VAISALA

USER'S GUIDE

Vaisala HUMICAP® Humidity and Temperature Transmitters HMW70U/Y

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1. PRODUCT DESCRIPTION

The HMW70 transmitters are wall mounted transmitters for the measurement of humidity (HMW70U) and for the measurement of humidity and temperature (HMW70Y).

The HMW70U/Y transmitters can be mounted directly on the wall. They are easy to install and maintain. One point calibration is easily performed with the HMI41 indicator and the calibration cable 19116ZZ.

Both transmitter types incorporate the HUMICAP®180 humidity sensor which uses an operating principle based on changes in the capacitance of a thin polymer film as it absorbs water molecules. The HMW70Y transmitters measure temperature with the reliable Pt 1000 sensor.

2. TO BE NOTED WHEN MEASURING HUMIDITY

In the measurement of humidity and especially in calibration, it is essential that the temperature equilibrium is reached. Even a slight difference in the temperature between the measured object and the sensor causes an error. For example, at +20 °C (+ 68 °F) and 50 %RH, a temperature difference of ±1 °C between the measured object and the sensor causes an error of ±3 %RH. If relative humidity is 90 %RH, the error is about ±5.4 %RH.

The error is at its greatest when the temperature of the sensor differs from that of the surroundings and the humidity is high. A few degrees' difference in temperature may cause water to condense on sensor surface. Efficient ventilation accelerates evaporation whereas in an unventilated space, it may take hours. The HUMICAP®180 sensor returns to its normal functioning as soon as water has evaporated. Any contaminated water condensing on the sensor may shorten its life span and change the calibration.

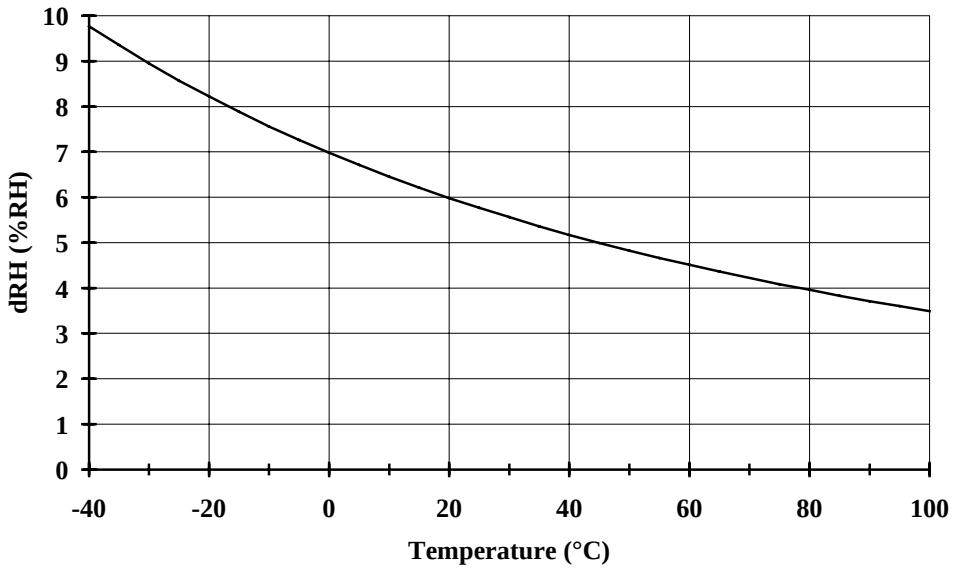


Figure 2.1 Measurement error at 100 %RH when the temperature difference between the ambient and the sensor is 1 °C

3. INSTALLATION

3.1 Selecting the place of installation

Select a place that gives a true picture of the environment or process and is as clean as possible. Air should circulate freely around the sensor. A rapid air flow is recommended as it ensures the same temperature for the ambient air and the sensor head.

