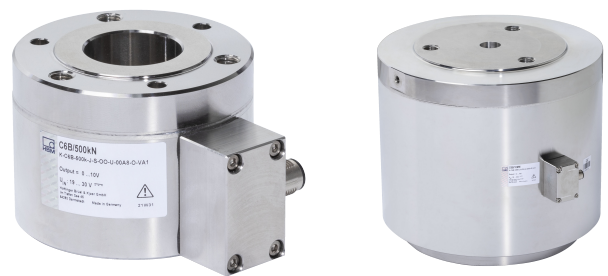


DATA SHEET

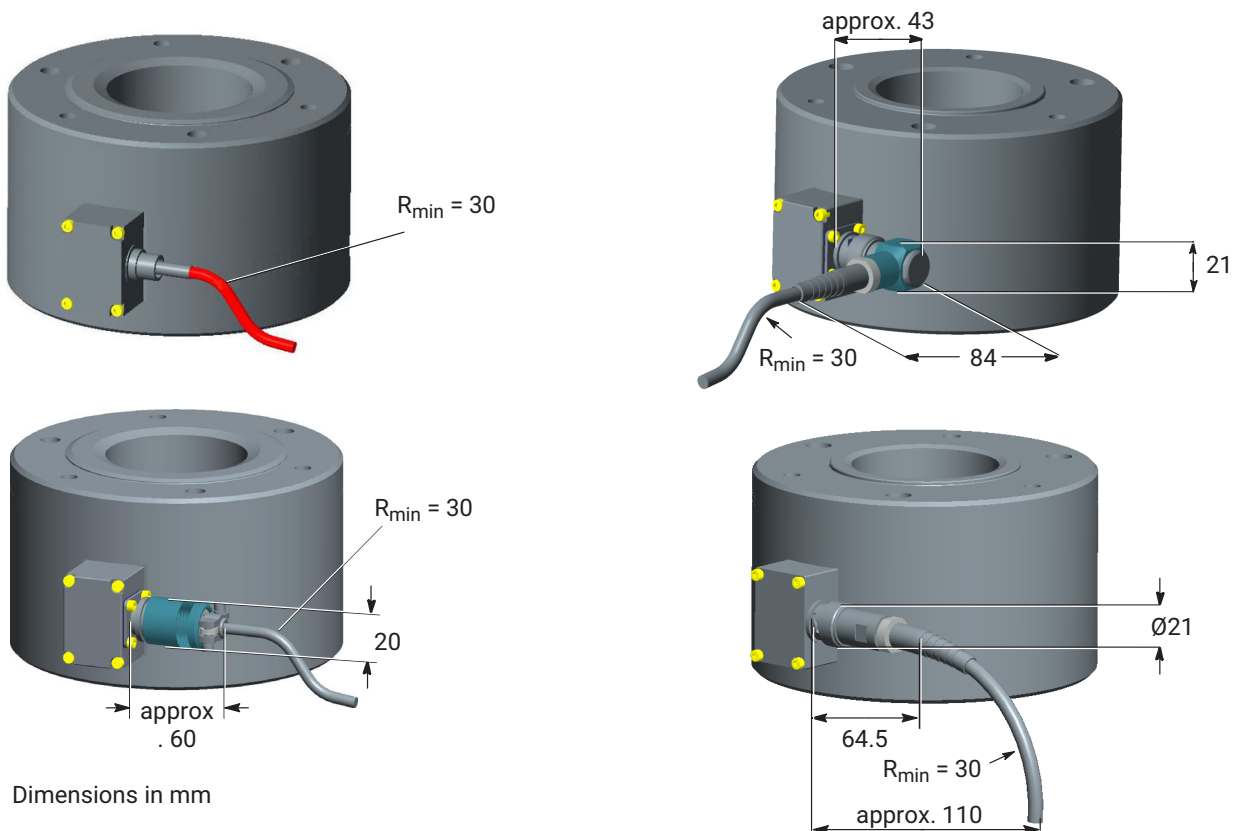
# C6B Force transducers

## SPECIAL FEATURES

- Rugged compressive force transducers
- Nominal (rated) force 200 kN ... 10 MN
- Hermetically welded, versions with IP68 available
- Extensive mounting aids
- Can be configured with different cable lengths, plug fitting, integrated amplifier and TEDS on request

