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DATASHEET

MMT143

Vaisala · Authorized Partner

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VAISALA

MMT143 Moisture and Temperature Transmitter for Oil

For OEM applications



Features

- Continuous online measurement of moisture in oil
- Measures in lubrication, hydraulic, and transformer oils
- Measures relative saturation (%RS) and water activity (a_w) - ppm calculation available for transformer oil
- Available in two versions: standard range and extended range
- Proven Vaisala HUMICAP® sensor: over 20 years in oil applications
- RS-485 digital output with Modbus™ support
- Traceable calibration (certificate included)
- Compatible with Vaisala Indigo80 handheld indicator and Insight PC software

Vaisala MMT143 Moisture and Temperature Transmitter for Oil is an excellent economical solution for reliable online monitoring of moisture in oil.

Benefits

- Reliable
- Durable
- Small size, easy to integrate

Reliable Vaisala HUMICAP technology

MMT143 incorporates the latest generation of the Vaisala HUMICAP sensor. The sensor is developed for demanding moisture measurement in liquid hydrocarbons and has been successfully used in oil applications for over two decades. The sensor's excellent chemical tolerance provides accurate and reliable measurement over the measurement range.

Water saturation measurement

MMT143 measures moisture in oil in terms of relative saturation (%RS), water activity (a_w), and temperature (T). Relative saturation and water activity indicate directly whether there is a risk of free water formation. The measurement is independent of oil type, age, and temperature.

Water content as ppm conversion

In addition to water activity, MMT143 can output ppm, the average mass concentration of water in oil. Vaisala has this conversion readily available for most insulating liquid types, including mineral transformer oil.

Compact, rugged, and intelligent

Due to its compact size, MMT143 is quickly and easily installed in tight spaces. Units are delivered fully assembled but you can reconfigure them to suit your needs.

Insight PC software and the Indigo80 handheld indicator can also be used for other configuration options, as well as for viewing and logging measurement data (for more information, see vaisala.com/insight and vaisala.com/indigo)

MMT143 specifications

Measurement performance

Sensor	HUMICAP® 180L2
Sensor protection	Stainless steel filter (standard / high flow)
Water activity and relative saturation [1]	
Measurement range	0–100 %RS (0–1 a_w)
Accuracy (including non-linearity, hysteresis, and repeatability):	
0–90 %RS (0–0.9 a_w)	±2 %RS (-±0.02 a_w)
90–100 %RS (0.9–1 a_w)	±3 %RS (±0.03 a_w)
Response time in oil flow (typical)	< 1 min (dry-wet)
Temperature [1]	
Measurement range	−20 ... +80 °C (−4 ... +176 °F) for standard range version −40 ... +80 °C (−40 ... +176 °F) for extended range version
Accuracy at +20 °C (+68 °F)	±0.2 °C (±0.36 °F)
Moisture	
Calculates moisture content in ppm for most insulating liquid types, including mineral transformer oil.	

1) Measurement performance is specified for an oil flow greater than 0.2 m/s.

Operating environment

Pressure range	0–50 bar for standard range version 0–200 bar for extended range version
Operating temperature	
Standard range	−20 ... +60 °C (−4 ... +140 °F)
Extended range	−40 ... +60 °C (−40 ... +140 °F)
Storage temperature	−40 ... +80 °C (−40 ... +176 °F)
Oil flow	Min. 0.2 m/s
IP rating	IP66

Inputs and outputs

Digital outputs (1 port)	RS-485, non-isolated Modbus RTU protocol Vaisala Industrial Protocol
Analog current output (1 port)	4–20 mA
Resolution for current output	0.002 mA
Accuracy for current output at +20 °C (68 °F)	±0.05 mA
Load for current output	Max. 500 Ω
Temperature dependency	0.0008 mA / °C
Operating voltage	
With digital output	6–28 V DC
With current output	18–28 V DC

Mechanical specifications

Cable connections (2 ports)	M8 4-pin male Separate connectors for analog output and digital output (one of each).
Mechanical connections	ISO G1/2" or 1/2"-14 NPT
Weight	Model with ISO G1/2" thread: 90 g (3.2 oz) Model with 1/2"-14 NPT thread: 100 g (3.5 oz)
Housing	
Transmitter body material	Stainless steel (AISI 316L)

