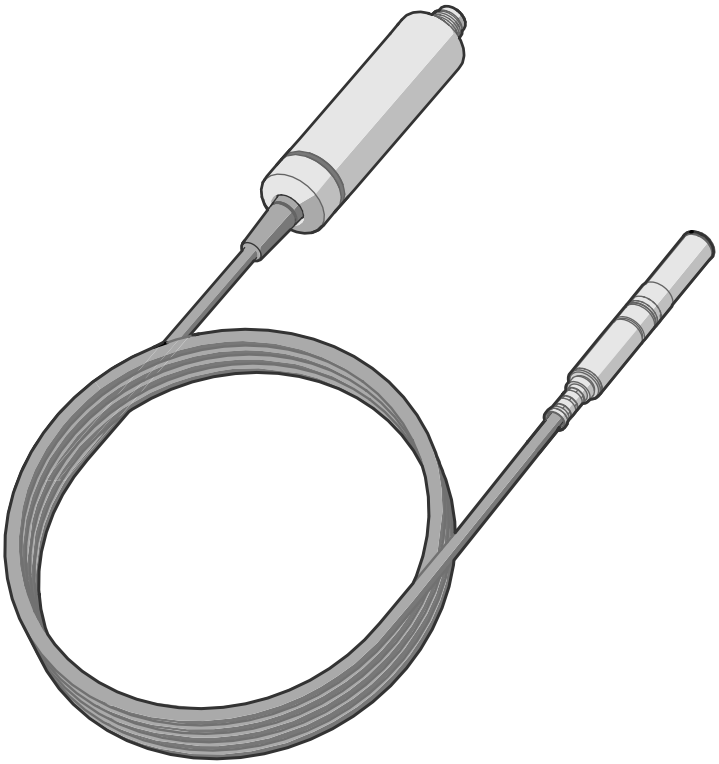
M211982EN-L

Quick Guide

Vaisala Indigo-compatible humidity and temperature probes

HMP Series with MMP8 and TMP1



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Vaisala Oyj
Vanha Nurmijärventie 21, FI-01670 Vantaa, Finland
P.O. Box 26, FI-00421 Helsinki, Finland
+358 9 8949 1
vaisala.com
docs.vaisala.com

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Product overview

This document is a quick guide for installation of HMP series probes. For the complete user guide including, for example, further information on the optional installation kits available, see HMP Series with MMP8 and TMP1 User Guide (M212022EN).

HMP series probes are humidity and temperature measurement probes with a digital output (Modbus® protocol). The probes are designed for demanding humidity and temperature measurement applications. The probes have a two-part structure, with measurement electronics contained in the probe body and sensor(s) in the probe head. The probe body and the probe head are connected by a fixed cable, except on the HMP1 model. Length options for this connecting cable depend on the probe model.

The probes are compatible with Vaisala Indigo transmitters and Vaisala Indigo80 Handheld Indicator. They can also be connected to Vaisala Insight software for configuration, calibration, adjustment, diagnostics, and temporary online monitoring.

Probe structure

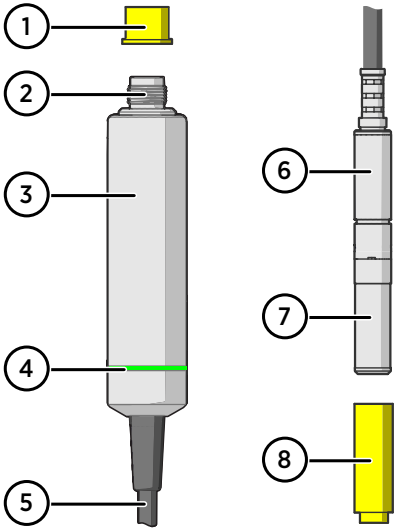


Figure 1 Probe parts

1 Protection cap (remove before use)
2 5-pin M12 connector
3 Probe body with type label
4 Status indicator LED:

Green	Power on and probe online, flashes when communicating
Red	Error
Off	Power off, or indicator disabled

5 Fixed probe cable, variable length (do not cut).
HMP1 model does not have a probe cable, as its probe head is directly attached to the probe body.
6 Probe head (HMP7 model shown)
7 Location of sensor(s) on the probe head. Other probe models have a removable filter over the sensors but HMP1, HMP9, and TMP1 do not.
8 Protection cap (remove before use)

To prevent the warming of the indicator LED from causing a slight measurement error, HMP1 keeps the indicator normally off (even when power is on). The same applies to HMP3 and HMP7 probes that have a 0.15-m (0.49-ft) probe connection cable. If the probe is in error state, the red LED is shown.

Basic features and options

- Comprehensive list of output parameters
- Sensor purge provides superior chemical resistance (HMP models only)
- Condensation prevention feature minimizes condensation on probe (HMP models with composite sensors only)
- Traceable calibration certificate:
  - HMP and MMP models: 6 points for humidity, 1 point for temperature
  - TMP1: 2 points for temperature
- Standalone Modbus® RTU over RS-485
- Compatible with Indigo transmitters and Indigo80 handheld indicator
- Can be connected to Vaisala Insight PC software for configuration, calibration, adjustment, diagnostics, and temporary online monitoring

Output parameters

On HMP probe models, the values of all available output parameters are locked when the sensor is being warmed by the sensor purge or condensation prevention functions.

● Output parameter is available on this model.
◐ Output parameter is available on this model, but its value is unavailable when condensation prevention functions are warming the sensor. Writing temperature to Modbus register 0x0334 from an external source makes the output value available during condensation prevention.
– Output parameter is not available on this model.

Table 1 Availability of output parameters

Output parameter	Output unit	HMP1, 3, 4, 5, 7, 8, and 9	MMP8	TMP1
Absolute humidity	g/m^3	◐	–	–
Absolute humidity at NTP	g/m^3	◐	–	–
Dew/frost point temperature	°C	●	–	–
Dew/frost point temperature at 1 atm	°C	●	–	–
Dew point temperature	°C	●	–	–
Dew point temperature at 1 atm	°C	●	–	–
Dew/frost point depression	°C	◐	–	–
Enthalpy	kJ/kg	◐	–	–
Mixing ratio	g/kg	●	–	–
Relative humidity	%RH	◐	–	–
Relative humidity (dew/frost)	%RH	◐	–	–
Relative saturation	%RS	–	●	–
Temperature	°C	◐	●	●

Output parameter	Output unit	HMP1, 3, 4, 5, 7, 8, and 9	MMP8	TMP1
Water activity	-	–	●	–
Water concentration	ppm_v	●	–	–
Water concentration in oil	ppm_w	–	●	–
Water concentration (wet basis)	vol-%	●	–	–
Water mass fraction	ppm_w	●	–	–
Wet-bulb temperature	°C	◐	–	–
Water vapor pressure	hPa	●	–	–
Water vapor saturation pressure	hPa	◐	–	●

Installation

When you choose the installation location for the probe, consider the following:

- Verify the operating environment specification of the probe model. The probe head typically has a much wider operating temperature range than the probe body.
- If the temperature of the measured environment differs greatly from ambient temperature, the entire probe head and preferably plenty of cable must be inside the measured environment. This prevents measurement inaccuracy caused by heat conduction along the cable.
- Probe mounting options are model-specific.

