

NSK ROLLED BALL SCREWS R SERIES

NSK Ltd.

Extract of the catalogue No. E3159
“Precision Machine Components”

B-I-6.4 Rolled Ball Screw R Series

(1) Product classification

NSK rolled ball screws are classified by nut model as shown in Table I-6.4.

Table I-6•4 Classification of rolled ball screws

Nut model	Nut shape		Recirculation system	Lead classification	Page
RNFTL		Flanged, Tube projecting type	Return tube type	Fine, medium lead	B257
				High helix lead	B261
RNFBL		Flanged Circular	Return tube type	Fine, medium lead	B263
RNCT		V-thread (no flange) Projecting tube type	Return tube type	Fine lead	B265
RNSTL		Square type	Return tube type	Small, medium leads	B267
RNFCL		Flanged Circular	End cap type	High helix lead	B269
				Ultra high helix lead	B271

(2) Features

- Short delivery time: R Series is standardized, and available in stock.
- Interchangeable screw shaft and ball nut: Screw shaft and nut assembly components are sold separately, and randomly-matched. The maximum axial play after assembly is shown in the dimension tables (from Page B257 ~ B272).
- Low prices: Screw shaft is processed by rolling. This is why prices are lower than those of precision types.
- Abundant series: There are 128 types of nut assembly combinations in the series. Each combination has two to three different lengths in screw shaft.

(3) Accuracy

- ◇ Lead accuracy: Ct10 grade ($v_{3\sigma}=0.210$).
Refer to "Technical Description: Accuracy" (Page B445) for details.

- ◇ Axial play: Varies with internal specification. Refer to the dimension tables (Page B257).

- ◇ Run out of screw shaft center: Ct10 grade

(4) Nut installation

Refer to "Technical Description: Installation" (Page B477).

(5) Shaft end machining

It is necessary to machine screw shaft end of the rolled ball screw.
Refer to "Configuration of rolled ball screw shaft end" (Page B29) if you use standard support unit. Refer to "Technical Description: Shaft end machining" (Page B480) for procedures and precautions.

(6) Rust prevention

Rust prevention agent is applied at time of delivery. But special surface treatment is not given to these ball screws.

NSK furnishes treatment such as phosphate coating or electrolysis low temperature chrome plating on request.

Reference number of rolled ball screw is described below.
Please use reference number to order, or for a price inquiry.

(7) Reference number

Nut assembly (example)

R N F T L 25 10 A 5 S

Product code (rolled nut)

Nut model FTL, FBL, STL,
CT, FCL

Screw shaft diameter (mm)

Seal code S: With seal
No code: Without seal

Effective turns of balls (turns of
balls x circuit number)

Internal design code

Lead (mm)

Screw shaft (example)

R S 25 10 A 20

Product code (Rolled screw shaft)

Screw shaft diameter (mm)

Screw shaft length (x 100 mm)

Internal design code

Lead (mm)

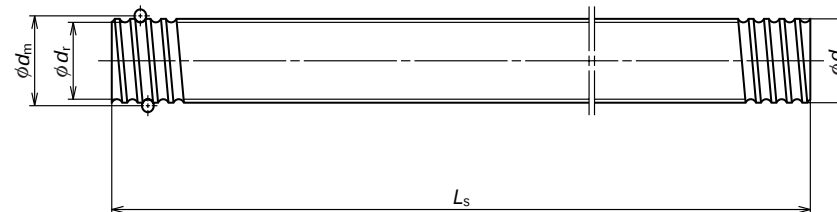
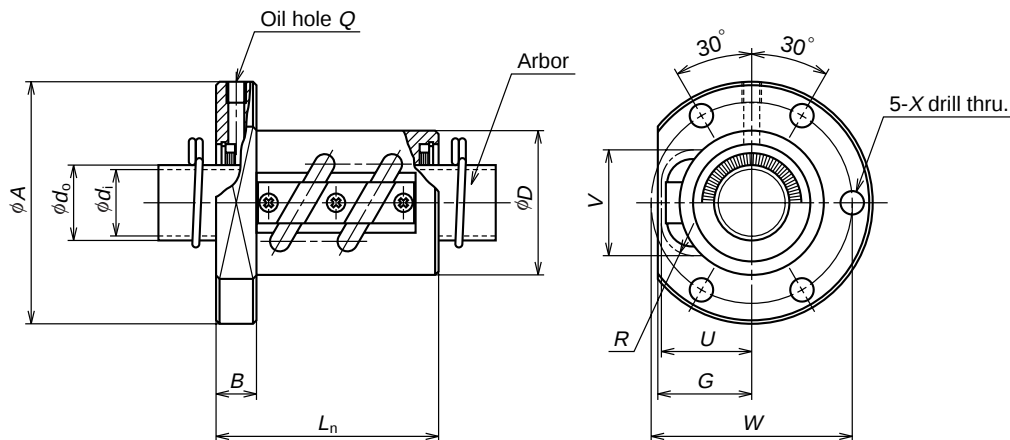
(8) Combinations of shaft diameter/lead

Combinations are shown below in Table I-6.5. The table also indicates nut model codes and page numbers to be referred.

Table I-6.5 Combinations of shaft diameter/lead

Shaft diameter	Lead														
	3	4	5	6	8	10	12	16	20	25	32	40	50	64	80
10	○ B257 △ B265			○ B257 ● B263											
12					○ B257 ● B263		○ B261 ○ B269								
14		○ B257 ● B263 △ B265 □ B267	○ B257 ● B263 △ B265 □ B267												
15									○ B269						
16						○ B257		○ B261 ○ B269			○ B271				
18					○ B265 ● B263 △ B265 □ B267										
20			○ B257 ● B263 △ B265 □ B267			○ B257 ● B263 □ B267			○ B261 ○ B269			○ B271			
25			○ B257 ● B263 △ B265 □ B267			○ B257 ● B263 △ B265 □ B267				○ B261 ○ B269			○ B271		
28				○ B257 ● B263 △ B265 □ B267											
32						○ B259 ● B263 △ B265 □ B267					○ B261 ○ B269			○ B271	
36						○ B259 ● B263 △ B265 □ B267									
40						○ B259 △ B265						○ B261 ○ B269			○ B271
45							○ B259 △ B265 □ B267								
50						○ B259		○ B259 △ B265					○ B269		

○ : RNFTL ● : RNFBL △ : RNCT □ : RNSTL ◎ : RNFCL

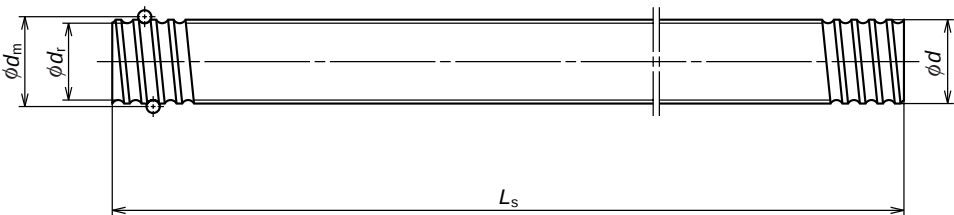
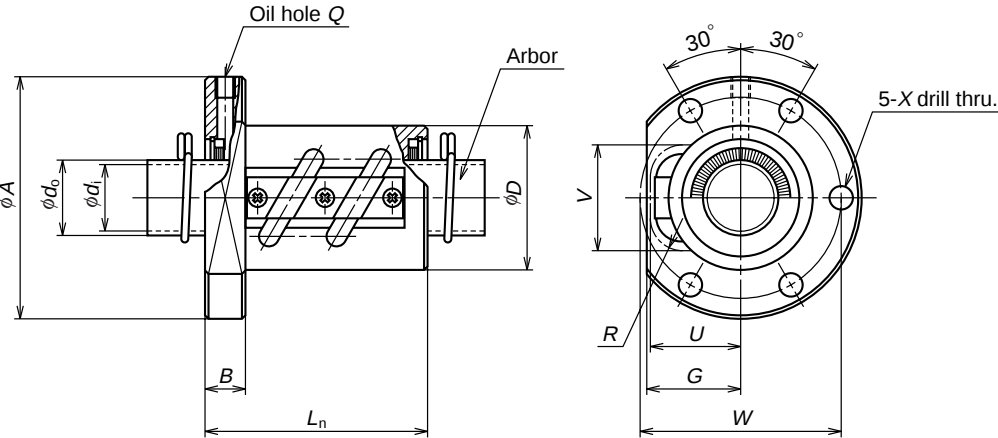


Ball nut No.	Shaft dia. <i>d</i>	Lead <i>l</i>	Ball dia. <i>D_w</i>	Ball circle dia. <i>d_m</i>	Root dia. <i>d_r</i>	Effective turns of balls Turns × Circuits	Basic load rating				Axial play Max.
							N		{kgf}		
							Dynamic <i>C_a</i>	Static <i>C_{0a}</i>	Dynamic <i>C_a</i>	Static <i>C_{0a}</i>	
RNFTL 1003A3.5	10	3	2.381	10.65	8.0	3.5×1	3780	6730	385	685	0.10
RNFTL 1006A2.5S	10	6	2.381	10.65	8.1	2.5×1	2830	4810	290	490	0.10
RNFTL 1208A2.5S	12	8	2.778	12.65	9.6	2.5×1	3730	6560	380	670	0.10
RNFTL 1404A3.5S	14	4	2.778	14.5	11.5	3.5×1	5370	10800	545	1100	0.10
RNFTL 1405A2.5S	14	5	3.175	14.5	11.0	2.5×1	5260	9720	535	990	0.10
RNFTL 1610A2.5	16	10	3.175	16.75	13.3	2.5×1	5660	11500	575	1180	0.10
RNFTL 1610A2.5S											
RNFTL 1808A3.5	18	8	4.762	18.5	13.6	3.5×1	13200	25800	1350	2630	0.15
RNFTL 1808A3.5S											
RNFTL 2005A2.5	20	5	3.175	20.5	17.0	2.5×1	6360	14200	650	1450	0.10
RNFTL 2005A2.5S											
RNFTL 2010A2.5	20	10	4.762	21.25	16.2	2.5×1	10900	21800	1110	2220	0.15
RNFTL 2010A2.5S											
RNFTL 2505A5	25	5	3.175	25.5	22.0	2.5×2	12800	36300	1310	3710	0.10
RNFTL 2505A5S											
RNFTL 2510A2.5	25	10	6.35	26	19.0	2.5×1	17500	35200	1790	3590	0.20
RNFTL 2510A2.5S											
RNFTL 2510A5						2.5×2	31800	70300	3240	7170	
RNFTL 2510A5S											

- Remarks
1. Protruding portion of the tube does not have any interference with the ball nut housing if its dimensions corresponding to U and V are large enough.
 2. The actual entire screw shaft length may become slightly longer than nominal length L_s due to manufacturing tolerance.
 3. Seal is contained in the nut. Therefore, the external dimensions of those with a seal are the same as those without. In the side view drawing of ball nut, the above of the center line is with seal, and beneath is without seal. Seal for those with the shaft diameter of 14 mm or less is made of synthetic resin. Seal for those of 16 mm or over is a "Brush-seal."

Ball nut dimensions											Arbor		Screw shaft			
Outside dia.	Flange		Length	Bolt hole	Oil hole	Projecting tube	Outside dia.	Bore	Standard length			Screw shaft No.				
D	A	G	B	L_n	W	X	Q	U	V	R	d_o	d_i	L_s			
20	40	15	6	34	30	4.5	M3×0.5	15	15	7	8.1	6.1	400	800		RS1003A**
20	40	15	6	36	30	4.5	M3×0.5	15	15	5	8.1	6.1	400	800		RS1006A**
25	45	19	8	46	35	4.5	M3×0.5	19	18	7	9.6	7.6	400	800		RS1208A**
25	50	19	10	43	40	4.5	M6×1	19	20	7	11.5	9.5	500	1000		RS1404A**
30	50	22	10	45	40	4.5	M6×1	22	21	8	11.0	9.0	500	1000		RS1405A**
30	53	23	10	54	41	5.5	M6×1	23	23	8	13.3	11.3	500	1000	1500	RS1610A**
34	63	27	12	58	49	6.6	M6×1	27	27	14	13.6	11.6	500	1000	1500	RS1808A**
40	60	28	10	46	50	4.5	M6×1	28	27	10	17.0	14.6	500	1000	2000	RS2005A**
40	67	30	12	59	53	6.6	M6×1	30	29	12	16.2	13.8	500	1000	2000	RS2010A**
42	71	28	12	66	57	6.6	M6×1	28	31	10	22.0	19.6	1000	2000	2500	RS2505A**
44	80	34	15	62	62	9	M6×1	34	37	17	19.0	16.6	1000	2000	2500	RS2510A**
44	80	34	15	92	62	9	M6×1	34	37	17						

- Remarks
4. Nut assembly with arbor and the screw shaft are separated at time of delivery.
 5. At the end of the screw shaft reference number where marked with "**", fill with the value obtained by dividing the standard screw shaft length by 100 mm.
 6. Items in stock are not applied surface treatment. NSK provides treatment such as phosphate coating on request.

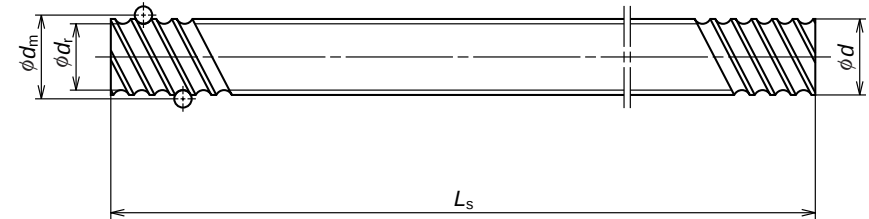
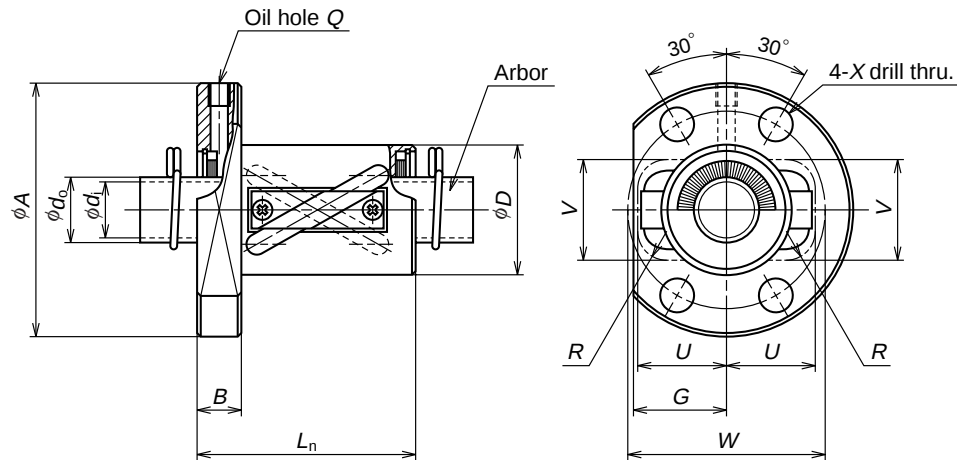


Ball nut No.	Shaft dia. <i>d</i>	Lead <i>l</i>	Ball dia. <i>D_s</i>	Ball circle dia. <i>d_m</i>	Root dia. <i>d_r</i>	Effective turns of balls Turns × Circuits	Basic load rating				Axial play Max.
							N		{kgf}		
							Dynamic <i>C_a</i>	Static <i>C_{0a}</i>	Dynamic <i>C_a</i>	Static <i>C_{0a}</i>	
RNFTL 2806A2.5	28	6	3.175	28.5	25.0	2.5×1	7430	20300	760	2070	0.10
RNFTL 2806A2.5S											
RNFTL 2806A5						2.5×2	13500	40600	1380	4140	
RNFTL 2806A5S											
RNFTL 3210A5	32	10	6.35	33.75	27.0	2.5×2	35700	92200	3640	9410	0.20
RNFTL 3210A5S											
RNFTL 3610A2.5	36	10	6.35	37	30.0	2.5×1	21000	51000	2140	5200	0.20
RNFTL 3610A2.5S											
RNFTL 3610A5						2.5×2	38100	102000	3890	10400	
RNFTL 3610A5S											
RNFTL 4010A7	40	10	6.35	41.75	35.0	3.5×2	53500	164000	5460	16800	0.20
RNFTL 4010A7S	45	12	7.144	46.5	39.0	2.5×2	49600	147000	5060	15000	0.23
RNFTL 4512A5											
RNFTL 4512A5S											
RNFTL 5010A7	50	10	6.35	51.75	45.0	3.5×2	59500	205000	6060	21000	0.20
RNFTL 5010A7S											
RNFTL 5016A5	50	16	9.525	52	42.0	2.5×2	99900	293000	10200	29900	0.23
RNFTL 5016A5S											

Remarks 1. The protruding portion of the tube does not interfere with nut housing if its corresponding dimensions to U and V are large enough.
2. The actual screw shaft length may become slightly longer than nominal length of L_s due to manufacturing tolerance.
3. The seal is contained in the nut. Therefore, the external dimensions of those with a seal are the same as those without.
In the side view drawing of the nut, the above of the center line is with seal, and beneath is without seal.
Seal is "BBrush-seal".

