

# Splash-proof Ultraviolet Flame Detectors

## C7012A, E

The C7012A, E are splash-proof flame detectors for sensing the ultraviolet radiation emitted by the combustion of oil, gas, or the gas and oil mixed fuel. These detectors are combined with various Protectorelays and exclusive amplifiers to provide the flame safeguard control system of high reliability.

### ■ Features

- The C7012A is used with the built-in rectification flame signal amplifier of a Protetorelay.
- The C7012E is used with the R4332A/B, R4334A, R4075C or RM7800 series to provide the continuous self-checking of the main body and the Protectorelay sensing circuitry with a built-in oscillating shutter by



interrupting the ultraviolet radiation at rates of one to two times per second or once every five seconds.

- Accessories such as swivel mount for flame sighting-angle adjustment and water cooling for the case are available.

### ■ Specifications

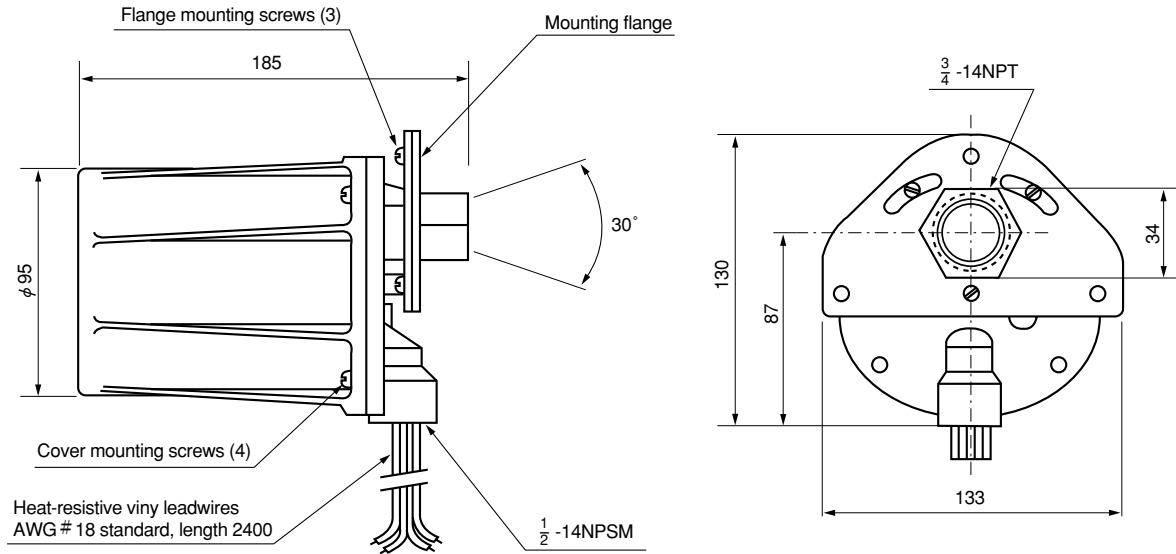
Applicable flame	Combustion flames of city gas, natural gas, propane gas, butane gas, light oil, heavy oil, coke gas, hydrogen, hydrochloric acid, ammonia, naphtha, ethylene, etc.					
Model No.	Electrical rating	Shutter power	Power voltage	Power consumption	Combustion safety control to use	Self-checking cycle
					Protectorelay/Amplifier	
C7012A1202	100Vac 50/60Hz	—	Rated voltage +10/-15 %	Less than 2.5W at 60 Hz	RM7890A, B, RM7895A/B, R4150F/N/P, WN200A, WN210A/R7257A1010-1, R485B, RA890F (Built-in amplifier) Note 1	—
C7012A1210 (Former C7012A1145 can replace this model)	120Vac 50/60Hz					
C7012E1186	208Vac 50/60Hz					
C7012E1211	100Vac 50/60Hz	100Vac	Rated voltage +10/-15 %	Less than 7.0W at 60Hz	RM7800 series: RM7890B, RM7895A/ R7847C Primary controls: R4075C, R4332A, R4332B, R4334A/R7247C1001, R7247C1019 Note 1	RM7890 & RM7895A check once every five seconds and lock out the system after 3 times continuous abnormality: Primary controls check one to two times per second and cut the output off at the abnormality
C7012E1245 (Former C7012E1104 can replace this model)	120Vac 50/60Hz	120Vac				
C7012E1146	200Vac 50/60Hz					
Detector sighting angle	Fixed at 30° angle, adjustment is possible with the sighting pipe.			Vibration Resistance	4.9m/s <sup>2</sup> max. at 10 to 60 Hz in X, Y or Z direction for 2 hrs, each.	
Insulation resistance	No leakage at 50MΩ min. by 500Vac megger between terminal ①, ②, ③ or ④ and the case			Structure specification	Splash-proof, NEMA4	
Dielectric strength	Withstand at 1500Vac for 1 minute between each black leadwire and the case			Case material	Aluminum die cast	
Ambient temperature	C7012A: -4 to +79°C C7012E: -29 to +79°C			Case color	Purple: Munsell 7.5D4/6	
Storage temperature	-51 to +79°C			Weight	1.9 kg	
Ambient humidity	90% RH max. at 40°C			Mounting	3/4" - 14NPT sighting pipe	
Max. pressure	137kPa at quarts viewing window			Wiring	1/2" - 14 NPSM 2400 mm lead wire by color AWG18: Heat-resistance to 105 °C	
Accessories (Separate order)	Water jacket: No. APN4701 Swivel mount: No. APN4710 Flame current tester: No. W136A1045 Ultraviolet sensing tube: Part No. 113228J (Former 113228 can replace 113228J)			Approval body	UL, FM, CSA (only 120V models for UL & CSA)	
Flame signal wire Extension length	JAN standard*: RG-11/U high frequency coaxial wires *United States Army & Navy Unified specification Extension length: 50 m RG-11/U (equivalent: 5C2V or 7C2V) Caution: Separate the flame signal wires from the conduit of ignition high voltage wires and power cables.					
Caution on installation	Take extreme caution when the detector is installed at a place where the following external disturbance or ambient environment exists:					
	Hot refractory above 1260 °C, ignition transformer, welding arc, lighting, solar radiation, germicidal lamp, bright flash, etc.			Diffraction analyzer, electronic microscope, Radiographic X-ray machine, High voltage vacuum switch, high voltage condenser, radio isotope, etc.		Vapor, smoke, oil vapor, dust, etc.

