

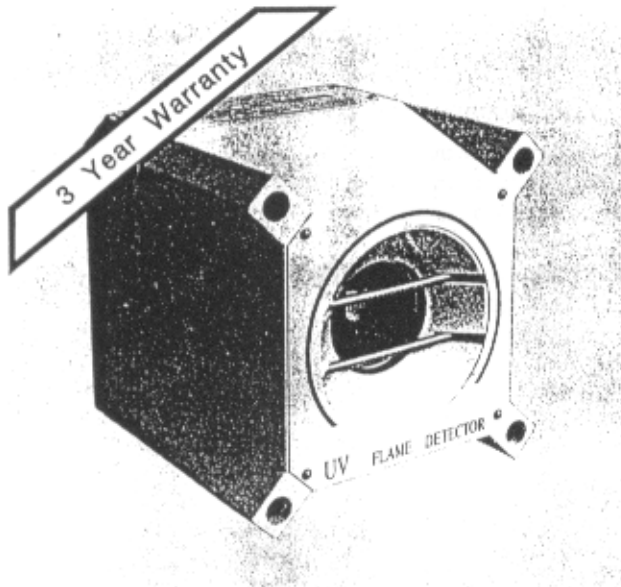
HARRINGTON

EXPLOSION PROOF ULTRAVIOLET
FLAME DETECTOR (MODEL 20/20U)

Harrington Signal, Inc.

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The Spectrex "Sharp Eye" product line is the new generation of optical flame detectors for the industrial market. This line of detectors is based on Spectrex's highly successful experience in high speed flame detection for military applications in tanks, personnel carriers and naval vessels.

The model 20/20U is a self contained flame detector designed to detect hydrocarbon based fuel fires. The 20/20U senses energy in the short wave section of the ultraviolet portion of the electro-magnetic spectrum. The sensor pass band has been carefully selected to ensure the greatest degree of spectral matching to the radiant energy emissions of flaming combustion, and the lowest degree of matching to non fire stimuli.

Circuit design

All fires that involve a fuel with hydrocarbon chemistry emit radiant energy of specific wavelengths that are unique to fire. This fact is the basis for the Spectrex circuit design. The Spectrex 20/20U constantly monitors the radiant emissions from the hazard area.

When the UV photo tube absorbs photons of radiant energy, it produces a current that is directly proportional to the radiant energy absorbed. The signal from the sensor is analyzed for frequency, intensity and duration. Simultaneous spectral matching of radiant energy in the sensor triggers the primary logic circuit to output an alarm signal. The 20/20U incorporates a photo tube that

High speed response

Immune to false alarms (solar blind)

Explosion proof

Standard 4 wire connection

M.T.B.F. minimum 100,000 hours

Designed to operate in extreme environmental conditions

3 Year Warranty

F.M. Approved

operates in a region of the spectrum where radiant output from the sun is negligible, and the radiant output from fire is significant.

As the UV photo tube absorbs photons of radiant energy it produces a current in direct proportion to the energy absorbed. The signal from the sensor is constantly measured for frequency, intensity and duration. When the signal satisfies threshold criteria the primary logic circuit outputs an alarm signal.

In addition to the basic signal evaluation circuit the 20/20U incorporates a unique self-calibrating circuit that ensures stable sensitivity over a range of background and non-fire radiations and temperature changes.

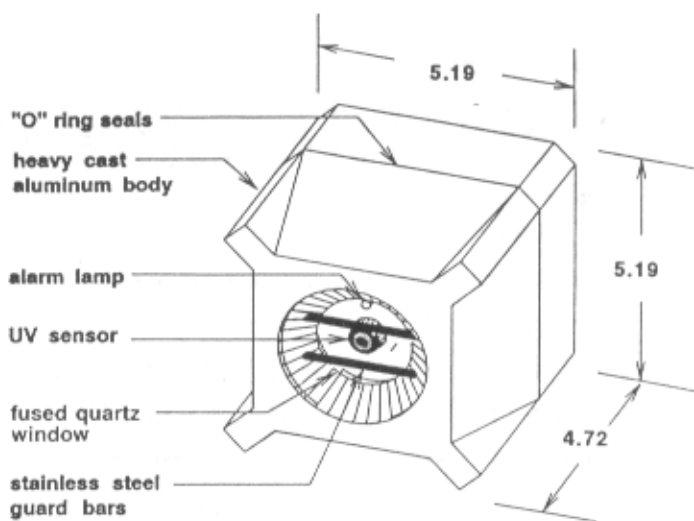
The 20/20U utilizes only Mil-spec. electronic components and materials. The input circuit is protected against reversed polarity of power leads and voltage transients, surges and spikes per MIL-STD-1275. The MTBF (mean time between failures) is calculated to be 100,000 hours (11+ years).

