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HMT330 Series Humidity and Temperature Transmitters for Demanding Humidity Measurement

The HMT330 transmitter family offers reliable performance for a wide variety of demanding industrial humidity measurements.

Features/Benefits

- Six models for demanding industrial applications
- Full 0 ... 100 %RH measurement, temperature range up to +180 °C (+356 °F) depending on model
- Pressure tolerance up to 100 bar depending on model
- 4th generation Vaisala HUMICAP® sensor for superior accuracy and stability
- Optional graphical display and keypad for convenient operation
- Multilingual user interface
- Excellent performance in harsh conditions; good chemical tolerance
- Corrosion-resistant IP65/IP66 housing
- 5-point calibration (certificate included)
- 10-year warranty when annually calibrated at the Vaisala Service Center
- RS232/485/422 WLAN/LAN
- MODBUS protocol support (RTU/TCP)
- Compatible with Vaisala viewLinc software

The Vaisala HUMICAP® Humidity and Temperature Transmitter Series HMT330 is designed for demanding industrial applications where stable measurements and extensive customization are essential. With multiple options to choose from, the instrument can be tailored to meet the specific needs of each individual application.

Proven Vaisala HUMICAP® Performance

The HMT330 series incorporates Vaisala's 40 years of experience in industrial humidity measurement. The updated fourth-generation HUMICAP sensor provides accurate and stable measurement even in environments with high humidity or chemical contaminants.

Chemical Purge Minimizes Effects of Contaminants

In environments with high concentrations of chemicals and cleaning agents, the chemical purge option helps to maintain measurement accuracy between calibration intervals.

The chemical purge involves heating the sensor to remove harmful chemicals. The function can be initiated manually or programmed to occur at set intervals.

Wide Range of Installation Options

The wide variety of measurement probes, several installation accessories, and universal mains and DC power options make the instruments easy to install in various locations and kinds of environment; walls, poles, pipelines, and ducts, for example. The input/output cable can be fed through the back of the transmitter, which is a useful feature, especially for cleanroom installations.

The HMT330 series includes six models:

- HMT331 for wall-mounted applications
- HMT333 for ducts and tight spaces
- HMT334 for high-pressure and vacuum applications
- HMT335 for high-temperature applications
- HMT337 for high-humidity applications
- HMT338 for pressurized pipelines

With multiple options to choose from, including local display, the HMT300 series can be tailored to meet the specific needs of each individual application. This device is designed to integrate seamlessly with the Vaisala viewLinc Environmental Monitoring System, which is a Part 11/Annex 11 compliant software that can be easily implemented following the GAMP5 guidelines.

Graphical Display of Measurement Data and Trends for Convenient Operation

The HMT330 series features an optional 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.

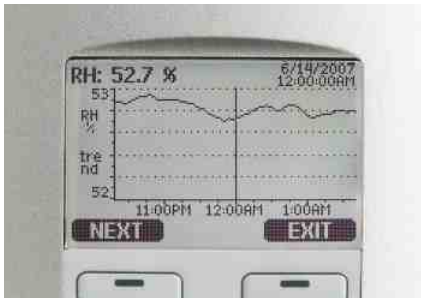
Versatile Outputs and Data Collection

The HMT330 can support up to three analog outputs; an isolated galvanic power supply and relay outputs are also available.

For serial interface the USB service cable, RS232, and RS485/422 can be used.

HMT330 is also capable of applying the MODBUS communication protocol and, together with an appropriate connection option, provides either MODBUS RTU (RS485) or MODBUS TCP/IP (Ethernet) communication.

The data logger, with real-time clock and battery backup, guarantees reliable logging of measurement data for over four years. The recorded data 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 (W)LAN interface, which enables a (wireless) Ethernet connection. A USB service cable makes it easy to connect the HMT330 to a PC via the service port.



The display shows measurement trends and over four years of real-time measurement history.

Flexible Calibration

The HMT330 instruments are calibrated at five humidity points at the factory and come with a calibration certificate that meets all the relevant traceability and compliance requirements.

A quick, one-point field calibration can be performed with the hand-held HM70 meter. A two-point field calibration can be performed, for example, with the HMK15 salt bath calibrator in a controlled environment. The transmitter can also be sent to Vaisala for recalibration, and accredited ISO/IEC17025 calibrations and special calibrations are available.

