

Z6... Load cell

with
IO-Link
option

SPECIAL FEATURES

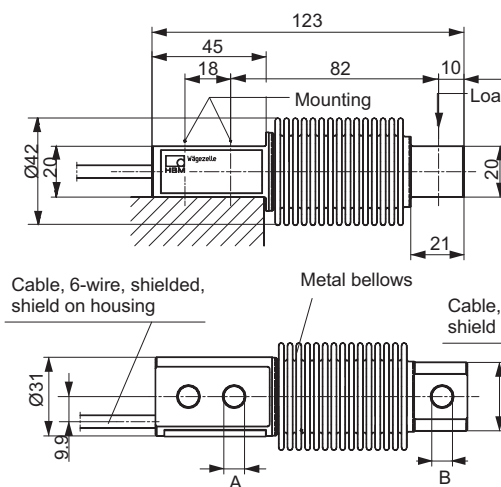
- Maximum capacities: 5 kg ... 1 t
- Load cells and mounting aids made of rust-resistant materials
- Legal for trade up to 6000 parts, test report to OIML R60
- Approval as per NTEP III M5000 (USA & Canada)
- Six-wire configuration
- Optimized for parallel connection
- Options: Explosion protection versions as per ATEX, IECEx and FM (US/CA)
- Available with M12x1 male connector as (K-)Z6-P
- Optional: Available with flexible (and space-saving) drag chain cable
- Available as LCMC measurement chain with smart option (IO-Link), with digital option (CANopen or RS-485), with analog option (4 ... 20 mA or 0 ... 10 V)

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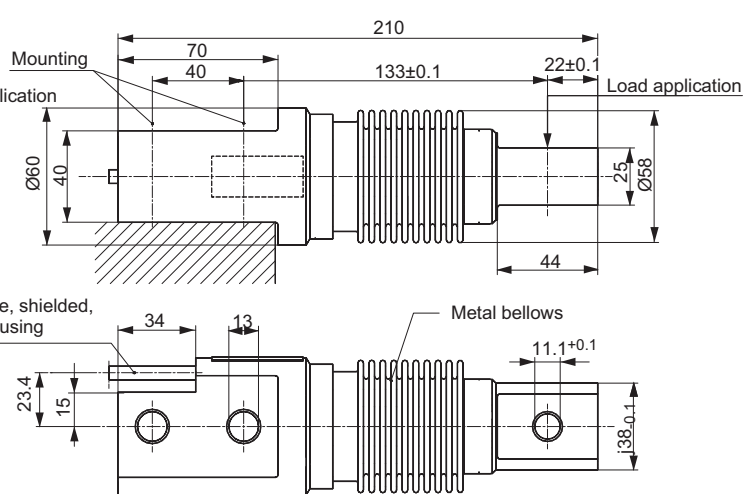


DIMENSIONS

Z6F; Maximum capacities 5 kg...500 kg



Z6; Maximum capacity 500 kg (G), 1 t (F)



	A	B
5...200 kg	8.2	8.2
500 kg	10.5	11.1

Cable Ø5.4; 3 m long (standard version)

Dimensions (in mm; 1 mm = 0.03937 inches)

SPECIFICATIONS

Type			Z6(F/G)D1	Z6(F/G)C3	Z6FC4	Z6FC6
Accuracy class to OIML R 60			D1	C3	C4	C6
Number of load cell verification intervals	n_{LC}		1000	3000	4000	6000
Maximum capacity	E_{max}	kg	5; 10; 20; 30; 50; 100; 200; 500	10; 20; 30; 50; 100; 200; 500	20; 30; 50; 100; 200; 500	20; 30; 50; 100; 200
		t	1	1	-	-
Minimum load cell verification interval	v_{min}	% of	0.036	0.009 0.0083 (30 kg)	0.0066	0.0066
		E_{max}	2778	11111 12000 (30 kg)	15000	15000
Y value	Y					
Accuracy class to NTEP IIIM¹⁾						
Number of load cell verification intervals	n_{LC}			5000		
Maximum capacity	E_{max}	kg		20; 30; 50; 100; 200		
Minimum load cell verification interval	v_{min}	% of E_{max}		$E_{max}/11111$ $E_{max}/12000$ (30 kg)		
General specifications						
Nominal (rated) output	C_n	mV/V	2			
Rated output tolerance with load appl. in stated direction		%	+(1;-0.1)	$\pm 0.05^2)$		
Temperature coefficient of rated output³⁾	TC_C	% of $C_n/10$ K	± 0.0500	± 0.0080	± 0.0070	± 0.0040
Temperature coefficient of zero signal	TC_0		± 0.0500	± 0.0125 ± 0.0116 (30 kg)	± 0.0093	± 0.0093
Relative reversibility error³⁾	d_{hy}	% of C_n	± 0.0500	± 0.0170	± 0.0130	± 0.0080
Non-linearity³⁾	d_{lin}		± 0.0500	± 0.0180	± 0.0150	± 0.0110
Creep upon loading in 30 min.	d_{DR}		± 0.0490	± 0.0166	± 0.0125	± 0.0083
Input resistance	R_{LC}	Ω	350...480			
Output resistance	R_0		356 ± 0.2	356 ± 0.12		
Reference voltage⁴⁾	U_{ref}	V	5			
Nominal (rated) range of the excitation voltage⁴⁾	B_u		0.5...12			
Insulation resistance	R_{is}		> 5			
Nominal (rated) range of the ambient temperature⁴⁾	B_T	$^{\circ}C$	-10...+40			
Operating temperature range⁴⁾	B_{tu}		-30...+70			
Storage temperature range	B_{tl}		-50...+85			
Limit load	E_L	% of	150			
Breaking load	E_d	E_{max}	≥ 300			

