

Adjustable Sensitivity Ultraviolet Flame Detector Models C7076A and C7076D

Function

The C7076 Ultraviolet Flame Detector is a solid-state, adjustable sensitivity device for sensing the ultraviolet radiation emanating from gas, oil, and pulverized coal flames. It is designed for burner management and flame safety systems that require optimum sensitivity or flame discrimination or both.

The flame detector must be used with Dynamic Self-Check Ultraviolet Amplifier R7476A to provide a closed-loop self-checking circuit which insures the integrity of both amplifier and flame detector 75 times per minute. Improper response to simulated flame loss results in a safety shutdown or an alarm or both. (See *Dynamic Self-Check Ultraviolet Amplifier*. Specification 81-08-03-03.)

Description

The C7076A and C7076D detector models are identical except for housings.

Model C7076A detector (Figure 1) is for use in standard installations. The aluminum and cadmium-plated steel housing meets NEMA 4 standards. It is water-tight and dust-tight; it can be used both indoors and outdoors. There is a 7/8-inch opening in the housing to accommodate a 1/2-inch flexible conduit. A hinge and quick-release latch allows the detector to swing out for fast and easy cleaning of the Integral quartz lens. An aspirator system lengthens the time between cleaning and allows sight-pipe seal-off when the detector is swung open. The aspirator has a 1-inch NPT tapping for mounting onto the sight pipes and a 3/8-inch NPT tapping for connecting to the air supply. The detector is mounted on the aspirator by a removable piano hinge. For allowable mounting positions, see, Figure 3.

Model C7076D detector (Figure 2) is for use in installations requiring explosion-proof packaging. The housing meets the requirements for Division I, Class I, Groups C and D; and Class II, Groups E, F, and G of the National Electrical Code (NFPA70).

There is a 1/2-inch NPT tapped opening in the bottom of the housing to accommodate conduit. The detector has a 1-inch NPT tapping for mounting onto a sight pipe, and two 5/16-18

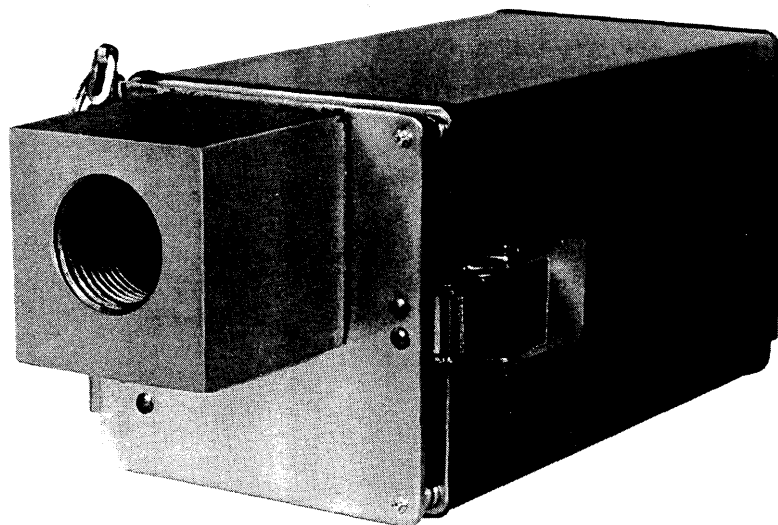
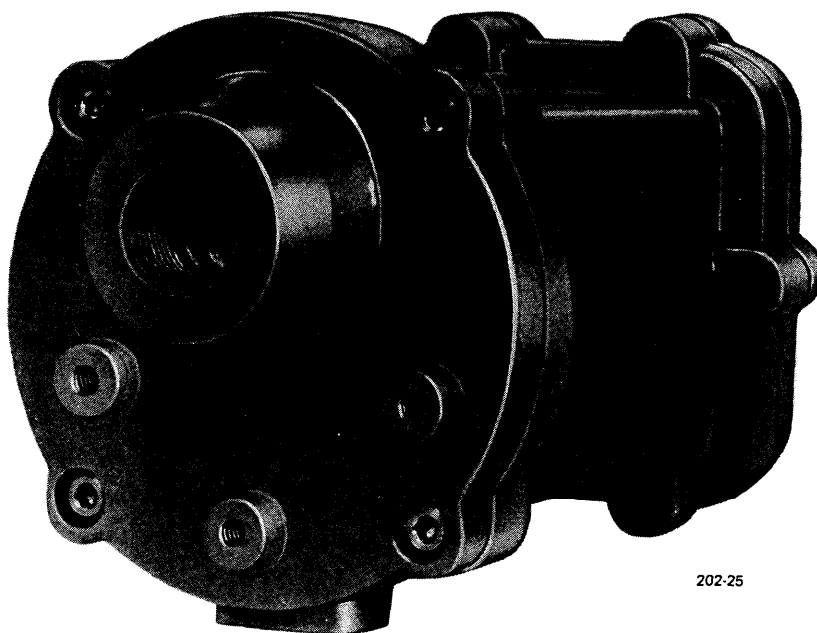


