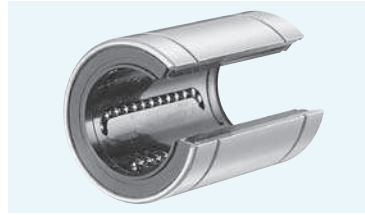


SM-OP TYPE

– Open Type –



part number structure

example **SMS25G UU-OP**

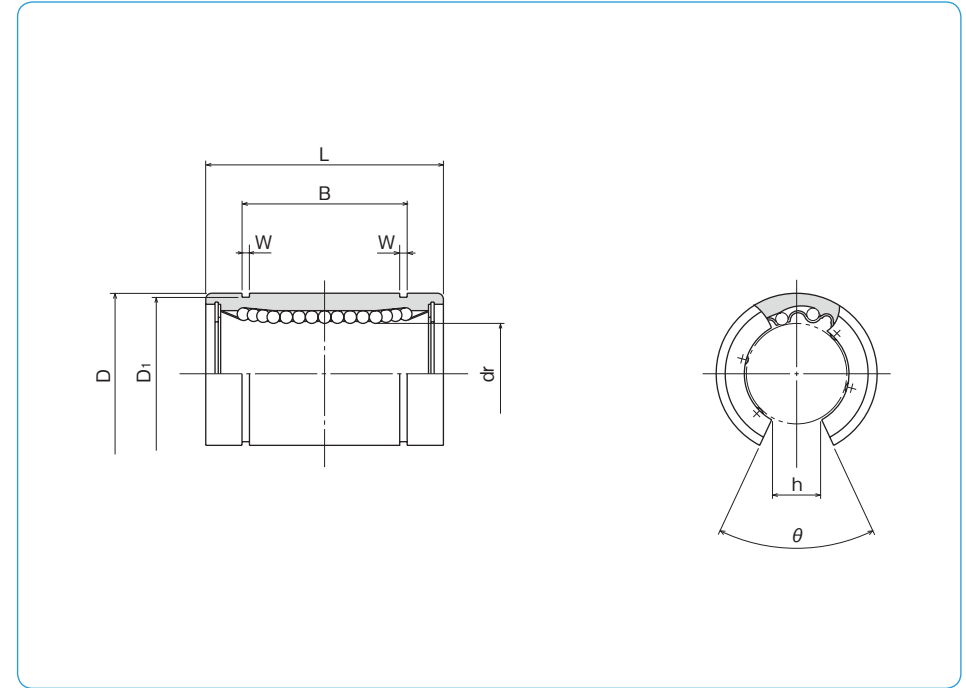
specification
SM: standard
SMS: anti-corrosion

inner contact diameter (dr)

retainer material
blank: standard/steel
 anti-corrosion/stainless steel
G: resin

open type

seal
blank: without seal
U: seal on one side
UU: seals on both sides



part number				number of ball circuits	dr mm	dr tolerance* μm	major dimensions	
standard steel retainer	resin retainer	anti-corrosion stainless retainer	resin retainer				D mm	D tolerance* μm
–	SM10G-OP	–	SMS10G-OP	3	10		19	
SM 12-OP	SM12G-OP	SMS12-OP	SMS12G-OP	3	12	0	21	0
SM 13-OP	SM13G-OP	SMS13-OP	SMS13G-OP	3	13	– 9	23	–13
SM 16-OP	SM16G-OP	SMS16-OP	SMS16G-OP	3	16		28	
SM 20-OP	SM20G-OP	SMS20-OP	SMS20G-OP	4	20	0	32	0
SM 25-OP	SM25G-OP	SMS25-OP	SMS25G-OP	5	25	–10	40	–16
SM 30-OP	SM30G-OP	SMS30-OP	SMS30G-OP	5	30		45	
SM 35-OP	SM35G-OP	SMS35-OP	SMS35G-OP	5	35	0	52	0
SM 40-OP	SM40G-OP	SMS40-OP	SMS40G-OP	5	40	–12	60	–19
SM 50-OP	SM50G-OP	SMS50-OP	SMS50G-OP	5	50	0	80	0
SM 60-OP	SM60G-OP	SMS60-OP	SMS60G-OP	5	60	–15	90	–22
SM 80-OP	SM80G-OP	–	–	5	80	0	120	0
SM100-OP	–	–	–	5	100	–20	150	–25
SM120-OP	–	–	–	6	120		180	
SM150-OP	–	–	–	6	150	0/–25	210	0/–29

