

InsuLogix® HMA

HYDROGEN, MOISTURE AND ACETYLENE MONITOR – PROVIDING ACTIONABLE INFORMATION FOR YOUR FLUID FILLED ELECTRICAL EQUIPMENT

The InsuLogix® HMA is a high-performance, low cost online monitor that detects and monitors faults in power transformers. The InsuLogix® HMA provides the transformer operator early warning of the presence of the two key gases that indicate the occurrence of internal faults.

WHY ACETYLENE AND HYDROGEN?

Fault gases are key indicators for flagging incipient faults but also to indicate the fault's severity and evolution in power transformers.

Monitoring the Hydrogen rate of change in oil to detect the faults in their early stages is a strategy that many utilities were following for last 30 years. However, in vast majority of situations, the transformer operators keep increasing the Hydrogen alarm thresholds until the more aggressive gasses appear in oil. This procedure comes to increase the operating cost for the transformer owner.

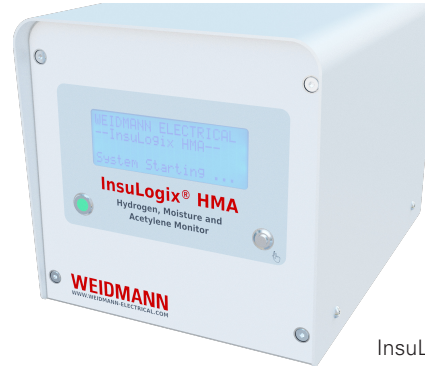
So-called nursing units (5, 6, 7, 8 and 9 gas monitors) are another strategy that transformer owners are employing in order to evaluate the transformer health and determine the right time for de-energizing the transformer while balancing the risk and the cost.

The 5, 6 and 7 gas monitors are providing only partial online diagnostics. In vast majority of situations, the alarms generated by gas monitors – multigas or single gas – are validated by testing an oil sample in a laboratory before the transformer expert makes a decision.

Generated by oil decomposition as a result of thermal stress produced by faults such as arcing and partial discharge starting at 150 °C, Hydrogen is the key gas for detecting the vast majority of incipient faults.

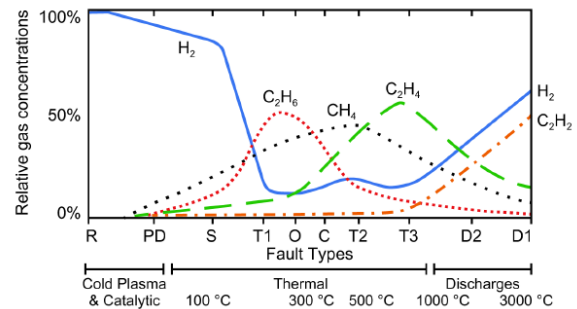
Acetylene is the key gas generated by high energy faults with temperatures above 500 °C. Acetylene in 1 ppm concentration in oil requires immediate attention. An increasing Acetylene trend requires immediate action.

Most of the time, the presence of Acetylene and an increasing trend are the key elements leading to the decision to de-energize the transformer



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By detecting and measuring both Hydrogen and Acetylene the InsuLogix® HMA is the only monitor that a transformer operator needs in order to efficiently and cost effectively monitor the health of the active part of power transformers.



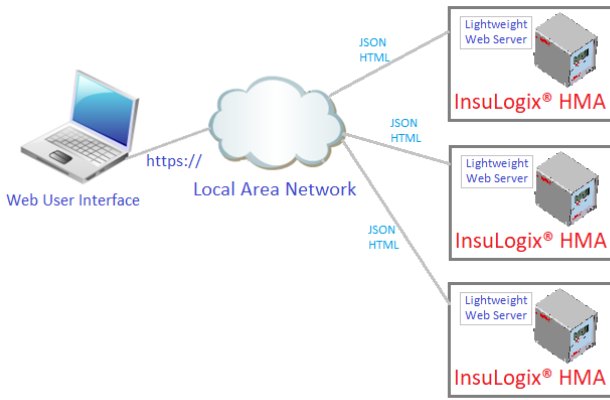
IEEE C57-104 2019: Figure 1 – Relative percentage of dissolved gas concentrations in mineral oil as a function of temperature and fault type [B86]*

INSULOGIX® HMA KEY FEATURES & BENEFITS

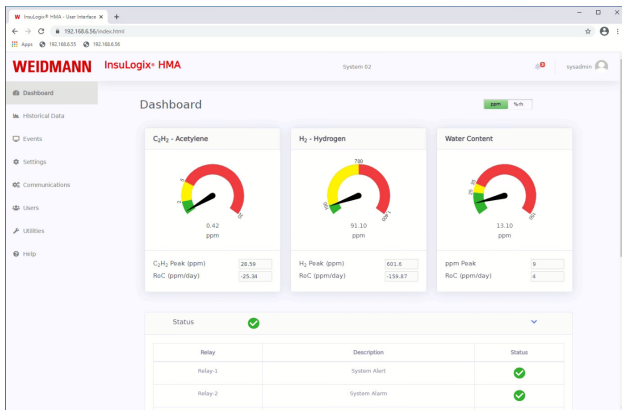
- Easy installation on single, 1.5" valve
- Cutting edge technology for detecting 0.5 ppm Acetylene dissolved in oil
- Modbus, DNP3, & IEC 61850 communication protocols available
- RS485 and Ethernet ports
- Configurable solid state relays
- Analog outputs (optional)
- Data recording in internal memory
- Web user interface for data visualization and administrative tasks
- Multiple monitors can be accessed via a single web server session
- Resistant to vacuum
- Tri-color LED indicator on front panel
- LCD display on front panel
- Compliant to industry guidelines for instrumentation operating in substation environment

