

C7035C, C7061F1, Ultraviolet Flame Detector

OPERATING INSTRUCTIONS

EN

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1 SAFETY

1.1 Please read and keep in a safe place



Please read through these instructions carefully before installing or operating. Following the installation, pass the instructions on to the operator. This unit must be installed and commissioned in accordance with the regulations and standards in force. These instructions can also be found at www.docuthek.com.

1.2 Explanation of symbols

1, 2, 3, a, b, c = Action

→ = Instruction

1.3 Liability

We will not be held liable for damage resulting from non-observance of the instructions and non-compliant use.

1.4 Safety instructions

Information that is relevant for safety is indicated in the instructions as follows:

⚠ DANGER

Indicates potentially fatal situations.

⚠ WARNING

Indicates possible danger to life and limb.

⚠ CAUTION

Indicates possible material damage.

All interventions may only be carried out by qualified gas technicians. Electrical interventions may only be carried out by qualified electricians.

1.5 Conversion, spare parts

All technical changes are prohibited. Only use OEM spare parts.

2 APPLICATION

C7035C and C7061F1 are explosion proof UV flame detectors for sensing the ultraviolet radiation generated by the combustion of gas, oil, or other fuels.

3 CHECKING THE USAGE

Explosion-proof housing meets requirement for use in hazardous location and are ATEX, IECEx and KCs certified against CENELEC standard II G Ex db IIC T6.

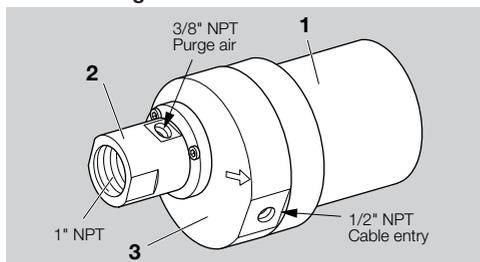
This UV flame detector is available in two versions:

- C7035C, non self-checking
- C7061F1, dynamic self-checking for continuous operation

C7061F1 provides a closed-loop, self-checking circuit which insures the integrity of both amplifier and flame detector.

Incorrect response from the sensing tube or flame amplifier circuitry results in a safety lockout of the burner controller, which will generate an alarm.

3.1 Part designations



- 1 Cover
- 2 Mounting flange
- 3 Faceplate

4 FEATURES

The C7035C and C7061F1 are especially designed for use with Honeywell burner controllers with appropriate flame amplifier:

- Continuous operation (C7061F): SLATE or 7800-series;
- Intermittent operation (C7035C): SLATE, 7800-series, DBC2000, BC1000 and Kromschroder FDU 510..3.

Operating voltage sensing tube: not applicable, managed internally.

Operating voltage shutter C7061F1: 115 V AC or 230 V AC terminal selectable.

- Housing designed to be explosion-proof is KCs, IECEx and ATEX certified to meet Ex db IIC T6
- Housing meets IP 66 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 C7035C, C7061F1
- Designed for use with 120/230 V AC Honeywell burner controllers:
 - SLATE BMS
 - 7800-SERIES
 - FDU 510x3 (C7035C only)
 - (D)BC2000 (C7035C only)
- Two detectors can be wired in parallel to reduce nuisance shutdown in difficult flame sighting application.
- 3/8" purge air connection provided on flange C7061F1 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 health is continuously monitored by the microprocessor of the burner controller (SLATE or 7800-SERIES).
- Indication arrow printed on the face plate for correct mounting, to assure proper operation of the shutter mechanism.

5 TECHNICAL DATA

- 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:

C7035C non self-checking ultraviolet flame detector.
C7061F1 dynamic self-checking ultraviolet flame detector.

Electrical ratings:

The C7035C and C7061F1 are powered from the Honeywell burner controller that delivers the necessary voltage to operate the sensing tube, independently of the supply voltage of the burner controller. The shutter of C7061F1 is also controlled from the burner controller. Depending on the supply voltage of the burner controller, the correct shutter voltage can be selected via the terminals of C7061F1 from the shutter drive output of the burner controller. Operating voltage sensing tube: not applicable, managed internally.

Operating voltage shutter C7061F1: 115 V AC or 230 V AC terminal selectable.

