



# HMT360 Series Intrinsically Safe Humidity and Temperature Transmitters

For Operation in up to Zone 0 / 20



## Features

- Measures humidity and temperature, outputs also dew point, mixing ratio, absolute humidity and wet bulb temperature
- Intrinsically safe
- Vaisala HUMICAP® Sensor features high accuracy, excellent long-term stability, and negligible hysteresis
- Six probe options
- Traceable calibration (certificate included)



Vaisala HUMICAP® Humidity and Temperature Transmitter Series HMT360 are the ideal solution for measuring humidity in hazardous areas. They operate safely and reliably even in the most hazardous classifications, such as zone 0. The HMT360 transmitters' proven performance and technology conform with rigorous international standards.

## Operating Conditions

- Safe operation with the entire transmitter in hazardous areas: Division 1 and 2 (USA, Canada), Categories 1G / Zone 0 and 1D / Zone 20 with protection cover (EU)
- Designed for harsh conditions
- Temperature range between -70 ... +180 °C (-94 ... +356 °F) depending on the probe option

## Intrinsically Safe

The entire HMT360 transmitter can be installed directly in explosive areas. It can withstand continuous exposure to potentially explosive environments that contain flammable gases or dust.

## Customized Configuration

Due to the options and accessories, the HMT360 series is truly flexible.

Customers may specify the transmitter configuration when ordering the instrument. However, changes in configuration can also easily be made in the field.

## Interchangeable Probes

HMT360 offers six probe options for various applications:

- HMT361 - wall mount
- HMT363 - confined spaces
- HMT364 - pressurized spaces
- HMT365 - high temperature
- HMT367 - high humidity
- HMT368 - pressurized pipelines

The interchangeable probes enable fast and easy removal or re-installation when required. Calibration, for example, is easy to perform due to the modular structure. All calibration coefficients are included in

the probe unit itself, which means that probes can be switched between transmitter bodies without losing the accuracy.

## Optimized Sensors

In addition to the standard Vaisala HUMICAP® Sensor, an application-specific, very chemically durable sensor is also available.

## Long-term Solution

The HMT360 transmitters are an investment: their rugged design, combined with trouble-free operation, ensure a long-term solution for monitoring humidity and dew point in explosive environments.

Customized calibration and maintenance contracts for the HMT360 series are available on request.

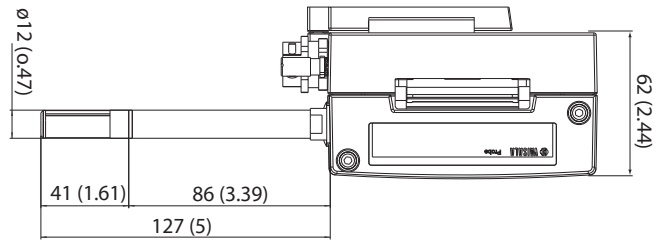
# Interchangeable Probes for HMT360 Intrinsically Safe Humidity and Temperature Transmitter

## HMT361 for Wall Mounting

|                   |                                  |
|-------------------|----------------------------------|
| Temperature range | -40 ... +60 °C (-40 ... +140 °F) |
| Probe diameter    | 12 mm (0.47 in)                  |



The HMT361 probe in this picture has a stainless steel netting filter.



Dimensions in mm (inches)

## HMT363 for Confined Spaces

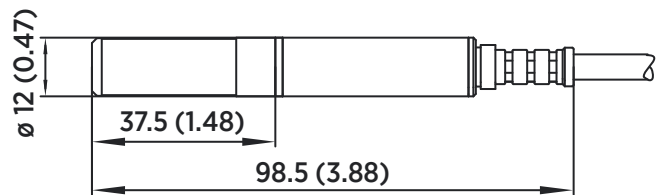
|                                     |  |
|-------------------------------------|--|
| Temperature range with teflon cable | -40 ... +120 °C (-40 ... +248 °F)                      |
| Temperature range with rubber cable | -40 ... +80 °C (-40 ... +176 °F)                       |
| Probe cable length                  | 2, 5 or 10 meters (6 ft 7 in, 16 ft 5 in, 32 ft 10 in) |
| Probe diameter                      | 12 mm (0.47 in)  |

