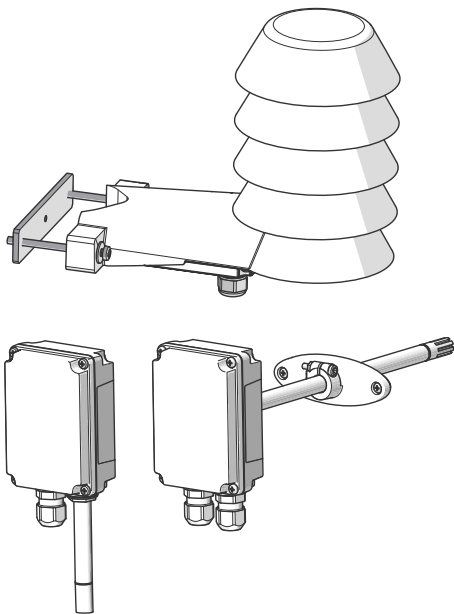


## Quick Guide

# Vaisala HMDW110 Series Humidity and Temperature Transmitters



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# HMDW110 Series

## Overview

HMDW110 series transmitters are accurate humidity and temperature transmitters for measurements in HVAC and cleanroom applications. The series consists of the following models:

- HMD110/112 models for installation in ventilation ducts.
- HMW110/112 models for wall installation.
- HMS110/112 models for outdoor use.

All models are loop-powered, with 2-wire current outputs for humidity and temperature. HMD112, HMW112, and HMS112 are standard models. HMD110, HMW110, and HMS110 are factory configurable models that are delivered with customer specific output settings, including calculated humidity parameters and special scaling of outputs.

HMDW110 series transmitters can be connected to Vaisala's RDP100 panel display for real-time viewing of the measurements. HMDW110 series can also supply the operating power to the display using only the loop power from the outputs.

**Note:** Datasheet and User's Guide (in English) are available from the product page at [www.vaisala.com/hmdw110](http://www.vaisala.com/hmdw110).

## Output Parameters Explained

HMDW110 series transmitters offer several output parameters. Relative humidity (RH) and temperature (T) are the measured parameters, the others are calculated based on RH and T.

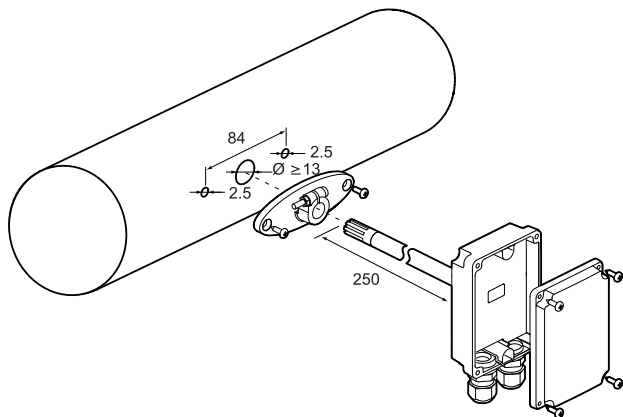
Parameter	Symbol	Units	Description
Temperature	T	°C °F	Temperature in Celsius or Fahrenheit scale.
Relative humidity	RH	%	Ratio of the partial pressure of water vapor in the air to the saturation vapor pressure of air at current temperature.
Dewpoint	Td/f	°C °F	Temperature at which the water vapor in the air will condense into water at the current pressure. When the dewpoint is below 0 °C, the transmitter outputs frostpoint (Tf) instead of dewpoint.
Enthalpy	h	kJ/kg BTU/lb	Sum of the internal energy of a thermodynamic system.
Wet bulb temperature	Tw	°C °F	The minimum temperature that can be reached by evaporative cooling in the current conditions.

**Note:** Check the type label on your transmitter to verify its output parameters and scaling of the output channels.

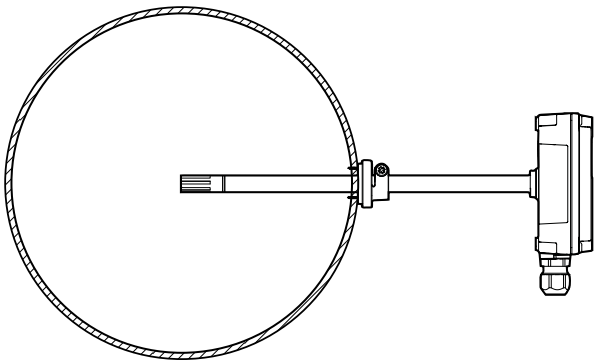
## HMD110/112 Installation

### Required tools:

- Medium size crosshead screwdriver (Pozidriv) for screws on cover and flange.
- Small slotted screwdriver for screw terminals.
- Drill with 2.5 mm and 13 mm bits for making the installation holes.
- Tools for cutting and stripping wires.
- 19 mm open-end wrench for tightening the cable gland.



