keep a SharpEye™ on your safety

40/40M 40/40I 40/40UFI 40/40L-LB 40/40UFL 40/40L4-L4B 40/40U-UB 40/40R

The 40/40 Series

Flame Detectors and Accessories

The latest SharpEye 40/40 Series Flame Detectors from Spectrex provide the most comprehensive protection against hydrocarbon-based fuel and gas fires, hydroxyl and hydrogen fires, as well as metal and inorganic fires. The detectors provide early warning of fires at long distances with high immunity to false alarms.

The latest 40/40 series are the highest performance, most cost-effective flame detectors currently on the market. New features include a stainless steel housing with a heated window, to eliminate condensation and icing; HART capabilities for digital communications; lower power requirements; and a compact, lightweight but highly durable and weather resistant design.

The 40/40 flame detector series is highly reliable, with a newly extended 5-year warranty period and compliance with the IEC 61508 Safety Integrity requirements of SIL2.

Spectrex, a leader in the flame and gas detection industry for over 15 years, provides products that are fully certified and employed around the world in a wide range of industrial and commercial facilities.

40/40M

Multi IR Flame Detector

Detects hydrocarbon and hydrogen flames at long distances and provides the highest immunity to false alarms with its multi spectrum design. The 40/40M can detect a gasoline pan fire at 215 ft (65m), or a hydrogen flame at 100 ft (30m) in less than 5 seconds.

40/40I

Triple IR (IR3) Flame Detector

Detects hydrocarbon fuel and gas fires at long distances and provides the highest immunity to false alarms with its triple spectrum design. The IR3 can detect a 1ft^2 (0.1m^2) gasoline pan fire at 215 ft (65m) in less than 5 seconds.

40/40L-LB

UV/IR Flame Detector

Models 40/40L (& LB) – A dual UV and IR detector, comprising an IR sensor that operates at a wavelength of 2.5-3.0 µm and a UV solar blind sensor, the 40/40L detects hydrocarbon-based fuel and gas fires, hydroxyl and hydrogen fires, as well as metal and inorganic fires. The UV sensor has a special logic circuit that prevents false alarms from solar radiation.

40/40UFL

Ultra Fast UV/IR Flame Detector

The new SharpEye UV-IR High-Speed Optical Flame detector 40/40UFL is designed to meet two major requirements. Fast Response Time (less than 20 msec) and High Reliability (immunity to False Alarm). The 40/40UFL detects hydrocarbon-based fuel and gas fires, hydroxyl and hydrogen fires, as well as metal and inorganic fires.

40/40L4-L4B

UV/IR Flame Detector

Models 40/40L4 (& L4B) - A dual UV and IR detector, comprising an IR sensor that operates at a wavelength of 4.5 µm and a solar blind UV sensor, the 40/40L detects only hydrocarbon-based fuel and gas fires.

40/40U-UB

UV Flame Detector

Detects hydrocarbon-based fuel and gas fires, invisible hydrogen flames and fires from hydrides, ammonia, silane and other organic materials with its unique UV solar blind sensor. The 40/40UB model includes a Built-in-Test (BIT) feature.

40/40R

Single IR Flame Detector

Detects hydrocarbon-based fuel and gas fires, comprising an IR sensor working at 4.5 µm wavelength for maximum sensitivity and provides immunity to false alarms from IR sources such as sunlight and IR projectors.

40/40UFI

Ultra Fast IR3 Flame Detector

An Ultra-Fast multi-spectrum IR3 Flame Detector, detects hydrocarbon fuel and gas fires at long distances, and is especially designed to detect an explosive 1 ft (0.3m) diameter gas cloud explosion in max. 50 msecs at 66 ft (20m) with the highest immunity to false alarms. The 40/40UFI IR3 can also detect a 1 ft^2 (0.1m^2) gasoline/n-Heptane pan fire at up to 300 ft (90m).

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SPECTREX

40/40 SERIES ACCESSORIES

Long Range Flame Simulators

Spectrex Flame Simulators will 'proof' test our flame detectors to verify reliable operation of detector, its outputs and the control system loop without the need for a real flame. No need for expensive scaffolding and other access problems – operates at distances up to 39.3ft/12m from detector when used with collimator attachment.

See Flame Simulators data sheets for more details

PN FS-1100 for 40/40I, 40/40UFI
PN FS-1200 for 40/40U-UB, L-LB, L4-L4B & UFL
PN FS-1300 for 40/40R
PN FS-1400 for 40/40M

Tilt Mount

The Tilt Mount is an adjustable mounting bracket to allow the detector to be oriented towards the intended fire detection area to maximize coverage.

PN 40/40-001

Duct Mount

The Duct Mount allows flame detection in areas where high temperatures exist or in cases where the detector cannot be installed inside the area. It comprises a special duct mount arrangement with specific optical window to allow installation in high temperature duct applications. The mount can be used with all Spectrex 40/40 Series flame detectors.

PN 777670

U-Bolt/Pole Mount

The U-bolt mount is available to facilitate either 2" or 3" pipe mounting.
Material: Stainless steel

PN 789260-2 - Pipe 2" Version
PN 789260-1 - Pipe 3" Version

Cone Viewer

Does the detector cover the area that needs protection? Is it located correctly and does the detector's cone of vision cover the most dangerous spot? The answer - use the Laser Detection Area Coverage Pointer that designates the optical flame detector's area of coverage (cone of vision) on-site at the specific installation. This acessory enables the designer/installer to optimize detector location and its actual detection area coverage.

PN 777166

Air Shield

The special Air Shield, developed for SharpEye optical flame detectors, allows their installation under tough environmental conditions where they may be exposed to oil vapors, sand, dust and other particulate matter.

PN 777650

Weather Protector

The Weather Protector is designed to protect the detector from rain and snow and direct extreme temperatures from the sun.

PN 777263 Plastic (ABS conductive), red
PN 777163 Stainless steel, red epoxy

Mini Laptop Kit

The mini laptop, pre-loaded with Spectrex software, enables the user to re-configure settings or perform diagnostics on all Spectrex flame and gas detectors. The kit includes cable harness with RS485/USB converter. The mini laptop is programmed with maintenance winhost for all detector types

For more details, refer to manual TM777070.

PN 777820

USB RS485 Harness Kit

The USB RS485 Harness Kit with RS485/USB converter, used with Spectrex Host software, enables the user to connect to any available PC or laptop to re-configure settings or perform diagnostics on all 40/40 series flame detectors

For more details, refer to manual TM777050.

PN 794079

Specifications subject to change
For more information view manual or website www.spectrex.net

SPECTREX

SPECTREX INC.

HIGH PERFORMANCE
LOW COST
FLAME DETECTION

SharpEye™

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THE NEW 20/20M

"MINI" FLAME DETECTOR SERIES

High Performance, Low Cost Flame Detection

The 20/20M Mini Series Flame Detectors are high performance, unique IR3 and UV/IR flame detectors featuring lower cost, lower power, and more compact structures. The mini detectors are highly resistant to harsh environments, immune to false alarms and are designed for use in OUTDOOR or INDOOR applications. The IR3 model is also available as intrinsically safe (I.S.) approved format.

The detectors' small size, low cost and low power allow easy installation in small or congested areas where Ex hazardous area approvals are not a prime requirement. Both models are packaged in rugged, stainless steel enclosures that are less than 50% of the size of our standard explosion-proof detectors and weigh only 2.5 lbs (1.2 kg).

20/20MI-1
MINI TRIPLE IR (IR3) FLAME DETECTOR

The 20/20MI-1 is an economical and compact Triple IR (IR3) Flame Detector with the highest immunity to false alarms, in a rugged stainless steel housing. It is available in either general-purpose, non-Ex approved or intrinsically safe approved (EExia) format.

20/20MI-3
MINI TRIPLE IR (IR3) FLAME DETECTOR

The 20/20MI-3 is similar to the 20/20MI-1, but has lower sensitivity. It is designed especially for small areas that require fast and reliable detection, with high immunity to false alarms. The 20/20MI-3 is suitable for applications like Turbine Enclosures, Heavy Duty Vehicles and Windmills.

20/20ML
MINI UV/IR FLAME DETECTOR

The low cost, compact, lightweight 20/20ML UV/IR Flame Detector comprises both UV and IR sensors, detecting hydrocarbon-based fuel and gas fires, hydroxyl and hydrogen fires, as well as metal and inorganic fires at distances of up to 50 ft (15m). The UV sensor incorporates a special logic circuit that helps prevent false alarms caused by solar radiation. Simultaneous detection of radiant energy by both the UV and IR sensors triggers an alarm signal.

