

**Ribble Enviro**  
*...everything gas detection*

# Data Sheet

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**FS20X and FS24X  
Flame Detectors**

# FS20X Detector

Advanced Multi Spectrum (UV/Dual IR/VIS) Flame Detector.

Based on the foundation of the highly successful and reliable SS4 detector, the FS20X detector represents a quantum leap in integrating Infrared and Ultraviolet sensing technologies. The FS20X detector is a Multi-Spectrum and UV/Dual IR/VIS and flame detector with a proven UV solar-blind sensor. FS20X delivers a faster response and fewer false alarms, performs in a wider ambient temperature range, with a much longer detection range compared to conventional UV/IR detectors.

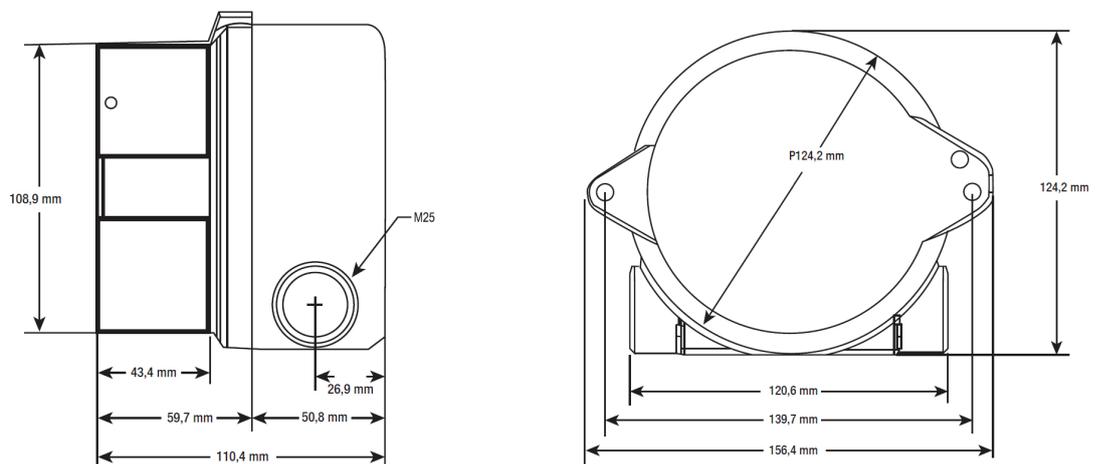


Conventional and older technology UV/IR detectors, using narrow band 4.3 micron IR sensors, will not always respond to smoky fires or if the detector lens is contaminated with oil and other substances since both UV and 4.3 micron signals are attenuated, obscured or absorbed by thick smoke or detector lens contaminations. All UV sensors will be attenuated to some degree.

Superior Technology Dual microprocessors enable fast and reliable performance. The master microprocessor performs high-speed digital sampling and signal processing calculations while the slave microprocessor handles sensor data, performs communications, self-diagnostics and manages interfaces and memory for storing event log and FirePic™ data. The FS20X detector has a detection range in excess of 60 m (200 feet) (very high sensitivity setting) for the detection of a 0.1m<sup>2</sup> (one square-foot) Heptane reference fire and has a field of view with a greater volumetric coverage than most UV/IR detectors. This means fewer detectors can be used to cover an area as compared to other manufacturers' detectors.

The FS20X detector using advanced algorithms for signal processing and fire and flame analysis to alarm to most fires in all industrial environmental conditions. If the detector's UV signal is degraded due to heavy smoke or a contaminated lens, FS20X's patented WideBand IR™, Near Band IR and Visible sensors will still alarm to fire, albeit at a reduced sensitivity and slower response time.

