

Honeywell

THE R7023B,C ARE FLAME DETECTOR RELAYS WHICH, IN ADDITION TO FLAME DETECTION, MAY BE USED TO SIGNAL THE PRESENCE OF ANY SOURCE OF ULTRAVIOLET (UV) LIGHT, INCLUDING ELECTRIC ARCS IN GENERATORS, MOTORS, AND SWITCHING GEAR. THESE RELAYS CAN ALSO BE USED TO SIGNAL THE INTERRUPTION OF A CONSTANT SOURCE OF UV.

□ When used as an optical detector, the R7023B,C Flame Detector Relays can sense the presence of clear glass and plastic objects which visible light detectors cannot. Ultraviolet light will not pass through clear glass or plastic.

□ The R7023 is a flame detector relay only. Suitable primary control must be used to provide safe-start check, safety lockout, load switching, and other required functions in flame safeguard systems.

□ The R7023B is used with a rectification type flame detector—either a flame rod, photocell, or C7012A,C Ultra-Vision Flame Detector (Purple Peeper); it provides double-pole, double-throw switching.

□ The R7023C is used with a C7027A or C7035A Ultra-Vision Flame Detector (Minipeeper) and provides single-pole, double-throw switching.

□ Control mounts compactly on the Q270A1024 Universal Subbase with captive mounting screws which also complete electrical connections.

□ Test jack in the flame detector network permits direct reading of the flame current.

□ Built-in protection against ignition crossover prevents damage to the R7023B electronic network when a flame rod is used to detect a spark-ignited pilot.

□ Lexan thermoplastic base practically eliminates breakage.

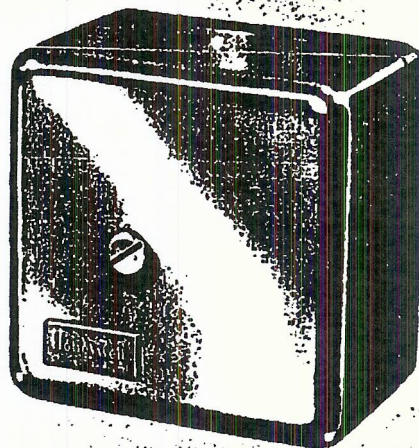
□ Optional minus 40 F [minus 40 C] rating available on R7023C.

R.L.

REV. 7-77 (.03)

EPRI Edgemont Precision Rebuilders Inc
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FLAME DETECTOR RELAY



R7023B,C

Form Number

60-2298-1

SPECIFICATIONS

MODEL:

R7023B Flame Detector Relay—for use with rectification flame detectors.

R7023C Flame Detector Relay—for use with C7027A or C7035A Flame Detectors.

VOLTAGE AND FREQUENCY: 120, 208, 220, 240V ac; 50/60 Hz.

CONTACT RATINGS (pilot duty): 125 VA.

FLAME RESPONSE TIMING: 0.8 or 3 seconds (nominal).

AMBIENT TEMPERATURE RATING: Minus 20 to plus 125 F [minus 12 to plus 52 C]. Optional minus 40 F [minus 40 C] rating available on R7023C.

FLAME DETECTOR REQUIRED:

R7023B—Rectifying flame rod, photocell, or C7012A, C Ultra-Vision Flame Detector (Purple Peeper).

R7023C—C7027A or C7035A Ultra-Vision Flame Detector (Minipeeper).

DIMENSIONS: Approximately 5 x 5 x 4-3/4 in. [127 x 127 x 120.7 mm] including subbase..

MOUNTING BASE: Q270A1024 Universal Subbase. Order separately.

ACCESSORIES:

1. W136A Microammeter (includes 117053 Plug).
2. 121708 Rectification Flame Simulator.
3. 123514B Ultraviolet Flame Simulator.
4. 117053 Meter Connector Plug.
5. FSP1535 Tester.

LISTINGS:

R7023C is Underwriters Laboratories Inc. Component Recognized: File No. MP268, Vol. 7; Guide No. MCC22.

R7023B and C are Canadian Standard Association Certified: File No. LR1620.

INSTALLATION

CAUTION

1. Disconnect all power before beginning the installation to prevent electrical shock or equipment damage.
2. Only a trained, experienced flame safeguard control serviceman should install or service this device.
3. All wiring must comply with applicable codes, ordinances, and regulations.

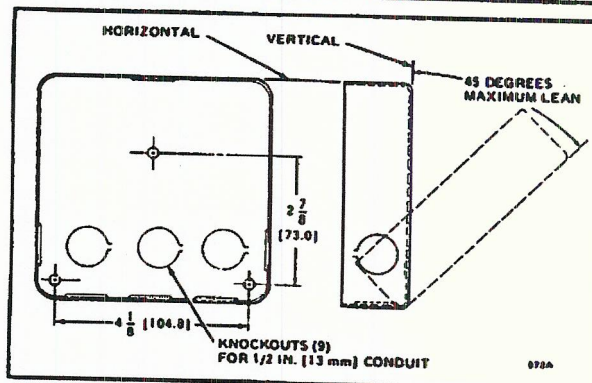


FIG. 1—APPROXIMATE SUBBASE DIMENSIONS IN INCHES [MILLIMETRES IN BRACKETS].

