

HMP4 Relative Humidity and Temperature Probe

For Pressurized and Vacuum Processes



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)
- Operating pressure 0 ... 10 MPa (0 ... 100 bar)
- Sensor purge provides superior chemical resistance
- Modbus RTU over RS-485
- Plug & play compatible with Indigo series of transmitters
- Traceable calibration certificate: 5 points for humidity, 1 point for temperature

Vaisala HUMICAP® Humidity and Temperature Probe HMP4 is designed for high-pressure applications such as compressed air systems in maritime, breathing air, and industrial applications, 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.

Chemical Purge Minimizes Effects of Contaminants

In environments with high concentrations of chemicals and cleaning agents, the chemical purge option helps to maintain measurement accuracy between calibration intervals.

The chemical purge involves heating the sensor to remove harmful chemicals. The function can be initiated manually or programmed to occur at set intervals.

Flexible Connectivity

The probe is plug and play compatible with Vaisala Indigo series of transmitters, or 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® 7, 8.1 and 10: see www.vaisala.com/insight).

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.

Technical Data

Measurement Performance

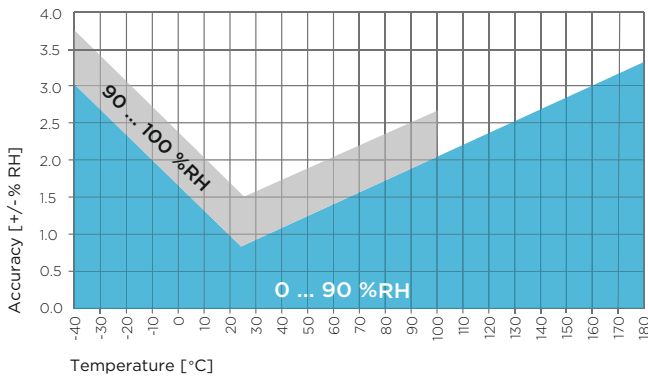
Relative Humidity

Sensor	HUMICAP R2 Composite
Measurement range	0 ... 100 %RH
Accuracy at +23 °C (+73.4 °F) ¹⁾	±0.8 %RH (0 ... 90 %RH)
T ₆₃ response time	15 s

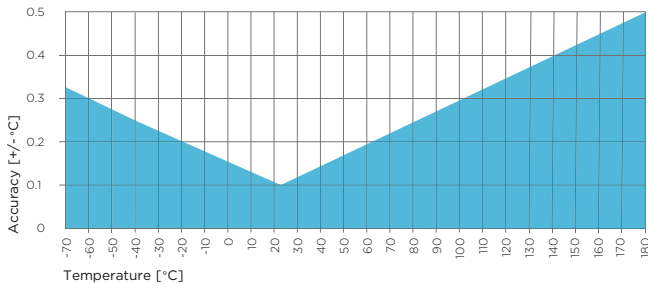
Temperature

Sensor	Pt100 RTD Class F0.1 IEC 60751
Measurement range	-70 ... +180 °C (-94 ... +356 °F)
Accuracy ¹⁾	±0.1 °C (±0.18 °F)

¹⁾ Defined against calibration reference



HMP4 Humidity Measurement Accuracy as a Function of Temperature (Including Non-Linearity and Repeatability)



HMP4 Temperature Measurement Accuracy over Full Range (Including Non-Linearity and Repeatability)

Operating Environment

Operating temperature range for probe body	-40 ... +80 °C (-40 ... +176 °F)
Operating temperature range for probe head	-70 ... +180 °C (-94 ... +356 °F)
Operating environment	Suitable for outdoor use
IP rating	IP66
Electromagnetic compatibility	EN61326-1, industrial environment
Operational pressure	< 100 bar

