Precision pressure transducer
Standard version
Models CPT6100, CPT6180

mensor

WIKA data sheet CT 25.10

Applications

- Testing technology
- Calibration technology
- Laboratories and maintenance shops
- Avionics

Special features

- Accuracy down to 0.01 % IS-50 (IntelliScale)
- Precision down to 0.004 % FS
- Measuring range from -1 ... 400 bar [-15 ... 6,000 psi]
- RS-232 or RS-485 interface
- Compact design

Precision pressure sensor, standard version, model CPT6100

Description

The models CPT6180 and CPT6100 precision pressure transducers are compact, robust sensors with a serial interface and a measuring range which is freely selectable between -1 ... 400 bar [-15 ... 6,000 psi]. The high accuracy of up to 0.01 % IS-50 makes the transducer one of the most accurate transducers in precision measurement technology. The standard output mode provides the pressure values via a query-response process.

Application

These precision pressure transducers are built into OEM instruments, e.g. in pressure, flow or humidity calibrators, or in any instrument where high-accuracy measurement is needed. They are used as reference pressure transducers within the automated manufacturing of pressure measuring instruments or calibration stands. Through a high accuracy, speed of reading and long-term stability, the transducers are particularly suited for applications in wind tunnels or in pressure chambers.

These characteristics make it a valuable tool in metrology, hydrology, oceanography, and in the aviation and space industries.

Functions

The models CPT6180 and CPT6100 have an RS-232 or RS-485 interface. The RS-485 interface offers the possibility of a genuine multidrop connection and simple cabling. There are four different baud rates to choose from.

The transducers can be configured for gauge and absolute pressure for any measuring range within the specified limits. With a calibration interval of 180 or 365 days and a high resolution of 6 or 7 significant figures, CPT6180 and CPT6100 are flexible enough to be used in a wide variety of applications.

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Smart in sensing

Data sheets showing similar products:
Precision pressure sensor, high-speed version; model CPT6140; see data sheet CT 25.11

Compact design

The pressure transducers are, due to their robust, compact design, easily integrable in a 19" rack without taking up much space. With the combination of male and female threads, a fast and secure fitting is always possible, negating the need for further sealing.

Specifications

Measuring range precision pressure transducer		
Model	CPT6100	CPT6180
Accuracy [1]	0.01 % FS [2]	0.01 % IS-50 [3]
Measuring ranges [4]		
Gauge pressure	0 ... 25 mbar to 0 ... 400 bar [0 ... 0.36 to 0 ... 6,000 psi]	0 ... 1 to 0 ... 400 bar [0 ... 15 to 0 ... 6,000 psi]
Bidirectional pressure	-12.5 ... 12.5 mbar to -1 ... 400 bar [-0.18 ... 0.18 to -14.5 ... 6,000 psi]	-1 ... 10 to 0 ... 400 bar [-15 ... 145 psi to 0 ... 6,000 psi]
Absolute pressure [5]	0 ... 0.5 to 0 ... 401 bar abs. [0 ... 7.5 to 0 ... 6,015 psi abs.]	0 ... 1 to 0 ... 401 bar abs. [0 ... 15 to 0 ... 6,015 psi abs.]
Precision [6]	0.004 % FS	0.004 % FS
Calibration interval	180 days	365 days

1) It is defined by the total measurement uncertainty, which is expressed with the coverage factor (k = 2) and includes the following factors: 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 during a periodic zero point correction every 30 days.
2) FS = Full span = end of measuring range - start of measuring range
3) 0.01 % IS-50 accuracy: between 0 ... 50 % of the full scale, the accuracy is 0.01 % of half of the full scale value and between 50 ... 100 % of the full scale, the accuracy is 0.01 % of reading.
4) For pressure ranges from ≥ 100 ... ≤ 138 bar [≥ 1,500 ... ≤ 2,000 psi] gauge will be sealed gauge sensors.
5) The minimum calibrated range of absolute sensor(s) is 600 mTorr
6) It is defined as the combined effects of linearity, repeatability and hysteresis throughout the stated compensated temperature range

CPT6100 as barometric reference	
Measuring range	■ 552 ... 1,172 mbar abs. ■ 8 ... 17 psi abs.
Accuracy [1]	0.01 % of reading
Precision [2]	0.004 % FS
Calibration interval	180 days

1) It is defined by the total measurement uncertainty, which is expressed with the coverage factor (k = 2) and includes the following factors: 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 during a periodic zero point correction every 30 days.
2) It is defined as the combined effects of linearity, repeatability and hysteresis throughout the stated compensated temperature range