Main Features

- Immune to False Alarms
- Large Field of View (100° horizontal/vertical)
- Low Power Consumption
- High-Speed Response
- Standard 4-Wire Connection
- 4-20mA Sink or Source (3-4 wires) Configuration
- RS-485 Modbus Compatible
- Automatic and Manual Built-In-Test (BIT)
- User-Programmable Function Configurable via software from a PC or handheld device
- MTBF Minimum 100,000 Hours
- 3 Year Warranty

Main Applications

AIRCRAFT HANGARS

Leaking fuel is the main danger in aircraft hangars, easily causing fires and potentially harming personnel, equipment and facilities. The SharpEye Mini Optical Flame Detectors allow military and commercial requirements for reliable fire protection to be met. Due to the 100° cone of vision, there is wider coverage of the protected area. The area around the walls of the hangar where the detectors are mounted does not require EX proof so the 20/20MI non EX is suitable.

OFF ROAD HEAVY DUTY VEHICLE

Large mining vehicles are vulnerable to catastrophic fires particularly in engine compartments, as have been experienced in recent times. It is vitally important that fire protection capabilities are up to date with the latest technologies. The high-speed short-range version of 20/20MI-3 (up to 10 ft) is ideal to protect the large engine compartment of the vehicles, and is used in coal, metals and minerals mining.

OFFICE AREAS AND ATRIUM AREAS

While an atrium space has many merits, there is a danger that it could become a building's weakness in fire protection, potentially allowing a fire to rapidly spread. The 20/20M Mini's fast detection identifies a fire in its earliest stages, facilitating suppression. Modern hospitals feature large atria and open space areas. Due to the difficulty or impossibility of moving patients in an emergency, hospitals must follow a defend and protect in place policy rather than conventional evacuation. Hospital fire protection and evacuation requirements are therefore highly complex and the SharpEye Mini Optical Flame Detector is responsible for meeting them with its low cost and supreme reliability.

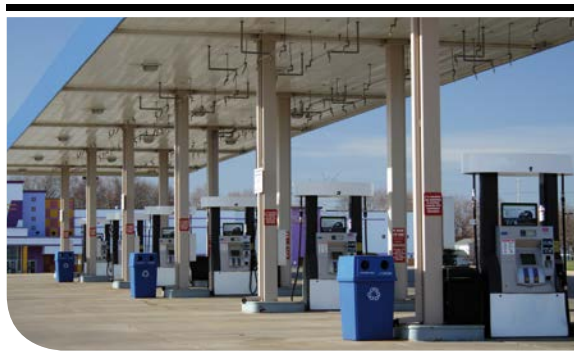
WASTE HANDLING

Recycling reduces the quantities of materials deposited in the world's landfill sites and saves natural resources, but must be coupled with appropriate fire safety measures. Unique risks are posed at recycling and waste handling operations, such as disposal and recycling of combustible materials. The 20/20M Mini Flame Detector is a successful choice to solve these issues, and has the additional benefit of low cost and low energy requirement. Recently, a recycling and waste handling plant in the Netherlands installed 84 SharpEye Optical Flame Detectors model 20/20MI to detect fire in the various deluge zones.

Main Applications

UNMANNED GAS STATIONS

Modern automobile fueling areas are designed with high-speed self-service pumps, enabling customers to fuel their vehicles fast, but more susceptible to fire. Risks can include customers forgetting to return the nozzle, burning cigarettes, running engines, sparks and other heat sources, whereby flammable liquids can be easily ignited. The 20/20ML was designed to prevent any such hazards from spreading, combining UV and IR sensors to detect hydrocarbon-based fuel and gas fires, hydroxyl and hydrogen fires, as well as metal and inorganic fires.



MARINE VESSELS ENGINE ROOMS

The engine room on a marine vessel is where the machinery of a ship is located. Fuel or oil spills from the machinery are a fire risk factor, alongside petrochemicals used for the cleaning and servicing of the machinery. The fuel, oil and petrochemicals are flammable and can easily ignite. Therefore, Spectrex Optical Flame Detectors are required to identify a fire and subsequently activate the installed fire suppression system. Spectrex 20/20M Mini Optical Flame Detectors are suitable for both commercial and military vessels.

Alongside the above-mentioned applications, the 20/20M Mini Series is specifically suited to the following applications:

- Automotive parts manufacturing
- Burners, boilers, and heaters
- Car parking towers and garages
- Chemical industry
- Nuclear power plants
- Power generation – pumps, generators and unmanned stations
- Recreational and sports arenas (facilities)
- Storage areas

General Specifications

		20/20MI-1	20/20MI-3	20/20ML
Spectral Response		Triple Spectrum Design		UV/IR Dual Sensor
		ft (m)	ft (m)	ft (m)
Detection Range (Highest Sensitivity Setting for 1 ft² (0.1m²) pan fire.	Gasoline	133 (40)	33 (10)	50 (15)
	n-Heptane	133 (40)	33 (10)	50 (15)
	Diesel Fuel	90 (27)	23.1 (7)	37 (11)
	JP5	100 (30)	23.1 (7)	37 (11)
	Kerosene	100 (30)	23.1 (7)	37 (11)
	Alcohol (Ethanol)	100 (30)	24.8 (7.5)	25 (7.5)
	IPA (Isopropyl Alcohol)	100 (30)	24.8 (7.5)	25 (7.5)
	Methanol	100 (30)	24.8 (7.5)	25 (7.5)
	Methane*	40 (12)	10 (3)	15 (5)
	LPG (Propane)*	40 (12)	10 (3)	15 (5)
	Hydrogen*	---		15 (5)
	Silane*	---		15 (5)
	Polypropylene Pellets	16 (5)	6 (2)	15 (5)
	Office Paper	50 (15)	13 (4)	12 (4)
	**20" (0.5m) long 8" (0.2m) width plume fire*			
Response Time		Typical 5 sec.		
Adjustable Time Delay		Up to 30 sec.		
Sensitivity Range		4 Sensitivity Ranges for 1 ft² (0.1m²) gasoline pan fire: 33 ft (10m)–133 ft (40m)	4 Sensitivity Ranges for 1 ft² (0.1m²) gasoline pan fire: 7.5 ft (2.5m)–33 ft (10m)	1 Sensitivity Range for 1 ft² (0.1m²) gasoline pan fire: 50 ft (15m)
Field of View		100° horizontal, 100° vertical		
Built-in-Test		Manual and Automatic BIT		
Temperature Range		Operating: -40°F (-40°C) to 160°F (70°C) Storage: -65°F (-55°C) to 185°F (85°C)		
Humidity		Up to 95%		

Electrical Specifications

	20/20MI-1	20/20MI-3	20/20ML
Power Supply	Operating Voltage: 18-32 VDC		
Power Consumption	Max. 25 mA in stand-by Max. 50 mA in alarm		Max. 40 mA in stand-by Max. 70 mA in alarm
Electrical Connection	12 wires 6 ft (2m) cable (for junction box connection) Optional: 12- wires electrical connector (the suitable connector will be supplied)		
Electrical Input Protection	According to MIL-STD-1275B		
Electromagnetic Compatibility	EMI/RFI protected CE Marked		

Outputs

	20/20MI-1	20/20MI-3	20/20ML
Relays*	Alarm and Fault SPST volt-free contact rates 2A at 30 VDC or 0.5A at 250 VAC Fault relay normally closed, Alarm Relay normally open **The Relays do not apply to 20/20MI EX approved version*		
4-20mA	Sink (source option) configuration		Source configuration
	Fault:	0 + 0.5mA	0 + 0.5mA
	BIT Fault:	2mA + 10%	2mA + 10%
	Normal:	5mA + 10%	4mA +5%
	IR Detection:	---	8mA +5%
	UV Detection:	---	12mA +5%
	Warning:	10mA + 5%	16mA + 5%
	Alarm:	15mA + 5%	20mA + 5%
	Resistance Loop:	100-600 Ω	100-600 Ω
RS-485	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

Dimensions	4" x 4" x 2.5" (100 x 100 x 62 mm)
Weight	St.St 316L 2.5lb (1.2 kg) Tilt Mount 0.8lb (0.37 kg)
Enclosure	Stainless Steel 316L with electro polish finish
Environmental standards	Meets MIL-STD-810C for humidity, Salt & Fog, Vibration, Mechanical Shock, High Temp, Low Temp
Water and Dust	IP66 and IP67 per EN60529 NEMA 250 6P

Approvals

	20/20MI-1	20/20MI-3	20/20ML
Hazardous Area Ex Approvals			
ATEX**	04ATEX2010 EX II 1 GD, EExia IIC T5 (60°C), T4 (85°C) Zener barriers (not included) are required to achieve the stated approval ** The Relays do not apply to 20/20MI EX approved version		---
Functional Approvals			
FM	Project ID 3020071	Project ID 3013906	Project ID 3020071
EN54-10 (VdS)	G207073	---	---
CPD	0786-CPD-20916	---	---
GOST R	POCC US.HO06.B00103		
Other Approvals			
DNV	A-12318		---
ABS	Project No. 1627964		---
GOST K	KZ.7500507.01.01.00029		

Accessories

LONG-RANGE FIRE SIMULATORS

The Spectrex Long-Range Flame Simulator allows testing of optical flame detectors in areas where real fires cannot be ignited. Testing is also mandatory in some industries to proof-test flame detector operation and to satisfy statutory requirements.