Ball nut dimensions											Arbor		Screw shaft			
Outside dia.	Flange			Length	Bolt hole		Oil hole	Projecting tube			Outside dia.	Bore	Standard length			Screw shaft No.
<i>D</i>	<i>A</i>	<i>G</i>	<i>B</i>	<i>L_n</i>	<i>W</i>	<i>X</i>	<i>Q</i>	<i>U</i>	<i>V</i>	<i>R</i>	<i>d_o</i>	<i>d_i</i>	<i>L_s</i>			
50	79	33	15	55	65	6.6	M6×1	33	34	10	25.0	22.6	1000	2000	2500	RS2806A**
50	79	33	15	79	65	6.6	M6×1	33	34	10						
55	97	39	18	97	75	11	M6×1	39	42	17	27.0	24.6	1000	2000	3000	RS3210A**
60	102	42	18	68	80	11	M6×1	42	46	17	30.0	27.6	1000	2000	3000	RS3610A**
60	102	42	18	98	80	11	M6×1	42	46	17						
65	114	44	20	120	90	14	M6×1	44	50	20	35.0	31.8	2000	3000	4000	RS4010A**
70	130	47	22	116	100	18	M6×1	47	55	20	39.0	35.8	2000	3000	4000	RS4512A**
80	140	52	22	122	110	18	M6×1	52	59	20	45.0	41.8	2000	3000	4000	RS5010A**
85	163	57	28	146	125	22	M6×1	57	63	25	42.0	38.8	2000	3000	4000	RS5016A**

Remarks 4. Nut assembly with arbor and the screw shaft are separated at time of delivery.
5. At the end of the screw shaft reference number where marked with "**", fill with the value obtained by dividing the standard screw shaft length by 100 mm.
6. Items in stock are not applied surface treatment. NSK provides treatment such as phosphate coating on request.

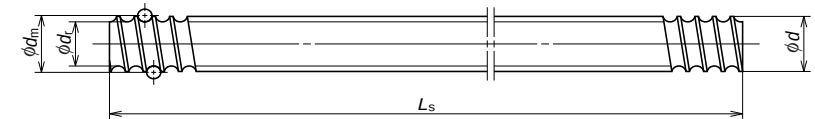
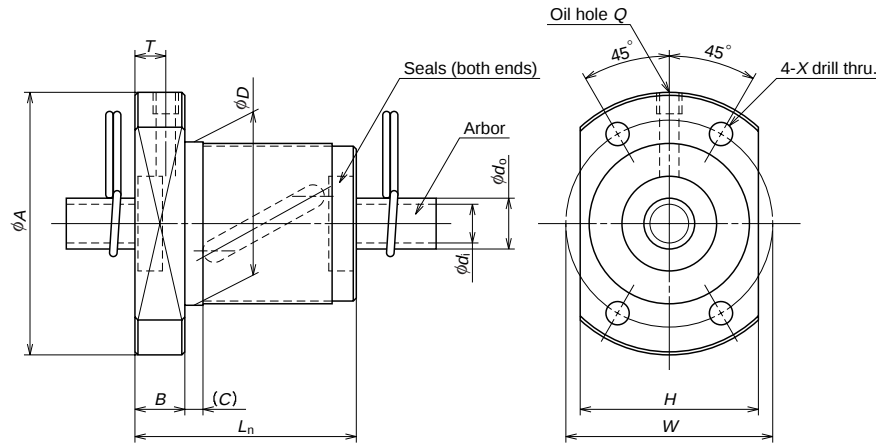


Ball nut No.	Shaft dia. <i>d</i>	Lead <i>l</i>	Ball dia. <i>D_a</i>	Ball circle dia. <i>d_m</i>	Root dia. <i>d_r</i>	Effective turns of balls Turns × Circuits	Basic load rating				Axial play Max
							(N)		{kgf}		
							Dynamic	Static	Dynamic	Static	
							<i>C_a</i>	<i>C_{0a}</i>	<i>C_a</i>	<i>C_{0a}</i>	
RNFTL 1212A3	12	12	2.381	12.65	10.1	1.5 × 2	3360	6270	340	640	0.10
RNFTL 1616A3 RNFTL 1616A3S	16	16	2.778	16.65	13.6	1.5 × 2	4880	9650	500	985	0.10
RNFTL 2020A3 RNFTL 2020A3S	20	20	3.175	20.75	17.3	1.5 × 2	7010	15400	715	1570	0.10
RNFTL 2525A3 RNFTL 2525A3S	25	25	3.969	26	22.0	1.5 × 2	10500	24100	1070	2450	0.12
RNFTL 3232A3 RNFTL 3232A3S	32	32	4.762	33.25	28.0	1.5 × 2	15300	37100	1560	3780	0.15
RNFTL 4040A3 RNFTL 4040A3S	40	40	6.35	41.75	35.0	1.5 × 2	24400	61600	2490	6280	0.20

- Remarks
1. Protruding portion of the tube does not have any interference with the ball nut housing if its dimensions corresponding to U and V are large enough.
 2. The actual entire screw shaft length may become slightly longer than nominal length L_s due to manufacturing tolerance.
 3. Seal is contained in the nut. Therefore, the external dimensions of those with a seal are the same as those without. In the side view drawing of ball nut, the above of the center line is with seal, and beneath is without seal. Seal for those with the shaft diameter of 14 mm or less is made of synthetic resin. Seal for those of 16 mm or over is a "Brush-seal."

Ball nut dimensions										Arbor		Screw shaft		
Outside dia.	Flange		Length	Bolt hole	Oil hole	Projecting tube			Outside dia.	Bore	Standard length			Screw shaft No.
D	A	G	B	L_n	W	X	Q	U	V	R	d_o	d_i	L_s	
24	44	17	8	44	34	4.5	M3 × 0.5	17	16	5	10.1	8.1	400 800	RS1212A**
30	55	22	10	50	43	6.6	M6 × 1	22	22	7	13.6	11.6	500 1000 1500	RS1616A**
35	68	25	12	59	52	9	M6 × 1	25	27	8	17.3	14.9	500 1000 2000	RS2020A**
45	80	31	12	69	63	9	M6 × 1	31	32	10	22.0	19.6	1000 2000 2500	RS2525A**
55	100	37	15	84	80	11	M6 × 1	37	40	12	28.0	25.6	1000 2000 3000	RS3232A**
70	120	46	18	103	95	14	M6 × 1	46	49	15	35.0	31.8	2000 3000 4000	RS4040A**

- Remarks
4. Nut assembly with arbor and the screw shaft are separated at time of delivery.
 5. At the end of the screw shaft reference number where marked with "**", fill with the value obtained by dividing the standard screw shaft length by 100 mm.
 6. Items in stock are not applied surface treatment. NSK provides treatment such as phosphate coating on request.

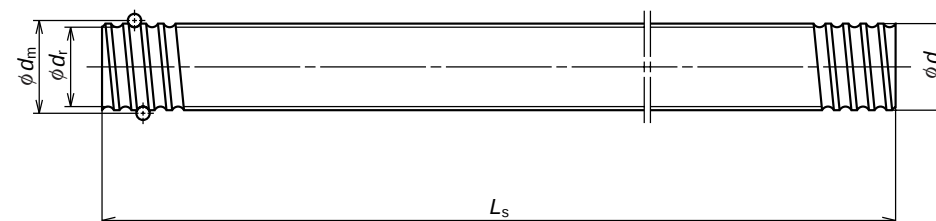
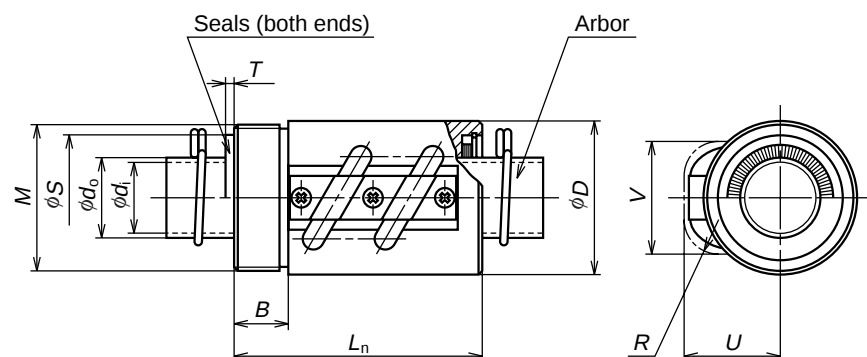


Ball nut No.	Shaft dia. <i>d</i>	Lead <i>l</i>	Ball dia. <i>D_a</i>	Ball circle dia. <i>d_m</i>	Root dia. <i>d</i>	Effective turns of balls Turns × Circuits	Basic load rating				Axial play Max.
							(N)		(kgf)		
							Dynamic <i>C_a</i>	Static <i>C_{0a}</i>	Dynamic <i>C_a</i>	Static <i>C_{0a}</i>	
RNFBL 1006A2.5S	10	6	2.381	10.65	8.1	2.5×1	2830	4810	290	490	0.10
RNFBL 1208A2.5S	12	8	2.778	12.65	9.6	2.5×1	3730	6560	380	670	0.10
RNFBL 1404A3.5S	14	4	2.778	14.5	11.5	3.5×1	5370	10800	545	1100	0.10
RNFBL 1405A2.5S	14	5	3.175	14.5	11.0	2.5×1	5260	9720	535	990	0.10
RNFBL 1808A3.5S	18	8	4.762	18.5	13.6	3.5×1	13200	25800	1350	2630	0.15
RNFBL 2005A2.5S	20	5	3.175	20.5	17.0	2.5×1	6360	14200	650	1450	0.10
RNFBL 2010A2.5S	20	10	4.762	21.25	16.2	2.5×1	10900	21800	1110	2220	0.15
RNFBL 2505A2.5S	25	5	3.175	25.5	22.0	2.5×1	7070	18200	720	1850	0.10
RNFBL 2505A5S						2.5×2	12800	36300	1310	3710	
RNFBL 2510A2.5S	25	10	6.35	26	19.0	2.5×1	17500	35200	1790	3590	0.20
RNFBL 2510A5S						2.5×2	31800	70300	3240	7170	
RNFBL 2806A2.5S	28	6	3.175	28.5	25.0	2.5×1	7430	20300	760	2070	0.10
RNFBL 2806A5S						2.5×2	13500	40600	1380	4140	
RNFBL 3210A2.5S	32	10	6.35	33.75	27.0	2.5×1	19700	46100	2010	4700	0.20
RNFBL 3210A5S						2.5×2	35700	92200	3640	9410	
RNFBL 3610A2.5S	36	10	6.35	37	30.0	2.5×1	21000	51000	2140	5200	0.20
RNFBL 3610A5S						2.5×2	38100	102000	3890	10400	
RNFBL 4010A5S	40	10	6.35	41.75	35.0	2.5×2	40100	116000	4090	1190	0.20

Remarks 1. The actual screw shaft length may be slightly longer than nominal length L_s due to manufacturing tolerance.
2. Nut assembly with arbor and screw shaft are separated at time of delivery.
3. The value obtained by dividing the standard screw length by 100 mm will be entered at the end of the reference number where marked with " * * ."

Ball nut dimensions											Arbor		Screw shaft		
Outside dia. D	Flange				Length		Bolt hole		Oil hole		Outside dia. d_o	Bore d_i	Standard length L_s		Screw shaft No.
	A	H	B		Overall length L	(C)	W	X	Q	T					
26	42	29	8	36	3	34	4.5	M3×0.5	5.0	8.1	6.1	400	800		RS1006A**
29	45	32	8	44	3	37	4.5	M3×0.5	5.5	9.6	7.6	400	800		RS1208A**
31	50	37	10	40	4	40	4.5	M6×1	5.0	11.5	9.5	500	1000		RS1404A**
32	50	38	10	40	4	40	4.5	M6×1	5.0	11.0	9.0	500	1000		RS1405A**
50	80	60	12	61	4	65	6.6	M6×1	6.0	13.6	11.6	500	1000	1500	RS1808A**
40	60	46	10	40	4	50	4.5	M6×1	5.0	17.0	14.6	500	1000	2000	RS2005A**
52	82	64	12	61	5	67	6.6	M6×1	6.0	16.2	13.8	500	1000	2000	RS2010A**
43	67	50	10	40	4	55	5.5	M6×1	5.0	22.0	19.6	1000	2000	2500	RS2505A**
60	96	72	15	66	5	78	9.0	M6×1	7.5	19.0	16.6	1000	2000	2500	RS2510A**
50	80	60	12	47	5	65	6.6	M6×1	6.0	25.0	22.6	1000	2000	2500	RS2806A**
67	103	78	15	67	5	85	9.0	M6×1	7.5	27.0	24.6	1000	2000	3000	RS3210A**
70	110	82	17	69	5	90	11.0	M6×1	8.5	30.0	27.6	1000	2000	3000	RS3610A**
76	116	88	17	99	5	96	11.0	M6×1	8.5	35.0	31.8	2000	3000	4000	RS4010A**

Remarks 4. Items in stock are not applied surface treatment. NSK provides treatment such as phosphate coating on request.
5. Seal for those with the shaft diameter of 14 mm or less is made of synthetic resin. Seal for those with 16 mm or larger is "Brush-seal."



