Vaisala HUMICAP® Moisture and Temperature Transmitter Series for Oil MMT330 enables the fast and reliable detection of moisture in oil. MMT330 series transmitters can be used in online moisture monitoring and as control devices, allowing separators and oil driers to be started only when needed.

Benefits
- Easy field calibration and maintenance – compatible with Vaisala HUMICAP® Hand-Held Moisture Meter for Oil MM70
- Approved for installation in MAN Diesel & Turbo Two-Stroke Diesel Engines lubrication systems

For Diverse Applications and Demanding Conditions
With a wide variety of probes, the transmitter can be used in lubrication systems, hydraulic systems, and transformers.

Indicates the Margin to Water Saturation
MMT330 measures moisture in oil in terms of the water activity (aw), relative saturation (%RS), and temperature (T). Water activity or relative saturation indicate directly whether there is a risk of free-water formation. The measurement is independent of oil type and age.

Water Content as ppm Conversion
In addition to water activity, MMT330 can output ppm, the average mass concentration of water in oil. Vaisala has this conversion readily available for mineral transformer oil.

For other oils, the oil-specific conversion coefficients can be programmed into the transmitter if the water solubility of the oil is known.

Graphical Display of Measurement Data and Trends for Convenient Operation
MMT330 features a large numerical and graphical display with a multilingual menu and keypad. It allows users to easily monitor operational data, measurement trends, and access measurement history for the past 12 months.

The optional data logger, with real-time clock, makes it possible to generate over four years of measurement history and zoom in on any desired time or time frame.

The display alarm allows any measured parameter to be tracked, with freely configurable low and high limits. 

Features
- Continuous online measurement of moisture in oil
- Ball-valve installation – no need to shut down the process or drain the oil
- Proven Vaisala HUMICAP® sensor, used for over 15 years in oil applications
- Analog outputs, RS-232/485, LAN
- Modbus protocol support (RTU/TCP)
The display shows measurement trends, real-time data, and measurement history.

**Versatile Outputs and Data Collection**

MMT330 can support up to three analog outputs; an isolated galvanic power supply and relay outputs are also available.

For serial interface the USB connection, RS-232, and RS-485 can be used.

In addition to the analog outputs, MMT330 provides Modbus RTU and TCP/IP communication protocol.

The data recorded by the data logger can be viewed on the local display or transferred to a PC with Microsoft Windows® software. The transmitter can also be connected to a network with an optional LAN interface, which enables a Ethernet connection. A USB service cable makes it easy to connect the MMT330 to a PC via the service port.

**Easy Installation**

With multiple options to choose from, the instrument can be tailored to meet the specific needs of each individual application and is delivered installation-ready and pre-configured for each delivery. Quick delivery time and global service network make MMT330 a perfect choice for any project.

Vaisala HUMICAP Hand-Held Moisture for Oil Meter MM70 is designed for field-checking MMT330 transmitters.
## Installation Options

The MMT332 probe is installed using a flange. It is designed for high-pressure applications.

### MMT332 for High Pressure Installations

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pressure range</td>
<td>0 ... 250 bar / 0 ... 3625 psia</td>
</tr>
<tr>
<td>Probe diameter</td>
<td>12 mm (0.5 in)</td>
</tr>
<tr>
<td>Installation flange</td>
<td>36 mm (1.4 in)</td>
</tr>
<tr>
<td>Temperature measurement range</td>
<td>-40 ... +180 °C (-40 ... 356 °F)</td>
</tr>
</tbody>
</table>

### MMT337 with Small-sized Probe

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pressure range</td>
<td>0 ... 10 bar / 0 ... 145 psia</td>
</tr>
<tr>
<td>Probe diameter</td>
<td>12 mm (0.5 in)</td>
</tr>
<tr>
<td>Temperature measurement range</td>
<td>-40 ... +180 °C (-40 ... 356 °F)</td>
</tr>
</tbody>
</table>

### MMT338 with Probe for Pipeline Installations

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pressure range with ball-valve</td>
<td>0 ... 40 bar / 0 ... 580 psia</td>
</tr>
<tr>
<td>Adjustable length</td>
<td>35 ... 157/379 mm (1.37 ... 6.2/14.9 in)</td>
</tr>
<tr>
<td>Temperature measurement range</td>
<td>-40 ... +180 °C (-40 ... 356 °F)</td>
</tr>
</tbody>
</table>

