

PTU300 Combined Pressure, Humidity and Temperature Transmitter for Demanding Applications



The Vaisala Combined Pressure, Humidity and Temperature Transmitter PTU300 is a versatile, multi-purpose instrument.

Features/Benefits

- Barometric pressure, humidity, and temperature measurement in one transmitter
- Available with up to two barometric pressure sensors for added reliability
- RS232C serial interface with NMEA protocol for GPS use
- Graphical display and keypad for convenient operation
- Analog outputs, RS232/485, WLAN/LAN
- MODBUS protocol support (RTU/TCP)
- Optional universal power supply module
- NIST traceable calibration (certificate included)
- HMT330MIK installation kit for outdoor use
- Applications include environmental monitoring in calibration laboratories, industrial applications, GPS meteorology: estimating precipitable water vapor in the atmosphere, weather stations

One Transmitter, Three Measurements

The 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 laboratories, 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

The 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

The 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

The PTU300 comes with a standard RS232 serial interface. The output format is compatible with major GPS receivers and NMEA-coded messages. An isolated RS485 is available as an option.

The PTU300 is also capable of applying the MODBUS communication protocol and, together with an appropriate connection option, provides either MODBUS RTU (RS485) or MODBUS TCP/IP (Ethernet) communication.

The data logger, with real-time clock and battery backup, guarantees reliable logging of measurement data for over four years. The recorded data

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 (W)LAN interface, which enables a (wireless) Ethernet connection. A USB service cable makes it easy to connect the 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 the 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.

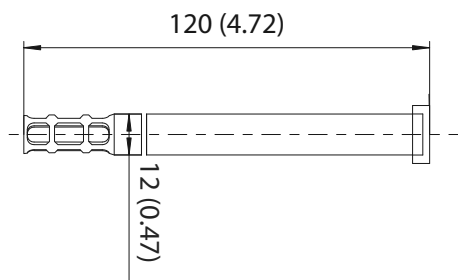
PTU300 Models



PTU301 for wall mounting

Dimensions

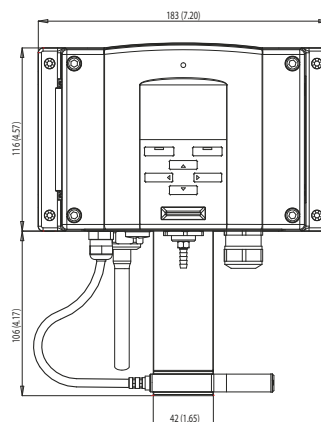
Dimensions in mm (inches)



PTU301 short cable probe with optional WLAN

Dimensions

Dimensions in mm (inches)



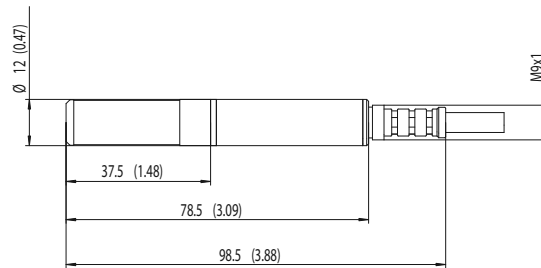
PTU300 Models



PTU303 probe for outdoor use

Dimensions

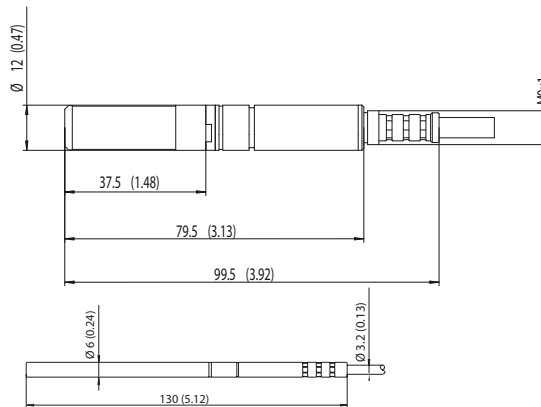
Dimensions in mm (inches)