### Installation

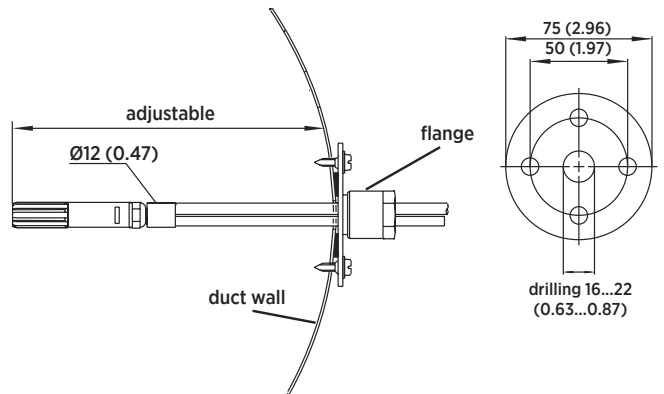
|  |            |
|--|------------|
| Duct installation kit                    | 210697     |
| Cable gland M20x1.5 with splitting seal  | HMP247CG   |
| Swagelok for 12mm probe, 1/2" NPT thread | SWG12NPT12 |



The HMT363 probe is small and fits into tight spaces. This one is connected with a teflon cable.



Dimensions in mm (inches)



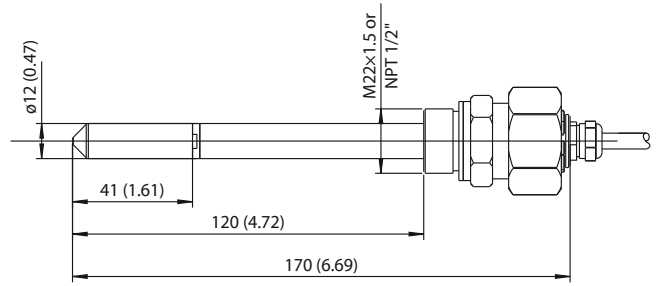
Left: Installation kit for duct mounting. Right: Installation flange. Aluminum or stainless steel.

### HMT364 for High Pressure

|                      |  |
|----------------------|--|
| Temperature range    | -70 ... +180 °C (-94 ... +356 °F)                      |
| Pressure range       | 0 ... 10 MPa   |
| Probe cable length   | 2, 5 or 10 meters (6 ft 7 in, 16 ft 5 in, 32 ft 10 in) |
| Probe diameter       | 12 mm (0.47 in)  |
| Fitting body M22x1.5 | 17223  |
| Fitting body NPT1/2  | 17225  |



The HMT364 probe is designed for measurement in pressurized spaces or vacuum chambers.



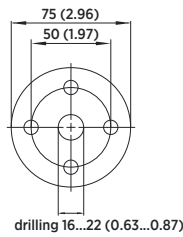
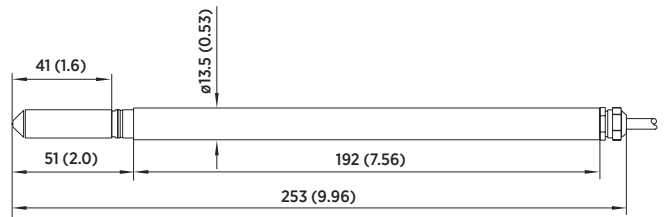
Dimensions in mm (inches)

### HMT365 for High Temperature

|   |  |
|---|--|
| Temperature range                       | -70 ... +180 °C (-94 ... +356 °F)                      |
| Probe cable length                      | 2, 5 or 10 meters (6 ft 7 in, 16 ft 5 in, 32 ft 10 in) |
| Probe diameter                          | 13.5 mm (0.53 in)                                      |
| <b>Installation</b>                     |  |
| Mounting flange                         | 210696   |
| Cable gland M20x1.5 with splitting seal | HMP247CG   |



The HMT365 probe is designed for high temperature environments.



