

## QUICK REFERENCE GUIDE

### Vaisala HUMICAP® Digital Humidity Module HMM105



- Digital humidity measurement module with detachable probe assembly for integration into environmental chambers.
- I<sup>2</sup>C 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 I<sup>2</sup>C 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).

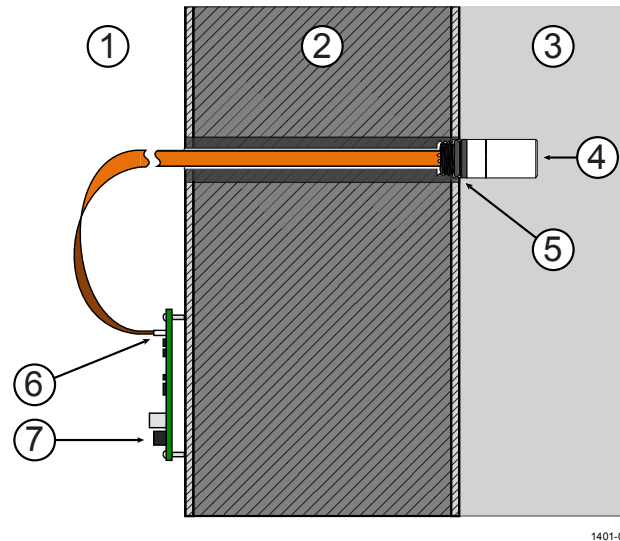


Figure 1 HMM105 Installed Through a Chamber Wall

- 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

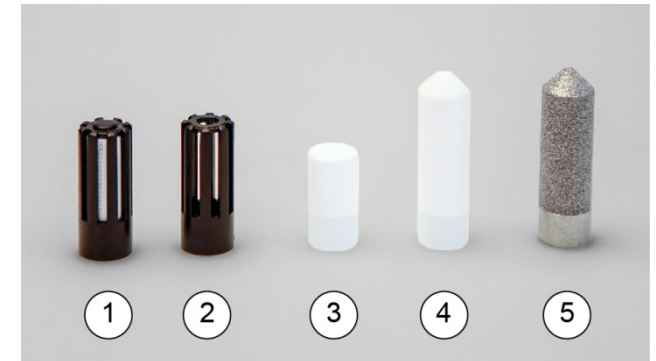


Figure 2 HMM105 Filter Options

- 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.

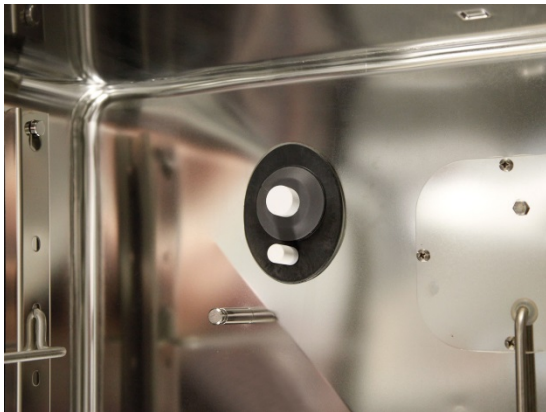


## INSTALLATION EXAMPLE



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.

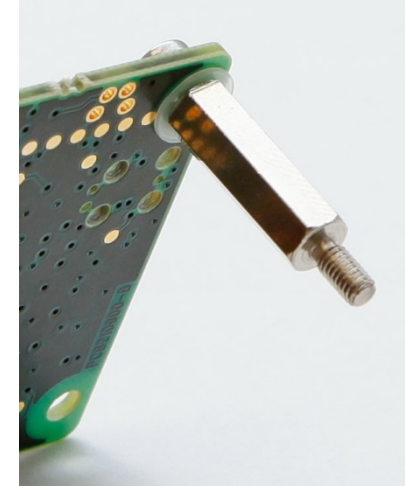
**NOTE** The probe and component board have been calibrated as a single unit, so they should be installed together. The same serial number is on both the component board and the probe. Do not mix component boards and probes with different serial numbers.

**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.



1405-037

Figure 5 Example of a Plastic Washer



1405-038

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.

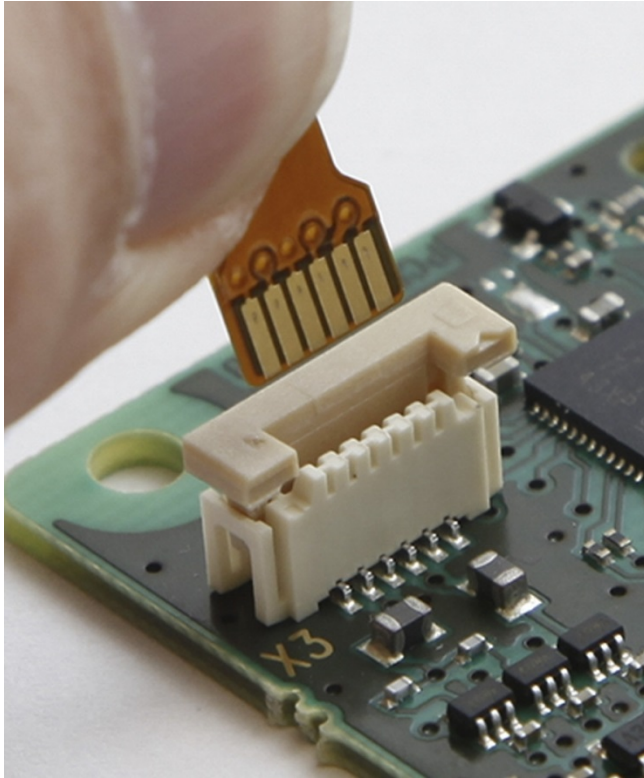


Figure 7 Connecting the Probe Cable

## WIRING

Connect power and I<sup>2</sup>C 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
	6, 8	Supply voltage 10 ... 35 VDC or 24 VAC
	5, 7	Ground
	1, 3	5 V I <sup>2</sup> C bus SDA
	2, 4	5 V I <sup>2</sup> C bus SCL
	9, 10	Not connected