PN 20/20-310 for 20/20MI; PN 20/20-311 for 20/20ML

For more information, see datasheet of the Long Range Fire Simulators.

TILT MOUNT

The Tilt Mounting Brackets allow accurate directional setting of the detector for optimum area coverage. These brackets' movement ensure maximum effectiveness and accurate location of the detector's coverage area.

PN 20/20-005

RAIN COVER

The Rain Cover is designed to protect the detector from rain and snow.

PN 787980

AIR SHIELD

The special Air Shield, developed for SharpEye optical flame detectors, allows installation of optical flame detectors under tough environmental conditions where they may be exposed to oil vapors, sand, dust and other particulate matter.

PN 20/20-787

LASER AIMER

The Laser Detection Area Coverage Pointer designates the optical flame detector's area of coverage (cone of vision) on-site at the specific installation. This add-on accessory enables the designer and installer to optimize the detector's location and the actual detection area coverage of each installed detector.

PN 787969

*For more information view manual or website **www.spectrex.net***
For all technical assistance or support, contact a Spectrex office or your local distributor listed online.
Specifications subject to change

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2020mini, June 2014

SharpEye™

20/20MPI

A compact, lightweight, high performance

IR3 Flame Detector
based on Spectrex's proven industrial IR3 technology

With its lightweight housing and low power consumption, the 20/20MPI provides a cost effective solution, specially suited to indoor applications such as transport terminals, storage areas, industrial kitchens and historical and cultural sites with large open areas, providing an efficient alternative smoke and heat detectors often prove to be ineffective.

The 20/20MPI is a compact, lightweight, high performance IR3 detector with a new design for retail use based on industrially proven IR3 technology. The 20/20MPI retains all the benefits of IR3 technology, including long distance detection and the highest immunity to false alarms.

Main Features

- Long distance Flame Detection (up to 140ft / 43m)
- Large Field of View (100° horizontal / 90° vertical)
- Highest immunity to false alarms
- Output options (two models):
  – Alarm and Fault relay outputs (4 wire)
  or
  – Stepped mA output (3 wire source)
- RS-485 Modbus Compatible
- Automatic and Manual Built-In-Test (BIT)
- 3 Year Warranty

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Main Applications

AIRPORT TERMINALS

Airport terminals situated in dense cities often have large halls, accompanied by retail, food and beverage outlets, each with their fire risks, which don't have full fire protection coverage. With the structure's size and complex design, fires are often difficult to detect and larger fires are less common due to the large air intake.

TRAIN STATIONS AND TERMINALS

Train stations and terminals often have large atria containing food and beverage outlets which have large air intake and often have little fire protection coverage. Additionally, within these areas, electricity and fuel are present, increasing the chances of ignition.

STORAGE AREAS

A wide range of substances are stored within open or closed storage facilities, part of which can be dangerous or flammable, creating a greater fire hazard than usual.

ARCHIVES

A large amount of paper work collecting dust poses potential fire hazards that require monitoring.

MALLS

With over 1,000 fire events taking place annually within the retail industry, it is imperative that the large open areas with high ceilings found in shopping malls have full fire protection coverage in order to avoid damage to assets and personnel.

HOSPITALS

Hospitals consist of large open spaces and confined rooms, all of which contain a wide variety of contents that pose hazards. Cooking and heating equipment, as well as electrical distribution, lighting and medical equipment such as oxygen tanks are found throughout hospital buildings and are all potential fire risks which should be protected against.

Main Applications

CAR PARKING TOWERS AND GARAGES

Areas intended for vehicle storage or maintenance contain large amounts of fuel and fumes within an enclosed space, posing a fire hazard that must be monitored.

PUBLIC BUILDINGS

Public buildings often house governmental offices and more, requiring excellent fire protection in order to prevent damage to assets and personnel in any potential fire.

BANKS AND OFFICES

Banks and offices face common fire hazards with large open areas, coupled with large amounts of paperwork and a large volume of people constantly passing through.

HISTORICAL AND CULTURAL SITES

Historical, cultural or national sites often contain irreplaceable assets, alongside flammable materials. A fire within these areas which were not designed with safety in mind would cause irreversible damage.

AIRCRAFT HANGARS

Large open floor areas with high roofs provide a suitable area for aircraft storage and repair. However, the large quantities of liquid jet fuel and risk of spill, coupled with maintenance activities provide potential ignition sources which is complicated by aircraft wing obstructions.

CABLE TUNNELS

Cable tunnels play an essential role in every industrial company. Any fire damage to the cables puts entire production areas out of action. As the cable tunnel environment deteriorates with time, cable insulation performance decreases, leaving an increased heating value and greater risk of tunnel fires and detection of these fires is essential in order to prevent further damage.

GENERAL SPECIFICATIONS

Spectral Response	Three IR Bands	ft	m		ft	m
Detection Range *Highest sensitivity setting for 1 ft² (0.1m²) pan fire	n-Heptane	140	43	Methanol	100	30
	Gasoline	140	43	IPA (Isopropyl Alcohol)	115	35
	Diesel Fuel	100	30	Methane*	40	12
	JP5	100	30	LPG (Propane)*	40	12
	Kerosene	100	30	Polypropylene Pellets	50	15
	Alcohol (Ethanol)	100	30	Office Paper	50	15
	**20" (0.5m) long 8" (0.2m) width plume fire*					
Response Time	Typically 5 seconds					
Adjustable Time Delay	Up to 30 seconds					
Sensitivity Range	4 sensitivity ranges for 1 ft² (0.1m²) gasoline pan fire: 35 ft (11m) up to 140 ft (43m)					
Field of View	100° horizontal, 90° vertical					
Built-in-Test	Manual and Automatic BIT					
Temperature Range	Operating: -40°F (-40°C) to +160°F (+70°C) Storage: -40°F (-40°C) to +160°F (+70°C)					
Humidity	Up to 95%					

ELECTRICAL SPECIFICATIONS

Power Supply	Operating Voltage: 18-32 VDC
Power Consumption	20/20MPI-R at 24V DC: Max. 15mA at Normal Max. 25mA at Alarm 20/20MPI-M at 24V DC: Max. 16mA at Normal Max. 36mA at Alarm
Electrical Connection	M20 Gland Connection
Electrical Input Protection	Per EN54-10
Electromagnetic Compatibility	EMI/RFI protected CE Marked per EN50130-4

OUTPUTS

20/20MPI-R	Relays	Alarm and Fault SPST volt-free contacts rated 2A at 30 VDC Fault relay normally closed, Alarm Relay normally open			
20/20MPI-M	0-20mA	Source configuration Fault: 0 +0.5mA BIT Fault: 2mA ±10% Normal: 4mA ±10%		Warning: 16mA ±5% Alarm: 20mA ±5% Resistance Loop: 100-600 Ω	

MECHANICAL SPECIFICATIONS

Dimensions	4.7" dia x 2.9" (119mm x 74mm)
Weight	10.6 oz (300g)
Tilt Mount Weight	2.5 oz (70g)
Enclosure and Tilt Mount	Polycarbonate
Water and Dust	IP55

PERFORMANCE APPROVALS

FM3260	Approved
EN54-10 (VdS)	Approved

ACCESSORIES

Tilt Mount	768004 (included with each new detector)
Protective Cover	768005 (included with each new detector)
Flame Simulator	FS-1100

Specifications subject to change
For more information view manual or website **www.spectrex.net**

Hazardous Locations Demand Superior Gas Detection!

Quasar 900 provides the most reliable gas detection in all weather conditions!

www.spectrex.net

The SafEye Quasar 900 Series is the very latest open path IR technology and detects a wide range of hydrocarbon gases – including alkanes (methane to hexane) and ethylene.
Path lengths can be up to 660ft (200m). Quasar 900 models can be tailored to protect your high-risk installation.
Reliability and performance is key and is assured with SIL2 approval and successful 3rd party FM performance / function testing to FM and EN standards

Why Open Path Gas Detectors?

