



P3 Top Class

P3

Absolute pressure transducer
Nominal (rated) pressure
10 bar to 3,000 bar

Special features

- For static and dynamic pressure variance, pressure peaks and pressure fluctuations
- Principle of measurement: foil strain gage



P3MB version with fixed cable

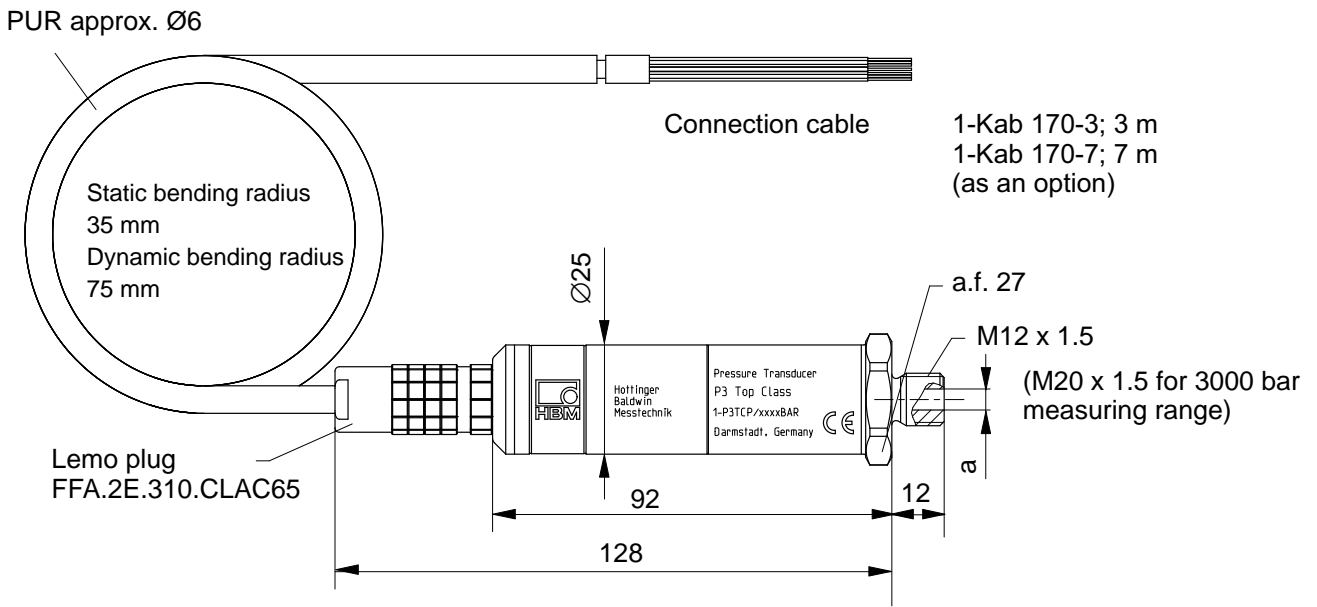
Top Class

- 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
- Electronic data sheet (TEDS) is integrated



P3MBP version with plug connection

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




Meas. range (bar)	Size a
10 – 200	4,8
500 – 2500	5,0

Specifications for P3, P3MB and P3MBP per DIN 16086

Type		P3, P3MB, P3MBP								
Mechanical input quantities										
Pressure type		absolute pressure								
Principle of measurement		foil strain gage								
Measuring range, 0 bar...	bar	10	20	50	100	200	500	1000	2000	3000
Accuracy class¹⁾		0.2	0.15	0.2	0.15	0.1		0.2		
Output characteristics										
Nominal (rated) sensitivity		mV/V	2						1.5	
Sensitivity tolerance		%	0.25	0.2		0.15				
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		%	± 0.1							
in the operating temperature range		%	± 0.15							
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		%	± 0.1							
in the operating temperature range		%	± 0.2							
Characteristic curve deviation (setting of initial point)		%	± 0.20	± 0.15	± 0.2	± 0.15	± 0.10		± 0.2	
Repeatability per DIN 1319		%	± 0.05							

¹⁾ 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 / gamme	measured / contrôleur	
Ident.Nr.: 121910237	Datum: 2010-09-30	
serial no / N°-ident	test date / date d'essai	