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

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 CENELEC II G Ex db IIC T6 (explosion-proof for use in Zone 1, 2)

Meets IP 66 (indoor, outdoor protection; rain-tight, dust-tight)

Protection:

Gas Zone 1 - gas ignition protection

Dust Zone 21 - dust ignition protection

Pressure rating of quartz viewing window:

690 kPa (100 psi)

Mounting:

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

Cable entry:

1/2" NPT internal thread for cable gland (not provided by Honeywell). The cable gland must be KCs/ATEX/IECEx approved in line with the application.

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:

Approximately 2.4 kg (5.3 lbs)

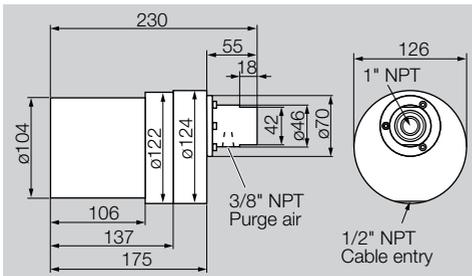
Serviceability:

Field replaceable ultraviolet sensing tube.

Replacement parts:

The web app PartDetective for selecting spare parts is available at www.adlatus.org.

5.1 Dimensions



Dimensional drawing in mm

6 INSTALLATION

6.1 When installing this product...

- Installer must be a trained, experienced, flame safeguard control technician.
- After installation is complete, check out product operation as provided in these instructions.

⚠ 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.
- Do not connect these detectors to non-Honeywell manufactured controls (primaries, programmers, multiburner systems, and burner management systems).
- All wiring must be NEC Class 1 (line voltage).
- Voltage and frequency of the power supply connected to this detector must agree with the values marked on the detector.
- Sight the detector so it does not respond to ignition spark.
- On multiburner installations, each detector must respond only to the flame of the burner it is supervising.
- Do not connect more than two C7035 or C7061 Flame Detectors in parallel.

Proper flame detector installation is the basis of a safe and reliable flame safeguard installation. Refer also to the burner manufacturer instructions. Carefully follow all instructions for the best possible flame detection application.

6.2 Basic requirements

The combustion flames of most carbon-based fuels emit sufficient ultraviolet radiation to enable the C7035C or C7061F1 UV 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 or union threaded to one end of a sight pipe inserted through the wall of the combustion chamber. The ultraviolet sensing tube in the flame detector sights the flame through the pipe.

When a flame is present, the UV tube in the C7035C or C7061F1 senses the ultraviolet radiation emitted. The C7035C or C7061F1 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.

6.3 Determine location

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

Temperature

- Install the C7035C or C7061F1 where the ambient temperature (outside the case) stays within the ambient operating temperature ratings. To keep the C7035C or C7061F1 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 the detector. If the detector continues to get too hot, cooling is necessary. Refer to page 6 (6.15 Sight pipe ventilation (purge air)).

Vibration

- If the C7035C or C7061F1 is subject to excessive vibration, use a special Antivibration Mount. If you use this mount, install it before you position and sight the detector.

Clearance

- Make sure there is enough room to easily mount the sight pipe, detector, and all required fittings, and to remove the detector for troubleshooting and servicing.

6.4 Radiation sources (other than flame)

Examples 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
 - Lightning
- Welding flames
- Bright incandescent or fluorescent artificial light
- Solar radiation
- Gas lasers
- Sun lamps
- Germicidal lamps
- Bright flashlight 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 detector 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 views a cooler area of the refractory.

Ignition spark is an intense source of ultraviolet radiation.

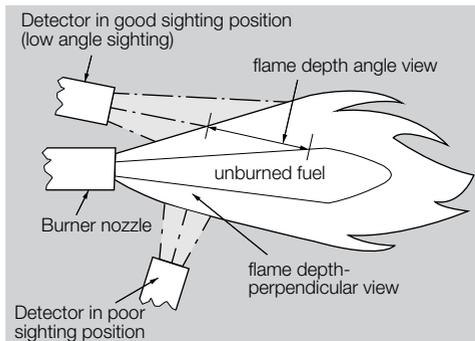
- When installing the detector, make sure it does not respond to ignition spark.

6.5 Single burner requirements

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 requirements are simplified.

