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PTU200 Combined Pressure, Humidity and Temperature Transmitter

PTU200 combines barometric pressure, humidity and temperature measurement in one transmitter.

Features/Benefits

- Barometric pressure, humidity and temperature measurement in one transmitter
- Available with two barometric pressure sensors for added reliability
- RS232C serial interface with NMEA protocol for GPS use
- Optional local display and RS485 serial interface
- NIST traceable (certificate included)
- Optional IP65 outdoor installation kit and tripod available

Applications

- GPS meteorology: estimating precipitable water vapor in the atmosphere
- GPS accuracy improvement
- Meteorological applications
- Environmental monitoring in calibration laboratories

Three-in-one measurement

The PTU200 combines barometric pressure, humidity and temperature measurement in one transmitter. This multipurpose instrument is suitable for various applications.

The user can select between two pressure accuracy classes. PTU200 can also be equipped with a second pressure sensor for added reliability.

Three different probes can be used with the PTU200 Transmitter. Two of the probes are relative humidity and temperature probes and one is a temperature probe.

Serial communication

An RS232C serial interface is standard with PTU200 Transmitters. The transmitter software is also compatible with major GPS receivers and NMEA (National Marine Electronics Association) coded messages. An optional RS485 interface is available.

Vaisala's proven sensor technology

The PTU200 Transmitter uses the BAROCAP® silicon capacitive barometric pressure sensor for pressure measurement. The humidity and temperature probes are fitted with Vaisala's HUMICAP® capacitive thin film sensor. The sensors are known for their high accuracy and excellent long-term stability. The temperature sensor is a platinum RTD sensor.

Outdoor installation kit

For outdoor use, an optimized outdoor installation kit PTU200MIK1 is available. The PTU200MIK1 includes a IP65 rated enclosure for the barometer, a static pressure head and a radiation shield for the humidity and temperature probe.

An optional tripod, the PTU200TRIPOD, is available to enable quick field setup.

Outdoor installation kit, PTU200MIK1.

Technical Data

Barometric Pressure

Pressure range	500...1100 hPa, 50...1100 hPa		
Accuracy	500…1100 hpa	50....1300 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	±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•

* Defined as ±2 standard deviation limits of endpoint nonlinearity, hysteresis error, or repeatability error.

** Defined as ±2 standard deviation limits of inaccuracy of the working standard including traceability to NIST.

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

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

Relative Humidity

Measurement range	0.8...100 %RH
Output scale	0...100 %RH equals 0...1 VDC
Accuracy at +20 °C (including nonlinearity and hysteresis)	
against factory references	±1 %RH
field calibration against references	±2 %RH (0...90% RH)
	±3 %RH (90...100% RH)
Typical long-term stability	better than 1 %RH per year
Temperature dependence	±0.05 %RH/°C
Response time (90%) at +20 °C	15 sec. with membrane filter
Sensor	HUMICAP® 180

Temperature

HMP45A-P & HMP45D Probes

Measurement range	-36...+60 °C (HMP45A-P)
	-40...+60 °C (HMP45D)
Accuracy	
at -40 °C	±0.5 °C
at +20 °C	±0.2 °C
at +60 °C	±0.4 °C
Temperature sensor	
HMP 45 A-P	Pt 1000 IEC 751 1/3 Class B
HMP 45D	Pt 100 IEC 751 1/3 Class B

PT100 Sensor Head

Measurement range	-40...+60 °C
Accuracy	±0.2°C
Temperature sensor	Pt 100 IEC 751 1/4 Class B

General

Temperature range	
operating	-40...+60 °C
with local display	0...+60 °C
storage	-40...+60 °C
with local display	-20...+60 °C
Humidity range	non-condensing
Supply voltage	10...30 VDC polarity protected
Supply voltage sensitivity	negligible
Current consumption	less than 30 mA
with local display	less than 30 mA (without backlight)
	less than 50 mA (with backlight)
hardware shutdown mode	less than 0.1 mA
Serial I/O	full duplex RS 232C• or
	bidirectional TTL level or
	half duplex RS 485/422 two-wire
code	ASCII
parity	even•, odd, none
data bits	7• or 8
stop bits	1• or 2
Baud rates	300, 600, 1200, 2400, 4800, 9600•
Pressure units	hPa•, mbar, kPa, Pa, inHg,
	mmH20, mmHg, torr, psia
Humidity units	%RH
Temperature units	°F, °C
Resolution	0.1 hPa•, 0.1 %RH, 0.01°C
Settling time at power-up (one sensor)	
class A	6 s•
class B	5 s•
Acceleration sensitivity	negligible
Weight	
depending on selected probe	2.3/1.3/1.1 kg

Transmitter body

Pressure connector	M5 (10-32) internal thread
Pressure fitting	barbed fitting for 1/8" I.D. tubing
	quick connector with shutoff valve for 1/8" hose
Maximum pressure limit	5000 hPa abs.
Electrical connector	female 9-pin subD
Housing	epoxy painted aluminum

HMP45A-P and HMP45D

Housing	ABS plastic
Probe cable length	20 m (HMP45A-P)
	3.5 m (HMP45D)
Housing classification	IP65
Sensor protection (standard)	membrane filter part no. 2787HM

Pt100 Probe

Probe cable length	2 m

Complies with EM standard EN61326-1:1997+ Am 1:1998, Generic Environment

Accessories

PTU200MIK1	outdoor mounting kit
PTU200TRIPOD	tripod stand

Factory settings are marked with a •.