B-3-1.6 Ball Screws for Transfer Equipment

1. Features

● Transporting mechanism

A series with accuracy grades of Ct7 and Ct10 only demonstrates high ball screw performance for transporting mechanism of Cartesian type robots and single axis actuators.

The following types are categorized ball screw for transfer equipment. VFA and RMA types have finished shaft ends. RMS type, R series of RNFTL, RNFBL, RNCT, RNFCL, and RNSTL types have blank shaft ends.

Table 1 Classifications of ball screws for transfer equipment

Finished shaft end	VFA type, RMA type
Blank shaft end	RMS type
	R Series
	RNFTL type, RNFBL type
	RNCT type, RNFCL type, RNSTL type

● 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.

2. Specifications

(1) Ball recirculation system

Figs. 1, **2**, and **3** show the structures of ball return tube, deflector (bridge type), and end cap ball recirculation systems.

Deflector (bridge type) recirculation system has the feature of compact nut outside diameter for small lead. End cap recirculation system is for screws with high helix lead and multiple start threads. Since the leads are in the range larger than 1.3 times of the screw shaft diameter, it is suitable for high-speed operation.

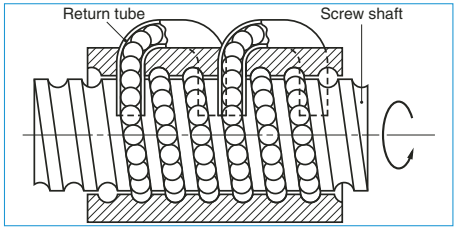


Fig. 1 Structure of return tube recirculation system

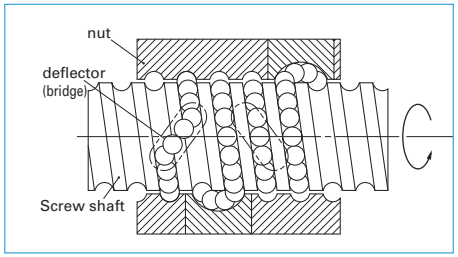


Fig. 2 Structure of deflector (bridge type) recirculation system

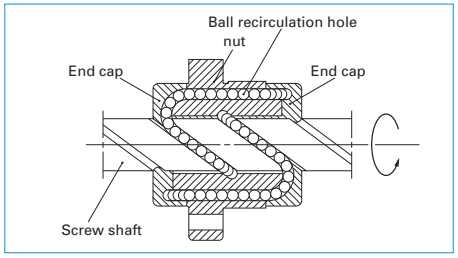


Fig. 3 Structure of end cap recirculation system

(2) Accuracy grade and axial play

Standard lead accuracy and axial play are shown on **Table 2**. Axial play varies with internal specification. Refer to the dimension tables.

Table 2 Accuracy grade and axial play

Accuracy grade	VFA type, RMA type, RMS type: Ct7 R Series: Ct10
Axial play	See dimension tables

(3) Allowable d·n value and the criterion of maximum rotational speed

Allowable d·n value and the criterion of maximum rotational speed are shown below. Please consult NSK if the rotational speed exceeds the permissible range below.

Table 3 Allowable d·n value and the criterion of maximum rotational speed

Allowable d·n value	50 000 or less
Criterion of maximum rotational speed	3 000 min^{-1}

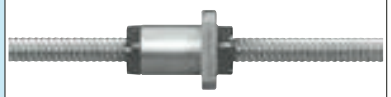
d•n value: shaft dia. d [mm] × rotational speed n [min^{-1}]

Note: Please also review the critical speed. See "Technical Description: Permissible Rotational Speed" (page B47) for details.

3. Product categories

Ball screws for transfer equipment have models as follows.