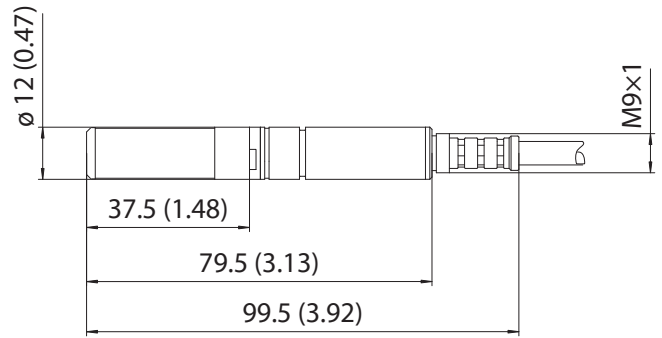
HMT365 probe and stainless steel installation flange. Dimensions in mm (inches).

### HMT367 for High Humidities

|   |  |
|---|--|
| Temperature range                         | -70 ... +180 °C (-94 ... +356 °F)                      |
| Probe cable length                        | 2, 5 or 10 meters (6 ft 7 in, 16 ft 5 in, 32 ft 10 in) |
| Probe diameter                            | 12 mm (0.47 in)  |
| <b>Installation</b>                       |  |
| Duct installation kit                     | 210697   |
| Cable gland M20x1.5 with splitting seal   | HMP247CG   |
| Swagelok for 12 mm probe, 3/8" ISO thread | SWG12ISO38   |
| Swagelok for 12 mm probe, 1/2" NPT thread | SWG12NPT12   |



The HMT367 probe is constructed to be installed in environments with high humidities.



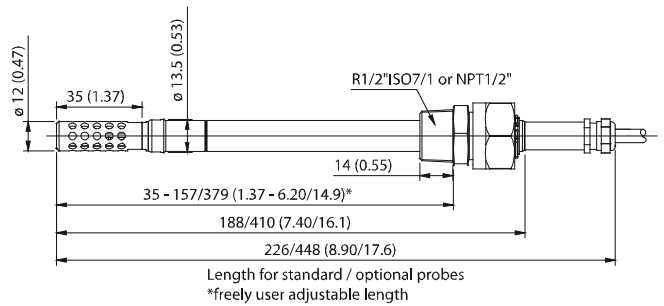
Dimensions in mm (inches)

### HMT368 for Pressurized Pipelines

|                                       |  |
|---------------------------------------|--|
| Temperature range                     | -70 ... +180 °C (-94 ... +356 °F)                      |
| Pressure range                        | 0 ... 4 MPa  |
| Probe cable length                    | 2, 5 or 10 meters (6 ft 7 in, 16 ft 5 in, 32 ft 10 in) |
| Probe diameter                        | 13.5 mm/12 mm (0.53 in/0.47 in)                        |
| Available probe lengths               | 226 mm/448 mm (8.90 in/17.6 in)                        |
| <b>Installation</b>                   |  |
| Fitting body ISO1/2 solid structure   | DRW212076SP  |
| Fitting body NPT1/2 solid structure   | NPTFITBODASP   |
| Ball valve ISO 1/2 with welding joint | BALLVALVE-1  |



The HMT368 probe enables flexible installation in pressurized pipelines.



