



BROCHURE

Hydrogen-Sensor

Dynamic Ratings

Distributed by AKRIBIS





**DYNAMIC
RATINGS**



Hydrogen Sensor

Dissolved Gas Monitoring



Accurate Measurements



Cost Effective



Easy to Use

RESPONSIVE

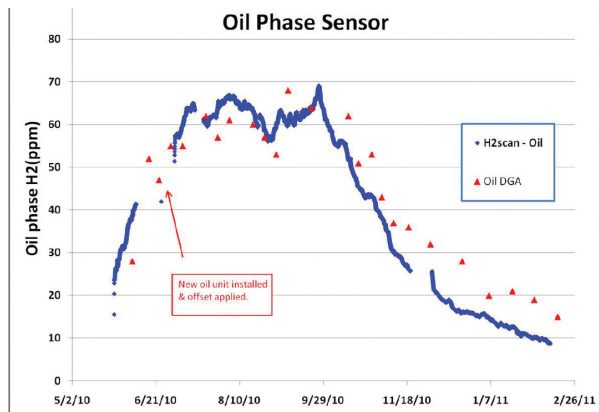
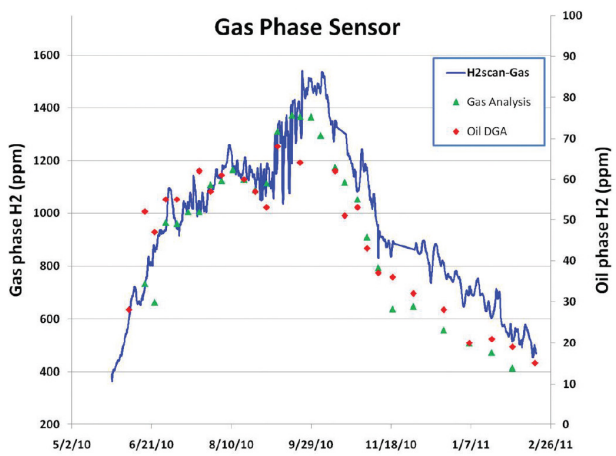
ASSET HEALTH SOLUTIONS

Early Detection of Abnormal Operating Conditions

Due to the tendency of hydrogen to be produced through a wide range of thermal conditions, online hydrogen monitoring is highly reliable as an early indicator of various internal transformer conditions ranging from partial discharge to the presence of active arcing. The Dynamic Ratings Hydrogen Sensor measures hydrogen collected in either the oil or the headspace of nitrogen blanketed transformers, taking advantage of hydrogen's low solubility rates and higher in-gas concentrations, to provide more consistent and reliable warnings as to the potential presence of incipient faults.



The utilization of online dissolved gas analysis monitoring has proven to be one of the most effective predictors of transformers health and condition. However, due to hydrogen's low solubility and slowed dispersion rates in oil, drain valve hydrogen monitoring can often result in delayed indication of incipient fault development. In cases where leaks are present on the transformer, these conditions may go undetected as hydrogen will often escape to the atmosphere, restricting equilibrium between the gas and oil phase from being established.



Accurate Measurement

This solid-state sensing element is hydrogen specific and insensitive to other transformer gases. Unlike other technologies, Dynamic Ratings sensor technology does not suffer from signal saturation at high hydrogen concentrations. The sensor continuously measures oil temperature and provides an oil temperature corrected hydrogen signal that can be used to activate relays and provide early warnings of a transformer failure. The sensor's chip-based technology uses palladium-nickel alloys with advanced proprietary materials coating to protect the sensor.



Cost Effective

The Hydrogen sensor has an unlimited useful life¹ where the sensor is a low cost solution for key incipient fault marker that is easy to install and maintain. The sensor reduces dependence on costly oil sample based DGA diagnostics. The sensor has no consumable components or any degradation, does not require carrier or calibration gases to maintain accuracy and has a theoretically unlimited useful life.

¹Life expectancy is 10-15 years.



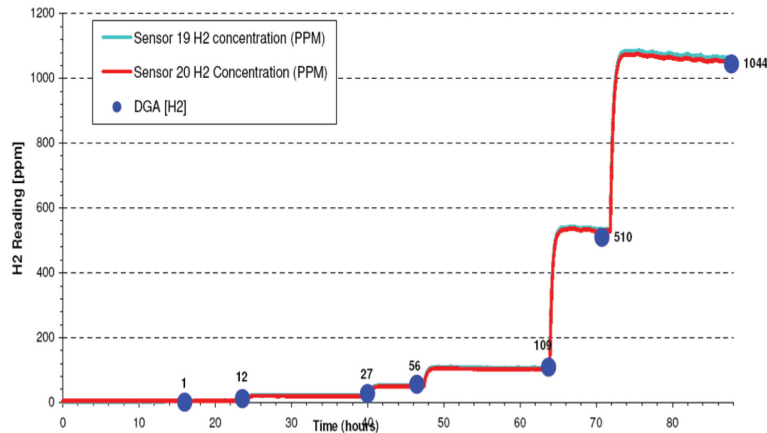
Easy to Use

The sensor can be retrofitted onto active transformers during normal operation without having to de-energize them. The sensor has no membrane, consumables, moving parts or reference gas. The sensor is calibrated to be representative of dissolved gas in oil readings for simplified interpretation.

