# HUMICAP® Humidity and Temperature Probe HMP110

## Features

- Miniature-size humidity transmitter
- Low power consumption and fast start-up for battery-powered applications
- Measurement range: 0 ... 100 %RH; -40 ... +80 °C (-40 ... +176 °F)
- Cable detachable with standard M8 quick connector
- IP65 metal housing
- Optional RS-485 digital output supports Modbus RTU
- ±1.5 %RH measurement accuracy (0 ... 90 %RH)

HMP110 is a trouble-free and cost-effective humidity transmitter with high accuracy and good stability. It is suitable for volume applications or integration into other manufacturers' equipment. HMP110 is also suitable for glove boxes, greenhouses, fermentation and stability chambers, data loggers, and incubators.

## Benefits

- Latest generation Vaisala HUMICAP® 180R sensor for best stability and high chemical tolerance
- HMP110R replacement probe service available for easy maintenance
- Comes with calibration certificate
- Optional dew point, wet bulb temperature, and enthalpy calculation

### Easy Installation

The probe cable has a screw-on quick connector for easy installation. Different cable lengths and accessories are available.

### Low Current Consumption

HMP110 is suitable for battery-powered applications because of its very low current consumption. It also has a fast start-up time.

### Several Outputs

Temperature measurement is a standard feature in the HMP110, with dew point, wet bulb temperature, and enthalpy as optional calculated parameters. Three standard voltage outputs are available. An optional RS-485 output with Modbus support is also available.

### Robust Design

The stainless steel body of HMP110 is classified as IP65. Thus, it survives rough conditions. HMP110 has high chemical tolerance thanks to the HUMICAP® 180R sensor.

### Easy Maintenance

Maintaining measurement traceability is easy using the HMP110R replacement probe. We send you a replacement probe, you detach the old probe and send it back to us. This way the measurement is available at all times without interruptions.

# Technical Data

## Measurement Performance

| | |
|---|---|
| **Relative Humidity** | |
| Measurement range | 0 ... 100 %RH |
| Accuracy: [1) 2)] | |
| at 0 ... +40 °C (+32 ... +104 °F) | ±1.5 %RH (0 ... 90 %RH)<br>±2.5 %RH (90 ... 100 %RH) |
| at −40 ... 0 °C, +40 ... +80 °C<br>(−40 ... +32 °F, +104 ... +176 °F) | ±3.0 %RH (0 ... 90 %RH)<br>±4.0 %RH (90 ... 100 %RH) |
| Factory calibration uncertainty<br>at +20 °C (+68 °F) | ±1.1 %RH (0 ... 90 %RH)<br>±1.8 %RH (90 ... 100 %RH) |
| Humidity sensor types | HUMICAP® 180R<br>HUMICAP® 180V |
| Stability | ±2 %RH over 2 years |
| **Temperature** | |
| Measurement range | −40 ... +80 °C (−40 ... +176 °F) |
| Accuracy (Probes with Analog Output): | |
| at 0 ... +40 °C (+32 ... +104 °F) | ±0.2 °C (±0.36 °F) |
| at −40 ... 0 °C, +40 ... +80 °C<br>(−40 ... +32 °F, +104 ... +176 °F) | ±0.4 °C (±0.72 °F) |
| Accuracy (Probes with Digital Output): | |
| at +15 ... +25 °C (+59 ... +77 °F) | ±0.1 °C (±0.18 °F) |
| at 0 ... +15 °C, +25 ... +40 °C<br>(+ 32 ... +59 °F, +77 ... +104 °F) | ±0.15 °C (±0.27 °F) |
| at −40 ... 0 °C, +40 ... +80 °C<br>(−40 ... +32 °F, +104 ... +176 °F) | ±0.4 °C (±0.72 °F) |
| Temperature sensor | Pt1000 RTD Class F0.1 IEC 60751 |
| **Calculated Parameters** | |
| Measurement range for dew point temperature | −40 ... +80 °C (−40 ... +176 °F) |
| Measurement range for wet bulb temperature | −40 ... +80 °C (−40 ... +176 °F) |
| Measurement range for enthalpy | −40 ... 1540 kJ/kg<br>(−10 ... +660 BTU/lb) |
| Accuracy at 20 °C (68 °F) and 80 %RH: [1)] | |
| Dew Point | |
| at 0 ... +40 °C (+32 ... +104 °F)<br>• when dew point depression < +15 °C (+59 °F)<br>• when dew point depression +15 ... +25 °C (+59 ... +77 °F) | ±1 °C (±33.8 °F)<br><br>±2 °C (±35.6 °F) |
| at −40 ... 0 °C, +40 ... +80 °C<br>(−40 ... +32 °F, +104 ... +176 °F)<br>• when dew point depression < +15 °C (+59 °F) [3)] | ±2 °C (±35.6 °F) |
| Wet Bulb Temperature | |
| at 0 ... +40 °C (+32 ... +104 °F)<br>(0 ... 90 %RH) | ±0.4 °C (0.72 °F)<br>(probes with analog output)<br><br>±0.3 °C (0.54 °F)<br>(probes with digital output) |
| Enthalpy | |
| at +15 ... +25 °C (+59 ... +77 °F)<br>(0 ... 90 %RH) | ±1.2 kJ/kg (0.52 BTU/lb)<br>(probes with analog output)<br><br>±0.9 kJ/kg (0.4 BTU/lb)<br>(probes with digital output) |
| **Analog Outputs** | |
| Accuracy at +20 °C (+68 °F) | ±0.2 % of FS |
| Temperature dependence | ±0.01 % of FS/°C (±0.006 % of FS/°F) |