Table 4 Product categories of ball screws for transfer equipment

Nut model	Shape	Flange shape	Recirculation system	Preload system	Page
VFA		Flanged rectangular	Return tube type	Non-preload Slight axial play	353 – B358
RMA RMS		Flanged Circular Ⅲ	Deflector (bridge) type	Non-preload Slight axial play	B359 – B372
RNFTL		Flanged Circular Ⅰ Projecting tube type	Return tube type	Non-preload Slight axial play	B373 – B378
RNFBL		Flanged Circular Ⅱ	Return tube type	Non-preload Slight axial play	B379 – B380
RNCT		V-thread (no flange) Projecting tube type	Return tube type	Non-preload Slight axial play	B381 – B382
RNFCL		Flanged Circular Ⅲ	End cap type	Non-preload Slight axial play	B383 – B386
RNSTL		Square type	Return tube type	Non-preload Slight axial play	B387 – B388

4. Structure of reference number

The followings describe the structure of "Reference number for ball screw".

◇Reference number for VFA, RMA, and RMS types

VFA 15 10 - C7 S - 500

- VFA: Ball screw for transfer equipment: VFA, RMA, RMS
- 15: Screw shaft diameter (mm)
- 10: Lead (mm)
- C7: Accuracy grade code
- S: Axial play
- 500: Screw shaft length (mm)

◇Reference number for R series

Nut assembly (example)

RNFTL 25 10 A5 S

- RNFTL: Nut model : RNFTL, RNFBL, RNCT, RNFCL, RNSTL
- 25: Screw shaft diameter (mm)
- 10: Lead (mm)
- A5: Internal design code
- S: Seal code S: With seal
- No code: Without seal
- Effective turns of balls (turns of balls × number of circuit)

Screw shaft (example)

RS 25 10 A 20

- RS: Product code
- 25: Screw shaft diameter (mm)
- 10: Lead (mm)
- A: Internal design code
- 20: Screw shaft length (in the unit of 100 mm)

5. Combinations of shaft diameter and lead

Combinations of shaft diameter and lead are shown below.
For details of standard stock products, contact NSK.

Table 5 Combinations of shaft diameter and lead for VFA, RMA, RMS types

Screw shaft diameter \ Lead	1	1.5	2	10	20
6	B359, 371				
8	B361, 371	B363, 371	B365, 371		
10			B367, 371		
12			B369, 371	B353	
15				B355	B357

Table 6 Combinations of shaft diameter and lead for R series

Screw shaft diameter (mm)	Lead (mm) 3	4	5	6	8	10	12	16	20	25	32	40	50	64	80
10	○B373 △B381			○B373 ●B379											
12					○B373 ●B379		○B377 ◎B383								
14		○B373 ●B379 △B381 □B387	○B373 ●B379 △B381 □B387												
15									◎B383						
16						○B373		○B377 ◎B383			◎B385				
18					○B373 ●B379 △B381 □B387										
20			○B373 ●B379 △B381 □B387			○B373 ●B379 □B387			○B377 ◎B383			◎B385			
25			○B373 ●B379 △B381 □B387			○B359 ●B365 △B367 □B373				○B377 ◎B383			◎B385		
28				○B375 ●B379 △B381 □B387											
32						○B375 ●B379 △B381 □B387					○B377 ◎B383			◎B385	
36						○B375 ●B379 △B381 □B387									
40						○B375 △B381 ●B379						○B377 ◎B383			◎B385
45							○B375 △B381 □B387								
50						○B375 △B381		○B375 △B381					◎B383		

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

6. Precautions for designing

As shown in the illustration on Page B83 and B103, general precautions for ball screw.

(1) Nut assembly

When delivered, the nut of R series is separated from the screw shaft, and inserted into an arbor shaft. The nut must be inserted to the screw shaft when mounting ball screw.

