High Accuracy Differential Pressure Transducer Model CPT8900

Applications

- Pressure calibration
- High accuracy pressure monitoring
- Pressure sensing in critical applications
- Aerospace

Special Features

- Static line range: 0 ... 5 to 250 psi (0 ... 0.34 to 17 bar)
- Static accuracy: up to 0.008% IS-33
- Differential range: ±0.18 to -15 ... 1500 psid (±12.5 mbar to -1 ... 100 bar d)
- Differential accuracy: up to 0.01% FS
- Static line pressure effects included in accuracy statement
- Temperature compensation: 0 to 50°C
- USB, RS-232, or RS-485 communication
- Two year warranty

Description

Overview

The model CPT8900 High Accuracy Differential Pressure Transducer is designed to excel in performance in differential pressure measurements. Advancements in pressure sensor technology and sensor characterization are heavily leveraged to fulfill the needs of a demanding market. With static accuracies up to 0.008% IS-33, differential accuracies at 0.03% FS or better, and compensations for static line pressure effects across the entire static range, the CPT8900 stands alone in performance and value in the high accuracy differential pressure transducer market.

Application

The CPT8900 High Accuracy Differential Pressure Transducer is ideal for OEM instruments that require a high accuracy pressure transducer. Examples are: flow calibrators, humidity calibrators, pressure controllers, aerospace wind tunnel calibration, automotive sensor testing, hydrology, oceanography, in the aviation and space industries, or wherever high accuracy differential pressure measurement and longterm calibration stability are valued.

High Accuracy Differential Pressure Transducer Model CPT8900

Functions

The model CPT8900 High Accuracy Differential Pressure Transducer has a USB, RS-232, or RS-485 interface. The RS-485 interface offers multi-drop capability with simple cabling. The CPT8900 has five baud rates to choose from.

This transducer can be configured with customizable combinations of static line ranges and differential ranges to fit your specific application. With a recalibration time of 365 days and a high resolution of 8 significant figures, the CPT8900 is flexible enough to be used in a wide variety of applications.

Design

The CPT8900 High Accuracy Differential Pressure Transducer features dual-sensor technology, providing a true differential measurement while also allowing you to measure the static line pressure with our premium accuracies. It's sturdy and robust design can be easily integrated to fit your application. Standard fittings are easily changed using the SAE 7/16-20 female connections.

Data sheets showing similar products and accessories:
Precision pressure transducers, CPT9000, CPT6030, see datasheet CT25.12, CT25.14

Specifications
Model CPT8900

Precision Pressure Transducer		
Static Line		
Range	0 ... 5 to 0 ... 250 psia (0 ... 350 mbar to 0 ... 17 bar)	
Accuracy [1]	0.01% FS (standard)	
	0.008% FS (optional)	
	0.008% IS-50 [2] (optional)	For ranges >15 psi (1 bar) only
	0.008% IS-33 [3] (optional)	
Differential		
Range	±0.18 to -15 ... 1500 psi d (±12.5 mbar to -1 ... 100 bar d)	
Accuracy	0.01% FS or 0.03% FS, depending on range (see table below)	
Calibration interval	365 days	
Pressure units	39 and 1 user defined	

1) It is defined by the total measurement uncertainty, with the coverage factor (k = 2) and includes the intrinsic performance of the instrument, the measurement uncertainty of the reference instrument, long-term stability, influence of ambient conditions, drift, and temperature effects over the compensated range with recommended zero point adjustment every 30 days.
2) 0.008 % IS-50 accuracy: Between 0 ... 50 % of the full scale, the accuracy is 0.008% of half of the full scale value and between 50 ... 100 % of the full scale, the accuracy is 0.008 % of reading.
3) 0.008 % IS-33 accuracy: Between 0 ... 33 % of the full scale, the accuracy is 0.008% of one third of the full scale value and between 33 ... 100 % of the full scale, the accuracy is 0.008 % of reading.

Precision Differential Pressure Sensor Technology	
Range [4]	**Accuracy [5]**
±0.18 to -3 ... 3 psi d (±12.5 mbar to -200 ... 200 mbar d)	0.03% FS [6]
-15 ... 1500 psi d (-1 ... 100 bar d)	0.01% FS [7]

4) The negative portion of a bidirectional range has the same accuracy as the equivalent positive range.
5) It is defined by the total measurement uncertainty, with the coverage factor (k = 2) and includes the intrinsic performance of the instrument, the measurement uncertainty of the reference instrument, long-term stability, influence of ambient conditions, drift, static line pressure effects over the full static range, and temperature effects over the compensated range with recommended zero point adjustment every 30 days.
6) Maximum static range available for this differential range is 0 ... 120 psia (0 ... 8.25 bar).
7) For 0.01% FS accuracy, the differential range must have a span ≥20 psi (1.4 bar). For ranges with a span <20 psi (1.4 bar), the accuracy will be 0.03% FS.