Prüfergebnisse:
test results / résultats d'essai

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

Aus den Prüfergebnissen berechnete und sonstige messtechnische Eigenschaften:
metrological characteristics calculated from the measuring results and other metrological characteristics calculated in part from the results of the test

Kennwert C [mV/V] sensitivity / sensibilité	1.9980
Kennlinienabweichung, Anfangspunkteinstellung [%vC] nonlinearity / non-linéarité	0.036
Relative Umkehrspanne [%vC] reversibility / réversibilité	0.045

Allgemeine Zusatzinformationen:
general information / informations complémentaires

Alle weiteren messtechnischen Eigenschaften des Auftrags sind durch Typprüfungen und laufende Produktkontrollen des Qualitätssystems abgesichert.
Ces autres caractéristiques techniques de l'essai 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-9001) / ISO 9001 and ISO 14001 certified / Certifié selon ISO 9001 et ISO 14001

Akreditiertes DKG Kalibrierlaboratorium und EMV-Prüflaboratorium
Accrédité DKG calibration laboratory and EMC testing laboratory
Laboratoire accrédité par le DKG en métrologie d'essai DKG
DKG-K-00191; D-PL-12029-01

Hüttlinger Balteilm Messtechnik GmbH Im Tiefen See 48 D-64293 Darmstadt 233 00 10439
Kontakt: Telefon 0615 2011-3 Fax 0615 2011-10439
E-Mail: info@hbm.com

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
Mechanical input quantities	
Pressure type	absolute pressure
Principle of measurement	foil strain gage

Measuring range, 0 bar...	bar	10	20	50	100	200	500	750	1000	2000 2500	3000
Accuracy class ¹⁾		0.2	0.15	0.15	0.13				0.1		
Output characteristics											
Nominal (rated) sensitivity	mV/V	2 ± 0.15%									1.5 ± 0.15%
Sensitivity tolerance	%	0.2	0.15			0.10					
Zero signal tolerance	%	± 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	%	± 0.05									
in the nominal (rated) temperature range	%	± 0.10									
in the operating temperature range	%										
Effect of temperature on sensitivity in the nominal (rated) excitation voltage range per 10 K, rel. to actual value	%	± 0.05									
in the nominal (rated) temperature range over 0 °C	%	± 0.1									
in the nominal (rated) temperature range below 0 °C	%	± 0.2									
in the operating temperature range	%										
Characteristic curve deviation (setting of initial point)	%	0.20	0.15	0.15	0.13	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									

1) 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

Hottinger Baldwin Messtechnik GmbH
in Tatten See 45
D-64293 Darmstadt
Zertifiziert nach ISO 9001 und ISO 14001
1001001 und ISO 14001 zertifiziert / Certification selon ISO 9001 et ISO 14001
Autocertification selon ISO 9001 / Autocertification selon ISO 14001

Prüfprotokoll Top Class

Typ: P3-TC Auftrag: 801106428
Messbereich in bar: 2500 Prüfer: Rucker
Identif.: 121410243 Datum: 23.07.2008

Nennwert, Ausgangsspanne in mV/V
Nominal sensitivity, output span in mV/V

Prüfergebnisse:
Ausgangsspanne in mV/V
Output span in mV/V

Eingangsspanne in bar Input span in bar	Ausgangsspanne in mV/V Output span in mV/V	
	steigende Last rising load	fallende Last falling load
0	0.0000	-0.0001
500	0.4003	0.4003
1000	0.8003	0.8007
1250	1.0002	1.0007
1500	1.2002	1.2006
2000	1.5999	1.6001
2500	1.9992	1.9992

Aus den Prüfergebnissen berechnete messtechnische Kenngrößen:
Messtechnische Kenngrößen berechnet aus den Prüfergebnissen:
Coefficients calculated from the test results:
Coefficients calculés à partir des résultats d'essai:

Kennwert, Ausgangsspanne C in mV/V
Sensitivity, output span / sensibilité, marge de sortie: 1.9992

Kennlinienabweichung, Anfangspunkteinsteilung in %/C
combined error / erreur combinée: 0.038

Relative Hysteresis in %/C
relative hysteresis / hystérésis relatif: 0.025

Maximale Interpolationsabweichung in %/C
maximal deviation (coefficient of a cubic interpolation function through the series) (Maximum deviation from a cubic interpolation function through the series) (Déviation maximale par rapport à une fonction d'interpolation cubique des séries de données): -0.013