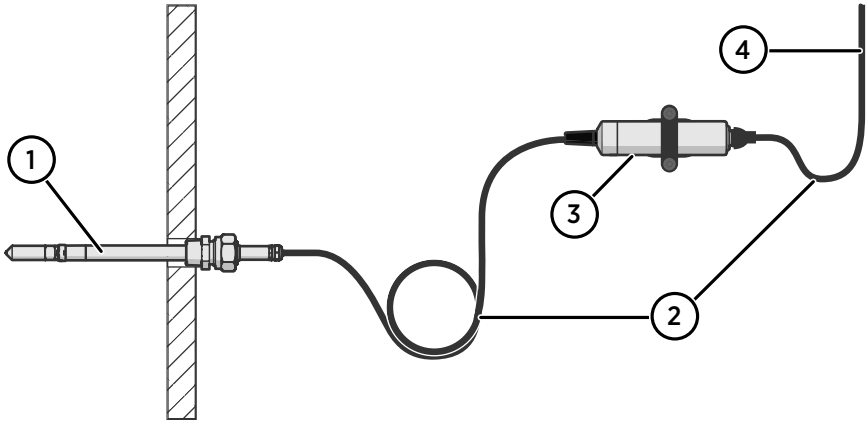
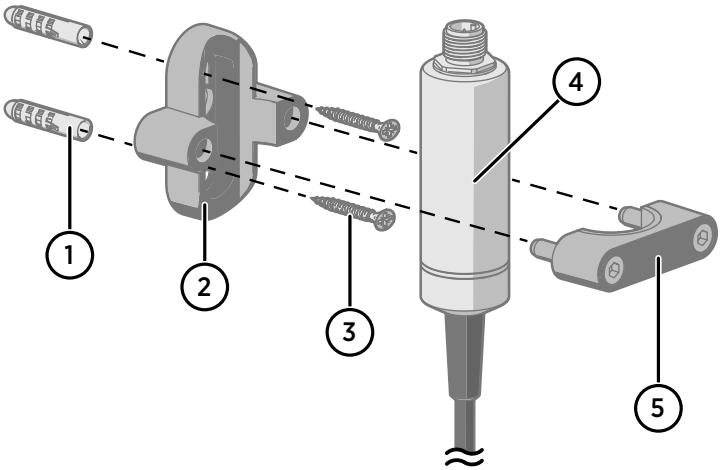


Figure 2 Example installation

1 Mount the probe head horizontally to prevent any water condensing on the probe head from running to the sensors.
2 Let the cable hang loosely to prevent condensed water from running along the cable to the probe body or probe head.
3 Attach the probe body to a wall or other surface using supplied probe holder (item code ASM213582).
4 Cable to Modbus master or Indigo device.

Probe holder ASM213582



1 Wall plugs (2 pcs included, 6×30 nylon)
2 Base of the probe holder
3 Screws (2 pcs included, 4.8×25 DIN7981C PZ A4)
4 Ø 25 mm (0.98 in) probe body
5 Top of the probe holder with 2 hex screws (4-mm socket)

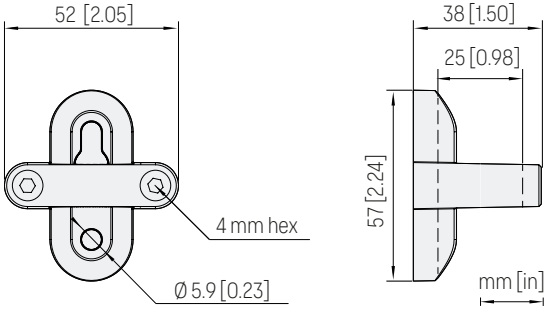


Figure 3 Probe holder ASM213582 dimensions

Wiring

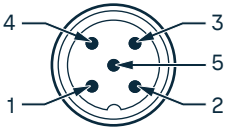


Figure 4 M12 5-pin A-coded male connector pinout

Pin #	Function	Notes	Wire colors in Vaisala cables
1	Power supply	Operating voltage: • HMP7: 18–30 V DC • Other models: 15–30 V DC Current consumption: 10 mA typical, 500 mA max.	Brown
2	RS-485 -		White
3	Power GND and RS-485 common		Blue
4	RS-485 +		Black
5	Not connected		Gray

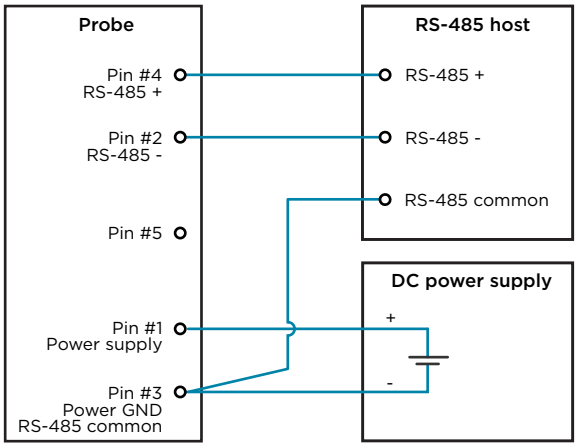


Figure 5 RS-485 wiring

Recommended maximum length of the RS-485 line is 30 m (98 ft).

Configuring environmental compensations

After installation, configure the pressure compensation setting, if relevant to your probe and its measurement environment.

For example, when you have installed the probe in a process with a pressure differing from normal atmospheric pressure, update the correct pressure into the pressure compensation setpoint parameter or register of the probe. This allows the probe to apply the appropriate pressure compensation into its measurement results.

You can configure the setting with the Insight software or the Indigo80 handheld indicator, or using the Modbus protocol.

HMP1 probe

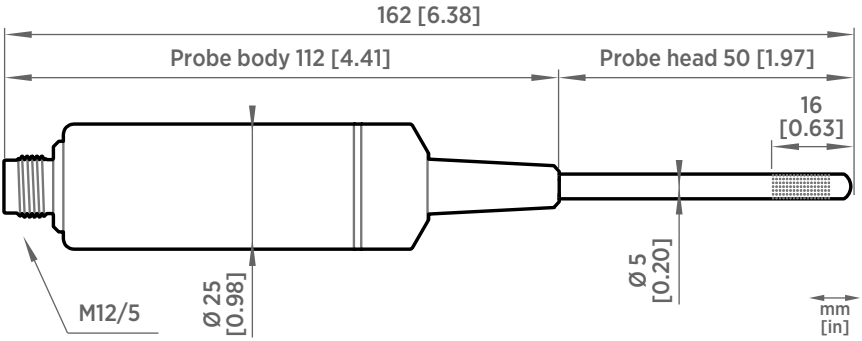


Figure 6 HMP1 probe dimensions

Vaisala HUMICAP® Humidity and Temperature Probe HMP1 is designed for ambient measurement in indoor spaces. Its probe head and body are integrated into a single unit with no cable between them. HMP1 can be directly connected to Indigo300 and Indigo200 series transmitters to form a single wall-mounted unit.

- Operating temperature −40 ... +60 °C (−40 ... +140 °F)
- Integrated filter (non-replaceable)

CAUTION! Do not damage the probe head by bending, crushing, or striking it.

