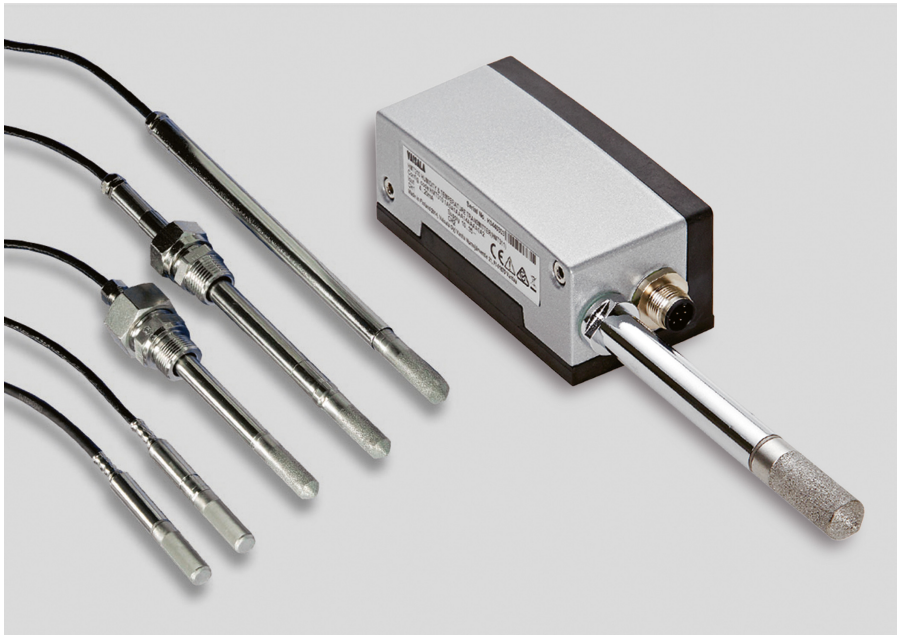
Álava Ingenieros
GRUPO ÁLAVA

VAISALA

# HMT310 Humidity and Temperature Transmitter



## 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.

### A Variety of Features to Choose From

The following optional features and accessories are available for the HMT310 series:

- Warmed probe and sensor heating for high humidity conditions
- Chemical purge for applications risking an interference with chemicals in the measuring environment
- Calculated humidity quantities
- Sensor protection options and probe cable lengths
- Mounting kits
- Rain shield

### Six Models for Demanding Applications

The HMT310 series includes:

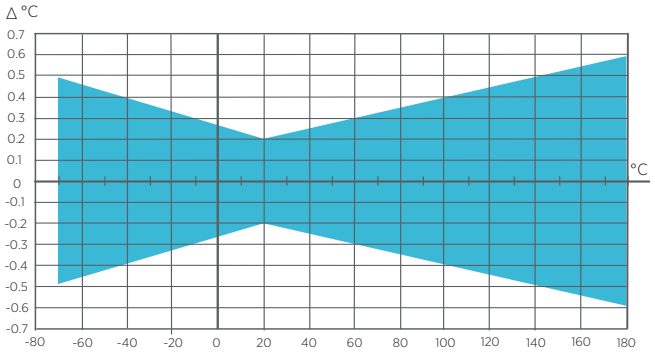
- HMT311 for wall mounting
- HMT313 for duct mounting and tight spaces
- HMT314 for high pressures up to 100 bar and vacuum conditions
- HMT315 for high temperatures
- HMT317 for high humidity applications, warmed probe option
- HMT318 for pressurized pipelines up to 40 bar

# Technical Data

## Measurement Performance

| | |
|---|---|
| **Relative Humidity** | |
| Measurement range | 0 ... 100 %RH |
| Response time (90 %) at +20 °C (+68 °F) in 0.1 m/s air flow | 17 s with grid filter<br>50 s with grid and steel, netting filter<br>60 s with sintered filter |
| Factory calibration uncertainty (+20 °C) | ±0.6 %RH (0 ... 40 %RH)[1)]<br>±1.0 %RH (40 ... 97 %RH)[1)] |
| Accuracy [2) 3)] | |
| at +15 ... +25 °C (+59 ... +77 °F) | ±1 %RH (0 ... 90 %RH)<br>±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 |
| **Humidity Sensor Types** | |
| HUMICAP® 180R | Typical applications |
| HUMICAP® 180RC | Applications with chemical purge/ warmed probe |
| HUMICAP® 180V | Catalytic sensor for $H_2O_2$ environments |
| HUMICAP® 180VC | Catalytic sensor with chemical purge for $H_2O_2$ environments |
| **Temperature** | |
| HMT311 | −40 ... +60 °C (−40 ... +140 °F) |
| HMT313 | −40 ... +80 °C (−40 ... +176 °F) or<br>−40 ... +120 °C (−40 ... +248 °F) |
| HMT314, HMT315, HMT317, HMT318 | −70 ... +180 °C (−94 ... +356 °F) |
| Typical accuracy at +20 °C (+68 °F) | ±0.2 °C (±0.36 °F) |
| Temperature sensor | Pt100 RTD Class F0.1 IEC 60751 |

