



HMDW110 Series Humidity and Temperature Transmitters

For High-accuracy Measurements in HVAC Applications



Features

- Accurate humidity and temperature transmitters for measurements in HVAC and cleanroom applications
- Outdoor transmitter with professional-grade radiation shield
- Proven HUMICAP® 180R sensor for superior long-term stability
- ± 2 %RH accuracy
- 3-point traceable calibration (certificate included)
- On-site calibration with HM70 Hand-Held Meter or Vaisala Insight PC software
- Current (4 ... 20 mA) or Modbus RTU output variants
- Default output parameters are relative humidity and temperature. Dew point temperature, wet bulb temperature, and enthalpy outputs selectable with Vaisala Insight PC software.

Vaisala HUMICAP® Humidity and Temperature Transmitter Series HMDW110 measure relative humidity and temperature in multiple HVAC applications. The series includes transmitters for duct mounting, IP65-classified wall transmitters, and outdoor transmitters with integrated radiation shields.

Proven Vaisala HUMICAP® Performance

The cost-efficient HMDW110 series transmitters are equipped with trusted HUMICAP® 180R sensors. The sensor's superior long-term stability minimizes maintenance needs throughout the transmitter's lifetime. If necessary, the transmitter can be field-calibrated using either an HM70 Hand-Held Humidity and Temperature Meter, or Vaisala Insight PC software. HMDW110 series instruments are individually adjusted and delivered with a traceable calibration certificate.

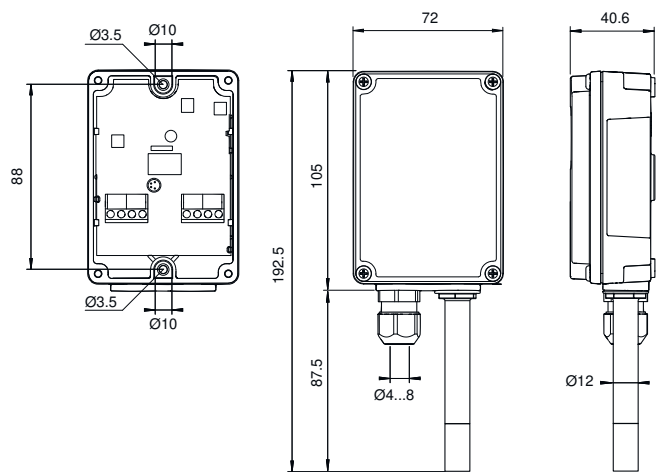
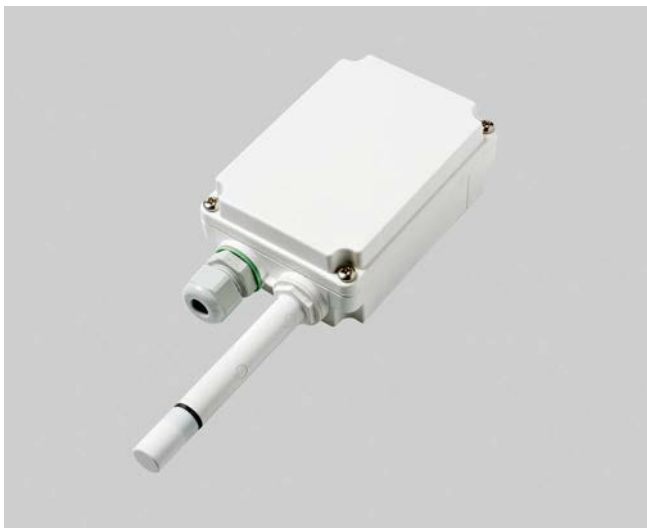
Unrivaled Outdoor Humidity Measurements

The integrated radiation shield of the outdoor models HMS110 and HMS112 enables unrivaled measurement performance. It reduces the impact of sunshine on temperature and humidity measurements, and ensures measurement accuracy in outdoor conditions. The most popular control parameters in free cooling – dew point temperature, wet bulb temperature, and enthalpy – are available as output parameters.

