

GASSONIC MM0100

ULTRASONIC GAS LEAK DETECTOR

USES

- Instant detection of pressurized gas leaks
- On-/Offshore gas installations

FEATURES

- Intrinsically safe, EExi design
- Not sensitive to changing wind directions
- Not sensitive to fast dispersion of escaping gas
- Detects hydrocarbon gas leaks at the speed of sound with leak rates as small as 0.1 kg/sec (4 mm leak at 35 BAR)
- Leak detection up to 20 metres from the detector
- No calibration and minimal maintenance required
- Detection of all gases
- Sophisticated stainless steel microphone
- No delicate optical parts
- No saturation by high gas concentrations
- Meets ATEX and UL/ULC regulations for hazardous area installation



INTRODUCTION

The Gassonic MM0100 is an intrinsically safe 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 be able to detect it. 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 very quickly diluted or blown away by the wind.

Instead of “sniffing” the gas, the Gassonic MM0100 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 like a gas cloud. Practical experience has shown that ultrasound emitted from leaking gas can be detected, up to 20 metres away from the leak!

The Gassonic MM0100 is a pure analog ultrasonic gas leak detector, which has a track record of more than 1800 installed units worldwide in the petrochemical industry. It is the optimal choice for instant and reliable gas leak detection in outdoor applications. The ultrasonic gas leak detector does not provide concentration levels in LEL as do traditional gas detectors; instead it instantaneously emits an alarm signal if a leak is detected.

THE GASSONIC MM0100

The Gassonic MM0100 is designed for extreme environmental conditions with a robust stainless steel microphone unit to ensure reliable detection. The trigger level of the Gassonic MM0100 can easily be adjusted on the individual detector according to the background noise found in the area. Besides, the detector has a built-in alarm delay function to prevent any false alarms from occurring due to brief leak-like sounds. Because the microphone unit is an extremely stable transducer and the detector does not consist of any consumerables, the Gassonic MM0100 has an MTBF of more than 25 years Naval Sheltered.

DETECTION COVERAGE

The Gassonic MM0100 will instantly raise an alarm when it picks up the noise generated by leaking pressurized gas. The Gassonic MM0100 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 MM0100 offers the ability to calculate the detection coverage. When calculating the coverage of the Gassonic MM0100, 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

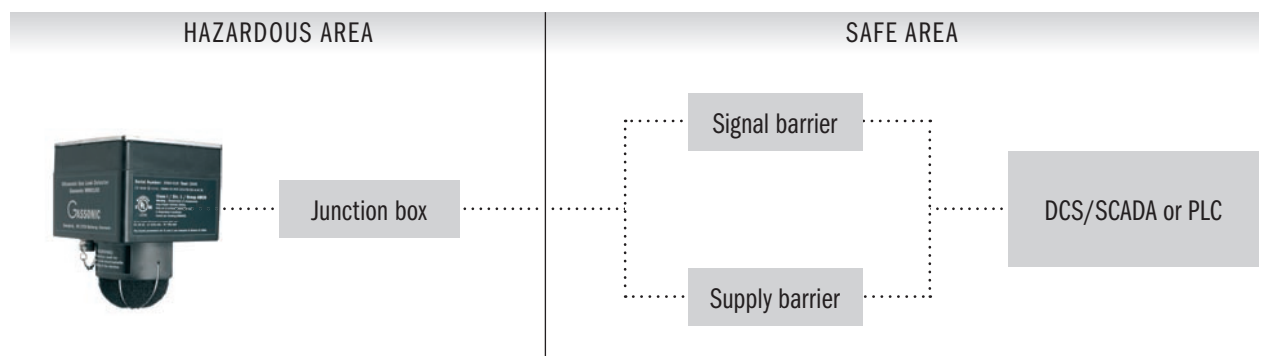
The Gassonic MM0100 filters out low-frequency background noise below 25 kHz. However, a few noise sources may generate ultrasonic noise above 25 kHz. To prevent this from triggering the detector, a background noise survey of the plant should be performed using an ultrasonic mapping meter. A background 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 verify the actual detection coverage area. This is done by means of nitrogen gas.

INSTALLATION

The Gassonic MM0100 is intrinsically safe, EExi. It can be installed on its own or in conjunction with other detection equipment. If the detector (and the junction box) 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 MM0100 can be connected directly to the plant alarm system (DCS, PL/PLC, Fire&Gas, Scada). This is illustrated below.

