



**The Searchline Excel is
the World's best selling
infrared open path
gas detector**

Searchline Excel



Applications include:

- Offshore platforms & vessels (FPSO's)
- Downstream chemical processing plants
- Gas transport and pipelines
- Large storage areas & buildings

The Searchline Excel is the World's best selling infrared open path gas detector with over 20,000 units installed in challenging applications throughout industry. From the Arctic Circle to Middle Eastern Deserts, customers have repeatedly selected the Searchline Excel as their preferred choice.

Product Evolution

Honeywell Analytics pioneered the original design of open path infrared combustible gas detectors with the introduction of the original Searchline back in 1987. Since then we have continued to work in conjunction with major international oil and gas companies to fully understand the detailed application requirements of these systems.

In 1998 we introduced Searchline Excel which has become the industry standard for open path gas detection by meeting and exceeding all customer driven demands.

Product history

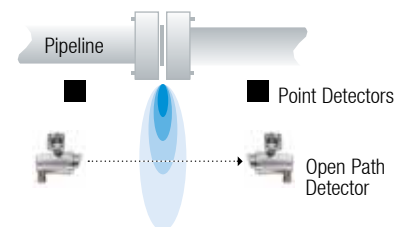
1987 Searchline Introduced 500 Units Sold	1990 Searchline 500 Introduced 3,500 Units Sold
1998 Searchline Excel Introduced 20,000+ Units Sold	2000 Searchline Excel duct mount Introduced

Why open path gas detection?

Open path detectors complement the use of individual point detectors and offer many significant benefits including:

- Wider area coverage - most likely to pick up any leak
- Very high speed of response
- NO unrevealed failure modes - no possibility of blocked gas path to detector
- Detector location not as critical
- Indicates size of hazard

Gas leak missed by point detectors but picked up by Open Path Detector



Searchline Excel

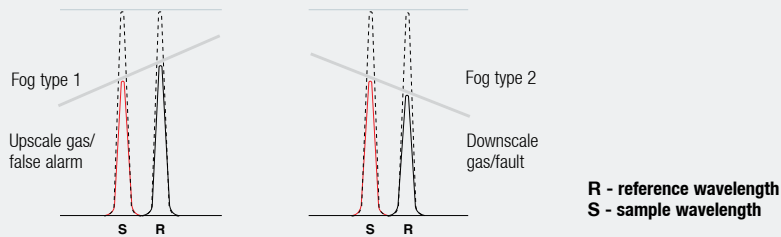


The Difference

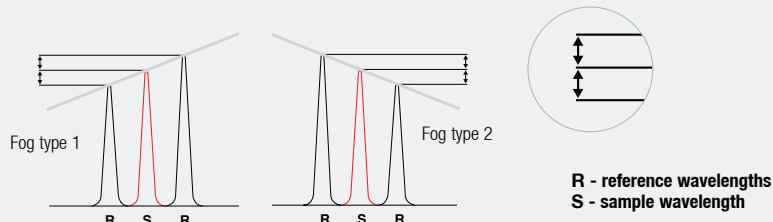
The patented optical design used in Searchline Excel has proven itself as the only solution available that fully addresses all the challenges of open path gas detection. Unlike some competitive devices, it does not try to hide fundamental design inadequacy with the

use of software masks that can compromise the unit's ability to detect gas. Searchline Excel employs a patented double band pass filter that fully compensates for all types of fog and / or rain, thereby allowing it to continue to operate accurately and reliably in all climatic conditions.

Different fog types scatter/absorb differently



The solution... double band pass filter



The differential scatter and absorption has a linear effect with respect to the reference wavelengths. The output from the reference

detector is the average between the reference bands and will be exactly the same as the sample wavelength.



Radially symmetrical heating elements bonded to transmitter and receiver windows.

The unique **coaxial design of the optics** also means that Searchline Excel is also the only open path gas detector that can operate correctly under partial obscuration conditions without the possibility of generating a false alarm.



Searchline Excel is the only open path gas detector in the world that has achieved performance approval by FM.



