

## Quick Detection of Flame from Distance, Compact UV Sensor with High Sensitivity and Wide Directivity, Suitable for Flame Detectors and Fire Alarms.

Hamamatsu R2868 is a UVTRON ultraviolet ON/OFF detector that makes use of the photoelectric effect of metal and the gas multiplication effect. It has a narrow spectral sensitivity of 185 nm to 260 nm, being completely insensitive to visible light. Unlike semiconductor detectors, it does not require optical visible-cut filters, thus making it easy to use.

In spite of its small size, the R2868 has wide angular sensitivity (directivity) and can reliably and quickly detect weak ultraviolet radiations emitted from flame due to use of the metal plate cathode (eg. it can detect the flame of a cigarette lighter at a distance of more than 5 m.).

The R2868 is well suited for use in flame detectors and fire alarms, and also in detection of invisible discharge phenomena such as corona discharge of high-voltage transmission lines.



## APPLICATIONS

- Flame detectors for gas / oil lighters and matches
- Fire alarms
- Combustion monitors for burners
- Inspection of ultraviolet leakage
- Detection of discharge
- Ultraviolet switching

## SPECIFICATIONS

### GENERAL

| Parameter         | Description / Value | Unit |
|-------------------|---------------------|------|
| Spectral Response | 185 to 260          | nm   |
| Window Material   | UV glass            | —    |
| Weight            | Approx. 1.5         | g    |

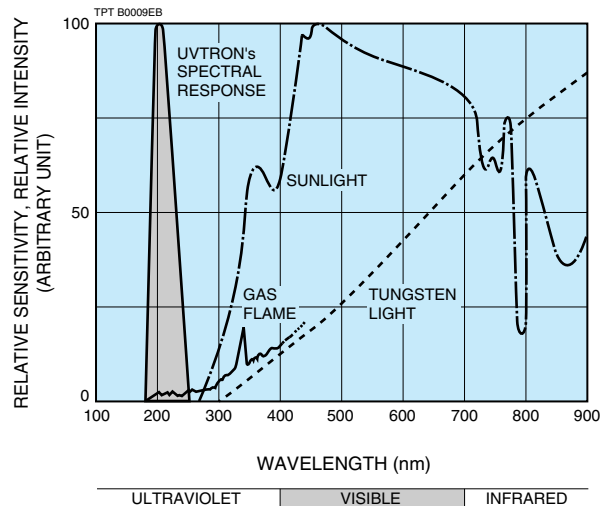
### MAXIMUM RATINGS

| Parameter                              | Value      | Unit |
|--|------------|------|
| Supply Voltage                         | 400        | V    |
| Peak Current <sup>①</sup>              | 30         | mA   |
| Average Discharge Current <sup>②</sup> | 1          | mA   |
| Operating Temperature                  | -20 to +60 | °C   |

### CHARACTERISTICS (at 25 °C)

| Parameter   | Value     | Unit              |
|---|-----------|-------------------|
| Discharge Starting Voltage (with UV radiation) (DC) | Max. 280  | V                 |
| Recommended Operating Voltage (DC)                  | 325 ± 25  | V                 |
| Background <sup>③</sup>                             | Max. 10   | min <sup>-1</sup> |
| Sensitivity <sup>④</sup>                            | Typ. 5000 | min <sup>-1</sup> |

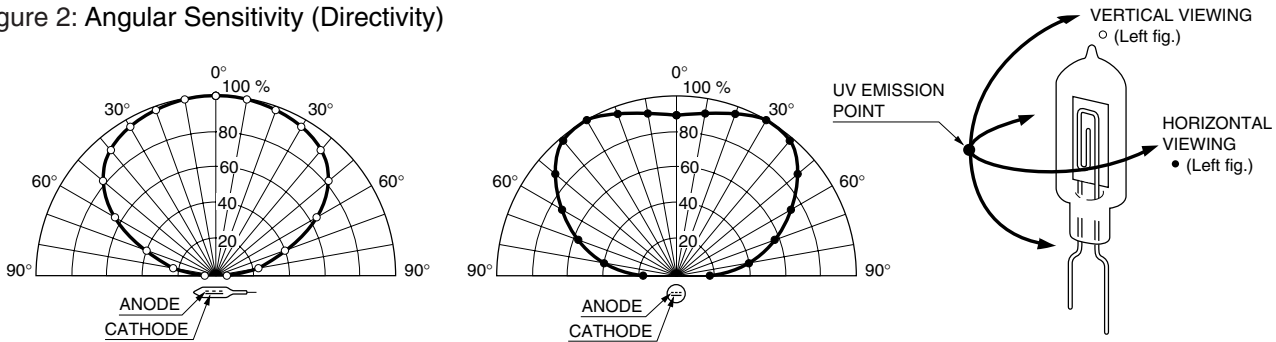
Figure: UVTRON's Spectral Response and Various Light Sources



