

Z4A

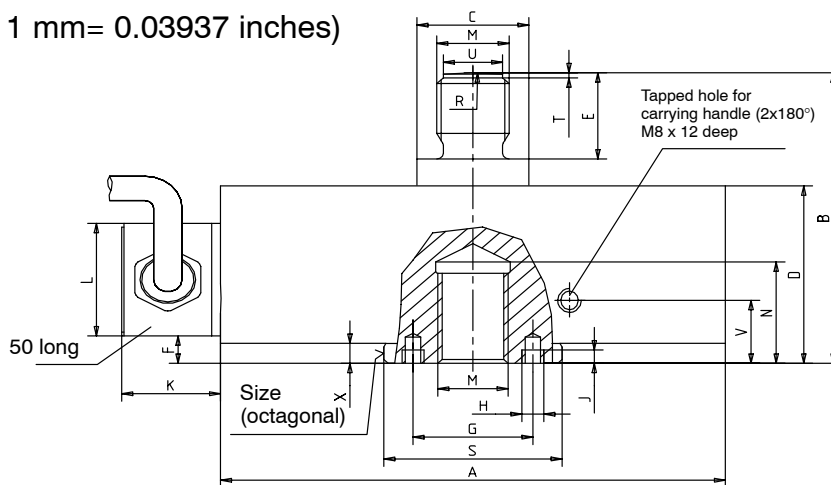
Force Transducer



Special features

- Tensile /compressive force transducer with maximum accuracy
- Nominal (rated) forces 20 kN ... 500 kN
- Possible classification according to instrument class in conjunction with DKD calibration certificate according to ISO 376
- Transfer standard in international force comparison
- 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						M16	27	60	40	1.4	13		5.3	38
1-Z4A/50 kN	120	83	26	55	23	10.2	-	-	-	22	30	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						
Data according to VDI standards 2638							
Nominal (rated) force	F_{nom}	kN	20	50	100	200	500
Accuracy class ¹⁾	00					0.5	
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 (0.2 F_{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 (0.2 F_{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_Q	%	0.015				
Effect of transverse forces (Transverse forces 10 % F_{nom}) ²⁾	d_Q	%	0.03				
Effect of eccentricity per mm	d_E	%	0.01	0.005			
Rel. creep over 30 min.	d_{crF+E}	%	0.02				
Input resistance	R_e	Ω	>345				
Output resistance	R_a	Ω	356 ± 0.3				
Isolation resistance	R_{is}	Ω	>5·10 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	N·m	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⁾ classification guaranteed only in conjunction with a DKD calibration certificate acc. ISO376

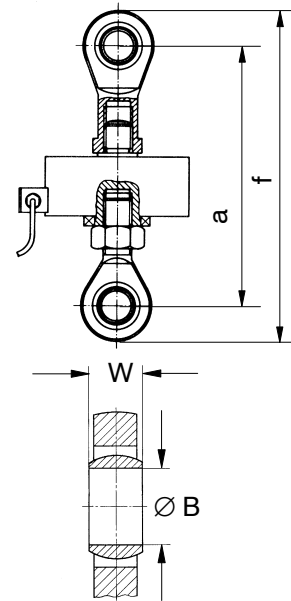
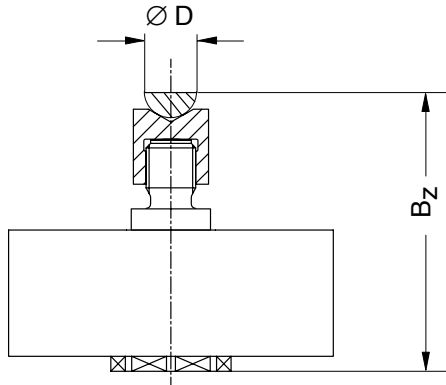
²⁾ half pivot height for Z4A

Accessories for Z4A

Force introduction parts for standard measurements in industry

Knuckle eye ZGOW/ZGUW

Compressive force introduction ZDK



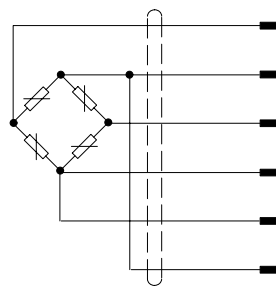
Type	ZDK Order no.	Weight (kg)	Bz	$\varnothing D \begin{smallmatrix} -0.1 \\ -0.3 \end{smallmatrix}$
Z4A/20 kN	1-Z4A/20kN/ZDK	0.10	99	20
Z4A/50 kN	1-Z4A/50kN/ZDK	0.18	111	25
Z4A/100 kN	1-Z4A/100kN/ZDK	0.40	140	36
Z4A/200 kN	1-Z4A/200kN/ZDK	1.26	200	50
Z4A/500 kN	1-Z4A/500kN/ZDK	5.80	365	80

