# HMP7 Relative Humidity and Temperature Probe

## For High Humidities

### Features

- RH accuracy up to ±0.8 %RH
- Temperature accuracy up to ±0.1 °C (±0.18 °F)
- Temperature measurement range −70 ... +180 °C (−94 ... +356 °F)
- Vapor and pressure proof construction
- Probe heating and sensor warming functions minimize condensation on probe
- Sensor purge provides superior chemical resistance
- Modbus RTU over RS-485
- Compatible with Indigo transmitters and Insight PC software
- Traceable calibration certificate: 6 points for humidity, 1 point for temperature

Vaisala HUMICAP® Humidity and Temperature Probe HMP7 is designed for applications that involve constant high humidity or rapid changes in humidity, such as drying and test chambers, combustion air, and other humidifiers and meteorological measurements, where measurement performance and chemical tolerance are essential.

### Proven Vaisala HUMICAP® Performance

Vaisala is the original innovator of the thin-film capacitive humidity measurement technology, which has now become the industry standard in humidity measurement.

HUMICAP® technology results from Vaisala's 40-year experience in industrial humidity measurement, providing the best stability, fast response time, and low hysteresis in a wide range of applications.

### Avoiding Condensation at Extreme Humidity

Probe heating functionality heats up not only the sensor, but the whole probe head. When probe temperature is heated above dew point temperature, condensation on the probe can be avoided while measuring the dew point temperature of the process. By setting the temperature compensation value obtained, for example, with the TMP1 temperature probe, true relative humidity at process temperature can be measured while avoiding condensation by elevated probe temperature.

### Vaisala Indigo Product Family

Indigo transmitters offer a variety of connectivity options through analog signals or digital outputs, configurable relays, and wireless (WLAN) configuration interface, providing a suitable solution for all industrial humidity measurements. The cable length between the probe and transmitter can be extended to up to 30 meters. For more information, see www.vaisala.com/indigo.

### Flexible Connectivity

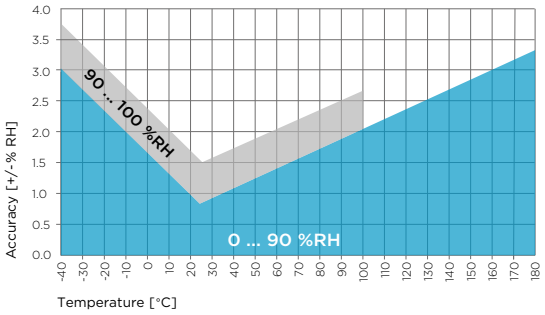
The probe is compatible with Vaisala Indigo series of transmitters, and it can be used as a standalone digital Modbus RTU transmitter over RS-485 serial bus. For easy-to-use access to field calibration, device analytics, and configuration functionality, the probe can be connected to Vaisala Insight software for Windows®: see www.vaisala.com/insight.

# Technical Data

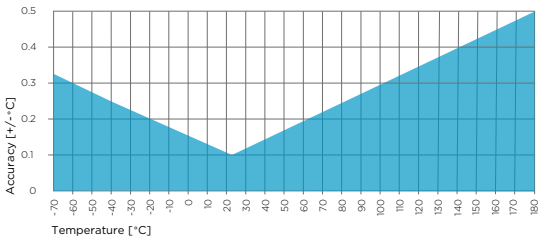
## Measurement Performance

| | |
|---|---|
| **Relative Humidity** | |
| Measurement range | 0 ... 100 %RH |
| Accuracy at +23 °C (+73.4 °F) [1] | ±0.8 %RH (0 ... 90 %RH) |
| Factory calibration uncertainty [2] | ±0.5 %RH (0 ... 40 %RH)<br>±0.8 %RH (40 ... 95 %RH) |
| $T_{63}$ response time | 15 s |
| Sensor options | HUMICAP® R2<br>HUMICAP® R2C [3]<br>HUMICAP® 180VC [3] [4] |
| **Temperature** | |
| Measurement range | −70 ... +180 °C (−94 ... +356 °F) |
| Accuracy at +23 °C (+73.4 °F) [1] | ±0.1 °C (±0.18 °F) |
| Factory calibration uncertainty [2] | ±0.1 °C (±0.18 °F) at +23 °C (+73.4 °F) |
| Sensor | Pt100 RTD Class F0.1 IEC 60751 |

