LINEAR SYSTEMS

UV SENSOR (UV 02)

(Technical Data)

The UV Flame Sensor designed by Linear Systems uses very sensitive electronic UV tube. The specially tuned UV tube is designed to detect the UV radiations emitted by the naked flame. The UV Flame Sensor used is **HPK R2868** which make use of the photoelectric effect of metal & the gas multiplication effect. It is insensitive to normal light and refractory glow in furnace walls. Hence, the UV Flame Sensor is ideally suited for detecting all types flames, namely, flames due to Gas/Coal/Oil fired burners in Boilers and Furnaces.

The UV tube is enclosed in a sealed quartz glass beaker to provide additional protection from adverse environmental conditions. The UV Flame Sensor is housed in a economical plastic jacket to provide mechanical protection and various mounting features. **Please note that UV Tube is fragile and breakable, hence special care must be taken while handling the UV Flame Sensor.**

The sensor can be mounted up to about 100 meters from the Amplifier/Controller. However, it is important to use continuous shielded wire without joints for reliable operation.

The UV Flame Sensor is designed to operate reliably at 50 deg C. It will be necessary to provide an Air Jacket to keep the UV tube within the specified temperature limit.

Features :

- Capable of detecting very weak ultraviolet rays inspite of Sensor's small size.
- Insensitive to visible light and infra red radiations.
- Speed of response is very high (few milliseconds)
- High reliability and Long life (Over 10,000 hours of continual discharge)
- Quenching Time: approximately 50 ms.
- Operating Temperature: -10 to 50 deg C

	Parametres	**Rating**
General	Spectral Response	180 to 260nm
	Window material of Sensor	UV Glass
Charactristics (at 25degreeC)	Discharge starting Voltage (with UV radiation)	280 v dc Max
	Recommended Operating Voltage	325+25 V dc
	Recommended average discharge current	100 mA
	Background *	10cpm Max
	Sensitivity **	5000cpm Type

Notes :

*Measured under room illuminations(approximately 500 lux) & recommended operating conditions. These values may increase if the following environmental factors are present.

1. Mercury lamps, sterlization lamps or halogen lamps are located nearby.
2. Direct or reflected sunlight is incident on the tube.
3. Electrical sparks such as welding sparks are present.
4. Radiation sources are present.
5. High electric field (including static field)generates across the field.

** These are the representative values for a wavelength of 200nm & a light input of 10pW/cm2. In actual case, the sensitivity will vary with the wavelength of the UV radiation & the drive circuitry employed.

Figure 1: UV TRON's Spectral Response and Various Light Sources

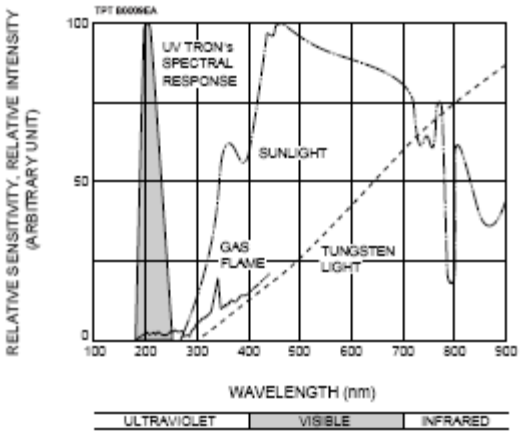


Figure 2: Angular Sensitivity (Directivity)

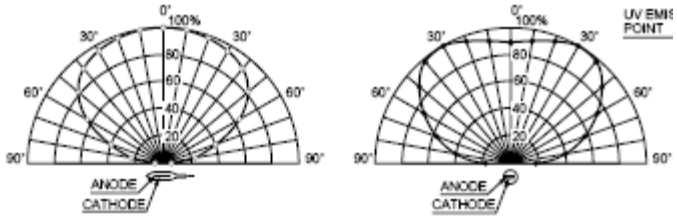
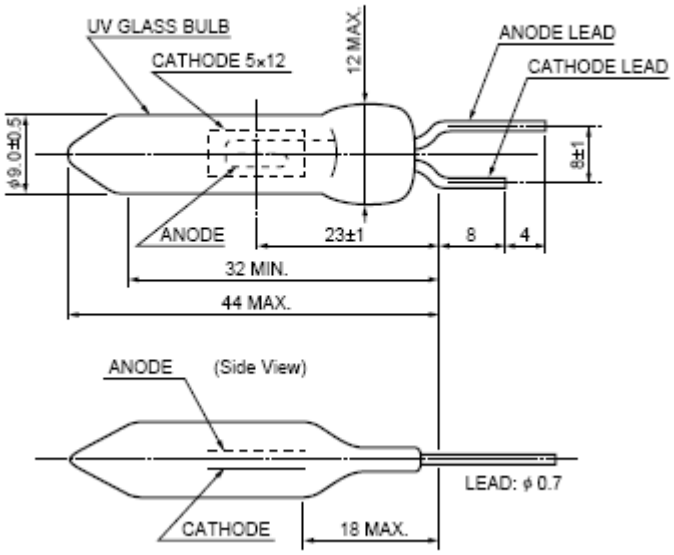


Figure 3: Dimensional Outline (Unit: mm)



Handling & Operating Precautions for UV Sensors

- **About background**
  When a voltage is applied to the Sensor, discharge may occasionally occur even with no incidence of UV radiation. This phenomenon is called Background. The major causes for this are

  1) Cosmic Ray Radiations
  2) Static Electricity

  A properly designed signal processing circuit is required to prevent faulty operation caused by Background.

- **About UV Radiations in living environments**
  The UV Sensor may operate by mistake when extraneous UV radiations enter it. There are many different UV radiation sources that may be found in common circumstances are
  1) Sunlight
  2) Sparks from Arc welding
  3) Electric sparks
  4) Sterlization lamps
  5) Halogen lamps

  Sufficient care must be taken to eliminate extraneous UV radiations since the Sensor has a very high sensitivity so it detects even weak UV radiation.

- **Precautions for using Two or more UV Sensors simultaneously**
  The UV Sensor itself emits UV radiation in operation. When using two or more Sensors at the same time in close position, care should be taken so that they do not optically interfere with each other.

- **Vibration & Shock**
  If the Sensor is subjected to severe vibration or shock, the glass bulb may break or the electrodes May be deformed. This may cause deterioration in characteristics, eventually resulting in faulty operation. So extreme care should be taken in handling the tube.

- **Polarity**
  Connect the Sensor with correct polarity. If connected in reverse direction, operating errors may occur.

- **Humidity**
  Humidity around the leads generates leak current, dropping the anode voltage, & stopping from operating. In particular, if dirt or dust get on the leads, that make it easier for humidity to be absorbed. So keep the area around the leads clean.

- **Optimum Supply Voltage Range**
  Be sure to operate UV Sensor within the optimum range of supply voltage as specified. Operation outside this voltage will result in faulty operation.

Mechanical dimension