(a) Consideration to end configuration of screw shaft

The balls may fall out during moving the assembled nut from the arbor to the screw shaft if the sizes and shapes of the arbor and the screw shaft are not appropriate.
If the end of the ball groove can touch the end of the arbor, connect both ends and move the assembled nut from the arbor to the screw shaft (**Fig. 4**).
If the end face of the arbor cannot connect to the end face of the screw because of configuration of both ends of screw shaft, wrap a tape outside of ball screw shaft so that the layers of tape is equal

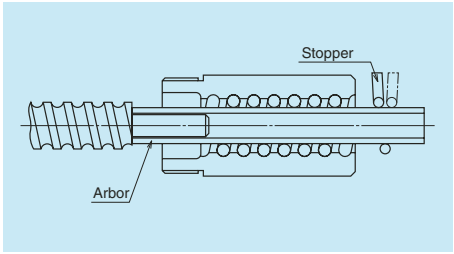


Fig. 4 Inserting nut into screwshaft

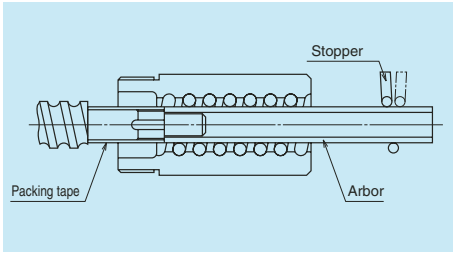


Fig. 5 Arbor and shaft end configuration

with the outside diameter of the arbor (**Fig. 5**).
If there is a key way or a nick along the way, fill such gaps prior to moving the ball nut.

(b) Installation of arbor

Confirm the correct nut orientation for installation.
Remove the stop ring on the side from where the assembled nut is to be removed. Align the centers of the screw shaft and the arbor while pressing firmly the screw shaft end against the arbor.

(c) Moving the nut

Slide the nut until it lightly touches the shoulder of the ball groove section, and stop it. Turn the ball nut to the direction so that it moves to the ball grooves, while pressing the arbor to the screw shaft. Do not separate the arbor from the screw shaft until the ball groove end appears completely in the ball nut.

(2) Shaft end configuration

RMS type and R seriese must be machining of blank shaft ends. See page B27, use of NSK suport unit.

(a) Cutting screw shaft

Carry out the same process as "(1) Machining of blank shaft ends of precision ball screws" above.

(b) Annealing the shaft end (Heat the section of the shaft end to be machined with an acetylene torch. Then gradually cool it in ambient atmosphere.)

* The area not machined loses hardness if exposed to heat. This may shorten the all screw life. Cool with water the areas where should not be heated to avoid heat conduction.

(c) Turning by lathe

Cut to the length, turn shaft end steps, turn thread screw, and provide the center hole. Refer to JIS B1192 which sets standards for the shaft end accuracy.

(d) Processing by grinding

Apply the same precautions as for cutting for centering, securing nut, and work rest. Grind sections where the bearings and a "Spann ring" are installed.

(e) Milling processing
Process keyways and tooth seats for lock washers.

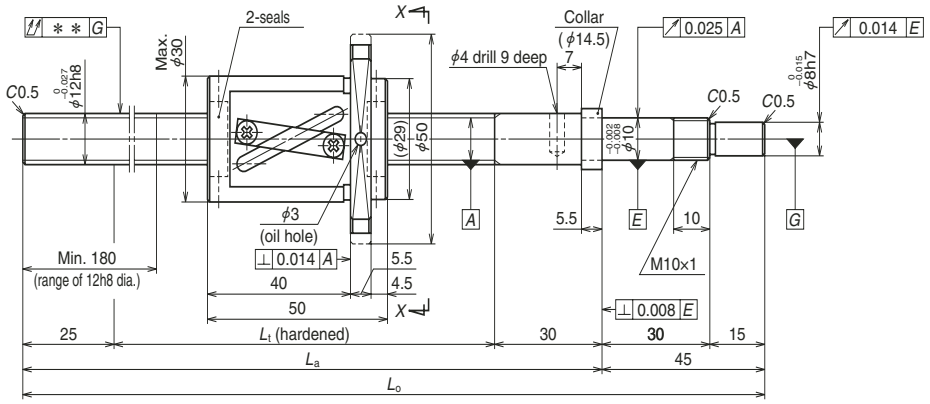
(f) Deburring, washing, and rust prevention
Wash with clean white kerosene after processing. Apply lubricant for immediate use. For later use, apply rust preventive agent.
Note: Contact NSK if nut is accidentally removed.

