

C7061C/F

ULTRA VIOLET FLAME DETECTOR

PRODUCT HANDBOOK



APPLICATION

The C7061C/F are flame detectors for sensing the ultraviolet radiation generated by the combustion of gas, oil, or other fuels.

Explosion-proof housing meets requirement for use in hazardous location.

C7061 is available in two version.

- C7061C : Non self-checking
- C7061F : Dynamic self-checking for continuous operation.

C7061F provides a closed-loop, self-checking circuit which insures the integrity of both amplifier and flame detector. Improper response simulated flame loss results in a safety shutdown and/or alarm.

FEATURES

- Housing designed to be explosion-proof and KOSHA approved : Ex d IIC T6
- Housing meets IP65 enclosure standard
- Two quartz lens construction
Quartz viewing window for explosion-proof requirement
Quartz magnifying lens for improved sensing ability(Option)
- Ultraviolet radiation sensing tube field replaceable
- Detector can be mounted horizontally, vertically or at any other angle.
- Terminal block is of wire clamp type with removable screws and is situated in the compartment of C7061
- Designed for use with Honeywell burner control and flame switch of both 115Vac and 220Vac version.
- Two detectors can be wired in parallel to reduce nuisance shutdown in difficult flame sighting application.
- A swivel mount is available to facilitate flame sighting
- 3/8" purge air connection provided on flange

C7061F only

- Oscillating shutter interrupts ultraviolet radiation reaching the UV sensor 12 times per minute to provide the UV sensor tube checking function. Amplifier circuitry components are checked from microprocessor in the 7800 series control.
- Requires faceplate alignment and have integral locating reference points to assure proper shutter mechanism

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SPECIFICATION

IMPORTANT

The specification in this publication do not include normal manufacturing tolerance. Therefore, this unit may not exactly match the specifications listed. This product is tested and calibrated under closely controlled conditions, and minor difference in performance can be expected if those conditions are changed.

Models

C7061C non self-checking ultraviolet flame detector.
C7061F Dynamic self-checking ultraviolet flame detector.

Electrical Rating:

The C7061 is powered from Honeywell burner control that delivers the necessary voltages to operate tube and shutter.

Voltage and Frequency of burner control :

115Vac or 220Vac, 50/60Hz

The system operates correctly at a nominal voltage (-15%,+10%, 50/60Hz)

Ambient Operating Temperature Ratings

-20°C to 70°C (-22°F to 160°F)

Storage Temperature Ratings

-50°C to 80°C (-60°F to 175°F)

Enclosure Rating(Housing)

Meets Ex d IIC T6 (explosion-proof for use in Zone1,2)

Meets IP65(indoor, outdoor protection; rain-tight, dust-tight)

Pressure Rating of Quartz Viewing Window

690KPa(100psi)

Mounting

Mounting flange with 1" NPT internal thread for attaching to sight pipe

Purge Air Connection

3/8" NPT internal thread on mounting flange

Threaded Leadwire Faceplate Opening

1/2" NPT internal for attaching conduit

Wiring Connection

Terminal block inside the housing, wire clamp type, removable screws

Weight

C7061C/F : Approximately 2.4kg(5.3lbs)

Dimension

See fig. 1

Serviceability

Field replaceable ultraviolet sensing tube, coil and shutter assembly

Approvals:

Korea Occupational Safety and Health Agency(KOSHA) approved : For use in Hazardous locations
Ex d IIC T6 IP65

Replacement Parts

129464N Ultraviolet Sensing Tube
190971B Coil and Shutter Assembly

Accessories

118367A Swivel mount
Need bushing, 1 inch NPT external thread on both end, for installation(Not included)
124204 Quartz Focusing Lens, rated for 128kPa

ORDERING INFORMATION

When ordering specify :

- Complete model nr.
C7061F1011 : Dynamic self-checking
C7061C1011 : Non self-checking type

Order separately :

- Amplifier
R7861 flame amplifier for C7061F
R7849 flame amplifier for C7061C
* to be used with 7800 series flame safeguard control
- Flame safeguard control
7800 series for C7061F and C7061C
BC1000/DBC2000 for C7061C
- Accessories, if desired
- Replacement part, if desired

