

GASSONIC SURVEYOR

ULTRASONIC GAS LEAK DETECTOR

APPLICATIONS (EXAMPLES)

- Offshore and Onshore Oil and Gas Installations
- Petrochemical Processing Plants
- Gas Pipeline Compressor Stations
- Gas Storage Facilities
- Hydrogen gas leak detection

FEATURES

- Intrinsically safe, EEXi design
- Instant detection of pressurized gas leaks (from Ø 2 mm)
- Not sensitive to changing wind directions and gas dilution
- Wide dynamic range (44-104 dB)
- Advanced microphone technology ensuring well-defined and wide detection coverage (up to 20 metre radius at a leak rate of 0.1 kg/s)
- Interface outputs include 4-20 mA analogue and alarm/fault relays
- Full AISI 316L stainless steel enclosure ensuring corrosion resistance in harsh environmental conditions
- Minimal maintenance and calibration requirements
- Compatible with the Gassonic 1701 - Portable Test and Calibration Unit
- Retrofittable with Gassonic MM0100 installations
- ATEX and IEC Ex certified



INTRODUCTION

The Gassonic Surveyor is a microphone based ultrasonic gas leak detector that detects gas leaks by sensing the airborne ultrasound emitted from leaking gas at high pressure. Traditional gas detection systems (infrared and catalytic point and open path gas detection) rely on a concentration build up of the leaking gas to enable detection.

These systems work fairly well in closed or indoor installations, but in outdoor, ventilated areas such as offshore platforms, many gas leaks can go undetected for long periods of time. The problem is that due to the nature of these systems, the gas needs to be in physical contact with the sensor or within the path of an

infrared light beam before it can be detected. In outdoor installations this is very difficult to ensure, as the leaking gases are rapidly diluted or blown away by the wind.

Instead of "sniffing" the gas and relying on an LEL concentration level, the Gassonic Surveyor instantly detects the distinct ultrasonic noise emitted by the leaking gas. Ultrasound emitted from a gas leak is not affected by the wind direction or diluted as is a gas cloud. This makes the Gassonic Surveyor the optimal choice for instant and reliable fixed gas leak detection in outdoor applications.

GASSONIC

THE GASSONIC SURVEYOR

The Gassonic Surveyor ensures gas leak detection at the speed of sound. It does not need the gas to accumulate or come into physical contact with the detector. As a consequence, it may reduce hazardous situations from escalating into catastrophic scenarios. The Gassonic Surveyor is an intrinsically safe ultrasonic gas leak detector based on robust and proven microphone technology. It is designed for long and reliable operation in extreme environmental conditions.



1 ELECTRICAL INTERFACES

- Analogue 4-20 mA for real-time readout of ultrasonic sound level and error/fault conditions
- Separate alarm relay and fault/error relay output

2 VISUAL INDICATION (LED)

- Visual indication for various detector functionalities

3 ROBUST MICROPHONE TECHNOLOGY

The Gassonic Surveyor is based on customized stainless steel microphones designed to withstand rough handling and corrosive environments. The microphones are manufactured with the highest precision to ensure tolerances of less than one micron. The microphone technology has demonstrated extraordinary long term stability in all weather conditions. This conclusion is based on more than 10 years of field experiences with installation of Gassonic detectors in environmentally challenging surroundings, including installations in remote desert areas (Oman) and Arctic locations (Russia). The microphone is protected by a wind screen.

4 INTEGRATED CABLE TERMINATION

Integrated cable termination. No extra junction box needed.

5 EXTERNAL DETECTOR SET-UP

- Externally operated in EEX hazardous areas by means of magnet stick. Enables field testing and calibration.
- Compatible with the Gassonic 1701 – Portable Test and Calibration Unit for onsite testing and calibration



DETECTION COVERAGE

The Gassonic Surveyor will instantly raise an alarm when it picks up the noise generated by leaking pressurized gas. The Gassonic Surveyor will not wait for the gas to accumulate into a potentially dangerous cloud, but reacts immediately upon a gas release.