Basic information precision pressure transducer	
Resolution	■ CPT6100: 6 significant figures ■ CPT6180: 7 significant figures
Filter	Adjustable exponential filter from 0 ... 99 % The filter is only active within a defined range of 0.010 % FS.
Warm-up time	Approx. 15 min up to the specified accuracy
Pressure units	36
Voltage supply	
Power supply	DC 12 V ± 10 %, 55 mA max.
Analogue output (Only CPT6100)	■ DC 0 ... 1 V ■ DC 0 ... 5 V ■ DC 0 ... 10 V

Basic information precision pressure transducer

Mechanical shock	Max. 3g
Case	
Mounting position	< 1 bar [< 15 psi] negligible Can be adjusted through zero point adjustment (linear shift of the characteristic curve)
Dimensions	→ See technical drawings
Weight	505 g [1.11 lb]

Communication

Interface	■ RS-232 ■ RS-485
Baud rate (User-selectable)	■ 9600 ■ 19200 ■ 38400 ■ 57600 baud
Multi-drop capability	The maximum number of RS-485 transducers which can be connected to a single host computer is 31.
Signal output	Query and response
Command sets	■ Mensor default command set ■ Mensor legacy command set
Response time	■ 100 ms for a FS pressure pulse ■ 20 ms for a FS pressure pulse
Noise	■ Filter set to 90 % (factory default): 20 ppm peak-to-peak and 6.5 ppm rms. ■ Filter set to 0 %: 53 ppm peak to peak and 12.5 ppm rms. ■ Filter set to 99 %: 13 ppm peak to peak and 4.2 ppm rms
Measuring rate	■ 50 Hz / 20 ms ■ 10 Hz / 100 ms

Pressure connection

Connection	7/16-20 SAE, tube fitting For pressure and reference port The reference port is sealed for absolute pressure transducers	
Pressure adapters	■ 6 mm tube fitting ■ ¼" tube fitting ■ ¼ NPT, female thread ■ ⅛ NPT, female thread ■ ⅛ BSP, female thread ■ ¼ NPT, female thread incl. safety relief valve for pressure range ≤ 70 bar [≤ 1,000 psi] ■ ⅛ NPT, female thread incl. safety relief valve for pressure range < 70 bar [< 1,000 psi]	
Wetted parts	■ Aluminium ■ Brass ■ Stainless steel 316 ■ Buna-N ■ Viton® ■ Silicone grease	■ Silicone rubber ■ Nylon ■ Ceramic ■ Glass ■ Silicon
Permissible pressure media	Pressure ranges ≤ 1 bar [≤ 15 psi]	Clean, dry, non-corrosive gases
	Pressure ranges > 1 bar [> 15 psi]	Media compatible with the listed wetted parts All other ranges compatible with aluminum, 316SS, brass, Buna-N, Viton®, sealant, and silicone grease.
	Not designed for oxygen use	
Overpressure limit	150 % FS or greater, depending on range	

Operating conditions	
Altitude	< 3,048 m [< 10,000 ft]
Place of use	Indoor
Operating temperature	0 ... 50 °C [2 ... 122 °F]
Compensated temperature range	15 ... 45 °C [59 ... 113 °F]
Storage temperature range	-20 ... +70 °C [-4 ... 158 °F]
Relative humidity, condensation	0 ... 95 % r. h. (non-condensing)
Mounting position	■ Horizontal ■ Vertical ■ Customised

Approvals

Logo	Description	Region
CE	**EU declaration of conformity**	European Union
	EMC directive EN 61326-1 emission (group 1, class B) and immunity (industrial application)	
	Pressure Equipment Directive PS > 200 bar; module A, pressure accessory	
	RoHS directive	
UKCA	**UKCA**	United Kingdom
	Electromagnetic compatibility regulations	
	Pressure equipment (safety) regulations	
	Restriction of hazardous substances (RoHS) regulations	

