

Honeywell

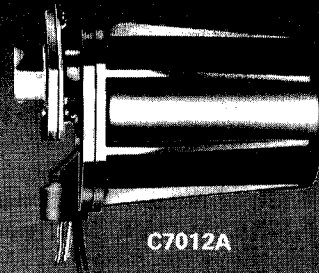
THE C7012A AND C ARE ELECTRONIC FLAME DETECTORS FOR SENSING THE ULTRAVIOLET RADIATION GENERATED BY THE COMBUSTION OF GAS, OIL, PULVERIZED COAL, OR OTHER FUELS.

- The C7012A and C can be used in new or existing rectification type flame safeguard systems. (When used with flame safeguard controls which have a selection of plug-in amplifiers, a rectification type amplifier must be used.)
- These detectors are usually used with controls which have a 3 second (nominal) flame response time to prevent nuisance shutdowns.
- Threaded conduit fitting and color-coded lead-wires provide rapid electrical hookup.
- C7012A housing meets NEMA 4 standards (water-tight and dust-tight, indoor and outdoor).
- The quartz viewing window (rated at 20 psi [137.9 kPa]) in the adapter flange of the C7012A prevents high temperature gases, dust, or moisture from entering the detector housing.
- High pressure viewing window (rated for 50 psi [344.7 kPa]), magnifying lens, and antivibration mount are available as accessories for the C7012A.
- Protective heat block is built into the C7012A mounting flange.
- The C7012C has an explosion-proof housing for use in hazardous atmospheres.
- The viewing window in the C7012C is rated for 100 psi [689.5 kPa].
- Swivel mount is available as an accessory for either the C7012A or C.

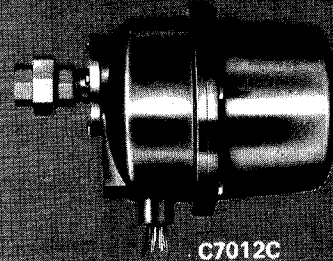
H.K.
REV. 4-81

Form No.
60-2046-5

PURPLE PEEPER ULTRAVIOLET FLAME DETECTORS



C7012A



C7012C

C7012A,C

 Flame Safeguard Center

SPECIFICATIONS

IMPORTANT

THE SPECIFICATIONS GIVEN IN THIS PUBLICATION DO NOT INCLUDE NORMAL MANUFACTURING TOLERANCES. THEREFORE, THIS UNIT MAY NOT MATCH THE LISTED SPECIFICATIONS EXACTLY. ALSO, THIS PRODUCT IS TESTED AND CALIBRATED UNDER CLOSELY CONTROLLED CONDITIONS, AND SOME MINOR DIFFERENCES IN PERFORMANCE CAN BE EXPECTED IF THOSE CONDITIONS ARE CHANGED.

MODELS:

C7012A Purple Peeper Ultraviolet Flame Detector—
for use in rectification type flame safeguard
systems.

C7012C Purple Peeper Ultraviolet Flame Detector—
same as C7012A, except with explosion-proof
housing for use in hazardous atmospheres.

ELECTRICAL RATINGS:

Voltage and Frequency—

C7012A—separate models for 120, 208, or 240
volts ac, each suitable for operation at 50 or
60 Hz.

C7012C—120 volts ac, 50/60 Hz.

Power Consumption—10 watts maximum at 60 Hz.

FLAME FAILURE RESPONSE TIME: Less than 0.1
second.

AMBIENT OPERATING TEMPERATURE RATINGS
(outside the case): plus 25 F to plus 135 F [minus 4
to plus 57 C].

MAXIMUM FACEPLATE TEMPERATURE:

C7012A—172 F [78 C] in 135 F [57 C] ambient.

C7012C—163 F [73 C] in 135 F [57 C] ambient.

NOTE: The faceplate is the surface of the detector
housing behind the mounting flange or union and
including the conduit fitting (Figs. 1 and 2).

