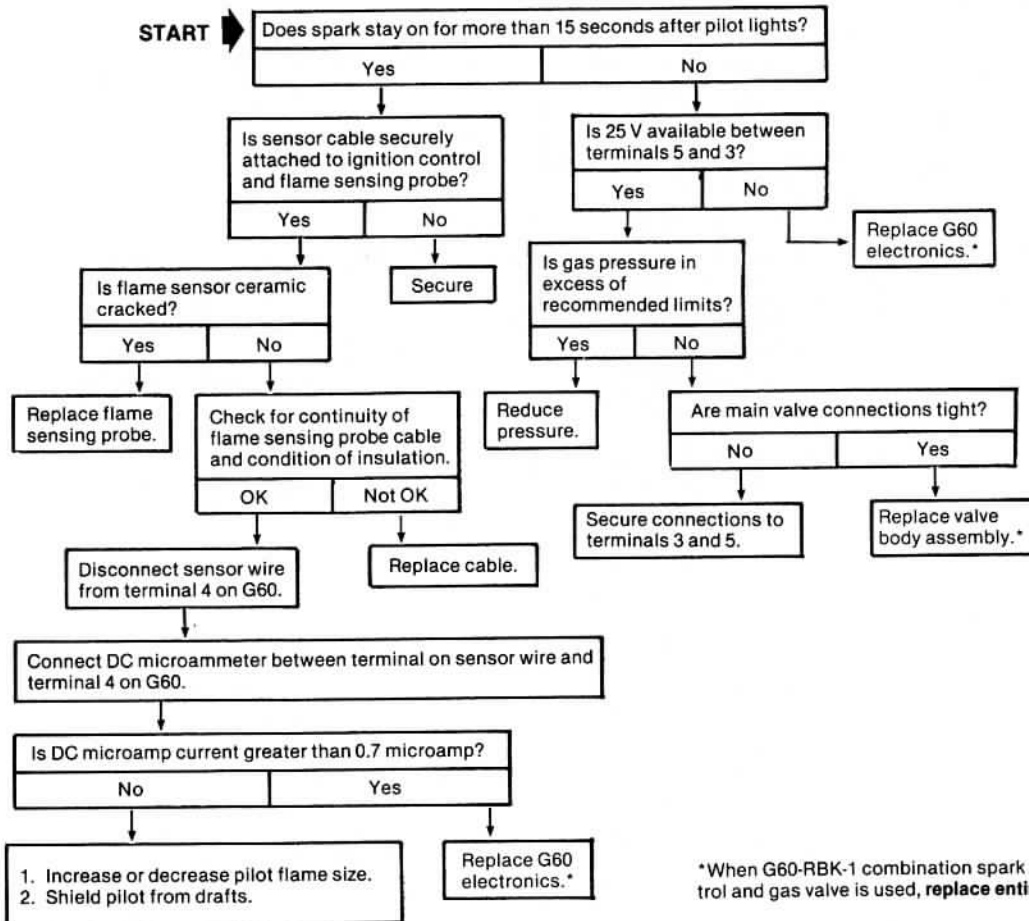


TABLE III, Without Vent Damper

PILOT LIGHTS, MAIN VALVE WILL NOT COME ON



*When G60-RBK-1 combination spark ignition control and gas valve is used, **replace entire assembly.**

