



**P3 Top Class**



**P3MB version with fixed cable**



**P3MBP version with plug connection**



TEDS: Transducer Electronic Data Sheet

# P3

**Absolute pressure transducer**

**Nominal (rated) pressure 10 bar to 3000 bar**

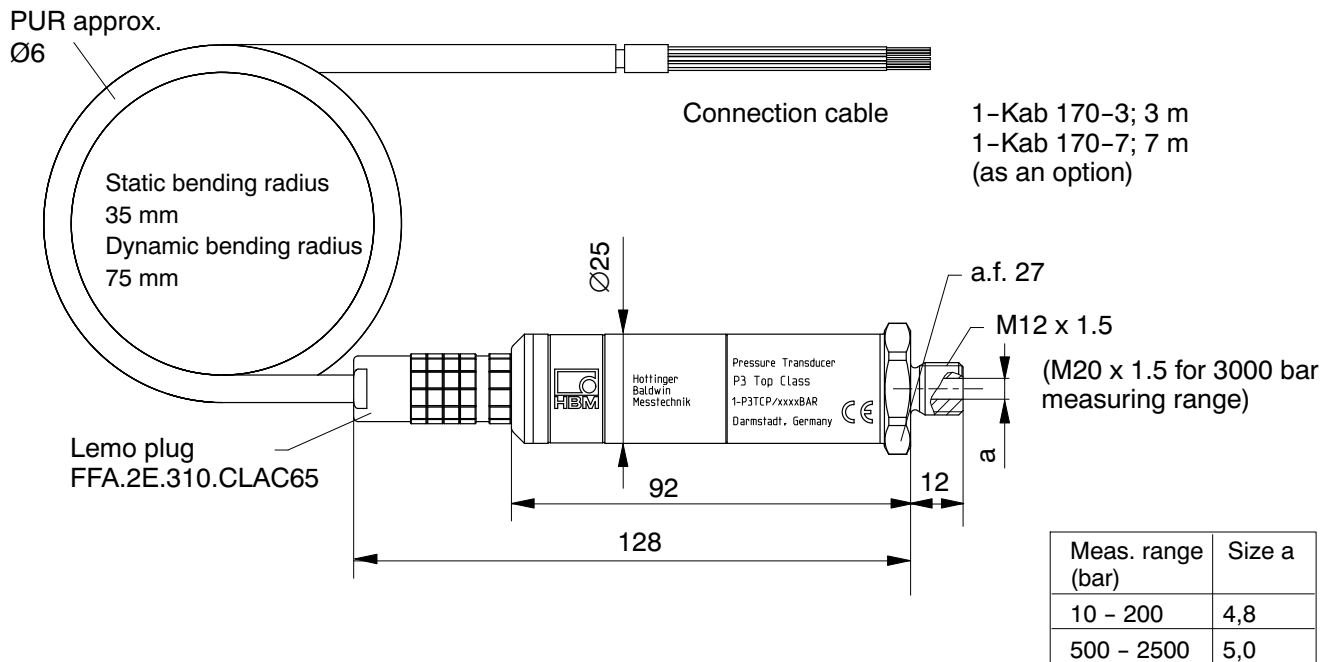
## Special features

- For static and dynamic pressure variance, pressure peaks and pressure fluctuations
- Principle of measurement: foil strain gage
- OPTION: Explosion protection per ATEX

## Top Class

- Better temperature response
- Individually documented values
- Improved accuracy class
- Closer sensitivity tolerance (suitable for parallel connection, for differential pressure measurement, for example)
- PT100 for temperature compensation in four-wire circuit