Technical Data

Performance

RELATIVE HUMIDITY

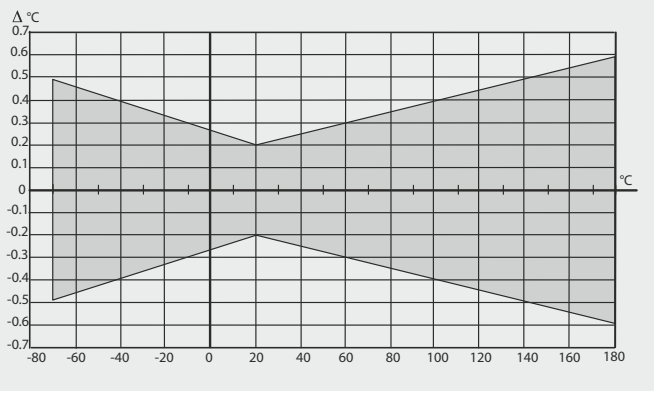
Measurement range	0 ... 100 %RH
Accuracy (including non-linearity, hysteresis, and repeatability)	
with Vaisala HUMICAP® 180 or 180R*	for typical applications
with Vaisala HUMICAP® 180C or 180RC*	for applications with chemical purge/warmed probe
with Vaisala HUMICAP® 180VC	catalytic sensor with chemical purge for H_2O_2 environments
at +15 ... +25 °C (59 ... +77 °F)	±1 %RH (0 ... 90 %) ±1.7 %RH (90 ... 100 %RH)
at -20 ... +40 °C (-4 ... +104 °F)	±(1.0 + 0.008 x reading) %RH
at -40 ... +180 °C (-40 ... +356 °F)	±(1.5 + 0.015 x reading) %RH
Factory calibration uncertainty (+20 °C)	±0.6 %RH (0 ... 40 %RH) ±1.0 %RH (40 ... 97 %RH)
	(Defined as ±2 standard deviation limits. Small variations possible; see also calibration certificate.)
Response time (90%) at +20 °C (+68 °F)	8 s/17 s** with grid filter
in still air	20 s/50 s** with grid + steel netting filter
	40 s/60 s** with sintered filter

*HUMICAP 180R or 180RC recommended

** with HUMICAP 180R or 180RC or 180VC sensor

TEMPERATURE

Accuracy at +20 °C (+68 °F)	± 0.2 °C (± 0.36 °F)
Accuracy over temperature range (measurement range depends on model)	



Temperature sensor	Pt100 RTD Class F0.1 IEC 60751

Other available variables (model-dependent)

dew point temperature, mixing ratio, absolute humidity, wet bulb temperature, enthalpy, water vapor pressure

Inputs and Outputs

Operating voltage	10 ... 35 VDC, 24 VAC ±20%
with optional power supply module	100 ... 240 VAC, 50/60 HZ
Power consumption at +20 °C (U_{in} 24 VDC)	
RS232	max. 25 mA
U_{out} 2 x 0 ... 1 V/0 ... 5 V/0 ... 10 V	max. 25 mA
I_{out} 2 x 0 ... 20 mA	max. 60 mA
display and backlight	+ 20 mA
during chemical purge	max. 110 mA
during probe heating (HMT337)	+ 120 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	±0.05% full scale
Temperature dependence of the analog outputs	±0.005%/°C full scale
External loads	
current outputs	R_L < 500 ohm
0 ... 1 V output	R_L > 2 kohm
0 ... 5 V and 0 ... 10 V outputs	R_L > 10 kohm
Max. wire size	0.5 mm^2 (AWG 20) stranded wires recommended
Digital outputs	RS232, RS485 (optional)
Protocols	ASCII commands, MODBUS RTU
Service connection	RS232, USB
Relay outputs (optional)	0.5 A, 250 VAC
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, WPA2/802.11i
Authentication / Encryption (WLAN)	
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, graphical trend display of any parameter
Menu languages	English, Chinese, Finnish, French, German, Japanese, Russian, Spanish, Swedish

Mechanics

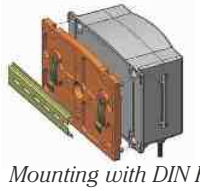
Cable bushing	M20 x 1.5 for cable diameter 8 ... 11 mm/0.31 ... 0.43"
Conduit fitting	1/2" NPT
User cable connector (optional)	M12 series 8-pin (male)
option 1	female plug with 5 m (16.4 ft.) black cable
option 2	female plug with screw terminals
Probe cable diameter	
HMT333 (+80 °C)	6.0 mm
other probes	5.5 mm
Standard probe cable lengths	2 m, 5 m or 10 m (Additional lengths available, please see order forms for details)
Housing material	G-AlSi 10 Mg (DIN1725)
Housing classification	IP 66 IP65 (NEMA4X) with local display
Weight depending on selected probe, cable and modules	1.0 - 3.0 kgs