1) Load cells of OIML accuracy class C3 also conform to accuracy class NTEP (USA) III M5000 with maximum capacities 20 to 200 kg. They therefore have a second NTEP label.

2) For load cell Z6FC3/10kg: $\leq \pm 0.1$ %.

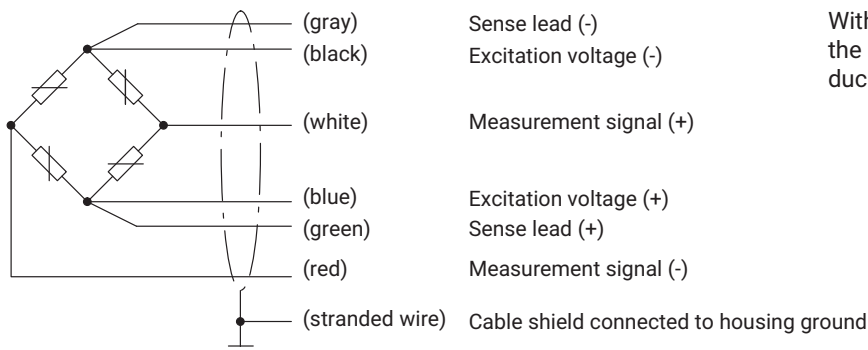
3) The values for non-linearity, relative reversibility error and temperature response of the output range are recommended values. If these values are added together, the total is within the accumulated error limit to OIML R60.

4) For use in potentially explosive atmospheres see the Ex safety instructions.

Maximum capacity		kg	5	10	20	30	50	100	200	500	1000
Permissible oscillation stress		% of E_{max}	100	100	100	100	100	100	100	70	100
Nominal (rated) displacement approx.	s_{nom}	mm	0.24	0.3	0.29	0.28	0.27	0.31	0.39	0.6	0.55
Weight approx.	G	kg	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	2.3
Degree of protection (IP) to EN60529 (IEC529)			IP 68 (tougher test conditions: 1 m water column;100 h)								
Material			Stainless steel ⁵⁾								
Measuring body			Stainless steel ⁵⁾								
Bellows			Stainless steel/Viton®								
Cable entry			PVC								
Cable sheath											

⁵⁾ To EN 10088-1

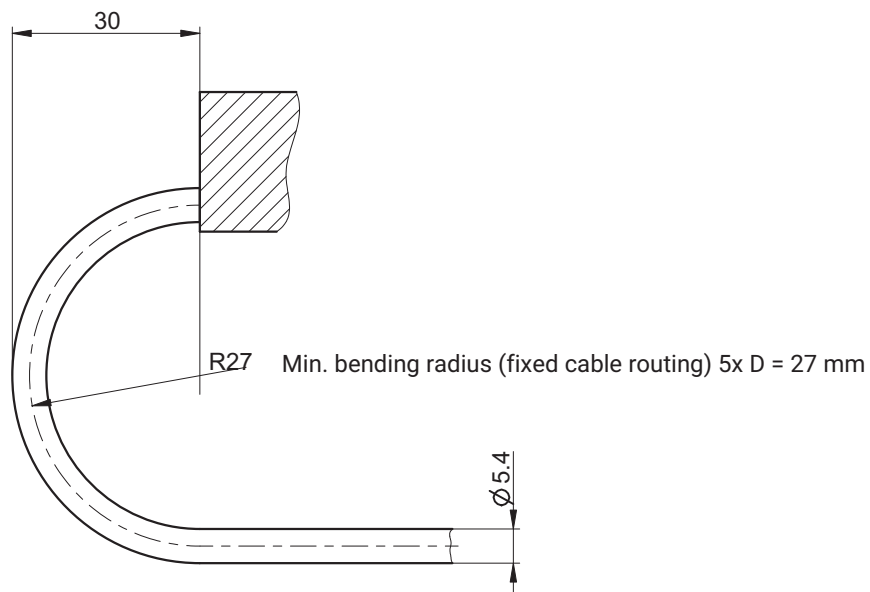
Cable assignment (6-wire configuration)