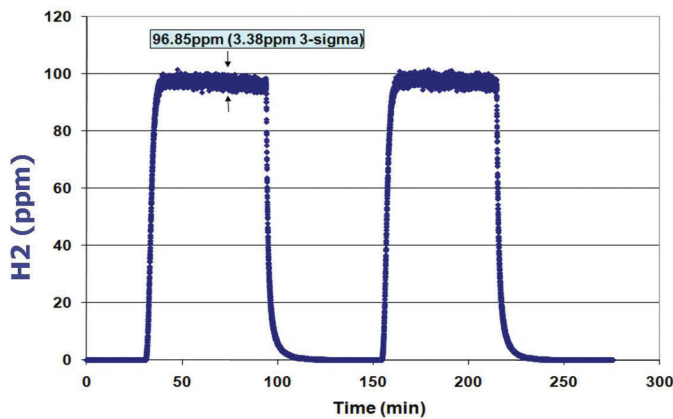
Applications

May be installed on new and retrofit applications

- Any class of oil filled transformer (Transmission/Distribution/Commercial/Industrial)
- Instrument transformers
- Load tap changers and other oil-filled assets



Sensor matches DGA readings in oil phase



Sensor performance in gas phase

Hydrogen Sensor Specifications

Parameter	Dissolved Hydrogen In-Oil	Hydrogen in Headspace
Measurement Range	25-5000 ppm	25-5000 ppm *in liquid equivalent
Accuracy¹	20% of reading or 25 ppm, whichever is greater	500 ppm to 25 ppm
Repeatability²	10% of reading or 15 ppm, whichever is greater	300 ppm to 15ppm
Operating Temperature	-40°C to 70°C (-40°F to 158°F)	-40°C to 70°C (-40°F to 158°F)
Storage Temperature	-40°C to 85°C (-40°F to 185°F)	-40°C to 85°C (-40°F to 185°F)
Oil Temperature Range³	-40°C to 105°C (-40°F to 221°F)	N/A
Cross Sensitivity	< 1%	< 2%

¹Errors are in addition to any introduced by the measurement standard.

²For consecutive measurements to an identical hydrogen concentration.

³Main tank bulk oil temperature.

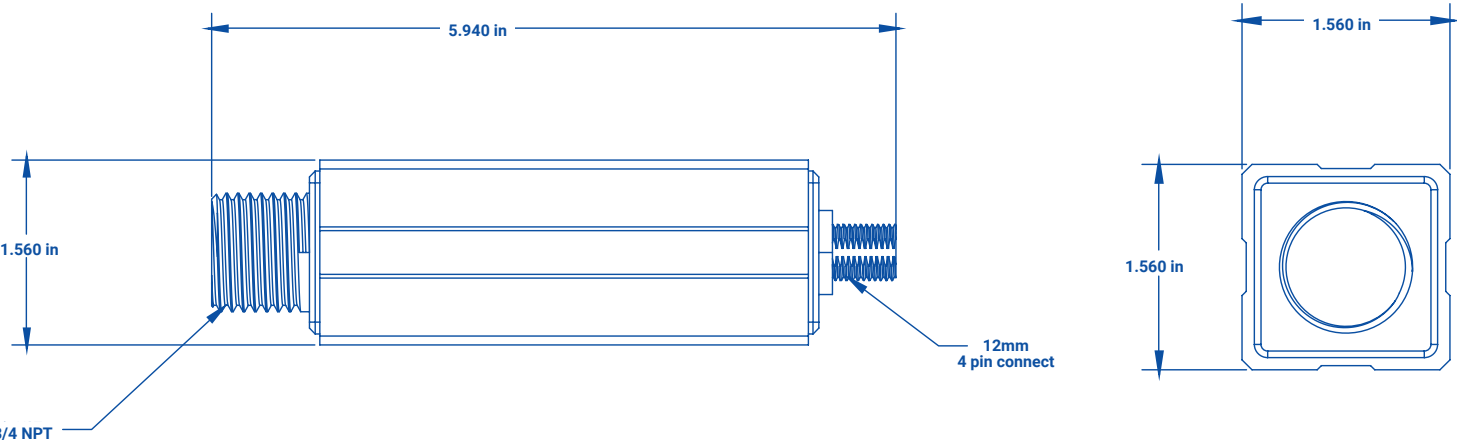
Physical Specifications

Wetted Materials	316SS, 40% mineral filled nylon, polyimide, glass
Sealing	316SS, 40% mineral filled nylon, polyimide, glass
Housing	Hard anodized 6061 aluminum
Humidity & Corrosion Resistance	Class C5M Marine rated; salt-water condensing (IEC 60068-2-11 & DIN EN ISO 12944)
Ingress Protection	IP68; 25 feet water for 14 days (IEC 60529)
Vibration	3-axis Sinusoidal, Wideband and Random [Simulated Long-Life] (IEC 60068-2-6: table C.2, IEC 60068-2-64: paragraph A.2, category no. 2, IEC 61373: 2010 Cat 1B section 9)
Shock	30g, shock duration 18ms (IEC 60068-2-27)
Serial Communications	2-Wire RS485, MODBUS RTU
Power Supply	12-30 VDC, 10 Watt
Ratings	CE Mark (IEC 61000), ROHS 2011/65/EU compliant, EMC/RFI and Other Electrical Certification, IEC 55022 IFCC Part 15, IEC 55024, IEC 55011, IEC 61000-4-2 through 61000-4-6 and 61000-4-8, IEC 61010-1, IEC 60255-5, IEC 61326

How To Order

Part Number	Descriptions
SE-030	Hydrogen Monitoring in Headspace
SE-031	Hydrogen Monitoring in Oil ¹

¹For use in mineral oil. Sensors for other oil types available upon request.



Request a quote from your regional office.

An ISO 9001, ISO 14001, ISO 27001, ISO 45001 Certified Company.

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