

QUICK REFERENCE GUIDE

Vaisala HUMICAP® Digital Humidity Module HMM105



- Digital humidity measurement module with detachable probe assembly for integration into environmental chambers.
- I²C output for relative humidity (RH) or dewpoint (Td).
- Vaisala HUMICAP® 180R sensor for excellent measurement accuracy.



PRODUCT OVERVIEW

HMM105 is an open frame measurement module intended for integration into environmental chambers. The module provides a digital output of relative humidity (RH), dewpoint (Td), and temperature (T) through the I²C interface. Temperature is measured for internal compensation purposes, and provided as an output for reference.

HMM105 includes automatic temperature compensation across the operating temperature range. No external temperature compensation should be applied to the measured humidity values.

HMM105 consists of a component board and a probe head on a 30 cm (11.8 inch) flexible flat cable. The flat cable is detachable from the component board, which allows for an easier installation and a smaller diameter installation tube in the chamber wall (minimum Ø 7 mm).

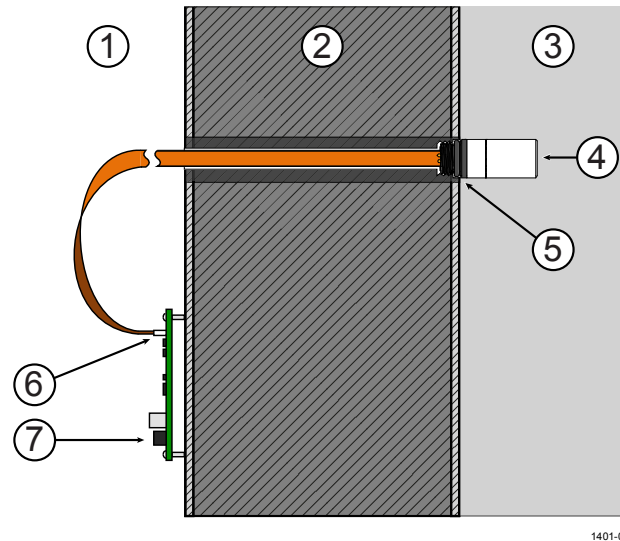


Figure 1 HMM105 Installed Through a Chamber Wall

- 1 = Equipment space.
- 2 = Chamber wall.
- 3 = Chamber interior (the measured environment).
- 4 = Probe head with HUMICAP® sensor under PTFE filter.
- 5 = M10x1 mounting thread on the installation tube.
- 6 = Connector for flat cable (marked X3).
- 7 = Connector for signal and power cable (marked X6).

OPTIONS AND ACCESSORIES

| Item | Order Code |
|---|-------------|
| Humidity sensor | HUMICAP180R |
| Short PTFE sintered filter | DRW23993SP |
| Plastic grid filter | 6221 |
| Plastic grid and membrane filter | 10159HM |
| PTFE sintered filter | 219452SP |
| Stainless steel sintered filter | HM47280SP |
| 0.6 m cable with Molex Milli-Grid™ connectors | ASM210962SP |