Spectrex invented the xenon flash lamp design that revolutionized the open-path gas detection market, which, until then, was plagued by false alarms due to the drawbacks of the previous designs. Now, Open path detectors complement the use of individual point detectors, take executive action and offer many significant benefits including:

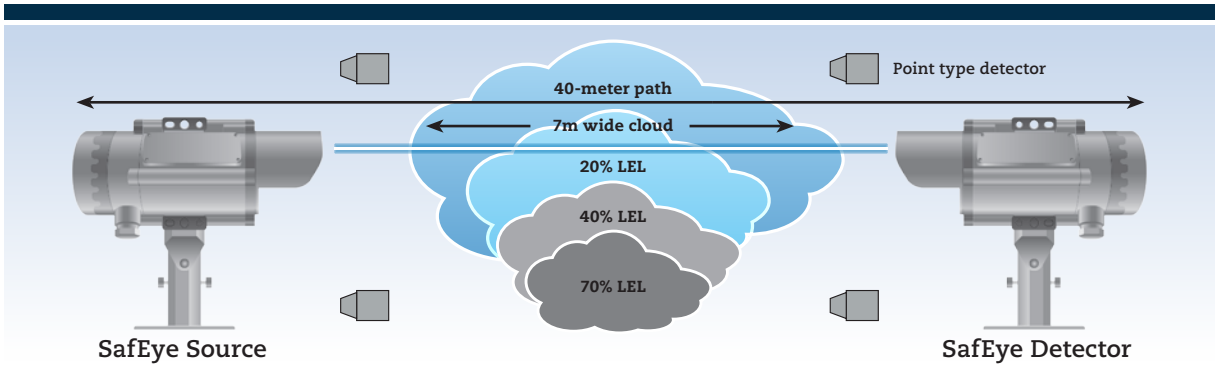
- Wider area coverage
- Most likely method to pick up any leak
- Very high speed of response
- No unrevealed failure modes
- Beam block warning
- Detector location is less critical
- Size of gas hazard indicated

From the Arctic Circle to Middle Eastern Deserts

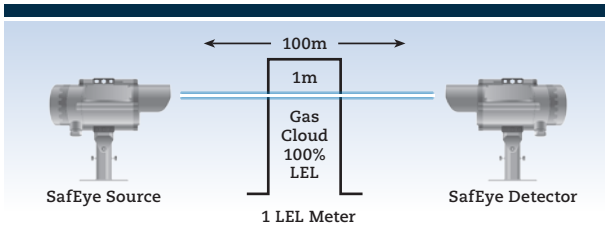
Applications include:

- Offshore platforms & FPSOs
- Petrochemical plants
- Chemical processing plants
- Gas filling and distribution terminals
- Gas transport and pipelines
- Large storage areas & buildings
- Perimeter monitoring

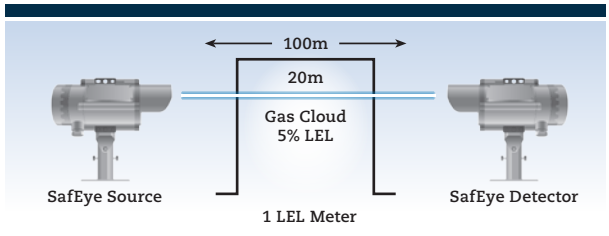
Gas leak can be picked up by Open Path Detectors that point detectors miss!



This scenario shows how the matrix of point type detectors can miss a leak or eventually only see diluted gas levels whereas SafEye 900 Open-Path will, in this case, measure 20% LEL x 7m = 1.4 LEL.m - well above 1 LEL.m alarm level



1 LEL meter (1 LEL.m) = a cloud of 100% LEL methane gas that is 1 meter wide



1 LEL meter (1 LEL.m) = a cloud of 5% LEL methane gas that is 20 meter wide

Don't just take our word for it!

We had Factory Mutual (FM) independently test Quasar 900 to recognized worldwide Function and Performance standards for open-path gas detectors (FM6325 and EN60079-29-4). Guess what – we passed with flying colors!

Why do we do this?

(apart from anything else, it costs a lot). Well, its to give you the assurance that what we say about Quasar 900 is true – and in safety, that's important!

IMMUNITY TO FALSE ALARMS

Quasar 900 is totally immune to interference from sunlight or any other sources of radiation such as flare stacks, arc welding or lightning.

PERFORMANCE IN ALL WEATHERS

The Quasars 900's high power xenon lamp will compensate for changing weather conditions, including rain, fog, mist, snow and makes it immune to influences from solar radiation, arc-welding, stack flares or vibration from machinery.

The optical lenses are thermostacically heated to prevent the formation of ice and build up of snow on the optics even under severe weather conditions. It also eliminates build up of condensation on the lenses.

Quasar is rated for operation over a very wide temperature range from -67°F to + 149°F (-55°C to + 65°C) - a truly worldwide product

RELIABILITY

Quasar 900 is approved to SIL2 (IEC61508), equipped with heated optics and tolerates a very wide temperature range to provide reliable detection

FAILSAFE

No unrevealed failures. In normal operation, the output signal is 4 to 20 mA, depending on the measured gas concentration.

Sub-4mA signals includes indications for beam blockage (2mA), a fault (1mA). In addition, a continuous self-test of the Quasar 900 will issue a pre-warning signal (3mA) where the detector is still operational but requires some attention – for example when the transmitter or receiver is misaligned or if there is a deposit build-up on the optics. Maintenance without downtime!

BUILT-IN DATA LOGGER

An internal data-logger keeps a detailed record of the previous 100 events.

GAS LIBRARY

The detectors can be calibrated to methane, propane or ethylene. The calibration selection must be determined when ordering.

MINIMUM DETECTABLE LEVEL

Due to Quasar 900's inherent stability and sensitivity, the minimum detectable level is 0.15 LEL.m

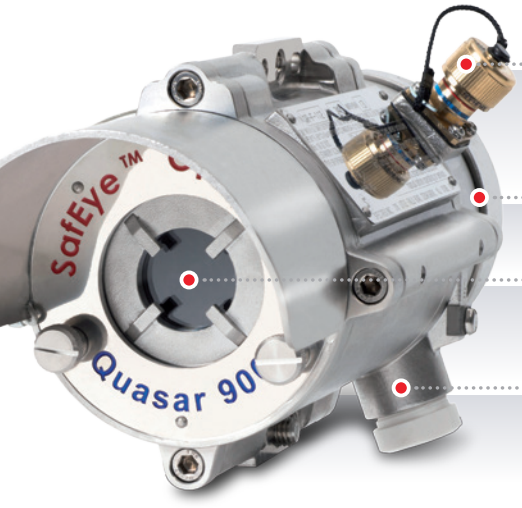
SIMPLE TO ALIGN AND COMMISSION

One person can easily align and commission the system without the need for special training or skills. After an initial coarse adjustment by eye, a telescope is fitted allowing fine adjustment to optimized the adjustment for maximum signal strength.

Installation Options

QUASAR OFFERS OPTIONS FOR YOUR INSTALLATION:

- 0-20mA analog output with HART capability
- RS485 Modbus, where up to 256 detectors can be linked.



I.S. approved conection port for hand held terminal in field or safe area

316L Stainless Steel housing

Heated optics

Electrical entries (x2)
¾" NPT or M25

Worldwide Approvals

- **Hazardous area (Zone 1)**
  FM/FMC, ATEX, IECEx, GOST R Inmetro
- **Performance (3rd party):**
  FM 6325 approved by FM
  EN60079-29-4 tested by FM
- **Reliability:**
  SIL2 (TUV)

HART

HART capabilities within the Quasar 900 can provide digital communications between the field and the safe area. This can provide real time information on the status of an individual detector as well as configuration and historical data of each device, without the need for extra cable cores.

A key feature of HART is that digital signals are transmitted on the same two wires as the 0-20mA current signal.

Useful and useable information available via HART includes:

- Display set-up
- Reconfigure set-up – such as heater control, address
- Display detector status and definition
- Perform detector diagnostics
- Troubleshooting
- View Event Log

Complete Access in the Field or Safe Area

The unique, intrinsically safe approved connection port on the Quasar 900 receiver allows simple connection of various types of handheld unit that will communicate with Quasar 900 in the hazardous area. These handheld devices allow user to check alignment, zero, perform configuration changes, view event log, perform diagnostic functions, in conjunction with Spectrex software.

