

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
- Analog and Modbus® RTU output models available
- 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
- Indoor spaces
- 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, transmitters with an optional display, and models with Modbus RTU output.

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.

Flexible connectivity

For easy access to configuration and device analytics functionalities, transmitter models HMW87 and HMW87D can also be connected to Vaisala Insight PC software for Windows® and the Vaisala Indigo80 Handheld Indicator. For more information, see vaisala.com/insight and vaisala.com/indigo80.

Model number	Type	Output	Special features	IP rating
TMW82	Wall-mount, T-only	2-wire, current 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
XMW85 ¹⁾	Wall-mount, RH+T or RH+T+CO ₂	Modbus RTU output	Configurable model with own Order Form ²⁾ Optional display	IP30
HMW87	Wall-mount, RH+T	Modbus RTU output	Calculated parameters ³⁾	IP65
HMW87D	Wall-mount, RH+T	Modbus RTU output	Display Calculated parameters ³⁾	IP65
TMW88	Wall-mount, T-only	2-wire, current output		IP65
HMW88	Wall-mount, RH+T	2-wire, current output	Calculated parameters ³⁾	IP65
HMW88D	Wall-mount, RH+T	2-wire, current output	Display Calculated parameters ³⁾	IP65
HMW89	Wall-mount, RH+T	3-wire, voltage output	Calculated parameters ³⁾	IP65
HMW89D	Wall-mount, RH+T	3-wire, voltage output	Display Calculated parameters ³⁾	IP65
TMD82	Duct-mount, T-only	2-wire, current output		IP65
HMD82	Duct-mount, RH+T	2-wire, current output	Calculated parameters ³⁾	IP65
HMD82D	Duct-mount, RH+T	2-wire, current output	Display Calculated parameters ³⁾	IP65
HMD83	Duct-mount, RH+T	3-wire, voltage output	Calculated parameters ³⁾	IP65
HMD83D	Duct-mount, RH+T	3-wire, voltage output	Display Calculated parameters ³⁾	IP65
TMS82	Outdoor, T-only	2-wire, current output	Radiation shield	IP65
HMS82	Outdoor, RH+T	2-wire, current output	Radiation shield Calculated parameters ³⁾	IP65
HMS82C	Outdoor, RH+T	2-wire, current output	HMS82 with NPT ½" conduit fitting ³⁾	IP65
HMS83	Outdoor, RH+T	3-wire, voltage output	Radiation shield Calculated parameters ³⁾	IP65
HMS83C	Outdoor, RH+T	3-wire, voltage output	HMS83 with NPT ½" conduit fitting ³⁾	IP65

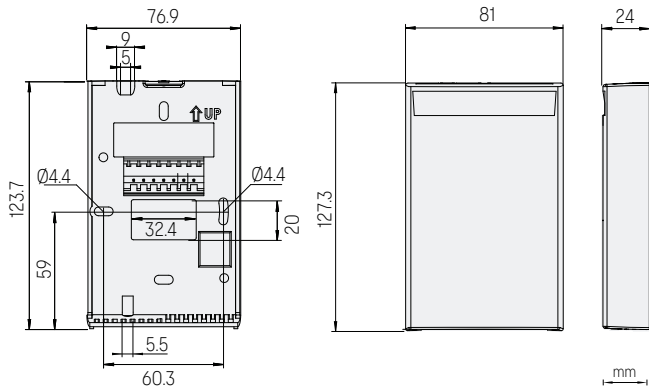
1) For more information, see the *XMW85 Series Datasheet*, available at docs.vaisala.com.

2) *XMW85 Order Form* available at docs.vaisala.com.