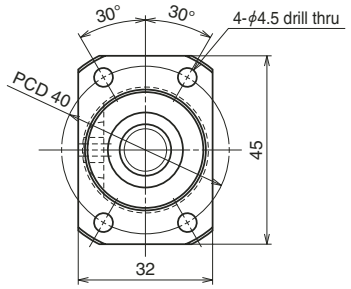
NSK

Screw shaft ø12

Lead 10

Unit: mm





View *X-X*

Ball screw specification		
Shaft dia.×Lead / Direction of turn		12 × 10 / Right
Ball recirculation		Return tube
Ball dia. / Ball circle dia.		2.381 / 12.5
Screw shaft root dia.		10.0
Effective turns of balls		2.5 × 1
Accuracy grade / Axial play code		Ct7 / S
Basic load rating (N)	Dynamic C_a	3 750
	Static C_{0a}	6 480
Axial play		0.010 or less
Dynamic friction torque (N·cm)		1.5 or less
Spacer ball		None
Factory-packed grease		NSK grease LR3
Internal spatial volume of nut (cm^3)		1.4
Reference of grease replenishing amount		0.7

Recommended support unit

For drive side (Fixed)	For opposite to drive side (Simple)
WBK10-01A (square)	WBK12SF-01 (square)
WBK10-11 (round)	

VFA

Unit: mm

Ball screw No.	Stroke		Screw shaft length		
	Nominal	Maximum (L_t-nut length)	L_t	L_a	L_o
VFA1210C7S-410	250	260	310	365	410
VFA1210C7S-610	450	460	510	565	610

Lead accuracy			Shaft run-out** ↗↗	Mass (kg)	Permissible rotational speed N (min^{-1})	
					Supporting condition	
T	e_p	υ_{300}			Fixed - Simple support	Fixed - Free
0	0.085	0.052	0.100	0.56	3 000	3 000
0	0.155	0.052	0.160	0.73	3 000	1 300

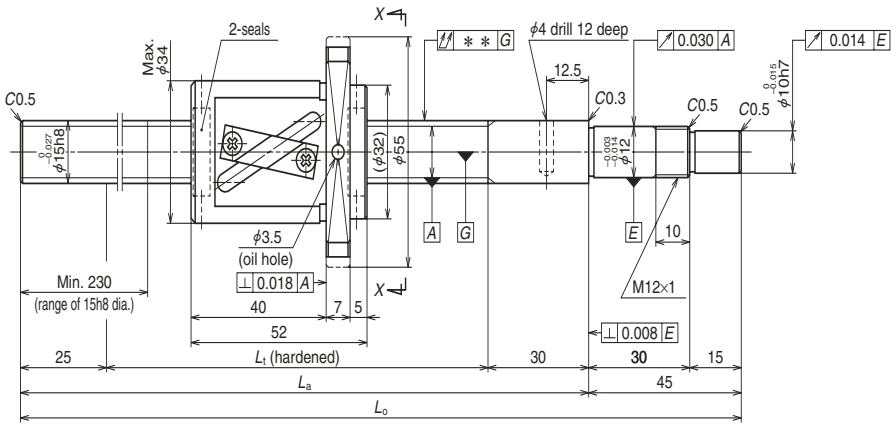
Notes: 1. We recommend NSK support units (page B389). WBK12SF-01 (on simple support side) supports ball screw directly on shaft outside diameter.
2. Use of NSK grease LR3 is recommended. Recommended quantity of grease is about 50% of ball nut's internal space. See page D16 for details.
3. Permissible rotational speed is determined by d · n value and critical speed. See pages B47 and B349.

