H2scan

Hydrogen is the future, we can sense it!

H_2 sensors for transformer dissolved gas monitoring using our proven DGA platform

Gridscan™ chip-based technology uses palladium-nickel alloys with an advanced proprietary materials coating to protect the sensor, enabling it to measure hydrogen in oil or gas phase of power transformers and ancillary equipment.

This solid-state sensing element is hydrogen specific, insensitive to other transformer gases and can be immersed directly in the transformer oil during normal operation to measure hydrogen levels continuously. The Gridscan™ platform has no consumable components or any degradation of the sensor, does not require carrier or calibration gases to maintain accuracy and has a theoretically unlimited useful life.

GRIDSCAN™

AN H2SCAN PATENTED TECHNOLOGY

- **Major OEM partners**
- **Installed Worldwide**
- **Low Cost**

GRIDSCAN™ 5000
H_2 Sensor Specifications

Parameter	Oil Phase	Gas Phase
Measurement Accuracy Range	25 - 5,000 ppm	500 - 100,000 ppm
Accuracy[1]	20% of reading or 25 ppm†	20% of reading or 500 ppm
Repeatability[2]	10% of reading or 15 ppm†	10% of reading or 300 ppm
Response Time	< 60 minutes	< 60 minutes
Operating Temperature (Ambient)	-40°C to +70°C	-40°C to +70°C
Storage Temperature	-40°C to +85°C	-40°C to +85°C
Oil Temperature Range[3]	-40°C to +105°C	n/a
Data Log Storage	1 Year	1 Year
Cross-sensitivity to H_2O, CO_2, C_2H_2, C_2H_4, CO, etc.	<1%	<1%
Serial Communications	RS485, MODBUS RTU	RS485, MODBUS RTU
Power Supply	9-48 VDC, 10 Watt	9-48 VDC, 10 Watt

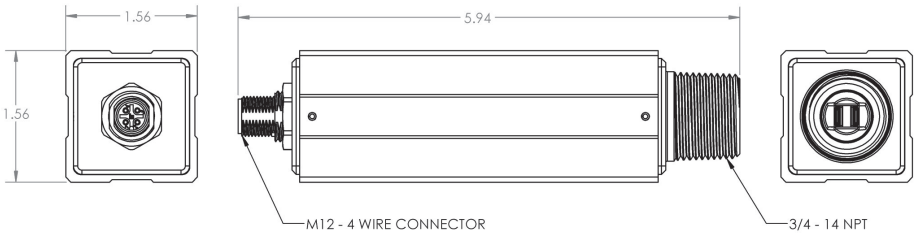
† whichever is greater

Physical Specifications

Wetted Materials:
316SS, 40% mineral filled Nylon, polyimide, glass
Sealing:
Hermetic glass-to-metal feedthrough, Buna-N gaskets
Housing:
Hard Anodized 6061 Aluminum

Humidity and Corrosion Resistance:
Class C5M Marine rated; salt-water condensing (IEC 60068-2-11 & DIN EN ISO 12944)

DIMENSIONS (inches)



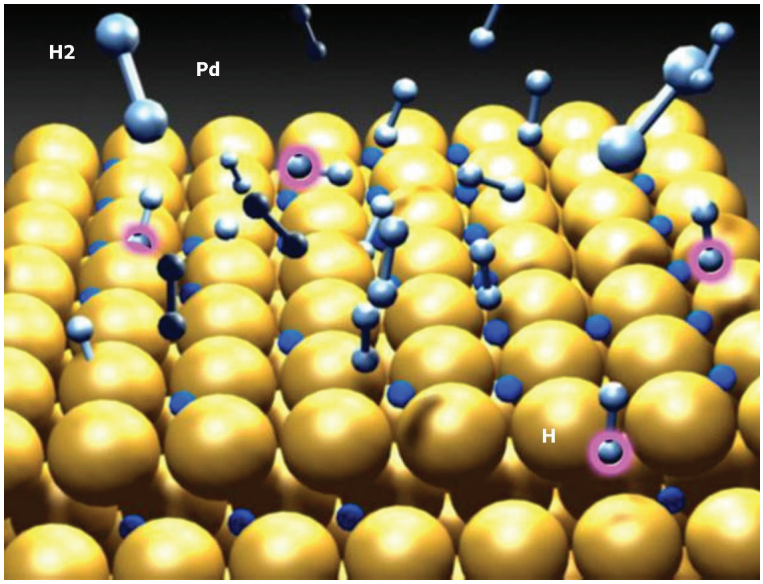
Ratings:
CE Mark (IEC 61000)
ROHS 2011/65/EU compliant
EMC/RFI and Other Electrical Certification