Inputs and Outputs

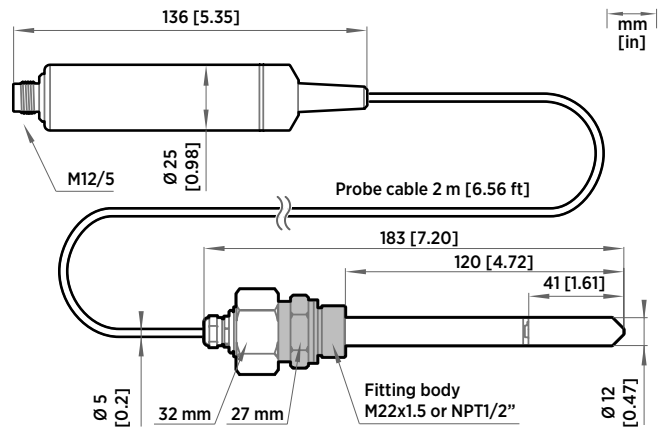
Operating voltage	15 ... 30 VDC
Current consumption	10 mA typical, 500 mA max.
Digital output	RS-485, non-isolated
Default serial settings	19200 bps N 8 2
Protocols	Modbus RTU

Output Parameters

Relative humidity, temperature, dew point temperature, wet-bulb temperature, absolute humidity, mixing ratio, water concentration, water mass fraction, water vapor pressure, enthalpy

Mechanical Specifications

Probe fitting	M22x1.5 and NPT1/2" fittings included
Connector	M12/5
Weight	530 g (18.7 oz)
Materials	
Probe	AISI316
Probe body	AISI316
Cable jacket	FEP



HMP4 Probe Dimensions

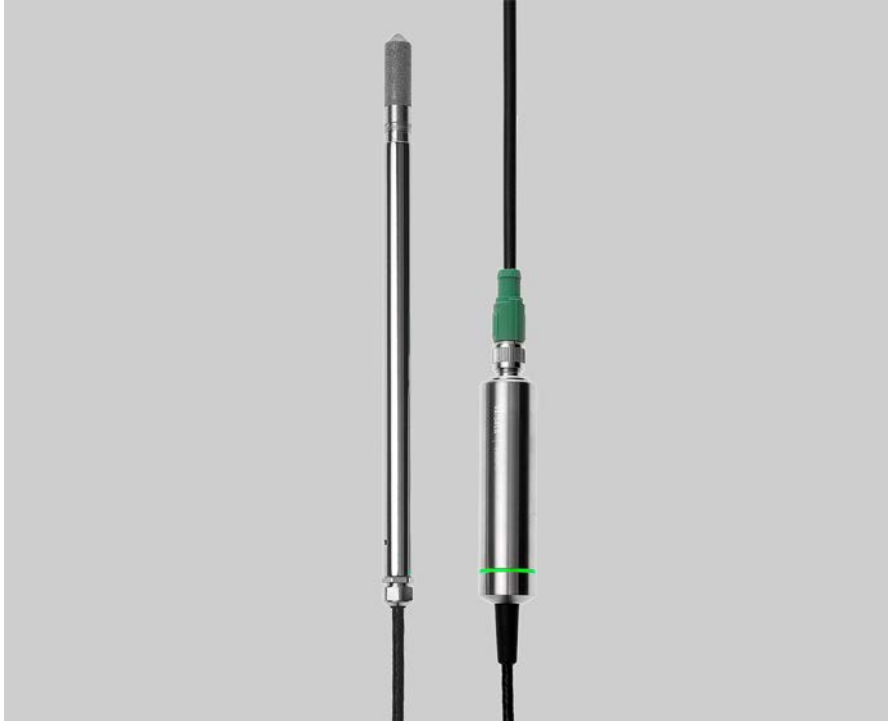
SI Traceable Calibration

Uncertainty of relative humidity calibration ($k = 2$)	±0.5 %RH (0 ... 40 %RH) ±0.8 %RH (40 ... 95 %RH)
Uncertainty of temperature calibration ($k = 2$)	±0.1 °C (±0.18 °F) at +23 °C (+73.4 °F)