DIMENSION

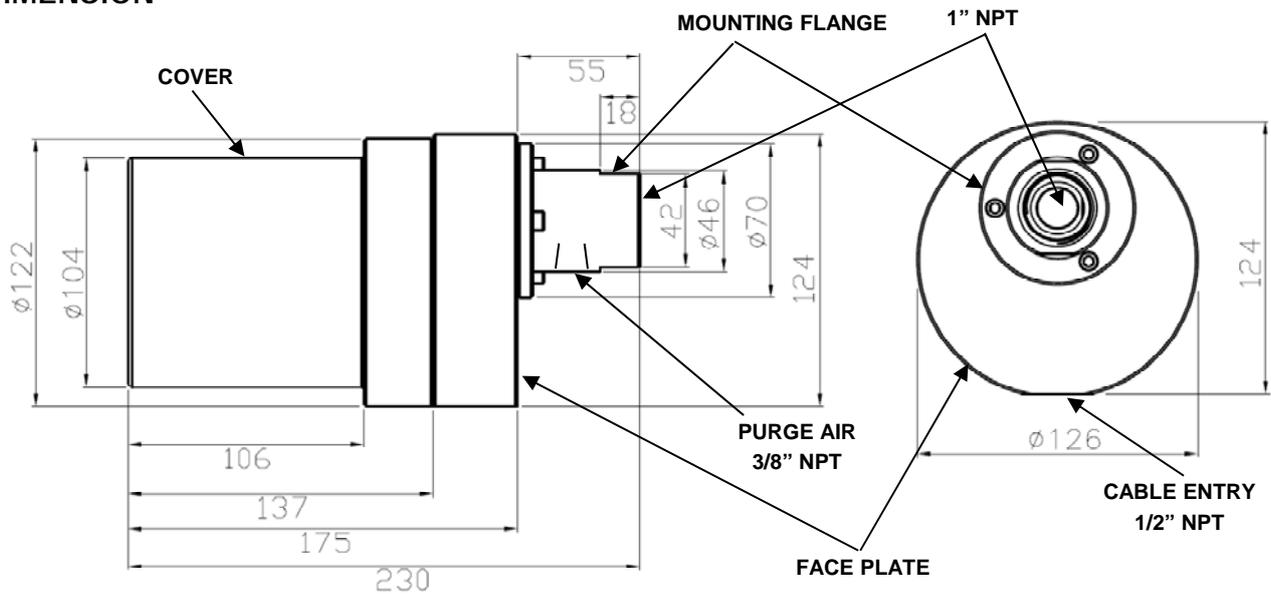


Fig.1 Dimensional drawing in mm

INSTALLATION

When Installing this Product,,

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



CAUTION

Equipment damage hazard.
Sensing tube can fail to discriminate between flame conditions.

Change sensing tube after 40,000 hours of continuous use



WARNING

Electrical shock hazard.
Can cause serious injury or death.
Disconnect power supply before beginning installation to prevent electrical shock and equipment damage.
More than one disconnect may be involved.

IMPORTANT

1. Do not connect these detectors to non-Honeywell manufactured controls (primaries, programmers, multiburner systems, and burner management systems). Unsafe condition could result.
2. All wiring must be NEC class I (line voltage).
3. Voltage and frequency of the power supply connected to this detector must agree with the values described on this instruction.
4. Sight the detector so it does not respond to ignition spark
5. On multiburner installations, each detector must respond only to the flame of the burner it is supervising
6. Do not connect more than two C7061 flame detectors in parallel.

Proper flame detector installation is the basis of safe and reliable flame safeguard installation. Carefully follow all instruction for the best possible flame detection application.

Basic Requirement

The combustion flames of most carbon-based fuels emit sufficient ultraviolet radiation to enable the C7061 Solid state (Purple peeper) Ultraviolet Flame Detector to prove the presence of a flame in a combustion chamber. The detector is mounted outside the combustion chamber with its mounting flange to one end of a sight pipe inserted through the wall of the combustion chamber. The ultraviolet sensing tube in the flame detectors sights the flame through the pipe.

When a flame is present, the UV tube in the C7061 senses the ultraviolet radiation emitted. The C7061 then produces a signal that is sent to the amplifier in the flame safeguard control. The amplified signal pulls the flame relay into the control to allow proper system operation.

In most installation, the detector needs to respond to the pilot flame alone, then the pilot and main burner flame together, and finally the main burner flame alone. The detector must meet all sighting requirements that apply:

- Pilot flame alone – the smallest pilot flame that can be detected must be capable of reliably igniting the main burner.
- Pilot and main burner flame together – the detector must sight the junction of both flames.
- Main burner flame alone – the detector must sight the most stable part of the flame for all firing rates.

Determine Location

Before beginning the actual installation, determine the best location for mounting the detector. Carefully consider the factors discussed in the section before deciding on the location.

Temperature

Install the C7061 where the ambient temperature(outside the case) stays within the ambient operating temperature ratings.

To keep the C7061 below its maximum rating, it may be necessary to add additional insulation between the wall of the combustion chamber and the detector. A shield or screen can be added to reflect radiated heat away from detector. If the detector continues to get too hot, cooling is necessary . Refer to the Sight Pipe Ventilation section.

