VAISALA

PTU300 Combined Pressure, Humidity and Temperature Transmitter

For Demanding Applications

Vaisala Combined Pressure, Humidity and Temperature Transmitter PTU300 is a unique instrument measuring three parameters simultaneously.

You can choose from the following probe options: PTU301 for wall mounting for example in laboratories or engine rooms, PTU303 for general use, PTU307 warmed probe for outdoor and demanding meteorology applications, and PTU30T for pressure and temperature measurement only.

Proven Vaisala Sensor Technology

PTU300 incorporates sensors known for their high accuracy and excellent long-term stability: Vaisala BAROCAP® for pressure measurement and Vaisala HUMICAP® for humidity measurement. The temperature sensor is a platinum RTD sensor.

Graphical Display of Measurement Data and Trends for Convenient Operation

PTU300 features a large numerical and graphical display with a multilingual menu and keypad. It allows users to easily monitor operational data, measurement trends, and access measurement history for the past 12 months.

The optional data logger, with real-time clock, makes it possible to generate over four years of measurement history and zoom in on any desired time or time frame.

The display alarm allows any measured parameter to be tracked, with freely configurable low and high limits.

Versatile Outputs and Data Collection

PTU300 comes with a standard RS-232 serial interface. The output format is compatible with major GPS receivers and NMEA-coded messages. An isolated RS-485 interface is available as an option.

PTU300 is also capable of applying the Modbus communication protocol and, together with an appropriate connection option, provides either Modbus RTU (RS-485) or Modbus TCP/IP (Ethernet) communication.

The data logger records data that can be viewed on the local display or transferred to a PC with Microsoft® Windows® software. The transmitter can also be connected to a network with an optional LAN interface, which enables an Ethernet connection. A USB service cable makes it easy to connect PTU300 to a PC via the service port.

Outdoor Installation Kit

Outdoor installation is possible using the optional HMT330MIK installation kit, for applications requiring reliable measurements for meteorological purposes.
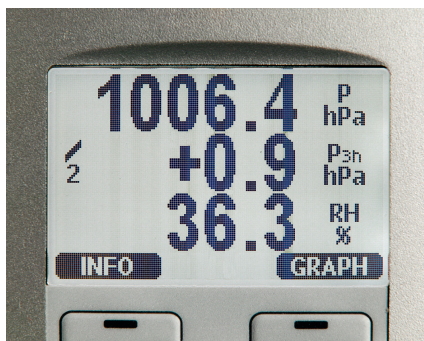
Flexible Calibration

Quick, one-point field calibration for humidity is easy using Vaisala Hand-Held Humidity Meter HM70.

With Vaisala Barometric Pressure Transfer Standard PTB330TS, including optional humidity and temperature probe, field check and calibration can be performed for all three parameters.

The display also shows the WMO pressure trend ΔP 3h and tendency of 0 ... 8.

Applications

- Environmental monitoring in calibration laboratories
- Industrial applications in semiconductor industry, engine testing and maritime sector
- GPS meteorology: estimating precipitable water vapor in the atmosphere, weather stations
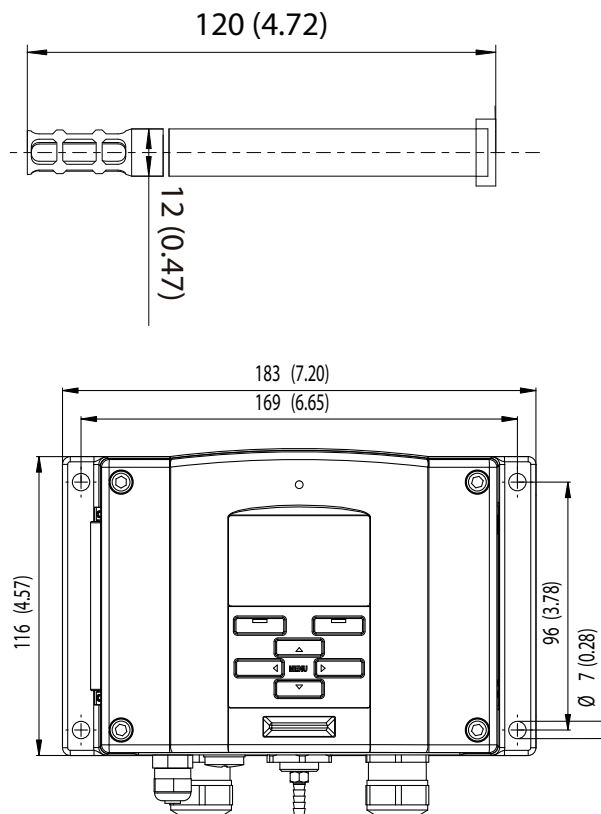
Model	Dimensions in mm

