



Instruction Manual For
Ultraviolet – Type Flame Detector
Model HF-24



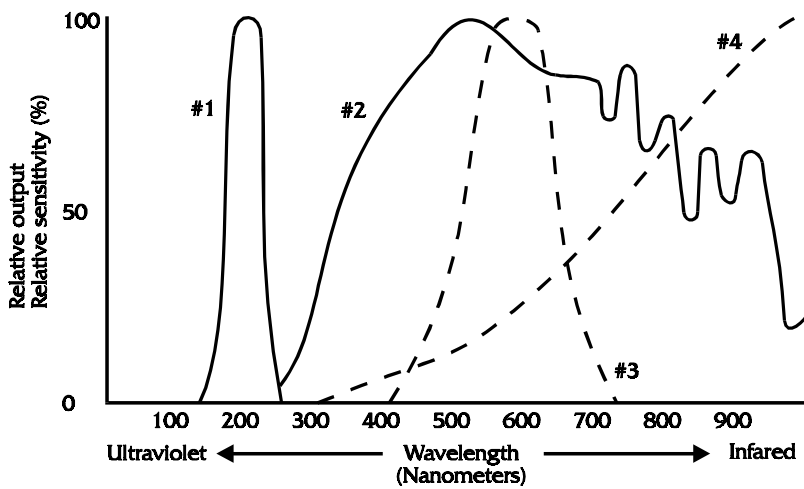
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UV Detection Basics

Summary

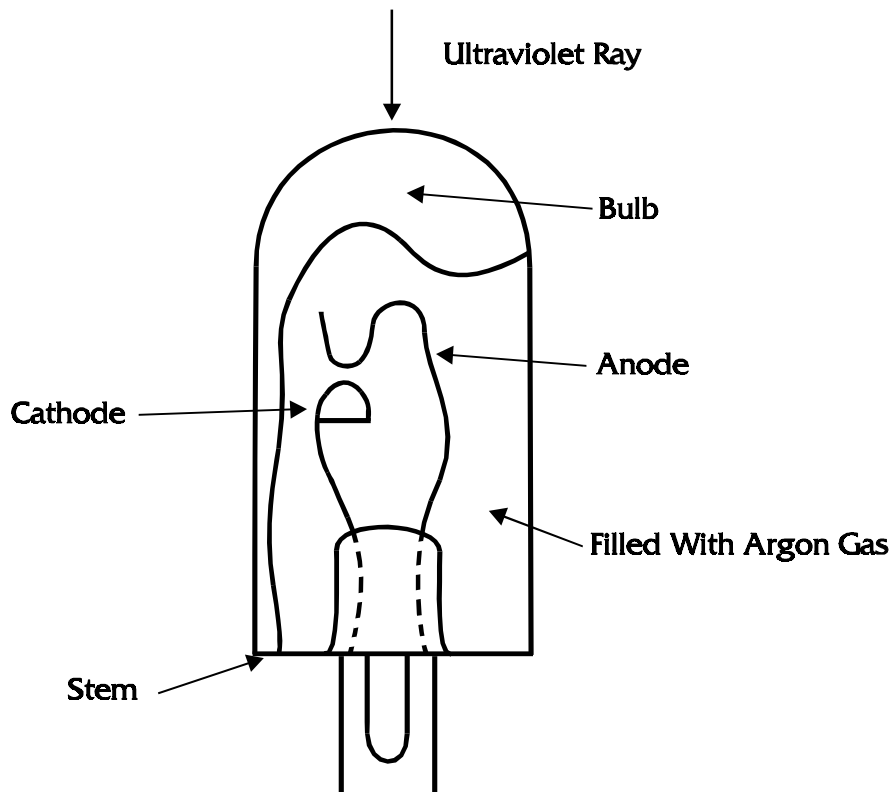
The ultraviolet type flame detector, which uses a UV tube, absorbs feeble ultraviolet light contained in flames and detects them in the form of a discharge pulse train with the help of the photo-electric effect and electron avalanche phenomenon. The detector has a counter circuit, which prevents malfunctions from taking place because of single shot or momentary UV rays, such as lightening and cosmic radiation.