HMP3 probe

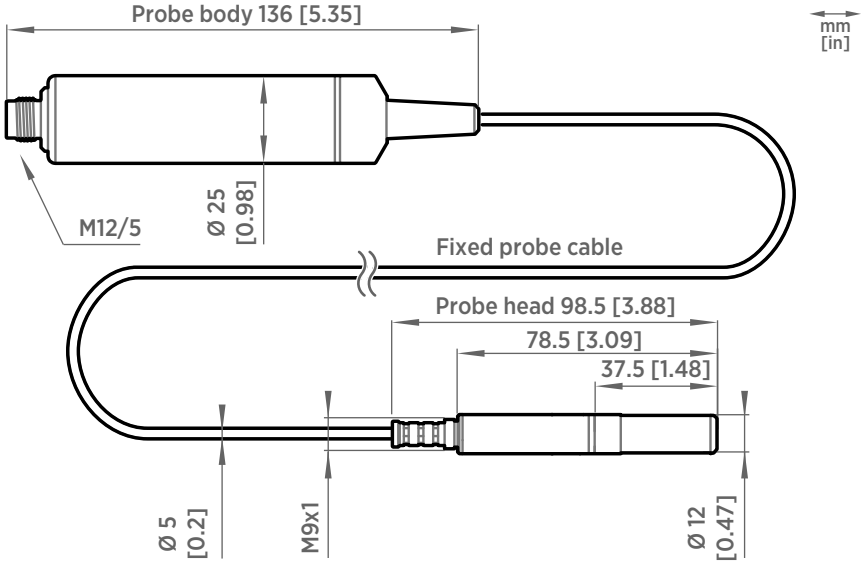


Figure 7 HMP3 probe dimensions

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 the probe suitable for applications such as paint booths and other industrial applications where periodic recalibration alone is not sufficient for maintaining the probe performance. Other applications include, for example, industrial HVAC systems, cleanrooms, and environmental chambers.

- Operating temperature for probe head −40 ... +120 °C (−40 ... +248 °F)
- Operating temperature for probe body −40 ... +80 °C (−40 ... +176 °F)

If purchased with a composite sensor instead of the field-replaceable HUMICAP® R2 sensor, HMP3 can use the sensor purge feature. In environments with high concentrations of chemicals and cleaning agents, sensor purge helps to maintain measurement accuracy between calibration intervals.

HMP4 probe

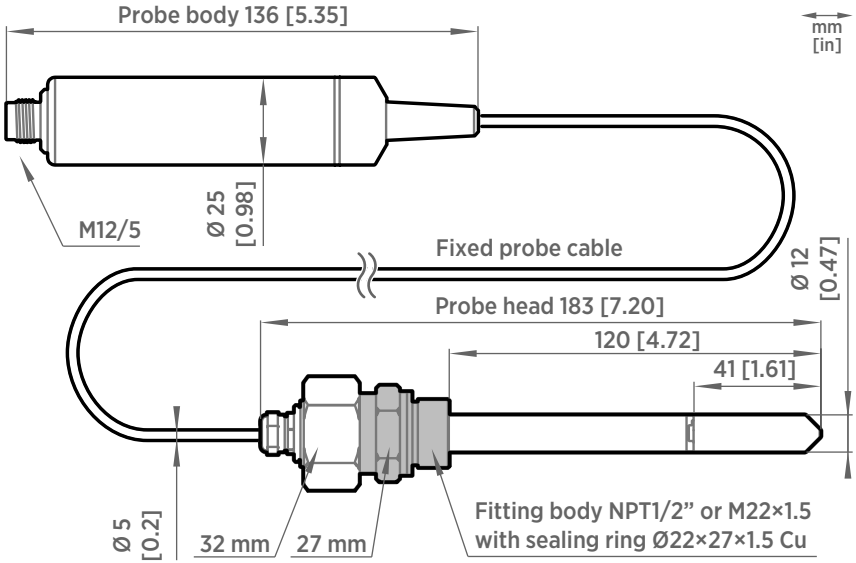


Figure 8 HMP4 probe dimensions

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.

- Temperature measurement range −70 ... +180 °C (−94 ... +356 °F)
- Operating pressure 0–100 bar
- Operating temperature for probe body −40 ... +80 °C (−40 ... +176 °F)
- M22×1.5 or NPT1/2" fitting body

Use a sealing ring (Ø22×27×1.5 Cu) with the M22×1.5 fitting. Replace the sealing ring every time the probe is detached. Three sealing rings are supplied with the fitting.

HMP5 probe

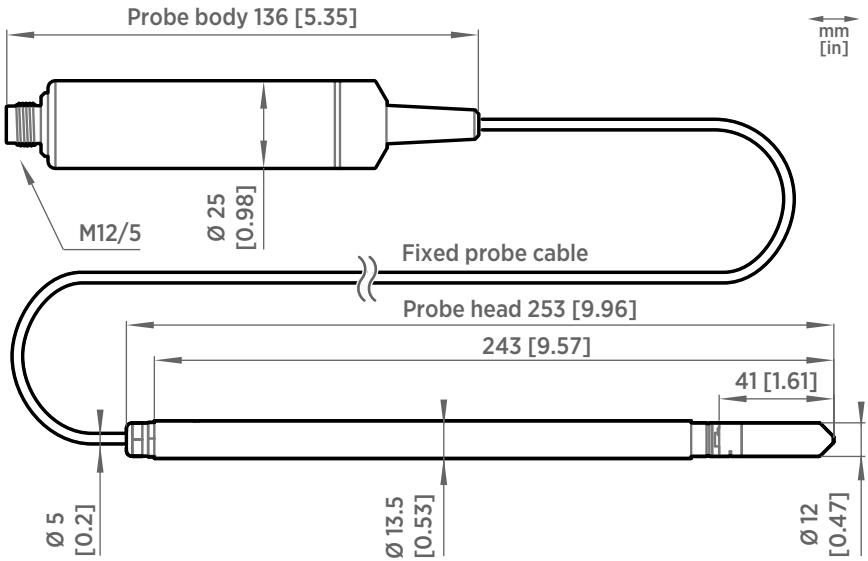


Figure 9 HMP5 probe dimensions

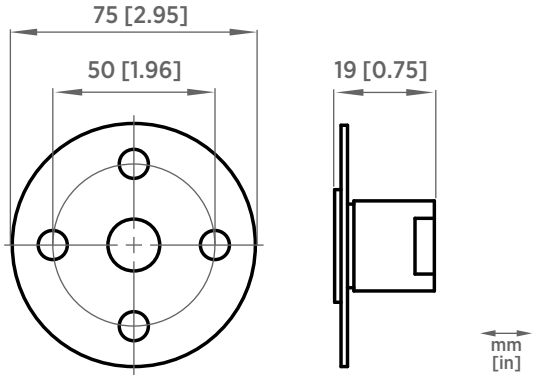


Figure 10 Optional mounting flange 210696 dimensions

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.

