



**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 6,000 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  
6,000+ Units Sold

**2000**

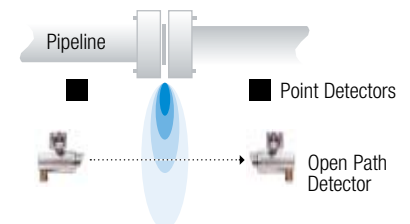
Searchline Excel  
duct mount  
Introduced

## Why open path gas detection?

Open path detectors compliment 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

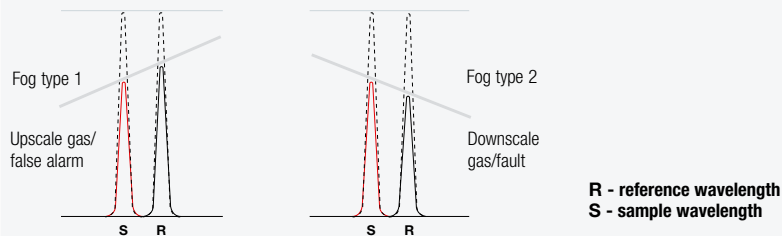


## The Difference

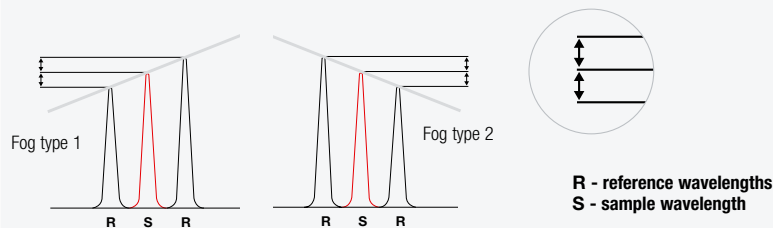
The patented optical design used in Searchline Excel has proven itself as the only solution available that fully addresses all the challenges of open path gas detection. Unlike some competitive devices, it does not try to hide fundamental design inadequacy with the use

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 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



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

operate correctly under partial obscuration conditions without the possibility of generating a false alarm.