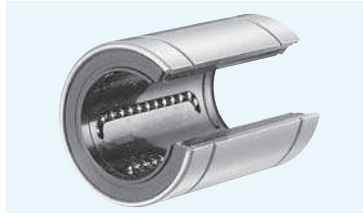
* Accuracy is measured prior to machining open slit.

mm	L tolerance mm	B		W mm	D ₁ mm	h mm	θ	eccentricity* μm	basic load rating		mass g	shaft diameter mm
		mm	tolerance mm						C N	Co N		
29	0 –0.2	22	0 –0.2	1.3	18	6.8	80°	12	372	549	23	10
30		23		1.3	20	8	80°		510	784	32	12
32		23		1.3	22	9	80°		510	784	37	13
37		26.5		1.6	27	11	80°		774	1,180	58	16
42		30.5		1.6	30.5	11	60°		882	1,370	79	20
59	0 –0.3	41	0 –0.3	1.85	38	12	50°	15	980	1,570	203	25
64		44.5		1.85	43	15	50°		1,570	2,740	228	30
70		49.5		2.1	49	17	50°		1,670	3,140	355	35
80		60.5		2.1	57	20	50°		2,160	4,020	546	40
100		74		2.6	76.5	25	50°		3,820	7,940	1,420	50
110	0 –0.4	85	0 –0.4	3.15	86.5	30	50°	25	4,700	10,000	1,650	60
140		105.5		4.15	116	40	50°		7,350	16,000	3,750	80
175		125.5		4.15	145	50	50°		14,100	34,800	7,200	100
200		158.6		4.15	175	85	80°		16,400	40,000	11,600	120
240		170.6		5.15	204	105	80°		21,100	54,300	15,700	150

1N=0.102kgf

KB-OP TYPE (Euro Standard)

– Open Type –



part number structure

example **KBS25G UU-OP**

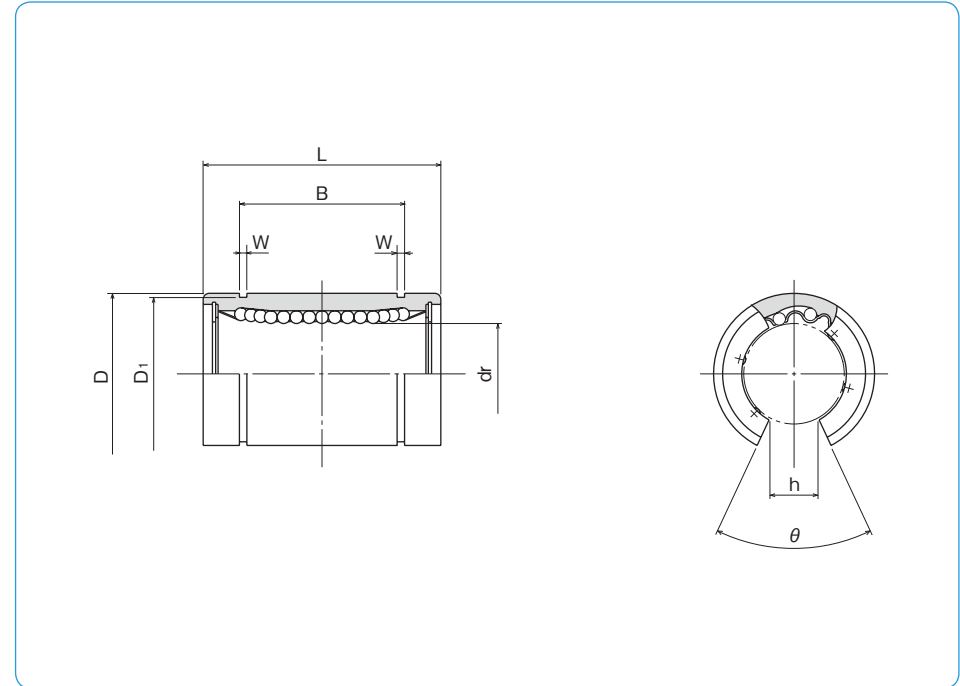
specification
KB: standard
KBS: anti-corrosion

inner contact diameter (dr)

