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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 dewpoint, 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 -40...+180°C (-40...+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.

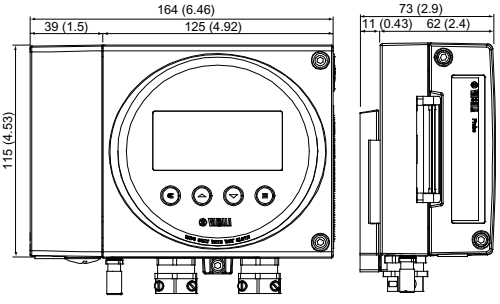
Long-term solution

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

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

Dimensions

Dimensions in mm (inches)



Technical Data

Performance

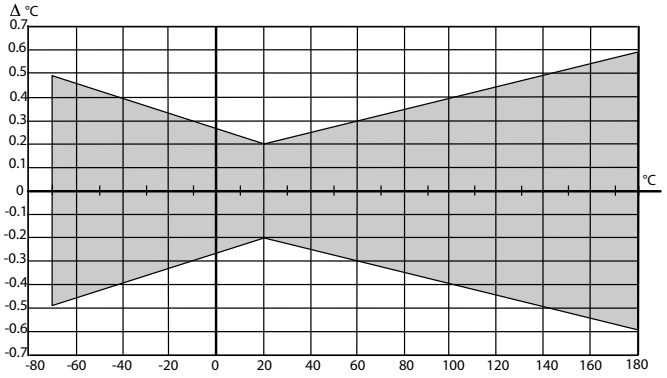
Relative humidity

Measurement range	0 ... 100 % RH
Accuracy (including non-linearity, hysteresis, and repeatability)	
with Vaisala HUMICAP® 180 or 180R	for typical applications
with Vaisala HUMICAP® 180C or 180RC	for applications with chemical purge/warmed probe
at +15... +25 °C (59... +77 °F)	± 1.0 % RH (0 ... 90 %RH) ±1.7 %RH (90 ... 100 %RH)
at -20 °C ... +40 °C (-4...+104 °F)	±(1.0 + 0.008 x reading) %RH
at -40 °C ... +180 °C (-40... +356 °F)	± (1.5 +0.015 x reading) %RH
with Vaisala HUMICAP® 180L2	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	8 s
with grid + steel netting filter	20 s
with sintered filter	40 s

Temperature

Measurement range	-40 ... +180 °C (-40...+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	Pt 1000 RTD 1/3 Class B IEC 751

Accuracy over temperature range



Other variables

Optionally available	dewpoint 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 on 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

Classification with current outputs

Europe / CENELEC (PTB)

EU (94/9/EC, ATEX100a)	II 1 G EEx ia IIC T4 PTB 00 ATEX 2112 X
Safety factors	Ui = 28 V, Ii = 100 mA, Pi = 0.7 W Ci = 1 nF, Li = 0 H
Environmental specifications	
T_{amb}	-20...+60 °C (-4...+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: Vmax = 28 VDC, Imax = 100 mA, Ci = 1 nF, Li = 0, Pi = 0.7 W, T_{amb} = 60 °C(140 °F), T5

Japan (TIIS) Ex ia IIC T4
Code number: TC17897

Safety factors: Ui = 28 VDC, Ii = 100 mA, Ci = 1 nF, Pi = 0.7 W, Li = 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 CT5
Certificate No. CE042052
Standard GB3686.1-2000 and GB3836.4-2000

Russia (STV) Ex ia IIC T4
Certificate No. ROSS FI.GB04.V00634

Safety factors: Ui = 28 V, Ii = 100 mA, Pi = 700 mW
Ci = 1 nF, Li = 0 H, T_{amb} = -20 °C...+60 °C

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-AlSi10Mg (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 (USA & Canada)	210664

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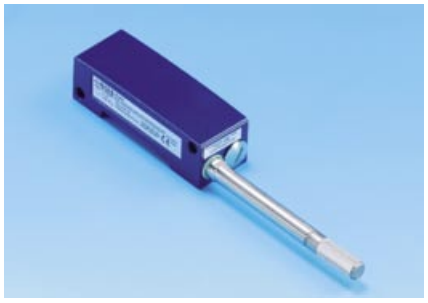
Interchangeable Probes for HMT360 Intrinsically Safe Humidity and Temperature Transmitter



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

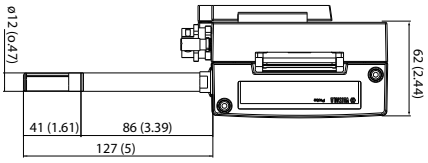
HMP361 for wall mounting

Technical Data

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

Dimensions

Dimensions in mm (inches
HMP361 probe



The HMP363 probe is small and fits into tight spaces. In the picture above, the probe is connected with a teflon cable. A rubber cable version is available as well.