*1) Defined against calibration reference. Including non-linearity, hysteresis, and repeatability.*
*2) Defined as ±2 standard deviation limits. Small variations possible; see calibration certificate.*
*3) Chemical purge feature available with this sensor*
*4) $H_2O_2$ resistant. With HUMICAP® 180VC sensor, accuracy is not specified below −20 °C (−4 °F) operating temperature.*




HMP7 Humidity Measurement Accuracy as Function of Temperature




HMP7 Temperature Measurement Accuracy over Full Range

## Mechanical Specifications

| | |
|---|---|
| Connector | M12 5-pin A-coded male |
| Weight | 310 g (10.9 oz) |
| **Materials** | |
| Probe | AISI316L |
| Probe body | AISI316L |
| Cable jacket | FEP |

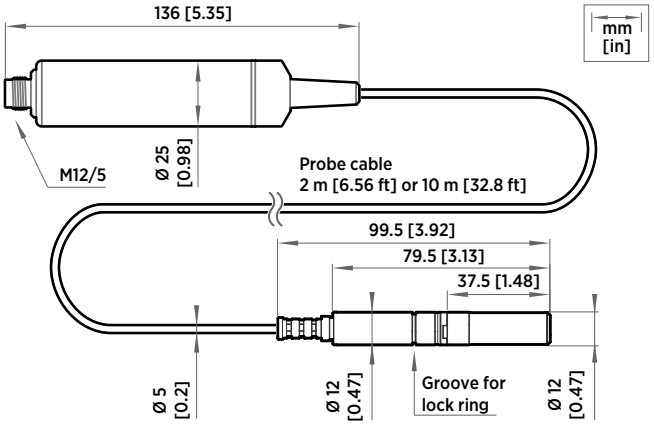
## Operating Environment

| | |
|---|---|
| Operating temperature for probe body | −40 ... +80 °C (−40 ... +176 °F) |
| Operating temperature for probe head | −70 ... +180 °C (−94 ... +356 °F) |
| Operational pressure | < 10 bar |
| Operating environment | Suitable for outdoor use |
| Measurement environment | For air, nitrogen, hydrogen, argon, helium, oxygen, and vacuum [1] |
| IP rating of probe body | IP66 |
| EMC compatibility | EN61326-1, industrial environment |

*1) Consult Vaisala if other chemicals are present. Consider safety regulations with flammable gases.*

## Inputs and Outputs

| | |
|---|---|
| Operating voltage | 18 ... 30 VDC |
| Current consumption | 10 mA typical, 500 mA max. |
| Digital output | RS-485, non-isolated |
| Protocols | Modbus RTU |
| **Output Parameters** | |
| Relative humidity, temperature, dew point temperature, wet-bulb temperature, absolute humidity, mixing ratio, water concentration, water mass fraction, water vapor pressure, enthalpy | |




HMP7 Probe Dimensions

## Accessories

| | |
|---|---|
| Duct installation kit for RH probe | 210697 |
| Solar radiation shield | DTR502B |
| Cable gland M20×1.5 with split seal | HMP247CG |
| Swagelok® for 12 mm probe, 1/2" ISO thread | SWG12ISO12 |
| Swagelok® for 12 mm probe, 3/8" ISO thread | SWG12ISO38 |
| Swagelok® for 12 mm probe, 1/2" NPT thread | SWG12NPT12 |
| USB PC connection cable [1] | 242659 |

*1) Vaisala Insight software for Windows available at www.vaisala.com/insight*

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