ТРАНСМИТТЕРЫ ТЕМПЕРАТУРЫ

HMP 60, 110, 155

ТЕХНИЧЕСКИЕ ХАРАКТЕРИСТИКИ

По вопросам продаж и поддержки обращайтесь:

Vaisala INTERCAP® Humidity and TemperatureProbe HMP60

The HMP60 for extreme conditions.

Features/Benefits

- Miniature-size humidity probe
- Low power consumption
- Measurement range:
  0 ... 100 %RH; -40 ... +60°C
- Cable detachable with standard M8 connector
- Rugged metal housing
- Interchangeable Vaisala INTERCAP® Sensor
- Optional RS485 digital output

  Optional dew point output
- Applications: volume applications, integration into other manufacturers' equipment, glove boxes, greenhouses, fermentation chambers, data loggers

HMP60

The HMP60 is a simple, durable and cost-effective humidity probe. It is suitable for volume applications, integration into other manufacturers' equipment, incubators, glove boxes, greenhouses, fermentation chambers, and data loggers.

Easy Installation

The probe cable has a screw-on quick connector for easy installation. Different cable lengths are available. Also other compatible M8 series cables can be used. Accessories are available for different installation needs.

Low Current Consumption

The HMP60 is suitable for battery-powered applications because of its very low current consumption.

Several Outputs

There are two configurable voltage outputs with relative humidity, temperature or dew point scaling. Four voltage output ranges are available. An optional RS485 output with Modbus support is also available.

Rugged Design

The HMP60 is designed for extreme conditions. The stainless steel body of the HMP60 is classified as IP65. The probe has a sealed structure and the sensor is protected by a membrane filter and a plastic grid, or optionally by a stainless steel filter.

Recalibration Not Needed

The Vaisala INTERCAP® Sensor is interchangeable. No recalibration is required; the sensor can simply be replaced, also in the field.

Technical Data

Performance

RELATIVE HUMIDITY

Measurement range	0 ... 100 %RH
Typical accuracy	
temperature range	0 ... +40 °C
0 ... 90 %RH	±3 %RH
90 ... 100 %RH	±5 %RH
temperature range	-40 ... 0 °C, +40 ... +60 °C
0 ... 90 %RH	±5 %RH
90 ... 100 %RH	±7 %RH
Humidity sensor	Vaisala INTERCAP®

TEMPERATURE

Measurement range	-40 ... +60 °C
Accuracy over temperature range	
+10 ... +30 °C	±0.5 °C
-40 ... +10, +30 ... +60 °C	±0.6 °C

DEW POINT

Measurement range	-40 ... +60 °C
Typical accuracy	
temperature range	0 ... +40 °C
when dew point depression < 15 °C	±2 °C
temperature range	-40 ... 0 °C, +40 ... +60 °C
when dew point depression < 10 °C	±3 °C
dew point depression = ambient temperature - dew point	

ANALOG OUTPUTS

Accuracy at 20 °C	±0.2 % of FS
Temperature dependence	±0.01 % of FS/°C

Inputs and Outputs

Operating voltage	5 ... 28 VDC / 8 ... 28 VDC with
(Use lowest available operating	5 V output
voltage to minimize heating.)	8 ... 28VDC with loop power
	converter
Current consumption	1 mA average, max. peak 5 mA
Start-up time	
probes with analog output	4 s at operating voltage
	13.5 ... 16.5 VDC
	2 s at other valid operating voltages
probes with digital output	1 s
Outputs	
2 channels	0 ... 1 VDC/0 ... 2.5 VDC / 0 ... 5 VDC/1 ... 5 VDC
1-channel loop-power converter (separate	
module, compatible with humidity accuracy only)	4 ... 20 mA
digital output (optional)	RS485 2-wire half duplex
External loads	
0 ... 1 V	R_L min 10 kΩ
0 ... 2.5 V /0 ... 5 V	R_L min 50 kΩ

Operating Environment

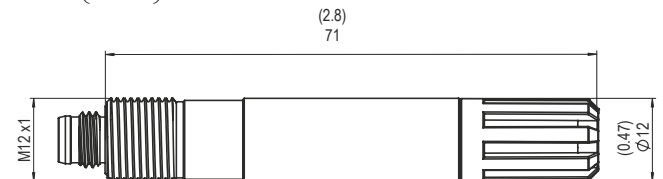|	
Operating temperature	-40 ... +60 °C
Electromagnetic compatibility	EN 61326-1: Electrical equipment for measurement, control and laboratory use – EMC requirements – for use in industrial locations.