Dimensions in mm (inches)

# HMT360 Series Technical Data

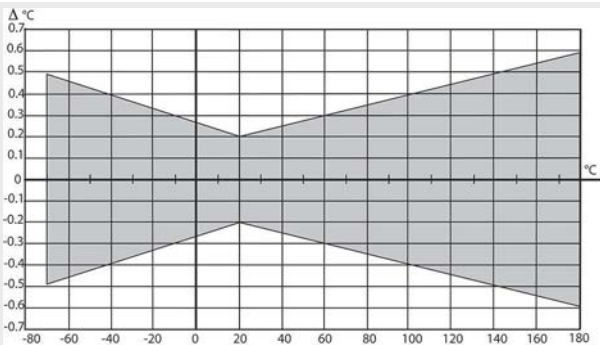
## Measurement Performance

### Relative Humidity

|   |  |
|---|--|
| Measurement range   | 0 ... 100 %RH  |
| Accuracy (Including Non-linearity, Hysteresis, and Repeatability):                                      |  |
| With Vaisala HUMICAP® 180R  | For typical applications                               |
| At +15 ... +25 °C (59 ... +77 °F)   | ± 1.0 %RH (0 ... 90 %RH)<br>± 1.7 %RH (90 ... 100 %RH) |
| At -20 ... +40 °C (-4 ... +104 °F)  | ±(1.0 + 0.008 x reading) %RH                           |
| At -40 ... +180 °C (-40 ... +356 °F)  | ± (1.5 + 0.015 x reading) %RH                          |
| Factory calibration uncertainty (+20 °C)  | ± 0.6 %RH (0 ... 40 %RH)<br>± 1.0 %RH (40 ... 97 %RH)  |
| (Defined as ±2 standard deviation limits. Small variations possible, see also calibration certificate.) |  |
| Response Time (90 %) at +20 °C (+68 °F) in Still Air:   |  |
| With grid filter  | 17 s   |
| With grid + steel netting filter  | 50 s   |
| With sintered filter  | 60 s   |

### Temperature

|  |  |
|--|--|
| Measurement range                                  | -70 ... +180 °C (-94 ... +356 °F)<br>(depends on selected probe) |
| Typical accuracy of electronics at +20 °C (+68 °F) | ±0.2 °C (0.36 °F)  |
| Typical temperature dependence of electronics      | 0.005 °C/°C (0.005 °F/°F)  |
| Sensor   | Pt1000 RTD Class F0.1 IEC 60751                                  |



Accuracy over Temperature Range

### Other Variables

|                      |  |
|----------------------|--|
| Optionally available | Dew point temperature, mixing ratio, absolute humidity, wet bulb temperature |
|----------------------|--|

## Operating Environment

|                                       |  |
|---------------------------------------|--|
| Operating temperature for electronics | -40 ... +60 °C (-40 ... +140 °F)   |
| Operating temperature with display    | -20 ... +60 °C (-4 ... +140 °F)  |
| Storage temperature                   | -40 ... +70 °C (-40 ... +158 °F)   |
| Pressure range                        | See probe specifications   |
| EMC compliance                        | EN61326-1, Industrial Environment<br><b>Note 1</b> HMT360 complies with IEC 61000-4-5 only when using external EXi approved surge arrester in the safe area.<br><b>Note 2</b> Compliance with IEC 61000-4-3:<br><ul style="list-style-type: none"> <li>• Within frequency range 80 ... 200 MHz immunity is 4 V/m</li> <li>• At 10 V/m RF field test within frequency range 80 ... 200 MHz may cause additional deviation of 1.5 %RH</li> </ul> |

## Inputs and Outputs

|  |  |
|--|--|
| Operating voltage  | 12 ... 28 V  |
| With serial port (service mode)  | 15 ... 28 V  |
| Analog outputs   | Two-wire 4 ... 20 mA, one standard, one optional<br>Connection via safety barriers |
| Typical accuracy of analog outputs at +20 °C                             | ±0.05 % full scale   |
| Typical temperature dependence of analog outputs                         | 0.005 % / °C (0.005 % / °F) full scale   |
| RS-232C serial output for service use (requires cable accessory 25905ZZ) | Connector type RJ45  |
| Display  | Two-line LCD   |