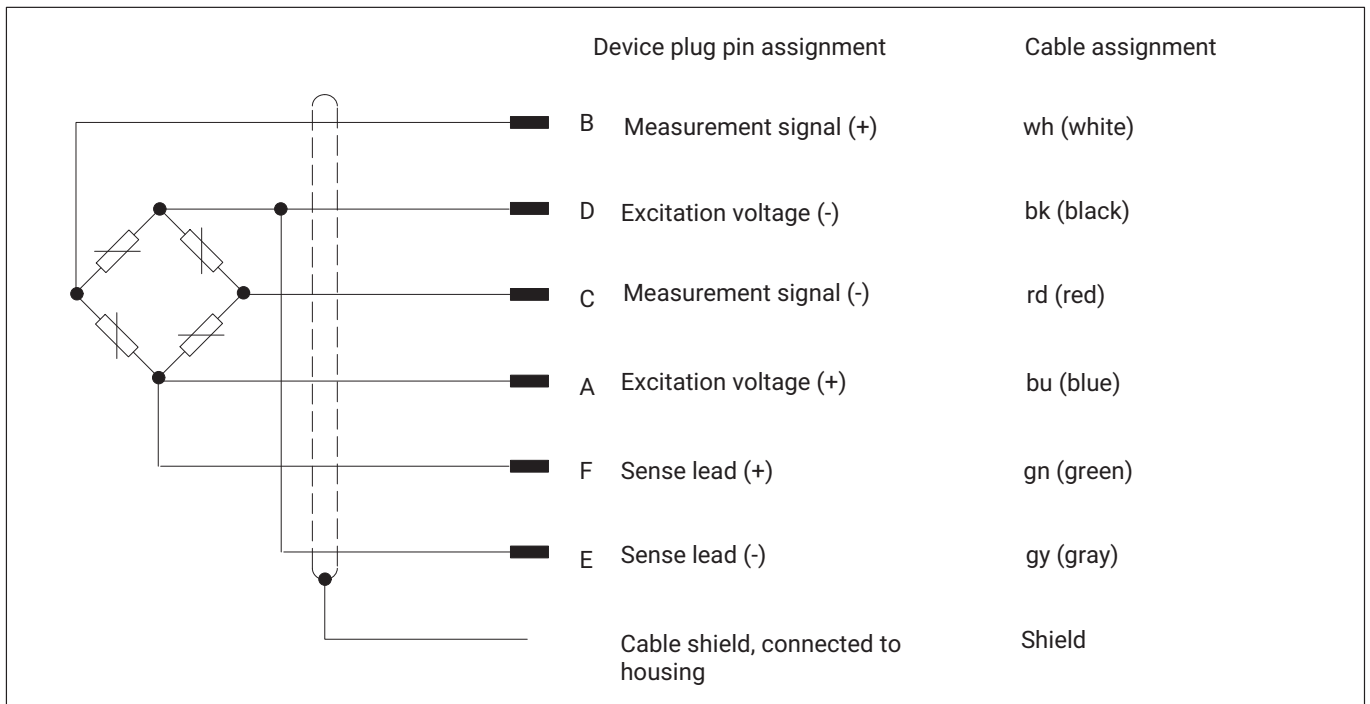


## CONNECTION OPTIONS



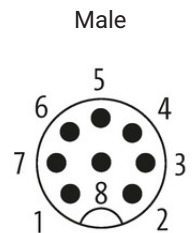
## ELECTRICAL CONNECTION

### Pin assignment without integrated amplifier

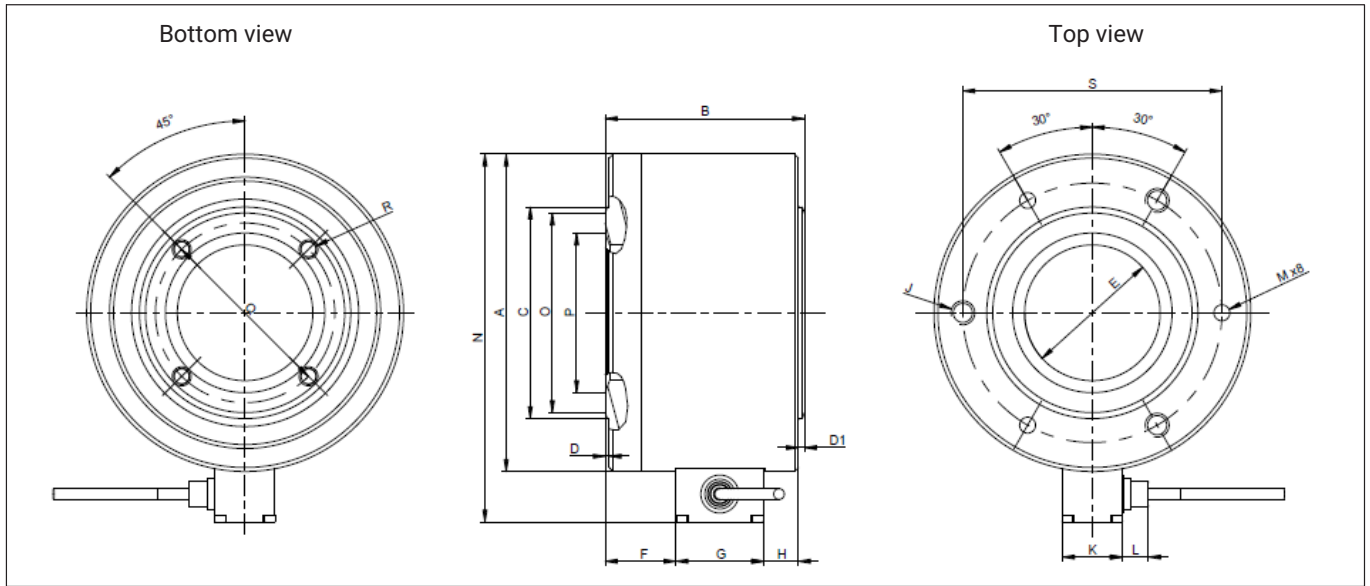


### Pin assignment with integrated amplifier

Pin	Color code	M12 device plug		Cable assignment fixed cable with free end
		Version VA 1 (voltage output)	Version VA 2 (current output)	
1	White	Supply voltage 0 V (GND)		White
2	Brown	Not assigned		Black
3	Green	Zero control input		Green
4	Yellow	Not assigned		Not assigned
5	Gray	Output signal 0 ... 10 V	Output signal 4 ... 20 mA	Gray
6	Pink	Output signal 0 V	Not assigned	Blue
7	Blue	Not assigned		Not assigned
8	Red	Power supply +19...+30 V		Red
Cable shield, connected to housing				