1. Remove the yellow transport protection cap and separate the fastening flange from the transmitter.
2. Use the flange to mark the location and size of the installation holes on the side of the duct.
3. Drill the installation holes in the duct. Secure the fastening flange to the duct with the two screws (included).
4. Push the probe of the transmitter through the flange and into the duct. The probe should reach far enough so that the sensor is located in the middle of the duct.

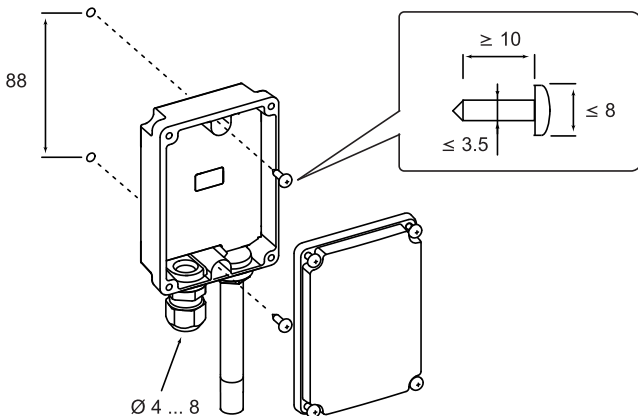


5. Secure the transmitter to the flange by tightening the screw on the flange that holds the probe in place.
6. Open the transmitter cover, and route the cable(s) through the cable gland (s). Connect the wires to the screw terminals. See section Wiring HMDW110 on page 9.
7. Tighten the cable gland(s) and close the transmitter cover.

## HMW110/112 Installation

### Required tools:

- Medium size crosshead screwdriver (Pozidriv) for cover screws.
- Small slotted screwdriver for screw terminals.
- Two installation screws:  $\varnothing < 3.5$  mm, head  $\varnothing < 8$  mm.
- Depending on the wall material and screw type, you may need a drill and a suitable drill bit to make installation holes for screws.
- Tools for cutting and stripping wires.
- 19 mm open-end wrench for tightening the cable gland.



1. Open the transmitter cover and use two screws (not included) to attach the transmitter to the wall. The probe and cable gland should point down.
2. Route the power and signal cable to the screw terminals and connect the wires. See section Wiring HMDW110 on page 9.
3. Tighten the cable gland and close the transmitter cover.
4. Remove the yellow transport protection cap from the probe.

## HMS110/112 Installation

### Required tools:

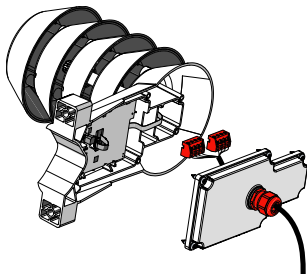
- Medium size crosshead screwdriver (Pozidriv).
- Small slotted screwdriver for screw terminals.
- Tools for cutting and stripping wires.
- 19 mm open-end wrench for tightening the cable gland.

### Additional tools for pole installation:

- Zip ties for securing the cable to the pole.

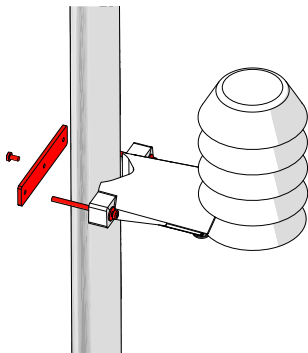
### Additional tools for wall installation:

- Drill and bits.
- Screws (2 pcs,  $\varnothing < 5.5$  mm) and wall plugs.
- Cable clips for securing the cable to the wall.



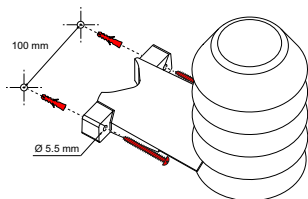
1. Open the six screws that hold the transmitter cover.
2. Route the power and signal cable to the screw terminals and connect the wires. See section Wiring HMDW110 on page 9.
3. Disconnect the wired screw terminal blocks by pulling them off from the component board.
4. Adjust the length of cable between the cable gland and the terminal blocks. Make the cable short enough to close the cover without leaving a cable loop in the transmitter.