Vibration

If the C7061 is subject to excessive vibration, use a special 123539 Antivibration Mount. If you use this mount, install it before you positioned and sight the detector.

Clearance

Make sure there is enough room to easily mount the sight detector for trouble shooting and servicing.

Radiation Sources (Other than Flame)

Example of radiation sources(other than flame) that could actuate the detection system :

Ultraviolet sources:

Hot refractory above 1260°C(2300°F).

Spark:

- Ignition transformers.
- Welding arcs.
- Lighting.

Welding flames.

Bright incandescent or fluorescent artificial light.

Solar radiation.

Gas lasers.

Sun lamps.

Germicidal lamps.

Bright flash light held close to the sensing tube.

Gamma ray and X-ray sources:

Diffraction analyzers.

Electron microscopes.

Radiographic X-ray machines.

High voltage vacuum switches.

High voltage coronas.

Radioisotopes.

Except under unusual circumstances, none of these sources except hot refractory and ignition spark would be present in or near the combustion chamber.

The detector can respond to hot refractory above 1260°C (2300°F) if the refractory surface represents a significant percentage of the detectors field of view. If the temperature of the hot refractory causes the flame relay (in the flame safeguard control) to pull in, re-aim the sight pipe so the detector view a cooler area of the refractory.

Ignition spark is an intense source of ultraviolet radiation.

When installing the detector, make sure it does not respond to ignition spark.

Single Burner Requirement

The detector must have an unobstructed view of a steady part of the flame it is supervising. This requires a proper sighting angle and minimized ultraviolet radiation attenuation effects. However, when supervising only one burner, sighting requirement are simplified

Sighting Angle (Fig. 2)

The first 30 percent of a flame detector closest to the burner nozzle (the flame root) emits the most ultraviolet energy. Also, if the detector sight the flame at an angle of instead of perpendicularly, it views more flame depth. Therefore, the best sighting angle is nearly parallel to the axis of the flame, permitting the detector to view a large portion of the first 30 percent of the flame closest to the burner nozzle, as illustrated in Fig. 2

Low angle sighting permit the detector to view a greater depth of flame, thus reducing the effects of instabilities in the flame pattern. Also, the environment near the burner nozzle is usually cleaner than at any other part of sight and can keep the viewing window cleaner, thus reducing the maintenance required.

Because it is necessary for the UV sensing tube to actually see the flame. It is best to locate the detectors as close to the flame as physical arrangement. Temperature, and other restriction permit. These restrictions are described in detail in the following paragraphs.

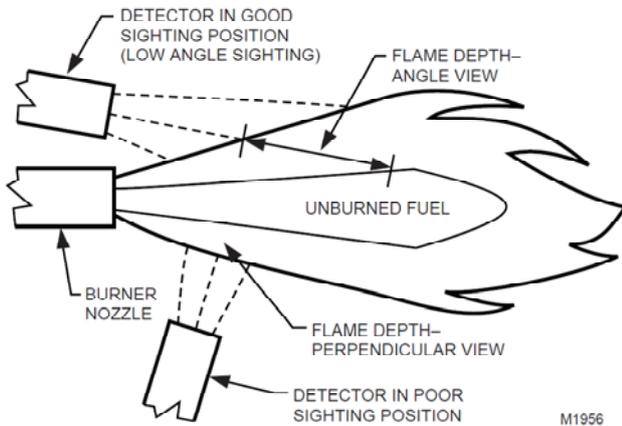


Fig.2 Dimensional drawing in mm

NOTE : When possible, it is desirable to tilt the detector and sight pipe downward to prevent the buildup of soot in the pipe or on the viewing window.

Parallel Flame Detectors

Switching flame patterns, commonly encountered on burners with high turn down ratios, can require two parallel detectors to prove the flame at the highest and lowest firing rates and for modulation in between. In this case, one detector supervises the pilot(interrupted) and both detectors supervise the main burner flame. During the main burner run period, either detector is capable of maintaining system operation. A maximum of two C7061 Detectors can be connected in parallel.

In addition to assuring more reliable flame detection, parallel detectors facilitate maintenance during burner operation. Each detector can be removed, in turn, without shutdown the supervised burner. However, flame simulating failure occurring in the flame signal amplifier or in either detector will cause shutdown.

Screen Effects

Smoke, oil mist, dirt and dust are masking agents that attenuate too much radiation, the amount of ultraviolet radiation reaching the detector is reduced. The flame signal can then become too low to hold in the flame relay, resulting in burner shutdown.

The problem can be eliminated by diluting the contaminants. A strong flow of air through the sight pipe will clear a viewing path through the attenuating material. Refer to the Sight Pipe Ventilation Section.

