

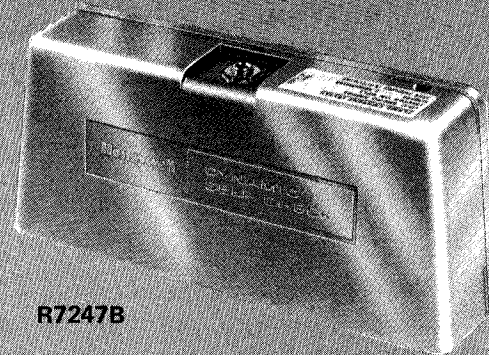
Honeywell

THE R7247B AND C DYNAMIC SELF CHECK RECTIFICATION AMPLIFIERS ARE SOLID STATE PLUG-IN UNITS. THEY RESPOND TO A FLAME DETECTOR SIGNAL AND INDICATE THE PRESENCE OF A FLAME WHEN USED WITH FLAME SAFEGUARD CONTROLS (SUCH AS R4140, R4075C,D,E AND R4138C,D) AND APPROPRIATE FLAME DETECTORS.

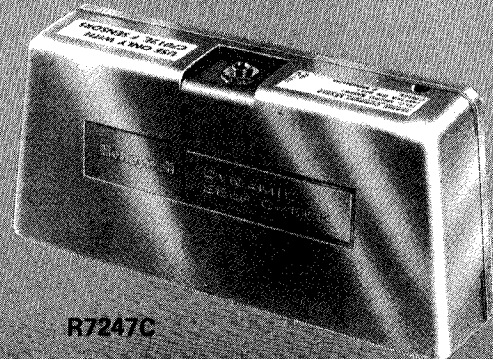
- Self-checking circuitry tests all electronic components in the flame detection system 60 to 240 times a minute during burner operation, and shuts down the burner if the detection system fails.
- Red flame indicating lamp blinks when flame detector "sees" flame.
- Flame failure response time is 2 to 4 seconds.
- R7247B is for use with rectifying flame rods (for gas burners); includes arc gap to protect against damage from high voltage ignition interference.
- R7247C is for use with C7012E or F Purple Peeper Ultraviolet Flame Detectors (for gas, oil, or coal burners); includes solid state switch for C7012 shutter.
- May use redundant parallel C7012E or F detectors with the R7247C to decrease nuisance shutdowns.
- Field replaceable amplifier plugs into an edge connector on a flame safeguard control by means of a printed circuit board, keyed to ensure proper orientation.
- Meter jack for measuring flame signal with system in operation.
- Operates from the power supplied by the standard transformer in the flame safeguard control.
- Color-coded green plastic cover identifies the amplifier as a rectification type.

J.B.
REV. 3-76 (.046)

DYNAMIC SELF CHECK RECTIFICATION AMPLIFIERS



R7247B



R7247C

R7247B,C

SPECIFICATIONS

MODELS:

- R7247B Dynamic Self Check Rectification Amplifier—solid state plug-in amplifier for use with flame safeguard controls and rectifying flame rods.
- R7247C Dynamic Self Check Rectification Amplifier—solid state plug-in amplifier for use with flame safeguard controls and C7012E or F Purple Peeper Ultraviolet Flame Detectors.

ELECTRICAL RATINGS:

Voltage and Frequency—120V ac (102V to 132V), 50/60 Hz.
 Power Consumption at 60 Hz (amplifier only)—

	NO FLAME SIGNAL	WITH FLAME INDICATING LAMP BLINKING
R7247B	0.7 W	1.2 W
R7247C	0.9 W	1.4 W

FLAME FAILURE RESPONSE TIME: 2 to 4 seconds.

FLAME SIGNAL (microamperes):

NOTE: The selector switch on the W136A Test Meter must be set to the SPL (damped) position for a steady reading. Standard meters will give an oscillating meter reading.

	MINIMUM ACCEPTABLE	MAXIMUM EXPECTED
R7247B ^a	1-1/4	2-1/2
R7247C	2	7

^aFor a rectifying photocell or a C7012A or C, see Table I, page 5.

FLAME DETECTORS (order separately):

- Rectifying Flame Rods, for gas burners (for use with R7247B)—C7004, C7007, C7011 holders only (order rods separately); C7005, C7008, C7009, Q179 complete assemblies.
- Purple Peeper Ultraviolet Flame Detectors, for gas, oil, or coal burners (for use with R7247C)—C7012E or F.

AMBIENT TEMPERATURE RATINGS:

- Operating—minus 40 F to plus 150 F [minus 40 C to plus 65 C].
- Storage—Minus 60 F to plus 150 F [minus 51 C to plus 65 C].