Operating Environment

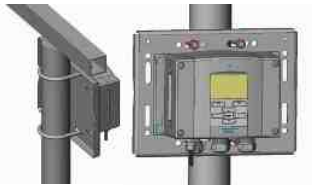
Operating temperature	
for probe	same as measurement range
for transmitter body	-40 ... +60 °C (-40 ... 140 °F)
with display	0 ... +60 °C (32 ... 140 °F)
Electromagnetic compatibility	Complies with EMC standard EN61326-1, Industrial Environment
	Note: Transmitter with display test impedance of 40 ohm is used in IEC61000-4-5 (Surge immunity)

Mounting Options

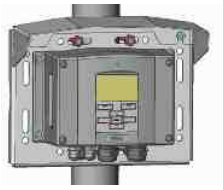
*Mounting with Wall Mounting Kit**



Mounting with DIN Rail Installation Kit



Pole Installation with Installation Kit for Pole or Pipeline

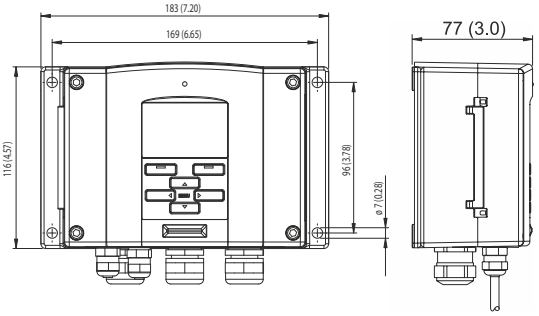


Mounting Rain Shield with Installation Kit

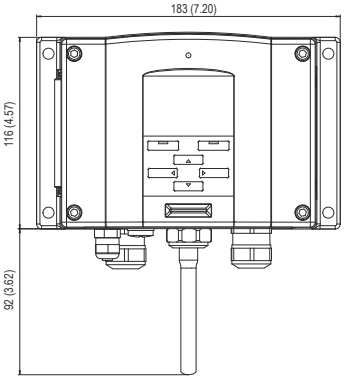
*not mandatory for wall installations

Dimensions

Dimensions in mm (inches)



Transmitter with WLAN antenna



TYPE APPROVED PRODUCT
CERTIFICATE NO.: A-13529

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HMT331 Humidity and Temperature Transmitter for Demanding Wall-Mounted Applications

The HMT331 is a state-of-the-art wall-mounted humidity measurement instrument.

The Vaisala HUMICAP® Humidity and Temperature Transmitter HMT331 is a high-quality wall-mounted transmitter for demanding HVAC and condition-monitoring applications.

Typical Applications

- cleanrooms
- pharmaceutical processes
- swimming halls
- museums and archives

HMT331 Humidity and Temperature Transmitter with short flexible probe and optional WLAN.

Technical Data

Temperature measurement range	-40 ... +60 °C (-40 ... +140 °F)

Accessories

USB service port cable with PC software	219916
Connection cable for HM70	211339
Wall-mounting plate (plastic)	214829
Pole installation kit with rain shield	215109
DIN rail installation set	215094
PPS plastic grid filter with stainless steel net	DRW010281SP
Stainless steel sintered filter	HM47280SP

HMT333 Humidity and Temperature Transmitter for Ducts and Tight Spaces

The Vaisala HUMICAP® Humidity and Temperature Transmitter HMT333 is a versatile instrument for applications where a small remote probe is needed, for example in demanding HVAC applications. Its small thermal mass enables rapid response to temperature changes.

The HMT333 transmitter's compact probe is designed for remote applications.

Typical Applications

- cleanrooms
- pharmaceutical processes
- environmental chambers
- processes with moderate temperature and humidity

Duct installation kit for HMT333 and HMT337.

Flexible Installation

To install the probe in ducts, channels, and through walls, an installation kit is available with a stainless steel flange, lead-through piece, and steel support bar.

The HMT333 has two probe cable options – a flexible rubber cable that withstands temperatures of up to +80 °C, and a durable cable that withstands temperatures of up to +120 °C. Both cable options are available in lengths of 2, 5, and 10 meters. Additionally, flexible rubber cable (+80 °C) is available in 20-meter lengths.

For outdoor environments, the DTR502B solar radiation shield provides protection for the probe. The shield can be installed on a pole, beam, or flat surface.

