

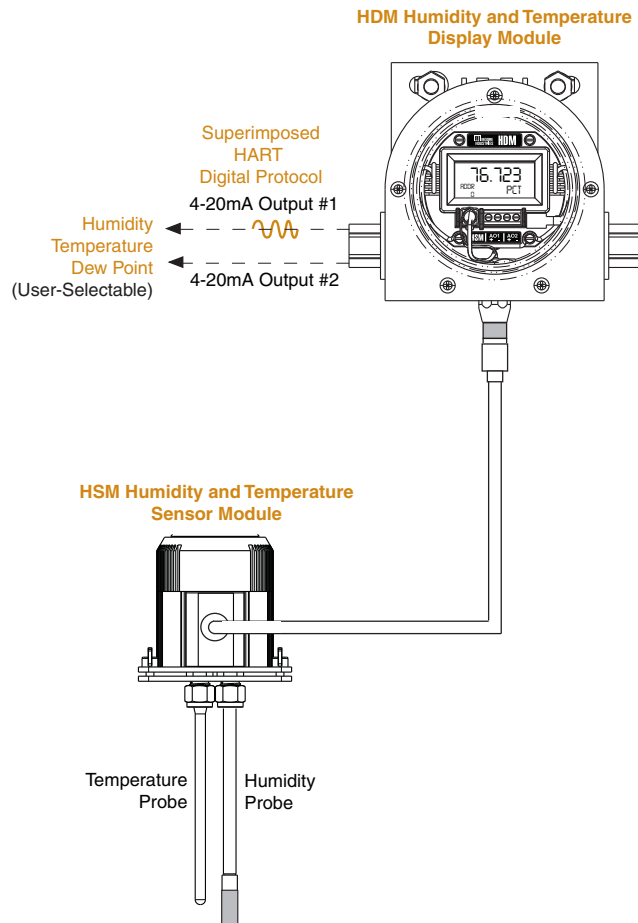
April 2011

Description

The HTZ Smart HART® Transmitter simultaneously measures humidity and temperature in industrial, commercial, manufacturing, and HVAC applications. Based on the humidity and temperature values, the HTZ also provides a dew point measurement as a calculated variable.

The 2-wire (loop-powered) HTZ features dual isolated and scalable 4-20mA outputs proportional to two of the following (user-selectable): relative humidity (RH), ambient temperature or dew point calculation. The analog output signals are ready for direct interface with HART or non-HART based DCS, PLC and other computer-based systems.

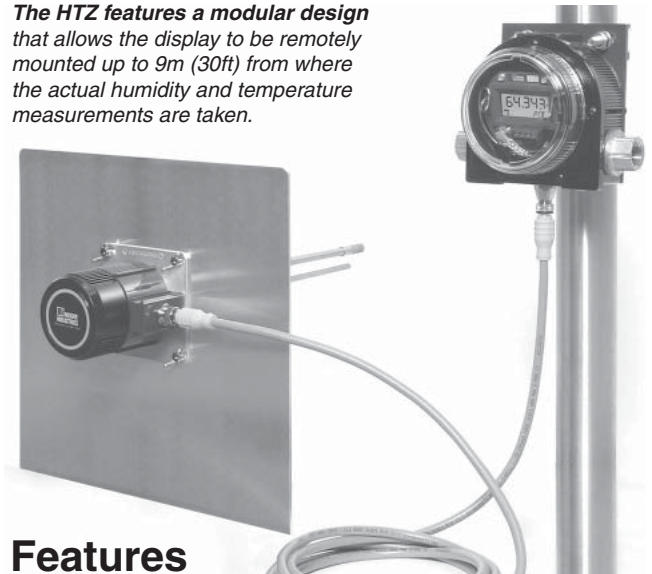
Figure 1. The HTZ consists of two components: The HSM Humidity and Temperature Sensor Module and the HDM Humidity and Temperature Display Module.



CE Conformant – EMC Directive 2004/108/EC
EN 61326

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HART is a registered trademark of the HART Communication Foundation.

The HTZ features a modular design that allows the display to be remotely mounted up to 9m (30ft) from where the actual humidity and temperature measurements are taken.