*1) Including non-linearity, hysteresis, and repeatability.*
*2) With HUMICAP® 180V sensor, accuracy is not specified below −20°C (−4 °F) operating temperature.*
*3) Dew point depression = ambient temperature − dew point.*

## Mechanical Specifications

| | |
|---|---|
| IP rating | IP65 |
| Body thread | MI2x1 / 10 mm (0.4 in) |
| Cable connector | M8 4-pin female (IEC 60947-5-2) |
| **Materials** | |
| Body | Stainless steel (AISI 316) |
| Grid filter | Chrome coated ABS plastic |
| Cable | Polyurethane or FEP |
| **Weight** | |
| Probe | 17 g (0.6 oz) |
| Probe with 0.3 m (1 ft) cable | 28 g (1 oz) |

## Operating Environment

| | |
|---|---|
| Operating temperature | −40 ... +80 °C (−40 ... +176 °F) |
| EMC compliance | EN 61326-1, industrial environment |

## Inputs and Outputs

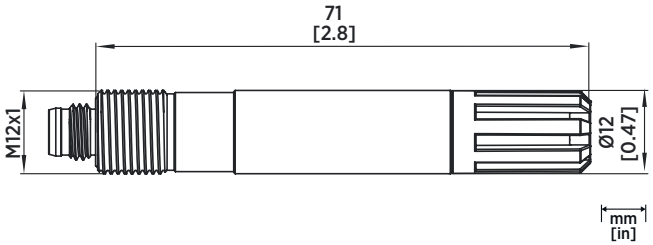
| | |
|---|---|
| Power consumption | 1 mA average, max. peak 5 mA |
| **Operating Voltage[1]** | |
| With 1 V / 2.5 V output | 5 ... 28 VDC |
| With 5 V output | 8 ... 28 VDC |
| With loop power converter | 8 ... 28 VDC |
| With digital output | 5 ... 28 VDC |
| **Start-Up Time** | |
| HMP110 probes with analog output | 4 s at operating voltage<br>13.5 ... 16.5 VDC<br>2 s at other valid operating voltages |
| HMP110 probes with digital output | 1 s |
| **Outputs** | |
| 2 channels | 0 ... 1 VDC / 0 ... 2.5 VDC / 0 ... 5 VDC / 1 ... 5 VDC |
| 1-channel loop-power converter (separate module, compatible with humidity accuracy only) | 4 ... 20 mA |
| Digital output (HMP110 probes with digital output) | RS-485 2-wire half duplex, supports Modbus RTU |
| **External Loads** | |
| 0 ... 1 V | $R_L$ min 10 kΩ |
| 0 ... 2.5 V /0 ... 5 V | $R_L$ min 50 kΩ |

