

Data sheet

# OEM Pressure transmitters for cylinder pressure

## Type MBS 1800



Sensor for optimized service life for continuous pressure monitoring in diesel and gas engines. Due to its outstanding precision and long term stability of its quality, this sensor is suitable for demanding monitoring and control tasks.

The sensor contains numerous innovative details like the Double-Shell™ housing, the inboard preload element as well as the Patented 1) Leak Proof Design™.

These innovations make this sensor not only to the most precise but also the safest sensor available.

1) Patent list:

- 505015 (AT)
- 2 174 107 (EP)
- 12/452, 880 (US)

**Features**

Designed with optimized service life for continuous cylinder pressure monitoring in Diesel and Gas engines.

- Highest precision
- High service life
- Long term stable quality
- Double Shell™ housing
- Patented pre-stressed element
- FE optimised membrane (Nickel based alloy)
- Compact design for shoulder sealed installation
- Integrated charge amplifier with current or voltage output
- High quality charge amplifier with state of the art drift compensation circuit
- Optimized for service times as long as 20,000 hours

### Performance

Measuring range	250 bar
Overload range	300 bar
Sensitivity, 4 – 20 mA output ( $\pm 0.5\%$ )	50 $\mu\text{A}$ / bar
Sensitivity, 0.5 – 4.5 V output ( $\pm 0.5\%$ )	13 mV / bar
Non-linearity (best fit straight line)	$\leq \pm 0.5\%$ FS
Thermal sensitivity (span) shift (20 – 350 °C)	$\leq \pm 1.0\%$ FS
Cyclic drift at 1300 rpm, 18 bar IMEP, Diesel	$\leq \pm 0.8$ bar
Acceleration sensitivity	0.002 bar / g
Frequency range (-3 dB) (with cyclic drift compensation)	0.0001 Hz – 34 kHz
Sensor burst pressure	> 2000 bar
Durability (0 – 250 bar)	> 1000 $\times 10^6$ cycles or > 20000 hour

### Cyclic drift compensation

Engine type	Engine speed range
2-Stroke	40 – 3000 rpm
4-Stroke	80 – 6000 rpm

Active above 10 bar pressure differential.

### Electrical specifications

Nom. output signal (short-circuit protected)	4 – 20 mA	0.5 – 4.5 V
Supply voltage [ $U_b$ ]	Polarity protected	12 – 32 V
	Nominal	24 V
Supply – current consumption	$\leq 35$ mA	$\leq 15$ mA
Supply voltage dependency	$\leq \pm 0.05\%$ FS / 10 V	
Current limitation	20 mA $\pm 0.5$ mA	–
Output impedance	–	$\leq 85$ k $\Omega$
Load [ $R_L$ ] (load connected to 0V)	$R_L \leq (U_b - 12 \text{ V}) / 0.02 \text{ A}$	$R_L \geq 5$ k $\Omega$

### Environmental conditions

Media temperature range	Sensor front	-50 – 350 °C
	Electronic	-50 – 80 °C
Ambient temperature range		-50 – 80 °C
Storage temperature range		-50 – 110 °C
EMC – Emission		EN 61000-6-3
EMC – Immunity		EN 61000-6-2 (Signal ports)
Vibration stability	Sinusoidal	15.9 mm-pp, 5 Hz – 25 Hz
		20 g, 25 Hz – 2 kHz
Shock resistance	Shock (amplifier)	500 g / 1 ms
	Shock (sensor)	2000 g / 0.5 ms
Enclosure (depending on electrical connection)		IP67

Mechanical conditions

Mounting torque	<b>Thread size</b>	<b>Mounting torque</b>
	M10	15 – 20 Nm
	M14	20 – 25 Nm
	> M14	25 – 100 Nm
Electrical connector	M12 (8 pin) (see fig. 1)	
Mechanical connection	(see fig. 2 to fig. 5)	
Net weight	0.16 kg	
Materials	Wetted parts	Stainless steel

Ordering standard

**MBS 1800**

**Sensor version**  
 Integrated charge amplifier: 1  
 In line charge amplifier: 2

**Pressure range**  
 0 – 250 bar: 34

**Output signal**  
 4 – 20 mA: 1  
 0.5 – 4.5 V: A

**Electrical connection**  
 M12 (8 pin): P1

**Cable**  
 No cable (integrated): 00  
 3 Meter cable (In line): 03

**Mechanical connection**  
 M10 (In line only): LK 01  
 M14 (In line only): LK 02  
 Customer specific: LKXX

Electrical connection

Please refer to the table below for the pin allocation

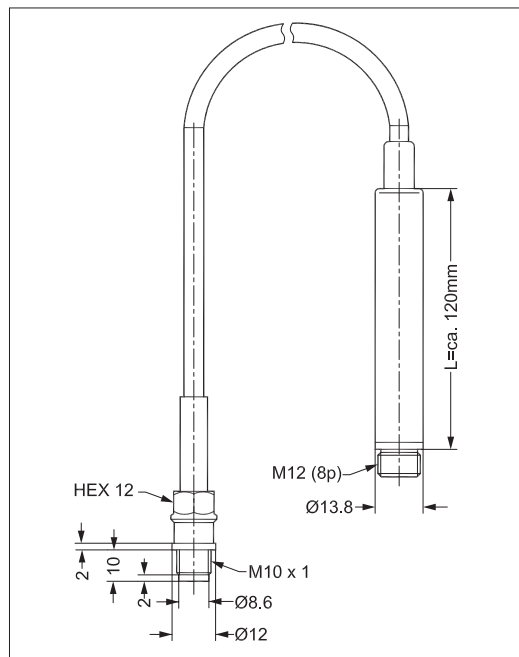
M12 (8 pin)	Pin	4 – 20 mA	0.5 – 4.5 V
	1	GND	GND
	2	–	–
	3	Output 4...18 mA	–
	4	(Com. Input)*	(Com. Input)*
	5	–	Output 0.5...4.5 V
	6	(Com. Output)*	(Com. Output)*
	7	(Drift Comp. Off)*	(Drift Comp. Off)*
	8	Supply 12...32 V	Supply 12...32 V