The handheld units are robust weather-proof devices, certified intrinsically safe for use in a hazardous, classified area.

Two options are available, both able to connect to the intrinsically safe approved connection port on the Quasar 900 receiver.

- HART handheld
- RS485 handheld

For work in a safe area / workshop, other options are available, still connected via the I.S. port. for your convenience.

These take the form of cable harnesses to connect with our Mini Laptop kit (p/n 777820-1) or to your own PC/laptop, using free Spectrex software

GENERAL SPECIFICATIONS

Detection Range	**Model**	**901**	**902**	**903**	**904**
	Feet	23-66	50-132	115-330	265-660
	Meters	7-20	15-40	35-100	80-200
Detected Gas	C1-C8				
Response Time	3 sec.				
Immunity to False Alarm	Not influenced by solar radiation, hydrocarbon flames and other external IR radiation sources.				
Sensitivity Range	0-5 LEL.m methane and propane 0-8 LEL.m ethylene				
Spectral Response	2.0 - 3.0µm				
Displacement/Misalignment Tolerance	±0.5°				
Drift	±7.5% of the reading or ±4% of the full scale (whichever is greater)				
Minimum Detectable Level	0.15 LEL.m				
Temperature Range	–67°F (–55°C) to 149°F (65°C)				
Humidity	Up to 95% non-condensing (withstands up to 100% RH for short periods)				
Heated Optics	To eliminate condensation and icing on the window				
Warranty	Safety system – 3 years Flash source bulb – 10 years				

ELECTRICAL SPECIFICATIONS

Power Supply	24VDC nominal (18-32 VDC)
Power Consumption (peak includes heated optics)	Detector: 250mA (300mA Peak) Source: 250mA (300mA Peak)
Warm Up Time	30 sec for transmitter and receiver
Electrical Connection (specify)	2 x 3/4" – 14NPT conduits or 2 x M25 x 1.5mm ISO
Electrical Input Protection	per MIL-STD-1275B
Electromagnetic Compatibility	EMI/RFI protected per EN50270

OUTPUTS – INTERFACES

0-20mA Current Output	Sink (source option) configuration - maximum load of 500 ohm at 18-32 VDC			
	Gas reading	4-20mA	Obscuration/beam block	2mA
	Normal, zero reading	4mA	Zero calibration mode	1mA
	Maintenance call	3mA	Fault	0mA
	Misalignment	2.5mA		
RS-485 Interface – Modbus Compatible	The RS-485 input/output provides complete data information to a PC and receives control commands from the PC or handheld unit			
HART	HART communications on 0-20mA analog current (FSK) – used for maintenance and asset management			
Visual Status Indicator	3 color LED: Green – Power on, Yellow – Fault, Red – Alarm			

MECHANICAL SPECIFICATIONS

Hazardous Area Approval	ATEX/IECEx	Approved per Ex d e ib [ib Gb] IIB + H2 T4 Gb Ex tb IIIC T135°C Db The detector or source units have a combination of approvals. Each is a single enclosure (Exd) with integral, segregated rear terminal section (Exe) and intrinsically safe (Exia) data-port for external in-situ connection to Hand-Held Diagnostic unit.
	FM/FMC	Approved per Class I Div 1 Groups B, C and D Class II,III Div 1 Groups E, F and G
	Inmetro	Approved per Ex d e ib [ib Gb] IIB+H2 T4 Gb
Performance	Approved per FM6325 and tested by FM per EN60079-29-4	
Reliability	SIL2 per IEC61508 (TUV)	
Enclosure	The source and detector housings are stainless steel 316L with electro polish finish. The circuit boards are conformal coated and protected from mechanical vibrations. The tilt mount is also stainless steel 316L.	
Dimensions	Detector/Source	10.5 x 5.1 x 5.1 inch (267 x 130 x 130mm)
	Tilt Mount	4.7 x 4.7 x 5.5 inch (120 x 120 x 158mm)
Weight	Detector/Source	11lb (5kg)
	Tilt Mount	4.2lb (1.9kg)
Water and Dust Tight	IP66 and IP68 NEMA 250 6P	
Environmental	Meets MIL-STD-810C for Humidity, Salt and Fog, Vibration, Mechanical Shock, High and Low Temperature	

ACCESSORIES

Tilt Mount	P/N 888270	**HART Harness Kit**	P/N 888815
Pole Mount (U-bolt 5 inch)	P/N 799225	**USB/RS485 Harness Converter Kit**	P/N 794079-8
Commissioning Kit	P/N 888247	**Mini Laptop Kit**	P/N 777820-1
HART Hand-Held Diagnostic Unit	P/N 888810	**Sunshade**	P/N 888263

Accessories

COMMISSIONING KIT
P/N 888247

The Commissioning/Alignment Kit is required for commissioning and maintenance checks.
Only one kit is required per site, Includes: Alignment Telescope, Magnetic Mode Selector, Function Check Filters (2) and set of Socket keys for access to units

SUNSHADE, STAINLESS STEEL
P/N 888263

TILT MOUNT
P/N 888270

POLE MOUNT (U-Bolt, 5 inch)
P/N 799225

Communication, Diagnostics, Set-up

Commissioning, maintenance and diagnostics tools for the Quasar 900 Series, which provides verification, status and instructions for changing detector parameters.

HART HAND-HELD DIAGNOSTIC UNIT
P/N 888810
Certified I.S. (EExia) for use in the hazardous area and connects to I.S. port on 900.

MINI LAPTOP KIT
P/N 777820-1
Preloaded with Spectrex software. For use in Safe area only. Connects, for convenience, to port on 900 or RS 485 terminals.

If, instead, user wishes to use their own HART handheld or PC / laptop in safe area, we offer:

HART HARNESS KIT
P/N 888815
For standard HART Hand-Held (I.S.) to connect between the Hand-Held and the I.S. Port on 900, including a harness.

USB RS485 HARNESS CONVERTER KIT
P/N 794079-8
With RS485/USB converter, kit is used with Spectrex Host software, enables the user to connect to any available PC or laptop. For use in safe area only. Connects, for convenience, to connection port on 900 or RS485 terminals

How to choose your new
Quasar 900

Quasar 900 Part numbers

Model	=	Receiver	+	Transmitter	Installation Distance
901		QR-X-11X	+	QT-X-11X	23-66 ft / 7-20m
902		QR-X-11X	+	QT-X-21X	50-132 ft / 15-40m
903		QR-X-11X	+	QT-X-31X	115-330 ft / 35-100m
904		QR-X-11X	+	QT-X-41X	265-660 ft / 80-200m

Part no. code for specific requirements

RECEIVER

QR - X - 1 1 X

- **C:** ATEX
- **F:** FM
- **B:** Inmetro

- **1:** M25
- **2:** ¾" NPT

TRANSMITTER

QT - X - X 1 X

- **C:** ATEX
- **F:** FM
- **B:** Inmetro

- **1:** 7-20m: *Short Range*
- **2:** 15-40m: *Medium Range 1*
- **3:** 35-100m: *Medium Range 2*
- **4:** 80-200m: *Long Range*

- **1:** M25
- **2:** ¾" NPT

For more information view manual or website **www.spectrex.net**

For all technical assistance or support, contact a Spectrex office or your local distributor listed online.
Specifications subject to change

