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PTU300 Combined Pressure, Humidity and Temperature Transmitter for Industrial Use

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

Features/Benefits

- Barometric pressure, humidity and temperature measurement in one transmitter
- Available with two barometric pressure sensors - added reliability
- RS-232C serial interface with NMEA protocol for GPS use
- Optional display, RS-485, analog output, and relay
- Optional power supply module
- NIST traceable calibration
- HMT330MIK Installation kit for outdoor use
- Applications include environmental monitoring in calibration laboratories, GPS meteorology: estimating precipitable water vapor in the atmosphere; weather stations

One transmitter, three measurements

The Vaisala Combined Pressure, Humidity and Temperature Transmitter PTU300 measures barometric pressure in two accuracy classes, humidity, and temperature.

You can choose which probe best suits your needs: PTU301 for laboratories, PTU303 for outdoor use, the warmed PTU307 probe for demanding meteorology, and PTU30T for pressure and temperature only.

Vaisala proven sensor technology

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

Graphical trend display

The PTU300 series features a large numerical and graphical display, allowing users to easily monitor operational data, measurement trends and 1-year measurement history. The optional data logger with real-time clock makes it possible to generate over four years of measured history, and zoom in on any desired time or time frame. The battery backup of the real-time clock guarantees a reliable logging of measured data.

The display also shows the WMO pressure trend ΔP 3h and tendency of 0 ... 9.

Data collection and transfer to PC

The recorded measurement data can be viewed on the display or transferred to a PC with Microsoft Windows® software. A USB-RJ45 cable makes it easy to connect the PTU300 to a PC.

Flexible calibration

A quick, one-point field calibration for humidity can easily be done using the Vaisala Hand-Held Humidity Meter HM70.

Serial communication

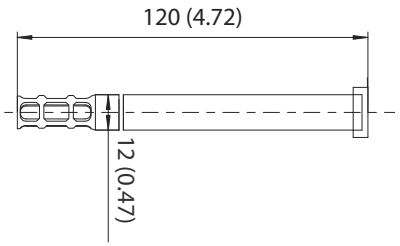
The PTU300 comes with a standard RS-232 serial interface. The output format is compatible with major GPS receivers and NMEA coded messages. RS-485 is available as an option.

Outdoor installation kit

The optional HMT330MIK Installation Kit is available for outdoor installation. It provides reliable measurements for meteorological purposes.

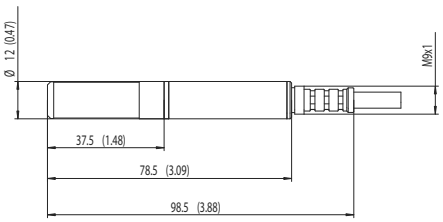
PTU301 for wall-mounting

Temperature measurement range:
-40 ... +60 ˚C (-40 ... +140 ˚F)



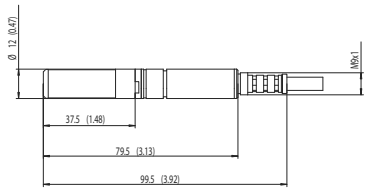
PTU303 for outdoor use

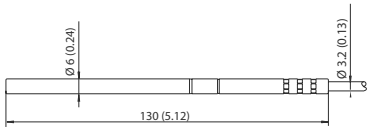
Temperature measurement range:
-40 ... +80 ˚C (-40 ... +176 ˚F) or
-40 ... +120 ˚C (-40 ... +248 ˚F)



PTU307/30T warmed probe for demanding meteorological installations

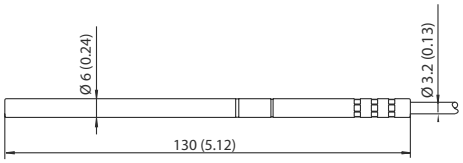
Temperature measurement range:
-70 ... +180 ˚C (-94 ... +356 ˚F)





PTU30T for temperature only measurement

Temperature measurement range:
-70 ... +180 ˚C (-94 ... +356 ˚F)



Technical Data

Performance

Barometric pressure

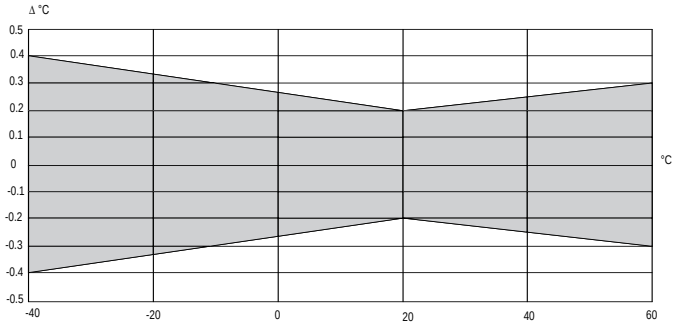
Pressure range		500 ... 1100 hPa, 50 ... 1100 hPa	
Accuracy	500 ... 1100 hPa	500 ... 1100 hPa	50 ... 1100 hPa
	Class A	**Class B**	
Linearity	±0.05 hPa	±0.10 hPa	±0.20 hPa
Hysteresis*	±0.03 hPa	±0.03 hPa	±0.08 hPa
Repeatability*	±0.03 hPa	±0.03 hPa	±0.08 hPa
Calibration uncertainty**	±0.07 hPa	±0.15 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, mmH20, 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 of the working standard including traceability to NIST.
*** 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.

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

Accuracy over temperature range



Temperature sensor	PT100 RTD 1/3 Class B IEC 751

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

Inputs and outputs

Operating voltage	10 ... 35 VDC, 24 VAC
with optional power supply module	100 ... 240 VAC, 50/60 Hz
Power consumption at +20 °C (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 (HMT337)	+120 mA
Settling time at power-up (one sensor)	
class A	4 s
class B	3 s
External loads	
current outputs	R_L < 500 ohm
0 ... 1 V output	R_L > 2 kohm
0 ... 5 V and 0 ... 10 V outputs	R_L > 10 kohm
Recommended wire size	0.5 mm^2 (AWG 20) stranded wires
Digital outputs	RS-232, RS-485 (optional)
Service connection	RS-232, USB
Relay outputs (optional)	0.5 A, 250 VAC
Optional data logger with real-time clock	
Logged parameters	max. three 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, graphic trend display of any parameter
Menu languages	English, Finnish, French, German, Japanese, Chinese, Spanish, Swedish, Russian
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

Technical Data

Operating Environment

Operating temperature	-40 ... +60 °C (-40 ... +140 °F)
with display	0 ... +60 °C (+32 ... +140 °F)
Humidity range	non-condensing
Electromagnetic compatibility	EN61326-1:1997 + Am1:1998 +Am2:2001; Industrial Environment

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	6.0 mm
other probes	5.5 mm
Housing material	G-AlSi 10 Mg (DIN 1725)
Housing classification	IP 65 (NEMA 4)
Weight	
depending on selected probe	1.5 ... 2.0 Kg

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	215108
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)