

*“Changing the way industry looks at gas sensing”*

# GasFinder

## How GasFinder works

Boreal Laser's GasFinder & GasFinder MC are open-path gas detectors that use an integrated transmitter/receiver unit and a remote, passive retro-reflector.

In GasFinder (see below) the transceiver also houses the laser diode, drive electronics, detector module and micro-computer subsystems. The transceiver unit is contained in an IP65 enclosure and has connectors for power input and data I/O. Laser light is emitted from the transceiver through the atmosphere to the reflector and back. The return light is focused onto a photodiode. A portion of the laser beam is passed through an onboard reference cell to provide a continuous calibration update. These two optical signals are then compared to determine the actual concentration of gas along the optical path. The computed gas concentration is displayed on the back panel of the instrument as well as being transmitted to a computer where the data may be displayed and stored.

In GasFinder MC a small Central Control Unit (CCU) contains the laser, electronics and computer. Fibre-optic cable carries the laser light to transmitter heads, which direct the beam along an open path to a reflector. The return light is collected on a photo-detector and the photo current is carried to the CCU via coaxial cable. The transmitter heads are intrinsically safe. One CCU can monitor up to 8 heads.

Both GasFinder and GasFinder MC employ visible aiming lasers, making alignment easy and swift. The outgoing beam diverges and overfills the reflector, providing excellent tolerance to vibration and heating effects.



## Operational Specifications

H2S Sensitivity and Accuracy	Better than 20 ppm-m
Dynamic range	4 orders of magnitude
Response Time	1 second (default) Programmable
Path length	< 1m to > 1000m
Light source	Semiconductor diode laser
Eye Safety	Class I or Class IIIa (ANSI) FDA/CDRH approved
Data I/O Interface Options	RS232, 9600 baud 4-20 mA Current Loop

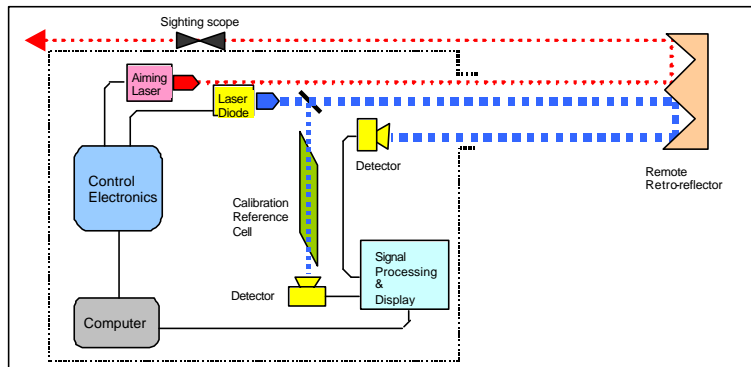
## Physical Specifications

### GasFinder

Weight	5 kg
Dimensions (L x W x H)	26 x 20 x 16 cm
Power Requirements	2A @ 12 Vdc
Ambient Temperature	-30°C to +50°C
Hazardous Area Classification	Cl 1, Div 2, Groups A,B,C,D

### GasFinder MC

<u>Central Control Unit</u>	Weight	12 kg
	Dimensions (W x D x H)	44 x 38 x 13 cm
	Power requirement	<1A @ 110 Vac
	Ambient Temperature	0°C to 50°C
<u>Open Path Transmitter</u>	Weight	4 kg
	Dimensions (L x dia)	35 x 10 cm
	Ambient Temperature	-45°C to +80°C
	Ingress Protection	IP 65
<u>Duct Transmitter Unit</u>	Weight	2 kg
	Dimensions (L x dia)	25 x 12 cm
	Ambient Temperature	-45°C to +80°C
	Number of channels/paths	Up to 8
	Maximum cable lengths	1000 m
	Hazardous Area Classification	Cl 1, Div 1, Groups A,B,C,D Cenelec Zone 1



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**Three patented features** provide laser gas detector leadership in price, performance, and ease of use.

- 1. “No phase adjustment” detection technology:**  
enables paths from 1m to 1000m without requiring any phase adjustments or calibration.
- 2. Built-in, permanent calibration reference cell:**  
means GasFinders are delivered calibrated, stay in calibration and never need to be re-calibrated.
- 3. Fibre-optic multiplexing:**  
enables multiple path/point monitoring.