MOUNTING: Printed circuit board is keyed to edge connector on flame safeguard control to ensure proper operation.

DIMENSIONS:

- Inches—5-13/16 long, 2-13/16 wide, 1-1/4 thick.
- Millimetres—148 long, 71 wide, 32 thick.

WEIGHT: 8 ounces [227 grams].

APPROVALS:

- UNDERWRITERS LABORATORIES INC. LISTED SECTION OF PRIMARY SAFETY CONTROL: File No. MP268; Guide No. MCCZ.
- FACTORY MUTUAL APPROVED: Report Nos. 24150, 24180, 24181, 24313, and 26037.

ACCESSORIES:

- 1. W136A Test Meter (includes 117053 Meter Connector Plug).
- 2. 117053 Meter Connector Plug (for older W136A models).

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. Order number.

ORDER SEPARATELY—

- 1. Flame detector to match amplifier.
- 2. 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.

INSTALLATION

CAUTION

1. Installer must be a trained, experienced, flame safeguard control serviceman.
2. Disconnect power supply before beginning installation to prevent electrical shock and equipment damage.
3. All wiring must comply with applicable local electrical codes, ordinances, and regulations.
4. Perform all required checkout tests after installation is complete.

MOUNTING THE AMPLIFIER ON THE FLAME SAFEGUARD CONTROL (FIG. 1)

IMPORTANT

DO NOT remove the amplifier cover.

1. Make sure the amplifier nameplate is on the outside. Then, align the circuit board with the receptacle on the flame safeguard control.
2. Push in the amplifier until the circuit board is fully inserted into the receptacle.

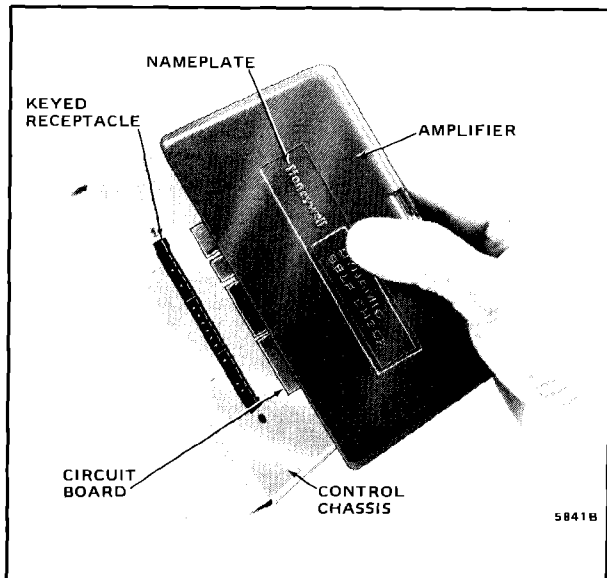


FIG. 1—INSTALLING AN R7247B OR C DYNAMIC SELF CHECK RECTIFICATION AMPLIFIER.

INSTALLING THE FLAME DETECTOR

Proper flame detector installation is the basis of a safe and reliable flame safeguard installation. Be sure to use the correct flame detector. Install a rectifying flame

rod with the R7247B, and use a C7012E or F flame detector with the R7247C. (A rectifying photocell or C7012A or C may be used with an R7247B, but only the flame signal amplifier is tested during burner operation.)

Refer to the instructions packed with the flame detector and to the burner manufacturer's instructions. Follow instructions carefully to make the best possible application of the flame detector. *Keep the flame signal leadwires as short as possible.*

SPECIAL CONSIDERATIONS FOR THE C7012E or F

Two sources of power must be provided for the C7012E or F Purple Peep Ultraviolet Flame Detector (with self-checking shutter). The power to the *black* leadwires of the C7012E may be 120V, 208V, 220V, or 240V ac, depending on the model of the detector. The C7012F is available only in a 120V model. This voltage must match the power supply of the flame safeguard control. The power to the *white* leadwires *must* be 120V ac; this is the power supply for the operation of the self-checking shutter.

For 120V flame safeguard controls, the line power supply feeds the white shutter leadwires directly through switching action within the R7247C amplifier.

USING THE OPTIONAL 130716A AUTOTRANSFORMER (Fig. 2)

If the C7012E or F must be mounted with its sighting axis within 45 degrees of vertical (instead of the preferred horizontal position), or with the arrow on its faceplate not pointing directly downward, the shutter requires 135 volts to operate properly. An optional 130716A Autotransformer will provide the correct voltage. However, it can only be used with flame safeguard controls supplying 120 volts to the shutter.