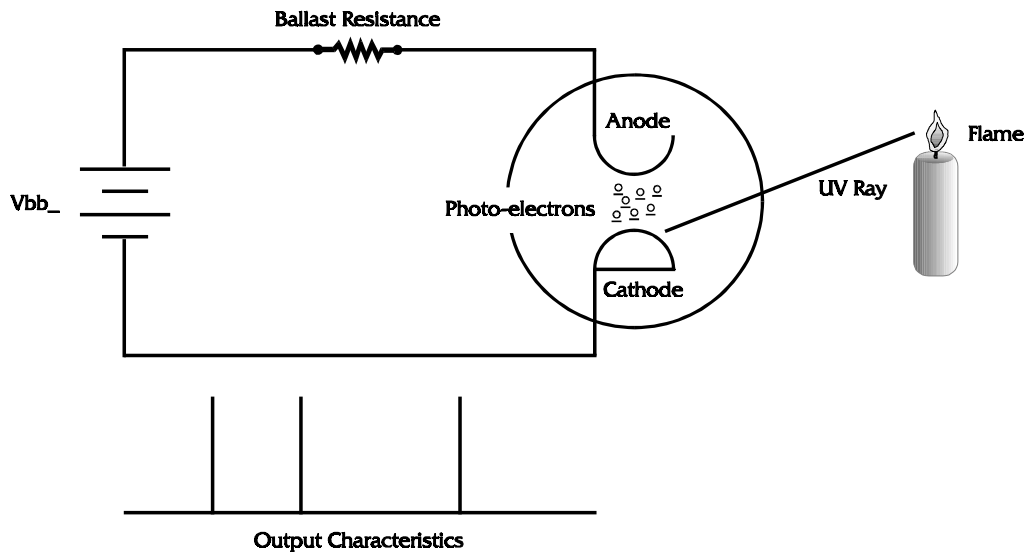
Comparison of Spectral Characteristics

- ▶ Curve #1: Response of UV tube
- ▶ Curve #2: Sunlight
- ▶ Curve #3: Sensitivity of the human eye
- ▶ Curve #4: Tungsten filament lamp