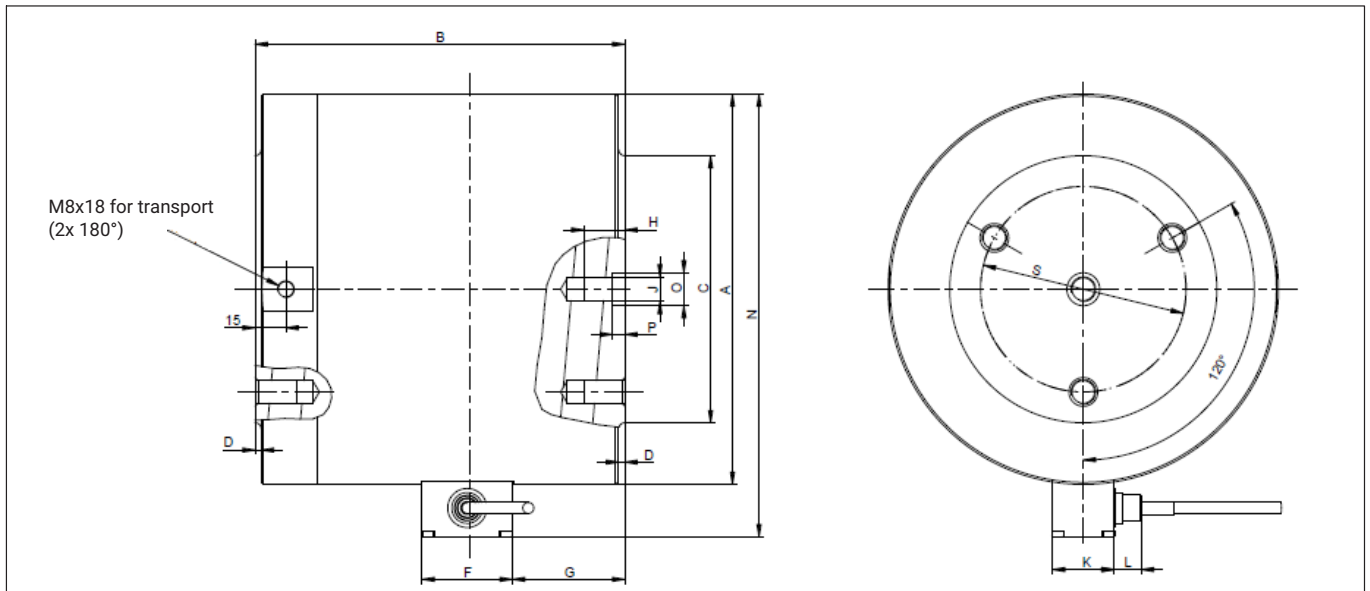


## DIMENSIONS (IN MM)



Nominal (rated) force	A	B	C ±0.1	D	D1	E ±0.1	F	G	H	J	K	L <sup>1)</sup>	L <sup>2)</sup>	M H11	N <sup>1)</sup>	N <sup>2)</sup>	O	P	Q ±0.1	R	S ±0.1
<b>200 kN</b>	80	60	40.4	1	1	32	16.25	42	0.75	M8, 8 mm deep	26	12	14	6	100	106	-	35	48	M6, 8 mm deep	64
<b>500 kN</b>	80	60	52	1	1	32	16.25	42	0.75		26	12	14	6	100	106	-	-	42		64
<b>1 MN</b>	159	100	88	2	3	68	35.5	44	17.5	M12, 15 mm deep	31	12	14	8	184	186	-	75	98	M8, 15 mm deep	130
<b>2 MN</b>	159	100	106	2	3	68	35.5	44	17.5		31	12	14	8	184	186	100	80	90		130

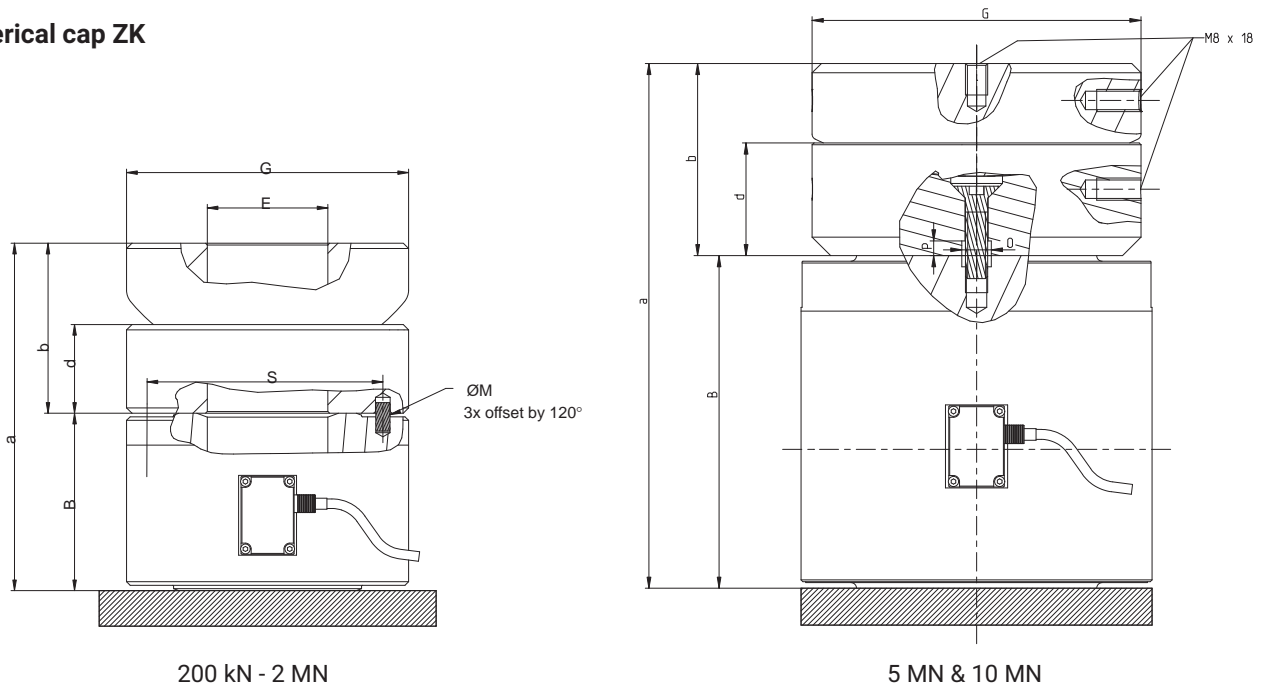
- 1) Fixed cable option
- 2) Plug option



Nominal (rated) force	A	B	C	D	F	G	H	J	K	L <sup>1)</sup>	L <sup>2)</sup>	N <sup>1)</sup>	N <sup>2)</sup>	O F7	P	S
<b>5 MN</b>	190	180	130	3	44	55	20	M12	31	12	14	216	218	16	6	100±0.2
<b>10 MN</b>	267	240	180	3	44	96	30	M20	31	12	14	293	295	25	10	140