Unit: mm

Ball nut No	Shaft dia. <i>d</i>	Lead <i>l</i>	Ball dia. <i>D_w</i>	Ball circle dia. <i>d_w</i>	Root dia. <i>d_r</i>	Effective turns of balls Turns × Circuits	Basic load rating				Axial play Max.
							(N)		{kgf}		
							Dynamic <i>C_a</i>	Static <i>C_{0a}</i>	Dynamic <i>C_i</i>	Static <i>C_{0i}</i>	
RNCT 1003A3.5	10	3	2.381	10.65	8.0	3.5 × 1	3780	6730	385	685	0.10
RNCT 1404A3.5S	14	4	2.778	14.5	11.5	3.5 × 1	5370	10800	545	1100	0.10
RNCT 1405A2.5S	14	5	3.175	14.5	11.0	2.5 × 1	5260	9720	535	990	0.10
RNCT 1808A3.5 RNCT 1808A3.5S	18	8	4.762	18.5	13.6	3.5 × 1	13200	25800	1350	2630	0.15
RNCT 2005A2.5 RNCT 2005A2.5S	20	5	3.175	20.5	17.0	2.5 × 1	6360	14200	650	1450	0.10
RNCT 2505A5 RNCT 2505A5S	25	5	3.175	25.5	22.0	2.5 × 2	12800	36300	1310	3710	0.10
RNCT 2510A5 RNCT 2510A5S	25	10	6.35	26	19.0	2.5 × 2	31800	70300	3240	7170	0.20
RNCT 2806A5 RNCT 2806A5S	28	6	3.175	28.5	25.0	2.5 × 2	13500	40600	1380	4140	0.10
RNCT 3210A5 RNCT 3210A5S	32	10	6.35	33.75	27.0	2.5 × 2	35700	92200	3640	9410	0.20
RNCT 3610A5 RNCT 3610A5S	36	10	6.35	37	30.0	2.5 × 2	38100	102000	3890	10400	0.20
RNCT 4010A7 RNCT 4010A7S	40	10	6.35	41.75	35.0	3.5 × 2	53500	164000	5460	16800	0.20
RNCT 4512A5 RNCT 4512A5S	45	12	7.144	46.5	39.0	2.5 × 2	49600	147000	5060	15000	0.23
RNCT 5010A7 RNCT 5010A7S	50	10	6.35	51.75	45.0	3.5 × 2	59500	205000	6060	21000	0.20
RNCT 5016A5 RNCT 5016A5S	50	16	9.525	52	42.0	2.5 × 2	99900	293000	10200	29900	0.23

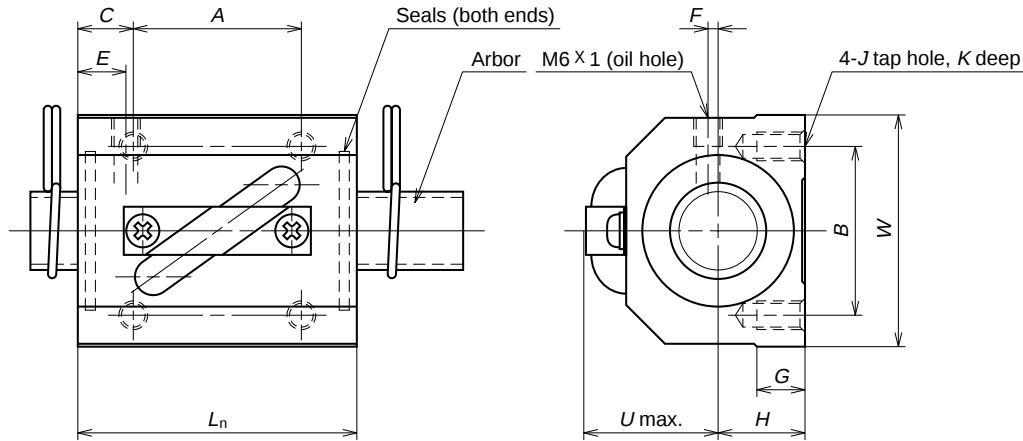
Ball nut dimensions							Seal dimensions		Arbor		Screw shaft			
Outside dia.	Flange		Length	Projecting tube			Diameter	Thickness	Outside dia.	Bore	Standard length			Screw shaft No.
D	M	B	L _n	U	V	R	S	T	d ₀	d _i	L _s			
20	M18 × 1	10	38	15	15	7			8.1	6.1	400	800		RS1003A**
25	M24 × 1	10	43	19	20	7			11.5	9.5	500	1000		RS1404A**
30	M26 × 1.5	10	45	22	21	8			11.0	9.0	500	1000		RS1405A**
34	M32 × 1.5	12	58	27	27	14	28.5	2.5	13.6	11.6	500	1000	1500	RS1808A**
40	M36 × 1.5	12	48	28	27	10	29.5	2.5	17.0	14.6	500	1000	2000	RS2005A**
42	M40 × 1.5	15	69	28	31	10	34.5	2.5	22.0	19.6	1000	2000	2500	RS2505A**
44	M42 × 1.5	15	92	34	37	17	38.5	2.5	19.0	16.6	1000	2000	2500	RS2510A**
50	M45 × 1.5	15	79	33	34	10	37.5	2.5	25.0	22.6	1000	2000	2500	RS2806A**
55	M50 × 1.5	18	97	39	42	17	45.5	2.5	27.0	24.6	1000	2000	3000	RS3210A**
60	M55 × 2	18	98	42	46	17	50.5	3.0	30.0	27.6	1000	2000	3000	RS3610A**
65	M60 × 2	25	125	44	50	20	54.5	3.0	35.0	31.8	2000	3000	4000	RS4010A**
70	M65 × 2	30	124	47	55	20	60.5	3.0	39.0	35.8	2000	3000	4000	RS4512A**
80	M75 × 2	40	140	52	59	20	64.5	3.0	45.0	41.8	2000	3000	4000	RS5010A**
85	M80 × 2	40	158	57	63	25	68.5	3.0	42.0	38.8	2000	3000	4000	RS5016A**

- Remarks
1. Protruding portion of the tube does not have any interference with the ball nut housing if its dimensions corresponding to U and V are large enough.
 2. The actual entire screw shaft length may become slightly longer than nominal length L_s due to manufacturing tolerance.
 3. A seal cannot be installed in the V thread side. It may be installed in the opposite side.
Seal is contained in the nut. Therefore, the external dimensions of those with a seal are the same as those without. In the side view drawing of ball nut, the above of the center line is with seal, and beneath is without seal.

- Seal for those with the shaft diameter of 14 mm or less is made of synthetic resin. Seal for those of 16 mm or over is a "Brush-seal."
- There is no seal on the V-thread side for RNCT1404A3.5S and RNCT1405A2.5S
4. Nut assembly with arbor and the screw shaft are separated at time of delivery.
 5. At the end of the screw shaft reference number where marked with "**", fill with the value obtained by dividing the standard screw shaft length by 100 mm.
 6. Items in stock are not applied surface treatment. NSK provides treatment such as phosphate coating on request.

Rolled ball screws

Return tube type, Square nut (Fine, medium lead)

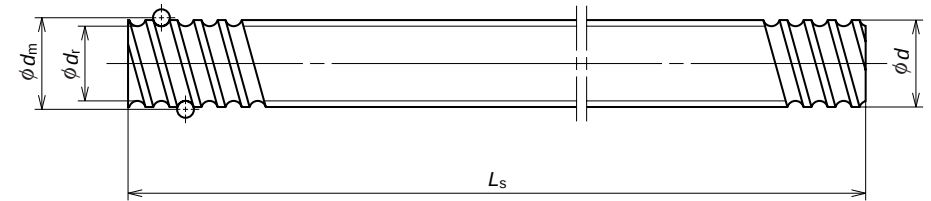


Ball nut No.	Shaft dia. <i>d</i>	Lead <i>l</i>	Ball dia. <i>D_B</i>	Ball circle dia. <i>d_B</i>	Root dia. <i>d_r</i>	Effective turns of balls Turns × Circuits	Basic load rating				Axial play Max.
							(N)		{kgf}		
							Dynamic <i>C_a</i>	Static <i>C_{0a}</i>	Dynamic <i>C_c</i>	Static <i>C_{0a}</i>	
RNSTL 1404A3.5S	14	4	2.778	14.5	11.5	3.5×1	5370	10800	545	1100	0.10
RNSTL 1405A2.5S	14	5	3.175	14.5	11.0	2.5×1	5260	9720	535	990	0.10
RNSTL 1808A3.5S	18	8	4.762	18.5	13.6	3.5×1	13200	25800	1350	2630	0.15
RNSTL 2005A2.5S	20	5	3.175	20.5	17.0	2.5×1	6360	14200	650	1450	0.10
RNSTL 2010A2.5S	20	10	4.762	21.25	16.2	2.5×1	10900	21800	1110	2220	0.15
RNSTL 2505A2.5S	25	5	3.175	25.5	22.0	2.5×1	7070	18200	720	1850	0.10
RNSTL 2510A2.5S	25	10	6.35	26	19.0	2.5×1	17500	35200	1790	3590	0.20
RNSTL 2806A2.5S	28	6	3.175	28.5	25.0	2.5×1	7430	20300	760	2070	0.10
RNSTL 2806A5S						2.5×2	13500	40600	1380	4140	
RNSTL 3210A2.5S	32	10	6.35	33.75	27.0	2.5×1	19700	46100	2010	4700	0.20
RNSTL 3210A5S						2.5×2	35700	92200	3640	9410	
RNSTL 3610A2.5S	36	10	6.35	37	30.0	2.5×1	21000	51000	2140	5200	0.20
RNSTL 3610A5S						2.5×2	38100	102000	3890	10400	
RNSTL 4512A2.5S	45	12	7.144	46.5	39.0	2.5×2	49600	147000	5060	15000	0.23

Remarks 1. The actual screw shaft length may be slightly longer than nominal length L_s due to manufacturing tolerance.
2. Nut assembly with arbor and screw shaft are separated at time of delivery.
3. The value obtained by dividing the standard screw length by 100 mm will be entered at the end of the reference number where marked with " * ".

Nut model: RNSTL

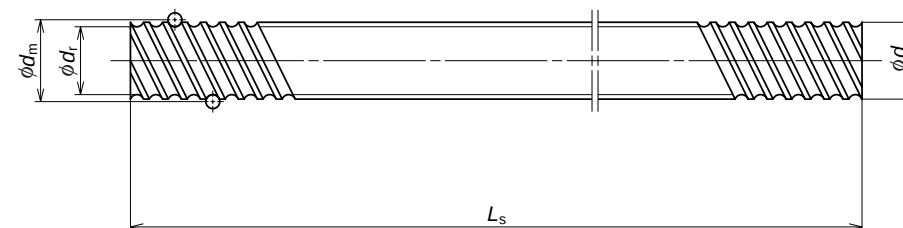
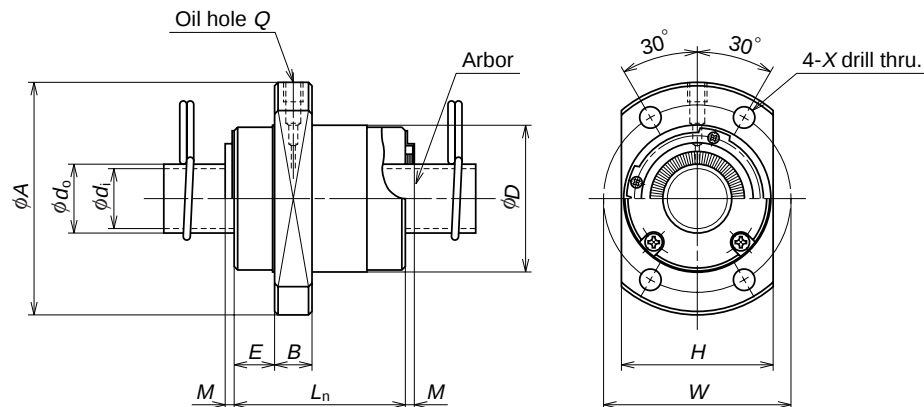
NSK



Unit: mm

Ball nut dimensions											Arbor		Screw shaft			
Length	Width	Center height	Bolt hole				Oil hole				Outside dia.	Bore	Standard length			Screw shaft No.
L_n	W	H	A	B	C	J	K	E	F	U	d_o	d_i	L_s			
38	34	13	22	26	8	M4	7	7	3	20	11.5	9.5	500	1000		RS1404A**
38	34	13	22	26	8	M4	7	7	3	21	11.0	9.0	500	1000		RS1405A**
56	48	17	35	35	11	M6	10	8	3	26	13.6	11.6	500	1000	1500	RS1808A**
38	48	17	22	35	8	M6	9	6	2	27	17.0	14.6	500	1000	2000	RS2005A**
58	48	18	35	35	12	M6	10	10	2	28	16.2	13.8	500	1000	2000	RS2010A**
35	60	20	22	40	6.5	M8	10	6	0	27	22.0	19.6	1000	2000	2500	RS2505A**
94	60	23	60	40	17	M8	12	10	0	32	19.0	16.6	1000	2000	2500	RS2510A**
42	60	22	18	40	12	M8	12	8	0	32	25.0	22.6	1000	2000	2500	RS2806A**
67	60	22	40	40	14											
64	70	26	45	50	9.5	M8	12	10	0	38	27.0	24.6	1000	2000	3000	RS3210A**
94	70	26	60	50	17											
64	86	29	45	60	9.5	M10	16	11	0	41	30.0	27.6	1000	2000	3000	RS3610A**
96	86	29	60	60	18											
115	100	36	75	75	20	M12	20	13	0	46	39.0	35.8	2000	3000	4000	RS4510A**

Remarks 4. Items in stock are not applied surface treatment. NSK provides treatment such as phosphate coating on request.
5. Seal for those with the shaft diameter of 14 mm or less is made of synthetic resin. Seal for those with 18 mm or larger is "Brush-seal."



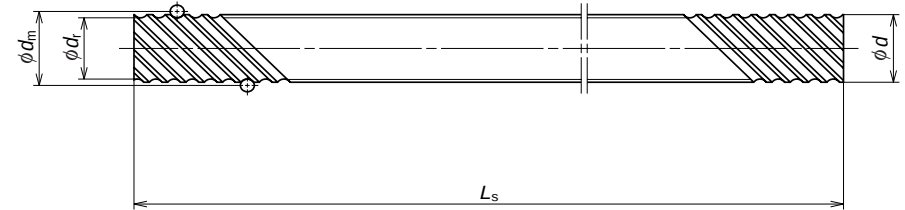
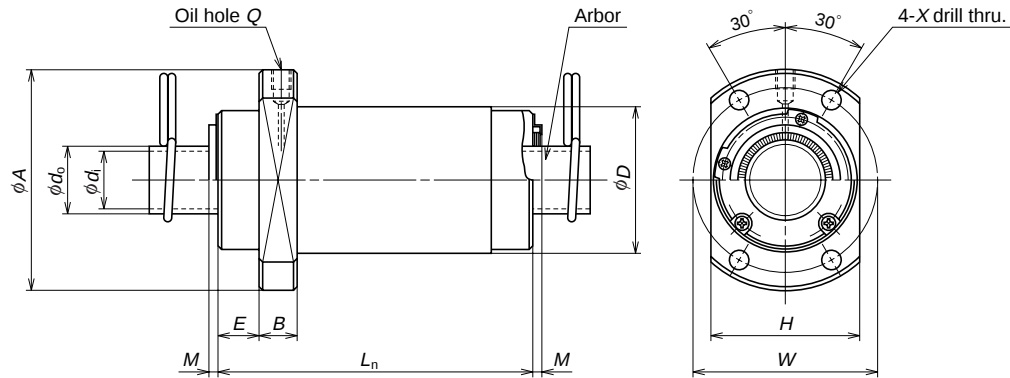
Unit: mm

