

MMT310 Series Moisture and Temperature Transmitter for Oil



Two probe options: MMT317 and MMT318

Features/Benefits

- Continuous measurement of moisture in oil
- Proven Vaisala HUMICAP® sensor, 10 years in oil applications
- Measurements in lubrication, hydraulic and transformer oils
- Excellent pressure and temperature tolerance
- Measuring water activity - ppm calculation for transformer oil
- Small size, easy to integrate
- NIST traceable calibration
- Applications: e.g. monitoring of transformer oil and of lubrication systems in marine and paper industry

The Vaisala HUMICAP® Moisture and Temperature Transmitter Series for Oil MMT310 is a fast and reliable on-line detector for moisture in oil.

Reliable Vaisala HUMICAP® technology

The MMT310 series incorporates the latest generation of the Vaisala HUMICAP® Sensor, developed for demanding moisture measurement in liquid hydrocarbons. The sensor's excellent chemical tolerance provides accurate and reliable measurement over the wide measurement range.

Measuring water activity

The MMT310 series measures moisture in oil in terms of the water activity (aw) and temperature (T).

Water activity directly indicates if there is a risk of free water formation. The measurement is independent of oil type, age, and temperature.

Water content as ppm calculation for transformer oils

Ppm units are traditionally used in transformer applications. They indicate the average mass concentration of water in oil. The ppm calculation for mineral oil based transformer oil is optional in the MMT310 series.

Diverse applications and demanding conditions

The MMT310 series can be used in lubrication and hydraulic systems as well as in transformers. It can be used for on-line moisture monitoring and as a control function, allowing separators and oil purifiers to be started only when necessary.

Installation options

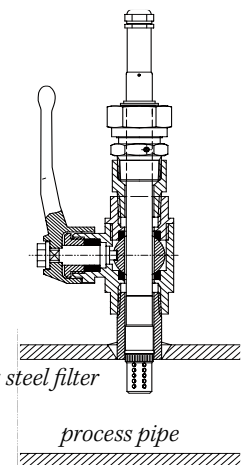
The MMT318 has two adjustable probe lengths. The transmitter can be ordered with a ball valve set that enables the insertion and removal of the moisture probe for calibration, without the need to empty the oil system.

The MMT317 has a small pressure-tight probe with optional Swagelok fittings.

Several outputs, one connector

The MMT310 series has two analog outputs and an RS-232 serial output. The output signals and the supply power travel in the same cable, the only cable connected to the unit.

The MMT318 probe can be inserted directly into the process pipe. With the ball valve system BALLVALVE-1, the probe can be inserted and removed without shutting down the process.



Technical Data

Measured values

Water activity	
Measurement range a_w	0 ... 1
Accuracy (including non-linearity, hysteresis and repeatability)	
0 ... 0.9	±0.02
0.9 ... 1.0	±0.03
Response time (90 %) at +20 °C in still oil (with stainless steel filter)	10 min
Sensor	Vaisala HUMICAP®
Temperature	
Measurement range	-40 ... +180 °C (-40 ... +356 °F)
Typical accuracy at +20 °C	±0.1 °C (±0.18 °F)
Typical temperature dependence of electronics	±0.05 °C/°C (±0.005 °F/°F)
Sensor	Pt100 IEC751/3 class B

Electrical connections

Two analog outputs, selectable and scalable	0 ... 20 mA or 4 ... 20 mA
Typical accuracy of analog output at +20 °C	±0.05 % full scale
Typical temperature dependence of analog output	0.005 %/°C (0.003 %)/°F full scale
Serial output	RS-232C
Connections	8-pole connector with RS-232C, current outputs (two channels) and U_{in} 24 VDC (10 ... 35 VDC)
Operating voltage U_{in}	
Minimum operating voltage U_{in} with RS-232C	10 VDC
I_{out} 0 ... 20 mA, 4 ... 20 mA	11 VDC + ($R_{load}/60$) VDC
Power consumption at +20 °C, U_{in} = 24 VDC	
with RS-232C	20 mA
I_{out} 2 x 0 ... 20 mA	60 mA

General

Operating temperature range for electronics	-40 ... +60 °C (-40 ... +140 °F)
Storage temperature	-55 ... +80 °C (-67 ... +176 °F)
Pressure range for MMT318 with ball valve up to 120 °C	0 ... 40 bar
Pressure range for MMT317	0 ... 10 bar
Material	
transmitter housing	G-ALSi 10 Mg
transmitter base	ABS/PC
Housing classification	IP65 (NEMA 4)
Cable feed through alternatives	8-pole connector with 5 m cable, female 8-pin connector screw joint for cable diameter 4 ... 8 mm
Sensor protection	stainless steel grid
Probe cable length	2, 5 or 10 meters
Complies with EMC standard EN61326-1, Industrial environment	

Note: When using the current output, the RF field susceptibility level according to standard EN61000-4-3 with a frequency band of 110 ... 165 MHz, is only 3 V/m (generic environment) with the specified accuracy.

Dimensions

Dimensions in mm (inches)