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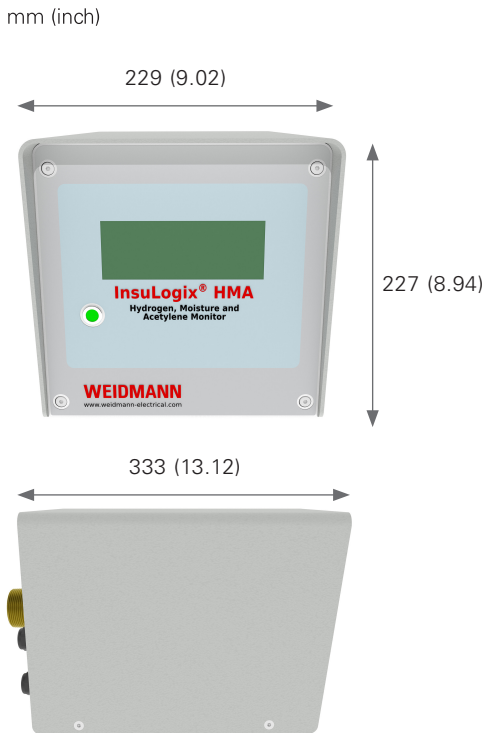
User interface – communication architecture



User interface main dashboard



General Dimensions



DISCLAIMER: Illustrations, specifications and average values are subject to change. Weidmann reserves the right to revise the datasheet at any time, without notification.

Technical Specifications

Measuring Range	C ₂ H ₂ : 0.5-500 ppm (dissolved-in-oil); H ₂ : 25-5000 ppm (dissolved-in-oil); H ₂ O: 0-95 %RH
Accuracy	C ₂ H ₂ : +/-0.5 ppm or 15 % of reading** H ₂ : +/- 25 ppm or 15 % of reading** ** whichever is greater
Low Detection Limit (LDL)	C ₂ H ₂ : 0.5 ppm (dissolved-in-oil) H ₂ : 25 ppm (dissolved-in-oil)
Alarm relays	[12] Programmable Relays Solid State (Form C) Signal Relays (1-8) – Rated Load: 0.50 A @ 125 VAC, 1A @ 24 VDC – Max Switching Voltage: 125 VAC, 60 VDC Power Relays (9-12) – Rated Load: 10 A @ 120 VAC, 8 A @ 30 VDC – Max Switching Voltage: 250 VAC, 125 VDC
Analog outputs (optional)	[4] DC Current Outputs: 0/4-20 mA
Communication protocols	Modbus, DNP3, IEC 61850
LED Status Indicator	One; Green-Yellow-Red
LCD Display	80 character LCD display (4 x 20) Display size: 146.00mm x 62.50mm (5.75" x 2.46") Backlight: white LED
Data recording and event logs	10 years @ default (1 hour) recording frequency; minimum 2 years
User interface software	Residing in unit, Web-Server based
Input power supply	AC Input Voltage range: 115 – 265 VAC (47 – 63 Hz); 1.4 A (3 A Max) DC Input Voltage range: 120 – 370 VDC; 120 W Internally fused at 3 A
Rear Panel RJ45	IP67 RJ45 female connector with bayonet style locking cap; 10/100Base-T
Cable Glands	[3] Nylon dome style 0.24" to 0.47" diameter cable capacity
Protection class	IP66 (NEMA 4X)
Pollution degree	4 – Electrical equipment for outdoor use
Operating Altitude	2000 m
Operating temperature	- 40 to + 65 °C
Storage temperature	- 40 to + 85 °C
Operating humidity	5 to 95 %RH non-condensing
Storage humidity	5 to 95 %RH non-condensing
Dimensions	227 mm x 229 mm x 333 mm (8.9" x 9.0" x 13.1")
Weight	13.5 kg (29.76 lb)
Installation	1.5" NMPT connection from monitor (1.5" NPT Union included)
Pressure Rating	Resistant to full vacuum
Compliant to industry standards	Weidmann can supply the test reports upon request

* [B87] Duval, M., "Ongoing Activities at IEEE, IEC and CIGRE on DGA", Proceedings of the Transformer & Switchyard Users Group (TSUG) Meeting, St-Louis, Aug 5, 2013.

† - Testing performed in both N₂ blanketed and free breathing environments showed no significant difference in results

†† - Reported values are resultant from testing with ball valves

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