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Q-900, February 2017

SPECTREX

SafEye XENON 700S

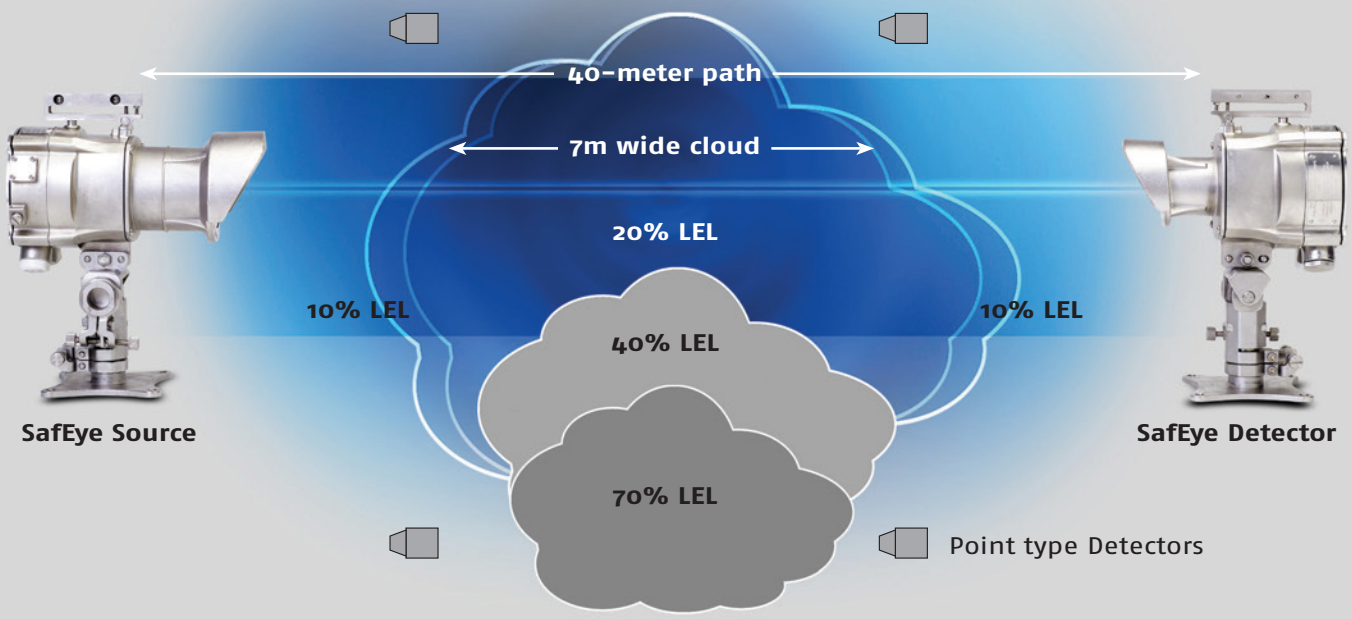
OPEN-PATH GAS DETECTION SYSTEM

SIL2 APPROVED BY TUV

WE INVENTED IT... WE PERFECTED IT!

LEL.METERS

Open-path Gas Detection Concepts



This scenario shows how the matrix of point type detectors can miss a leak or eventually only see diluted gas levels whereas SafEye 700S Open-Path will, in this case, measure 20% LEL x 7 m = 1.4 LEL.m - well above 1 LEL.m alarm level

Not all gas clouds are hazardous - only if a flammable gas cloud or plume is wide enough to allow flame acceleration to speeds greater than 100 m/sec does it become a significant threat.

- Just as an athlete performing the long jump needs a run-up distance, so too a flame front needs distance to reach the velocities which cause the damaging effects of over-pressure, pressure pulse and windage.
- The generally accepted quantity of gas that creates the potential to cause consequential damage if ignited is a cloud of the size 5 m diameter a stoichiometric concentration (about 200% LEL).
- To provide a safety margin, this concentration is halved to 100% LEL. Thus an open path beam traversing this cloud would indicate 5 LEL.m.
- Location of the SafEye 700S Open-Path Gas Detector is less important than with point type detectors as it provides a warning alarm from a diluted gas cloud and does not need to be close to the leakage source.
- Point type detectors measure gas at their location in terms of % LEL, whereas open-path gas detectors measure the amount of gas anywhere along the length of the path, in terms of the integral of concentration and length (LEL x meters).

LEL.METERS

Detector output = gas cloud length (m) x gas cloud concentration (LEL)

The unit of measurement is LEL.meters:
100% LEL of the gas = 1 LEL
1 LEL.meter = 1 LEL x 1 meter

Therefore:
20 m x 5% LEL = 1 LEL.meter
1 m x 100% LEL = 1 LEL.meter
10 m x 10% LEL = 1 LEL.meter

Highest Quality backed by

3-year warranty for the 700S-system

10-year warranty for Xenon Flash Bulb

Integrates well-proven and superior Xenon Flash technology which has an excellent operational record in many installations ranging from the deserts of Africa and Asia and the very hot and humid Far East, to the wet and cold North Sea and the dry and cold regions of Alaska.

- **Proven Technology**
  The NEW SafEye Version is based on proven technology and performance. Thousands of first generation Flash Type SafEye are installed on offshore platforms, FPSO's, refineries, and other onshore applications operated by British Petroleum (BP), Shell, ExxonMobil, Statoil, and others.
- **One-Person Commissioning and Installation**
  One person can simply and easily align and commission SafEye with separate horizontal and vertical adjustments.
- **Fast Response**
  Direct reading, high sensitivity and fast response (3 sec) ensures instant action and maximum safety.
- **Harsh Environment**
  Well-proven in harsh environments (rain, snow, fog, hot and humid weather), up to 90% beam blockage, an excellent operational record in many installations worldwide.
  - Heated Optics on the source and detector increase the temperature of the optical surface to reduce icing, condensation and snow.
  - Resilient and excellent performance withstanding extreme vibrations, displacement and shock.
  - Solar blind and immune to false alarms from industrial environments.
- **Reliable**
  Fully approved by TUV to SIL2 (IEC 61508)
- **Detects a Wide Range of Gases**
  Reliable detection of gas leaks including a wide range of gaseous hydrocarbons, such as: Alkanes, Alkenes (C1-C8), Alcohols, LNG, LPG, Ethylene, etc.
- **Cost Effective**
  Less units needed for protection compared with point type detection.
  One system can replace from 5 to 20 point gas detectors. Low cost of ownership, much lower installation cost!
- **Large Misalignment Tolerance**
  Provides relatively wide angle of view, better than 1°, to withstand vibration, mechanical shock and displacements.
- **Standard Interface Options**
  Standard 4-20 mA output with a new mode (3 mA) "Maintenance call" or RS-485, Modbus-compatible output to allow networking (up to 256 detectors) to a central monitoring / PC system. This feature also enables easy maintenance, local and remote diagnostic tools.
- **No Poisoning Effect**
  Electro-optical system, not affected by chemicals.
- **Rugged Construction**
  Stainless steel 316L, IP66/67, Zone 1 ready design.

TYPICAL APPLICATIONS

Oil Rigs
SafEye Open Path Gas Detection System provides alarm and shutdown signals that enable emergency and preventive measures.

Onshore Oil & Gas Industry
Many process and storage areas in the modern refinery are protected by the SafEye systems.

FPSO Vessels
SafEye Open Path Systems protect duct, air intakes and HVAC providing warning and alarm in case of migration of dangerous gas concentrations.

Process Plants & Pipelines
LNG/LPG and Polymers are being monitored by the SafEye system that detects at LEL levels.

Open-Path Applications:

- Offshore Oil & Gas drilling and production
- Petrochemical and Chemical storage and production areas
- Storage & loading of hazardous materials and waste areas
- Engine & Turbine air intake and modules
- LNG-LPG storage, pumping and filling
- Fence-line emission monitoring
- Storage Tank Farm protection
- Paint industries, including paint-booths
- Bus terminals (natural gas powered)
- Waste disposal and processing

PRODUCT DESCRIPTION

The SafEye 700S Optical Open Path (Line-of-Sight) Gas Detection System employs “spectral fingerprint” analysis of the atmosphere using the Differential Optical Absorption Spectroscopy (DOAS) technique in a unique (patented) method.

SafEye 700S consists of an advanced Xenon Flash infrared transmitter (source) and infrared detector (receiver), separated over a line of sight from 13 ft. (4 m) up to 460 ft. (140 m) to detect and quantify flammable gas presence, even when challenged by extremely harsh environments where dust, fog, rain, snow or vibration can cause a high reduction of signal.

The SafEye 700S analyzes atmospheric absorption at three selected spectral bands, two in a region where the target gas absorbs and one where it does not absorb. The ratio between these absorption lines can provide accurate information of the gas concentration along an optical path.

The reference sensor detects beam blockage, compensates for changing humidity and detects failed light source or dirty optics.

SafEye’s source and detector units are both housed in low profile, rugged and stainless steel enclosures.

SafEye 700S includes heated optics on the transmitter (source) and receiver (detector) to address icing, condensation and snow.

Modern accessories include an Intrinsically Safe approved, Hand-Held Unit which is an all-in-one Diagnostic / Calibration / Interrogation plug-in unit that assists one-person installation and maintenance.