Features

- **The HTZ delivers exceptional measurement accuracy.** The HTZ's high accuracy humidity, temperature and dew point measurements make it ideal for precision applications.
- **Versatile programming options allow set up with a HART Communicator, a HART-based system or a PC** on-site or from any point (with HART communications) on the 4-20mA wires of Analog Output #1.
- **Simple maintenance is provided** by humidity and temperature probes, as well as a RH sensor itself, that can be quickly removed for cleaning or replacement.
- **Set input failure mode**, using the Intelligent Configuration Software, for each 4-20mA output to drive upscale, downscale or hold the last value, should there be a sensor failure, or if the cable between the modules is disconnected.
- **FREE PC Configuration Software and Cable** are provided with each order.
- **The HDM display module shows** real-time status of relative humidity, temperature, dew point, analog output #1, analog output #2 or scrolls between all variables in four second intervals.
- **A wide ambient temperature operating range** of -40°C to +85°C (-40°F to +185°F) allows installation in most all environments, indoors and outdoors.

HTZ

Smart HART® Humidity and Temperature Transmitter

Modular and Flexible Design

The HTZ Smart HART® Humidity and Temperature Transmitter consists of two components connected by a cable:

HSM Humidity and Temperature Sensor Module

Designed to mount on a surface (such as in duct ventilation systems) at the measurement site, the HSM has temperature and humidity probes that accurately collect and transmit real-time ambient conditions to the HDM Humidity and Temperature Display Module. Both probes can be removed for service and/or replacement. In addition, the RH sensor itself can be removed for replacement by unscrewing a removable, sintered filter at the end of the probe. The HSM comes in a rugged, NEMA 4X (IP66) enclosure that can be safely mounted outdoors and in wash-down areas.

HDM Humidity and Temperature Display Module

The surface-mount or pipe-mount HDM can be installed at the measurement point, or as far away as 9 meters (30ft) from the HSM. The HDM features a programmable display that can be set to indicate humidity, temperature, dew point, analog (current) output #1, analog (current) output #2, or scroll between the five values at four second intervals. A custom engineering unit (EGU) can also be assigned to the displayed temperature variable.

The HDM provides two loop-powered, isolated 4-20mA signals. Each output can be programmed to represent relative humidity, temperature or dew point.

Selectable Input Failure Mode—Each 4-20mA output can be set to drive upscale (selectable between 20.0-23.6mA), downscale (selectable between 3.6-4.0mA) or hold the last value should there be a sensor failure or if the cable between the HSM and HDM is disconnected.

The HDM comes in a field-mount, NEMA 4X (IP66) enclosure that can be mounted outdoors and in wash-down areas.

Connection Cable

The HSM connects to the HDM via a quick-connect IP66 cable that is available in 3m (10ft), a 6m (20ft) or 9m (30ft) lengths.

Figure 2. HSM Humidity and Temperature Sensor Module.

