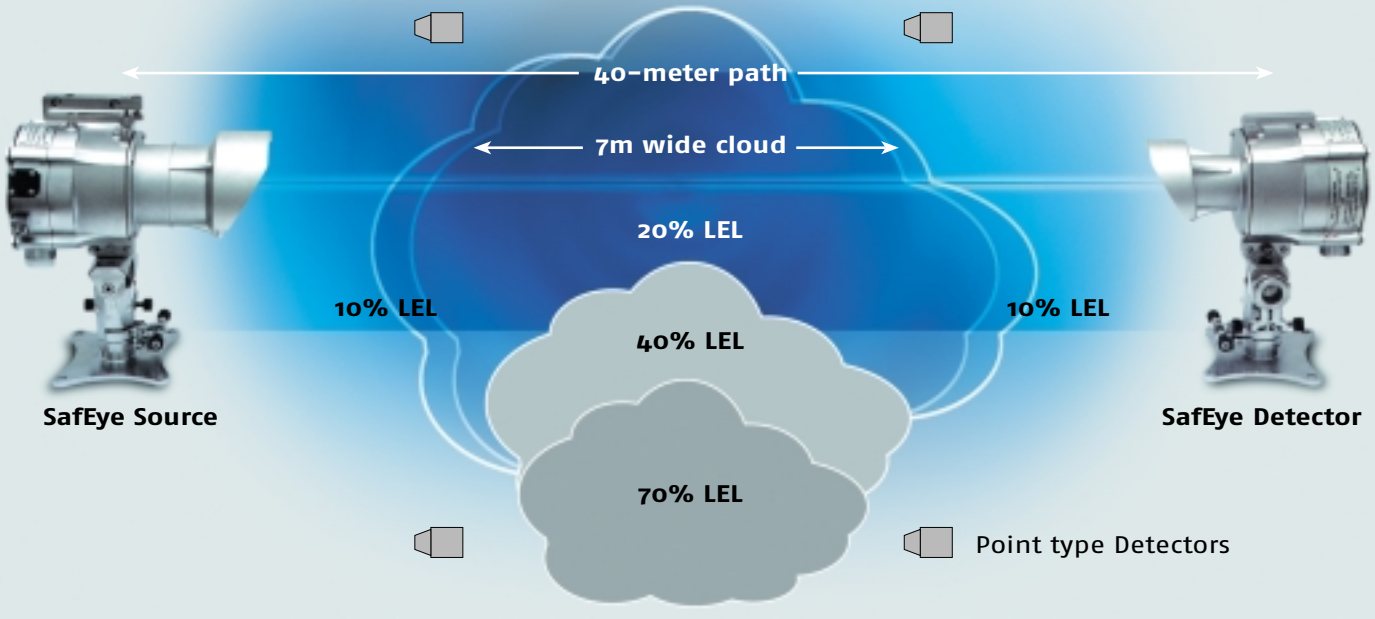
GASTECH
AUSTRALIA

SafEye XENON 700

OPEN-PATH GAS DETECTION SYSTEM

WE INVENTED IT... WE PERFECTED IT!

Open-path Gas Detection Concepts



This scenario shows how matrix of Point' type detectors can miss a leak or eventually only see diluted gas levels whereas SafEye 700 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 700 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 years warranty for the 700-system

10 years 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.
- **Detects Wide Range of Gases**
  Reliable detection of gas leaks including a wide range of gaseous hydrocarbons such as: Alkanes, Alkenes (C_1-C_8), 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 effected by chemicals.
- **Rugged Structure**
  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 , Polymers or toxic substances like Ammonia or Benzene, are being monitored by SafEye system that detects at LEL or PPM 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 700 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 700 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 700 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, stainless steel, ATEX approved enclosures. The main enclosure is approved EExd flameproof with an integral, segregated, EExe increased safety terminal section. The hand-held communication unit can be connected in-situ via the intrinsically safe approved (EExia) data port on the detector. The combined ATEX approval is therefore Ex II 2(1) GD, EExde ia [ia] IIC T5 (55˚C).

SafEye 700 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	701	702	703	721	722	723
	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 / LPG		
Response Time	T90 - 3 sec						
Immunity to false alarm	Is 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˚						
Drift	Long term ±5% of full scale						
Temperature Range	-40˚F (-40˚C) to 131˚F (55˚C)						
Warranty	SafEye system - 3 years Flash source bulb - 10 years						

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-1275A
Electromagnetic Compatibility	EMI/RFI protected CE Marked

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

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

Mechanical Specification

Hazardous Area Approval

ATEX EX II 2(1) GD, EExde ia [ia] IIC T5 (55˚C).
The detector or source units have a combination of approvals. Each is a single enclosure (EExd) with integral, segregated rear terminal section (EExe) and intrinsically safe (EExia) data-port for external in-situ connection to Hand-Held Diagnostic unit.

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	8.2 x 5.7 x 6 inch (210 x 145 x 154 mm)
Source	10 x 5.3 x 6.9 inch (255 x 135 x 175 mm)
Tilt Mount	4.7 x 4.7 x 5.5 inch (120 x 120 x 140 mm)

Weight

Detector	9.2 Lb (4.2 Kg.)
Source	10.1 Lb (4.6 Kg)
Tilt Mount	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

Accessories

Tilt Mount

Stainless steel 316L, enables the detector to rotate in all directions and fine alignment up to 5˚. (P/N 799640)

Installation Kit

This kit includes a Telescope (P/N 799210), Function Check Filter (P/N 792260 (1-5)) and set of Socket Keys

Hand Held Kit

See on the next page (P/N 799810)

Hand Held Communicator Kit (P/N 799810)

The Hand Held Unit is a diagnostic/calibration/interrogation tool with quick plug connection, which provides easy and economical SafEye maintenance.

The hand-held unit will provide verification, status and instructions for correcting the detector's parameters.

Features

- An Intrinsically Safe approved, all-in-one Hand-Held Diagnostic unit can assist one-person installation and maintenance.
- Fast and easy analysis of the operating status, correct operation and the need for maintenance of SafEye Xenon.
- On site programming of SafEye detector's functions and changing detector's set-up
- Verification that the installation has been performed successfully and provides all the detector's parameters during installation
- Maintenance/Trouble Shooting - provides recommendation of maintenance action to overcome problems and optimize the detector's performance.
- Recommend corrective actions including: cleaning the window; aligning the detector/source; performing zero calibration; replacing the detector or source.

Contact Information

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