HMP5 Relative Humidity and Temperature Probe

For High Temperatures



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)
- Operating temperature range for probe body -40 ... +80 °C (-40 ... +176 °F)
- Sensor purge provides superior chemical resistance
- Modbus RTU over RS-485
- 250-mm (9.84 in) probe allows easy process installation through insulation
- Plug & play compatible with Indigo series of transmitters
- Traceable calibration certificate: 5 points for humidity, 1 point for temperature

Vaisala HUMICAP® Humidity and Temperature Probe HMP5 is designed for high-temperature applications such as baking ovens, pasta dryers, and industrial drying kilns, 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.

Chemical Purge Minimizes Effects of Contaminants

In environments with high concentrations of chemicals and cleaning agents, the chemical purge option helps to maintain measurement accuracy between calibration intervals.

The chemical purge involves heating the sensor to remove harmful chemicals. The function can be initiated manually or programmed to occur at set intervals.

Flexible Connectivity

The probe is plug and play compatible with Vaisala Indigo series of transmitters, or 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® 7, 8.1 and 10: see www.vaisala.com/insight).

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.

Technical Data

Measurement Performance

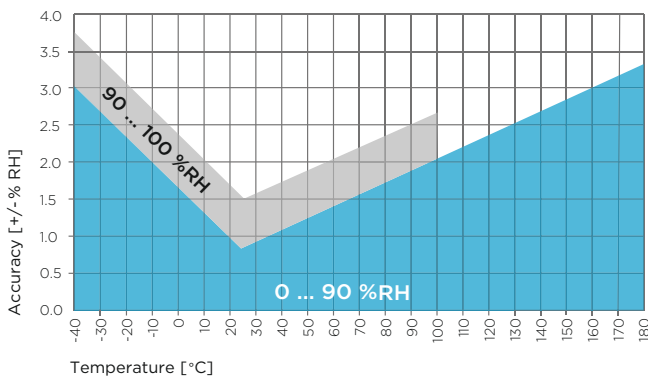
Relative Humidity

Sensor	HUMICAP R2 Composite
Measurement range	0 ... 100 %RH
Accuracy at +23 °C (+73.4 °F) ¹⁾	±0.8 %RH (0 ... 90 %RH)
T ₆₃ response time	15 s

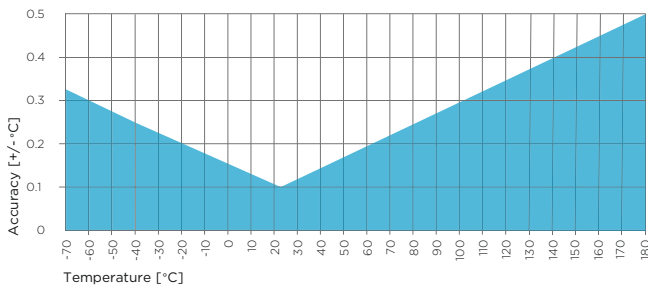
Temperature

Sensor	Pt100 RTD Class F0.1 IEC 60751
Measurement range	-70 ... +180 °C (-94 ... +356 °F)
Accuracy at +23 °C (+73.4 °F) ¹⁾	±0.1 °C (±0.18 °F)

¹⁾ Defined against calibration reference



HMP5 Humidity Measurement Accuracy as a Function of Temperature (Including Non-Linearity and Repeatability)



HMP5 Temperature Measurement Accuracy over Full Range (Including Non-Linearity and Repeatability)

Operating Environment

Operating temperature range for probe body	-40 ... +80 °C (-40 ... +176 °F)
Operating temperature range for probe head	-70 ... +180 °C (-94 ... +356 °F)
Operating environment	Suitable for outdoor use
IP rating	IP66
Electromagnetic compatibility	Complies with EMC standard EN61326-1, Electrical equipment for measurement, control and laboratory use - EMC requirements - Industrial environment