Type	Upper knuckle eye Lower knuckle eye Order no.	Weight (kg)	a		f		W	$\varnothing B$	M _A (N·m)
			min approx.	max approx.	min approx.	max approx.			
Z4A/20 kN	1-Z4/20kN/ZGOW 1-Z4/20kN/ZGUW	0.2	158	170	198	210	21	16 ^{H7}	120
Z4A/50 kN	1-U2A/2t/ZGOW 1-U2A/2t/ZGUW	0.8 0.4	190	199	245	254	25	20 ^{H7}	350
Z4A/100 kN	1-Z4/100kN/ZGOW 1-Z4/100kN/ZGUW	1.1	261	269	331	339	37	30 ^{H7}	950
Z4A/200 kN	1-U2A/10t/ZGOW 1-U2A/10t/ZGUW	3.2 1.1	352	357	475	480	35	50 ^{+0.001 -0.014}	2000
Z4A/500 kN	1-Z4/500kN/ZGOW 1-Z4/500kN/ZGUW	17.3 12.0	570	590	764	784	44	60 ^{+0.003 -0.018}	4000 ¹⁾

¹⁾ secured with 2 screws to prevent rotation; transducer side with internal 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 (+)

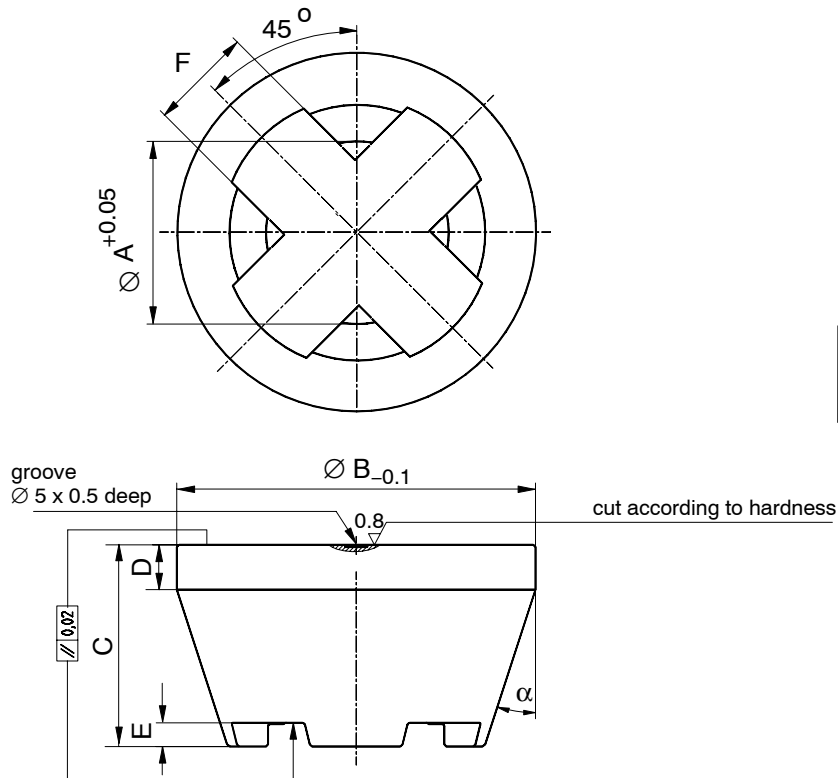
gy (grey)

Sensor circuit (-)

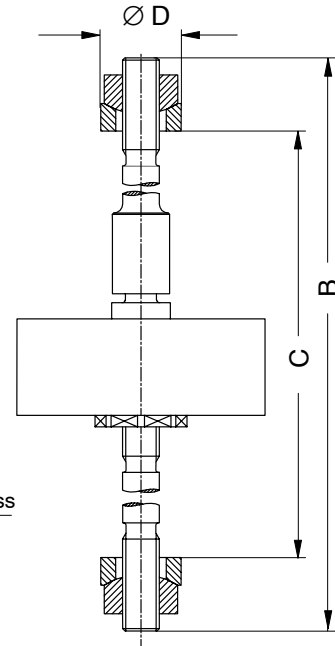
Cable shielding, connected to housing

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

EDO4



Tensile force introduction ZKM



Type	Thrust piece Order no.	Weight (kg)	$\varnothing A$	$\varnothing B$	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	

Type	ZKM Order no.	Weight (kg)	B	C		$\varnothing D$
				min	max	
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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