

# SUPER TRADELINE

RA117A PROTECTORELAY  
OIL BURNER CONTROL

## APPLICATION

The RA117A stack-mounted oil primary control provides line voltage switching of interrupted ignition burners (formerly called intermittent ignition burners). Used with a Honeywell series 10, 3-wire thermostat; any 24 V, 2-wire thermostat; or any line volt thermostat or controller. The thermostat heat anticipator setting must be adjusted to 0.4 A for 24 V thermostats only.

If the burner fails to ignite during startup, a safety switch

trips and locks out the burner system. To restart, the safety switch must be reset manually. If the burner flame goes out during burner operation, the Protectorelay locks out unless the flame is reestablished within the 75 second (nominal) safety switch timing. If the power supply fails, the control returns to the starting position, ready to restart when power is restored.

The RA117A is designed to replace many existing controls (refer to Table 1). Ensure the electrical ratings and element insertion length are suitable before installing.

TABLE 1—RA117A CROSS REFERENCE

HONEYWELL	WHITE RODGERS	GENERAL ELECTRIC	GENERAL PERFEX
R116A,B	602	A101A2	5200
R117A	603	A101B2	5230
R123A,B	610-2	CR7856	5520
R124A,B	610-32		5525 <sup>c</sup>
R134A	611-1		
R168A	611-31		
R494A	615		
RA116A,B	6L18		
RA117A			
RA416A			
RA816A			
RA817A,C			
RA817A,C <sup>b,c</sup>			

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DELCO	PENN	ITT GENERAL	MERCOID	DETROIT
COA	664	5200	JM	CA701 <sup>a</sup>
COA-1	670	R96A102A	JM1	CA702 <sup>a</sup>
	672	R96G102DC		
	680			
	682			

<sup>a</sup> A Detroit 3-wire thermostat must be replaced by a 2-wire thermostat with a suitable heat anticipator.

<sup>b</sup> When replacing a model having an F or O terminal to power a clogged filter indicator light, provide a separate transformer for the light.

<sup>c</sup> Do not use RA117A to replace this control where timed ignition is required for a wall-flame burner.

## INSTALLATION

### WHEN INSTALLING THIS PRODUCT...

1. Read these instructions carefully. Failure to follow them could damage the product or cause hazardous condition.

2. Check the ratings given in these instructions and on the product to ensure the product is suitable for your application.

3. Ensure the installer is a trained, experienced service technician.

4. After completing installation, use these instructions to check product operation.

## CAUTION

- Do not bend contact arms or stops on the Pyrostat detector mechanism or make any adjustments other than those given in the instructions.
- Remove the cardboard packing behind the drive shaft lever by pushing the packing up and pulling it straight out over the top of the lever. Do not remove packing by pulling sideways.
- Ensure all wiring complies with applicable codes and ordinances.

If mounting instructions are supplied by the furnace, boiler, or burner manufacturer, follow their recommendations carefully. Where no instructions are furnished, proceed as follows.

### MOUNTING (Refer to Fig. 1)

Follow the mounting instructions supplied by the furnace, boiler, or burner manufacturer, if available. Otherwise, use the instructions provided below.

When replacing one of the controls listed above, identify each leadwire as it is removed from the old control by marking the wire with the number of the RA117A terminal to which it will be connected. Refer to Table 2 to translate the old terminal identifications to the new RA117A terminal identifications.

TABLE 2—IDENTIFYING TERMINALS FOR RA117A REPLACEMENT.

TERMINAL IDENTIFICATION ON OLD CONTROL	TERMINAL IDENTIFICATION ON NEW RA117A
1, LH, or HOT LINE	1
2, LG, or LINE	2
3, M, or MOTOR	3
4, I, or IGNITION	4

If the position of the old control was satisfactory, install the new RA117A in the same location as the old one, making sure to insert the bimetal element the same distance into the stack as the old element. If the old element was inserted more than 5-1/2 inches [140 millimeters], insert the new RA117A 5-1/2 inches [140 millimeters] into the stack.

If the position of the old control was not satisfactory, close the old holes tightly with a metal plate and follow these instructions.

1. Follow these location considerations:

- Locate between the boiler or furnace and draft regulator.
- Locate as near as possible to the boiler or furnace.
- If mounting in an elbow, locate the element near

the outer curve where the hottest gases flow.

- Do not locate where the temperature may exceed 1000° F [556° C].
2. Cut a 1-3/8 inch [35 millimeter] hole in the stack at the location desired.
  3. Drill two holes and fasten the mounting flange using the screws provided. The flange should fit the mounting surface snugly, but it may be bent to fit a different radius stack or flattened to fit a flat surface. Do not force the collar or mounting flange past the stop.
  4. Insert the bimetal element at the center of the stack in direct path of the hottest flue gasses.
  5. Tighten the lock screw.