## Mechanical Specifications

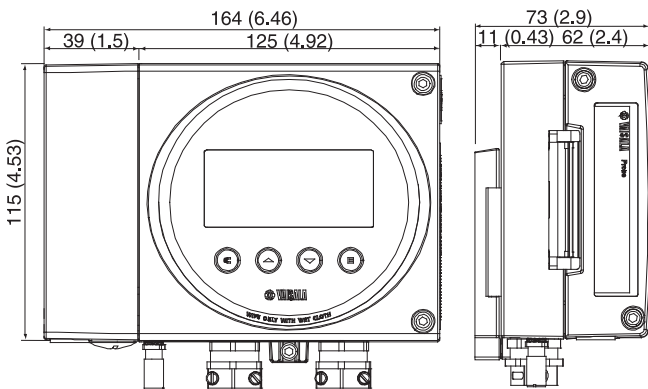
|                  |   |
|------------------|---|
| Connections      | Screw terminals, 0.33 ... 2.0 mm <sup>2</sup> wires (AWG 14-22) |
| Cable bushings   | For 7.5 ... 12 mm or 10 ... 15 mm cable diameters (M20)         |
| Conduit fitting  | NPT 1/2"  |
| Housing material | G-ALSi10Mg (DIN 1725)   |
| Housing weight   | 950 g (2.1 lb)  |

## Compliance

|           |               |
|-----------|---------------|
| IP rating | IP66 (NEMA4X) |
|-----------|---------------|

## Accessory Availability

| Accessory  | Part number             | Models                         |
|--|-------------------------|--------------------------------|
| Ball valve ISO 1/2 with welding joint  | BALLVALVE-1             | HMT368                         |
| <ul style="list-style-type: none"> <li>Pressure range at +20 °C (+68 °F) 0 ... 20 bar (0 ... 290 psia) (during installation max. 10 bar (145 psia))</li> </ul> |                         |                                |
| Cable gland M20 x 1.5 with splitting seal  | HMP247CG                | HMT363, HMT365, HMT367         |
| Duct installation kit  | 210697                  | HMT363, HMT367                 |
| Fitting body ISO1/2 solid structure  | DRW212076SP             | HMT368                         |
| Fitting body M22 x 1.5   | 17223                   | HMT364                         |
| Fitting body NPT1/2  | 17225                   | HMT364                         |
| Fitting body NPT1/2 solid structure  | NPTFITBODASP            | HMT368                         |
| Mounting flange  | 210696                  | HMT365                         |
| Swagelok for 12mm probe, 1/2" NPT thread   | SWG12NPT12              | HMT363, HMT367                 |
| Swagelok for 12mm probe, 3/8" ISO thread   | SWG12ISO38              | HMT363, HMT367                 |
| Galvanic isolator  | 212483                  | All models                     |
| Zener barrier  | 210664                  | All models                     |
| Calibration adapter for HMK15  | 211302                  | HMT361, HMT363, HMT364, HMT367 |
| Serial interface cable for PC connectors RJ45 - D9 female  | 25905ZZ                 | All models                     |
| Protection cover (for use in the presence of combustible dust, ATEX)   | 214101                  | All models                     |
|  | II 1 D (IP65 T = 80 °C) |                                |



Dimensions in mm (inches)

## Classification with Current Outputs

### Europe / VTT

|                        |   |
|------------------------|---|
| EU (94/9/EC, ATEX100a) | II 1 G Ex ia IIC T4 Ga<br>Certificate No. VTT 09 ATEX 028 X   |
| Safety factors         | $U_i = 28 \text{ V}$ , $I_i = 100 \text{ mA}$ , $P_i = 700 \text{ mW}$<br>$C_i = 1 \text{ nF}$ , $L_i$ negligibly low |

### Environmental specifications

|  |  |
|--|--|
| $T_{amb}$  | -40 ... +60 °C (-40 ... +140 °F)                     |
| $P_{amb}$  | 0.8 ... 1.1 bar                                      |
| Dust classification (with protection cover 214101) | II 1 D (IP65 T=+80 °C (+176 °F))<br>VTT 04 ATEX 023X |