PRESSURE RATING OF QUARTZ VIEWING WIN- DOW:

C7012A—20 psi [137.9 kPa]. Magnifying lens (20 psi
[137.9 kPa] rating) or high pressure viewing win-
dow (50 psi [344.7 kPa] rating) available; see
Accessories.

C7012C—100 psi [689.5 kPa].

HOUSING:

C7012A—violet, cast-aluminum cover; mounting
flange (with heat block) and faceplate are separate
to provide heat insulation and seal-off. Meets
NEMA 4 standards (watertight and dust-tight,
indoor and outdoor).

C7012C—explosion-proof, 2-piece, violet, cast-
aluminum.

MOUNTING:

C7012A—mounting flange with either 3/4 or 1 inch
NPT internal threads (depending on model) for
attaching to sighting pipe.

C7012C—pipe union with 1 inch NPT internal threads
for attaching to sighting pipe.

WIRING CONNECTIONS:

C7012A—four NEC Class 1 color-coded leadwires,
length 8 feet [2.4 metres]. Faceplate has leadwire
opening with 1/2 inch NPSM internal threads for
attaching conduit.

C7012C—four NEC Class 1 color-coded leadwires,
length 6 feet [1.8 metres]. Faceplate has leadwire
opening with 1/2 inch NPT internal threads for
attaching pipe.

APPROVALS:

UNDERWRITERS LABORATORIES INC. LISTED
(120 volt models only):

C7012A—File No. MP268, Guide No. MCCZ.

C7012C—for use in hazardous locations; Class
I—Groups C and D, and Class II—Groups E,
F, and G; File No. E34649, Guide No. ZTSZ.

NOTE: All devices meeting UL component recognition
bear the following symbol:



Replacement exchange controls that meet cur-
rent UL requirements will have UL approval and
will be identified with the term REMER'D fol-
lowing the listing or component recognition
mark.

CANADIAN STANDARDS ASSOCIATION CERTI-
FIED (120 volt models only): C7012A—File
No. LR1620.

FACTORY MUTUAL APPROVED: C7012A—Report
No. 13564.

(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 (C7012A only).
3. Diameter of sighting pipe for C7012A (3/4 or 1 inch).

ORDER SEPARATELY:

1. Replacement parts, if desired.
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.

DIMENSIONS: See Fig. 1 or 2.

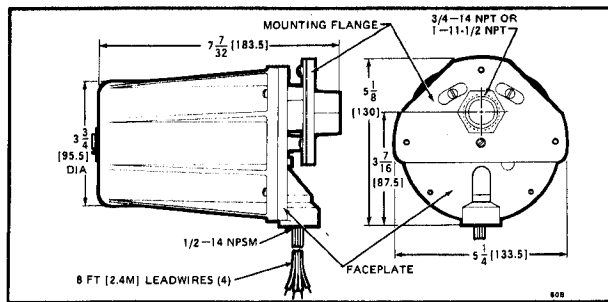


FIG. 1—DIMENSIONS OF THE C7012A IN INCHES [MILLIMETRES SHOWN IN BRACKETS].

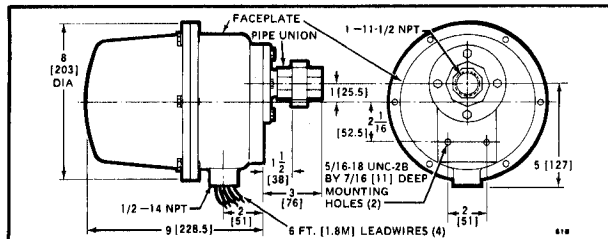


FIG. 2—DIMENSIONS OF THE C7012C IN INCHES [MILLIMETRES SHOWN IN BRACKETS].

WEIGHT:

C7012A—approximately 3-1/2 pounds [1.6 kilograms].

C7012C—approximately 14 pounds [6.4 kilograms].