Searchline Excel



The fundamental design of Searchline Excel has remained the same since its original launch and it continues to lead the field. Other manufacturers have tried unsuccessfully to develop comparable instruments but none have the experience or technology that is utilised in Searchline Excel.

Sample and reference detector alignment

- Reduced sensitivity to alignment
- Guaranteed performance
- Reduced sensitivity to partial obscuration

Improved hand-held software

- Simple confirmation of alignment
- Visual indication of target and current signal levels
- Compatible with existing systems

Improved telescope

- High Power Rifle Telescope
- Easier to align with greater zoom and magnification
- Robust shock resistant design

Being in this dominant position has not meant that we have neglected our close relationships with key users. In fact, we have been listening carefully and working together with them to make the best even better! As a direct result of customer feedback Searchline Excel is even easier to align and has the option of an industry standard MODBUS digital output.



True Alignment System

A good installation is key to obtaining the best performance from an open path gas detection system. Optimum alignment of the transmitter and receiver will ensure the best performance of the system in the harshest climatic conditions.

A visual check of the path using a telescope is required to ensure that there are no physical obstructions in the beam. With the new True Alignment System used on Searchline Excel this alignment is so accurate that the requirement for further adjustment using a software based alignment tool is eliminated.



Improved telescope mounting mechanism

- Simple engagement and locking mechanism
- 3 point mounting datum ensures true alignment
- Sight can be angled to most convenient position
- So accurate that further 'software guided' adjustments not required



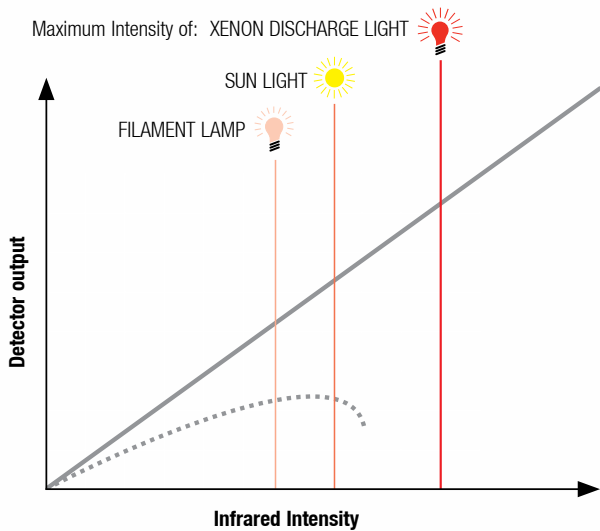
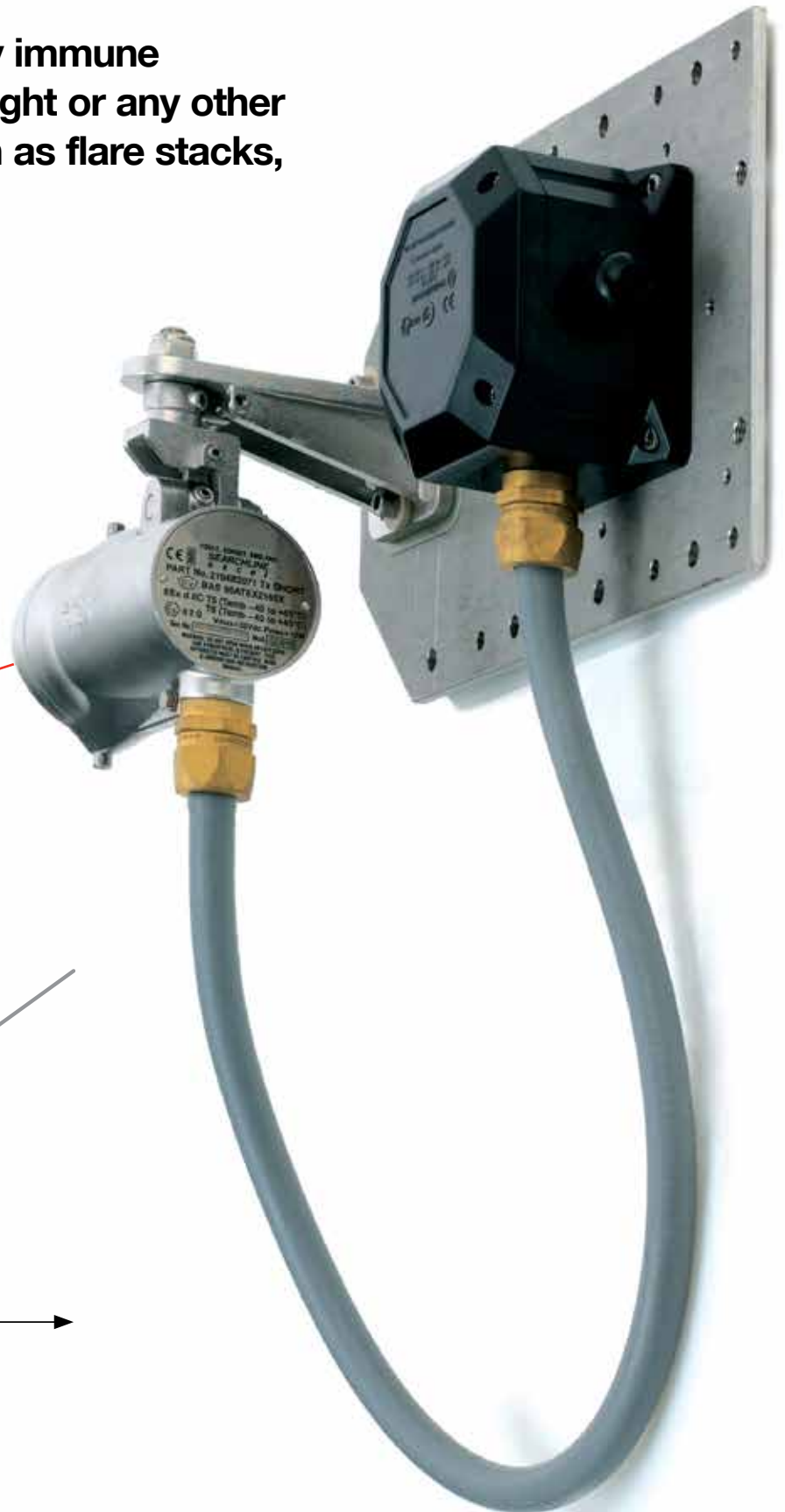
Solar Immune