- Temperature measurement range −70 ... +180 °C (−94 ... +356 °F)
- Operating temperature of probe body −40 ... +80 °C (−40 ... +176 °F)
- 250-mm (9.84 in) probe allows easy process installation through insulation

HMP7 probe

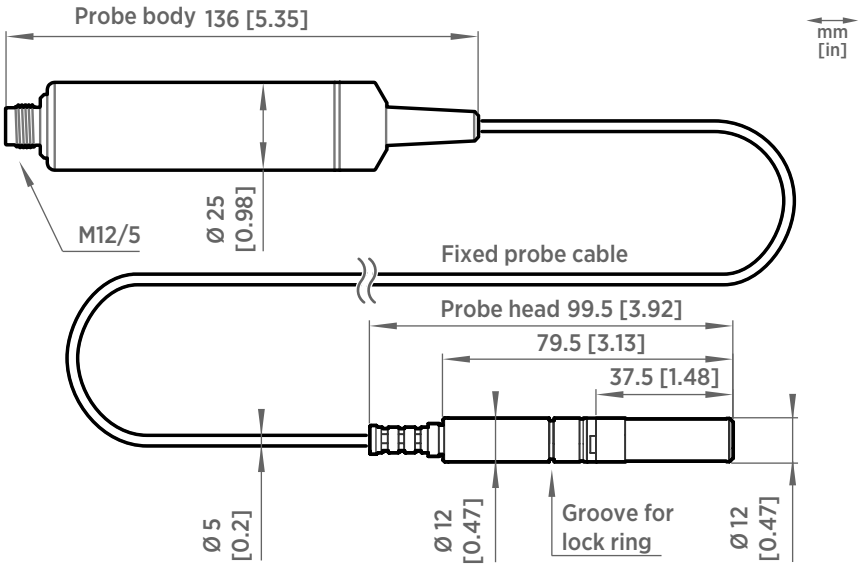


Figure 11 HMP7 probe dimensions

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.

- Temperature measurement range −70 ... +180 °C (−94 ... +356 °F)
- Operating temperature of probe body −40 ... +80 °C (−40 ... +176 °F)
- Condensation prevention with probe heating
- Vapor and pressure proof construction

The Indigo80 handheld indicator and Indigo500 transmitters support HMP7 temperature compensation from TMP1. For more information, see:

- HMP Series with MMP8 and TMP1 User Guide (M212022EN)
- Indigo500 User Guide (M212287EN)

HMP8 probe

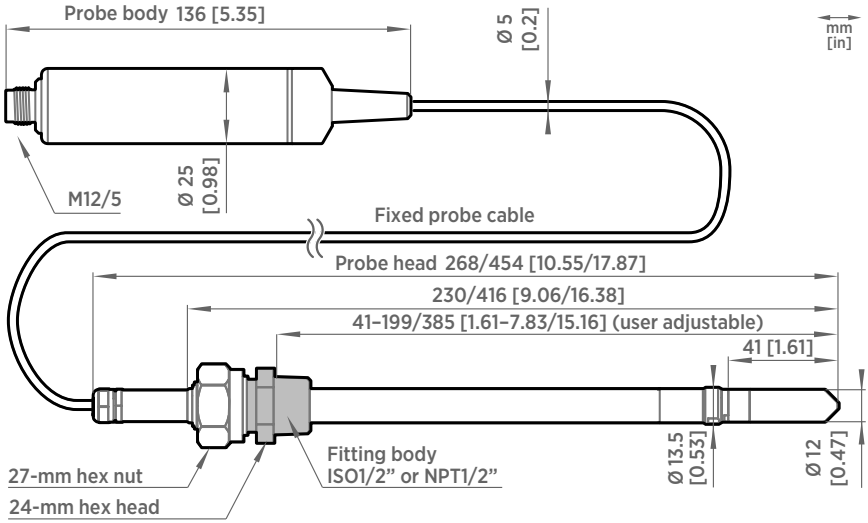


Figure 12 HMP8 probe dimensions

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.

HMP8 is available in two different lengths (268-mm and 454-mm probe head options), and the installation depth of the probe is adjustable.

- Temperature measurement range −70 ... +180 °C (−94 ... +356 °F)
- Operating temperature of probe body −40 ... +80 °C (−40 ... +176 °F)
- Operating pressure 0–40 bar
- Probe installation depth can be freely adjusted and probe can be hot-swapped from pressurized pipelines with an optional ball valve kit
- ISO1/2″ or NPT1/2″ fitting body

For more information on using the probe with the ball valve, see Ball Valve Kit (BALLVALVE-1) Installation Guide (M212837EN).

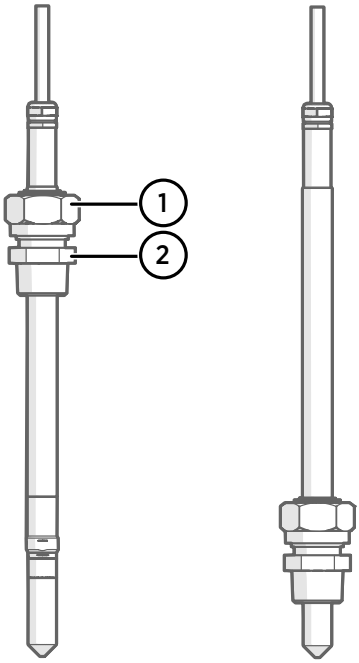


Figure 13 HMP8 probe head

1 Clasp nut, 24-mm hex nut
2 Fitting body, 27-mm hex head

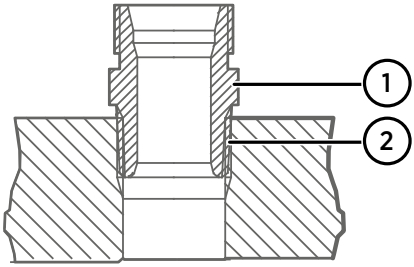


Figure 14 Sealing of fitting body into process

1 Fitting body with 24 mm hex nut and tapered thread
2 Seal with a suitable thread sealant. For example, LOCTITE® No. 542 with activator No. 7649, MEGA-PIPE EXTRA No. 7188, or PTFE tape.

Follow the instructions of the sealant manufacturer.
PTFE tape does not lock the parts together. Use two fork wrenches (24 mm and 27 mm) when tightening and opening the clasp nut of the probe.

Tightening the clasp nut

1. Adjust the probe to a suitable depth according to the type of installation.

2. Tighten the clasp nut to finger tightness.
3. Draw a line on the fitting screw and the clasp nut to mark their position.
4. Tighten the nut a further 50 ... 60º (1/6 turn) with a wrench. If you have a suitable torque wrench, tighten the nut to max 45 ±5 Nm (33 ±4 ft-lbs).

   Do not overtighten the clasp nut.

CAUTION! Take care not to damage the probe body. A damaged body makes the probe less tight and may prevent it from going through the clasp nut.

CAUTION! In pressurized processes it is essential to tighten the supporting nuts and screws very carefully to prevent loosening of the probe by the action of pressure.

When installed in a process with a pressure differing from normal atmospheric pressure, input the correct pressure into the pressure compensation setpoint parameter or register of the probe. This allows the probe to apply the appropriate pressure compensation into its measurement results.