It is also desirable to sight the detector at an area containing fewer masking agents such as near the burner nozzle or near the entrance of the combustion air. Increasing the viewing area of the detector by shortening the sight pipe by increasing the diameter of the sight pipe also reduces the attenuating effects of masking agents.

Multiburner Requirements

(Flame Discrimination)

In addition to meeting the requirement for a single burner, a multiburner installation requires discrimination between flames. Flame discrimination can be defined as locating all flame detectors so that each detector responds only to the flame of the burner it is supervising.

In multiple burner systems, not every detector can be positioned so its line-of-sight does not intercept flame from other burners. For example, this situation occurs in front-fired boiler-furnaces having more than one row of burners, or in multilevel opposed-fired furnaces where the burners face each other.

When planning such an installation, locate each flame detector so that it has the best possible view of the first 30 percent closest to the burner nozzle (the flame root) it is supervising, and the worst possible view of all other flames.

Fig.3 illustrates a critical detector application problem that requires flame discrimination. Flame discrimination is accomplished for Detector A by repositioning it until the flame relay (in the flame safeguard control) does not respond to Flame B. Note that Detector A is aimed at the first 30 percent of Flame A where the ultraviolet radiation is most intense. It sights the tip of Flame B, but it is not aimed at the first 30 percent of Flame B where ultraviolet is intense. Detector A is repositioned to assure maximum response to Flame A while rejecting Flame B. Similarly, Detector B is positioned to assure maximum response to Flame B while rejecting Flame A.

If you repositioned a detector and still cannot achieve flame discrimination, try reducing the viewing area by increase the length or decreasing the diameter of the sight pipe, or adding an orifice plate.

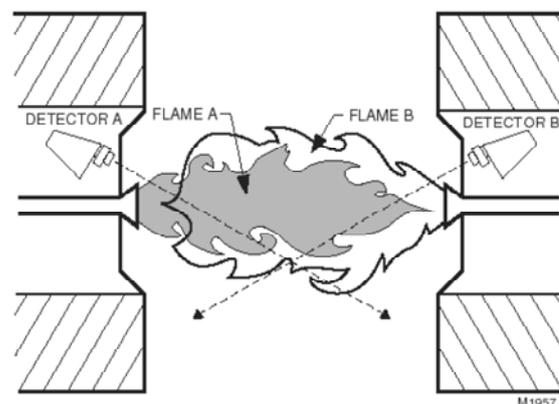
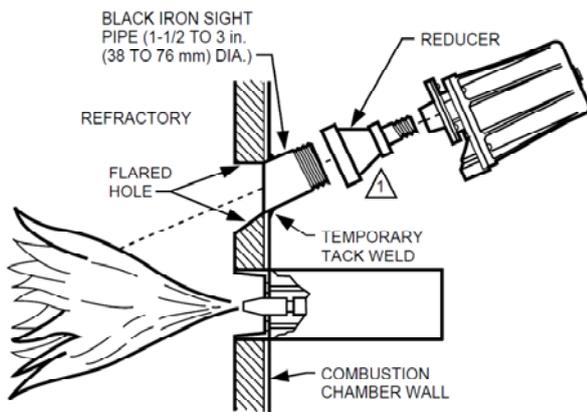


Fig.3 Example of flame discrimination Problem(opposed fired burners).

Install the Sight Pipe (Fig.4)

After you have determined the location of and sighting angle, select the sight pipe. A black iron pipe with a diameter of at least 1-1/2 in.(38 mm) is recommended. Do not use stainless steel or galvanized pipe because they reflect ultraviolet radiation internally and complicate aiming the pipe.

Sight pipes with diameters 2 to 3 in (51 to 76 mm) produce better results for horizontal rotary burners, which requires wide viewing angles. A wide viewing angle can also obtained by using a short sight pipe.



⚠ PIPING ACCESSORIES MAY BE ADDED, IF REQUIRED

Fig.4 Typical mounting of C7061

Prepare Hole in Combustion Chamber Wall

Cut or drill a hole of the proper diameter for the sight pipe in the wall of the combustion chamber at the selected location. Flare the hole to leave room for small adjustment of the sighting angle. The taper of the hole should be about 1 in. for every 3in. (25 mm for every 76 mm) of wall thickness.

Mount Sight Pipe

Thread one end of the pipe to fit the mounting flange, union, or required coupling. Cut the pipe to the desired length (as short as practical) and at an angle so it fits flush with the wall of the combustion chamber. Track weld the pipe to the wall in a trial position. Do not weld the sight pipe permanently in place until after completing the Adjustment and Checkout.

NOTE : If you use 118367A Swivel Mount and you are positive about location and sighting angle, you can permanently weld the pipe.

