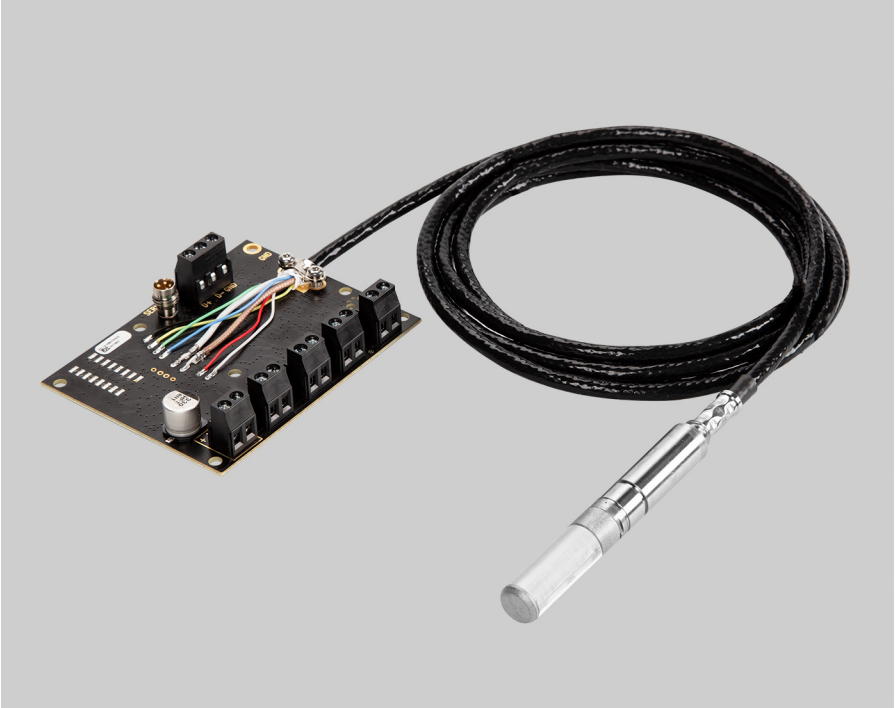
HMM170 Humidity and Temperature Module

For Environmental Chambers



Features

- Suitable for high humidity environments
- Condensation prevention with warmed sensor and probe
- Wide temperature range -70 ... +180 °C (-94 °F ... +356 °F)
- Sensor purge against typical chemicals
- HUMICAP® R2 sensor with improved corrosion tolerance
- Suitable for vacuum and pressurized chambers
- Several output parameters available
- Suitable for moisture-in-oil measurement
- H_2O_2 tolerant sensor version available

Vaisala HUMICAP® Humidity and Temperature Module HMM170 is an open frame OEM module for integration into demanding environmental chambers and harsh conditions. The module provides a digital RS-485/Modbus RTU and three freely configured analog output channels. The module provides relative humidity, temperature, dew point, and other calculated parameters.

Designed for Harsh Environments

The HMM170 probe covers the full temperature range -70 ... +180 °C (-94 ... +356 °F) used in climate chambers and the whole humidity range up to condensation. The small probe and compact component board offer easy and flexible installation. The 2, 5, and 10 meter probe cable options offer excellent cost optimization and flexibility to any OEM application. By ordering HMM170 with the appropriate sensor, you can use the module in environments that are frequently sterilized with vaporized hydrogen peroxide (H_2O_2) or to measure humidity in oil medium, for example, for transformer and engine monitoring applications.

Robust Sensor Technology

The latest general purpose HUMICAP® R2 sensor has an improved corrosion resistance. The sensor can tolerate typical chemicals, such as cleaning agents used in climate chambers. The automatic sensor chemical purge function keeps the sensor clean from typical chemical fumes and the additional probe warming function prevents condensation. In case HMM170 gets in contact with water, the automatic heating rapidly dries the sensor to enable fast and accurate humidity measurement.

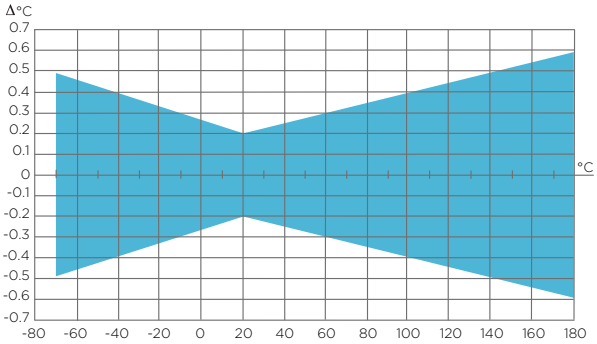
Convenient to Use

HMM170 is easy to install and convenient to use. It provides both digital and analog outputs for multiple needs. An integrated service port enables quick and simple way to configure, check, and calibrate the module with the help of a USB cable and Vaisala Insight software. The service port supports Vaisala HM70 Hand-held instrument for easy field checks.