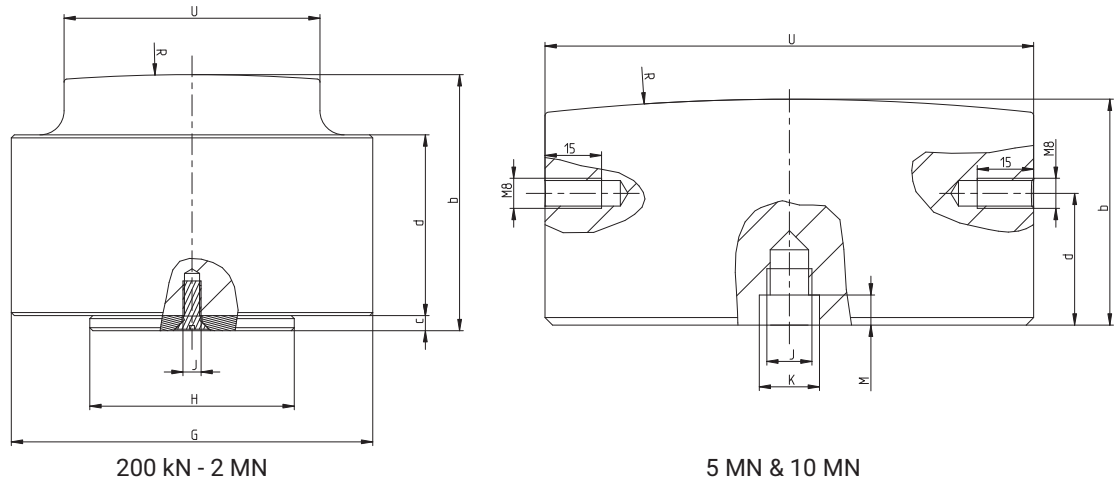
- 1) Fixed cable option
- 2) Plug option