(continued on page 3)

ORDERING INFORMATION

WHEN PURCHASING REPLACEMENT AND MODERNIZATION PRODUCTS FROM YOUR TRADELINE WHOLESALE OR YOUR DISTRIBUTOR, REFER TO THE TRADELINE CATALOG OR PRICE SHEETS FOR COMPLETE ORDERING NUMBER, OR SPECIFY—

1. Order number.
2. Voltage and frequency.
3. Mounting subbase Q270A.
4. Flame detector, if required.
5. Accessories, if desired.

IF YOU HAVE ADDITIONAL QUESTIONS, NEED FURTHER INFORMATION, OR WOULD LIKE TO COMMENT ON OUR PRODUCTS OR SERVICES, PLEASE WRITE OR PHONE:

1. YOUR LOCAL HONEYWELL RESIDENTIAL DIVISION SALES OFFICE (CHECK WHITE PAGES OF PHONE DIRECTORY).

2. RESIDENTIAL DIVISION CUSTOMER SERVICE
HONEYWELL INC., 1885 DOUGLAS DRIVE NORTH
MINNEAPOLIS, MINNESOTA 55422 (612) 542-7500

(IN CANADA—HONEYWELL CONTROLS LIMITED, 740 ELLESMERE ROAD, SCARBOROUGH, ONTARIO M1P 2V9)
INTERNATIONAL SALES AND SERVICE OFFICES IN ALL PRINCIPAL CITIES OF THE WORLD.

MOUNT SUBBASE

Select a location for the subbase where the ambient temperature will remain within the specified rating of minus 20 to plus 125 F [minus 12 to plus 52 C].

Mount the subbase using the screws provided. The top and bottom of the case should be horizontal and the back vertical. The control may lean backward as much as 45 degrees if necessary.

WIRE SUBBASE

1. All wiring must comply with applicable electrical codes, ordinances, and regulations. Use NEC Class 1 (line voltage) wiring.

2. For normal installations, use moisture-resistant No. 14 wire suitable for at least 167 F [75 C].

3. For high temperature installations, use moisture-resistant No. 14 wire, selected for a temperature rating above the maximum operating temperature, for all but the ignition and flame detector "F" leadwires.

a. For the ignition, use Honeywell Spec. No. R1061012 Ignition Cable or equivalent. (This wire is rated at 350 F [175 C] for continuous duty, and up to 500 F [260 C] for intermittent use. It has been tested to 25,000 volts.)

b. For the flame detector "F" leadwire, use Honeywell Spec. No. R1298020 or equivalent. (This wire is rated up to 400 F [205 C] for continuous duty. It is tested for operation up to 600 volts and breakdown up to 7500 volts.)

4. For fog ignition installations in a contaminating environment, use Honeywell Spec. No. R1239001 High Tension Ignition Cable or equivalent. (This wire is very resistant to severe conditions of oil, heat, and corona, and is tested to withstand high voltages up to 25,000 volts RMS in a salt bath for 1 minute without breakdown. It is rated at 200 F [93 C] for continuous duty, and up to 350 F [175 C] for intermittent use.)

IMPORTANT

Do not run high voltage ignition transformer wires in the same conduit with the flame detector wiring.

HOOKUPS

Connections for the R7023B and R7023C are shown in Figs. 2 and 3.

R7023B

In the presence of flame, the flame detector permits a rectified current to flow through the electronic network of the R7023B. This rectified current is amplified in the electronic network, after which it energizes the flame relay. The flame relay closes contacts between terminals 6 and 8 and between terminals 3 and 5. It opens contacts between terminals 3 and 4 and between terminals 6 and 7.

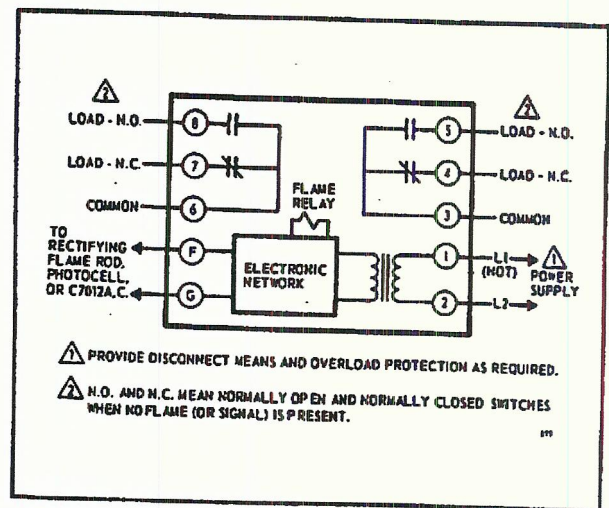


FIG. 2—WIRING SCHEMATIC FOR THE R7023B.