Technical Data

Measurement Performance

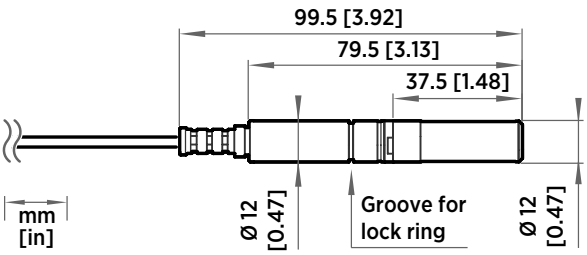
Relative Humidity	
Measurement range	0 ... 100 %RH
Accuracy (including non-linearity, hysteresis and repeatability):	
at +15 ... +25 °C (59 ... +77 °F)	±1 %RH (0 ... 90 %RH) ±1.7 %RH (90 ... 100 %RH)
at -20 ... +40 °C (-4 ... +104 °F)	± (1.0 + 0.008 × reading) %RH
-at -40 ... +180 °C (-40 ... +356 °F)	± (1.5 + 0.015 × reading) %RH
Factory calibration uncertainty (+20 °C / +68 °F)	±0.6 %RH (0 ... 40 % RH) ±1.0 %RH (40 ... 97 % RH) Defined as ±2 standard deviation limits.
Humidity sensor types	Vaisala HUMICAP® R2C Vaisala HUMICAP® 180L2 Vaisala HUMICAP® 180VC
Response time (90 %) at +20 °C (+68 °F) in 0.1 m/s air flow with Vaisala HUMICAP® R2C sensor	
with steel netting filter with sintered filter	50 s 60 s
Temperature	
Measurement range	-70 ... +180 °C (-94 ... +356 °F)
Temperature sensor	Pt100 RTD Class F0.1 IEC 60751
Typical accuracy at +20 °C (+68 °F)	±0.2 °C (± 0.36 °F)



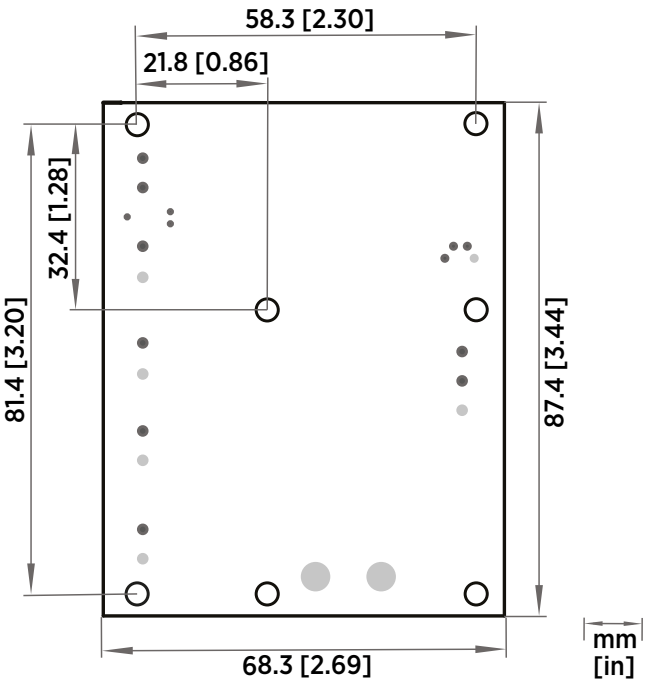
Accuracy over Temperature Range in Temperature Measurement

Operating Environment

Operating temperature for components board	-40 ... +60 °C (-40 ... +140 °F)
Storage temperature	-55 ... +80 °C (-67 ... +176 °F)
Operating pressure	0 ... 10 bar



Probe Head Dimensions



Component Board Dimensions

Inputs and Outputs

Three analog outputs (selectable and scalable)	0 ... 20 mA, 4 ... 20 mA 0 ... 1 V, 0 ... 5 V, 1 ... 5 V, or 0 ... 10 V
Typical accuracy of analog output at +20 °C (+68 °F)	±0.05 % full scale
Typical temperature dependence of analog output	0.005 %/°C (0.003 %/°F) full scale
Digital output	RS-485 serial, Modbus
Service port	M8 connector for USB cable
Operating voltage	12 ... 35 VDC
Power Consumption	
Analog outputs	12 mA (voltage) 50 mA (current)
Chemical purge at 24 VDC	+220 mA
Warmed probe at 24 VDC	+240 mA
External load	R_L < 500 Ω
Start-up time	3 s at power-up
Maximum wire size	0.5 ... 1.5 mm2 (AWG)

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