DMP5 Dew Point and Temperature Probe

For high-temperature applications

Features

- Measures humidity at temperatures up to +180 °C (+356 °F)
- Dew point measurement range −40 ... +100 °C (−40 ... +212 °F) $T_{d/f}$
- Dew point measurement accuracy up to ±2 °C (±3.6 °F) $T_{d/f}$
- Sensor purge improves long-term stability and chemical resistance
- Condensation-tolerant
- Modbus RTU over RS-485
- Compatible with Vaisala Indigo products and Insight PC software
- Traceable calibration certificate

Vaisala DRYCAP® Dew Point and Temperature Probe DMP5 is designed for humidity measurement in applications with high temperatures. The long and robust steel probe and an optional installation flange allow easy installation with adjustable depth through insulation, for example, in ovens.

Measure humidity directly in hot processes

DMP5 is built for direct measurement in hot and dry processes, up to +180 °C (+356 °F). As the probe can be directly placed in the process, there is no need for a sampling system or trace heating. As a result, high measurement accuracy and constancy are maintained. DMP5 provides unmatched dry-end measurement accuracy at temperatures up to 140 °C; however, it can operate safely at temperatures up to 180 °C.

DMP5 incorporates the Vaisala DRYCAP® sensor, which is accurate, reliable, and stable. The sensor is condensation-tolerant and immune to particulate contamination, oil vapor, and most chemicals. Sensor warming minimizes the risk of condensation accumulating on the sensor. If the DRYCAP® sensor does get wet, it will rapidly dry and recover its swift response time. In low humidity conditions, the sensor autocalibrates to ensure accurate measurement.

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.

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.

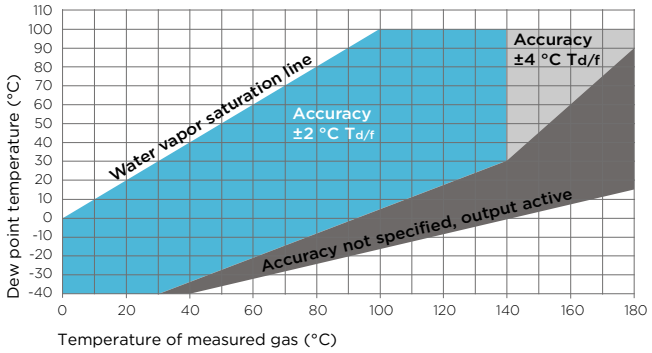
The Indigo80 handheld indicator is ideal for spot-checking and process monitoring, as well as for configuring and troubleshooting the probe. For more information, see www.vaisala.com/indigo.

Technical data

Measurement performance

Dew point	
Sensor	DRYCAP® 180S
Measurement range	−40 ... +100 °C (−40 ... +212 °F) $T_{d/f}$
Accuracy	±2 °C (±3.6 °F) $T_{d/f}$ See accuracy graph
Response time 63 % [90 %] [1]	
From dry to wet	5 s [10 s]
From wet to dry	45 s [5 min]
Temperature	
Measurement range	0 ... +180 °C (+32 ... +356 °F)
Accuracy at +100 °C (+212 °F)	±0.4 °C (±0.72 °F)
Temperature sensor	Pt100 RTD Class F0.1 IEC 60751
Mixing ratio	
Measurement range (typical)	0 ... 1000 g/kg (0 ... 7000 gr/lbs)
Accuracy (typical)	±12 % of reading
Absolute humidity	
Measurement range	0 ... 600 g/m³
Accuracy	±10 % of reading (typical)

1) Tested with sintered filter.



Dew point accuracy vs. measurement conditions

Operating environment

Operating temperature range for probe head	−40 ... +180 °C (−40 ... +356 °F)
Operating temperature range for probe body	−40 ... +80 °C (−40 ... +176 °F)
Storage temperature	−40 ... +80 °C (−40 ... +176 °F)
Measurement environment	For air, nitrogen, hydrogen, argon, helium, and oxygen [1]
IP rating for 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

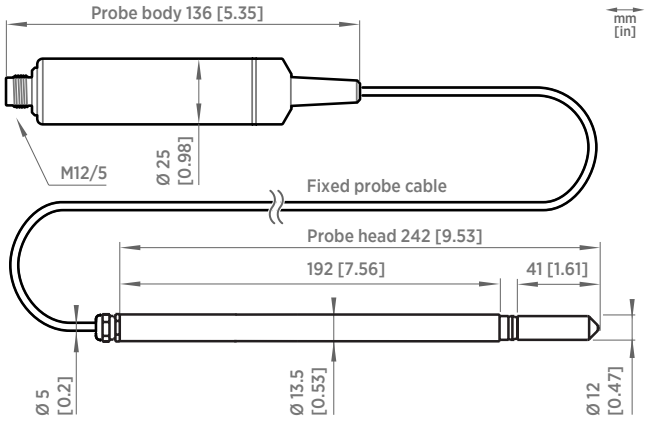
Absolute humidity (g/m³)	Relative humidity (%RH)
Absolute humidity at NTP (g/m³)	Relative humidity (dew/frost) (%RH)
Dew point temperature (°C)	Temperature (°C)
Dew/frost point temperature (°C)	Water concentration (ppm_v)
Dew/frost point temperature at 1 atm (°C)	Water concentration (wet basis) (vol-%)
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)	

Compliance

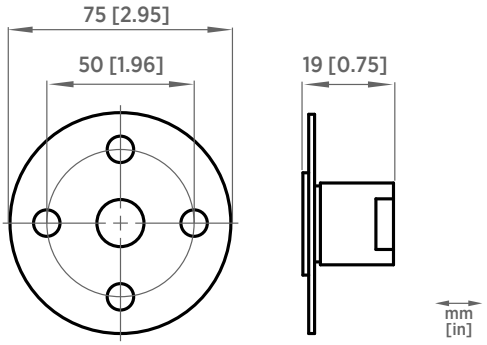
EU directives and regulations	EMC Directive (2014/30/EU) RoHS Directive (2011/65/EU) amended by 2015/863
Electromagnetic compatibility (EMC)	EN 61326-1, industrial environment
Type approvals	DNV GL certificate no. TAA00002YT
Compliance marks	CE, China RoHS, RCM

Mechanical specifications

Connector	M12 5-pin A-coded male
Weight	436 g (15.37 oz)
Probe cable length	2 m (6.56 ft) or 10 m (32.8 ft)
Materials	
Probe	AISI 316L
Probe body	AISI 316L
Cable jacket	FEP



DMP5 dimensions



Optional mounting flange 210696 dimensions

Accessories

Mounting flange	210696
Indigo USB adapter [1)]	USB2

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