HUMICAP® Humidity and Temperature Probe HMP155

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

**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

**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. Thus, 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. Thus, 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.
## HMP155 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)**
- ±0.6 %RH (0 ... 40 %RH)
- ±1.0 %RH (40 ... 95 %RH)

**Accuracy (including non-linearity, hysteresis, and repeatability)**

<table>
<thead>
<tr>
<th>Temperature Range</th>
<th>Accuracy</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 ... +20 °C (+32 ... +68 °F)</td>
<td>±1.0 %RH (0 ... 90 %RH)</td>
</tr>
<tr>
<td>0 ... +60 °C (+32 ... +140 °F)</td>
<td>±1.2 %RH (0 ... 90 %RH)</td>
</tr>
<tr>
<td>0 ... +40 °C (+4 ... +104 °F)</td>
<td>±1.4 %RH (0 ... 90 %RH)</td>
</tr>
</tbody>
</table>

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

## HMP155 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

**Accuracy with voltage output**

<table>
<thead>
<tr>
<th>Temperature Range</th>
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</tr>
</thead>
<tbody>
<tr>
<td>0 ... +20 °C (+32 ... +68 °F)</td>
<td>±(0.226 - 0.0028 × temperature) °C</td>
</tr>
<tr>
<td>0 ... +60 °C (+32 ... +140 °F)</td>
<td>±(0.055 + 0.0057 × temperature) °C</td>
</tr>
</tbody>
</table>

**Accuracy with passive (resistive) output**

<table>
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<th>Temperature Range</th>
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</tr>
</thead>
<tbody>
<tr>
<td>0 ... +20 °C (+32 ... +68 °F)</td>
<td>±(0.026 ± 0.00028 × temperature) °C</td>
</tr>
<tr>
<td>0 ... +60 °C (+32 ... +140 °F)</td>
<td>±(0.028 ± 0.00028 × temperature) °C</td>
</tr>
</tbody>
</table>

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

## HMP155 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

## HMP155 inputs and outputs

**Operating voltage**
7 ... 28 V DC

**Minimum operating voltage**
- 0 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: Maximum 110 mA
With warmed probe: Maximum 150 mA

**Settling time at startup**
- Voltage output: 2 s RS-485: 3 s

## HMP155 mechanical specifications

**Dimensions (H × W)**
279 × 40 mm (10.9 × 1.6 in)

**Length of additional temperature probe cable**
2 m (6 ft 7 in)

**Connection**
- 8-pin male M12 connector

**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

**Dimensions in mm (inches)**