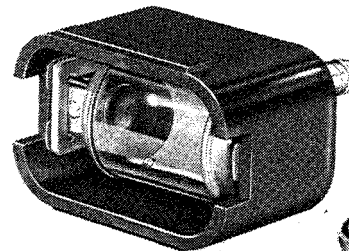


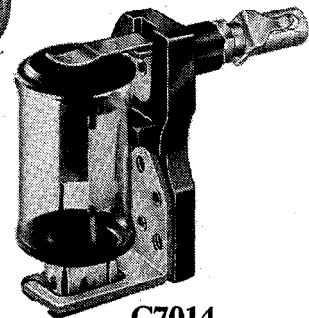
# C7013A, C7014A Photocell(Visible) Flame Detector

The C7013A and C7014A Flame Detectors are designed for mounting inside the blast tube of small commercial and industrial oil burners to monitor the combustion flame.

The C7013A is for conventional pressure atomizing oil burners while the C7014A is used with burners having a shell combustion head.



C7013



C7014

- The C7013A and C7014A Flame Detectors can be used with Honeywell electronic flame safeguard controls utilizing the rectification principle of flame detection.
- The small size of the flame detectors allows mounting below the burner nozzle in the blast tube to provide reliable flame detection.
- A focusing lens is available for the C7013A to maximize the photocell's response to flame emitted visible radiation.
- The design of the C7013A housing provides for an optional filter and filter holder to protect the photocell from excessive heat and minimize the effect of hot (glowing) refractory radiation.
- The C7014A photocell is easily removable to provide for convenient servicing and maintenance.
- Rajah connectors on the C7013A cover and C7014A holder provide easily accessible electrical connections.

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# Specifications

## MODELS:

- C7013A—for standard pressure-atomizing burners.
- C7014A—for burners using Shell Combustion Head.

NOTE: In areas of high humidity, use C7013A.

## ELECTRICAL CONNECTION:

- C7013A—Rajah stud terminal (male?).
- C7014A—Rajah spring-snap terminal (female?).

<sup>a</sup> Companion connectors are not furnished

PHOTOCELL Visible radiation sensor.

MAXIMUM PERMISSIBLE TEMPERATURE: 165° F

[74° C] at photocell.

APPROVALS: Underwriters Laboratories Inc. listed File

No. MP268; Factory Mutual approved; Industrial Risk Insurers acceptable; Canadian Standards Association certified Master Report LR 95329-1.

DIMENSIONS : See Fig. 1.

## ACCESSORIES:

38576 Filter. Fits C7013A only. Use to reduce heat or effect of hot refractory on photocell.

38570 Filter Holder. Fits C7013A only. Used to hold 38576 Filter and 121610 Magnifying Lens.

38242 Rajah Connector (plug end).

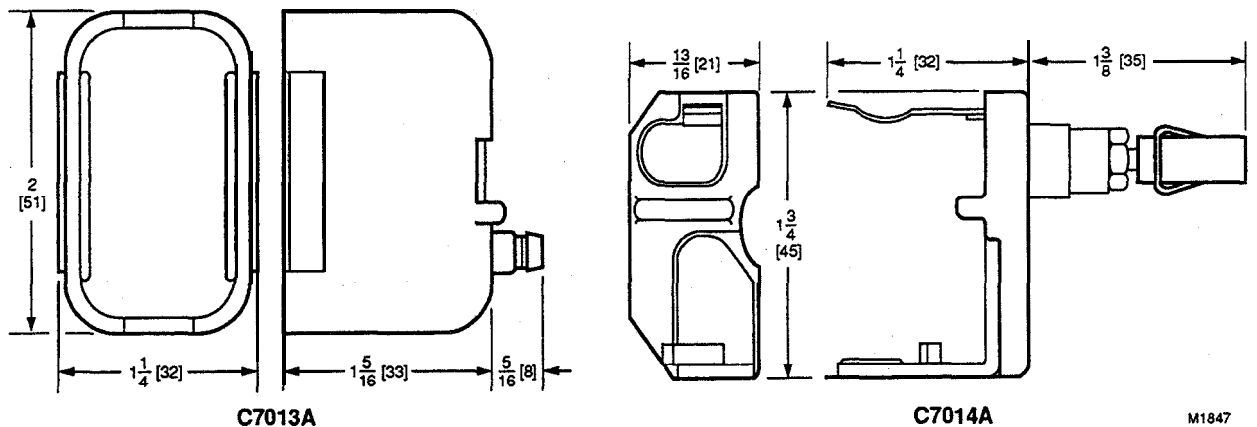
121610 Focusing Lens. Fits C7013A only.

