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GASSONIC OBSERVER-*i*
Frequently Asked Questions

What is Artificial Neural Network (ANN)?
The ANN uses a mathematical algorithm to search for familiarity in large and complex sets of data. ANN works similarly to the way the human brain processes the constant flow of information. For example, when we meet a person, our eyes transfer immense visual data to the brain, and over time, this vast information is recalled to recognize this person over time, even years later. It can also be used to connect that person to their relatives.

In essence, the more we train our brain to recognize familiarity, the better we will be able to recognize or deny a person's face. The brain does not look for an exact match, it looks for familiarity, and so does the ANN. The ANN algorithm of the Gassonic Observer-i has the ability to not only recognize the distinct sound signature from a gas leak, but has the ability to discern between familiar sound signatures and those from acoustic background noise not related to gas leaks – and reject them.

Did the ANN learn gas leaks or background noise, or a combination of the two?
The ANN learned a combination of both. The ANN algorithm was taught using a multitude of non-leak and gas leak events.

Does the Observer-i learn the "normal" background noises of a plant?
The Observer-i does not learn in the field. Utilizing ANN Technology, it has already been taught. To pre-train the unit, we gathered countless readings and samplings in plant noise, e.g., grinders, compressors, machinery, and so on, eliminating the need for further in-field training. It is important to note that some detectors do require training in the field and that can prove to be quite complicated, requiring special PC software.

Why is the FQHI the default setting if it's not necessary for the majority of applications?
The Gassonic Observer-i is marketed for compressor houses. Some are turbine compressors which emit high levels of ultrasonic noise. In these ultra-high noise areas, you will need the FQHI setting. We market this unit as "plug and play;" take out of box and put into your application. We want to ensure this works in the worst case application – turbine compressors.

Is a site survey required to select FQHI or FQLO?
No, it is not required; however, to determine which setting works best for that particular application, you can survey the site in the field, on the unit itself. Site surveys are required for UGLD not utilizing ANN technology to determine the trigger level setting and coverage of the detector. It is important to

determine the coverage of the detector in order to allocate the number and positioning of the detectors. Because of the ANN, we know that the Gassonic Observer-i can detect 0.1 kg/sec leaks up to 17 meters away, out of the box with FQHI and 28 meters with a FQLO setting. We do not require a noise survey, but we can provide guidelines on the number of units needed and the allocation of the units.

So we should spec a range of 17 meters to be safe?
No, only if the application is over a compressor.

Will the Observer-i track and display ultrasonic noise or only noise from gas leaks?
The Observer-i will display the ambient background noise in dB on the unit's display and when a gas leak occurs, an "A" will be displayed and after the delay time the readout will blink. The ambient background noise dB level and gas leak alarm is also available on the analog output of the unit.

Is the 4-20mA = 0-XX kg/sec leak rate or is it simply a step change to indicate a leak is present that exceeds 0.1 kg/sec?
When the unit's ANN algorithm detects a positive leak, any leak - big or small - that is loud enough for the detector to recognize, the Analog output jumps to 16 mA, indicating a warning, and after the internal delay time runs out, it jumps to 20 mA. Either you have a leak or you do not have a leak.

Can you approximately locate a gas leak using the Observer-i or is this done in conjunction with fixed point detectors?
A single Observer-i cannot locate a gas leak, but you will know that it is in the detector's location. Triangulation is possible if other Observer's are used in overlapping coverage installation.

When would the Classic Mode be recommended?
The Classic Mode option was reintroduced in order to satisfy all customers. This mode remains available for current customers who are using previous versions of the Observer. If these customers do not want to go into Enhanced Mode and use ANN, but just want to plug and play in their existing configuration, the Classic Mode is the most suitable option. New customers will prefer the Enhanced Mode.

Would Enhanced Mode ALWAYS outperform Classic Mode?
Yes, Enhanced Mode delivers better coverage, but still maintains a high level of false alarm immunity. Even in the Enhanced Mode FQHI setting, the Gassonic Observer-i is capable of detecting a 0.1 kg/sec gas leak up to 17 meters (56ft) away. The Classic Mode relies on dB trigger levels set to a safe amplitude above the ambient background noise. For an ultra-high noise area (turbine compressor), a Classic Mode trigger level of up to 84 dB might be needed and this will result in a maximum 0.1 kg/sec gas leak coverage of 7 meters (23ft).