Figure 1 – C7076A Adjustable Sensitivity Ultraviolet Flame Detector



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Figure 2 - C7076D Adjustable Sensitivity Ultraviolet Flame Detector

UNC tapped holes for attaching bracket for additional security. For allowable mounting positions, see Figure 4.

The front compartment on both models contains the terminal block which is the wire clamp type with removable screws (terminal lugs can be used).

The rear compartment contains the electronics chassis including an ultra-violet sensing tube, shutter assembly, power supply, solid state circuitry, sensitivity adjustment controls, and flame current meter jack. The chassis plugs into an octal socket in the housing. The detector's entire electronics package slides out for inspection and may be rapidly replaced in the field to keep a critical unit on the line.

The C7076 detector has two sensitivity adjustments, labeled A and B – each with a 400:1 dynamic range - that can be set independently and locked to prevent drift due to vibration, and an integral flame signal meter jack to facilitate precise sighting.

The high level output of the ultraviolet flame detector permits long distance transmission without special wiring, and its solid state circuitry assures long life and stable sensitivity over wide ranges of temperature and voltage. The detector tube used is twenty times more sensitive than the conventional UV tube.

The C7076 detector provides the inherent precision and safety of UV flame detection while overcoming screening conditions, which diminish the reliability of existing UV detectors.

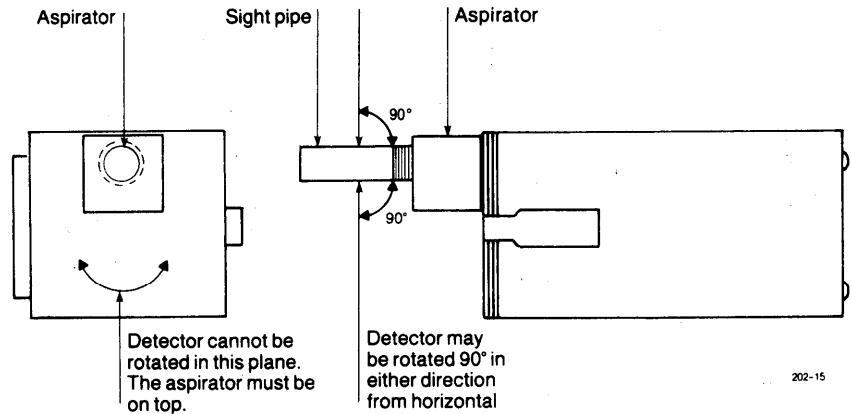


Figure 3 - Mounting Positions, Model C7076A

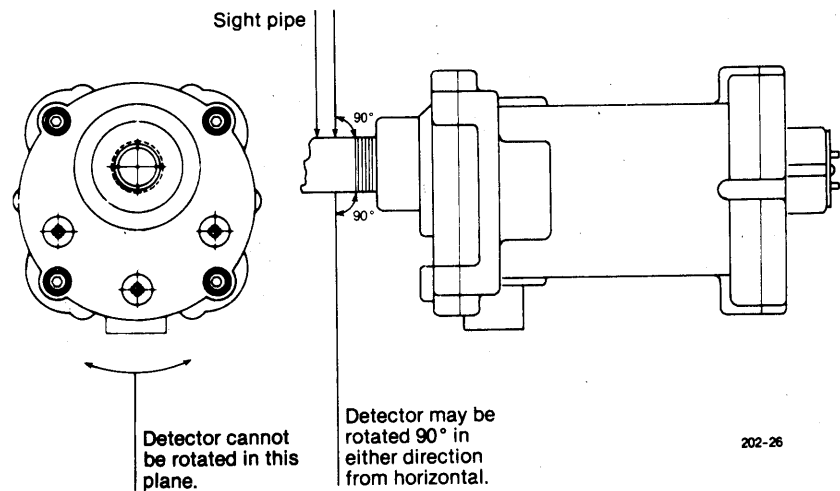


Figure 4 - Mounting Positions, Model C7076D

Specifications

Operating Conditions

Maximum Aspirator Temperature (C7076A only) 107°C (225°F).

