

HMT310 Humidity and Temperature Transmitter



The Vaisala HUMICAP® Humidity and Temperature Transmitter HMT310 models (from left to right): HMT313, HMT317, HMT314, HMT318, HMT315 and HMT311.

Features/Benefits

- Next-generation Vaisala HUMICAP® Sensor for excellent accuracy and stability
- Full 0 ... 100 %RH measurement, temperature range up to +180 °C (depending on model)
- Small size, easy to integrate
- Insensitive to dust and most chemicals
- NIST traceable

Reliable Vaisala HUMICAP® Technology

The HMT310 incorporates the latest-generation Vaisala HUMICAP® Sensor. The Vaisala HUMICAP® Sensor is a capacitive thin-film polymer sensor. It features high accuracy, excellent long-term stability and negligible hysteresis. It is insensitive to dust, particulate dirt and most chemicals.

Several Outputs, One Connector

The HMT310 is powered up with 12 ... 35 VDC. It has two analog outputs and an RS-232 serial output. 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 and 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, different mounting kits, sensor protection options and probe cable lengths, warmed probe and sensor heating for high humidity conditions (HMT317), and chemical purge for applications risking an interference with chemicals in the measuring environment.

Technical Data

Measured Values

RELATIVE HUMIDITY

Measurement range 0 ... 100 %RH

Sensor

Vaisala HUMICAP®180R typical applications
 Vaisala HUMICAP®180RC applications with chemical
 purge and/or warmed probe

Accuracy (incl. non-linearity, hysteresis and repeatability)

at a temperature range of

+15 ... +25 °C ±1 %RH (0 ... 90 %RH)
 ±1.7 %RH (90 ... 100 %RH)
 -20 ... +40 °C ±(1.0 + 0.008 x reading) %RH
 -40 ... +180 °C ±(1.5 + 0.015 x reading) %RH

Factory calibration uncertainty ±0.6 %RH (0 ... 40 %RH)*
 (+20 °C) ±1.0 %RH (40 ... 97 %RH)*

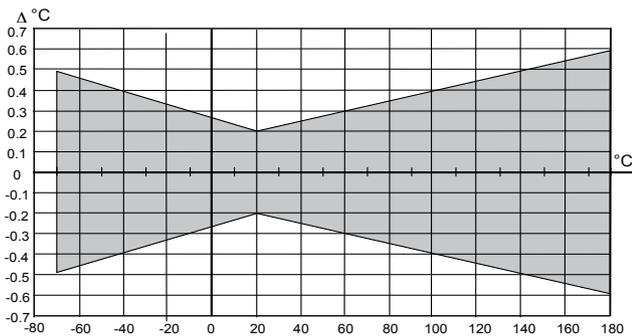
* Defined as ±2 standard deviation limits. Small variations possible, see also calibration certificate.

Response time (90 %) at +20 °C 17 s with grid filter
 in 0.1 m/s air flow 50 s with grid and steel, netting filter
 60 s with sintered filter

TEMPERATURE

HMT311 -40 ... +60 °C (-40 ... +140 °F)
 HMT313 -40 ... +80 °C (-40 ... +176 °F)
 or -40 ... +120 °C (-40 ... +248 °F)
 HMT314, HMT315, HMT317, HMT318 -70 ... +180 °C (-94 ... +356 °F)

Accuracy over temperature range (see graph below)



Typical temperature dependence of electronics ±0.05 °C/°C (±0.005 °F/°F)
 Temperature sensor Pt100 RTD Class F0.1 IEC 60751

Electrical Connections

Two analog outputs, 0 ... 20 mA or 4 ... 20 mA
 selectable and scalable
 Typical accuracy of analog output at +20 °C ±0.05 % full scale
 Typical temperature dependence 0.005 %/°C (0.003 %/°F)
 of analog output of full scale
 Serial output RS-232C
 Connections M12 8-pole connector with RS-232C,
 current outputs (two channels) and U_{in}
 Operating voltage 12 ... 35 VDC, the maximum
 operating voltage for a device with
 sensor heating is 24 VDC
 Power consumption 30 mA with RS-232
 External load R_i < 500 Ohm
 Startup time after power-up 3 s

General

Operating temperature range for electronics -40 ... +60 °C (-40 ... +140 °F)
 Storage temperature range -55 ... +80 °C (-67 ... +176 °C)
 Operating pressure
 HMT314 0 ... 100 bar
 HMT318 0 ... 40 bar
 HMT315, HMT317 vapor tight
 Transmitter housing material G-AlSi10Mg
 Transmitter base material ABS/PC
 Housing classification IP65
 Cable feed through 8-pole connector with 5 m cable,
 alternatives Female 8-pin connector screw joint for
 cable diameter 4 ... 8 mm
 Sensor protection PPS grid with stainless steel net,
 PPS grid, Sintered filter
 Membrane stainless steel filter
 Complies with EMC standard EN61326-1, Industrial environment

Note: When using the current output, the RF field susceptibility level according to standard EN61000-4-3 with a frequency band of 110 ... 165 MHz, is only 3V/m (generic environment) with the specified accuracy.

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