PTU301 for wall mounting

120 (4.72)

12 (0.47)

183 (7.20)

169 (6.65)

116 (4.57)

96 (3.78)

Ø 7 (0.28)

Model	Dimensions in mm

Ø 12 (0.47)

M9x1

37.5 (1.48)

78.5 (3.09)

98.5 (3.88)
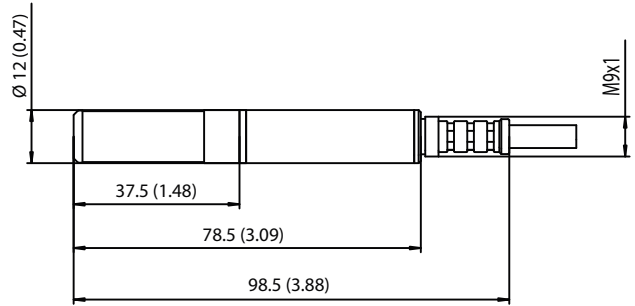
PTU303 probe for outdoor use

Ø 12 (0.47)

M9x1

37.5 (1.48)

79.5 (3.13)

99.5 (3.92)

Ø 6 (0.24)

Ø 3.2 (0.13)

130 (5.12)
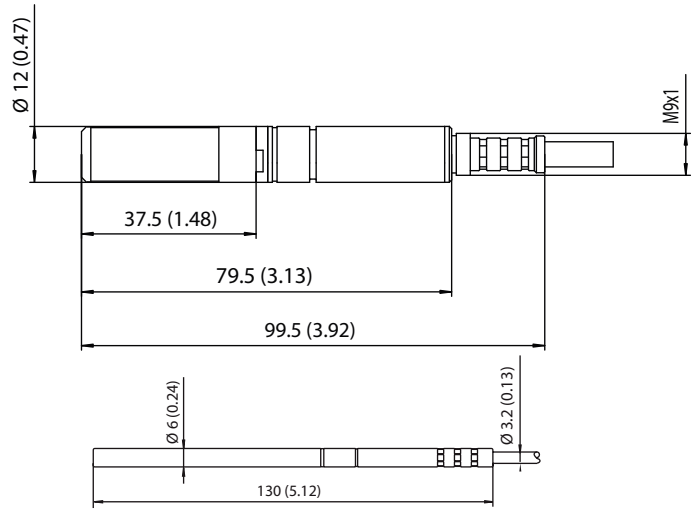
PTU307 warmed probe for demanding
meteorological installations

Ø 6 (0.24)

Ø 3.2 (0.13)

130 (5.12)
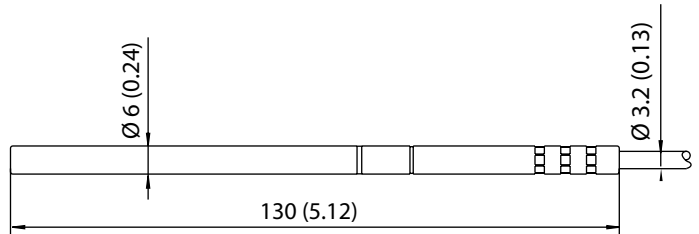
PTU30T for pressure and temperature only
measurement
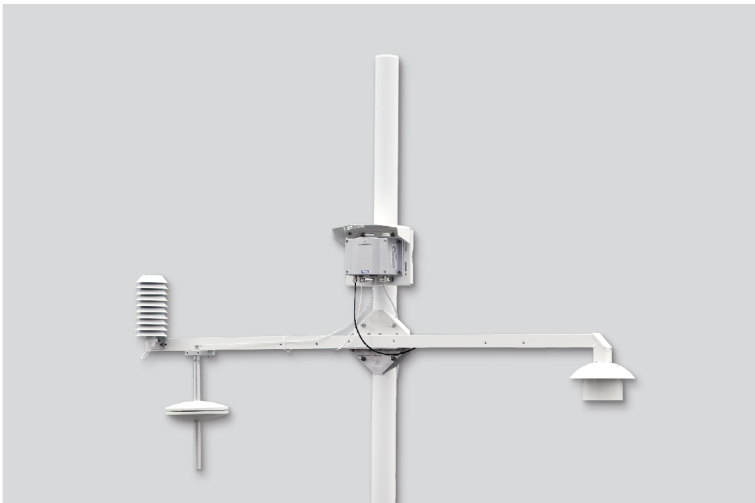
HMT330MIK Meteorological Installation Kit enables PTU307 to be installed outdoors to obtain reliable measurements for meteorological purposes.

