

# Cylinder Pressure Sensor

## for Continuous Monitoring

Type 6613CA

Piezoelectric pressure sensor with 0 ... 5 V output signal for continuous pressure measurement of medium speed gas and diesel engines. Because of its low thermal shock and high stability over the long term, this sensor is suitable for demanding monitoring and control tasks.

- Robust design, with excellent long term stability
- Suitable for knock detection
- Very good thermodynamic behaviour

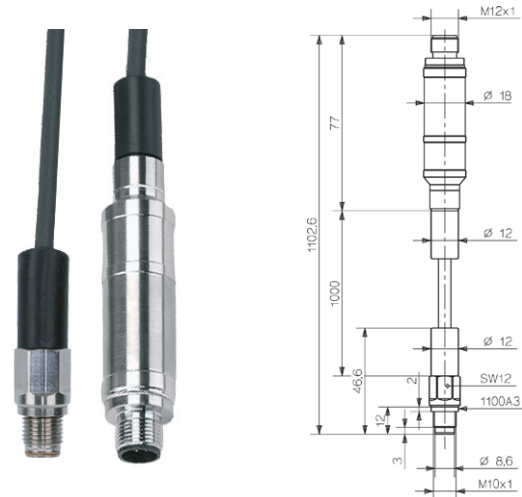
### Description

The quartz measuring element and the charge amplifier incorporated in the plug are interconnected by an integral cable. The charge amplifier has two measuring ranges and 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. The measuring range and/or time constants are selected by appropriate interconnection of the plug pins. As a result of its patented "antistrain" design, the measuring element is insensitive to integral mounting. The rugged diaphragm permits the sensor to be used for knock detection.

The sensor has been designed so that a life of several thousand operating hours can be achieved in a diesel and gas engines, but individual sensor life time is strongly depending on application.

### Application

Type 6613CA has been specially developed for the monitoring and control of medium speed engines. Cylinder pressure measurements can be made with high precision because of its very good thermodynamic characteristics.



### Technical Data

Measuring range		
Range I	bar	0 ... 250
Range II	bar	0 ... 100
Sensitivity		
Range I (±0,5 %)	mV/bar	10
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 ... 85
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
Time constant	s	≈10
Output voltage (with 1 mA load)		
max.	V	4,4 ... 5
min.	V	>0
Signal range	V	2,5
Zero point	V	2 ... 2,2
Supply voltage	VDC	7 ... 32
Output impedance	Ω	100
Plug DIN	M12x1	IP67
Weight	g	140
Tightening torque	N·m	15
Connector	8 pin	M12x1

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**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 pipe 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.

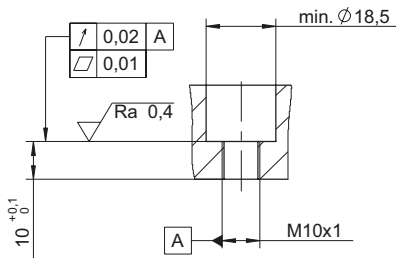


Fig. 1: Mounting bore (4-stroke application) for flush mounting

**Accessories Included**

- Cr-Ni seal

**Type**  
1100A3

**Optional Accessories**

- Torque wrench 8 ... 40 N·m\*
- Fork wrench SW 12 for 1300A11\*
- Adapter M14 x 1,25
- Tubular socket wrench

**Type**  
1300A11  
1300A13  
6582A1  
1300A6

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

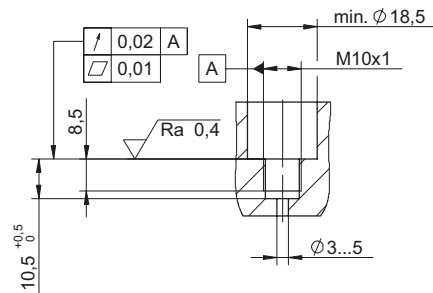


Fig. 2: Mounting bore (4-stroke application) for recessed mounting with additional gas channel. Admissible bore length depends on the application. Too long bore may interfere the quality of the measuring results



Fig. 3: Type 6613CA installed in indicator with additional stop valve for the sensor

**Connecting Cables**

Type 1700B69A10, 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	

**Ordering Code**

Cylinder pressure sensor for continuous monitoring **6613CA**

**Type**

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