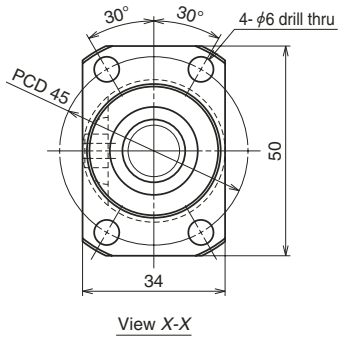
NSK

Screw shaft ø15

Lead 10

Unit: mm





View *X-X*

Ball screw specification		
Shaft dia.xLead / Direction of turn		15 × 10 / Right
Ball recirculation		Return tube
Ball dia. / Ball circle dia.		3.175 / 15.5
Screw shaft root dia.		12.2
Effective turns of balls		2.5 × 1
Accuracy grade / Axial play code		Ct7 / S
Basic load rating (N)	Dynamic C_a	7 070
	Static C_{0a}	12 800
Axial play		0.010 or less
Dynamic friction torque (N·cm)		2.5 or less
Spacer ball		None
Factory-packed grease		NSK grease LR3
Internal spatial volume of nut (cm^3)		2.3
Reference of grease replenishing amount		1.2

Recommended support unit

For drive side (Fixed)	For opposite to drive side (Simple)
WBK12-01A (square)	WBK15SF-01 (square)
WBK12-11 (round)	

VFA

Unit: mm

Ball screw No.	Stroke		Screw shaft length		
	Nominal	Maximum (L_t-nut length)	L_t	L_a	L_o
VFA1510C7S-500	300	348	400	455	500
VFA1510C7S-700	500	548	600	655	700
VFA1510C7S-1000	800	848	900	955	1 000

Lead accuracy			Shaft run-out**	Mass (kg)	Permissible rotational speed N (min^{-1})	
					Supporting condition	
T	e_p	υ_{300}			Fixed - Simple support	Fixed - Free
0	0.120	0.052	0.075	0.89	3 000	2 600
0	0.195	0.052	0.110	1.1	3 000	1 150
0	0.310	0.052	0.180	1.5	2 340	510

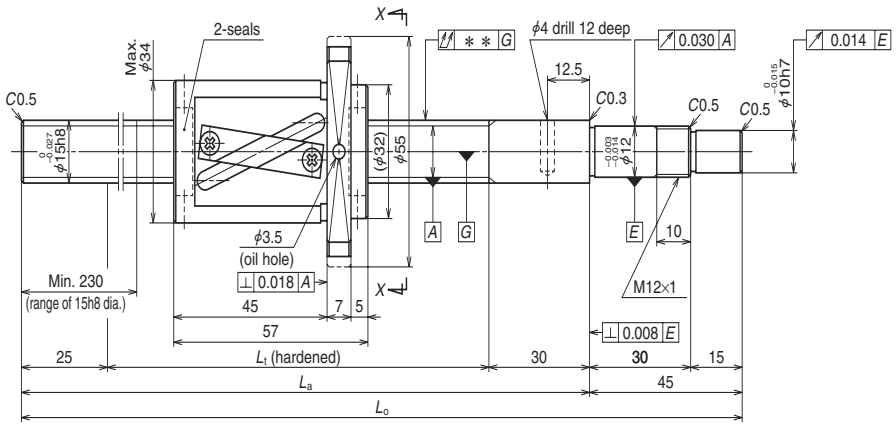
Notes: 1. We recommend NSK support units (page B389). WBK12SF-01 (on simple support side) supports ball screw directly on shaft outside diameter.
2. Use of NSK grease LR3 is recommended. Recommended quantity of grease is about 50% of ball nut's internal space. See page D16 for details.
3. Permissible rotational speed is determined by d · n value and critical speed. See pages B47 and B349.