# Sieger 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 utilized in Searchline Excel.**

## **Sample and reference detector alignment**

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

## **Improved handheld 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



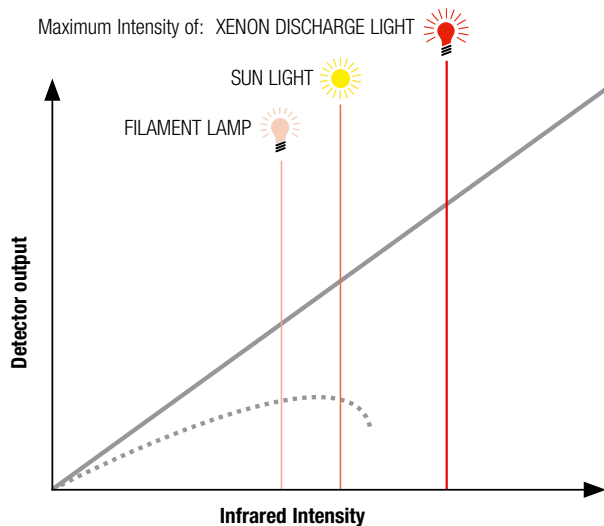
# Solar Immune



**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

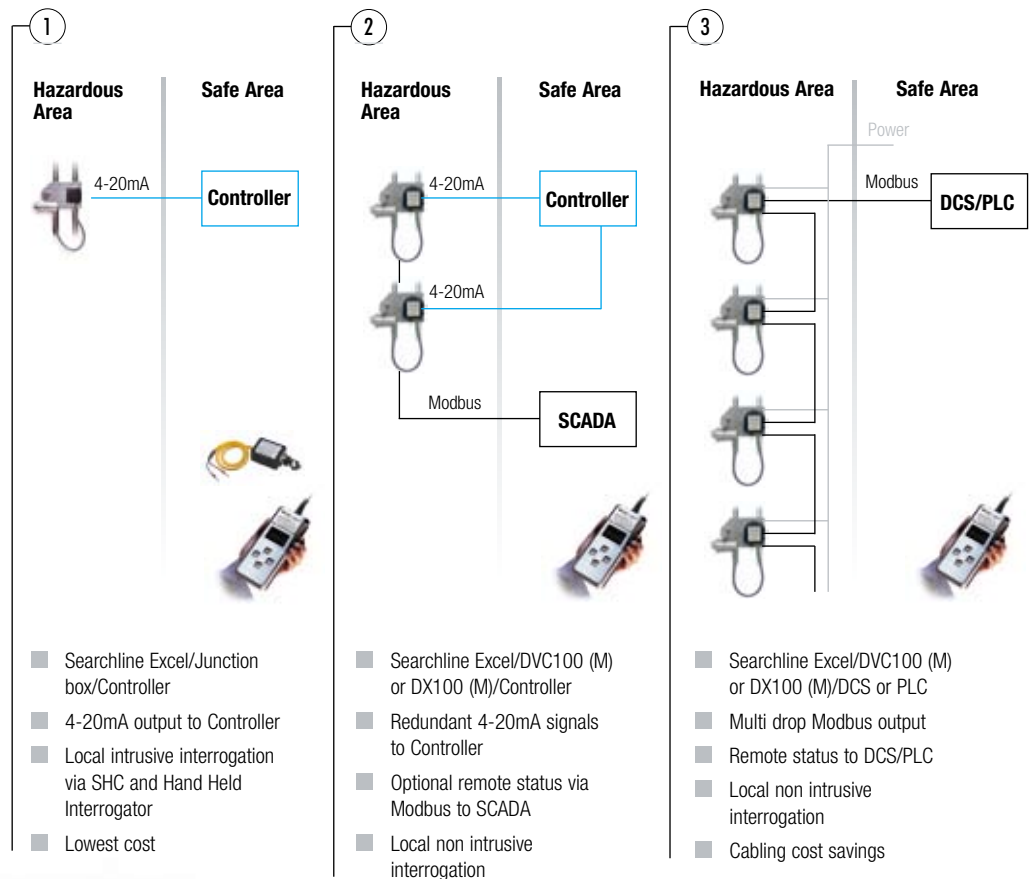
#### Options



DX100 (M)  
UL/CSA/FM approved



DVC100 (M)  
ATEX approved



# Cross-Duct Technology

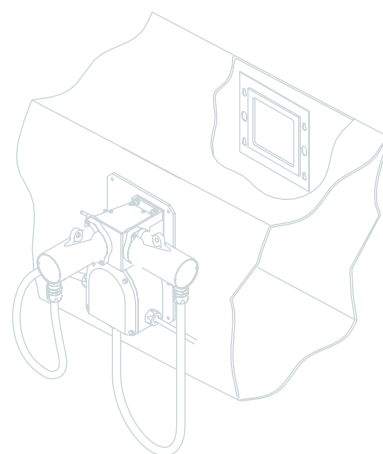


## Features & benefits

- 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
- Not affected by interference from water vapour
- 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.



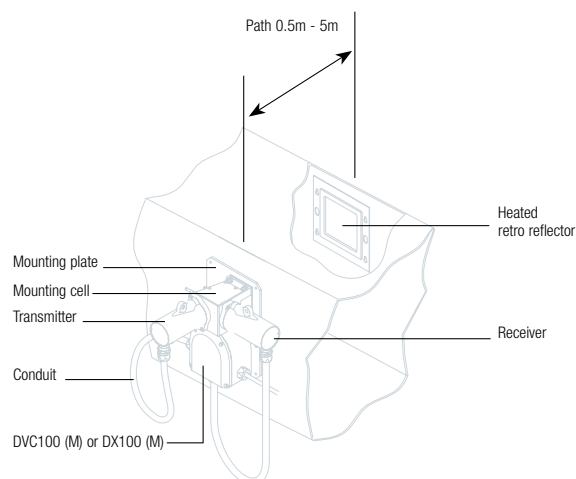


# Technical Summary - Searchline Excel Cross-Duct



Specification	
<b>Available Gas Calibrations:</b>	Methane*
<b>Detection Range:</b>	0-100% LEL
<b>Minimum Alarm Thresholds:</b>	20% LEL (>0.5 to 2.5m duct width) 10% LEL (>2.5m to 5m duct width)
<b>Speed of Response:</b>	T90 < 1 second
<b>Output Signals</b>	Measuring range: 4-20mA sink or source (Default current source) Over range: 21mA Warning: 3mA Beam Block: 2.5mA Inhibit: 2mA Fault: 0mA
<b>Diagnostics:</b>	RS 485 serial link
<b>Digital Output:</b>	Modbus RS485 multi drop. (Using DVC100(m) or DX100(m)).
<b>Operating Temperature:</b>	-40 to +65°C (-40 to 150°F) ambient. Contact Honeywell Analytics for high temperature applications.
<b>Operating Humidity:</b>	0-99% (non condensing)
<b>Operating Pressure:</b>	91.5 - 105.5 kPa (non compensated)
<b>Repeatability:</b>	5.0% LEL (<1 metre duct width) 2.5% LEL (>1 metre duct width)
<b>Warm-up Time:</b>	<1 hour (fully stabilised)
<b>Power Supply:</b>	18 to 32V DC
<b>Power Consumption:</b>	Unit: 13W max. Heated Reflector Panel: 6W (nom) @ 24Vdc
<b>Enclosure Material:</b>	316 Stainless steel
<b>IP Rating:</b>	IP66 and IP 67
<b>Weight:</b>	Transceiver 13kg, reflector panel 2.0kg (>0.5 to 2.5m duct width), 4kg (>2.5 to 5.0m duct width)
<b>Vibration:</b>	2-60 Hz, max ptp amplitude 1mm
<b>EMC Standards:</b>	EN50270:1999
<b>Performance Approval:</b>	FM performance approved
<b>Safety Approvals:</b>	ATEX:  II 2 G EExd IIC T5 (-40 to +65°C). EExd IIC T6 (-40 to +40°C) Heated Panel: EExd IIC T4 (-40 to +60°C) UL: Class 1, Div 1, Groups B, C and D Class 1, Zone 1, AEx d IIB + Hydrogen (Amb -40°C to +65°C)