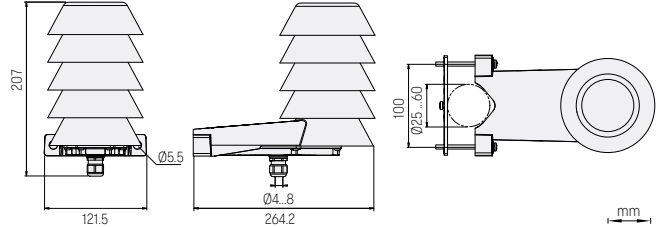
3) Output parameters for humidity: relative humidity, dew point temperature, wet bulb temperature, and enthalpy.

Dimensions

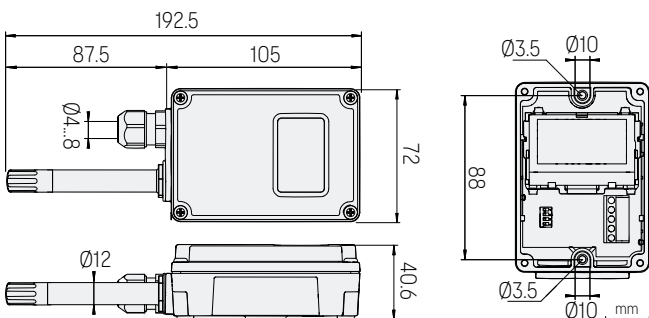
HMW82/83 RH+T and TMW82 T-only transmitters for wall-mounting (IP30)



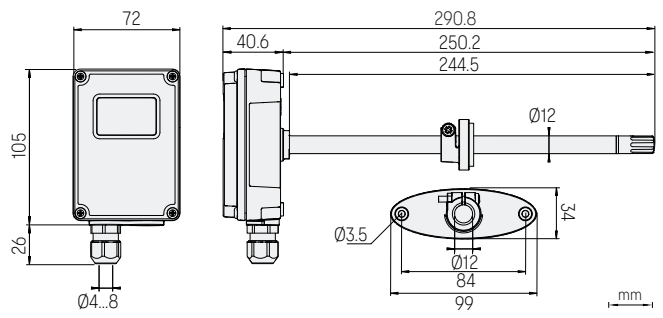
HMS82/83 RH+T and TMS82 T-only transmitters for outdoor measurements (IP65)



HMW87(D), HMW88/89(D) RH+T, and TMW88 T-only transmitters for wall-mounting (IP65)



HMD82/83(D) RH+T and TMD82 T-only transmitters for ducts (IP65)



Technical data

Measurement performance, HMW82, HMW83, and TMW82

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 ¹⁾	
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

¹⁾ For model-specific operating temperature ranges, see table 'Operating environment'.

Measurement performance, HMW87(D)

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 ... +70 °C (–4 ... +50 °F, +86 ... +158 °F)	±5 %RH (0–90 %RH) ±7 %RH (90–100 %RH)
Accuracy in temperature range –40 ... –20 °C (–40 ... –4 °F)	±7 %RH (90–100 %RH)
Stability in typical HVAC applications	±2 %RH over 2 years
Humidity sensor	Vaisala INTERCAP®
Temperature ¹⁾	
Measurement range	–40 ... +70 °C (–40 ... +158 °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 ... +70 °C (–40 ... +158 °F)
Measurement range for enthalpy	–40 ... 805 kJ/kg (–10 ... +358 BTU/lb)

¹⁾ For model-specific operating temperature ranges, see table 'Operating environment'.

Measurement performance, HMD82(D), HMD83(D), TMD82, HMW88(D), HMW89(D), TMW88, HMS82, HMS83, and TMS82

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 ¹⁾	
Measurement range	–40 ... +60 °C (–40 ... +140 °F) (Analog output scaling –40 ... +60 °C)
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)

¹⁾ For model-specific operating temperature ranges, see table 'Operating environment'.