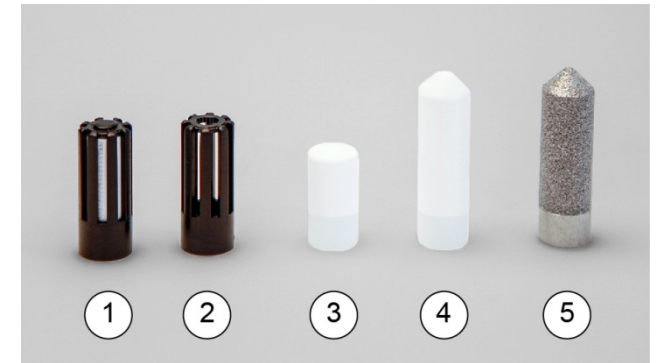


Figure 2 HMM105 Filter Options

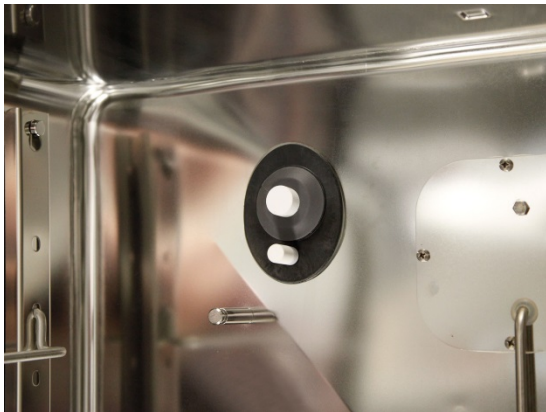
- 1 = Plastic grid and membrane filter.
- 2 = Plastic grid filter. Provides the fastest response time but least protection against contaminants.
- 3 = Short PTFE sintered filter. The standard, general purpose filter for HMM105. Smallest footprint inside the chamber.
- 4 = PTFE sintered filter.
- 5 = Stainless steel sintered filter. Best mechanical durability.

INSTALLATION EXAMPLE



1405-042

Figure 3 HMM105 Installed next to GMP231



1405-043

Figure 4 HMM105 (bottom) and GMP231 (top) Inside Chamber

IMPORTANT – READ BEFORE INSTALLATION



Observe precautions for handling electrostatic sensitive devices.

CAUTION To prevent the installation screws from touching the contacts on the underside of the board, use plastic washers or spacers.

CAUTION Do not pull, twist, or make very sharp bends to the flat cable during installation.

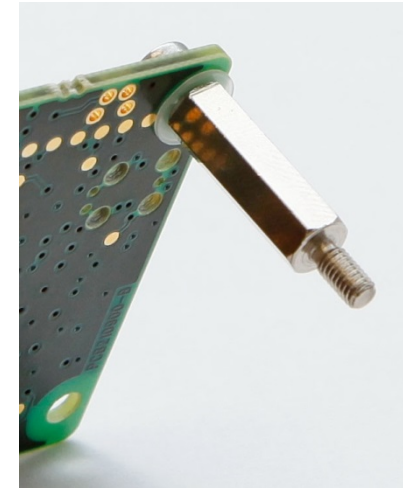
NOTE The probe and component board have been calibrated as a single unit, so they should be installed together. The same serial number is on both the component board and the probe. Do not mix component boards and probes with different serial numbers.

NOTE Difference between storage and installation conditions may cause condensation to form on the HMM105. To prevent damage when supply voltage is applied, allow temperature to equalize and condensation to dry off before taking the HMM105 into use.

INSTALLING THE COMPONENT BOARD

Mount the component board in the equipment space of the chamber using the four fixing holes in the corners (\varnothing 3.2 mm). Make sure that the flat cable from the probe, once installed through the chamber wall, can easily reach the connector marked X3 on the component board.

The metal plated hole is not connected electrically anywhere. The board does not have any shield ground.



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Figure 5 Example of a Plastic Washer



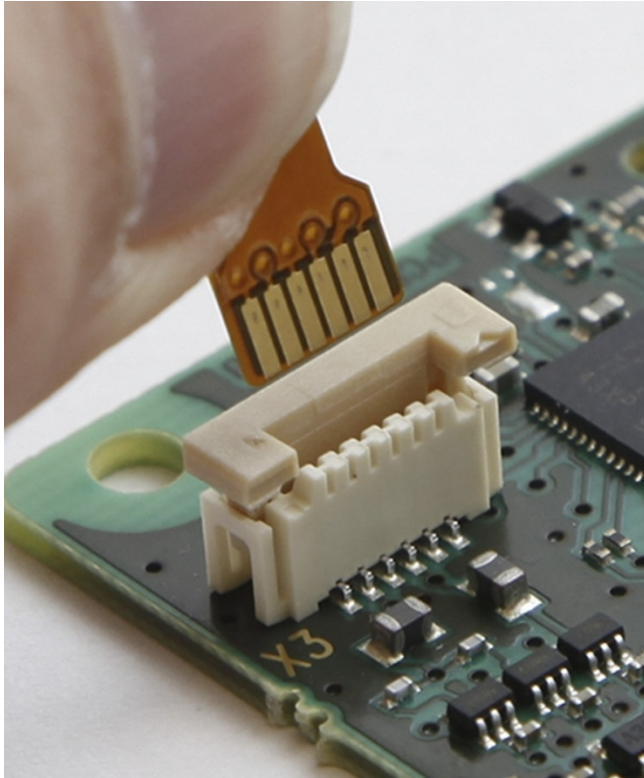
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Figure 6 Example of a Plastic Spacer

INSTALLING THE PROBE

The probe of the HMM105 is designed to be attached from its M10x1 mounting thread. The recommended installation uses a hollow installation tube that is installed through the chamber wall. The tube must have suitable threads on the chamber side.

