MMT162 Compact Moisture in Oil and Temperature Transmitter for OEM Applications

The MMT162 enables on-line moisture monitoring in oils even in the most demanding applications.

Features/Benefits
- Continuous measurement of moisture in oil
- Measures in lubrication, hydraulic and transformer oils
- Excellent pressure and temperature tolerance
- Proven Vaisala HUMICAP® Sensor, 15 years in oil applications
- Measures water activity - ppm-calculation available for transformer oil
- Small size, easy to integrate
- NIST traceable calibration (certificate included)

The Vaisala HUMICAP® Moisture and Temperature Transmitter for Oil MMT162 is an excellent economical solution for reliable on-line detection of moisture in oil.

Reliable Vaisala HUMICAP® Technology
The MMT162 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 a decade. The sensor’s excellent chemical tolerance provides accurate and reliable measurement over the measurement range.

Water Activity Measurement
The MMT162 measures moisture in oil in terms of the water activity (aw) and temperature (T). Water activity directly indicates whether there is a risk of free water formation. The measurement is independent of oil type, age and temperature. The ppm calculation for mineral oil based transformer oil is optional in the MMT162.

Several Outputs - One Connector
The MMT162 has two analog outputs that can be scaled and the measurement ranges changed. Additionally, the transmitter has an RS-485 serial output. The signals and the unit power travel in the same cable.
An optional LED-cable enables a visual alarm.

Compact, Rugged and Intelligent
Due to its compact size, the MMT162 is quickly and easily installed in tight spaces. Units are delivered fully assembled, however, you can reconfigure them to suit your needs.

MM70
In combination with an MM70 indicator, the MMT162 provides an ideal tool for on site calibration. The MI70 indicator can be used as a display, communication, and data-logging device for the MMT162.
Technical Data

**Measured Values**

**WATER ACTIVITY**

- **Measurement range**: 0 ... 1 aw
- **Accuracy (including non-linearity, hysteresis and repeatability)**:
  - 0 ... 0.9: ± 0.02
  - 0.9 ... 1.0: ± 0.03

**Response time**

- in oil flow (typical): <1 min (dry-wet)

**MOISTURE**

- Calculated moisture content in ppm for mineral transformer oil

**TEMPERATURE**

- **Accuracy at +20 °C (+68 °F)**: ± 0.2 °C (0.36 °F)

**Operating Environment**

- **Operating temperature**: -40 ... +60 °C (-40 ... +140 °F)
- **Oil temperature**: -40 ... +80 °C (-40 ... +176 °F)
- **Pressure range**
  - metal version: up to 200 bar
  - plastic version: up to 40 bar
- **Oil flow**: some flow recommended

**Outputs**

- **Analog outputs (two channels)**
  - **current output**: 0 ... 20 mA, 4 ... 20 mA
  - **voltage output**: 0 ... 5 V, 0 ... 10 V
- **Alarm level indication by analog signal**: user selectable
- **Digital outputs**: RS-485

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<thead>
<tr>
<th>Pin</th>
<th>I</th>
<th>II</th>
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<tbody>
<tr>
<td>1</td>
<td>Vsupply</td>
<td>Vsupply</td>
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<tr>
<td>2</td>
<td>Ch 1</td>
<td>RS-485 + / B</td>
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<tr>
<td>3</td>
<td>GND</td>
<td>GND</td>
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<tr>
<td>4</td>
<td>Ch 2</td>
<td>RS-485 + / A</td>
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**General**

- **Sensor**: HUMICAP®
- **Cable connections (2 ports)**: M8, 4 pin
- **Minimum operating voltage with**
  - RS-485 output: 14 ... 28 VDC
  - voltage output: 16 ... 28 VDC
  - current output: 22 ... 28 VDC
- **Supply current**
  - normal measurement: 20 mA + load current
  - External load for
    - voltage output: min. 10 kOhm
    - current output: max. 500 Ohm
- **Housing material**
  - metal: AISI 316L
  - plastic: PPS + 40% GF
- **Mechanical connections with bonded seal ring (washer)**
  - metal version: G 1/2” ISO or NPT 1/2”
  - plastic version: G 1/2” ISO
- **Housing classification**: IP65 (NEMA 4)
- **Storage temperature range**: -40 ... +80 °C (-40 ... +176 °F)
- **Weight**
  - with plastic housing: 65 g (2.3 oz)
  - with metal housing: 200 g (7 oz)
- **Complies with EMC standard EN61326-1, Electrical equipment for measurement control and laboratory use - EMC requirements; Industrial environment**

**Options and Accessories**

- **Stainless steel filter (standard)**: 225356SP
- **Stainless steel filter for high flow (>1 m/s)**: 221494SP
- **Connection cable for MM70 hand-held meter**: 219980
- **USB serial interface cable**: 219690
- **Sealing ring set (U-seal) ISO G1/2, 3 pcs**: 221525SP
- **Sealing ring set (copper) ISO G1/2, 3 pcs**: 221524SP
- **ISO 1/2” plug**: 218773
- **NPT 1/2” plug**: 222507
- **Sampling cell**: DMT242SC
- **Sampling cell w. Swagelok connectors**: DMT242SC2
- **Connection cable**
  - 2 m (6.5 ft), M8 snap-on: 211598
  - 0.32 m (1 ft) Shielded, M8 threaded: HMP50Z032
  - 3.0 m (9.8 ft), Shielded, M8 threaded: HMP50Z300SP
  - 5.0 m (16.4 ft), Shielded, M8 threaded: HMP50Z500SP
  - 10 m (32.8 ft), Shielded, M8 threaded: HMP50Z1000SP
  - 3 m, connector 90° angle: 221739
  - 5 m, connector 90° angle: 221740
  - M8 threaded, Ch1 signal + Ch2 LED: MP300LEDCL

[Dimensions in mm (inches)]

Please contact us at www.vaisala.com/requestinfo