

# Precision pressure sensor

## Basic version

### Model CPT6020



WIKA data sheet CT 25.13

#### Applications

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

#### Special features

- Accuracy: 0.020 % FS
- Measuring range: 25 mbar ... 1,001 bar  
[10 inH<sub>2</sub>O ... 15,015 psi]
- Temperature compensation: 0 ... 50 °C [32 ... 122 °F]
- RS-232 or RS-485 communication
- Rugged and compact design



Precision pressure sensor, model CPT6020

#### Description

The CPT6020 precision pressure sensor is a pressure sensing instrument that provides high-accuracy pressure measurements. This sensor 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 model CPT6020 precision pressure sensor is for OEM instruments that require high-accuracy pressure sensor.

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

Or 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 an RS-232 or RS-485 interface. The RS-485 interface offers multi-drop capability and simple cabling that includes power and communications. Four different baud rates can be selected and the sensor can be located up to 1,220 m [4,000 ft] from the host.

The sensor can be configured for gauge or absolute pressure types. With a calibration interval of 185 days and a high resolution of 8 significant digits, the CPT6020 is flexible enough to be used in a wide variety of applications.

## Design

The 316L stainless steel construction and wetted parts 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 to fit your application. Standard fittings are easily changed using the AN-4 female connection or the Autoclave® F250C connection.

## Specifications Model CPT6020

Precision pressure sensor technology	
Accuracy <sup>1)</sup>	0.020 % FS
<b>Measuring ranges</b>	
Gauge pressure	0 ... 25 mbar to 0 ... 100 bar 0 ... 0.36 to 0 ... 1,500 psi
Bidirectional pressure <sup>2)</sup>	-12.5 ... +12.5 mbar to -1 ... 100 bar -0.18 ... +0.18 to -15 ... 1,500 psi
Absolute pressure	0 ... 350 mbar abs. to 0 ... 1,001 bar abs. 0 ... 5 to 0 ... 15,015 psi abs.
<b>Optional as barometric reference</b>	
Measuring range	552 ... 1,172 mbar abs. [8 ... 17 psi abs.]
Accuracy <sup>1)</sup>	0.020 % of reading
Pressure units	39 and 1 user-defined
Calibration interval	185 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) The negative portion of a bidirectional range has the same accuracy as the equivalent positive range.

Precision pressure sensor	
<b>Case</b>	
Orientation effects	Negligible – completely removable with a zero point correction
Dimensions	See technical drawings
Weight	Approx. 250 g [0.55 lbs] (depending on range)
Ingress protection	IP67
<b>Display</b>	
Resolution	100 ppb or better
Warm-up time	15 min
<b>Connections</b>	
Pressure connections	SAE J514/JIC 4 or Autoclave® F250C: for pressure ranges > 400 bar [> 6,000 psi]
Overpressure safety	2 x proof, 3 x burst, static pressure < 3.45 bar [< 50 psi]
Pressure port adapters	■ Without ■ Only up to pressure ranges 400 bar [6,000 psi]: 1/8" female BSP fitting, 1/4" male BSP fitting, 1/8" female NPT fitting, 1/4" male NPT fitting, 6 mm tube fitting, 1/4" tube fitting and female 7/16-20 SAE fitting
Wetted parts	Pressure ranges ≤ 350 mbar [≤ 5 psi]: 316 stainless steel, silicon, glass-filled resins, epoxy Pressure ranges > 350 mbar ... 100 bar [> 5 ... 1,500 psi]: 316 stainless steel Pressure ranges > 100 bar [1,500 psi]: 316 stainless steel, fluorocarbon rubber
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

Precision pressure sensor	
<b>Voltage supply</b>	
Supply voltage	DC 9 ... 18 V (DC 12 V nominal)
Current/power consumption	< 26 mA at DC 12 V $\pm$ 5 % (40 W max.)
<b>Permissible ambient conditions</b>	
Compensated temperature range	0 ... 50 °C [32 ... 122 °F]
Operating temperature range	-40 ... +85 °C [-40 ... +185 °F]
Storage temperature range	-40 ... +85 °C [-40 ... +185 °F]
Humidity	0 ... 95 % r. h. (non-condensing)
Operating altitude	< 3,000 m or 10,000 ft
<b>Internal volume</b>	
Measure port	< 1 ml [1 cc]
Reference port	Approx. 40 ml [40 cc]
<b>Communication</b>	
Interface	RS-232 or RS-485
Baud rate	57,600 baud: default 9,600, 19,200 and 115,200 user selectable
Measuring rate	50 values/s: default - (factory adjustable)
<b>Command sets</b>	
	Mensor default command set Mensor legacy command set