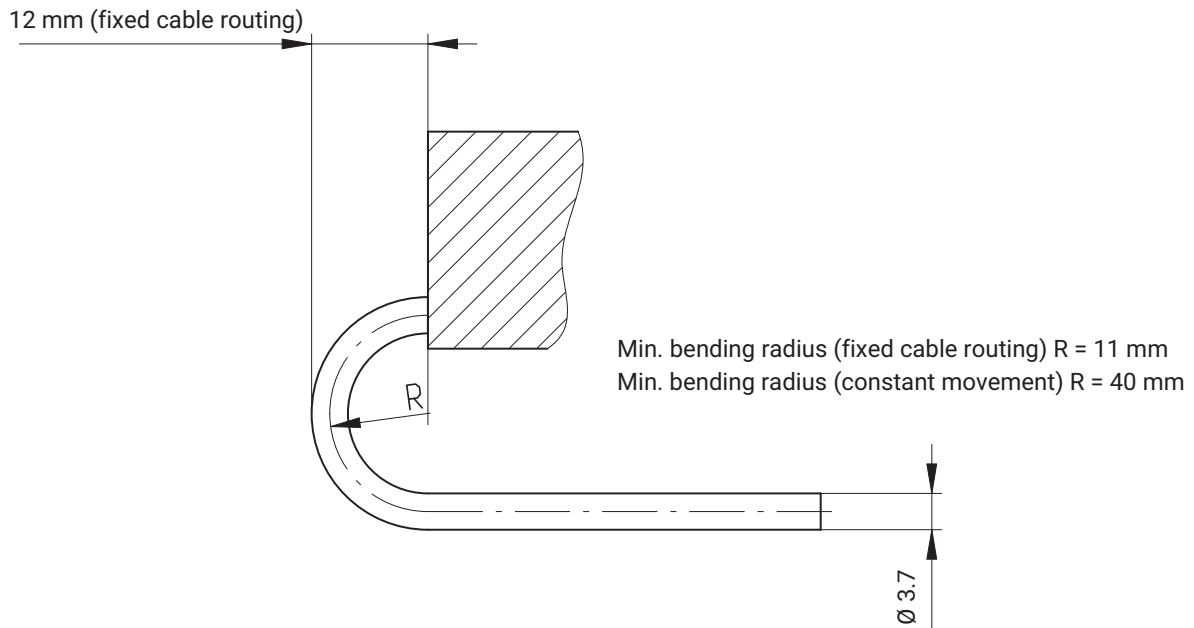
With this cable assignment, the output voltage at the signal conditioner is positive when the transducer is under load.

CONNECTION DIMENSIONS OF THE CABLE

Standard PVC cable (3m; alternatively 6 or 12m)



Drag chain cable (optional, code: DC3)



MOUNTING AIDS, NOT INCLUDED IN SCOPE OF SUPPLY (DIMENSIONS IN MM)

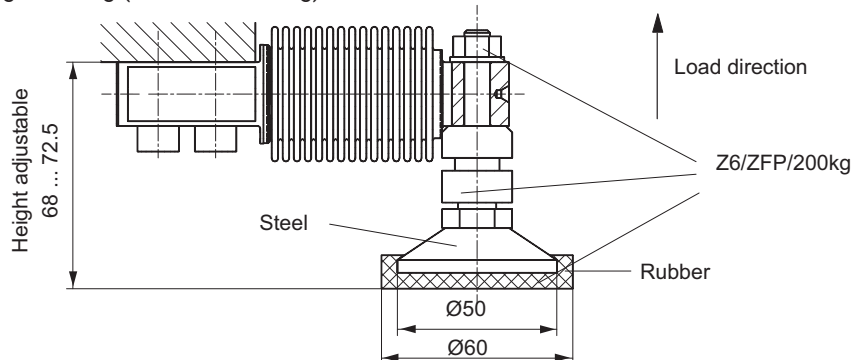
To minimize error effects from load application, HBK offers different tried and tested load application elements for this type of load cell based on the mounting conditions:

Ordering number	Mounting aid
1-Z6/ZFP/200kg	Oscillating loading foot
1-Z6/xxxkg/ZGWR	Knuckle eye (maintenance free)
1-Z6/200kg/ZRR	Fold-back arm
1-Z6/ZKP/200kg	Oscillating loading foot
1-Z6/xxxkg/ZK	Cone, conical pan
1-Z6/PCX/500kg/SET	Oscillating loading foot (set)
1-Z6/ZPU/xxxkg	Mounting base/mounting kit
1-Z6/xxxkg/ZPL	Pendulum bearing
1-Z6/xxxkg/ZEL	Rubber-metal bearing

Notice: All mounting aids are made of rust-resistant material. The rubber parts of the ZEL are made of chloroprene rubber.

