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# OBSERVER-i

## Ultrasonic gas leak detector

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The technologies traditionally used in fixed installations to detect hydrocarbon gas leaks (e.g. catalytic, infrared and linear infrared sensors) share a common limitation: the gas must be in the immediate vicinity of the detector or within a pre-defined area in order to detect a leak.

Unfortunately, external environmental conditions such as changing wind direction and rapid dispersion of the gas cloud escaping from an outdoor installation can cause gas detection to fail because the gas never reaches the detector!

Ultrasonic gas detection uses acoustic sensors to identify noise fluctuations that are imperceptible to the human ear. When a pressurised gas escapes, the leak produces a broadband acoustic noise, which covers audible frequencies up to the ultrasonic frequencies.

Apart from the fact that this type of acoustics-based technology is little affected by changes in wind direction (except for strong headwinds), gas dilution or the direction of the gas leak, it is not gas discriminating. It can therefore be used to detect hydrocarbon leaks.

Finally, we will no longer speak of point gas detectors but of monitoring areas. The **OBSERVER-i** with its advanced technical performance will react instantly when a gas leak occurs, at distances of up to 28 meters (all directions), thus allowing substantial savings in point sensors and their maintenance.

## Product description

The **OBSERVER-i** is a third generation ultrasonic gas leak detector for the rapid detection of gas leaks under pressure (from 2 bar). It uses ANN's patented acoustic technology to detect only gas leaks by suppressing unwanted background noise. It is an advanced and safe method of gas leak detection!

The **OBSERVER-i** is the world's first ultrasonic gas leak detector equipped with Artificial Neural Network (ANN) real-time broadband acoustic sound processing technology. This technology is based on extensive studies and real recording of gas leak sounds and industrial background noise from a wide array of industry sources over the years.

### An innovative artificial intelligence algorithm

By using new artificial neural network (ANN) algorithms, the frequency range of the **OBSERVER-i** detector can be extended to 12 kHz without taking into account unwanted background noise. Compared to previous versions of ultrasonic gas leak detectors, the low frequency range significantly increases the detection range in all application areas while maintaining immunity to false alarms.

ANN technology allows for installation without time-consuming setup sequences and industry-leading remote detection with the unprecedented suppression of false alarms. In addition, the technology ensures a consistent gas leak detection coverage radius in both noisy and quiet areas.

### Automatic acoustic test technology

The **OBSERVER-i** incorporates the patented and proven Senssonic™ automatic test function. This automatic test checks the electrical integrity of the device as well as the microphone every 15 minutes and thus ensures the functionality of the detector at all times. The microphone and its windscreen are constantly monitored to ensure optimum sensitivity and coverage radius.

The Senssonic™ automatic test is the only technology on the market that automatically tests the microphone system and the microphone shield. This ensures that dirt and other contaminants on the detector's weather shield that may reduce its detection performance are detected.



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## Technical specifications

| System Specifications | |
|---|---|
| Detector Type | Ultrasonic (acoustic) gas leak detector |
| Background Noise Rejection Method | Artificial Neural Network (ANN) |
| Gas Leak Recognition Method | Artificial Neural Network (ANN) |
| Min. Acoustic Det. Frequency (ANN Mode) | 12 kHz |
| Min. Detection Limit | 40 dB (u) |
| Accuracy | ±3 dB |
| Self-test | Performed every 15 minutes |
| Min. Pressure Requirement | 2 BAR (29 psi) |
| Detector Coverage (ref. Methane) | **Enhanced Mode (ANN) (@ 0.1 kg/sec):**<br>FQHI setting (59 dB ANN sensitivity level):<br>17 meters (56 ft.) Default<br>*Ultra-high to medium background noise*<br>FQLO setting (54 dB ANN sensitivity level):<br>28 meters (92 ft.)<br>*Medium to low background noise*<br><br>**Classic Mode (@ 0.1 kg.sec):**<br>Ultra-high: 7 meters w/84 dB T.L.<br>High: 12 meters w/74 dB T.L.<br>Medium: 18 meters w/64 dB T.L.<br>Low: 24 meters w/54 dB T.L. |
| Response Time | < 1 s (speed of sound) |
| Approvals Classification | **ATEX/IECEx :**<br>Ex d ia IIB+H2 Gb T6, Ex tb IIIC T85°C Db<br>(Ta = –40 °C to +60 °C)<br>**CSA :**<br>Ex d ia IIB+H2 Gb T6, Ex tb IIIC T85°C Db<br>**FM/CSA :**<br>Classe I, Div. 1, 2 Groups B,C,D ;<br>Classe II, Div. 1, 2 Groups E,F,G ;<br>Classe III, T5<br>(Ta = –40 °C to +60 °C) |
| Approvals | ATEX, CSA, FM, IECEx, CE<br>HART 6.0 registered<br>FM certified to IEC 61508 (SIL 3) |
| Accessories | 1701 Test and Calibration Unit<br>SB100 Bump Test Tool |
| Device Drivers | DDL, DTM available at MSAsafety.com |
| Warranty | 2 years |

| Electrical Specifications | |
|---|---|
| Input Power | 15–36 VDC, 250 mA max.<br>24 VDC, 170 mA nominal |
| Relay Ratings (optional) | 8 A @ 250 VAC |
| Current Output (sink or source) | **Status Indications:**<br>0 mA : Start up, no power<br>1 mA : Pulsed acoustic error<br>3 mA : Unit inhibit<br>**Classic Mode:**<br>4–20 mA, 40–120 dB (u)<br>**ANN Mode:**<br>4–12 mA, 40–120 dB (u)<br>16 mA, warning<br>20 mA, alarm |
| EMC/RFI | EMC Directive 2004/108/EC<br>EN 61000-6-2, EN 61000-6-4 |
| Serial Digital Communication | HART, Modbus |
| Cable Requirements | Max. cable length between Observer-i and power source @ 24 VDC (20 ohm) 2.08 mm2 (14 AWG) – 1,809 m (5,928 ft) |

| Environmental Specifications | |
|---|---|
| Operating Temperature Range | –40°C to 60°C (–40°F to 140°F) |
| Operating Humidity Range | 10-95 % HR, non-condensing |

| Mechanical Specifications | |
|---|---|
| Housing | Stainless Steel AISI 316L |
| Dimensions | 203 x 203 x 201 mm<br>(7.99 x 7.99 x 7.91 in) |
| Weight | 7.5 kg (16,6 lbs) |
| Conduit Entries | M20 x 1,5<br>(additional ¾" NPT adapter available) |
| Mounting Holes | 2 x mounting screws – M8 x 19 max |
| Ingress Protection | IP66 / Type 4X |
| Standard Configuration | OBSERVER i-1-1-1-1-1-1 |



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