ROBUST, HIGH PRECISION USB TEMPERATURE, HUMIDITY AND AIR PRESSURE SENSOR — PTH450

DESCRIPTION

The PTH450 includes an enhanced precision temperature and humidity sensor, further pushing the precision limit. It is designed to acquire environmental temperature, humidity, and atmospheric pressure (barometric) data. Its core digital sensor chips are built around industry-proven technologies and are individually factory-calibrated, linearized and temperature-compensated, resulting in cutting-edge performance and field interchangeability. Thanks to its unique probe construction, the PTH450 can sustain various temperatures. The compact probe eases integration, even in space-constrained locations, and the built-in particle filter protects against dust, soot and other contaminants.

APPLICATIONS

- OEM
- Greenhouse
- Server rooms
- Manufacturing
- Pre-certification
- LIMS integration
- Humidity control
- Scientific research
- Building automation
- Engineering and R&D
- Environmental chamber

INSTALLATION TIME
Less than 10 minutes

UNIQUE SERIAL NUMBER
Each unit is assigned a unique serial number, allowing for traceability and certification.

FREE DAQ SOFTWARE
Real-time data visualization and logging

DATA INTEGRATION
Command-line tools for direct data access and integration

OPTIONS
- Virtual COM Port (VCP) communication protocol
- 3-point user calibration mechanism

ALSO AVAILABLE
Traceability certificates

Warning: This product should not be used in applications where its failure may cause personal injury.

Note: While every effort has been made to ensure accuracy in this publication, no responsibility can be accepted for errors or omissions.
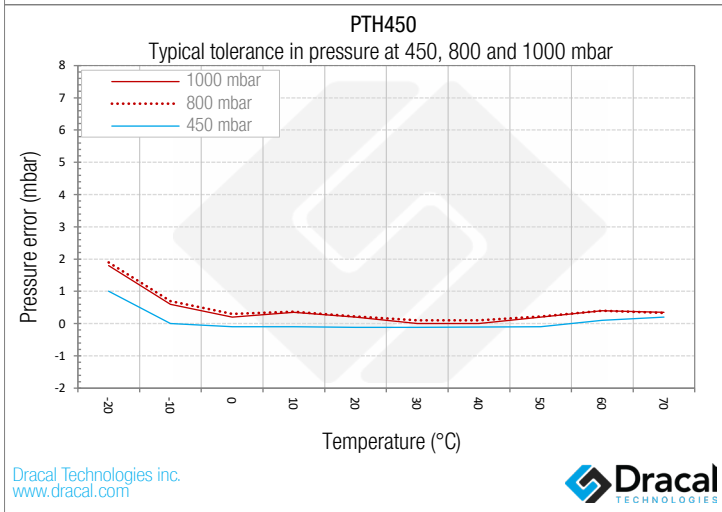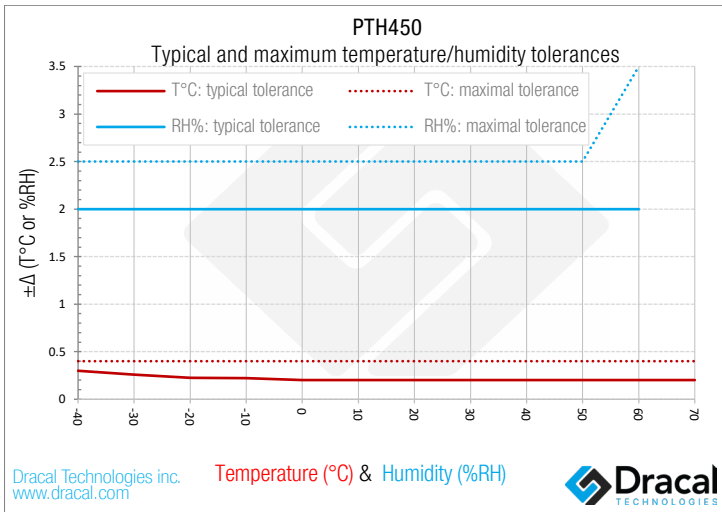
Note: Data may change without notification, and you are strongly advised to obtain copies of the most recently issued datasheet.