How do these units perform inside an oil refinery where the pressure levels are traditionally lower?
We have installations in refineries, mostly at the H2 areas and the high pressure areas. This technology is excellent for detecting pressurized hydrogen (H2).

Is the unit prone to icing?
No, we have thousands of Observer-Hs and earlier units installed in the North Sea (Arctic Circle) and there are no reported problems with icing. If the unit does get ice buildup over the sensor, the Senssonic self-test (patented external acoustic self-test) will warn of the condition. The unit's temperature range is -40°C to 60°C (-40°F to 140°F).

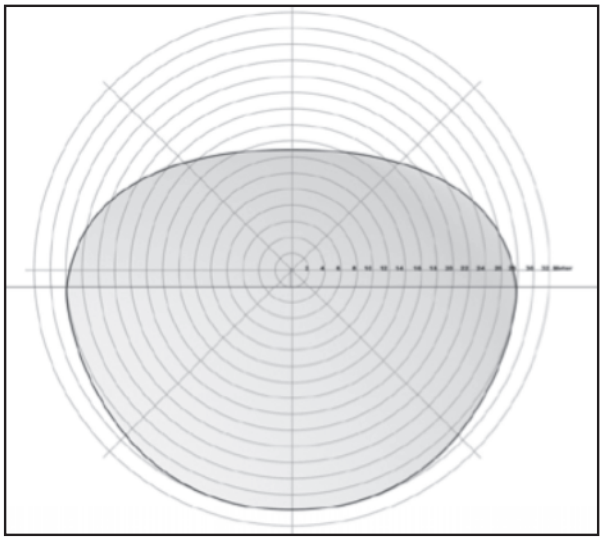
Will the Observer-i recognize an air leak as a false alarm?
Instrumentation air is normally lower pressure with smaller leaks, resulting in lower leak noise than a system gas leak. However, if the air leak is close enough to the detector it will detect it as a leak. This is why placement of the UGLD is very important to prevent false alarms from air leaks.

Will the Observer-i detect steam leaks?
Yes, if the steam is under high pressure, so called "super-heated" steam.

Is there an internal clock used by the ANN?
The Observer-i, like all electronic instruments, runs on an internal clock. This also makes it possible to have event logging, which the Observer-i is doing.

How many degrees of angle can the Observer-i detect… 360?

The unit is omni-directional, but has slightly more coverage downwards.



Is there a way to calibrate the Observer-i?

The Observer-i does not require calibration. Nevertheless, we have a portable test and calibration unit called the Gassonic 1701. If the customer's plant regulations require calibration of ultrasonic gas leak detectors, the 1701 unit can be used. The 1701 itself is a calibrated unit and needs factory calibration every two years.

What happens if background noise in a plant changes over time?

Plant conditions change constantly. For instance, if the plant is running at 50% capacity at installation and over time goes to 90%, the ultrasonic signature will change. Also if new equipment is introduced or if existing equipment gets older, the ultrasonic signature will change. Since the Observer-i uses ANN technology and has been pre-trained, no re-training is needed for the unit.

Do competitors use the range down to 12 kHz?

No, the Observer-i is the only UGLD that can go down to 12 kHz.

What is the competitive advantage to go down to 12 kHZ?

Lower frequencies travel further than high frequency. A leak noise has frequencies in the full sound spectrum (20 kHz to 100 kHz), both audible frequency and ultrasonic frequency. If the detector listens to the lower frequency, the detection distance is longer, due to the fact that 12 kHz leak noise is traveling further than that of 20 or 25 kHz leak noise. Earlier generations of Ultrasonic Gas Leak Detectors only "listened" for the gas leak noise in the ultrasonic frequency range from about 25 kHz and up, but by means of the new ANN sound algorithms in the Gassonic Observer-i, the detector's frequency range can be lowered to 12 kHz without picking up unwanted background noise.

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For more information, visit www.MSAgasdetection.com

Note: This bulletin contains only a general description of the products shown. While uses and performance capabilities are described, under no circumstances shall the products be used by untrained or unqualified individuals and not until the product instructions including any warnings or cautions provided have been thoroughly read and understood. Only they contain the complete and detailed information concerning proper use and care of these products.

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