HMP155 Humidity and Temperature Probe

New Probe for Reliability
The new Vaisala HUMICAP® Humidity and Temperature Probe HMP155 provides reliable humidity and temperature measurement.

Long-term Stability
The HMP155 has a new generation 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 liquid 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 a patented, warmed probe for reliable measuring. 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 the HMP155 is ideal for measurement in environments with changing temperatures. The new membrane filter fastens RH measurement.

Features/Benefits
- Vaisala HUMICAP®180R sensor - superior long-term stability
- Optional warmed humidity probe
- Plug-and-play
- Chemical purge
- USB connection for service use
- Installation kits for DTR13 and DTR502 radiation shields and also for a Stevenson screen
- Weather-proof housing IP66
- New, fast temperature probe
- Different output possibilities: voltage, RS-485, resistive Pt100
- Applications: meteorology, aviation and road weather, instrumentation

Long Lifetime
Protecting the sensor from scattered and direct solar radiation, and precipitation will increase its lifetime. Thus, Vaisala recommends installing the HMP155 in one of the following radiation shields: DTR503, DTR13, or a Stevenson screen. For the additional temperature probe, an installation kit is available to be used with DTR502 radiation shield.

Easy Maintenance
The probe can be calibrated using a pc with a USB cable, with the push buttons, or with the MI70 indicator.
Technical Data

Performance

Relative Humidity

<table>
<thead>
<tr>
<th>Measurement range</th>
<th>Accuracy (incl. non-linearity, hysteresis and repeatability)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 ... 100 %RH</td>
<td>±1 %RH (0 ... 90 %RH) ±1.7 %RH (90 ... 100 %RH)</td>
</tr>
<tr>
<td>+15 ... +25 °C (+59 ... +77 °F)</td>
<td>±(1.0 + 0.008 x reading) %RH</td>
</tr>
<tr>
<td>-20 ... +40 °C (-4 ... +104 °F)</td>
<td>±(1.2 + 0.012 x reading) %RH</td>
</tr>
<tr>
<td>+40 ... +60 °C (+104 ... +140 °F)</td>
<td>±(1.2 + 0.012 x reading) %RH</td>
</tr>
<tr>
<td>-60 ... +40 °C (-76 ... +104 °F)</td>
<td>±(1.4 + 0.032 x reading) %RH</td>
</tr>
</tbody>
</table>

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. Small variations possible, see also calibration certificate.

Recommended humidity sensor: HUMICAP®180R(C)

Response time at +20 °C in still air with a sintered PTFE filter

<table>
<thead>
<tr>
<th>Relative Humidity</th>
<th>Response Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>63 %</td>
<td>20 s</td>
</tr>
<tr>
<td>90 %</td>
<td>60 s</td>
</tr>
</tbody>
</table>

Temperature

<table>
<thead>
<tr>
<th>Measurement range</th>
<th>Accuracy with voltage output at</th>
</tr>
</thead>
<tbody>
<tr>
<td>-80 ... +60 °C (-112 ... +140 °F)</td>
<td>±(0.226 - 0.0028 x temperature) °C</td>
</tr>
<tr>
<td>+20 ... +60 °C</td>
<td>±(0.055 + 0.0057 x temperature) °C</td>
</tr>
</tbody>
</table>

Passive (resistive) output according to IEC 751 1/3 Class B

<table>
<thead>
<tr>
<th>Reference Term</th>
<th>Accuracy</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/3 Class B</td>
<td>±(0.1 + 0.00167 x (temperature) °C</td>
</tr>
</tbody>
</table>

RS485 output

<table>
<thead>
<tr>
<th>Reference Term</th>
<th>Accuracy</th>
</tr>
</thead>
<tbody>
<tr>
<td>-80 ... +20 °C</td>
<td>±(0.176 - 0.0028 x temperature) °C</td>
</tr>
<tr>
<td>+20 ... +60 °C</td>
<td>±(0.07 + 0.0025 x temperature) °C</td>
</tr>
</tbody>
</table>

Accuracy over temperature range (opposite Temperature sensor)

Pt100 RTD 1/3 Class B IEC 751

Response time with additional temperature probe in 3 m/s air flow

<table>
<thead>
<tr>
<th>Relative Humidity</th>
<th>Response Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>63 %</td>
<td>&lt;20 s</td>
</tr>
<tr>
<td>90 %</td>
<td>&lt;35 s</td>
</tr>
</tbody>
</table>

Other Variables

dewpoint/frost point temperature, wet bulb temperature, mixing ratio

General

Operating temperature range

-80 ... +60 °C (-112 ... +140 °F)

Storage temperature range

-80 ... +60 °C (-112 ... +140 °F)

Connection

- 8-pin male M12 connector

Connection cables

3, 10, and 30 m

Cable material

PUR

Wire size

AWG26

Service cables

USB connection cable
MI70 connection cable

Additional T probe cable length

2 m

Housing material

PC

Housing classification

IP66

Sensor protection

sintered PTFE
optional membrane filter

Weight (probe)

86 g

Electromagnetic compatibility: Complies with the EMC standard EN61326-1, Electrical equipment for measurement control and laboratory use - EMC requirement for use in industrial locations

Inputs and Outputs

Operating voltage

7 ... 28 VDC*

*Note: minimum operating voltage 12 V with 0 ... 5 V output and 16 V with 0 ... 10 V output, probe heating, chemical purge or XHEAT.

Outputs

<table>
<thead>
<tr>
<th>Voltage Output</th>
<th>Resistance</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 ... 1 V, 0 ... 5 V, 0 ... 10 V</td>
<td>Pt100 (4-wire connection), resitive</td>
</tr>
</tbody>
</table>

RS485

Average current consumption

(+15 VDC, load 100 kOhm)

<table>
<thead>
<tr>
<th>Reference Term</th>
<th>Current Consumption</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 ... 1 V output</td>
<td>&lt;3 mA</td>
</tr>
<tr>
<td>0 ... 10 V output</td>
<td>+0.5 mA</td>
</tr>
</tbody>
</table>

RS485

during chemical purge

max. 110 mA

with warmed probe

max. 150 mA

Settling time at power-up

<table>
<thead>
<tr>
<th>Voltage Output</th>
<th>Time (s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Voltage output</td>
<td>2 s</td>
</tr>
<tr>
<td>RS485</td>
<td>3 s</td>
</tr>
</tbody>
</table>

Dimensions

Dimensions in mm

VAISALA

For more information, visit www.vaisala.com or contact us at sales@vaisala.com

Ref. B210752EN-D ©Vaisala 2011
This material is subject to copyright protection, with all copyrights retained by Vaisala and its individual partners. All rights reserved. Any logos and/or product names are trademarks of Vaisala or its individual partners. The reproduction, transfer, distribution or storage of information contained in this brochure in any form without the prior written consent of Vaisala is strictly prohibited. All specifications — Technical included — are subject to change without notice.