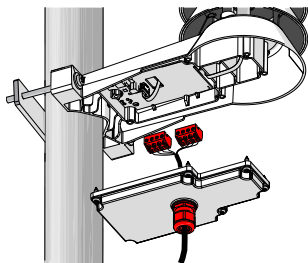
### 5a. Pole installation

- Use the supplied clamp and screws to mount the transmitter on a pole.
- To prevent the transmitter from turning on the pole, tighten the set screw on the center hole of the clamp.



### 5b. Wall installation

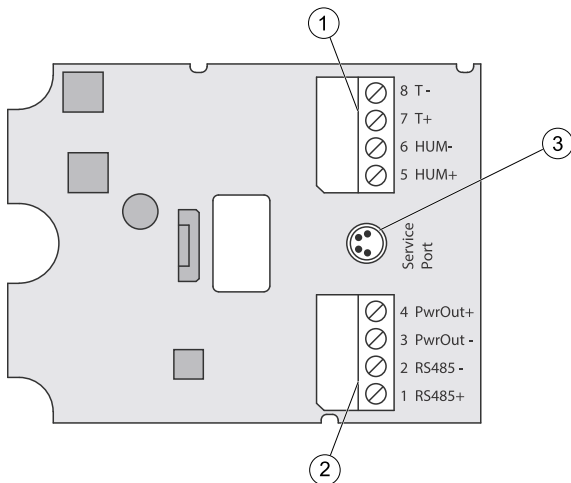
- Drill two holes for wall plugs 100 mm apart.
- Place the wall plugs in the holes.
- Mount the transmitter using two screws of sufficient length.



6. Plug in the screw terminal blocks, close the cover, and tighten the screws.
7. Secure the cable to the pole using a zip tie. Allow some cable to hang down from the cable gland to prevent water from entering the transmitter along the cable.

## Component Board

All HMDW110 transmitter models use the same component board and have two 4 ... 20 mA outputs (loop powered). There is also a service port for configuration and calibration use.



1 = Terminal block for 4 ... 20 mA current loop outputs.

2 = Terminal block for RS-485 output to RDP100 display panel (optional).

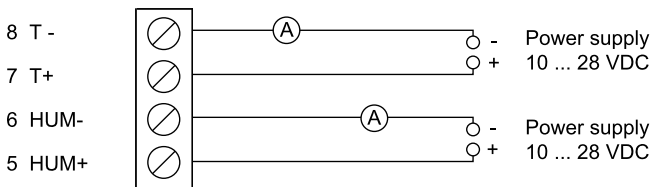
3 = Service port connector (4-pin M8).

**Note:** You can pull out the terminal blocks from the component board for easier installation, and to disconnect the transmitter from power and RS-485 when using the service port.

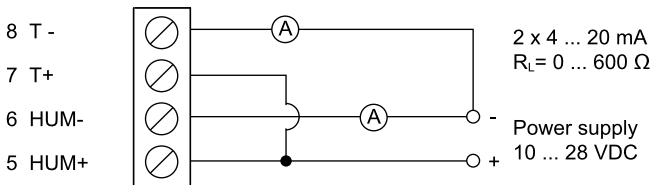
## Wiring HMDW110

You must always connect the humidity measurement current loop (HUM, terminals 5 and 6) to power the transmitter. Connecting the temperature measurement current loop (terminals 7 and 8) is optional.

$2 \times 4 \dots 20 \text{ mA}$   
 $R_L = 0 \dots 600 \Omega$



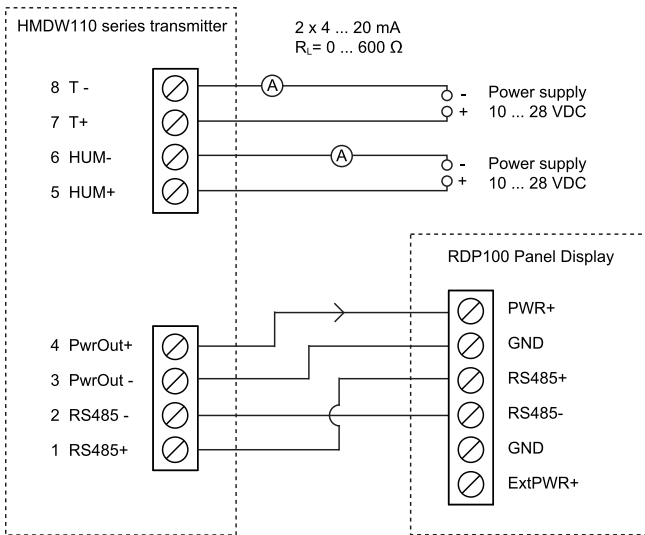
You can also wire both loops with a single power supply.