Koeffizienten der kubischen Ausgleichsfunktion der Form:
Coefficients of a cubic interpolation function through the rising and falling series:
Coefficients de la fonction d'interpolation cubique des séries de mesure croissantes et décroissantes:

R	0.373363
S	-0.0122918
T	1249.07

Alle weiteren messtechnischen Eigenschaften des Aufnehmers sind durch Typenfragen und äußere Produkturteile des Qualitätsmanagements abgesichert.
All other metrological characteristics of the transducer are verified by type testing and regular product audits of the quality department.
Tous les autres caractéristiques techniques du capteur sont garanties par le Service Qualité, au moyen d'essais et d'audits réguliers du produit.

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Test report P3 Top Class

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.

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Zertifiziert nach ISO 9001 und ISO 14001
1001001 und ISO 14001 zertifiziert / Certification selon ISO 9001 et ISO 14001
Autocertification selon ISO 9001 / Autocertification selon ISO 14001

Prüfprotokoll Top Class

Identif.: 121410243 Datum: 23.07.2008

Prüfung der Temperaturkompensation
Test of temperature compensation / Essai de compensation de la température

Prüfergebnisse:
Ausgangsspanne in mV/V
Output span in mV/V

Eingangsspanne in bar Input span in bar	Ausgangsspanne in mV/V Output span in mV/V	Nullsignal zero signal, zero
20	-0.0005	
70	-0.0034	

Eingangsspanne Temperatur in °C
Input span in mV/V

Eingangsspanne Temperatur in °C Input span in mV/V	Ausgangsspanne in mV/V Output span in mV/V	Kennwert sensitivity / sensibilité
20	1.9992	
70	2.0002	

Aus den Prüfergebnissen berechnete messtechnische Kenngrößen:
Messtechnische Kenngrößen berechnet aus den Prüfergebnissen:
Coefficients calculated from the test results:
Coefficients calculés à partir des résultats d'essai:

Temperaturkoeffizient des Nullsignals, bezogen auf den Nennwert in %/10K
temperature coefficient of zero signal / coefficient de température du signal zéro: -0.0300

Temperaturkoeffizient der Ausgangsspanne, bezogen auf den Kennwert in %/10K
temperature coefficient of span / coefficient de température de la sensibilité: 0.0103

Alle aus den Messergebnissen ermittelten Kenngrößen entsprechen den Spezifikationen gemäß Datenblatt.
Tous les paramètres techniques déterminés à partir des résultats de mesure ont répondu à des spécifications par données.
Tous les autres caractéristiques techniques du transducteur ont été vérifiées par des essais et des audits réguliers du produit de la qualité department.
Tous les autres caractéristiques techniques du capteur sont garanties par le Service Qualité, au moyen d'essais et d'audits réguliers du produit.

Der Temperaturkoeffizient der Ausgangsspanne wird bei Belastung mit Nenndruck bzw. mit max. 500 bar bestimmt.
Le coefficient de la température de la marge de sortie est déterminé avec la charge de pression nominale ou avec max. 500 bar.

Alle weiteren messtechnischen Eigenschaften des Aufnehmers sind durch Typenfragen und äußere Produkturteile des Qualitätsmanagements abgesichert.
All other metrological characteristics of the transducer are verified by type testing and regular product audits of the quality department.
Tous les autres caractéristiques techniques du capteur sont garanties par le Service Qualité, au moyen d'essais et d'audits réguliers du produit.