6.6 Sighting angle

The first 30% of a flame closest to the burner nozzle (the flame root) emits the most ultraviolet energy. Also, if the detector sights the flame at an angle 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% of the flame closest to the burner nozzle.



Detector sighting angle

Low angle sighting permits 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.
- 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.

6.7 Parallel flame detectors

Shifting flame patterns, commonly encountered on burners with high turndown 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 detectors (C7035C or C7061F1) 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 shutting down the supervised burner.

- However, a flame simulating failure occurring in the flame signal amplifier or in either detector will cause a shutdown.

6.8 Screening effects

- Smoke, oil mist, dirt and dust are masking agents that attenuate the ultraviolet radiation that the flame emits.

If they absorb 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 page 6 (6.15 Sight pipe ventilation (purge air)).

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.

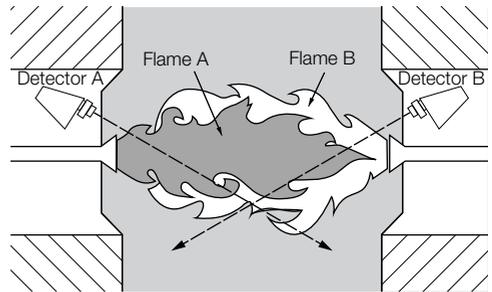
Increasing the viewing area of the detector by shortening the sight pipe or by increasing the diameter of the sight pipe also reduces the attenuating effects of masking agents.

6.9 Multiburner requirements (flame discrimination)

In addition to meeting the requirements 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 flames 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% closest to the burner nozzle (the flame root) it is supervising, and the worst possible view of all other flames.



Example of flame discrimination problem (opposed fired burners).

This figure above 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% 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% of Flame B where UV 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 reposition a detector and still cannot achieve flame discrimination, try reducing the viewing area by increasing the length or decreasing the diameter of the sight pipe, or adding an orifice plate.

6.10 Install the sight pipe

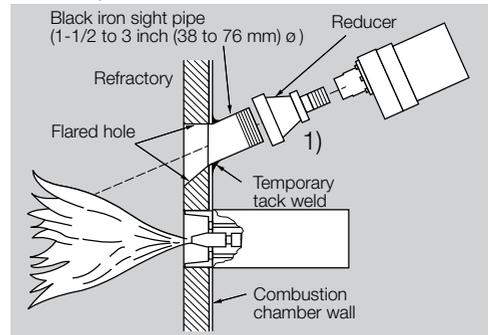
After you have determined the location and sighting angle, select the sight pipe.

- A black iron pipe with a diameter of at least 38 mm (1-1/2 inch) 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 51 to 76 mm (2 to 3 inch) produce better results for horizontal rotary burners, which require wide viewing angles.

A wide viewing angle can also be obtained by using a short sight pipe.



Typical mounting of C7035C and C7061F1

- 1) Piping accessories may be added, if required.

6.11 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 adjustments of the sighting angle.

→ The taper of the hole should be about 25 mm for every 76 mm (1 inch for every 3 inch) of wall thickness.

6.12 Mount sight pipe

- 1 Thread one end of the pipe to fit the mounting flange, union, or required coupling.
 - 2 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.
 - 3 Tack weld the pipe to the wall in a trial position. Do not weld the sight pipe permanently in place until after completing the Adjustments and Checkout.
- If you use a Swivel Mount and you are positive about the location and sighting angle, you can permanently weld the pipe.

6.13 Install fittings

In some cases, the sight pipe does not directly fit the C7035C or C7061F1 mounting flange or union. 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.

6.14 Reducer

For sight pipes of larger diameter than the mounting flange connector or union, install a reducer as illustrated in "Typical mounting of C7035 and C7061".

6.15 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.

- 1 C7035C and C7061F1 provides 3/8 in. internal thread for purge air connection. Remove plug to install air supply line.
- 2 Use a flexible air supply line, to allow for repositioning of detector and sight pipe until a final and permanent position has been decided.
- 3 A continuous flow of air must be maintained to keep the detector cool and sight pipe clean.
- 4 At least 3 CFM at approximately 8 in. w.c. above chamber pressure is recommended.
- 5 The air supply must be clean, free of oils and water, and preferably cool.