Install Fittings

In some cases, the sight pipe does not directly fit the C7061 mounting flange. Also, it may be desirable or necessary to ventilate the sight pipe. You may also want to use a swivel mount or an antivibration mount. Each of these cases can require additional fittings.

Reducer

For sight pipes of larger diameter than the mounting flange connector, install reducer as illustrated in Fig.4. The reducer requires a close nipple with 1 in. NPT external threads.

Sight Pipe Ventilation (Purge Air)

It may be necessary to ventilate the sight pipe to cool the detector or to clear a viewing path through UV radiation attenuating material.

C7061 provides 3/8 in. internal thread for purge air connection. Remove plug to install air supply line. Use a flexible air supply line, to allow for repositioning of detector and sight pipe until a final and permanent position has been decided. A continuous flow of air must be maintained to keep the detector cool and sight pipe clean. At least 3 CFM at approximately 8 in. w.c. above chamber pressure is recommended. The air supply must be clean, free of oils and water, and preferably cool.

Swivel Mount

To facilitate proper flame sighting, use 118367A Swivel Mount(ordered separately). The swivel mount requires a reducer of the proper size of to mount it onto the sight pipe. It also requires a one-inch close nipple for mounting C7061C and C7061F (For 118367A Swivel Mount mounting details, refer to 60-0361)

Antivibration Mount

The detector withstands normal burner vibration. If the vibration is excessive, 123569 Antivibration Mount is available. (Fro mounting details, see from 60-0361.) If you use this mount, install if before positioning and sighting the detector

Mount the Detector

Mount the detector onto the sight pipe, reducer, or other fitting.

The C7061F Self-Checking Flame Detectors incorporate an oscillating shutter mechanism and, therefore require special consideration of mounting positions other than vertically sighting downward or upward. The C7061F has arrow indicators (see Fig. 5) on the faceplate to facilitate mounting in positions The arrow must be vertically aligned with the arrow pointing downward (see Fig. 5). The C7061F must be mounted with the conduit below the horizontal (see Fig. 5).

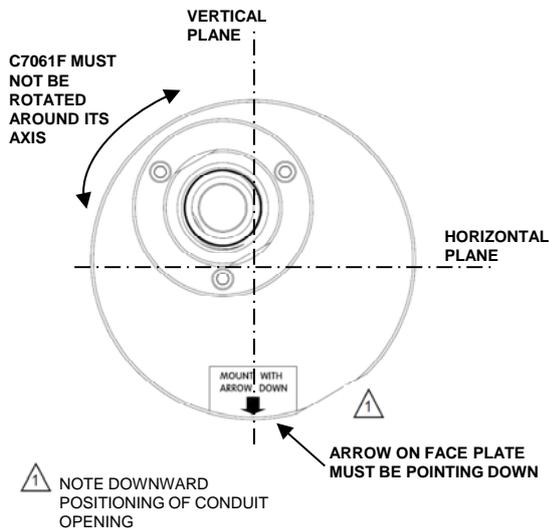
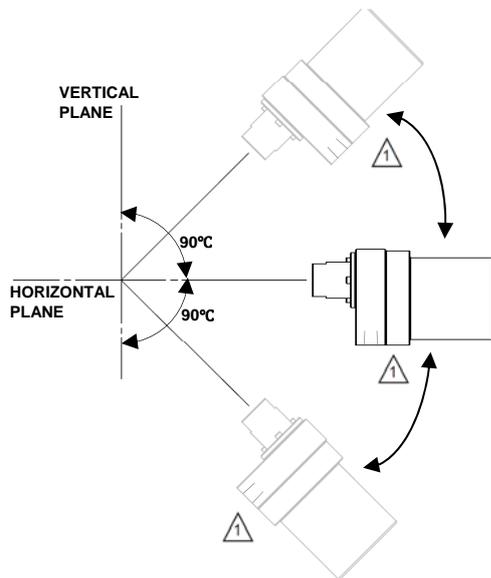


Fig.5 C7061 mounting position

IMPORTANT

The arrow on the faceplate must be aligned in a vertical plane with the arrow pointing down.

To turn C7061F/C (Fig. 6).

1. Loosen 3 crews between flange and face plate
2. Turn the C7061F in the most favorable position.
3. Tighten the screws securely.

To connect purge air supply

1. Remove plug on flange by using hexagonal wrench(M8)
2. Connect air supply line (3/8 in. NPT)



Fig.6 Mounting flange of C7061



Fig.7 Purge air connection

WIRING (FIG.8)



CAUTION

Equipment damage hazard.
Improper wiring can permanently damage amplifier.