Mechanics

Materials	
body	stainless steel (AISI 316)
grid filter	chrome coated ABS plastic
cable	polyurethane or FEP
Housing classification	IP65
Body thread	MI2x1 / 10 mm
Cable connector	4-pin M8 (IEC 60947-5-2)
Weight	
probe	17 g
probe with 0.3 m cable	28 g

Options and Accessories

Vaisala INTERCAP® Sensor, 1 piece	15778HM
Vaisala INTERCAP® Sensor, 10 pcs	INTERCAPSET-10PCS
Sensor protection	
plastic grid	DRW010522
membrane filter	DRW010525
stainless steel sintered filter	HM46670SP
4 ... 20mA loop power converter	UI-CONVERTER-1CB
Mounting bracket for converter	225979
Plastic M12 installation nuts, pair	18350SP
USB cable for PC connection	219690
Probe mounting clamp set, 10 pcs	226067
Probe mounting flange	226061
Connection cables	
0.3 m PU	HMP50Z032SP
3 m PU	HMP50Z300SP
180 °C 3 m FEP	226902SP

Dimensions

in mm (inches)

Vaisala HUMICAP ® Humidity and Temperature Probe HMP110

The HMP110 with excellent stability and high chemical tolerance.

Features/Benefits

- Miniature-size humidity transmitter
- Low power consumption and fast start-up for battery powered applications
- Measurement range: 0 ... 100 %RH; -40 ... +80°C
- Cable detachable with standard M8 quick connector
- Reliable: Latest generation HUMICAP® 180R sensor for best stability and high chemical tolerance. IP65 metal housing.
- Optional RS485 digital output
- Traceable: Comes with calibration certificate. ±1.5 %RH measurement accuracy (0 ... 90 %RH)
- HMP110R replacement probe service available for easy maintenance
- Optional dew point calculation

The HMP110 is a trouble-free and cost-effective humidity transmitter with high accuracy and good stability. It is suitable for volume applications or integration into other manufacturers' equipment. The HMP110 is also suitable for glove boxes, greenhouses, fermentation and stability chambers, data loggers, and incubators.

Easy Installation

The probe cable has a screw-on quick connector for easy installation. Different cable lengths and accessories are available.

Low Current Consumption

HMP110 is suitable for battery-powered applications because of its very low current consumption. It also has a fast start-up time.

Several Outputs

The temperature measurement is a standard feature, dew point measurement is optional. Three standard voltage outputs are available. An optional RS485 output with Modbus support is also available.

Robust Design

The stainless steel body of the HMP110 is classified as IP65. Thus, it survives rough conditions. The HMP110 has high chemical tolerance because of the HUMICAP® 180R sensor.

Easy Maintenance

Maintaining measurement traceability is easy using the HMP110R replacement probe. We send you a replacement probe, you detach the old probe and send it back to us. In this way the measurement is available at all times without interruptions.

Technical Data

Performance

RELATIVE HUMIDITY

Measurement range	0 ... 100 %RH

Accuracy (incl. non-linearity, hysteresis and repeatability)

temperature range	0 ... +40 °C
0 ... 90 %RH	±1.5 %RH
90 ... 100 %RH	±2.5 %RH
temperature range	-40 ... 0 °C, +40 ... +80 °C
0 ... 90 %RH	±3.0 %RH
90 ... 100 %RH	±4.0 %RH

Factory calibration uncertainty (+20 °C)

0 ... 90 %RH	±1.1 %RH
90 ... 100 %RH	±1.8 %RH
Humidity sensor	Vaisala HUMICAP® 180R
Stability	±2 %RH over 2 years

TEMPERATURE

Measurement range	-40 ... +80 °C

Accuracy over temperature range

0 ... +40 °C,	±0.2 °C
-40 ... 0 °C, +40 ... +80 °C	±0.4 °C
Temperature sensor	Pt1000 RTD Class F0.1 IEC 60751

DEW POINT

Measurement range	-40 ... +80 °C

Accuracy (incl. non-linearity, hysteresis and repeatability)

temperature range	0 ... +40 °C
when dew point depression < 15 °C	±1 °C
when dew point depression 15 ... 25 °C	±2 °C
temperature range	-40 ... 0 °C, +40 ... +80 °C
when dew point depression < 15 °C - dew point	±2 °C
depression = ambient temperature - dew point	