Structure of the UV tube



Basic Operating Circuit of the UV Tube



Mounting

Locations Suitable for Mounting

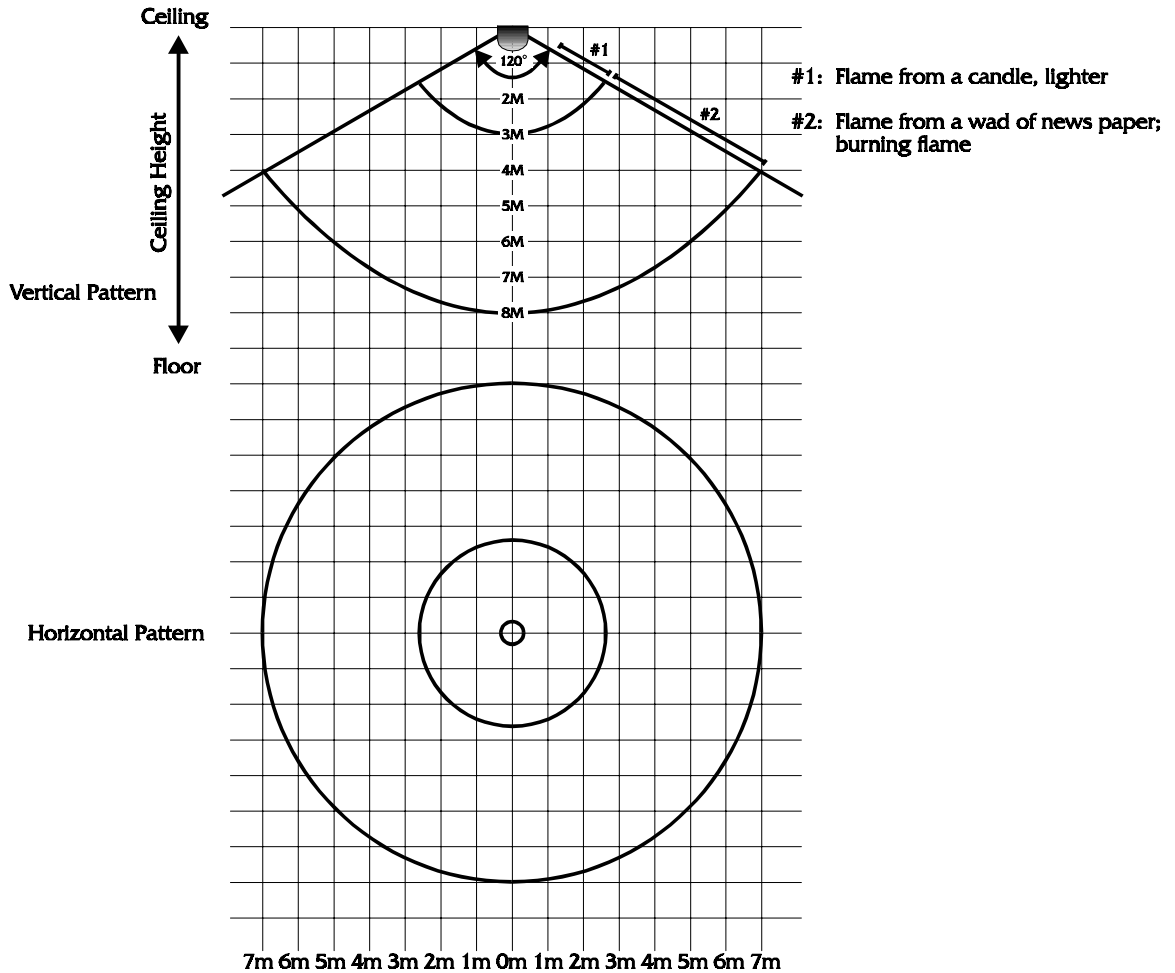
- ▶ Location where fire is strictly prohibited
- ▶ Location where there is a printing press
- ▶ Garage
- ▶ Film library
- ▶ School
- ▶ Department store
- ▶ Art museum
- ▶ VTR room
- ▶ Factory
- ▶ Hospital
- ▶ Warehouse
- ▶ Storage for critical materials
- ▶ Computer data room
- ▶ Hotel
- ▶ Important cultural property

Locations Not Suitable for Mounting

- ▶ Outdoors
- ▶ Location close to germicidal lamp based on UV rays
- ▶ Location where there is a machine which will produce electric sparks
- ▶ Location where welding jobs are carried out
- ▶ Location involving frequent vibrations and shocks
- ▶ Location which will generate corrosive gas
- ▶ Location calling for any explosion proof means
- ▶ Location where there is a source of radiation
- ▶ Location which tends to gather dust or oil film

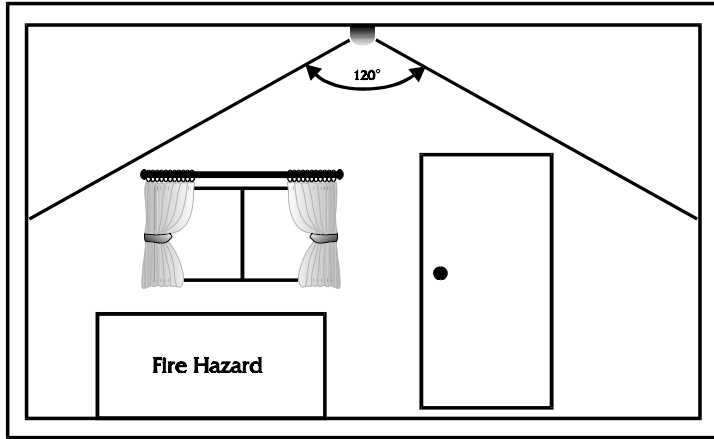
Detectable Area

The detectable area depends on the distance from the detector to a flame as illustrated below. An alarm condition is produced when a required number of UV rays enter the UV tube, setting off the counter circuit.