REPLACEMENT PARTS:

All models—

113228 Ultraviolet Sensing Tube.

191286 Ultraviolet Sensing Tube for operation down to minus 20 F [minus 29 C] outside the case.

113236 Electron Tube.

115330 Electron Tube.

C7012A only—

114372 Quartz Viewing Window, rated for 20 psi [137.9 kPa].

114465 Gasket, silicone rubber; for installing viewing window (3 required).

120739 Gasket, asbestos-neoprene; heat insulation and seal-off for mounting flange.

C7012C only—

122037 Quartz Viewing Window, rated for 100 psi [689.5 kPa].

ACCESSORIES:

All models—

7616BV Bag Assembly; includes 118373 Pipe Tee, galvanized iron, with 3 female connections (3/4, 3/4, and 1/4 inch NPT internal threads), and 132588 Pipe Nipple, galvanized iron, with 3/4 inch NPT external threads on both ends. For connecting an air supply to ventilate the sighting pipe. Can be used with or without the swivel mount.

118369 Bushing, galvanized iron, with 3/4 inch NPT internal threads on one end and 1 inch NPT external threads on the other end. For adapting a detector with 1 inch NPT internal threads (for mounting) to a 3/4 inch sighting pipe, or to the pipe nipple and tee in the 7616BV Bag Assembly for connecting an air supply.

W136A Test Meter (includes 196146 Meter Connector Plug).

117053 Meter Connector Plug (for older W136A models).

118367A Swivel Mount.

C7012A only—

122748 Quartz Viewing Window, rated for 50 psi [344.7 kPa].

124204 Quartz Magnifying Lens; rated for 20 psi [137.9 kPa]; for increasing the ultraviolet radiation sensed by the detector.

120934 Mounting Flange, aluminum, with 3/4 inch NPT internal threads for attaching to sighting pipe.

124198 Mounting Flange, aluminum, with 1 inch NPT internal threads for attaching to sighting pipe.

123539 Antivibration Mount.

PLANNING THE INSTALLATION

Follow the burner manufacturer's instructions, if provided, when installing the C7012A or C. If the manufacturer has not provided detailed instructions, follow the general instructions below.

BASIC REQUIREMENTS FOR UV DETECTORS

All flames produce ultraviolet radiation. The UV (ultraviolet) detector takes advantage of this fact to prove the presence or absence of flame.

When the detector is exposed to ultraviolet radiation, a signal is passed to the amplifier section of the flame safeguard control, where it is amplified and used to trigger the flame relay. The C7012 produces a rectified direct current signal; this permits the detector to be used with any flame safeguard control which uses the rectifica-

tion principle of flame detection. Since it is necessary for the detector to actually see the flame, it is best to locate the detector as close to the flame as physical arrangement and temperature restrictions will permit.

Sighting requirements for an ultraviolet detector are as follows:

1. For pilot flame only—sighting must be along the long axis of the pilot flame as close as possible to the point at which the flame becomes too small to ignite the main burner.

2. Main flame only—sighting line must be at the most stable part of the flame for all firing rates. Some burners may require 2 detectors in parallel to prove both high and low firing.

3. For both pilot and main flame—sighting must be at the junction of the 2 flames.

RADIATION SOURCES (OTHER THAN FLAME) SENSED BY THE UV DETECTOR

The UV detector is sensitive to all sources of ultraviolet radiation. It is, in addition, somewhat less sensitive to X-rays and to gamma rays. Sources of radiation other than the flame do not normally cause difficulty with the exception of ignition spark.

IMPORTANT

THE DETECTOR WILL RESPOND TO IGNITION SPARK AND THE DETECTOR MUST BE AIMED SO THE SPARK IS NOT SIGHTED.

The following list includes sources of ultraviolet, X-ray, and gamma ray radiation that could trigger the UV detector:

- Hot refractory (above 2500 F [1371 C]).
- Spark –
 - ignition transformers.
 - welding arcs.
 - lightning.
- Bright incandescent or fluorescent artificial light.
- Solar radiation ("daylight").
- Gas lasers.
- Sun lamps.
- Germicidal lamps.
- Diffraction analyzers.
- Electron microscopes.
- Radiographic X-ray machines.
- High-voltage vacuum switches and condensers.
- Defective television sets.
- Radioisotopes.
- Bright flashlight held next to the sensor and aimed at its sensitive region.