*1) Defined as ±2 standard deviation limits. Small variations possible, see also calibration certificate.*
*2) Including non-linearity, hysteresis, and repeatability.*
*3) With HUMICAP® 180V and 180VC sensors, accuracy is not specified below −20 °C (−4 °F) operating temperature.*




Accuracy Over Temperature Range

## Operating Environment

| | |
|---|---|
| Operating temperature for electronics | −40 ... +60 °C (−40 ... +140 °F) |
| Storage temperature | −55 ... +80 °C (−67 ... +176 °F) |
| **Operating Pressure** | |
| HMT314<br>HMT318<br>HMT317 | 0 ... 100 bar<br>0 ... 40 bar<br>0 ... 10 bar |
| EMC compliance | EN61326-1, Industrial environment |

## Inputs and Outputs

| | |
|---|---|
| Two analog outputs, selectable and scalable | 0 ... 20 mA or 4 ... 20 mA<br>0 ... 5 V or 0 ... 10 V<br>1 ... 5 V available through scaling |
| Typical accuracy of analog output at +20 °C | ±0.05 % full scale |
| Typical temperature dependence of analog output | 0.005 %/°C (0.003 %/°F) of full scale |
| Serial output | RS-232C |
| Connections | M12 8-pin male connector with RS-232C, current/voltage outputs (two channels) and $U_{in}$ |
| Operating voltage | 10 ... 35 VDC |
| External load | $R_L$ < 500 Ω |
| Startup time after power-up | 3 s |
| **Minimum Operating Voltage** | |
| RS-232C output | 10 VDC |
| Analog output | 15 VDC |
| Probe heating and chemical purge | 15 VDC |
| Pressures above 10 bara (145 psia) | 24 VDC |
| **Power Consumption** | |
| RS-232 | 12 mA |
| $U_{out}$ 10 V (10 kΩ) channel 1 & channel 2 | 12 mA |
| $I_{out}$ 20 mA (load 511 Ω) channel 1 & channel 2 | 50 mA |
| Chemical purge at 24 VDC | + 220 mA |
| Warmed probe at 24 VDC | + 240 mA |

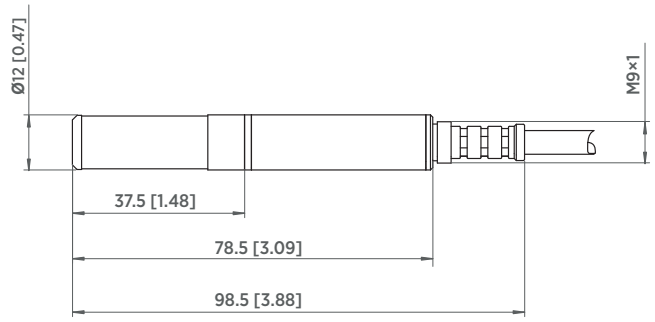
## Mechanical Specifications

| | |
|---|---|
| Transmitter housing material | G-AlSi10Mg |
| Transmitter base material | PPS |
| IP rating | IP66 |
| Probe cable length | 2, 5, or 10 m (6 ft 7 in, 16 ft 5 in, 32 ft 10 in) |
| Cable feed through alternatives | M12 8-pin male connector with 5 m cable,<br>or<br>8-pin female screw terminal connector for cable diameter 4 ... 8 mm |
| Sensor protection | PPS grid with stainless steel net<br>PPS grid<br>Sintered filter<br>Membrane stainless steel filter<br>$H_2O_2$ filter |

