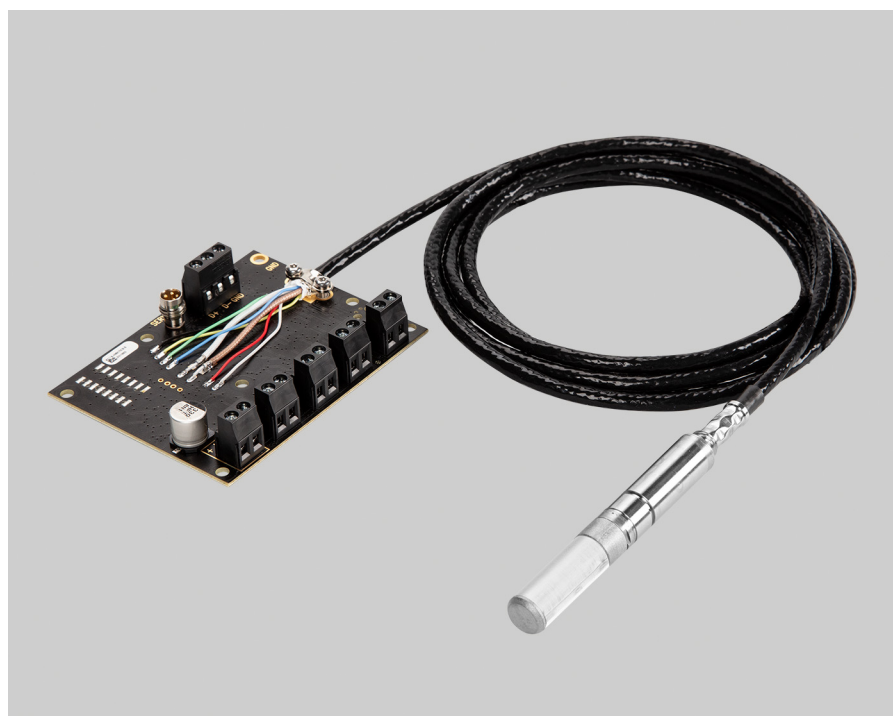




HMM170 Humidity and Temperature Module

For Environmental Chambers



Features

- Warmed sensor and probe for condensation prevention
- Chemical purge for maintaining sensor performance
- Suitable for use in high humidity environments, vacuum, and pressurized chambers
- Temperature measurement range -70 ... +180 °C (-94 ... +356 °F)
- Sensor options for corrosion tolerance, H₂O₂ tolerance, and moisture-in-oil measurement
- 3 analog output channels
- Modbus RTU over RS-485
- Several output parameters available
- 3 probe cable length options
- Compatible with Vaisala Insight software

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 output and three freely configurable analog output channels. The module provides relative humidity, temperature, dew point, and other calculated parameters.

Designed for Harsh Environments

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 probe cable options (2, 5, or 10 m (6.5, 16.4, or 32.8 ft)) 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 (H₂O₂) 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 a quick and simple way to configure, check, and calibrate the module with the help of a USB cable and Vaisala Insight software.

Technical Data

Measurement Performance

Relative Humidity

Measurement range 0 ... 100 %RH

Accuracy ¹⁾

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 at +20 °C (+68 °F) ²⁾	±0.6 %RH (0 ... 40 %RH) ±1.0 %RH (40 ... 90 %RH) ±1.1 %RH (90 ... 95 %RH)

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:

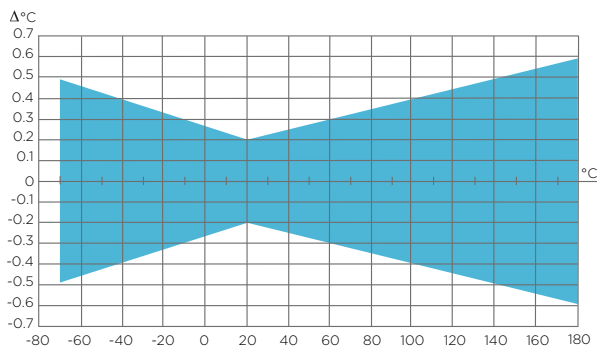
with steel netting filter	50 s
with sintered filter	60 s

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)

¹⁾ Including non-linearity, hysteresis and repeatability.

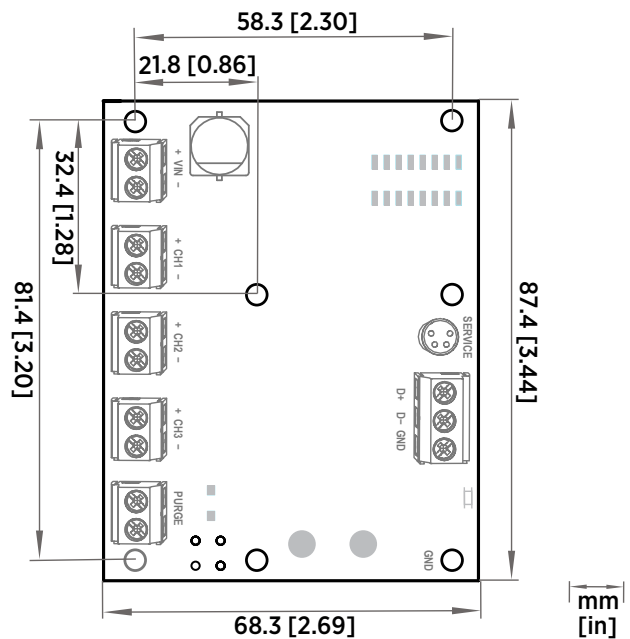
²⁾ Defined as ±2 standard deviation limits. Small variations possible; see also calibration certificate.



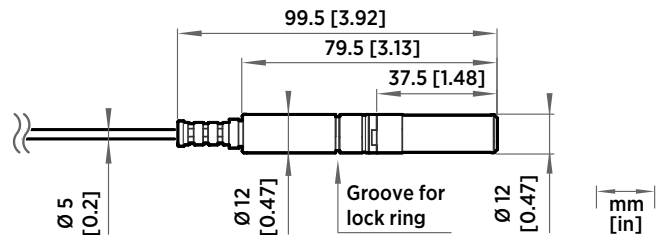
Accuracy over Temperature Range in Temperature Measurement

Operating Environment

Operating temperature for component board	-40 ... +60 °C (-40 ... +140 °F)
Operating humidity range for component board	0 ... 100 %RH, non-condensing
Storage temperature	-55 ... +80 °C (-67 ... +176 °F)
Operating pressure	0 ... 10 bar



Component Board Dimensions



Probe Head 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 15 ... 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 $R_L < 500 \Omega$

Start-up time 3 s at power-up

Maximum wire size 0.5 ... 1.5 mm² (AWG)

VAISALA

www.vaisala.com

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