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

This is achieved by using a xenon flash lamp that is actually brighter than the sun at the infrared detection wavelengths and solid state detectors with a wide dynamic range.

The lamp is also modulated to have a unique pulse duration and shape. The receiver then uses high speed digital signal processing to validate that all the signals received have this unique signature and rejects any extraneous signals.



- Searchline Excel Solid state detectors
- Older system lead salt detectors

Modbus Digital Output



Modbus digital output - know before you go!

The multi drop Modbus capability can enable significant savings in installation and cabling costs. A single comms cable can be run between up to 32 detectors instead of the usual 'home run' required for each detector. Additionally, the 2 way digital communication protocol allows configuration,

warning and fault diagnosis information to be communicated back to the control room. This reduces servicing and maintenance costs as the operator can diagnose the state of any individual unit before deciding to send anyone into the field.

Installation options

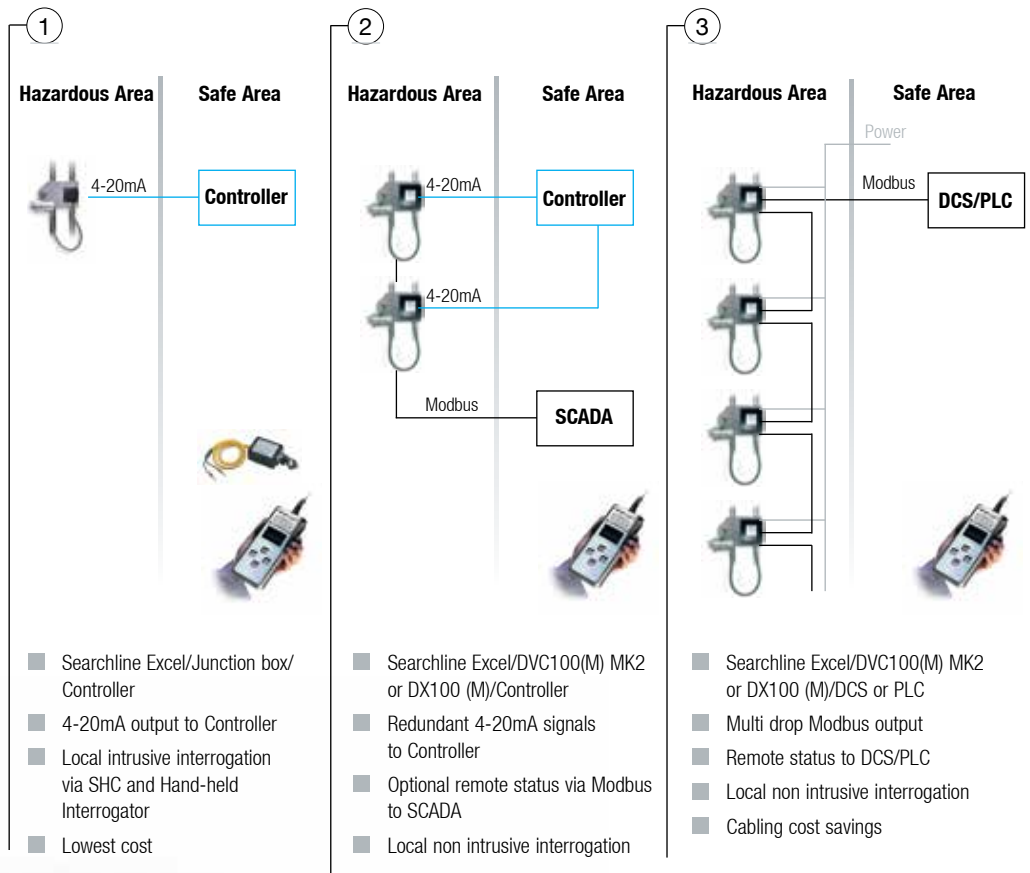
Options



DX100 (M)
UL/CSA/FM approved



DVC100(M) MK2
ATEX/IECEx approved



Cross-Duct Technology

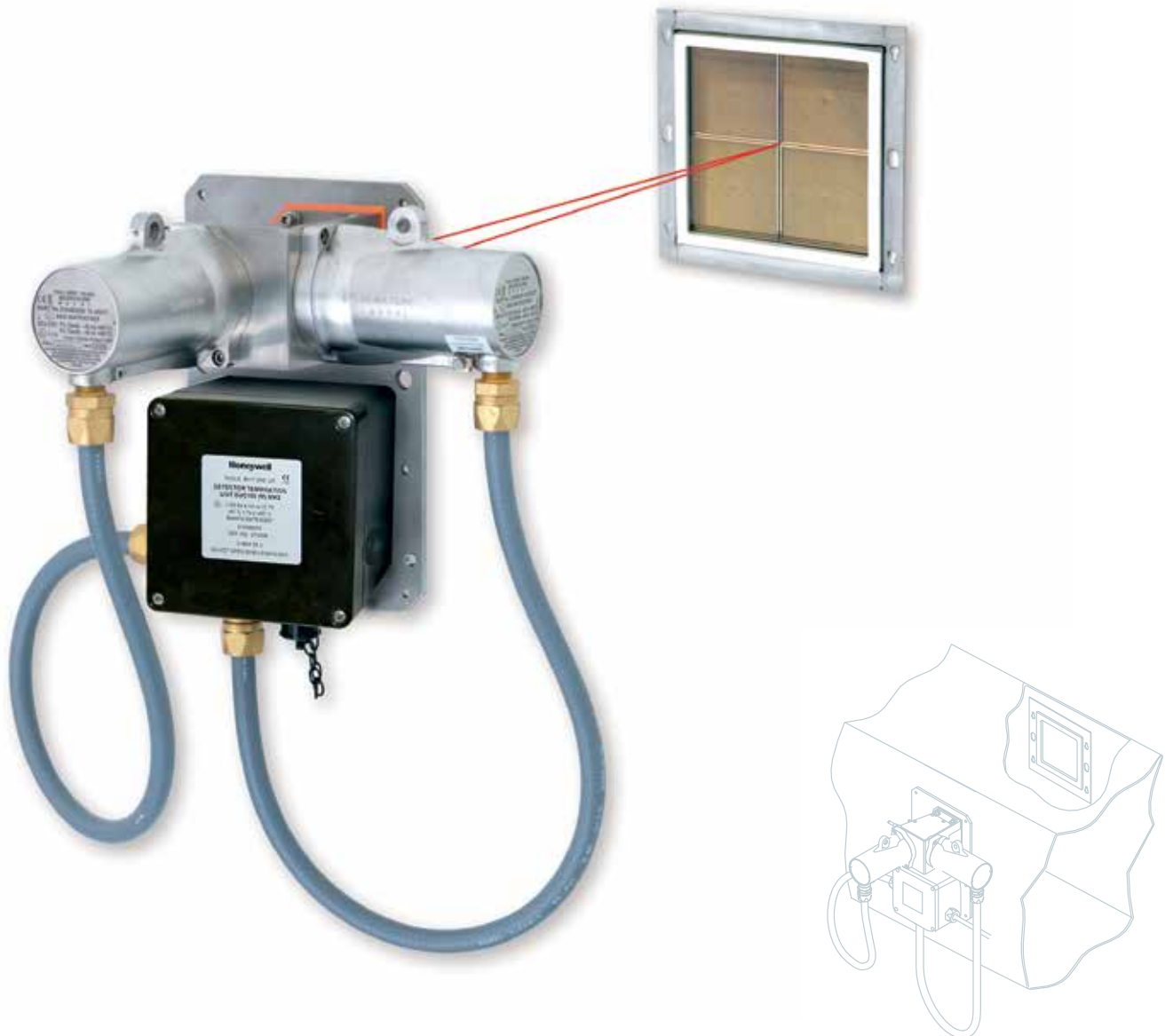


Features & benefits

- Fast speed of response provides earliest warning
- High sensitivity allows low alarm set points
- Alignment free design makes installation simple
- Duct flex and vibration tolerance keeps the system online
- Integral functional gas test facility allows for simple system check
- Contamination resistant optics reduce the need for unscheduled maintenance
- Immune to catalytic poisons
- Works in inert atmospheres

Based on the proven open path design, Searchline Excel Cross-Duct was developed in response to the unique requirements for monitoring in HVAC ducting and Turbine Enclosures.

Searchline Excel Cross-Duct delivers the highest speed of response at low alarm set points over a wide temperature range.

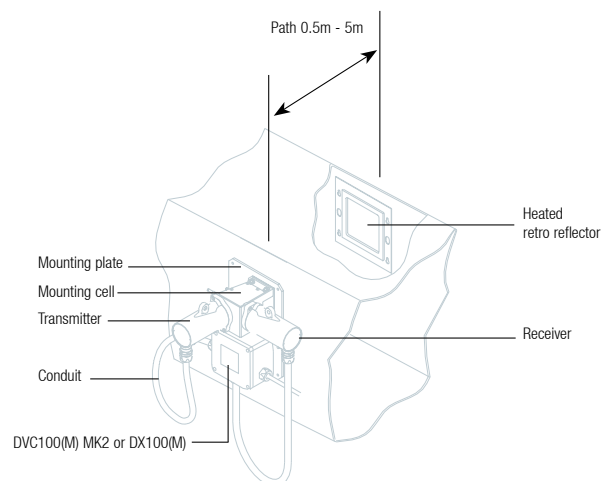
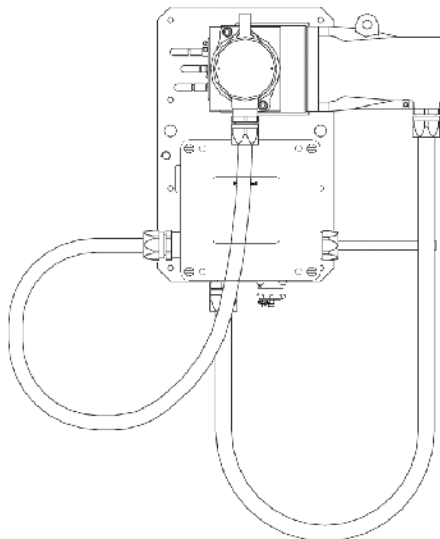