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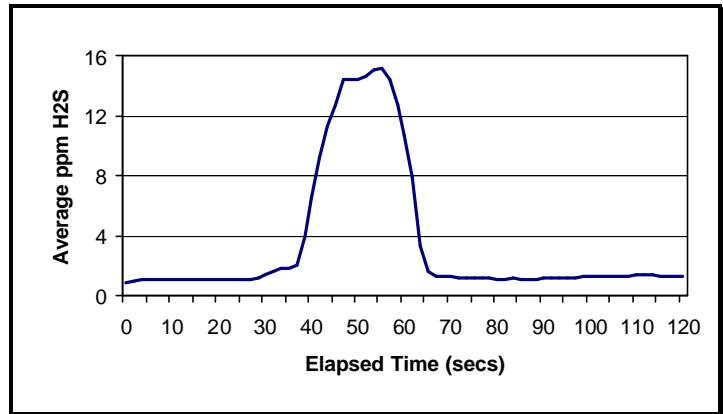
## *H<sub>2</sub>S Safety in Sour Gas Operations*

The sour (H<sub>2</sub>S) content of hydrocarbon fields worldwide is increasing, and many natural gas fields have very high H<sub>2</sub>S – sometimes in excess of 50%. H<sub>2</sub>S is extremely dangerous because, although people can smell it at low levels (about 5 ppb) it does not smell much worse at the exposure limit value of 10 ppm or at potentially fatal levels in excess of 100 ppm. Therefore smell is an unreliable means of determining dangerous levels. Existing H<sub>2</sub>S point sensors are maintenance-intensive, slow to respond and provide limited coverage. Most H<sub>2</sub>S sensors do not work reliably in hot or cold weather, or in humid marine environments.

Open path monitoring with GasFinder detects H<sub>2</sub>S (and/or CH<sub>4</sub>) leaks from oil and natural gas operations quickly and unambiguously. Path lengths can be up to 1 km. GasFinder can be used for fixed monitoring applications or for temporary protection of workers during construction projects.

Using the multiple path capability of GasFinder MC, it is now possible to provide complete facility perimeter coverage at relatively low cost. Linear array early warning detection systems, covering several kilometres with no breaks in coverage, can be established between large producing fields and nearby population centres.

H<sub>2</sub>S safety monitoring with GasFinder can be applied equally well to refineries and sulfur plants. In fact, GasFinders have been monitoring fence line levels of H<sub>2</sub>S at one US refinery for 4 years - over 35,000 hours of continuous trouble-free operation.



GasFinder detecting controlled H<sub>2</sub>S leak on 500m path downwind of a sour gas injection well. Note immediate response and return to background on termination of release

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### Lowest Cost of Ownership

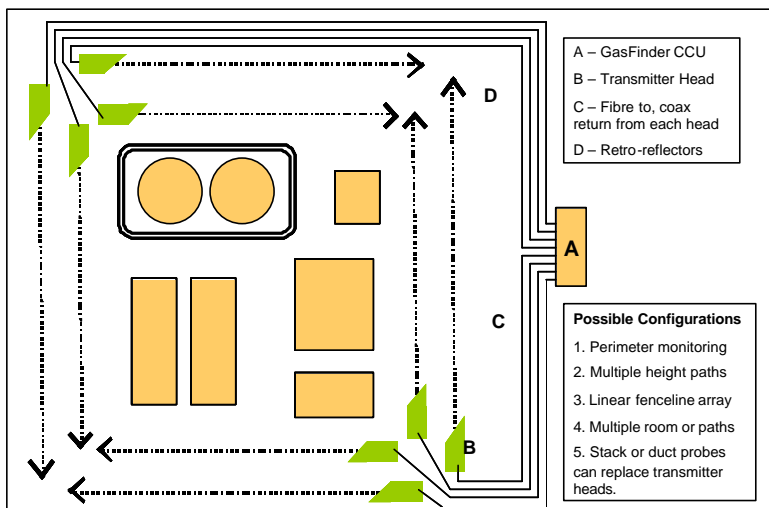
- Low engineering, installation and training costs
- No consumables and no maintenance

### Better than point sensor arrays

- H<sub>2</sub>S specific—no interference from other gases
- 1 second response, 0.2 ppm accuracy over 100 m
- No hysteresis – returns to zero after event
- Detects over a large area, not just single points
- Reliable performance in all conditions

### Better than other open path monitors

- Self-calibrating—no calibration needed
- Easy set-up and alignment
- Path lengths from 1 to 1000 m
- Portable operation possible with GasFinder



GasFinder MC (shown above with INTRINSICALLY SAFE open path transmitter head) can be used in various configurations (left) for improved safety monitoring in sour gas operations