retainer material
blank: standard/steel
 anti-corrosion/stainless steel
G: resin

open type

seal
blank: without seal
U: seal on one side
UU: seals on both sides



part number				number of ball circuits	dr		major dimensions	
standard steel retainer	resin retainer	anti-corrosion stainless retainer	resin retainer		mm	tolerance* μm	D mm	tolerance* μm
—	KB10G-OP	—	KBS10G-OP	3	10	+ 8	19	0
KB12-OP	KB12G-OP	KBS12-OP	KBS12G-OP	3	12	0	22	- 9
KB16-OP	KB16G-OP	KBS16-OP	KBS16G-OP	3	16	+ 9	26	0
KB20-OP	KB20G-OP	KBS20-OP	KBS20G-OP	4	20	- 1	32	-11
KB25-OP	KB25G-OP	KBS25-OP	KBS25G-OP	5	25	+11	40	0
KB30-OP	KB30G-OP	KBS30-OP	KBS30G-OP	5	30	- 1	47	-13
KB40-OP	KB40G-OP	KBS40-OP	KBS40G-OP	5	40	+ 13	62	0
KB50-OP	KB50G-OP	KBS50-OP	KBS50G-OP	5	50	- 2	75	-15
KB60-OP	KB60G-OP	KBS60-OP	KBS60G-OP	5	60		90	0
KB80-OP	—	—	—	5	80	+16/-4	120	-15

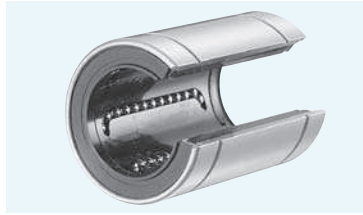
* Accuracy is measured prior to machining open slit.

mm	L tolerance mm	B tolerance mm		W mm	D ₁ mm	h mm	θ	eccentricity* μm	basic load rating		mass g	shaft diameter mm
		mm	mm						dynamic C N	static Co N		
29	0 -0.2	22	0 -0.2	1.3	18	6.8	80°	12	372	549	23	10
32		22.9		1.3	21	7.5	78°		510	784	35	12
36		24.9		1.3	24.9	10	78°		578	892	48	16
45		31.5		1.6	30.3	10	60°		862	1,370	84	20
58	0 -0.3	44.1	0 -0.3	1.85	37.5	12.5	60°	15	980	1,570	195	25
68		52.1		1.85	44.5	12.5	50°		1,570	2,740	309	30
80		60.6		2.15	59	16.8	50°		2,160	4,020	665	40
100		77.6		2.65	72	21	50°		3,820	7,940	1,080	50
125	0 -0.4	101.7	0 -0.4	3.15	86.5	27.2	54°	20	4,700	9,800	1,900	60
165		133.7		4.15	116	36.3	54°		7,350	16,000	4,380	80

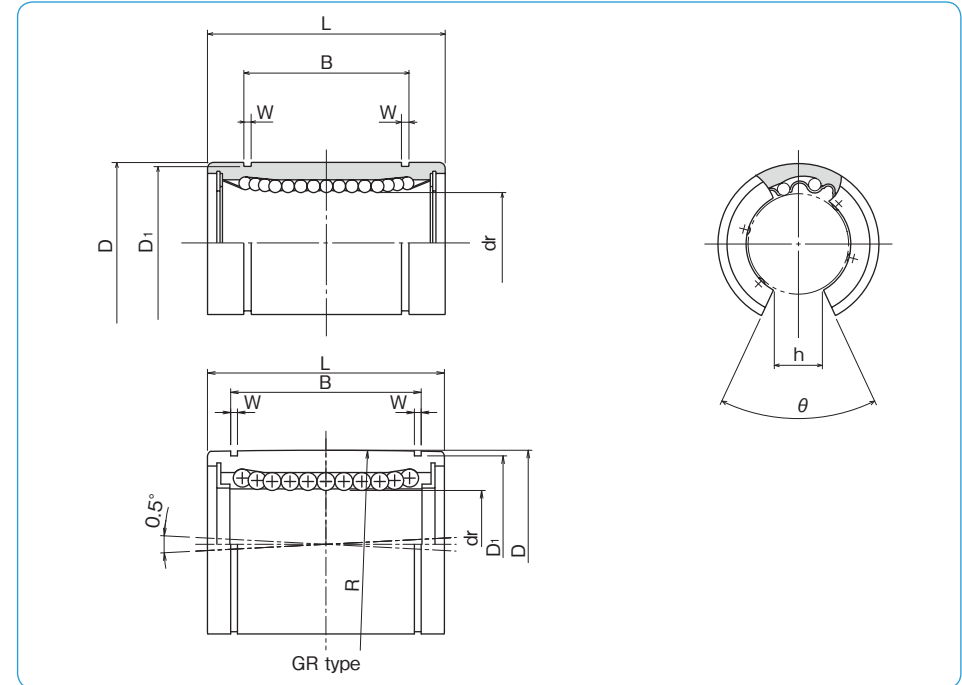
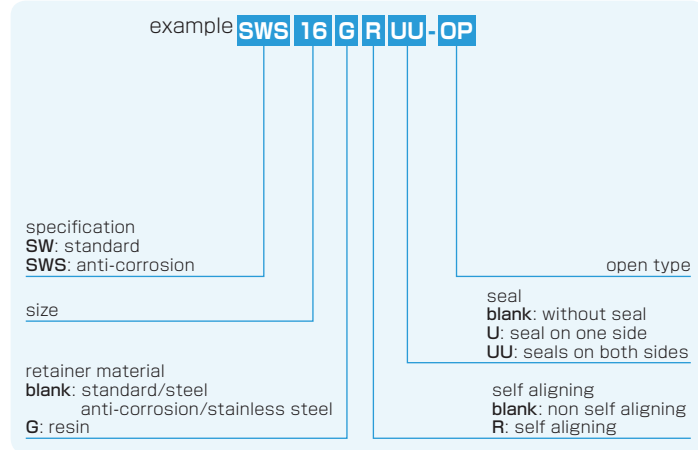
1N=0.102kgf