PRODUCT SPECIFICATIONS

General Specifications

Detection Range	Model	701S	702S	703S	721S	722S	723S
	ft	13-66	50-230	165-460	13-66	50-230	165-460
	m	4-20	15-70	50-140	4-20	15-70	50-140
	Detected gas	C_1-C_8			Ethylene		
Response Time	T90 - 3 sec.						
Immunity to False Alarm	Not influenced by solar radiation, hydrocarbon flames and other external IR radiation sources						
Spectral Response	2.0 - 4.0 µm.						
Sensitivity Range	0 - 5 LEL.m (optional 0 - 2 LEL.m)						
Displacement/Misalignment Tolerance	±1˚						
Accuracy	±5% of full scale or ±10% of the reading, whichever is greater						
Repeatability	±5% of the reading						
Temperature Range	-40˚F (-40˚C) to 131˚F (55˚C)						
Warranty	SafEye system - 3 years Flash source bulb - 10 years						

Outputs – Interfaces

4-20 mA Current Output	Sink (source option) configuration	
	Maximum load	600Ω at 18-32 VAC
	4-20mA	Gas reading
	4mA	Normal, zero reading
	3mA	Maintenance call
	2mA	Obscuration/misalignment /beam block
	1mA	Zero calibration mode
	0mA	Fault
HART Protocol	HART communications on the 0-20mA analog current (FSK) - used for maintenance, configuration changes and asset management, available in mA source output wiring options	
RS-485 Interface - Modbus Compatible	The RS-485 input/output provides complete data information to a PC and receives control commands from the PC or handheld unit	
Relays	Alarm, Fault and Accessory SPST volt-free contacts rated 5A at 30 VDC or 250 VAC Fault relay normally closed, others normally open	

Electrical Specifications

Power Supply		24 VDC nominal (18-32 VDC)
Power Consumption (peak includes heated optics)		Detector: 150mA (300 mA Peak) Source: 100mA (300 mA Peak)
Electrical Connection (specify)		2 x 3/4" - 14NPT conduits or 2 x M25 x 1.5 mm ISO
Electric Input Protection		According to MIL-STD-1275B
Electromagnetic Compatibility		EMI/RFI protected against EN 50270 & CE Marked

Mechanical Specifications

Enclosure		The source and detector housings are stainless steel 316L with electropolish finish. The circuit boards are conformal coated and protected from mechanical vibrations. The tilt mount is also Stainless Steel 316L
Dimensions	Detector Source Tilt Mount	8.2 x 5.7 x 6 inch (210 x 145 x 154 mm) 10 x 5.3 x 6.9 inch (255 x 135 x 175 mm) 4.7 x 4.7 x 5.5 inch (120 x 120 x 140 mm)
Weight	Detector Source Tilt Mount	9.2 Lb (4.2 Kg.) 10.1 Lb (4.6 Kg) 4.2 Lb (1.9 Kg)
Water and Dust Tight		IP66 and IP67 NEMA 250 6P
Environmental		Meets MIL-STD-810C for Humidity, Salt & Fog, Vibration, Mechanical Shock, High Temp, Low Temp

Approvals

Hazardous Area Approval	IECEx	Ex d e ia [ia Ga] IIC T5 Gb Ta = -40°C to +55°C
Reliability		IEC61508 - SIL2 (TUV)
Other		TR CU/EAC

Accessories

Tilt Mount	P/N 799640
Pole Mount (U-Bolt 2-3 inch)	P/N 888140
Pole Mount (U-Bolt 4-5 inch)	P/N799225
Wall Mount	P/N 799255
HART Hand-held Diagnostic Unit	P/N 888810
USB/RS485 Harness Converter Kit	P/N 794079
Commission Kit	P/N 799247
Weather Cover for the Source Unit	P/N 799267
Weather Cover for the Detector Unit	P/N 799250
Mini Laptop Kit	P/N 777820

Specifications subject to changes

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Represented by:

DS-G-700S, April 2017

SPECTREX

SafEye

300 SERIES GAS DETECTION SYSTEMS FOR

AIR DUCT

- **Faster response and more reliable results**
- **More effective and more economical...**
  Compared to 'Point' Type Detectors or 'Sample Draw' Systems!

Reliable High Speed Detection

Main Features

High Sensitivity

- Alarm up to 0.5 LEL.m
- 5 times more sensitive than the normal Open Path equipment

Fast Response

- Fast response time of 2 seconds
- 5 to 10 times faster than the commonly used Open Path detector and 20-50 times faster than the Point Detector.

Low Maintenance

High reliability, simple installation, alignment and maintenance, equipment not subject to poisoning.

Proven Technology

Used in air ducts on FPSO's and offshore rigs for British Petroleum (BP), Shell and ABB Lummus for turbines, air intakes, etc.

Harsh Environment

Specially designed to perform under extreme conditions such as high-speed airflows, high temperatures (up to 158˚F (70˚C)), humidity and corrosive gases, where point detectors may not be effective.

Standard Interface Options

Standard 4-20 mA outputs or RS-485 output to allow networking (up to 64 detectors) to a central monitoring/PC system.

This feature also enables easy maintenance, local and remote diagnostic tools.

SafEye 300 Duct Open Path Detectors were specially designed and are widely used to monitor and alarm against ingress of hazardous gas concentrations into air intakes of turbine engines and HVAC air ducts. Formation and migration of gas clouds and their possible penetration into safe places, control rooms, turbine engines, etc. is a substantial risk that needs to be addressed.

Users, designers and safety and operational engineers are increasingly required to provide for adequate and fast detection and alarm to protect these hazards.

For duct applications, over a small path across an air inlet, the system is designed to respond with a very high sensitivity, full scale of 1 LEL.m for 2-6.6 ft. (0.6-2 m) wide inlet and full scale of 2.5 LEL.m for 6.6-23 ft. (2-7 m) wide inlet.

The SafEye 300 Duct system, due to its special optics design, provides for a misalignment tolerance of 2° in all directions and is protected against false gas reading and alarms which are caused by partial obscuration and blocking, misalignment, vibration, flexing or tilts.

Each SafEye unit is factory calibrated in a temperature cycle run at the entire operating temperature range. The temperature compensating mechanism allows correct operation in changing and extreme temperatures while maintaining the system's accuracy. Its internal microprocessor will automatically compensate for low signals with its internal Automatic Gain Control (AGC).

The SafEye 300 Duct system can be factory calibrated to gas mixtures that are associated with offshore production and processing and onshore installations.

General Specifications

Detected Gases	Simultaneous detection of C1-C8 flammable gases
Detection Range and Response Time	Model: 301 / 302 Distance: 2-11.5ft (0.6-3.5m) / 9.9-49.5ft (3-15m) Response Time: 2 sec. / 5 sec.
Immunity to False Alarm	Not influenced by solar radiation, hydrocarbon flames, other external IR radiation sources, high airflows and high loaded streams
Spectral Response	3.0-4.0 µm
Sensitivity Range	0-2.5 LEL.m Standard; 0-1 LEL.m by dip-switch setting
Misalignment Tolerance	±2˚
Drift	Long-term ±5% of full scale
Temperature Range	-40˚F (-40˚C) to 158˚F (70˚C)

Electrical Specifications

Power Supply	24 VDC (18-32 VDC)
Power Consumption	Detector: 150mA @ 24 VDC (200 mA Peak) Source: 100mA @ 24 VDC (220 mA Peak)
Electrical Connection	2 x 3/4" - 14NPT conduits or 2 x M25 x 1.5 mm ISO
Electrical Input Protection	According to MIL-STD-1275B
Electromagnetic Compatibility	EMI/RFI protected CE Marked

Outputs

0-20mA Sink (source option) configuration	Maximum load: 600Ω at 18-32V DC 4-20mA: Gas reading 4mA: Normal, zero reading 2mA: Obscuration/misalignment /beam block 1mA: Zero calibration mode 0mA: Fault
HART Protocol	HART communications on the 0-20mA analog current (FSK) - used for maintenance, configuration changes and asset management
RS-485	The RS-485 input/output provides complete data information to a PC and receives control commands from the PC or handheld unit

Relays

	Type	Normal Position	Maximum Ratings
Alarm	SPDT	NO, NC	2A at 30V DC
Accessory	SPST	Open	5A at 30V DC
Fault	SPST	Closed	5A at 30V DC

Mechanical Specifications

Dimensions		5.2" (132mm) x 5.2" (132mm) x max. 4.7" (120mm)
Weight	Al. Encl.	Detector: max 8.7 lb (3.7 kg) Source: max 8.58 lb (3.9 kg)
	St. Encl.	Detector: max 13.4 lb (6.1 kg) Source: max 13.84 lb (6.3 kg)
Mechanical Design		The standard detector housing is heavy-duty, copper-free (less than 1%) aluminum. The housing is finished in white epoxy enamel and is also available in 316 Stainless Steel
Environmental Standards		Meets MIL-STD-810C for Humidity, Salt & Fog, Vibration, Mechanical shock, High Temp, Low Temp
Water and Dust Tight		IP66 and 67 per EN60529 NEMA 250 6P

Hazardous Area Approvals

FM	Class I, Division 1, Groups B, C and D, Dust Ignition proof for Class II, Division 1, Groups E, F and G. Performance per Class no. 6325

Accessories

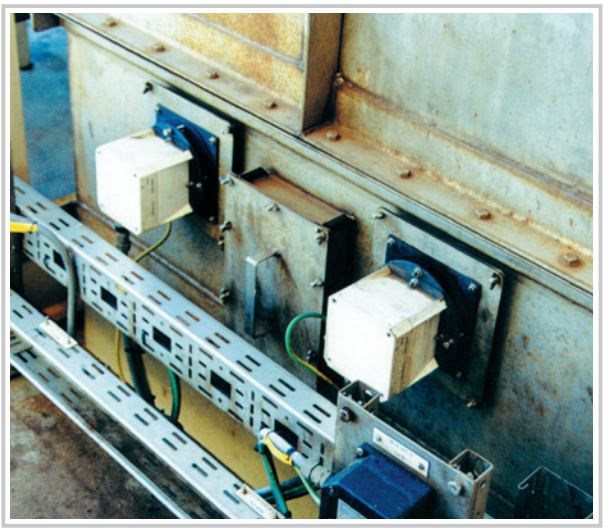
The following optional accessories designed for the SafEye system are available.

