



HMT310 Series Humidity and Temperature Transmitters

For Demanding Industrial Applications



Features

- 4th generation Vaisala HUMICAP® sensor for superior accuracy and stability
- Full 0 ... 100 %RH measurement, temperature range up to +180 °C (+356 °F), depending on model
- Small size, easy to integrate
- Insensitive to dust and most chemicals
- Two analog signals and RS-232 ASCII output
- Pressure tolerance up to 100 bar

HMT310 incorporates the latest generation Vaisala HUMICAP® sensor. The sensor is a capacitive thin-film polymer sensor providing high accuracy, excellent long-term stability and negligible hysteresis. It is insensitive to dust, particulate dirt and most chemicals. HMT310 has various options for different environments and measurements.

Several Outputs, One Connector

HMT310 is powered up with 10 ... 35 VDC. It has two analog outputs and an RS-232 serial output in one M12/8 pin connector. The output signal and the supply power travel in the same cable, the only cable connected to the unit.

Chemical Purge

Chemical purge helps to maintain measurement accuracy between calibration intervals. It involves heating the sensor to remove harmful chemicals. The function can be initiated manually or programmed to occur at set intervals.

Optional Functions

The following optional functions are available: several probes for various applications, calculated humidity quantities, variety of mounting kits, rain shield, sensor protection options and probe cable lengths, warmed probe and sensor heating for high humidity conditions, and chemical purge for applications risking an interference with chemicals in the measuring environment.

The HMT310 series includes six models for demanding applications:

- HMT311 for wall mounting

- HMT313 for duct mounting and tight spaces
- HMT314 for high pressures up to 100 bar and vacuum conditions
- HMT315 for high temperatures
- HMT317 for high humidity applications, warmed probe option
- HMT318 for pressurized pipelines up to 40 bar

Technical Data

Measurement Performance

Relative Humidity

Measurement range	0 ... 100 %RH
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Sensor:

Vaisala HUMICAP180R	Typical applications
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Vaisala HUMICAP180RC	Applications with chemical purge/warmed probe
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Vaisala HUMICAP180V	Catalytic sensor for H ₂ O ₂ environments
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Vaisala HUMICAP180VC	Catalytic sensor with chemical purge for H ₂ O ₂ environments
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Response time (90 %) at +20 °C (+68 °F) in 0.1 m/s air flow	17 s with grid filter 50 s with grid and steel, netting filter 60 s with sintered filter
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Factory calibration uncertainty (+20 °C)	±0.6 %RH (0 ... 40 %RH) ¹⁾ ±1.0 %RH (40 ... 97 %RH) ¹⁾
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Accuracy (Including Non-Linearity, Hysteresis, and Repeatability) at a Temperature Range of:

+15 ... +25 °C (+59 ... +77 °F)	±1 %RH (0 ... 90 %RH) ±1.7 %RH (90 ... 100 %RH)
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-20 ... +40 °C (-4 ... +104 °F)	±(1.0 + 0.008 x reading) %RH
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-40 ... +180 °C (-40 ... +356 °F)	±(1.5 + 0.015 x reading) %RH
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Temperature

HMT311	-40 ... +60 °C (-40 ... +140 °F)
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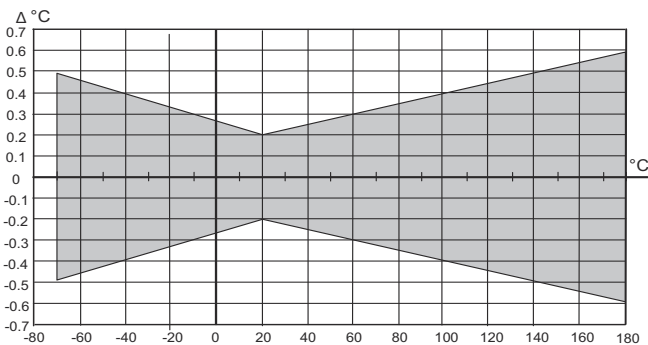
HMT313	-40 ... +80 °C (-40 ... +176 °F) or -40 ... +120 °C (-40 ... +248 °F)
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HMT314, HMT315, HMT317, HMT318	-70 ... +180 °C (-94 ... +356 °F)
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Typical accuracy at +20 °C (+68 °F)	±0.2 °C (±0.36 °F)
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Temperature sensor	Pt100 RTD Class F0.1 IEC 60751
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¹⁾ Defined as ±2 standard deviation limits. Small variations possible, see also calibration certificate.