SPECIFICATIONS

Parameter	Condition		Value	Units
Temperature (probe)				
Operating range	-40 to 125	Max	-	°C
Accuracy	20 to 60°C	Typ.	±0.1	°C
		Max.	±0.3	
Accuracy	-40 to 20°C	Typ.	±0.2	°C
		Max	±0.3	
Accuracy	60 to 125°C	Typ.	±0.4	°C
		Max.	±0.6	
Accuracy	-40 to 125°C	Typ.	±0.4	°C
		Max.	±0.6	
Resolution	Typ.		0.015	°C
Repeatability	Typ.		0.06	°C
Response time	t63%		10	s
Factory calibrated	Individually[2]		yes	–
Extended temperature range[6]	-45 to 130			°C
Long-term drift	Max.		<0.03	°C/yr
Relative humidity (probe)				
Operating range[3]	Non-condensing	–	0 to 100	%RH
Accuracy	0 to 55 %RH	25°C	Typ. ±1.5	%RH
			Max ±2	
Accuracy	55 to 100 %RH	25°C	Typ. ±2	%RH
			Max ±3	
Accuracy	0 to 100 %RH	0 to 80°C	Typ. ±2	%RH
			Max. ±3	
Resolution	Typ.		0.01	%RH
Hesterisis	25°C		0.8	%RH
Factory calibrated	Individually[2]		Yes	–
Long-term drift[5]	Typ., -40 to 125°C		<0.25	%RH/yr

SPECIFICATIONS (continued)

Parameter	Condition			Value	Units
Atmospheric pressure					
Sensor location	Inside the USB interface housing				
Operating temperature range	–			-20 to 70	°C
Operating pressure range	For full accuracy			45 to 110	kPa
Accuracy	70 to 110 kPa	25°C	Max.	±0.15	kPa
Accuracy	70 to 110 kPa	10 to 40°C	Typ.	±0.18	kPa
Accuracy	45 to 110 kPa	0 to 50°C	Max.	±0.2	kPa
Accuracy	45 to 110 kPa	-20 to 70°C	Max	±0.35	kPa
Extended pressure range[6]	Linear range of ADC			1 to 120	kPa
Overpressure	Pmax			600	kPa
Altitude resolution[4]	–			≈10	cm
ADC resolution	–			24	bits
Response time	–			0.5	s
Factory calibrated	Individually[2]			Yes	–
Signal Noise Filter	1st order			–	–
Noise	–			±0.0065	kPa
Long term drift	–			±0.1	kPa/yr
Probe					
Cable material	Silicone				
Cable length	–			1 (3)	m (ft)
First filter material	Punctured anodized aluminum				–
Sec. fi ter material	PTFE membrane				–
Efficiency	Particle size ≥200 nm			99.99	%
Housing and USB cable					
Temperature operating range	–			-20 to 70	°C
Humidity operating range	Non condensing			10 to 90	%RH
Material	–			ABS	–
IP rating[3]	–			51	–
USB cable length	–			1 (3)	m (ft)

[PTH450 User manual (PDF)](#)

Designed and assembled in Canada

SPECIFICATIONS (continued)

Parameter	Condition	Value	Units
Power supply			
Voltage	Powered through a USB port	5	V
Current	At 5V	15	mA
Miscellaneous			
Temperature compensated	By the manufacturer	Yes	–
Lifetime	–	5	years
Certification(s)			
RoHS	RoHS3	Yes	–
CE	CE/REACH	Yes	

[1] Only if the cable is not moved/flexed while the temperature is below 0°C.

[2] Each sensor is individually conditioned by the manufacturer of the semi-conductor sensor chips in the best stable conditions, and their correction coefficients are recorded for each of them.

[3] If water condensation or splashing is possible, installing the probe pointing down is recommended to reduce the risk of water build-up in the sensor. If water splashing is possible, take extra precautions to protect the sensor and the cable converter. Depending on the application, extra housing may be required.

[4] In a fully controlled environment.

[5] Typical value for operation in average relative humidity and temperature range. Maximum value is < 0.5 %RH/yr. Higher drift values might occur due to contaminant environments with vaporized solvents, out-gassing tapes, adhesives, packaging materials, etc. For optimal perfomance, keep the unit in a contaminant free (VOCs) and well ventilated area.

[6] Avoid exposing the sensor to extended periods outside its operating range to prevent damage. Precision is not guaranteed beyond the specified operating ranges.