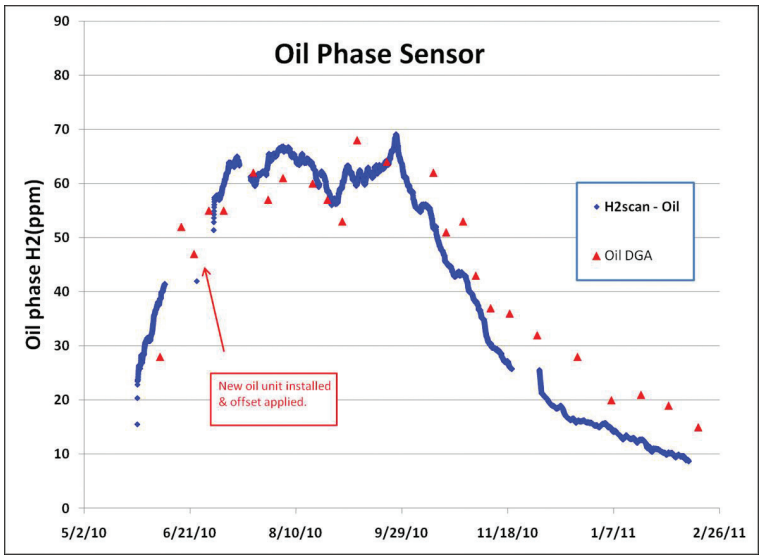
- IEC 55022 IFCC Part 15
- IEC 55024
- IEC 55011
- IEC 61000-4-2 through 61000-4-6, and 61000-4-8
- IEC 61010-1
- IEC 60255-5
- IEC 61326

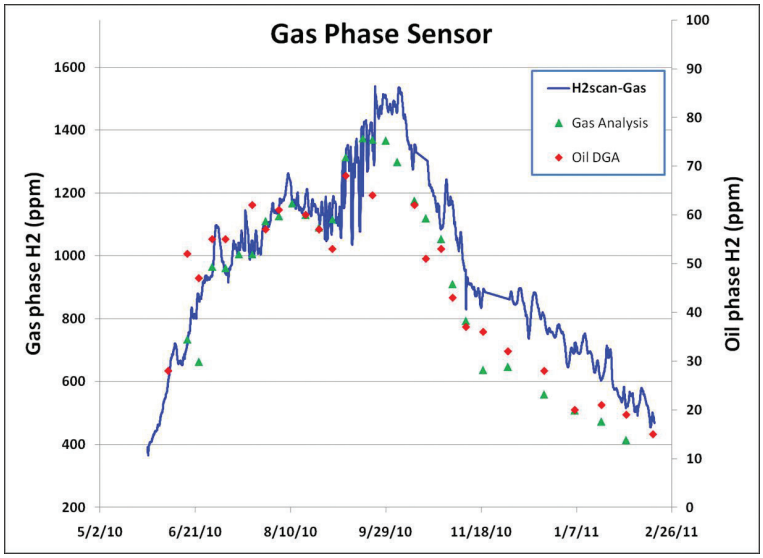
Ingress Protection: IP68; 25 feet water for 14 days (IEC 60529)
Vibration: 3-axis Sinusoidal, Wideband and Random [Simulated Long-Life] (IEC 60068-2-6 table C.2, IEC 60068-2-64 paragraph A.2, cate-gory no. 2, IEC 61373: 2010 Cat 1B section 9)
Shock: 30g, shock duration 18ms (IEC 60068-2-27)