1. Mount the probe to the M10x1 thread inside the chamber.
2. Route the cable through the installation tube to the component board.
3. Before plugging in the flex cable, verify that the serial number of the probe cable matches the serial number on the component board.
4. Lift the locking actuator of the connector marked **X3**.
5. Plug in the cable, with the metal contacts facing as shown in Figure 7 below.
6. Push down the locking actuator of the **X3** connector.



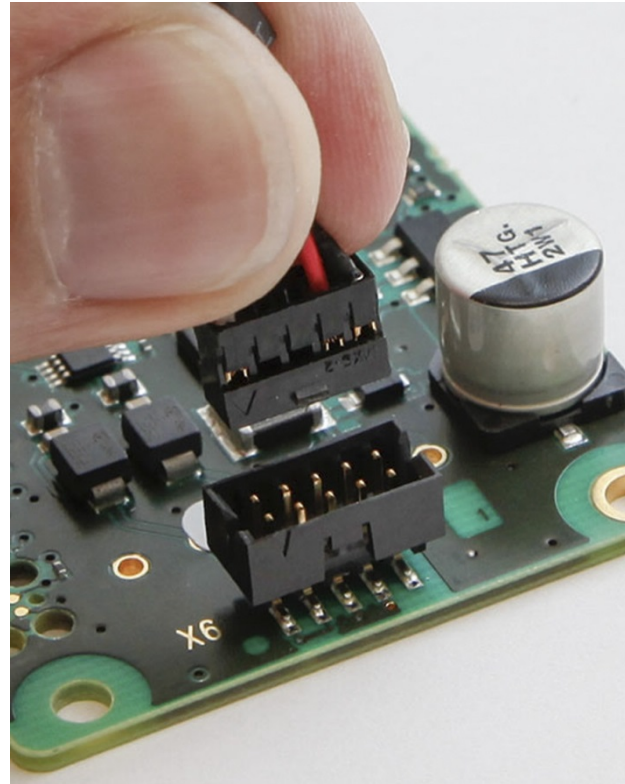
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Figure 7 Connecting the Probe Cable

WIRING

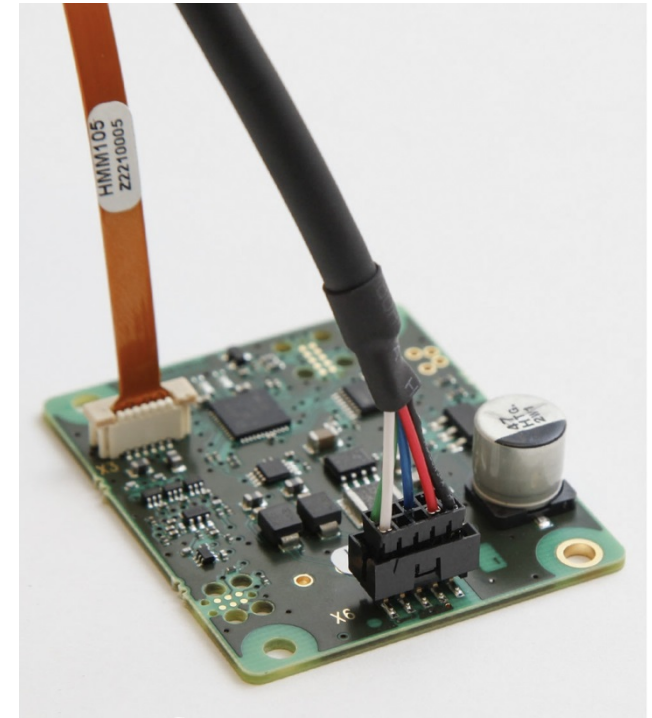
Connect power and I²C bus through the connector marked **X6**. It is a Molex 87832-1007, 2 mm pitch shrouded pin header with a locking window.