SW-OP TYPE (Inch Standard)

– Open Type –



part number structure



steel retainer	part number		anti-corrosion		number of ball circuits	dr		major dimensions	
	standard	resin retainer	steel retainer	resin retainer		inch (mm)	tolerance* inch/(μm)	inch (mm)	tolerance* inch/(μm)
SW 8-OP	SW 8G-OP	SW 8GR-OP	SWS 8-OP	SWS 8G-OP	3	.5000 (12.700)	0 (-.00040)	.8750 (22.225)	0 (-.00050)
SW10-OP	SW10G-OP	SW10GR-OP	SWS10-OP	SWS10G-OP	3	.625 (15.875)	0 (-.00040)	1.1250 (28.575)	0 (-.00050)
SW12-OP	SW12G-OP	SW12GR-OP	SWS12-OP	SWS12G-OP	4	.7500 (19.050)	0 (-.00040)	1.2500 (31.750)	0 (-.00065)
SW16-OP	SW16G-OP	SW16GR-OP	SWS16-OP	SWS16G-OP	5	1.0000 (25.400)	0 (-.00040)	1.5625 (39.688)	0 (-.00065)
SW20-OP	SW20G-OP	SW20GR-OP	SWS20-OP	SWS20G-OP	5	1.2500 (31.750)	0 (-.00040)	2.0000 (50.800)	0 (-.00075)
SW24-OP	SW24G-OP	SW24GR-OP	SWS24-OP	SWS24G-OP	5	1.5000 (38.100)	0 (-.00050)	2.3750 (60.325)	0 (-.00075)
SW32-OP	SW32G-OP	SW32GR-OP	SWS32-OP	SWS32G-OP	5	2.0000 (50.800)	0 (-.00050)	3.0000 (76.200)	0 (-.00090)
SW40-OP	-	-	-	-	5	2.5000 (63.500)	0 (-.00060)	3.7500 (95.250)	0 (-.00090)
SW48-OP	-	-	-	-	5	3.0000 (76.200)	0 (-.00060)	4.5000 (114.300)	0 (-.00100)
SW64-OP	-	-	-	-	5	4.0000 (101.600)	0 (-.00090)	6.0000 (152.400)	0 (-.00100)

* Accuracy is measured prior to machining clearance slit.

