



The SharpEye Triple IR (IR3) Hydrogen Flame Optical Detector 20/20SH is a self-contained, triple-spectrum flame detector specifically designed for the detection of hydrogen flames. The optical

sensors and filters have been carefully selected to ensure the greatest degree of spectral matching to the radiant energy emitted by the hydrogen fire and the lowest degree of matching to non-fire stimuli.

The well-known Triple Infrared Spectrum design incorporated in the various SharpEye Optical Flame Detectors has been further developed in this detector to include sensors with special filters with spectral bands typical to hydrogen flame emission main combustion product - water vapor (H<sub>2</sub>O) in the 1-4 microns band and reference filters to discriminate background radiation.

This highly advanced detector uses programmable algorithms, which check the ratio and correlation of data, received by the three sensors. The microprocessor design allows for unique field programmability, making the 20/20SH highly immune to false alarms.



The detector has applications in a wide range of industrial and commercial facilities that use hydrogen fuel cells, hydrogen gas generators and hydroxy-fuels. As the hydrogen community moves towards commercialization, the new emerging use of hydrogen for automotive transportation requires special safety measures for the unique refilling stations, storage tanks and special hydrogen fuel cells handling facilities.

*\* Note: The hydrogen flame detector is NOT designed to detect hydrocarbons fires.*

## MAIN FEATURES

- Triple Spectrum Design
- Sensitivity Selection
- User Programmable Configuration
- Highly Immune to False Alarms
- Automatic and Manual Built-In Test (BIT)
- Standard 4-wire Connection
- 4-20mA sink or source (3-4 wires) configuration
- RS-485 Modbus Compatible
- MTBF Minimum 100,000 Hours
- 3-Year Warranty
- FM, ATEX Approved

## APPLICATIONS

- **Hydrogen fuel cells industry** - production, storage and transportation
- **Hydrogen vehicle refueling stations**
- **Battery charging areas**
- **Chemical process industry** - production, storage, transportation
- **Parking** - special enclosed structures for hydrogen fuelled cars
- **Refineries** - hydrogenation processes
- **Space industry** - hydroxy propellant storage, transportation
- **Stationary fuel cell systems** in equipment enclosures

# SharpEye™ 20/20SH

## GENERAL SPECIFICATIONS

<b>Spectral Response</b>	Three IR Bands
<b>Detection Range</b> (Highest sensitivity setting for a 8" (0.2m) wide, 20" (0.5m) high flame)	Hydrogen 100 ft (30m) Alcohol (Ethanol) 60 ft (18m) Methanol 26 ft (8m) <i>* Note: Hydrocarbon flames will not be detected at any range.</i>
<b>Response Time</b>	Typical 5 sec.
<b>Adjustable Time Delay</b>	Up to 30 sec. (up to 20 sec. in compliance with FM requirements)
<b>Sensitivity Range</b>	4 Sensitivity Ranges for a 8" (0.2m) wide, 20" (0.5m) high Hydrogen flame: 25 ft (7.5m), 50 ft (15m), 75 ft (22m) and 100 ft (30m)
<b>Field of View</b>	90° horizontal, 90° vertical
<b>Built-in-Test</b>	Manual and Automatic BIT
<b>Temperature Range</b>	Operating: -40°F (-40°C) to 160°F (70°C) Storage: -65°F (-55°C) to 185°F (85°C)
<b>Humidity</b>	Up to 95%

## ELECTRICAL SPECIFICATIONS

<b>Power Supply</b>	Operating Voltage: 18-32 VDC
<b>Power Consumption</b>	Max. 100mA in stand-by Max. 150mA in alarm
<b>Electrical Connection</b>	2 x 3/4" - 14NPT conduits or 2 x M25 x 1.5 mm ISO
<b>Electrical Input Protection</b>	According to MIL-STD-1275B
<b>Electromagnetic Compatibility</b>	EMI/RFI protected CE Marked

## OUTPUTS

<b>Relays</b>	Alarm - 2A at 30 VDC, 0.5A at 250 VAC Fault and Accessory - 5A at 30 VDC and 250 VAC Fault relay normally closed, others normally open
<b>4-20mA</b>	Sink (source option) configuration Fault: 0 +0.5mA BIT Fault: 2mA ±10% Normal: 5mA ±10% Warning: 10mA ±5% Alarm: 15mA ±5% Resistance Loop: 100-600 Ω
<b>RS-485</b>	The detector is equipped with an RS-485 communication link that can be used in installation with computerized controllers. The RS-485 is Modbus compatible.

## MECHANICAL SPECIFICATIONS

<b>Dimensions</b>	4.7" x 5.2" x 5.2" (120 x 132 x 132 mm)
<b>Weight</b>	Aluminum: 8.1Lb (3.7 Kg) St.St 316L: 14.3Lb (6.5 Kg)
<b>Enclosure</b>	Aluminum, heavy-duty copper free (less than 1%), white epoxy enamel finish. Optional - Stainless Steel 316L with electro polish finish.
<b>Environmental Standards</b>	Meets MIL-STD-810C for Humidity, Salt & Fog, Vibration, Mechanical Shock, High Temp, Low Temp
<b>Water and Dust</b>	IP66 and IP67 per En60529 NEMA 250 6P

## HAZARDOUS AREA APPROVALS

<b>ATEX</b>	EX II 2G, EExd IIB + H <sub>2</sub> T5 (70°C), T4 (85°C) EX II 2G, EExde IIB + H <sub>2</sub> T5 (70°C)
<b>FM</b>	Class I Div. 1, Groups B, C & D Class II Div. 1, Groups E, F & G

## ACCESSORIES

<b>Fire Simulator</b>	20/20-313
<b>Swivel Mount</b>	20/20-003 (St. St. 316L)
<b>PDA Kit</b>	799820, 799810