6.16 Swivel mount

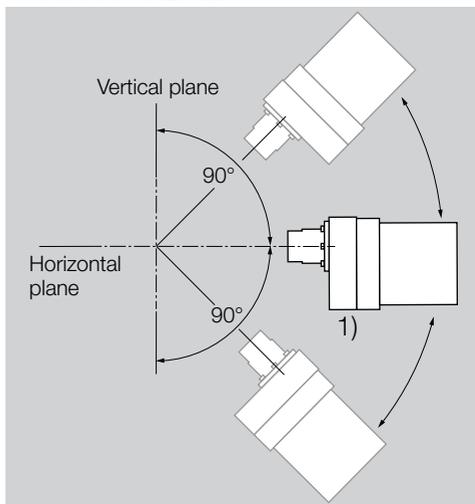
- To facilitate proper flame sighting, C7035C or C7061F1 can be installed with a swivel mount (order separately).
- The swivel mount requires a reducer of the proper size of to mount it onto the sight pipe.
- It also requires a one-inch close nipple for mounting C7035 and C7061.

6.17 Antivibration mount

The detector withstands normal burner vibration. If the vibration is excessive, use an Antivibration mount to avoid damage to the flame detector. If you use this mount, install it before positioning and sighting the detector.

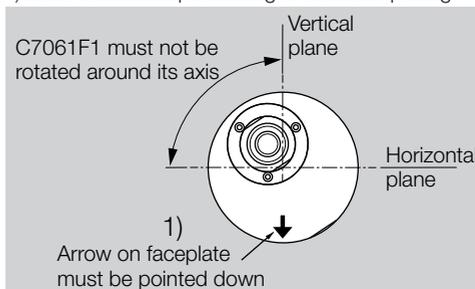
6.18 Mount the detector

- Mount the detector onto the sight pipe, reducer or other fitting, see previous instructions.
- The C7061F1 Self-Checking Flame Detectors incorporate an oscillating shutter mechanism and, therefore, require special consideration for mounting positions other than vertically sighting downward or upward, as illustrated in following.
- C7061F1 has arrow indicators on the faceplate to facilitate mounting in positions.
- The arrow must be vertically aligned with the arrow pointing downward.
- The C7061F1 must be mounted with the conduit below the horizontal.



Mounting positions

- 1) Note downward positioning of conduit opening.



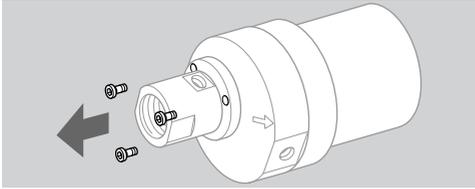
Mounting position (arrow down)

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

To turn the C7035C or C7061F1

→ The collar and coupling are in two pieces; do not separate them.

- 1 Loosen 3 crews between flange and face plate.

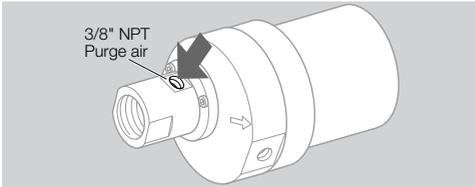


Mounting flange

- 2 Turn the C7061F1 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).



Purge air connection

- 2 Connect air supply line (3/8 inch NPT).

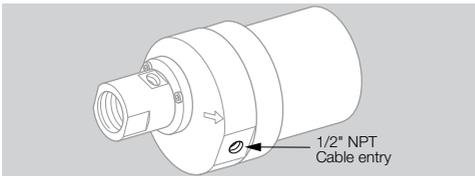
7 WIRING

⚠ CAUTION

Equipment damage hazard!

Improper wiring can permanently damage amplifier.

- When using a C7061F1 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).



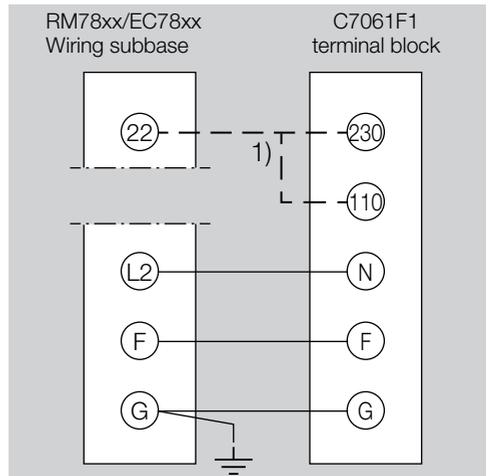
- 1 The C7035C and C7061F1 have a 1/2" NPT female threaded cable entry opening for mounting a matching 1/2" NPT male threaded cable gland, which must be certified against the local applicable standards for hazardous locations and fit the diameter of the (certified) cable that is used. The cable and cable gland are not provided by Honeywell.

