Precision pressure transducer
Basic version
Model CPT6020

mensor

Applications

- Calibration technology
- High-accuracy pressure monitoring
- Pressure sensing in critical applications
- Aerospace

Special features

- Accuracy: 0.020 % FS
- Measuring range: 0 ... 25 mbar up to 1,001 bar
  [0 ... 10 inH_2O up to 15,015 psi]
- Temperature compensation: 0 ... 50 °C [32 ... 122 °F]
- USB, RS-232 or RS-485 communication
- Rugged and compact design

Precision pressure transducer, basic version, model CPT6020

Description

The model CPT6020 precision pressure transducer is a self-contained pressure sensing instrument that provides high-accuracy pressure measurements. This transducer used a low-hysteresis silicon sensor with electronically compensated pressure linearity over the compensated temperature range.

The CPT6020 is characterised over the full pressure and temperature range to achieve 0.020 % FS accuracy. This specification includes linearity, hysteresis, repeatability and temperature errors. Also featured is an output which is updated at a rate of 50 readings per second (20 ms).

Application

The CPT6020 is used in OEM applications where a high-accuracy pressure sensing is required.
Examples are:
- Flow calibrators, humidity calibrators, pressure controllers
- For aerospace wind tunnel calibration and also for the automotive sensor testing

- In the aviation and space industries in general, hydrology and oceanography

Also for applications where high-accuracy pressure measurements and long-term calibration stability are required. It can also be used as a transfer standard or in pressure calibration and testing areas of production facilities.

Functions

The model CPT6020 has a USB, RS-232 or RS-485 interface. The RS-485 interface offers multi-drop capability and cabling that includes power and communications. Five different baud rates can be selected and the transducer can be located up to 1,220 m [4,000 ft] from the host.

Each transducer can be configured for gauge or absolute pressure types. With a calibration interval of 180 days and a high resolution of 8 significant digits, the CPT6020 is flexible enough to be used in a wide variety of applications.

WIKA

Smart in sensing

Design

The stainless steel 316L construction and IP67 rating are an asset when utilising in corrosive or wet environments. Its compact design offers an advantage in miniaturisation of product design in many OEM applications.

The pressure connection and housing can be customised for individual applications. Standard fittings are easily changed using the AN-4 female connection or the Autoclave® F250C connection.

Specifications

Measuring range precision pressure transducer	
Accuracy [1]	0.020 % FS
Measuring ranges	
Gauge pressure [2]	0 ... 25 mbar to 0 ... 1,000 bar [0 ... 0.36 to 0 ... < 15,000 psi]
Bidirectional pressure [2] [3]	-12.5 ... +12.5 mbar to -1 ... 1,000 bar [-0.18 ... +0.18 to -15 ... 15,000 psi]
Absolute pressure	0 ... 350 mbar abs. to 0 ... 1,001 bar abs. [0 ... 5 to 0 ... 15,015 psi abs.]
As barometric reference	
Measuring range	552 ... 1,172 mbar abs. [8 ... 17 psi abs.]
Accuracy [1]	0.020 % of reading
Calibration interval	180 days
Pressure units	39 and 1 user-defined

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 adjustment every 30 days.
2) For pressure ranges from ≥ 100 ... ≤ 1,000 barg [≥ 1,500 ... ≤ 15,000 psig] will be sealed gauge sensors.
3) The negative portion of a bidirectional range has the same accuracy as the equivalent positive range.

Basic information precision pressure transducer		
Display		
Resolution	100 ppb or better	
Boot-up time	■ RS-232 ■ RS-485	750 ms
	USB	3.5 s
Warm-up time	Approx. 15 min	
Voltage supply		
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	< 26 mA at DC 12 V ±5 % ($0.40\,W_{max}$)
	USB	< 47 mA at DC 5 V ±5 % ($0.25\,W_{max}$)
Internal volume		
Measure port	< 1 ml [< 1 cc]	
Reference port	Approx. 40 ml [40 cc]	

Basic information precision pressure transducer

Case	
Orientation effects	Removable with a zero point correction
Dimensions	→ See technical drawings
Weight	Approx. 250 g [0.55 lb] (depending on range)
Ingress protection	IP67