Ball nut No.	Shaft dia. <i>d</i>	Lead <i>l</i>	Ball dia. <i>D_w</i>	Ball circle dia. <i>d_m</i>	Root dia. <i>d_r</i>	Effective turns of balls Turns × Circuits	Basic load rating				Axial play Max.
							(N)		(kgf)		
							Dynamic	Static	Dynamic	Static	
							<i>C_a</i>	<i>C_{0a}</i>	<i>C_a</i>	<i>C_{0a}</i>	
RNFCL 1212A3	12	12	2.381	12.65	10.1	1.7 × 2	3740	6640	380	675	0.10
RNFCL 1212A6						1.7 × 4	6780	13300	690	1350	
RNFCL 1520A3	15	20	3.175	15.5	12.2	1.7 × 2	6730	12300	685	1260	0.10
RNFCL 1520A6S						1.7 × 4	6730	12300	685	1260	
RNFCL 1616A3	16	16	2.778	16.65	13.5	1.7 × 2	5430	10400	555	1060	0.10
RNFCL 1616A3S						1.7 × 2	5430	10400	555	1060	
RNFCL 1616A6						1.7 × 4	9860	20800	1010	2120	
RNFCL 1616A6S						1.7 × 4	9860	20800	1010	2120	
RNFCL 2020A3	20	20	3.175	20.75	17.3	1.7 × 2	7810	16500	795	1680	0.10
RNFCL 2020A3S						1.7 × 2	7810	16500	795	1680	
RNFCL 2020A6						1.7 × 4	14200	33000	1450	3360	
RNFCL 2020A6S						1.7 × 4	14200	33000	1450	3360	
RNFCL 2525A3	25	25	3.969	26	22.0	1.7 × 2	11700	25800	1190	2630	0.12
RNFCL 2525A3S						1.7 × 2	11700	25800	1190	2630	
RNFCL 2525A6						1.7 × 4	21200	51500	2160	5250	
RNFCL 2525A6S						1.7 × 4	21200	51500	2160	5250	
RNFCL 3232A3	32	32	4.762	33.25	28.0	1.7 × 2	17100	40500	1740	4130	0.15
RNFCL 3232A3S						1.7 × 2	17100	40500	1740	4130	
RNFCL 3232A6						1.7 × 4	31000	81000	3160	8260	
RNFCL 3232A6S						1.7 × 4	31000	81000	3160	8260	
RNFCL 4040A3	40	40	6.35	41.75	35.0	1.7 × 2	27200	67900	2770	6920	0.20
RNFCL 4040A3S						1.7 × 2	27200	67900	2770	6920	
RNFCL 4040A6						1.7 × 4	49300	136000	5030	13800	
RNFCL 4040A6S						1.7 × 4	49300	136000	5030	13800	
RNFCL 5050A3	50	50	7.938	52.25	44.0	1.7 × 2	40600	106000	4140	10800	0.25
RNFCL 5050A3S						1.7 × 2	40600	106000	4140	10800	
RNFCL 5050A6						1.7 × 4	73700	212000	7510	21600	
RNFCL 5050A6S						1.7 × 4	73700	212000	7510	21600	

Remarks 1. The actual screw shaft length may be slightly longer than nominal length L_s due to manufacturing tolerance.
2. Nut assembly with arbor and screw shaft are separated at time of delivery.
3. The value obtained by dividing the standard screw length by 100 mm will be entered at the end of the reference number where marked with "**".

Ball nut dimensions										Arbor		Screw shaft			
Outside dia.	Flange			Length			Bolt hole		Oil hole	Outside dia.	Bore	Standard length			Screw shaft No.
<i>D</i>	<i>A</i>	<i>H</i>	<i>B</i>	<i>E</i>	<i>L_n</i>	<i>M</i>	<i>W</i>	<i>X</i>	<i>Q</i>	<i>d_o</i>	<i>d_i</i>	<i>L_s</i>			
26	44	28	6	9	30	—	35	4.5	M3 × 0.5	10.1	8.1	400	800		RS1212A**
33	51	35	10	11	45	$\frac{—}{3}$	42	4.5	M6 × 1	12.2	10.2	500	1000	1500	RS1520A**
32	53	34	10	10	38	$\frac{—}{3}$	42	4.5	M6 × 1	13.6	11.6	500	1000	1500	RS1616A**
						$\frac{—}{3}$									
						$\frac{—}{3}$									
39	62	41	10	11.5	46	$\frac{—}{3}$	50	5.5	M6 × 1	17.3	14.9	500	1000	2000	RS2020A**
						$\frac{—}{3}$									
						$\frac{—}{3}$									
47	74	49	12	13	55	$\frac{—}{3}$	60	6.6	M6 × 1	22.0	19.6	1000	2000	2500	RS2525A**
						$\frac{—}{3}$									
						$\frac{—}{3}$									
58	92	60	12	16	70	$\frac{—}{3}$	74	9	M6 × 1	28.0	25.6	1000	2000	3000	RS3232A**
						$\frac{—}{3}$									
						$\frac{—}{3}$									
73	114	75	15	19.5	85	$\frac{—}{3.5}$	93	11	M6 × 1	35.0	31.8	2000	3000	4000	RS4040A**
						$\frac{—}{3.5}$									
						$\frac{—}{3.5}$									
90	135	92	20	21.5	107	$\frac{—}{3.5}$	112	14	M6 × 1	44.0	40.8	2000	3000	4000	RS5050A**
						$\frac{—}{3.5}$									
						$\frac{—}{3.5}$									

Remarks 4. Items in stock are not applied surface treatment. NSK provides treatment such as phosphate coating on request.
5. The entire length of the nut becomes longer by "2 × M" for those with a seal. The seal is "Brush-seal."



Ball nut No.	Shaft dia. <i>d</i>	Lead <i>l</i>	Ball dia. <i>D_a</i>	Ball circle dia. <i>d_m</i>	Root dia. <i>d_r</i>	Effective turns of balls Turns × Circuits	Basic load rating				Axial play Max.
							(N)		{kgf}		
							Dynamic <i>C_a</i>	Static <i>C_{0a}</i>	Dynamic <i>C_a</i>	Static <i>C_{0a}</i>	
RNFCL 1632A2 RNFCL 1632A2S RNFCL 1632A3 RNFCL 1632A3S RNFCL 1632A6 RNFCL 1632A6S	16	32	2.778	16.65	13.5	0.7 × 4	4600	8460	470	865	0.10
1.7 × 2						5430	10400	555	1060		
1.7 × 4						9860	20800	1010	2120		
RNFCL 2040A2 RNFCL 2040A2S RNFCL 2040A3 RNFCL 2040A3S RNFCL 2040A6 RNFCL 2040A6S	20	40	3.175	20.75	17.3	0.7 × 4	6610	13600	675	1380	0.10
1.7 × 2						7810	16500	795	1680		
1.7 × 4						14200	33000	1450	3360		
RNFCL 2550A2 RNFCL 2550A2S RNFCL 2550A3 RNFCL 2550A3S RNFCL 2550A6 RNFCL 2550A6S	25	50	3.969	26	22.0	0.7 × 4	9870	21200	1010	2160	0.12
1.7 × 2						11700	25800	1190	2630		
1.7 × 4						21200	51500	2160	5250		
RNFCL 3264A3 RNFCL 3264A3S RNFCL 3264A6 RNFCL 3264A6S	32	64	4.762	33.25	28.0	1.7 × 2	17100	40500	1740	4130	0.15
1.7 × 4						31000	81000	3160	8260		
RNFCL 4080A3 RNFCL 4080A3S RNFCL 4080A6 RNFCL 4080A6S	40	80	6.350	41.75	35.0	1.7 × 2	27200	67900	2770	6920	0.20
1.7 × 4						49300	136000	5030	13800		

Remarks 1. The actual screw shaft length may be slightly longer than nominal length L_s due to manufacturing tolerance.
2. Nut assembly with arbor and screw shaft are separated at time of delivery.
3. The value obtained by dividing the standard screw length by 100 mm will be entered at the end of the reference number where marked with " * ".

Ball nut dimensions											Arbor		Screw shaft	
Outside dia. D	Flange			Length			Bolt hole		Oil hole	Outside dia. d_o	Bore d_i	Standard length L_s		Screw shaft No.
	A	H	B	E	L_n	M	W	X	Q					
32	50	34	10	10	34 66 66	— 3 3	41	4.5	M6 $\times$ 1	13.5	11.5	500 1000 1500		RS1632A**
38	58	40	10	11	41 81 81	— 3 3	48	5.5	M6 $\times$ 1	17.3	14.9	500 1000 1500 2000		RS2040A**
46	70	48	12	13	50 100 100	— 3 3	58	6.6	M6 $\times$ 1	22.0	19.6	1000 2000 2500		RS2550A**
58	92	60	12	15.5	126 — 3	— 3 3	74	9	M6 $\times$ 1	28.0	25.6	1000 2000 3000 4000		RS3264A**
73	114	75	15	19	158 — 3.5 — 3.5	— 3.5 — 3.5	93	11	M6 $\times$ 1	35.0	31.8	2000 3000 4000 5000		RS4080A**

Remarks 4. Items in stock are not applied surface treatment. NSK provides treatment such as phosphate coating on request.
5. The entire length of the nut becomes longer by "2 $\times$ M" for those with a seal. The seal is "Brush-seal."

B-I-6.6 Accessories

Accessories to use with ball screw are available in stock.

Table I-6-6 Support unit categories

Application		Shape	Support side	Bearing in use	Bearing boreBearing seat diameter	Page
Small equipment, light load	Square	WBK**-01 	Fixed support side	Angular contact ball bearing	$\phi 6 \sim \phi 25$	B277 ~
		WBK**-S-01 	Simple support	Deep groove ball bearing	$\phi 6 \sim \phi 25$	B277 ~
		WBK**-SF-01 	side	Deep groove ball bearing	$\phi 12, \phi 15$ (Exclusive for VFA Series)	B291
	Round	WBK**-R-01 (Support kit) 	Fixed support	Deep groove ball bearing (arranged to have angular contact)	$\phi 4, \phi 6$ (Exclusive for RMA and RMS Series)	B293
		WBK**-11 	side	Angular contact ball bearing	$\phi 6 \sim \phi 25$	B277 ~
Machine tools, heavy load	Round	WBK**-DF*-31 	Fixed support side	Thrust angular contact ball bearing	$\phi 17 \sim \phi 40$	B296 ~

(1) Support units

① Classification

Ball screw support units are classified into categories by their shape (Table I-6.6). Select the type that is appropriate for you to use.

② Features

- Short delivery time: Standardized items in stock
- Use most suitable bearings
On the fixed support side, the angular contact ball bearing is used. It has great rigidity and low friction torque which match the rigidity of the ball screw. The thrust angular contact ball bearing with high precision and great rigidity is another choice for the fixed support side.
- High dust prevention, and low friction torque
Oil seal is installed in small clearance on the fixed support side. A deep-groove ball bearing with a shield on both sides is used on the simple support side. This minimizes friction torque.
- Lock nut is provided.
A lock nut of fine grade finish is provided to fix the bearing with high precision.

③ Reference number and applicable ball screw

(For light load) **WBK 08 S-01**

Support unit product code

Nominal size

Support side code No code:Fixed support side
S:Simple support side
R:Fixed support side (support kit)

Design serial number

(For heavy load) **WBK 25 DF-31**

Nominal size

Bearing combination
DF (duplex), DFD (triplex), DFF (quadruple)

Design serial number

Table I-6•7 and 8 show "shaft diameter/lead combinations" of standard ball screws that are applicable to support units.

Table I-6•7 Support units for light load and applicable "shaft diameter/lead combinations"

Light load / small equipment	Support unit / reference number			"Shaft diameter/lead combinations" of standard ball screws that are applicable to support unit
	Square		Round	
	Fixed support side (driving motor side)	Simple support side (opposite to driving motor)	Fixed support side	
	WBK06-01A	—	WBK06-11	$\phi 4 \times 1$, $\phi 6 \times 1$
	WBK08-01A	WBK08S-01	WBK08-11	$\phi 8 \times 1$, $\phi 8 \times 1.5$, $\phi 8 \times 2$, $\phi 10 \times 2$, $\phi 10 \times 2.5$
	WBK10-01A	WBK10S-01	WBK10-11	$\phi 10 \times 4$, $\phi 12 \times 2$, $\phi 12 \times 2.5$, $\phi 12 \times 5$, $\phi 12 \times 10$
	WBK12-01A	WBK12S-01	WBK12-11	$\phi 14 \times 5$, $\phi 14 \times 8$, $\phi 15 \times 10$, $\phi 15 \times 20$, $\phi 16 \times 2$ $\phi 16 \times 2.5$, $\phi 16 \times 5$, $\phi 16 \times 16$, $\phi 16 \times 32$
	WBK15-01A	WBK15S-01	WBK15-11	$\phi 20 \times 4$, $\phi 20 \times 5$, $\phi 20 \times 10$, $\phi 20 \times 20$, $\phi 20 \times 40$
	WBK20-01	WBK20S-01	WBK20-11	$\phi 20 \times 4$, $\phi 20 \times 5$, $\phi 20 \times 6$, $\phi 20 \times 10$, $\phi 20 \times 20$ $\phi 25 \times 25$, $\phi 25 \times 50$, $\phi 28 \times 5$, $\phi 28 \times 6$
	WBK25-01	WBK25S-01	WBK25-11	$\phi 32 \times 5$, $\phi 32 \times 6$, $\phi 32 \times 8$, $\phi 32 \times 10$ $\phi 32 \times 25$, $\phi 32 \times 32$,

- Remarks**
- Reference number is based on the bearing bore on the fixed support side.
 - Please note that the reference numbers 12 or below on the simple-support side do not match the bore of the deep-groove ball bearing in use.

Table I-6•8 Support units for heavy load and applicable "shaft diameter/lead combinations"

Heavy load / machine tools	Support unit / reference number		"Shaft diameter/lead combinations" of standard ball screws that are applicable to the support unit
	Fixed support side (drive motor side)	Fixed support side (opposite to drive motor)	
	WBK30DF-31	WBK25DF-31	$\phi 36 \times 10$
	WBK30DFD-31	WBK25DFD-31	$\phi 36 \times 10, \phi 40 \times 10$
	WBK30DF-31	WBK30DF-31	$\phi 40 \times 5, \phi 40 \times 8, \phi 40 \times 10, \phi 40 \times 12$
	WBK30DFD-31	WBK30DFD-31	$\phi 40 \times 12$
	WBK35DF-31	WBK35DF-31	$\phi 45 \times 10$
	WBK40DF-31	WBK40DF-31	$\phi 50 \times 10$
	WBK40DFD-31	WBK40DFD-31	$\phi 50 \times 10$

*Refer to Page B27 for shaft end configuration to use support units.

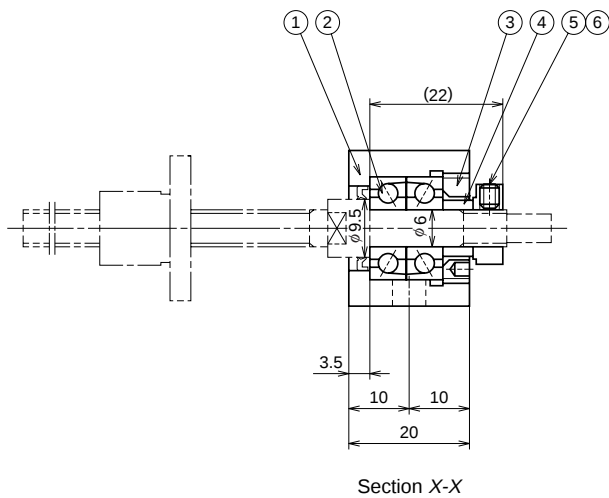
4. Dimensions of support unit for light load / small equipment

Table I-6•9 shows characteristic value of the support units for light load / small equipment.

