Differential pressure transducer
High-accuracy version
Model CPT8900

Applications

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

Special features

- Static pressure range: 0 ... 340 mbar to 0 ... 17 bar [0 ... 5 to 0 ... 250 psi]
- Differential range: ±12.5 mbar to -1 ... 100 bar [±0.18 to -15 ... 1,500 psi]
- Accuracy down to 0.008 % IS-33 or 0.01 % FS
- Temperature compensation: 0 ... 50 °C [32 ... 122 °F]
- USB, RS-232, or RS-485 communication

Differential pressure transducer, model CPT8900

Description

Overview

The high-accuracy differential pressure transducer, model CPT8900, is designed to deliver outstanding performance in differential pressure measurements. With a static accuracy of down to 0.008 % IS-33, a differential accuracy of 0.03 % FS or better and compensation for static pressure effects over the entire static range, the CPT8900 is unique in terms of performance and value in the market for high-accuracy differential pressure transducers.

Application

The CPT8900 high-accuracy differential pressure transducer is ideal for OEM instruments that require a high-accuracy pressure transducer.
Examples are:

- For flow calibrators, humidity calibrators, pressure controllers
- For wind tunnel calibration in aerospace and for automotive sensor testing.
- In the aviation and space industries in general, hydrology and oceanography

Also for applications where high-accuracy differential pressure measurement and long-term calibration stability are required.

Functions

The model CPT8900 features a USB, RS-232, or RS-485 interface. The RS-485 interface offers multi-drop capability with simple cabling.

This transducer can be configured with combinations of static line ranges and differential ranges. With a calibration interval of 365 days and a high resolution of 8 significant digits, the CPT8900 is flexible enough to be used in a wide range of tasks.

Data sheets showing similar products:
Pressure controller, Air data test set; model CPA8001 see data sheet CT 29.01
Air data test indicator; model CPA2501; see data sheet CT 29.02
Precision pressure transducer, basic version; model CPT6020; see data sheet CT 25.13

Design
The high-accuracy differential pressure transducer CPT8900 features dual-sensor technology, which provides a differential measurement and at the same time can measure the static pressure with our highest accuracies.

Its sturdy and robust design can be easily adapted to your application. Standard fittings are easily changed using the SAE 7/16-20 female connectors.

Specifications

Precision pressure transducer			
Static pressure			
Pressure range	0 ... 340 mbar to 0 ... 17 bar [0 ... 5 to 0 ... 250 psi]		
Accuracy [1]	■ 0.01 % FS ■ 0.008 % FS		
	■ 0.008 % IS-50 [2] ■ 0.008 % IS-33 [3]	For ranges to > 1 bar [> 15 psi]	
Pressure unit (static line)	■ bar ■ mbar ■ psi	■ kPA ■ MPa	■ inHg at 0 °C ■ inH_2O at 20 °C
Differential pressure			
Pressure range [4]	±12.5 mbar to -1 ... 100 bar [±0.18 to -15 ... 1,500 psi]		
Accuracy [1]	0.01 % FS [5]	-1 ... 100 bar [-15 ... 1,500 psi]	
	0.03 % FS [6]	±12.5 mbar to -200 ... +200 mbar [±0.18 to -3 ... +3 psi]	
Pressure type	■ bar ■ mbar ■ psi	■ kPA ■ MPa	■ inHg at 0 °C ■ inH_2O at 20 °C
Calibration interval	365 days		

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.
4) The negative portion of a bidirectional range has the same accuracy as the equivalent positive range.
5) For an accuracy of 0.01 % FS, the differential range must have a span ≥ 1.4 bar [≥ 20 psi]. For ranges with a span of < 1.4 bar [< 20 psi], the accuracy is 0.03 % FS.
6) Maximum static range for this differential range is 0 ... 8.25 bar [0 ... 120 psi].