PTU307 warmed probe for demanding meteorological installations

Dimensions

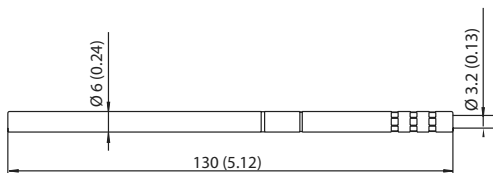
Dimensions in mm (inches)



PTU30T for pressure and temperature only measurement

Dimensions

Dimensions in mm (inches)



Technical Data

Performance

BAROMETRIC PRESSURE

Pressure range	500 ... 1100 hPa	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 uncertainty**	±0.07 hPa	±0.15 hPa	±0.20 hPa
Accuracy at +20 °C***	±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	1 s	1 s
Pressure units	hPa, mbar, kPa, Pa, inHg, mmH2O, mmHg, torr, psia		

* Defined as ±2 standard deviation limits of endpoint non-linearity, hysteresis error or repeatability error and calibration.

** Defined as ±2 standard deviation limits of accuracy in the working standard including NIST traceability.

*** Defined as the root sum of the squares (RSS) of endpoint non-linearity, hysteresis error, repeatability error and calibration uncertainty at room temperature.

**** Defined as ±2 standard deviation limits of temperature dependence over the operating temperature range.

RELATIVE HUMIDITY

Measurement range	0 ... 100 %RH
Accuracy (including non-linearity, hysteresis, and repeatability at +15 ... +25 °C)	±1 %RH (0 ... 90 %RH) ±1.7 %RH (90 ... 100 %RH)
at -20 ... +40 °C	±(1.0 + 0.008 x reading) %RH
at -40 ... +60 °C	±(1.5 + 0.015 x reading) %RH
Factory calibration uncertainty (+20 °C)	
(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*
for applications with chemical purge/warmed probe Vaisala HUMICAP® 180C or 180RC*

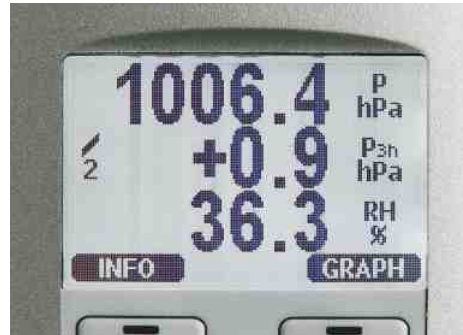
Response time (90%) at +20 °C (+68 °F) in still air

with grid filter	8 s / 17 s*
with grid + steel netting filter	20 s / 50 s*
with sintered filter	40 s / 60 s*

* with HUMICAP® 180R or 180RC sensor

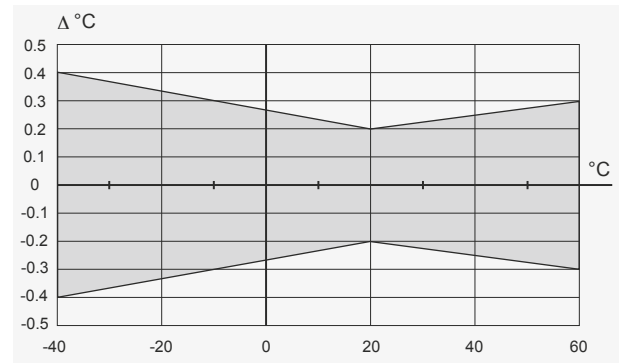
TEMPERATURE

Measurement range, all probes	-40 ... +60 °C (-40 ... +140 °F)
Accuracy at +20 °C (+68 °F)	±0.2 °C (±0.4 °F)
Temperature units	°C, °F



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

ACCURACY OVER TEMPERATURE RANGE



Temperature sensor

Pt100 RTD Class F0.1 IEC 60751

Operating Environment

Operating temperature	-40 ... +60 °C (-40 ... +140 °F)
with optional display	0 ... +60 °C (+32 ... +140 °F)
Humidity range	non-condensing
Electromagnetic compatibility	Complies with EMC standard EN61326-1, Industrial Environment
Note:	Transmitter with display test impedance of 40 ohm is used in IEC61000-4-5 (Surge immunity)