## REPLACEMENT PARTS:

101851 Rajah Connector, socket end—C7014A.

38316 Photocell—C7013A and C7014A.

Fig. 1-Dimensions in inches [millimetres in brackets].



# Ordering Information

When purchasing replacement and modernization products from your TRADELINE® wholesaler or your distributor, refer to the TRADELINE Catalog or price sheets for complete ordering number, or specify—

1. Model number.
2. Accessories, if needed.
3. Replacement parts, 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 and Building Controls Division sales office (check white pages of phone directory).
2. Residential and Building Controls Division Customer Satisfaction  
Honeywell Inc., 1885 Douglas Drive North  
Minneapolis, Minnesota 55422 (612) 542-7500

(In Canada-Honeywell Controls Limited, 740 Ellesmere Road, Scarborough, Ontario M1P2V9) International Sales and Service offices in all principal cities of the world.

# Installation

## WHEN INSTALLING THIS PRODUCT..

1. Read these instructions carefully. Failure to follow them could damage the product or cause a hazardous condition.
2. Check the ratings given in the instructions and on the product to make sure the product is suitable for your application.
3. **Installer must be a trained, experienced service technician.**
4. After installation is complete, check out product operation as provided in these instructions.

## CAUTION

1. Disconnect power supply before making wiring connections to prevent electrical shock and equipment damage, more that one disconnect may be involved.
2. All wiring must comply with applicable electrical codes, ordinances, and regulations. Use NEC Class 1 (line voltage) wiring.
3. Use moisture-resistant No. 14 wire suitable for at least 165° F [74° C].

Fig. 2—Mounting of C7013A in conventional pressure atomizing oil burner.

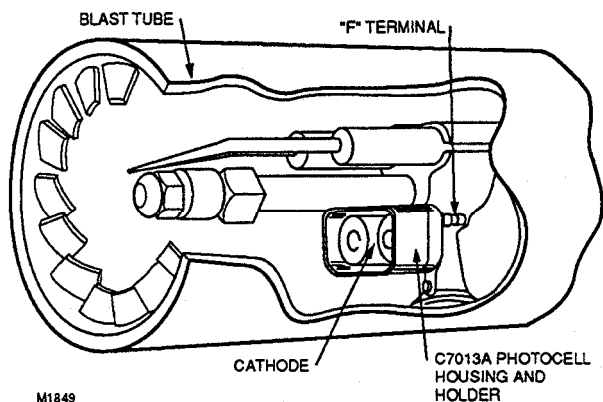


Fig. 3—Mounting of C7014A in shell combustion head burner.

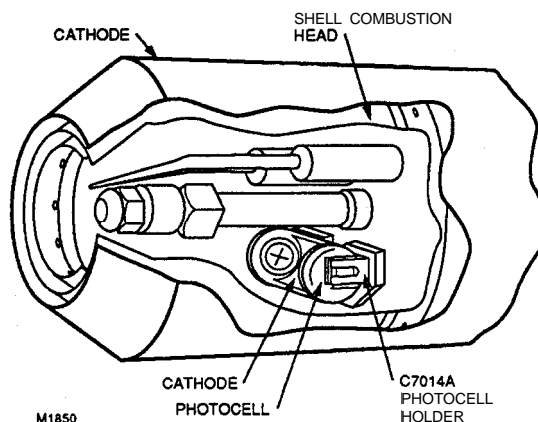


Fig. 4—C7014A photocell mount.