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

- 3 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 page 9 (8.3 Flame signal).
- 4 For wiring, use moisture-resistant no. 14 wire suitable for at least 75°C (167°F) if the detector is used with a flame safeguard primary control, or at least 90°C (194°F) if used with a flame safeguard programming control.
- 5 For high temperature installations, use Honeywell specification no R1298020 wire or equivalent for the F leadwire. This wire is rated up to 204°C (400°F) 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.
- 6 Refer to the wiring diagrams below.

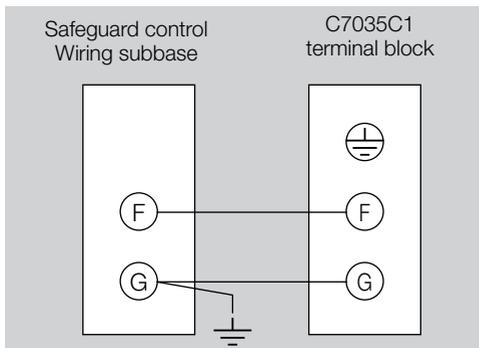
⚠ CAUTION

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



Wiring C7061F1 with 7800 flame safeguard control

- 1) If RM78xx control used connect to 110 V on terminal block. If EC78xx is used connect to 230 V on terminal block.



Wiring C7035C with flame safeguard control

→ 1) Do not connect any wires to unused terminal.

7.1 Connecting detectors in parallel

For a flame that is difficult to sight, using two parallel C7035 or 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 detectors (C7035 or C7061) can be connected in parallel to the same terminals of the burner controller.

Do not connect more than two C7035 or C7061 detectors in parallel.

→ Voltage and frequency rating of the C7035 or C7061 must match the power supply of the flame safeguard control.

8 ADJUSTMENTS AND CHECKOUT

Do not put the system into operation until all check-out tests in the Instructions for the appropriate flame safe-guard control and any others specified in the burner installation instructions are satisfactorily completed.

8.1 UV sensor tube test

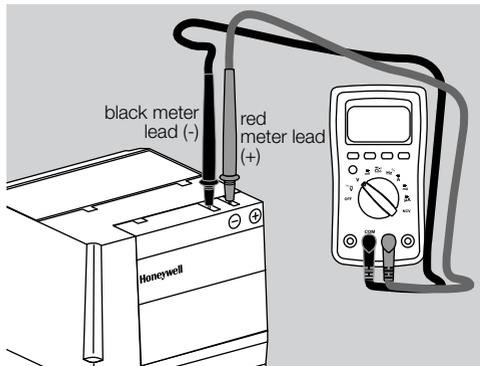
→ For initial burner lightoff, consult the burner manufacturer instructions or the flame safeguard control instructions.

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 page 4 (6.4 Radiation sources (other than flame)).

8.2 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 1 MΩ/V and a 0 to 5 V DC scale be used for R7861 Amplifier flame signal measurements.



Measuring voltage flame signal with 7800 Series controls

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 V DC voltage is displayed on the module.

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

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 page 9 (8.3 Flame signal). 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 page 9 (8.3 Flame signal). If you cannot obtain the proper signal, refer to page 9 (9 Troubleshooting).

8.3 Flame signal

Flame signal for 7800 product family

Flame detector	Burner controller	Dynamic Self-Check ¹⁾²⁾	Minimum ¹⁾ acceptable steady voltage	Maximum expected voltage
C7035C	EC/RM78xx + R7849A	No	1.25 V DC	5.0 V DC
C7035C	Slate with R8001S1071	No	0.8 V DC	8.0 V DC
C7035C	FDUx3	No	2.0 V DC	5.0 V DC
C7035C	DBC2000	No	4 μ A	14 μ A
C7061F1	EC/RM78xx + R7861A	Yes	1.25 V DC	5.0 V DC
C7061F1	Slate with R8001S1051	Yes	0.8 V DC	8.0 V DC

1) Shutter operation of the C7061F1 causes fluctuations in the voltage reading. Read the average stable voltage, disregarding the peaks.