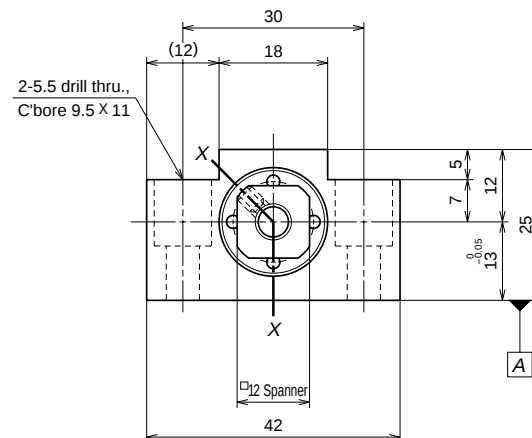
Table I-6•9 Characteristic values of support units for light load

Support unit reference number	Fixed side support unit						Support unit on simple support side		
	Bearing in use (angular contact ball bearing)						Bearing in use (deep-groove ball bearing)		Support unit reference number
	Bearing reference number	Axial direction				Maximum starting torque N·cm {kgf·cm}	Bearing reference number	Radial direction	
		Basic dynamic load rating C _r N {kgf}	Load limit N {kgf}	Preload N {kgf}	Rigidity N/μm {kgf/μm}			Basic dynamic load rating C _r N {kgf}	
WBK06-01A (Square) WBK06-11 (Round)	706ATYDFC7P5	2670 {273}	1040 {106}	17 {2.0}	28 {2.9}	0.49 {0.05}	—	—	—
WBK08-01A (Square) WBK08-11 (Round)	708ATYDFC8P5	4400 {450}	1450 {148}	59 {6.0}	53 {5.4}	0.88 {0.09}	606ZZ {231}	2260	WBK08S-01 (Square)
WBK10-01A (Square) WBK10-11 (Round)	7000ATYDFC8P5	6600 {670}	2730 {278}	200 {21}	94 {9.6}	1.9 {0.19}	608ZZ {335}	3300	WBK10S-01 (Square)
WBK12-01A (Square) WBK12-11 (Round)	7001ATYDFC8P5	7150 {725}	3040 {310}	215 {22}	104 {10.6}	2.1 {0.21}	6000ZZ {465}	4550	WBK12S-01 (Square)
WBK15-01A (Square) WBK15-11 (Round)	7002ATYDFC8P5	7600 {775}	3370 {345}	235 {24}	113 {11.5}	2.3 {0.23}	6002ZZ {570}	5600	WBK15S-01 (Square)
WBK20-01 (Square) WBK20-11 (Round)	7204ATYDFC8P5	17900 {1820}	8260 {840}	440 {45}	155 {15.8}	5.4 {0.55}	6204ZZ	12800 {1300}	WBK20S-01 (Square)
WBK25-01 (Square) WBK25-11 (Round)	7205ATYDFC8P5	20200 {2060}	9960 {1020}	580 {59 p}	192 {19.6}	7.2 {0.73}	6205ZZ	14000 {1430}	WBK25S-01 (Square)

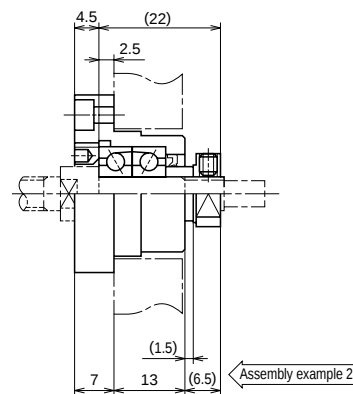
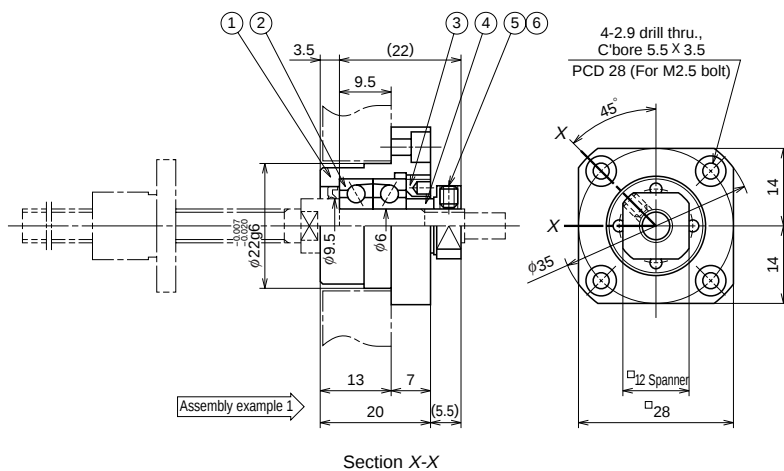
Square type **Reference number: WBK06-01A**



Unit: mm



Round type **Reference number: WBK06-11**



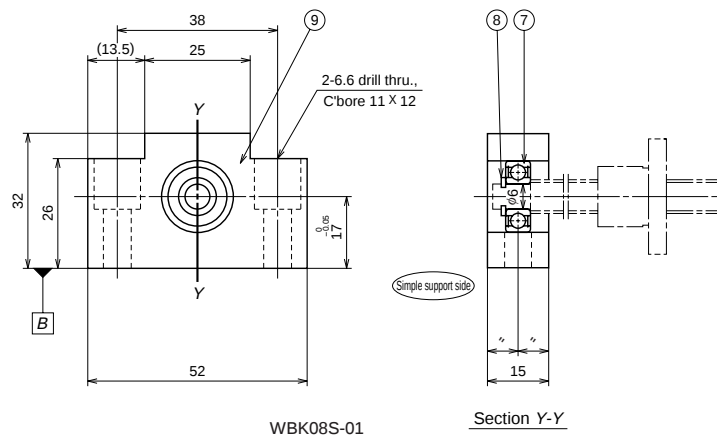
Parts list

Number	Name of part	Quantity	Remarks
①	Bearing housing	1	With oil seal
②	Bearing	One set	706ATYDFC7P5
③	Retaining cover	1	
④	Spacer	1	
⑤	Lock nut	1	For M6, tightening torque 245N·cm {25kgf·cm}
⑥	Set screw	1	M3, with a set piece (pad)

Remarks

1. When installing a square support unit, place A side to the base. Use a spacer if necessary to adjust height.
2. Components ①, ②, ③ are assembled into a unit. Do not disassemble.
3. An appropriate volume of grease is packed in the support unit.
4. Tighten the set screw ⑥ after adjustment.

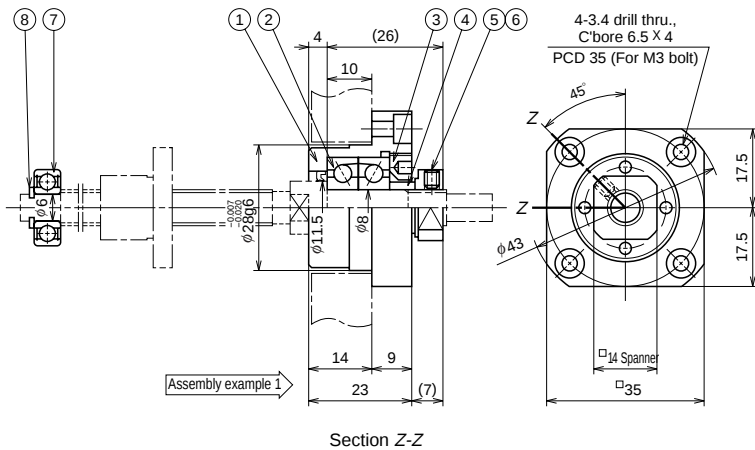
Square type Reference number: WBK08-01A (fixed support side); WBK08S-01 (simple support side)



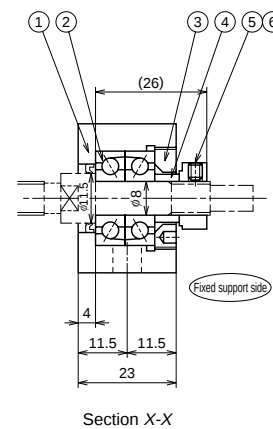
WBK08S-01

Section Y-Y

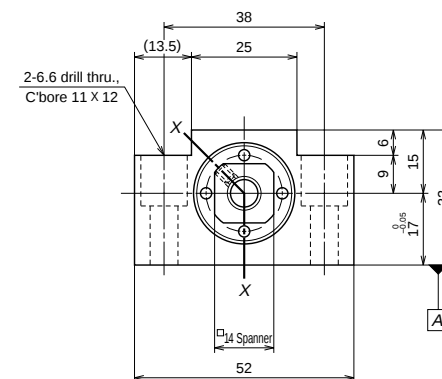
Round type **Reference number: WBK08-11**



Section Z-Z



Section X-X



WBK08-01A

Unit: mm

NSK
WBK08
Standard stock

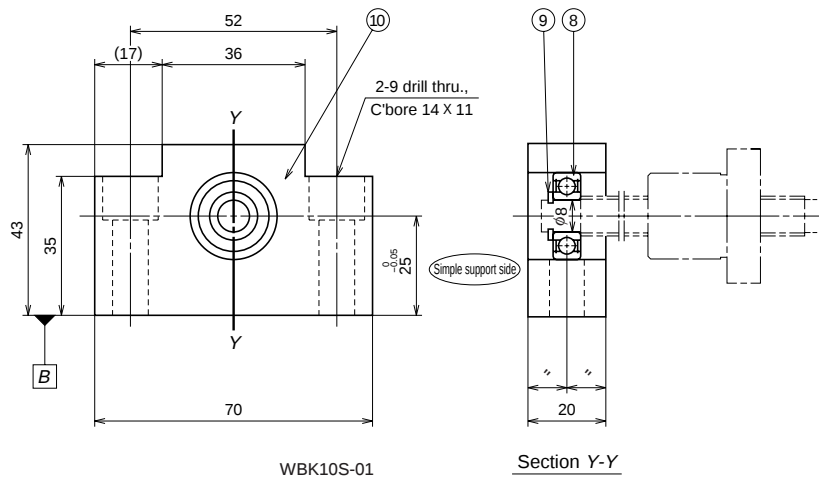
Parts list

Number	Name of part	Quantity	Remarks
①	Bearing housing	1	With oil seal on fixed support side
②	Bearing	One set	706ATYDFC7P5
③	Retaining cover	1	
④	Spacer	1	
⑤	Lock nut	1	For M8, tightening torque 490N·cm {50 kgf·cm}
⑥	Set screw	1	M3, with a set piece (pad)
⑦	Bearing	1	606ZZ
⑧	Retaining ring	1	
⑨	Bearing housing	1	Simple support side (only square type)

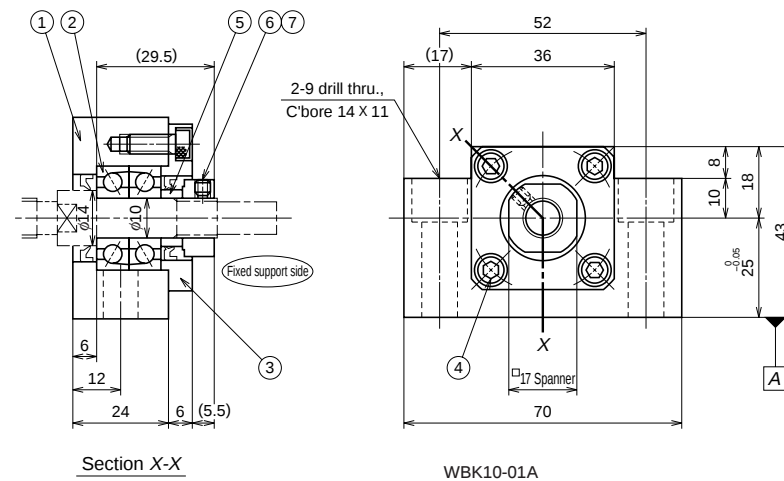
Remarks

1. When installing a square support unit, place A and B sides to the base. Use a spacer if necessary to adjust height.
2. Components ①, ②, ③ are assembled into a unit. Do not disassemble.
3. An appropriate volume of grease is packed in the support unit.
4. Tighten the set screw ⑥ after adjustment.

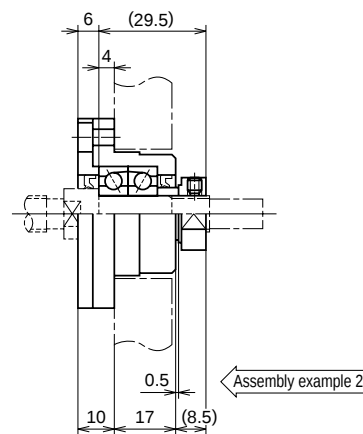
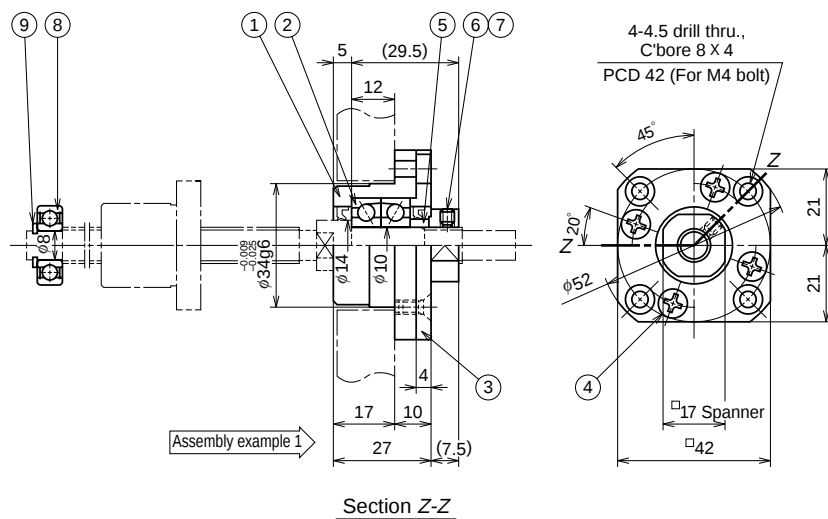
Square type Reference number: WBK10-01A (fixed support side); WBK10S-01 (simple support side)



Unit: mm



Round type Reference number: WBK10-11



Parts list

Number	Name of part	Quantity	Remarks
①	Bearing housing	1	With oil seal on fixed support side
②	Bearing	One set	7000ATYDFC8P5
③	Retaining cover	1	
④	Hexagon socket head cap screw or cross recessed pan head screw	4	M4
⑤	Spacer	1	
⑥	Lock nut	1	For M10, tightening torque 930N·cm {95 kgf·cm}
⑦	Set screw	1	M4 with a set piece (pad)
⑧	Bearing	1	608ZZ
⑨	Retaining ring	1	
⑩	Bearing housing	1	Simple support side (only square type)

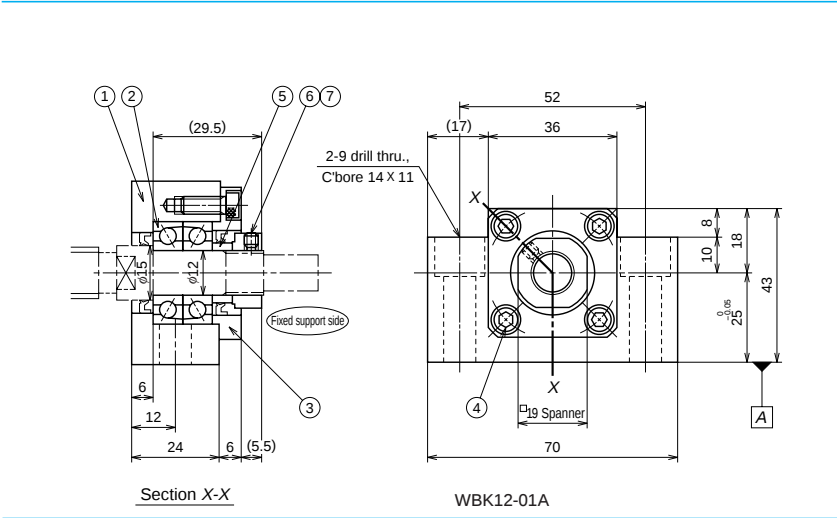
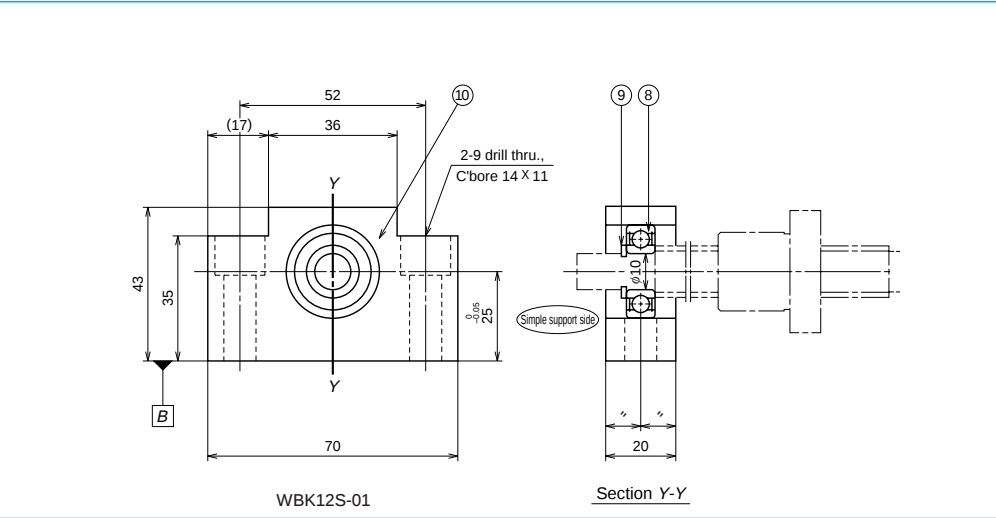
Remarks

1. When installing a square support unit, place A and B sides to the base. Use a spacer if necessary to adjust height.
2. Components ①, ②, ③ are assembled into a unit. Do not disassemble.
3. An appropriate volume of grease is packed in the support unit.
4. Tighten the set screw ⑦ after adjustment.