TABLE IV, With Vent Damper

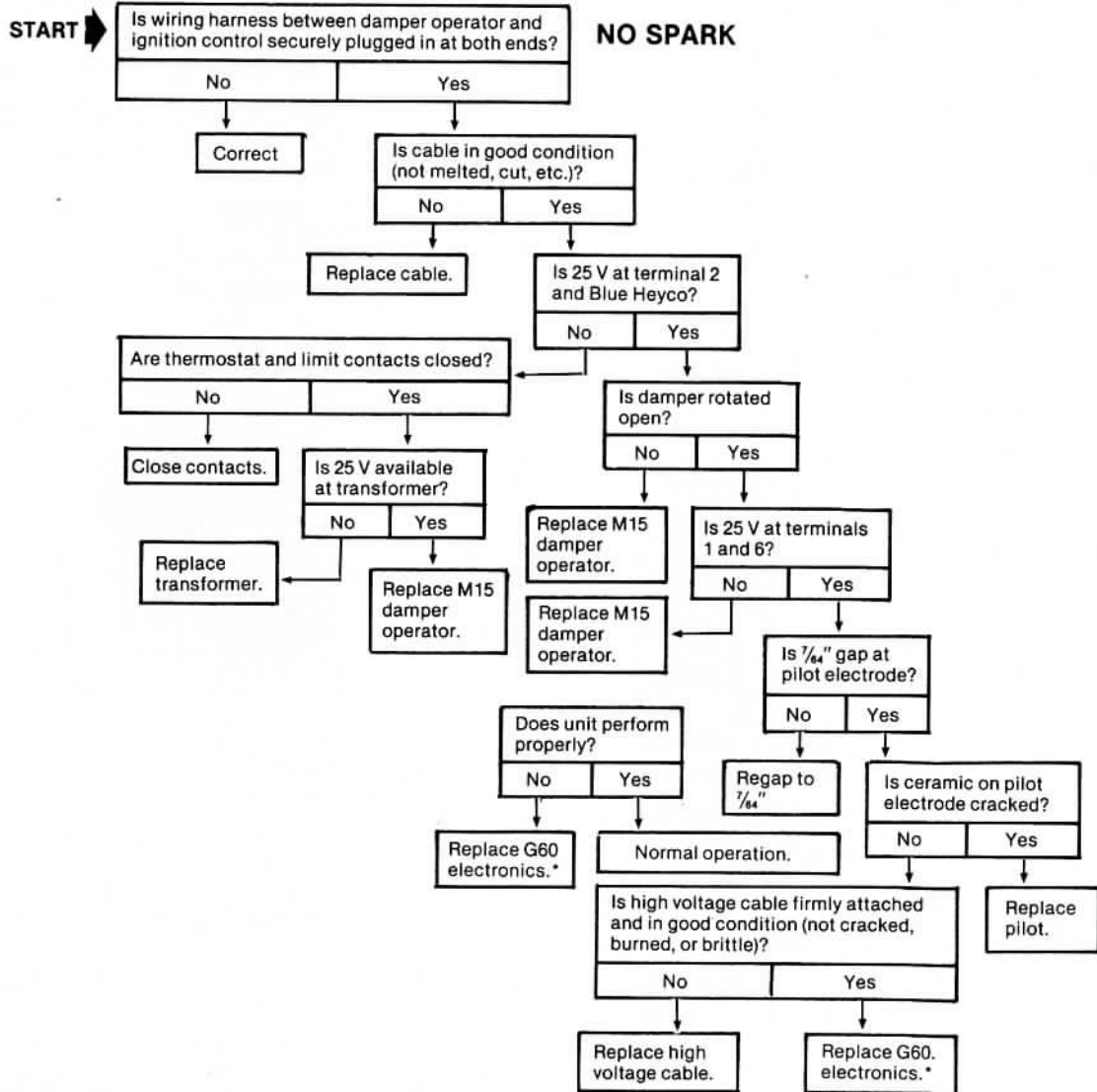