Duct Mounting
The duct mount interfaces between the detector and the duct surface.

The duct mount enables the detector's alignment up to 3° in all directions (P/N 794716).

Commissioning / Alignment Kit for standard and duct type units is required for commissioning and future maintenance checks. Only one kit is required per site.

The kit includes an Alignment Telescope P/N 794110, a Magnetic Mode Selector P/N 790285 and a Function Check Filter P/N 794220-1÷5 for system testing along with socket keys for access to units (P/N 792247).



Air Duct Installation on ETAP Platform in the North Sea

Typical Applications

Offshore Oil & Gas Rigs and FPSOs; Onshore Oil & Gas Terminals; Storage Farms and Filling Stations; Petrochemical and Chemical Industries; Power Utilities and Turbines areas; Automotive, Painting, Printing, Pharmaceutical Industries and many more.

Specific applications include:

- HVAC ducts (Heating Ventilation Air Conditioning) in accommodations areas
- Air ducts in process areas
- Stacks and exhaust towers
- Compressors and generators enclosures
- Curing ovens and drying equipment, printing equipment
- Engine & Turbine air intake and exhaust
- Air intake to safety enclosures
- Paint-booths and paint production and drying processes
- Air ventilation shafts

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Represented by:

SafEye Quasar 950/960

H_2S and Ammonia Open Path Gas Detectors

The latest SafEye Quasar open path UV detection technology includes the 950 and the 960 series. The Quasar 950 models detect toxic Hydrogen Sulfide gas and the Quasar 960 models detect toxic Ammonia gas, both with path lengths of up to 200ft (60m). The Quasar 950 and 960 models can be tailored to protect your personnel and high-risk installation. Reliability is key and is assured with SIL2.

All Quasar 950/960 detectors incorporate heated windows to minimize any effects from condensation, icing, snow and are totally immune to interference from sunlight or any other sources of radiation such as flare stacks, arc welding or lightning. A range of outputs are available including 0-20mA, HART, Modbus RS485 to suit all control systems.

FEATURES & BENEFITS

- Long Range Toxic Gas Detection up to 200ft (60m)*
- Detection of toxic gases
  - 950 Series detects H_2S
  - 960 Series detects NH_3
- High Sensitivity and fast response
- Heated optics to improve performance in ice, condensation and snow conditions
- Continuous operation in extreme and harsh environmental conditions
- Solar blind and immune to industrial environments
- Withstands extreme vibration conditions
- Multiple output options for maximum flexibility and compatibility
  - 0-20mA
  - HART Protocol for maintenance and asset management
  - RS-485, Modbus Compatible
- Simple, one person installation, alignment, and calibration
- Programmable configuration via the handheld unit
- Fast connection to I.S. approved handheld diagnostic/calibration unit
- 3mA “maintenance call”
- 3 Year Warranty
- ATEX & IECEx Ex II 2 (2) G D
  Ex db eb ib [ib Gb] IIB+H2 T4 Gb
  Ex tb IIIC T135°C Db
- TR CU/EAC
- Inmetro (UL)
- Safety Integrity Level SIL2 (TUV)

APPLICATIONS

Offshore platforms & FPSOs
Petrochemical plants
Chemical processing plants
Gas filling and distribution terminals
Gas transport and pipelines
Perimeter monitoring

*An 80% reduction in the maximum distance is recommended in adverse conditions.

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SPECTREX

SafEye Quasar 950/960

H_2S and Ammonia Open Path Gas Detector

GENERAL SPECIFICATIONS

Detected Gases	Detection of toxic gases such as Hydrogen Sulfide (H_2S) and Ammonia					
Model	**951**	**961**	**952**	**962**	**953**	**963**
Detection Range	17-66ft 5-20m	17-66ft 5-20m	50-132ft 15-40m	50-132ft 15-40m	115-200ft 35-60m	115-200ft 35-60m
Detected Gas	H_2S	Ammonia	H_2S	Ammonia	H_2S	Ammonia
Response Time	T90≤10 sec					
Immunity to False Alarm	Not influenced by solar radiation, hydrocarbon flames and other external IR radiation sources					
Spectral Response	200-300nm					
Sensitivity Range	0-500 ppm.m					
Displacement/Misalignment Tolerance	±1°					
Drift	Long term ±5% of full scale					
Temperature Range	–67°F to 149 °F (–55 °C to 65 °C)					
Humidity	Up to 95% non-condensing (withstands up to 100% RH for short periods)					

ELECTRICAL SPECIFICATIONS

Operating Voltage	24 VDC nominal (18-32 VDC)
Power Consumption	Detector: 250mA (300mA peak) Source: 250mA (300mA Peak)
Warm up Time	60 sec for transmitter and receiver
Electrical Connection (specify)	2 x 3/4" – 14NPT conduits or 2 x M25 x 1.5mm ISO
Electrical Input Protection	According to MIL-STD -1275B
Electromagnetic Compatibility	EMI/RFI protected to EN50270

OUTPUTS

0-20mA Current Output	Sink (source option) configuration - maximum load of 500Ω at 18-32VDC			
	Gas reading	0-20mA	Obscuration/beam block	2mA
	Normal, zero reading	4mA	Zero calibration mode	1mA
	Maintenance call	3mA	Fault	0mA
	Misalignment	2.5mA		
HART Protocol	Optional HART communications on the 0 -20mA analog current (FSK) - used for maintenance and asset management			
RS-485	RS-485 Modbus compatible communication link that can be used in computer controlled installations			
Visual Status Indicator	3 color LED: Green – Power on, Yellow – Fault, Red – Alarm			

MECHANICAL SPECIFICATIONS

Materials	- Source and detector housings are Stainless Steel 316L with electro polish finish - Circuit boards are conformal coated and protected from mechanical vibrations	
Mounting	Stainless Steel 316L with electro polish finish	
Dimensions	Detector / Source	10.5" x 5.1" x 5.1" (267 x 130 x 130mm)
	Tilt Mount	4.7" x 4.7" x 5.5" (120 x 120 x 158mm)
Weight	Detector / Source	11lb (5kg)
	Tilt Mount	4.2lb (2kg)
Environmental Standards	Meets MIL-STD-810C for Humidity, Salt & Fog, Vibration, Mechanical Shock, High Temp, Low Temp	
Water and Dust	IP66 and IP68 per EN60529, NEMA 250 6P	

APPROVALS

Hazardous Area	ATEX & IECEx	Ex II 2 (2) G D Ex db eb ib [ib Gb] IIB+H2 T4 Gb Ex tb IIIC T135°C Db Ta = -55°C to +65°C
	TR CU/EAC	1Ex d e ib [ib Gb] IIB + H2 T4 Gb X Ex tb IIIC T135°C Db X
	Inmetro	Ex db eb ib [ib Gb] IIB + H2 T4 Gb Ex tb IIIC T135°C Db X
Reliability	SIL2 per IEC61508 (TUV)	

ACCESSORIES

Tilt Mount	P/N 888270	**HART Hand-Held Harness Kit**	P/N 888815
Wall Mount	P/N 799255	**USB/RS485 Harness Converter Kit**	P/N 794079
Commissioning Kit	P/N 888847	**U-Bolt/Pole Mount (4-5 inch)**	P/N 799225
Sunshade	P/N 888263	**U-Bolt/Pole Mount (2-3 inch)**	P/N 888140
HART Hand-Held Diagnostic Kit	P/N 888810	**Mini Laptop Kit**	P/N 777820