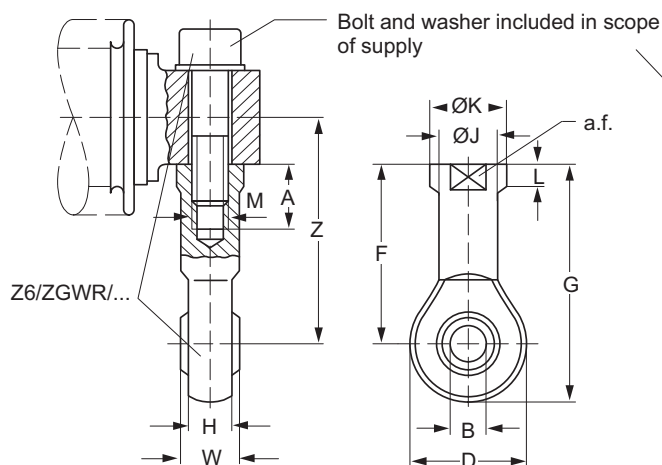
Oscillating loading foot ZFP

for maximum capacities 5 kg ... 200 kg (1-Z6/ZFP/200 kg)



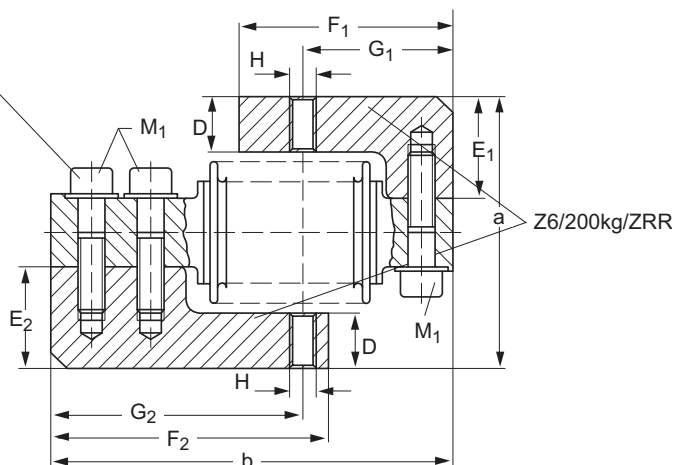
Knuckle eye ZGWR (maintenance free)

for max. capacities 5 kg...1 t (1-Z6/200kg/ZGWR; 1-Z6/1t/ZGWR)



Fold-back arm ZRR

for max. capacities 5 kg ... 200 kg (1-Z6/200kg/ZRR)

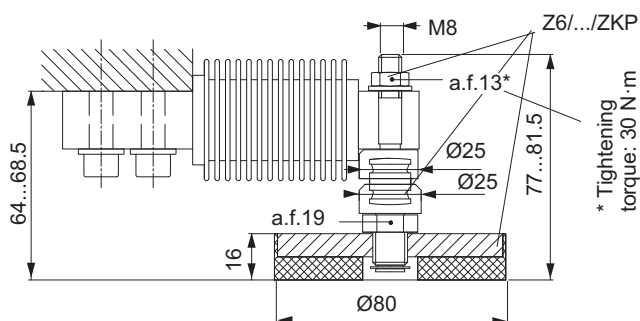


Maximum capacity	ZGWR	A	B	D	F	G	H	Ø J	Ø K	L	M	a.f.	W	Z
5...200 kg	Z6/200kg/ZGWR	16	8 ^{H7}	24	36	48	9	12.5	16	5	M8	14	12	46
500 kg	Z6/1t/ZGWR	20	10 ^{H7}	28	43	57	10.5	15	19	6.5	M10	17	14	53
1 t	Z6/1t/ZGWR	20	10 ^{H7}	28	43	57	10.5	15	19	6.5	M10	17	14	55.5

Maximum capacity	ZRR	D	E ₁	E ₂	F ₁	F ₂	G ₁	G ₂	H	M ₁	a	b	Depth
5...200 kg	Z6/200kg/ZRR	16	30	30	65	85	46	77	M8	M8x30	80 ± 1.1	123	15