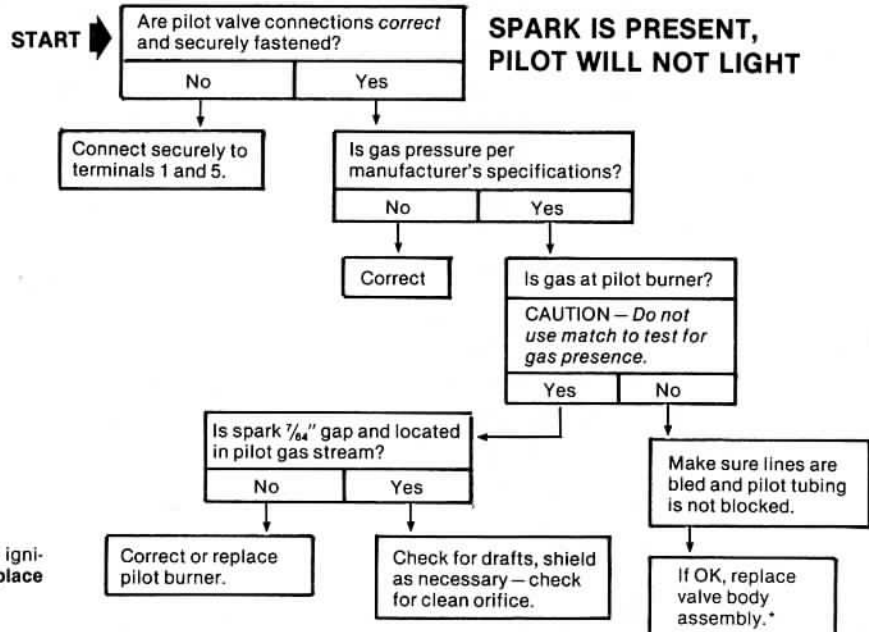
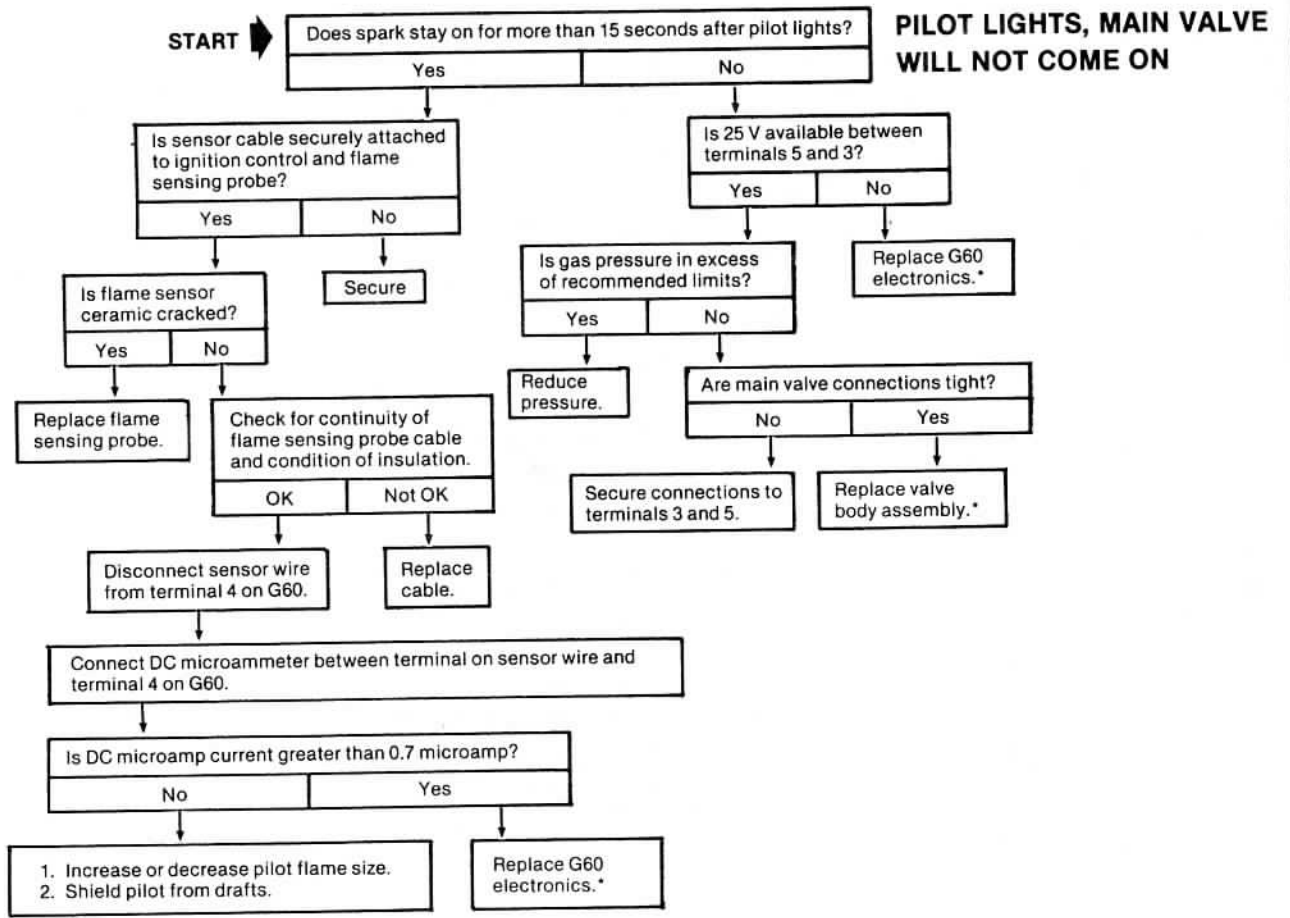