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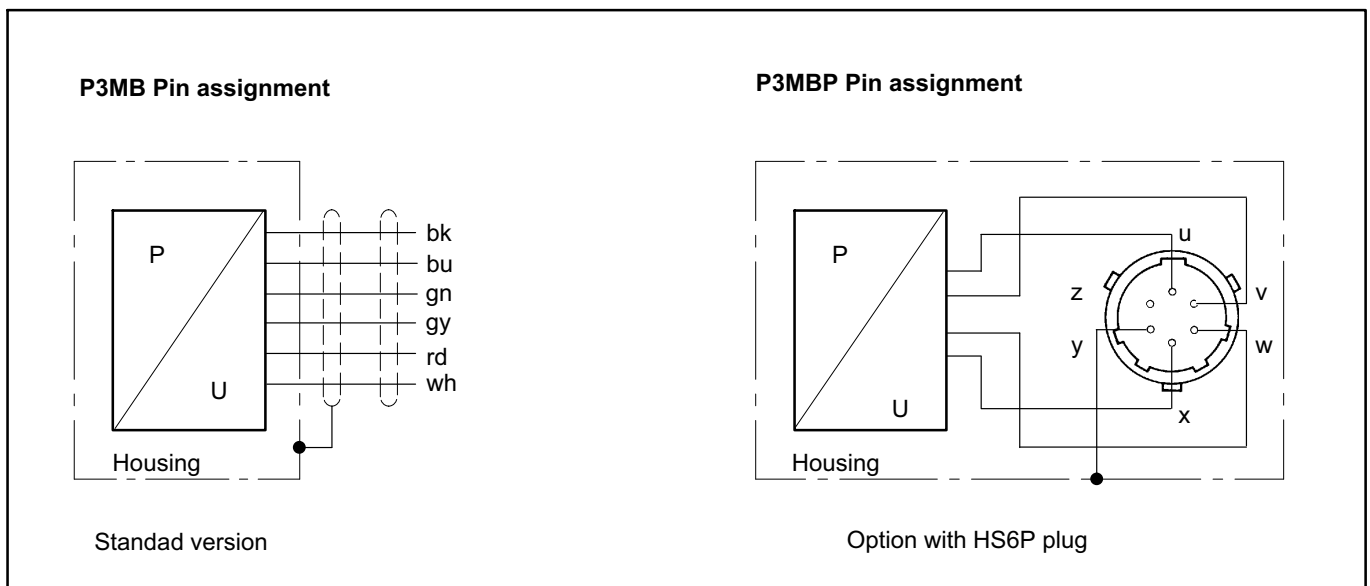
The following data applies to P3 and P3 Top Class

Mechanical input quantities											
Measuring range, 0 bar...	bar	10	20	50	100	200	500 750	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 ³	2500			2000			800		900	
Control volume	mm ³	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 ±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; 1.4548; 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 ²	1000									
Impact duration	ms	4									
Impact form	-	Half sine wave									
Acceleration sensitivity per 10 m/s ² 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									

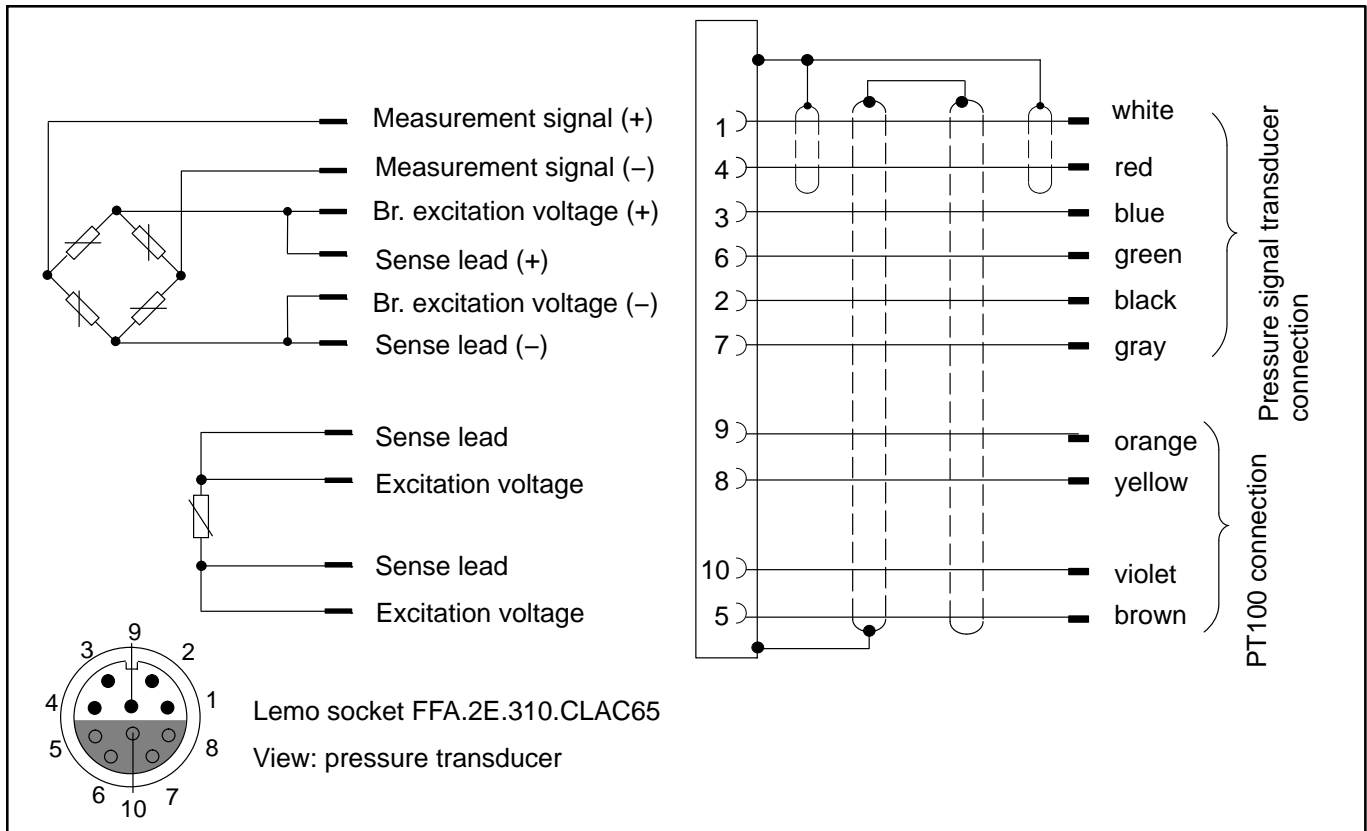
Economical, standard versions available from stock:

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
750 bar	1-P3TCP/750BAR	–	–
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

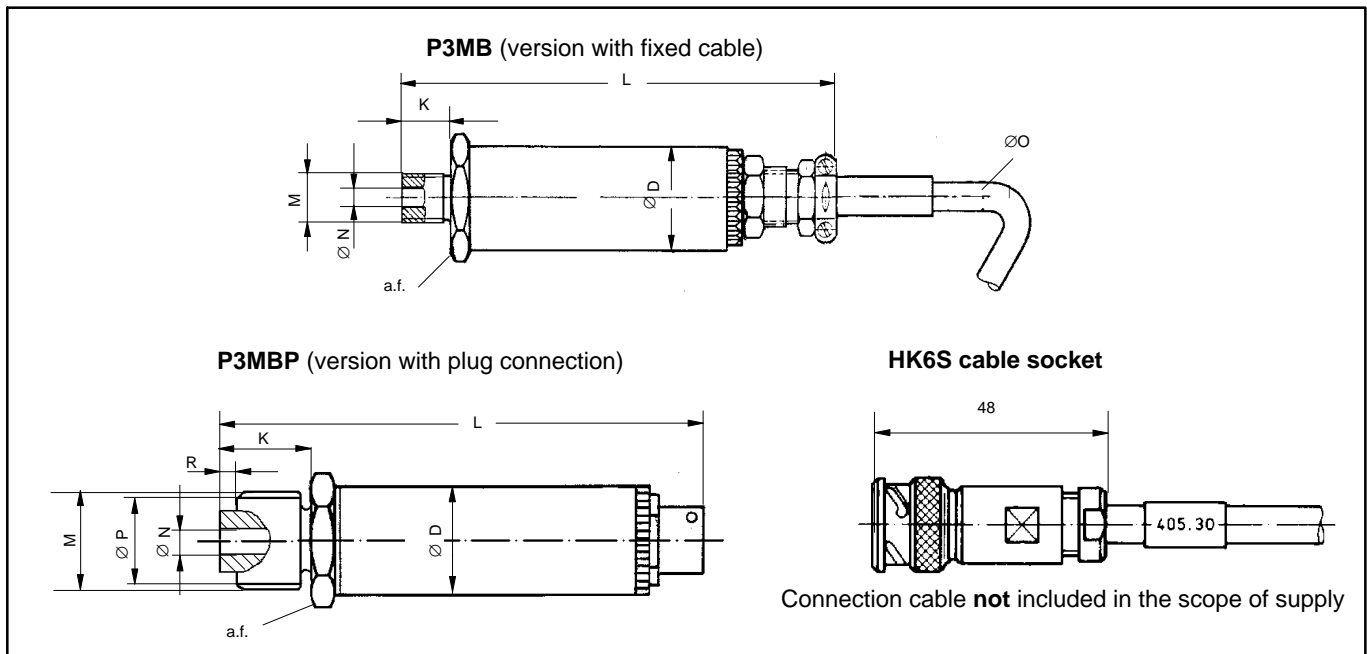
Pin assignment P3MB and P3MBP



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

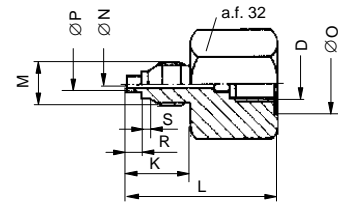
Included in scope of supply

- 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 Absolute pressure transducer

Order No.
K-P3

Code	Option 1: Design
MB	MB - Classic, with cable connection [not with option 3 = P]
MBP	MPB - Classic, with plug H6SP [only with option 3 = P]

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, unterminated [only with option 1 = MB]
Y	Connection cable, 20 m, unterminated [only with option 1 = MB]
M	Connection cable, 3 m, connector MS [only with option 1 = MB]
N	Connection cable, 20 m, connector MS [only with option 1 = MB]
D	Connection cable, 3 m, connector D15 [only with option 1 = MB]
F	Connection cable, 20 m, connector D15 [only with option 1 = MB]