Inputs and Outputs

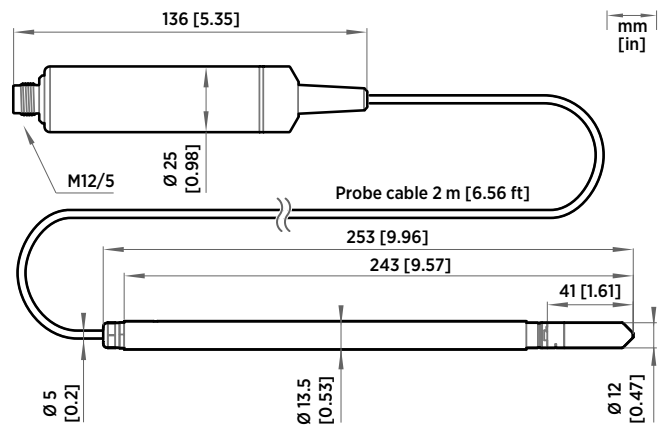
Operating voltage	15 ... 30 VDC
Current consumption	10 mA typical 500 mA max.
Digital output	RS-485, non-isolated
Default serial settings	19200 bps N 8 2
Protocols	Modbus RTU

Output Parameters

Relative humidity, temperature, dew point temperature, wet-bulb temperature, absolute humidity, mixing ratio, water concentration, water mass fraction, water vapor pressure, enthalpy

Mechanical Specifications

Connector	M12/5
Weight	436 g (15.37 oz)
Materials	
Probe	AISI316L
Probe body	AISI316L
Cable jacket	FEP



HMP5 Probe Dimensions

SI Traceable Calibration

Uncertainty of relative humidity calibration ($k = 2$)	±0.5 %RH (0 ... 40 %RH) ±0.8 %RH (40 ... 95 %RH)
Uncertainty of temperature calibration ($k = 2$)	±0.1 °C (±0.18 °F) at +23 °C (+73.4 °F)



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 and sensor warming functions minimize condensation on probe
- Sensor purge provides superior chemical resistance
- Modbus RTU over RS-485
- Plug & play compatible with Indigo series of transmitters
- Traceable calibration certificate: 5 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 plug and play compatible with Vaisala Indigo series of transmitters, or 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® 7, 8.1 and 10: see www.vaisala.com/insight).

Technical Data

Measurement Performance

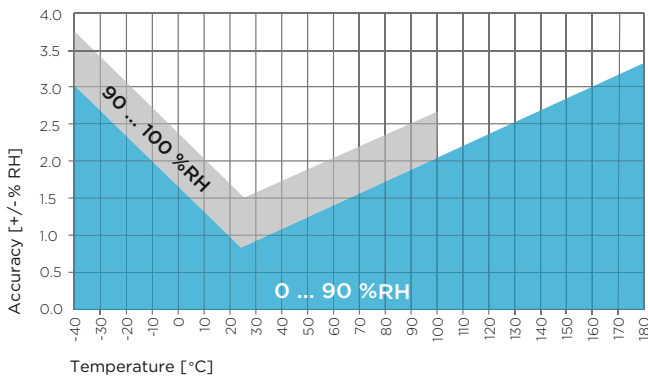
Relative Humidity

Sensor	HUMICAP R2 Composite
Measurement range	0 ... 100 %RH
Accuracy at +23 °C (+73.4 °F) ¹⁾	±0.8 %RH (0 ... 90 %RH)
T ₆₃ response time	15 s