## Approvals

### Approvals included in the scope of delivery

Logo	Description	Country
	<b>EU declaration of conformity</b>	European Union
	EMC directive <sup>1)</sup>	
	EN 61326-1 emission (group 1, class A) and immunity (industrial application)	
	RoHS directive	

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

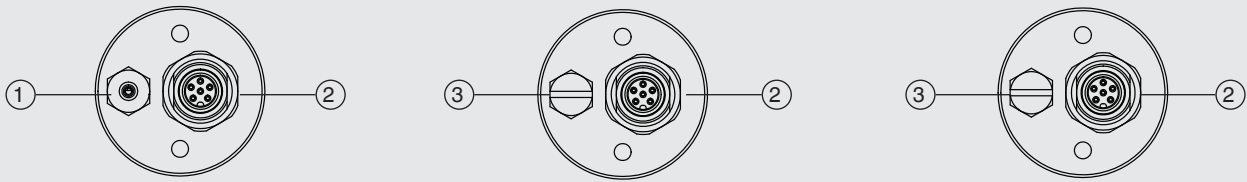
Certificate	
<b>Calibration <sup>2)</sup></b>	<ul style="list-style-type: none"> <li>■ A2LA calibration certificate (standard on factory) (traceable and accredited in accordance with ISO/IEC 17025)</li> <li>■ DKD/DAkkS calibration certificate for absolute pressure measuring ranges (traceable and accredited in accordance with ISO/IEC 17025)</li> <li>■ DKD/DAkkS calibration certificate for gauge pressure measuring ranges (traceable and accredited in accordance with ISO/IEC 17025)</li> </ul>
<b>Recommended recalibration interval</b>	185 days (dependent on conditions of use)

2) Calibration in a vertical position.

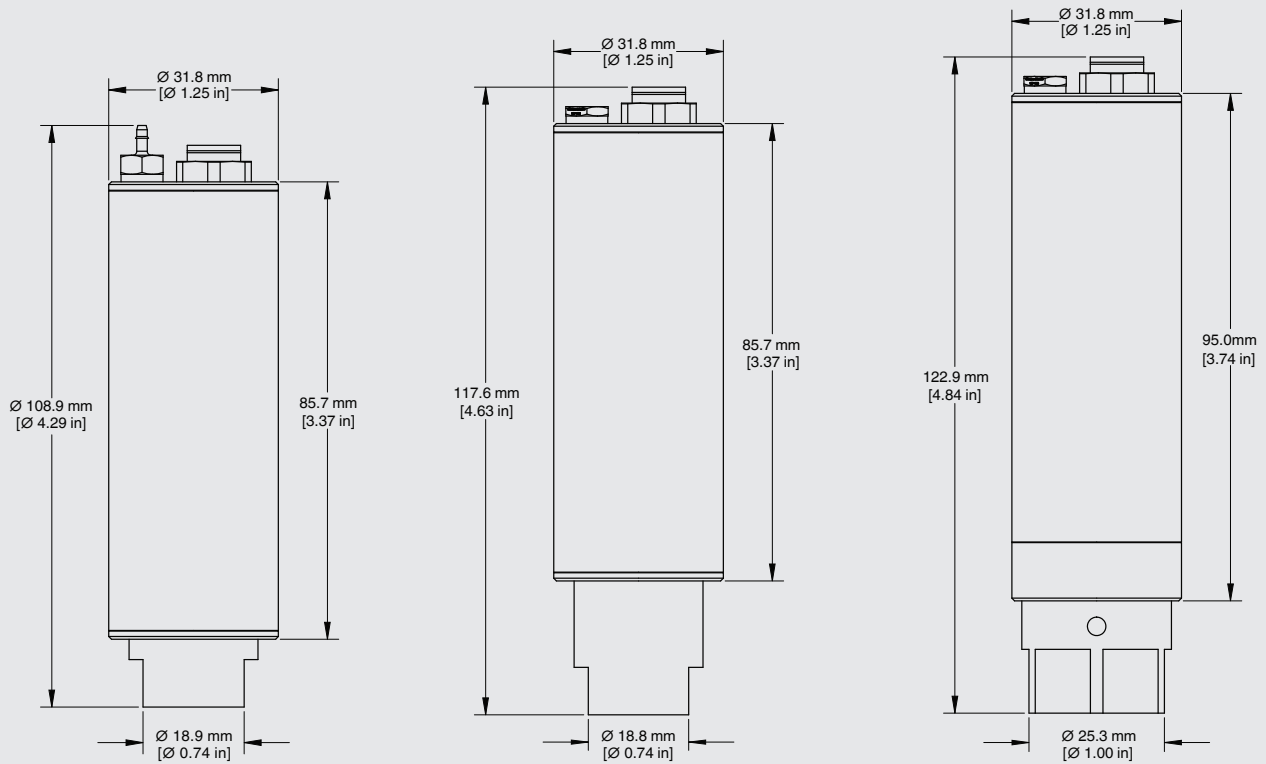
Approvals and certificates, see website

## Dimensions in mm [in]

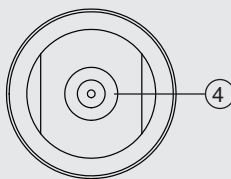
### Interface and reference port 1)