When using a C7061F with an R7861 Dynamic Self-Check Amplifier, be careful not to short the white shutter leadwires together (by wiring incorrectly, leaving an incorrect jumper wire, or stripping the insulation too much so the bare leadwires can touch).

1. All wiring must comply with applicable local electrical codes, ordinances, and regulations. Use NEC Class 1 wiring.
2. Keep the flame signal leadwires as short as possible from the flame detector to the terminal strip or wiring

subbase. 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 1.

3. For wiring, 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.
4. For high temperature installations, use Honeywell specification no. R1298020 wire 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 for 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.
5. Refer to Fig. 8 and Fig.9 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 a flame that is difficult to sight, using two parallel C7061 Flame Detectors reduces nuisance shutdowns. If only one of the parallel detectors loses the flame signal, the other indicates the presence of the flame and keeps the burner running. When two parallel C7061 Detectors are used, a flame-simulating failure in either detector causes the burner to shut down. Two C7061 Detectors can be connected in parallel to the same terminals on 120 volt flame safeguard controls. *To avoid exceeding the rating of the solid-state shutter switch in the R7861 Flame Signal Amplifier, do not connect more than two C7061 Detectors in parallel.*

IMPORTANT

Voltage and frequency rating of the C7061A must match the power supply of the flame safeguard control.

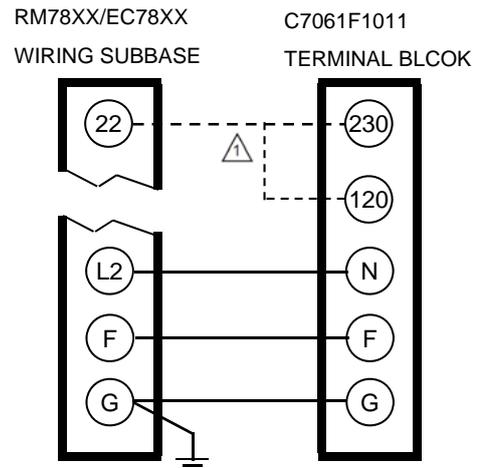
CAUTION

Equipment damage hazard.
When using the C7061F in conjunction with an flamesafeguard control at 230Vac, parallel sensors can **not** be used.

ADJUSTMENTS AND CHECKOUT

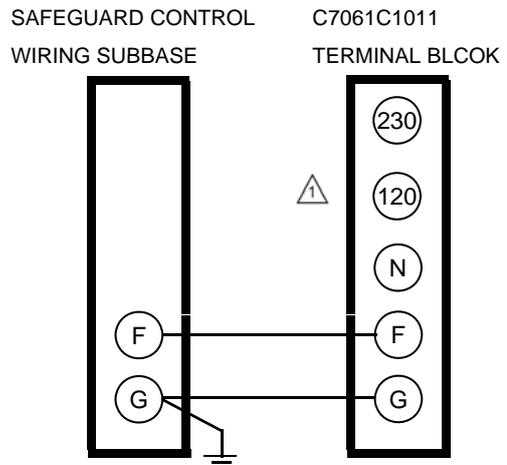
UV Sensor Tube Test

For initial burner light off, consult the burner manufacturer instructions or the flame safeguard control instructions.



⚠ IF RM78XX CONTROL IS USED CONNECT TO 120V LUG ON TERMINAL BLCOK. IF EC78XX IS USED CONNECT TO 230V ON TERMINAL BLCOK.
TWO C7061F CAN NOT BE CONNECTED IN PARALLEL IN 230VAC APPLICATION.

Fig.8 Wiring C7061F with 7800 flame safeguard control



⚠ DO NOT CONNECT ANY WIRES TO UNUSED TERMINAL.

Fig.9 Wiring C7061C with flame safeguard control

If the system does not start during the initial burner lightoff, check the UV sensor tube in the flame detector. If a reddish glow appears when there is no flame present, replace the UV sensing tube. When performing this test, make sure there are no extraneous sources of ultraviolet radiation in the test area (see Radiation Sources section).

Adjust Detector Sighting

With the flame detector installed and the burner running, adjust the sighting position of the detector for optimum flame signal.

It is suggested that a volt-ohm meter with a minimum sensitivity of one mega ohm/volt and a zero to five or ten Vdc scale be used for R78XX Amplifier flame signal measurements. Be careful to make the proper connections of positive (red) meter lead to positive (+) control jack and negative (black) meter lead to negative (-) or (-Com) jack with 7800 Series controls. When the 7800 Series control has a Keyboard Display Module, a zero to five Vdc voltage is displayed on the module.

NOTES:

1. The shutter operation causes fluctuations in the voltage reading. Read the average stable reading, disregarding the peaks.
2. The flame signal must be steady (or stable as described in note 1).

