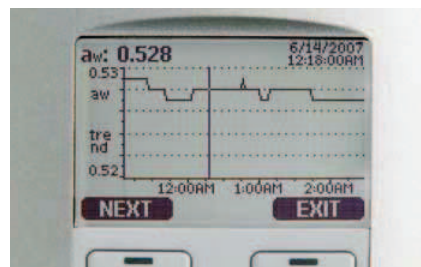


## MMT330 Series Moisture and Temperature Transmitters for Oil



The display shows measurement trends, real time data and history.

The MMT330 transmitter family offers a range of solutions for demanding moisture in oil measurements.

### Features/Benefits

- Continuous on-line measurement of moisture in oil
- Ball valve installation - no need to shut down the process
- Proven Vaisala HUMICAP® Sensor, 15 years in oil applications.
- Easy to calibrate and maintain in the field - Compatible with Vaisala HUMICAP® Hand-Held Moisture for Oil Meter MM70
- NIST traceable calibration (certificate included)
- Analog outputs, WLAN/LAN
- MODBUS protocol support (RTU/TCP)
- Approved for Installation in lubrication system of MAN Diesel & Turbo Two-Stroke Diesel Engines.

The Vaisala HUMICAP® Moisture and Temperature Transmitter Series for Oil MMT330 enables fast and reliable detection of moisture in oil. The MMT330 can be used in on-line moisture monitoring and as a control device, allowing separators and oil driers to be started only when needed.

Proper monitoring saves both oil and the environment. With the MMT330 it is easy and economical to monitor the changes of moisture in oil.

### Reliable Vaisala HUMICAP® Technology

The MMT330 incorporates the latest generation of the Vaisala HUMICAP® Sensor, which is the result of 15 years of field experience. It was developed for demanding moisture measurement in liquid hydrocarbons.

The sensor's excellent chemical tolerance provides accurate and reliable measurement over a wide measurement range.

### For Diverse Applications and Demanding Conditions

Because of the variety of probes, the transmitter can be used in lubrication systems, hydraulic systems, and transformers.

### Indicates the Margin to Water Saturation

The MMT330 measures moisture in oil in terms of the water activity (aw) and temperature (T). Water activity indicates directly whether there is a risk of free water formation. The measurement is also independent of oil type and age.

## Water Content as ppm Conversion

In addition to water activity, the 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 to the transmitter if the water solubility of the oil is known.

## Graphical Measurement Trend and Historical Display

The MMT330 can be ordered with a large numerical and graphical display with a multilingual menu. It allows the user to monitor operational data, measurement trends and up to 1-year measurement history. The optional data logger with real-time clock makes it possible to generate over four years of measured history, and zoom in on any desired time or time frame.

The display alarm allows tracking of any measured parameter, with a freely configurable low and high limit.

## Data Collection and (Wireless) Transfer to PC

The recorded measurement data can be viewed on the display or transferred to a PC with Microsoft Windows® software. The transmitter can also be connected to a network with an optional (W)LAN interface, which enables a (wireless) Ethernet connection.

## Versatile Outputs and Easy Installation

The MMT330 provides up to three analog outputs. Galvanic isolation of supply power and analog outputs is also available. For serial interface the USB connection, RS232 and RS485 can be used. In addition, alarm relay option is available.

The MMT330 has several options for transmitter mounting. Transmitters



*The Vaisala HUMICAP® Hand-Held Moisture for Oil Meter MM70 is designed for field checking MMT330 transmitters.*

are delivered pre-configured with all settings installation ready.

MMT330 is also capable in applying the MODBUS communication protocol and together with an appropriate connection option provides either MODBUS RTU (RS485) or MODBUS TCP/IP (Ethernet) communication.