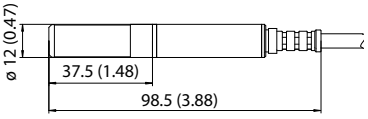
HMP363 for confined spaces

Technical Data

Temperature range with	
teflon cable	-40...+120 °C (-40...+248 °F)
rubber cable	-40...+80 °C (-40...176 °F)
Sensor head cable length	2, 5 or 10 meters
Sensor head 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

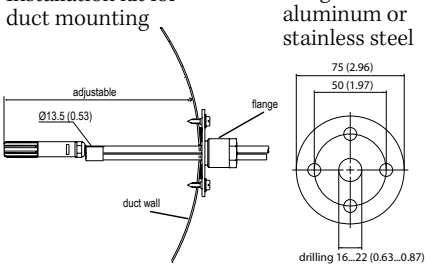
Dimensions

Dimensions in mm (inches
HMP363 probe



Installation kit for duct mounting

Installation flange: aluminum or stainless steel



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

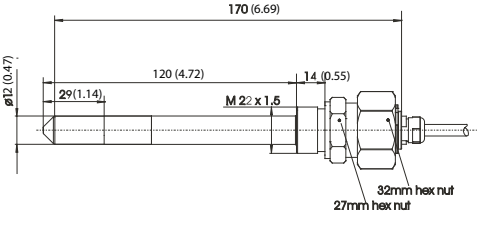
HMP364 for high pressure

Technical Data

Temperature range	-40...+180 °C (-40...+356 °F)
Pressure range	0...10 MPa
Sensor head cable length	2, 5 or 10 meters
Sensor head diameter	12 mm
Installation	
Fitting body M22x1.5	17223
Fitting body NPT1/2	17225

Dimensions

Dimensions in mm (inches
HMP364 probe



The HMP365 probe is designed for high temperature environments.

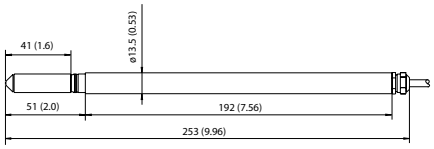
HMP365 for high temperature

Technical Data

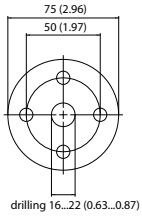
Temperature range	-40...+180 °C (-40...+356 °F)
Sensor head cable length	2, 5 or 10 meters
Sensor head diameter	13.5 mm
Installation	
Mounting flange	210696
Cable Gland M20x1.5 with splitting seal	HMP247CG

Dimensions

Dimensions in mm (inches)
HMP365 probe



Installation flange:
stainless steel



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

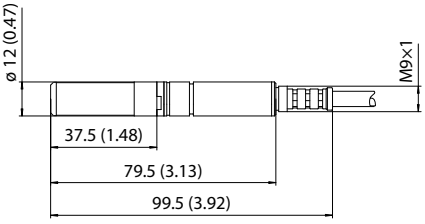
HMP367 for high humidities

Technical Data

Temperature range	-40...+180 °C (-40...+356 °F)
Sensor head cable length	2, 5 or 10 meters
Sensor head 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)
HMP367 probe



The HMP368 probe enables flexible installation in pressurized pipelines.

HMP368 for pressurized pipelines

Technical Data

Temperature range	-40...+180 °C (-40...+356 °F)
Pressure range	0...4 MPa
Sensor head cable length	2, 5 or 10 meters
Sensor head diameter	13.5 mm/12 mm
Two probe lenghts available,	
Installation	
Fitting body ISO1/2 solid structure	DRW212076
Fitting body NPT1/2 solid structure	212810
Ball valve ISO 1/2 with welding joint	BALLVALVE-1

Dimensions

Dimensions in mm (inches)
HMP368 probe