UV-IR Flame Detector
User’s Guide

Model: VS-200PB

http://www.gltexports.com

**DESCRIPTION**

VS-200PA-ST is a smart “explosion-proof” UV/IR flame, combining two sensors for both the UV(Ultra-violet) and IR(Infrared) spectra. This detector is well protected against the versatile false alarms, such as ARC welding, artificial light sources(halogen lamps, electronic flashes, etc) and other well-known spurious fires.

Typical Applications:
- Oil, gas and petrochemical refineries /production/storage/off loading/shipping
- Semiconductor chemical process areas
- Power Generation pumps, engine rooms and manned stations
- Automotive-manufacturing paint spray booths
- Paint-manufacturing facilities
- Printing industry-solvent handling, presses, drying process
- Chemical industry -production, storage, transportation
- Trade centers, culture halls, any public commercial buildings
- Warehouses -storage facilities for flammable materials

**FEATURES**

- Dual Spectrum(UV/IR)
- Typical response time of 3 to 5 seconds
- Aluminium enclosures against hazardous areas
- Excellent false alarm immunity
- Silicon-molded electronic circuits against the spark ignitions, harsh environments, etc.
- User Programmable Configuration (selecting the sensitivity levels, etc)
Technological Specifications

Input Voltage: DC24V (11 to 32Vdc)

Power Consumption: Max. 40mA in standby

Outputs: Max. 70mA in alarm

<Dry Contact Relays>
2A at 30Vdc
0.6A at 125Vac

Alarm:
- N.O. (Normally open contacts)
- N.C. (Normally closed contacts)

Fault:
- N.C. (Normally closed contacts)

<Optional outputs>
4-20mA current output
RS-485 output

Alarm Latching: Latching/Non-latching selectable

Spectral Response:
- UV: 0.185 to 0.260 microns
- IR: 4.3 micron

Response Characteristics:
Typical Response Time: 3 to 5 sec at 15m
(1 sq.ft n-Heptan at 50ft)

*Within 15 sec Response Time:

<table>
<thead>
<tr>
<th>Fuel</th>
<th>Size</th>
<th>Distance (m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>n-Heptane</td>
<td>33x33cm</td>
<td>Nom. 36m</td>
</tr>
</tbody>
</table>

Sensitivity: Selectable 4 modes

Field of View: 90° (horizontal/vertical)

Electrical Connection: PG13.5 or M20 cable gland

or on request

Temperature Range: -40°C to +85°C
Humidity Range: Up to 95% RH

Dimensions: 130×130×78mm (w/o optional swivels)

Weight: 0.5kg (w/o optional swivels)

Ingress Protection: IP66/IP67

Certifications: Designed to meet EN54-10/FM3260

Enclosure Classification

Optional Accessories: Swivels

FALSE ALARM IMMUNITY

<table>
<thead>
<tr>
<th>False Alarm Source</th>
<th>Distance</th>
<th>Modulated / Unmodulated Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arc welding, 4mm rod / 200A</td>
<td>3m</td>
<td>No alarm</td>
</tr>
<tr>
<td>500W quartz halogen lamp (w/o, with protective window)</td>
<td>IAD</td>
<td>No alarm</td>
</tr>
<tr>
<td>1500W electric quartz heater</td>
<td>IAD</td>
<td>No alarm</td>
</tr>
<tr>
<td>Fluorescent Light, 40W</td>
<td>IAD</td>
<td>No alarm</td>
</tr>
<tr>
<td>Incandescent Light</td>
<td>IAD</td>
<td>No alarm</td>
</tr>
<tr>
<td>Sunlights (direct/indirect)</td>
<td>IAD</td>
<td>No alarm</td>
</tr>
<tr>
<td>Others</td>
<td>IAD</td>
<td>No alarm</td>
</tr>
</tbody>
</table>

*Notes: IAD=Immune at any distance
Field Installation

Components Indications

- IR Window
- UV Window
- Swivel (option)
- Power LED (Green)
- IR Sensor
- Alarm LED (Red)
- Fault LED (Yellow)
- UV Sensor

Installing

1. Unscrew the Front Cover to open the enclosure.

2. Set the DIP switch as you need (refer to “DIP Switch Setting” at appendix A).

3. Let the applicable wires go through the cable gland of Back Cover and connect them to the terminal blocks.

WARNING: Do not disassemble or touch internal components other than DIP switches/Terminal blocks against possible any damages inside.