Well-suited for Cleanroom Monitoring

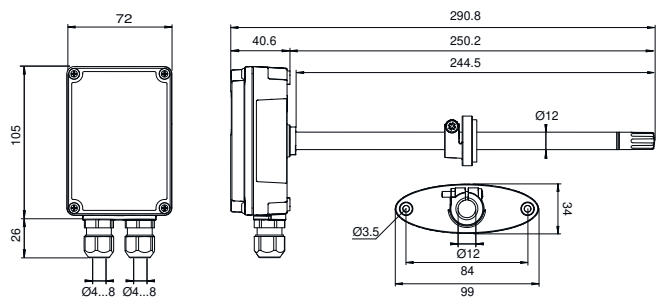
The HMD110 and HMW110 transmitters can be ordered with the catalytic HUMICAP® sensor HUMICAP® 180V. The catalytic sensor improves stability especially in hydrogen peroxide sterilized environments where repeated condensation is expected. An optional panel display can be added for remote monitoring. Transmitters can be installed into difficult-to-reach locations, while measurement data can be read from a more convenient spot.

Technical Data



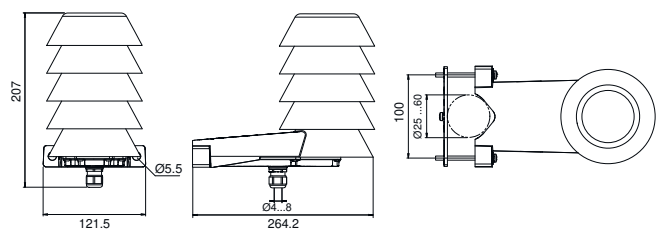
Dimensions in mm

HMW110/112 RH+T transmitters for measurements in wet areas



Dimensions in mm

HMD110/112 RH+T transmitters for ducts



Dimensions in mm

HMS110/112 RH+T transmitters for outdoor measurements

Models

Model Number	Type	Output	Special Features	Ingress Protection
HMW110	Wall-mount, RH+T	2-wire current or Modbus RTU output	Configurable model ¹⁾	IP65
HMW112	Wall-mount, RH+T	2-wire current output		IP65
HMD110	Duct-mount, RH+T	2-wire current or Modbus RTU output	Configurable model ¹⁾	IP65
HMD112	Duct-mount, RH+T	2-wire current output		IP65
HMS110	Outdoor, RH+T	2-wire current or Modbus RTU output	Radiation shield, configurable model ¹⁾	IP65
HMS112	Outdoor, RH+T	2-wire current output	Radiation shield	IP65

¹⁾ Delivered with customer specific output settings, including calculated humidity parameters and special scaling of outputs.

Measurement Performance

Relative Humidity

Measurement range	0 ... 100 %RH
Accuracy at temperature range +10 ... +30 °C (+50 ... +86 °F)	
0 ... 90 %RH	±2 %RH
90 ... 100 %RH	±3 %RH
Accuracy at temperature range -20 ... +10 °C, +30 ... +60 °C (-4 ... +50 °F, +86 ... +140 °F)	
0 ... 90 %RH	±3 %RH
90 ... 100 %RH	±4 %RH
Accuracy at temperature range -40 ... -20 °C (-40 ... -4 °F)	
0 ... 100 %RH	±4 %RH
Stability in typical HVAC applications	±0.5 %RH/year
Humidity sensor	Vaisala HUMICAP® 180R

Temperature

Measurement range	-40 ... +60 °C (-40 ... +140 °F)
Accuracy at +20 °C (+68 °F)	±0.2 °C (±0.36 °F)
Temperature dependence	±0.01 °C/°C
Temperature sensor	Pt1000 RTD Class F0.1 IEC 60751

Calculated Parameters

Measurement range for dew point temperature and wet bulb temperature	-40 ... +60 °C (-40 ... +140 °F)
Measurement range for enthalpy	-40 ... 460 kJ/kg (-10 ... +190 BTU/lb)

Accuracy of the calculated parameters should be calculated at the actual condition based on the RH and temperature specification.