TABLE V, With Vent Damper



*When G60-RBK-1 combination spark ignition control and gas valve is used, **replace entire assembly.**

TABLE VI, With Vent Damper



*When G60-RBK-1 combination spark ignition control and gas valve is used, **replace entire assembly.**

**AUTOMATIC SPARK IGNITION AND AUTOMATIC FLUE DAMPER
FOR TYPES P-CG-PI, CGM-PI AND EG-PI BOILERS
— FOR USE WITH NATURAL GAS ONLY —**

BEGINNING NOTE: The G60-RBK-1 is a combination ignition control and gas valve. This control is factory mounted and wired on all PCG/CGM-3 thru 6-PI boilers and is field installed on all EG-35 thru 50-PI boilers (see page 3).

The G60-PAK-1 is the ignition control only. The gas valve is mounted separately. This control is factory mounted on all PCG/CGM-7 thru 8-PI boilers and is field installed on all EG-55 thru 75-PI boilers. Pre-drilled mounting holes are provided on the inside jacket panel for mounting the G60-PAK-1 ignition control (see page 3).

IGNITION CONTROL (where field installed)

G-60-RBK-1 is the combination ignition control and gas valve.

G-60-PAK-1 is the ignition control box only.

- I. Erect the boiler following standard erecting instructions.
- II. Mount the G-60-RBK-1, or the gas valve when the G-60-PAK-1 is used, to the gas manifold. The arrow on the gas valve, or portion of the G-60-RBK-1 that is the gas valve, should point in the direction of gas flow.
- III. For G-60-RBK-1, attach pilot tubing to tapping at either side of gas valve. Do not use tapping marked "Press. Tap." For G-60-PAK-1, remove compression fitting from the tapping at the bottom of gas valve and use this fitting and tapping to attach pilot tubing.
- IV. Refer to wiring diagram No. 550-224-030 for type EG Water Boilers with tankless heater or to No. 550-224-026 for all other boilers.

FLUE DAMPER

- I. If flue damper was ordered, it will be shipped loose in separate carton.
- II. Position the damper directly on top of draft diverter (see Page 3) with the arrow stamped on damper pointing straight up. Make sure the blade position indicator is in a visible location following installation.

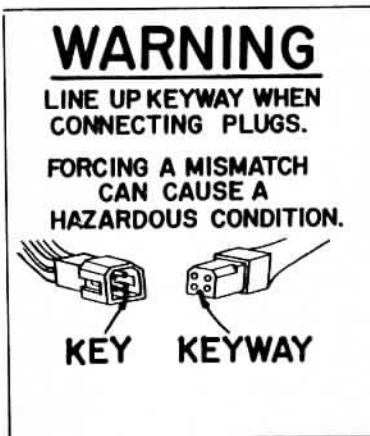
NOTE: A minimum clearance of 6" between the damper device and combustible construction must be maintained. The clearance from the jacket top to combustible ceiling must be a minimum of 40 inches on CG-PI boilers, 46 inches on all EG-PI boilers.

CAUTION: Modifying the draft diverter or damper device will void the A.G.A. Certification.

Where screws or rivets are used to secure the damper to the draft diverter, they must not interfere with the free movement of the damper blade.

- III. Route the wiring harness cable from the damper operator to spark ignition control. Wiring between damper motor and boiler jacket must be in metal conduit.

CAUTION: Keep wiring harness cable clear of all hot surfaces.



- IV. Place female plug end of special wiring harness through conduit hole in the damper operator and plug into the damper operator male terminal. The plug connection must remain inside the enclosure. Secure wiring in place with the strain relief connector provided on harness cable.
- V. Remove dummy plug (if in place) from receptacle on spark ignition control. Run male plug end of harness through hole in boiler jacket top and plug into ignition control. Secure wiring in place with strain relief connector provided on harness cable.
- VI. On all boilers the appropriate operating instruction plate must be attached to the front interior jacket panel: Either Part No. 550-141-309 "Operating Instructions for Boilers with Intermittent Ignition" or Part No. 550-141-310 "Operating Instructions for Boilers with Flue Damper and Intermittent Ignition".

CAUTION: Once damper is installed, if either of the wiring harness plugs are disconnected system safety shut-down will occur. Boiler will not operate further until the plug is re-connected.

