

P47 Series Steam Pressure Limit Controls

Application

The P47 controls are designed for high limit, cutout, or operating control applications. When used as a limit or cutout control, the P47 is intended primarily to limit the pressures in steam heating systems.

The controls which OPEN on a pressure increase are for use on high limit, cutout, or operating applications.

The controls which CLOSE on a pressure increase are typically used to deenergize a unit heater blower when the steam pressure is below that required for adequate heating.

The 4-wire, two-circuit models (P47GA) have two separate sets of contacts. The main load contacts (LINE-M2) open on pressure increase and simultaneously the auxiliary circuit (LINE-M1) closes. These models may be used to limit steam pressures and energize an alarm indicator.

The SPDT models (EA and FA) may be used on open high or close high applications, and may also be used to control 3-wire, two position valves or dampers.

The controls with the lockout feature require manual reset to reclose the circuit and can only be reset after the pressure normalizes. The reset is "trip-free" and will not permit restart until the reset lever has been pushed and released.

The P47 controls may also be used for air and non-combustible gas or liquid applications which are not harmful to iron, copper, or brass. Do not install where ambient temperature exceeds 140°F (60°C) or falls below -30°F (-34°C).

CAUTION: Risk of equipment damage. Never exceed the maximum overpressure for the control. Refer to the table below to determine the maximum overpressure.

Control Range psig (kPa)	Maximum Overpressure psig (kPa)
0 to 15 (1 to 100)	50 (345)
20" Hg. Vac. to 50 (-70 to 350)	180 (1240)
0 to 150 (0 to 1000)	300 (2069)
50 to 240 (500 to 1500)	300 (2069)
175 to 425 (1200 to 2930)	540 (3720)

Installation

Mounting

1. Mount the control to the boiler tap above the water level. Be sure there is no shutoff between the control and the boiler. (Usually there is a tap for mounting the control and/or a pressure gauge on top of the boiler.)
2. Connect the siphon (when required) between the boiler and the control so live steam does not enter the bellows corrugation. (A siphon is not supplied as standard with 0 to 15 psig [0 to 103 kPa] range controls.)
3. The P47 control must be mounted to a tap separate from the pressure gauge or other devices. Refer to Fig. 2 for typical P47 mounting.
4. If the control is not mounted on the boiler, anchor the control by two mounting holes in the back of the case using the screws supplied. Make certain the connecting pipes to the boiler are installed at a slight angle to permit condensate to drain through the siphon back into the boiler.
5. Put a small amount of pipe dope or thread sealing tape on the male threads.
6. To tighten the pressure connection, use a wrench on the hexagonal flats of the bellows pressure connector.

IMPORTANT: Do not tighten the connection by grasping the control case and turning. Never use a pipe wrench on the bellows cup.

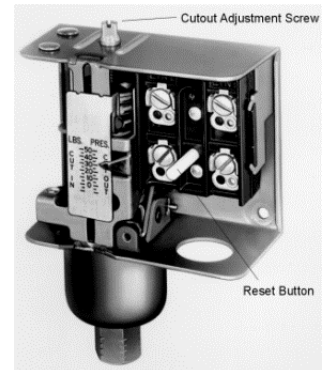


Fig. 1 -- Interior view of two-pole pressure control with manual reset

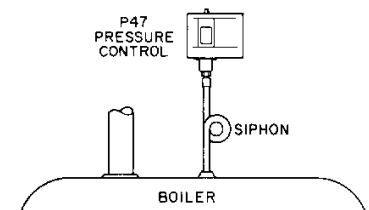


Fig. 2 — Typical mounting arrangement.

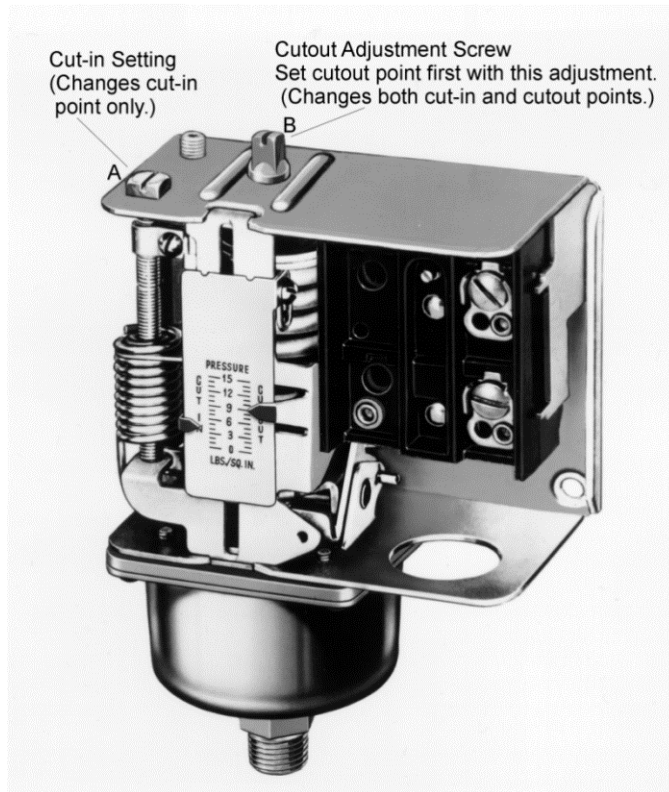


Fig. 3 -- Interior view of P47AA (open-high control)

Note: If the boiler manufacturer recommends a specific mounting location for the pressure control, follow the manufacturer's mounting recommendations.