- NOTE:**
- ① This is the maximum momentary current that can be handled if its full width at half maximum is less than 10  $\mu$ s.
  - ② If the tube is operated near this or higher, the service life is noticeably reduced. Use the tube within the recommended current values.
  - ③ Measured under room illuminations (approx. 500 lux) and recommended operating conditions. Note that these values may increase if the following environmental factors are present.
    - (1) Mercury lamps, sterilization 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 tube.
  - ④ These are representative values for a wavelength of 200 nm and a light input of 10 pW/cm<sup>2</sup>. In actual use, the sensitivity will vary with the wavelength of the ultraviolet radiation and the drive circuitry employed.

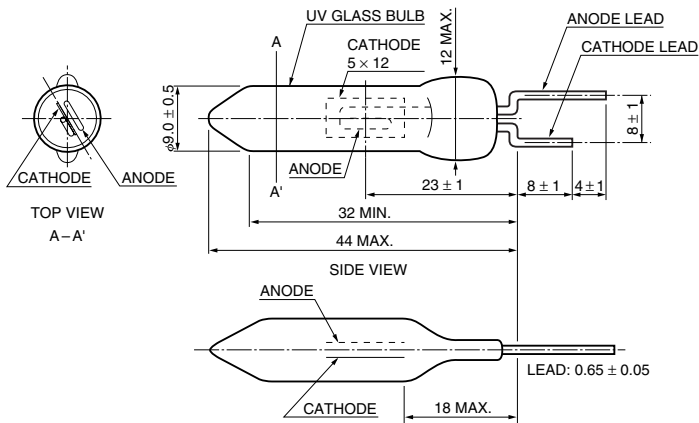
# FLAME SENSOR UVTRON<sup>®</sup> R2868

Figure 2: Angular Sensitivity (Directivity)



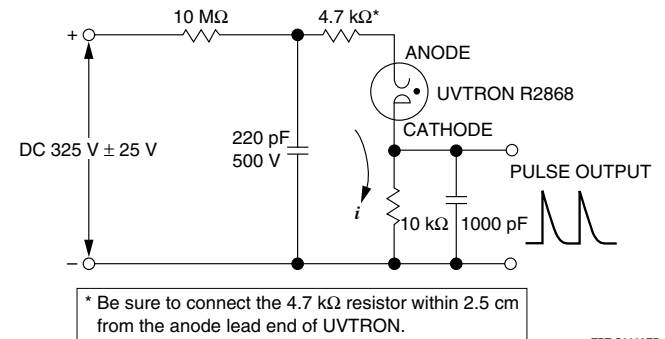
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Figure 3: Dimensional Outline (Unit: mm)



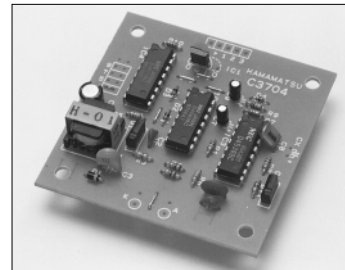
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Figure 4: Recommended Operating Circuit



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## ●UVTRON Driving circuit C3704 series (sold separately)



Hamamatsu also provide the driving circuit C3704 series for R2868 operation. C3704 series include a high voltage power supply and a signal processing circuit in printed circuit board, which allows to operate R2868 easily as a flame sensor with the low input voltage (DC 5 V to 30 V) only. For the details, please refer to the data sheet of C3704 series.

## ■PRECAUTIONS FOR USE

### ●Ultraviolet Radiation

The UVTRON itself emits ultraviolet radiation in operation. When using two or more UVTRONs at the same time in close position, care should be taken so that they do not optically interfere with each other.

### ●Vibration and shock

UVTRONs have passed vibration and shock tests in compliance with IEC 60068-2-6 (sinusoidal vibration test 1.5 mm peak to peak, 100 m/s<sup>2</sup>, 10 Hz to 500 Hz) and IEC 60068-2-27 (shock test 1000 m/s<sup>2</sup>, 11 ms). However if subjected to strong mechanical shocks such as drop impacts, the glass envelope may crack or internal electrodes may deform resulting in poor electrical characteristics. So use extreme caution when handling the UVTRON. If the leads are machined or cut with a wire cutter, the internal electrodes may be subjected to vibrations or shocks greater than the above tests, resulting in poor electrical characteristics as in the case where they are subjected to drop impacts.

### ●Polarity

Connect the UVTRON with correct polarity. Should it be connected with reverse polarity, operating errors may occur.

## ■WARRANTY

The UVTRON is covered by a warranty for a period of one year after delivery. The warranty is limited to replacement of any defective tube due to defects traceable to the manufacturer.

# HAMAMATSU

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