

Vaisala Moisture, Hydrogen and Temperature Transmitter MHT410 for Online Transformer Condition Monitoring

The Vaisala MHT410 Moisture, Hydrogen and Temperature Transmitter provides reliable online monitoring of insulating oil in power transformers. With its unique probe design, the MHT410 delivers accurate measurement and trend data about the health of the transformer in real time.

- Information on transformer fault situations
- Enables timely, proactive maintenance decisions to minimize expensive service shutdowns and outages

Reliable measurement

Unlike conventional solutions, the MHT410 transmitter measures moisture, hydrogen and temperature directly in the transformer oil. A non-membrane technology, the MHT410 can handle both under pressure and overpressure conditions. Each probe is also individually pressure tested.

Due to its robust design and reliable measurement technology, false alarms are a thing of the past.

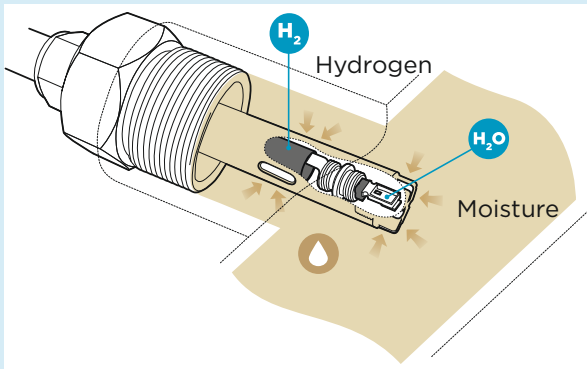
Easy to install

Featuring three critical measurements in one compact probe, the MHT410 can easily be installed and mounted to an operational transformer in minutes - by one person.

- One device, one installation
- Adjustable probe installation depth fits in a variety of transformer valves and is in direct contact with representative oil
- No field adjustments necessary



5-year-warranty proves the outstanding reliability.



Moisture and hydrogen sensors are in direct contact with representative oil in the transformer.

- Moisture fluctuations can be detected quickly and reliably due to adjustable probe design.
- Hydrogen measurement has no membrane so there's nothing to service or replace making the design robust and reliable. The hydrogen sensor never depletes so there's no need to replace it.

>> [See our installation video at vaisala.com/MHT410](https://vaisala.com/MHT410)

Robust design and long-term stability

The MHT410 doesn't have pumps, hoses, batteries, valves, membranes or other sensitive wearing parts that could fail or lead to outages.

It withstands wide temperature changes, vibration and harsh outdoor conditions. The metal housing is IP66 rated and equipped with a weather shield. Special attention has also been given to EMC tolerance. For example, all electrical connections are isolated. The MHT410 can also tolerate short-term electrical breaks.

A Global Technology Developer

Headquartered in Finland, Vaisala is a high tech company that has developed measurement technologies since 1936. Last 40 years, the company has also concentrated in demanding industrial processes. Our commitment produced the Vaisala moisture-in-oil sensor, which has become the worldwide standard. For the power industry, Vaisala has been providing reliable moisture measurement solutions for 20 years - longer than any other company in the industry.

Why Measure?

Power transformers are critical components in the electric grid. Age, increased load levels and network failures all take a toll on transformers, increasing the risk of unpredicted faults and outages.

- Hydrogen levels and their rate of change indicate the severity of a fault situation.
- Moisture has a direct impact on the lifetime of a transformer. Oil moisture has a significant effect on transformer cellulose condition and the oil's ability to insulate. These changes in moisture levels can occur rapidly.

Continuously monitoring hydrogen and moisture levels with an in-situ probe is the first step in extending the life of a transformer through implementation of predictive maintenance practices leading to lower total cost of ownership.

Technical Data

Measured Parameters

HYDROGEN (H ₂)	
Measurement range	0 ... 5000 ppm
Accuracy (in oil temp.range - 20 ... +60 °C (-4...+140 °F))	±20% of reading or ±25 ppm (whichever is greater)

MOISTURE IN OIL	
Measurement range	0 ... 100 % RS / a _w 0 ... 1
Accuracy (in oil temp.range 0 ... +60 °C (+32 ... +140 °F)) (including non-linearity, repeatability, hysteresis)	
0 ... 90 % RS / a _w 0 ... 0.9	±2 % RS / a _w ± 0.02
90 ... 100 % RS / a _w 0.9 ... 1.0	±3 % RS / a _w ± 0.03

TEMPERATURE	
Measurement range	-40 ... +120 °C (-40 °F ... +248 °F)
Accuracy (in oil temp.range 0 ... +60 °C (+32 ... +140 °F))	±0.2 °C (0.36 °F)

OPERATING ENVIRONMENT	
Operating temperature range of electronics	-40 ... +60 °C (-40 °F ... +140 °F)
Storage temperature range	-40 ... +60 °C (-40 °F ... +140 °F)
Pressure tolerance (probe, short-term)	Max 10 bara

ELECTRICAL CONNECTIONS	
Operating voltage	15 ... 30 VDC, 24 VAC (±15 %)
Current output	Three isolated 4 ... 20 mA, loop powering required
Digital output	isolated RS485 half-duplex, RS485 (service port)
Protocols	MODBUS RTU, serial ASCII commands

MECHANICAL CONNECTIONS	1 1/2" NPT
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PERFORMANCE	
Calculated parameters	ppm for mineral oil
Self diagnostics	Device monitors its own functionality. LED lights indicate state of the operation. Fault reporting digitally or via current output.

Accessories	External display, power source and ball valve
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