HMP9 probe

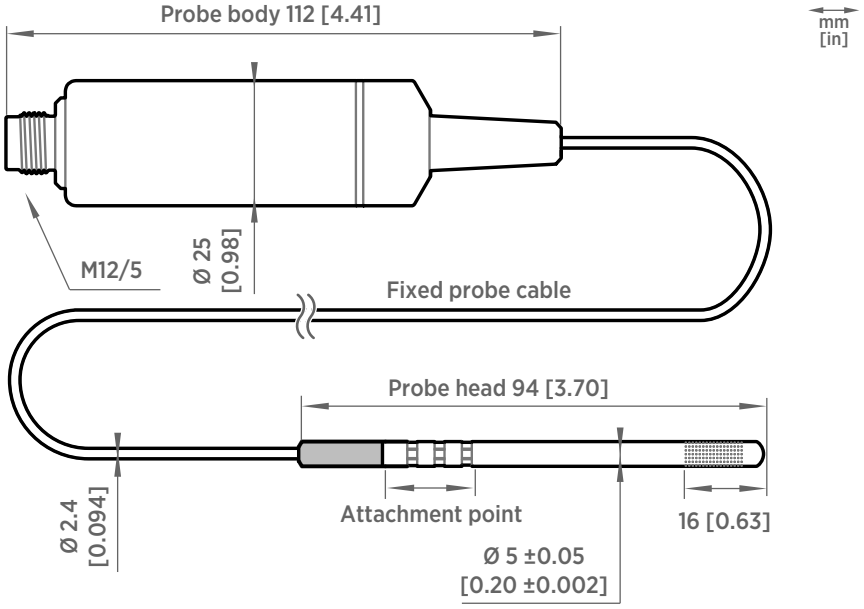


Figure 15 HMP9 probe dimensions

Vaisala HUMICAP® Humidity and Temperature Probe HMP9 is designed for easy installation into rapidly changing environments where fast response time, measurement performance, and chemical tolerance are essential.

The probe head can be mounted through thin metal walls using the included cable gland or mounting grommet. Two grommets are included: small one for 6.5 mm diameter hole, and large one for 12.5 mm diameter hole.

You can also attach the probe head directly using a zip tie. The probe head should be attached from the point near the black plastic part.

- Temperature measurement range −40 ... +120 °C (−40 ... +248 °F)
- Operating temperature of probe body −40 ... +60 °C (−40 ... +140 °F)
- Integrated filter (non-replaceable)

CAUTION! Do not damage the probe head by bending, crushing, or striking it. Avoid overtightening when installing the probe head through a cable gland.

Installing HMP9 through a cable gland

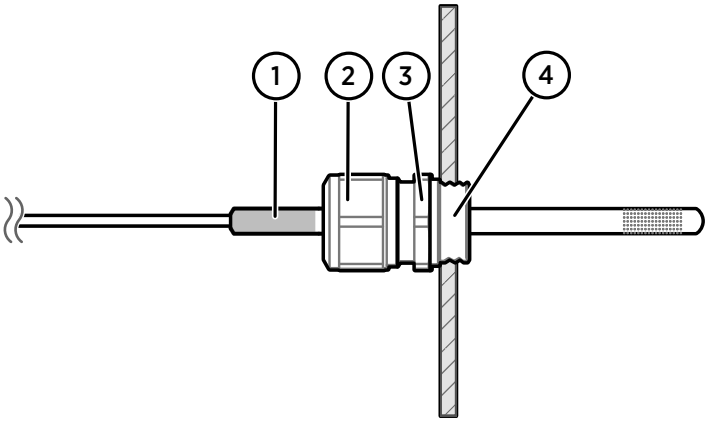


Figure 16 Installing HMP9 probe head through a cable gland

1 Black plastic part of the HMP9 probe head
2 Nut for tightening the probe in place
3 Base of the cable gland
4 M10×1.5 threads of the cable gland

- M10×1.5 cable gland (included with HMP9 probe)
- Drill with 8.5 mm bit
- M10×1.5 threading tap
- 13 mm wrench

1. Drill a 8.5 mm diameter hole in the installation location.
2. Use a threading tap to create a M10×1.5 thread in the hole.
3. Install the base of the cable gland in the hole and tighten with a 13 mm wrench.
4. Insert the seal of the cable gland in the base and place the nut of the cable gland over the probe head.
5. Insert the probe head in the cable gland up to the black plastic part of the probe head. Leave the black plastic part entirely outside the cable gland. Tighten the cable gland to finger tightness.
6. Tighten the nut of the cable gland with a 13 mm wrench until the probe head stops moving. Do not overtighten.

MMP8 probe

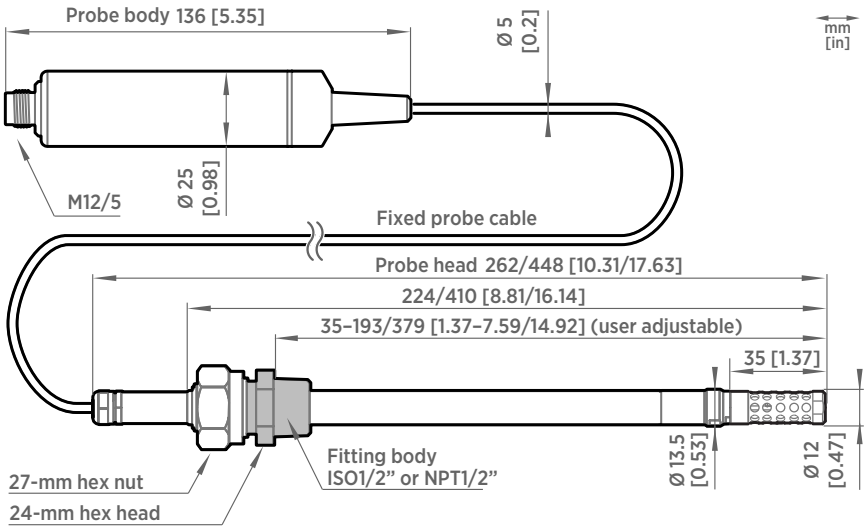


Figure 17 MMP8 dimensions

Vaisala HUMICAP® Moisture in Oil Probe MMP8 enables fast and reliable measurement of moisture in oil. It uses the proven Vaisala HUMICAP® sensor, which was developed for demanding dissolved moisture measurements in transformer and lubrication oils, hydraulic fluids, and other liquids.

MMP8 measures dissolved moisture in oil in terms of water activity (a_w), relative saturation (%RS), and temperature (T). Water activity or relative saturation indicate directly whether there is a risk of free water formation. This data is relevant in lubrication oil applications where detecting water ingress and preventing free water formation is crucial. The measurement is independent of oil type and age.

- Temperature measurement range −40 … +180 °C (−40 … +356 °F)

When installed with an optional ball valve kit, MMP8 is ideal for installation into processes where the probe needs to be installed or removed while the process is running. MMP8 is available in two different lengths, and the installation depth of the probe is adjustable. Pressure fitting options are ISO 1/2″ and NPT 1/2″. MMP8 is delivered with a manual pressing handle that allows the probe to be pushed against process pressure.

For more information on using the probe with the ball valve, see Ball Valve Kit (BALLVALVE-1) Installation Guide (M212837EN).

Moisture ppm calculation for transformer oils

MMP8 can also output ppm, the average mass concentration of water in oil. Vaisala has this conversion readily available for specific oils, including mineral transformer oil. This allows continuous measurement of ppm concentration in power transformer condition monitoring.

The table below lists the oil solubility coefficients of the oil types that can be used for the MMP8 probe.