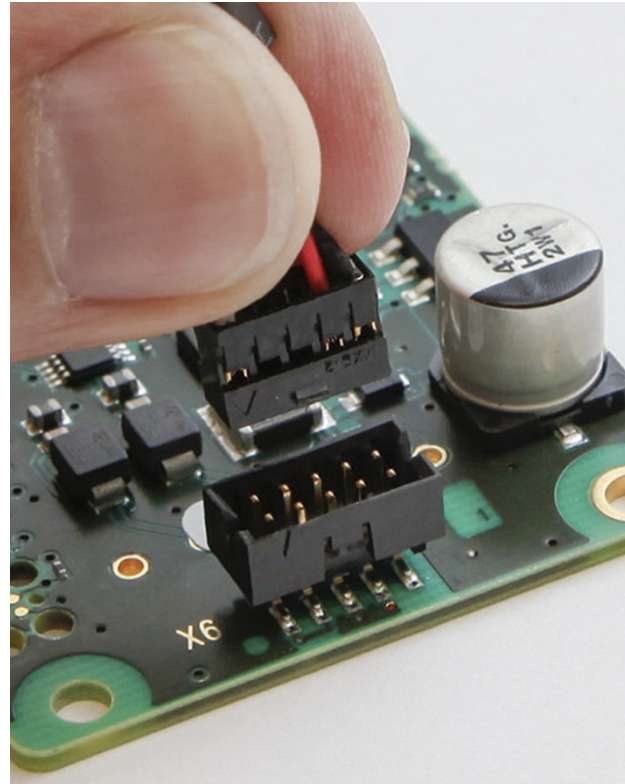


Figure 8 Connecting the Power and I<sup>2</sup>C Bus Cable

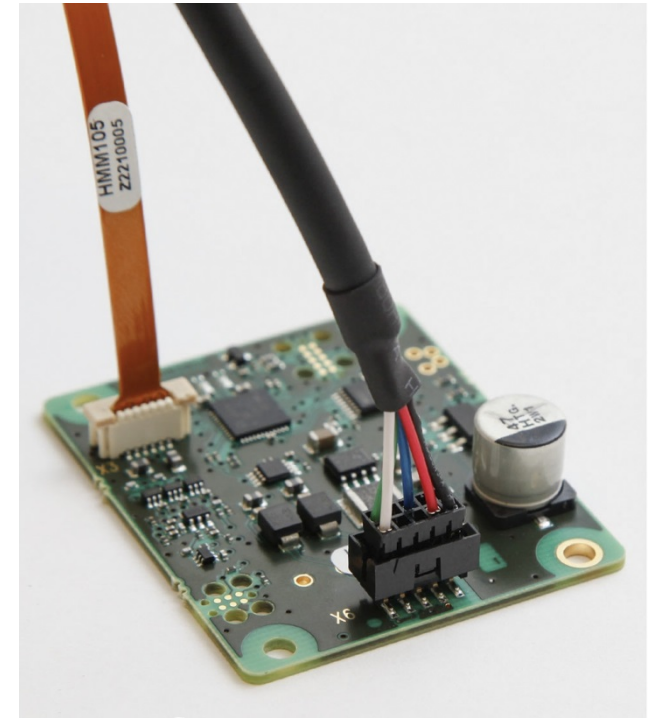


Figure 9 Both Cables Connected

## DIMENSIONS

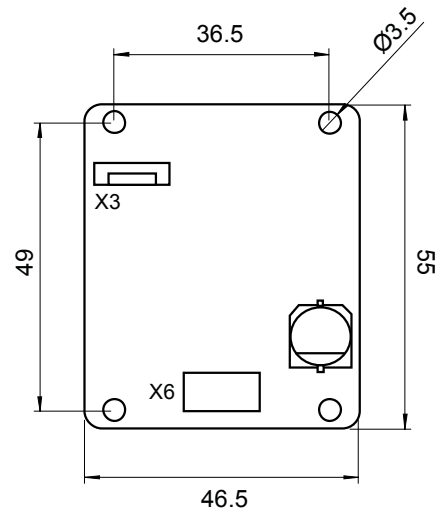


Figure 10 Board Dimensions in mm

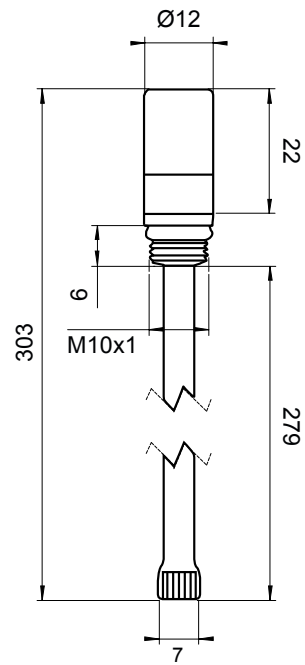


Figure 11 Probe Dimensions in mm

## TECHNICAL DATA

Product datasheet and the I<sup>2</sup>C protocol implementation description are available for download on product pages at [www.vaisala.com/hmm105](http://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 <sup>2</sup> C 5 V
Supply voltage	10 ... 35 VDC, 24 VAC ±20%
Power consumption (DC/AC)	<15/25 mA
Connector for supply voltage and I <sup>2</sup> 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.