These sources usually do not cause problems in flame safeguard systems, but the installer should be aware of them when installing or maintaining the detectors.

SPECIFIC REQUIREMENTS OF THE C7012A AND C

The C7012 is mounted outside the combustion chamber. The mounting flange or union is screwed to one end of a sighting pipe inserted through the furnace wall. The UV cell in the C7012 sights the flame through the sighting pipe.

TEMPERATURE RANGES

The ambient temperature at the detector case must be within the range plus 25 F [minus 4 C] to plus 135 F [plus 57 C]. Higher or lower temperatures may affect the condition of certain internal components such as the electrolytic capacitor and rectifier.

NOTE: An ultraviolet sensing tube, Part No. 191286, is available as a replacement part for operation down to minus 20 F [29 C] outside the case.

If the ambient temperature at the case is 135 F [57 C], the maximum allowable temperature at the faceplate of the C7012A is 172 F [78 C], of the C7012C, 163 F [73 C]. The faceplate is the surface of the detector housing behind the mounting flange or union and including the conduit fitting (Figs. 1 and 2). If conditions result in more heat than this at the faceplate, some means must be devised to shield or insulate the detector. See section on Faceplate Temperature on page 7 for suggested methods.

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, flame safeguard control technician.
4. After installation is complete, check out product operation as provided in these instructions.

CAUTION

1. Disconnect power supply before beginning installation to prevent electrical shock and equipment damage.
2. Do not connect these detectors to non-Honeywell manufactured flame safeguard controls (primaries, programmers, multiburner systems, burner management systems, etc.) as it could be unsafe.

Proper flame detector installation is the basis of a good flame safeguard installation. Refer to the burner manufacturer's instructions as well as to the following instructions. Follow instructions carefully to make the best possible application of the flame detector.

SIGHTING PIPE INSTALLATION

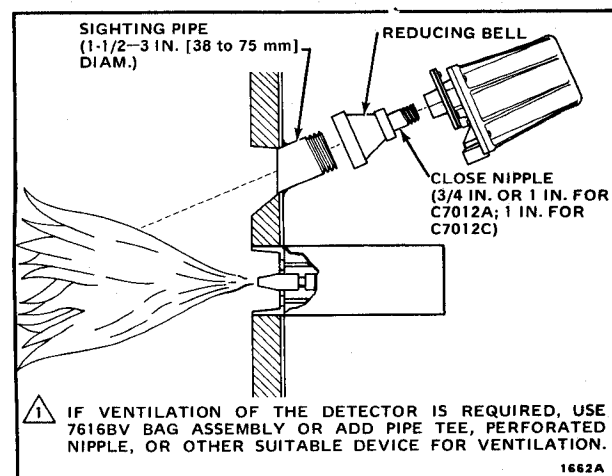


FIG. 3—TYPICAL MOUNTING OF THE C7012A,C.

INSTALL SIGHTING PIPE

Thread one end of a piece of black iron pipe of a suitable diameter and cut it to the desired length (as short as practicable). Do not use stainless steel or galvanized pipe because they reflect light internally and complicate aiming the pipe. Tack weld the pipe to the boiler plate in a trial position. Do not weld in place until satisfactory operation is proved.

IMPORTANT

DO NOT weld the sighting pipe in place until after completing the ADJUSTMENTS AND CHECKOUT on page 6.

ADD PIPE FITTINGS

Install a reducing bell and a close nipple as shown in Fig. 3. The C7012A requires a 3/4 or 1 inch close nipple; the C7012C, a 1 inch nipple.

When using 118367A Swivel Mount, see instruction sheet, form 60-0361.

SIGHTING PIPE VENTILATION FOR OIL FLAMES

Ventilate the sighting pipe in oil systems where vapors or oil mist may impede the detector's view of the flame. A good method for negative pressure combustion chambers is to drill a couple of small holes in the external portion of the sighting pipe. For positive pressure burners, tap the sighting pipe, use 7616BV Bag Assembly, or install a pipe tee, and provide a supply of pressurized air from the burner blower.