Basic information		
Display		
Resolution	100 ppb or better	
Start time	< 2 s	
Warm-up time	Approx. 15 min	
Units	39 and 1 x freely programmable	
Internal volume		
Differential port	Without relief valve	3.6 cm^3
	With relief valve	6.4 cm^3
Static reference port	Without relief valve	3.6 cm^3
	With relief valve	6.6 cm^3
Ingress protection	IP20	
Case		
Orientation effects	Negligible with zero point adjustment	
Weight	< 1 kg [< 2.2 lb] Without dual differential relief valve	

Pressure connection	
Connection	7/16-20 SAE, female
Pressure adapters	■ Without ■ 6 mm tube fitting ■ ¼" tube fitting ■ ¼ NPT, female thread ■ ⅛ NPT, female thread ■ ⅛ BSP, female thread
Permissible pressure media	Clean, dry, non-corrosive gases
Wetted parts	
Pressure ranges > 350 mbar [> 5 psi]	■ Aluminium 6061 T6 ■ Brass ■ Stainless steel 316L
Pressure ranges ≤ 350 mbar [≤ 5 psi]	■ Silicon ■ Epoxy ■ Glass-filled resins
Overpressure limit	■ 2 x test pressure ■ 3 x burst pressure

Communication	
Interface	■ USB 2.0 ■ RS-232 ■ RS-485
Baud rate	■ 9600 ■ 19200 ■ 38400 ■ 57600 (default setting) ■ 115200
Command sets	■ Mensor default command set ■ Mensor legacy command set
Sample rate	50 values/s; default - (adjustable ex-works)

Voltage supply and performance data [1]		
Power supply	■ RS-232 ■ RS-485	DC 9 ... 18 V (DC 12 V nominal)
	USB	DC 3.0 ... 5.25 V (DC 5 V nominal) bus-powered
Power consumption	■ RS-232 ■ RS-485	< 48 mA at DC 12 V ±5 % (0.57 W_{max})
	USB	< 44 mA at DC 5 V ±5 % (0.22 W_{max})
Power supply unit		
Working temperature	0 ... 40 °C [32 ... 104 °F]	
	If operation outside this range is required, a qualified external power supply unit must be used which is rated for the transducer's intended ambient conditions of -40 ... +85 °C [-40 ... +185 °F].	

Operating conditions	
Place of use	Indoor Not for wet locations
Operating altitude	Up to 2,000 m [6,562 ft] above sea level
Operating temperature range	-40 ... +85 °C [-40 ... +185 °F]
Compensated temperature range	0 ... 50 °C [32 ... 122 °F] Extended range on request

Operating conditions	
Storage temperature range	-40 ... +85 °C [-40 ... +185 °F]
Humidity	5 ... 95 % relative humidity
Condensation	Non-condensing
Mounting position	Vertical
EMC (HF field)	EN 61326-1 emission (group 1, class B) and immunity (industrial environment)

Approvals

Logo	Description	Region
CE	**EU declaration of conformity**	European Union
	EMC Directive EN 61326 emission (group 1, class B) and immunity (industrial environment)	
	RoHS directive	

Certificates

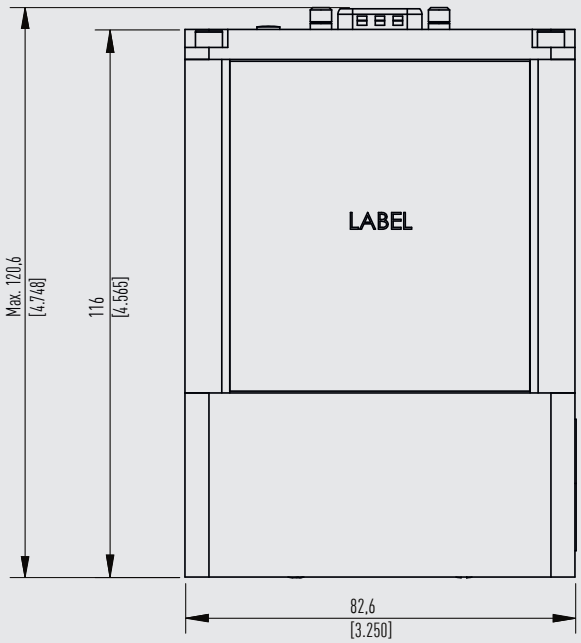
Description	
Calibration	■ A2LA calibration certificate (standard ex-works) ■ DAkkS calibration certificate for an absolute pressure measuring range (traceable and accredited in accordance with ISO/IEC 17025) ■ DAkkS calibration certificate for a gauge pressure measuring range (traceable and accredited in accordance with ISO/IEC 17025)
Recommended calibration interval	365 days (dependent on conditions of use)