*1) Use lowest available operating voltage to minimize heating.*

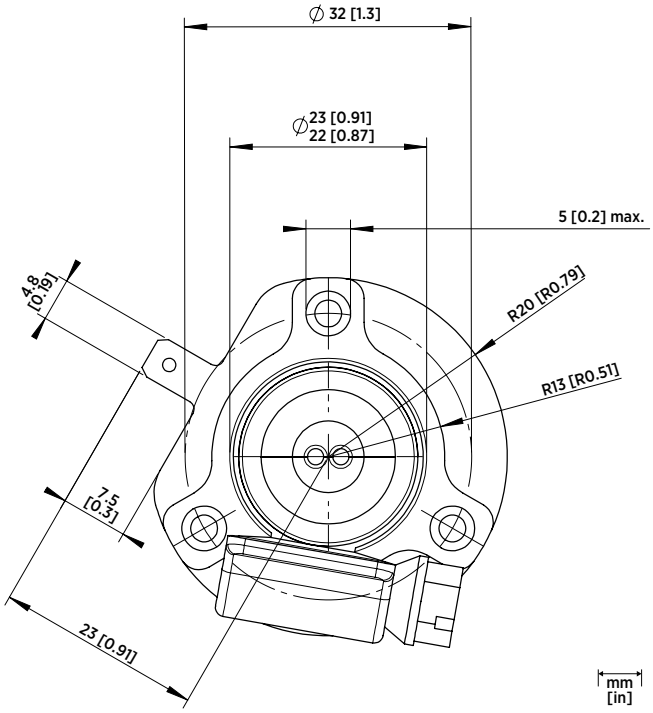
## Spare Parts and Accessories

| | |
|---|---|
| 4 ... 20 mA loop power converter | UI-CONVERTER-1CB |
| Mounting bracket for converter | 225979 |
| Plastic M12 installation nuts, pair | 18350SP |
| USB cable for PC connection | 219690 |
| Probe mounting clamp set, 10 pcs | 226067 |
| Probe mounting flange | 226061 |
| **Sensor Protection** | |
| Plastic grid | DRW010522SP |
| Membrane filter | DRW010525SP |
| Stainless steel sintered filter | HM46670SP |
| PTFE sintered filter | DRW244938SP |
| Stainless steel grid filter | ASM212652SP |
| **Connection Cables** | |
| Standard 0.3 m (1 ft) | HMP50Z032SP |
| Standard 3 m (9.8 ft) | HMP50Z300SP |
| +80 °C 1.5 m (+176 °F 5 ft) | 225777SP |
| +80 °C 3 m (+176 °F 10 ft) | 225229SP |
| +180 °C 3 m (+356 °F 10 ft) FEP | 226902SP |
| Connection cable for HM70 | 219980SP |
| Flat extension cable 1 m (3 ft) [1)] | CBL210649SP |

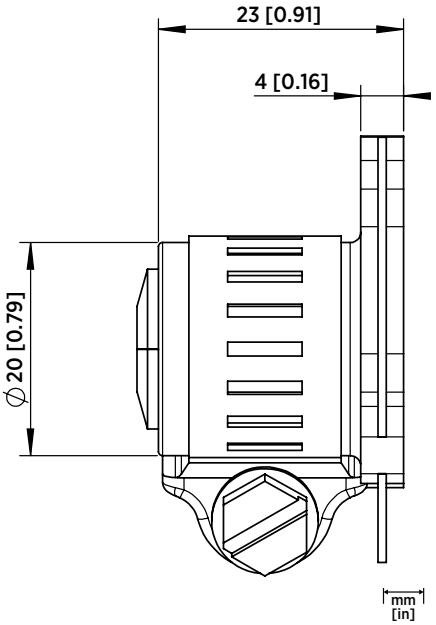
*1) Connecting HMP110 to MI70 requires using both flat cable CBL210649SP and connection cable 219980SP.*




HMP110 Probe




Probe Mounting Flange, Front View




Probe Mounting Flange, Side View

CE

VAISALA

www.vaisala.com

Published by Vaisala | B210852EN-M © Vaisala Oyj 2019