2) Shutter operates at 12 cycles per minute.

8.4 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. Follow the procedures in the instructions for the appropriate flame safeguard control and the burner manufacturer instructions.

8.5 UV and 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 V DC (7800-Series), 0.5 V DC (Slate and FDU) or 2 μ A (DBC2000).
- 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.

8.6 Response to other ultraviolet sources

Some sources of artificial light produce small amounts of UV. Under certain conditions, an ultraviolet detector cannot distinguish flame from the artificial sources.

Do not use an artificial light source to check the response of an ultraviolet detector. To check for proper flame detector operation, test for flame failure response under all operating conditions.

8.7 Weld the sight pipe

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

8.8 Final checkout

- 1 Before placing the burner into service or after performing any service, repairs or maintenance, verify the installation using the procedures in the Checkout sections of the appropriate flame safeguard control.
- 2 After completing the checkout, run the burner through at least one complete cycle to verify correct operation.

9 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.
- Open the master switch to disconnect power before removing or installing the detector or parts of them. More than one disconnect may be involved.

Equipment required

A volt-ohm meter with a minimum sensitivity of with a minimum sensitivity of 1 M Ω /V and a 0 to 5 V DC scale is suggested. When the Keyboard Display Module is included with the control, a flame signal displays on the module. For the replacement of the spare parts, see page 10 (11 Service).

UV Sensor tube test

See page 8 (8.1 UV sensor tube test).

Unsatisfactory flame signal

If a satisfactory flame signal (see page 9 (8.3 Flame signal)) 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.

→ For instructions to replace the viewing window, sensing tube, and coil and shutter assembly, see page 10 (11 Service).

9.1 Preliminary inspection

- 1 Check for the proper line voltage. Make sure the connections are correct and power supply is of the correct voltage and frequency.
- 2 Check the detector wiring for defects:
 - Incorrect connections.
 - Wrong type or size of wire.
 - Deteriorated wire.
 - Open circuits.
 - Short circuits.
 - 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):
 - Add additional insulation between the wall of the combustion chamber and the detector.
 - Add a shield or screen to reflect radiated heat away from the detector or
 - Add cooling (refer to Sight Pipe Ventilation and Accessories sections).

9.2 Removing detector from sight pipe

→ See also page 6 (6.18 Mount the detector).

- 1 Remove purge air supply if it is installed.
 - 2 Carefully unscrew flame detector from sight pipe.
 - 3 The detector can be removed from flange by loosening three screws holding the mounting flanges.
 - 4 Flange will be stayed with mounting onto sight pipe.
- Focusing lens (Option) will be free when unscrewed. Do not drop it!

9.3 Procedure for zero meter reading

- 1 Replace the plug-in amplifier. Then recheck the flame signal.
 - 2 Replace the ultraviolet sensing tube (see page 10 (11 Service)). Then recheck the flame signal.
 - 3 Replace the coil and shutter assembly (see page 10 (11 Service)). Then recheck the flame signal.
 - 4 If you cannot yet obtain a meter reading, replace the detector.
- At the completion of troubleshooting, be sure to perform the procedures page 8 (8 Adjustments and checkout).

10 SPARE PARTS

The web app PartDetective for selecting spare parts is available at www.adlatus.org.

For the replacement of the spare parts, see page 10 (11 Service).

11 SERVICE

⚠ WARNING

Electrical shock hazard!

Can cause serious injury or death.

- Disconnect power before removing or installing the detector or its cover. More than one disconnect can be involved.

11.1 Maintenance

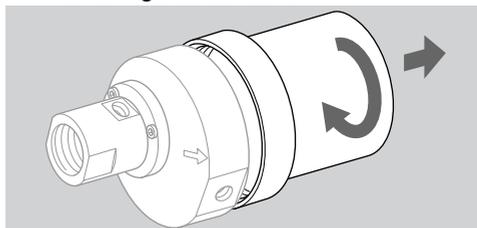
- 1 Clean the viewing window (or focusing lens) when necessary. Remove the detector, see Troubleshooting page 10 (9.2 Removing detector from sight pipe) and use a clean cloth over the eraser end of a pencil.