General Specifications [8]	
Case	
Orientation effects	Removable with re-zeroing
Dimensions	See technical drawings
Weight	< 2.2 lbs (< 1 kg) (without dual differential relief valve)
Ingress protection	IP-20
Display	
Resolution	100 ppb or better
Boot-up time	<2 sec
Warm-up time	15 min.
Connections	
Pressure Ports	7/16-20 SAE (female)
Overpressure limit	2X proof, 3X burst
Pressure port adapters	Standard: without Optional: 6mm tube fitting, 1/4” tube fitting, 1/4” NPT female fitting, 1/8” NPT female fitting, 1/8” BSPG female fitting
Materials, wetted parts	316L SS, 6061 T6 aluminum, brass < 5 psi: silicon, epoxy, glass-filled resins
Pressure media	Clean, dry, non-corrosive gases
Voltage supply	
Power supply	RS-232/RS-485: 9 to 18 VDC (12 VDC nominal) USB: 3.0 to 5.25 VDC (5 VDC nominal) Bus Powered
Power consumption	RS-232/485: <48 mA at 12 VDC ±5% (0.57 Wmax) USB: <44mA at 5 VDC ±5% (0.22 Wmax)

General Specifications [8]		
Permissible ambient conditions		
Compensated temperature range	0 to 50 °C (32 to 122 °F) (consult factory for expanded ranges)	
Operating temperature range [8]	-40 to 85 °C (-40 to 185 °F)	
Storage temperature range	-40 to 85 °C (-40 to 185 °F)	
Humidity	0 ... 95% r.h. (non-condensing)	
Operating altitude	<2000 meters (6,5000 feet)	
Place of use	Indoor Not for wet locations	
Pollution degree	Degree 2	
Internal volume		
Differential port	without relief valve: 3.6 cc	with relief valve: 6.4 cc
Static (reference) port	without relief valve: 3.6 cc	with relief valve: 6.6 cc
Communication		
Interface	USB 2.0, RS-232 or RS-485	
Baud rate	Default 57,600 baud - 9600, 19200, 38400 and 115200 user selectable	
Measuring rate	50 values/second (standard)	
Command sets	See manual, Section 6 Operation	

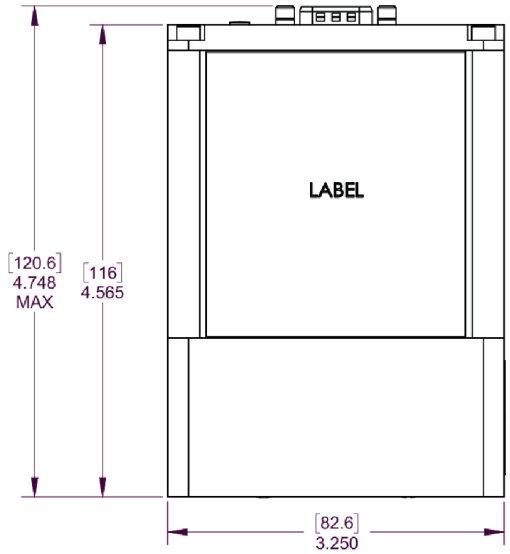
8) Some specifications may be adjusted at the factory to fit unique applications. Please contact Mensor to discuss your requirements.
9) The standard power adapter included with the CPT8900 (RS-232/RS-485) is rated for operation only between 0 °C and 40 °C. If operation is required outside this range, the user must use a qualified external DC power supply rated for the intended environmental conditions of the transducer (–40°C to 85°C).

Approvals and Certificates		
Logo	**Description**	**Country**
CE	**EU Declaration of Conformity** **EU Importer: WIKA, 63911 Klingenberg, Germany**	European Union
	EMC directive EN 61326-1 emission (group 1, class B) and immunity (industrial application)	
	RoHS directive	