Technical Summary - Searchline Excel Cross-Duct



Specification	
Available Gas Calibrations	Methane (gas mixtures where methane is the main constituent (>70%) and the balance is C ₂ - C ₆ hydrocarbons)*
Detection Range	0-100% LEL
Minimum Alarm Thresholds	20% LEL (>0.5 to 2.5m duct width) 10% LEL (>2.5m to 5m duct width)
Speed of Response	T90 < 1 second
Output Signals	Measuring range: 4-20mA sink or source (Default current source) Over range: 21mA Warning: 3mA Beam Block: 2.5mA Inhibit: 2mA Fault: 0mA
Diagnostics	RS485 serial link
Digital Output	Modbus RS485 multi drop. (Using DVC100(M) or DX100(M))
Operating Temperature	-40°C to +50°C (-40°F to 122°F) ambient. An internal duct temperature of up to 60°C (140°F) is acceptable, provided the ambient temperature outside the duct at the Transmitter and Receiver unit is within the operating range. Contact Honeywell Analytics for high temperature applications
Operating Humidity	0-99% (non condensing)
Operating Pressure	91.5-105.5 kPa (non compensated)
Repeatability	5.0% LEL (<1 metre duct width) 2.5% LEL (>1 metre duct width)
Warm-up Time	<1 hour (fully stabilised)
Power Supply	Unit: 18 to 32V dc Heated Reflector Panel: 18 to 28V dc
Power Consumption	Unit: 13W max. Heated Reflector Panel: 6W (nom) @ 24VDC
Enclosure Material	316 Stainless steel
IP Rating	IP66 and IP67
Weight	Transceiver 13kg, reflector panel 5kg (>0.5m to 2.5m duct width), 10kg (>2.5 to 5.0m duct width)
Vibration	2-60Hz, max ptp amplitude 1mm
EMC Standards	EN50270
Safety Approvals	ATEX, IECEx: Ⓜ II 2 G Ex d IIC T5 (T _{amb} -40°C to +65°C) Ⓜ II 2 G Ex d IIC T6 (T _{amb} -40°C to +40°C) UL: Class 1 Groups B, C, D and Class 1 Zone 1 AEx d IIB + Hydrogen (Amb -40°C to +65°C) Heated Panel ATEX: Ⓜ II 2 G Ex d IIC Gb T3 (T _{amb} -40°C to +60°C) UL: Class 1, DIV 1, Groups B, C, D T _{amb} -40°C to +60°C