FLAME DETECTOR INSTALLATION

The C7012A and C detectors may be mounted in any position.

1. C7012A—Loosen the 3 screws holding the case to the mounting adapter, then rotate and separate the case from the flange. Screw the flange onto the sighting pipe.

C7012C—Remove one-half of the pipe union and screw it onto the sighting pipe.

2. Add the detector case to the flange (C7012A) or the union (C7012C).

VIBRATION

The detector will withstand normal burner vibrations. For applications where the vibration is excessive, however, a special shock mounting, Part No. 123539, is available for the C7012A. If the shock mount is used, all tests for position and sighting should be made with the mount in place.

WIRING (FIG. 4)

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

2. Keep the flame signal leadwires from the flame detector to the terminal strip or wiring subbase as short as possible. Capacitance increases with leadwire length, reducing the signal strength. The maximum permissible leadwire length depends on the type of leadwire and conduit type and diameter. The ultimate limiting factor in flame signal leadwire length is the signal current. Refer to Table I in the ADJUSTMENTS AND CHECKOUT section.

3. The detector comes with color-coded, plastic-insulated, No. 18 leadwires, rated for 221 F [105 C]. They are 8 feet [2.4 metres] long on a C7012A, or 6 feet [1.8 metres] long on a C7012C. These wires must be run in a conduit.

4. If the leadwires aren't long enough to reach the terminal strip or wiring subbase, make the required splices in a junction box.

5. If splicing is necessary, use moisture-resistant No. 14 wire suitable for at least 167 F [75 C] if the detector is used with a flame safeguard primary control, or at least 194 F [90 C] if used with a flame safeguard programming control.

6. For high temperature installations, use Honeywell Spec. No. R1298020 or equivalent for the "F" leadwire. (This wire is rated up to 400 F [204 C] for continuous duty. It is tested for operation up to 600 volts and breakdown up to 7500 volts.) For the other leadwires, use moisture-resistant No. 14 wire selected for a temperature rating above the maximum operating temperature.

7. Refer to Fig. 4 for wiring connections.

IMPORTANT

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

CONNECTING DETECTORS IN PARALLEL

For flames that are difficult to sight, using two parallel C7012A or C Flame Detectors will reduce nuisance shutdowns. If only one of the parallel detectors loses the flame signal, the other will still indicate the flame's presence and will keep the system running. A flame simulating failure in either detector will cause the system to shut down.

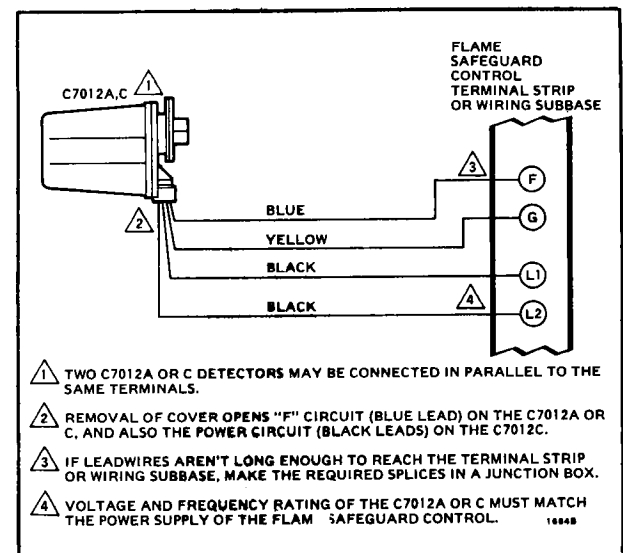


FIG. 4—TYPICAL WIRING CONNECTIONS FOR THE C7012A,C.

ADJUSTMENTS AND CHECKOUT

RUNAWAY SENSING TUBE TEST

NOTE: For initial burner lightoff, consult the burner manufacturer's instructions or the instruction sheet for the flame safeguard control.