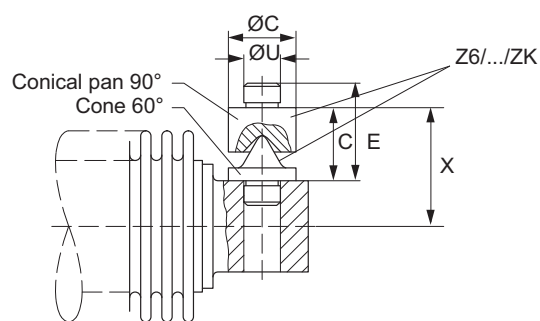
Oscillating loading foot ZKP

for max. capacities 5 kg...200 kg (1-Z6/ZKP/200kg)



Cone, conical pan ZK

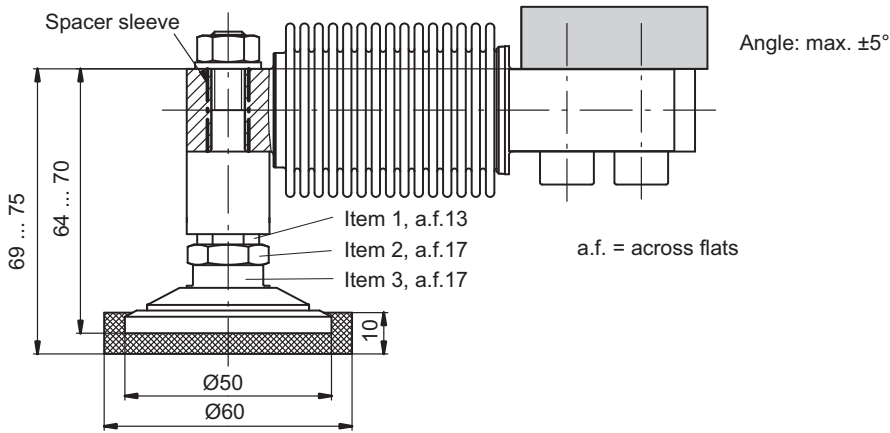
for max. capacities 5 kg...1 t (1-Z6/200kg/ZK, 1-Z6/1t/ZK)



Maximum capacity	Cone, conical pan ZK	Ø C	D	E	Ø U	X
5...200 kg	Z6/200kg/ZK	15	16	21	8.1 _{-0.05}	26
500 kg	Z6/1t/ZK	18	24	32	11 _{-0.05}	34
1 t	Z6/1t/ZK	18	24	32	11 _{-0.05}	36.5

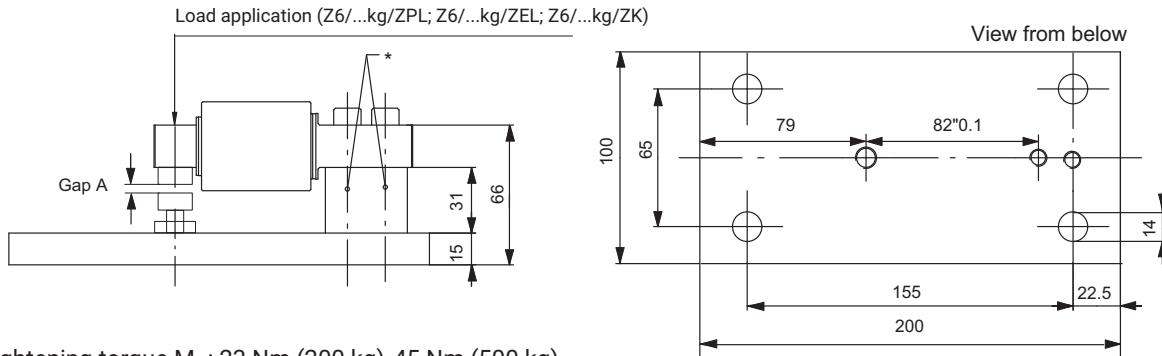
Oscillating loading foot PCX

for maximum capacities 5 kg... 500 kg (1-Z6/PCX/500kg/SET); 1 set comprising 4 pieces Z6/PCX/500kg



Mounting base/mounting kit ZPU

for maximum capacities 5 kg ... 200 kg (1-Z6/ZPU/200kg) and 500 kg (1-Z6/ZPU/500kg)

