

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 Vernova'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.



Utilities - An expandable, all-in-one DGA monitoring solution, tailored for medium to large transformers.



Industrials - Compact DGA monitoring solution, aiding in reducing process interruption and minimizing costly production downtime.

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



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	315 × 219 × 196 mm 12.4 × 8.63 × 7.72"
Accuracy**	±10 % of reading ±25 ppm	Gas and Moisture Alert (Hi), Gas and Moisture Alarm (HiHi), System Alarms		Installed Weight	Resistive touchscreen
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)		Shipping Weight	9.0 Kg (20 lb)
"Composite Gas" Sensor		Moisture alarms can be set on level reached or average level		Computer interface	USB
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		PRODUCT OPTIONS & SENSORS	
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		Finned heat sink adapter (1.5") for use when ambient temp > 40 °C (104 °F) or oil temp > 90 °C (194 °F)	
"Discrete H2" Gas Sensor (Mineral oil only)		Manual Sampling		Valve adaptors 2" to 1.5"	
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		Transformer models calculations (for mineral oil only)	
Repeatability	Highest of ±5 % of reading or ±10 ppm	ENVIRONMENT		Analogue input cards, 4-20mA, 10V load max, isolated to 2000Vac RMS	
Moisture Sensor		Conditions		Dual digital input cards for dry contacts, internal wetting 24Vdc, isolated 2000Vac	
Thin film capacitive type sensor immersed in insulating oil		Operating Ambient Temperature		Analogue output cards, 4-20mA, 10V load max, isolated to 2000Vac RMS	
Range	0-100 % RH	-40 °C to +55 °C (-40 °F to +131 °F)		PSTN analogue modem V92/56K	
Accuracy	± 2 % RH	Operating Ambient Humidity		GSM/GPRS wireless modem	
Repeatability	± 2 % RH	0-95 % RH, non-condensing		Network Ethernet communication using copper or multimode fiber optic (ST)	
FEATURES		Oil Temperature at Valve		Oil temperature sensor, magnetic mount, (4-20mA)	
Display		-40 °C to +105 °C (-40 °F to +221 °F) with finned heat sink adapter option		Split core load CT (4-20mA)	
Back-lit LCD, 128 × 64 pixels		Oil Pressure at Valve		Ambient temperature sensor (4-20mA)	
Keypad to setup unit and acknowledge alarms		0-700KPa (0-100psi) Vacuum resistant sensor		Anodized Aluminum Enclosure - CRC required (minimum quantities applicable)	
Communications		Enclosure			
Standard RS-232 port (DB-9 connector), for local connection to computer for configuring the system		Material		Aluminum	
Standard RS-485 (terminal block), isolated to 2000Vac RMS, for remote communication or connection to local Hydran network		Rating		NEMA Type 4X certified, meets requirements of IP56	
Optional: TCP/IP over Ethernet Copper or Fiber Optic 10/100Mbps/s		Power Requirements			
		90-132 Vac or 180-264 Vac switch mode universal power supply, 47-63 Hz, 650VA max			

*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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