During the initial burner lightoff, make sure the flame safeguard control starts (i.e., the load relay, usually 1K, pulls in). If it does not start, check the sensing tube in the ultraviolet detector. If the tube is glowing all the time when no flame is present, replace the sensing tube.

ADJUST DETECTOR MOUNTING POSITION

With the detector installed and the burner(s) running, adjust the position of the detector for optimum flame signal. Read the flame signal in microamps at the meter jack on the plug-in flame signal amplifier or on the flame safeguard control (Fig. 5). Use a microammeter with a 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 RED (+) meter lead to the red spade tip and the BLACK (-) lead to the black spade tip before inserting the plug into the meter jack.

NOTES:

1. If using an R7247B DYNAMIC SELF CHECK Amplifier, 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 2-1/2 to 4 times a second (from bright to dim). If the lamp is ON or OFF continuously while reading the flame signal, replace the amplifier.
2. If using an RA890H or J Self-Checking Flame Safeguard Control, depress the TEST button (on the amplifier or on the control) while making a measurement to stabilize the current reading. (The green flame indicating lamp on the RA890H or J should be ON continuously while reading the flame signal.)
3. The flame signal must be steady.

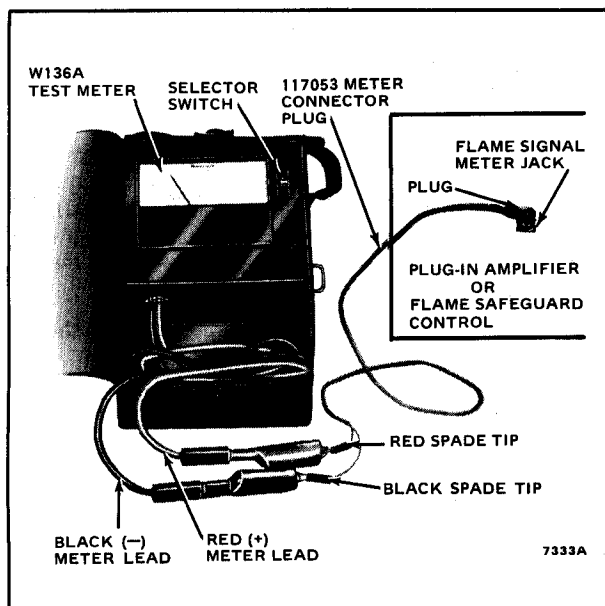


FIG. 5—MEASURING THE FLAME SIGNAL.

Move the detector and sighting pipe around to sight the flame at various positions and angles. Try to get a maximum steady (or stable) reading on the meter. The signal must be above the minimum acceptable current listed in Table I below.

Measure 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 burner flame when using direct spark ignition). Also measure the flame signal at high and low firing rates and while modulating in between (as applicable). With the detector in its final position, all required flame signals must be steady and as specified in Table I. If you cannot obtain the proper signal(s), refer to the TROUBLESHOOTING section.

TABLE I—FLAME SIGNAL

PLUG-IN FLAME SIGNAL AMPLIFIER (GREEN)	FLAME SAFEGUARD CONTROL(S)	MINIMUM ACCEPTABLE STEADY CURRENT (MICROAMPS)	MAXIMUM CURRENT EXPECTED (MICROAMPS)
R7247A	R4075C,D,E; R4138C,D; R4140	2	6
R7247B ^a (Dynamic Self Check)	R4075C,D,E; R4138C,D; R4140	2	4
R7253A	R4126, R4127	2	6
R7257A	R4150	2	6
R7289A	R4795A,D	2	6
None	R485B; R7023B; RA890E,F; RA890H,J (Self-checking) ^b	2	5

^aSet selector switch on test meter to "SPL" (damped) position to read current. The circuitry tests *only the flame signal amplifier* during burner operation and shuts down the burner if the *amplifier* fails.

^bDepress "TEST" button while reading current.