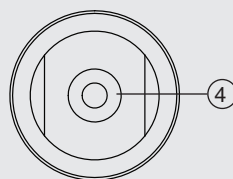
### Case



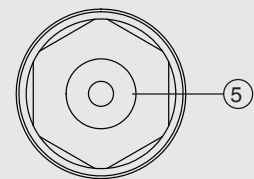
### Pressure connection



$\leq 100 \text{ bar}$   
 $[\leq 1,500 \text{ psi}]$



$100 \dots 400 \text{ bar}$   
 $[1,500 \dots 6,000 \text{ psi}]$



$400 \dots 1,000 \text{ bar}$   
 $[6,000 \dots 15,000 \text{ psi}]$

- ① Reference port for hose connection 1/16" barb
- ② 6-pin M8 connector
- ③ Seal screw

- ④ SAE J514 37° flare port 7/16-20 thread
- ⑤ Autoclave® F250 C female port

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

## 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.

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

### Three WIKA-Cal licences are available together with a pressure controller of CPC series

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 (light version)	Cal-Template (full version)	Log-Template (full version)
<ul style="list-style-type: none"> <li>■ Semi-automated calibration</li> </ul>	<ul style="list-style-type: none"> <li>■ Fully automatic calibration</li> </ul>	<ul style="list-style-type: none"> <li>■ Live measurement recording for a certain period of time with selectable interval, duration and start time</li> <li>■ Creation of logger protocols with graphic and/or tabular representation of the measurement results in PDF format</li> <li>■ Export of measurement results as CSV file possible</li> </ul>
<ul style="list-style-type: none"> <li>■ Creation of calibration certificates 3.1 per DIN EN 10204</li> <li>■ Export of calibration reports to Excel® template or XML file</li> <li>■ Calibration of gauge pressure measuring instruments with absolute pressure references and vice versa</li> <li>■ Creation of calibration certificates with no limitations on measuring points</li> </ul>		
Ordering information for your enquiry for a single license:		
WIKA-CAL-LZ-Z-Z	WIKA-CAL-CZ-Z-Z	WIKA-CAL-ZZ-L-Z
Ordering information for your enquiry for the pair license:		
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 for CPT6020	Order code
Description	CPX-A-T4
<b>Power supply</b> Via RS-232 interface cable	-1-
<b>Power supply</b> Via RS-485 interface cable	-2-
<b>Adapter cable</b> RS-232 to USB	-5-
<b>Adapter cable</b> RS-485 to USB	-6-
<b>Pressure adapter</b> SAE J514/JIC 4 male to 1/4 BSP female; max. 400 bar [6,000 psi]	-A-
<b>Pressure adapter</b> SAE J514/JIC 4 male to 1/8 BSP female; max. 400 bar [6,000 psi]	-B-
<b>Pressure adapter</b> SAE J514/JIC 4 male to 6 mm tube fitting; max. 400 bar [6,000 psi]	-C-
<b>Pressure adapter</b> SAE J514/JIC 4 male to 7/16-20 SAE female; max. 400 bar [6,000 psi]	-D-
<b>Pressure adapter</b> SAE J514/JIC 4 male to 1/4" tube fitting; max. 400 bar [6,000 psi]	-E-
<b>Pressure adapter</b> SAE J514/JIC 4 male to 1/8 NPT female; max. 400 bar [6,000 psi]	-S-
<b>Communication cable</b> Shielded with flying leads	-G-
<b>Transport case</b>	-T-
<b>Ordering information for your enquiry:</b>	
1. Order code: CPX-A-T4 2. Option:	↓ [ ]

## Scope of delivery

- Precision pressure sensor, basic version, model CPT6020
- Operating instructions
- Pressure adapter (as specified)
- 1.5 m [5 ft] connection cable with flying leads
- A2LA calibration certificate (standard on factory)

## Options

- DKD/DAkkS 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 / Pressure connection adapter / Transport case / Further approvals / Additional ordering information

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