

Sensors for Refrigerants

For the last 3 decades, IST has been supplying sensors for the refrigeration industry. The primary gases to be detected were ammonia and various Freons. However, Freon was found to deplete the ozone layer in the upper atmosphere and was consequently banned from production through an international agreement.

The new refrigerants are generally designated as HydroFluoroCarbons (HFC). The main difference between HFCs and Freon is the lack of chlorine in the HFC. IST has successfully tested solid-state sensors for the detection of both AZ50 (which is a 50/50 mixture of HFC125 and HFC143A) and HFC134A. IST will test these new HFC refrigerants as they are introduced.

These new refrigerants are relatively expensive and this has caused ammonia (NH₃) to become the refrigerant of choice. IST offers both solid-state and electrochemical (EL) sensors for the detection of ammonia. The EL sensor can be more selective than the solid-state sensor, but the life expectancy of the EL sensor is typically only 6 months to 1 year. Generally speaking, the NH₃ EL sensor has an even shorter life expectancy than other standard EL sensors such as those for carbon monoxide or hydrogen sulfide. Where possible, the solid-state sensor should be used for ammonia applications. The life expectancy of this sensor is in excess of 20 years and comes with a standard 3-year warranty.

SENSOR SPECIFICATIONS:

	Solid-State	Electrochemical
Nominal Ranges:		
Ammonia	50 ppm to % by volume Specify Range	50 ppm to 1000 ppm Specify Range
AZ50 (R507)	1000 ppm	N/A
HFC134A	1% by volume	N/A
Life Expectancy:	20 year	1 year
Temperature:	-20 C to +60 C	-20 C to +40 C
Maintenance:	Depending on environmental conditions, periodically clean the protective sinter with acetone. Three months to one year cleaning interval is typical. Monthly recalibration recommended for safety.	Monthly check of span required to make sure no loss of sensitivity has occurred. Check with IST for 6-month sensor replacement program. A pre-calibrated sensor is shipped every 6 months.
Selectivity:	Interference by most solvents, hydrocarbons, and H ₂ . Consult factory.	Interference by H ₂ . Interference by other gases is minimal.

SENSOR TRANSMITTER TECHNICAL SPECIFICATIONS:

Model Numbers:	4-20IQ, SM95
Power:	14-24 VDC
Current Drain:	400 mA
Output Current:	4-20 mA non-isolated (isolated optional) or 100 to 500 µA
Temperature:	-40 to +60 C
Humidity:	15% - 96% non-condensing
Controls:	<p>4-20IQ: Span, zero, heater, and alarm setpoints. Magnetic wand to activate switches for non-intrusive automated calibration.</p> <p>SM95: Conventional pot adjustment for zero, span, and heater.</p>
Display:	<p>4-20IQ: LED display</p> <p>SM95: None</p>
Fault:	Output current goes to 0 mA
Dimensions:	<p>4-20IQ: 4.54"H x 7.82"L x 5.05"W (116mm x 200mm x 129mm) Weight: 3.89 lbs (1.77 kg)</p> <p>SM95: 2.85"H x 8.87"L x 3.8"W (73mm x 226mm x 97mm) Weight: 2.9 lbs. (1.32 kg)</p>
Case:	UL, CSA Certified Class I, Division I, Groups B,C, and D CELENEC Approvals Pending Approvals for use with solid state sensors only