Communication

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

Pressure connection

Connection	■ FSAE J514/JIC 4 ■ Autoclave® F250C: for pressure ranges > 400 bar [> 6,000 psi]	
Pressure port adapters	Without	-
	■ 6 mm tube fitting ■ ¼" tube fitting ■ ¼ NPT, male thread ■ ⅛ NPT, female thread ■ ¼ BSP, male thread ■ ⅛ BSP, female thread ■ 7/16-20 SAE, female thread	Only up to pressure ranges 400 bar [6,000 psi]
Reference port	< 100 bar [< 1,500 psi]	1/16" barb fitting
	■ > 100 bar [> 1,500 psi] ■ > 100 bar abs. [> 1,500 psi abs.]	Sealed relief valve [1]
Wetted parts	Pressure ranges ≤ 350 mbar [≤ 5 psi]	■ Stainless steel 316 ■ Silicon ■ Glass-filled resins ■ Epoxy
	Pressure ranges > 350 mbar ... 100 bar [> 5 ... 1,500 psi]	■ Stainless steel 316
	Pressure ranges > 100 bar [> 1,500 psi]	■ Stainless steel 316 ■ Fluorocarbon rubber
Overpressure limit	2 x proof, 3 x burst, static pressure < 3.45 bar [< 50 psi]	

1) Sealed relief valve has flurocarbon rubber O-ring with a release pressure setting of 0.69 ... 1.38 bar [10 ... 20 psi]

Operating conditions		
Altitude	< 3,048 m [< 10,000 ft]	
Place of use	Indoor	
Operating temperature	-40 ... +85 °C [-40 ... +185 °F]	
Compensated temperature range	0 ... 50 °C [32 ... 122 °F]	
Storage temperature range	-40 ... +85 °C [-40 ... +185 °F]	
Relative humidity, condensation	0 ... 95 % r. h. (non-condensing)	
Permissible media	Pressure ranges ≤ 350 mbar [≤ 5 psi]	Clean, dry, non-corrosive gases
	Pressure ranges > 350 mbar [> 5 psi]	Media compatible with the listed wetted parts
Mounting position	■ Horizontal ■ Vertical ■ Customised	
Pollution degree	2 per EN 61010-1	
EMC (HF field)	EN 61326-1 emission (group 1, class A) and immunity (industrial application)	

Approvals

Logo	Description	Region
CE	**EU declaration of conformity**	European Union
	EMC directive [1] EN 61326-1 emission (group 1, class A) and immunity (industrial application)	
	RoHS directive	
UKCA	**UKCA**	United Kingdom
	Electromagnetic compatibility regulations	
	Restriction of hazardous substances (RoHS) regulations	

[1]   **Warning!** This is class A equipment for emissions and is intended for use in industrial environments. In other environments, e.g. residential or commercial installations, it can interfere with other equipment under certain conditions. In such circumstances the operator is expected to take the appropriate measures.

Certificates

| Certificate	
Calibration [1]	■ 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)
Recommended calibration interval	6 months (dependent on conditions of use)

[1]   Calibration in a vertical position.
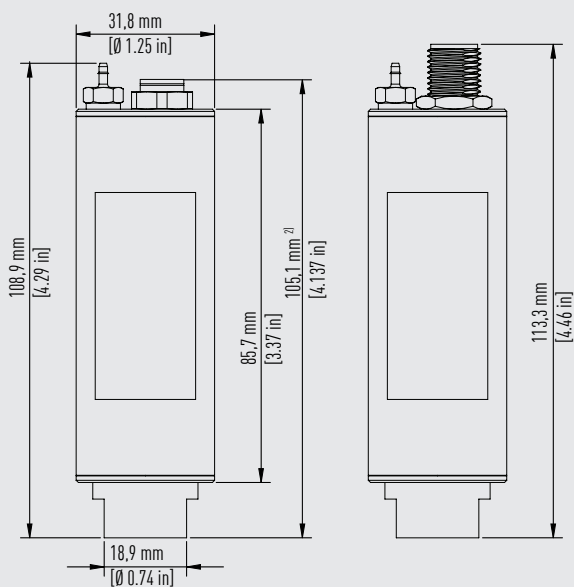
→ Approvals and certificates, see website