\* Used for production purposes

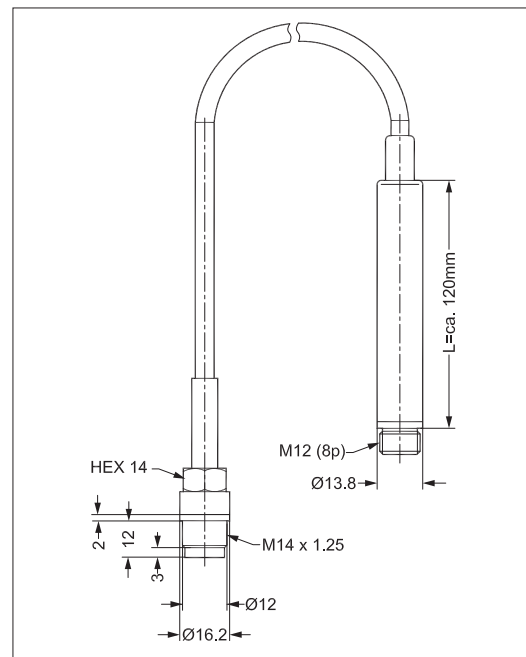
Shielded cables must be used, grounded at controller end.

Technical data

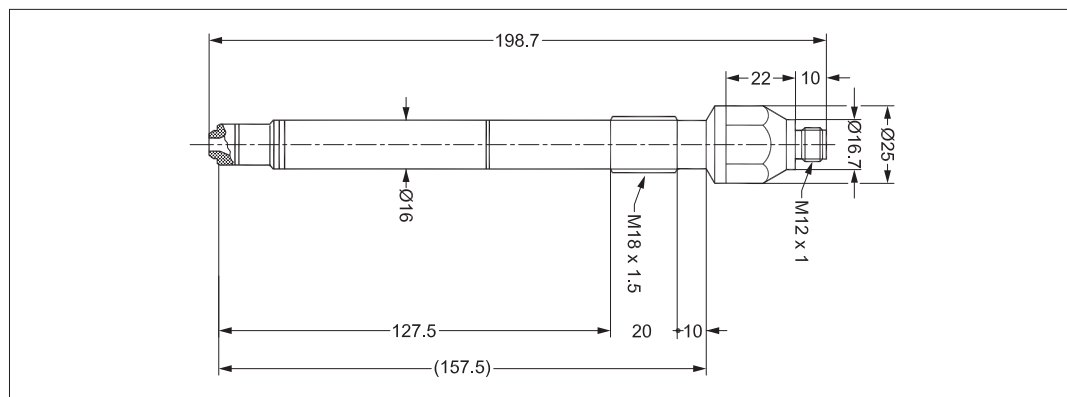
In line M10



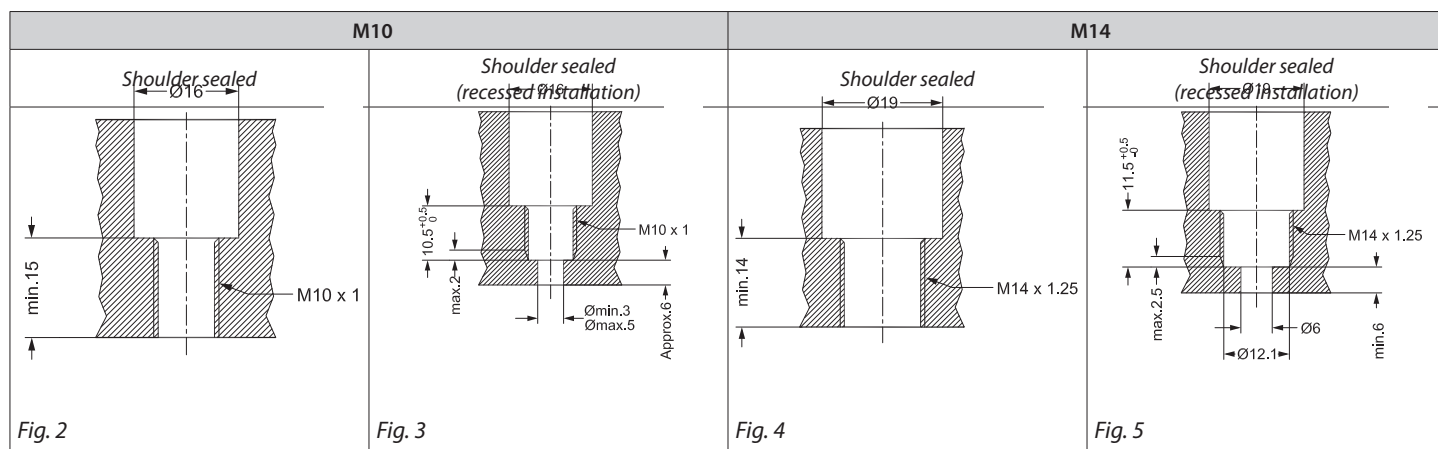
In line M14



Integrated version



Mounting of In-line sensor



The sensor is designed for shoulder sealed installation (fig. 4). If the sensor is installed in recessed position (fig. 5) the length of the indicating channel has to be chosen that short,

that pipe oscillations, which can reduce the service life of the sensor and the expressiveness of measurements, are avoided.

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