Q	Connection cable, 3 m, connector D-Sub-HD [only with option 1 = MB]
R	Connection cable, 20 m, connector D-Sub-HD [only with option 1 = MB]
P	mit Stecker HS6P, welded [only with option 1 = MBP]

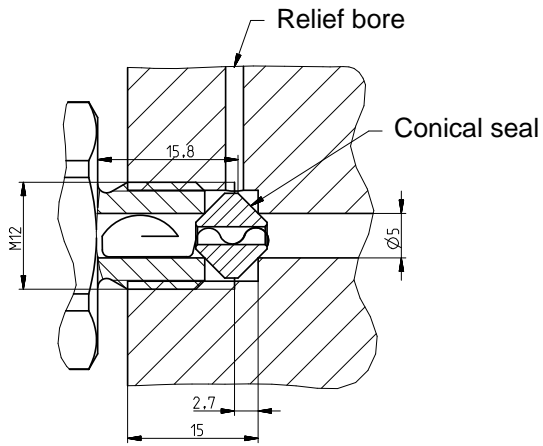
Code	Option 4: Transducer Identification
S	Without Transducer Identification (TEDS)
T	With Transducer Identification (TEDS) [not with option 3 = K, Y, P]



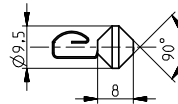
Pressure transducer mounting

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

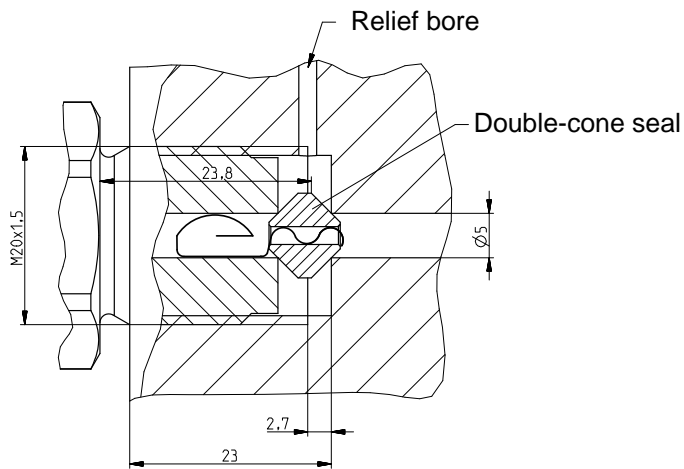
P3 500–2500 bar



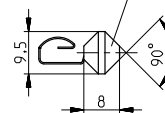
Conical seal
500–3000 bar



P3 3000 bar



Double-cone seal
with retaining spring



Subject to modifications.
All product descriptions are for general information
only. They are not to be understood as a guarantee
of quality or durability.

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measure and predict with confidence