Technical Data

Measurement Performance

Barometric Pressure

	500 ... 1100 hPa	500 ... 1100 hPa	50 ... 1100 hPa
Pressure range		500 ... 1100 hPa	50 ... 1100 hPa
Accuracy	500 ... 1100 hPa	500 ... 1100 hPa	50 ... 1100 hPa
	Class A	Class B	
Linearity	±0.05 hPa	±0.10 hPa	±0.20 hPa
Hysteresis	±0.03 hPa	±0.03 hPa	±0.08 hPa
Repeatability	±0.03 hPa	±0.03 hPa	±0.08 hPa
Calibration unceratinty	±0.07 hPa	±0.15 hPa	±0.20 hPa
Accuracy at +20 °C / +68 °F	±0.10 hPa	±0.20 hPa	±0.30 hPa
Temperature dependence	±0.1 hPa	±0.1 hPa	±0.3 hPa
Total accuracy (-40 ... +60 °C / -40 ... +140 °F)	±0.15 hPa	±0.25 hPa	±0.45 hPa
Long-term stability/year	±0.1 hPa	±0.1 hPa	±0.2 hPa
Response Time (100 % Response):			
One sensor	2 s	1s	1 s
Pressure units	hPa, mbar, kPa, Pa, inHg, mmH20, mmHg, torr, psia		

Relative Humidity

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Measurement range	0 ... 100 %RH
Accuracy (Including Non-linearity, Hysteresis, and Repeatability):	
At +15 ... +25 °C / +59 ... +77 °F	±1 %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 ... +60 °C / -40 ... +140 °F	±(1.5 + 0.015 x reading) %RH
Factory calibration uncertainty (+20 °C / +68 °F) (Defined as ±2 standard deviation limits. Small variations possible, see also calibration certificate.)	±0.6 %RH (0 ... 40 %RH) ±1.0 %RH (40 ... 97 %RH)
Sensor for typical applications	Vaisala HUMICAP 180 or 180R
Sensor for applications with chemical purge/warmed probe	Vaisala HUMICAP 180C or 180RC
Response Time (90 %) at +20 °C (+68 °F) in Still Air:	
With grid filter	8 s / 17 s [1]
With grid + steel netting filter	20 s / 50 s [1]
With sintered filter	40 s / 60 s [1]

Temperature

Measurement range, housing (barometric pressure measurement limit) [2]	-40 ... +60 °C (-40 ... +140 °F)
Measurement range, probes (operational limit when measuring RH or T)	PTU301: -40 ... +60 °C (-40 ... +140 °F) PTU303: -40 ... +80 °C (-40 ... +176 °F) PTU307: -40 ... +180 °C (-40 ... +356 °F) PTU30T: -70 ... +180 °C (-94 ... +356 °F) [3]
Accuracy at +20 °C (+68 °F)	PTU301, PTU303, PTU307: ±0.2 °C (±0.4 °F) PTU30/T: ±0.1 °C (±0.18 °F)
Temperature units	°C, °F
Temperature sensor	Pt100 RTD Class F0.1 IEC 60751

1) With HUMICAP 180R or 180RC sensor
2) Note that the operational temperature limits of the PTU303, PTU307, and PTU30T probes are higher than for the PTU300 transmitter itself. The transmitter's temperature limit is based on the upper temperature limit for barometric pressure measurement, +60 °C (+140 °F)
3) PTU30T is used for T and P measurements only, RH measurement not in use.
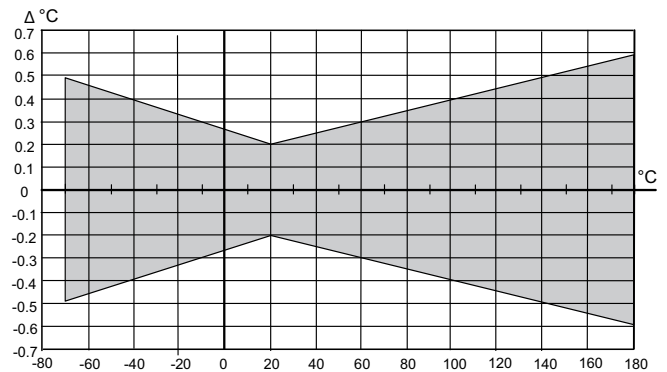
Accuracy over Temperature Range

Operating Environment

Operating temperature	-40 ... +60 °C (-40 ... +140 °F)
Operating temperature with optional display	0 ... +60 °C (+32 ... +140 °F)
Humidity range	Non-condensing
EMC compliance	EN61326-1, Industrial Environment

Note: Transmitter with display test impedance of 40 Ω is used in IEC61000-4-5 (Surge immunity)

Mechanical Specifications

Cable bushing	M20 x 1.5 for cable diameter 8 ... 11 mm / 0.31 ... 0.43″
Conduit fitting	1/2″ NPT
User cable connector (optional) Option 1 Option 2	M12 series 8-pin (male) Female plug with 5 m (16.4 ft) black cable Female plug with screw terminals
Cable diameter, PTU303	6.0 mm
Cable diameter, other probes	5.5 mm
Standard probe cable lengths	2 m, 5 m or 10 m [1]
Housing material	G-AlSi 10 Mg (DIN 1725)
IP rating	IP66 IP65 (NEMA4X) with local display
Weight (depending on selected probe)	1.0 - 3.0 kg / 2.2 - 6.6 lb

1) Additional cable lengths available, please see order form for details.