Accuracy at 20 °C (68 °F) and 80 %RH:

Dew point	±0.7 °C (1.2 °F)
Wet bulb temperature	±0.5 °C (0.9 °F)
Enthalpy	±1.6 kJ/kg (0.7 BTU/lb)
Factory calibration uncertainty at 20 °C (+68 °F)	±1.5 %RH/±0.2 °C

Operating Environment (All Models)

Operating temperature	-40 ... +60 °C (-40 ... +140 °F)
Operating humidity	0 ... 100 %RH
Maximum wind/flow speed	30 m/s
Storage temperature	-40 ... +60 °C (-40 ... +140 °F)
Electromagnetic compliance	EN61326-1, Industrial Environment

Inputs and Outputs

Devices Ordered With Analog Output

Outputs	4 ... 20 mA, loop powered
Loop resistance	0 ... 600 Ω
Supply voltage	20 ... 28VDC at 600 Ω load 10 ... 28VDC at 0 Ω load
Interface for RDP100 Remote Display Panel	Power and data supplied from transmitter

Devices Ordered With Modbus Output

Interface	RS-485, not isolated, no line termination
Default serial settings	19200 bps N 8 2
Protocols	Modbus RTU
Supply voltage	10 ... 28VDC

Spare Parts and Accessories

Remote Display Panel	RDP100
Conduit fitting + O-ring (M16x1.5 / NPT1/2 Inch)	210675SP
Conduit fitting + O-ring (M16x1.5 / PG9, RE-MS)	210674SP
Fastening set HMS110	237805
Fastening flange assembly (screws included)	ASM210771SP
Porous PTFE Filter	DRW239993SP
Membrane Filter	ASM210856SP
Terminal Block, Blue	236620SP
USB cable for PC connection	219690
Connection cable for HM70 hand-held meter	219980SP
HUMICAP® 180R sensor	HUMICAP180R
Catalytic HUMICAP® sensor	HUMICAP180V

Mechanical Specifications

Maximum wire size	1.5 mm ² (AWG 16)
Standard housing color	White (RAL9003)
Housing material	PC + 10 %GF (UL-V0 approved)

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HMS110 Series Humidity and Temperature Transmitters

For High-accuracy Outdoor Measurements in Building Automation Applications



Features

- Reliable outdoor transmitters with integrated radiation shields
- ± 2 %RH accuracy
- Proven HUMICAP® 180R sensor for long-lasting accuracy
- 3-point traceable calibration (certificate included)
- Default output parameters are relative humidity and temperature. Dew point temperature, wet bulb temperature, and enthalpy outputs selectable with a PC connection
- Current output (4 ... 20 mA)
- On-site calibration with HM70 Hand-Held Meter or PC connection
- Ingress protection IP65

Vaisala HMS110 Series HUMICAP® Humidity and Temperature Transmitters are designed for demanding outdoor measurements in building automation applications. These ± 2 % transmitters include an integrated radiation shield to reduce the influence of solar radiation on temperature and humidity measurements.

Proven Vaisala HUMICAP® Performance for Outdoor Measurements

HMS110 transmitters are equipped with the trusted HUMICAP® 180R – a robust, general-purpose humidity sensor that functions well in high humidity. The sensor's superior stability ensures long-lasting accuracy and minimal maintenance throughout the transmitter's lifetime.

The integrated radiation shield allows unrivaled measurement performance, reducing the impact of sunshine on temperature and humidity measurements and ensuring measurement accuracy in outdoor conditions.

Easy Installation and Maintenance

HMS110 transmitters are easy to install. They can be mounted directly onto a wall or pole without any extra accessories. There are no loose parts, screws are retained in the enclosure, all connectors are clearly labeled, and the connectors are within easy reach.

The HUMICAP® sensor's excellent long-term stability and high-quality materials ensure minimal need for maintenance. If necessary, the transmitter can be field-calibrated using either HM70 Hand-Held Humidity and Temperature Meter, or a PC connection.

Technical Data

Models

Model	Type	Output	IP Rating
HMS110	Outdoor, RH+T	2-wire, current output	IP65
HMS112	Outdoor, RH+T	2-wire, current output	IP65

HMS110 is delivered with customer specific output settings, including calculated humidity parameters and special scaling of outputs.