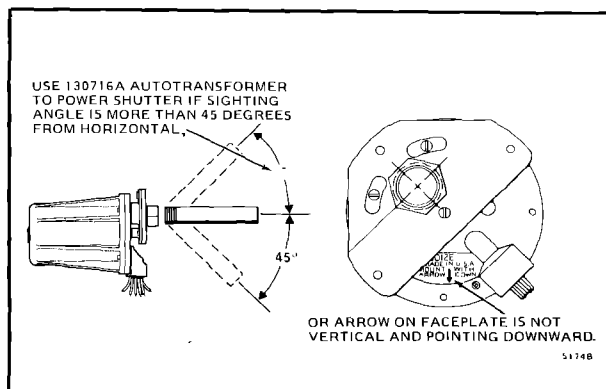


FIG. 2—CORRECT MOUNTING POSITION FOR THE C7012E OR F.

USING REDUNDANT PARALLEL C7012E OR F DETECTORS

For flames that are difficult to sight, using redundant parallel C7012E or F flame detectors will reduce nuisance shutdowns. If only one of the parallel detectors loses the flame signal, the other will still indicate the presence of the flame and will keep the system running. *A flame-simulating failure in either detector will cause the system to shut down.*

IMPORTANT

To avoid exceeding the rating of the solid state shutter switch in the R7247C, do not connect more than two C7012E or F detectors in parallel.

WIRING THE FLAME DETECTOR

All wiring must be NEC Class 1 and conform to local codes and ordinances. If the leadwires aren't long enough to reach the wiring subbase or terminal strip, splices must be made in a junction box.

The printed circuit board on the amplifier mates with the receptacle on the flame safeguard control to provide power and flame detector connections to the R7247B,C. For complete wiring details, refer to the instruction sheets for the appropriate flame safeguard control and flame detector.

CHECKOUT

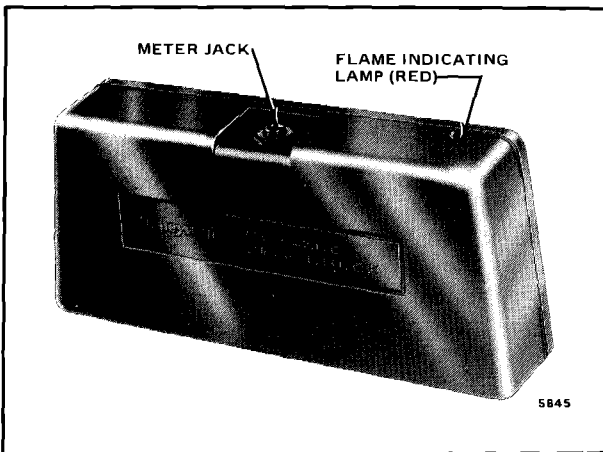


FIG. 3—R7247B AND C AMPLIFIER COMPONENTS.

PRELIMINARY INSPECTION

Make certain that:

1. Wiring connections are correct and all terminal screws are tight.
2. Amplifier is securely mounted on the flame safeguard control.
3. Flame detector is clean and it is installed and positioned properly. Consult the appropriate instruction sheet.
4. Correct combination of amplifier and flame detector is used:

R7247B—rectifying flame rods (for gas burners).

NOTE: A rectifying photocell (for oil burners) or a C7012A or C Purple Peeper Ultraviolet Flame Detector (for gas, oil, or coal burners) can be used with an R7247B. However, the circuitry then tests only the flame signal amplifier during burner operation and shuts down the burner if the amplifier fails.

R7247C—C7012E or F Purple Peeper Ultraviolet Flame Detectors (for gas, oil, or coal burners).

5. Voltage rating of the flame detector matches the power supply of the flame safeguard control.

FLAME SIGNAL MEASUREMENT (Fig. 4)

CAUTION

Follow the lightoff instructions in the instruction sheet for the appropriate flame safeguard programming control.

Measure the flame signal at the appropriate times defined in the CHECKOUT tests in the instruction sheet for the flame safeguard control. Consult the appropriate instruction sheet for the complete flame detector checkout procedure.

Read the flame signal in microamps at the meter jack on the plug-in flame signal amplifier. Use a microammeter with a damped 0 to 25 microamp dc range, such as a Honeywell W136A, which has a plug for inserting into the meter jack. (A 117053 Meter Connector Plug may be ordered separately if needed.) Connect the plus (red) meter lead to the red spade tip and the minus (black) meter lead to the black spade tip before inserting the plug into the meter jack.