→ For approvals and certificates, see website

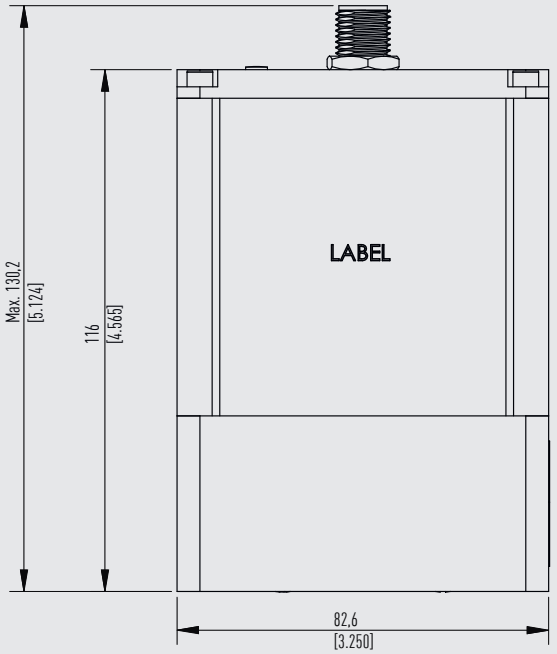
Dimensions in mm [in]

View from the front

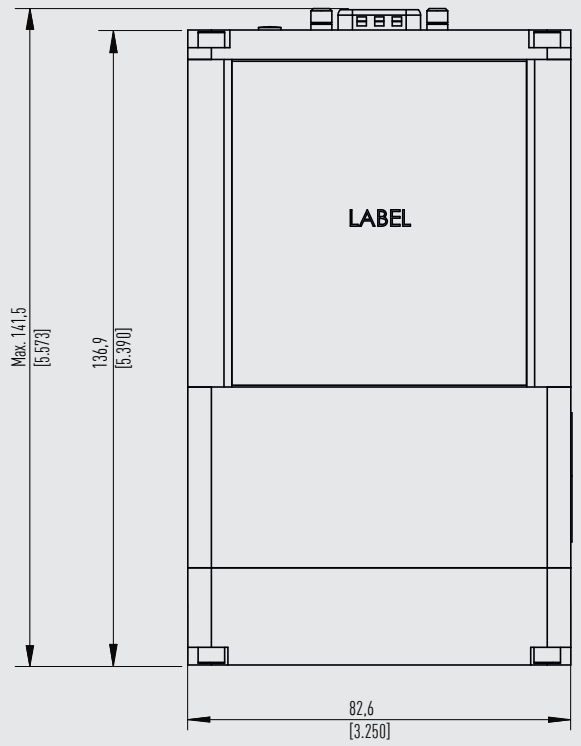
RS-232/RS-485, without relief valve



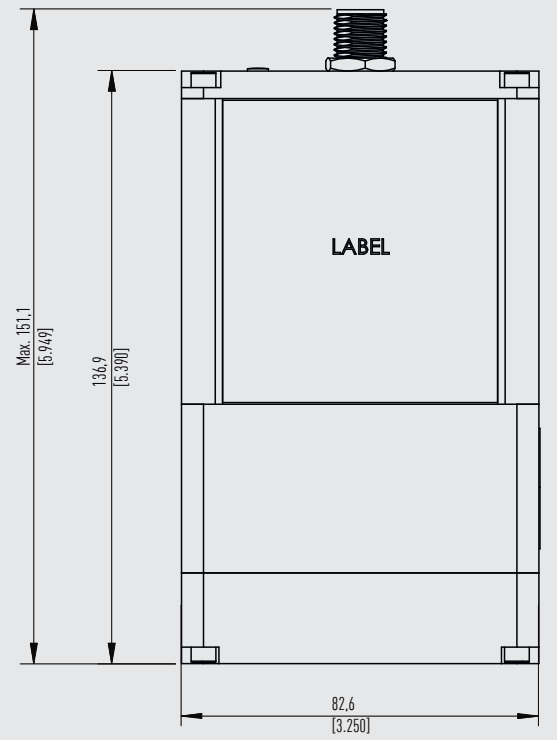
USB, without relief valve



RS-232/RS-485, with relief valve



USB, with relief valve

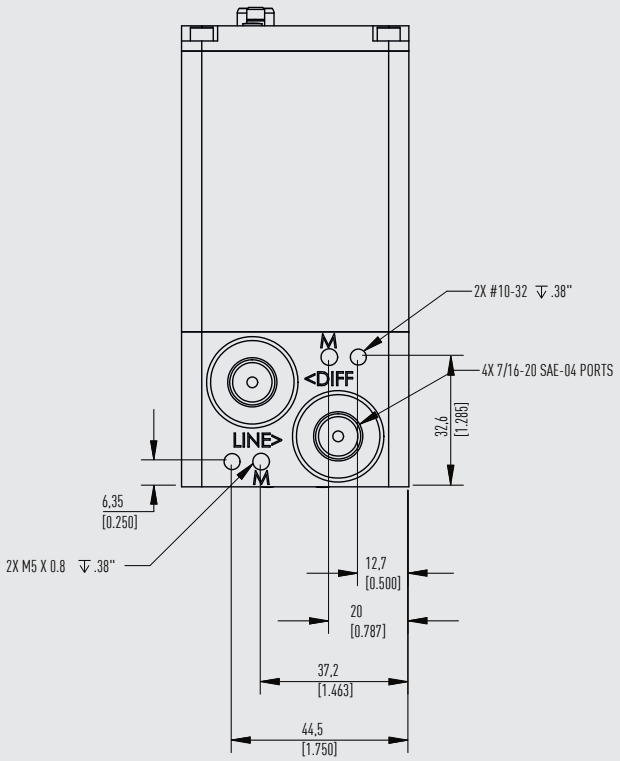


