HMT360 Series Intrinsically Safe Humidity and Temperature Transmitters

The Vaisala HUMICAP® Humidity and Temperature Transmitter HMT361 wall mount transmitter, shown with five 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
- Five interchangeable probes
- 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 they may change the configuration in the field.

Five interchangeable probes

The HMT360 offers five probe options for various applications:

HMP361	- wall mount
HMP363	- confined spaces
HMP364	- high pressure
HMP365	- high temperature
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 standard Vaisala HUMICAP® Sensor, also application specific, very chemically durable sensor is 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.

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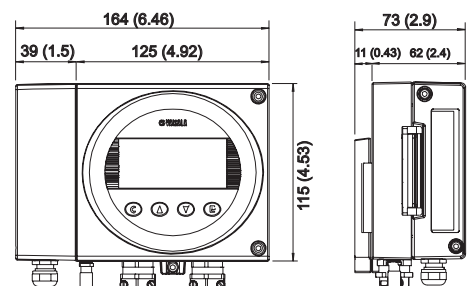
Technical Data

Performance

Relative humidity measurement

Measurement range	0...100 %RH

Accuracy (including nonlinearity, hysteresis and repeatability)
Maximum achievable accuracy when calibrated against high quality, certified humidity standards:

0...90 %RH	±1 %RH
90...100 %RH	±2 %RH

When calibrated against salt solutions (ASTM E104-85)

0...90 %RH	±2 %RH
90...100 %RH	±3 %RH
Response time (90%) at 20 °C (+68 °F) in still air (with sintered filter)	15 seconds

Sensors

HUMICAP® 180	for typical applications
HUMICAP® 180L2	for applications with a demanding chemical environment

Temperature measurement

Measurement range	-40...+180 °C (-40...+356 °F) (depends on selected probe)
Typical accuracy of electronics at +20 °C (+68 °F)	±0.1 °C (±0.18 °F)
Typical temperature dependence of electronics	0.005 °C/°C (0.005 °F/°F)
Sensor	Pt 1000 RTD 1/3 Class B IEC 751

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 EN61326-1:1997 + Am1:1998 + Am2:2001; 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	U_i = 28 V, I_i = 100 mA, P_i = 0.7 W
	C_i = 1 nF, L_i = 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,
	C_i = 1 nF, L_i = 0, P_i = 0.7 W, T_{amb} = 60 °C(140 °F), T5

Japan (TIIS)

	Ex ia IIC T4
	Code number: TC15354
Safety factors:	U_i = 28 VDC, I_i = 100 mA, C_i = 1 nF,
	P_i = 0.7 W, L_i = 0, T_{amb} = 60 °C(140 °F)

Australia (TestSafe)

	EX ia IIC T5 IP65
	Certificate No: Ex AUS Ex 3738X
Safety factors:	U_i = 28 V, I_i = 100 mA, P_i = 0.7 W,
	C_i = 1 nF, L_i = 0 mH

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

Mechanics

Connections	screw terminals, 0.33...2.0 mm² wires (AWG 14-22)
Cable bushing	Pg11 (5...12 mm)
Conduit fitting	Pg11/NPT 1/2"-14
Housing material	G-AlSi10Mg (DIN 1725)
Housing classification	IP65 (NEMA 4)
Housing weight	950 g

Options and accessories

Calculated output variables	dewpoint temperature, mixing ratio, absolute humidity, wet bulb temperature
Additional analog output	4...20 mA
Duct mounting installation kit (for HMP363)	HMP233FAH

Installation flange (for HMP365)

aluminium	HMP235FA
stainless steel	HMP235FS
Ball valve set (for HMP368)	DMP248BVS
pressure range at +20 °C	0...40 bar
	(during installation max. 10 bar)

Serial interface cable for PC

connectors RJ45 - D9 female	25905ZZ
Shield against rain	HMT360SAR

Protection cover for use in the presence of combustible dust

	214101
HMK15 adapter fitting for 12 mm probes	211011
Galvanic isolator	212483
Zener barrier	210664

CE

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Interchangeable Probes for HMT360 Intrinsically Safe Humidity and Temperature Transmitter

The HMP361 probe with stainless steel sintered filter.