Inputs and Outputs

Operating voltage	10 ... 35 VDC, 24 VAC ±20%
with optional power supply module	100 ... 240 VAC, 50/60 Hz
Power consumption at +20 °C (U_{in} 24 VDC)	
RS232	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
Settling time at power-up (one sensor)	
class A	4 s
class B	3 s
External loads	
current outputs	$R_L < 500 \text{ ohm}$
0 ... 1 V output	$R_L > 2 \text{ kohm}$
0 ... 5 V and 0 ... 10 V outputs	$R_L > 10 \text{ kohm}$

Recommended wire size	0.5 mm ² (AWG 20) stranded wires
Digital outputs	RS232, RS485 (optional)
Protocols	ASCII commands, MODBUS RTU
Service connection	RS232, USB
Relay outputs (optional)	0.5 A, 250 VAC
Ethernet interface (optional)	
Supported standards	10BASE-T, 100BASE-TX
Connector	8P8C (RJ45)
IPv4 address assignment	DHCP (automatic), static
Protocols	Telnet, MODBUS TCP/IP
WLAN interface (optional)	
Supported standards	802.11b
Antenna connector type	RP-SMA
IPv4 address assignment	DHCP (automatic), static
Protocols	Telnet, MODBUS TCP/IP
Security	WEP 64/128, WPA2
Authentication / Encryption (WLAN)	
Open / no encryption	
Open / WEP	
WPA Pre-shared key / TKIP	
WPA Pre-shared key / CCMP (a.k.a. WPA2)	
Optional data logger with real-time clock	
Logged parameters	max. four with trend/min/max values
Logging interval	10 sec. (fixed)
Max. logging period	4 years, 5 months
Logged points	13.7 million points per parameter
Battery lifetime	min. 5 years
Display	LCD with backlight, graphical trend display of any parameter
Menu languages	English, Chinese, Finnish, French, German, Japanese, Russian, Spanish, Swedish
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 at +20 °C	±0.05% full scale
temperature dependence	±0.005%/°C full scale
Pressure	500 ... 1100 hPa 50 ... 1100 hPa
accuracy at +20 °C	±0.30 hPa ±0.40 hPa
accuracy at -40 ... +60 °C	±0.60 hPa ±0.75 hPa

Mechanics

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)	M12 series 8-pin (male)
option 1	female plug with 5 m (16.4 ft) black cable
option 2	female plug with screw terminals

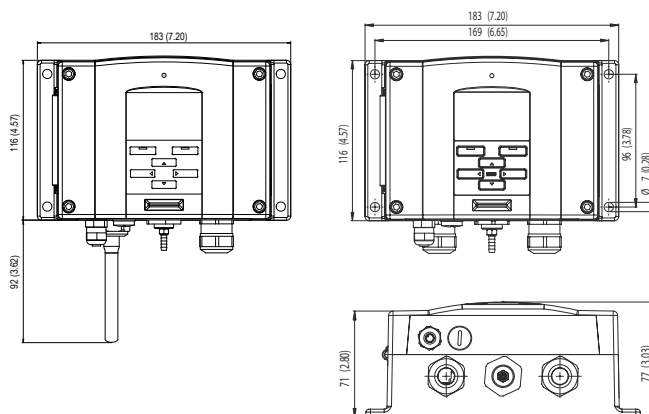
Probe cable diameter	PTU303 other probes	6.0 mm 5.5 mm
Standard probe cable lengths	2 m, 5 m or 10 m (Additional cable lengths available, please see order form for details)	
Housing material	G-AlSi 10 Mg (DIN 1725)	
Housing classification	IP 66 IP65 (NEMA4X) with local display	
Weight	depending on selected probe	1.0 - 3.0 kgs

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

Dimensions in mm (inches)



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TYPE APPROVED PRODUCT
CERTIFICATE NO.: A-13529

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