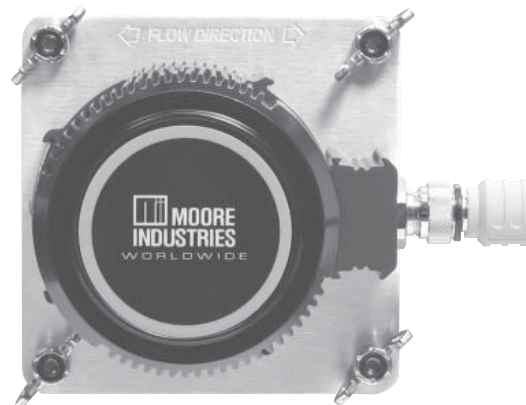
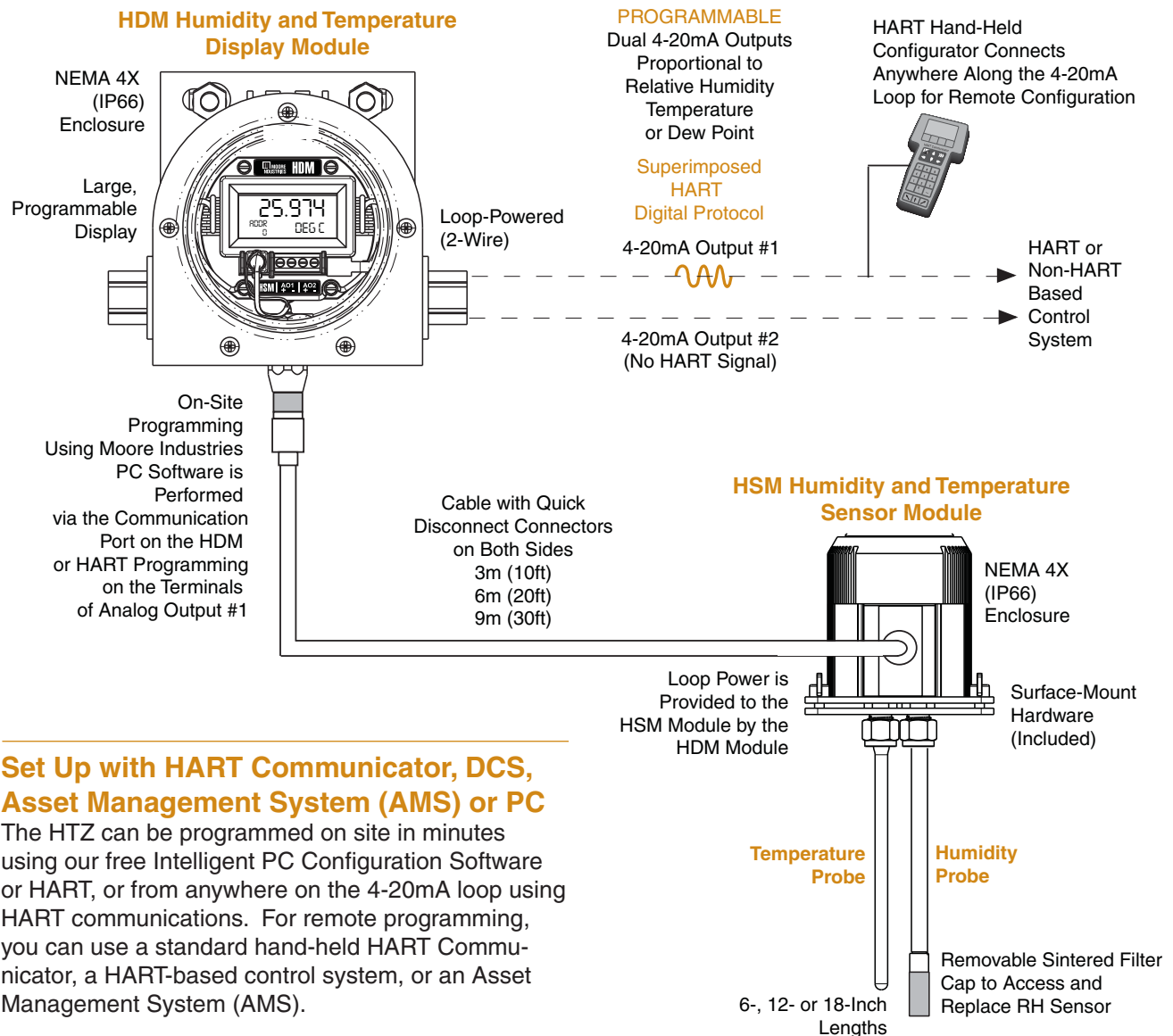


Figure 3. HDM Humidity and Temperature Display Module.



Figure 4. The HTZ Smart HART Humidity and Temperature Transmitter programs to provides dual 4-20mA signals proportional to relative humidity, temperature or dew point (user-selectable).



Set Up with HART Communicator, DCS, Asset Management System (AMS) or PC

The HTZ can be programmed on site in minutes using our free Intelligent PC Configuration Software or HART, or from anywhere on the 4-20mA loop using HART communications. For remote programming, you can use a standard hand-held HART Communicator, a HART-based control system, or an Asset Management System (AMS).

HTZ Device Description (DD)

Moore Industries' HTZ Device Description (DD) is the device-specific programming information that is loaded into a standard HART Communicator. It allows access to all of the unit's programming functions.