[1] Errors are in addition to any introduced by the measurement standard
[2] For consecutive measurements to an identical hydrogen concentration
[3] Main tank bulk oil temperature

H_2 Sensor Key Features and Benefits







H2scan's proprietary Sensor on a Flex™ technology brings many years of research, experience and commercial success in various industries, including petroleum refineries, chemical production, nuclear power plants, fuel cells and more to the Gridscan™ platform developed specifically for monitoring hydrogen in electric power transformers and other oil filled apparatus.

Gridscan™ models can be retrofitted onto active transformers without having to de-energize them. Unlike other technologies, H2scan's 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.

- Low cost solution for key incipient fault marker that is easy to install and maintain
- Operates immersed directly in transformer oil or headspace
- Continuous hydrogen monitoring reveals potential faults to ensure timely action and avoid downtime
- Reduced dependence on costly oil sample based DGA diagnostics
- No membrane, consumables, moving parts or reference gas
- Life expectancy is 10-15 years

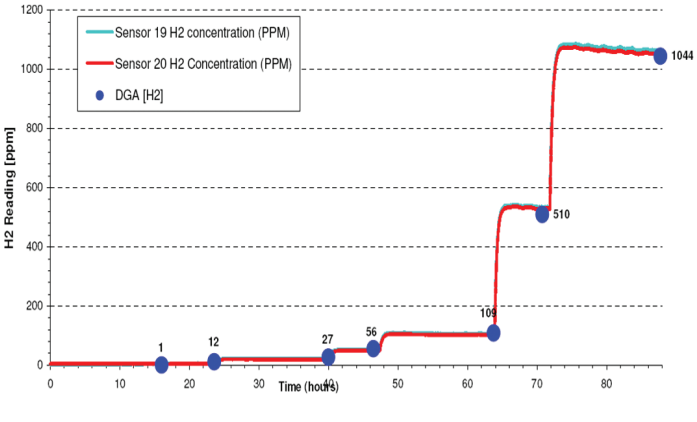
H_2 Sensor for Transformers and Other Oil Filled Assets

May be installed on New and Retrofit Applications

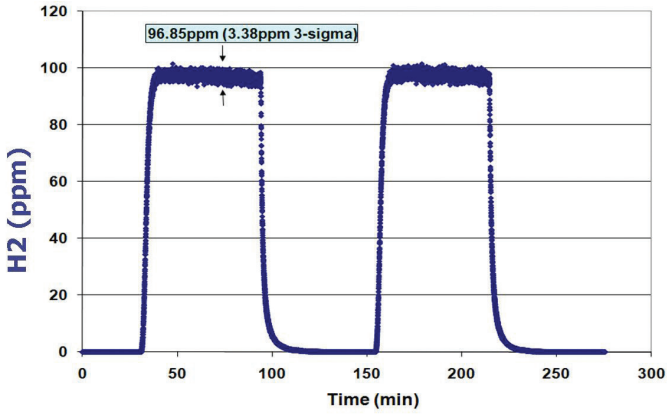
- Any class of oil filled transformer (Transmission/Distribution/Commercial/Industrial)
- Instrument Transformers
- Load Tap Changers and other oil-filled assets

Transformer Installation

H2 Sensor Performance



Sensor matches DGA readings in Oil Phase



Sensor performance in Gas Phase

If you have any questions, please contact us at the address below:

H2scan Corporation Headquarters:
27215 Turnberry Lane, Unit A
Valencia, CA 91355 USA

Leon White, P.E.
VP Transformer Sales & Business Development

Phone: 661-775-9575
Fax: 661-775-9515
E-mail: sales@h2scan.com
Website: www.h2scan.com