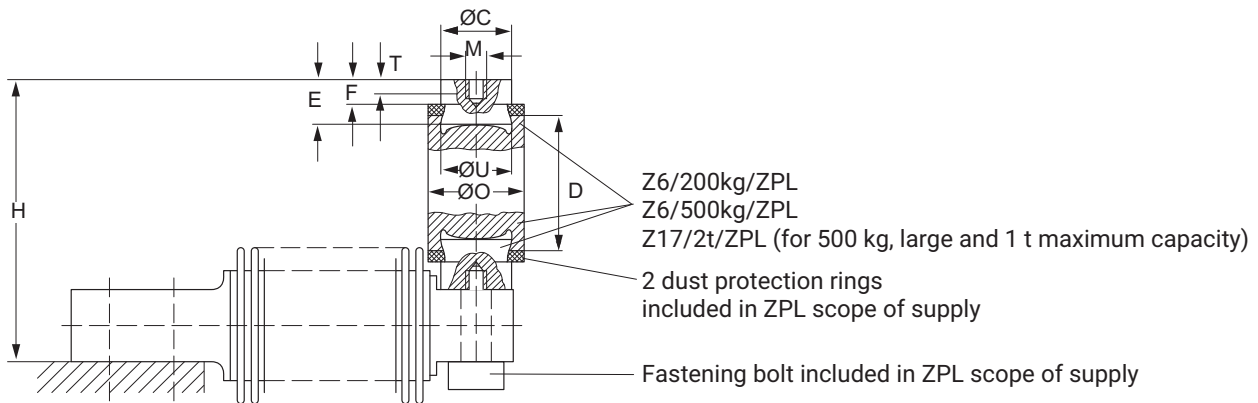


* Tightening torque M_A : 23 Nm (200 kg); 45 Nm (500 kg)

Gap A: In a load cell at maximum capacity, there should be a gap width of 0.05 mm

Pendulum bearing ZPL

for maximum capacities 5 kg ... 200 kg (1-Z6/200kg/ZPL); 500 kg (1-Z6/500kg/ZPL), 1 t (1-Z17/2t/ZPL)



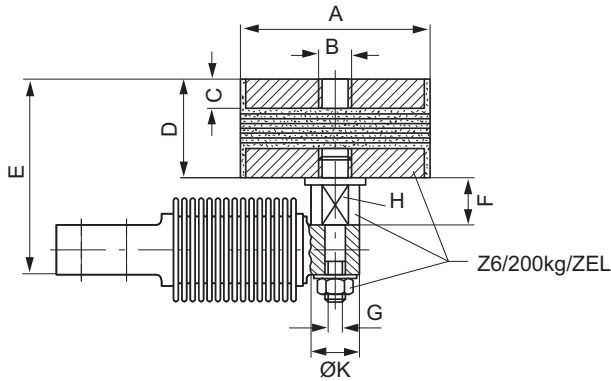
Maximum capacity	Pendulum bearing ZPL	Ø C	D	H	M	ØO	T	E	F	ØU	$F_R^{1)}$ (% of load)	$s_{max}^{2)}$ (mm)
5...200 kg	Z6/200kg/ZPL	20 _{-0.2}	45	89 ^{+0.6} _{-0.8}	M8	30	6.5	17	9	20 ^{D10}	2.8	3.5
500 kg	Z6/500kg/ZPL	20 _{-0.2}	45	89 ^{+0.6} _{-0.8}	M8	30	6.5	17	9	20 ^{D10}	2.8	3.5
1 t	Z17/2t/ZPL	30 _{-0.1}	60	126.5	M10	46	8	22	14	30 ^{D10}	2	7.5

1) F_R : Restoring force in N, with 1 mm lateral displacement

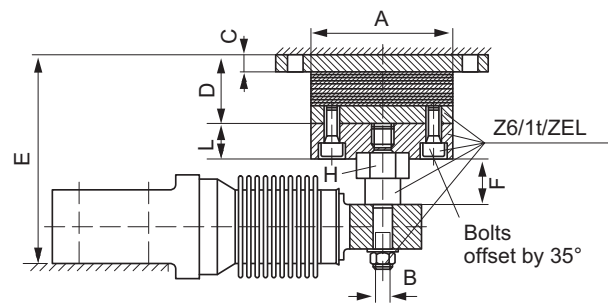
2) s_{max} : Max. permissible lateral displacement at maximum capacity

Rubber-metal bearing ZEL

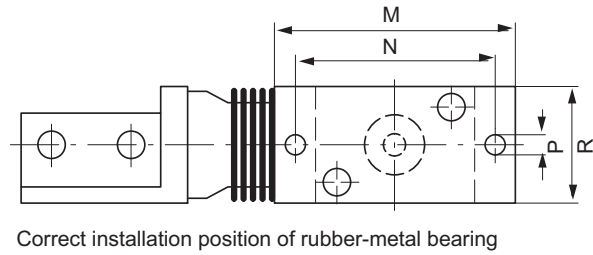
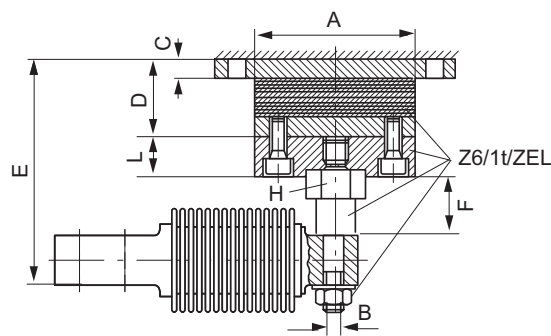
for maximum capacities 5 kg...200 kg (1-Z6/200kg/ZEL)



for maximum capacities 1 t (1-Z6/1t/ZEL)



for maximum capacity 500 kg (1-Z6/1t/ZEL)