This combination of sensor, and Spectrex's detection logic will sense, analyze and distinguish between a fire event and a false alarm stimulus within milliseconds.

AD#98-0038

Physical design:

The standard detector housing is a heavy duty copper free aluminum casting. The housing finish is epoxy enamel. The special hard surface UV transmittent fused quartz window is protected by two guard bars. The housing window and back cover are both sealed with a special "o" ring to prevent intrusion of dust, salt spray, and foam/water fire fighting agents. The back cover is attached to the detector housing with a stainless steel cable, to increase ease of installation and wire termination. The circuit boards are conformally coated and shock mounted to minimize damage from mechanical vibration and impact. The detector housing is explosion proof for Class I Div. 1, 2 Groups B, C, D and Class II Div. 1, 2 Groups E, F, G and rated 6P per NEMA 250.



Dimensions in inches

Applications:

The 20/20U UV flame detector has been designed as a general purpose flame detector. It has applications in a wide range of industrial and commercial facilities, where the threat of accidental fire involves hydrocarbon fuels such as gasoline, hydraulic fluid, various solvents, aviation fuel, natural gas, propane, acetylene, etc.

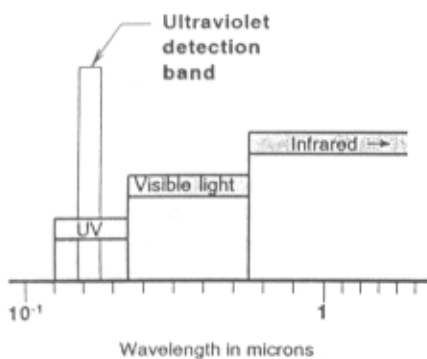
Field applications include:

- Aircraft facilities
- Automotive manufacturing
- Petrochemical facilities
- Printing
- Munitions manufacturing
- Power generation
- Warehousing of flammable liquids and gases

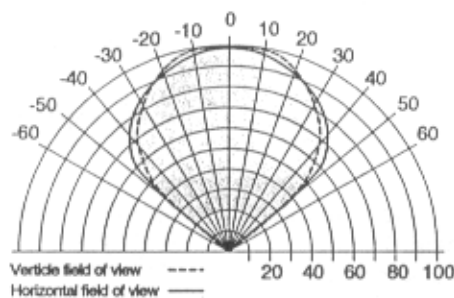
General specifications:

Spectral response:

UV sensor 0.18 - 0.26 microns



Field of view: 90° horizontal 70° vertical



Electrical: Operating voltage: 20-32 VDC

Power consumption: 50 mA in standby
90 mA in alarm

The input circuit is protected against reversed polarity of power leads, voltage transients, surges and spikes according to MIL-STD-1275

Electrical interface:

Standard 4 wire connection with cascading capability.

Dry contact relays:

Alarm contact ratings: N.O. 2 A at 30 VDC
and 2 A at 250 VAC

Accessory contact ratings: N.O. and N.C.
2 A at 30 VDC
and 2 A at 250 VAC

Environmental tests: MIL-STD-810C

Temperature range:

Operating: -40°C (-40°F) to 70°C (160°F)
Storage: -55°C (-65°F) to 85°C (185°F)

Explosion proof enclosure:

NFPA Class I Div. 1, 2 groups B*, C and D
Class II Div. 1, 2 groups E, F and G
* Requires seal at detector

Provisions for installation of a swivel mount
Water and dust tight per NEMA 250 Type 6P

Relative humidity up to 100% for the operating temperature range

Exposure to 5% salt solution fog for 48 hours

Exposure to a dust concentration of .3 grams/cubic ft. at a velocity of 1750 fpm for 12 hours

Vibration at an acceleration of 1.5 g within the range of 5 to 30 Hz, and an acceleration of 4.2 g within the range of 30 to 500 Hz

Mechanical shock of 40 g half sine wave for 11 msec.

Electrical connection:

Standard 3/4 in. 14NPT conduit

F.M. Approved

Detection range:

1 square ft. gasoline fire at 15 m. (50 ft.)
1 square ft. n-heptane fire at 16 m. (53 ft.)

Response time:

Pan fire 0.5 sec. nominal

THREE YEAR WARRANTY