Data Sheet

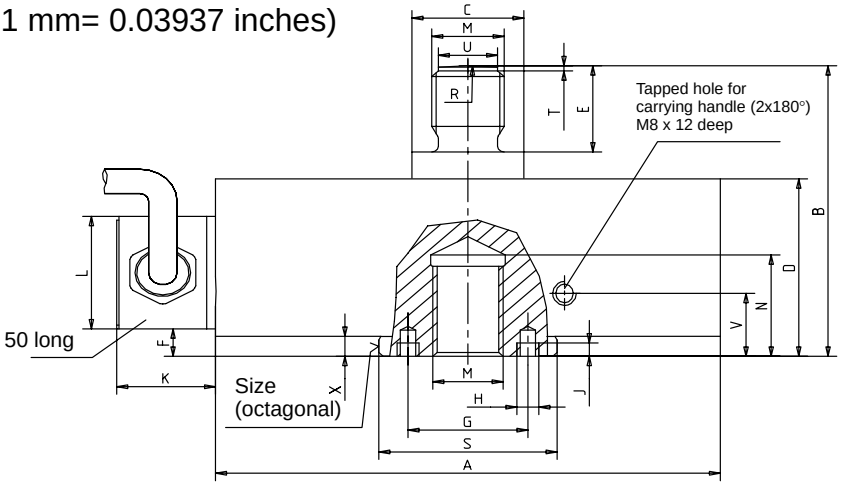
Z4A

Force Standards

Special features

- **Tensile /compressive force transducer with maximum accuracy**
- **Nominal forces 20 kN ... 500 kN**
- **Classification option by device classes with DKD calibration certificate according to EN10002-3 or ISO/FDIS 376**
- **Transfer standard in international force reference**
- **Good long–term stability**

Dimensions (in mm; 1 mm= 0.03937 inches)



Type/ Order no.	∅ A	B	∅ C_{f7}	D	E	F	G	H	J	K	L	M	N	R	∅ S_{f7}	T	∅ U	V	X	a./f.
1–Z4A/20 kN	115	77	25	47	23	7.3	–	–	–	22	30	M16	27	60	40	1.4	13	–	5.3	38
1–Z4A/50 kN	120	83	26	55	23	10.2						M20x1.5	28	60	48	1.4	17		8.2	45
1–Z4A/100 kN	146	107	40	69	33	12.2						M30x2	37	160	62	1.4	27		10.2	59
1–Z4A/200 kN	180	137	50	89	43	13.1	68	M6	6			M39x2	45	160	76	1.8	36		11.1	73
1–Z4A/500 kN	275	250	100	145	95	21	118	M8	8	32	43	M72x4	87	400	140	3	65	35	20	134

Specifications

Type			**Z4A / Z4A-G**				
Data according to VDI standards 2638							
Nominal force	**F_{nom}**	**kN**	**20**	**50**	**100**	**200**	**500**
Accuracy class			0.02				0.05
Nominal sensitivity	C_{nom}	mV/V	2				
rel. sensitivity deviation	d_c	%	0.1				
rel. tensile/compressive force sensitivity diff.	d_{zd}	%	0.2				
Zero signal tolerance	$d_{s,o}$	%	0.5				
rel. zero point compensation (zero signal return)[1]	f_o	%	±0.08				
Rel. range ($0.2F_{nom}$ to F_{nom}) at:[1]							
unchanged mounting position, typically	b_i	%	0.02				
different mounting positions, typically	b	%	0.03				
Rel. range of inversion ($0.2F_{nom} - F_{nom}$)[1]	u	%	0.06				0.15
Linearity deviation	d_{lin}	%	0.02				0.03
Effect of temperature on sensitivity/10 K by reference to nominal sensitivity	TK_c	%	0.01				
Effect of temperature on zero signal/10 K by reference to nominal sensitivity	TK_0	%	0.015				
Effect of transverse forces (Transverse forces 10 % F_{nom})	d_Q	%	0.03				
Effect of eccentricity per mm	d_E	%	0.01		0.005		
Rel. creep over 15 mins.	d_{crF+E}	%	0.02				
Input resistance	R_e	Ω	>345				
Output resistance	R_a	Ω	356 ± 0.3				
Isolation resistance	R_{is}	Ω	$>5 \cdot 10^9$				
Reference excitation voltage	U_{ref}	V	5				
Operating range of the excitation voltage	$B_{U,G}$	V	0.5 ... 12				
Nominal temperature range	$B_{t,nom}$	°C	+10...+40				
Operating temperature range	$B_{t,G}$	°C	-30...+85				
Storage temperature range	$B_{t,S}$	°C	-50...+85				
Reference temperature	t_{ref}	°C	+22				
Max. operational force	(F_G)	%	150				
Limit force	(F_L)	%	150				
Breaking force	(F_B)	%	250				
Static lateral limit force	(F_Q)	%	30				
Limit torque	M_G	Nm	120	350	950	2000	4000
Nominal displacement	S_{nom}	mm	0.2		0.25	0.28	0.45
Fundamental resonance frequency	f_G	kHz	4.1	4.5	3.4	3.6	2.5
Weight		kg	1.8	2.4	5.5	11.2	42
Rel. permissible vibrational stress	F_{rb}	%	70			50	
Cable length, six–wire connection		m	6				
Degree of protection to DIN EN60529			IP 67				