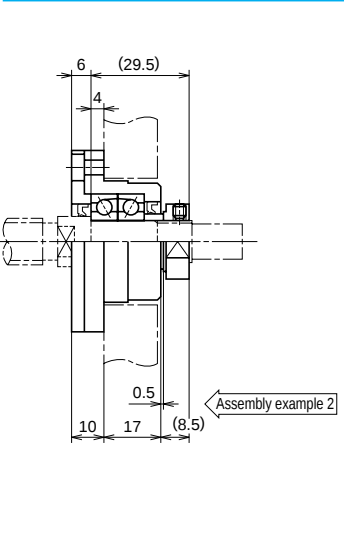
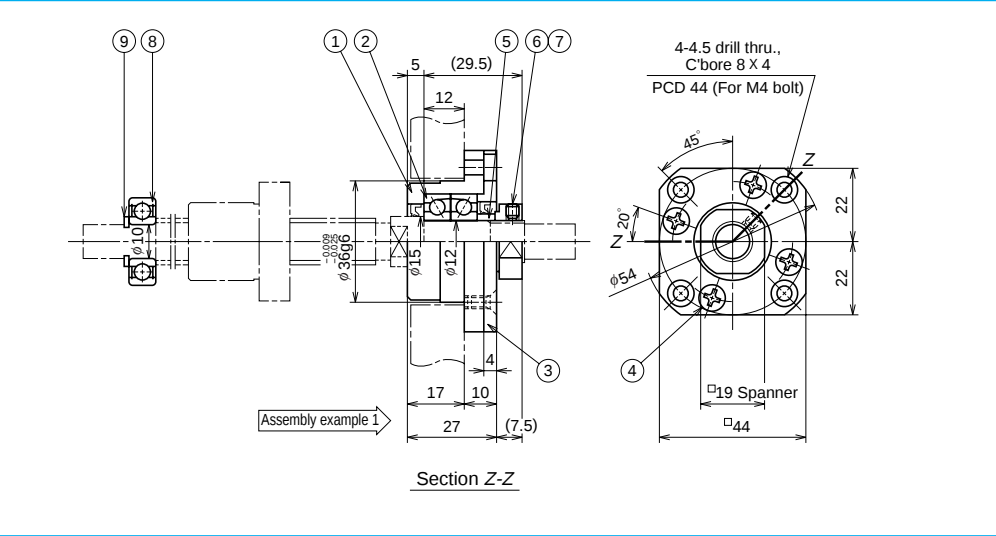


Square type Reference umber: WBK12-01 (fixed support side); WBK12S-01 (simple support side)

Unit: mm



Round type Reference number: WBK12-11



Parts list

Number	Name of part	Quantity	Remarks
①	Bearing housing	1	With oil seal on fixed support side
②	Bearing	One set	7001ATYDFC8P5
③	Retaining cover	1	
④	Hexagon socket head cap screw or cross recessed pan head screw	4	M4
⑤	Spacer	1	
⑥	Lock nut	1	For M12, tightening torque 1370N·cm {140 kgf·cm}
⑦	Set screw	1	M4 with a set piece (pad)
⑧	Bearing	1	6000ZZ
⑨	Retaining ring	1	
⑩	Bearing housing	1	Simple support side (only square type)

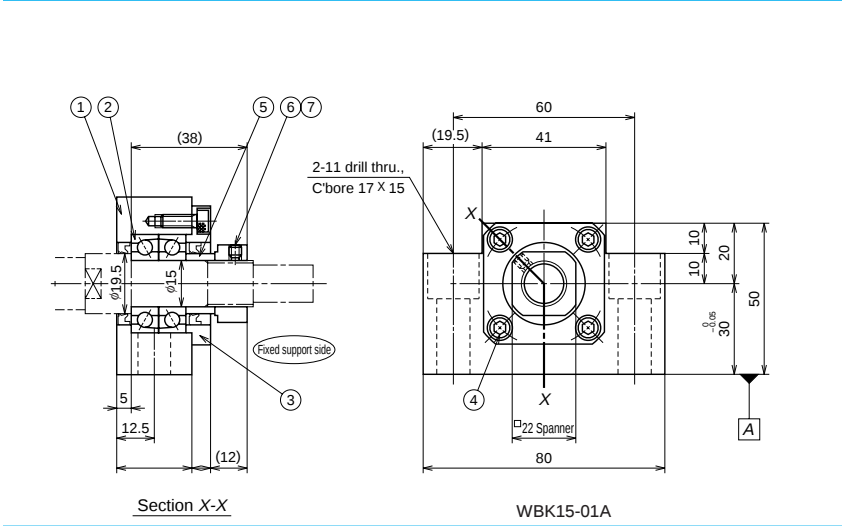
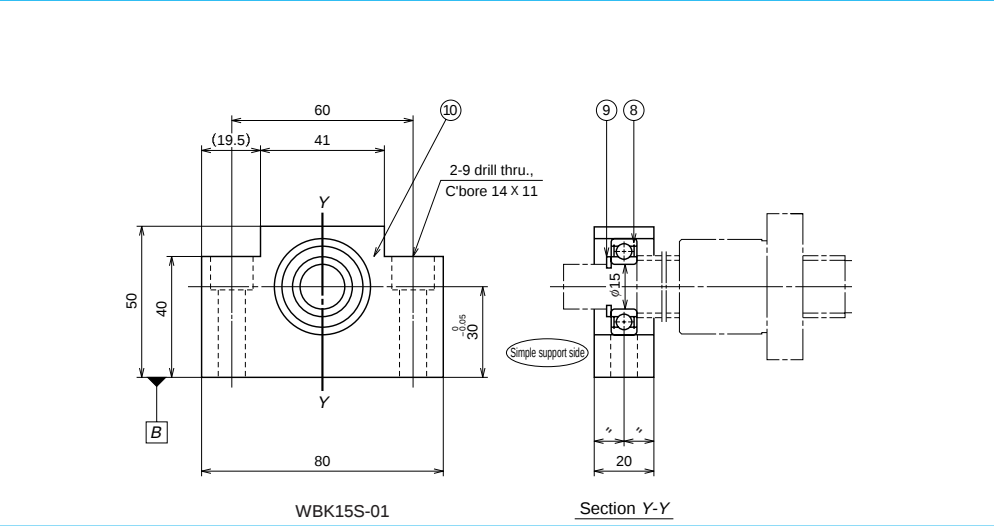
Remarks

- When installing a square support unit, place A and B sides to the base. Use a spacer if necessary to adjust height.
- Components ①, ②, ③ are assembled into a unit. Do not disassemble.
- An appropriate volume of grease is packed in the support unit.
- Tighten the set screw ⑦ after adjustment.

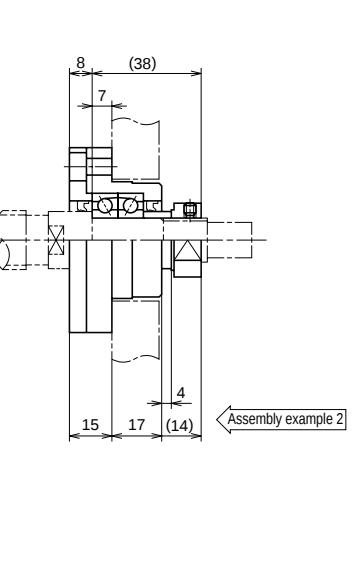
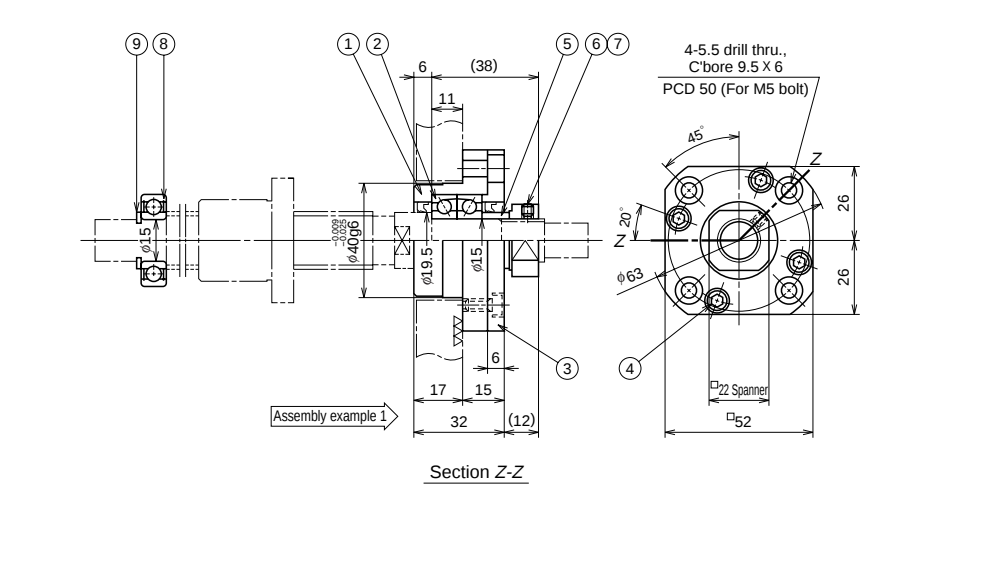


Square type Reference number: WBK15-01A (fixed support side); WBK15S-01 (simple support side)

Unit: mm



Round type Reference number: WBK15-11



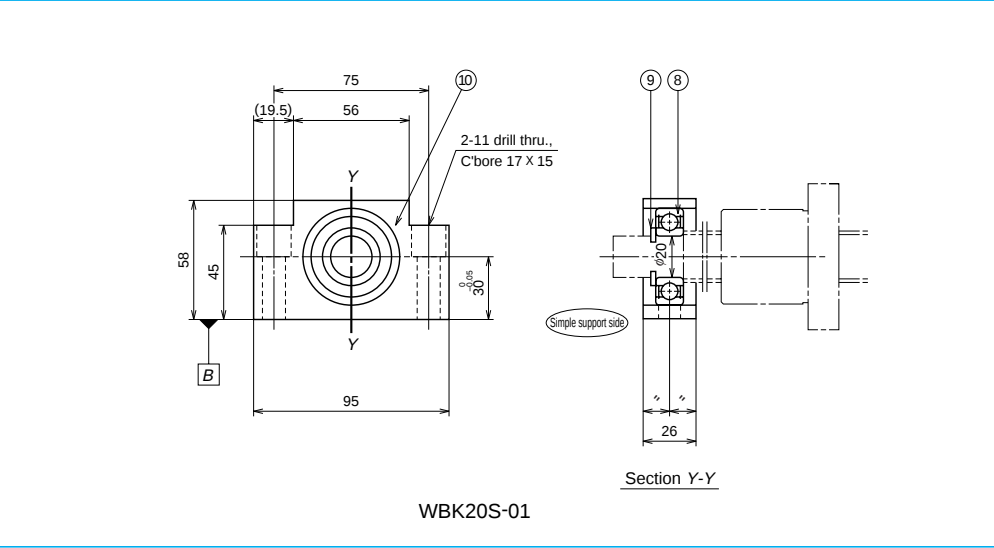
Parts list

Number	Name of part	Quantity	Remarks
①	Bearing housing	1	With oil seal on fixed support side
②	Bearing	One set	7002ATYDFC8P5
③	Retaining cover	1	
④	Hexagon socked head cap screw	4	M4
⑤	Spacer	1	
⑥	Lock nut	1	For M15, tightening torque 2350N·cm {240 kgf·cm}
⑦	Set screw	1	M4 with a set piece (pad)
⑧	Bearing	1	6002ZZ
⑨	Retaining ring	1	
⑩	Bearing housing	1	Simple support side (only square type)

Remarks

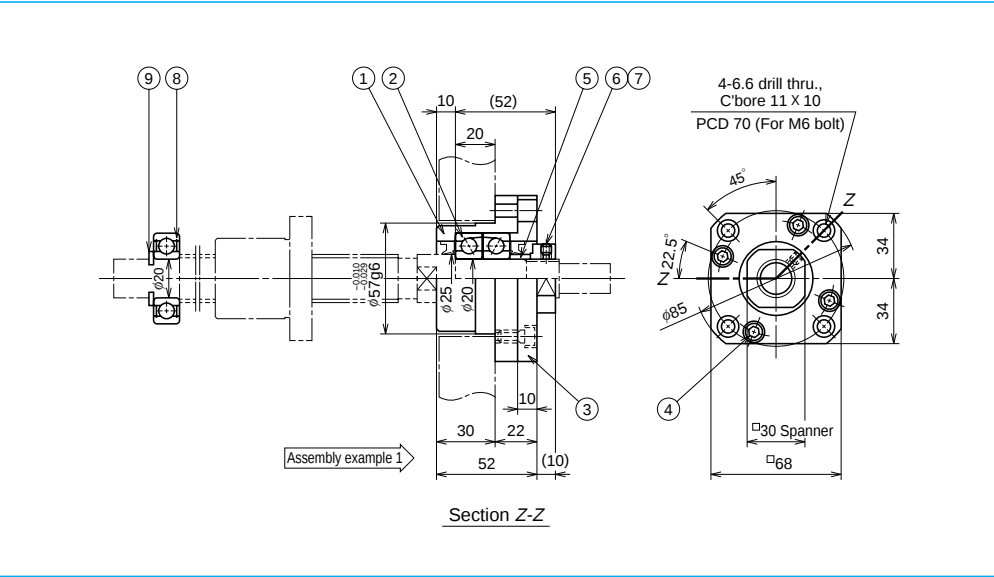
- When installing a square support unit, place A and B sides to the base. Use a spacer if necessary to adjust height.
- Components ①, ②, ③ are assembled into a unit. Do not disassemble.
- An appropriate volume of grease is packed in the support unit.
- Tighten the set screw ⑦ after adjustment.