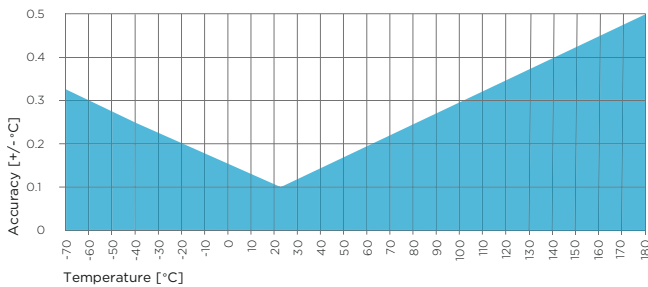
Temperature

Sensor	Pt100 RTD Class F0.1 IEC 60751
Measurement range	-70 ... +180 °C (-94 ... +356 °F)
Accuracy at +23 °C (+73.4 °F) ¹⁾	±0.1 °C (±0.18 °F)

¹⁾ Defined against calibration reference



HMP7 Humidity Measurement Accuracy as Function of Temperature (Including Non-Linearity and Repeatability).



HMP7 Temperature Measurement Accuracy over Full Range (Including Non-Linearity and Repeatability)

Operating Environment

Operating temperature range for probe body	-40 ... +80 °C (-40 ... +176 °F)
Operating temperature range for probe head	-70 ... +180 °C (-94 ... +356 °F)
Operating environment	Suitable for outdoor use
IP rating	IP66
Electromagnetic compatibility	EN61326-1, Electrical equipment for measurement, control and laboratory use - EMC requirements - Industrial environment

Inputs and Outputs

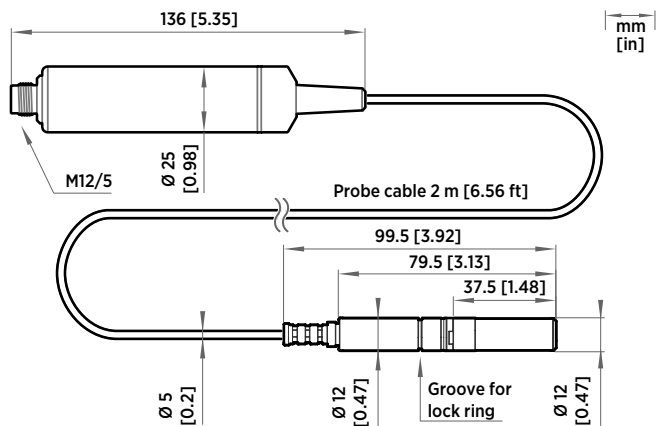
Operating voltage	18 ... 30 VDC
Current consumption	10 mA typical 500 mA max.
Digital output	RS-485, non-isolated
Default serial settings	19200 bps N 8 2
Protocols	Modbus RTU

Output Parameters

Relative humidity, temperature, dew point temperature, wet-bulb temperature, absolute humidity, mixing ratio, water concentration, water mass fraction, water vapor pressure, enthalpy

Mechanical Specifications

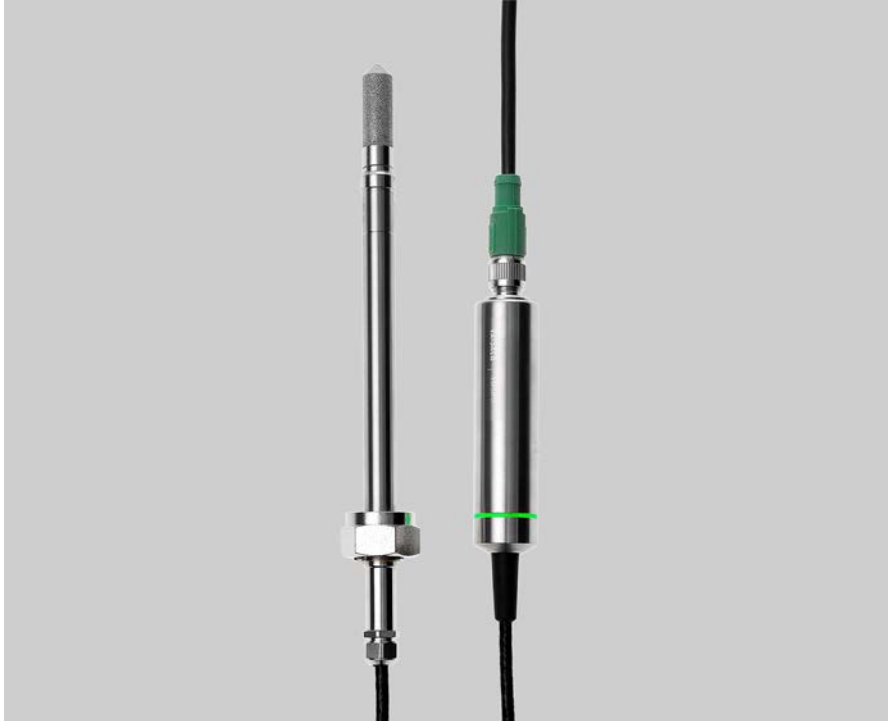
Connector	M12/5
Weight	310 g (10.9 oz)
Materials	
Probe	AISI316L
Probe body	AISI316L
Cable jacket	FEP