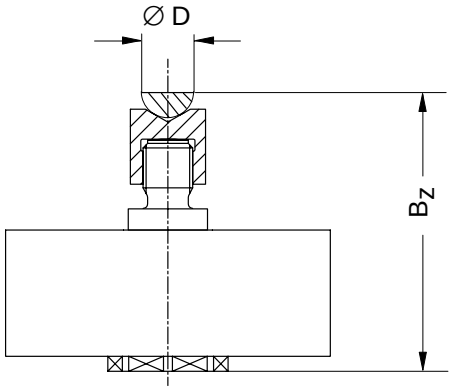
[1] see supplementary information according to EN10002–3 for Z4A–G

[2] corresponds to half the pivot height

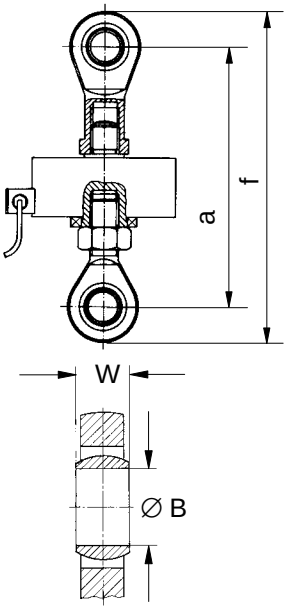
Accessories for Z4A

Force introduction parts for standard measurements in industry

Compressive force introduction **ZDK**



Knuckle eye **ZGOW/ZGUW**



Type	ZDK Order no.	Weight [kg]	B_Z	∅ D $^{-0.1}_{-0.3}$
Z4A/20 kN	1–Z4A/20kN/ZDK	0.10	99	20
Z4A/50 kN	1–Z4A/50kN/ZDK	0.18	111	25
Z4A/100 kN	1–Z4A/100kN/ZDK	0.40	140	36
Z4A/200 kN	1–Z4A/200kN/ZDK	1.26	200	50
Z4A/500 kN	1–Z4A/500kN/ZDK	5.80	365	80

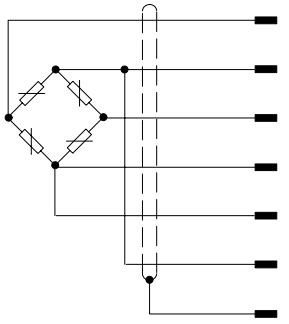
Type	Upper knuckle eye Lower knuckle eye Order no.	Weight [kg]	a	f	W	∅ B	M_A (Nm)
Z4A/20 kN	1–Z4A/20kN/ZGOW 1–Z4A/20kN/ZGUW	0.2	170	213	21	16^{H7}	120
Z4A/50 kN	1–U2A/2t/ZGOW 1–U2A/2t/ZGUW	0.8 0.4	193	245	25	20^{H7}	350
Z4A/100 kN	1–Z4A/100kN/ZGOW 1–Z4A/100kN/ZGUW	1.1	265	335	37	30^{H7}	1000
Z4A/200 kN	1–U2A/10t/ZGOW 1–U2A/10t/ZGUW	3.2 1.1	360	485	35	50 $^{+0.001}_{-0.014}$	2000[1)]
Z4A/500 kN	1–Z4A/500kN/ZGOW 1–Z4A/500kN/ZGUW	17.3 12.0	590	785	44	60 $^{+0.003}_{-0.018}$	4000[2)]

[1)] secured with 2 screws to prevent rotation; underside with inner thread

[2)] for pivot side only (outer thread)

