



# Pressure measurement technology from HBM Competence up to 15000 bar\*



**BlueLine**  
Ultra high-pressure transducer

up to 15000 bar\*

\* (218 kpsi)



# Pressure transducers, pressure transmitters ... ... reliable and robust –



## The experts for static and dynamic applications

Pressure measurement is a key application in many fields of industry. HBM pressure transducers and pressure transmitters ensure reliable and secure test results up to 15000 bar (218 kpsi). Here's why HBM is the obvious choice:

Accuracy

0.75 bar ... 0.1 bar  
(10.9 psi ... 1.5 psi)



P3 Top Class



P3 Top Class

BlueLine



P3IC/P3ICP Industrial Class



P3MBP

BlueLine

10 bar ... 3000 bar ... 5000 bar ... 15000 bar  
(145 psi ... 44 kpsi ... 73 kpsi ... 218 kpsi)

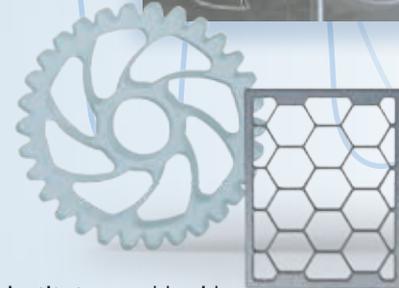
Pressure

- **Outstanding reliability:** HBM pressure transducers offer a rugged design based on monolithic (one-piece) steel measuring bodies as well as excellent overload protection and service life.
- **Highly ruggedized:** Even in extremely adverse ambient conditions – HBM pressure transducers are corrosion-resistant and offer IP67 protection.
- **Extremely dynamic:** Strain gage technology-based pressure transducers from HBM provide reliable and trustworthy results even in dynamic applications with a large number of load cycles – from the lowest pressures, all the way up to 15000 bar (218 kpsi).

# up to 15000 bar\*



Photo: Water-jet cutting at Döfler



\* (218 kpsi)

## P3TCP TOP Class:

Transducers from this series are held in high regard by national metrology institutes world-wide due to their excellent performance and accuracy. The BlueLine TOP Class pressure transducer has been confirmed for use as a transfer standard for comparison between Japan and Germany:

"The stability of the transfer standard (P3TCP/10000 bar<sup>1)</sup>) during the comparison period was evaluated from the pilot institute calibration results and it was shown that the transfer standard was sufficiently stable to meet the requirements of this supplementary comparison."

Quote from Kobata T., Sabuga W. et al, Metrologia, 2010, No. 47, Tech. Suppl., 07009

<sup>1)</sup> (145 kpsi)

## Applications

- Hydraulics
- Water-jet cutting
- Test bench engineering:
  - Functionality test rigs
  - Endurance test stands
- High-pressure sterilization
- Hydroforming

## Industries:

- Automotive
- Rail engineering
- Building
- Chemical industry
- Power engineering
- Plant engineering
- Mechanical engineering



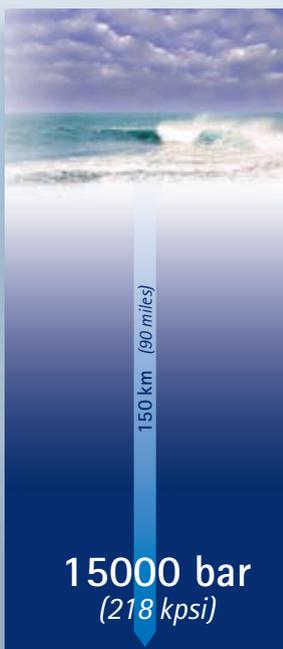
# HBM pressure measurement technology ... ... for reliable measurement results

## Robust, precise and reliable

HBM meets the challenges of new technologies and processes in industry applications, for example, in mechanical engineering and production engineering. Our pressure transducers combine properties that are typical for HBM, i.e. robustness, accuracy and reliability. This combination of excellent characteristics has also been specially implemented into transducers operating at the highest pressure ranges.

## Sophisticated design: the monolithic measuring body

The monolithic (one-piece) steel measuring body forms the nucleus of these foil strain gage-based pressure transducers. There are no potential weak spots offering contact with the medium, such as seam welds or clamp fixtures. The monolithic, enclosed pressure chamber makes the transducers the ideal solution for use in dynamic applications, at the same time offering maximum reliability and durability.



## Maximum performance - all the way up to ultra high-pressure applications

Our competence in the ultra-high pressure area benefits our entire range of pressure transducers. Our experience and know-how in this field has resulted in continuous enhancement of the design to obtain optimum measurement characteristics.





