

# Cylinder Pressure Sensor for Continuous Monitoring

Type 6613C...

Sensor designed with optimum service life for continuous cylinder pressure monitoring in diesel and gas engines. Because of its low thermal shock and high stability over the long term, this sensor is suitable for demanding monitoring and control tasks.

- Available with voltage or current output
- Long life
- Insensitive to integral mounting

### Description

The quartz measuring element and the charge amplifier incorporated in the plug are interconnected by an integral cable. The charge amplifier has two selectable time constants. The short time constant guarantees stability of the output signal even with rapid changes in load and speed. The long time constant allows static calibration of the measuring chain. As a result of its patented "antistrain" design, the measuring element is insensitive to integral mounting, and largely insensitive to dirt and contamination. The rugged diaphragm permits the sensor to be used for knock detection.

The life expectancy of the sensor has been designed so that a life of >16 000 h can be achieved in a gas engine running. With heavy-oil operation, the service life depends very much on the corrosion occurring, while extreme contamination can reduce measuring accuracy.

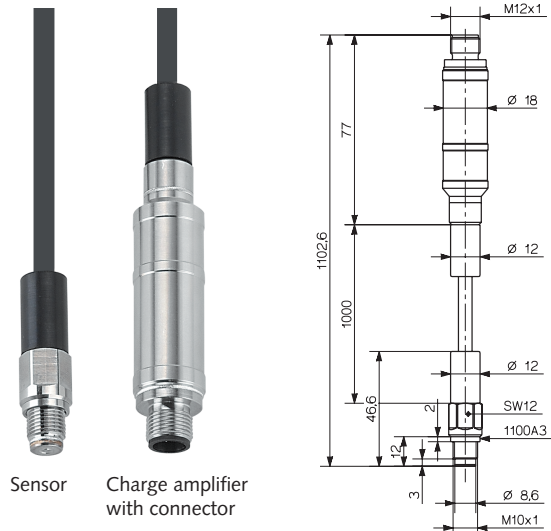
### Applications

#### Type 6613CA

For use with engines with speeds >500 1/min. This sensor has a voltage output and also two measuring ranges which are selected by an appropriate pin connection.

#### Type 6613CB21

This version is particularly suitable for slow running engines (speed 30 ... 500 1/min). The sensor has a current output (2-wire) and a measuring range of 200 bar.



### Technical Data

	Type	6613CA	6613CB21
Measuring range			
Range I	bar	0 ... 250	0 ... 200
Range II	bar	0 ... 100	–
Sensitivity			
Range I (±0,5 %)	mV/bar	10	0,05 mA/bar
Range II (±0,5 %)	mV/bar	25	–
Overload	bar	300	
Linearity	% FSO	≤±1%	
Sensitivity to acceleration	bar/g	0,001	
Operating temperature range			
Sensor	°C	–50 ... 350	
Plug with charge amplifier	°C	–10 ... 110	
Thermal shock at 1 500 1/min, p <sub>mi</sub> = 9 bar	bar	≤±0,5	
Change in sensitivity			
200 ±150 °C	%	≤±2	
200 ±50 °C	%	≤±1	
Frequency range (–3dB)			
Type 6613CA	Hz	0,016 ... 20 000	
Type 6613CB21	Hz	0,0008 ... 20 000	

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**Technical Data**

	Type	6613CA	6613CB21
Time constant	s	10	200
Output voltage (with 1 mA load)	V	>0 ... 5	
Output current	mA	8 ... 20	
Signal range	V/mA	2,5	10
Zero point	V/mA	2 ... 2,2	10
Supply voltage	VDC	7 ... 32	16 ... 30
Load resistance	Ω	400	
Output impedance	Ω	100	
Plug DIN	M12x1	IP67	
Weight	g	140	
Tightening torque	N·m	15	
Connector	8 pole	M12x1	

**Mounting**

In order to minimize thermal stress on the sensor, it should be located so that good heat dissipation to colder components is possible. This can normally be achieved by a set-back location. Optimum sensor life is achieved at an average temperature of 200 ... 300 °C in the sensor body. An angled gas channel can also reduce the effect of flame on the diaphragm, and thereby minimize the short term drift of the sensor. In order to prevent singing oscillations, the lengths of the gas channel should not exceed 30 mm. Strong gas oscillations occur when the gas column between sensor and combustion chamber resonates. Superimposed on the cylinder pressure, these pressure oscillations impose an additional load on the sensor, resulting in reduced life of the sensor.

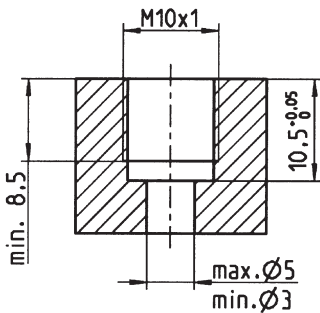


Fig. 1: Sensor bore



Fig. 2: Type 6613CA installed in indicator valve G1/2" with M10 thread and additional stop valve for Type 6613CA

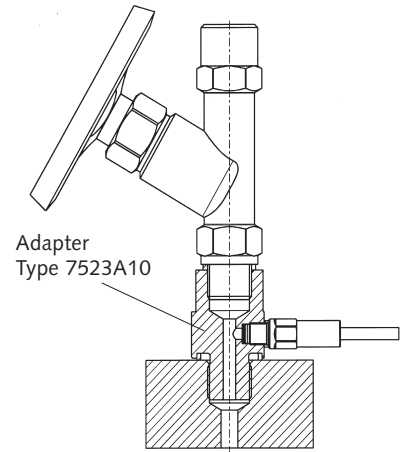


Fig. 3: Sensor installed with adapter Type 7523A10 underneath the indicator valve

**Connecting Cables**

<b>Type 1700A69</b> , plug M12x1 at sensor side, one free cable end, Cable length l = 10 m, 3-wires	black = GND**	standard cable without range selection,
	blue = signal 2,5 Vpp = 250 bar	
	brown = power supply 7 ... 32 VDC	
<b>Type 1700A71</b> , plug M12x1* at sensor side, one free cable end, Cable length l = 10 m, 4-wires	black = GND	standard cable, enables range selection, Range I/Range II
	blue = signal 2,5 Vpp = 250 bar	
	brown = power supply 7 ... 32 VDC	
	white = range selection	
<b>Type 1787A...</b> , plug M12x1* at sensor side, one free cable end, Cable length A5 = 5 m, A20 = 20 m 8-wires	Pin allocation, see manual of Type 6613CA chapter 3.2.5	

\* Only suitable for type 6613CA

\*\* Does not connected for Type 6613CB21

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### Accessories Included

- Cr-Ni seal

### Type

1100A3

### Ordering Key

Type 6613C □

### Optional Accessories

- Torque wrench 8 ... 40 N·m\*
- Fork wrench SW 12 for 1300A11\*
- Adapter M14x1,25
- Adapter BSP R1/2"
- Adapter G1/2"
- Tubular socket wrench

### Type

1300A11  
1300A13  
6582A1  
6582A2  
7523A10  
1300A6

Measuring range 0 ... 250 bar	<b>A</b>
Measuring range 0 ... 200 bar	<b>B21</b>



\* refer to data sheet special tools and sensor dummies 1300\_000-068

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