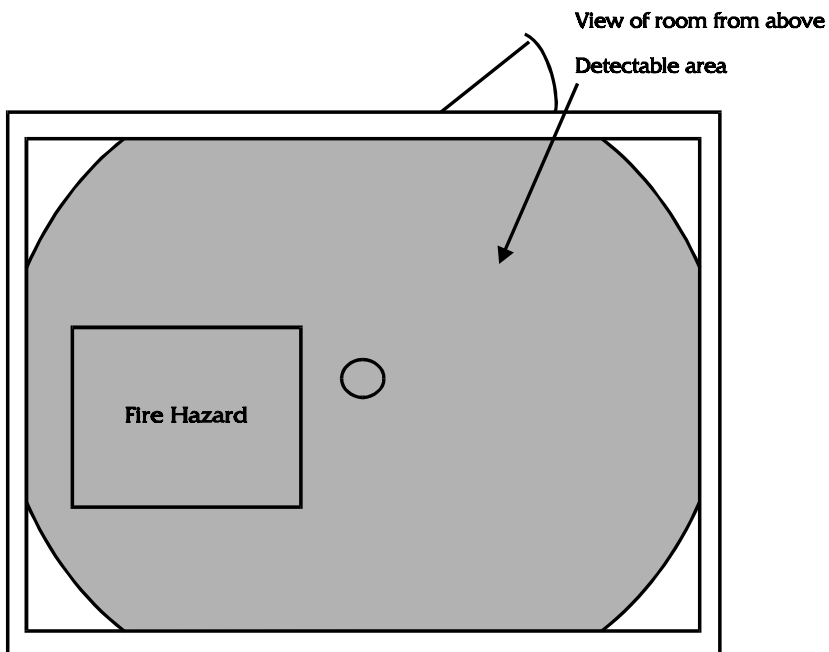


Mounting Example

- ▶ The detector should be mounted above something on which you want to lay stress

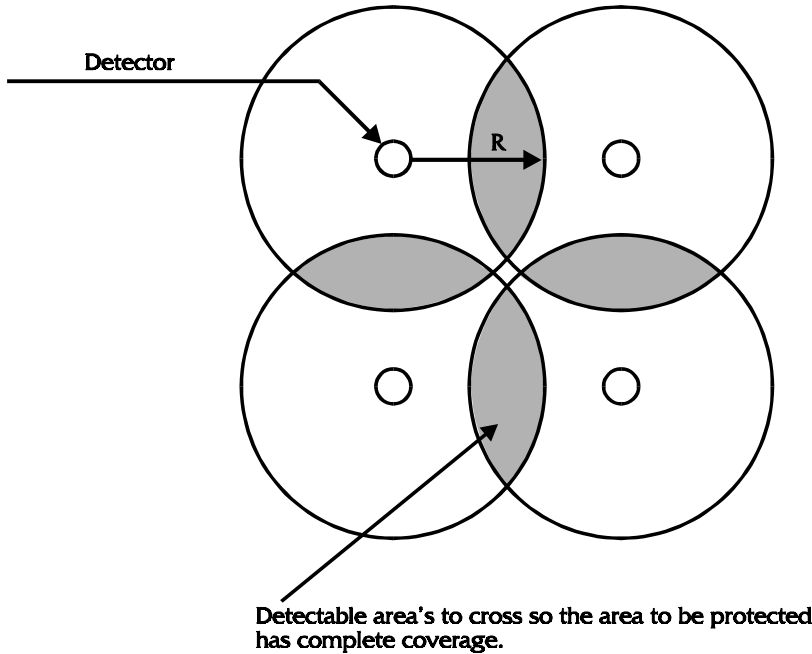


Fire hazard: Something from which fire tends to be produced



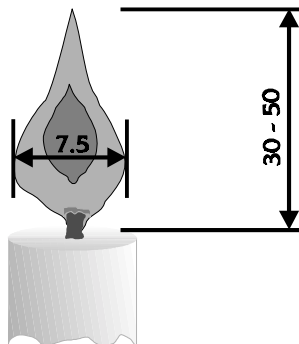
Detector to Detector Distance

In mounting more than one detector, the value of 'R' shown below is determined according to the detectable area mentioned in 2.2.



