

HMT360 Series Intrinsically Safe Humidity and Temperature Transmitters



The Vaisala HUMICAP® Humidity and Temperature Transmitter HMT361 wall mount transmitter, shown with six probe options, is designed specifically for hazardous and explosive environments.

Features/Benefits

- Measures humidity and temperature, outputs also dew point, mixing ratio, absolute humidity and wet bulb temperature
- 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)
- Intrinsically safe
- Designed for harsh conditions
- Vaisala HUMICAP® Sensor features high accuracy, excellent long-term stability, and negligible hysteresis
- Six probe options
- Temperature range between -70 ... +180°C (-94 ... +356°F) depending on the probe option
- NIST traceable (certificate included)

The 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. The HMT360 transmitters' proven performance and technology conform with rigorous international standards.

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 microprocessor based electronics, 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

The HMT360 offers six probe options for various applications:

| | |
|--------|-------------------------|
| HMP361 | - wall mount |
| HMP363 | - confined spaces |
| HMP364 | - pressurized spaces |
| HMP365 | - high temperature |
| HMP367 | - high humidity |
| HMP368 | - 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



The HMP361 probe in this picture has a stainless steel netting filter.

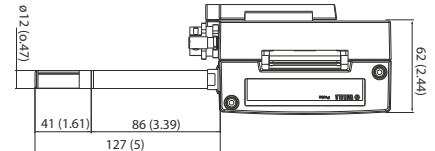
Technical Data

HMP361 for wall mounting

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

Dimensions

Dimensions in mm (inches)



The HMP363 probe is small and fits into tight spaces. This one is connected with a teflon cable.

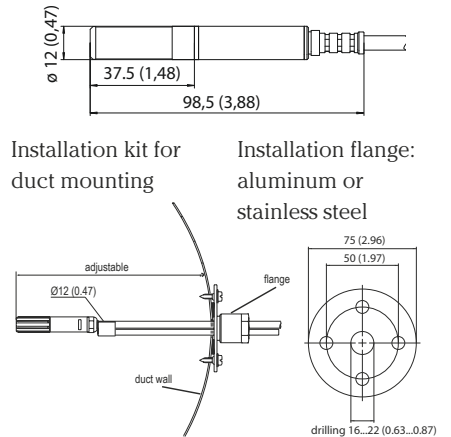
Technical Data

HMP363 for confined spaces

| | |
|--|--------------------------------------|
| Temperature range with | |
| teflon cable | -40 ... +120 °C (-40 ... +248 °F) |
| rubber cable | -40 ... +80 °C (-40 ... +176 °F) |
| Probe cable length | 2, 5 or 10 meters |
| Probe diameter | 12 mm |
| Installation | |
| Duct installation kit | 210697 |
| Cable Gland M20x1.5 with splitting seal | HMP247CG |
| Swagelok for 12mm probe, 1/2" NPT thread | SWG12NPT12 |

Dimensions

Dimensions in mm (inches)



The HMP364 probe is designed for measurement in pressurized spaces or vacuum chambers.

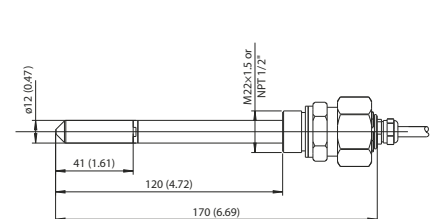
Technical Data

HMP364 for high pressure

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

Dimensions

Dimensions in mm (inches)





The HMP365 probe is designed for high temperature environments.

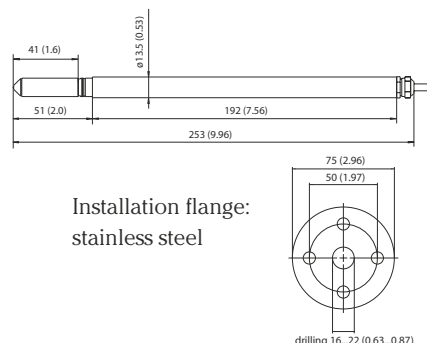
Technical Data

HMP365 for high temperature

| | |
|--|--------------------------------------|
| Temperature range | -70 ... +180 °C (-94 ... +356 °F) |
| Probe cable length | 2, 5 or 10 meters |
| Probe diameter | 13.5 mm |
| Installation | |
| Mounting flange | 210696 |
| Cable Gland M20x1.5 with splitting seal | HMP247CG |

Dimensions

Dimensions in mm (inches)



Installation flange:
stainless steel



The HMP367 probe is constructed to be installed in environments with high humidities.