CHECKOUT PROCEDURE

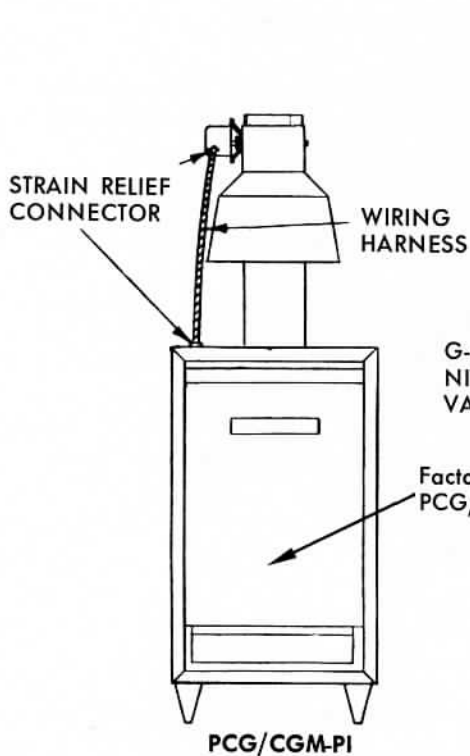
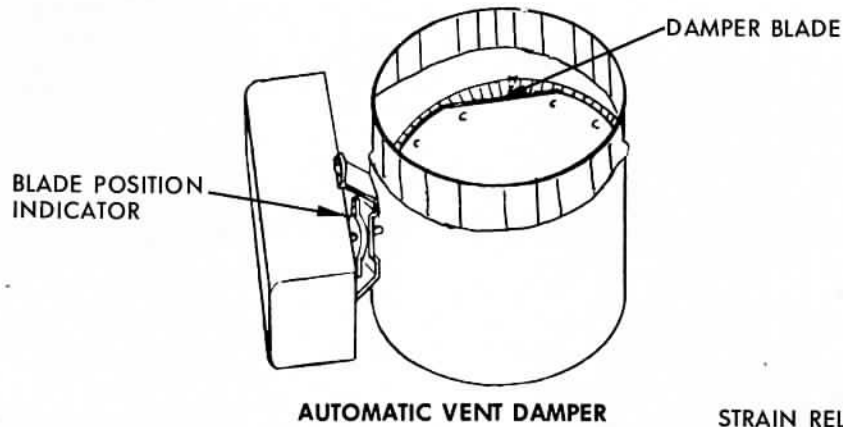
Before leaving the installation, observe three operating cycles using the thermostat to see that all components are functioning properly.

TO PLACE IN OPERATION:

- I. Turn room thermostat to a high setting so the contacts close (call for heat). The damper operator will slowly open the damper. The damper position can be determined by the white indicator on the shaft (see Page 3).
- II. When the damper is fully open, the ignition control will ignite the pilot burner. When the pilot is proven, main gas valve will open and main burners will ignite.

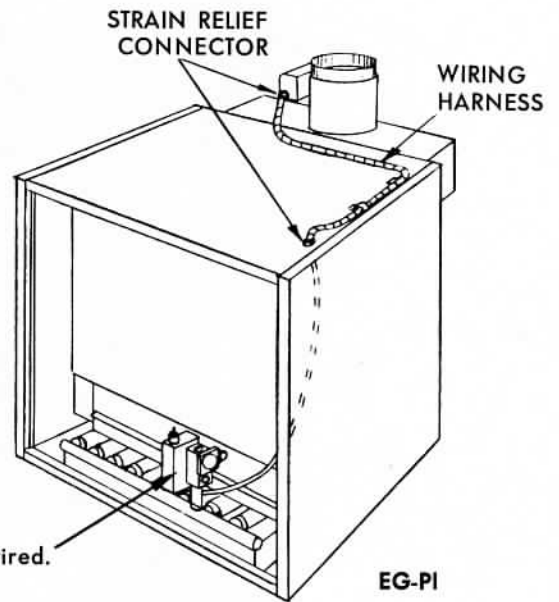
CAUTION: Damper must be fully open before the ignition control will light pilot gas.

- III. Turn thermostat to a low setting to open the contacts. The pilot and main burner flames will extinguish after which the damper operator closes the damper.
- IV. Repeat this checkout cycle two more times to be sure operation is as indicated above.
- V. Return thermostat to the normal setting.
- VI. Set thermostat heater to the setting indicated in wiring diagram notes.
- VII. Ensure the proper wiring diagram is attached to the inside of the jacket door panel.