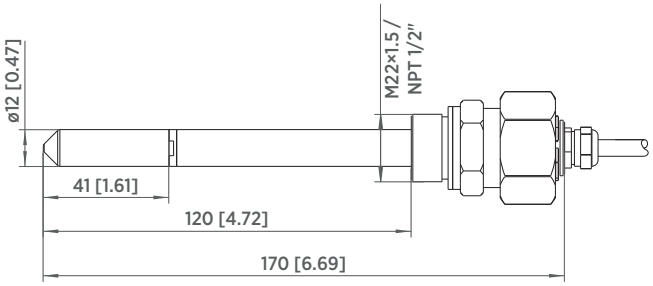
## Spare Parts and Accessories

| | |
|---|---|
| Rain shield | ASM211103 |
| USB cable | 238607 |
| PPS plastic grid with stainless steel netting | DRW010281SP |
| PPS plastic grid filter | DRW010276SP |
| Sintered filter AISI 316L | HM47280SP |
| Stainless steel filter | HM47453SP |
| Stainless steel filter with membrane | 214848SP |
| Catalytic $H_2O_2$ filter | 231865 |

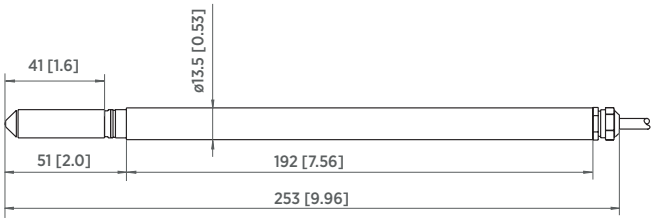
## Dimensions in mm [in]



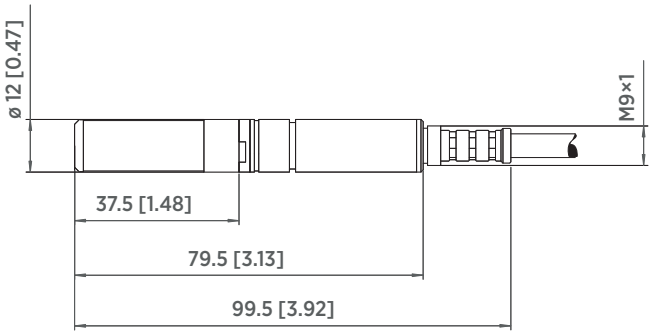

HMT313 Probe



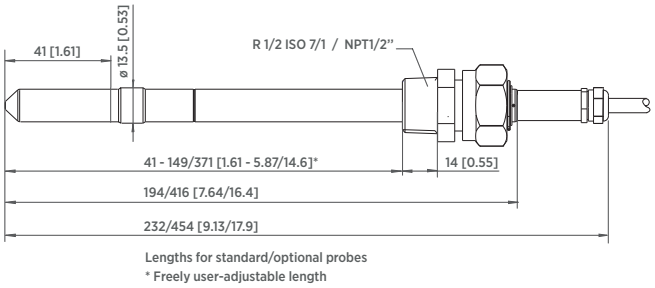

HMT314 Probe



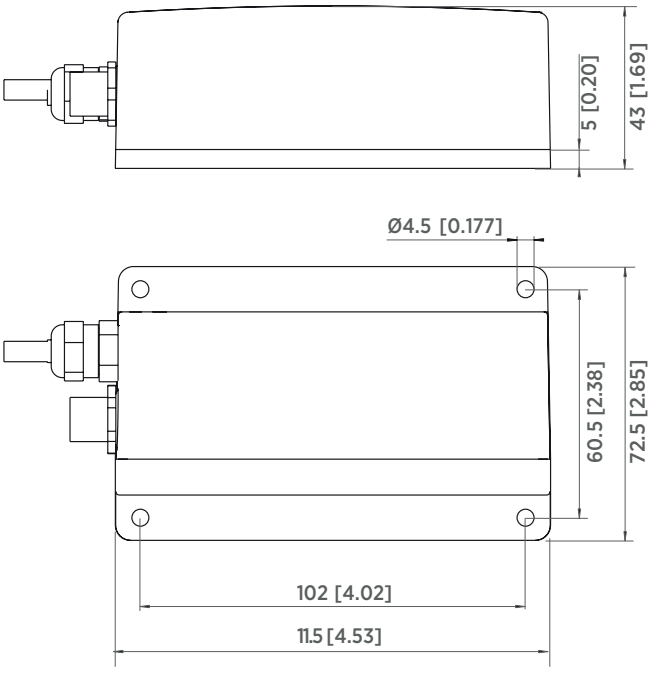

HMT315 Probe




HMT317 Probe




HMT318 Probe




HMT310 Transmitter Body

Álava Ingenieros
GRUPO ÁLAVA

tel: +34 915 679 700
www.alavaingenieros.com | alava@grupoalava.com

CE

VAISALA

www.vaisala.com

Published by Vaisala | B210769EN-J 