Unlike other gas detection technologies the Gassonic Surveyor offers the ability to calculate the detection coverage. When calculating the coverage of the Gassonic Surveyor, three factors must be considered:

- 1) Leak size
- 2) Gas pressure
- 3) Ultrasonic background noise level

GAS LEAK RATE

The gas leak rate is an indicator of the amount of gas that will escape through a leak. This is very important as it is a measure of how rapidly a potentially dangerous gas cloud will accumulate from the leak. The gas leak rate is influenced by the leak size and the gas pressure. For a hydrocarbon gas leak, 0.1 kg/s is typically used as the performance standard for leak detection. This is considered a small leak.

ULTRASONIC BACKGROUND NOISE LEVEL

The Gassonic Surveyor filters out low-frequency background noise below 25 kHz. However, a few noise sources may generate ultrasonic

noise above 25 kHz. To prevent this from triggering the detector, a background noise survey of the plant should be performed using an ultrasonic mapping meter.

A background noise survey makes it possible to adjust the sensitivity of the individual detector ensuring that it is not affected by the ultrasonic background noise in the area it is covering.

COMMISSIONING AND VERIFICATION

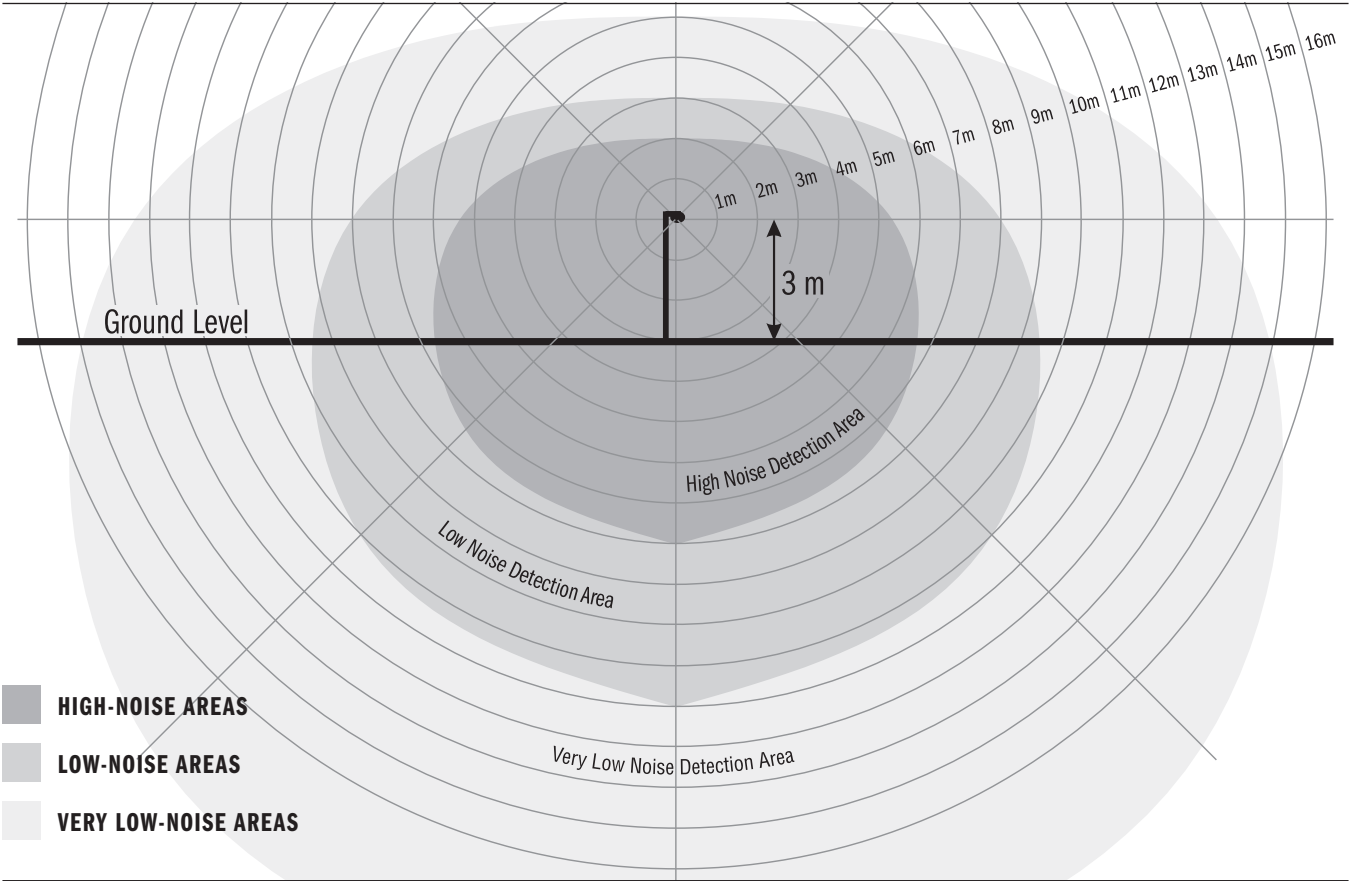
During commissioning, real gas leak simulation can be performed to precisely verify the actual detection coverage area. This is done by means of nitrogen gas.