Optional approvals

Logo	Description	Country
-	**MTSCHS** Permission for commissioning	Kazakhstan

Certificates

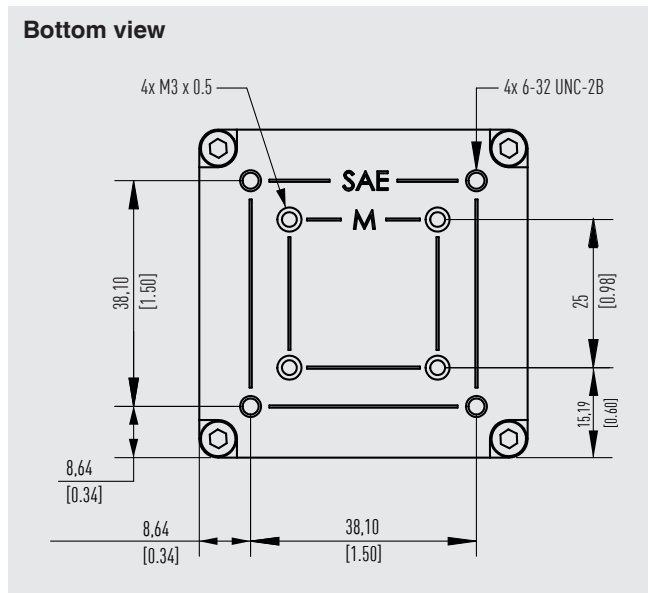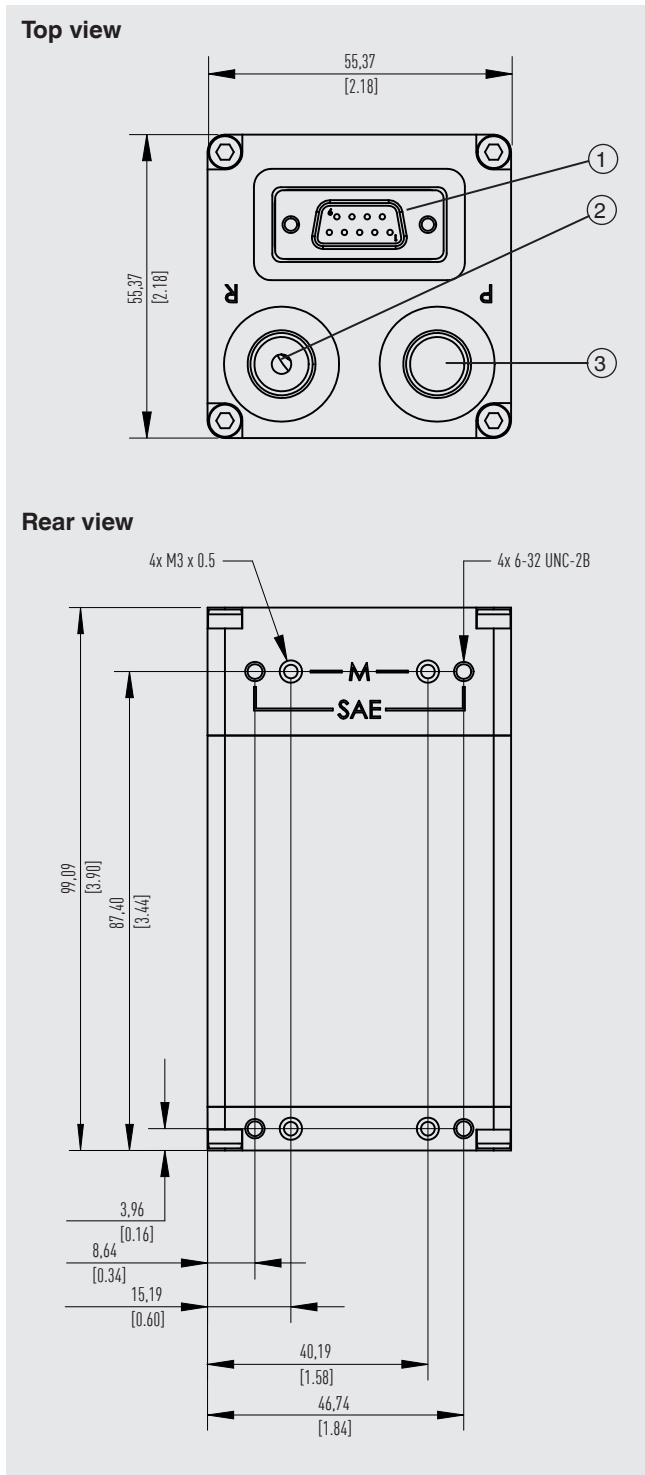| Certificate	
Calibration [1]	
CPT6100 and CPT6180	■ A2LA calibration certificate (traceable and accredited in accordance with ISO/IEC 17025) ■ DAkkS calibration certificate - absolute pressure (traceable and accredited in accordance with ISO/IEC 17025) ■ DAkkS calibration certificate - gauge pressure (traceable and accredited in accordance with ISO/IEC 17025)
Analogue output only for CPT6100	■ Without ■ A2LA calibration certificate (traceable and accredited in accordance with ISO/IEC 17025) ■ DAkkS calibration certificate - analogue output (traceable and accredited in accordance with ISO/IEC 17025)
Recommended calibration interval	6 months (dependent on conditions of use)

1) Calibration in a vertical position.