- to be continued
① Disassemble the parts of knob joint on Front Cover to combine with the swivel mount and fasten them tightly, as follows.

⑤ Adjust the tilting angles of completed detector for your application situation/purpose.
Installation Considerations

The followings should be considered when installing flame detectors.

- Point detector toward where the flame is expected.
- Ensure an unobstructed view of the area to be monitored.
- Employ more than one detector to ensure the hazard is fully covered.
- Mount the detector about 1 meter below the ceiling so it can respond before being blocked by smoke accumulation at the ceiling (in case of ceiling installation).
- Tilt detector down a minimum of 10 degree or 20 degree (most desirable at 45 degree) to reduce dirt and dust accumulation which could obscure the detector's viewing window.
- The detector should be accessible for cleaning the windows.
- Securely mount detector so as to reduce vibration, impact as much as possible.
- Consider adjusting the sensitivity modes (detection speeds) against the false alarms/potential inhibitors below in surroundings below, which may prevent detector from detecting a fire or reduce its sensitivity to fire;
  - Solid objects such as machinery, glass or plexglass between the detector and potential fire source
  - Water, fog, rain, dirt or dust on the detector window or heavy smoke between the detector and potential fire.
Start up procedure

Once powered up, VS-200PA-HS will begin appr. 20 sec start up routine. During this time, the Green(power) LED will be Flashing. Once the start up procedure has finished and no faults are present, the detector will begin Normal operation (Green LED will remain on).

<table>
<thead>
<tr>
<th>LED Status</th>
<th>Green LED (Power)</th>
<th>Red LED (Alarm)</th>
<th>Yellow LED (Fault)</th>
<th>Current Output &lt;Optional&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power up – 20 second start delay</td>
<td>Blinking</td>
<td>Off</td>
<td>Off</td>
<td>2 mA</td>
</tr>
<tr>
<td>Internal Power Fault or system power out of range / Fault</td>
<td>Off</td>
<td>Off</td>
<td>Blinking</td>
<td>0 mA</td>
</tr>
<tr>
<td>Normal Operation</td>
<td>Solid</td>
<td>Off</td>
<td>Off</td>
<td>4 mA</td>
</tr>
<tr>
<td>UV Detection</td>
<td>Solid</td>
<td>Off</td>
<td>Off</td>
<td>12 mA</td>
</tr>
<tr>
<td>IR Detection</td>
<td>Solid</td>
<td>Off</td>
<td>Off</td>
<td>8 mA</td>
</tr>
<tr>
<td>Fire Detection(Warning)</td>
<td>Off</td>
<td>Solid</td>
<td>Off</td>
<td>16 mA</td>
</tr>
<tr>
<td>Fire confirmed</td>
<td>Blinking</td>
<td>Blinking</td>
<td>Blinking</td>
<td>20 mA</td>
</tr>
</tbody>
</table>

**WARNING:**⚠️ During Start up procedure, ensure all external equipments are disabled to prevent unwanted activation until its procedure completion.
Detector Maintenance

Perform the following maintenances on a regular basis.

- Clean the windows.
  - Use a cleaner (solvent) that completely vaporizes such as Ethanol.
  
  **WARNING:** Do not clean the windows with a cleaner that contains silicon, making the windows shinning, resulting in absorbing UV radiation.

- Tighten the mounting nuts/swivel/cable gland
- Check for un-obstructed view
- Check for possible spurious alarm items in the Field of View
- Grounding of detector/panel and its cable shielding
- Ingress protection at cable gland, etc.

Warranty

One-Year Limited Warranty

Unless mutually agreed for specific dealings, GLT EXPORTS LTD. warrants our flame detectors against defects in materials and workmanship for a period of one year from receipt by the end user. During the warranty period, GLT EXPORTS LTD. will, at its option, either or replace products that prove to be defective. Replacement products may be new or refurbished at GLT Exports Ltd.'s discretion.