Install the transmitter in a place where no cold or hot spot can develop. If the sensor head is installed in a duct or channel where the temperature is different from the ambient temperature, insulate the point of entry. An uninsulated installation might lead to condensation on the sensor head and even if no condensation occurs, the resultant air flow may change the temperature near the sensor head and distort the readings.

3.2 Mounting

The HMW70U/Y transmitters can be mounted directly on the wall. First attach the base plate with the two screws provided. Thread wires through the opening in the transmitter board. Note the UP sign which shows the correct mounting position. Be careful not to damage the HUMICAP®180 sensor.

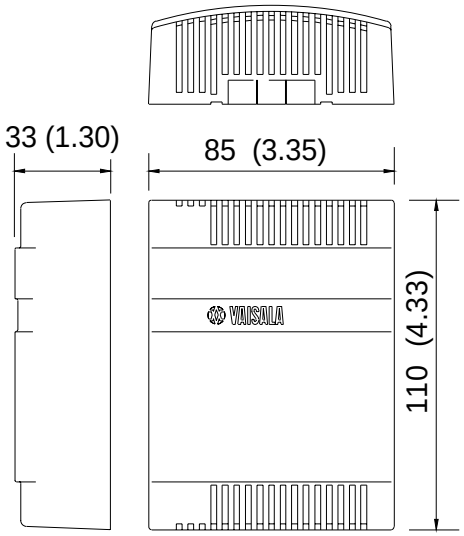


Figure 3.2 Dimensions of the HMW70U/Y (in mm)

3.3 Electrical connections and calibration potentiometers

Signal cables are connected to a removeable 5-pole screw connector. Make connections according to Figure 3.3.

RH test connector (X5) is used with the HMI41 indicator for one point calibration.