| Connector Pinout | Pin # | Function |
|------------------|-------|---|
| 9 7 5 3 1 | 6, 8 | Supply voltage 10 ... 35 VDC or 24 VAC |
| 10 8 6 4 2 | 5, 7 | Ground |
| | 1, 3 | 5 V I ² C bus SDA |
| | 2, 4 | 5 V I ² C bus SCL |
| | 9, 10 | Not connected |



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Figure 8 Connecting the Power and I²C Bus Cable



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Figure 9 Both Cables Connected

DIMENSIONS

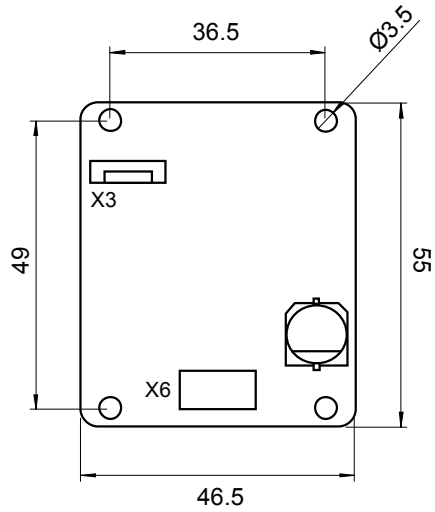


Figure 10 Board Dimensions in mm

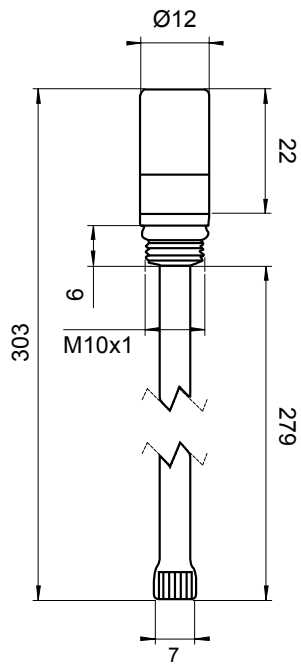


Figure 11 Probe Dimensions in mm

TECHNICAL DATA

Product datasheet and the I²C protocol implementation description are available for download on product pages at www.vaisala.com/hmm105.

| Property | Description / Value |
|---|--|
| Measured parameters | |
| Relative humidity | 0 ... 100 %RH |
| Dewpoint | -20 ... +100 °C (-4 ... +212 °F) Td |
| Operating temperature range | |
| Component board | -5 ... +55 °C (+23 ... +131 °F) |
| Probe (continuous use) | 0 ... +180 °C (+32 ... +356 °F) |
| Probe (short term peak)* | +200 °C (+392 °F) |
| PTFE sintered filters | -40 ... +200 °C (-40 ... +392 °F) |
| Stainless steel sintered filter | -40 ... +200 °C (-40 ... +392 °F) |
| Plastic grid filters | -20 ... +80 °C (-4 ... +176 °F) |
| Storage temperature | -40 ... +75 °C (-40 ... +167 °F) |
| Sensor | Vaisala HUMICAP® 180R |
| Output | I ² C 5 V |
| Supply voltage | 10 ... 35 VDC, 24 VAC ±20% |
| Power consumption (DC/AC) | <15/25 mA |
| Connector for supply voltage and I ² C bus | Molex 87832-1007, 10 pin header |
| Mechanics | |
| Probe diameter | 12 mm |
| Probe flex cable length | 0.3 m |
| Probe lead-through material | PPS plastic |

* Total exposure to peak temperature max. 30 days

ELECTROMAGNETIC COMPATIBILITY

HMM105 has been tested according to applicable parts of standard EN61326-1, industrial environment:

| Test Standard | Test(s) |
|---------------|--|
| EN 55022 | Emissions radiated Emissions conducted to AC Emissions conducted to DC |
| EN 61000-4-3 | Immunity to RF field |
| EN 61000-4-4 | Immunity to electric fast transient (EFT) |
| EN 61000-4-5 | Immunity to surge |
| EN 61000-4-6 | Immunity to conducted RF |
| EN 61000-4-11 | Immunity to voltage dips and short interrupts |

NOTE

This manual does not create any legally binding obligations for Vaisala towards the customer or end user. All legally binding commitments and agreements are included exclusively in the applicable supply contract or Conditions of Sale.