How to Determine if Your HART Communicator Has a HTZ Device Description

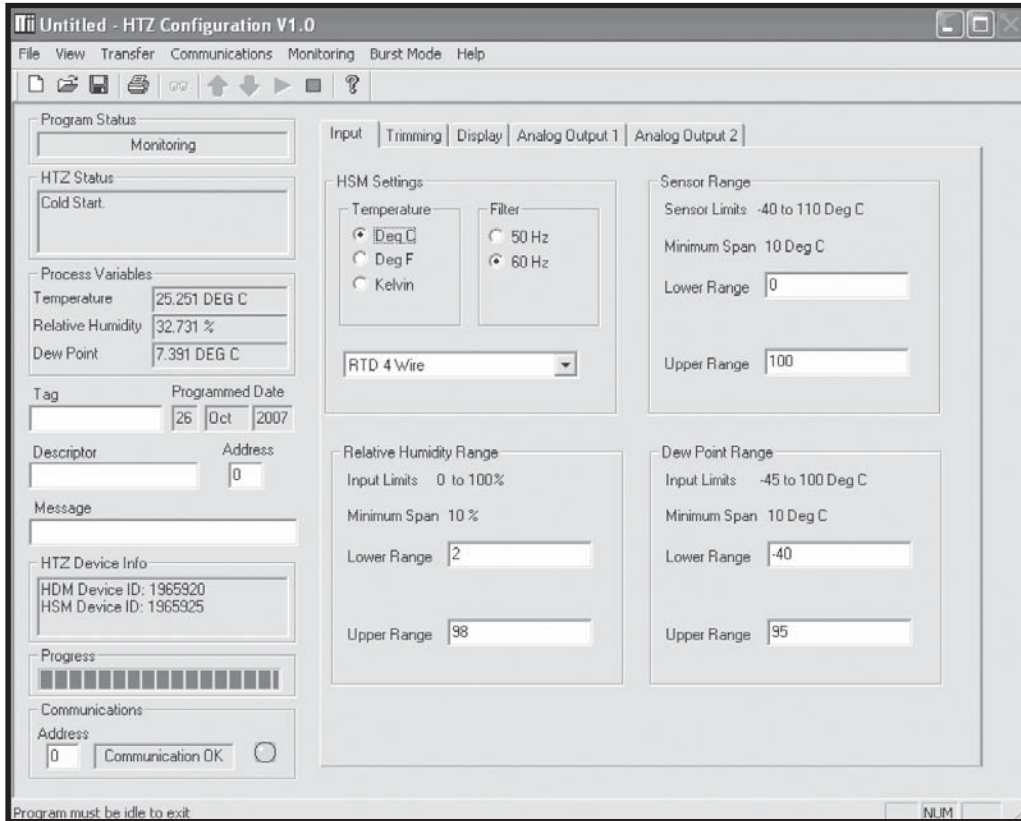
Hand-held HART Communicators typically feature a list of companies in a DD library. The Moore Industries HTZ will appear if you have the proper DD installed. If the hand-held does not have the proper DD, contact the Moore Industries Interface Solution

Center nearest you. If you are using an Emerson Process Management Model 375 HART Communicator, the DD can be found on the configuration tools CD that comes free with the HTZ, or you may download the latest HTZ DD from our web site at: www.miinet.com

Also Programs with the Generic HART DD

Even if your communicator is not up to date, most of the important programming features can be accessed without the HTZ DD by using the "Generic" HART DD available on HART Communicators.

One Window. One Minute. One Set Up.



FREE Intelligent PC Configuration Software with Versatile Programming Options

Our FREE Intelligent PC Configuration Software and Interface Cable allow you to set up all transmitter settings from one PC window, in about one minute.

For programming from any access point on the loop, a HART-to-RS232 Smart Interface Cable (modem) can be purchased separately (see Ordering Information for details) to access the HTZ programming options. The HART modem can also be connected directly to the transmitter.

Once a configuration is created, it can be downloaded to multiple transmitters. The HTZ software also lets you save, E-mail, and print copies for documentation purposes. Just a few of the time saving and performance enhancing features include:

Set Up Safeguards—It is nearly impossible to make incompatible configuration selections.

Transmitter/Configuration Auto Recognition—

The program software automatically recognizes the transmitter model and its configuration parameters.

Toolbar for Frequently Used Commands—

A conveniently located toolbar provides quick access to often used configuration functions.

Real-Time Process Readout—The process measurement and the communication status between the transmitter and PC is continually shown on the software window.

Precise Digital Output Trimming—This essentially eliminates the impact of measurement errors introduced by inaccurate readout devices.

Selectable Under Range, Over Range and Sensor Failure Values—By setting different default values for each condition, you can distinguish between the failure modes when they occur.

Store and Print Files—The configuration record you've created may be downloaded to any number of transmitters, stored for recordkeeping or printed.