Pin assignment

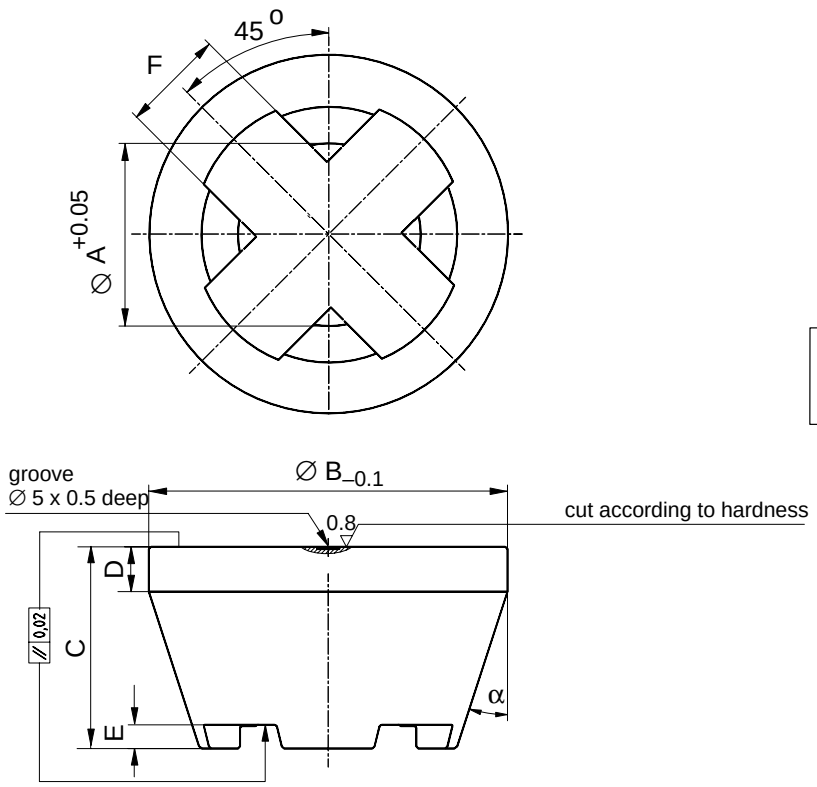
6–connection cable



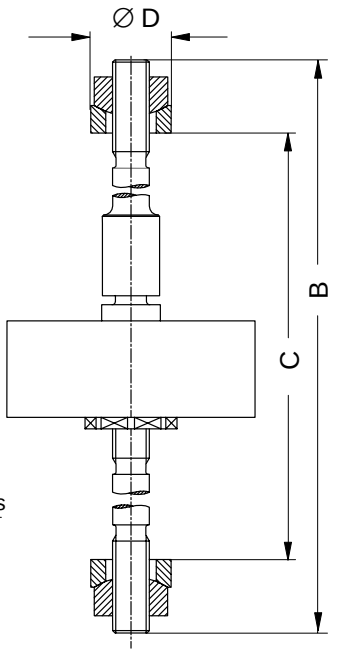
wh (white)	Measurement signal (+) U_A
bk (black)	Excitation voltage (–) U_B
rd (red)	Measurement signal (–) U_A
bu (blue)	Excitation voltage (+) U_B
gr (green)	Sensor circuit (+)
gy (grey)	Sensor circuit (–)
Schielding	Cable schielding, connected to housing

Force introduction parts for precision measurements, recommended for Z4A-G
e.g. according to DIN EN 10002-3 or ISO 376

EDO4



Tensile force introduction **ZKM**



Type	Thrust piece Order no.	Weight [kg]	∅ A	∅ B	C	D	E	F	α
Z4A/20 kN	1–EDO4/20 kN	0.34	16.2	48	29	8	5	12	18°
Z4A/50 kN	1–EDO4/50 kN		20.2		29		5		
Z4A/100 kN	1–EDO4/100 kN	1.58	30.2	80	45	10	5	23	
Z4A/200 kN	1–EDO4/200 kN		39.2						
Z4A/500 kN	1–EDO4/500 kN	4.35	72.4	112	68	15	12	30	15°

Type	ZKM Order no.	Weight [kg]	B	min C max	∅ D
Z4A/20 kN	1–Z4A/20kN/ZKM	0.82	325	228 276	35 –0.120 –0.280
Z4A/50 kN	1–Z4A/50kN/ZKM	1.45	350	248 299	45 –0.130 –0.290
Z4A/100 kN	1–Z4A/100kN/ZKM	2.32	395	277 334	50 –0.130 –0.290
Z4A/200 kN	1–Z4A/200kN/ZKM	4.19	447	317 382	64 –0.140 –0.330
Z4A/500 kN	1–Z4A/500kN/ZKM	20.1	623	432 522	90 –0.170 –0.390

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