Dimensions in mm [in]

Low-pressure version
< 100 bar [< 1,500 psi]
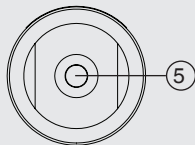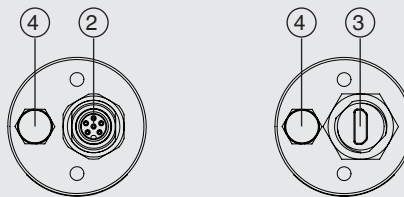
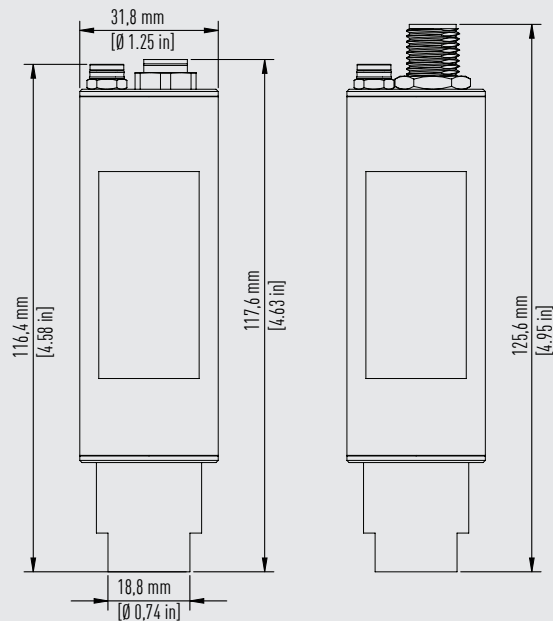### Interface and reference port [1]
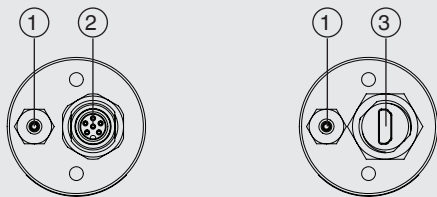
Case

Pressure connection

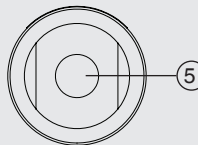## Medium-pressure version
100 ... 400 bar [1,500 ... 6,000 psi]

Interface and reference port [1]

Case

Pressure connection
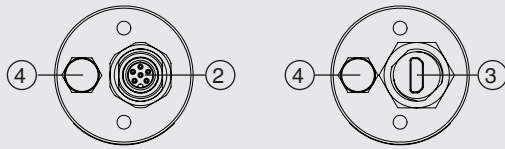
① Reference port for hose connection 1/16" barbed

② 6-pin M8 connector for RS-232 and RS-485 version

③ Micro-USB connector

④ Sealed relief valve

⑤ SAE J514 37° flare port 7/16-20 thread

1) Reference port only for gauge pressure range; the port is plugged at absolute pressure range and sealed gauge ranges
2) Maximum dimension for absolute variant

High-pressure version
> 400 ... 1,000 bar [> 6,000 ... 15,000 psi]

Interface and reference port [1]