Measurement Performance

Relative Humidity

Measurement range	0 ... 100 %RH
Stability in typical HVAC applications	±0.5 %RH/year
Humidity sensor	Vaisala HUMICAP® 180R

Accuracy at temperature range +10 ... +30 °C (+50 ... +86 °F):

0 ... 90 %RH	±2 %RH
90 ... 100 %RH	±3 %RH

Accuracy at temperature range -20 ... +10 °C, +30 ... +60 °C (-4 ... +50 °F, +86 ... +140 °F):

0 ... 90 %RH	±3 %RH
90 ... 100 %RH	±4 %RH

Accuracy at temperature range -40 ... -20 °C (-40 ... -4 °F):

0 ... 100%RH	±4 %RH
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Temperature

Measurement range	-40 ... +60 °C (-40 ... +140 °F)
Accuracy at +20 °C (+68 °F)	±0.2 °C (±0.36 °F)
Temperature dependence	±0.01 °C/°C
Temperature sensor	Pt1000 RTD Class F0.1 IEC 60751

Calculated Parameters

Factory calibration uncertainty at 20 °C (+68 °F)	±1.5 %RH/±0.2 °C
Measurement range for dew point temperature and wet bulb temperature	-40 ... +60 °C (-40 ... +140 °F)
Measurement range for enthalpy	-40 ... 460 kJ/kg (-10 ... +190 BTU/lb)
Accuracy of the calculated parameters should be calculated at the actual condition based on the RH and temperature specification.	
Accuracy at 20 °C (68 °F) and 80 %RH:	
Dew point	±0.7 °C (1.2 °F)
Wet bulb temperature	±0.5 °C (0.9 °F)
Enthalpy	±1.6 kJ/kg (0.7 BTU/lb)

Operating Environment

Operating temperature	-40 ... +60 °C (-40 ... +140 °F)
Operating humidity	0 ... 100 %RH
Maximum wind/flow speed	30 m/s (67 mph)
Storage temperature	-40 ... +60 °C (-40 ... +140 °F)
EMC compliance	EN61326-1, Industrial Environment

Inputs and Outputs

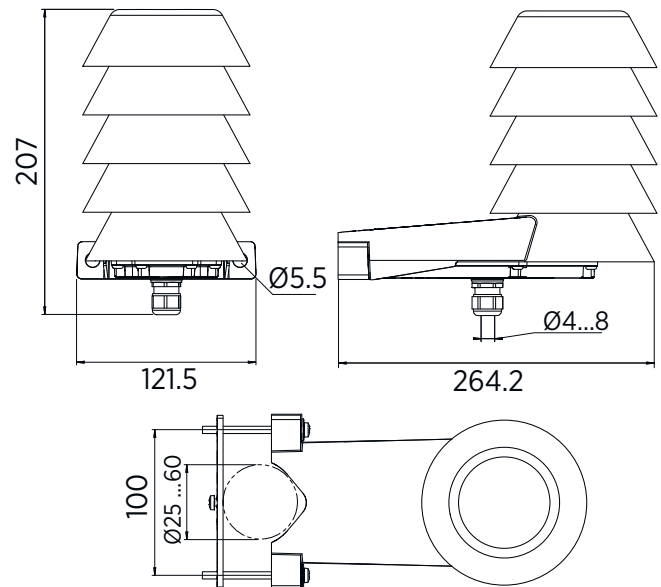
Analog outputs	4 ... 20 mA, loop powered
Loop resistance	0 ... 600 Ω
Supply voltage	20 ... 28VDC at 600 Ω load 10 ... 28VDC at 0 Ω load
Data input for RDP100 Remote Panel Display	RS-485 Vaisala proprietary protocol

Mechanical Specifications

Max. wire size	1.5 mm ² (AWG 16)
Standard housing color	White (RAL9003)
Housing material	PC + 10 %GF (UL-V0 approved)

Spare Parts and Accessories

Remote Panel Display	RDP100
Conduit fitting + O-ring (M16 × 1.5 / NPT1/2 Inch)	210675SP
Conduit fitting + O-ring (M16 × 1.5 / PG9, RE-MS)	210674SP
Fastening set HMS110	237805
Membrane Filter	ASM210856SP
Terminal Block, Blue	236620SP
USB cable for PC connection	219690
Connection cable for HM70 hand-held meter	219980SP
HUMICAP® 180R sensor	HUMICAP180R



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HMDW80 Series Humidity and Temperature Transmitters

For Building Automation Applications



Features

- Reliable transmitters for basic HVAC humidity measurements
- ± 3.0 %RH accuracy
- Full 0 ... 100 %RH measurement range
- Optimized for easy installation and low maintenance
- User exchangeable INTERCAP® sensor for easy field replacement
- UL-V0 flammability rating
- Output parameters: relative humidity and temperature with optional dew point temperature, wet bulb temperature and enthalpy parameters

Vaisala HMDW80 Series INTERCAP® Humidity and Temperature Transmitters measure relative humidity and temperature in various building automation applications. HMDW80 series transmitters combine easy installation and reliable operation with a low requirement for maintenance.