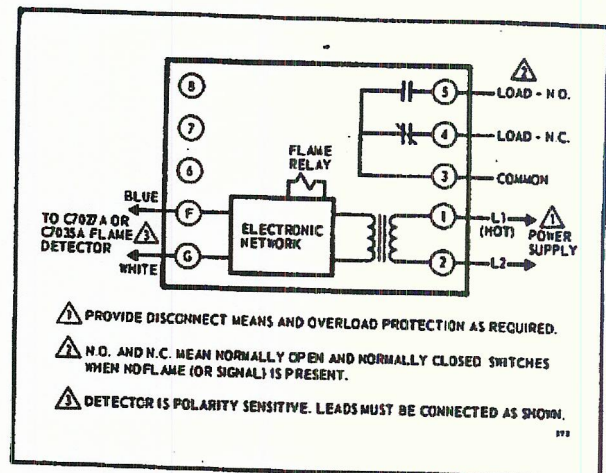


FIG. 3—WIRING SCHEMATIC FOR THE R7023C.

R7023C

In the presence of ultraviolet radiation, the UV detector used with the R7023C permits a signal to pass to the electronic network of the control. The electronic network amplifies this signal to a point where it can operate the flame relay. The flame relay closes contacts between terminals 3 and 5, and opens contacts between terminals 3 and 4.

NOTE: When using R7023B to replace R7009A, the location and numbering of the terminals on the base of these two relays are different. Connect R7009A terminal 5 to R7023B terminal 8 and connect R7009A terminal 4 to terminal 5 of the R7023B.

CHECKOUT

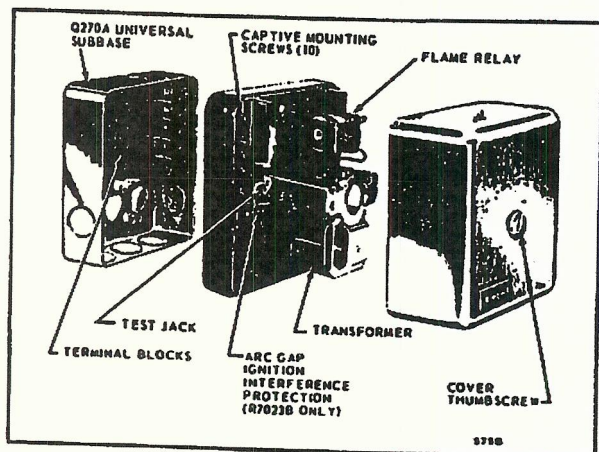


FIG. 4—INTERNAL COMPONENTS OF THE R7023.

PRELIMINARY INSPECTION

Make certain that:

1. Wiring connections are correct and all mounting screws are tight.
2. Flame detector installation is completed.
3. Correct combination of model number and flame detector is used.
4. Burner (if applicable) is ready to fire.
5. Power is on at the system disconnect switch.

Start the system and run through one complete cycle. If operation appears normal, do the flame current check which follows and any other tests required. Refer to the instructions packed with the primary control. If the control is used to prove a pilot, a pilot turndown test must be done.

FLAME CURRENT CHECK

The flame current test jack on the front of the R7023 makes direct measurement of the flame current possible. The flame signal must be steady, and it must be at least 2 microamperes on the R7023B, or 1.5 microamperes on the R7023C. To measure the current, connect the leads from a 117053 Meter Connector Plug to the leads of the W136A Microammeter color-to-color. Insert the plug into the TEST JACK shown in Fig. 4. If the current is not steady, or is too low, adjust the detector. If a flame rod detector is used, ensure that there is sufficient ground area.

HOW TO DETECT AND ELIMINATE IGNITION INTERFERENCE (FLAME ROD INSTALLATIONS ON R7023B ONLY)

WHAT IT IS

Ignition interference is a false signal from a spark ignition source, superimposed upon the basic flame signal. It is normally associated with a marginal flame reading, usually caused by a marginal flame ground.

Interference can be either additive or subtractive to the main flame signal, depending on the hookup of the primary leads to the ignition transformer. Subtractive interference can cause a nuisance shutdown; positive interference may not even be noticed.

HOW DETECTED

The arc gap circuit protects the R7023B from ignition interference. However, it also prevents operation when ignition interference is present above the arcing level of the device. If a shutdown is caused by ignition interference, the arc gap protector will glow.

Continuous interference below the arcing level can be detected by reading flame current with pilot and ignition on, then with pilot only. Any substantial difference indicates the presence of ignition interference.

Intermittent ignition interference may be due to very turbulent air in the ignition electrode area. For arc-over elsewhere, examine the electrodes for spacing, and for unusual dirt conditions or dust accumulations between the ignition leads and flame leads.

HOW ELIMINATED (tabulated in order of importance)

1. Provide adequate flame grounding area.
2. Be sure the ignition electrode and the flame rod are on opposite sides of the grounding area.
3. Check for correct spacings on the ignition electrode. Spacing should be 1/16 to 3/32 in. [1.6 to 2.4 mm] for 6,000 volt systems, 1/8 to 3/16 in. [3.2 to 4.8 mm] for 10,000 volt systems.
4. Eliminate any marginal spacings at other areas along the lead routes. Replace any deteriorated leads.

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