Table 2 Oil solubility coefficients for Vaisala moisture in oil products

Oil type	Oil 0 (A)	Oil 1 (B)
Mineral oils (for example, Shell Diala, Nynas Nytro)	-1662.70	7.3694
Midel 7131	-687.54	5.6236
FR3	-684	5.3318
Dow Corning 561	-1248.64	6.5427

After installing the MMP8 probe, configure the coefficients using the Insight PC software or the Indigo80 handheld indicator.

For determining the coefficients using your own apparatus, see Determining Oil-specific Coefficients for Moisture in Oil Probes Technical Note (M212935EN).

Configuring coefficients using Insight

After installation, you can configure coefficients for the MMP8 probe using the Insight PC software.

Configuring these settings requires using Insight in **Advanced Mode**.

1. Connect the probe to the Insight software.
2. Select and open the **Configure device** menu.
3. Select **Calculation coefficients**.
4. In the **Oil A** and **Oil B** fields, enter the values of the required coefficients.
5. Select **Save**.

Configuring coefficients using Indigo80

After installation, you can configure coefficients for the MMP8 probe using the Indigo80 handheld indicator.

1. Connect the probe(s) to the indicator.
2. Open the indicator main menu by pressing .
3. Select **Devices**. If you have more than one device connected to the indicator, make a further selection between the devices.
4. Select **Settings** to access and change the features available for your probe.
5. Select **Calculation coefficients**.
6. Select **Oil A**, and use the arrow buttons to set the required value.

7. Select **Oil B**, and use the arrow buttons to set the required value.

TMP1 probe

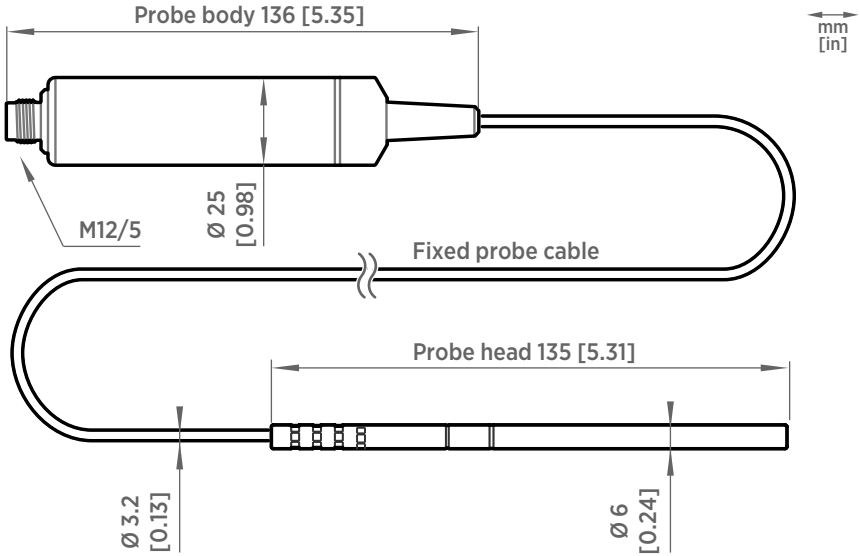


Figure 18 TMP1 probe dimensions

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.

- Temperature measurement range −70 ... +180 °C (−94 ... +356 °F)
- Operating temperature of probe body −40 ... +80 °C (−40 ... +176 °F)

Using probe with Indigo transmitters

Indigo transmitters are host devices that extend the feature set of connected probes with a range of additional options for outputs, configuration access, measurement viewing, and status monitoring.

Available features vary depending on the transmitter model. Models without display use a LED indicator for notifications.

Connecting probe to Indigo200 series transmitters

Indigo200 series transmitters have a probe connector where compatible probes can be attached directly. A cable may also be used to connect the probe. Cables are available to order at store.vaisala.com.

CAUTION! The IP classification of probes is valid only when the probes are connected to the probe connection cable, or to the cable connector inside the locking wheel of the transmitter.

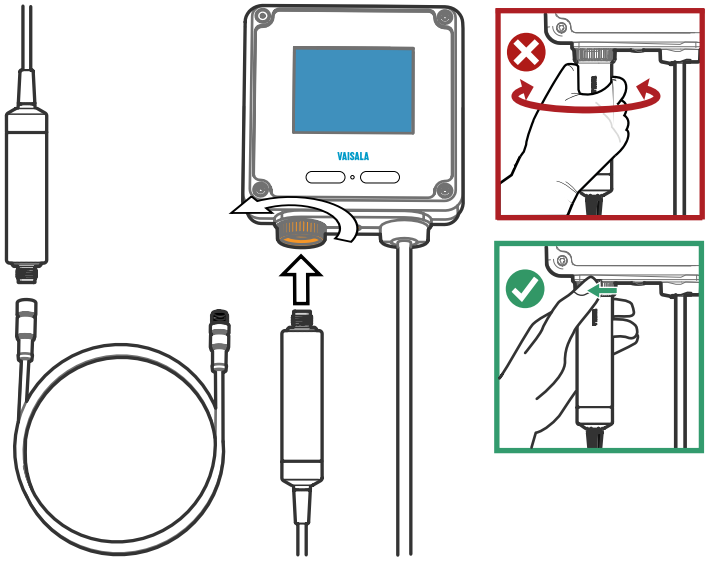


Figure 19 Connecting probe to Indigo200 series transmitter

1. Insert the probe or the cable into the transmitter's connector. Using a cable is recommended for strain relief.

2. Turn the locking wheel of the transmitter to lock the probe or cable in place. **Do not turn the probe or the cable itself**, as that will damage the connectors.
3. If you are using a cable, connect the probe to the cable.
4. When the transmitter recognizes the connected probe, it shows a notification message on the display.

Connecting probe to Indigo300 transmitter

Indigo300 transmitters have a probe connector where compatible probes can be attached directly. A cable may also be used to connect the probe. Cables are available to order at store.vaisala.com.

CAUTION! The IP classification of probes is valid only when the probes are connected to the probe connection cable, or to the cable connector inside the locking wheel of the transmitter.

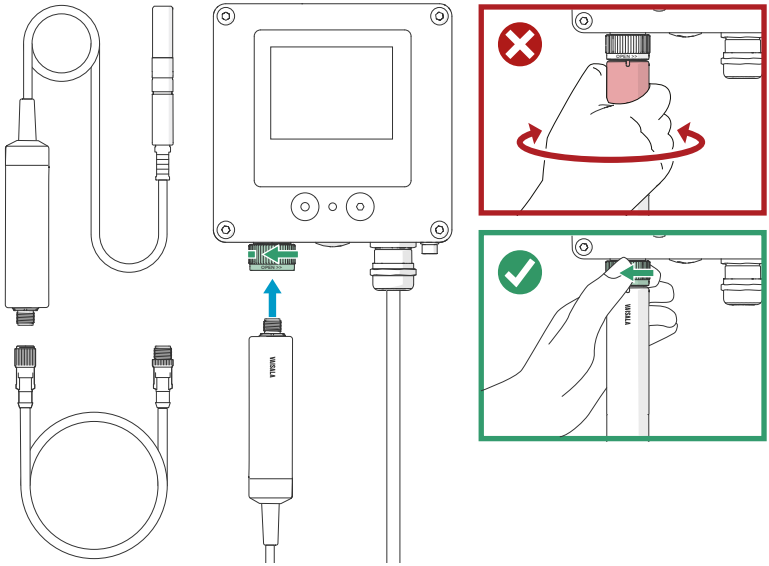


Figure 20 Connecting probe to Indigo300 transmitter

1. Insert the probe or the cable into the transmitter's connector.
2. Turn the locking wheel of the transmitter to lock the probe or cable in place. **Do not turn the probe or the cable itself**, as that will damage the connectors.
3. If you are using a cable, connect the probe to the cable.
4. When the transmitter recognizes the connected probe, it shows a notification message on the display.