### USA (FM)

|          |  |
|----------|--|
| USA (FM) | Classes I, II, III, Division 1, Groups A-G and Division 2, Groups A-D, F and G<br>FM Project ID: 3010615 |
|----------|--|

|                |   |
|----------------|---|
| Safety factors | $V_{max} = 28 \text{ VDC}$ , $I_{max} = 100 \text{ mA}$ ,<br>$C_i = 1 \text{ nF}$ , $L_i = 0$ , $P_i = 0.7 \text{ W}$ ,<br>$T_{amb} = +60 \text{ °C}$ (+140 °F), T5 |
|----------------|---|

### Japan (TIIS)

|              |                                      |
|--------------|--------------------------------------|
| Japan (TIIS) | Ex ia IIC T4<br>Code number: TC20238 |
|--------------|--------------------------------------|

|                |  |
|----------------|--|
| Safety factors | $U_i = 28 \text{ VDC}$ , $I_i = 100 \text{ mA}$ , $C_i = 1 \text{ nF}$ ,<br>$P_i = 0.7 \text{ W}$ , $L_i = 0$ , $T_{amb} = +60 \text{ °C}$ (+140 °F) |
|----------------|--|

### Canada (CSA)

|         |  |
|---------|--|
| Class I | Division 1 and Division 2, Groups A, B, C, D |
|---------|--|

|          |   |
|----------|---|
| Class II | Division 1 and Division 2, Groups G and Coal Dust |
|----------|---|

|           |  |
|-----------|--|
| Class III | CSA File No: 213862 0 000, CSA Report: 1300863 |
|-----------|--|

|                |  |
|----------------|--|
| Safety factors | $T_{amb} = +60 \text{ °C}$ (+140 °F), T4<br>Intrinsically safe when connected as per Installation Drawing DRW213478. |
|----------------|--|

### China (PCEC)

|              |  |
|--------------|--|
| China (PCEC) | Ex ia II CT4<br>Certificate No. CE092145<br>Standard GB3836.1-2000 and GB3836.4-2000 |
|--------------|--|

### IECEx (VTT)

|             |   |
|-------------|---|
| IECEx (VTT) | Ex ia IIC T4 Ga<br>Certificate No. IECEx VTT 09.0002x |
|-------------|---|

|                |   |
|----------------|---|
| Safety factors | $U_i = 28 \text{ V}$ , $I_i = 100 \text{ mA}$ , $P_i = 700 \text{ mW}$<br>$C_i = 1 \text{ nF}$ , $L_i$ negligibly low |
|----------------|---|

### Environmental specifications

|  |   |
|--|---|
| $T_{amb}$  | -40 ... +60 °C (-40 ... +140 °F)              |
| $P_{amb}$  | 0.8 ... 1.1 bar                               |
| Dust classification (with protection cover 214101) | Ex ta IIC T500 80 °C Da<br>IECEx VTT 12.0016X |

### EAC (Russia, Kazakhstan, Belarus) (TRCU)

|  |   |
|--|---|
| EAC (Russia, Kazakhstan, Belarus) (TRCU) | 0Ex ia IIC T4 Ga X<br>Certificate No. RU C-<br>FI.MLJ06.B.00068 |
|--|---|

### Environmental specifications

|           |                                  |
|-----------|----------------------------------|
| $T_{amb}$ | -40 ... +60 °C (-40 ... +140 °F) |
| $P_{amb}$ | 0.8 ... 1.1 bar                  |

### Korea (KOSHA)

|               |  |
|---------------|--|
| Korea (KOSHA) | Ex ia IIC T4<br>Certificate No. 17-AV4BO-0419X |
|---------------|--|

|                |   |
|----------------|---|
| Safety factors | $U_i = 28 \text{ V}$ , $I_i = 100 \text{ mA}$ , $P_i = 700 \text{ mW}$<br>$C_i = 1 \text{ nF}$ , $L_i =$ negligibly low |
|----------------|---|

### Environmental specifications

|           |                                  |
|-----------|----------------------------------|
| $T_{amb}$ | -40 ... +60 °C (-40 ... +140 °F) |
| $P_{amb}$ | 0.8 ... 1.1 bar                  |

