VAISALA

HMP4 Relative Humidity and Temperature Probe
For pressurized and vacuum processes
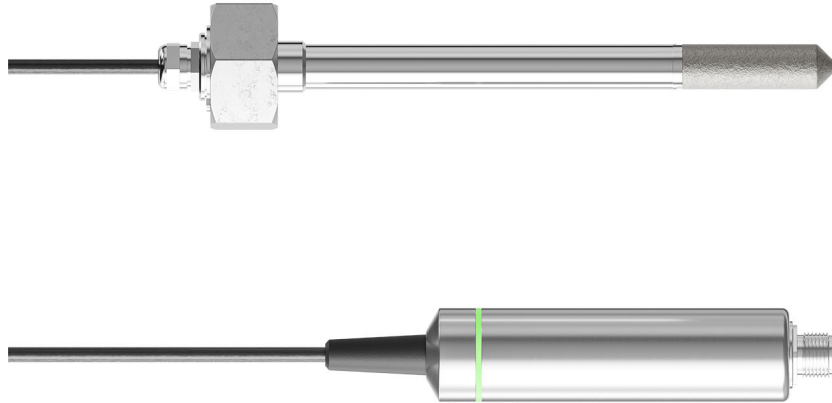
Vaisala HUMICAP® Humidity and Temperature Probe HMP4 is designed for high-pressure applications such as compressed air systems in maritime, breathing air, and industrial applications, where measurement performance and chemical tolerance are essential.

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.

Sensor purge minimizes effects of contaminants

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

The sensor 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 can be used as a standalone digital Modbus RTU transmitter over an RS-485 serial bus, and it can also be connected to Indigo transmitters and the Indigo80 handheld indicator. 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.

Vaisala Indigo product family

Indigo transmitters extend the capabilities of Indigo-compatible measurement probes. The transmitters can display measurements on the spot as well as transmit them to automation systems through analog signals, digital outputs, and relays. Cable length between probe and transmitter can be extended to up to 30 meters.

The Indigo80 handheld indicator is ideal for spot-checking and process monitoring, as well as for configuring, troubleshooting, calibrating, and adjusting the probe. For more information, see www.vaisala.com/indigo.

Technical data

Measurement performance

### Relative humidity

Measurement range	0–100 %RH, at max. +95 °C (203 °F) T_d
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]

Temperature

Measurement range	−70 ... +180 °C (−94 ... +356 °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)
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) Sensor purge feature available with this sensor.
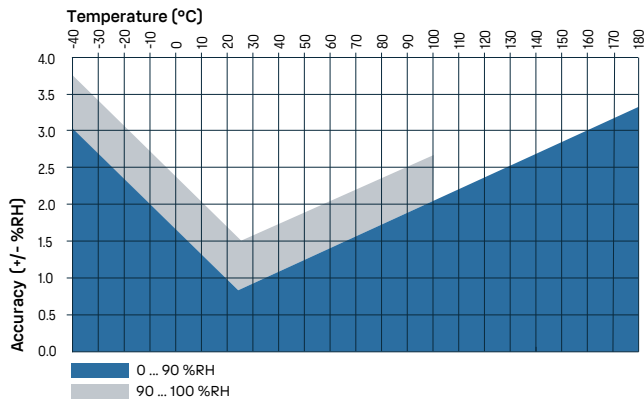
HMP4 humidity measurement accuracy as a function of temperature
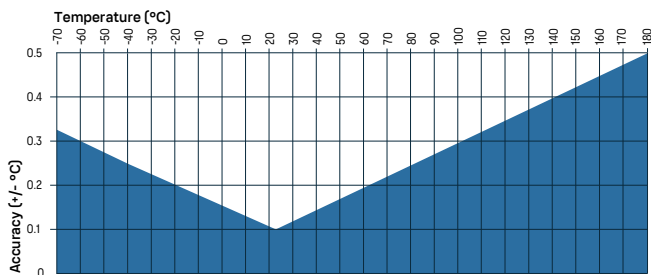
HMP4 temperature measurement accuracy over full range

Operating environment

Operating temperature of probe body	−40 ... +80 °C (−40 ... +176 °F)
Operating temperature of probe head	−70 ... +180 °C (−94 ... +356 °F)
Operating humidity of probe head	Max. +100 °C (212 °F) T_d
Storage temperature	−40 ... +80 °C (−40 ... +176 °F)
Operational pressure	< 100 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

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

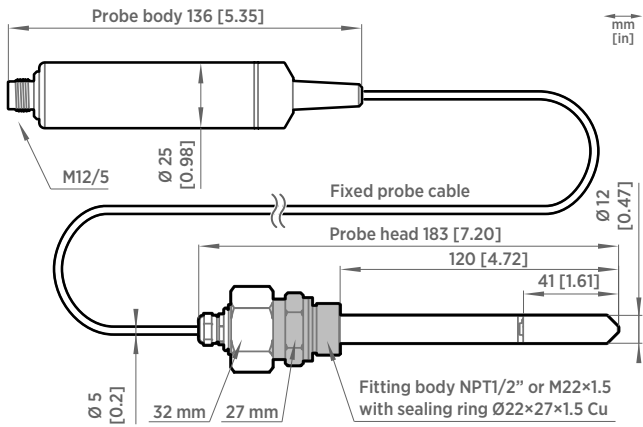|	
EU directives and regulations	EMC Directive (2014/30/EU) RoHS Directive (2011/65/EU) as amended by 2015/863
Electromagnetic compatibility (EMC)	EN 61326-1, industrial environment
Type approvals	DNV GL certificate no. TAA00002YT
Compliance marks	CE, China RoHS, RCM

Mechanical specifications

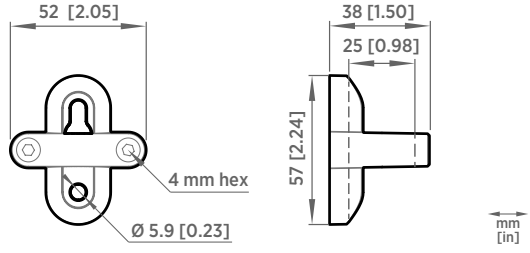|	
Connector	M12 5-pin A-coded male
Fitting body	M22×1.5 or NPT1/2"
Weight (with a 2-m cable)	530 g (18.7 oz)
Probe cable length	2 m (6.56 ft)
Materials	
Probe	AISI 316
Probe body	AISI 316
Cable jacket	FEP

Accessories

Indigo USB adapter [1]	USB2
Calibration adapter for HMK15	211302SP

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

HMP4 probe dimensions

Probe body 136 [5.35]

Ø 25 [0.98]

M12/5

Fixed probe cable

Probe head 183 [7.20]

120 [4.72]

41 [1.61]

Ø 12 [0.47]

Ø 5 [0.2]

32 mm   27 mm

Fitting body NPT1/2" or M22×1.5
with sealing ring Ø22×27×1.5 Cu

mm [in]

Probe holder ASM213582 dimensions

52 [2.05]

4 mm hex

Ø 5.9 [0.23]

38 [1.50]

25 [0.98]

57 [2.24]

mm [in]