Ambient Operating Temperature Ratings – 40 to + 71°C (– 40 to + 160°F).
(On C7076A, derate ambient 1°F for every 13°F of aspirator temperature over 160°F).

Storage Temperature Ratings – 51° to + 85°C (– 60° to + 185°F).

Electrical Ratings

	Line Voltage (+ 10%, - 15%)	Frequency (Hertz)	Shutter Voltage*	Maximum Power Consumption**	
				Watts	VA
	100	50/60	100	7	14
	120	60	120	7	14
	200	50/60	120	7	14
	220/240	50/60	120	7	14
	117†	50	117	7	14
	220††	50	120	7	14
	240††	50	120	7	14

*Supplied by the appropriate flame safeguard control operating at the designated line voltage.

**Does not include shutter power, which is supplied by the flame safeguard control.

†For applications in South Africa.

††For European applications.

Air Flow Requirements (C7076A only)

Purge air:

3.3 ml/sec (0.7 SCFM) is required to maintain 102 mm (4 inches) of differential pressure from the aspirator inlet to the combustion chamber. Recommended air flow of 14 ml/sec (3 SCFM).

Seal-off air:

34.5 kPa (5 psig) maximum combustion chamber pressure.

Performance

Sensitivity Selection

Remote sensitivity selection:

External switch wired to select the setting of sensitivity control, either A or B.

External selector switch:

Must be rated for switching 20 milliamps at 48 volts dc.

Sensitivity Adjustment

Range: 400 to 1.

Flame Signal

Measured at the flame current meter jack.

C7076 Detector: 1.4 to 5.5 microamps (nominal).

R7476A Amplifier: 2.5 to 5.5 microamps (nominal).

Shutter Frequency

1.25 Hz, nominal. Interrupts the line-of-sight of the detector about 75 times per minute to provide self-checking.

Pressure

C7076A: Quartz viewing lens, 138 kPa (20 psig) maximum.

C7076D: Quartz viewing lens, 981 kPa (142 psig) maximum.

Design

Dimensions

Figures 5 and 6.

Weight

C7076A: 3 kg (6.6 lb).

C7076D: Approximately 8 kg (17.6 lb)

Accessories

118367A swivel mount.

W136A1045 test meter (includes 117053 meter connector plug).

117053 meter connector plug (for older W136A models).

Replacement Parts

C7076A:

191002B plug-in electronics chassis 120V

Coil and shutter assembly

190971E for all models, except 100V model.

190971F for 100V models.

191053 ultraviolet sensing tube.

191050 viewing lens.

190999 grommet, silicone-rubber for viewing lens.

191054 gasket, silicone-rubber seal for front and rear cover plates.

190998A aspirator assembly.

191203-00767 hinge.

191205 pin and chain.

C7076D:

Coil and shutter assembly

190971 E for all models, except 100V model.

190971 F for 100V model.

191050 viewing lens.

191053 ultraviolet sensing tube.

Approvals

C7076A Underwriters Laboratories Inc. Listed (120 volt models only): File No. MP268 Guide No. MCCZ.

Canadian Standards Association Certified (120 volt models only): File No. LR1620.

Factory Mutual Approved: Report No. FM26980.

Industrial Risk Insurers Approvable.

C7076D Underwriters Laboratories Inc. Listed: File No. E34649 Guide No. ZTSZ.

Industrial Risk Insurers Approvable.