Dimensions (in mm; 1 mm = 0.03937 inches) for P3 Top Class




# Specifications for P3, P3MB and P3MBP per DIN 16086

Type		P3, P3MB, P3MBP								
<b>Mechanical input quantities</b>										
<b>Pressure type</b>		absolute pressure								
<b>Principle of measurement</b>		foil strain gage								
<b>Measuring range, 0 bar...</b>	bar	10	20	50	100	200	500	1000	2000	3000
<b>Accuracy class<sup>1)</sup></b>		0.2	0.15	0.2	0.15		0.1		0.2	
<b>Output characteristics</b>										
<b>Nominal (rated) sensitivity</b>	mV/V	2								1.5
<b>Sensitivity tolerance</b>	%	0.25	0.2			0.15				
<b>Effect of temperature on zero signal</b> in the nominal (rated) excitation voltage range per 10 K, rel. to nominal (rated) sensitivity										
in the nominal (rated) temperature range		± 0.1								
in the operating temperature range		± 0.15								
<b>Effect of temperature on sensitivity</b> in the nominal (rated) excitation voltage range per 10 K, rel. to actual value										
in the nominal (rated) temperature range		± 0.1								
in the operating temperature range		± 0.2								
<b>Characteristic curve deviation</b> (setting of initial point)	%	± 0.20	± 0.15	± 0.2	± 0.15		± 0.10		± 0.2	
<b>Repeatability</b> per DIN 1319	%	± 0.05								

<sup>1)</sup> Accuracy class is not a DIN 16086 concept. The figure conforms to the maximum single deviation; that is the characteristic curve deviation (setting of initial point) and deviations as a result of temperature, related to a difference of 10 K.

### Test report P3MB, P3MBP



#### Prüfprotokoll

test certificate / protocole d'essai

Typ: P3	Auftrag: 801103344	
Typ / type	order no / commande	
Nennmessbereich: 500 bar	Prüfer: Goebel	
range / portée	examinateur / contrôleur	
Ident-Nr: 121910237	Datum: 2010-09-30	
serial no / n°-client	test date / date d'essai	

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**Prüfergebnisse:**  
test results / résultats d'essai

Eingangsgröße des Messbereichs [%]	Ausgangsgröße [mV/V]
input quantity / portée d'essai	output quantity / résultat
0	0.0000
50	0.9992
100	1.9980
50	1.0001
0	0.0001

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**Aus den Prüfergebnissen berechnete und sonstige messtechnische Eigenschaften:**  
messtechnical characteristics calculated from the measured test results and other

Kennwert C [mV/V]	1.9980
combined error / erreur combinée	
Kennlinienabweichung, Anfangspunkteinstellung [%vC]	0.036
relative hysteresis / hystérésis relatif	
Relative Umkehrspanne [%vC]	0.045

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**Allgemeine Zusatzinformationen:**  
general information / informations complémentaires

Alle weiteren messtechnischen Eigenschaften des Auftrags sind durch Typprüfungen und laufende Produktkontrollen des Qualitätsmanagements abgesichert.  
Tous les autres caractéristiques techniques du capteur sont garanties par le service Qualité, au moyen d'essais et de audits réalisés sur le produit.

Zertifiziert nach ISO 9001 und ISO 14001 (DQS-00001)      Akkreditiertes DKD Kalibrierlaboratorium und EMV-Prüflaboratorium  
ISO 9001 and ISO 14001 certified / Certifié selon ISO 9001 et ISO 14001      Laboratoire accrédité par le DKD en mécanique d'essai CE38  
D-K-00101; D-PL-12029-01

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Information on the linearity of the individual transducer

Information on the sensitivity, characteristic curve deviation and rel. reversibility error of the individual transducer.

# Specifications P3 Top Class per DIN 16086

Type	P3 Top Class										
<b>Mechanical input quantities</b>											
Pressure type	absolute pressure										
Principle of measurement	foil strain gage										
Measuring range, 0 bar...	bar	10	20	50	100	200	500	1000	2000 2500	3000	
Accuracy class <sup>1)</sup>		0.2	0.15	0.15	0.13				0.1		
<b>Output characteristics</b>											
Nominal (rated) sensitivity	mV/V	2 ± 0.15%								1.5 ± 0.15%	
Sensitivity tolerance	%	0.2	0.15				0.10				
Zero signal tolerance	%	± 0.1									
Creep upon unloading 15 min.	%	0.2	0.15			0.05	0.03				
Effect of temperature on zero signal in the nominal (rated) excitation voltage range per 10 K, rel. to nominal (rated) sensitivity	in the nominal (rated) temperature range	± 0.05									
	in the operating temperature range	± 0.10									
Effect of temperature on sensitivity in the nominal (rated) excitation voltage range per 10 K, rel. to actual value	in the nominal (rated) temperature range over 0 °C	± 0.05									
	in the nominal (rated) temperature range below 0 °C	± 0.1									
	in the operating temperature range	± 0.2									
Characteristic curve deviation (setting of initial point)	%	0.20	0.15	0.15	0.13	0.10	0.10	0.10	0.10	0.10	
Rel. interpolation error (max. deviation) of a cubic interpolation function over the test series	%	0.10	0.08				0.05				
Long-term stability of zero signal and span (data per year)	%	0.4					0.20				
Repeatability per DIN 1319	%	± 0.05									

