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DATASHEET

HMP155

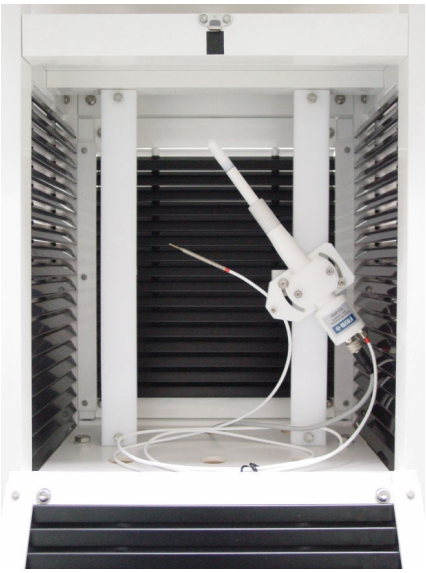
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HUMICAP® Humidity and Temperature Probe HMP155



HMP155 with an additional temperature probe and optional Stevenson screen installation kit.

Features

- Vaisala HUMICAP®180R sensor: superior long-term stability
- Optional warmed humidity probe and chemical purge
- Plug-and-play
- USB connection for service use
- Use with DTR13 and DTR503 radiation shields and a Stevenson screen
- Weather-proof housing IP66
- Optional, fast temperature probe
- Different output possibilities: voltage, RS-485, resistive Pt100
- Applications: meteorology, aviation and road weather, instrumentation

Vaisala HUMICAP® Humidity and Temperature Probe HMP155 provides reliable humidity and temperature measurement. It is designed especially for demanding outdoor applications.

Long-term stability

HMP155 uses the proven Vaisala HUMICAP®180R sensor that has excellent stability and withstands well harsh environments. The probe structure is solid and the sensor is protected by default with a sintered Teflon filter, which gives maximum protection against water, dust, and dirt.

Warmed probe and high-humidity environment

Measuring humidity reliably is challenging in environments where humidity is near saturation. Measurements may be corrupted by fog, mist, rain, and heavy dew. A wet probe may not give an accurate measurement in the ambient air.

This is an environment to which Vaisala has designed this patented, warmed probe for reliable measurements. As the sensor head is warmed continuously, the humidity level inside it stays below the ambient level. It also reduces the risk of condensation forming on the probe.

Fast measurements

With its fast response time, the additional temperature probe for HMP155 is ideal for measuring in environments with changing temperatures. The membrane filter speeds up the relative humidity measurement.

Long lifetime

Protecting the sensor from precipitation, and scattered and direct solar radiation increases its lifetime. Vaisala recommends installing HMP155 in one of the following radiation shields: DTR503, DTR13, or Stevenson screen. For the additional temperature probe, an installation kit is available for Vaisala DTR502 Radiation Shield.

Calibration

The probe can be calibrated using a computer with a USB cable, with the push buttons, or with the MI70 indicator.

Technical data

Humidity measurement performance

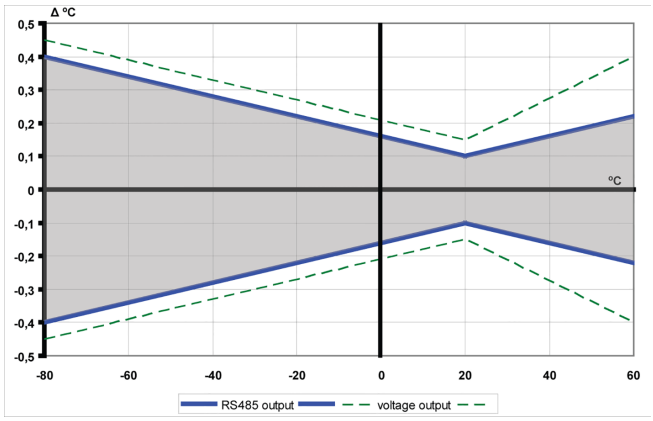
Sensor	HUMICAP®R2, 180R and INTERCAP for typical applications HUMICAP®R2C, 180RC, and INTERCAPC for applications with chemical purge and/or warmed probe
Observation range	0–100 %RH
Response time at +20 °C (+68 °F) in still air with sintered Teflon filter	63 %: 20 s 90 %: 60 s
Factory calibration uncertainty at +20 °C (+68 °F)[1)]	±0.6 %RH (0–40 %RH) ±1.0 %RH (40–95 %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 … −20 °C (−40 … −4 °F)	±(1.2 + 0.012 × reading) %RH
At +40 … +60 °C (+104 … +140 °F)	±(1.2 + 0.012 × reading) %RH
At −60 … −40 °C (−76 … −40 °F)	±(1.4 + 0.032 × reading) %RH

