

## MMT162 Compact Moisture in Oil and Temperature Transmitter for OEM Applications



### Features/Benefits

- Continuous measurement of moisture in oil
- Measures in lubrication, hydraulic and transformer oils
- Excellent pressure and temperature tolerance
- Vaisala HUMICAP® Sensor - proven in the field since 1973
- Measures water activity - ppm-calculation available for transformer oil
- Small size, easy to integrate
- NIST traceable calibration (certificate included)

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

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.

### Water content as ppm calculation for transformer oils

In transformer applications ppm-units are traditionally used. It indicates the average mass concentration of water in oil. The ppm calculation for mineral oil based transformer oil is optional in the MMT162.

### For diverse applications and demanding conditions

Lubrication systems, hydraulic systems and transformers are among the typical applications of the MMT162. Its measurements can be used for on-line moisture monitoring and as a control function, allowing dryers and oil purifiers to be started only when necessary.

### 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 re-configure them to suit your needs.

### MM70

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



*The Vaisala HUMICAP® Hand-held Moisture Meter for Oil MM70 is ideal for confirming the performance of the MMT162 in the field.*

# 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)
-----------------------------	--------------------

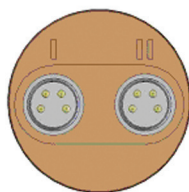
## Operating Environment

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 ... 1 V, 0 ... 5 V, 0 ... 10 V
Alarm level indication by analog signal	user selectable
Digital outputs	RS-485

Pin	I	II
1	Vsupply	Vsupply
2	Ch 1	RS-485 - / B
3	GND	GND
4	Ch 2	RS-485 + / A

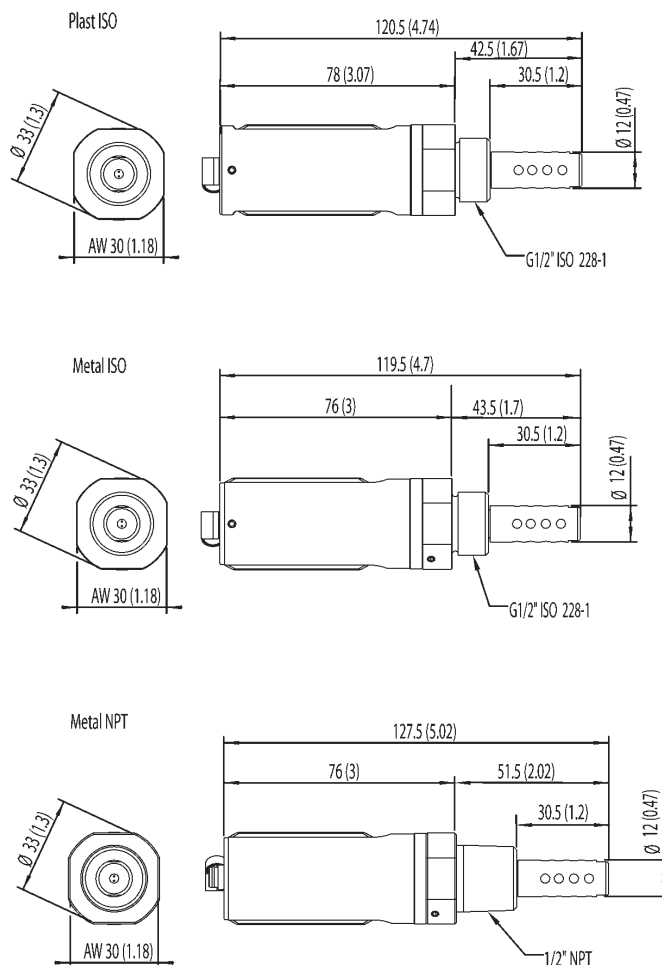


## Options and accessories

Stainless steel filter (standard)	221494SP
Stainless steel filter for high flow (>1 m/s)	221493SP
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
100 ... 240 VAC external power supply (not IP65)	POWER-1
Connection cable	
2 m (6.5 ft), M8 snap-on	2211598
0.32 m (1 ft) Shielded, M8 threaded	HMP50Z032
3.0 m (9.8 ft), Shielded, M8 threaded	HMP50Z300
5.0 m (16.4 ft), Shielded, M8 threaded	HMP50Z500
10 m (32.8 ft), Shielded, M8 threaded	HMP50Z1000
3 m, Shielded, connector 90° angle	221739
5 m, Shielded, connector 90° angle	221740
M8 threaded, Ch1 signal + Ch2 LED	MP300LEDCBL

## Dimensions

Dimensions in mm (inches)



## 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	

HUMICAP® is a registered trademark of Vaisala. Specifications subject to change without prior notice. ©Vaisala Oyj