Specifications

Performance Humidity Input
Measurement Range:
 0-100% RH
Calibrated Accuracy*:
 ±0.75% RH between
 33-75% RH; ±1% below
 33% RH and above 75%
 RH (with -VTRH calibration
 option); Nominal accuracy
 without -VTRH calibration is
 ±1.8% between 20-80% RH
Ambient Temperature
Effect: 0.005%/°C
Long Term Stability: ±1%
 RH/year
Response Time: 10
 seconds to 90% of final
 value on a step input
 change @25°C, 1m/s air

Temperature Input
Measurement Range:
 -40°C to +110°C
 (-40°F to +230°F)
Calibrated Accuracy*:
 ±0.036°C at trim points (with
 -VTB calibration option);
 Nominal Accuracy without
 -VTB calibration is ±0.1°C
Ambient Temperature
Effect: 0.003°C/°C
Long Term Stability:
 1 year: 0.1°C
 3 years: 0.17°C
 5 years: 0.24°C
Response Time: 200msec
 maximum for the output to
 change from 10% to 90%
 of its scale for an input step
 change of 0%
 to 100%

Dewpoint
Range: -45°C to +100°C
 (-49°F to +212°F)
 (calculated from
 temperature and RH inputs)
Accuracy*: Typical @25°C,
 ±0.5°C between 40-95%
 RH; ±1-2°C between
 10-40% RH

Performance Ambient Temperature
(continued) Effect: 0.005°C/°C
Long Term Stability:
 ± 0.5°C RMS over 1 year
Response Time:
 10 seconds to 90% of final
 value
Dew Point Calculation:
 EW * RH / 100 (refer to
 Equation 1 for explanation)

Analog Output
Output Range: 4-20mA
Linear Region:
 3.8-21.4mA
Hardware Limits:
 3.6-23.6mA
Accuracy: ±2 microamps
Ambient Temperature
Effect: 0.009% of span
 (16mA)/°C
Long-Term Stability:
 1 year: 0.012%
 3 years: 0.020%
 5 years: 0.026%
Rise Time: 100msec
 maximum for the output to
 change from 10% to 90% of
 its scale for a step change of
 the sourcing variable of
 0% to 100%
Damping: User-set
 between 0-30 seconds
Power Supply
Requirements: 12-42Vdc
 at output terminals
Power Supply Effect:
 ±0.002 of span per 1V
 change
Load Effect: Negligible
 within specified power limits
Load Capability:
 (500 ohms@24V)
 $\frac{\text{Supply Voltage} - 12V}{0.024A} = \text{Ohms}$
Ripple: 10mVpp,
 frequencies up to 120Hz,
 measured across a 250
 ohm load resistor
Start up Time: <5sec
 (trimming disabled)

Performance Isolation: 500Vac between
(continued) each output and between
 outputs and case
Overall Accuracy: Sum of
 input and output accuracy,
 ambient temperature effect
 and long term stability
Analog Output Response
Time: 500msec from step
 input until the analog output
 reaches 90% of its final value

Ambient Operating Range:
Conditions -40°C to +85°C
 (-40°F to +185°F)
HDM Storage Range:
 -40°C to +85°C
 (-40°F to +185°F)
HSM Storage Range:
 Recommended 10-50°C,
 (50-122°F), 20-60%RH;
 Maximum 0-80°C, (32-176°F),
 0-95%RH
Humidity Sensor
Temperature Limits: -40°C
 to +110°C (-40°F to +230°F)
Humidity Sensor Maximum
Pressure: 125psia
Relative Humidity:
 0-95% relative humidity,
 non-condensing
RFI/EMI Protection:
 20V/m@80-1000MHz,
 1kHz AM, when tested to
 IEC61326, 1998

Adjustments All adjustments made using
 Moore Industries' Intelligent
 PC Configuration Software or
 HART-enabled hand-held
 or host

Indicators LCD: 2x5 14-segment
 characters, alphanumeric
 readout accurate to the
 nearest digit.
Range: -99999 to 99999;
 Decimal point can be
 user-set

Weight HDM: 918g (32.4 oz)
HSM: 601g (21.2 oz)
Cable: 3m, 250g (8.8 oz);
6m, 454g (1.0 lbs);
9m, 658g (1.45 lbs)

* High accuracy relative humidity measurements are achieved within a RH range of 33-75% using the trimming feature of Moore Industries' Intelligent PC Configuration Software with the RH sensor calibrated against a controlled RH environment (See the -VTRH option under "Sensor Length/Calibration" in Ordering Information). High accuracy temperature measurements are achieved using the trimming feature of the Intelligent PC Configuration Software with the temperature sensor immersed in a temperature calibration bath (Sensor-to-Transmitter matching factory calibration; See the -VTB option under "Sensor Length/Calibration" in Ordering Information). High accuracy dew point measurements are achieved using the trimming feature of the Intelligent PC Configuration Software at 25°C, between 40-90% RH. Stated accuracies do not include ambient temperature effects.