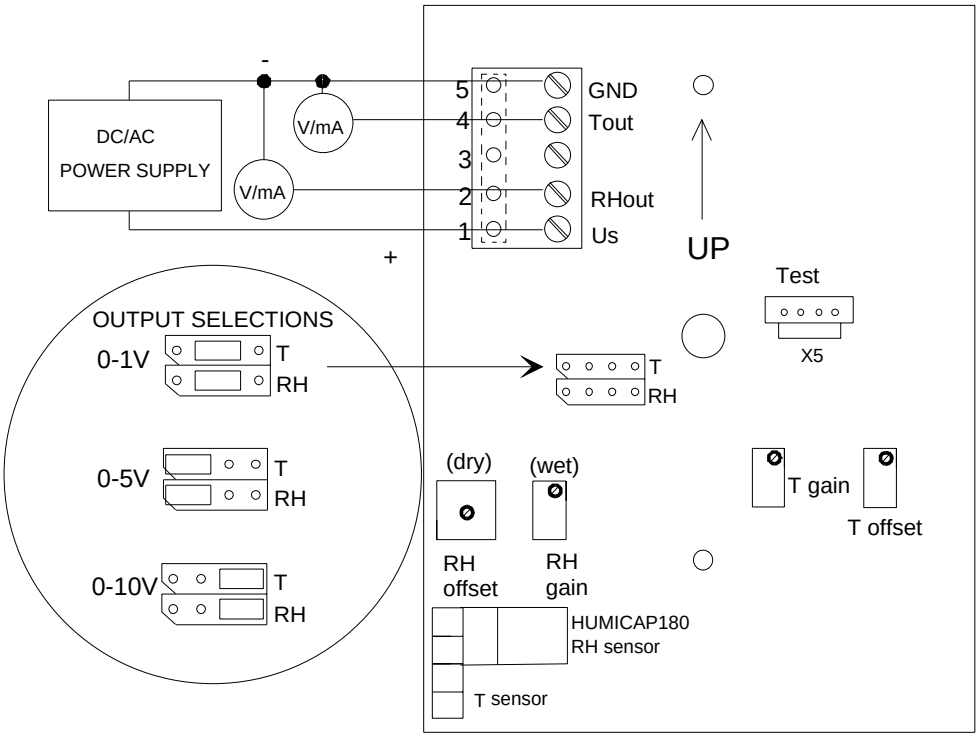


Figure 3.3 Electrical connections

3.4.1 Connection to an AC supply

The HMW70U/Y transmitters can also be connected to an AC supply without an external rectifier. However, when more than one transmitter is connected to one AC transformer, a common loop is formed and there is an increased risk of a short-circuit. To avoid this, use a separate floating supply for each transmitter (see Figure 3.4.1). However, if several transmitters have to share one transformer, the phase (~) must always be connected to Us connector in each transmitter.

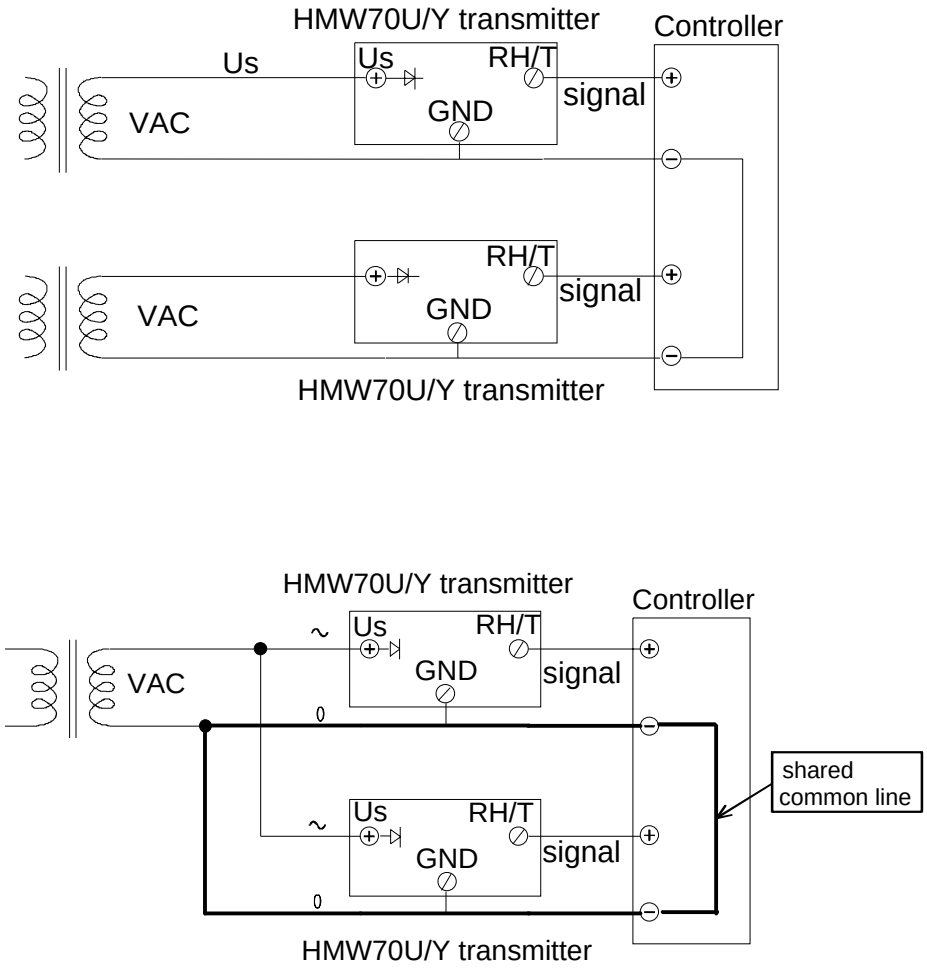


Figure 3.4.1 Connection to an AC supply

4. CALIBRATION

The accuracy is recommended to be checked at least once a year; the interval depends on the operating conditions and the required accuracy of the measurement. The transmitter calibration can be conveniently checked with the HMI41 indicator equipped with an appropriate probe and optional calibration cable. If adjustment is needed, use the one-point calibration potentiometer.

