

UVTRON® Discharge / Flame Sensors

Precautions for Use

1. Safety, legal, regulatory, and intellectual property precautions

- •Hamamatsu Photonics makes constant efforts to improve product quality and reliability, but this does not guarantee the product integrity of UVTRON[®]. Please implement a design providing ample safety (redundant design, fire spread prevention design, malfunction prevention design, etc.) within customer's equipment manufactured using a UVTRON[®] in order to avoid personal injury, fire and damage to society that might possibly occur in the unlikely event of a failure of the UVTRON[®]. In particular, when a UVTRON[®] is used in an equipment or an environment where the malfunction or failure of the UVTRON[®] could result in personal injury, death or serious damage to property (hereinafter referred to as the "particular application"), the safety design must take into account the possible failures. We will not be liable for any use in such particular application unless we give our prior written consent by way of specification sheets, etc.
- •Since the durability of UVTRON[®] varies depending on the operating environment and conditions, be sure to evaluate and confirm the operation of UVTRON[®] in the condition in which it is installed in the customer's equipment and in the actual operating environment. If any doubt arises about the safety of UVTRON[®], please notify us as soon as possible and also be sure to implement technical measures for the above stated safety design (redundant design, fire spread prevention design, malfunction prevention design, etc.).
- •When exporting a UVTRON[®] (including cases when providing technology), please comply with export-related laws and regulations in your country, such as the Foreign Exchange and Foreign Trade Law of Japan, and be sure to obtain an export license or a service transaction license if necessary. Please contact our sales office for information on whether or not the UVTRON[®] is subject to these export-related laws and regulations.
- •The application examples described in our product literature are not intended to guarantee suitability for any particular application or the success or failure of any commercial use. No guarantee or license is granted for the enforcement of any intellectual property rights. We will not be held liable for any intellectual property rights issues that may arise with third parties as a result of using this information.
- •When disposing of a UVTRON[®], take appropriate measures in compliance with applicable regulations regarding waste disposal, and correctly dispose of it yourself or entrust proper disposal to a licensed industrial waste disposal company. In any case, be sure to comply with the regulations in your country or state to ensure correct disposal.

2. Precautions for usage environment

Usage in special environments

The UVTRON[®] is not designed for use in special environments such as those listed below and we assume no responsibility for the use in such special environments and locations.

- (1) In liquids such as water, oil, chemical solutions, and organic solvents
- (2) In dusty environments
- (3) In environments exposed to sea breeze or corrosive gases
- (4) In environments at extremely high temperature
- (5) In environments that causes condensation on the surface of UVTRON® glass bulb
- (6) In environments subject to excessive vibrations or shocks
- (7) In environments where strong static charges or electromagnetic waves are generated
- (8) In environments at extremely high or low pressures

Background noise (BG)

When a voltage is applied to a UVTRON[®], sporadic discharges may occur in the UVTRON[®] even with no incident UV light. This is called "background noise". Major causes of background noise are as follows:

- (1) Radiation including cosmic rays
- (2) Static electricity
- (3) High electric fields, high magnetic fields, and strong electromagnetic waves
- (4) Intense light (such as from lasers) with extremely high radiant intensity greater than sunlight

The UVTRON® is not designed to be radiation resistant. A signal processing circuit is required to prevent equipment malfunctions that may occur due to background noise. Please contact us for detailed information.

OUV light sources in usage environment

Faulty operation may occur when extraneous UV light enters a UVTRON®. The following are some examples of UV light sources.

- (1) Sparks from arc welding NOTE: These emit very high intensity UV light.
- (2) Electrical sparks (such as those from pantograghs on the roof of electric trains or by motor)
- (3) Sterilization lamps (low-pressure mercury lamps, etc.)
- (4) Halogen lamps (illumination light sources, car headlights, etc.)
- (5) High color-rendering lamps such as xenon lamps and metal halide lamps

(6) UVTRON[®] installed within 5 meters of each other NOTE: UVTRON[®] itself emits UV light when it discharges due to detection of UV light.

The UVTRON[®] is highly sensitive to UV light and senses even weak UV light coming from unexpected places. Take sufficient precautions for the area where the UVTRON[®] is installed and used.