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

Temperature measurement performance

Sensor	Pt100 RTD element, Class F 0.1 IEC 60751
Observation range	−80 … +60 °C (−112 … +140 °F)
Response time for additional temperature probe in 3 m/s (7 mph) air flow	63 %: < 20 s 90 %: < 35 s
Other measured variables	Dew point / Frost point temperature, wet bulb temperature, mixing ratio
Accuracy with voltage output	
At −80 … +20 °C (−112 … +68 °F)	±(0.226 − 0.0028 × temperature) °C
At +20 … +60 °C (+68 … +140 °F)	±(0.055 + 0.0057 × temperature) °C
Accuracy with passive (resistive) output	
According to Tolerance Class AA IEC 60751 [1)]	±(0.1 + 0.0017 × |temperature|) °C
Accuracy with RS-485 output	
At −80 … +20 °C (−112 … +68 °F)	±(0.176 − 0.0028 × temperature) °C
At +20 … +60 °C (+68 … +140 °F)	±(0.07 + 0.0025 × temperature) °C

1) Tolerance Class AA IEC 60751 corresponds to IEC 751 1/3 Class B.



HMP155 accuracy over temperature range: voltage and RS-485

Inputs and outputs

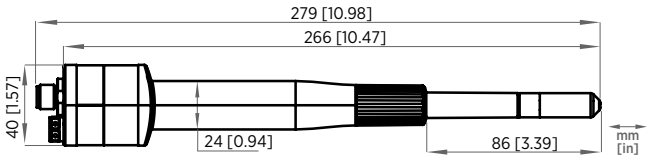
Operating voltage	7–28 V DC
Minimum operating voltage	0–1 V output or RS-485: 7 V 0–5 V output, or warmed probe: 12 V 0–10 V output, chemical purge, or XHEAT: 16 V
Outputs	Voltage output: 0–1 V, 0–5 V, 0–10 V Resistive Pt100 4-wire connection RS-485
Average power consumption (+15 V DC, load 100 kΩ)	0–1 V output: < 3 mA 0–10 V output: +0.5 mA RS-485: < 4 mA During chemical purge: Max. 110 mA With warmed probe: Max. 150 mA
Settling time at startup	Voltage output: 2 s RS-485: 3 s

Operating environment

Operating temperature for humidity measurement	−80 … +60 °C (−112 … +140 °F)
Storage temperature	−80 … +60 °C (−112 … +140 °F)
Operating humidity	0–100 %RH
IP rating	IP66

Mechanical specifications

Dimensions (H × W)	279 × 40 mm (10.9 × 1.6 in)
Weight	93 g (3.25 oz)
Length of additional T-probe cable	2 m (6 ft 7 in)
Connection	8-pin male M12 connector
Connection cables	3.5 m (11 ft 6 in), 10 m (32 ft 10 in), 30 m (98 ft 5 in)
Maximum wire size	0.129 mm^2 (26 AWG)
Service cables	USB connection cable MI70 connection cable
Materials	
Filter	Sintered Teflon or membrane
Housing	Polycarbonate (PC)
Additional temperature probe	Stainless steel AISI 316L
Cable	PUR



Compliance

EU directives and regulations	EMC Directive (2014/30/EU) RoHS Directive (2011/65/EU) as amended by 2015/863
Electromagnetic compatibility (EMC)	EN 61326-1, Electrical equipment for measurement, control and laboratory use - EMC requirements; industrial environment CISPR 32 / EN 55032, Class B
RoHS	EN IEC 63000:2018
Application standards	EN 15518-3:2023, Winter maintenance equipment - Road weather information systems - Part 3: Requirements on measured values of stationary equipment

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