

Transformer Fault gas Detection & Monitoring



integrated



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 **PowerView**
Testing & Monitoring Equipment

Pioneering the future of power testing and monitoring

Fault Gas Early Detection & Monitoring



Fastest response time to fault

Measuring Hydrogen , Methane, Ethane ,Ethylene Acetylene, moisture and total gas pressure.



Easy installation and powerful software for data analysis

Less than 1 hour installation, wireless communication and most advanced software

Description

The Transformer FGA is designed for fastest response to prevent serious faults in the earlier stage , plan outage and replacement and evaluate asset condition It is capable of monitoring hydrogen gas generation, methane generation, moisture and complete fault gas pressure

Installation

The FGM installation is simple, and it takes less than 30 minutes as it uses ultra long-range wireless communication. The monitoring comes in 2 warrants (solar and mains powered). The solar version is completely wireless and stand-alone, so no cable installations are necessary for power supply or data communication.



Ultra low power consumption

Built in Batteries with 5 years lifetime



Fastest response to fault gasses

Fault gases in transformer oils are generated in the main tank when the oil is imposed to excessive electrical and thermal stress (due to evolving fault). As the fault generation accelerates the gasses are released .

Some small portion of the gases gets dissolved in the transformer oil (depending on the oil solubility coefficient).

- 1.Hydrogen (H₂): H₂ gas is generated when the transformer oil is overheated or when the insulation is degraded due to the presence of moisture or oxygen. Overheating can be caused by high loads, short circuits, or a malfunctioning cooling system.
- 2.Methane (CH₄): Methane gas is produced when the insulation paper within the transformer is overheated and decomposes. This can occur due to overloading, short circuits, or exposure to high temperatures.
- 3.Ethylene (C₂H₄): Ethylene gas is generated when the insulation paper in the transformer is degraded due to oxidation or thermal aging. This can occur due to exposure to high temperatures or oxygen.
- 4.Acetylene (C₂H₂): Acetylene gas is produced when electrical arcs occur within the transformer, such as during a fault or short circuit. It can also be generated due to the decomposition of insulation material.



Fault Gas Early Detection & Monitoring



Alarms, notifications and reporting

Fully customizable alarms , email and SMS notification and trending



Low ownership smart substation integration

Cheapest ownership cost and installation due to ultra low power consumption and wireless communication.

Most advanced reporting and communication protocols

Technical specification

Detection and measurement range – Hydrogen (H ₂)	Up to 40,000 ppmv
Detection and measurement range – Methane (CH ₄)	Up to 50,000 ppmv
Detection and measurement range – Ethane (C ₂ H ₆)	Up to 30,000 ppmv
Detection and measurement range – Ethylene (C ₂ H ₄)	Up to 30,000 ppmv
Detection – Acetylene (C ₂ H ₂)	Sensitive to acetylene and other compatible combustible fault gases; quantitative response depends on gas composition and concentration
Accuracy	±5% of range for H ₂ and CH ₄ ; ±10% of range for C ₂ H ₆ / C ₂ H ₄
Minimum detection limit – H ₂	25 ppm dissolved H ₂ concentration in transformer oil
Minimum detection limit – Other combustible fault gases	Sensitive at approximately 250 ppm dissolved-gas concentration in transformer oil and above, depending on gas type and oil/headspace equilibrium conditions
Detected combustible fault gases	H ₂ , CH ₄ , C ₂ H ₂ , C ₂ H ₄ , C ₂ H ₆
Environmental compensation	Compensated for variations in temperature, pressure and relative humidity within the specified operating range
Response time	≤20 s
Primary diagnostic sensitivity	Optimized for early hydrogen detection and combustible fault-gas trending
Application note	Intended for continuous early-warning and trend monitoring. It does not replace laboratory DGA or selective multi-gas chromatographic analysis.

Fault Gas Early Detection & Monitoring

Operating temperature (electronics)	-40 ... +70 °C
Storage temperature	-50 ... +80 °C
Operating humidity	0 ... 100 %RH, condensing
Pressure tolerance	80-120 HPa
Power supply	Batteries 3.5 V
Batteries lifetime with factory settings (1 sample/h)	5 years

IECEx Quality Assessment Report	IEC 80079-34:2018
ATEX Quality Assurance Notification	2014/34/EU
RoHS (2 & 3) Compliant	2011/65/EU & 2015/863
China RoHS Compliant	SJT/T 11363 & 11364
REACH Compliant	EC 1907/2006 (33 & 67)

Test	Specification	Summary of Test Conditions
High Temperature Operating	IEC 60068-2-2	1000 Hours @ 85°C
Low Temperature Operating	IEC 60068-2-1	1000 Hours @ - 50°C
Drop	IEC 60068-2-31	1-meter drop onto concrete
Shock	IEC 60068-2-27	50G peak/11ms half sine pulse, 3 axes (positive and negative pulses)
Vibration	IEC 60068-2-6	31 Hz – 150 Hz (2G acceleration) 1 hour per axis, 3 axes
Sand/Dust	MIL-STD-810G Method 510.5	Sand: 150-600 um SO2 particle size, 23 m/s nom, velocity, 5 hrs @ 70°C per axis, 3 axes Dust: Red China Clay, 1.5 m/s nom, velocity, 6 hrs @ 70°C per axis, 3 axes

EMC: Radiated Immunity	IEC/EN 61000-4-3	80 MHz – 2.7 GHz up to 10 V/m
EMC: Magnetic Immunity	IEC/EN 61000-4-8	30 A/m, 3 axes
EMC: Electrostatic Discharge	IEC/EN 61000-4-2	Up to 4kV on ground plane, up to 8kv corona discharge



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