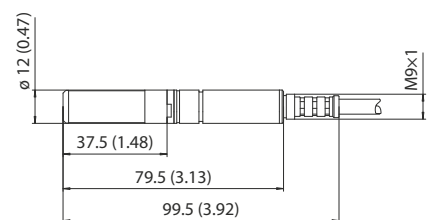
Technical Data

HMP367 for high humidities

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

Dimensions

Dimensions in mm (inches)



The HMP368 probe enables flexible installation in pressurized pipelines.

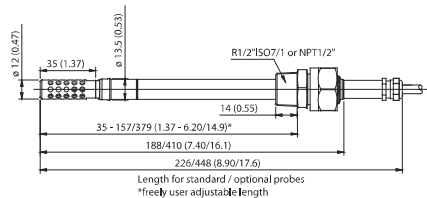
Technical Data

HMP368 for pressurized pipelines

| | |
|---------------------------------------|--------------------------------------|
| Temperature range | -70 ... +180 °C (-94 ... +356 °F) |
| Pressure range | 0 ... 4 MPa |
| Probe cable length | 2, 5 or 10 meters |
| Probe diameter | 13.5 mm/12 mm |
| Two probe lengths available. | |
| Installation | |
| Fitting body ISO1/2 solid structure | DRW212076SP |
| Fitting body NPT1/2 solid structure | NPTFITBODASP |
| Ball valve ISO 1/2 with welding joint | BALLVALVE-1 |

Dimensions

Dimensions in mm (inches)



Technical Data

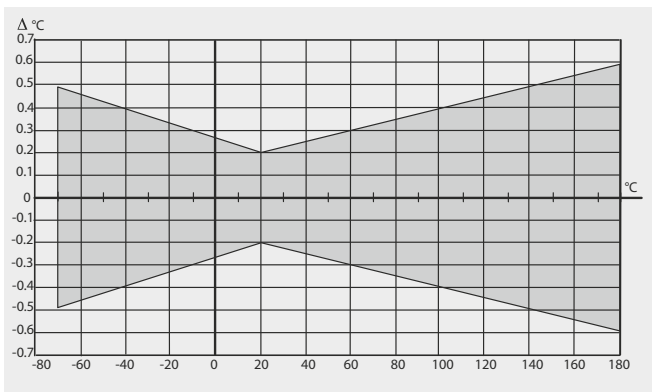
Performance

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) |
| | ±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 |
| with Vaisala HUMICAP® 180 _L 2 | for application with demanding chemical environment |
| at -10 ... +40 °C (14 ... +104 °F) | ± (1.0 + 0.01 x reading) %RH |
| at -40 ... +180 °C (-40 ... +356 °F) | ± (1.5 + 0.02 x reading) %RH |
| Factory calibration uncertainty (+20 °C) | ± 0.6 % RH (0 ... 40 %RH) |
| | ± 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) |
| | (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

Temperature range

| | |
|---------------------------------------|----------------------------------|
| operating temp. range for electronics | -40 ... +60 °C (-40 ... +140 °F) |
| with display | -20 ... +60 °C (-4 ... +140 °F) |
| storage | -40 ... +70 °C (-40 ... +158 °F) |
| Pressure range | see probe specifications |

Complies with EMC standard EN61326-1, Electrical equipment for measurement, control and laboratory use - EMC requirements; Industrial Environment.

NOTE! IEC 1000-4-5 complies only when using external EXI approved surge arrester in the safe area.