## Pressure calibration by HBM experts

### First German Calibration Service laboratory

HBM's laboratory was the first ever to be accredited by the German Calibration Service (DKD) in 1977. Our DKD pressure laboratory was accredited two years later. We offer you:

- An extensive range of calibration steps
- Outstanding accuracy (minimal uncertainty of measurement >0.008 %) through use of piston manometers.

### The German Calibration Service (DKD)

- Association of calibration laboratories in Germany offering certified quality
- Each laboratory is accredited by the German National Metrology Institute (PTB).

### Working standard calibration

- Responsibility for calibration is in the hands of the laboratory performing the calibration assignment
- Traceability has to be explicitly documented: At HBM this is accomplished according to the DIN ISO 10012-1 standard
- On request, working standard calibrations can be performed by your local HBM service team.

### Pressure

Measurement range bar (psi, kpsi) <i>(kpsi = kilopounds of force per square inch. 1 kpsi = 1000 psi)</i>	External*		DKD calibration		Working standard calibration		
	Gage pressure		Gage pressure	Possible steps	Abs. pressure	Gage pressure	Possible steps
0.05 bar (0.7 psi)					•	•	■ □
0.1 bar (1.5 psi)					•	•	■ ■
0.2 bar (2.9 psi)					•	•	■ ■
0.25 bar (3.6 psi)					•	•	■ ■
0.5 bar (7.3 psi)					•	•	■ ■
1 bar (14.5 psi)			•	■	•	•	■ ■
2 bar (29 psi)			•	■	•	•	■ ■
5 bar (73 psi)			•	■	•	•	■ ■
7 bar (102 psi)			•	■	•	•	■ ■
10 bar (145 psi)	•	■			•	•	■ ■
20 bar (290 psi)			•	■	•	•	■ ■
50 bar (725 psi)			•	■	•	•	■ ■
100 bar (1.5 kpsi)			•	■	•	•	■ ■
200 bar (2.9 kpsi)			•	■	•	•	■ ■
500 bar (7.3 kpsi)			•	■	•	•	■ ■
1000 bar (15 kpsi)			•	■	•	•	■ ■
2000 bar (29 kpsi)			•	■	•	•	■ ■
3000 bar (44 kpsi)			•	■	•	•	■ ■
3600 bar (52 kpsi)			•	■	•	•	■ ■
5000 bar (73 kpsi)	•	■			•	•	■ ■
10000 bar (145 kpsi)	•	■					
15000 bar (218 kpsi)	•	■					
			Minimum uncertainty >0.008 %				

■ Standard offer      A 2+2      Increasing/decreasing series; test procedure acc. to DKD-R 6-1  
 Not available      B 1+1      Increasing/decreasing series

\* Performed by an accredited laboratory; possible steps and number of measurement series on request



# Pressure transducers, pressure transmitters ... ... perfectly matched to your

				
Pressure transducer	P3IC	P3ICP	P3TCP	P3TCP Blue Line
Class	Industrial Class		Top Class	
Pressure type	Absolute pressure	Absolute pressure	Absolute pressure	Absolute pressure
Nominal (rated) pressure (minimum and maximum)	<p>10 bar (145 psi)</p> <p>3000 bar (44 kpsi)</p>	<p>10 bar (145 psi)</p> <p>3000 bar (44 kpsi)</p>	<p>10 bar (145 psi)</p> <p>3000 bar (44 kpsi)</p>	<p>5000 bar (73 kpsi)</p> <p>15000 bar (218 kpsi)</p>
Accuracy class	0.1 ... 0.2	0.1 ... 0.2	0.1 ... 0.2	0.25 ... 0.6
Nominal (rated) temperature range	-10°C ... +80°C (+14°F ... +176°F)	-10°C ... +80°C (+14°F ... +176°F)	-10°C ... +80°C (+14°F ... +176°F)	-10°C ... +80°C (+14°F ... +176°F)
Operating temperature range	-40°C ... +120°C (-40°F ... +248°F)	-40°C ... +120°C (-40°F ... +248°F)	-40°C ... +100°C (-40°F ... +212°F)	-40°C ... +100°C (-40°F ... +212°F)
Degree of protection per EN60529	IP67	IP67	IP67	IP67
Measuring system	Strain gage	Strain gage	Strain gage	Strain gage
Electrical connection	Cable	Plug	Plug	Plug
Special characteristics	<ul style="list-style-type: none"> <li>· TEDS</li> <li>· PT100 (2-wire)</li> <li>· Robust</li> <li>· High accuracy</li> <li>· Monolithic measuring body</li> </ul>	<ul style="list-style-type: none"> <li>· TEDS</li> <li>· PT100 (2-wire)</li> <li>· Robust</li> <li>· High accuracy</li> <li>· Monolithic measuring body</li> </ul>	<ul style="list-style-type: none"> <li>· TEDS</li> <li>· PT100 (4-wire)</li> <li>· Robust</li> <li>· Very high accuracy</li> <li>· Monolithic measuring body</li> <li>· Comprehensive test report</li> <li>· Excellent temperature behavior</li> </ul>	<ul style="list-style-type: none"> <li>· TEDS</li> <li>· PT100 (4-wire)</li> <li>· Robust</li> <li>· High number of load cycles</li> <li>· Monolithic measuring body</li> <li>· Comprehensive test report</li> <li>· Excellent temperature behavior</li> </ul>

