

OBSERVER-*i* Ultrasonic Gas Leak Detector

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 upon extensive studies and real recording of gas leak sounds and industrial background noise from a wide array of industry sources. The ANN algorithm has been “trained” with these recordings to automatically distinguish between unwanted acoustic background noise and potentially hazardous gas leaks.

Using ANN technology, the OBSERVER-*i* makes it possible to fully analyze the sound spectrum from 12 kHz and beyond, as common high pass filters are not used. This process provides a broader leak detection range that also increases sensitivity for detection of smaller gas leaks, without interference from unwanted background noise.

ANN technology enables the OBSERVER-*i* to be installed without time-consuming training sequences, and provides industry-leading detection distance with unprecedented suppression of false alarms. In addition, ANN technology ensures that the OBSERVER-*i* has the same gas leak detection coverage within high and low noise areas. Further, as it is self-adaptive, the device requires no alarm set points to be configured, nor do alarm set points need to be adjusted if background ultrasound were to increase or decrease over time.

The OBSERVER-*i* is backwards-compatible with earlier versions of the Observer detector family by means of the Classic Mode setting, where ANN is disabled and the electrical interface matches earlier versions of Observers. The OBSERVER-*i* features the patented Senssonic™ self-test function. This well-proven self-test checks the device’s electrical integrity and microphone every 15 minutes and ensures that the OBSERVER-*i* is operational at all times. The microphone and microphone windscreen are constantly monitored to ensure that the detector always has optimal sensitivity and detection coverage.

Features	Benefits
ARTIFICIAL NEURAL NETWORK (ANN)	Improved detection range and background noise rejection prevents false alarms
SENSSONIC INTEGRATED ACOUSTIC SELF-TEST	Fail-safe operation
ONE-PERSON ACOUSTIC SOUND CHECK WITH TRACEABLE PORTABLE TEST UNIT	High reliability and trouble free maintenance
HART AND MODBUS	Provides complete status and control capability in the control room
EVENT LOGGING	Stores fault, sound check, calibration, and alarm event history

Applications

- Floating production
- Storage and offloading vessels (FPSOs)
- Gas compressor and metering stations
- Gas storage facilities
- Hydrogen storage facilities
- LNG/GTL trains
- LNG re-gasification plants
- Offshore and onshore oil and gas installations
- Petrochemical processing plants



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
DETECTOR COVERAGE (ref. methane)	<p>Classic Mode (@ 0.004kg/sec)</p> <p>Ultra high 10 ft. (3 m) High 20 ft. (6 m) Medium 36 ft. (11 m) Low 46 ft. (14 m)</p> <p>Classic Mode (@ 0.01 kg/sec)</p> <p>Ultra high 16 ft. (5 m) High 30 ft. (9 m) Medium 43 ft. (13 m) Low 52 ft. (16 m)</p> <p>Classic Mode (@ 0.1 kg/sec)</p> <p>Ultra high 23 ft. (7 m) High 39 ft. (12 m) Medium 56 ft. (17 m) Low 69 ft. (21 m)</p> <p>ANN Mode (min. trigger level 49 dB)</p> <p>0.004 kg/s 66 ft. (20 m) 0.01 kg/s 82 ft. (25 m) 0.1 kg/s 98 ft. (30 m)</p>
RESPONSE TIME	< 1 s (speed of sound)
APPROVALS CLASSIFICATION	<p>ATEX/IECEX Ex d ia IIB+H2 Gb T6, Ex tb IIIC T85°C Db (Ta = -40°C to +60°C)</p> <p>CSA Ex d ia IIB+H2 Gb T6, Ex tb IIIC T85°C Db</p> <p>FM/CSA Class I, Div. 1, 2 Groups B, C, D; Class II, Div. 1, 2 Groups E, F, G; Class III, T5 (Ta = -40°C to +60°C)</p>
APPROVALS	ATEX, CSA, FM, IECEx, CE HART 6.0 registered FM certified to IEC 61508 (SIL 3)
ACCESSORIES	GASSONIC 1701 test and calibration unit GASSONIC SB100 bump test tool
DEVICE DRIVERS	DDL, DTM available at generalmonitors.com
WARRANTY	2 years

Environmental Specifications	
OPERATING TEMPERATURE RANGE	-40°F to 140°F (-40°C to 60°C)
OPERATING HUMIDITY RANGE	10-95% RH, non-condensing

Mechanical Specifications	
HOUSING	Stainless steel AISI 316L
DIMENSIONS	7.99" x 7.99" x 7.91" (203 x 203 x 201 mm)
WEIGHT	16.5 lbs (7.5 kg)
MOUNTING HOLES	2x mounting screws – M8 x 19 max
INGRESS PROTECTION	IP66 / Type 4X
STANDARD CONFIGURATION	OBSERVER-i-1-1-1-1-1-1

Electrical Specifications	
INPUT POWER	15-36 VDC, 250 mA max. 24 VDC, 170 mA max
RELAY RATINGS (optional)	8 A @ 250 VAC
CURRENT OUTPUT (sink or source)	<p>Status Indications</p> <p>0 mA: Start up, no power 1 mA: Pulsed acoustic error 3 mA: Unit inhibit</p> <p>Classic Mode</p> <p>4 – 20 mA, 40 – 120 dB (u)</p> <p>ANN Mode</p> <p>4 – 12 mA, 40 – 120 dB (u) 16 mA, warning 20 mA, alarm</p>
EMC/RFI	HART, Modbus
CABLE REQUIREMENTS	Max. cable length between Observer-i and power source @ 24 VDC (20 ohm) 2.08 mm ² (14 AWG) – 5,928 ft. (1,809 m)