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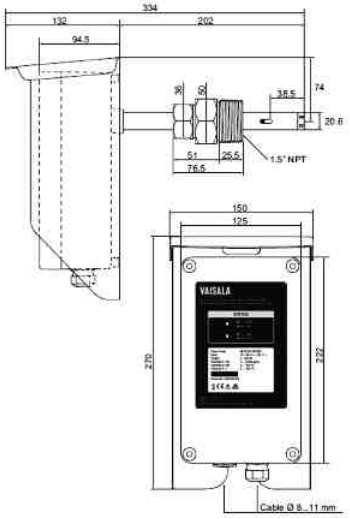
Vaisala Moisture, Hydrogen and Temperature Transmitter MHT410 for Online Transformer Condition Monitoring

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

Dimensions

Dimensions in mm



Features/Benefits

- Online monitoring of insulating oil
- Measures directly from oil without a need of pumps, membranes etc.
- Moisture and hydrogen sensors are in direct contact with representative oil in the transformer
- Monitor health of the transformer in real time
- Information on transformer fault situations
- Unique probe design, robust and easy to install
- Compact size
- 5 year standard warranty
- Isolated inputs and outputs, EMC tolerant device with IP66 metal housing
- Adjustable probe installation depth fits in a variety of transformers

Technical Data

Measurement Performance

HYDROGEN MEASUREMENT	
Measurement range (in oil)	0 ... 5000 ppm
Accuracy (in oil temp. range	
-20 ... +60 °C) (-4 ... + 140 °F)	±20% of reading or ±25 ppm(whichever is greater)
Repeatability	±10 % of reading or ±15 ppm (whichever is greater)
Min. detection limit	20 ppm
Typical long-term stability	3 % of reading / year
Cross sensitivity to other gases	< 2 % (CO_2, C_2H_2, C_2H_4, CO)
Response time	63%: 2.5 hours (when sensor is not in reference cycle), 90%: 17 hours
Warm-up time	2 hours, 12 hours for full specification
Sensor	Catalytic palladium-nickel alloy film solid-state sensor
MOISTURE IN OIL MEASUREMENT	
Measurement range (in oil)	0 ... 100 %RS / a_w 0 ... 1
Accuracy at 20 °C (+68 °F) (including non-linearity, hysteresis and repeatability)	
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)
Sensor response time	
(90%, at +20 °C (+68 °F) in still oil)	10 min
Sensor	HUMICAP® 180L2
TEMPERATURE MEASUREMENT	
Measurement range	-40 ... +120 °C (-40 ... +248 °F)
Accuracy at +20 °C (+68 °F)	± 0.2 °C (0.36 °F)
Sensor	Pt1000 RTD Class F0.1 IEC 60751

Technical Data

Operating Environment

Oil type	Mineral oil
Operating humidity range	0 ... 100 %RH, condensing
Operating temperature range (electronics)	-40 ... +60 °C (-40 ... 140 °F)
Storage temperature range	-40 ... +60 °C (-40 ... 140 °F)
Pressure tolerance (probe, short-term)	Vacuum ... 10 bara
Pressure tolerance (probe, continuous)	Max. 4 bara
Integrated protection for short power outages	> 3 seconds
Electromagnetic compatibility:	
Complies with EMC standard EN61326-1, Industrial environment	
Complies with CISPR22 class B emission limits when DC powered	
Fulfills the requirements of IEC 61000-6-5 in the following tests:	
	IEC 61000-4-2
	IEC 61000-4-3
	IEC 61000-4-4
	IEC 61000-4-5
	IEC 61000-4-6
	IEC 61000-4-8 (100 A/m continuous)
	IEC 61000-4-11
	IEC 61000-4-12
	(The list will be continuously updated)

Connections And Outputs

Operating voltage*	15 ... 30 VDC, 24 VAC (±15%) (power supply input is galvanically isolated)
Power consumption	4 W, typical 12 W max.
Analog output (current)*	Three isolated 4 ... 20 mA, passive (sinks current)
External load	Max. 500 Ohm
Error status indication in case of device error	3.5 mA default, user configurable for each channel
Accuracy of analog outputs at +20 °C	± 0.125 % full scale
Temperature dependence of the analog outputs	± 0.006 %/ °C full scale
Digital outputs*	Isolated RS-485 half-duplex, RS-485 (Service Port, non-isolated)
Protocols	MODBUS RTU, serial ASCII commands
Screw terminals	Wire size AWG 22-14
	Single wire (solid) 1.5 mm^2
	Stranded wire (flex.) 1.0 mm^2
	Recommended wire torque 0.4 Nm

*Max. isolation voltage 1.5 kV DC

Mechanics

Mechanical connection on transmitter	1.5" NPT (male)
Cable bushing (optional)	M20x1.5 for cable diameter 8 ... 11mm/0.31 ... 0.43"
Conduit fitting (optional)	1/2" NPT
Interface cable (optional, pre-assembled)	5 meters, 9.2 mm outer diameter
Housing material	AlSi 10 Mg
Housing classification	IP66
Transmitter weight without cables	4.1 kg

Other

Self-diagnostics indication	Status LEDs, analog output, MODBUS
Integrated data logging capabilities	Non-volatile memory up to 44 years storage with default logging
Individual functional test reports	Calibration test reports for moisture, hydrogen and temperature
	Probe leak test report (5 bara)
Factory warranty	5 years

Display with Relays (External Option)

Pre-configured range for hydrogen	0...5000 ppm
Pre-configured alarm relays (user re-configurable)	Relay 1 trigger limit 200 ppm (hi)
	Relay 2 trigger limit 1500 ppm (hihi)
Input	4...20 mA, loop-powered
Accuracy	0.05 % of span (-10...+60 °C)
Relays	2 x solid state (SSR) max. 250 VAC, 150 mA
Display	4-digit red LED, 14.5 mm
Dimensions	100 x 100 x 57 mm (WHD)
Case Protection	IP65
Case material and color	ABS-plastic, grey
Cable glands	2 x M16x1.5

Spare Parts and Accessories

USB cable for PC connection	219690
External din rail power 100 ... 240 Vac to 24 Vdc	242422
5 meter shielded PUR cable	CBL210392-5MSP
10 meter shielded PUR cable	CBL210392-10MSP
Cable gland	214728SP
Detachable screw terminal block	236620SP
Loop-powered external display, Nokeval 302 (with alarm relays)	242003
MI70 connection cable	219980
Conduit fitting	214780SP

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