**Spherical cap ZK**

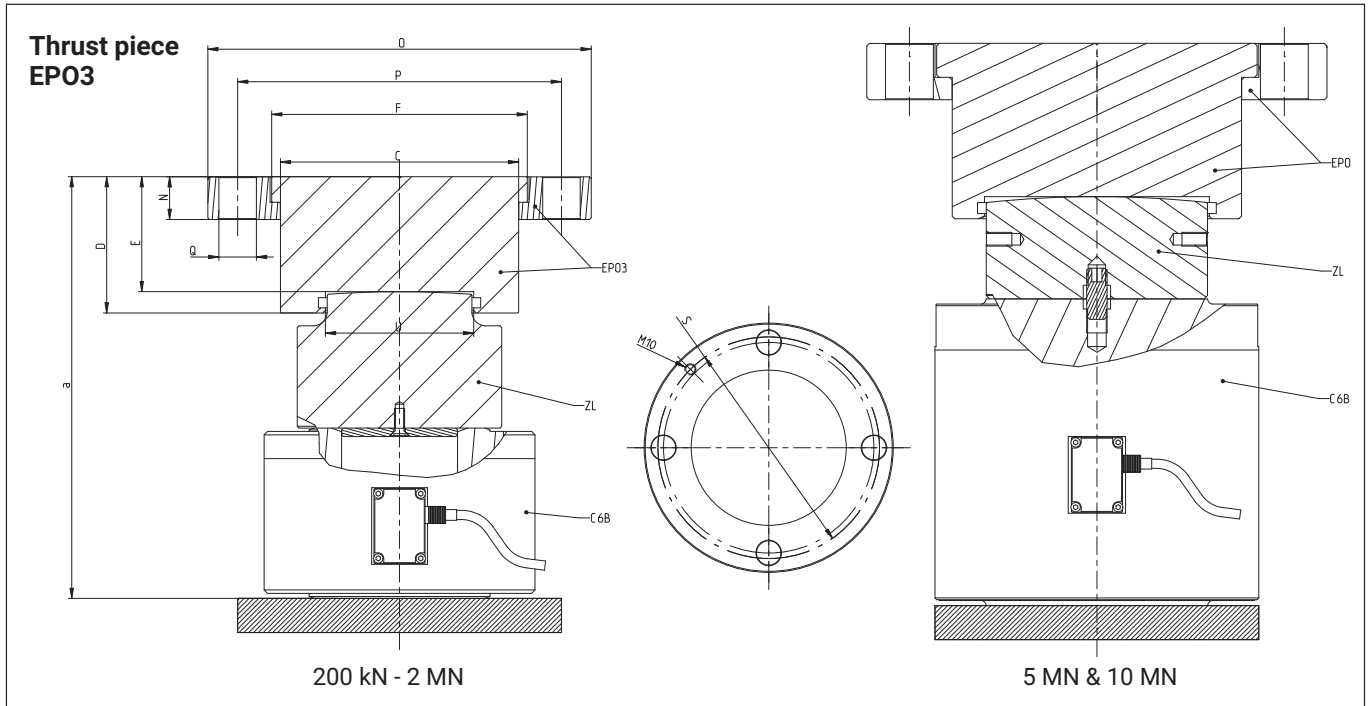


Nominal (rated) force	ZK ordering number	Weight in kg	B	E±0.1	G	M H11	O F7	P	S	a	b	d
200 kN ... 500 kN	1-C6/50T/ZK	1.7	60	32	82	6	-	-	64±0.1	112	52	28
1 MN	1-C6/100T/ZK	3.8	100	68	121	8	-	-	130±0.1	174.5	75.3	40
2 MN	1-C6/200T/ZK	11.6	100	68	159	8	-	-	130±0.1	195	95.5	50
5 MN	1-C6/500T/ZK	20.6	180	-	178	-	16	8		284	104	61
10 MN	1-C6/10MN/ZK	50.2	240	-	240	-	25	12		385	145	88

**Load button ZL**



Nominal (rated) force	ZL ordering number	Weight in kg	G	H <sub>0.1</sub>	J	R	U <sub>0.2</sub>	K F7	M	b	c	d
200 kN	1-C6/20T/ZL	0.8	60	31.9	M5	300	32	-	-	50	5	30
500 kN	1-C6/50T/ZL	0.8	60	31.9	M5	300	44	-	-	50	5	30
1 MN	1-C6/100T/ZL	6.4	120	67.9	M6	600	64	-	-	85	5	60
2 MN	1-C6/200T/ZL	6.8	120	67.9	M6	600	85	-	-	85	5	60
5 MN	1-C6/500T/ZL	6.5	-	-	M12	600	129.8	16	8	60	-	35
10 MN	1-C6/10MN/ZL	30.1	-	-	M20	1000	219.8	25	12	110	-	67



Nominal (rated) force	EPO3 ordering number	Weight in kg	C	D	E	F	N	O	P	Q	S	U <sub>0.2</sub>	a
200 kN	1-EPO3R/20T	1.2	47.8	27.5	20	58	14	110	90	13	90	32	125
500 kN	1-EPO3/50T	3.4	81.8	50	39.5	89	10	147	120	18	130	44	144.5
1 MN	1-EPO3/100T	3.2	81.9	50	39.5	89	10	147	120	18	130	64	219.5
2 MN	1-EPO3/250T	13	139.8	80	67.5	150	25	225	190	22	200	85	247.5
5 MN	1-EPO3/500T	27	169.8	103	90	188	33	270	220	28	250	130	250
10 MN <sup>1)</sup>	1-EPO3/10MN	55	260	140	120	290	-	-	-	-	-	220	430

<sup>1)</sup> Version with nominal (rated) force 10 MN is supplied without clamping ring

## SPECIFICATIONS C6B

Nominal (rated) force	$F_{nom}$	kN	200	500				
		MN			1	2	5	10
<b>Accuracy</b>								
<b>Accuracy class</b>			0.5					
<b>Relative reproducibility and repeatability errors in unchanged mounting position</b>	$b_{rg}$	%	0.2	0.1	0.06			
When hardened compression plates are used			0.1	0.06				
If load button ZL is used, or with load button ZL and thrust piece EPO			0.2	0.1	0.06			
When used with spherical cap ZK								