ANALOG OUTPUTS

Accuracy at 20 °C	±0.2 % of FS
Temperature dependence	±0.01 % of FS/°C

Inputs and Outputs

Operating voltage	5 ... 28 VDC / 8 ... 28 VDC with
(Use lowest available operating	5 V output
voltage to minimize heating)	8 ... 28 VDC with loop power
	converter
Current consumption	1 mA average, max. peak 5 mA
Start-up time	
HMP110 probes with analog output	4 s at operating voltage
	13.5 ... 16.5 VDC
	2 s at other valid operating voltages
HMP110D probes with digital output	1 s

Outputs

2 channels	0 ... 1 VDC / 0 ... 2.5 VDC / 0 ... 5 VDC / 1 ... 5 VDC
1-channel loop-power converter (separate module,	
compatible with humidity accuracy only)	4 ... 20 mA
digital output (HMP110D)	RS485 2-wire half duplex
External loads	
0 ... 1 V	R_L min 10 kΩ
0 ... 2.5 V /0 ... 5 V	R_L min 50 kΩ

Operating Environment

Operating temperature range	-40 ... +80 °C
Electromagnetic compatibility	EN 61326-1: Electrical equipment
	for measurement, control and laboratory use – EMC
	requirements – for use in industrial locations.

Mechanics

Materials	
body	stainless steel (AISI 316)
grid filter	chrome coated ABS plastic
cable	polyurethane or FEP
Housing classification	IP65
Body thread	MI2x1 / 10 mm
Cable connector	4-pin M8 (IEC 60947-5-2)
Weight	
probe	17 g
probe with 0.3 m cable	28 g

Options and Accessories

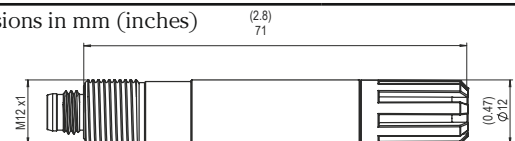|	
Sensor protection	
plastic grid	DRW010522SP
membrane filter	DRW010525SP
stainless steel sintered filter	HM46670SP
4 ... 20 mA loop power converter	UI-CONVERTER-1CB
Mounting bracket for converter	225979
Plastic M12 installation nuts, pair	18350SP
USB cable for PC connection	219690
Probe mounting clamp set, 10 pcs	226067
Probe mounting flange	226061
Connection cables	
standard 0.3 m	HMP50Z032SP
standard 3 m	HMP50Z300SP
80 °C 1.5 m	225777SP
80 °C 3 m	225229SP
180 °C 3 m FEP	226902SP
connection cable for HM70	219980

Dimensions

Dimensions in mm (inches)

HMP155 Humidity and Temperature Probe

HMP155 with an additional temperature probe and optional Stevenson screen installation kit.

Features/Benefits

- Vaisala HUMICAP®180R sensor - superior long-term stability
- Optional warmed humidity probe and chemical purge
- Plug-and-play
- USB connection for service use
- Fits with DTR13 and DTR503 radiation shields and also for a Stevenson screen
- Weather-proof housing IP66
- Optional, fast temperature probe
- Different output possibilities: voltage, RS-485, resistive Pt100
- Applications: meteorology, aviation and road weather, instrumentation

The Vaisala HUMICAP® Humidity and Temperature Probe HMP155 provides reliable humidity and temperature measurement. It is designed especially for demanding outdoor applications.

Long-term Stability

The HMP155 has the proven Vaisala HUMICAP®180R sensor that has excellent stability and withstands well harsh environments. The probe structure is solid and the sensor is protected by default with a sintered teflon filter, which gives maximum protection against liquid water, dust, and dirt.

Warmed Probe and High Humidity Environment

Measuring humidity reliably is challenging in environments where humidity is near saturation. Measurements may be corrupted by fog, mist, rain, and heavy dew. A wet probe may not give an accurate measurement in the ambient air.

This is an environment to which Vaisala has designed a patented, warmed probe for reliable measuring. As the sensor head is warmed continuously, the humidity level inside it stays below the ambient level. Thus, it also reduces the risk of condensation forming on the probe.

Fast Measurements

With its fast response time, the additional temperature probe for the HMP155 is ideal for measurement in environments with changing temperatures. The new membrane filter speeds up the RH measurement.

Long Lifetime

Protecting the sensor from scattered and direct solar radiation, and precipitation will increase its lifetime. Thus, Vaisala recommends installing the HMP155 in one of the following radiation shields: DTR503, DTR13, or a Stevenson screen. For the additional temperature probe, an installation kit is available to be used with DTR502 radiation shield.

