

Fixed Ultrasonic Gas Leak Detection, an Integrated Technology in Modern Fixed Fire and Gas Detection Systems

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For many years, the conventional sensor technology of choice used in fixed gas detection systems has been point gas detection sensors and open path gas detection sensors.

Escaping gas are quickly diluted and carried away by the wind, particularly in outdoor applications, where the point gas detection can have difficulties in detecting the leaking gas.

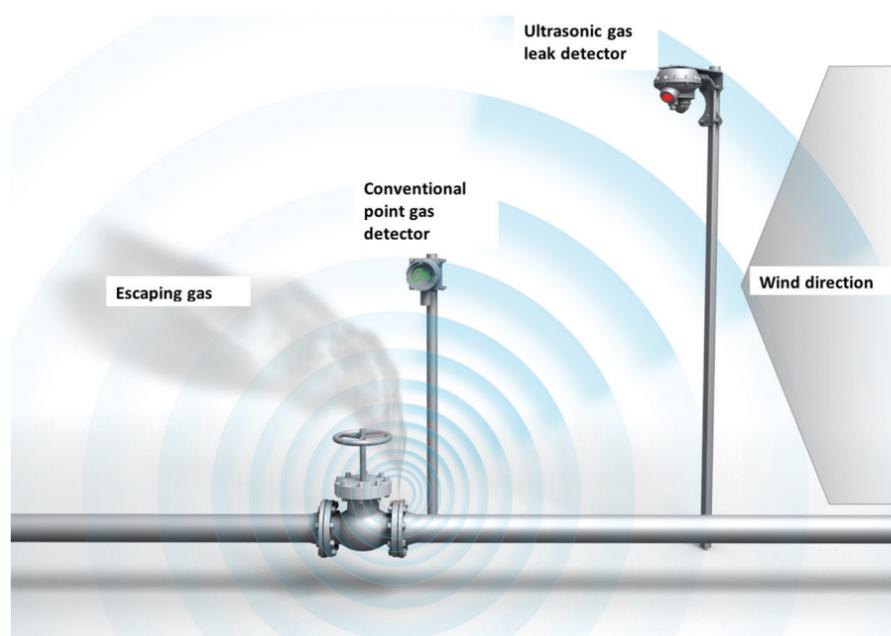


Figure 1

Figure 1 shows the leaking gas drifting away from the conventional gas detector because of the wind, where the acoustic ultrasound from the pressurised gas leak will reach the ultrasonic gas leak detector very fast.

In the early 90's, open path gas detection was introduced to help the industry to try to overcome some of the limitations of the point detector in outdoor installations. The open path gas detection systems consist of an infrared light transmitter and a receiver; if leaking gas is entering the path between transmitter and receiver, some of the infra-light energy is absorbed by the gas. The absorption of infrared light in the gas cloud can then be related to the total concentration of gas in the path between the transmitter and the receiver.

Both open path gas detection and point gas detection require that the escaping gas is actually entering the detector detection zone, to be detected. In the mid 90's, the company Gassonic A/S marked the world's first ultrasonic gas leak detector to aid the oil & gas industry in having an additional sensor technology that could supplement the conventional fixed gas detection technology. The leaking gas could now be detected even if the gas was not entering the detector zone directly, due to changing wind directions.

The technology was designed for pressurized gas installations on offshore or onshore gas facilities where there is a requirement for dangerous flammable hydrocarbon gas leaks to be detected very fast. The ultrasonic gas leak detector technology was a completely different approach to detection of gas leaks, where the ultrasonic gas leak detector detected the acoustic ultrasonic sound from the leaking gas instead of the gas itself, enabling the leak could be detected very fast. The speed of detection was the driving criteria for the development of fixed ultrasonic gas leak detectors.

The ultrasonic gas leak detector cannot detect a LEL level or a ppm level, but the argument for

the development of the ultrasonic gas leak detector was that the gas concentration at the detector could be much lower than in the actual leak spot, and therefore the point and open path gas detection philosophy needed a third technology, that could compensate for the distance between the gas leak and the conventional gas detector. As with many new technologies, ultrasonic gas leak had to prove its efficiency, but today, fixed ultrasonic gas leak detectors are an integrated sensor technology in most modern fixed gas detection systems, particularly in outdoor plant installations where leaking high pressure gas can cause dangerous explosions, if not detected very fast. With the right mix of point gas detection, open path gas detection and ultrasonic gas leak detection, onshore or offshore gas installation will have a very fast and reliable gas detection system thanks to the right combination of sensor technologies in the field.

The Latest Generation of Fixed Ultrasonic Gas Leak Detectors

Over the years, ultrasonic gas leak detectors has gone through generations, from the first simple "microphone only" detectors, until today's advanced ultrasonic gas leak detectors with integrated acoustic selftest functions and in the coming months, a new ultrasonic gas leak detector from Gassonic/General Monitors is to be released with HART interface.

The HART interface makes it possible for the plant operator to carry out predictive maintenance on the detectors, so that the "health" of each detector can be constantly monitored via the HART interface.

The release of the Gassonic Observer-H with HART interface will integrate ultrasonic gas leak detection technology to an even greater degree, in combination with conventional gas detectors as most leading brands of conventional gas detectors today, offer HART interface on their conventional gas detectors.

Figure 2 shows the new ultrasonic gas leak detector Gassonic Observer H, with HART interface.

The conclusion is that not one single fixed gas detection technology can ensure detection of dangerous gas leaks, but a combination of sensor technologies in the field is ultimately required for a safer plant environment.



Figure 2

About the Author

Martin T.Olesen pioneered the world of ultrasonic gas leak detection with the first generation of ultrasonic gas leak detectors in the mid 1990's. After the success of the first generation detectors, Gassonic A/S was established in 2003 in Denmark, with Martin T.Olesen as Director, where Gassonic A/S was developing the second generation of ultrasonic gas leak detectors, the Gassonic Observer and the Gassonic Surveyor. Today, Gassonic A/S is a part of General Monitors, and in September 2010, General Monitors and Gassonic was acquired by MSA.