

# features

- UV/IR dual-sensor
- High-speed response
- Multiple detection levels
- 20 msec response to saturated signal
- Immune to false alarms (solar blind)
- 90°/90° cone of vision
- User-programmable configuration
- Standard 4-wire connection
- 4-20mA output (source)
- FM, Cenelec/ATEX Approved
- MTBF minimum 100,000 hours
- Unitized - no separate controller required

The new generation of radiant energy flame detectors, SharpEye 20-20 L & 20-20 LB series, is an improved line of Ultra Violet/Infra Red (UV/IR) optical flame detectors, which combines state-of-the-art technology with existing proven performance equipment. Detection performance is controlled by a microprocessor and is easily adapted to all environments, applications & requirements. The result is a unique and superior flame detector, which provides excellent detection sensitivity with extreme immunity to false alarms. These enhanced models were developed in light of our successful experience in high-speed flame detection technology for both military and commercial industrial applications.

Both the 20-20 L & 20-20 LB are self-contained dual-sensor flame detectors designed to detect hydrocarbon-based fuel fires and non-organic fires. The flame detector senses energy in the short wave section of both the ultra-violet and infrared portions of the electromagnetic spectrum.

The sensor band pass has been carefully selected to ensure the greatest degree of spectral matching to the

radiant energy emissions of fire, and the lowest degree of matching to non-fire stimuli.

The UV channel incorporates a special logic circuit that eliminates false alarms caused by solar radiation and other non-fire UV sources. The UV channel sensitivity is stabilized over the working temperature range.

The IR sensor is sensitive to radiation over the range of 2.5 to 3.0 microns. The IR channel will register a detection signal, at the appropriate level, when the detector's IR sensor is exposed to radiation on the appropriate frequency range.

Only radiation in this range lasting for a preset time and threshold and having an intermittent pattern characteristic to fire will register an alarm signal. The signals from both sensors are analyzed for frequency, intensity and duration. Simultaneous matching of radiant energy in both the UV & IR sensors triggers an alarm signal.

In addition to the basic alarm evaluation circuit, the SharpEye 20-20 LB Flame Detector

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# SharpEye 20/20 L-LB UV/IR Flame Detector Data Sheet

291 (12-02)

incorporates an automatic self-test function that verifies the cleanliness of the lens and proper operation of the radiation sensors and internal electronic circuits. This function is called the BIT (Built-in-test).

Both detectors utilize Mil-spec electronic components & materials. The MTBF (Mean time between failures) is calculated to be 100,000 hours (11+ years). This outstanding performance permits a 3-year warranty on the entire detector, not just the sensors.

The UV/IR Optical Flame Detectors are designed as general purpose flame detectors. They offer applications in a wide range of industrial and commercial facilities, where the threat of accidental fires may involve hydrocarbon fuels such as: gasoline, hydraulic fluid, paint, solvents, aviation fuel, propane, and hypergolic fuels ( $H_2/O_2$ ), as well as unique flames of hydrazine, ammonia, and hydrogen flames.

## approvals

*FM approval	For use in hazardous (classified) locations Class I Div. 1, Groups B, C & D Class II Div. 1, Groups E, F & G
CENELEC approval	EExd IIB + H2 T5 (70°) T4 (85°) Per En 50014 & 50018 *EExde IIB + H2 T5 (70°) Per 50014, 50018, & 50019
*ATEX approval	ATEX 1162 and 1160 Per CE 0518 Ex II 2G

## mechanical

Dimensions:	120 x 132 x 132 mm
Weight:	Aluminium: 3.7 Kg Base 1.7Kg
Spectral response:	UV: 0.185-0.260 microns IR: 2.5-3 microns
Detection range:	1 sq.ft. gasoline fire @ 50 ft. 1 sq. ft. n-heptane fire @ 50 ft. 1 sq. ft. diesel oil fire @ 37 ft. 1 sq. ft. 95% alcohol fire @ 37 ft.
Response time:	Typical 3 seconds for a 1sq.ft. gasoline pan fire.
Time delay:	Adjustable time delay up to 30 seconds.
Field of view:	90°horizontal, 90° vertical.
Built-in-test:	Manual & automatic BIT in model 20-20 LB only.
Temperature range:	
Operating	-40°F - 160°F
Storage	-65°F - 185°F
Humidity:	Relative humidity of up to 95% for the operational temperature.

## electrical

Operating voltage	18-32 Vdc
Power consumption	
Standby	Max. 100 mA
Alarm	Max. 125 mA

Electrical connection:

Standard two ¾" 14 NPT cable entries.  
Optional two M25 x 1.5 cable entries.

Electrical input protection:

Complete electrical interface protection against reversed polarity voltage, surges, and spikes according to MIL-STD-1275.

Electromagnetic compatibility:

The detector is designed and approved according to the following EMC requirements:

Electrostatic discharge	IEC801-2: 1984
Conducted emission	EN55022 Class A
Radiated emission	EN55022 Class A
Radiated Immunity	IEC801-3: 1984
EFT/B	IEC801-4: 1988

Outputs:

\*Dry contact relays:

Alarm:	2 Amps @ 30 Vdc 0.5 Amps @ 250 Vac
Accessory:	5 Amps @ 30 Vdc & 250 Vac
Fault:	5 Amps @ 30 Vdc & 250 Vac

\* 4-20 mA current output:

The 4-20mA is source.

Fault:	0 ± 0.5 mA
Normal:	4 mA ± 5%
IR detection:	8 mA ± 5%
UV detection:	12 mA ± 5%
Warning:	16 mA ± 5%
Alarm:	20 mA ± 5%
Resistance loop:	100-600 Ohms

\*Optional, carries additional charge

## part numbers

<b>20-20 L</b>	UV/IR Flame Detector
<b>20-20 LB</b>	UV/IR Flame Detector with built-in-test
<b>20-20-003</b>	Swivel mounting base
<b>20-20-930</b>	Air shield
<b>20-20-311</b>	Fire simulator test unit
<b>20-20-190</b>	Beam collimator for extending test unit range