





Hydran M2-X HZ



UL Certified Class I Division 2 – Hazardous Locations

The Hydran M2-X is now available with a UL certification for North America where it is now suitable to be installed on any transformers that are located in hazardous location designated as: Class I Division 2 Groups A, B, C, D. These are hazardous locations where ignitable concentrations of flammable gases, vapors or liquids are not likely to exist under normal operating conditions but where the risk still exists.

UL Marking designation for North America

Flammable Gas or Vapor	Area Classification	Gas Group	Temperature Class
 Class I	 Division 2	 Groups A, B, C, D <small>A: acetylene - B: hydrogen C: ethylene - D: propane</small>	 T4A (<= 120 °C)

Key Benefits

- Can be deployed on transformers located in Hazardous Locations - Class I Div. 2
- 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 Hazloc device can monitor other parameters such as top oil temperature and load current to 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

Applications

The benefits of on-line condition monitoring can be realized across a fleet of transformers of various sizes and voltage levels. 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.

The newly certified Hydran M2-X offers a breakthrough in on-line DGA as it is designed for Industrial applications for use on transformers located in hazardous locations. The HazLoc version joins the next generation of the field-proven family of Hydran on-line DGA monitoring solutions, providing continuous monitoring of dissolved gases and moisture levels, alerting users of developing faults and minimizing the risk of unplanned outages.

Measurements

- Dissolved gas and moisture in oil measurement
- Available with the traditional Hydran composite gas (H₂, CO, C₂H₂, C₂H₄) sensor or with a discrete Hydrogen only (H₂) sensor
- Compatible with various transformer oil types (standard mineral insulating oils and newer natural and synthetic ester based fluids)

Hazardous Locations

- UL certified for North America to be used in areas designated for: Class I Division 2
- Covered under Standards:
UL 121201, 9th Edition, CAN/CSA C22.2 No.213-17, UL 122701, 3rd Edition ISA 12.27.01-2011

Proven Technology

- Field proven solution, delivering online DGA solutions for over 40 years
- Estimated sensor life in excess of 10 years*
- 7-year product warranty
- Single valve install on any type of transformer valve, no outage required

Expandable

- Easily upgradable in the field
- Integrates with the Multilin 845 protection relay for enhanced transformer monitoring
- Compatible with GE's acclaimed Perception™ software to download, trend and analyze data



Technical Specifications

MEASUREMENTS

Fuel cell type sensor behind a gas permeable membrane in contact with transformer insulating oil

Range	25-2000 ppm (volume/volume H ₂ equivalent)
Accuracy**	±10 % of reading ±25 ppm
Response time	10 minutes (90 % of step change)

"Composite Gas" Sensor

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
Repeatability	highest of ±5 % of reading or ±5 ppm

"Discrete H₂" Gas Sensor (Mineral oil only)

Relative sensitivity	H ₂ : 100 % of concentration Interference from CO, C ₂ H ₂ and C ₂ H ₄ less than 3 % of concentration
Repeatability	Highest of ±5 % of reading or ±10 ppm

Moisture Sensor

Thin film capacitive type sensor immersed in insulating oil

Range	0-100 % RH
Accuracy	± 2 % RH
Repeatability	± 2 % RH

FEATURES

Display

Backlit LCD, 128 x 64 pixels
Keypad to setup unit and acknowledge alarms

Communications

Standard RS-232 port (DB-9 connector), for local connection to computer for configuring the system

Standard RS-485 (terminal block), isolated to 2000 Vac RMS, for remote communication or connection to local Hydran network
Optional: Ethernet TCP/IP using copper wired connection

Protocols

Standard: Modbus®, DNP 3.0

Alarms

Gas and Moisture Alert (Hi), Gas and Moisture Alarm (HiHi), System Alarms

Gas alarms can be set on gas level reached or on hourly or daily trend (gas level rate of change)

Moisture alarms can be set on level reached or average level

Alarms can also be configured for optional additional analogue inputs or for calculation results from optional transformer models

5 dry contact relays (type C, SPDT), NO/NC, 3A @250 Vac resistive load, 3A @30 Vdc resistive load

Manual Sampling

Easily accessible external oil sampling port, for use with glass syringe with Luer stopcock

ENVIRONMENT

Conditions

Operating ambient temperature	-40 °C to +55 °C (-40 °F to +131 °F)
Operating ambient humidity	0-95 % RH, non-condensing
Oil Temperature at valve	-40 °C to +105 °C (-40 °F to +221 °F) with finned heat sink adaptor option
Working Oil Pressure	2 bar absolute (1 bar gauge) Vacuum resistant sensor

Certification

UL Certification for Hazardous Location Class I Division 2 Groups A, B, C, D

Enclosure Rating

NEMA Type 4X certified, meets requirements of IP56

Power Requirements

90-132 Vac or 180-264 Vac switch mode universal power supply, 47-63 Hz, 650 VA max

Mechanical

Has a 1.5" NPT male thread, can mount on 1.5" NPT valve or greater using optional adaptors

Dimensions 315 x 219 x 196 mm
12.4 x 8.63 x 7.72 "

Installed weight 7.5 kg (16.5 lb)

Shipping weight 9.0 kg (20 lb)

PRODUCT OPTIONS & SENSORS

Finned heat sink adaptor (1.5") for use when ambient temp > 40 °C (104 °F) or oil temp > 90 °C (194 °F).

Valve adaptors 2" to 1.5"

Transformer models calculations (for mineral oil only)

Analogue input cards, 4-20 mA, 10 V load max, isolated to 2000 Vac RMS

Analogue output cards, 4-20 mA, 10 V load max, isolated to 2000 Vac RMS

Oil temperature sensor, magnetic mount, (4-20 mA)

Split core load CT (4-20 mA)

Ambient temperature sensor (4-20 mA)

Hydran M2-X-HZ	O1	S1	A0	B0	C0	D0	PO	GO	VCO	VO	E0	M0	L0	Default
Oil type	Ox	Sx	Ax	Bx	Cx	Dx	Px	Gx	VCx	Vx	Ex	Mx	Lx	Selection Description
	O1													Mineral Oil
	NE													Natural Ester Oil (CRC Required)
	SE													Synthetic Ester Oil (CRC Required)
Sensor type		S1												Composite gas sensor
		H2												Hydrogen only sensor
Card slot A,B,C,D			A0	B0	C0	D0								No analogue card
			A1	B1	C1	D1								Analogue Input card, 4-20 mA
			A2	B2	C2	D2								Analogue Output card, 4-20 mA
Communication Protocol Options							PO							Modbus/DNP3 over RS 232/RS 485 Standard
							P1							Modbus/DNP3 over TCP/IP Ethernet Card wired connection, 10/100 Mbps/s
Valve Type								GO						Installation on gate valve (standard)
								G1						Installation on globe valve
Valve Connection									VCO					Standard Connection - 1.5" Male NPT
									VC1					Valve adaptor 2" Male NPT to 1.5" Female NPT
Heat Finned Adaptor										VO				No Finned Heat-Skin Adaptor
										V1				Finned Heat-Skin Adaptor - 1.5" Male NPT
Enclosure											E0			Aluminum -Standard
Transformer Models												M0		No Transformer Models
												M1		Transformer Models Enabled (Requires additional sensors)
Language													L0	English labels and manuals
													L1	French labels and manuals

*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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Hydran M2-X-HazLoc-Brochure-EN-2020-06-Grid-GEA-33161



Imagination at work