## Wiring HMDW110 with RDP100 Display

You must always connect the humidity measurement current loop (HUM, terminals 5 and 6) to power the transmitter. Connecting the temperature measurement current loop (terminals 7 and 8) is optional.

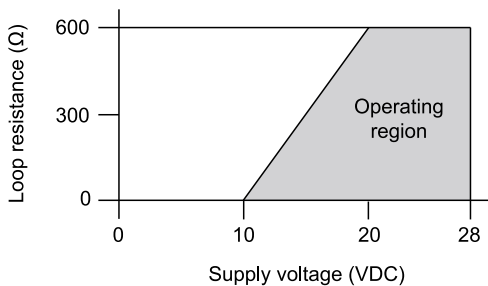
Connect the RDP100 panel display using terminals 1 ... 4. The HMDW110 series transmitter provides both power and data to the RDP100.



**Note:** When using the RDP100 with HMDW110 series transmitters, remove the jumper on the RDP100 component board.

## Power Supply Requirements

HMDW110 series transmitters are designed for a supply voltage range of 10 ... 28 VDC. The minimum required voltage depends on the loop resistance (0 ... 600  $\Omega$ ) as shown below.



## Connecting to the Service Port

The RS-485 line of the service port is shared with the connection to RDP100 display panel; the M8 service port connector is just an additional connector for easier access. You can use the service port for configuration, calibration, and troubleshooting of the transmitter.

You can connect to the service port with the following equipment:

- Computer with a Windows operating system, USB computer connection cable 219690, and a suitable terminal program.
- Vaisala MI70 Hand-Held Indicator and the MI70 connection cable 219980.

**Caution:** Before using the service port, disconnect the terminal block that connects the transmitter to the power supply (terminals 5 ... 8). This prevents possible equipment damage that may be caused by ground loops.

If the transmitter is connected to the RDP100 panel display (terminals 1 ... 4), disconnect that block also. This prevents the communication between the transmitter and display from interfering with your connection.

**Note:** The default RS-485 settings of a HMDW110 series transmitter are 19200 8 N 1. These settings are needed for compatibility with the RDP100 panel display. If you are not using the display, you can change the settings using the **SERI** command. Note that the service port settings will also change.

**Note:** You can download the PuTTY terminal program from [www.vaisala.com](http://www.vaisala.com).

## List of Serial Commands

**Note:** For more information and examples of using the serial commands, refer to the HMDW110 Series User's Guide.

Command	Description
?	Show status.
??	Show status (will respond in poll mode).
ADDR [0 ... 255]	Show or set address.
ADJD [yyyymmdd]	Show or set adjustment date.
AERR [ch1level ch2level]	Show or set error level for analog output.
AMODE	Show analog output settings.
AOVER [on/off]	Enable or disable analog output 10% over range.
ASEL [ch1 ch2 [ch1low ch1high ch2low ch2high]]	Show or set analog output parameters and scaling. Example: asel rh t 0 100 -40 60
ATEST [ch1 ch2]	Test analog outputs by forcing them to a given value.
CLOSE	Close connection to transmitter in POLL mode.
CRH	User calibration for humidity measurement.
CRHCLR	Clear user calibration for humidity measurement. Factory calibration remains.
CT	User calibration for T measurement.
CTCLR	Clear user calibration for temperature measurement. Factory calibration remains.
FCRH	User calibration after humidity sensor change.
ERRS	Show active errors.
FILT [0.001 ... 1]	Show or set measurement filtering. Default is 1, no filtering.
FORM	Set output format of measurement messages.
FRESTORE	Restore factory settings. Clears all user settings, restores the factory calibration that was done at Vaisala factory.
HELP	Show list of serial commands.
INTV [0 ... 255s/m/h]	Set measurement output interval.
L	Show adjustment offset and gain.

Command	Description
LI	Set adjustment offset and gain.
OPEN [addr]	Open connection to transmitter in POLL mode.
R	Start continuous output of measurement messages.
RESET	Reset the transmitter.
SDELAY [0 ... 255]	Show or set serial line turnaround delay. 255 = 1024 ms.
SEND [addr]	Output one measurement message.
SERI [baud P D S]	Set serial line settings. Default is 19200 N 8 1 (required for compatibility with RDP100 display panel).
SMODE [stop/run/poll]	Set serial line operation mode.
SYSTEM	Show transmitter information.
TIME	Show transmitter uptime (time since last reset).
UNIT [m/n]	Set units to metric (m) or non-metric (n).





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