VAISALA

HMP3 General Purpose Humidity and Temperature Probe

Vaisala HUMICAP® Humidity and Temperature Probe HMP3 is a general purpose probe designed for various industrial processes. The probe structure allows for replacing the sensor without tools, making it suitable for applications such as paint booths and other industrial applications where periodic recalibration alone is not sufficient for maintaining the probe performance. Other suitable applications include, for example, industrial HVAC systems, cleanrooms, and environmental chambers.

Designed for field maintenance

Probe design allows for several operating environments and flexible field maintenance. Filter and HUMICAP® R2 sensor element are field replaceable for applications that require frequent replacements. Calibration and adjustment of humidity measurement is also needed if the HUMICAP® R2 sensor is replaced. The following filter types are recommended for HMP3:

- Stainless steel mesh filter (12 µm mesh size) for typical applications such as air handling units
- Sintered stainless steel filter for applications where maximal protection from dust ingress is essential
- PPS plastic grid filter for best humidity response time

Chemical purge available with composite sensors

If purchased with a composite sensor instead of the field replaceable HUMICAP® R2 sensor, HMP3 can use the chemical purge feature. 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 compatible with Vaisala Indigo series 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®. For more information, see www.vaisala.com/insight.

DNV GL type approval certificate no. TAA00002YT

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) ±0.8 %RH (40 … 95 %RH)
T_{63} response time	15 s
Sensor options	HUMICAP® R2 HUMICAP® R2C [3] HUMICAP® 180VC [3] [4]

Temperature

Sensor	Pt100 RTD Class F0.1 IEC 60751
Measurement range	−40 … +120 °C (−40 … +248 °F)
Accuracy [1]	±0.1 °C (±0.18 °F)
Factory calibration uncertainty [2]	±0.1 °C (±0.18 °F) at +23 °C (+73.4 °F)

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.
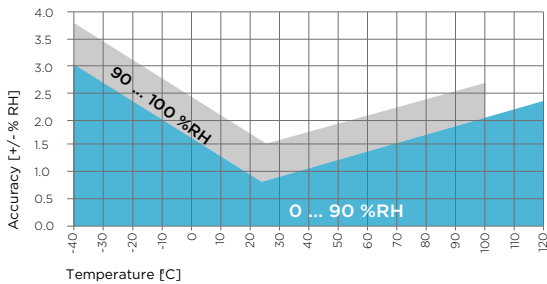
HMP3 humidity measurement accuracy as a function of temperature
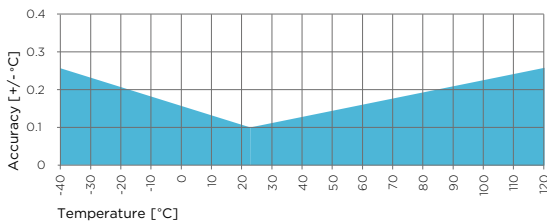
HMP3 temperature measurement accuracy over full range

Operating environment

Operating temperature of probe head	−40 … +120 °C (−40 … +248 °F)
Operating temperature of probe body	−40 … +80 °C (−40 … +176 °F)
Storage temperature	−40 … +80 °C (−40 … +176 °F)
Operating environment	Suitable for outdoor use
Measurement environment	For air, nitrogen, hydrogen, argon, helium, and oxygen [1]
IP rating of probe body	IP66

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

Inputs and outputs

Operating voltage	15 … 30 V DC
Current consumption	10 mA typical, 500 mA max.
Digital output	RS-485, non-isolated
Protocols	Modbus RTU

Output parameters

Absolute humidity (g/m³)	Relative humidity (%RH)
Absolute humidity at NTP (g/m³)	Relative humidity (dew/frost) (%RH)
Dew point temperature (°C)	Temperature (°C)
Dew/frost point temperature (°C)	Water concentration (ppm$_v$)
Dew/frost point temperature at 1 atm (°C)	Water concentration (wet basis) (vol-%)
Dew point temperature at 1 atm (°C)	Water mass fraction (ppm$_w$)
Dew point temperature difference (°C)	Water vapor pressure (hPa)
Enthalpy (kJ/kg)	Water vapor saturation pressure (hPa)
Mixing ratio (g/kg)	Wet-bulb temperature (°C)

Compliance

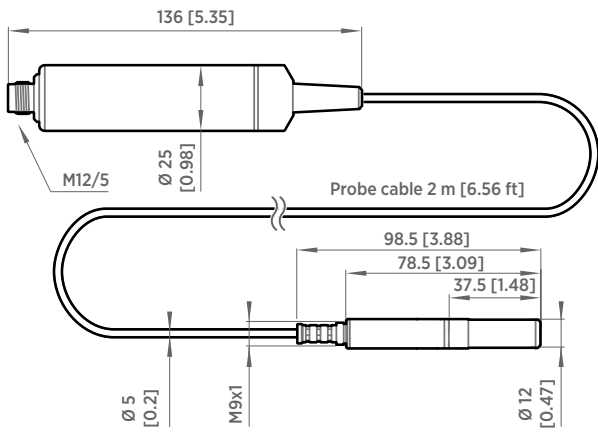|	
EU directives and regulations	EMC Directive (2014/30/EU) RoHS Directive (2011/65/EU) amended by 2015/863
EMC compatibility	EN 61326-1, industrial environment
Type approvals	DNV GL certificate no. TAA00002YT
Compliance marks	CE, China RoHS, RCM

Mechanical specifications

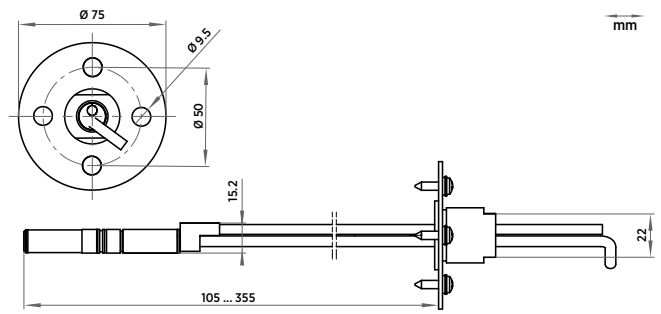|	
Connector	M12 5-pin A-coded male
Weight	302 g (10.65 oz)
Materials	
Probe	AISI 316L
Probe body	AISI 316L
Cable jacket	FEP

Accessories

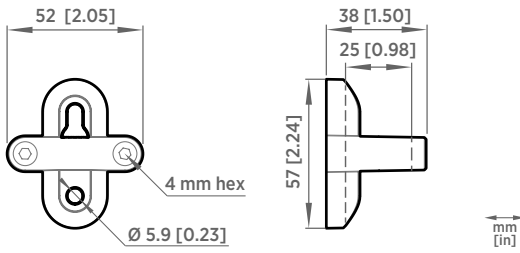|	
Duct installation kit	210697
Solar radiation shield DTR502B	DTR502B
Cable gland M20×1.5 with split seal	HMP247CG
Indigo USB adapter [1]	USB2

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

136 [5.35]

M12/5

Ø 25 [0.98]

Probe cable 2 m [6.56 ft]

98.5 [3.88]
78.5 [3.09]
37.5 [1.48]

Ø 5 [0.2]

M9x1

Ø 12 [0.47]

mm
[in]

HMP3 probe dimensions

Ø 75

Ø 9.5

Ø 50

15.2

22

105 ... 355

mm

Duct installation kit 210697 dimensions with probe

52 [2.05]

4 mm hex

Ø 5.9 [0.23]

38 [1.50]
25 [0.98]

57 [2.24]

mm
[in]

Probe holder ASM213582 dimensions

B211826EN-C