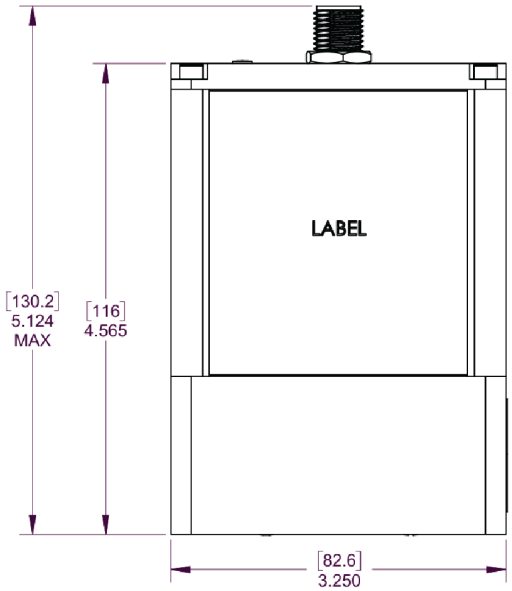
Certificates	
Calibration	A2LA calibration certificate (standard on factory)
Recommended recalibration interval	365 days

Dimensions in in [mm]

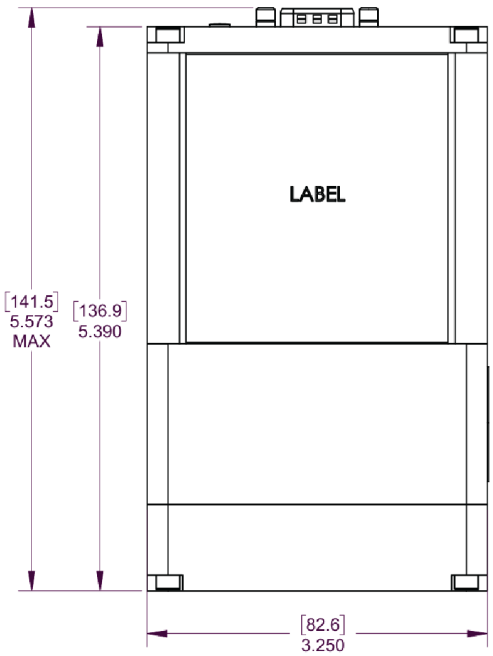
Front Profile



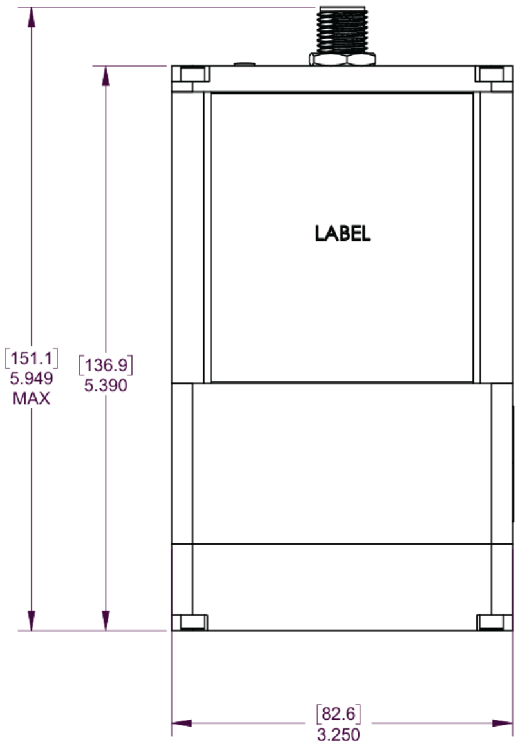
RS-232/RS-485
No Relief Valve



USB
No Relief Valve



RS-232/RS-485
With Relief Valve

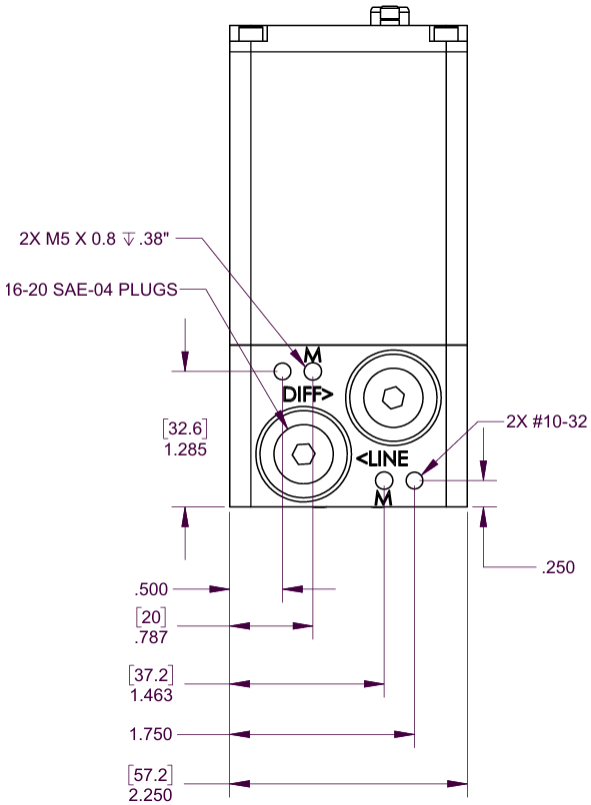


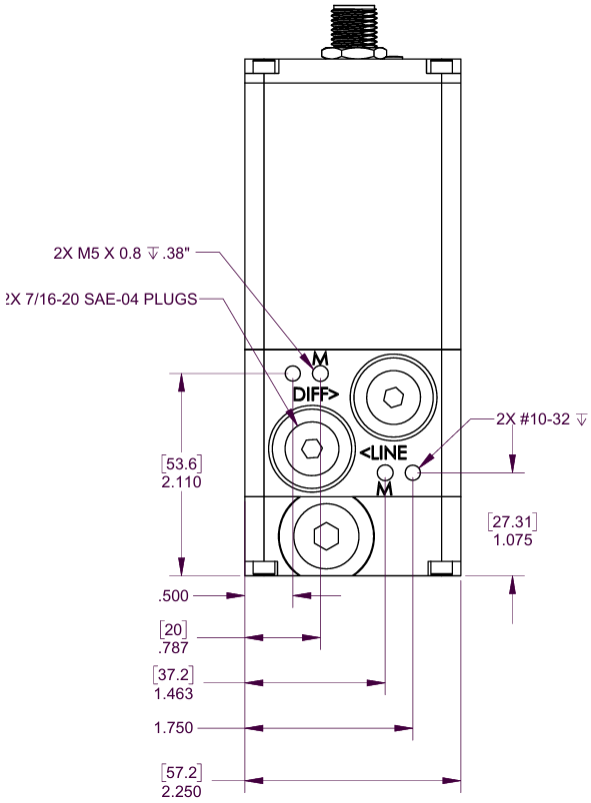
USB
With Relief Valve

*For option with external relief to atmosphere, overall width is 4.293 [109.1]

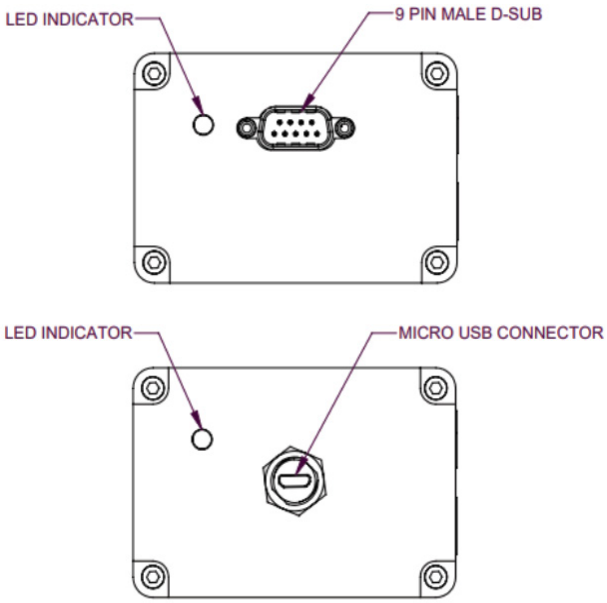
Dimensions in in [mm]

Side Profile
With and without relief valve
Note: Opposite side will have same dimensions mirrored over the y-axis

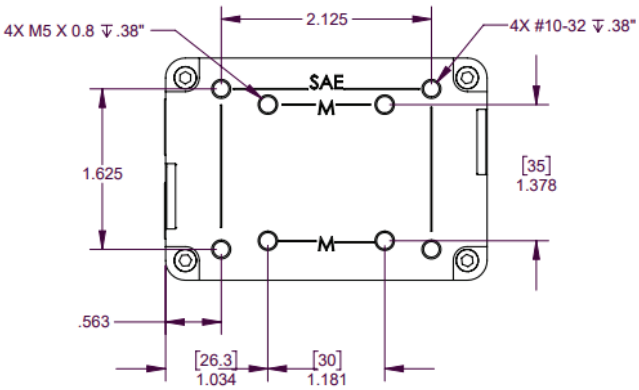




Top Profile
RS-232/RS-485 and USB connection



Bottom Profile
Same for both with and without relief valve



WIKA-Cal calibration software

Easy and fast creation of a high-quality calibration certificate

The WIKA-Cal calibration software is used for generating calibration certificates or logger protocols for pressure measuring instruments. A demo version is available for free download.
A template helps the user and guides him through the creation process of a document.
To switch from the demo version to a licensed version, a USB dongle with a valid licence must be purchased.
The pre-installed demo version changes automatically to the selected version when plugging in the USB dongle and remains available as long as the USB dongle is connected to the PC.