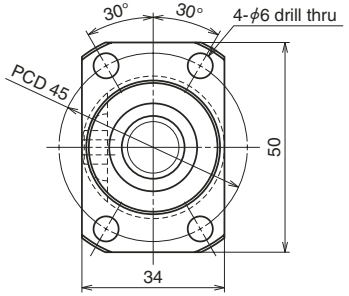
NSK

Screw shaft ø15

Lead 20

Unit: mm





View *X-X*

Ball screw specification		
Shaft dia.xLead / Direction of turn		15 × 20 / Right
Ball recirculation		Return tube
Ball dia. / Ball circle dia.		3.175 / 15.5
Screw shaft root dia.		12.2
Effective turns of balls		1.5 × 1
Accuracy grade / Axial play code		Ct7 / S
Basic load rating (N)	Dynamic C_a	4 560
	Static C_{0a}	7 730
Axial play		0.010 or less
Dynamic friction torque (N·cm)		2.5 or less
Spacer ball		None
Factory-packed grease		NSK grease LR3
Internal spatial volume of nut (cm^3)		2.3
Reference of grease replenishing amount		1.4

Recommended support unit

For drive side (Fixed)	For opposite to drive side (Simple)
WBK12-01A (square)	WBK15SF-01 (square)
WBK12-11 (round)	

VFA

Unit: mm

Ball screw No.	Stroke		Screw shaft length		
	Nominal	Maximum (L_t-nut length)	L_t	L_a	L_o
VFA1520C7S-500	300	343	400	455	500
VFA1520C7S-700	500	543	600	655	700
VFA1520C7S-1000	800	843	900	955	1 000

Lead accuracy			Shaft run-out**	Mass (kg)	Permissible rotational speed N (min^{-1})	
					Supporting condition	
T	e_p	υ_{300}			Fixed - Simple support	Fixed - Free
0	0.120	0.052	0.075	0.94	3 000	2 630
0	0.195	0.052	0.110	1.2	3 000	1 160
0	0.310	0.052	0.180	1.6	2 350	510

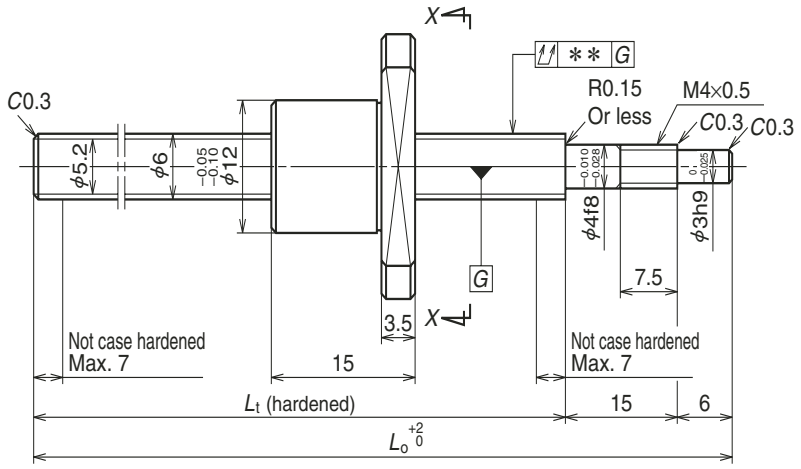
Notes: 1. We recommend NSK support units (page B389). WBK12SF-01 (on simple support side) supports ball screw directly on shaft outside diameter.
2. Use of NSK grease LR3 is recommended. Recommended quantity of grease is about 50% of ball nut's internal space. See page D16 for details.
3. Permissible rotational speed is determined by d · n value and critical speed. See pages B47 and B349.