HMP361 for wall mounting

Technical Data

HMT361 = HMT360 transmitter + HMP361 probe
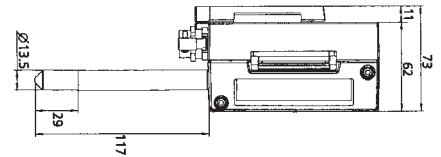Temperature range
-40...+60 °C (-40...+140 °F)
Sensor head diameter   13.5 mm
Sensor protection options
PPS grid with stainless steel netting
Stainless steel sintered filter
PPS grid
Membrane filter

Dimensions

Dimensions in mm.

HMP361 probe

The HMP363 probe is small and fits into tight spaces. In the picture above , the probe is fitted with a PPS grid with steel netting filter.

HMP363 for confined spaces

Technical Data

HMT363 = HMT360 transmitter + HMP363 probe
Temperature range
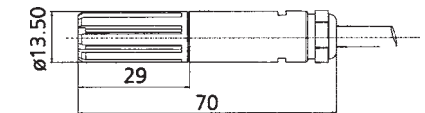-40...+120 °C (-40...+248 °F)
Sensor head cable length
2, 5 or 10 meters
Sensor head diameter   13.5 mm
Sensor protection options
PPS grid with stainless steel netting
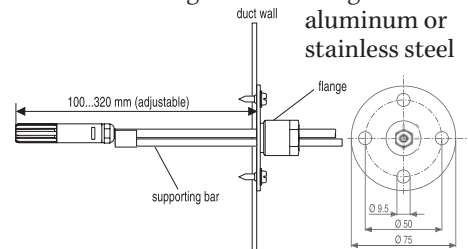
Dimensions

Dimensions in mm.
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

HMT364 = HMT360 transmitter + HMP364 probe
Temperature range
-40...+180 °C (-40...+356 °F)
Pressure range   0...10 MPa
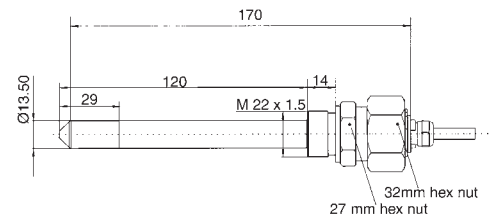Sensor head cable length
2, 5 or 10 meters
Sensor head diameter   13.5 mm
Sensor protection options
PPS grid with stainless steel netting
Stainless steel sintered filter

Dimensions

Dimensions in mm.

HMP364 probe

*The HMP365 probe is designed for high temperatures.*

HMP365 for high temperature

Technical Data

HMT365 = HMT360 transmitter + HMP365 probe

Temperature range
-40...+180 °C (-40...+356 °F)

Sensor head cable length
2, 5 or 10 meters

Sensor head diameter 13.5 mm

Sensor protection options
PPS grid with stainless steel netting
Stainless steel sintered filter

Dimensions

Dimensions in mm.
HMP365 probe
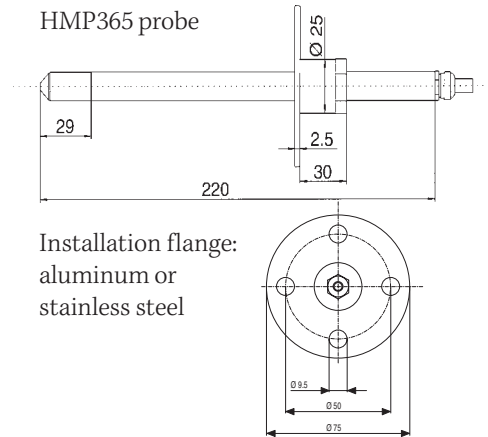
Installation flange: aluminum or stainless steel

The HMP368 probe enables flexible installation in pressurized pipelines.

HMP368 for pressurized pipelines

Technical Data

HMT368 = HMT360 transmitter + HMP368 probe

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

Sensor protection options
Stainless steel sintered filter

Dimensions

Dimensions in mm.

HMP368 probe

182 / 404 (7.17 / 15.9)

29 - 137 / 359 (1.14 - 5.39 / 14.1) *   14 (0.55)

29 (1.14)   Ø 13.5 (0.531)

R 1/2 ISO 7/1 or NPT 1/2"

220 / 442 (8.66 / 17.4)

lengths for standard / optional probes
* freely user-adjustable length

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