Accuracy over temperature range

Operating Environment

Operating temperature for electronics	-40 ... +60 °C (-40 ... +140 °F)
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Storage temperature	-55 ... +80 °C (-67 ... +176 °F)
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Operating pressure

HMT314	0 ... 100 bar
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HMT318	0 ... 40 bar
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HMT315, HMT317	vapor tight
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EMC compliance	EN61326-1, Industrial environment
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Inputs and Outputs

Two analog outputs, selectable and scalable	0 ... 20 mA or 4 ... 20 mA 0 ... 5 V or 0 ... 10 V 1 ... 5 V available through scaling
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Typical accuracy of analog output at +20 °C	±0.05 % full scale
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Typical temperature dependence of analog output	0.005 %/°C (0.003 %/°F) of full scale
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Serial output	RS232C
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Connections	M12 8-pole connector with RS232C, current/voltage outputs (two channels) and U _{in}
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Operating voltage	10 ... 35 VDC
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External load	R _L < 500 Ω
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Startup time after power-up	3 s
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Minimum Operating Voltage

RS-232C output	10 VDC
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Analog output	15 VDC
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Probe heating and chemical purge	15 VDC
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Pressures above 10 bara (145 psia)	24 VDC
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Power Consumption

RS-232	12 mA
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U _{out} 10 V (10 kΩ) channel 1 & channel 2	12 mA
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I _{out} 20 mA (load 511 Ω) channel 1 & channel 2	50 mA
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Chemical purge at 24 VDC	+ 220 mA
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Warmed probe at 24 VDC	+ 240 mA
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Mechanical Specifications

Transmitter housing material	G-AISI10Mg
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Transmitter base material	PPS
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IP rating	IP66
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Probe cable length	2 m, 5 m, or 10 m
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Cable feed through alternatives	8-pole connector with 5 m cable, Female 8-pin connector screw joint for cable diameter 4 ... 8 mm
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Sensor protection	PPS grid with stainless steel net, PPS grid, Sintered filter, Membrane stainless steel filter, H ₂ O ₂ filter
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Spare Parts and Accessories

Rain shield	ASM211103
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USB cable	238607
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PPS Plastic Grid with Stainless Steel Netting	DRW010281SP
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PPS Plastic Grid Filter	DRW010276SP
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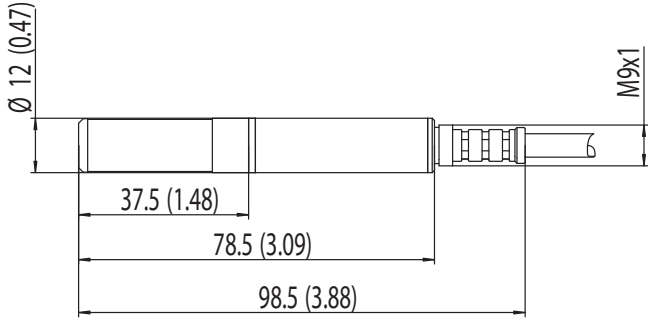
Sintered Filter AISI 316L	HM47280SP
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Stainless Steel Filter	HM47453SP
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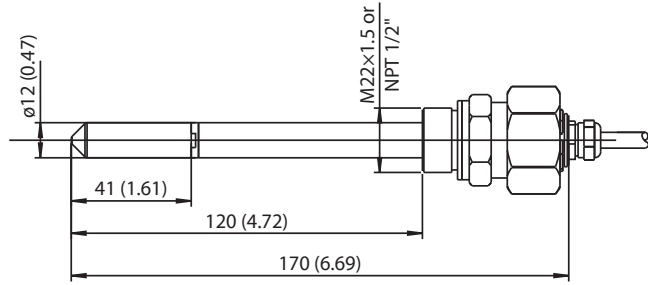
Stainless Steel Filter with Membrane	214848SP
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Catalytic H ₂ O ₂ Filter	231865
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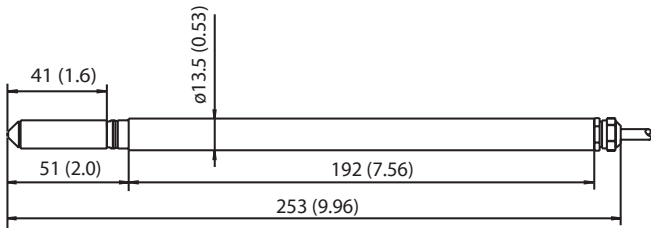
Probe dimensions in mm (inches)



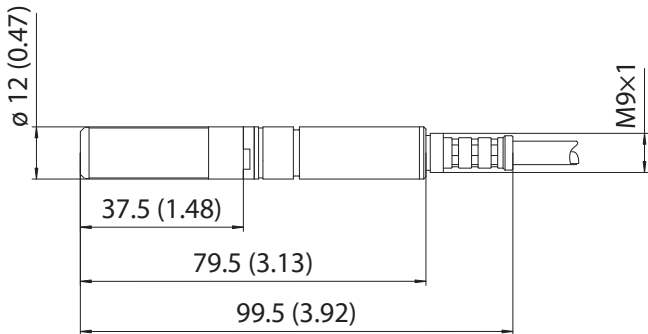
HMT313 Probe



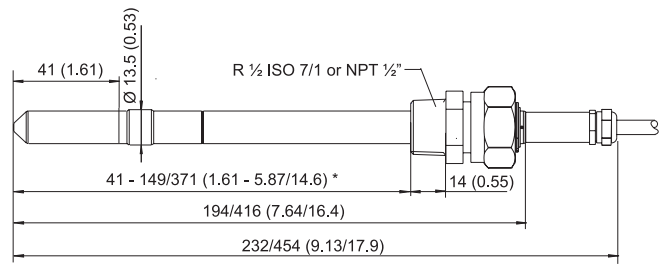
HMT314 Probe



HMT315 Probe



HMT317 Probe



Lengths for standard / optional probes
* freely user-adjustable length

HMT318 Probe

Transmitter body dimensions in mm (inches)