PTH450
Typical and maximum temperature/humidity tolerances

- T°C: typical tolerance
- T°C: maximal tolerance
- RH%: typical tolerance
- RH%: maximal tolerance

Dracal Technologies inc.
www.dracal.com

Temperature (°C) & Humidity (%RH)

Dracal TECHNOLOGIES

PTH450
Typical tolerance in pressure at 450, 800 and 1000 mbar

- 1000 mbar
- 800 mbar
- 450 mbar

Temperature (°C)

Dracal Technologies inc.
www.dracal.com

Dracal TECHNOLOGIES

CAUTION: Please remember that electromagnetic interference (EMI) may decrease the accuracy of the sensor. Avoid using this device near EMI sources such as motors, high-voltage transformers, and fluorescent tubes.
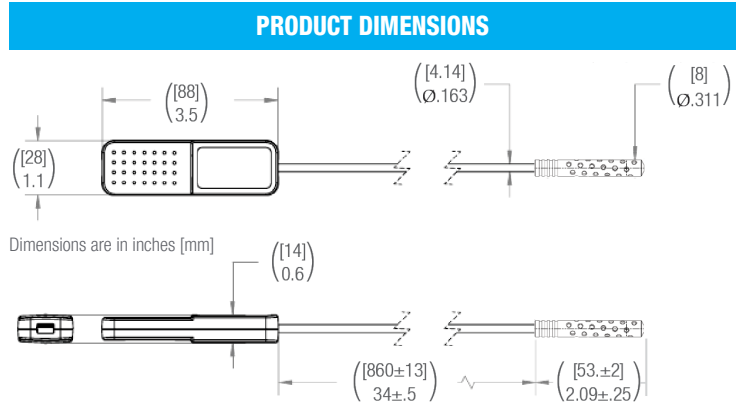
NOTE: Note that this product is not waterproof and requires protection if contact with water is possible.

TIP: Avoid installing the sensor in a location where strong vibration is likely to occur. Strong vibrations may cause slight inaccuracies in the reading.

TIP: Before using any precision measurement equipment, it is advised to power the unit for at least 15 minutes.

AVAILABLE CHANNEL(S)
As displayed in our logging software

CHANNEL ID*	DECRIPTION	TYPE	NATURE
00	MS5611 Pressure	Pressure	Real
01	SHT31 Temperature	Temperature	Real
02	SHT31 Relative Humidity	Relative Humidity	Real
03	Dew point	Dew point	Virtual
04	Humidex	Humidex	Virtual
05	Heat index	Heat index	Virtual
06	Altitude	Height	Virtual

* Channel ID as it appears in DracalView. Virtual channel IDs differ in DracalView and dracal-usb-get.

PRODUCT DIMENSIONS

Dimensions are in inches [mm]

ORDERING

PRODUCT(S)

PART NUMBER	OPTION	DESCRIPTION
601081	USB-PTH450	Atmospheric pressure, temperature and relative humidity sensor with improved accuracy and aluminum probe.
608081	USB-PTH450-CAL	Atmospheric pressure, temperature and relative humidity sensor with improved accuracy and aluminum probe - calibratable.
603081	VCP-PTH450	Atmospheric pressure, temperature and relative humidity sensor with improved accuracy and aluminum probe - with VCP mode.
605081	VCP-PTH450-CAL	Atmospheric pressure, temperature and relative humidity sensor with improved accuracy and aluminum probe - calibratable with VCP mode.

TRACEABILITY CERTIFICATE(S)

NT1WT	1-point temperature certificate for one (1) unit
NT2WT	2-point temperature certificate for one (1) unit
NT3WT	3-point temperature certificate for one (1) unit
NT4WT	4-point temperature certificate for one (1) unit
NT1WH	1-point relative humidity certificate for one (1) unit
NT2WH	2-point relative humidity certificate for one (1) unit
NT3WH	3-point relative humidity certificate for one (1) unit
NT4WH	4-point relative humidity certificate for one (1) unit
NT1WP	1-point pressure certificate for one (1) unit
NT2WP	2-point pressure certificate for one (1) unit
NT3WP	3-point pressure certificate for one (1) unit
NT4WP	4-point pressure certificate for one (1) unit
NT5WP	5-point pressure certificate for one (1) unit

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