COVERAGE CHARACTERISTICS

The detection coverage of the Gassonic Surveyor is determined by the ultrasonic noise levels in the area of installation. Experience has shown that most process environments can be divided into three overall noise levels. This is illustrated in the image on the next page.

The detection coverage characteristics are based on live tests and show the minimum coverage of the Gassonic Surveyor detector in areas without solid physical obstructions between the detector and the leak. Gassonic A/S can be consulted on further instructions related to installation.

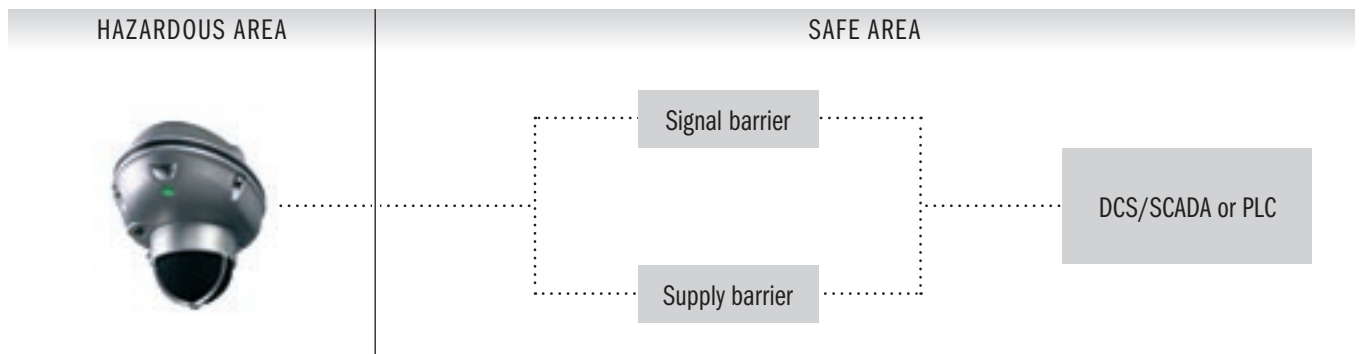
DETECTION COVERAGE CHARACTERISTICS



HIGH-NOISE AREAS In "high-noise areas" (background noise < 78dB), the trigger level must be set at 84 dB. This corresponds to a detection radius of 5-8 metres.	Typical areas: <ul style="list-style-type: none">• Turbo compressor areas• Completely open offshore weather deck• Next to very noisy machinery
LOW-NOISE AREAS In "low-noise areas" (background noise < 68dB), the trigger level must be set at 74 dB. This corresponds to a detection radius of 9-12 metres.	Typical areas: <ul style="list-style-type: none">• Areas with no machinery• Areas with low frequency machine made noise
VERY LOW-NOISE AREAS In "very low-noise areas" (background noise < 58dB), the trigger level must be set at 64 dB. This corresponds to a detection radius of 13-20 metres.	Typical areas: <ul style="list-style-type: none">• Onshore wellhead areas in calm environment• Salt dome gas storage facilities in calm environment

INSTALLATION PRACTICE

The Gassonic Surveyor is intrinsically safe, EEXi. It can be installed on its own or in conjunction with other detection equipment. If the detector is to be placed in an EEX area, the power supply and the alarm relay output must be connected in a safe area through proper EEX barriers. The Gassonic Surveyor can be connected directly to the plant alarm system (DCS, PL/PLC, Fire&Gas, SCADA). This is illustrated below.



MAINTENANCE

The Gassonic Surveyor is practically maintenance free and does not require regular calibration. However, most plant regulations require regular tests of the equipment. The Gassonic 1701 is a customized portable test and calibration unit, which can be used for onsite testing and calibration of the Gassonic detectors.