FACEPLATE TEMPERATURE

Operate system until temperatures have stabilized. Check temperature at faceplate of C7012. The faceplate is the surface of the detector housing behind the mounting flange or union and including the conduit fitting (Figs. 1 and 2). If it is higher than specified, devise some means of insulation. Possible arrangements are:

1. Shield or screen between burner wall and faceplate to reflect radiated heat.
2. Perforated pipe nipple between pipe and mounting flange (for negative pressure combustion chambers).
3. Pipe tee with forced air supply between pipe and mounting flange.

PILOT TURNDOWN TEST

If the detector is used to prove a pilot flame before the main fuel valve(s) can be opened, perform a Pilot Turndown Test before welding the sighting pipe in position. Follow the procedures given in the instruction sheet for the appropriate flame safeguard control, and in the burner manufacturer's instructions.

ULTRAVIOLET RESPONSE TESTS

IGNITION SPARK RESPONSE TEST

Test to make certain that ignition spark is not actuating the flame relay (usually 2K) on the flame safeguard control.

1. Close the pilot and main burner manual shutoff valves.
2. Start the burner and run through the ignition period. Ignition spark should occur, but the flame relay must not pull in. The flame signal should not be more than 1/4 microamp.

3. If the flame relay does pull in, resight the detector farther out from the spark, or away from possible reflection. It may be necessary to construct a barrier to block the ignition spark from the detector's view. Continue adjustments until the flame signal due to ignition spark is less than 1/4 microamp.

RESPONSE TO OTHER ULTRAVIOLET SOURCES

Some sources of artificial light produce small amounts of ultraviolet radiation. Under certain conditions, an ultraviolet detector will respond to them as if it is sensing a flame. **DO NOT USE AN ARTIFICIAL LIGHT SOURCE TO CHECK THE RESPONSE OF AN ULTRAVIOLET DETECTOR.** To check for proper detector operation, flame failure response tests should be conducted under all operating conditions.

WELD THE SIGHTING PIPE

When the flame signal is acceptable after all adjustments have been made, remove the detector and weld the sighting pipe in its final position. (If you are using a swivel mount, the pipe may already be welded.) Then reinstall the detector.

FINAL CHECKOUT

Before putting the burner into service, check out the installation using the procedures in the CHECKOUT section of the instruction sheet for the appropriate flame safeguard control. After completing the checkout, run the burner through at least 1 complete cycle to verify proper operation.

TROUBLESHOOTING

CAUTION

1. Use utmost care while troubleshooting the detector; line voltage is present on some of the terminals when power is on.
2. Open the master switch to disconnect power before removing or installing the detector or its cover.

RUNAWAY SENSING TUBE

If the flame safeguard control fails to start on a call for heat; i.e., the load relay, usually 1K, fails to pull in, check the sensing tube in the ultraviolet detector. If the tube is glowing all the time when no flame is present, replace the sensing tube.

UNSATISFACTORY FLAME SIGNAL

If you can't obtain a satisfactory flame signal while adjusting the sighting position of the detector, follow these procedures. If you encounter other problems in the system, refer to the TROUBLESHOOTING section in the instruction sheet for the appropriate flame safeguard control.

NOTE: Instructions for replacing the electron tubes, ultraviolet sensing tube, and quartz viewing window are given in the following SERVICE section.

SYSTEM CHECK

Start burner system and observe sequence. If burner ignites, but flame safeguard control fails to hold in:

1. Remove C7012A from its mounting flange by loosening 3 screws and rotating case away from flange. Remove C7012C by unscrewing pipe union and detaching unit.
2. With flame safeguard control energized, hold a lighted match or other source of flame in front of C7012 flame viewing window.
3. If the flame relay in the control pulls in, the C7012 is functioning properly. If flame relay does not pull in, look for a dirty quartz window or sighting pipe, or a misaligned sighting pipe. Measure the flame signal as described in the previous ADJUSTMENTS AND CHECKOUT section (see Fig. 5).
4. If flame relay still does not pull in after cleaning quartz window and sighting pipe, or realigning sighting pipe, proceed with C7012 check.