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 |
| 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 |
| Analog outputs | connection via safety barriers |
| RS232C serial output for service use | connector type RJ45 |
| Display | two-line LCD |

Mechanics

| | |
|------------------------|---|
| Connections | screw terminals, 0.33...2.0 mm |
| | 2 wires (AWG 14-22) |
| Cable bushings | For 7.5...12mm or 10...15mm cable diameters (M20) |
| Conduit fitting | NPT 1/2" (M20) |
| Housing material | G-AlSi ₁₀ Mg (DIN 1725) |
| Housing classification | IP66 (NEMA 4X) |
| Housing weight | 950 g |

Options and Accessories

| | |
|--|--|
| Duct installation kit (for HMP363/367) | 210697 |
| Mounting flange (for HMP365) | 210696 |
| Ball valve ISO 1/2 with welding joint (for HMP368) | BALLVALVE-1 |
| pressure range at +20 °C (+68 °F): | 0 ... 20 bar (0 ... 290 psia) |
| | (during installation max. 10 bar (145 psia)) |
| Calibration adapter for HMK15 | 211302 |
| Serial interface cable for PC | |
| connectors RJ45 - D9 female | 25905ZZ |
| Galvanic isolator | 212483 |
| Zener barrier | 210664 |
| Protection cover (for use in the presence of combustible dust, ATEX) | 214101 |
| | II 1 D IP65 T = 80 °C |

Classification with Current Outputs

EUROPE / VTT

EU (94/9/EC, ATEX100a) II 1 G Ex ia IIC T4 Ga
VTT 09 ATEX 028 X issue No: 2
Safety factors $U_i = 28 \text{ V}$, $I_i = 100 \text{ mA}$, $P_i = 700 \text{ mW}$
 $C_i = 1 \text{ nF}$, 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) II 1 D (IP65 $T=70$ °C)
VTT 04 ATEX 023X

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

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

JAPAN (TIIS) Ex ia IIC T4
Code number: TC20238

Safety factors: $U_i = 28 \text{ VDC}$, $I_i = 100 \text{ mA}$, $C_i = 1 \text{ nF}$,
 $P_i = 0.7 \text{ W}$, $L_i = 0$, $T_{amb} = 60$ °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: $T_{amb} = 60$ °C, T4,
Intrinsically safe when connected as per
Installation Drawing DRW213478.

CHINA (PCEC)

Ex ia II CT4

Certificate No. CE092145

Standard GB3836.1-2000 and GB3836.4-2000

IECEx (VTT)

Ex ia IIC T4 Ga

IECEx VTT 09.0002x issue No: 2

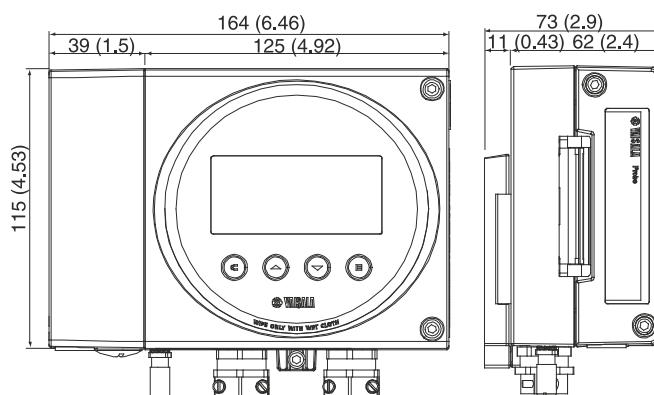
Safety factors $U_i = 28 \text{ V}$, $I_i = 100 \text{ mA}$, $P_i = 700 \text{ mW}$
 $C_i = 1 \text{ nF}$, L_i negligibly low

Environmental specification

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

Dimensions

Dimensions in mm (inches)



Accessories

| Accessory | part number | HMT361 | HMT363 | HMT364 | HMT365 | HMT367 | HMT368 |
|---|--------------|--------|--------|--------|--------|--------|--------|
| Ball valve ISO 1/2 with welding joint | BALLVALVE-1 | | | | | | √ |
| Cable Gland M20 x 1.5 with splitting seal | HMP247CG | | √ | | √ | √ | |
| Duct installation kit | 210697 | | √ | | | √ | |
| Fitting body ISO1/2 solid structure | DRW212076SP | | | | | | √ |
| Fitting body M22 x 1.5 | 17223 | | | √ | | | |
| Fitting body NPT1/2 | 17225 | | | √ | | | |
| Fitting body NPT1/2 solid structure | NPTFITBODASP | | | | | | √ |
| Mounting flange | 210696 | | | | √ | | |
| Swagelok for 12mm probe, 1/2" NPT thread | SWG12NPT12 | | √ | | | √ | |
| Swagelok for 12mm probe, 3/8" ISO thread | SWG12ISO38 | | √ | | | √ | |



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