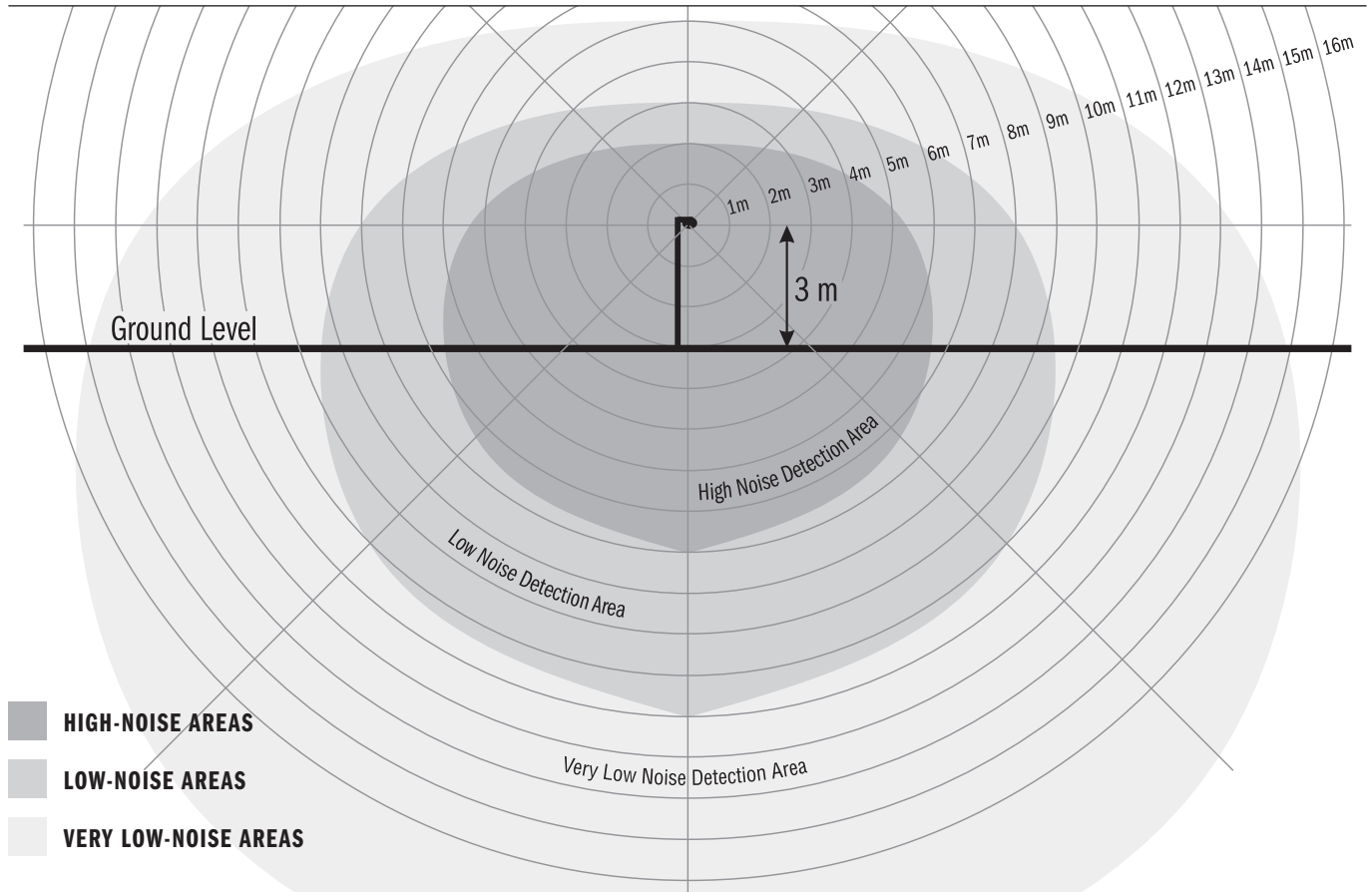


MAINTENANCE

The Gassonic MM0100 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 customised portable test and calibration unit, which can be used for onsite testing and calibration of the Gassonic MM0100.

DETECTION COVERAGE CHARACTERISTICS

The detection coverage of the Gassonic MM0100 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. The detection coverage characteristics below are based on live tests and show the minimum coverage of the Gassonic MM0100 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.



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:

- 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:

- 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:

- Onshore wellhead areas in calm environment
- Salt dome gas storage facilities in calm environment

BASIC SPECIFICATIONS FOR THE GASSONIC MM0100

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

Input voltage 15 – 28 V DC
 Maximum current consumption 30 mA

TRIP OUTPUT DATA

Contact Resistance

Normal 1.28kΩ ± 1%
 Alarm 10 kΩ ± 1%
 (No power or ultrasonic noise level above trigger level)

Maximum Contact Power

0.25 W (25 V, 10 mA)
 Note: the trip output is not connected to the inputs or the chassis.
 Consequently, the resistance to any other wire or part is greater than 10 MΩ

VIBRATION SENSITIVITY

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

CONNECTIONS

2 pair armed EC 60331

Power Supply Inputs: Pair 1

Blue wire + 24V DC
 Black wire 0V DC

Trip Outputs: Pair 2

Blue/Black wires Signal (Alarm/Normal)
 Armour braiding Earth
 Collective screen and drain wire Cut back and insulated

ENVIRONMENTAL DATA

Operational temperature range -40°C to 55°C
 Humidity 0 to 100% relative humidity
 Ingress Protection IP66

MTBF

NS (Naval Sheltered) 25.6 years

DIMENSIONS

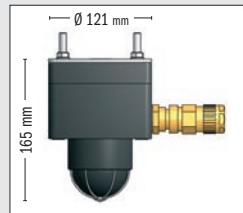
Housing Ø 121 x 165 mm (Ø 4.76 x 6.50 in)
 Cable Length: 6 m (integrated)

RF EMISSION AND IMMUNITY

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

APPROVALS

ATEX: EEx ib IIC T6
 UL/ULC: CLASS 1 DIV 1 Groups ABCD



Gassonic MM0100	Gassonic EH6028
Alarm Settings	
Levels (dB): 44, 54, 64, 74, 84, 94, 104 (Factory setting: 84) SPL	Levels (dB): 54, 59, 64, 69, 74, 79, 84, 89, 94, 99 (Factory setting: 79) SPL
Delay time: 0 sec, 15 sec, 30 sec, 2 min, 8 min (Factory setting: 15 sec)	Delay time: 0 sec
Microphone Output	
High-pass cut-on frequencies (kHz): 10, 15, 20, 25 (Factory setting: 25)	High-pass cut-on frequencies (kHz): 25

ORDERING INFORMATION

CONSULTING SERVICES

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

ACCESSORIES

Spare Microphone (fitted with SS protection grid): MM4189
 Windscreen: DS0592
 Protective windscreen holder: WU0399
 Allen screw and chain kit: UA1358A
 Junction box: Gassonic 1702
 Mounting bracket: UA1352A
 Portable test and calibration unit: Gassonic 1701

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