**DIMENSIONS**  
Side and Back Views  
(All Dimensions in mm)



# General Specification

## FEATURES

- Patented WideBand IR™ Infrared combined with Ultraviolet
- Detection range greater than 60 m (200 feet) to 0.1 m<sup>2</sup> (1 sq. ft.) heptane fire
- Patented Electronic Frequency Analysis
- Visible sensor for optimum false alarm rejection
- Selectable detection sensitivities
- Solar blind 90° field of view
- Dual microprocessors for reliable performance
- Real-time clock for accurate time dating of events
- FirePic™ — Up to 6 pre-fire event data storage
- Event log — Up to 200 events with date and time stamp
- Built-in RS-485 ModBus communication
- Built-in non-isolated 4-20 mA analog output (sink or source)
- Alarm, Fault and Fire Verification relays
- Automatic Optical Path and Electronic self-test
- Patented Electronics Module for component protection with plug-in terminations for easy field installation
- Two M25 conduit entries
- Low power consumption
- High RFI and EMI immunity
- FM hazardous area approved
- Ex d ATEX /IECEX approved
- CU-TR approved
- INMETRO approved
- Meets SIL 2 requirements
- Certified to EN54-10:2002
- FM 3260 performance

## BENEFITS

- Detects hydrocarbon and non-hydrocarbon fuel fires in all environmental conditions
- Wide operating temperature range
- Arc welding immunity
- False alarm rejection
- Minimal maintenance for trouble-free operation
- PC software and interface module (FSIM) for fault diagnostics real-time graphs (RTGs), and downloading of FirePics™ and event log
- Suitable for a wide variety of applications



# FS24X Detector

True triple IR wide band sensing and sophisticated detection algorithms.

FS24X provides wideband Multi-Spectrum Triple IR (IR/IR/IR/Visible) flame detection. It is part of our FSX family of advanced technology Electro-Optical fire detectors. Using our patented\* WideBand IR™, WideBand 4.3 micron IR™, and Visible detection technology, the FS24X sets the standard for flame detection. Sophisticated software algorithms and dual microprocessors ensure that the FS24X has the highest fire detection performance combined with optimal false alarm rejection.

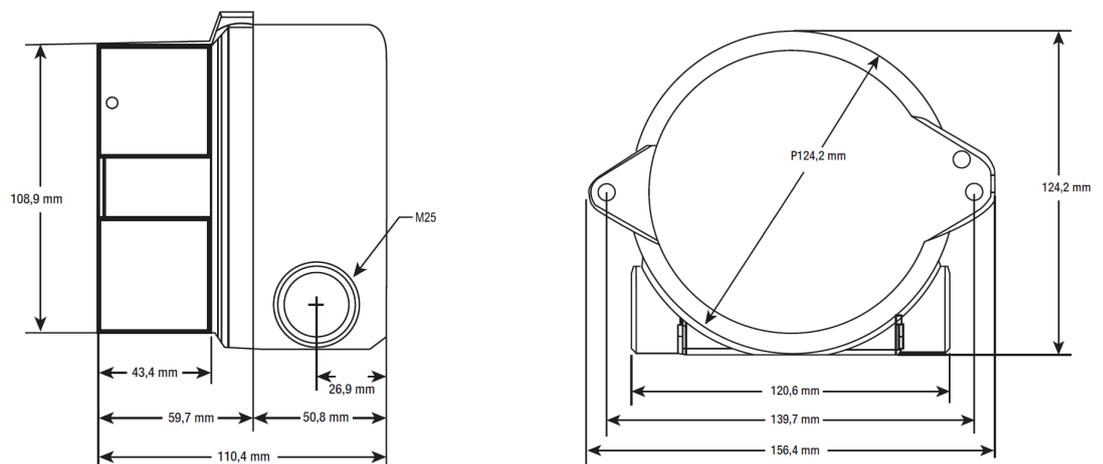
The WideBand IR™ Infrared technology using high-speed solid-state Quantum sensors allows detection of all types of fires, hydrocarbon and non-hydrocarbon, in all weather conditions.



Dual microprocessors provide a high level of fail-safe operation combined with fast and reliable performance. The master microprocessor performs high-speed digital sampling and signal-processing calculations, while the slave microprocessor handles various sensor data, performs communications, self-diagnostics and provides interface versatility and additional memory for storing Event Log and FirePic™ data.