Specification
1-08-03-01

Dimensions: $\frac{\text{millimetres}}{\text{inches}}$

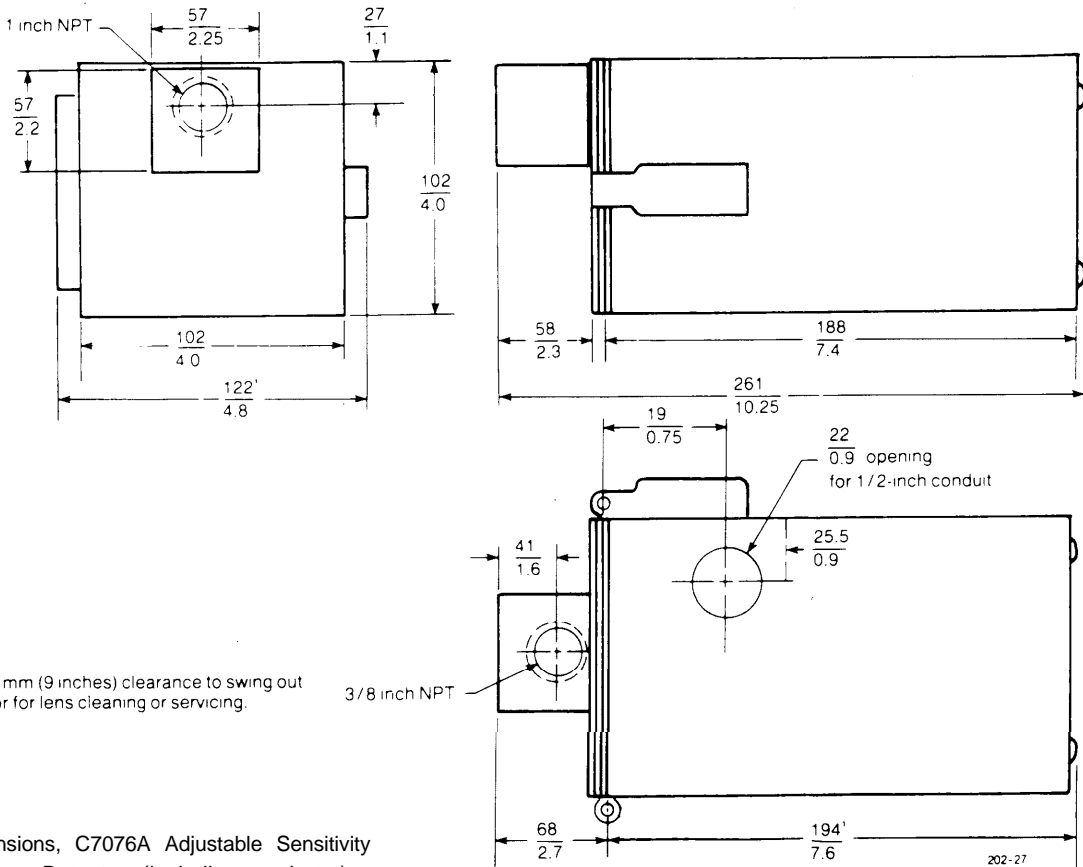


Figure 5—Dimensions, C7076A Adjustable Sensitivity Ultraviolet Flame Detector (including aspirator)

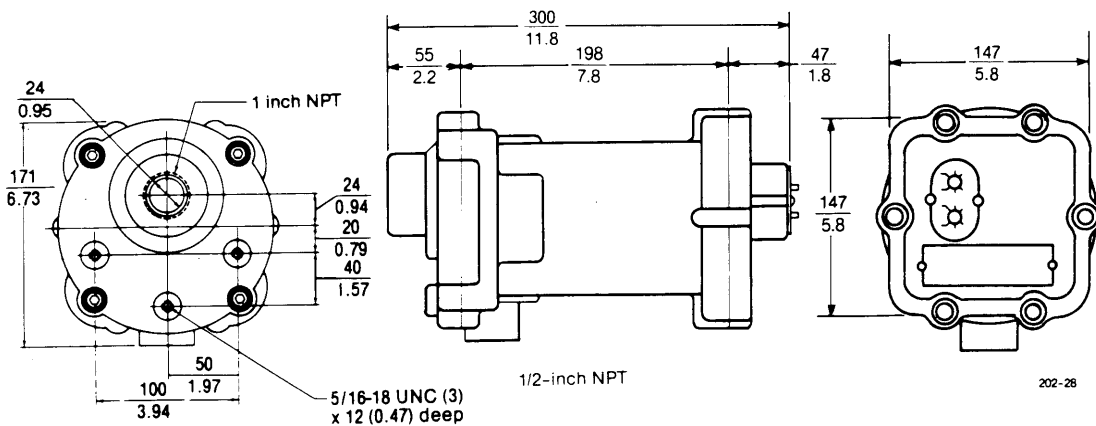


Figure 6—Dimensions, C7076D Adjustable Sensitivity Ultraviolet Flame Detector

Ordering Information

Ordering Number	Voltage and Frequency	Mounting Means
C7076A1007	120V, 60 Hz	1 inch pipe-threaded
C7076A1015	100V, 50/60 Hz	
C7076A1031	220/240V, 50/60Hz	
C7076A1049	117V, 50 Hz	
C7076D1027	120V, 60 Hz	
C7076D1043	220/240V, 50 Hz	

*With explosion-proof housing for use in hazardous atmospheres.

Specifications are subject to change without notice.