- The user is guided through the calibration or logger process
- Management of calibration data and instrument data
- Intelligent pre-selection via SQL database
- Menu languages: German, English, Italian, French, Dutch, Polish, Portuguese, Romanian, Spanish, Swedish, Russian, Greek, Japanese, Chinese
  More languages will be due with software updates
- Customer-specific complete solutions possible

The supported instruments are continuously expanded and even customer-specific adaptations are possible.

For further information see data sheet CT 95.10

The WIKA-Cal calibration software is available for online calibrations together with a PC. The scope of software functions depends on the selected licence. Several licences can be combined on one USB dongle.

<table>
<tr><th>Cal-Template (light version)</th><th>Cal-Template (full version)</th><th>Log-Template (full version)</th></tr>
<tr><td>■ Semi-automated calibration with use of any Mensor controller</td><td>■ Fully automatic calibration with use of any Mensor controller</td><td rowspan="2">■ Live measurement recording for a certain period of time with selectable interval, duration and start time
■ Creation of logger protocols with graphic and/or tabular representation of the measurement results in PDF format
■ Export of measurement results as CSV file possible</td></tr>
<tr><td colspan="2">■ Creation of calibration certificates 3.1 per DIN EN 10204
■ Export of calibration reports to Excel® template or XML file
■ Calibration of gauge pressure measuring instruments with absolute pressure references and vice versa
■ Creation of calibration certificates with no limitations on measuring points</td></tr>
<tr><th colspan="3">Ordering information for your enquiry for a single license:</th></tr>
<tr><td>WIKA-CAL-LZ-Z-Z</td><td>WIKA-CAL-CZ-Z-Z</td><td>WIKA-CAL-ZZ-L-Z</td></tr>
<tr><th colspan="3">Ordering information for your enquiry for the pair license:</th></tr>
<tr><td colspan="2">Cal-Template (light version) together with Log-Template (full version)</td><td>WIKA-CAL-LZ-L-Z</td></tr>
<tr><td colspan="2">Cal-Template (full version) together with Log-Template (full version)</td><td>WIKA-CAL-CZ-L-Z</td></tr>
</table>

Accessories

Accessories for CPT8900	
Description	**CPX-A**
Power supply with communications cable RS-232 communciation cable, 1.5m	1
Power supply with communication cable RS-485 communications cable, 1.5m	2
Cable USB, 1m	3
Cable USB, 3m	4
Adapter cable USB to RS-232	5
Adapter cable USB to RS-485	6
Pressure adapter set SAE J514/JIC 4 male to 6 mm tube fitting	M
Pressure adapter set SAE J514/JIC 4 male to 1/4” tube fitting	I
Pressure adapter SAE J514/JIC 4 male to 1/4” NPT female fitting	N
Pressure adapter SAE J514/JIC 4 male to 1/8” NPT female fitting	S
Pressure adapter set SAE J514/JIC 4 male to 1/8” BSP female fitting	B
Transport case Carrying Case	T
Pressure adapter Calibration adapter	C
Relief Valve Dual differential relief valve	D
Relief Valve Dual differential relief valve with relief to atmosphere	A
Ordering information for your enquiry:	
Please contact manufacturer for more information regarding accessories.	

Scope of delivery

- High Accuracy Differential Pressure Transducer, model CPT8900
- Operating instructions
- Pressure adapter (as specified)
- A2LA calibration certificate (standard on factory)

Options

- Power supply & communication cable
- Dual-differential relief valve
- Carrying case

Ordering information

CPT8900 / Instrument version / Pressure unit (static) / Maximum static pressure range / Static accuracy / Pressure unit (differential) / Minimum differential pressure range / Maximum differential pressure range / Differential accuracy / Type of certificate / Orientation / Temperature compensation / Baud rate / Digital interface / Electrical connection length / Dual-differential relief valve / Pressure port adapters / Carrying case / Additional order information

Specifications and dimensions given in this leaflet represent the state of engineering at the time of printing.
Modifications may take place and materials specified may be replaced by others without prior notice.

All standard Mensor products are provided with a calibration certificate traceable to NIST. The calibration program at Mensor is accredited to both ISO/IEC 17025:2017 and Z540-1-1994 by A2LA. Mensor is certified to ISO9001:2015.

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