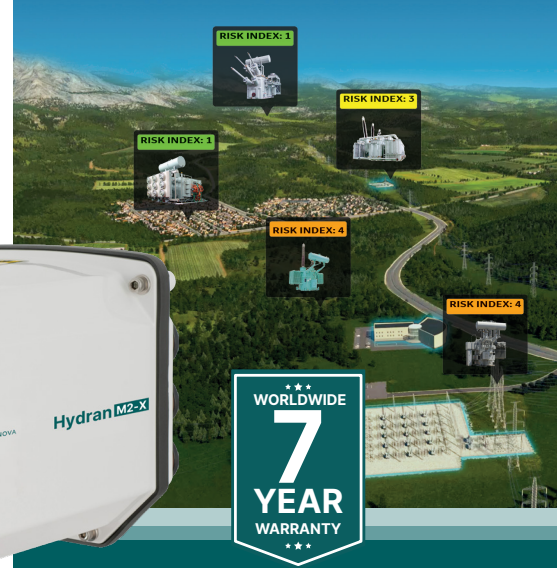


HYDRAN M2-X



Enhanced Monitoring with Extended Sensor Life

When a transformer's insulation system is overstressed, the oil and paper undergo chemical degradation producing both hydro-carbon gases and moisture that dissolve into the insulating oil. This increased aging will shorten the transformer's life, impact its reliability and in some cases can even lead to catastrophic failures.

The Hydran M2-X is the next generation of the field-proven family of Hydran DGA monitoring solutions.

It provides continuous monitoring of gas and moisture levels to alert users of developing faults and minimize the risk of unplanned outages. The M2-X builds on GE Vernova's strong domain expertise to deliver an optimized, low maintenance monitoring device with an extended sensor life.

Key Benefits

- Small form factor, no moving parts, low maintenance, and support for APM software analytics, enabling fleet level deployments
- Condition monitoring for a wide range of transformers with mineral insulating oils or ester based fluids (natural and synthetic)
- Extending beyond DGA monitoring, through the connection of sensors, the Hydran M2-X can monitor other parameters such as top oil temperature, load current and through the use of IEEE based mathematical models, can provide further insight on changing transformer conditions
- Providing critical transformer gas behavior data for Asset Performance Management (APM) strategies, facilitating planning of site intervention and maintenance activities
- Supports a wide range of communication methods and protocols to enable easy and secure integration with GE's digital platforms including Perception™ transformer fleet management software, APM software tools, historians and SCADA systems

Applications

Advanced, flexible and expandable DGA monitoring solution tailored for utility and industrial transformers.

Easily integrates with Kelman multi-gas DGA devices and the Multilin 845 protection & control relay to provide continuous synchronization of chemical and electrical measurements for enhanced transformer monitoring.

Proven Technology

- Field proven solution, delivering online DGA solutions for over 40 years
- Over 50,000 Hydran units sold worldwide
- Estimated sensor life in excess of 10 years*
- 7 year product warranty

Expandable

- Compatible with various transformer oil types (standard mineral insulating oils and newer natural and synthetic ester based fluids)
- Available with the traditional Hydran composite gas (H_2 , CO, C_2H_2 , C_2H_4) sensor or with a discrete Hydrogen only (H_2) sensor
- Easily upgradeable in the field to accept analogue signals to monitor other key transformer parameters
- Computation of winding hot spot and other IEEE transformer models for enhanced diagnostics of the transformer's condition (depending on sensors installed)
- Integrates with Kelman multi-gas DGA devices

Intuitive

- Easy to install on a single existing transformer valve, often without an outage required
- Integrated display and keypad for simplified local user interaction and data visualization
- Built-in moisture sensor provides water in oil measurement, critical to identifying paper degradation and leaking gaskets
- Compatible with GE Vernova's acclaimed Perception™ software to download, trend and analyze transformer health data