<b>Rel. reversibility error (hysteresis) at 0.5 <math>F_{nom}</math></b>	$V_{0.5}$	%	0.5					
When hardened compression plates are used			0.5	0.3				
If load button ZL is used, or with load button ZL and thrust piece EPO			0.5					
When used with spherical cap ZK								
<b>Non-linearity</b>	$d_{lin}$	%	1					
When hardened compression plates are used			0.4					
If load button ZL is used, or with load button ZL and thrust piece EPO			1					
When used with spherical cap ZK								
<b>Relative creep</b>	$d_{crf+E}$	%	0.06					
<b>Effect of eccentricity</b>	$d_E$	%/mm	0.2	0.06				
<b>Temperature coefficient of sensitivity</b>	$TC_S$	%/10K	0.1					
<b>Temperature coefficient of zero signal</b>	$TC_0$	%/10K	0.05					
<b>Rated electrical output</b>								
<b>Nominal (rated) output</b>	$C_{nom}$	mV/V	2					
<b>Rel. zero signal deviation</b>	$d_{s,0}$	%	1					
<b>Deviation of the characteristic value with optional "adjusted rated output"</b>	$d_c$	%	2.5					
When hardened compression plates are used			0.5					
If load button ZL is used, or with load button ZL and thrust piece EPO			0.5					
When used with spherical cap ZK								
<b>Rated output range (without rated output adjustment)</b>	C	mV/V	2 ... 2.48 mV/V					
<b>Input resistance</b>	$R_e$		380 ... 420					
<b>Output resistance</b>	$R_a$	$\Omega$	280 ... 360					
<b>Output resistance with "adjusted rated output" option</b>	$d_{Ra}$		365					
<b>Insulation resistance</b>	$R_{is}$	G $\Omega$	>5					
<b>Operating range of the excitation voltage</b>	$B_{U,G}$	V	0.5 ... 12					
<b>Reference excitation voltage</b>	$U_{ref}$		5					
<b>Connection</b>			6-wire circuit					
<b>Temperature</b>								
<b>Reference temperature</b>	$T_{ref}$	$^{\circ}C$	+23					
<b>Nominal (rated) temperature range</b>	$B_{t,nom}$		-10 ... +70					
<b>Operating temperature range</b>	$B_{T,G}$		-30 ... +85					
<b>Storage temperature range</b>	$B_{T,S}$		-50 ... +85					