HMP7 Probe Dimensions

SI Traceable Calibration

Uncertainty of relative humidity calibration ($k = 2$)	±0.5 %RH (0 ... 40 %RH) ±0.8 %RH (40 ... 95 %RH)
Uncertainty of temperature calibration ($k = 2$)	±0.1 °C (±0.18 °F) at +23 °C (+73.4 °F)



Features

- RH accuracy up to 0.8 %RH
- Temperature accuracy up to 0.1 °C (0.18 °F)
- Operating pressure 0 ... 4 MPa (0 ... 40 bar)
- Temperature measurement range -70 ... +180 °C (-94 ... +356 °F)
- Sensor purge provides superior chemical resistance
- Probe installation depth can be freely adjusted and probe can be hot-swapped from pressurized pipelines with an installation valve
- Modbus RTU over RS-485
- Plug & play compatible with Indigo series of transmitters
- Traceable calibration certificate: 5 points for humidity, 1 point for temperature

Vaisala HUMICAP® Humidity and Temperature Probe HMP8 is designed for pressurized applications in compressed air systems, refrigerant dryers, and other pressurized industrial applications, where easy insertion and removal of the probe and adjustable installation depth into the pipeline are needed.

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.

Chemical Purge Minimizes Effects of Contaminants

In environments with high concentrations of chemicals and cleaning agents, the chemical purge option helps to maintain measurement accuracy between calibration intervals.

The chemical purge involves heating the sensor to remove harmful chemicals. The function can be initiated manually or programmed to occur at set intervals.

Flexible Connectivity

The probe is plug and play compatible with Vaisala Indigo series of transmitters, or 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 (see www.vaisala.com/insight).

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.

Technical Data

Measurement Performance

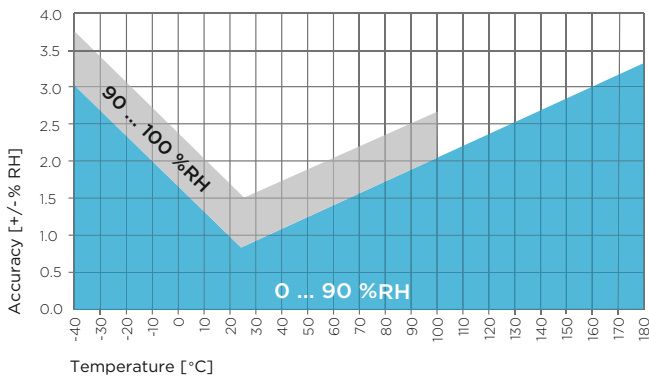
Relative Humidity

Sensor	HUMICAP R2 Composite
Measurement range	0 ... 100 %RH
Accuracy at +23 °C (+73.4 °F) ¹⁾	±0.8 %RH (0 ... 90 %RH)
T ₆₃ response time	15 s