<sup>1)</sup> Accuracy class is not a DIN 16086 concept. The figure conforms to the maximum single deviation; that is the characteristic curve deviation (setting of initial point) and deviations as a result of temperature, related to a difference of 10 K.

## Extended test report

Page 1

### Test report P3 Top Class

Page 2

Information on the linearity of the individual transducer

Information on the sensitivity, characteristic curve deviation and rel. reversibility error of the individual transducer.

Information on the max. interpolation error as a % and the coefficient of the cubic compensation function in the form  $X = R \cdot Y^3 + S \cdot Y^2 + T \cdot Y$  of the individual transducer

Information on the temperature dependency of the individual transducer

Information on the temperature coefficient of the zero signal and on the temperature coefficient of the output span of the individual transducer.

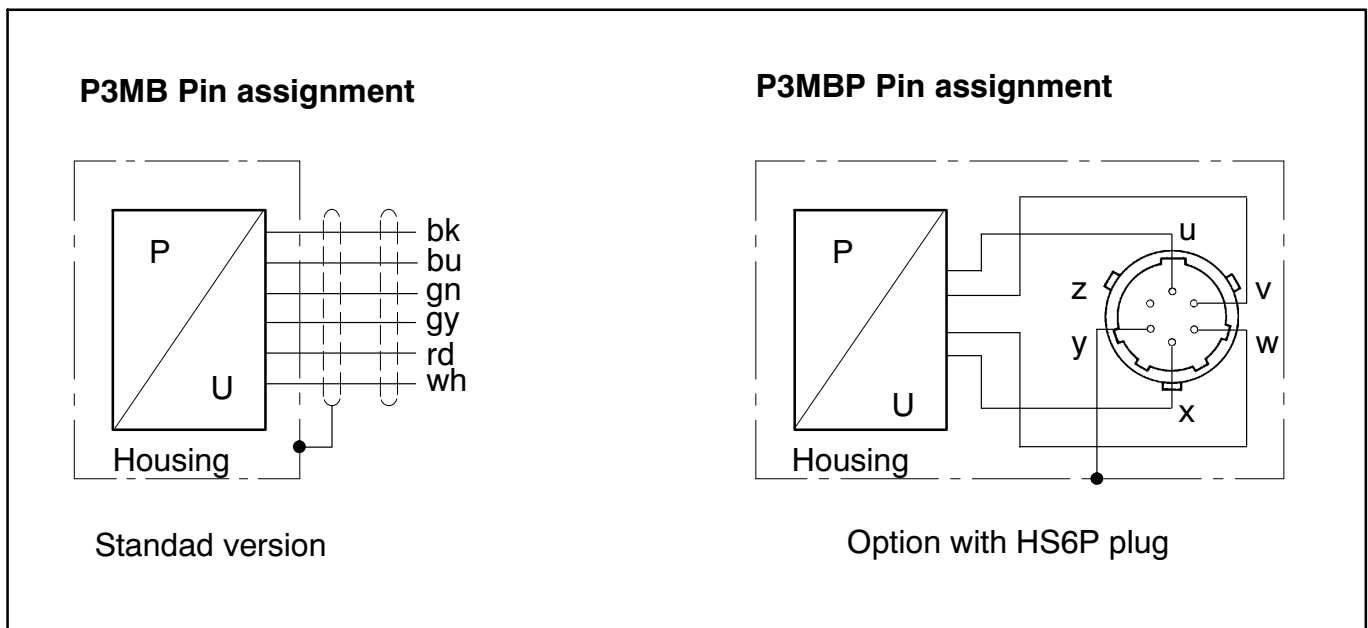
## The following data applies to P3 and P3 Top Class