All wiring must conform to the local, national, and regional regulations. Do not install the control on electrical loads in excess of the rating that is listed on the inside of the control cover. Use copper conductors only.

Wiring

⚠ WARNING: Risk of electrical shock.
Disconnect the power supply before mounting and wiring to prevent possible electrical shock. On multiple circuit units, more than one circuit may have to be disconnected.

IMPORTANT: Use the terminal screws furnished in the switch (8-32 x 1/4 in.). Longer terminal screws can interfere with the switch mechanism and damage the switch.

⚠ CAUTION: Risk of equipment damage.
Disconnect the power supply before mounting and wiring to prevent possible equipment damage. On multiple circuit units, more than one circuit may have to be disconnected.

Refer to Figures 8 and 9 for the SPDT wiring hookups on EA and FA types. The red terminal is common, the red to yellow circuit closes on pressure increase, and the red to blue circuit opens on pressure increase.

See Figures 4-7 for wiring hookups on other P47 models.

Adjustment

Figure 3 illustrates open-high models. On open low models, adjusting screw "A" raises or lowers the cut-in point (this also raises or lowers the cutout point by a like amount). Set the cut-in point first using adjusting screw "A." Cutout adjusting screw "B" changes the cutout point only.

Checkout Procedure

Before leaving the installation, observe at least three complete operating cycles to be sure that all components are functioning correctly.

Test the limit switch function to be sure the system shuts down when the limit contacts open.

Repairs and Replacement

Field repairs must not be made except for replacement of the knob and cover. For a replacement knob or cover, contact the nearest Johnson Controls distributor.

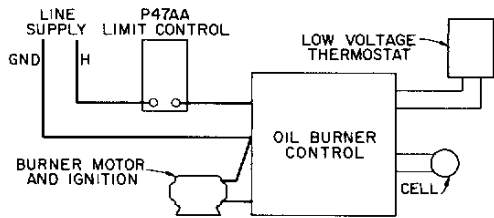


Fig. 4 — Typical wiring diagram showing a P47AA SPST control wired into an oil burner circuit.

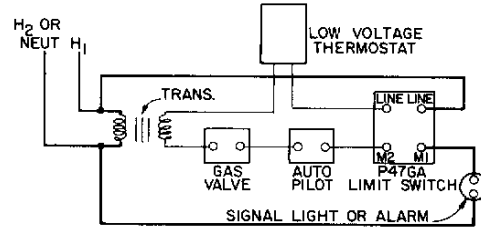


Fig. 7 — Typical wiring diagram showing a P47GA 4-wire control wired into a gas burner circuit with alarm or signal circuit incorporated.

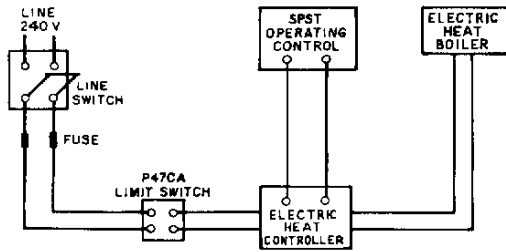


Fig. 5 — Typical wiring diagram showing a P47CA wired into an electric heat steam boiler circuit.

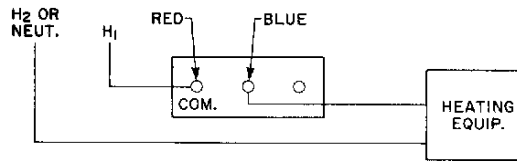


Fig. 8 — Typical wiring diagram showing a P47EA SPDT control wired for heating application (high limit).

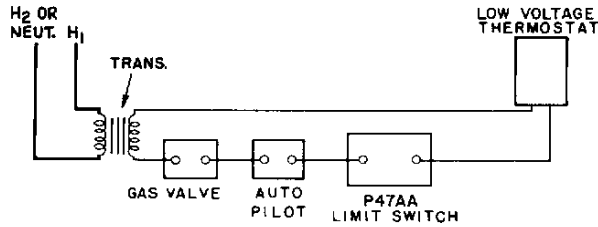


Fig. 6 — Typical wiring diagram showing a P47AA SPST control wired into a gas burner circuit.

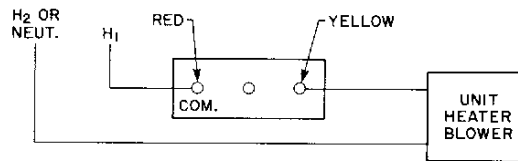


Fig. 9 — Typical wiring diagram showing a P47EA SPDT control for low limit applications.

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