VAISALA

**Bid Specification**

2024-02-28



# HMD82 Humidity and Temperature Duct Mount Transmitter for Building Automation Applications

**Features/Benefits:**

- Reliable transmitters for basic HVAC humidity measurements
- Relative humidity measurement accuracy up to ± 3.0 %RH
- Temperature measurement accuracy up to ± 0.5 °C (± 0.9 °F)
- Loop powered, 4 ... 20 mA output signals
- IP65 rated enclosure
- Optional display available with HMD82D model
- Optimized for easy installation and low maintenance
- User exchangeable INTERCAP® sensor for easy field replacement
- Output parameters available: relative humidity, temperature, dew point temperature, wet-bulb temperature, and enthalpy
- **Note:** DIP switches available on HMD82 & HMD82D to control humidity output parameter and scaling

**Summary:**

Duct mounted transmitters shall incorporate a thin-film polymer capacitive INTERCAP® relative humidity sensor. Sensor to be interchangeable in the field without requiring calibration. Accuracy is to be ± 3 %RH from 0 ... 90 %RH and ± 5 %RH from 90 ... 100 %RH between +10 ... +30 °C (+50 ... +86 °F). Sensor to have a stability of ± 2 %RH over a two year period in typical HVAC conditions. Temperature sensor shall be a platinum 1000 Ω RTD with a linear output of 4 … 20 mA corresponding to -40 ... +60 °C (-40 ... +140°F) with an accuracy of ± 0.3 °C (± 0.54 °F) at +20 °C (+68 °F). Transmitter to be loop powered by 10 … 28 VDC (at 0 Ω load) or 20 … 28 VDC (at 600 Ω load) and provide a linear output signal of 4 … 20 mA corresponding to 0 ... 100 %RH. Shall have options to calculate and output additional parameters including: dew point temperature, wet-bulb temperature, and enthalpy. Available models are listed below:

**Vaisala Model:** HMD82 (Relative Humidity and Dry-Bulb Temperature)
**Vaisala Model:** HMD82D (Relative Humidity and Dry-Bulb Temperature with Display)
**Vaisala Model:** HMD82TD (Dew Point Temperature and Dry-Bulb Temperature)
**Vaisala Model:** HMD82W (Wet-Bulb Temperature and Dry-Bulb Temperature)
**Vaisala Model:** HMD82H (Enthalpy and Dry-Bulb Temperature)
**Vaisala Model:** TMD82 (Dry-Bulb Temperature Only, 1 analog output channel)

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# HMD83 Humidity and Temperature Duct Mount Transmitter for Building Automation Applications

## Features/Benefits

- Reliable transmitters for basic HVAC humidity measurements
- Relative humidity measurement accuracy up to ± 3.0 %RH
- Temperature measurement accuracy up to ± 0.5 °C (± 0.9 °F)
- 3-wire, 0 ... 10 V output signals
- User exchangeable INTERCAP® sensor for easy field replacement
- Optional display available with HMD83D model
- Optimized for easy installation and low maintenance
- IP65 rated enclosure
- Output parameters available: relative humidity, temperature, dew point temperature, wet-bulb temperature, and enthalpy
- **Note:** DIP switches available on HMD83 & HMD83D to control humidity output parameter and scaling

**Summary:**

Duct mounted transmitters shall incorporate a thin-film polymer capacitive INTERCAP® relative humidity sensor. Sensor is to be interchangeable in the field without requiring calibration. Accuracy is to be ±3 %RH from 0... 90 %RH and ± 5 %RH from 90 ... 100 %RH between +10 ... +30 °C (+50 ... +86 °F). Sensor to have a stability of ± 2 %RH over a two year period in typical HVAC conditions. Temperature sensor shall be a platinum 1000 Ω RTD with a linear output of 0 … 10 V corresponding to -40 ... +60 °C (-40 ... +140 °F) with an accuracy of ± 0.3 °C (± 0.54 °F) at +20 °C (+68 °F). Transmitter to be powered by 18 … 35 VDC or 24 VAC ± 20 % 50/60 Hz and provide a linear output signal of 0 … 10 V corresponding to 0 ... 100 %RH. Shall have options to calculate and output additional parameters: dew point temperature, wet-bulb temperature, and enthalpy. Available models are listed below:

**Vaisala Model:** HMD83 (Relative Humidity and Dry-Bulb Temperature)
**Vaisala Model:** HMD83D (Relative Humidity and Dry-Bulb Temperature with Display)
**Vaisala Model:** TMD83 (Dry-Bulb Temperature Only)

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# HMS82 Humidity and Temperature Outdoor Transmitter for Building Automation Applications

**Features/Benefits:**

- Reliable transmitters for basic HVAC humidity measurements
- Relative humidity measurement accuracy up to ± 3.0 %RH
- Temperature measurement accuracy up to ± 0.5 °C (± 0.9 °F)
- Loop powered, 4 ... 20 mA output signals
- User exchangeable INTERCAP® sensor for easy field replacement
- Ingress protection IP65
- Output parameters available: relative humidity, temperature, dew point temperature, wet-bulb temperature, and enthalpy
- Shield protects temperature and humidity probes from scattered, as well as direct solar radiation, and precipitation
- Easy to install on a pole, horizontal beam, or flat surface
- **Note:** DIP switches available on HMS82 model to control humidity output parameter and scaling

**Summary:**

Outdoor mounted transmitter shall incorporate a thin-film polymer capacitive INTERCAP® relative humidity sensor. Sensor is to be interchangeable in the field without requiring calibration. Transmitter probe is to be integrated in a naturally aspirated solar radiation and precipitation shield. Accuracy is to be ± 3 %RH from 0 ... 90 %RH and ± 5 %RH from 90 ... 100 %RH between +10 ... +30 °C (+50 ... +86 °F). Sensor to have a stability of ± 2 %RH over a two year period in typical HVAC conditions. Temperature sensor shall be a platinum 1000 Ω RTD with a linear output of 4 … 20 mA corresponding to -40 ... +60 °C (-40 ... +140°F) with an accuracy of ± 0.3 °C (± 0.54 °F) at +20 °C (+68 °F). Transmitter to be loop powered by 10 … 28 VDC (at 0 Ω load) or 20 … 28 VDC (at 600 Ω load) and provide a linear output signal of 4 … 20 mA corresponding to 0 ... 100 %RH. Shall have options to calculate and output additional parameters: dew point temperature, wet-bulb temperature, and enthalpy. Available models are listed below:

**Vaisala Model:** HMS82 (Relative Humidity and Dry-Bulb Temperature)
**Vaisala Model:** HMS82C (Relative Humidity and Dry-Bulb Temperature with NPT ½" conduit fitting)
**Vaisala Model:** HMS82TD (Dew point Temperature and Dry-Bulb Temperature)
**Vaisala Model:** HMS82W (Wet-bulb Temperature and Dry-Bulb Temperature)
**Vaisala Model:** HMS82H (Enthalpy and Dry-Bulb Temperature)
**Vaisala Model:** TMS82 (Dry-Bulb Temperature Only, 1 analog output channel)

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# HMS83 Outdoor Humidity and Temperature Transmitter for Building Automation

**Features/Benefits:**

- Reliable transmitters for basic HVAC humidity measurements
- Relative humidity measurement accuracy up to ± 3.0 %RH
- Temperature measurement accuracy up to ± 0.5 °C (± 0.9 °F)
- 3-wire, 0 ... 10 V output signals
- Ingress protection IP65
- User exchangeable INTERCAP® sensor for easy field replacement
- Output parameters available: relative humidity, temperature, dew point temperature, wet-bulb temperature, and enthalpy
- Shield protects temperature and humidity probes from scattered, as well as direct solar radiation and rain
- Easy to install on a pole, horizontal beam, or flat surface
- **Note:** DIP switches available on HMS83 model to control humidity output parameter and scaling

**Summary:**

Outdoor mounted transmitter shall incorporate a thin-film polymer capacitive INTERCAP® relative humidity sensor. Sensor is to be interchangeable in the field without requiring calibration. Transmitter probe is to be integrated in a naturally aspirated solar radiation and precipitation shield. Accuracy is to be ± 3 %RH from 0 ... 90 %RH and ± 5 %RH from 90 ... 100 %RH between +10 ... +30 °C (+50 ... +86 °F). Sensor to have a stability of ± 2 %RH over a two year period in typical HVAC conditions. Temperature sensor shall be a platinum 1000 Ω RTD with a linear output of 0 … 10 V corresponding to -40 ... +60 °C (-40 ... +140 °F) with an accuracy of ± 0.3 °C (± 0.54 °F) at +20 °C (+68 °F). Transmitter to be powered by 18 … 35 VDC or 24 VAC ± 20 % 50/60 Hz and provide a linear output signal of 0 … 10 V corresponding to 0 ... 100 %RH. Shall have options to calculate and output additional parameters: dew point temperature, wet-bulb temperature, and enthalpy. Available models are listed below:

**Vaisala Model:** HMS83 (Relative Humidity and Dry-Bulb Temperature)

**Vaisala Model:** HMS83C (Relative Humidity and Dry-Bulb Temperature with NPT ½” conduit fitting)

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# HMW82 Humidity and Temperature Transmitters for Building Automation Applications

**Features/Benefits:**

- Reliable wall-mounted transmitter for basic HVAC humidity measurements
- Relative humidity measurement accuracy up to ± 3.0 %RH
- Temperature measurement accuracy up to ± 0.5 °C (± 0.9 °F)
- Loop powered, 4 ... 20 mA output signals
- IP30 rated enclosure
- User exchangeable INTERCAP® sensor for easy field replacement; optimized for easy installation and low maintenance


**Summary:**

Wall-mounted transmitters shall incorporate a thin-film polymer capacitive INTERCAP® relative humidity sensor. Humidity sensor is to be calibration-free and interchangeable in the field. Instrument must be able to measure 0 ... 100 %RH with accuracy of ± 3 %RH from 0 ... 70 %RH and ± 5 %RH from 70 ... 100 %RH between +10 ... +30 °C (+50 ... +86 °F). Humidity sensor must have a stability of at least ± 2 %RH over a two year period in typical HVAC applications. Temperature sensor shall be digital (or Pt100 if using HMW82P100 model) with a linear output of 4 … 20 mA corresponding -5 °C to 55 °C (+23 ... +131 ºF). Transmitter is to be loop powered by 10 … 28 VDC (at 0 Ω load) or 20 … 28 VDC (at 600 Ω load) and provide a linear output signal of 4 … 20 mA corresponding to 0 ... 100% RH. Available models are listed below:


**Vaisala Model:** HMW82 (Relative Humidity and Dry-Bulb Temperature)
**Vaisala Model:** TMW82 (Dry-Bulb Temperature Only)
**Vaisala Model:** HMW82P100 (Relative Humidity and Dry-Bulb Temperature with additional Pt100 temperature sensor)


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# HMW83 Humidity and Temperature Transmitters for Building Automation Applications

**Features/Benefits:**

- Reliable wall-mounted transmitter for basic HVAC humidity measurements
- Relative humidity measurement accuracy up to ± 3.0 %RH
- Temperature measurement accuracy up to ± 0.5 °C (± 0.9 °F)
- 3-wire, 0 ... 10 V output signals
- IP30 rated enclosure
- User exchangeable INTERCAP® sensor for easy field replacement; optimized for easy installation and low maintenance

**Summary:**

Wall-mounted transmitters shall incorporate a thin-film polymer capacitive INTERCAP® relative humidity sensor. Humidity sensor is to be calibration-free and interchangeable in the field. Instrument must be able to measure 0 ... 100 %RH with accuracy of ± 3 %RH from 0 ... 70 %RH and ± 5 %RH from 70 ... 100 %RH between +10 ... +30 °C (+50 ... +86 °F). Humidity sensor must have a stability of at least ± 2 %RH over a two year period in typical HVAC applications. Temperature sensor shall be digital with a linear output of 0 … 10 V corresponding to -5 ... 55 °C (+23 ... +131 ºF). Transmitter to be powered by 18 … 35 VDC or 24 VAC ± 20 % 50/60 Hz and provide a linear output signal of 0 … 10 V corresponding to 0 ... 100 %RH. Available models are listed below:

**Vaisala Model:** HMW83 (Relative Humidity and Dry-Bulb Temperature)

**Vaisala Model:** TMW83 (Dry-Bulb Temperature Only)

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# HMW88 Humidity and Temperature Transmitter for Building Automation Applications