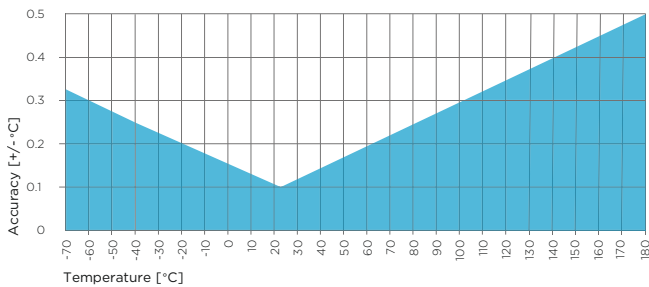
Temperature

Sensor	Pt100 RTD Class F0.1 IEC 60751
Measurement range	-70 ... +180 °C (-94 ... +356 °F)
Accuracy at +23 °C (+73.4 °F) ¹⁾	±0.1 °C (±0.18 °F)

¹⁾ Defined against calibration reference



HMP8 Humidity Measurement Accuracy as a Function of Temperature (Including Non-Linearity and Repeatability)



HMP8 Temperature Measurement Accuracy over Full Range (Including Non-Linearity and Repeatability)

Operating Environment

Operating temperature range for probe body	-40 ... +80 °C (-40 ... +176 °F)
Operating temperature range for probe head	-70 ... +180 °C (-94 ... +356 °F)
Operating environment	Suitable for outdoor use
IP rating	IP66
Electromagnetic compatibility	Complies with EMC standard EN61326-1, Electrical equipment for measurement, control and laboratory use - EMC requirements - Industrial environment
Operational pressure	< 40 bar

Inputs and Outputs

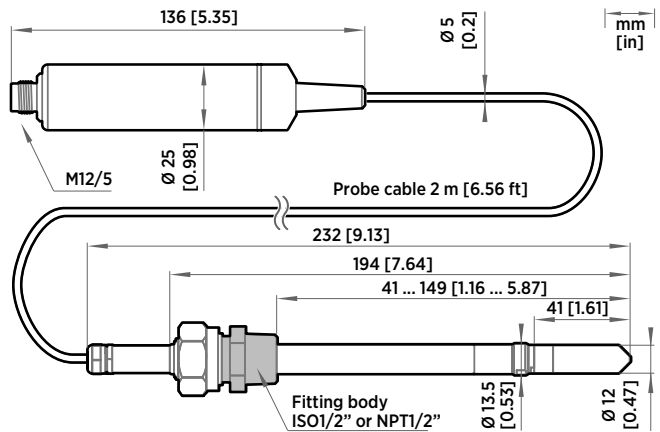
Operating voltage	15 ... 30 VDC
Current consumption	10 mA typical 500 mA max.
Digital output	RS-485, non-isolated
Default serial settings	19200 bps N 8 2
Protocols	Modbus RTU

Output Parameters

Relative humidity, temperature, dew point temperature, wet-bulb temperature, absolute humidity, mixing ratio, water concentration, water mass fraction, water vapor pressure, enthalpy

Mechanical Specifications

Probe fitting	ISO1/2" and NPT1/2" fittings included
Connector	M12/5
Weight	570 g (20.1 oz)
Materials	
Probe	AISI316L
Probe body	AISI316L
Cable jacket	FEP



HMP8 Probe Dimensions

SI Traceable Calibration

Uncertainty of relative humidity calibration ($k = 2$)	±0.5 %RH (0 ... 40 %RH) ±0.8 %RH (40 ... 95 %RH)
Uncertainty of temperature calibration ($k = 2$)	±0.1 °C (±0.18 °F) at +23 °C (+73.4 °F)



Features

- Temperature accuracy up to 0.1 °C (0.18 °F)
- Temperature measurement range -70 ... +180 °C (-94 ... +356 °F)
- Modbus RTU over RS-485
- Plug & play compatible with Indigo series of transmitters
- Traceable 2-point calibration certificate (calibration points at +20 and +70 °C (+68 and +158 °F))

Vaisala Temperature Probe TMP1 is designed for demanding temperature measurements in industrial applications such as pharmaceutical industry and calibration laboratories, where accuracy and robustness are essential.