Mechanical input quantities											
Measuring range, 0 bar...	bar	10	20	50	100	200	500	1000	2000 2500	3000	
Initial value	bar	0									
Operating range at reference temperature	%	0...200					0...150				
Overload limit at reference temperature	%	250					200				
Test pressure	%	250					200			150	
Dynamic loading											
Permissible pressure	%	100									
Permissible oscillation width to achieve a typical 10,000,000 DIN 50100 load cycles	%	70									
Dead volume	mm <sup>3</sup>	2500			2000			800		900	
Control volume	mm <sup>3</sup>	9	7				1.5				
Output characteristics											
Fundamental resonance frequency	kHz	13	15	26	38	67	100				
Input resistance at reference temperature	Ω	350 ± 5									
Output resistance at reference temperature	Ω	350 ± 1.5									
Insulation resistance	MΩ	5000									
Electrical strength	V	90									
Excitation voltage											
Reference excitation voltage	V	5									
Nominal (rated) excitation voltage	V	0.5 ... 7.5									
Operating range	V	0.5 ... 12									
Ambient conditions											
Permissible voltage between measuring circuit and transducer ground at reference temperature	V	50									
Materials for parts which come into contact with the environment		1.4301; 1.4541; 1.4542; 1.6354 PU / chrome-plated and nickel-plated brass									
Reference temperature	°C	23									
Nominal (rated) temperature range	°C	-10...+80									
Limiting temperature range	°C	-40...+100									
Storage temperature range	°C	-40...+100									
Impact resistance (tested to DIN 40046)											
Impact acceleration	m/s <sup>2</sup>	1000									
Impact duration	ms	4									
Impact form	-	Half sine wave									
Acceleration sensitivity per 10 m/s <sup>2</sup> for exciting frequencies of 20% of the natural frequency	%	< ± 0.001									
Mechanical specifications											
Pressure connection		M12 x 1.5							M20 x 1.5		
Electrical connection		Lemo connector ERA.2E.310.SSL or a fixed 3 m cable or an HS6P device plug									
Bending radius of the connection cable, min.											
static	mm	35									
dynamic	mm	75									
Mounting position		any									
Weight without cable approx.	g	approx. 200									
Degree of protection (per DIN 40050, IEC 529)		IP67									

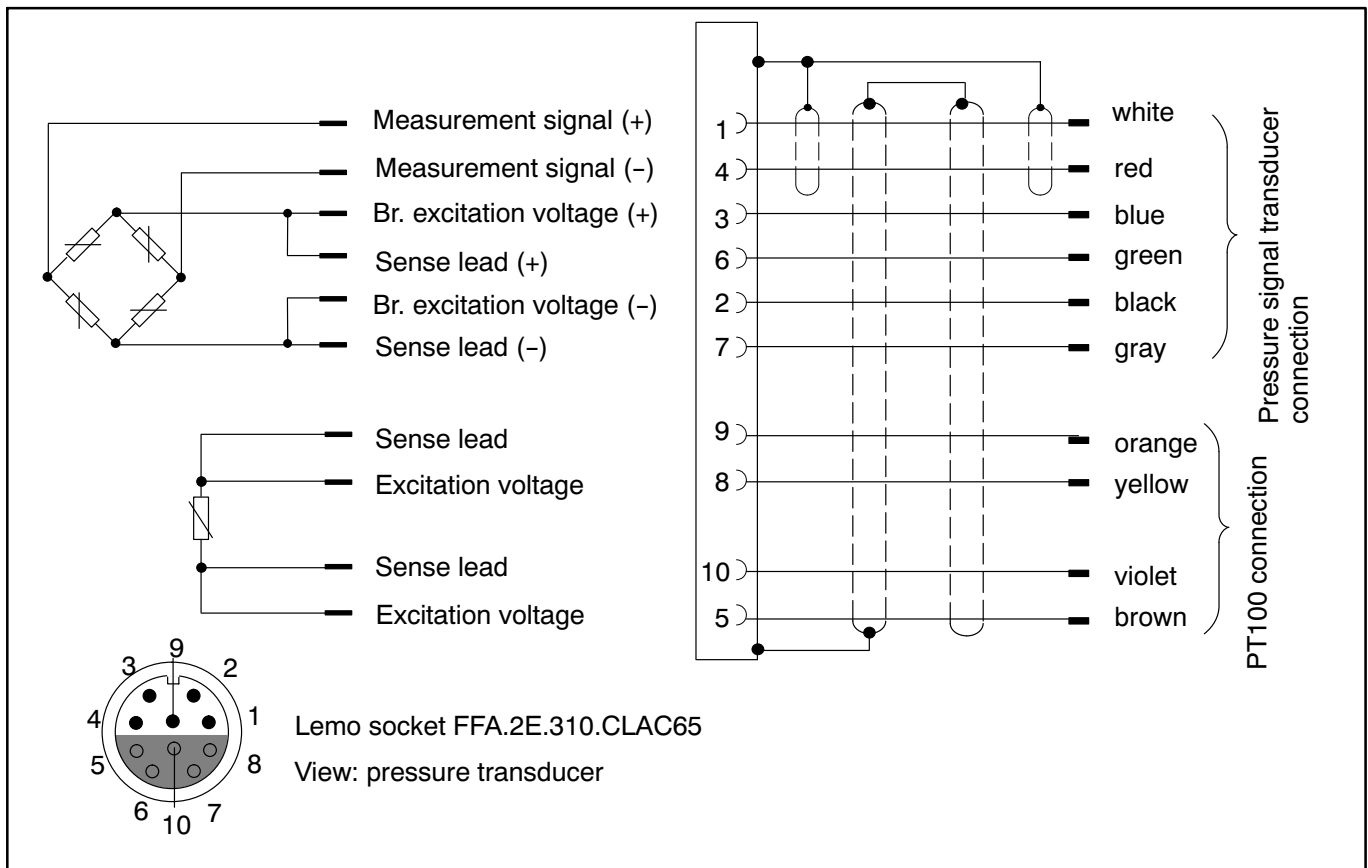
**Economical, standard versions available from stock:**