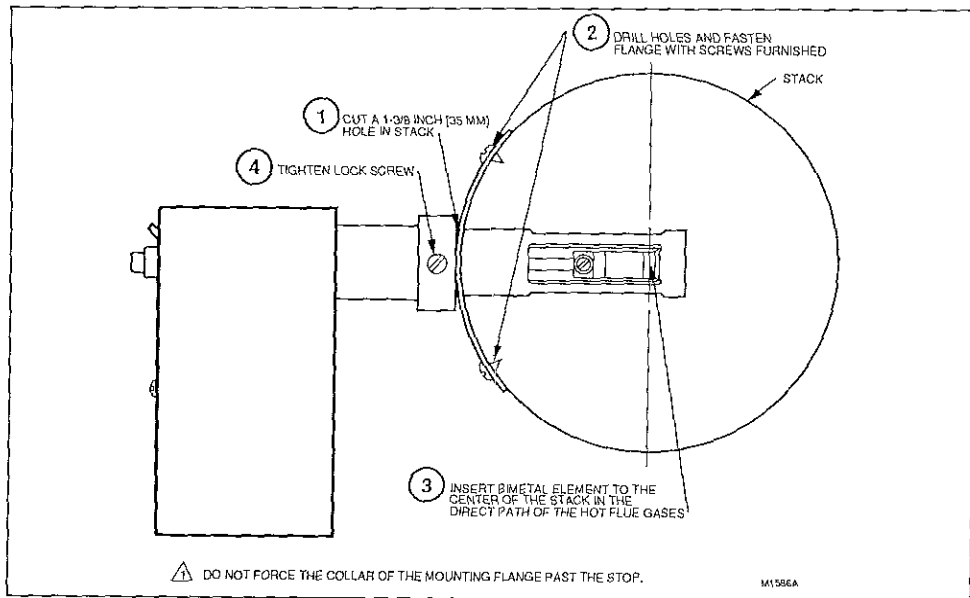


Fig. 1—Mounting and location considerations.

## WIRING

All wiring must comply with applicable codes and ordinances.

1. Connect the leadwires to the RA117A terminals as they were identified above.

2. Connect the thermostat to the RA117A as shown in Fig. 2 or Fig. 3.

## STARTUP AND CHECKOUT

# WARNING

## FIRE HAZARD CAN CAUSE SEVERE BURNS

Ensure the combustion chamber is free of oil or oil vapor before starting system.

## STEP THE PYROSTAT DETECTOR CONTACTS

The detector contacts are actuated by a friction clutch that is mounted on a rod connected directly to the heat-actuated element. Occasionally, this clutch gets "out of step" after a long period of idleness. To place the clutch and the contacts "in step,"

1. Remove the cover.

2. Pull the lever forward 1/4 inch (Fig. 4).

3. Slowly release the lever.

4. Replace the cover.

## START THE SYSTEM

1. Ensure the Pyrostat detectors are in step.

2. Push in and release the safety switch reset button.

3. Open the hand valve in the oil supply line.

4. Set the limit control and thermostat to call for heat.

5. Close the line switch. The burner should start.

## CHECK THE SAFETY FEATURES

Simulate Flame Failure:

1. Follow the starting procedure to turn on the burner.

2. Close the hand valve in the oil supply line.

3. The RA117A locks out after one minute (approximate) scavenging period and 75 second (nominal) safety switch timing.

4. Reset the safety switch and open the hand valve in the oil supply line.

Simulate Ignition Failure:

1. Follow the starting procedure to turn on the burner, except do not open the oil supply hand valve.

2. Safety switch locks out after 75 second (nominal) safety switch timing. Ignition and burner motor stops and oil



To trip the safety switch, move the safety switch lever down until the red reset button pops out. Refer to Fig. 5. The burner will not operate until the safety switch is reset by pushing the red reset button.

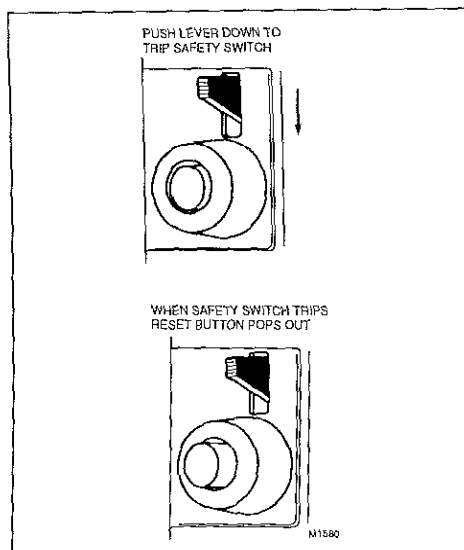


Fig. 5—Tripping and resetting the safety switch.

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