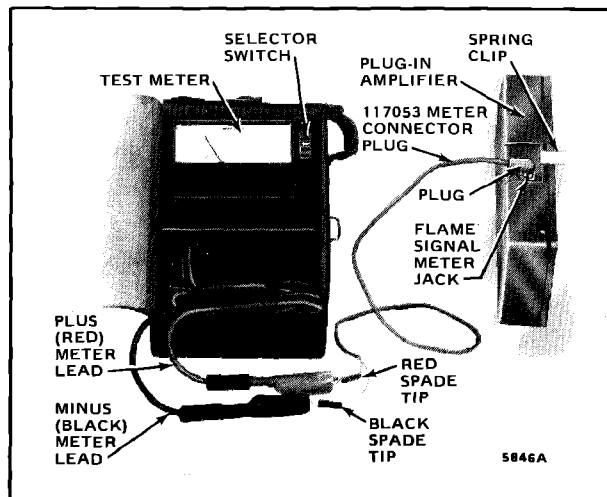


FIG. 4—MEASURING THE FLAME SIGNAL.

Set the selector switch on the test meter to the SPL (damped) position. Allow a few seconds for the current to stabilize. The red flame indicating lamp on the amplifier should blink about 1 to 4 times a second (depending on the flame detector used).

The flame signal for the pilot alone, the main burner flame alone, and both together (unless monitoring only the pilot flame when using an intermittent pilot, or only the main oil flame when using direct spark ignition) must be as specified in Table I below.

If the signal is unsteady, or less than the minimum acceptable current, check the flame detector installation and circuitry as follows:

1. Check the supply voltage at the wiring subbase or terminal strip.
2. Check the detector wiring for defects, including—
 - wrong type or size of wire.
 - deteriorated wire.
 - open circuits.
 - short circuits.
 - leakage paths caused by moisture, soot, or accumulated dirt.
3. For a flame rod, make sure—
 - there is enough ground area.
 - the flame rod is located in the flame properly.
 - temperature at the flame rod insulator is no greater than 500 F [260 C].
 - ignition interference is not present.
4. For all other detectors, clean the detector lens, filter, viewing window, and sighting pipe (as applicable).
5. For a C7012A,C,E, or F Purple Peeper Ultraviolet Flame Detector, replace the 113236 and 115330 Electron Tubes (unless it is a solid state model).

6. Check that the temperature at the detector does not exceed its maximum rated temperature.

7. Make sure that the flame adjustment is not too lean.

8. Make sure the detector is sighting the flame properly.

9. If necessary, resight or reposition the detector.

If you cannot obtain proper operation, replace the plug-in amplifier. If you still cannot obtain proper operation, replace the flame detector.

IMPORTANT

If you make any changes in the flame detection system, repeat ALL required tests in the CHECK-OUT section of the instruction sheet for the flame safeguard control.

FLAME INDICATING LAMP (red)

After obtaining a proper flame signal, complete the amplifier checkout. With the master switch closed (power applied to the amplifier), observe the flame indicating lamp for these conditions.

1. *No flame*—lamp should glow slightly. Replace the amplifier if there is no glow, or if the lamp is ON (bright) continuously or blinking.

2. *Flame present*—lamp should blink about 2-1/2 to 4 times a second on an R7247B, or 1 to 2 times a second on an R7247C. Replace the amplifier if the lamp does not blink.

TABLE I—FLAME SIGNAL

FLAME DETECTOR	FLAME SIGNAL AMPLIFIER	MINIMUM ACCEPTABLE STEADY CURRENT ^a (MICROAMPERES)	MAXIMUM CURRENT EXPECTED (MICROAMPERES)	ADDITIONAL CHECKS IF SIGNAL IS UNSTEADY OR WEAK
Rectifying Flame Rod	R7247B	1-1/4	2-1/2	Make sure that there is sufficient grounding area and that the ground connections are good.
Rectifying Photocell ^b	R7247B ^c	1-1/4	2-1/2	Make sure that the flame adjustment is not too lean. Clean the lens, filter, and viewing window (as applicable). Check voltage to the detector. Check the sighting.
C7012A or C Ultraviolet (Purple Peeper)	R7247B ^c	2	4	
C7012E or F Ultraviolet (Purple Peeper) ^d	R7247C	2 ^d	7	

^aThis minimum or stronger signal should easily be obtained if the detector is correctly installed and positioned to sense flame properly. *This current must be obtained before completing checkout.*

^bUse Honeywell photocell (Part No. 38316) only.

^cIf using a rectifying photocell or a C7012A or C with an R7247B, the circuitry tests *only the flame signal amplifier* during burner operation and shuts down the burner if the *amplifier* fails.

^dThe shutter operation causes fluctuations in the current reading. Read the average stable current, disregarding the peaks.