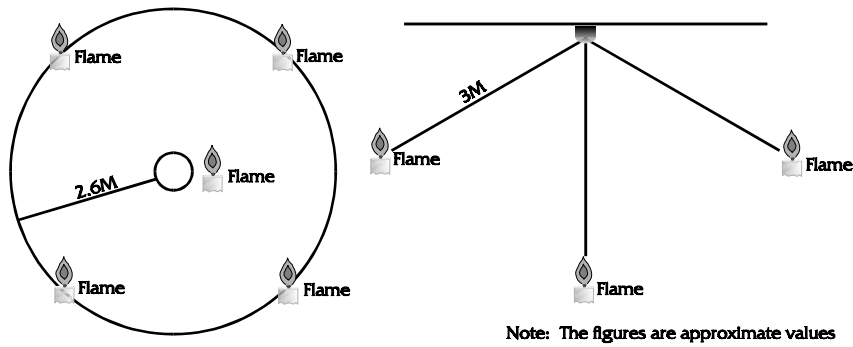
Performance Check

- ▶ Approximately one second after the power supply is switched on, the detector which has been mounted reaches its' normal operating condition
- ▶ Make flames within the detectable area using a candle or a lighter and confirm that an alarm is produced within 5 to 30 seconds in the area approximately 3m apart from the sensor
- ▶ The flame of a candle or a lighter should satisfy the requirements shown below



Note: The figures are approximate values in millimeters

- ▶ Performance tests should be carried out in the area specified below



- ▶ Ultraviolet lamps or similar means are used for making performance tests at a location where fire is strictly prohibited (this detector cannot be mounted at a location calling for any explosion proof means). If an ultraviolet lamp is used for testing purposes, then the lamp should have a maximum ultraviolet output @ 200nm.

Maintenance & Inspection

Cleaning

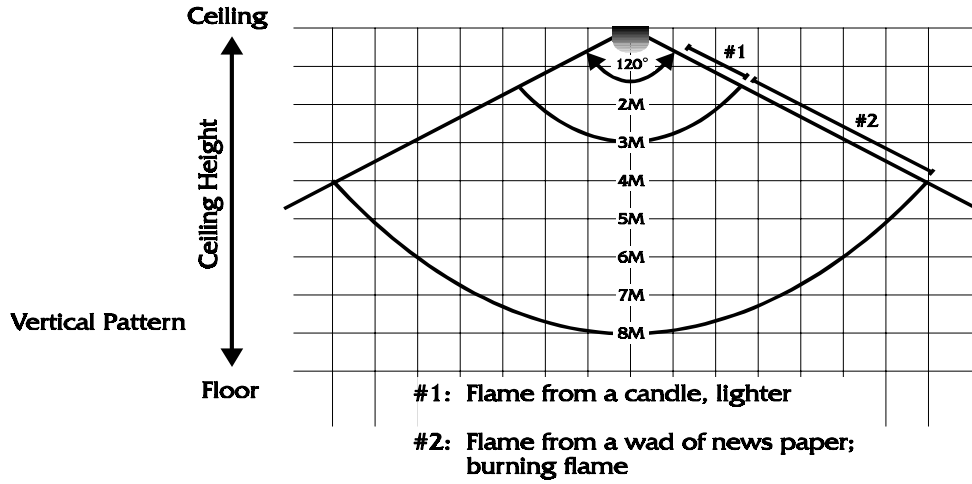
Any built up dust or oil film on the surface of the UV tube will significantly reduce its' sensitivity. The exposure of the UV tube should be cleaned at its' surface at regular intervals (half-yearly under normal environments). (In cleaning, take care that no undue force is applied to the UV tube.)

Performance Check

In addition to the soils above, there may be something, like larvae and webs, which hinders proper detection. In such cases, the sensor performance should be checked, as appropriate, using a lighter or the like.

Detector Specifications

Detectable Area



Specification

Ordering code:	HF-24
Operating voltage:	15-30 Vdc (Nominal rating 24Vdc)
Standby current:	200µA at 24Vdc
Detection angle:	120° Cone
UV sensitivity range:	185 to 260 nm
Maximum current in alarm state:	250mA (without base)
Operating temperature range:	-10°C to +50°C
Maximum humidity:	95%RH - Non condensing (at 40°C)
Colour and case material:	Ivory ACS
Weight:	150g (210g with base)

Compatible Bases

The HF-24 is Compatible with most "HSC-4R" style bases available from Hochiki America.