
Technical write up, on the MPS Technology used within the Aquitrone AT-SRG refrigerant gas sensors.

<https://www.aquilar.co.uk/at-srg/>

Aquilar Ltd, the Horsham-based manufacturer of gas detection equipment, has unveiled their next generation Aquitrone AT-SRG platform for Air Conditioning & Heat Pump refrigerant leak detection. The platform features innovative MPS™ sensor technology, specifically addressing some of the major disadvantages associated with detection systems using traditional sensor technologies such as Metal Oxide Semiconductor or Catalytic Bead/Pellistor.

The HVACR market is witnessing continuous, and dynamic change with regard to the refrigerant landscape. The high GWP of legacy refrigerants is driving global environmental regulations, such as Europe's F Gas regulations, and the USA's EPA/AIM towards a phase down/out of almost all high GWP refrigerants, including the likes of R410a and R404a. As a requirement of these regulations, the requirement for 'containment' of refrigerant within equipment is critical and underpinned by mandated requirements for manual and continuous leak checking.

In addition to the environmental regulations, the relevant safety standards, such as EN378 in Europe and ASHRAE 15/34 in the US, mandate the requirement for refrigerant detection systems depending on system charge sizes and potential for a refrigerant leak into an occupied space or machinery room to result in a concentration dangerous to occupant health.

The transition to lower GWP refrigerants, such as R32 & R290 is addressing the high GWP issue, however it also introduces a higher risk profile in the form of flammability. As such, the requirement for leak free design and operation is enhanced. For Europe, the direction of travel for many OEMs appears to be towards R290 (GWP of 3), with many manufacturers of heat pumps and other HVAC equipment transitioning product designs to this refrigerant.

Against this market backdrop, Aquilar are addressing the growing requirements for effective refrigerant detection, offering an innovative solution for both new installations, and retrofit options for existing legacy fixed refrigerant detection installations.

The MPS™ is a MEMS based sensor technology, proprietary to NevadaNano and developed initially for military applications 20 years ago. The sensor operates by measuring changes in the thermodynamic properties of air and gas, and combined with data from the on board environmental sensor, utilizes patented algorithms to provide an accurate, stable and fully environmentally compensated measurement of the target gas concentration.

Traditional MOS or catalytic bead/pellistor based systems are widely used in the market, however they do have significant drawbacks, including propensity for poisoning, cross interference from other gases/chemical compounds, requirement for regular calibration, and relatively short lifetimes. By contrast, the new AT-SRG from Aquilar, with MPS™ sensor technology offers a 'Fit & Forget' solution, with:

- 15+ year sensor lifetime, meaning a low lifetime cost of ownership
- No calibration required for the lifetime of the sensor
- Compact UK single gang electrical socket size for an aesthetically-pleasing, non-intrusive appearance
- Simple installation, set-up and commissioning
- Easy system testing with a plug-in alarm emulation module (no gas required)
- Immune to poisoning – the sensor is not affected by hairspray, deodorants or other non-target gases
- Multiple alarm outputs, audible and visual, centralised and BMS monitoring • Automatic temperature and humidity compensation • Mains and low voltage power options • Easy sensor replacement (plug & play) with interchangeable sensor heads for different gas type
- AT-SRG is available for A1 refrigerants (R410a), A2L (R32) and A3 (R290)

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