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 ageing 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’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, DS Agile substation HMI, PREDIX™, and other 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 (H₂, CO, C₂H₂, C₂H₄) sensor or with a discrete Hydrogen only (H₂) sensor
- Easily upgradable 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’s acclaimed Perception™ software to download, trend and analyze transformer health 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 Hz equivalent)
- **Accuracy**: ±10% of reading ±25 ppm
- **Response time**: 10 minutes (90% of step change)

**Composite Gas** Sensor

- Relative sensitivity: Hz. 100% of concentration CO: 15 ± 4% of concentration

**4-20mA**

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

**Oil Sensor**

- Thin film capacitive type sensor immersed in insulating oil

#### Features

- **Display**: Backlit LCD, 128 x 64 pixels
- **Keypad**: to setup unit and acknowledge alarms

### Communications

- **Standard RS-232 port (9-pin connector)**, for local connection to computer for configuring the system
- **Standard RS-485 (terminal block)**, isolated to 2000Vac RMS, for remote communication or connection to local Hydran network

**Optional Ethernet or Fiber Fiber optic over TCP/IP**

**Protocols**

- **Modbus®, DNP 3.0**
- **IEC 61850**

**Alarms**

- Gas and Moisture Alert (Hi), Gas and Moisture Alarm (HiH)
- System Alarms

**Response time**

- 10 minutes (90% of step change)

**Repeatable**

- ±0.5% of reading or ±10 ppm

**Morote Sensor**

- Thin film capacitive type sensor immersed in insulating oil

#### Environment

- **Conditions**:
  - Operating ambient temperature: -40°C to +55°C (-4°F to +131°F)
  - Operating ambient humidity: 0% RH
  - Oil temperature at valve:
    - -40°C to +105°C (-4°F to +221°F)
  - Oil pressure at valve:
    - 0–2000 KPa (0–100 psi)

**Enclosure Rating**

- NEMA Type 4X certified, meets requirements of IP66

**Power Requirements**

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

**Mechanical**

- Has a 1.5” NPT male thread, can mount on 1.5” NPT valve or greater using optional adapters

**Dimensions**

- 315 x 193 x 196 mm
- 12.4 x 7.6 x 7.72”

**Installed weight**

- 7.5kg (16.5lb)

**Shipping weight**

- 9.0kg (20lbs)

**PRODUCT OPTIONS & SENSORS**

- Finned heat sink adapter (1.5”) for use when ambient temp > 40°C (104°F) or oil temp > 90°C (194°F).
- Transformer model calculations (for mineral oil only)
- Analogue input cards, 4–20mA, 10 V load max, isolated to 2000Vac RMS
- Dual digital input cards for dry contacts, internal wetting 24Vac, isolated 2000Vac
- Analogue output cards, 4–20mA, 10V load max, isolated to 2000Vac RMS

**Oil Type**

- Mineral Oil
- Natural Ester Oil
- Synthetic Ester Oil
- Composite gas sensor
- Hydrogen only sensor (with mineral oil only)
- No analogue card
- Analogue input card, 4-20mA
- Analogue Output card, 4-20mA
- Digital dual input card
- Serial communication over RS485
- TCP/IP Ethernet over copper with RJ45 connector
- TCP/IP Ethernet over MM Fibre with ST connector
- Modern analogue PSTN
- Modern wireless (GPRS)/G4
- Installation on gate valve (standard)
- Installation on globe valve
- No adapters (1.5” NPT)
- Finned Heat-sink adapter (1.5”)
- Valve adapter 2” to 1.5”
- Valve adapter 2” to 1.5” + Heat sink adapter
- Multi-protocol (Modbus and DNP3)

**Language**

- English labels and manuals
- French labels and manuals
- Spanish labels and manuals
- German labels and manuals
- Russian labels and manuals

**Shipping Options**

- Value shipping
- Flat rate shipping
- Freight (with freight carrier)

**Selection Description**

- Oil type: Oil type
- Oil sensor type: Oil sensor type
- Card slot: Card slot
- Communication: Communication
- Valve: Valve
- Adapter: Adapter
- Protocol: Protocol

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