C7012 CHECK

1. With voltmeter scale on W136, check for line voltage between power terminals supplying the detector.
2. Remove cover from C7012.
3. With flame safeguard control energized, visually check the 113236 and 115330 Electron Tubes. If neither filament is lighted, it indicates transformer malfunction or a broken wire in the flame safeguard control. Replace the control.

4. If one or both filaments are lighted, substitute new tubes one at a time. After each tube replacement, test for pull-in of the flame relay in the flame safeguard control by holding a flame (match or cigarette lighter) in front of viewing window.

5. If necessary, replace the UV sensing tube and check for flame relay pull-in as in step 4 above.

6. If tube replacement does not clear up the trouble, replace the C7012.

SERVICE

CAUTION

1. Only a qualified service technician should attempt to service or repair flame safeguard controls and burner systems.
2. Open the master switch to disconnect power before removing or installing the detector or its cover.

PERIODIC MAINTENANCE

Scheduled periodic maintenance is necessary for proper functioning.

1. Replace 113236 and 115330 Electron Tubes annually. These tubes are tested by Honeywell to ensure reliability and safety. **DO NOT REPLACE WITH COMMERCIAL SUBSTITUTES.** Tubes of other manufacturers will cause nuisance shutdowns.

2. Do not replace the UV sensing tube unless it operates improperly. Order Part No. 113228 (or 191286 for operation down to minus 20 F [minus 29 C] outside the case).

3. Clean the quartz window periodically with a clean cloth on the end of an eraser type pencil. It is not necessary to remove the window from the mount.

To gain access to window on the C7012A, loosen the 3 screws holding case to mounting flange, rotate case and remove unit. On the C7012C, disconnect the unit at the union; then loosen and remove the 4 bolts holding the mounting plate from the case. The window is now accessible.

NOTE: A quick check on the window can be made by measuring the flame signal as described in the **ADJUSTMENTS AND CHECKOUT** section. If the current is not steady, clean the window. If still unsteady, investigate further.

4. Adjust burner system for smoothest, most reliable operation as recommended by burner manufacturer.

REMOVAL OF C7012 TUBES

1. De-energize C7012. Remove the detector cover.
2. Remove 115330 and 113236 Electron Tubes by pulling them from their sockets.

3. Remove the UV sensing tube by inserting screwdriver between tube base and socket and gently prying the tube out of its socket. Angle the base of the tube away from the socket and withdraw the tube from its fiber position guide. Use caution; move UV tube only in the manner just described.

4. Use care when replacing the UV tube. Make certain UV tube is placed in the same position as the tube removed.

REPLACING THE QUARTZ VIEWING WINDOW (OR MAGNIFYING LENS)

IMPORTANT

A quartz window or lens must be used. Ordinary glass filters out ultraviolet radiation.

C7012A

1. Remove both parts of mounting flange and cover.
2. If the quartz window and 3 rubber mounting washers are attached to the mounting flange, proceed with step 5, below.

3. Remove the UV sensing tube (Part No. 113228) as described under Removal of C7012 Tubes.

4. From the inside of the detector, push out the quartz window and the 3 rubber mounting washers. Use a pencil or similar rod.

5. Replace 1 of the rubber washers in the cavity. Place the new quartz window (flat or curved surface down, it doesn't matter) on the washer; then place 2 rubber washers (only 1 for a magnifying lens) on top of the window.

6. Replace the mounting flange first (to seal the window assembly); replace the UV tube (Part No. 113228); then replace the cover.

C7012C

1. Remove pipe flange (near union). Remove the 4 bolts which hold it in place.

2. Unscrew coupling which contains inner lens.

3. Remove threaded insert.

4. Remove O-ring and window.

5. Replace window, O-ring, threaded insert, and coupling.

6. Bolt flange to case with the 4 bolts.

Dear Customer,

We welcome your comments and suggestions for improving this publication. Your assistance is greatly appreciated and will enable us to provide better technical information for you.

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