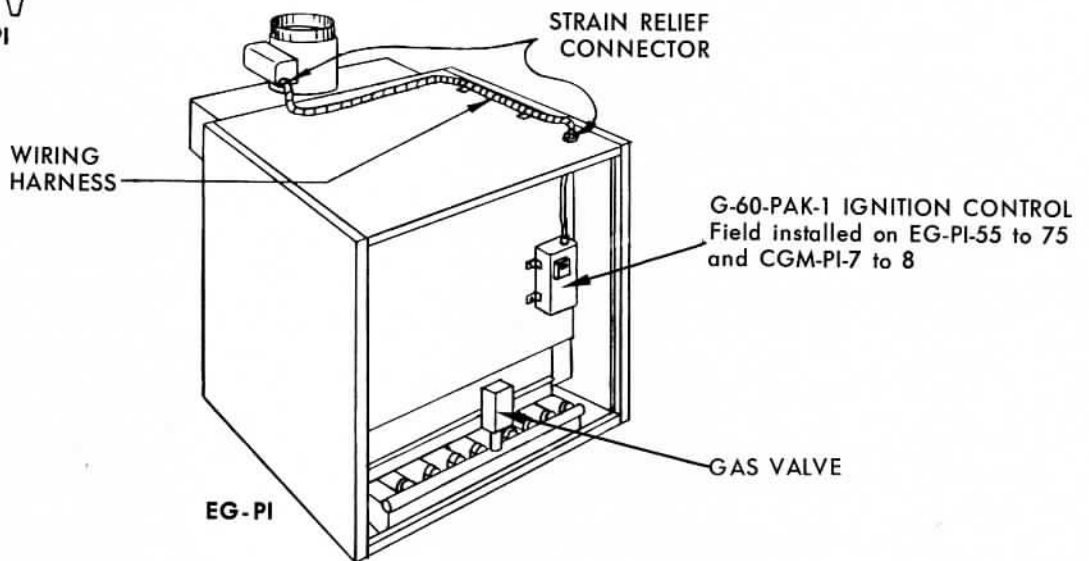


G-60-RBK-1 COMBINATION IGNITION CONTROL AND GAS VALVE

Factory installed and wired.
PCG/CGM-PI-3-6



Field installed and wired.
EG-PI-35 to 50



NOTE:

Damper must be installed directly on top of drafthood. No other connection can be made between drafthood and damper or the boilers A.G.A. certification and Weil-McLain Warranty will be voided.