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

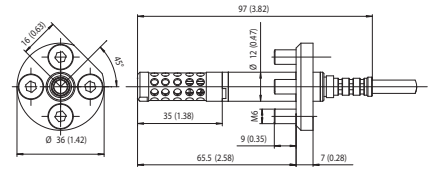
### Installation Options

#### MMT332 For High Pressure Installations

Pressure range	0 ... 250 bar / 0 ... 3625 psia
Probe diameter	12 mm / 0.5 inch
Installation	
Flange	36 mm / 1.4 inch
Temperature	
Measurement range	-40 ... +180 °C (-40 ... 356 °F)

### Dimensions

Dimensions in mm (inches)



The MMT337 probe, with optional Swagelok connector, is ideal for tight spaces with a thread connection. The small probe is designed for integrating into confined spaces with small diameter lines.

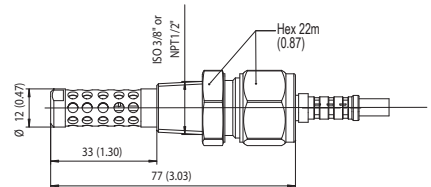
### Installation Options

#### MMT337 with Small Sized Probe

Pressure range	0 ... 10 bar / 0 ... 145 psia
Probe diameter	12 mm / 0.5 inch
Installation	
Fitting Body	R 3/8" ISO
Fitting Body	1/2" ISO
Fitting Body	NPT 1/2"
Temperature	
Measurement range	-40 ... +180 °C (-40 ... 356 °F)

### Dimensions

Dimensions in mm (inches)



The MMT338 is ideal for installations in pressurized processes where the probe needs to be removed while the process is running. The probe depth is adjustable.

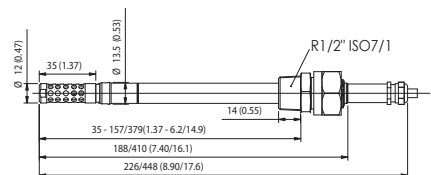
### Installation Options

#### MMT338 with Probe for Pipeline Installations

Pressure range with ball valve	0 ... 40 bar / 0 ... 580 psia
	up to 120 °C (248 °F) and 40 bar
Adjustable length	35 ... 157/379 mm / 1.37 ... 6.2 / 14.9 inch
Installation	
Fitting Body	R1/2" ISO
Fitting Body	NPT 1/2"
Ball Valve Set	BALLVALVE-1
Sampling Cell	DMT242SC2
Temperature	
Measurement range	-40 ... +180 °C (-40 ... 356 °F)

### Dimensions

Dimensions in mm (inches)



# Technical Data

## Measured Values

WATER ACTIVITY	
Measurement range $a_w$	0 ... 1
Accuracy (including nonlinearity, hysteresis and repeatability)	
0 ... 0.9	$\pm 0.02$
0.9 ... 1.0	$\pm 0.03$
Response time (90 %) at +20 °C in still oil (with stainless steel filter)	10 min.
Sensor	HUMICAP®

## Performance

TEMPERATURE	
Measurement range	
MMT332	-40 ... +180 °C (-40 ... +356 °F)
MMT337	-40 ... +180 °C (-40 ... +356 °F)
MMT338	-40 ... +180 °C (-40 ... +356 °F)
Accuracy at +20 °C (+68 °F)	$\pm 0.2$ °C (0.36 °F)

## Operating Environment

Operating temperature	
for probes	same as measurement ranges
for transmitter body	-40 ... +60 °C (-40 ... +140 °F)
with display	0 ... +60 °C (+32 ... +140 °F)
Pressure range for probes	See probe specifications

Complies with EMC standard EN61326-1, Electrical equipment for measurement, control and laboratory use - EMC requirements; Industrial environment.

## Inputs and Outputs

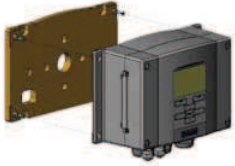
Operating voltage	10 ... 35 VDC, 24 VAC
with optional power supply module	100 ... 240 VAC 50/60 Hz
Power consumption @ 20 °C ( $U_{in}$ 24VDC)	
RS-232	max 25 mA
$U_{out}$ 2 x 0...1V / 0...5V / 0...10V	max 25 mA
$I_{out}$ 2 x 0...20 mA	max 60 mA
display and backlight	+ 20 mA
Analog outputs (2 standard, 3rd optional)	
current output	0 ... 20 mA, 4 ... 20 mA
voltage output	0 ... 1 V, 0 ... 5 V, 0 ... 10 V
Accuracy of analog outputs at 20 °C	$\pm 0.05$ % full scale
Temperature dependence of the analog outputs	$\pm 0.005$ %/°C full scale
External loads	
current outputs	$R_L < 500$ ohm
0 ... 1V output	$R_L > 2$ kohm
0 ... 5V and 0 ... 10V outputs	$R_L > 10$ kohm