→ Approvals and certificates, see website

Dimensions in mm [in]

Top view

Rear view

Bottom view

Isometric view

① RS-232 or RS-485 interface

② Reference port (7/16-20 SAE)

③ Pressure port (7/16-20 SAE)

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 possible
- Maximum level of automation in connection with our CPx series

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 together with one CPx series precision pressure measuring instrument.
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
Limitation to two measuring points	No limitation of the measuring points approached		■ Creation of logger protocols with graphic and/or tabular representation of the measuring results in PDF format
■ Creation of 3.1 inspection certificates per DIN EN 10204 ■ Calibration data can be exported to Excel® template or XML file ■ Calibration of pressure measuring instruments			■ Possibility of exporting measuring results as CSV file
Ordering information 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 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

Accessories for model CPT6100		Order code
Description [1]		**CPX-A-T1**
-	**Power supply** With RS-232 interface cable	-1-
	Power supply With RS-485 interface cable	-2-
-	**Adapter cable** RS-232 to USB	-5-
	Adapter cable RS-485 to USB	-6-
	Adapter set 6 mm Swagelok® male thread (2 adapters) max. 137 bar [2,000 psi] Material: brass	-M-
	Adapter set 6 mm Swagelok® male thread (2 adapters) $P_{max.}$ 400 bar [6,000 psi] Material: stainless steel	-C-
	Adapter set ¼" tube fitting (2 adapters) $P_{max.}$ 137 bar [2,000 psi] Material: brass	-I-
	Adapter set ¼" tube fitting (2 adapters) $P_{max.}$ 400 bar [6,000 psi] Material: stainless steel	-E-
	Adapter set ⅛ BSPG female thread (2 adapters) $P_{max.}$ 137 bar [2,000 psi] Material: brass	-B-
	Adapter set ¼ NPT female thread (2 adapters) $P_{max.}$ 137 bar [2,000 psi] Material: brass	-N-
	Adapter set ¼ NPT female thread (2 adapters) $P_{max.}$ 400 bar [6,000 psi] Material: stainless steel	-A-
	Adapter set ⅛ NPT female thread (2 adapters) $P_{max.}$ 137 bar [2,000 psi] Material: brass	-S-
	Adapter set ⅛ NPT female thread (2 adapters) $P_{max.}$ 400 bar [6,000 psi] Material: stainless steel	-F-
-	**Transport case**	-T-
Ordering information for your enquiry:		
	1. Order code: CPX-A-T1 **2. Option:**	⇓ [ ]

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

Accessories for model CPT6180			Order code
Description [1]			**CPX-A-T2**
-	**Power supply** With RS-232 interface cable		-1-
	Power supply With RS-485 interface cable		-2-
-	**Adapter cable** RS-232 to USB		-5-
	Adapter cable RS-485 to USB		-6-
-	Adapter set ⅛ NPT female thread incl. safety relief valve For pressure ranges ≤ 70 bar [≤ 1,000 psi]		-3-
-	Adapter set ⅛ NPT female thread incl. safety relief valve For pressure ranges > 70 bar [> 1,000 psi]		-4-
	Adapter set 6 mm Swagelok® male thread (2 adapters) $P_{max.}$ 137 bar [2,000 psi] Material: brass		-M-
	Adapter set 6 mm Swagelok® male thread (2 adapters) $P_{max.}$ 400 bar [6,000 psi] Material: stainless steel		-C-
	Adapter set ¼" tube fitting (2 adapters) $P_{max.}$ 137 bar [2,000 psi] Material: brass		-I-
	Adapter set ¼" tube fitting (2 adapters) $P_{max.}$ 400 bar [6,000 psi] Material: stainless steel		-E-
	Adapter set ⅛ BSPG female thread (2 adapters) $P_{max.}$ 137 bar [2,000 psi] Material: brass		-B-
	Adapter set ¼ NPT female thread (2 adapters) $P_{max.}$ 137 bar [2,000 psi] Material: brass		-N-
	Adapter set ¼ NPT female thread (2 adapters) $P_{max.}$ 400 bar [6,000 psi] Material: stainless steel		-A-
	Adapter set ⅛ NPT female thread (2 adapters) $P_{max.}$ 137 bar [2,000 psi] Material: brass		-S-
	Adapter set ⅛ NPT female thread (2 adapters) $P_{max.}$ 400 bar [6,000 psi] Material: stainless steel		-F-
-	**Transport case**		-T-
Ordering information for your enquiry:			
		1. Order code: CPX-A-T2 **2. Option:**	⇓ [ ]

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

Scope of delivery

- Precision pressure sensor model CPT6180 or model CPT6100
- Operating instructions
- Calibration certificate

Ordering information

CPT6100 / Instrument version / Pressure unit / Type of pressure / Start of measuring range / End of measuring range / Accuracy / Type of certificate / Mounting position / Interface / Baud rate / Output mode / Analogue output / Type of certificate for analogue output / Pressure adapter / Further approvals / Additional ordering information

CPT6180 / Instrument version / Pressure unit / Type of pressure / Start of measuring range / End of measuring range / Type of certificate / Mounting position / Interface / Baud rate / Output mode / Mounting thread / Pressure adapter / Further approvals / Additional ordering information

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