For the CPT8900 with external relief to atmosphere, the overall width is 109.1 mm [4.293 in]

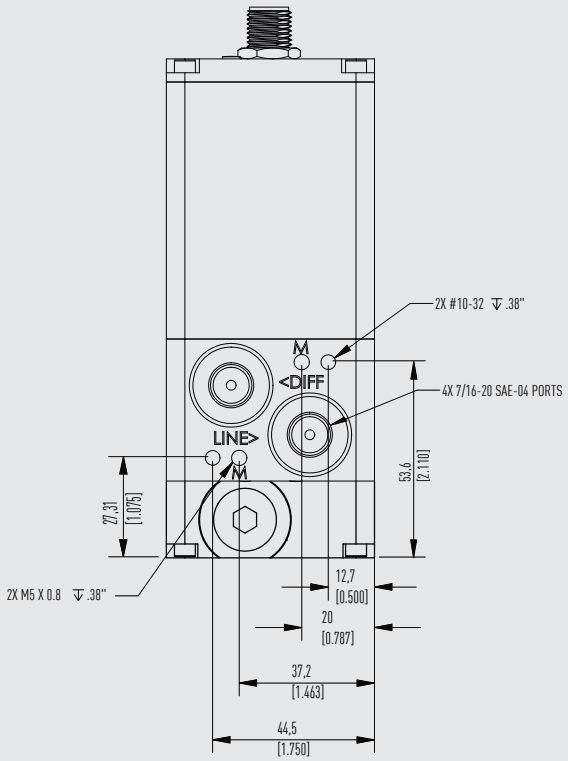
Side view

The opposite side has the same dimensions, which are mirrored across the y-axis

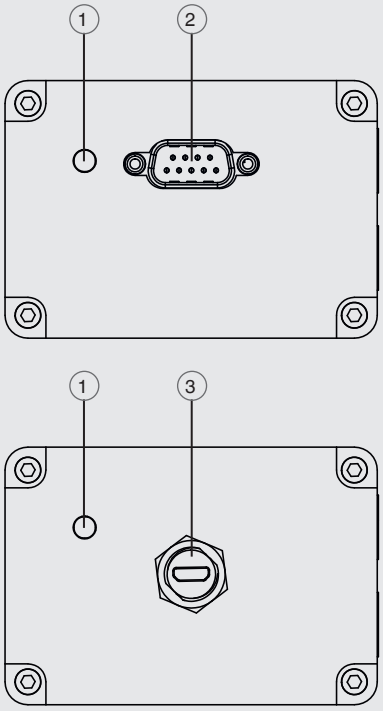
Without relief valve
For RS-232/RS-485 or USB connection



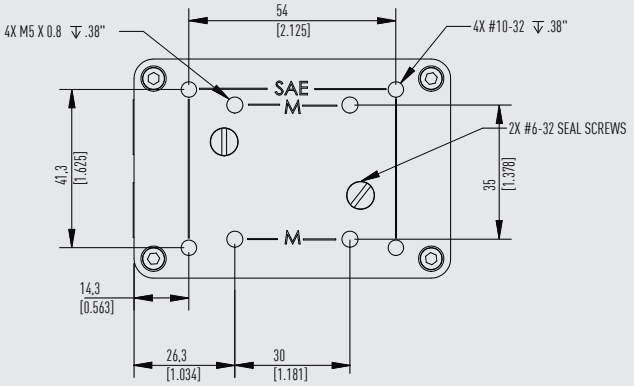
With relief valve
For RS-232/RS-485 or USB connection