Max wire size	0.5 mm <sup>2</sup> (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)
Ethernet interface (optional)	
Supported standards	10BASE-T, 100BASE-TX
Connector	8P8C (RJ45)
IPv4 address assignment	DHCP (automatic), static
Protocols	Telnet, MODBUS TCP/IP
WLAN interface (optional)	
Supported standards	802.11b
Antenna connector type	RP-SMA
IPv4 address assignment	DHCP (automatic), static
Protocols	Telnet, MODBUS TCP/IP
Security	WEP 64/128, WPA
Authentication / Encryption	
Open / no encryption	
Open / WEP	
WPA Pre shared key / TKIP	
WPA Pre shared key / CCMP (a.k.a. WPA2)	
Optional data logger with real-time clock	
Logged parameters	max. four with trend/min/max values
Logging interval	10 sec (fixed)
Max. logging period	4 years 5 months
Logged points	13,7 million points per parameter
Battery lifetime	min. 5 years
Display	LCD with backlight, graphic trend display of any parameter
Display menu languages	English, Chinese, Spanish, German, French, Japanese, Russian, Swedish, Finnish

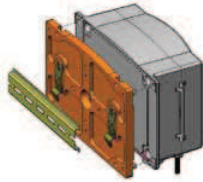
## Mechanics

Cable bushing	M20x1.5 for cable diameter 8 ... 11mm/0.31 ... 0.43"
Conduit fitting	1/2"NPT
Interface cable connector (optional)	M12 series 8 pin (male)
option 1	with plug (female) with 5 m / 16.4 ft black cable
option 2	with plug (female) with screw terminals
USB-RJ45 Serial Connection Cable (incl. Mi70 Link software)	219685
Probe cable diameter	5.5 mm
Probe cable lengths	2 m, 5 m or 10 m
Housing material	G-AlSi 10 Mg (DIN 1725)
Housing classification	IP 65 (NEMA 4X)
Sensor protection	Stainless steel grid standard filter/ Stainless steel grid filter for high flow rates (>1 m/s)

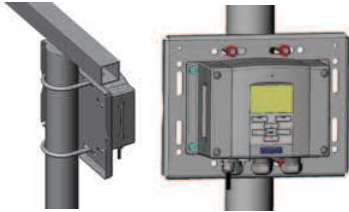
## Mounting Options



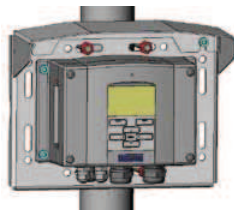
Mounting with Wall Mounting Kit



Mounting with DIN Rail Installation Kit



Pole Installation with Installation Kit for Pole or Pipeline

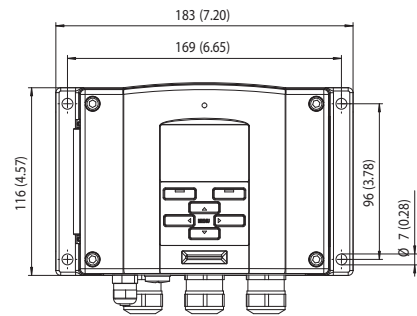
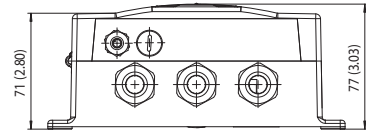


Mounting Rain Shield with Installation Kit

HUMICAP® is a registered trademark of Vaisala.

## Dimensions

Dimensions in mm (inches)



TYPE APPROVED PRODUCT  
CERTIFICATE NO.: A-11440

# VAISALA

For more information, visit [www.vaisala.com](http://www.vaisala.com) or contact us at [sales@vaisala.com](mailto:sales@vaisala.com)

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