Square type Reference number: WBK20-01 (fixed support side); WBK20S-01 (simple support side)

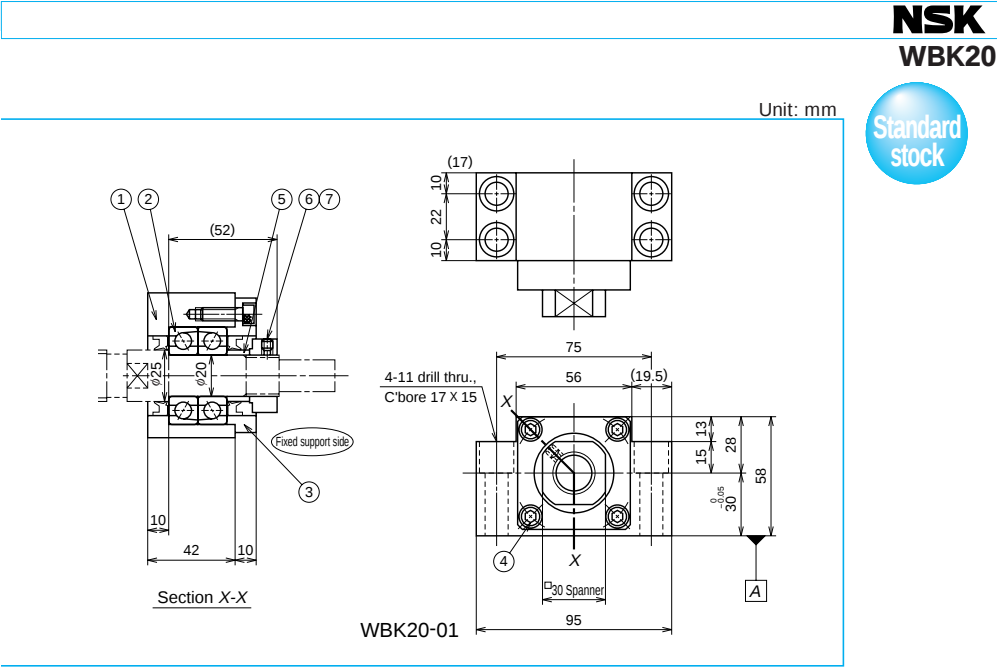


WBK20S-01

Round type Reference number: WBK20-11



Section Z-Z



WBK20-01

Parts list

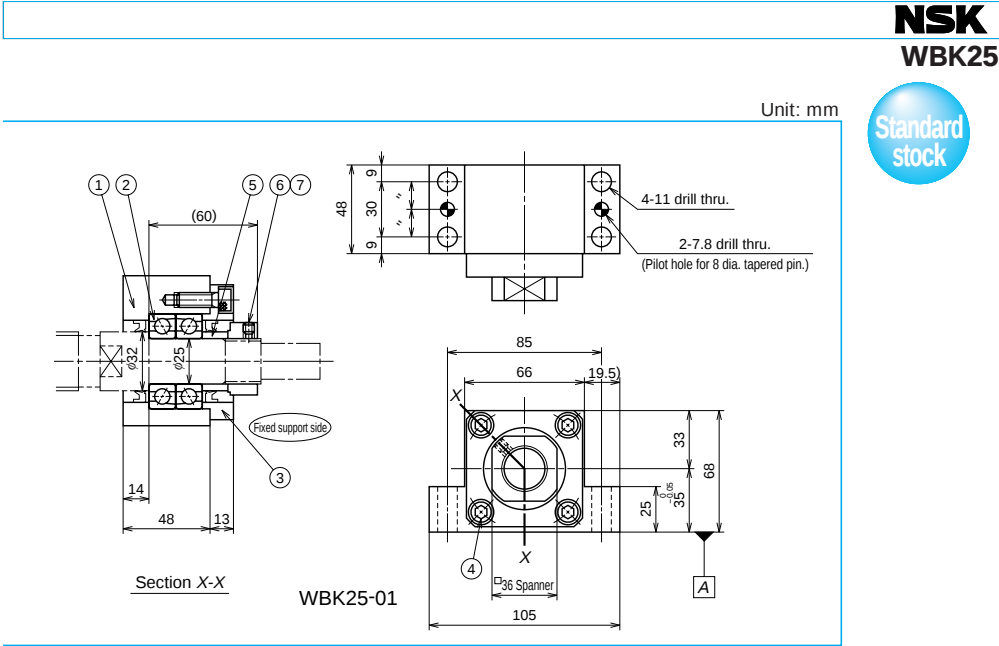
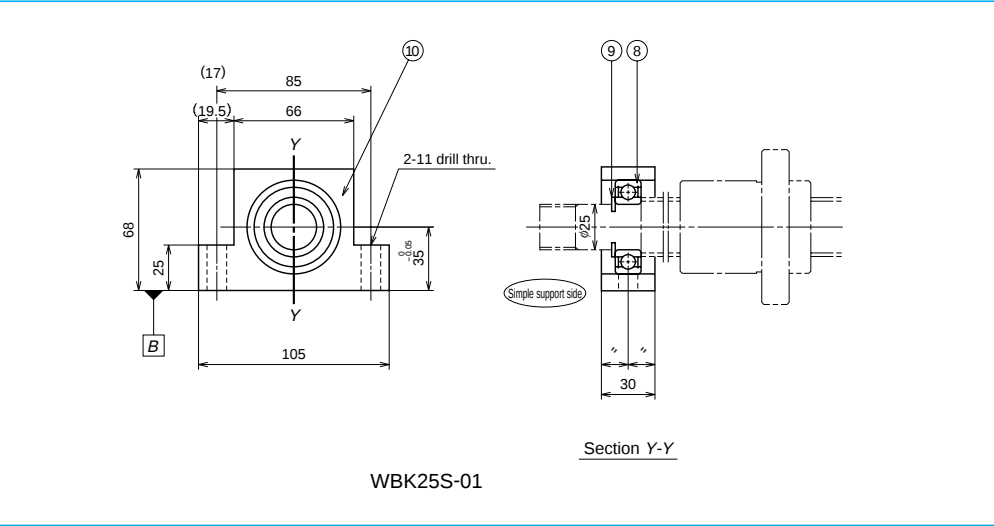
Number	Name of part	Quantity	Remarks
①	Bearing housing	1	With oil seal on fixed support side
②	Bearing	One set	7204ATYDFC8P5
③	Retaining cover	1	
④	Hexagon socked head cap screw	4	M6
⑤	Spacer	1	
⑥	Lock nut	1	For M20, tightening torque 4700N·cm {480 kgf·cm}
⑦	Set screw	1	M4 with a set piece (pad)
⑧	Bearing	1	6204ZZ
⑨	Retaining ring	1	
⑩	Bearing housing	1	Simple support side (only square type)

Remarks

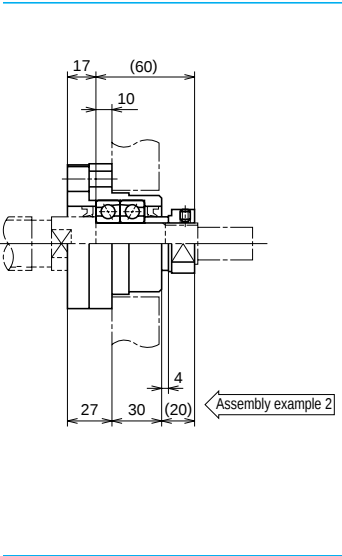
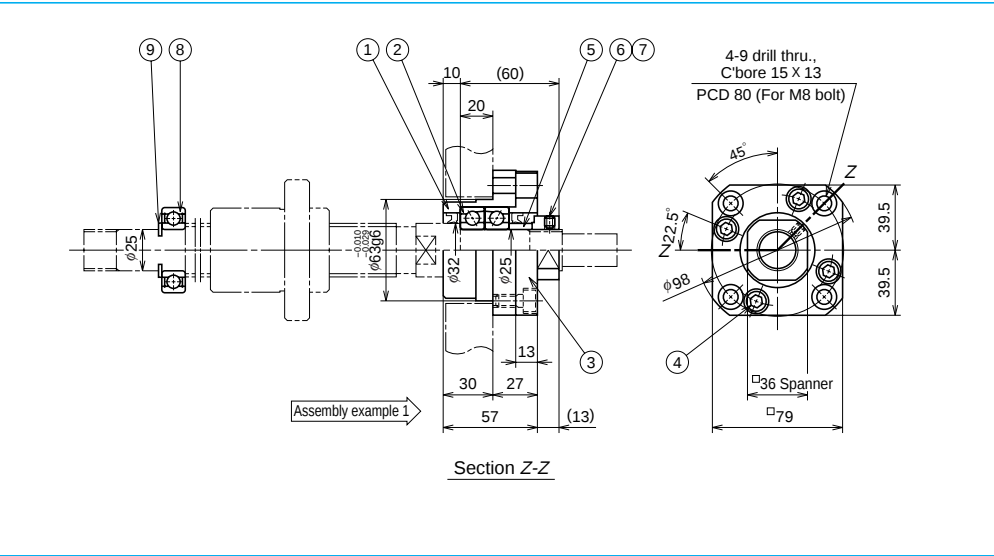
- When installing a square support unit, place A and B sides to the base. Use a spacer if necessary to adjust height.
- Components ①, ②, ③ are assembled into a unit. Do not disassemble.
- An appropriate volume of grease is packed in the support unit.
- Tighten the set screw ⑦ after adjustment.



Square type Reference number: WBK25-01 (fixed support side); WBK25S-01 (simple support side)



Round type Reference number: WBK25-11



Parts list

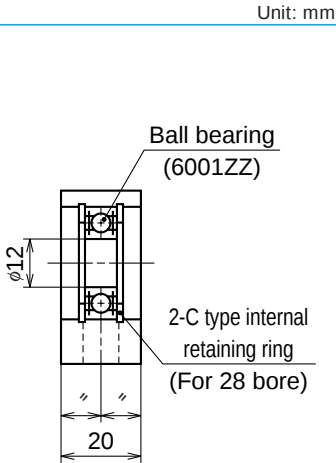
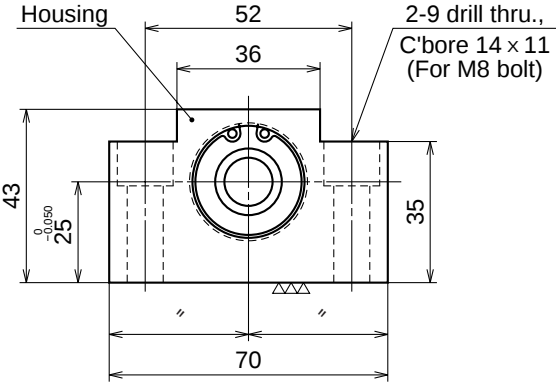
Number	Name of part	Quantity	Remarks
①	Bearing housing	1	With oil seal on fixed support side
②	Bearing	One set	7204ATYDFC8P5
③	Retaining cover	1	
④	Hexagon socked head cap screw	4	M6
⑤	Spacer	1	
⑥	Lock nut	1	For M25, tightening torque 8400N·cm {860 kgf·cm}
⑦	Set screw	1	M6 with a set piece (pad)
⑧	Bearing	1	6205ZZ
⑨	Retaining ring	1	
⑩	Bearing housing	1	Simple support side (only square type)

Remarks

- When installing a square support unit, place A and B sides to the base. Use a spacer if necessary to adjust height.
- Components ①, ②, ③ are assembled into a unit. Do not disassemble.
- An appropriate volume of grease is packed in the support unit.
- Tighten the set screw ⑦ after adjustment.



Square type Reference number: WBK12SF-01 (Simple support side: For VFA1210)



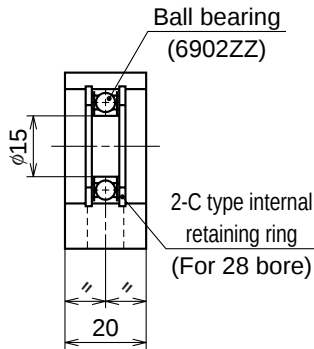
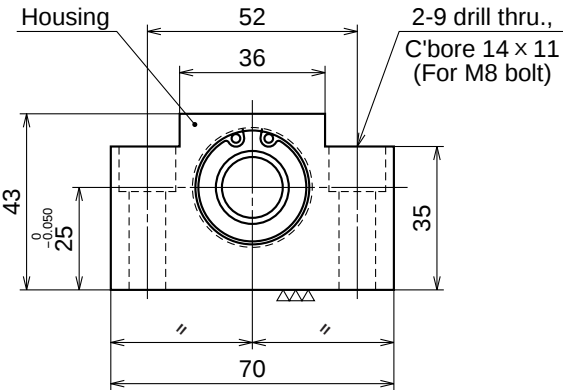
Parts list (WBK12SF-01)

Number	Name of part	Quantity	Remarks
①	Bearing housing	1	Simple support side
②	Bearing	1	6001ZZ
③	Retaining ring	2	

Remarks 1. When installing the square support unit, place side A to the base and install the unit in the vartical direction. Use a spacer if necessary to adjust height.
2. Do not disassemble the support unit.
3. An appropriate volume of grease is packed in the bearing.

Applicable ball screw : **VFA1210**

Square type Reference number: WBK15SF-01 (Simple support side: For VFA1510)



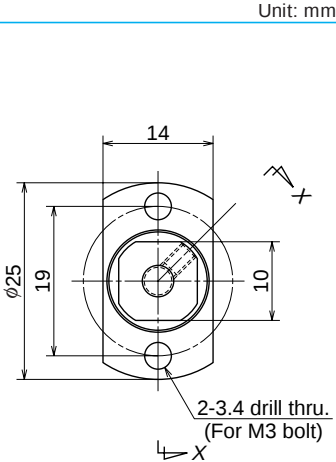
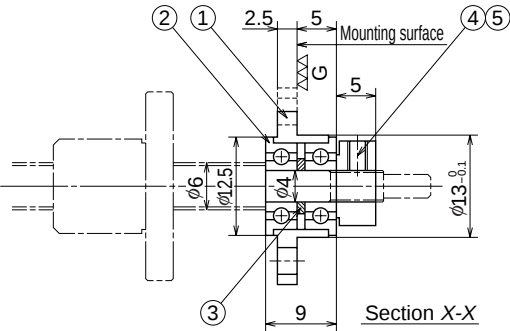
Parts list (WBK15SF-01)

Number	Name of part	Quantity	Remarks
①	Bearing housing	1	Simple support side
②	Bearing	1	6902ZZ
③	Retaining ring	2	

Remarks 1. When installing the square support unit, place side A to the base and install the unit in the vartical direction. Use a spacer if necessary to adjust height.
2. Do not disassemble the support unit.
3. An appropriate volume of grease is packed in the bearing.

Applicable ball screw : **VFA1510, VFA1520**

Round type Reference number: WBK04R-11



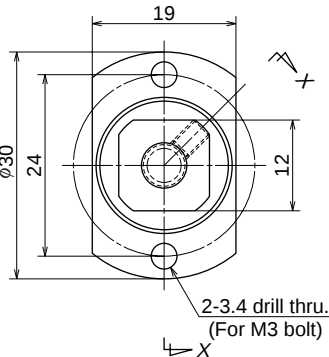
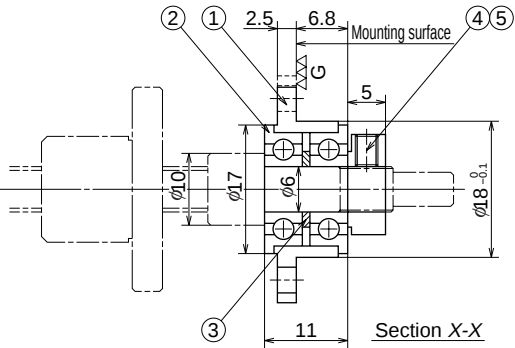
Parts list (WBK04R-11)			
Number	Name of part	Quantity	Remarks
①	Bearing housing	1	
②	Bearing	One set	F694ZZ
③	Spacer	1	
④	Lock nut	1	For M4, tightening torque 98N·cm {10 kgf·cm}
⑤	Set screw to secure the lock nut	1	M2.5 with a set piece (pad)

Remarks

1. Adjust phases of the bearing and the lock nut at time of assembly, and secure them in the state when the run out of the flange mounting surface is minimal.
2. Assembled to an arbor (M4 bolt, nut) at time of delivery. Remove it from the arbor and move to the ball screw shaft end before use.
3. An appropriate volume of grease is packed into the bearing.
4. Slightly tighten the set screw ⑤ after adjustment.