Maximum capacity	ZEL	A	B	C	D	E	F	G	H	K	L	M	N	P	R	FR ¹⁾ *	S _{max} ²⁾
5...200 kg	Z6/200kg/ZEL	75	M12	12	40	79 ± 1.3	18.5	M8	a.f.17	19	-	-	-	-	-	163	3
500 kg	Z6/1t/ZEL	80	M10	10	39	105 ^{+2.1} _{-2.2}	26	-	a.f.27	-	20	120	100	9	60	400	4.5
1 t	Z6/1t/ZEL	80	M10	10	39	117 ^{+2.1} _{-2.2}	26	-	a.f.27	-	20	120	100	9	60	400	4.5

1) FR: Restoring force in N, with 1 mm lateral displacement

2) S_{max}: in mm, max. permissible lateral displacement at maximum capacity

ORDERING NUMBERS

Type	Z6			
Accuracy class	D1 (OIML)	C3 (OIML) ¹⁾	C4 (OIML)	C6 (OIML)
Maximum capacity	Ordering number			
5 kg	1-Z6FD1/5KG-1			
10 kg	1-Z6FD1/10KG-1	1-Z6FC3/10KG-1		
20 kg	1-Z6FD1/20KG-1	1-Z6FC3/20KG-1	1-Z6FC4/20KG-1	1-Z6FC6/20KG-1
30 kg	1-Z6FD1/30KG-1	1-Z6FC3/30KG-1	1-Z6FC4/30KG-1	1-Z6FC6/30KG-1
50 kg	1-Z6FD1/50KG-1	1-Z6FC3/50KG-1	1-Z6FC4/50KG-1	1-Z6FC6/50KG-1
100 kg	1-Z6FD1/100KG-1	1-Z6FC3/100KG-1	1-Z6FC4/100KG-1	1-Z6FC6/100KG-1
200 kg	1-Z6FD1/200KG-1	1-Z6FC3/200KG-1	1-Z6FC4/200KG-1	1-Z6FC6/200KG-1
500 kg	1-Z6FD1/500KG-1	1-Z6FC3/500KG-1 1-Z6GC3/500KG ²⁾	1-Z6FC4/500KG-1	
1 t	1-Z6FD1/1T	1-Z6FC3/1T		

1) The maximum capacities from 20 kg up to and including 200 kg also have an NTEP III M5000 label.

2) Type Z6G with large measuring body, just as 1t version

Cable lengths: 3 m standard cable for all maximum capacities

Z6 LOAD CELLS, OPTIONAL VERSIONS

K-Z6-		
1	Code	Option 1: Design
	F	Z6F
	G	Z6G (large) [only with Option 2: = C3 + Option 3: = 500]
2	Code	Option 2: Accuracy class
	D1	D1 (OIML) [not with Option 1: = G]
	C3	C3 (OIML) ¹⁾
	C4	C4 (OIML) [only with Option 3: = 20 / 30 / 50 / 100 / 200 / 500 + Option 5: = S3]
	C6	C6 (OIML) [only with Option 3: = 20 / 30 / 50 / 100 / 200 / 500 + Option 5: = S3]
3	Code	Option 3: Nominal load
	5	5 kg [only with Option 2: = D1]
	10	10 kg [only with Option 2: = D1 / C3]
	20	20 kg
	30	30 kg [only with Option 4: = N/(AI2/21)]
	50	50 kg
	100	100 kg
	200	200 kg
	500	500 kg [only with Option 2: = D1 / C3 / C4]
1000	1t [only with Option 2: = D1 / C3]	
4	Code	Option 4: Explosion-proof version
	N	No explosion protection
	AI1/21	ATEX+IECEEx+FM Zone 1/21
	AI2/21	ATEX+IECEEx Zone 2/21
	AI2/21_F	ATEX+IECEEx Zone 2/21 + FM [not with Option 2: = C4 / C6]
5	Code	Option 5: Cable length
	S3	3 m Standard
	6	6 m [not with Option 2: = C6]
	12	12 m [not with Option 2: = C6]
	DC3	3 m PUR drag chain cable [only with Option 1: = F + Option 2: = D1 / C3 + Option 4: = N]
6	Code	Option 6: Other
	N	Without
	AU	With Australian type label NMIA no. S497 [not with Option 3: = 30] [not with option 2= C6 + Option 3: = 20]

K-Z6 - - - - - -

1 2 3 4 5 6

¹⁾ Maximum capacities from 20 kg up to and including 200 kg also have an NTEP III M5000 label.