Typical Installation Locations

- Ventilation ducts
- Walls
- Wash-down areas
- Outdoor locations

The versatile HMDW80 series includes transmitters for wall and duct mounting, IP65-classified transmitters for humid areas, and transmitters with a radiation shield for outdoor use. It also includes temperature-only transmitters and transmitters with an optional display.

Calculated humidity parameters – dew point temperature, wet bulb temperature, and enthalpy – are also available.

Easy Installation

HMDW80 series transmitters are optimized for easy installation. There are no loose parts, screws are retained in the enclosure, all connectors are clearly labeled, and the connectors are within easy reach.

The duct mount transmitters are well suited to a variety of duct sizes, the outdoor transmitters can be mounted directly onto a wall or pole without any

extra accessories, and the wall mount transmitters can be installed without the need to make holes in the transmitter enclosure.

Reliable Operation

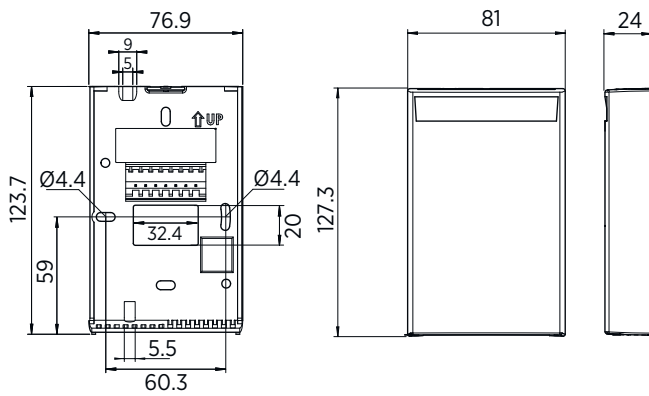
HMDW80 series transmitters require minimal maintenance thanks to their excellent sensor stability and high-quality materials. If necessary, the INTERCAP® sensor can be easily exchanged in the field with minimum downtime.

Model number	Type	Output	Special Features	IP rating
TMW82	Wall-mount, T-only	2-wire, current output		IP30
TMW83	Wall-mount, T-only	3-wire, voltage output		IP30
HMW82	Wall-mount, RH+T	2-wire, current output		IP30
HMW82P100	Wall mount, RH+T	2-wire, current output	Additional Pt100 sensor	IP30
HMW83	Wall-mount, RH+T	3-wire, voltage output		IP30
TMW88	Wall-mount, T-only	2-wire, current output		IP65
HMW88	Wall-mount, RH+T	2-wire, current output	Calculated parameters ¹⁾	IP65
HMW88D	Wall-mount, RH+T	2-wire, current output	Display, calculated parameters ¹⁾	IP65
HMW89	Wall-mount, RH+T	3-wire, voltage output	Calculated parameters ¹⁾	IP65
HMW89D	Wall-mount, RH+T	3-wire, voltage output	Display, calculated parameters ¹⁾	IP65
TMD82	Duct-mount, T-only	2-wire, current output		IP65
TMD83	Duct-mount, T-only	3-wire, voltage output		IP65
HMD82	Duct-mount, RH+T	2-wire, current output	Calculated parameters ¹⁾	IP65
HMD82D	Duct-mount, RH+T	2-wire, current output	Display, calculated parameters ¹⁾	IP65
HMD83	Duct-mount, RH+T	3-wire, voltage output	Calculated parameters ¹⁾	IP65
HMD83D	Duct-mount, RH+T	3-wire, voltage output	Display, calculated parameters ¹⁾	IP65
HMS82	Outdoor, RH+T	2-wire, current output	Radiation shield, calculated parameters ¹⁾	IP65
HMS82C	Outdoor, RH+T	2-wire, current output	HMS82 with NPT ½" conduit fitting ¹⁾	IP65
HMS83	Outdoor, RH+T	3-wire, voltage output	Radiation shield, calculated parameters ¹⁾	IP65
HMS83C	Outdoor, RH+T	3-wire, voltage output	HMS83 with NPT ½" conduit fitting ¹⁾	IP65