GASSONIC PRODUCT RANGE – COMPARISON OF ULTRASONIC GAS LEAK DETECTOR MODELS

FEATURE	Gassonic MM0100	Gassonic Surveyor	Gassonic Observer
Design philosophy	EEXi	EEXi	EEXd
Hazardous area certification	ATEX, UL/ULC	ATEX, IECEx	ATEX, UL/ULC, IECEx, GGTN
Acoustic self-test (Senssonic™)			✓
Digital communication RS485			✓
Interface 4 – 20 mA		✓	✓
Interface: Fault relay		✓	✓
Interface: Alarm relay	✓	✓	✓
Alarm trigger level steps	10 dB	5 dB	5 dB
Internal alarm delay setting	15, 30, 60, 120, 240, 480 sec.	0 to 150 sec. in 10 sec . steps	0 to 600 sec. in 10 sec. steps
User interface		LED indications	Full interactive display
Cable connection	Fixed 6 metre flying lead cable	Integrated cable connection compartment	Integrated cable connection compartment
Detector set up	Internal	Internal	External
Coverage @ 0.1 kg/sec	5-20 metres	5-20 metres	5-20 metres
Field testing (w/ Gassonic 1701)	✓	✓	✓
Field calibration (w/ Gassonic 1701)		✓	✓
Dynamic range	44-104 dB	44-104 dB	58-104 dB
Material	Fibreglas reinforced duroplastic	Stainless steel	Stainless steel
Temperature range	-40 to +55	-40 to +75	-40 to +60

BASIC SPECIFICATIONS FOR THE GASSONIC SURVEYOR

GENERAL DESCRIPTION

Detector type: Ultrasonic Gas Leak Detector
for fixed installations
Sensor technology. SS Microphone technology
Detector frequency range 25 kHz – 70 kHz
Dynamic range 44 dB – 104 dB SPL
Response time Instant
Detection coverage (leak rate 0.1 kg/s) 5 - 20 metre radius

POWER REQUIREMENTS (MINIMUM)

When using 4-20mA and Relay output
Input Voltage 13Vdc
Input Current 38mA
Input Power 494mW

When using Relay output only

Input Voltage 13Vdc
Input Current 27mA
Input Power 351mW

SAFETY DESCRIPTION

Power Supply

Ui 28Vdc
Ii 150mA
Pi 920mW
Ci 10nF

4-20mA source output

Uo. 5.88Vdc
Io 100mA
Co. 22nF

Relay (Galvanic isolated)

Ui 28Vdc
Ii 150mA
Pi 920mW

OUTPUT METHODS

Analogue interface

0 mA Low supply voltage/No power
3mA. Unit locally inhibit
4 - 20 mA 44 - 104 dB SPL

Relay (Option 1 or 2 operator selectable)

Option 1 Alarm relay (switch on preset trigger level)
Option 2 Error relay

NAMUR/Dry contact (Operator selectable)

NAMUR output
Normal 1.28k Ω \pm 1%
Alarm 10k Ω \pm 1%

ENVIRONMENTAL DATA

Operating temperature - 40 °C to + 75 °C
Humidity 0 to 100 % relative humidity
Ingress Protection IP66

CONSTRUCTION

Stainless steel AISI 316L
Weight: 2.24 kg

VIBRATION SENSITIVITY

0.13 m/s² perpendicular to the membrane will trigger the unit in the most sensitive range (44dB SPL)

DIMENSIONS

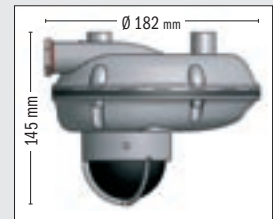
Ø 182*145 mm (7.17*5.71 in)
Two gland/conduit entries: M20 x 1.5

RF EMISSION AND IMMUNITY

Tested according to:
General electrical safety: EN61010-1
RF emission: EN61000-6-4
RF immunity: EN61000-6-2

CERTIFICATIONS

ATEX: II 2G EEx ia IIC T4
IECEX: EEx ia IIC T4



ORDERING INFORMATION

ACCESSORIES

Portable test and calibration unit: Gassonic 1701
Mounting bracket: UA1352A
Spare wind screen: DS0592A
Spare microphone: MM4190

CONSULTING SERVICES

Onsite sound mapping survey and detector allocation
Onsite commissioning and personnel training

GASSONIC

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