

# 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 (H<sub>2</sub>): H<sub>2</sub> 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 (CH<sub>4</sub>): 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 (C<sub>2</sub>H<sub>4</sub>): 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 (C<sub>2</sub>H<sub>2</sub>): 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 H2	Up to 40000 ppm
Detection and measurement range Methane	Up to 50.000 ppm
Measurement range Ethane and Ethylene	Up to 30.000 ppm
Accuracy	±5 % of range for H2 and methane and , ±10 % of range for Ethane / Ethylene
Min resolution	±50ppm
Minimum detection limit	50 ppm <sub>v</sub>
Cross sensitivity	No cross sensitivity to T, P and RH
Response time	20 sec
Warm-up time	5 sec
Total gas pressure monitoring range	gas Sensor with moisture and pressure analyzer
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)

## Fault Gas Early Detection & Monitoring

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 axis
<b>EMC: Radiated Immunity</b>	<b>IEC/EN 61000-4-3</b>	<b>80 MHz – 2.7 GHz up to 10 V/m</b>
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

### Ordering information

Ordering code	Description
101-1626	Battery powered
101-1627	Mains supply



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