Nominal (rated) force	$F_{nom}$	kN		200	500					
		MN				1	2	5	10	
<b>Characteristic mechanical quantities</b>										
Maximum operating force	$F_G$	% of $F_{nom}$	150							
Force limit	$F_L$		150							
Breaking force	$F_B$		>200					>180		
Static lateral force limit	$F_Q$	% of $F_{nom}$	No specification possible							
When hardened compression plates are used			20					10		
If load button ZL is used, or with load button ZL and thrust piece EPO			3							
When used with spherical cap ZK										
Permissible eccentricity	$e_G$	mm	5	6	11	12	10	10		
Nominal (rated) displacement	$s_{nom}$	mm	0.13	0.15	0.2	0.2	0.5	0.7		
Natural frequency	$f_G$	kHz	11.6	14.4	6.1	6.9	5.3	4		
Permissible oscillation stress	$F_{rb}$	% of $F_{nom}$	70							
Stiffness	$C_{ax}$	$10^6$ N/mm	1.54	3.33	5	10	14.29			
<b>General information</b>										
Degree of protection in accordance with EN 60 529 with "fixed cable" (standard version)			IP68 <sup>1)</sup>							
Degree of protection in accordance with EN 60 529 with "bayonet connector" option, socket connected to sensor			IP67							
Degree of protection in accordance with EN 60 529 with "threaded connector" option			IP64							
Spring element material			Stainless steel							
Measuring point protection			Hermetically welded measuring body							
Cable (standard version)			Outside diameter 5.4 mm							
Cable length		m	6 or 15							
<b>Mechanical shock resistance as per IEC 60068-2-6</b>										
Number		n	1000							
Duration		ms	2							
Acceleration		m/s <sup>2</sup>	650							
<b>Vibrational stress as per IEC 60068-2-27</b>										
Frequency range		Hz	5 ... 65							
Duration		min	30							
Acceleration		m/s <sup>2</sup>	150							
Weight	m	kg	1.6	1.8	10.1	10.7	32.0	84.0		
	m	lbs	3.5	4.0	22.3	23.6	70.5	185.2		

1) Test condition: 1 m water column, 100 hours

## SPECIFICATIONS C6B ACTIVE

Module type		VA1	VA2
<b>Rated electrical output</b>			
<b>Output signal</b>		0 ... 10 V	4 ... 20 mA
<b>Nominal (rated) output</b>		10 V	16 mA
<b>Deviation of the characteristic value with optional "adjusted rated output"</b>			
When hardened compression plates are used		10 V ± 0.25 V	16 mA ± 0.4 mA
If load button ZL is used, or with load button ZL and thrust piece EPO		10 V ± 0.05 V	16 mA ± 0.08 mA
When used with spherical cap ZK			
<b>Zero signal</b>		0 V	4 mA
<b>Range of output signal</b>		-0.3 ... 11 V	3 ... 21 mA
<b>Cut-off frequency (-3dB)</b>	kHz	2	
<b>Supply voltage</b>	V	19 ... 30	
<b>Nominal (rated) voltage</b>	V	24	
<b>Max. current consumption</b>	mA	15	30
<b>Temperature</b>			
<b>Nominal (rated) temperature range</b>	°C	-10 ... +50	
<b>Operating temperature range</b>	°C	-20 ... +60	
<b>Storage temperature range</b>	°C	-25 ... +85	
<b>Reference temperature</b>	°C	+23	



## VERSIONS AND ORDERING NUMBERS

Code	Measurement range	Ordering number
<b>200K</b>	200 kN	1-C6B/200KN
<b>500K</b>	500 kN	1-C6B/500KN
<b>1M00</b>	1 MN	1-C6B/1 MN
<b>2M00</b>	2 MN	1-C6B/2MN
<b>5M00</b>	5 MN	1-C6B/5MN
<b>10M0</b>	10 MN	1-C6B/10MN

The ordering numbers shown in gray are preferred types. They can be delivered rapidly.