GE VERNOVA

Technical Specifications

MEASUREMENTS		Protocols	Mechanical
Fuel cell type sensor behind a gas permeable membrane in contact with transformer insulating oil		Standard: Modbus®, DNP 3.0 Optional: IEC 61850 over TCP/IP	Has a 1.5 " NPT male thread, can mount on 1.5 " NPT valve or greater using optional adapters
Range	25-2000 ppm (volume / volume H ₂ equivalent)	Alarms	Dimensions
Accuracy**	±10 % of reading ±25 ppm	Gas and Moisture Alert (Hi), Gas and Moisture Alarm (HiHi), System Alarms	315 × 219 × 196 mm 12.4 × 8.63 × 7.72 "
Response Time	10 minutes (90 % of step change)	Gas alarms can be set on gas level reached or on hourly or daily trend (gas level rate of change)	Installed Weight
"Composite Gas" Sensor		Moisture alarms can be set on level reached or average level	Resistive touchscreen
Relative Sensitivity	H ₂ : 100 % of concentration CO: 15 ± 4 % of concentration C ₂ H ₂ : 8 ± 2 % of concentration C ₂ H ₄ : 1.5 ± 0.5 % of concentration	Alarms can also be configured for optional additional analogue inputs or for calculation results from optional transformer models	Shipping Weight
Repeatability	Highest of ±5 % of reading or ±5 ppm	5 dry contact relays (type C, SPDT), NO/NC, 3A@250Vac resistive load, 3A@30Vdc resistive load	9.0 Kg (20 lb)
"Discrete H2" Gas Sensor (Mineral oil only)		Manual Sampling	Computer interface
Relative Sensitivity	H ₂ : 100 % of concentration Interference from CO, C ₂ H ₂ and C ₂ H ₄ less than 3 % of concentration	Easily accessible external oil sampling port, for use with glass syringe with Luer stopcock	USB
Repeatability	Highest of ±5 % of reading or ±10 ppm	ENVIRONMENT	PRODUCT OPTIONS & SENSORS
Moisture Sensor		Conditions	Finned heat sink adapter (1.5 ") for use when ambient temp > 40 °C (104 °F) or oil temp > 90 °C (194 °F)
Thin film capacitive type sensor immersed in insulating oil		Operating Ambient Temperature	Valve adaptors 2 " to 1.5 "
Range	0-100 % RH	Operating Ambient Humidity	Transformer models calculations (for mineral oil only)
Accuracy	± 2 % RH	Oil Temperature at Valve	Analogue input cards, 4-20mA, 10V load max, isolated to 2000Vac RMS
Repeatability	± 2 % RH	Oil Pressure at Valve	Dual digital input cards for dry contacts, internal wetting 24Vdc, isolated 2000Vac
FEATURES		Enclosure	Analogue output cards, 4-20mA, 10V load max, isolated to 2000Vac RMS
Display		Material	PSTN analogue modem V92/56K
Back-lit LCD, 128 × 64 pixels		Rating	GSM/GPRS wireless modem
Keypad to setup unit and acknowledge alarms		Power Requirements	
Communications		90-132 Vac or 180-264 Vac switch mode universal power supply, 47-63 Hz, 650VA max	
Standard RS-232 port (DB-9 connector), for local connection to computer for configuring the system		Network Ethernet communication using copper or multimode fiber optic (ST)	
Standard RS-485 (terminal block), isolated to 2000Vac RMS, for remote communication or connection to local Hydran network		Oil temperature sensor, magnetic mount, (4-20mA)	
Optional: TCP/IP over Ethernet Copper or Fiber Optic 10/100Mbps/s		Split core load CT (4-20mA)	
		Ambient temperature sensor (4-20mA)	
		Anodized Aluminum Enclosure - CRC required (minimum quantities applicable)	

*Fuel cell sensor life projection based on accelerated aging test showing estimated MTTF of 11.5 years
 ** Accuracy is quoted for the sensors at calibration, for H₂ equivalent performance

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