Explosion protection versions as per ATEX, IECEx and FM (US/CA)

- AI1/21 ^{1), 2)} ATEX+IECEx+FM Zone 1/21, intrinsically safe;
- ATEX/IECEx: II 2G Ex ia IIC T6/T4 Gb + II 2D Ex ia IIIC T125°C Db
- FM(US/CA): Class I Zone 1 AEx/Ex ia IIC T4 Gb + Zone 21 AEx/Ex ia IIIC T125°C Db
- FM(US): Class I, II, III Division 1, Groups A, B, C, D, E, F, G T4
- AI2/21 ^{1), 4)} ATEX+IECEx Zone 2/21, not intrinsically safe;
- ATEX/IECEx: II 3G Ex ec IIC T6/T4 Gc + II 2D Ex tb IIIC T125°C Db
- AI2/21_F ^{1), 3)} ATEX+IECEx Zone 2/21 + FM, not intrinsically safe;
- ATEX/IECEx: II 3G Ex ec IIC T6/T4 Gc + II 2D Ex tb IIIC T125°C Db
- FM(US): Class I, II, III Division 2, Groups A, B, C, D, F, G T4

1) BVS 13 ATEX E 108 X + IECEx BVS 13.0109 X

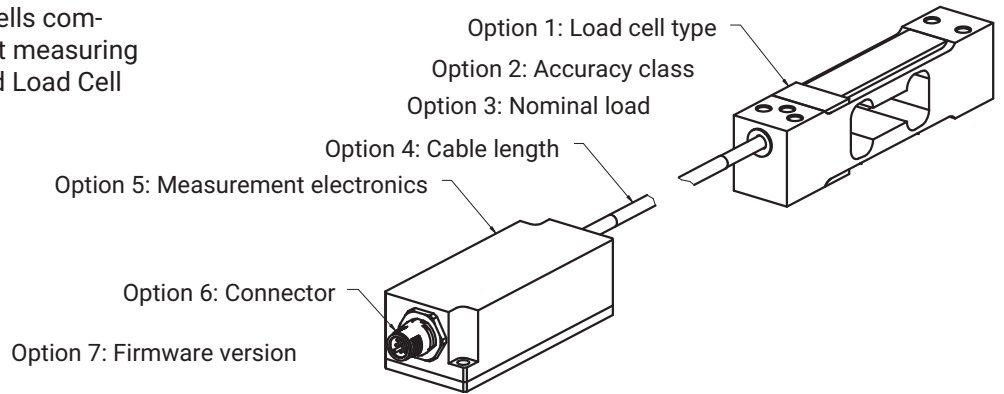
2) FM 18 US 0176 X + FM 18 CA 0144 X

3) FM 17 US 0159

4) Option AI2/21 IECEx + ATEX Zone 2/21 includes Zone 2/22

LCMC - LOAD CELL MEASURING CHAIN

A wide range of famous load cells combined with a choice of excellent measuring electronics makes your tailored Load Cell Measuring Chain.



K-LCMC-Z6 ordering options

K-LCMC		
1	Code	Option 1: Load cell type
	Z6	Z6
2	Code	Option 2: Accuracy class
	C3	C3
3	Code	Option 3: Nominal load
	10K0	10 kg
	20K0	20 kg
	30K0	30 kg
	50K0	50 kg
	100K	100 kg
	200K	200 kg
500K	500 kg	
4	Code	Option 4: Cable length
	0M3	0.3 m
	0M5	0.5 m
	1M0	1.0 m
3M0	3.0 m	
5	Code	Option 5: Measurement electronics
	105C	CAN (200 S/s)
	105R	RS485 (200 S/s) 2-wire
	112C	CAN (1,200 S/s)
	112R	RS485 (1,200 S/s) 4-wire
	RM42	Analog 4 ... 20 mA
	RM43	Analog 0 .. 10 V
RMIO	IO-link	
6	Code	Option 6: Connector
	M12A8	M12 A-coded, male, 8-pin [only with option 5 = 105C, 105R, 112C, 112R, RM42, RM43]
	M12A4	M12 A-coded, male, 4-pin [only with option 5 = RMIO]
7	Code	Option 7: Firmware version
	N	NA [only with option 5 = 105C, 105R, 112C, 112R, RM42, RM43]
	01	WTIO 1.07 [only with option 5 = RMIO]

K-LCMC - Z6 - C3 - - - - -

1 2 3 4 5 6 7