### Diagrams

- **MMT332 Dimensions in mm (inches)**
- **MMT337 Dimensions in mm (inches)**
- **MMT338 Dimensions in mm (inches)**
### Measurement Performance

**Water Activity**

- Measurement range $a_w$: $0 \ldots 1$
- Response time (90%) at $+20 \, ^\circ C$ in still oil (with stainless steel filter): 10 min

**Sensor**

- HUMICAP® 180L2

**Accuracy (Including Non-linearity, Hysteresis, and Repeatability):**

<table>
<thead>
<tr>
<th>Range</th>
<th>Accuracy</th>
</tr>
</thead>
<tbody>
<tr>
<td>$0 \ldots 0.9$</td>
<td>$\pm 0.02$</td>
</tr>
<tr>
<td>$0.9 \ldots 1.0$</td>
<td>$\pm 0.03$</td>
</tr>
</tbody>
</table>

**Temperature**

- Measurement range: $-40 \ldots +180 \, ^\circ C$ ($-40 \ldots +356 \, ^\circ F$)
- Accuracy at $+20 \, ^\circ C$ (+68 \, ^\circ F): $\pm 0.2 \, ^\circ C$ ($0.36 \, ^\circ F$)

### Operating Environment

**EMC compliance**

EN61326-1, Industrial environment

**Pressure range for probes**

See probe specifications

**Operating Temperature**

For probes: Same as measurement ranges

For transmitter body:

- $-40 \ldots +60 \, ^\circ C$ (+32 \ldots +140 \, ^\circ F)

With display:

- $0 \ldots +60 \, ^\circ C$ (+32 \ldots +140 \, ^\circ F)

*Note: Transmitter with display test impedance of 40 Ω is used in IEC61000-4-5 (Surge immunity)*

### Inputs and Outputs

**Operating voltage**

- $10 \ldots 35 \, VDC$, $24 \, VAC \pm 20 \%$

**Operating voltage with optional power supply module**

- $100 \ldots 240 \, VAC 50/60 \, Hz$

**Power Consumption at 20 °C ($U_{in}, 24 \, VDC$)**

<table>
<thead>
<tr>
<th>Interface</th>
<th>Max. Current</th>
</tr>
</thead>
<tbody>
<tr>
<td>RS-232</td>
<td>25 mA</td>
</tr>
<tr>
<td>$U_{out}$</td>
<td>2 x 0 ... 1V / 0 ... 5V / 0 ... 10V</td>
</tr>
<tr>
<td>$I_{out}$</td>
<td>2 x 0 ... 20mA</td>
</tr>
</tbody>
</table>

**Display and backlight**

- Max. 20 mA

**Analog Outputs (2 Standard, 3rd Optional)**

| Current output | $0 \ldots 20 \, mA$, $4 \ldots 20 \, mA$ |
| Voltage output | $0 \ldots 1 \, V$, $0 \ldots 5 \, V$, $0 \ldots 10 \, V$ |

**Accuracy of analog outputs at 20 °C**

- $\pm 0.05 \%$ full scale

**Temperature dependence of the analog outputs**

- $\pm 0.005 \%/\, ^\circ C$ full scale

**External Loads**

- Current outputs: $R_i \leq 500 \, \Omega$
- $0 \ldots 1 \, V$ output: $R_i > 2 \, k\Omega$
- $0 \ldots 5 \, V$ and $0 \ldots 10 \, V$ outputs: $R_i > 10 \, k\Omega$

**Max. wire size**

- 0.5 mm² (AWG 20) stranded wires recommended

**Digital outputs**

- RS-232, RS-485 (optional)

**Protocols**

- ASCII commands, Modbus RTU

**Service connection**

- RS-232, USB

**Relay outputs**

- 0.5 A, 250 VAC, SPDT, potential-free (optional)

### Compliance

**IP rating**

- IP66

**IP rating with local display**

- IP65

**NEMA rating with local display**

- 4X
**Dimensions**

Dimensions in mm (inches)

**Mounting Options**

Mounting with Wall Mounting Kit

Mounting with DIN Rail Installation Kit

Pole Installation with Installation Kit for Pole or Pipeline

Mounting Rain Shield with Installation Kit

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