**Features/Benefits:**

- Reliable wall-mounted transmitter for basic HVAC humidity measurements
- Relative humidity measurement accuracy up to ± 3.0 %RH
- Temperature measurement accuracy up to ± 0.3 °C (± 0.54 °F)
- Loop-powered, 4 ... 20 mA output signals
- User exchangeable INTERCAP® sensor for easy field replacement; optimized for easy installation and low maintenance
- Optional display available with HMW88D model
- IP65 rated enclosure
- Output parameters available: relative humidity, temperature, dew point temperature, wet-bulb temperature, enthalpy
- **Note:** DIP switches available on HMW88 & HMW88D to control humidity output parameter and scaling

**Summary:**

Wall-mounted transmitters shall incorporate a thin-film polymer capacitive INTERCAP® relative humidity sensor. Humidity sensor is to be calibration free and interchangeable in the field. Instrument must be able to measure 0 ... 100 %RH with accuracy of ± 3% RH from 0 ... 90 %RH and ± 5 %RH from 90 ... 100 %RH between +10 ... +30 °C (+50 ... +86 °F). Humidity sensor must have a stability of at least ± 2 %RH over a two year period in typical HVAC applications. Temperature sensor shall be a platinum 1000 Ω RTD with a linear output of 4 ... 20 mA corresponding to -40 ... +60 °C (-40 ... +140 °F) with an accuracy of ± 0.3 °C (± 0.54 °F) at +20 °C (+68 °F). Transmitter is to be loop powered by 10 … 28 VDC (at 0 Ω load) or 20 … 28 VDC (at 600 Ω load) and provide a linear output signal of 4 … 20 mA corresponding to 0 ... 100 %RH. Instrument must have options to calculate and output additional parameters such as: dew point temperature, wet-bulb temperature, and enthalpy. Available models are listed below:

**Vaisala Model:** HMW88 (Relative Humidity and Dry-Bulb Temperature)

**Vaisala Model:** HMW88D (Relative Humidity and Dry-Bulb Temperature with Display)

**Vaisala Model:** HMW88TD (Dew point and Dry-Bulb Temperature)

**Vaisala Model:** HMW88W (Wet-Bulb Temperature and Dry-Bulb Temperature)

**Vaisala Model:** HMW88H (Enthalpy and Dry-Bulb Temperature)

**Vaisala Model:** TMW88 (Dry-Bulb Temperature Only)

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# HMW89 Humidity and Temperature Transmitter for Building Automation Applications

**Features/Benefits:**

- Reliable wall-mounted transmitter for basic HVAC humidity measurements
- Relative humidity measurement accuracy up to ± 3.0 %RH
- Temperature measurement accuracy up to ± 0.3 °C (± 0.54 °F)
- 3-wire, 0 ... 10 V output signals
- User exchangeable INTERCAP® sensor for easy field replacement; optimized for easy installation and low maintenance
- Optional display available with HMW89D model
- IP65 rated enclosure
- Output parameters available: relative humidity, temperature, dew point temperature, wet-bulb temperature, enthalpy
- **Note:** DIP switches available on HMW89 & HMW89D to control humidity output parameter and scaling

**Summary:**

Wall-mounted transmitters shall incorporate a thin-film polymer capacitive INTERCAP® relative humidity sensor. Humidity sensor is to be calibration free and interchangeable in the field. Instrument must be able to measure 0 ... 100 %RH with accuracy of ± 3% RH from 0 ... 90 %RH and ± 5 %RH from 90 ... 100 %RH between +10 ... +30 °C (+50 ... +86 °F). Humidity sensor must have a stability of at least ± 2 %RH over a two year period in typical HVAC applications. Temperature sensor shall be a platinum 1000 Ω RTD with a linear output of 0 … 10 V corresponding to -40 ... +60 °C (-40 ... +140 °F) with an accuracy of ± 0.3 °C (± 0.54 °F) at +20 °C (+68°F). Transmitter to be powered by 18 … 35 VDC or 24 VAC ± 20 % 50/60 Hz and provide a linear output signal of 0 … 10 V corresponding to 0 ... 100% RH. Instrument must have options to calculate and output additional parameters such as: dew point temperature, wet-bulb temperature, and enthalpy. Available models are listed below:

**Vaisala Model:** HMW89 (Relative Humidity and Dry-Bulb Temperature)
**Vaisala Model:** HMW89D (Relative Humidity and Dry-Bulb Temperature with Display)

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