Measuring range, 0 bar to ...	Product number		
	P3 Top Class Lemo FFA 2E.310	P3MB cable connection 3 m cable, free ends	P3MBP with HS6P plug connection
10 bar	1-P3TCP/10BAR	1-P3MB/10BAR	1-P3MBP/10BAR
20 bar	1-P3TCP/20BAR	1-P3MB/20BAR	1-P3MBP/20BAR
50 bar	1-P3TCP/50BAR	1-P3MB/50BAR	1-P3MBP/50BAR
100 bar	1-P3TCP/100BAR	1-P3MB/100BAR	1-P3MBP/100BAR
200 bar	1-P3TCP/200BAR	1-P3MB/200BAR	1-P3MBP/200BAR
500 bar	1-P3TCP/500BAR	1-P3MB/500BAR	1-P3MBP/500BAR
1 000 bar	1-P3TCP/1000BAR	1-P3MB/1000BAR	1-P3MBP/1000BAR
2 000 bar	1-P3TCP/2000BAR	1-P3MB/2000BAR	1-P3MBP/2000BAR
2 500 bar	1-P3TCP/2500BAR	-	-
3 000 bar	1-P3TCP/3000BAR	1-P3MB/3000BAR	1-P3MBP/3000BAR

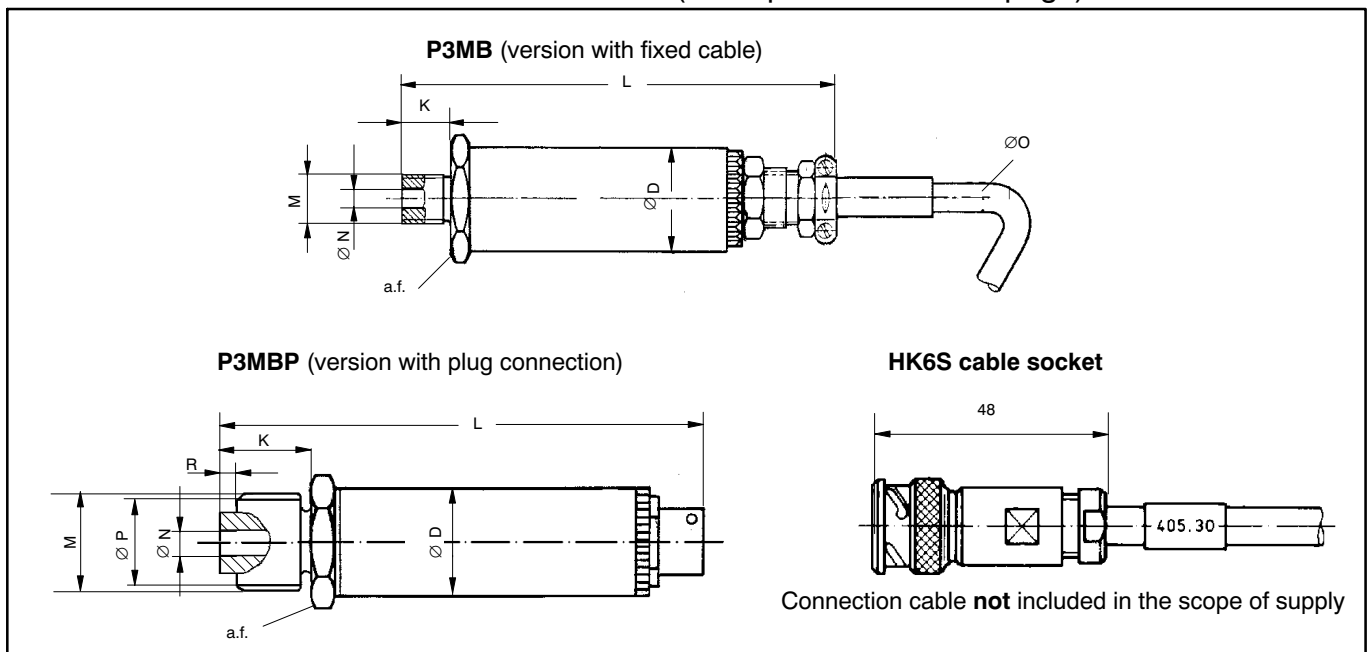
**Pin assignment P3MB and P3MBP**



## Pin assignment P3 Top Class



## Dimensions for P3MB and P3MBP versions (P3 Top Class see first page) :



P3MB		D	K	L	M	N	O	P	a.f.	R
with cable connection	10 bar...2000 bar	25	12	112	M12 x 1.5	5	6.5	-	27	-
	3000 bar	25	20	129	M20 x 1.5	5	6.5	17.5	27	3
with plug connection	10 bar...2000 bar	25	12	97	M12 x 1.5	5	-	-	27	-
	3000 bar	25	20	105	M20 x 1.5	5	-	17.5	27	3

**Accessories:**

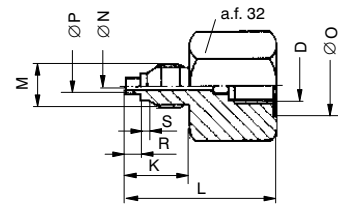
**Included in scope of supply:**

1 USIT ring U12.7 x 20 x 1.5 for P3MB.../ 10 bar to 500 bar  
 1 double-cone seal, 1.4305, for P3MB .... / 500 bar ... 3000 bar;  
 Bag with 2 x conical seals made of material 1.4305

**To be ordered separately:**

Connecting branches  
 for measuring ranges to 500 bar  
 Material: stainless steel 1.4305

Type	D	K	L	M	N	O	P	R	S
P3M/500/M20	M12 x1.5	25	50	M20 x 1.5	4	20.2	5	5	3
P3M/500/R1/2	M12 x 1.5	20	50	G1/2	4	20.2	5	5	3



All dimensions in mm

Connection cable P3TCP 1-Kab170-3 or 1-Kab170-7; Connection cable 1-KAB405.30A-3 (for variants with HS6P plug, to be ordered separately); Connection cables 1-Kab170-3 or 1-Kab170-7 must be ordered separately.