View from above
RS-232/RS-485 and USB connection



View from below
RS-232/RS-485 and USB connection



(1) LED indicator
(2) D-Sub male, 9-pin
(3) Micro-USB connector

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 and is available as a demo version for a cost-free download.
To switch from the demo version to a licenced version, a USB dongle with a valid licence must be purchased.
The preinstalled 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 preselection via SQL database
- Menu languages: German, English, Italian, French, Dutch, Polish, Portuguese, Romanian, Spanish, Swedish, Russian, Greek, Japanese, Chinese
  More languages are due with software updates
- Customer-specific complete solutions are possible

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

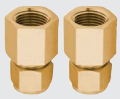
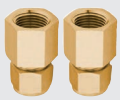
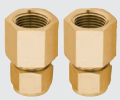
For further information, see data sheet CT 95.10

Three WIKA-Cal licences are available

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.

Cal-Template (demo version)	Cal-Template (light version)	Cal-Template (full version)	Log-Template (full version)
Fully automatic calibration	Semi-automatic calibration	Fully automatic calibration	■ Live measured value 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 measuring results in PDF format ■ Possibility of exporting measuring results as CSV file
Limitation to two measuring points	No limitation on the number of measuring points that can be approached		
■ Creation of 3.1 inspection certificates per DIN EN 10204 ■ Calibration reports can be exported to Excel® template or XML file ■ Calibration of pressure measuring instruments			
Ordering information for your enquiry for a single licence:			
Is available for a cost-free download	WIKA-CAL-LZ-Z-Z	WIKA-CAL-CZ-Z-Z	WIKA-CAL-ZZ-L-Z
Ordering information for your enquiry for a pair licence:			
Cal-Template (light version) together with Log-Template (full version)			WIKA-CAL-LZ-L-Z
Cal-Template (full version) together with Log-Template (full version)			WIKA-CAL-CZ-L-Z

Accessories and spare parts

Description [1]		Order code
		CPX-A-T6
	**Power supply** Via RS-232 interface cable Cable length: 1.5 m [4.9 ft]	-1-
	**Power supply** Via RS-485 interface cable Cable length: 1.5 m [4.9 ft]	-2-
-	**Interface cable** Micro-USB, 1 m [3 ft]	-3-
-	**Interface cable** Micro-USB, 3 m [9.8 ft]	-4-
	**Adapter cable** RS-232 to USB	-5-
	RS-485 to USB	-6-
	**Adapter set** Consisting of: 2 adapters with SAE J514/JIC 4, male thread to a 6 mm tube fitting $P_{Max.}$ 137 bar [2,000 psi] Material: brass	-M-
	**Adapter set** Consisting of: 2 adapters with SAE J514/JIC 4, male thread to ¼" tube fitting $P_{Max.}$ 137 bar [2,000 psi] Material: brass	-I-
	**Adapter set** Consisting of: 2 adapters with SAE J514/JIC 4, male thread to ¼ NPT, female thread $P_{Max.}$ 137 bar [2,000 psi] Material: brass	-N-
	**Adapter set** Consisting of: 2 adapters with SAE J514/JIC 4, male thread to ⅛ NPT, female thread $P_{Max.}$ 137 bar [2,000 psi] Material: brass	-S-
	**Adapter set** Consisting of: 2 adapters with SAE J514/JIC 4, male thread to ⅛ BSPG, female thread $P_{Max.}$ 137 bar [2,000 psi] Material: brass	-B-
-	**Transport case**	-T-
	**Calibration adapter** For reference pressure transducers and current supply	-C-

Description [1]			Order code
			CPX-A-T6
-	**Relief valve** Dual differential relief valve		-D-
-	**Relief valve** Dual differential relief valve vented to atmosphere		-A-
Ordering information for enquiry:			
		1. Order code: CPX-A-T6 **2. Option:**	⇓ **[ ]**

1) The figures are an example and may change in design, material composition and representation depending on the state of the art.

Scope of delivery

- Differential pressure transducer
- Operating instructions
- Pressure adapter
- Calibration certificate

Ordering information

CPT8900 / Instrument version / Pressure unit / Maximum pressure range Ps / Static/Ps accuracy / Pressure type / Minimum pressure range / Maximum pressure range / Differential/Qc measuring range accuracy / Type of certificate / Orientation / Temperature compensation / Baud rate / Digital interface / Electrical connection length / Double differential pressure relief valve / Pressure adapter

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