Move the detector and sight pipe around to sight the flame from various positions and angles. Try to get a maximum steady (or stable) reading on the meter that is above the minimum acceptable voltage listed in Table 1.

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 low and high firing rates and while modulating in between (as applicable). With the detector in its final position, all required flame signals must be steady (or stable) and as specified in Table 1. If you cannot obtain the proper signal, refer to the Troubleshooting section.

Pilot Turndown Test

When 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 sight pipe into position. Follow the procedures in the flame safeguard control instructions and in the burner manufacturer instructions.

Ultraviolet Response Tests Ignition Spark Response Test

Test to be sure that ignition spark is not actuating the flame relay in 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 LED must not light. The flame signal should not be greater than 0.25 Vdc.
3. If the flame relay does pull in, reposition the detector farther from the spark, or relocate/resight the detector to eliminate/reduce the detector response to reflected UV radiation. It may be necessary to construct a barrier to block the ignition spark from the detector view. Continue adjustments until the flame signal due to ignition spark is less than the flame signal values indicated in step 2.



Fig.10 Measuring voltage flame signal with 7800 Series control

Minimum Acceptable Steady Voltage(Vdc)	Maximum Expected Voltage(Vdc)
1.25	5.0

NOTES : C7061 with R7861 amplifier

1. Shutter operation of the C7061A causes fluctuations in the voltage reading. Read the average stable voltage, disregarding the peaks.
2. Shutter operates at 12 cycles per minute.

Table 1 Flame Signal with 7800 series

Response to other Ultraviolet Radiation Sources

Some sources of artificial light produce small amounts of ultraviolet radiation. Under certain conditions, an ultraviolet detector responds as if it is sensing a flame. Do not use an artificial light source to check the response of an ultraviolet flame detector. To check for proper detector operation, conduct flame failure response tests under all operating conditions.

Weld the Sight Pipe

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

Final Checkout

Before putting the burner into service, check out the installation using the Checkout procedures in the Instructions for the appropriate flame safeguard control. After completing the Checkout, run the burner through at least one complete cycle to verify correct operation.

IMPORTANT

Do not put the system into operation until all Checkout tests in the Instructions for the appropriate flame safeguard control and any others specified in the burner installation instructions are satisfactorily completed.

TROUBLESHOOTING

WARNING

Electrical shock hazard.

Can cause serious injury or death.

Open the master switch to disconnect power before removing or installing the detector or its cover. More than one disconnect may be involved.

Equipment Required

A volt-ohm meter with a minimum sensitivity of one mega ohm/volt and a zero to five or ten Vdc scale is suggested. When the Keyboard Display Module is included with the control, a flame signal displays on the module. For replacement parts, see Specifications section.

UV Sensor Tube Test

See UV Sensor Tube Test section.

Unsatisfactory Flame Signal

If a satisfactory flame signal (see Table 1) cannot be obtained 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 Instructions for the appropriate flame safeguard control.

NOTE: For instructions to replace the viewing window, sensing tube, and coil and shutter assembly, see the Service section.

Troubleshooting Procedures

First perform the Preliminary Inspection. Then follow the applicable procedures for either a low meter reading or a zero meter reading. After reinstalling the detector or replacing its cover, recheck the meter reading. To try to obtain the proper flame signal, adjust the position of the detector. If you complete all of the procedures and yet cannot obtain a proper flame signal, replace the detector.

Preliminary Inspection

1. Check for the proper line voltage. Make sure the master switch is closed, connections are correct, and power supply is of the correct voltage and frequency.
2. Check the detector wiring for defects:
 - a. Incorrect connections.
 - b. Wrong type or size of wire.
 - c. Deteriorated wire.
 - d. Open circuits.
 - e. Short circuits.
 - f. Leakage paths caused by moisture, soot, or dirt.
3. With the burner running, check the temperature at the detector. If it exceeds 175°F (79°C):
 - a. Add additional insulation between the wall of the combustion chamber and the detector.

- b. Add a shield or screen to reflect radiated heat away from the detector, or
- c. Add cooling (refer to Sight Pipe Ventilation and Accessories sections).

Removing Detector from Sight Pipe

Remove purge air supply if it is installed.
Carefully unscrew flame detector from sight pipe.

NOTE: The detector can be removed from flange by loosening three screws holding the mounting flanges. Flange will be stayed with mounting onto sight pipe. Focusing lens(Optional) will be free when unscrewed; do not drop it.

Procedure for Zero Meter Reading

1. Replace the plug-in amplifier. Then recheck the flame signal.
2. Replace the ultraviolet sensing tube (see Service section). Then recheck the flame signal.
3. Replace the coil and shutter assembly (see Service Section). Then recheck the flame signal.
4. If you cannot yet obtain a meter reading, replace the detector.