The FSX family of detectors feature our patented\* FirePic data storage and information retrieval facility. FirePic™ records pre-fire data, which can be recovered from the detector's non-volatile flash memory for post fire analysis and determination of the fire cause. Additionally, unique Real-Time Graphing (RTG™) allows viewing of the data which the detector senses in each waveband. A combination of outputs makes the FSX detectors useful beyond the immediate alarm and help in both protection and investigation of fire events in today's demanding industrial requirements. The FS24X detector has a detection range greater than 60 m (200 feet) (Very High Sensitivity setting) for the detection of a 0.1 m<sup>2</sup> (one square-foot) Heptane reference fire and has a cone of vision far greater in volumetric coverage than any other Multi-Spectrum IR detector. This means fewer detectors can be used as compared to other manufacturers' detectors.

**DIMENSIONS**  
Side and Back Views  
(All Dimensions in mm)



# General Specification

## FEATURES

- Patented WideBand IR™ technology
- Patented Electronic Frequency Analysis™
- Visible sensor for optimum false alarm rejection
- Selectable detection sensitivities
- Field-of-View: 90° cone-of-vision
- Dual microprocessors for reliable performance
- Real-time clock for accurate time dating of events
- FirePic™ – pre-fire event data storage
- Event log with date and time stamp
- RS-485 ModBus communication
- Non-Isolated 4-20 mA Analog output (sink or source)
- Alarm, Fault and Fire Verification relays
- Automatic optical path and electronic self-test
- Patented Electronics Module for components protection with easy plug-in terminations and field installation
- Two M25 conduit entries
- Low power consumption
- High RFI and EMI immunity

- FM, ATEX, CE mark approvals
- CU-TR approved
- INMETRO approved
- Meets SIL 2 requirements
- Certified to EN54-10:2002
- FM 3260 Performance

## BENEFITS

- Detects hydrocarbon and non-hydrocarbon fuel fires in all environmental conditions
- User selectable output options
- Wide operating temperature range
- Optimal false alarm rejection
- Minimal maintenance for trouble-free operation
- PC software and Interface Module (FSIM) for fault diagnostics, real-time graphics (RTGs), and downloading of FirePics™ and event log
- Suitable for a wide variety of applications
- Easy electronics module replacement
- Test lamps for manual testing



APPLICATION	FS20X	FS24X
Refineries and oil production facilities	✓	✓
Off-Shore platforms	✓	✓
Turbine/Compressor enclosures	✓	✓
Acetylene processing and storage	✓	
Oil and Gas pipelines and pumping stations	✓	✓
LNG/LPG loading and unloading facilities	✓	✓
Natural Gas and CNG plants	✓	✓
Ethanol, Methanol, and IPA production and storage	✓	✓
Crude oil and gasoline storage and tank farms	✓	✓
Aircraft hangars	✓	✓
Hydrogen plants and storage	✓	
Paint and solvent storage	✓	✓
Chemical production, storage, and loading facilities	✓	✓
Power plants	✓	✓
Silane gas storage	✓	

CERTIFICATES AND APPROVALS	
FM	Class I, Div. 1 & 2, Groups B, C, & D; Class II, Div. 1 & 2, Groups E, F, & G; Class III
ATEX/IECEx:	⊕ II 2 G Ex db IIC T4 (Ta: -60 to +110°C), T5 (Ta: -60 to +75°C), T6 (Ta: -60 to +60°C), II 2 D Ex tb IIIC T135°C
CE	Complies with EN6100-6-4 & EN50130-4
NMETRO	Approved
CU-TR	Approved
SIL Rating:	FMEDA available on request
EN54-10:	 FS20X certified 1175a/01 (LPCB); CPR 0832-CPR-F0515