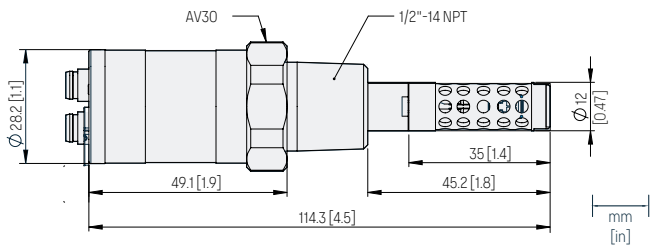
Compliance

EU directives and regulations	EMC Directive (2014/30/EU) RoHS Directive (2011/65/EU) as amended by 2015/863
Electromagnetic compatibility (EMC)	IEC/EN 61326-1, industrial environment [1] FCC part 15 B, Class B CAN ICES-3(B)/NMB-3(B)
Compliance marks	CE, China RoHS, KC, RCM

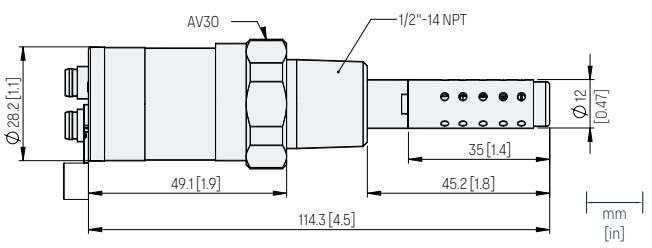
1) Water activity and relative saturation measurement output may deviate up to ±4 %RS (0.04 aw) in industrial environments < 100 MHz and 900–1000 MHz.

Spare parts and accessories

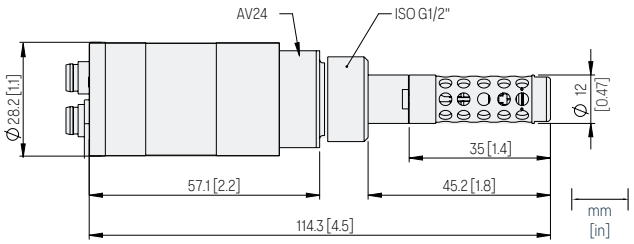
Stainless steel filter	HM47453SP
Stainless steel filter for high flow (> 1 m/s)	220752SP
Connection cable for Indigo80 handheld meter	262195SP
USB serial interface cable / cable for PC connection	219690
Sealing ring set (U-seal, 3 pcs) ISO G1/2"	221525SP
Sealing ring set (copper, 3 pcs) ISO G1/2"	221524SP
Sampling cell	DMT242SC
Sampling cell with Swagelok connectors	DMT242SC2
Connection cables	
1.5 m (4 ft 11 in) heavy duty cable	225777SP
3.0 m (9 ft 10 in) heavy duty cable	225229SP
5.0 m (16 ft 5 in), shielded, M8 threaded	HMP50Z500SP
10 m (32 ft 10 in), shielded, M8 threaded	HMP50Z1000SP
3 m (9 ft 10 in), shielded, connector 90° angle	231520SP
5 m (16 ft 5 in), shielded, connector 90° angle	231521SP



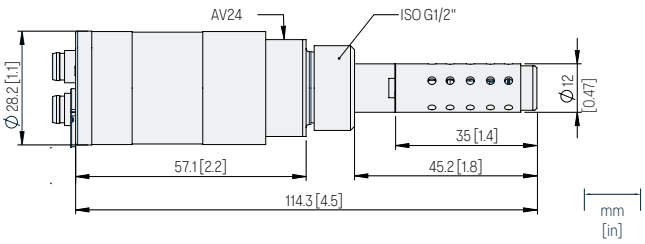
MMT143 dimensions, 1/2"-14 NPT thread, standard filter



MMT143 dimensions, 1/2"-14 NPT thread, high flow filter



MMT143 dimensions, ISO G1/2" thread, standard filter



MMT143 dimensions, ISO G1/2" thread, high flow filter

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