IMPORTANT

At the completion of Troubleshooting, be sure to perform the Adjustments and Checkout procedures.

SERVICE

WARNING

Electrical shock hazard.

Can cause serious injury or death.

Open the master switch to disconnect power before removing or installing the detector or its cover. More than one disconnect can be involved.

Periodic Maintenance

1. Clean the viewing window (or focusing lens) when necessary. Remove the detector (see Troubleshooting section) and use a clean cloth over the eraser end of a pencil. Do not remove the window (or lens) to clean it.
2. Keep the flame detection system adjusted for the smoothest, most reliable operation as recommended by the burner manufacturer.
3. Replace the sensing tube, coil and shutter assembly, or quartz focusing lens(Optional) only when necessary to obtain proper operation.

Removing Detector Cover :

1. Open the Master Switch.
2. Carefully unscrew cover from faceplate.
Hold faceplate and rotate cover in CCW.

Replacing Ultraviolet Sensing Tube (Fig. 11)

IMPORTANT

Be very careful not to kink or otherwise damage the flexible shutter.

1. Open the master switch and remove the cover from the detector (see instructions above).
2. Locate the UV sensing tube.
3. Remove two mounting crews holding socket bracket onto base frame.
Be careful not to harm leadwire to socket.
4. Pull-back sensing tube with socket bracket form location.
5. Insert a screwdriver between the tube base and the socket, and gently pry the tube out of its socket.
5. Pull the tube completely out of its socket.
6. Align the three pins on the new tube with the holes in the socket.
7. Carefully push the new tube firmly into the socket until the alignment guide snaps into place around the tip of the tube.
8. Locate sensing tube with socket bracket.
9. Insert the two mounting screws into U-shape guide of socket bracket and fasten
10. Gently push sensing tube forward to guide hole.
11. Tighten two mounting screw securely.
12. Make sure the new UV sensor tube is seated securely.
13. Replace the detector cover.

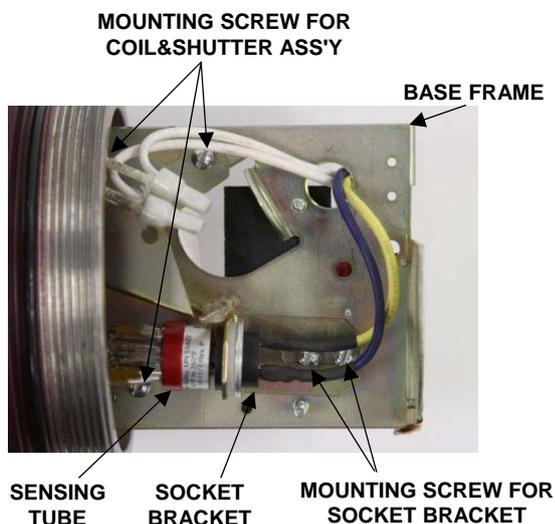


Fig.11 Inside parts of C7061F

Replacing Coil and Shutter Assembly (Fig. 11)

NOTE: Use only a 190971B Coil and Shutter Assembly.

1. Open the master switch and remove the detector cover (see Removing Detector Cover section).
2. Remove the ultraviolet sensing tube (steps 1 through 5 of Replacing Ultraviolet Sensing Tube section).
3. Cut the white wires as close as possible to the crimped connectors, and remove the crimped connectors.
4. Remove the three mounting screws from the base of the coil and shutter assembly. Put the screws in a safe place.
5. Remove the coil and shutter assembly.
6. Install the new coil and shutter assembly.

IMPORTANT

Be very careful not to kink or otherwise damage the flexible shutter.

7. Insert the three mounting screws into the base of the coil and shutter assembly and tighten securely.
8. Remove sufficient insulation from each of the two white leadwires remaining on the detector, and also from each of the two white leadwires on the new coil.
9. Using solderless connectors, connect one of the coil wires to one of the remaining white leadwires. Connect the other coil wire to the other remaining white leadwire.
10. Reinstall the sensing tube (steps F through I of Replacing Ultraviolet Sensing Tube section).
11. Replace the detector cover.

Replacing Quartz Focusing Lens(Optional) (Fig. 13)

IMPORTANT

Use quartz lens. Ordinary glass absorbs or filters out ultraviolet radiation.

1. Open the master switch; remove the detector from the sight pipe. (See appropriate sections.)
2. Remove three mounting screws between flange and faceplate
3. Remove quartz focusing lens
4. Install new quartz focusing lens.
Put lens onto guide hole.
5. Locate flange onto faceplate.
6. Tighten threew mounting screws securely.

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