Connecting probes to Indigo500 series transmitters

CAUTION! The IP classification of probes is valid only when the probes are connected to the probe connection cable.

If your transmitter was delivered with preconfigured analog outputs, make sure that you connect the measurement devices accordingly.

Probes are connected to Indigo500 series transmitters using a cable. Connections are made to the screw terminals inside the housing. The Indigo520 model allows 2 probes to be connected. After connecting a probe, use the touchscreen interface or the web user interface to configure the transmitter.

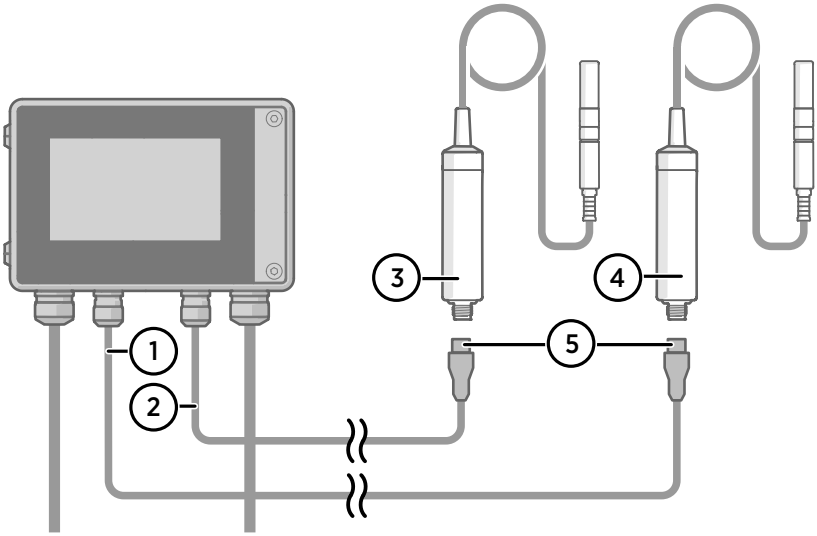


Figure 21 Connecting probes to Indigo500 transmitter

1 Probe connection cable for probe 1
2 Probe connection cable for probe 2 (dual-device support in Indigo520)
3 Probe to be connected as probe 2 (GMP252 example)
4 Probe to be connected as probe 1 (HMP7 example)
5 Probe cable connector (M12 5-pin A-coded female)

Using probe with Indigo80 handheld indicator

Indigo80 handheld indicator

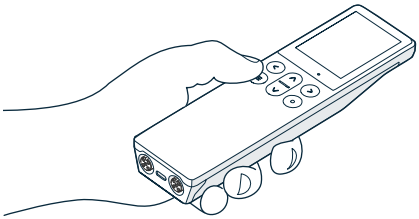


Figure 22 Indigo80 handheld indicator

Vaisala Indigo80 Handheld Indicator is a portable diagnostics tool that accommodates up to two compatible Vaisala devices for measuring a wide range of parameters.

With the indicator, you can:

- See real-time measurements and device and status information
- Log measurement data
- Calibrate and adjust the probe
- Configure probe features and settings such as condensation prevention, compensation setpoints, sensor purge, filtering factor, and serial communication. The available features and settings depend on the probe model and firmware version.
- Enable temperature compensation from another probe. For example, you can enable TMP1 to function as the temperature source for HMP7.

Accessing certain configuration options for your probe is possible only using the free Insight PC software, downloadable at vaisala.com/insight.

The help tours in the indicator's user interface guide you through the key features of the indicator. You can access the tours in the **Help** menu by pressing the ☰ button.

For more information on using the indicator, for example, editing the measurement views and performing data logging, see Indigo80 User Guide (M212722EN).

Probe compatibility

The Indigo80 handheld indicator is tested for compatibility with probes that have firmware version 1.2.5 or newer.

Probes with older firmware versions may have limited compatibility with the indicator.

For the most up-to-date version compatibility information, see Firmware version compatibility of Indigo80-compatible devices Technical Note (M212901EN).

Connecting probes to Indigo80

- Probe connection cable (M12-M12, Vaisala item code 272075SP)

Up to two Vaisala Indigo-compatible measurement devices can be connected to the ports located on the bottom of Indigo80. You can connect and disconnect devices both when the indicator is powered on and when it is off.

Vaisala recommends using cables provided by Vaisala when connecting devices to the indicator. Cables and other accessories are available to order at store.vaisala.com.

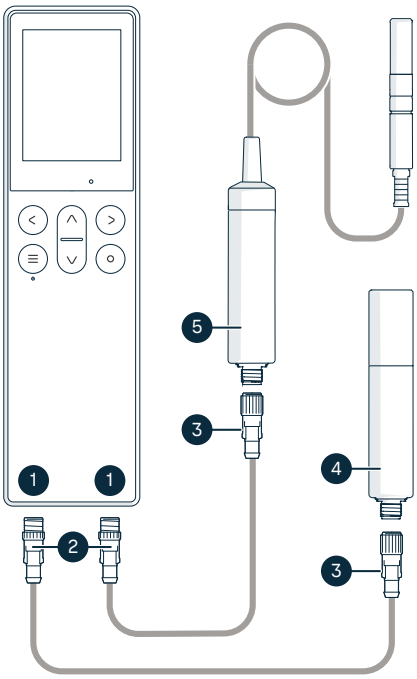


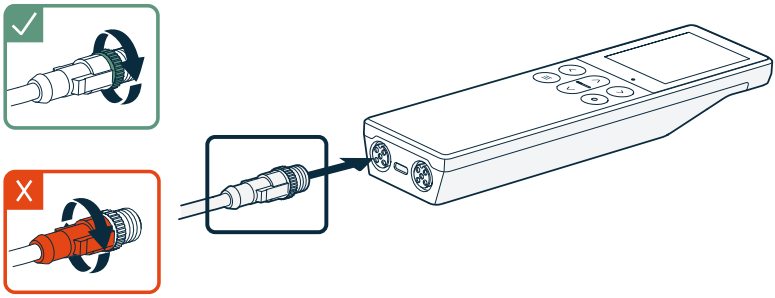
Figure 23 Example of connecting probes to Indigo80

1 M12-5F ports on the bottom of Indigo80 for connecting compatible Vaisala devices. Ports are labeled ❶ (left) and ❷ (right) on Indigo80.
2 M12-5M cable connector
3 M12-5F cable connector
4 Probe displayed as ❶ by Indigo80 (GMP252 shown)
5 Probe displayed as ❷ by Indigo80 (HMP7 shown)

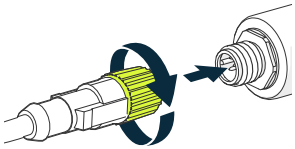
1. If the indicator is powered and no devices are connected to it, the text **Please connect a measurement device** will be shown on the display.

