

R7476A,B

Dynamic Self-check Ultraviolet Amplifier

PRODUCT HANDBOOK



APPLICATION

The R7476A Dynamic Self-Check Ultraviolet Amplifier is a solid-state unit designed for use with the C7076A,D Adjustable Sensitivity Ultraviolet Flame Detectors. A closed-loop self-checking circuit insures the integrity of both amplifier and flame detector 75 times per minute. Circuit status and checking rate is visually displayed by a flame-indicating lamp on the amplifier. It features a modular structure, plugging into a prewired FSP5075 Flame Amplifier Module, R4348B Flame Relay or an R4140 Programming Control.

SPECIFICATION

Model: R7476A

Flame Failure Response Time: 3 seconds nominal.

Model: R7476B

Flame Failure Response Time: 2 seconds max.

Flame Signal:

2.5 to 5.5 microampere (measured at the meter jack on the R7476 Amplifier).

Flame Detectors:

C7076A Adjustable Sensitivity Ultraviolet Flame Detector. Senses the ultraviolet radiation generated by a flame. For single or multiple burner applications. C7076 Sensors must be ordered separately.

C7076D Adjustable Sensitivity Ultraviolet Flame Detector. Same as C7076A,B, but has an explosion-proof housing meeting the requirements for Division 1, Class I, Group Card D; and Class II, Groups E, F and G of the National Electrical Code (NFPA 70).

C7076F meets European Ex-proof requirements.

Ambient Temperature Ratings:

Operating: -40°F to +150°F (-40°C to +66°C).

Storage: -60°F to +150°F (-51°C to +66°C).

Mounting:

Printed circuit board is keyed to edge connector on flame safeguard control to ensure proper orientation.

DIMENSIONS

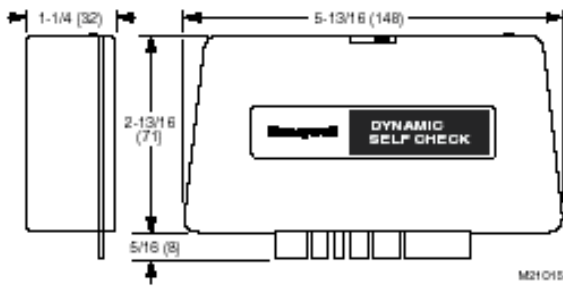


Fig. 1. Dimensions of R7476A,B Dynamic Self-Check Ultraviolet Amplifier in in. (mm).

Weight:

8 oz. (227 g).

Approvals R7476A:

Underwriters Laboratories Inc. Listed: File No. MP268; Guide No. MCCZ.

Factory Mutual Approved: Report Nos. 24150, 24180, 24181, 24313 and 26037.

Canadian Standards Association Certification: File No. LR1620.

R7476B approved for European market.

Accessories:

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

Protection:


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


IMPORTANT

 Do not connect more than two C7076A,D,F Flame Detectors in parallel to a single R7476A,B Amplifier.

The R7476A,B Dynamic Self-Check Ultraviolet Amplifier is a plug-in unit mated to the FSP5075 Flame Amplifier Module, R4348B Flame Relay or the R4140 Programming Control, allowing immediate field replacement without rewiring. For complete system wiring, see the FSP5075 instruction sheet (form 95-8271), R4348B instruction sheet (form 0787R2 HE) or the R4140 Programming Control instruction sheet (form 60-0427).

Mounting the Amplifier on the Flame Safeguard Control

IMPORTANT

 Do not remove the amplifier cover. Make sure the amplifier nameplate is on the outside.

1. Remove the cover from the FSP5075 Flame Amplifier Module or R4140 by loosening the two cover screws and lifting the cover. For the R4348B plug the amplifier into the amplifier receptacle.
2. Align the circuit board with the receptacle on the flame safeguard control (see Fig. 1).
3. Push in the amplifier until the circuit board is fully inserted into the receptacle.
4. Replace the FSP5075 or R4140 cover and tighten the cover screws. For the R4348B mount the control to the subbase

ORDERING INFORMATION

C7076 UV Sensor, FSP5075, R4140, R4348B must be ordered separately

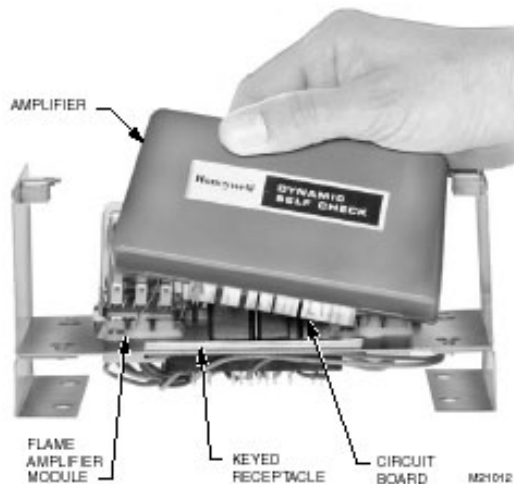


Fig. 2. Mounting the R7476A,B Amplifier on the Flame Safeguard Control.

Installing the Flame Detector

Proper flame detector application is the basis of a safe and reliable flame safeguard installation. Be sure to use only a C7076A,D,F Adjustable Sensitivity Ultraviolet Flame Detector with the R7476A or B.

Refer to the instructions packed with the flame detector (form 95-8269 or EN2R-9021) and to the burner manufacturer instructions. Follow instructions carefully to make the best possible application of the flame detector.

Parallel Flame Detectors

Two C7076A,D,F Detectors can be connected in parallel to the same R7476A,B Amplifier and still provide independent sensitivity adjustment. 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. This assures more reliable flame detection, decreases nuisance shutdowns and facilitates maintenance.