inch (mm)	L tolerance inch/(mm)	B		W inch (mm)	D ₁ inch (mm)	h inch (mm)	θ	eccentricity* inch (μm)	basic load rating		mass g	shaft diameter inch (mm)
		inch (mm)	tolerance inch/(mm)						dynamic C N	static Co N		
1.2500 (31.750)	0 (-.008)	.9625 (24.46)	0 (-.008)	.0459 (1.168)	.8209 (20.853)	.34 (7.9375)	80°	.0005 (12)	510	784	32	1/2 (12.700)
1.5000 (38.100)	0 (-.008)	1.1039 (28.04)	0 (-.008)	.0559 (1.422)	1.0590 (26.899)	.375 (9.5250)	80°	.0005 (12)	774	1,180	64	5/8 (15.875)
1.6250 (41.275)	0 (-.008)	1.1657 (29.61)	0 (-.008)	.0559 (1.422)	1.1760 (29.870)	.4375 (11.1125)	60°	.0006 (15)	862	1,370	86	3/4 (19.050)
2.2500 (57.150)	0 (-.012)	1.7547 (44.57)	0 (-.012)	.0679 (1.727)	1.4687 (37.306)	.5625 (14.2875)	50°	.0008 (20)	980	1,570	190	1 (25.400)
2.6250 (66.675)	0 (-.012)	2.0047 (50.92)	0 (-.012)	.0679 (1.727)	1.8859 (47.904)	.625 (15.875)	50°	.0008 (20)	1,570	2,740	390	1-1/4 (31.750)
3.0000 (76.200)	0 (-.012)	2.4118 (61.26)	0 (-.012)	0.859 (2.184)	2.2389 (56.870)	.75 (19.05)	50°	.0010 (25)	2,180	4,020	610	1-1/2 (38.100)
4.0000 (101.600)	0 (-.016)	3.1917 (81.07)	0 (-.016)	.1029 (2.616)	2.8379 (72.085)	1.0 (25.40)	50°	.0010 (25)	3,820	7,940	1,120	2 (50.800)
5.0000 (127.000)	0 (-.016)	3.9760 (100.99)	0 (-.016)	.1200 (3.048)	3.5519 (90.220)	1.25 (31.75)	50°	.0010 (25)	4,700	10,000	2,230	2-1/2 (63.500)
6.0000 (152.400)	0 (-.016)	4.726 (120.04)	0 (-.016)	.1200 (3.048)	4.3100 (109.474)	1.5 (38.10)	50°	.0012 (30)	7,350	16,000	3,750	3 (76.200)
8.0000 (203.200)	0 (-.016)	6.258 (158.95)	0 (-.016)	.1389 (3.530)	5.745 (145.923)	2.0 (50.80)	50°	.0012 (30)	14,100	34,800	8,740	4 (101.60)