The ordering number for the preferred types is 1-C6B..., the ordering number for the customized versions is K-C6B-...

Rated output adjustment	Transducer identification	Mechanical design	Plug protection	Electrical connection	Plug version for the "permanently attached cable" option	Integrated amplifier
Not adjusted <b>N</b>	Without TEDS chip <b>S</b>	Without load application <b>OO</b>	Without plug protection <b>U</b>	With fixed cable, 6 m <b>K</b>	Free ends <b>Y</b>	Without integrated amplifier <b>N</b>
Adjusted <b>J</b>	With TEDS chip <b>T</b>	With spherical cap <b>ZK</b> <b>ZK</b>	With plug protection <b>P</b>	With fixed cable, 15 m <b>V</b>	D-sub-HD15, 15-pin <b>F</b>	Amplifier VA1: 0...10V <b>VA1</b>
		With the ZL load button and EPO thrust piece <b>ZE</b>		With bayonet connector <b>B</b>	D-SUB-HD15, 15-pin <b>Q</b>	Amplifier VA2: 4...20 mA <b>VA2</b>
				With threaded connector <b>G</b>	Male connector ME3106PEMV <b>N</b>	
				M12 male connector, 8-pin, A-coded <sup>1)</sup> <b>00A8</b>	ODU male connector, 14-pin <b>P</b>	
					M12 male connector, 8-pin <b>M</b>	
					Without fixed cable <b>O</b>	

<sup>1)</sup> M12 male connector, 8-pin, A-coded only possible in conjunction with VA1/VA2

<b>Rated output adjustment</b>	The exact rated output is specified on the type plate. The sensor can be adjusted to an exact rated output of 2 mV/V. Then the relative tolerance of the rated output is dependent on the selected loading fittings. (see specifications, section "Rated electrical outputs"). You can connect the C6B in parallel if you order the sensor with adjusted rated output.
<b>Transducer identification</b>	Integration of TEDS chip (integrated electronic data sheet) as per IEEE 1451.4. If the relevant amplifier electronics are provided, the measurement chain will parameterize itself automatically.
<b>Mechanical design</b>	Standard delivery does not include load application parts. The C6B is optionally available with the appropriate load application parts and calibrated or adjusted.
<b>Plug protection</b>	A square profile is installed around the plug for mechanical protection. Dimensions WxHxD: 30 x 30 x 20 mm

<b>Electrical connection</b>	Permanently attached cable, 6 m is standard; options: Permanently attached cable, 15 m; bayonet connection (PT02E10-P-compatible); threaded connector (PT02E10-P-compatible)
<b>Connector assembly</b>	Mounted and verified plugs for direct use on HBM amplifiers. (Only in combination with permanently attached cable)
<b>Integrated amplifier</b>	The sensors can be purchased with an integrated amplifier, optionally delivering an output signal in volts or milliamps.

Cables/plugs	Ordering number
Configurable cable, available in different lengths and on request with plug mounted for connecting directly to the amplifier	K-CAB-F
Connection cable KAB157-3; IP67 (with bayonet connector); 3 m long, TPE outer sheath; 6 x 0.25 mm <sup>2</sup> ; free ends, shielded, outside diameter 6.5 mm	1-KAB157-3
Connection cable KAB158-3; IP54 (with threaded connector); 3 m long, TPE outer sheath; 6 x 0.25 mm <sup>2</sup> ; free ends, shielded, outside diameter 6.5 mm	1-KAB158-3
Connection cable KAB168 with M12 male connector, for connecting sensors with integrated amplifier. Available in 20 m (KAB168-20) and 5 m (KAB168-5)	1-KAB168-20; 1-KAB168-5
Loose cable socket (bayonet connection)	3-3312.0382
Loose cable socket (screw connection)	3-3312.0354
Ground cable, 400 mm	1-EEK4
Ground cable, 600 mm	1-EEK6
Ground cable, 800 mm	1-EEK8

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