A flame-simulating failure occurring in the R7476A,B Amplifier or in either detector causes a shutdown.

Do not connect more than two C7076A,D,F detectors in parallel, in order to avoid exceeding the rating of the solid-state shutter control circuit in the R7476A,B.

Redundant Flame Detection System

Two C7076A,D,F Detectors connected to two R7476A,B Amplifiers wired in parallel comprise a redundant flame detection system. A redundant system exhibits increased reliability and is recommended for critical burner applications.

A flame failure, flame signal loss or flame-simulating failure occurring in either detector subsystem causes an alarm, but not a shutdown, allowing corrective action to avert a shutdown.

A failure detected by both subsystems causes an immediate shutdown.

CHECKOUT



WARNING

Explosion Hazard, Fire Hazard or Equipment Damage Hazard.

Can cause severe injury, death or equipment damage.

Failure to follow the burner/boiler equipment manufacturer instructions and sequence of operation can result in fire, explosion or equipment damage.

Before initial burner lightoff, consult the instructions and sequence of operation from the burner/boiler manufacturer.

Preliminary Inspection

Perform the following inspection steps:

1. Check that the amplifier is securely mounted on the flame safeguard control.
2. Make sure that the flame detector is clean and is installed and applied properly. See the instruction sheet for the C7076A,D,F Flame Detector (form 95-8269 or EN2R-9021).

IMPORTANT



Only C7076A,D,F Flame Detectors are used with R7476A,B Amplifiers.

Flame Signal Measurement

Measure the flame signal at times defined in the checkout tests in the instruction sheet for the flame safeguard control. See the C7076A,D,F Instruction sheet (form 95-8269 or EN2R-9021) for the complete flame detector checkout procedure.

Read the flame signal in microampere at the meter jack on the R7476A,B Amplifier (see Fig. 3 for meter jack and flame indicating lamp locations).

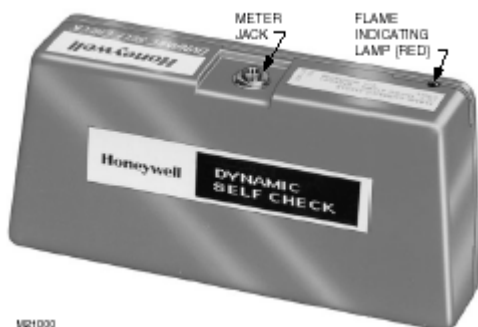


Fig. 3. R7476A,B Amplifier meter jack and flame indicating lamp locations.

1. Use a Honeywell W136A Test Meter with the selector switch set at SPL (see Fig. 4). If a W136A Meter is not available, a microammeter with a 0 to 5 microampere dc range, shunted with a 50 microfarad capacitor, may be used.
2. A 117053 Meter Connector Plug is needed (it may be ordered separately). Connect its red tip to the red (+) meter lead and its black tip to the black (-) meter lead.
3. Insert the plug into the flame signal meter jack and allow a few seconds for the meter reading to stabilize.

4. Read the average stable current, disregarding the peaks due to shutter operation. The red flame indicating lamp on the amplifier should blink about 1-1/2 times per second.
5. The meter reading must be at least 2.5 microampere.
6. If the signal is unstable or less than 2.5 microampere, perform the adjustments and check out the C7076A,D;F Flame Detector Instruction sheet (form 95-8269 or EN2R-9021).
7. If you can't obtain a satisfactory flame signal while adjusting the sensitivity, follow the troubleshooting procedures in the C7076A,D,F Instruction sheet.

IMPORTANT



If you make any changes in the flame detection system, perform the Adjustments and Checkout in the C7076A,D,F Flame Detector Instruction sheet (form 95-8269 or EN2R-9021). Then repeat ALL required tests in the Checkout section of the instruction sheet for the appropriate 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 glowing brightly.
2. Flame present.lamp should blink about 1-1/2 times a second. Replace the amplifier if the lamp does not blink.

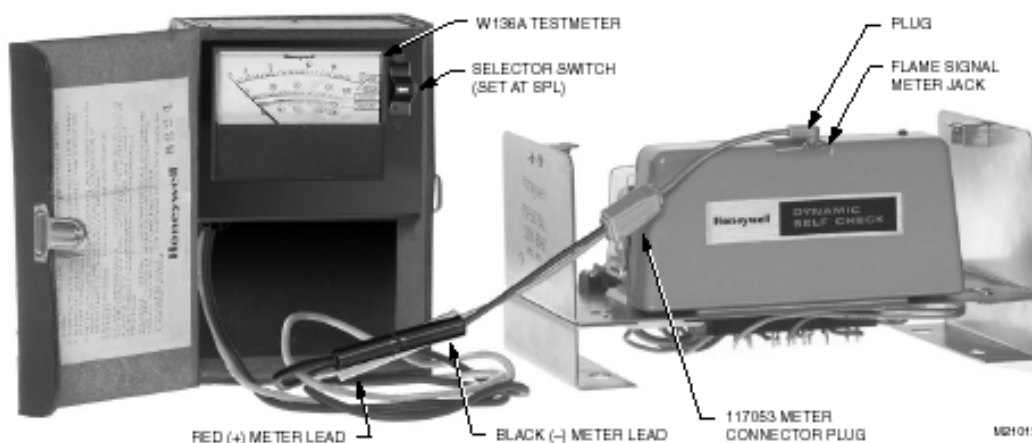


Fig. 4. Setup for flame signal measurement, R7476A Amplifier.

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