Optional Data Logger with Real-time Clock

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Logged parameters	Max. four with trend/min/max values
Logging interval	10 s (fixed)
Maximum logging period with maximum temporal resolution	4 years 5 months
Logged points	13.7 million points per parameter
Battery lifetime	Min. 5 years

Display

Material	LCD with backlight, graphical trend display of any parameter
Menu languages	English, Chinese, Finnish, French, German, Japanese, Russian, Spanish, Swedish

Inputs and Outputs

Operating voltage	10 ... 35 VDC, 24 VAC ±20 %
With optional power supply module	100 ... 240 VAC, 50/60 Hz
Settling time at power-up (one sensor)	Class A: 4 s Class B: 3 s
Recommended wire size	0.5 mm^2 (AWG 20) stranded wires
Digital outputs	RS-232, RS-485 (optional)
Protocols	ASCII commands, Modbus RTU
Service connection	RS-232, USB
Relay outputs (optional)	0.5 A, 250 VAC
Power Consumption at +20 °C (+68 °F) (U$_{in}$ 24 VDC)	
RS-232	Max. 28 mA
U$_{out}$ 3 x 0 ... 1 V / 0 ... 5 V / 0 ... 10 V	Max. 33 mA
I$_{out}$ 3 x 0 ... 20 mA	Max. 63 mA
Display and backlight	+20 mA
During chemical purge	Max. +110 mA
During probe heating	+120 mA
External Loads	
Current outputs	R$_L$ < 500 Ω
0 ... 1 V output	R$_L$ > 2 kΩ
0 ... 5 V and 0 ... 10 V outputs	R$_L$ > 10 kΩ
Ethernet Interface (Optional)	
Supported standards	10BASE-T, 100BASE-TX
Connector	8P8C (RJ45)
IPv4 address assignment	DHCP (automatic), static
Protocols	Telnet, Modbus TCP/IP
Analog Outputs (Optional)	
Current output	0 ... 20 mA, 4 ... 20 mA
Voltage output	0 ... 1 V, 0 ... 5 V, 0 ... 10 V
Humidity and Temperature:	
Accuracy of analog outputs at +20 °C (+68 °F)	±0.05 °% full scale
Temperature dependence of analog outputs	±0.005 %/°C (0.003 %/°F) full scale
Pressure:	
Accuracy of analog outputs at +20 °C (+68 °F)	±0.30 hPa (500 ... 1100 hPa) ±0.40 hPa (50 ... 1100 hPa)
Accuracy of analog outputs at -40 ... +60 °C / -40 ... +140 °F	±0.60 hPa (500 ... 1100 hPa) ±0.75 hPa (50 ... 1100 hPa)

Spare Parts and Accessories

PC software and cable	215005
USB-RJ45 Serial Connection Cable	219685
Connection cable for HM70	211339
Wall mounting plate (plastic)	214829
Pole installation kit with rain shield	215109
DIN rail installation set	211477
Duct installation kit, PTU303/307	210697
Cable gland and AGRO, PTU303/307	HMP247CG
Solar radiation shield, PTU303/307/30T	DTR502B
Meteorological installation kit	HMT330MIK
Duct installation kit (T probe)	215003
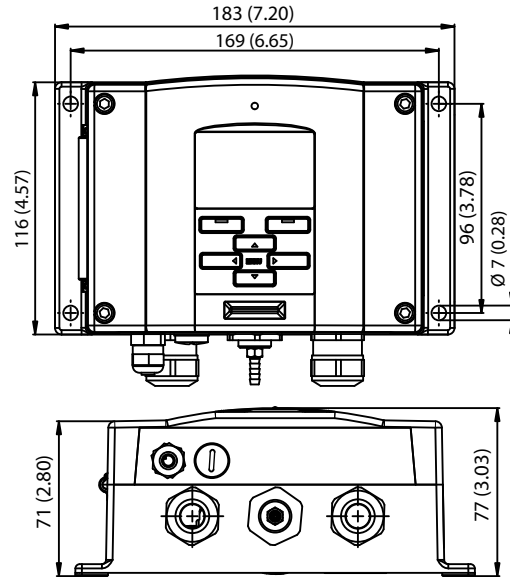
Dimensions in mm (inches)

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