Flexible Connectivity

The probe is plug and play compatible with Vaisala Indigo series of transmitters, or 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® 7, 8.1 and 10: see www.vaisala.com/insight).

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.

Relative Humidity Measurements in High Humidities

When the TMP1 probe is connected to a control system in parallel with HMP7 Relative Humidity and Temperature Probe, it is possible to have relative humidity measurement in actual process temperature while using probe heating in

the relative humidity probe. Probe heating helps to avoid condensation in situations where the dew point temperature of the process is close to the ambient temperature.

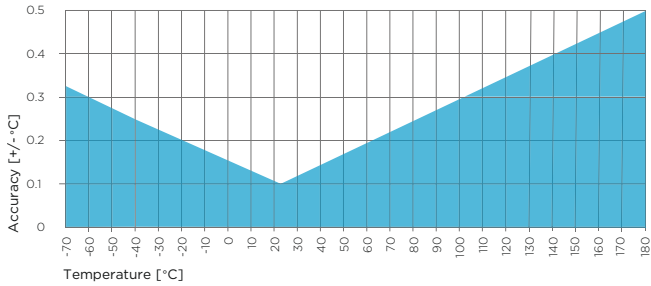
When the humidity probe is heated above dew point temperature, condensation can be avoided and the relative humidity in the actual process temperature can be back-calculated based on the true process temperature measurement received from TMP1.

Technical Data

Measurement Performance

Sensor	Pt100 RTD Class F0.1 IEC 60751
Measurement range	-70 ... +180 °C (-94 ... +356 °F)
Accuracy at +23 °C (+73.4 °F) ¹⁾	±0.1 °C (±0.18 °F)

1) Defined against calibration reference



TMP1 Temperature Measurement Accuracy over Full Range (Including Non-Linearity and Repeatability)

SI Traceable Calibration

Uncertainty of temperature calibration ±0.1 °C (±0.18 °F) at +23 °C (+73.4 °F) ($k = 2$)

Operating Environment

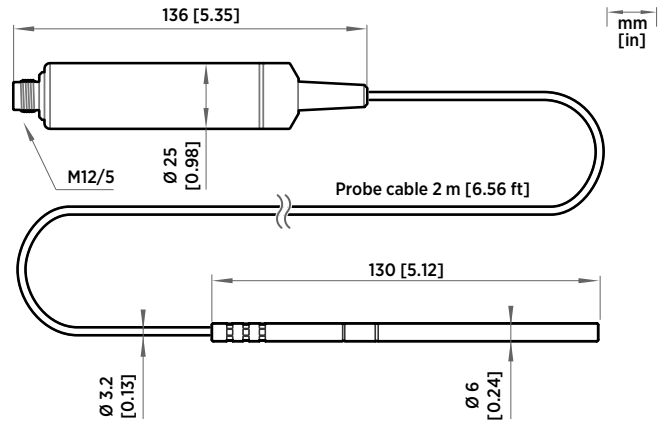
Operating temperature range for probe body	-40 ... +80 °C (-40 ... +176 °F)
Operating temperature range for probe head	-70 ... +180 °C (-94 ... +356 °F)
Operating environment	Suitable for outdoor use
IP rating	IP66
Electromagnetic compatibility	Complies with EMC standard EN61326-1, Industrial Environment

Inputs and Outputs

Operating voltage	15 ... 30 VDC
Current consumption	10 mA typical
Digital output	RS-485, non-isolated
Default serial settings	19200 bps N 8 2
Protocols	Modbus RTU
Output parameters	Temperature, water vapor saturation pressure

Mechanical Specifications

Connector	M12/5
Weight	224 g (7.9 oz)
Materials	
Probe	AISI316L
Probe body	AISI316L
Cable jacket	FEP



TMP1 Probe Dimensions