Equation 1. Dew Point Calculation

$EW = 10^{(0.66077 + (7.5 * T) / (237.3 + T))}$ ← This is the saturation vapor pressure over water

$EW_RH = EW * RH / 100$ ← Multiply EW with RH

$Dew\ Point\ (Dp) = ((0.66077 - \log_{10}(EW_RH)) * 237.3) / (\log_{10}(EW_RH) - 8.16077)$

Ordering Information

IMPORTANT: Specify **ONE** HSM Humidity and Temperature Sensor Module and **ONE** HDM Humidity and Temperature Display Module for each HTZ system. HSM and HDM modules cannot be used independently of one another, but can be ordered separately as replacement modules.

Unit	Input	Output	Power	Sensor Length/Calibration	Housing
HSM Humidity and Temperature Sensing Module (One HSM is required per installation)	PT-RH One Temperature (RTD) input and one Relative Humidity input	HDM Signal outputs to the HDM Smart HART Display Module	HDM Loop-power supplied by the HDM Module	- CL6 (either -CL6, -CL12 or -CL18 is required) 6-inch temperature (RTD) and RH probes - CL12 (either -CL6, -CL12 or -CL18 is required) 12-inch temperature (RTD) and RH probes - CL18 (either -CL6, -CL12 or -CL18 is required) 18-inch temperature (RTD) and RH probes - VTB Factory temperature sensor calibration using Sensor-to-Transmitter Trimming with NIST traceable test report; available customer-specified ranges: -20°C to +110°C (-4°F to +230°F); default, 50-100°F - VTRH Factory relative humidity calibration using RH Sensor-to-Transmitter Trimming against a controlled 33-75% RH range	LH3P Surface or pipe-mount enclosure (NEMA 4X, IP66) includes 2-inch pipe-mount hardware LH3Z Surface or duct-mount enclosure (NEMA 4X, IP66)

To order, specify:

Unit / Input / Output / Power / Sensor Length / Calibration [Housing]

Model Number Example:

HSM / PT-RH / HDM / HDM / -CL12 -VTB [LH3Z]

Unit	Input	Output	Power	Cable Length	Housing
HDM Humidity and Temperature Display Module (One HDM is required per installation)	HSM Signal input from the HSM Module	2X4-20MA Dual isolated, scaleable 4-20mA outputs user-selectable for two of the following: Relative Humidity Temperature Dew Point	12-42DC	- 3M 3m (10ft) connection cable - 6M 6m (20ft) connection cable - 9M 9m (30ft) connection cable	D3LCP Surface/pipe-mount enclosure (NEMA 4X, IP66) includes 2-inch pipe-mount hardware

To order, specify:

Unit / Input / Output / Power / Connection Cable Length [Housing]

Model Number Example:

HDM / HSM / 2X4-20MA / 12-42DC / -3M [D3LCP]

Everything You Need is Included

Each HTZ order comes with one copy of our Intelligent PC Configuration Software (Windows® compatible) and a configuration cable. Use the following information to order additional parts:

Replacement Parts and Accessories:

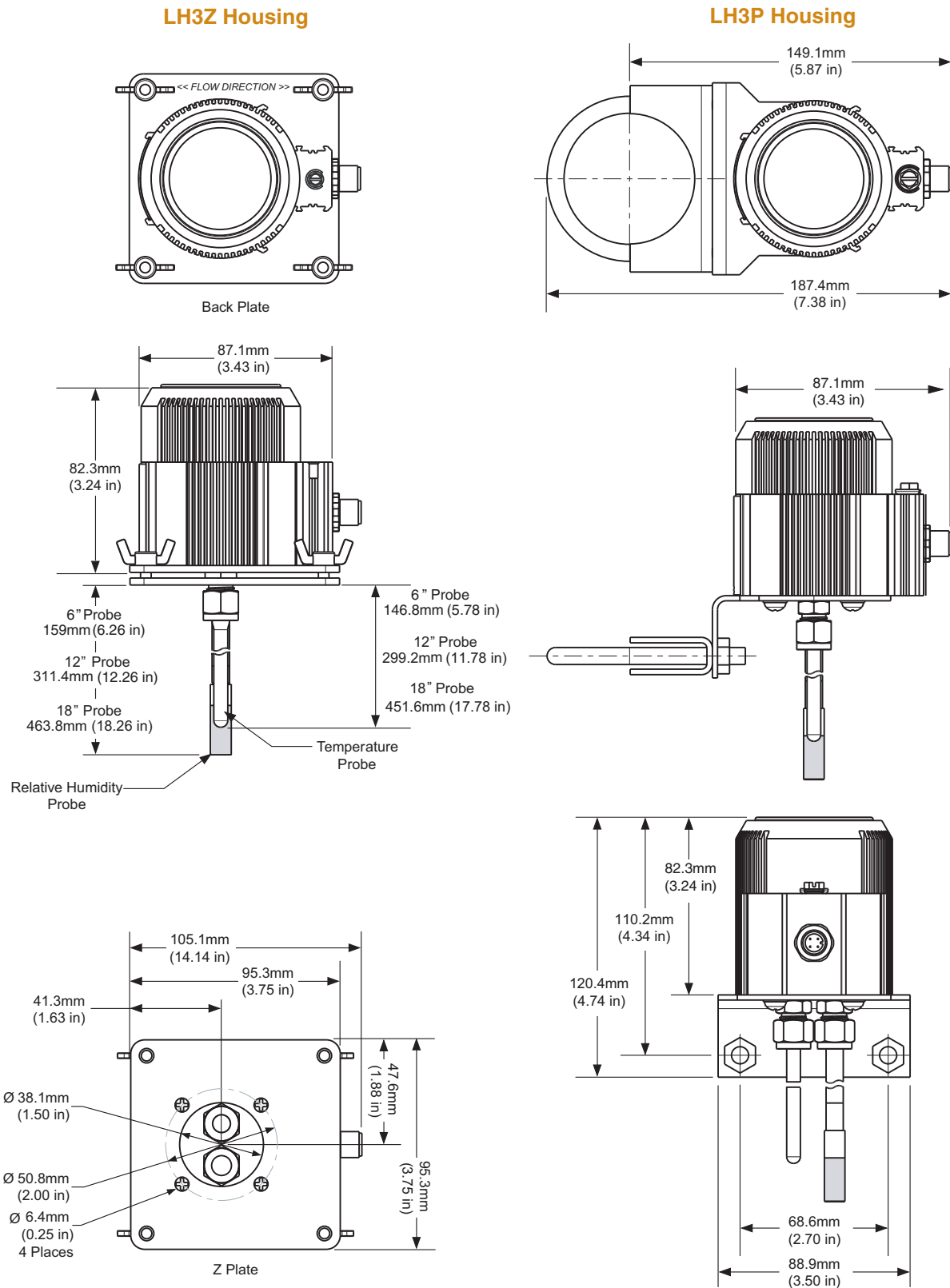
P/N 238-801-34* —Temperature (RTD) Probe (6-Inch)
P/N 238-801-04* —Temperature (RTD) Probe (12-Inch)
P/N 238-801-24* —Temperature (RTD) Probe (18-Inch)
P/N 238-801-36* —Humidity Probe (6-Inch)
P/N 238-801-06* —Humidity Probe (12-Inch)
P/N 238-801-26* —Humidity Probe (18-Inch)
P/N 801-880-75 —Humidity Sensor (SHT75)
P/N 208-802-20 —Replacement HDM Electronics, Display in HP (Hockey-Puck) Housing with Spring Clips
P/N 803-847-26 —Replacement 3m (10ft) Connection Cable
P/N 803-862-26 —Replacement 6m (20ft) Connection Cable
P/N 803-863-26 —Replacement 9m (30ft) Connection Cable

* Return to the Factory for replacement and recalibration.