# application

BlueLine



P3MBP Blue Line	P3MBP	P3MB	P2V	P15	P8AP
Absolute pressure	Absolute pressure	Absolute pressure	Absolute pressure	Absolute pressure	Absolute pressure
5000 bar (73 kpsi) 15000 bar (218 kpsi)	10 bar (145 psi) 3000 bar (44 kpsi)	10 bar (145 psi) 3000 bar (44 kpsi)	100 bar (1.5 kpsi) 7000 bar (102 kpsi)	10 bar (145 psi) 500 bar (7.3 kpsi)	10 bar (145 psi) 500 bar (7.3 kpsi)
0.3 ... 0.75	0.1 ... 0.2	0.1 ... 0.2	0.2 ... 0.3	1.0	0.3
-10°C ... +80°C (+14°F ... +176°F)	-10°C ... +80°C (+14°F ... +176°F)	-10°C ... +80°C (+14°F ... +176°F)	0°C ... +70°C (+32°F ... +158°F)	-20°C ... +70°C (-4°F ... +158°F)	-10°C ... +70°C (+14°F ... +158°F)
-40°C ... +100°C (-40°F ... +212°F)	-40°C ... +100°C (-40°F ... +212°F)	-40°C ... +100°C (-40°F ... +212°F)	-20°C ... +85°C (-4°F ... +185°F)	-25°C ... +70°C (-13°F ... +158°F)	-40°C ... +80°C (-40°F ... +176°F) optional: +140°C (+284°F)
IP67	IP67	IP67	IP67	IP65	IP67
Strain gage	Strain gage	Strain gage	Strain gage	Strain gage	Strain gage
Cable	Plug	Cable	Plug	Plug	Cable
<ul style="list-style-type: none"> <li>· Robust</li> <li>· High number of load cycles</li> <li>· Monolithic measuring body</li> </ul>	<ul style="list-style-type: none"> <li>· Robust</li> <li>· High accuracy</li> <li>· Monolithic measuring body</li> </ul>	<ul style="list-style-type: none"> <li>· Robust</li> <li>· High accuracy</li> <li>· Monolithic measuring body</li> </ul>	<ul style="list-style-type: none"> <li>· TEDS</li> <li>· Monolithic measuring body</li> <li>· 0.5 ... 10 V, 4 ... 20 mA analog output</li> </ul>	<ul style="list-style-type: none"> <li>· 0 ... 10 V, 4 ... 20 mA analog output</li> </ul>	<ul style="list-style-type: none"> <li>· Compact and small size</li> <li>· Vibration-proof</li> <li>· Pressure peak damping (optional)</li> </ul>



## Complete measurement chain

HBM offers you the complete measurement chain – from a single source – thus enabling you to select a specific measurement solution with the full assurance that your transducers, instrumentation and software are fully balanced and matched.

## Signal conditioning

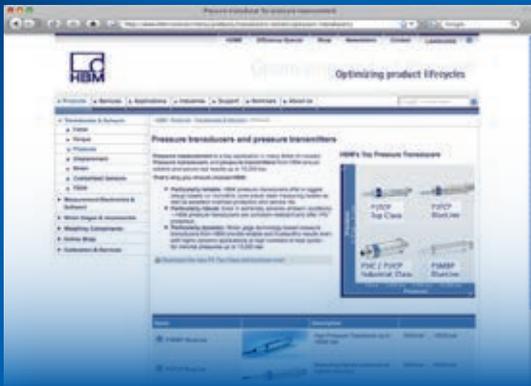
You can select from a wide range of analog and digital amplifiers – even for the most demanding test and measurement tasks.

## catman® analysis software

You can connect our measuring amplifiers to any PC to rapidly acquire data, and process and display your results. Using our user-friendly catman® measurement software, you can quickly and easily gain a full understanding of your measurement data. You can rely on complete solutions... made by HBM.

Find out more at:

[www.hbm.com/pressure](http://www.hbm.com/pressure)



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