Applicable ball screw : RMA0601

Round type Reference number: WBK06R-11



Parts list (WBK06R-11)			
Number	Name of part	Quantity	Remarks
①	Bearing housing	1	
②	Bearing	One set	F696ZZ
③	Spacer	1	
④	Lock nut	1	For M6, tightening torque 118N·cm {12 kgf·cm}
⑤	Set screw to secure the lock nut	1	M2.5 with a set piece (pad)

Remarks

1. Adjust phases of the bearing and the lock nut at time of assembly, and secure them in the state when the run out of the flange mounting surface is minimal.
2. Assembled to an arbor (M6 bolt, nut) at time of delivery. Remove it from the arbor and move to the ball screw shaft end before use.
3. An appropriate volume of grease is packed into the bearing.
4. Slightly tighten the set screw ⑤ after adjustment.

Applicable ball screw : RMA0801, RMA0801.5, RMA0802

Support unit

When using with a rolled ball screw

When using a support unit (for small equipment) for a rolled ball screw, install a spacer for holding a seal in the ball screw side of the shaft end.

Table I-6.10 shows the dimensions of spacer. NSK will provide the spacers on request. Use the

reference number in Table I-6•10, and place an order separately.

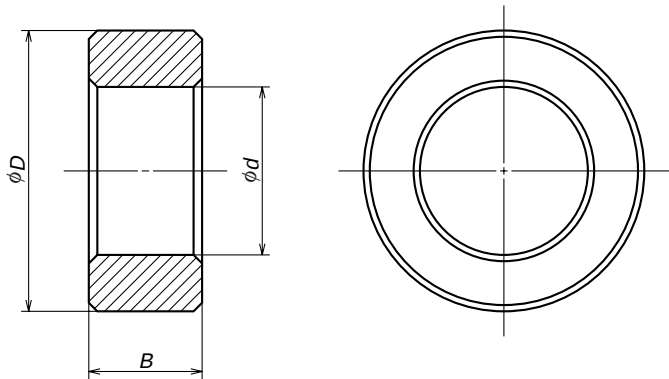


Fig. I-6.1 Drawing of support unit spacer

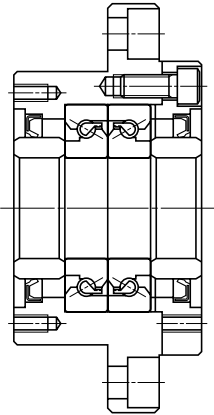
Table I-6.10 Dimensions of support unit spacer

Unit: mm

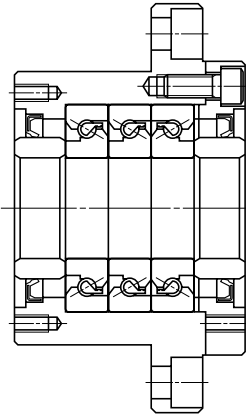
Support unit reference number	Dimensions			Spacer reference number
	Internal diameter d	Outside diameter D	Width B	
WBK06-**	6	9.5	5.0	B86006050-301
WBK08-**	8	11.5	5.5	B86008050-301
WBK10-**	10	14.5	5.5	B86010051-301
WBK12-**	12	15.0	5.6	B86012061-301
WBK15-**	15	19.5	10.0	B86015101-301
WBK20-**	20	25.5	11.0	B86020110-301
WBK25-**	25	32.0	14.0	B86025140-301

(2) Dimensions of support unit: heavy-load / for machine tools

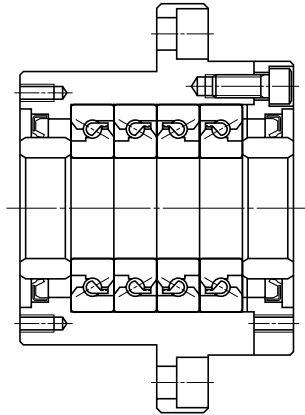
Support units for heavy-load / machine tools use a thrust angular contact ball bearing (TAC Series) with high rigidity and accuracy. The thrust angular contact ball bearing has very suitable functions and structure as a ball screw support bearing. There are three combinations as shown below.



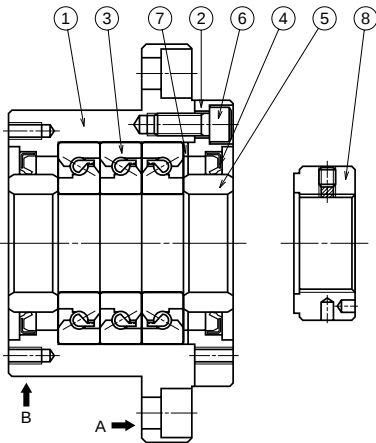
DF combination



DFD combination



DFF combination

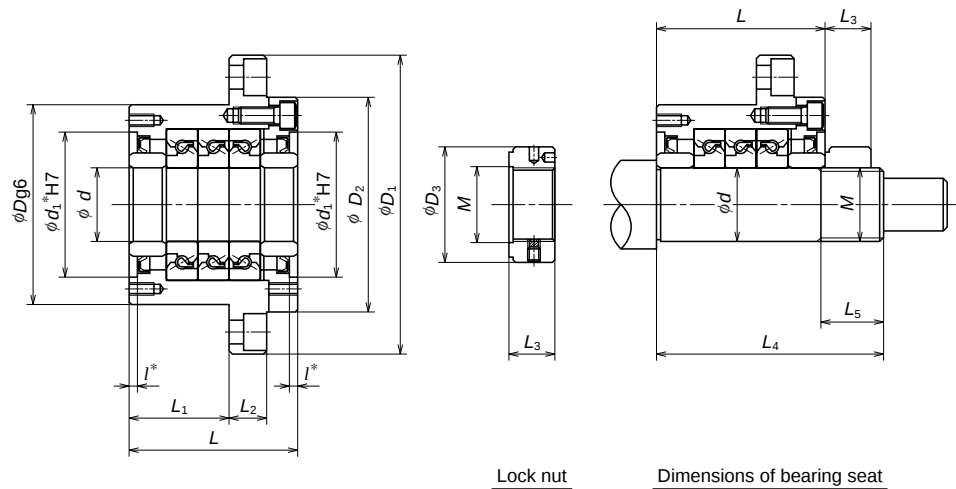


Parts list

Part number	Part name	Quantity
①	Housing	1
②	Retaining cover	1
③	High accuracy thrust angular contact ball bearing	One set
④	Dust seal	2
⑤	Collar	2
⑥	Preload bolt	6 or 8
⑦	Shim	One set
⑧	Lock nut	1

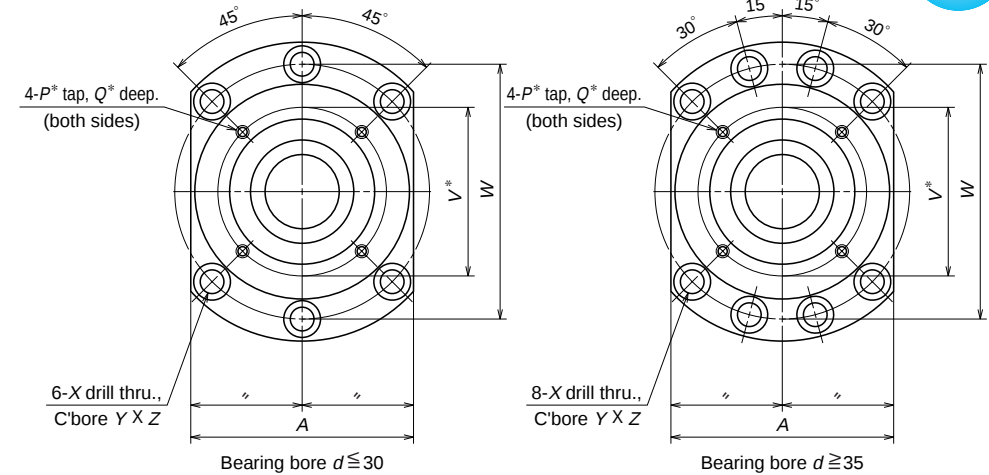
Remarks

- 1. Mount sections A and B to the machine base.
- 2. NSK support units are precisely preloaded and adjusted. Components ①, ②, ③, ④, ⑥, ⑦ are assembled into a unit. Do not disassemble.
- 3. Grease is packed into support units.
- 4. Lock nut ⑧ is exclusively prepared for ball screw. The end face of the nut is in strict control being precisely perpendicular to the V thread. Secure the lock nut using the set screw. Lock nut is also available as an accessory (See page B299). Refer to Page B301 as well for high-precision thrust angular contact ball bearing (TAC Series).



Lock nut

Dimensions of bearing seat

Bearing bore $d \leq 30$ Bearing bore $d \geq 35$

Support unit No.	Support unit																	Basic dynamic load rating C_a	
	d	D	D_1	D_2	L	L_1	L_2	A	W	X	Y	Z	d_1^{*}	I^{*}	V^{*}	P^{*}	Q^{*}	N	{kgf}
WBK 17DF-31	17	70	106	72	60	32	15	80	88	9	14	8.5	45	3	58	M5	10	21900	2240
WBK 20DF-31	20	70	106	72	60	32	15	80	88	9	14	8.5	45	3	58	M5	10	21900	2240
WBK 25DF-31	25	85	130	90	66	33	18	100	110	11	17.5	11	57	4	70	M6	12	28500	2910
WBK 25DFD-31					81	48												46500	4700
WBK 30DF-31	30	85	130	90	66	33	18	100	110	11	17.5	11	57	4	70	M6	12	29200	2980
WBK 30DFD-31					81	48												47500	4850
WBK 35DF-31	35	95	142	102	66	33	18	106	121	11	17.5	11	69	4	80	M6	12	31000	3150
WBK 35DFD-31					81	48												50500	5150
WBK 35DFF-31	40	95	142	102	96	48	18	106	121	11	17.5	11	69	4	80	M6	12	50500	5150
WBK 40DF-31					66	33												31500	3250
WBK 40DFD-31					81	48												51500	5250
WBK 40DFF-31					96	48												51500	5250

Remarks

1. Rigidity
Values in the Table are theoretical values obtained from the elastic deformation between the groove and the balls.
2. Starting torque
Starting torque indicates torque due to the preload of the bearing. It does not include seal torque.
3. The tolerance of the shaft bearing seat
We recommend "h5 grade of the fits tolerance.

Permissible axial load		Preload		Axial rigidity		Starting torque		Lock nut			Bearing seat for unit		
N	{kgf}	N	{kgf}	N/ μ m	{kgf/ μ m}	N·m	{kgf·m}	M	D_3	L_3	d	L_4	L_5
26600	2710	2150	220	750	75	14.0	1.5	M17×1.0	37	18	17	81	23
26600	2710	2150	220	750	75	14.0	1.5	M20×1.0	40	18	20	81	23
40500	4150	3150	320	1000	100	23.0	2	M25×1.5	45	20	25	89	26
81500	8300	4300	440	1470	150	31.0	3	M30×1.5	50	20	30	104	26
43000	4400	3350	340	1030	105	24.0	2.5					89	26
86000	8800	4500	460	1520	155	33.0	3	M35×1.5	55	22	35	104	26
50000	5100	3800	390	1180	120	28.0	3					92	26
100000	10200	5200	530	1710	175	37.0	4	M40×1.5	60	22	40	107	30
100000	10200	7650	780	2350	240	55.0	5.5					122	30
52000	5300	3900	400	1230	125	28.0	3	M40×1.5	60	22	40	92	30
104000	10600	5300	540	1810	185	38.0	4					107	30
104000	10600	7850	800	2400	245	57.0	5.5					122	30

Remarks

4. Dimensions with * (asterisk) mark
*Pilot diameter and tapped screws marked with "asterisk *" are used for seal unit installation for NSK standard hollow shaft ball screws. They also can be used for dust cover and damper installation.
5. Grease is packed into the bearing. It is not necessary to apply grease before use. We recommend "h5 grade of the fits tolerance.

Unit: mm

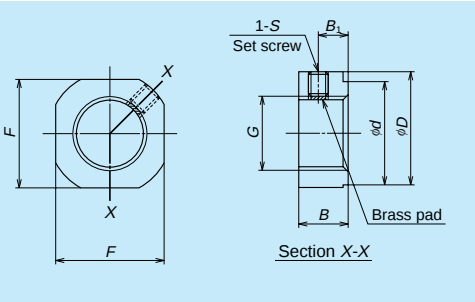
B
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Lock nut, grease unit, and travel stopper

In addition to the support units, NSK has other components for the ball screw as shown below.

(3) Lock nuts

Ball screw support bearing must be installed with minimum inclination. NSK lock nuts exclusive for ball screw help to reduce this inclination.



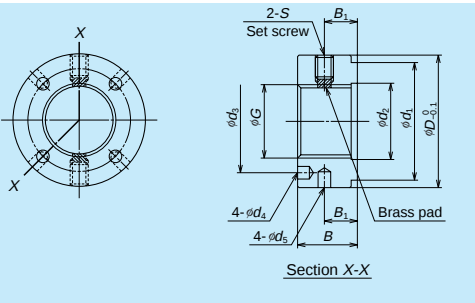
A Type Shapes and dimensions

A Type lock nuts

Unit: mm

Lock nut reference number	M	D	F	B	d	B ₁	S	Tightening torque N·m {kgf·m} (for reference)
WBK06L-01	M6 × 0.75	14.5	12	5	10	2.7	M3, with brass made set piece	245 {25}
WBK08L-01	M8 × 1.0	17	14	6.5	13	4	M3, with brass made set piece	490 {50}
WBK10L-01	M10 × 1.0	20	17	8	16	5	M4, with brass made set piece	930 {95}
WBK12L-01	M12 × 1.0	22	19	8	17	5	M4, with brass made set piece	1350 {140}
WBK15L-01	M15 × 1.0	25	22	10	21	6	M4, with brass made set piece	2350 {240}
WBK20L-01	M20 × 1.0	35	30	13	26	8	M4, with brass made set piece	4700 {480}
WBK25L-01	M25 × 1.0	42	36	16	34	10	M6, with brass made set piece	8400 {860}

Remarks: Insert a set piece (brass pad) and tighten the securing set screw.



S Type Shapes and dimensions

S Type lock nuts

Unit: mm

Lock nut reference number	G	D _{0.1}	B	d ₁	d ₂	d ₃	d ₄	d ₅	B ₁	S	Tightening torque N·m {kgf·m} (for reference)
WBK17L-31	M17 × 1.0	37	18	30	18	27	4.3	4	10	M6	5400 {550}
WBK20L-31	M20 × 1.0	40	18	30	21	30	4.3	4	10	M6	7350 {750}
WBK25L-31	M25 × 1.5	45	20	40	26	35	4.3	4	11	M6	13200 {1350}
WBK30L-31	M30 × 1.5	50	20	40	31	40	4.3	5	11	M6	19600 {2000}
WBK35L-31	M35 × 1.5	55	22	50	36	45	4.3	5	12	M6	29400 {3000}
WBK40L-31	M40 × 1.5	60	22	50	41	50	4.3	5	12	M6	39200 {4000}

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