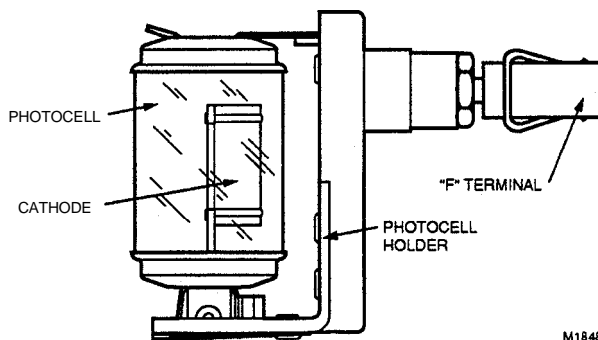
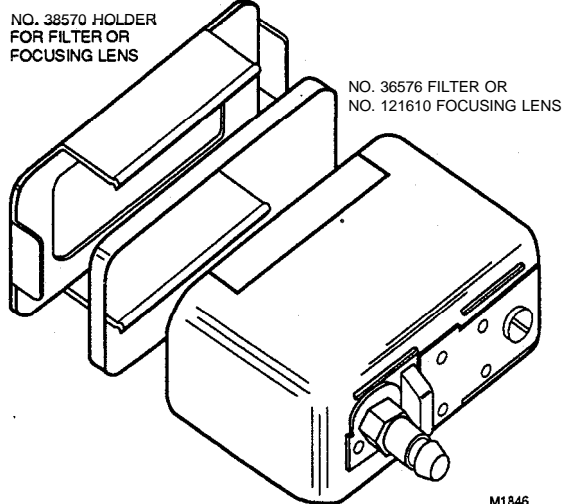


Fig. 5—Adding filter to C7013A photocell housing.



## LOCATION AND MOUNTING

The C7013A and C7014A flame detectors are primarily intended for installation by the manufacturer at the time the burner is assembled. Follow the installation instructions provided with the equipment by the burner manufacturer.

If the instructions were not provided or are unavailable, use the following recommendations.

Although the C7013A or C7014A flame detectors were originally installed by the burner manufacturer, the units can be replaced in the field. Before replacing the complete C7013A or C7014A unit, examine the installation of the unit as it is installed in the burner and noting the positioning of the flame detector.

# CAUTION

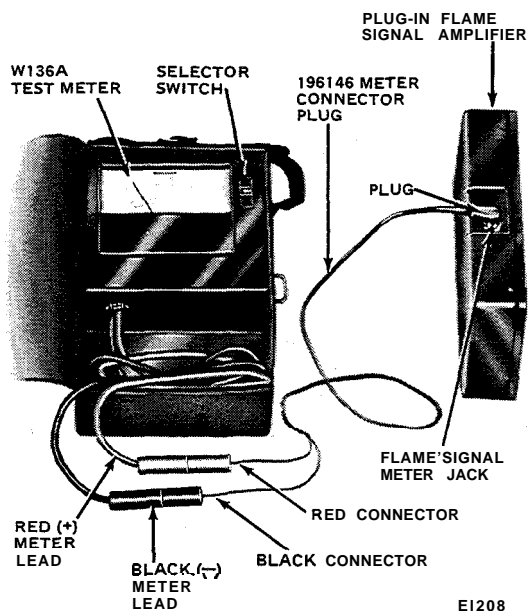
Disconnect the power supply to prevent electrical shock and equipment damage, more than one **disconnect may be involved**.

Remove the old unit and mount the new **C7013A** or **C7014A** in the blast tube in exactly the same position as the old unit (see **Figs. 2 and 3**). Positioning of the flame detector in the identical location as the old unit is important as the temperature at the photocell must not exceed 165° F [74° C]. The maximum temperature normally occurs at the end of a

**The performance** of the **C7013A, C7014A** Flame Detectors can be determined by measuring the flame signal (current/voltage) during burner operation.

Most existing Honeywell flame safeguard controls incorporate a flame signal jack on the amplifier of the control itself. The flame current measurement is made with a volt-ohmmeter such as the Honeywell **W136A** meter or a microammeter with a zero to 25 microampere scale. A meter connector plug (part no. 196146, provided with the **W136A**) is used to adapt the **W136A** to the flame current jack on the flame safeguard control. The **W136A** Meter probes are connected to the two ends of the connector plug (red to red, black to black). The plug end of the connector inserts directly into the flame current jack of the flame safeguard control or into the controls amplifier jack (see **Fig. 6**). During the burner run cycle, the minimum acceptable flame current is two microamperes.

**Fig. 6—Measuring the microamp flame signal.**



long burner “run”.