\*Contact Honeywell Analytics for other gases and approvals

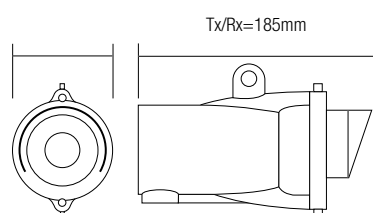




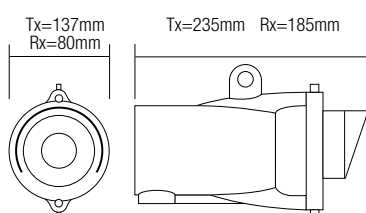
# Technical Summary - Searchline Excel



Specification	
<b>Available Gases:</b>	Methane, Ethane, Propane, Butane, Pentane, Ethylene, Propylene, Ethanol, Methanol.
<b>Range:</b>	0 to 5 LEL.m.
<b>Recommended Alarm Settings:</b>	(Low) 1.0 LEL.m; (high) 3.0 LEL.m.
<b>Path Lengths:</b>	Short Range 5 to 40m (15 to 130 ft.), Medium Range 40 to 120m (130 to 390ft.) and Long Range 120 to 200m (390 to 650ft.)
<b>Speed of Response:</b>	T90 less than 3 seconds. (under normal operating conditions).
<b>Output Signal:</b>	4 to 20mA (maximum loop resistance 600 ohms; source & sink available) and RS485. 21mA Over range. 4 to 20mA Normal operation (0 to 5 LELm). 3mA <sup>(1)</sup> Dirty optics. 2.5mA <sup>(1)</sup> Beam blocked. 2mA <sup>(1)</sup> Inhibit. 0mA Fault.
<b>Digital Output:</b>	Modbus RS485 multi drop. Using DVC100(m) or DX100(m).
<b>Operating Temperature:</b>	-40 to +65°C (-40 to 150°F).
<b>Operating Humidity:</b>	0 to 99% RH (non-condensing).
<b>Operating Pressure:</b>	91.5 to 105.5 KPa (915 to 1055 mbar) (non-compensated).
<b>Warm-up Time:</b>	Less than 5 minutes (operational), or less than 1 hour (fully stabilised).
<b>Power Supply:</b>	18V to 32V dc.
<b>Power Consumption:</b>	Short Range TX: 3.5 / 5.0*W maximum. Medium and Long Range TX: 5.5 / 7.5*W maximum. RX: 8W maximum.
<b>Enclosure Material:</b>	316 stainless steel.
<b>Weight</b> (inc. mounting bracket)	Short Range TX: 3.5kg. Medium and Long Range TX: 7kg. RX: 3.5kg.
<b>Vibration:</b>	2 to 60Hz, max ptp amplitude 1mm.
<b>Misalignment Tolerance:</b>	Short Range $\pm 0.5^\circ$ ( $\pm \sim 35$ cm at 40m). Medium Range $\pm 0.5^\circ$ ( $\pm \sim 104$ cm at 120m). Long Range $\pm 0.5^\circ$ ( $\pm \sim 170$ cm @ 200m).
<b>EMC Standards:</b>	EN50270:1999
<b>Performance Approval:</b>	FM performance approved.
<b>Safety Approval:</b>	ATEX: EExd IIC T5(-40°C to +65°C). EExd IIC T6(-40°C to +40°C). II 2G. UL: Class 1 Div 1 Groups B,C + D and Class 1 Zone 1 AEx d IIB + H2 (Tamb -40°C to +65°C). CSA: Class 1 Div 1 Groups B,C + D, T5 and Exd IIC T5 (Tamb -40°C to +65°C). FM: Class 1 Div 1 Groups B,C and D Other: SAA, GOSST. Independently assessed to IEC61508
<b>I.P. Rating:</b>	IP66 and IP67.  <sup>(1)</sup> User programmable.  * Turboheating activated (standard feature; user selectable). This is recommended for the most severe weather conditions.



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



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

[www.honeywellanalytics.com](http://www.honeywellanalytics.com)

### Customer business centre

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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	✓

#### Please Note:

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09/06  
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### Searchline Excel is the only open path gas detector in the world that has 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 recognized 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 only 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.



# Honeywell