Exclusions

The warranty on GLT EXPORTS LTD.'s flame detectors shall not apply to defects resulting from the following:

- Improper or inadequate maintenance by the customer
- Unauthorized modification or misuse
- Operation outside of the environmental specification for the product

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Appendix A: <DIP Switch Setting>

**DIP SWITCH SETTING**

Refer to the wiring connection (Appendix C).

```
<table>
<thead>
<tr>
<th>ON</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>8</td>
</tr>
</tbody>
</table>
```

- □ “0”
- □ “1”

<table>
<thead>
<tr>
<th>DIP SWITCH</th>
<th>Function Descriptions</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 2 3 4 5 6 7 8</td>
<td>Sensitivity Setting</td>
<td></td>
</tr>
<tr>
<td>b1 b2 * * * * * * *</td>
<td>0 0: Highest &lt;Factory Setting&gt;</td>
<td></td>
</tr>
<tr>
<td></td>
<td>0 1: High</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1 0: Medium</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1 1: Low</td>
<td></td>
</tr>
<tr>
<td>* * b1 b2 * * *</td>
<td>Alarm Delay Time Setting</td>
<td></td>
</tr>
<tr>
<td>* * * b1 b2 * *</td>
<td>0 0: 0 sec (No delay)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>0 1: 3 sec after alarm output &lt;Factory Setting&gt;</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1 0: 7 sec after alarm output</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1 1: 20 sec after alarm output</td>
<td></td>
</tr>
<tr>
<td>* * * * b1 b2 *</td>
<td>Alarm Latch On/Off Setting</td>
<td></td>
</tr>
<tr>
<td>* * * * b b</td>
<td>0 0: Reset after 5 sec &lt;Factory Setting&gt;</td>
<td></td>
</tr>
<tr>
<td></td>
<td>0 1: Reset after 10 sec</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1 0: Reset after 20 sec</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1 1: Latch until external reset</td>
<td></td>
</tr>
<tr>
<td>* * * * * * * b</td>
<td>Reserved (for future requests)</td>
<td></td>
</tr>
</tbody>
</table>


Appendix B: <Manual Reset>

Manual Reset (for VS-200 series)

(For "Manual Reset" position in the "BLACK" terminal block)
When shorting as indicated (or pushing the "user-installed" reset switch) over 1.5 sec, its manual reset will be done.

For the detailed wiring diagrams of each model,
Please refer to the next pages.
Appendix C: <Wiring Connections>

Wiring Diagram for VS-200 series

※ Applicable Wires: AWG 26~16
Stripped Length: 10mm
Appendix D: <Mechanical Dimensions>

For Cable Gland ("PG 13.5")
Appendix E: Recommendations in installing inside the buildings

2-1. Mounting

The detector can be mounted using the two mounting holes on the detector housing or the included swivel. It is preferred that the cable gland is pointing down. Leave a loop of spare cable with a diameter of apr. 10 cm (4 inch).

2.1.2 Weather Protection

In dirty or wet environments you should consider to mount a hood over the detector. That kind of hood can be mounted directly above the detector without effecting the Field of View of the detector.

2.1.3 Field of View

Keep in mind that the detector has a Cone of Vision f more than 90°. Make sure that detector is not directly looking into potential false alarm sources or friendly fires. By pointing the detector down in an angle of 45° it allows you to fully utilize the Field of View. In this case one side of the Cone of Vision will cover the area horizontally and the other side of the Cone of Vision will cover the area vertically.

When the detector is also mounted in a diagonal way at 45° it will cover a volume.

In order to avoid shadow area's that can not be seen by the flame detector it is advised to put another detector in the opposite corner.

As a rule of thumb the detector is mounted twice as high as the highest object in the protected area.

Warning:

Smoke absorbs flame radiation. This could effect the sensitivity of the detector. Mount the UV/IR detector at least 150 cm (5 feet) from the ceiling.

Warning:

Cold CO2 absorbs 4.4 µ radiation from a fire. When used in combination with a CO2 extinguishing system, be aware of the fact that re-ignition of the fire when CO2 gas is present may not be detected by the IR sensor.