2. Insert the probe connection cable in one of the ports on the bottom of the indicator.

   - **Note the orientation of the cable connector when inserting it**
   - **Hold the connector in place while turning its locking ring clockwise – never twist the connector body!**



3. Connect the probe to the M12-5F end of the probe connection cable.



   When the indicator recognizes the connected probe, it shows a notification on the display. A probe connected to the leftmost port in the indicator is labeled ❶ on the indicator's display, while the probe in the rightmost port is labeled ❷.

4. To change probes, simply detach the cable from the probe and connect a new probe.

For optimal measurement accuracy, the indicator guides you to check the connected probe's environment settings next.

Vaisala Insight software

Vaisala Insight software is a configuration software for Indigo-compatible devices. With the Insight software, you can:

- See probe information and status
- See real-time measurement
- Record data up to 48 hours and export in CSV format
- Configure probe features such as measurement filtering, sensor purge, condensation prevention, and serial communication
- Calibrate and adjust the probe

Microsoft Windows® operating system and Indigo USB adapter (item code USB2) or Vaisala USB cable (item code 242659) required.

Download Vaisala Insight software at www.vaisala.com/insight.

Connecting to Insight software

- Computer with a Microsoft Windows® operating system (64-bit version) and Vaisala Insight PC software installed
- Indigo USB adapter (item code USB2) or USB connection cable (item code 242659)

CAUTION! When connecting several devices at the same time, note that your computer may not be able to supply enough power through its USB ports. Use an externally powered USB hub that can supply >2 W for each port.

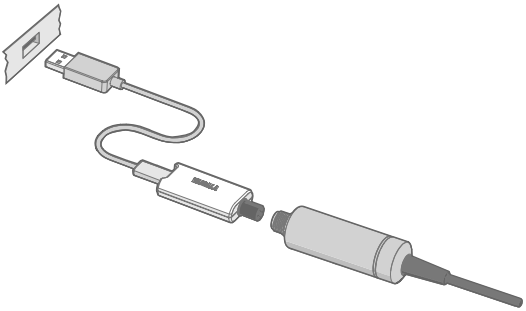


Figure 24 Connecting probe to Insight using Indigo USB adapter

1. Open the Insight software on your computer.

2. Verify the current operating mode of Insight from the **Settings** menu and change it if appropriate:
    - **Basic mode** is suitable for most use cases.
    - **Advanced mode** provides access to additional configuration options. Use **Advanced mode** only when instructed to do so by product documentation or Vaisala technical support.
3. Connect the USB adapter to a free USB port on the computer or USB hub.
4. Connect the probe to the USB adapter.
5. Wait for the Insight software to detect the probe.

Modbus

Default communication settings

Table 3 Default Modbus serial communication settings

Property	Description/Value
Serial bit rate	19200
Parity	None
Number of data bits	8
Number of stop bits	2
Flow control	None
Modbus device address	240

You can use up to ten probes on the same RS-485 line. You must configure each probe on the line to have a different Modbus address.

Measurement data registers

Measurement data is also available as integer registers. See HMP Series with MMP8 and TMP1 User Guide (M212022EN).

Table 4 Floating point measurement data registers (read-only)

Register number	Address	Description	Data format	Unit
1	0x0000	Relative humidity	32-bit float	%RH
3	0x0002	Temperature	32-bit float	°C
7	0x0006	Dew point temperature	32-bit float	°C
9	0x0008	Dew/frost point temperature	32-bit float	°C
11	0x000A	Dew/frost point temperature at 1 atm	32-bit float	°C
13	0x000C	Dew point temperature at 1 atm	32-bit float	°C
15	0x000E	Absolute humidity	32-bit float	g/m^3
17	0x0010	Mixing ratio	32-bit float	g/kg
19	0x0012	Wet-bulb temperature	32-bit float	°C
21	0x0014	Water concentration	32-bit float	ppm_v
23	0x0016	Water vapor pressure	32-bit float	hPa

Register number	Address	Description	Data format	Unit
25	0x0018	Water vapor saturation pressure	32-bit float	hPa
27	0x001A	Enthalpy	32-bit float	kJ/kg
29	0x001C	Water activity	32-bit float	
31	0x001E	Dew/frost point depression	32-bit float	°C
33	0x0020	Absolute humidity at NTP	32-bit float	g/m^3
35	0x0022	Water concentration in oil	32-bit float	ppm_w
41	0x0028	Relative saturation	32-bit float	%RS
43	0x002A	Water concentration (wet basis)	32-bit float	vol-%
45	0x002C	Relative humidity (dew/frost)	32-bit float	%RH
65	0x0040	Water mass fraction	32-bit float	ppm_w

Configuration registers

The configuration registers listed here are the most important for typical users. For more information on available configuration registers, see HMP Series with MMP8 and TMP1 User Guide (M212022EN).

Table 5 Modbus configuration data registers (writable)

Register number	Address	Description	Data format	Unit/Valid range
General				
1287	0x0506	Condensation prevention on/off. Enables the condensation prevention heating functions of the device. When warming is active, values of output parameters that depend on temperature measurement (for example, relative humidity) are unavailable unless temperature is written to register 0x0334 from an external source.	16-bit boolean	0 = off (default) 1 = on

Compensation setpoints				
769	0x0300	Pressure compensation setpoint The entered value is persistent and remains unchanged at device restart.	32-bit float	Unit: hPa Default: 1013.25 hPa
821	0x0334	Temperature compensation setpoint. If a value is written to this register, probe uses it instead of its own temperature measurement. When condensation prevention warming is active, temperature must be written to this register to enable output parameters that depend on temperature measurement (for example, relative humidity). At device reset, the value is cleared.	32-bit float	Unit: °C
Communication				
1537	0x0600	Modbus address	16-bit integer	1 ... 247 Default: 240

Table 6 Modbus function registers (writable)

Register number	Address	Description	Data format	Unit/Valid range
Functions				
1285	0x0504	Start sensor purge	16-bit integer	When writing to register: 1 = Start sensor purge When sensor purge is in progress, the value of the register will count up from 0 to 100. When the value reaches 100 the sensor purge is complete.
1542	0x0605	Restart device	16-bit integer	When writing to register: 1 = Restart the device

Maintenance and calibration services

Vaisala offers comprehensive customer care throughout the life cycle of our measurement instruments and systems. Our factory services are provided worldwide with fast deliveries. For more information, see vaisala.com/calibration.

- Vaisala Online Store at store.vaisala.com is available for most countries. You can browse the offering by product model and order the right accessories, spare parts, or maintenance and calibration services.
- To contact your local maintenance and calibration expert, see vaisala.com/contactus.

Warranty

For standard warranty terms and conditions, see vaisala.com/warranty.

Please observe that any such warranty may not be valid in case of damage due to normal wear and tear, exceptional operating conditions, negligent handling or installation, or unauthorized modifications. Please see the applicable supply contract or Conditions of Sale for details of the warranty for each product.

Technical support

Contact Vaisala technical support at helpdesk@vaisala.com. Provide at least the following supporting information as applicable:

- Product name, model, and serial number
- Software/Firmware version
- Name and location of the installation site
- Name and contact information of a technical person who can provide further information on the problem

For more information, see vaisala.com/support.

Recycling

Recycle all applicable material according to local regulations.

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