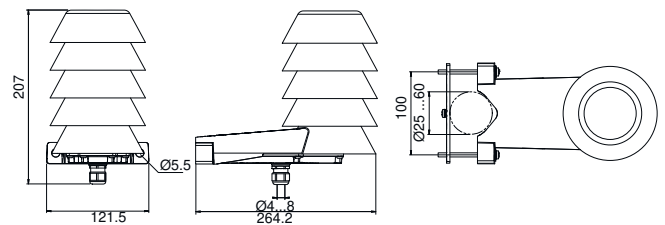
1) Output parameters for humidity: relative humidity, dew point temperature, wet bulb temperature, and enthalpy.

Dimensions

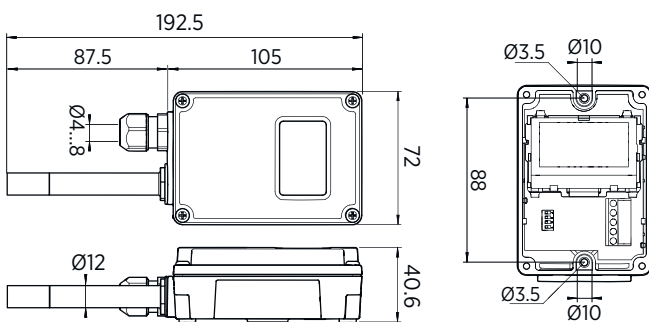
HMW82/83 RH+T and TMW82/83 T-only transmitters for wall-mounting



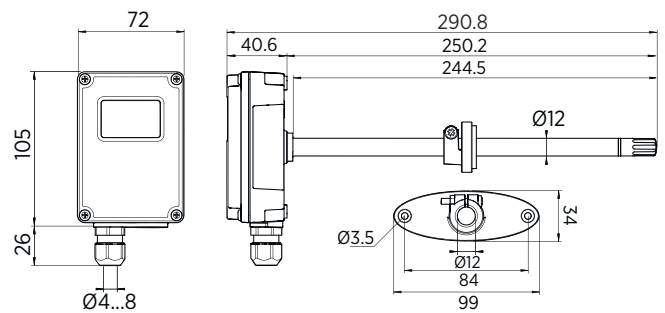
HMS82/83 RH+T transmitters for outdoor measurements



HMW88/89(D) and TMW88 RH+T transmitters for measurements in wet areas



HMD82/83(D) and TMD82/83 RH+T and T-only transmitters for ducts



Technical Data

Measurement Performance, Models HMW82/83 and TMW82/83

Relative Humidity	
Measurement range	0 ... 100 %RH
Accuracy in temperature range +10 ... +30 °C (+50 ... +86 °F)	±3 %RH (0 ... 70 %RH) ±5 %RH (70 ... 100 %RH)
Accuracy in temperature range -5 ... +10 °C, +30 ... +55 °C (+23 ... +50 °F, +86 ... +131 °F)	±7 %RH (0 ... 100 %RH)
Stability in typical HVAC applications	±2 %RH over 2 years
Humidity sensor	Vaisala INTERCAP®
Temperature	
Measurement range	-5 ... +55 °C (+23 ... +131 °F)
Accuracy at +10 ... +30 °C (+50 °F ... +86 °F)	±0.5 °C (±0.9 °F)
Accuracy at -5 ... +10 °C, +30 ... +55 °C (+23 ... +50 °F, +86 ... +131 °F)	±1.0 °C (±1.8 °F)
Temperature sensor	Digital temperature sensor
Temperature sensor HMW82P100	Pt100 Class F 0.1 IEC 60751, 3-wire connection