Technical Data

Temperature measurement range	-40 ... +80 °C (-40 ... +176 °F) or -40 ... +120 °C (-40 ... +248 °F)

Accessories

Duct installation kit	210697
Cable gland with split seal	HMP247CG
USB service port cable with PC software	219916
Connection cable for HM70	211339
Wall-mounting plate (plastic)	214829
Pole installation kit with rain shield	215109
Solar radiation shield	DTR502B
DIN rail installation set	215094
PPS plastic grid filter with stainless steel net	DRW010281SP
PPS plastic grid filter	DRW010276SP
Stainless steel sintered filter	HM47280SP

HMT334 Humidity and Temperature Transmitter for High Pressure and Vacuum Applications

The HMT334 is ideal for permanent installations in pressurized or vacuum processes.

The Vaisala HUMICAP® Humidity and Temperature Transmitter HMT334 is designed for humidity measurement in pressurized spaces or vacuum chambers. Every probe is tested for gas and vacuum-tight installation.

Typical Applications

- test chambers
- high-pressure and vacuum processes

Technical Data

Temperature measurement range	-70 ... +180 °C (-94 ... +356 °F)
Operating pressure	0 ... 10 MPa (0 ... 100 bar)

Accessories

Fitting body ISO M22 x 1.5	17223SP
Fitting body NPT 1/2"	17225SP
USB service port cable with PC software	219916
Connection cable for HM70	211339
Wall-mounting plate (plastic)	214829
Pole installation kit with rain shield	215109
DIN rail installation set	215094
PPS plastic grid filter with stainless steel net	DRW010281SP
PPS plastic grid filter	DRW010276SP
Stainless steel sintered filter	HM47280SP
Stainless steel grid filter	HM47453SP

HMT335 Humidity and Temperature Transmitter for High Temperatures

The HMT335 has a robust stainless steel probe, ideal for hot processes with high flow rates.

The Vaisala HUMICAP® Humidity and Temperature Transmitter HMT335 has a long stainless steel probe designed for high temperatures.

Robust Probe Ideal for High Flow Rates

With high tolerance for mechanical stress and high flow rates, the HMT335 is ideal for duct measurements. The stainless steel installation flange allows easy adjustment of the probe's installation depth.

Typical Applications

- hot drying processes
- food processes, e.g. baking ovens

The installation flange allows easy adjustment of the probe installation depth.

Technical Data

Temperature measurement range	-70 ... +180 °C (-94 ... +356 °F)

Accessories

Mounting flange	210696
USB service port cable with PC software	219916
Connection cable for HM70	211339
Wall-mounting plate (plastic)	214829
Pole installation kit with rain shield	215109
DIN rail installation set	215094
PPS plastic grid filter with stainless steel net	DRW010281SP
PPS plastic grid filter	DRW010276SP
Stainless steel sintered filter	HM47280SP
Stainless steel grid filter	HM47453SP

HMT337 Humidity and Temperature Transmitter for High Humidity Applications

The HMT337 is ideal for the most demanding process and meteorological measurements in high-humidity condensing environments.

Typical Applications

- professional meteorology
- intake air monitoring of engines and gas turbines
- timber drying kilns

Duct installation kit for HMT333 and HMT337.

The Vaisala HUMICAP® Humidity and Temperature Transmitter HMT337 is delivered in one of three configurations:

- Basic, with a non-warmed probe for moderate humidity
- With a warmed probe, for near-condensing conditions and dew point measurement
- With a warmed probe and an additional temperature sensor, for near-condensing conditions and relative humidity measurement

True Humidity Readings in Condensation Conditions

Vaisala's unique warmed probe provides fast and reliable measurement in environments where humidity is near saturation. The heating prevents condensation from forming on the sensor.

As the probe is heated, the humidity level inside it stays below the ambient level. With accurate temperature measurement, the ambient dew point can be calculated precisely.

If the relative humidity value is needed, an additional temperature sensor is used. The measured ambient temperature provides the compensation for calculating relative humidity and other humidity parameters.

Installation Options

Tight installation through a process wall can be achieved with Swagelok® fittings. The optional HMT330MIK Installation Kit is available for outdoor installations; duct installation kits are also available.