Effect of humidity

The UVTRON[®] has very high impedance during non-discharge operation (no UV light is detected). Use caution to ensure that the area around the UVTRON[®] leads is well insulated. If leakage current is generated by humidity around the UVTRON[®] leads, this may cause a drop in the anode supply voltage and stop the UVTRON[®] operation. Dirt, dust or other contaminants deposited on the leads can easily absorb moisture, so keep the area around

3. Precautions for handling and using UVTRON®

Shock

The UVTRON®, diver circuits, and UVTRON® modules have passed the shock test shown in the table below. However, if subjected to excessive shocks such as from dropping, the glass bulb may crack or internal electrodes may deform, worsening the electrical characteristics. So please use plenty of caution when handling them. If the UVTRON® lead wires are modified such as by cutting them with nippers, the internal electrodes may be subject to shocks exceeding those shown in the table below, causing the electrical characteristics to deteriorate just the same as when dropped. A safe way to lessen the shocks when cutting the lead wires is to align the nipper cutting edges perpendicular to the internal electrodes and cut each lead wire, or cut each lead wire slowly by cutting two or three times instead of cutting them all at once with the nippers. When mounting a UVTRON® onto a multi-split circuit board, split the circuit board in advance before mounting the UVTRON®.

Product		Shock test IEC 60068-2-27
UVTRON®	R9454, R9533	10000 m/s², 1 ms
	Others	1000 m/s², 11 ms
Driver circuits for UVTRON®, UVTRON® modules		1000 m/s², 11 ms

Storage and transportation

When storing or transporting a UVTRON®, keep it in the packing box. If the packing box is dropped or bumped during storage or transportation, an excessive mechanical stress may be applied, causing damage or degradation of characteristics. Handle with care and take adequate measures to avoid dropping and bumping. The UVTRON® should be stored indoors at low humidity and stable room temperature where no corrosive gases are present and no condensation occurs. Storing a UVTRON® for long periods of time may, in rare cases, lead to degradation of characteristics such as deterioration of the glass bulb. Please use it as soon as possible after delivery.

Dirt on glass bulb

The UVTRON® operates at a high voltage, which may cause dust and other contaminants to adhere to the surface of the glass bulb due to electrostatic adsorption. If the UVTRON® glass bulb becomes dirty, its UV transmittance may decrease or the glass quality may change. After installing the UVTRON® into equipment, periodically wipe the glass bulb with gauze or cleaning wipes moistened with alcohol to keep it clean. When handling the UVTRON®, do not touch the glass bulb with bare hands. Wear gloves to prevent the oil and grime of your hands from adhering to the glass bulb.

Soldering

Heating the UVTRON® leads excessively during soldering may cause the glass bulb to crack or the electrodes to deteriorate leading to faulty operation, so be extra careful when soldering. For the UVTRON® with hard pin leads, we recommend using a dedicated socket we provide. When soldering a UVTRON® directly onto a printed circuit board, use tweezers or similar tools to grip the root of the leads to prevent heat from conducting to the UVTRON®, and then solder at a soldering iron temperature of 350 °C or less within 5 seconds. Avoid using a solder tank. When finished soldering, be sure to completely wipe away the soldering flux with alcohol, etc.

Polarity

The UVTRON® has an anode and a cathode having electrical polarity. Mistakenly connecting the polarity in reverse will cause malfunctions, so be sure to connect the anode and cathode correctly.

I ead wires

The lead wires of UVTRON® can easily break at their roots (lead-to-alass sealing portion). When bending the lead wires, grip by the root of each lead wire with long-nose pliers or a similar tool, and bend it at a position slightly away from the root. Bending and extending the leads should be done no more than once.

Voltage

The optimum operating voltage range is specified for each type of the UVTRON®, driver circuits, and UVTRON® modules. Refer to the specifications and use it within the rated voltage range. Operation at a voltage outside the rated range may cause failures or malfunctions. Since a high voltage is applied during UVTRON® operation, use caution to avoid electrical shock.

OUVTRON[®] arrangement

When a UVTRON® starts discharging, it also emits UV light through the glass bulb. Do not look directly at the UVTRON® from a short distance for long periods of time. When two or more UVTRON® are used at the same time, the UV light from each UVTRON® may cause a sequential discharge operation, so place the UVTRON® in such a way that these will not optically interfere with each other.

4. Other precautions

- •When giving instructions to the end user, provide adequate explanations of the functions, performance, and handling of the UVTRON® and the equipment using it as well as the appropriate warnings and indications.
- The UVTRON® specifications are subject to change without prior notice due to improvements or other reasons. Our product literature has been carefully prepared to ensure accuracy but in rare cases may contain errors. When using our product, always check the delivery specification sheets for the latest specifications.
- Reproduction or copying of any content of the product literature is prohibited without permission of Hamamatsu Photonics.

5. Warranty period and scope

- If a UVTRON® fails due to manufacturing defects within one year after delivery, we will replace it free of charge. The scope of the warranty is limited to replacement of the product. The product will be out of warranty in case of use in particular application without our prior consent.
- Subject to local technical requirements and regulations, availability of products included in this promotional material may vary. Please consult with our sales office. Information furnished by HAMAMATSU is believed to be reliable. However, no responsibility is assumed for possible inaccuracies or omissions. Specifications are subject to change without notice. No patent rights are granted to any of the circuits described herein. ©2024 Hamamatsu Photonics K.K.

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