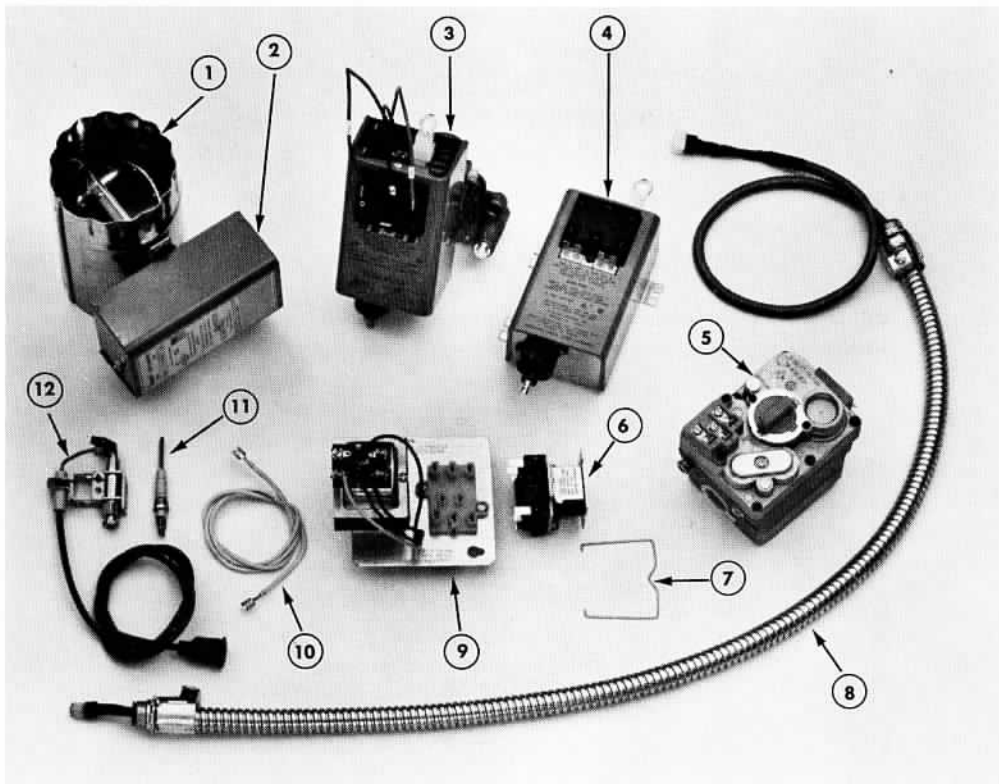
PARTS LIST

Warning: The Weil-McLain Type PI Intermittent Ignition Electronic Pilot System is not designed for retrofit or conversion installations.

These components are intended for repair and in-warranty servicing of factory built PI Systems only and must not be used for retrofit.

Any attempt to apply the system components to boilers which were shipped from the Weil-McLain factory with a different control system can void the warranty. Weil-McLain recommends that retrofit or conversion applications be accomplished by a thoroughly trained and bonded heating contractor.

TYPE PI — PARTS DESCRIPTION FOR P-CG, CGM, and EG NATURAL GAS-FIRED BOILERS



Item No.	Weil-McLain Part No.	Manufacturer		Description
		Name	Part No.	
1	510-512-315	Penn	Q19BM-3, 4"	Automatic Vent Damper and operator, 4" dia., Used With P-CG-3 and CGM-3 Boilers.
1	510-512-316	Penn	Q19BN-3, 5"	Automatic Vent Damper and operator, 5" dia., Used With P-CG-4, CGM-4, and EG-35 Boilers.
1	510-512-317	Penn	Q19BP-3, 6"	Automatic Vent Damper and operator, 6" dia., Used With P-CG-5, P-CG-6, CGM-5, CGM-6, EG-40, and EG-45 Boilers.
1	510-512-318	Penn	Q19BQ-3, 7"	Automatic Vent Damper and operator, 7" dia., Used With CGM-7, CGM-8, EG-50, and EG-55 Boilers.
1	510-512-320	Penn	Q19AE-1, 8"	Automatic Vent Damper and operator, 8" dia. Used With EG-65, and EG-75 Boilers.
2	510-312-255	Penn	M15AC-1	Automatic Vent Damper Operator.
3	511-044-280	Penn	G6ORBK-1	Combination Electronic Proven Pilot — Spark Ignition Control and Redundant Gas Control Valve, 1/2" N.P.T. x 1/4" N.P.T. Used With P-CG-3 thru P-CG-6, CGM-3 thru CGM-6, and EG-35 thru EG-50 Boilers.
4	511-330-101	Penn	G60PAK-1	Electronic Proven Pilot — Spark Ignition Control. Used With CGM-7, CGM-8, and EG-55 thru EG-75 Boilers.
5	511-044-210	Essex	SX242ST	Redundant Gas Control Valve Combination, 3/4" N.P.T. x 3/4" N.P.T. Used With CGM-7, CGM-8 and EG-55 thru EG-75 Boilers.
5	511-044-262	Honeywell	VR844M	Redundant Gas Control Valve Combination, 3/4" N.P.T. x 3/4" N.P.T. Used With CGM-7, CGM-8 and EG-55 thru EG-75 Boilers.
6	510-350-223	Essex	91-322000-11000	Plug-In Relay, DPST, 24 Volt Holding Coil. Used with forced hot water boilers without tankless heaters only.
7	—	Essex	—	Wire Clip for Plug-In Relay.
8	591-391-795	Penn	Y84ABB	Wiring Harness, connects M15 Automatic Vent Damper Operator to G60 Control.
9	510-312-164	White Rodgers	S84-66	Combination Transformer-Relay Receptacle, 120 Volt/24 Volt, 40 VA.
10	511-724-266	Penn	Y57-HH-30	Sensing Probe Wire with spade receptacles.
11	511-724-265	Penn	Y75AA-2	Sensing Probe.
12	511-330-100	Penn	J994DYW-6721	Combination Safety Pilot Burner, Ignition Electrode, and Ignition Cable.

WEIL-McLAIN Michigan City, Indiana 46360 • A Marley Company