Easy Maintenance

The probe can be calibrated using a pc with a USB cable, with the push buttons, or with the MI70 indicator.

Technical Data

Performance

RELATIVE HUMIDITY

Measurement range	0 ... 100 %RH

Accuracy (incl. non-linearity, hysteresis and repeatability) at

+15 ... +25 °C (+59 ... +77 °F)	±1 %RH (0 ... 90 %RH)
	±1.7 %RH (90 ... 100 %RH)
-20 ... +40 °C (-4 ... 104 °F)	±(1.0 + 0.008 x reading) %RH
-40 ... -20 °C (-40 ... -4 °F)	±(1.2 + 0.012 x reading) %RH
+40 ... +60 °C (+104 ... +140 °F)	±(1.2 + 0.012 x reading) %RH
-60 ... -40 °C (-76 ... -40 °F)	±(1.4 + 0.032 x reading) %RH
Factory calibration	±0.6 %RH (0 ... 40 %RH)*
uncertainty (+20 °C /+68 °F)	±1.0 %RH (40 ... 97 %RH)*

* Defined as ±2 standard deviation limits. Small variations possible, see also calibration certificate.

Recommended humidity sensor	HUMICAP®180R(C)

Response time at +20 °C in still air with a sintered PTFE filter

63 %	20 s
90 %	60 s

TEMPERATURE

Measurement range	-80 ... +60 °C (-112 ... +140 °F)

Accuracy with voltage output at

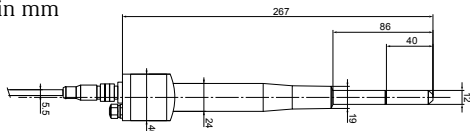|	
-80 ... +20 °C	±(0.226 - 0.0028 x temperature) °C
+20 ... +60 °C	±(0.055 + 0.0057 x temperature) °C
passive (resistive) output	
according to IEC 751 1/3 Class B	±(0.1 + 0.00167 x |temperature|)°C
RS485 output	
-80 ... +20 °C	±(0.176 - 0.0028 x temperature) °C
+20 ... +60 °C	±(0.07 + 0.0025 x temperature) °C

Accuracy over temperature range (opposite)	
Temperature sensor	Pt100 RTD Class F0.1 IEC 60751

Response time with additional temperature probe in 3 m/s air flow

63 %	<20 s
90 %	<35 s

OTHER VARIABLES

dew point/frost point temperature, wet bulb temperature, mixing ratio

Dimensions

Dimensions in mm

General

Operating temperature range	-80 ... +60 °C (-112 ... +140 °F)
Storage temperature range	-80 ... +60 °C (-112 ... +140 °F)
Connection	8-pin male M12 connector
Connection cables	3.5, 10, and 30 m
Cable material	PUR
Wire size	AWG26
Service cables	USB connection cable
	MI70 connection cable
Additional T probe cable length	2 m
Housing material	PC
Housing classification	IP66
Sensor protection	sintered PTFE
	optional membrane filter
Weight (probe)	86 g

Electromagnetic compatibility: Complies with the EMC standard EN61326-1, Electrical equipment for measurement control and laboratory use - EMC requirement for use in industrial locations

Inputs and Outputs

Operating voltage	7 ... 28 VDC*

*Note: minimum operating voltage 12 V with 0 ... 5 V output and 16 V with 0 ... 10 V output, probe heating, chemical purge or XHEAT.

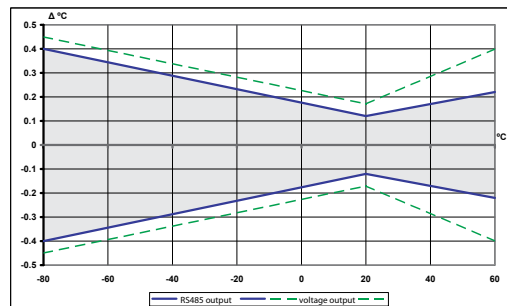|	
Outputs	
voltage output	0 ... 1 V, 0 ... 5 V, 0 ... 10 V
resistive Pt100 (4-wire connection)	
RS485	

Average current consumption (+15 VDC, load 100 kOhm)

0 ... 1 V output	<3 mA
0 ... 10 V output	+0.5 mA
RS485	<4 mA
during chemical purge	max. 110 mA
with warmed probe	max. 150 mA

Settling time at power-up

voltage output	2 s
RS485	3 s

VAISALA

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