Operating environment

Operating humidity	0–100 %RH
Maximum wind/flow speed	30 m/s
IP rating	See the table on page 2 of this document
Operating temperature	
HMW87	–40 ... +70 °C (–40 ... +158 °F) ¹⁾
HMW87D	–20 ... +70 °C (–4 ... +158 °F) ^{1) 2)}
HMW82/83 and TMW82	–5 ... +55 °C (+23 ... +131 °F)
HMD82/83, TMD82, HMW88/89, TMW88, HMS82/83, TMS82	–40 ... +60 °C (–40 ... +140 °F)
HMD82/83D, HMW88/89D	–5 ... +60 °C (+23 ... +140 °F)
Storage temperature	
HMW87	–40 ... +70 °C (–40 ... +158 °F) ¹⁾
HMW87D	–30 ... +70 °C (–22 ... +158 °F) ¹⁾
Other models	–40 ... +60 °C (–40 ... +140 °F)

¹⁾ Not for permanent exposure to temperatures > +60 °C (+140 °F).

²⁾ Display performance may vary near the extremes of the operating temperature range.

Inputs and outputs

Devices with current output (2-wire models)

Outputs	4–20 mA, loop powered
Loop resistance	0–600 Ω
Supply voltage	20–28 V DC at 600 Ω load 10–28 V DC at 0 Ω load

Devices with voltage output (3-wire models)

Outputs	0–10 V
Load resistance	10 kΩ min
Supply voltage	18–35 V DC 24 V AC ±20 % 50/60 Hz

Devices with Modbus output ¹⁾

Interface	RS-485, not isolated, no line termination
Protocols	Modbus RTU
Default serial settings	19200 bps N 8 2
Default Modbus device address	240
Supply voltage	10–28 V DC

¹⁾ See table 'Spare parts and accessories' for a list of configuration cables needed for HMW87 and HMW87D.

Spare parts and accessories

INTERCAP sensor	15778HM
10 pcs of INTERCAP sensors	INTERCAPSET-10PCS
Porous PTFE filter	DRW239993SP
Membrane filter	ASM210856SP
Conduit fitting + O-ring (M16×1.5 / NPT 1/2")	210675SP
Conduit fitting + O-ring (M16×1.5 / PG9, RE-MS)	210674SP
Terminal block, blue	236620SP
Front cover ¹⁾	ASM210793SP
Model-specific accessories	
Fastening set for HMS80	237805
Magnetic bracket ²⁾	ASM215638SP
Configuration cables for HMW87 and HMW87D:	
Vaisala Indigo USB adapter and M12 - M8 service cable (1.5 m (4 ft 11 in)), for connecting to Insight software ³⁾	USB2 and 262195SP
M12 - M8 service cable (1.5 m (4 ft 11 in)), for connecting to Indigo80	262195SP

¹⁾ For models HMD82D, HMD83D, HMW87D, HMW88D, and HMW89D.

²⁾ For wall-mount models HMW87, HMW87D, HMW88, HMW88D, TMW88, HMW89, and HMW89D.

³⁾ Vaisala Insight PC Software for Windows® is available at vaisala.com/insight.

Mechanical specifications

Max. wire size	1.5 mm ² (AWG 16)
Standard housing color	White (RAL9003)

Housing material

HMW82/83, TMW82	ABS/PC (UL-V0 approved)
HMW87(D), HMW88/89(D), HMD82/83(D), TMW88, TMD82, HMS82/83, TMS82	PC + 10 %GF (UL-V0 approved)

Compliance

EU directives and regulations	EMC Directive (2014/30/EU) RoHS Directive (2011/65/EU) as amended by 2015/863
Electromagnetic compatibility (EMC)	EN 61326-1, basic electromagnetic environment ¹⁾
EMC emissions	CISPR 32 / EN 55032, Class B FCC part 15 B, Class B ICES-3 / NMB-3 (Class B)
Compliance marks	CE, China RoHS, RCM

¹⁾ HMW87 and HMW87D transmitter models fulfill the requirements for industrial electromagnetic environment, considering that a maximum permissible electrostatic air discharge of ±7 kV has been specified for these products.