Note 1: Please select the model by confirming the combination of a power supply voltage and a shutter voltage.

## External dimensions

C7012A · E

(Unit: mm)



## Wiring

Refer to the following specification sheets for wiring:

Model No.	Protectorelay or primary control used with	Document No.
C7012A □□□□	R4150F	AI-1133E
	R4150N	AI-1127E
	R4150P	CP-SS-1148
	WN200A	CP-SS-1147
	WN210A	CP-SS-1147
	R485B	CP-SS-1134
	RA890F	CP-SS-1217
	RM7890A, B	CP-SS-1705
C7012E □□□□	RM7895A	CP-SS-1708
	R4075C	CP-SS-1149
	R4332A	CP-SS-1212
	R4332B	CP-SS-1313
	R4334A	CP-SS-1212
	RM7890B	CP-SS-1705
RM7895A	CP-SS-1708	

## ● Caution in wiring

- (1) When the C7012 Flame Detector color-coded leadwires are extended, use a junction box. There is no problem of making these leadwires run through the same conduit.
- (2) The C7012 leadwires and extension wires must have a separate conduit from the conduit for high voltage ignition and power leadwires.
- (3) The ignition transformer should be located away from the C7012 Flame Detector and be located as close as the burner.

- (4) The secondary high voltage leadwires of the ignition transformer and the ground wire should be connected in the same conduit with both ends of the conduit grounded.
- (5) When the C7012 Flame Detector is affected by the surge of the ignition transformer, ground the both ends of item (1) conduit.
- (6) In case ignition plugs for automobiles are used as the ignition electrodes, it is necessary to conduct the grounding as described in item (4) in view of easy generation of surging.

## ● Caution in sighting pipe mounting

### 1. Sighting pipe material

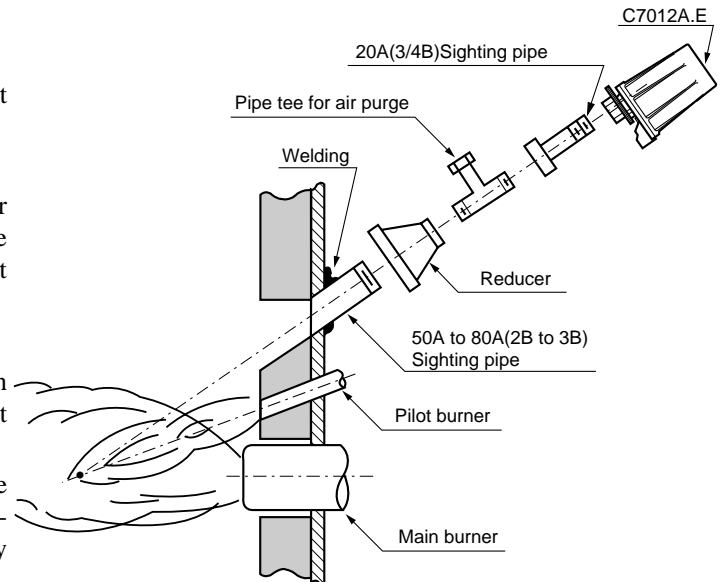
Use a black pipe to prevent the reflection of ultraviolet radiation and a heat-resisting pipe.

### 2. Sighting pipe dimensions

Determine the pipe sizes larger in diameter and shorter in length as much as possible by combining the same pipes or reducer to obtain the most stable flame current in relation to the sighting distance and sighting angle.

### 3. Sighting pipe mounting

- (1) Focus on the flame diagonally downward position above the burner and prevent the buildup of soot/dirt on the viewing window and in the pipe.
- (2) Weld temporarily one end of the sighting pipe to the combustion chamber plate and mount the flame detector to the other side of the pipe. Weld permanently after No. (3) checkout and adjustments are completed.
- (3) Make sure to perform the down-turn test for each burner in case of supervising each or both pilot burner and main burner. Position the flame detector to detect the positive ignition and stable flame current.



### 4. Air purging

When air cooling, smoke prevention, dust prevention, etc. become necessary, conduct the air purging with clean air.

*Specifications are subject to change without notice.*

**YAMATAKE**

**Savemation**

**Yamatake Corporation**

IBD Sensing and Control Department  
Totate International Building  
2-12-19 Shibuya Shibuya-ku Tokyo 150-8316 Japan  
Phone: 81-3-3486-2311  
Fax: 81-3-3486-2300

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