Programming Accessories:

P/N 750-75E05-01 —Interface Solution PC Configuration Software on CD (one copy comes free with each order)
P/N 803-040-26 —Non-Isolated PC Configuration Cable (one comes free with each order)
P/N 803-039-26 —Isolated PC Configuration Cable
P/N 235-829-02 —PC-Programming Kit includes one copy of our Intelligent PC Configuration Software and one HART-to-RS232 Cable with HART modem
P/N 803-048-26 —HART-to-RS232 Smart Interface Cable with HART Modem
P/N 208-836-00 —USB Communication Cable

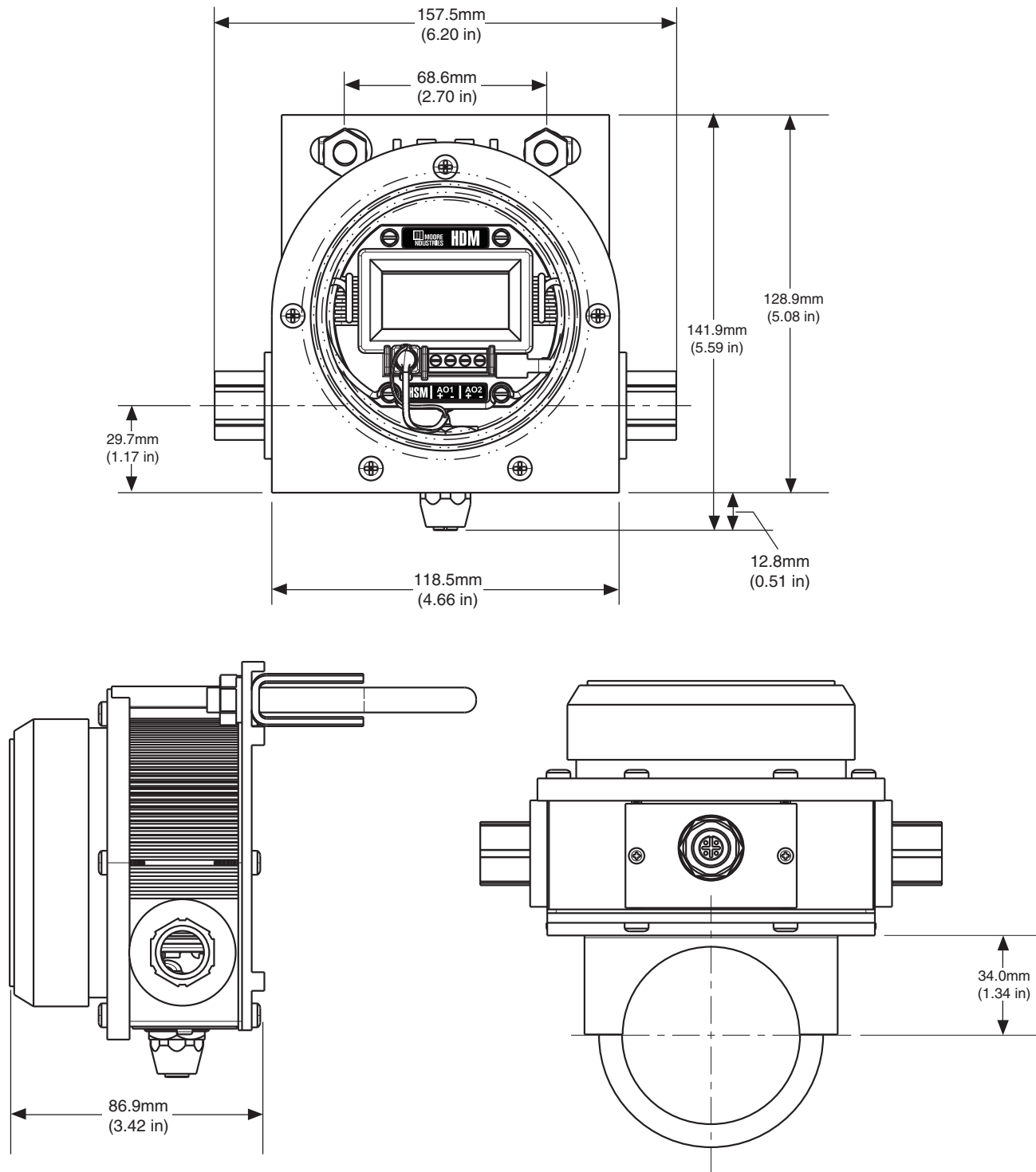
Figure 5. HSM Humidity and Temperature Sensor Module Dimensions.



HTZ

Smart HART® Humidity and Temperature Transmitter

Figure 6. HDM Humidity and Temperature Display Module Dimensions.



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