5. MAINTENANCE

5.1 Replacing the HUMICAP®180 sensor and the filter

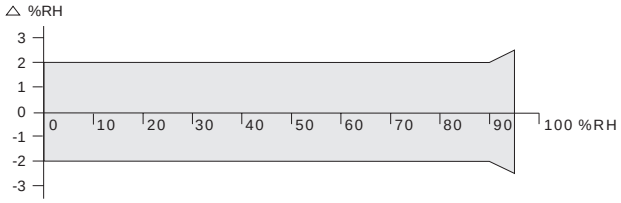
Remove the damaged sensor and insert a new one. Handle the sensor by the plastic socket. DO NOT TOUCH THE SENSOR PLATE. Recalibrate the transmitter.

6. TECHNICAL DATA

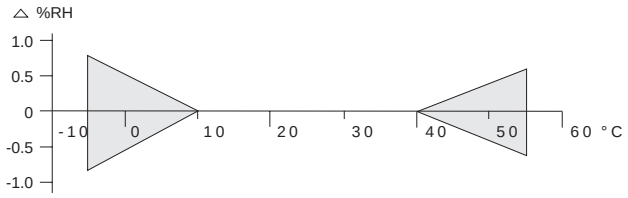
6.1 Relative humidity

Measurement range (output signal corresponds to 0...100 %RH)	0...95 %RH

Accuracy at +20 °C:



Temperature dependence:

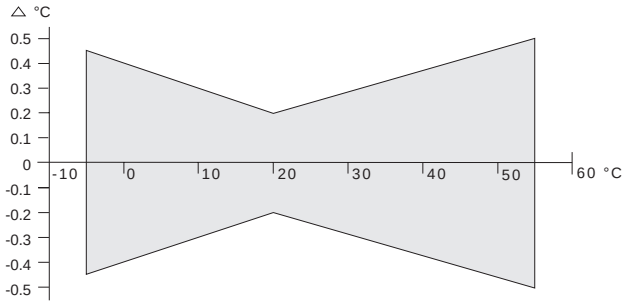


Response time (90%) at 20 °C in still air	15 s
Humidity sensor	HUMICAP® 180

6.2 Temperature (Y model only)

Measurement range	-5...+55 °C

Accuracy:



Linearity	better than 0.1 °C
Temperature sensor	Pt 1000 IEC 751 class B

6.3 General

Supply voltage range depends on the selected output signal.
When an AC supply is used, an isolated source is recommended.

	DC	AC
0...1 V	10...35 V	9...24 V
0...5 V	14...35 V	12...24 V
0...10 V	19...35 V	16...24 V

Factory setting 0...1 V. Other outputs selectable by jumper connections.
An output change causes an error which is less than 0.5 %RH
without recalibration.

Operating temperature range	-5...+55 °C
Storage temperature range	-40...+80 °C
Long-term humidity range for electronics	0...85 %RH
Housing:	
cover	ABS plastic
base plate	PA
Connections	Screw terminals 0.5...1.5 mm^2

6.4 Electromagnetic compatibility

The emission and immunity tests have been performed according to standards EN50081-1 and EN50082-1.

6.4.1 Emissions

Test	Setup according to	Performance
Radiated interference	EN55022	class B

6.4.2 Immunity

Test	Setup according to	Performance
Electrostatic discharge	IEC 801-2:1991	criteria B
Electrical fast transients	IEC 801-4:1988	criteria B
RF radiated fields	IEC 801-3:1984	criteria A
*GSM-field immunity	ENV50204:1995	criteria A

(* additional test)

CE

GUARANTEE

Vaisala issues a guarantee for the material and workmanship of this product under normal operating conditions for one year from the date of delivery. Exceptional operating conditions, damage due to careless handling or misapplication will void the guarantee.

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