Technical Data

Temperature measurement range	-70 ... +180 °C (-94 ... +356 °F)

Accessories*

Cable gland and AGRO	HMP247CG
Duct installation kit (RH probe)	210697
Duct installation kit (T probe)	215003
Swagelok fittings (NPT and ISO) for both RH and T probes (up to 10 bar)	
Solar radiation shield	DTR502B
Meteorological installation kit	HMT330MIK
USB service port cable with PC software	219916
Connection cable for HM70	211339
Wall-mounting plate (plastic)	214829
Pole installation kit with rain shield	215109
DIN rail installation set	215094
Warmed probe accessory	HMT330WPA
PPS plastic grid filter with stainless steel net	DRW010281SP
PPS plastic grid filter	DRW010276SP
Stainless steel sintered filter	HM47280SP
Stainless steel grid filter	HM47453SP

*for more installation accessories, check the order form

HMT338 Humidity and Temperature Transmitter for Pressurized Pipelines

The HMT338 is ideal for installations in pressurized processes where the probe needs to be removed while the process is running.

Typical Applications

- process lines
- environmental chambers
- vacuum-drying processes
- compressed air lines with refrigerant dryers

The Vaisala HUMICAP® Humidity and Temperature Transmitter HMT338 is designed for pressurized processes.

Insert or Remove the Probe while the Process is Running

With “hot tapping”, the probe is inserted directly into the process while it is running, without the need for venting or lowering the process pressure.

The probe is tightened to a ball-valve assembly fixed to the process pipe or wall. The adjustable hex nut is hand-tightened to temporarily hold the probe in place. The probe is then pushed down to the appropriate depth. The hex nut is then tightened with a wrench to lock the probe in place. Hot tapping is possible in pressures up to 10 bar.

Technical Data

Temperature measurement range	-70 ... +180 °C (-94 ... +356 °F)
Operating pressure	0 ... 4MPa (0 ... 40 bar)

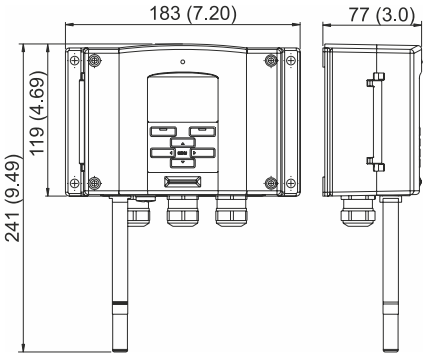
Accessories

Ball-valve set	BALLVALVE-1
Pressure fitting ISO 1/2 to NPT 1/2	210662
USB service port cable with PC software	219916
Connection cable for HM70	211339
Wall-mounting plate (plastic)	214829
Pole installation kit with rain shield	215109
DIN rail installation set	215094
PPS plastic grid filter with stainless steel net	DRW010281SP
PPS plastic grid filter	DRW010276SP
Stainless steel sintered filter	HM47280SP
Stainless steel grid filter	HM47453SP

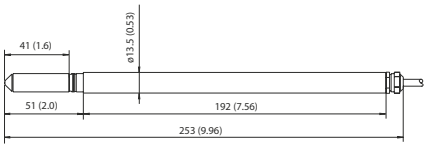
Dimensions of the Probes for the HMT330 Series

Dimensions in mm (inches)

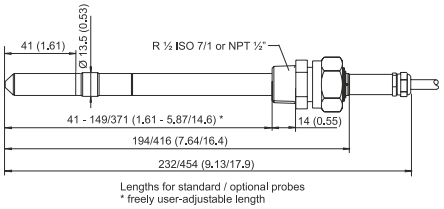
HMT331 probe



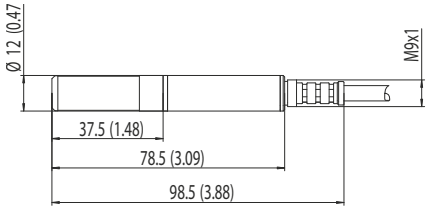
HMT335 probe



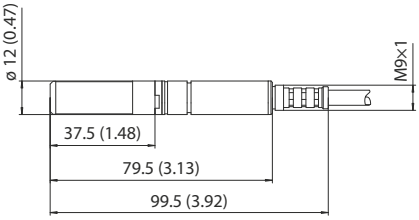
HMT338 probe



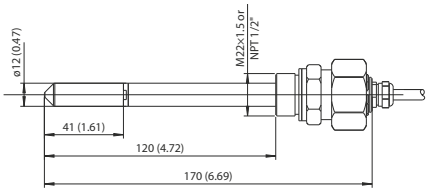
HMT333 probe



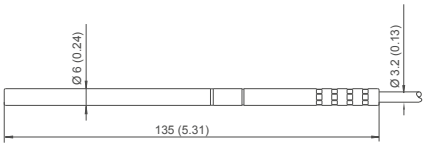
HMT337 RH probe



HMT334 probe



HMT337 T probe



Installation flange