Measurement Performance, Models HMD82/83, TMD82/83, HMW88/89, TMW88 and HMS82/83

Relative Humidity	
Measurement range	0 ... 100 %RH
Accuracy in temperature range +10 ... +30 °C (+50 ... +86 °F)	±3 %RH (0 ... 90 %RH) ±5 %RH (90 ... 100 %RH)
Accuracy in temperature range -20 ... +10 °C, +30 ... +60 °C (-4 ... +50 °F, +86 ... +140 °F)	±5 %RH (0 ... 90 %RH) ±7 %RH (90 ... 100 %RH)
Accuracy in temperature range -40 ... -20 °C (-40 ... -4 °F)	±7 %RH (0 ... 100 %RH)
Stability in typical HVAC applications	±2 %RH over 2 years
Humidity sensor	Vaisala INTERCAP®
Temperature	
Measurement range	-40 ... +60 °C (-40 ... +140 °F)
Accuracy at +20 °C (+68 °F)	±0.3 °C (±0.54 °F)
Temperature dependence	±0.01 °C/ °C
Temperature sensor	Pt1000 RTD Class F0.1 IEC 60751
Calculated Parameters	
Measurement range for dew point temperature and wet bulb temperature	-40 ... +60 °C (-40 ... +140 °F)
Measurement range for enthalpy	-40 ... 460 kJ/kg (-10 ... +190 BTU/lb)

Operating Environment

Maximum wind/flow speed	30 m/s
Storage temperature	-40 ... +60 °C (-40 ... +140 °F)
EMC compliance	EN61326-1, Industrial Environment
Operating Temperature	
HMW82/83 and TMW82/83	-5 ... +55 °C (+23 ... +131 °F)
HMD82/83, TMD82/83, HMW88/89, TMW88 and HMS82/83	-40 ... +60 °C (-40 ... +140 °F)
HMD82/83D and HMW88/89D	-5 ... +60 °C (+23 ... +140 °F)
Operating Humidity	
HMD82/83, TMD82/83, HMW88/89, TMW88 and HMS82/83	0 ... 100 %RH
HMW82/83, TMW82/83, HMD82/83D and HMW88/89D	0 ... 100 %RH, non-condensing

Measurement Performance, Models HMD82/83D and HMW88/89D

Relative Humidity	
Measurement range	0 ... 100 %RH
Accuracy in temperature range +10 ... +30 °C (+50 ... +86 °F)	±3 %RH (0 ... 90 %RH) ±5 %RH (90 ... 100 %RH)
Accuracy in temperature range -5 ... +10 °C, +30 ... +60 °C (+23 ... +50 °F, +86 ... +140 °F)	±5 %RH (0 ... 90 %RH) ±7 %RH (90 ... 100 %RH)
Stability in typical HVAC applications	±2 %RH over 2 years
Humidity sensor	Vaisala INTERCAP®
Temperature	
Measurement range	(Analog output scaling) -40 ... +60 °C (-40 ... +140 °F)
Accuracy at +20 °C (+68 °F)	±0.3 °C (±0.54 °F)
Temperature dependence	±0.01 °C/ °C
Temperature sensor	Pt1000 RTD Class F0.1 IEC 60751
Calculated Parameters	
Measurement range for dew point temperature and wet bulb temperature	-40 ... +60 °C (-40 ... +140 °F)
Measurement range for enthalpy	-40 ... 460 kJ/kg (-10 ... +190 BTU/lb)

Inputs and Outputs

Current output models (2-wire)	
Outputs	4 ... 20 mA, loop powered
Loop resistance	0 ... 600 Ω
Supply voltage	20 ... 28 VDC at 600 Ω load 10 ... 28 VDC at 0 Ω load
Voltage output models (3-wire)	
Outputs	0 ... 10 V
Load resistance	10 kΩ min
Supply voltage	18 ... 35 VDC 24 VAC ±20 % 50/60 Hz

Mechanical Specifications

Max wire size	1.5 mm ² (AWG 16)
Standard housing color	White (RAL9003)
Housing material	
HMW82/83, TMW82/83	ABS/PC (UL-V0 approved)
HMW88/89(D), HMD82/83(D), TMW88, TMD82/83, HMS82/83	PC + 10 %GF (UL-V0 approved)

Spare Parts and Accessories

INTERCAP sensor	15778HM
10 pcs of INTERCAP sensors	INTERCAPSET-10PCS
Conduit fitting + O-ring (M16x1.5 / NPT1/2 Inch)	210675SP
Conduit fitting + O-ring (M16x1.5 / PG9, RE-MS)	210674SP
Fastening set HMS80	237805
Porous PTFE Filter	DRW239993SP
Membrane Filter	ASM210856SP
Terminal Block, Blue	236620SP
HMD80 display lid	ASM210793SP

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