Case

Pressure connection

① Reference port for hose connection 1/16" barbed

② 6-pin M8 connector for RS-232 and RS-485 version

③ Micro-USB connector

④ Sealed relief valve

⑤ SAE J514 37° flare port 7/16-20 thread

⑥ Autoclave® F250C female port

1) Reference port only for gauge pressure range; the port is plugged at absolute pressure range and sealed gauge ranges
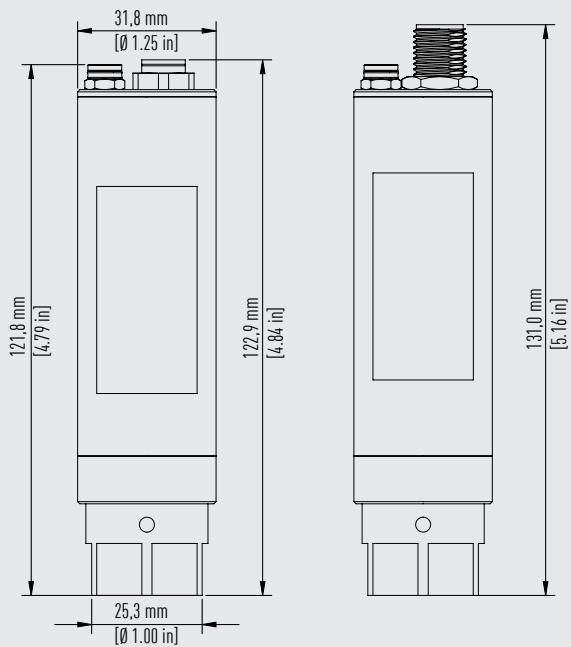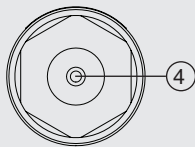
2) Maximum dimension for absolute-pressure variant

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 licensed 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 CPT9000 / CPT6020 [1]		Order code
Description		**CPX-A-T4**
	Power supply Via RS-232 interface cable Cable length: 1.5 m [4.9 ft]	-1-
	Via RS-232 interface cable Cable length: 3.0 m [9.8 ft]	-3-
	Via RS-232 interface cable Cable length: 5.0 m [16.4 ft]	-4-
	Power supply Via RS-485 interface cable Cable length: 1.5 m [4.9 ft]	-2-
	Via RS-485 interface cable Cable length: 3.0 m [9.8 ft]	-J-
	Via RS-485 interface cable Cable length: 5.0 m [16.4 ft]	-K-
	Adapter cable RS-232 to USB	-5-
	RS-485 to USB	-6-
	Legacy cable adapter RS-232 cable adapter For CPT6010 to CPT9000 or CPT6020	-8-
	RS-485 cable adapter For CPT6010 to CPT9000 or CPT6020	-7-
	Pressure adapter SAE J514/JIC 4, male thread to ¼ BSP, male thread P_{max}: 400 bar [6,000 psi]	-A-
	Pressure adapter SAE J514/JIC 4, male thread to ⅛ BSP, female thread P_{max}: 400 bar [6,000 psi]	-B-
	Pressure adapter SAE J514/JIC 4, male thread to 6 mm tube fitting P_{max}: 400 bar [6,000 psi]	-C-
	Pressure adapter SAE J514/JIC 4, male thread to 7/16-20 SAE, male thread P_{max}: 400 bar [6,000 psi]	-D-
	Pressure adapter SAE J514/JIC 4, male thread to ¼" tube fitting P_{max}: 400 bar [6,000 psi]	-E-
	Pressure adapter SAE J514/JIC 4, male thread to ¼ NPT, male thread P_{max}: 400 bar [6,000 psi]	-F-
	Pressure adapter SAE J514/JIC 4, male thread to ⅛ NPT, female thread P_{max}: 400 bar [6,000 psi]	-S-
-	**Pressure adapter** SAE J514/JIC 4, male thread to G ½ BSP, male thread P_{max}: 400 bar [6,000 psi]	-U-
-	**Gasket-flare** 50 pcs. gasket-flare 37° ¼" for J514/JIC 44 pressure port	-V-

Accessories for CPT9000 / CPT6020 [1]			Order code
Description			**CPX-A-T4**
	Communication cable Shielded with flying leads Cable length: 1.5 m [4.9 ft]		-G-
	Shielded with flying leads Cable length: 3.0 m [9.8 ft]		-H-
	Shielded with flying leads Cable length: 5.0 m [16.4 ft]		-I-
-	**Transport case**		-T-
Ordering information for your enquiry:			
		1. Order code: CPX-A-T4 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 transducer, basic version, model CPT6020
- Interface-cable: RS-232/RS-485 connection cable with flying leads; 1.5 m [5 ft] length or USB cable for IP67; 1 m [3 ft] length
- Pressure adapters (as specified)
- Operating instructions
- Calibration certificate

Ordering information

CPT6020 / Instrument version / Operating pressure range / Pressure unit / Type of pressure / Start of measuring range / End of measuring range / Type of certificate / Mounting position / Interface / Baud rate / Electrical connection length / Pressure connection adapter / Transport case / Further approvals / Additional ordering information

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