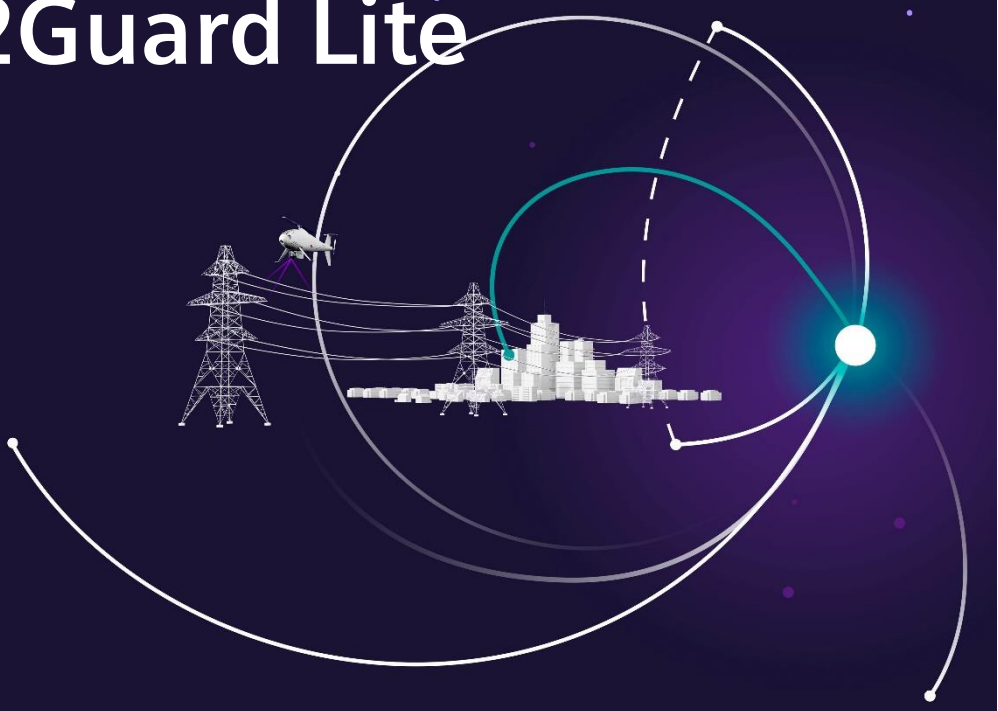
SITRAM H2Guard Lite

Monitoring & Diagnostics



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Introduction

Fleet wide transformer monitoring has just become available. Among the reasons for transformer outages, failures related to the winding have the highest ranking. In case of present partial discharge phenomena which are also referred to as “sparking” the transformer liquid produces internal gases. The key gas indicator of any abnormal condition in a transformer is hydrogen.

One reason for the statistical outcomes in researched failure rates could be that the transformer liquid is usually tested offline by classical DGA analysis in laboratories. This manual procedure is not always trivial and only offers a snapshot in time analysis due to the non-continuous test approach.

With the SITRAM H2Guard Lite, the new online DGA system (DGA: dissolved gas analysis), Siemens Energy offers a versatile single gas monitoring system for hydrogen measuring.

Features

SITRAM H2Guard Lite enables asset managers to check the hydrogen health condition of the transformer’s insulating liquid continuously. This provides the advantage of trending Hydrogen creation / evolution based on historical and present operating conditions.

AThe asset condition data allows a thorough evaluation and can reveal developing equipment issues before they become a problem.

SITRAM H2Guard Lite allows:

- Use as a stand-alone hydrogen data monitor or can be used with superior monitoring platforms.
- Easy integration into existing SCADA landscapes through standard protocol communication interfaces.

The actual miniature sensing element is located in the sensor tube which is installed on any suitable valve in either the liquid phase or gas phase (headspace) of a liquid filled transformer tank or the pipe system.

Benefits

- Fleet wide hydrogen gas monitoring
- Fast detection and reliable data output
- Easy to install / uninstall
- Improved scheduling of maintenance work and downtimes, repairs, adequate personnel support
- Very durable & minimum maintenance in comparison with other products
- Interoperability and simple operation
- Price attractive ownership with quick amortization considering classical assessment approaches

Grid Technologies Service - Transformers

Scope of Work / Deliverables

- Standard electrical and mechanical connection kit or individual mechanical connection kit on request
- Turnkey installation and communications services
- Expert analysis of monitoring data and customer support
- On-site training courses for operation and maintenance of our systems
- Design, installation, and commissioning of all necessary equipment.

Technical Details

The SITRAM H2Guard Lite has an advantageous compact solid-state thin film alloy design which catalyzes the molecular hydrogen into atoms which are picked up by the alloy mix and bound into the metallic lattice inside the film.

During this process of binding the hydrogen the bulk electrical properties of the alloy are changed and used as measurement basis.

The alloy design does not degrade over time and maintains its accuracy over its life expectancy.

Therefore, based on this measurement principle there is no need for consumables like reference gases which are used in gas chromatography, also no need for sensor element replacement, such in a classical membrane which is used in e.g., fuel cell sensor approaches based on the electrochemical principle or the thermal conductivity detection (TCD).

In case support is needed, Siemens Energy global service network is always happy to help.

Measuring Demands*

Range	25 – 5000ppm
Accuracy	20% of reading or 25ppm, whichever is greater
Repeatability	10% of reading or 15ppm, whichever is greater
Response Time	< 60min (90% of step change)
Cross-Sensitivity	< 2% to other gases CO, CO2, CH4, C2H2, C2H4, C2H6, C3H8, etc.

*For better understanding please refer to the details in the system manual.

SITRAM H2Guard Lite – General Data

Supply Voltage / Power Consumption	12-48 VDC 10W
Ambient Operating Conditions	-40°C...+70°C, indoor/outdoor also in harsh EMC areas, 5%...95%RH (non-condensing) for complete operating temperature
Operating Conditions	• Pressure and vacuum withstanding Oil temperature, pressure: ≤ 105°C / ≤ 10bar
Physical Dimensions and Weight	Tube > ¾" NPT / 3.5", System > L:151 W:39.6 H39.6 mm (L:5.9 W1.6 H1.6 inch), 387 grams
Ingress and Corrosion Protection	• IP68 (IEC 60529) • C5M (a.o. ISO 12944) • Weather and UV resistant powder coat (AAMA 2604) • Cast aluminum enclosure (UNS A03280) with a stainless-steel probe tube (316 type)
Resistance to Shock and Vibration	Among others tested on basis of: • DIN EN 60068-2-6 – Shock and Vibration • DIN EN 60068-2-64 –Vibration Environmental Test • DIN EN 60068-2-27 – Shock Test for Transformer Environment Additional performed tests such as extended, aggressive vibration dwell at 50 and 60 Hz.
Data Rate	Maximal 1 measurement value per second, Self-calibration: 2h every 12h
Analogue I/O	Optional • 1 x output, standard 4-20mA or 0-5VDC
Communication	• Serial RS-485 • Protocols: Modbus and DNP3.0 serial
Memory	• 1 year data storage capability

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