*Contact Honeywell Analytics for other gases and approvals



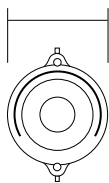
Technical Summary

Searchline Excel

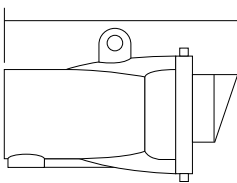


Specification	
Available Gases	Methane, Ethane, Propane, Butane, Pentane, Ethylene, Propylene, Ethanol, Methanol
Range	0 to 5 LEL.m
Recommended Alarm Settings	(Low) 1.0 LEL.m; (high) 3.0 LEL.m
Path Lengths	Short Range 5m to 40m (15ft to 130ft.), Medium Range 40m to 120m (130ft to 390ft.) and Long Range 120m to 200m (390ft to 650ft.)
Speed of Response	T90 less than 3 seconds. (under normal operating conditions)
Output Signal	4-20mA (maximum loop resistance 600 ohms; source & sink available) and RS485 21mA Over range 4-20mA Normal operation (0 to 5 LEL.m) 3mA ⁽¹⁾ Dirty optics 2.5mA ⁽¹⁾ Beam blocked 2mA ⁽¹⁾ Inhibit 0mA Fault
Digital Output	Modbus RS485 multi drop. Using DVC100(M) etc.
Operating Temperature	-40°C to +65°C (-40°F to 150°F)
Operating Humidity	0 to 99% RH (non-condensing)
Operating Pressure	91.5 to 105.5 KPa (915 to 1055 mbar) (non-compensated)
Warm-up Time	Less than 5 minutes (operational), or less than 1 hour (fully stabilised)
Power Supply	18V to 32VDC
Power Consumption	Short Range TX: 3.5 / 5.0*W maximum. Medium and Long Range TX: 5.5 / 7.5*W maximum. RX: 8W maximum
Enclosure Material	316 stainless steel
Weight (inc. mounting bracket)	Short Range TX: 3.5kg Medium and Long Range TX: 7kg RX: 3.5kg
Vibration	2 to 60Hz, max ptp amplitude 1mm.
Misalignment Tolerance	Short Range ±0.5° (±~35cm at 40m). Medium Range ±0.5° (±~104cm at 120m). Long Range ±0.5° (±~170cm at 200m)
EMC Standards	EN50270
Performance Approval	FM performance approved
Safety Approval	ATEX & IECEx: Ⓜ II 2G, Ex d IIC T5 (T _{amb} -40°C to +65°C) Ⓜ II 2G, Ex d IIC T6 (T _{amb} -40°C to +40°C) UL: Class 1 Groups B, C, D and Class 1 Zone 1 AEx d IIB + Hydrogen (Amb -40°C to +65°C) CSA: Class 1 Div 1 groups B, C, D, T5 and Exd IIC T5 (Amb -40°C to +65°C) FM: Class 1 Div 1 groups B, C, D & T5 (T _{amb} -40 to +65°C) Other: GOST Independently assessed to IEC61508
IP Rating	IP66 and IP67 (¹) User programmable. * Turboheating activated (standard feature; user selectable). This is recommended for the most severe weather conditions.

Tx / Rx = 80mm



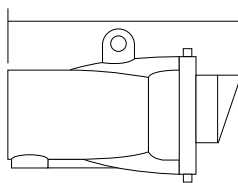
Tx / Rx = 185mm



Tx = 137mm
Rx = 80mm



Tx = 235mm Rx = 185mm



Short Range 5m to 40m (15ft to 130ft)

Medium Range 40m to 120m (130ft to 390ft) and Long Range 120m to 200m (390ft to 650ft)

Accessories

1. Deluge shield / sunshade
2. True alignment system
3. Gassing cell
4. Hand-held interrogator
5. Optical gas test filters
6. SHC protection device



Find out more

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Features / Benefits

Searchline Excel

Double band pass filters that fully compensate for all types of fog, rain and / mist interference	✓
100% Solar Immune	✓
Correct operation under partial obscuration conditions	✓
High vibration resilience	✓
Radially symmetrical and bonded window heating	✓
Fully temperature compensated solid state detectors	✓
Low power consumption in all conditions	✓
Simple 'lock on' alignment tool	✓
No extra 'software alignment' required	✓
Higher power and more robust design telescope	✓
Optional Modbus RS485 multi drop output	✓
FM hazardous area and performance approved	✓

Searchline Excel is the first open path gas detector in the World to have achieved performance approval by FM.

Products or services that meet FM Approvals' rigorous testing standards may bear the FM APPROVED mark, a visual symbol of excellence that is widely recognised and respected. This "Mark of Excellence" tells customers that a company's product conforms to the highest standards and will continue to meet those standards.

Additional FM tests

With its patented double band pass filter and unique coaxial optical design, Searchline Excel is the first open path gas detector that fully addresses the issues of performance under partial obscuration and fog/mist conditions. As these elements were not covered in the FM standard, our optical engineers worked alongside FM to develop and approve Searchline Excel to a new set of simulated fog/mist and partial obscuration tests.



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