→ Do not remove the window (or lens) to clean it.

→ If it is broken or damaged or it is coated with a substance that cannot be removed, replace the complete C7035C or C7061F flame detector.

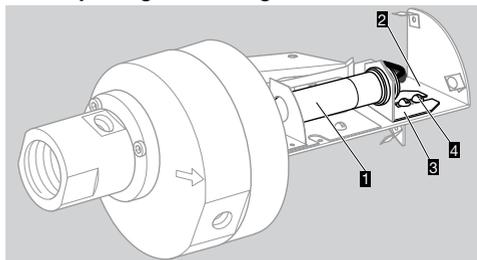
- 2 Keep the flame detection system adjusted for the smoothest, most reliable operation as recommended by the burner manufacturer.
- 3 Replace the sensing tube, coil and shutter assembly, or viewing window only when necessary to obtain proper operation.

11.2 Removing detector cover



- 1 Hold faceplate and rotate cover in CCW.
- 2 Carefully unscrew cover from faceplate and remove the cover.

11.3 Replacing UV sensing tube



Legend

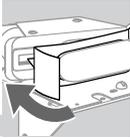
- 1 Sensing tube
 - 2 Base frame
 - 3 Socket bracket
 - 4 Mounting screw for socket bracket
- 1 Remove the detector cover, see page 10 (11.2 Removing detector cover).
 - 2 Locate the UV sensing tube.

⚠ CAUTION

Damage!

- Be very careful not to kink or otherwise damage the flexible shutter.
- Be careful not to harm leadwire to socket.

3 Insert a screwdriver between the tube base and the socket and gently pry the tube out of its socket.



4
5 Pull the tube completely out of its socket.



- 6**
7 Align the three pins on the new tube with the holes in the socket.
- 8** Carefully push the new tube firmly into the socket until the alignment guide snaps into place around the tip of the tube.
- 9** Locate sensing tube with socket bracket.
- 10** Insert the two mounting screws into U-shape guide of socket bracket and fasten.
- 11** Gently push sensing tube forward to guide hole.
- 12** Tighten two mounting screw securely.
- 13** Make sure the new UV sensor tube is seated securely.
- 14** Replace the detector cover.

12 CERTIFICATION

12.1 IECEx certified



KGS 23.0004X

Protection: Ex db IIC T6 Gb IP66 / Ex tb IIIC T80°C Db IP66

Temperature: $-20^{\circ} \leq T_a \leq +70^{\circ}C$

12.2 ATEX certified



INERIS 23ATEX0027X

Marking: Ex II 2 G D

Protection: Ex db IIC T6 Gb / Ex tb IIIC T80°C Db IP66

Temperature: $-20^{\circ} \leq T_a \leq +70^{\circ}C$

12.3 KCs certified



23-GA2BO-0514X / 23-GA2BO-0515X

Protection: Ex db IIC T6 Gb IP66 / Ex tb IIIC T80°C Db IP66

Temperature: $-20^{\circ} \leq T_a \leq +70^{\circ}C$

12.4 CE



CE approved against EN 298 (UKCA pending)

Refer to CE certificate of applicable burner controller or flame switch relay module

12.5 SIL 3 Capable



SIL 3 (capable) certified (C7061F1011-N only)

Refer to SIL certificate of applicable burner controller or flame switch relay module

13 DISPOSAL

Devices with electronic components:

WEEE Directive 2012/19/EU – Waste Electrical and Electronic Equipment Directive



At the end of the product life (number of operating cycles reached), dispose of the packaging and product in a corresponding recycling centre. Do not dispose of the unit with the usual domestic refuse. Do not burn the product.

On request, old units may be returned carriage paid to the manufacturer in accordance with the relevant waste legislation requirements.

FOR MORE INFORMATION

The Honeywell Thermal Solutions family of products includes Honeywell Combustion Safety, Eclipse, Exothermics, Hauck, Kromschröder and Maxon. To learn more about our products, visit ThermalSolutions.honeywell.com or contact your Honeywell Sales Engineer.

Honeywell Thermal Solutions (HTS)
2101 CityWest Blvd
Houston, TX 77042
United States
ThermalSolutions.honeywell.com

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