



### Features

- Continuous online measurement of moisture in oil and temperature
- Measurement temperature range  $-40 \dots +180 \text{ }^\circ\text{C}$  ( $-40 \dots +356 \text{ }^\circ\text{F}$ )
- Measurement accuracy up to  $\pm 0.01 a_w$  ( $\pm 1 \text{ \%RS}$ )
- Proven Vaisala HUMICAP<sup>®</sup> sensor, used for over 15 years in oil applications
- Modbus RTU over RS-485
- Traceable calibration certificate: 6 points for humidity, 1 point for temperature
- Compatible with Indigo transmitters and Insight PC software

Vaisala HUMICAP<sup>®</sup> Moisture in Oil Probe MMP8 enables fast and reliable measurement of moisture in oil. It uses proven Vaisala HUMICAP<sup>®</sup> sensor that was developed for demanding dissolved moisture measurements in transformer and lubrication oils, hydraulic fluids, and other liquids.

### Reliable Vaisala HUMICAP<sup>®</sup> Technology

MMP8 incorporates the latest-generation Vaisala HUMICAP<sup>®</sup> 180L2 sensor, which is the result of over 15 years of field experience. It was developed for demanding moisture measurement in transformer and lubrication oils and other liquids.

The sensor's excellent chemical tolerance provides accurate and reliable measurement over a wide measurement range. The HUMICAP<sup>®</sup> 180L2 sensor has excellent sensitivity in the dry end of the range which is typically needed in transformer applications.

### Measure the Margin to Water Saturation

MMP8 measures dissolved moisture in oil in terms of the water activity ( $a_w$ ), relative saturation (%RS), and temperature (T). Water activity or

relative saturation indicate directly whether there is a risk of free water formation. This data is relevant in lubrication oil applications where detecting water ingress and preventing free water formation is crucial. The measurement is independent of oil type and age.

In addition to water activity, MMP8 can output ppm, the average mass concentration of water in oil. Vaisala has this conversion readily available for specific oils, including mineral transformer oil. This allows continuous measurement of ppm concentration in power transformer condition monitoring.

For other oils, the oil-specific conversion coefficients can be calculated if the water solubility of the oil is known and the solubility characteristic remains constant.

### Easy Installation

When installed with the ball valve kit, the MMP8 is ideal for installation into processes where the probe needs to be installed or removed while the process is running. Probe installation depth is adjustable. Pressure fitting options are ISO 1/2" and NPT 1/2". MMP8 is delivered with a manual pressing handle that allows the probe to be pushed against process pressure.

# Technical Data

## Measurement Performance

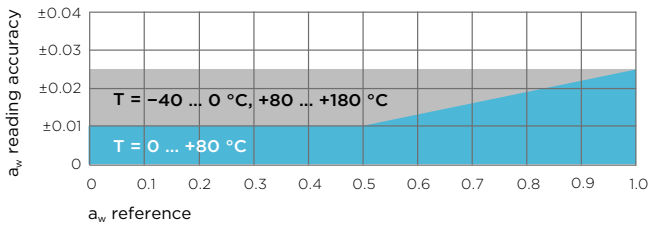
### Water Activity

Measurement range	0 ... 1 a <sub>w</sub>
T <sub>90</sub> response time <sup>1)</sup>	10 min
Sensor	HUMICAP® 180L2
Accuracy <sup>2)</sup>	±0.01 a <sub>w</sub> (±1 %RS)

### Temperature

Measurement range	-40 ... +180 °C (-40 ... +356 °F)
Accuracy at +20 °C (+68 °F)	±0.2 °C (0.36 °F)

<sup>1)</sup> At +20 °C (+68 °F) in still oil.  
<sup>2)</sup> In range 0 ... 0.5 a<sub>w</sub>, including non-linearity, hysteresis, and repeatability. See accuracy graph below.



A<sub>w</sub> Measurement Accuracy

## Operating Environment

Operating temperature range for probe head	-40 ... +180 °C (-40 ... +356 °F)
Operating temperature range for probe body	-40 ... +80 °C (-40 ... +176 °F)
Storage temperature range	-40 ... +80 °C (-40 ... +176 °F)
Operating pressure range	0 ... 40 bar (0 ... 580 psia)
Installation pressure	Up to 10 bar (145 psia)
IP rating of probe body	IP66
EMC compliance	EN61326-1, Industrial environment
<b>Ball Valve</b>	
Operating temperature	Up to +120 °C (+248 °F)
Operating pressure	Up to 40 bar (0 ... 580 psia)

## Inputs and Outputs

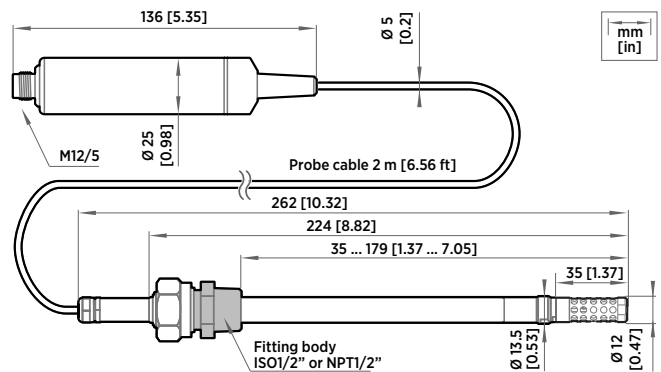
Operating voltage	15 ... 30 VDC
Current consumption	10 mA typical
Digital output	RS-485, non-isolated
Protocols	Modbus RTU

### Output Parameters

Temperature, water activity, relative saturation, water mass fraction (ppm)
---

## Mechanical Specifications

Connector	M12 5-pin A-coded male
Weight	510 g (18.0 oz)
Filter options	Stainless steel grid standard filter Stainless steel grid filter for high flow rates (> 1 m/s)
Probe cable length	2 m (6.56 ft)
Adjustable installation depth	35 ... 179 mm (1.37 ... 7.05 in)
<b>Materials</b>	
Probe	AISI316L
Probe body	AISI316L
Cable jacket	FEP



MMP8 Dimensions

## Accessories

Ball valve ISO 1/2" with welding joint	BALLVALVE-1
Ball valve ISO 1/2" with thread joint ISO 3/4"	BALLVALVE-2
USB PC connection cable <sup>1)</sup>	242659

<sup>1)</sup> Vaisala Insight software for Windows available at [www.vaisala.com/insight](http://www.vaisala.com/insight)