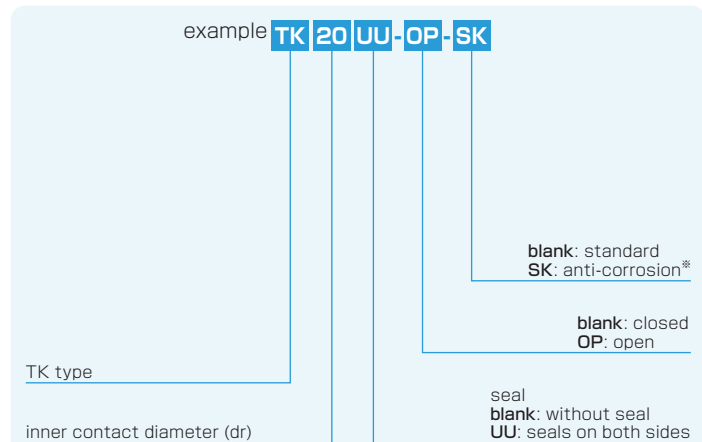
1N≅0.225lbf 1kg≅2.205lbs

TK TYPE

– TOPBALL Metric Type –



part number structure

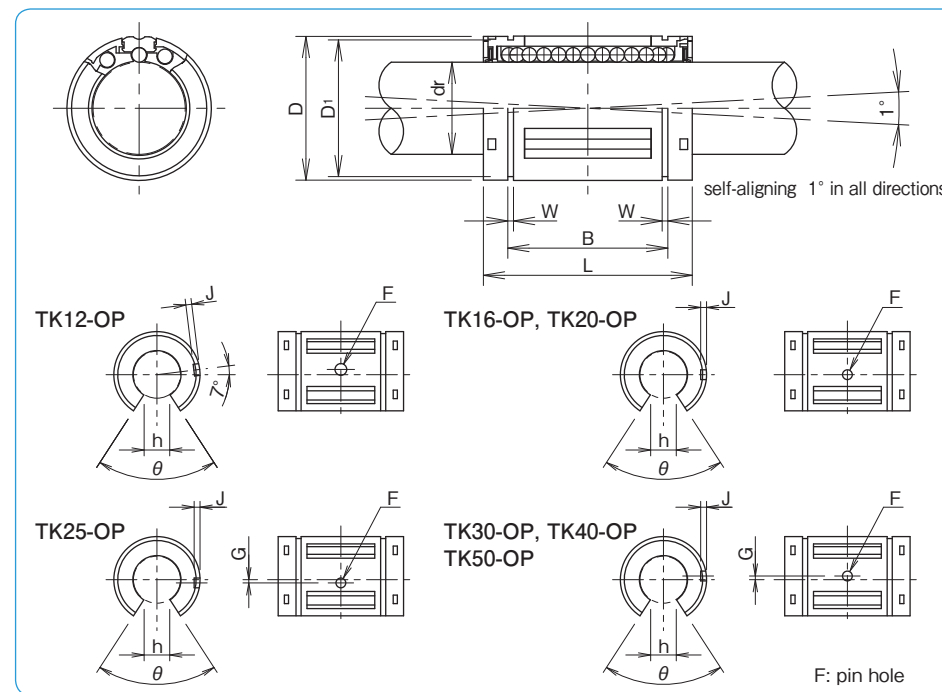


*For anti-corrosion the load plates are electroless nickel plated with stainless steel balls.

closed type		part number		open type		major dimensions					
	number of ball circuits	mass g		number of ball circuits	mass g	dr* mm	tolerance μm	D mm	mm	L mm	tolerance mm
TK 8	4	7.3	—	—	—	8		16	25		±0.2
TK10	5	14	—	—	—	10	+ 8	19	29		
TK12	5	21	TK12-OP	4	17	12	0	22	32		
TK16	5	43	TK16-OP	4	35	16	+ 9	26	36		
TK20	6	58	TK20-OP	5	48	20	- 1	32	45		
TK25	6	123	TK25-OP	5	103	25	+11	40	58		
TK30	6	216	TK30-OP	5	177	30	- 1	47	68		
TK40	6	333	TK40-OP	5	275	40	+13	62	80		
TK50	6	618	TK50-OP	5	520	50	-2	75	100		

* Based on nominal housing bore

** One-sided seal is also available. Please contact NB for details.



mm	B tolerance mm	W mm	D ₁ mm	h mm	θ	open type			basic load rating		shaft diameter mm	
						F ^{H11} mm	G mm	J mm	C N	Co N		
16.5	0	1.1	15.2	—	—	—	—	—	423	534	8	
22.0		1.3	18	—	—	—	—	—	750	935	10	
22.9		-0.2	1.3	21	6.5	66°	3	—	0.7	1,020	1,290	12
24.9			1.3	24.9	9	68°		—	1.0	1,250	1,550	16
31.5	0	1.6	30.3	9	55°	—		1.0	2,090	2,630	20	
44.1		1.85	37.5	11.5	57°	1.5		1.5	3,780	4,720	25	
52.1		1.85	44.5	14	57°	2		1.7	5,470	6,810	30	
60.6		-0.3	2.15	59	19.5	56°		1.5	2.4	6,590	8,230	40
77.6			2.65	72	22.5	54°		5	2.5	2.7	10,800	13,500