HK6S cable socket, Order no. 3-3312.0095

Cable plug for Greenline Order no. 1-MS3106PEMV

15-pin D-Sub plug, Order no. 2-9278.0321

**Seal accessories:**

10 to 200 bar	3-4218.0002	U seal/USIT ring U12.7 x 20 x 1.5, max. 500 bar
500 bar	3-4218.0002	U seal/USIT ring U12.7 x 20 x 1.5, max. 500 bar
	2-9278.0376	bag, conical seal P3MB/500-3000 bar
1000 to 3000 bar	2-9278.0376	bag, conical seal P3MB/500-3000 bar

## Options for K-P3-:

Code	Option 1: Design
MB	P3MB "Classic" (connection cable, 3 m); not with option 3 = P/C
MBP	P3MB "Classic" (connection cable, 3 m); only with option 3 = P/C

Code	Option 2: Measuring range
010B	10 bar
020B	20 bar
050B	50 bar
100B	100 bar
200B	200 bar
500B	500 bar
01KB	1000 bar
02KB	2000 bar
03KB	3000 bar

Code	Option 3: Electrical connection
K	Connection cable, 3 m, free ends (only with option 1 = MB)
Y	Connection cable, 20 m, free ends (only with option 1 = MB)
M	Connection cable, 3 m, MS plug (only with option 1 = MB)
N	Connection cable, 20 m, MS plug (only with option 1 = MB)
D	Connection cable, 3 m, D15 plug (only with option 1 = MB)
F	Connection cable, 20 m, D15 plug (only with option 1 = MB)
P	Plug HS6P, welded (only with option 1 = MBP)
A	ATEX II 2 G EEx ib IIC T4, connection cable, 3 m, free ends (only with option 1 = MB)
B	ATEX II 2 G EEx ib IIC T4, connection cable, 3 m, free ends (only with option 1 = MB)
C	ATEX II 2 G EEx ib IIC T4, plug HS6P, welded (only with option 1 = MBP)

Order no.: K-P3MB  -     -

Example order no.:

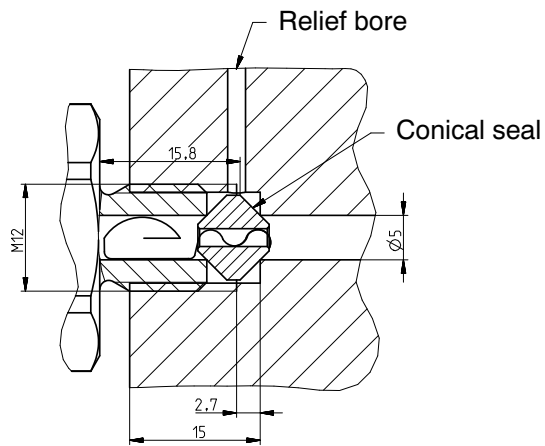
K-P3MB  P -  0  1  0  B -  A



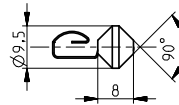
# Pressure transducer mounting

P3 10 bar to 500 bar: USIT ring U12.7 x 20 x 1.5 (not shown)

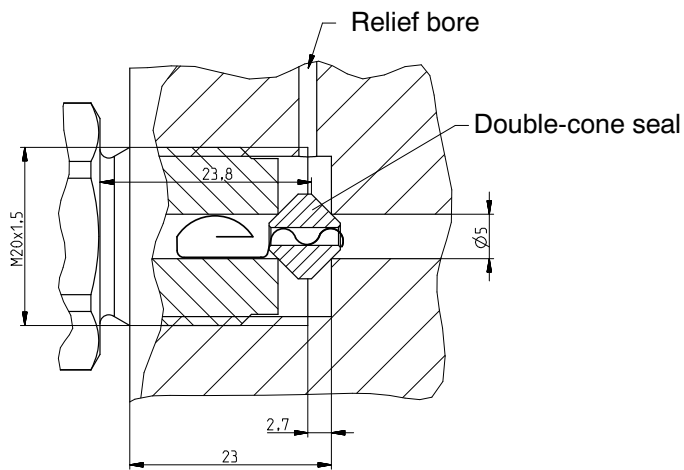
P3 500–2500 bar



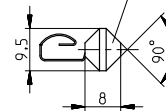
Conical seal  
500–3000 bar



P3 3000 bar



Double-cone seal  
with retaining spring



Änderungen vorbehalten.

Alle Angaben beschreiben unsere Produkte in allgemeiner Form. Sie stellen keine Beschaffenheits- oder Haltbarkeitsgarantie im Sinne des §443 BGB dar und begründen keine Haftung.

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