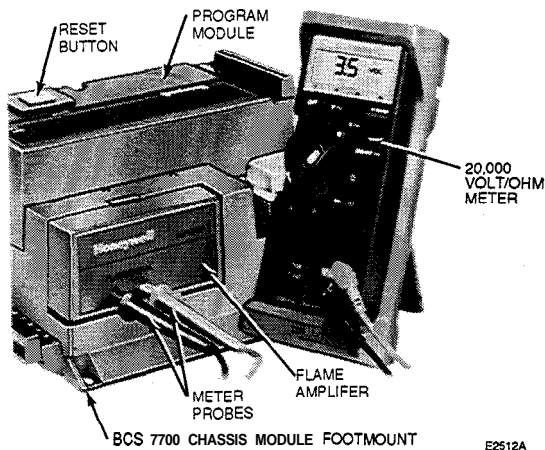
When replacing a **C7014A** flame detector unit, remove the photocell from the holder to prevent damage to the photocell during installation of the holder (see **Fig. 3**). After the holder has been positioned, replace the photocell as indicated in **Fig. 4**. The photocell must be positioned with the open curved side of the **cathode** directly facing towards the flame viewing area. This is essential as the visible radiation (**light**) from the burner flame must strike the active area of the photocell cathode.

Make the electrical connections as the burner manufacturer has provided and reconnect the power supply.

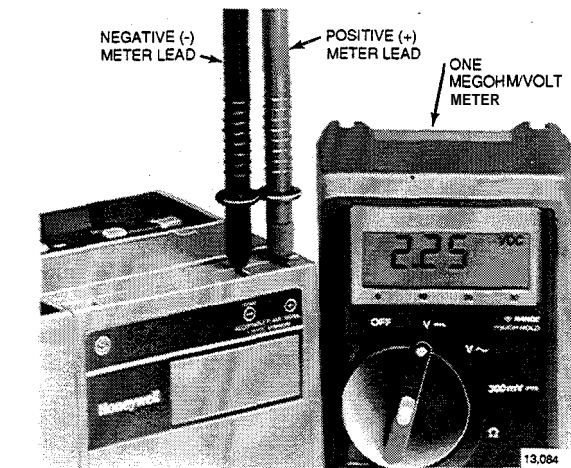
## Checkout

with a zero to 5 or 10 Vdc scale is recommended for the **BCS 7700** flame signal measurement. A one megohm/volt meter is suggested for the **7800 SERIES** controls. The flame signal measurement is made by inserting the positive (red) meter probe into the control positive (+) jack and the negative (black) probe into the negative (-) jack of the **BCS 7700** or the

**Fig. 7—Measuring BCS 7700 control flame signal voltage.**



**Fig. 8—Measuring 7800 SERIES controls flame signal voltage.**



The Honeywell **BCS 7700** and **7800 SERIES** controls provide for a voltage flame signal measurement. A volt-ohm meter with a minimum sensitivity of 20,000 ohm/volt and

(Corn) jack of the **SERIES 7800** controls (see Figs. 7, 8). With the system in operation, the minimum acceptable **flame** signal voltage is 2.2 Vdc for the BCS 7700 control and 1.25 Vdc for the 7800 **SERIES** controls.

Lower flame signals (current/voltage) from the **C7013A, C7014A** Flame Detectors can be caused by a) improper positioning of the photocell so that the flame radiation is not incident upon the active area of the photocell cathode, the envelope of the photocell, or the **C7013A** focusing lens; b)

filters arc contaminated (soot, dust, etc.); c) a high temperature at the photocell; or a d) defective photocell.

**If a C7013A flame detector is being used and a low flame signal is the result of difficult flame sighting, a focusing lens (part no. 121160) may be helpful to increase the flame signal (see Fig. 5).**

The effects of high temperature caused by radiation from **hot (glowing) refractory material can be minimized (C7013A)** by using a filter and filter holder (part no. 38576 and 38570, respectively) .

## Service

The **C7013A** and **C7014A** flame detector maintenance should include **aregular** inspection and cleaning (if required) of the photocell envelope to remove possible accumulations of contaminants (soot, dust, etc.). If the installation uses the **C7013A** and the optional focusing lens or filter, the lens and filter should **also** be inspected and cleaned (if necessary).

Annual replacement of the photocell is recommended. A spare photocell should be available for immediate replacement.

If a photocell does fail, a close inspection of the photocell may reveal the cause of failure and indicate the corrective action to be taken. Photocell **failure** due to excessive heat may be recognized by a cracked bluish appearance on the active area (face) of the cathode. Check for temperatures of 165° F [74° C] or higher at the photocell. **Failure** due to loss of vacuum in the photocell can be recognized by a change in color of the cathode active area. The active area changes to a black color due to oxidation of the photo detection substance.

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