GENERAL SPECIFICATIONS		
FSX Range Flame Detectors part numbers:	FS20X-211-23-6: Dual IR/UV Flame Detector (Aluminum) FS20X-211-24-6: Dual IR/UV Flame Detector (Stainless Steel) FS24X-911-23-6: QuadBand™ IR3+ Detector (Aluminum) FS24X-911-24-6: QuadBand™ IR3+ Detector (Stainless Steel)	
Field of view	FS20X: 90° Horizontal Cone of vision, ± 45° from on axis FS24X: 90° cone of vision, ± 45° from on axis	
Sensitivity	Very high (60m), high (45m), medium (30m) and low (15m) - switch selectable	
Response time	3-5 Seconds to 0.1 m <sup>2</sup> (1 sq. ft.) n-Heptane fire at 30 m (100 ft.) 3-10 Seconds to 0.1 m <sup>2</sup> (1 sq. ft.) n-Heptane fire at 60 m (200 ft.)	
Spectral sensitivity	<b>FS20X</b>	<b>FS24X</b>
	Ultraviolet: 185 - 260 nanometres Visible: 400 - 700 nanometres Near Band IR: 0.7 - 1.1 microns Wide Band IR: 1.1 - 3.5 microns	Visible: 400 - 700 nanometres Near Band IR: 0.7 - 1.1 microns Wide Band IR: 1.1 - 3.0 microns Wide Band IR: 3.0 - 5.0 microns
Power Consumption	<b>FS20X</b>	<b>FS24X</b>
	Operating: 85 mA @ 24 Vdc nominal Alarm: 135 mA @ 24 Vdc nominal Heater: 155 mA - additional Note: Heater will turn on at -17°C (0°F)	Operating: 56 mA @ 24 Vdc nominal Alarm: 106 mA @ 24 Vdc nominal Heater: 155 mA - additional Note: Heater will turn on at -17°C (0°F)
Operating voltage	24 Vdc nominal (18-32 Vdc) - regulated	
Output Relays	Fire Alarm: SPDT (NO / NC) - De-energised/energized, latching/non-latching Fault: SPST (NO) - De-energised, latching/non-latching Auxiliary: SPDT (NO / NC) - De-energised/energized, latching/non-latching Contacts rating: 1 amp @ 24 Vdc	
Analog output	0 - 20 mA stepped - source or sink user selectable	
Loop resistance	50 - 400 Ohms	
Communication	One of the following - user selectable: • RS-485, ModBus Protocol • RS-485, FireBus II	
Visual indicators	Green LED: Power; Red LED: Alarm; Yellow LED: Fault	
Temperature range	<b>FS20X</b>	<b>FS24X</b>
	Operating: -40 to +85°C (-40 to +185°F) Storage: -55 to +110°C (-67 to +230°F)	Operating: -60°C to +85°C (-76°F to +185°F) Storage: -55°C to +110°C (-67°F to +230°F)
Humidity range	5 to 98% relative humidity, non-condensing	
Vibration	Meets or exceeds MilSpec 810C Method 514.2, Curve AW12	
Wiring	2.5 mm <sup>2</sup> (14 AWG) to 0.326 mm <sup>2</sup> (22 AWG); shielded cable recommended	
Conduit entries	Two M25 conduit entries	
Enclosure materials	Copper-free powder coated aluminum or 316 stainless steel	
Enclosure type	4X, IP66 and NEMA 4	
Shipping weight	Aluminum: 1.6 kg (3.6 lbs); Stainless Steel: 3.2 kg (7 lbs)	
Mounting	Swivel bracket assembly - optional	

ACCESSORIES	
SM4	Stainless Steel Swivel mounting assembly for FS24X, and FS20X detectors
TL-2055	IR Test Lamp for testing FSX detectors, explosion proof version. Incl universal charger
TL-1055	IR Test Lamp for testing FSX detectors, non-explosion proof version. Incl universal charger
SH-001	Sunshield (316 Stainless Steel)
DASA6-N	Dust Airshield with fitting for 6mm hose
FSX-A001	Diagnostic Kit for FSX detectors
SPARE PARTS	
FS20X-211-10-6	Replacement Electronics Module for FS20X Detectors. Module only, Standard Temp. Range. EN54-10
FS24X-911-10-6	Replacement Electronics Module for FS24X Detector. Module only, Standard Temp. Range. EN54-10
FSX-A006	Replacement IR Bulb for TL1055 and TL2055
PSU-12	Universal charger for Test Lamps and Interface Kits. For 110-240 VAC with international plugs

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