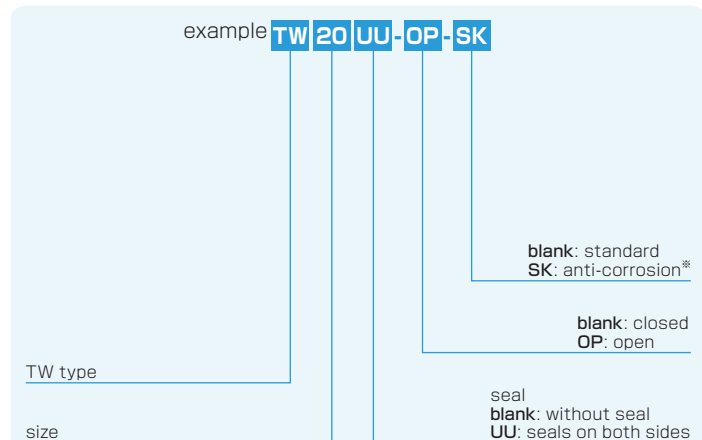
1N≒0.102kgf

TW TYPE

– TOPBALL Inch Type –



part number structure



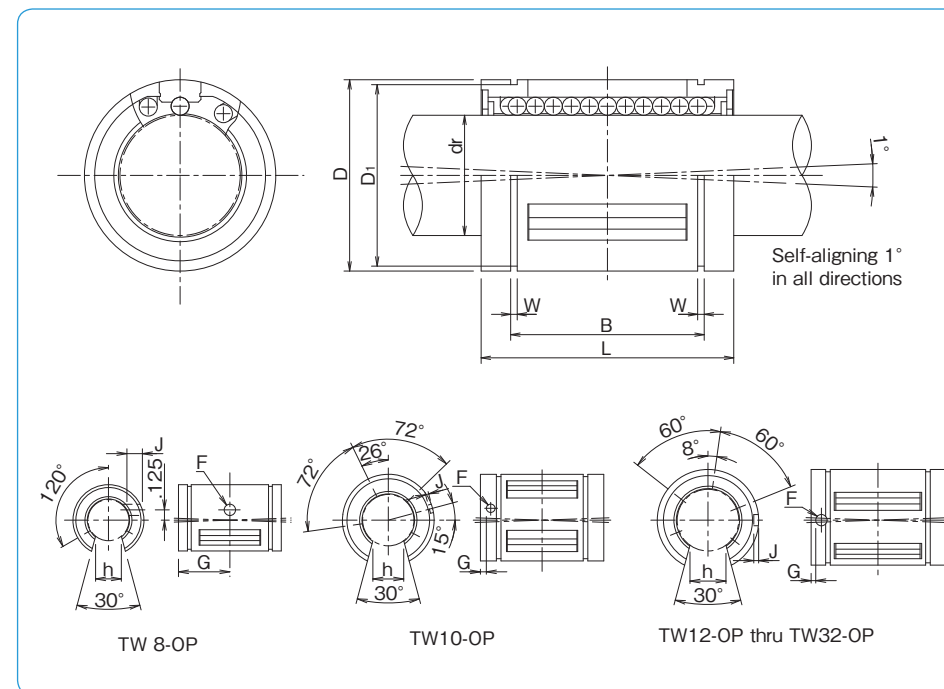
※For anti-corrosion the load plates are electroless nickel plated with stainless steel balls.

closed type	part number		open type		major dimensions				
	number of ball circuits	mass lbs	number of ball circuits	mass lbs	dr*	tolerance inch	D inch	L inch	tolerance inch
TW 3	4	.004	—	—	—	—	.3750	.562	±.008
TW 4	4	.009	—	—	—	—	.5000	.750	0
TW 6	4	.014	—	—	—	—	.6250	.875	-.015
TW 8	4	.043	TW 8-OP	3	.033	.5000	.8750	1.250	0
TW 10	5	.103	TW 10-OP	4	.083	.6250	1.1250	1.500	0
TW 12	6	.123	TW 12-OP	5	.102	.7500	1.2500	1.625	-.020
TW 16	6	.265	TW 16-OP	5	.220	1.0000	1.5625	2.250	0
TW 20	6	.485	TW 20-OP	5	.419	1.2500	2.0000	2.625	0/- .025
TW 24	6	.750	TW 24-OP	5	.639	1.5000	2.3750	3.000	0/- .030
TW 32	6	1.411	TW 32-OP	5	1.168	2.0000	3.0000	4.000	0/- .040

* Based on nominal housing bore

** Seals are not available on TW3.

*** One-sided seal is also available. Please contact NB for details.



B	W	D ₁	h	F	G	J	basic load rating dynamic C	static Co	nominal shaft diameter	
inch	inch	inch	inch	inch	inch	inch	lbf	lbf	inch	
—	—	—	—	—	—	—	35	47	3/16	
.515	0	.0390	.4687	—	—	—	60	80	1/4	
.703	-.015	.0390	.5880	—	—	—	95	120	3/8	
1.032	0	.0459	.8209	.313	.136	.6250	through	230	290	1/2
1.112	0	.0559	1.0590	.375	.105	.1250	.0390	400	500	5/8
1.272	-.020	.0559	1.1760	.438	.136	.1250	.0590	470	590	3/4
1.886	0	.0679	1.4687	.563	.136	.1250	.0470	850	1,060	1
2.011	0/- .025	.0679	1.8859	.625	.201	.1875	.0900	1,230	1,530	1-1/4
2.422	0/- .030	.0859	2.2389	.750	.201	.1875	.0900	1,480	1,850	1-1/2
3.206	0/- .040	.1029	2.8379	1.000	.265	.3125	through	2,430	3,040	2

1inch=25.4mm

1lbs≐0.454kg

1lbf≐4.448N