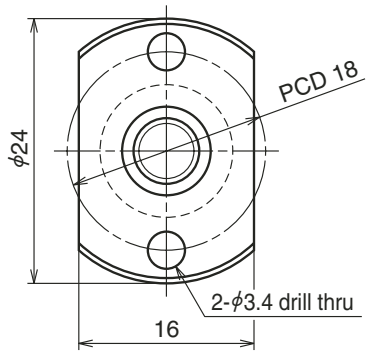
NSK

Screw shaft ø6

Lead 1

Unit: mm





View *X-X*

Ball screw specification		
Shaft dia.×Lead / Direction of turn		6 × 1 / Right
Ball recirculation		Deflector (bridge)
Ball dia. / Ball circle dia.		0.800 / 6.2
Screw shaft root dia.		5.2
Effective turns of balls		1 × 3
Accuracy grade / Axial play code		Ct7 / S
Basic load rating (N)	Dynamic C_a	520
	Static C_{0a}	925
Axial play		0.020 or less
Dynamic friction torque (N·cm)		1.0 or less
Spacer ball		None
Factory-packed grease		**See Notes 2.**

Recommended support unit

For drive side (Fixed)
WBK04R-11 (round)

RMA

Ball screw No.	Stroke		Screw shaft length	
	Nominal	Maximum (L_t-Nut length)	L_t	L_o
RMA0601C7S-160	100	124	139	160
RMA0601C7S-260	200	224	239	260

Unit: mm

Lead accuracy			Shaft run-out**	Mass (kg)	Permissible rotational speed N (min^{-1})
Target compensation T	Deviation e_p	Variation v_{300}			
0	0.052	0.052	0.060	0.045	3 000
0	0.085	0.052	0.090	0.065	3 000

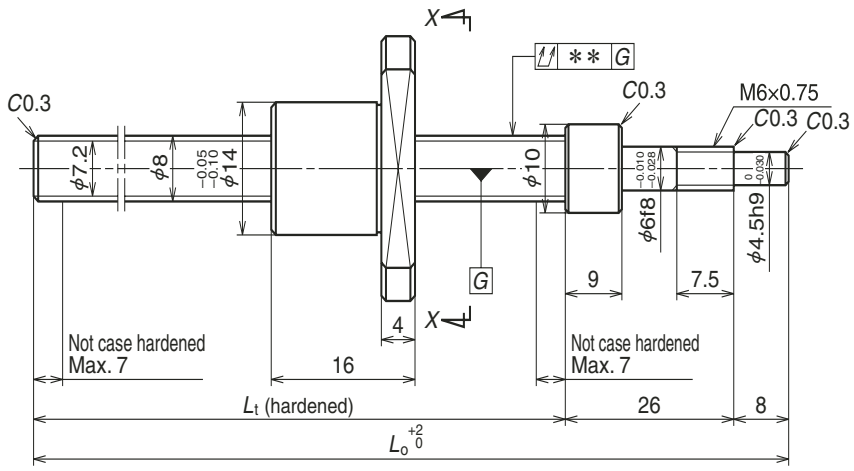
Notes: 1. We recommend NSK support bearing kit (page B389).
2. Only rust preventive oil is applied at time of delivery. Please apply lubricant (oil or grease) before use.
See page D13 for details.
3. Permissible rotational speed is determined by d·n value and critical speed. See pages B47 and B349.

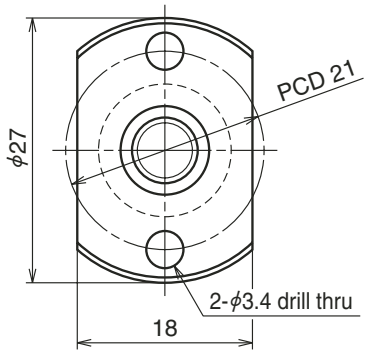
NSK

Screw shaft ø8

Lead 1

Unit: mm





View *X-X*

Ball screw specification		
Shaft dia.xLead / Direction of turn		8 × 1 / Right
Ball recirculation		Deflector (bridge)
Ball dia. / Ball circle dia.		0.800 / 8.2
Screw shaft root dia.		7.2
Effective turns of balls		1 × 3
Accuracy grade / Axial play code		Ct7 / S
Basic load rating (N)	Dynamic C_a	600
	Static C_{0a}	1 290
Axial play		0.020 or less
Dynamic friction torque (N·cm)		1.0 or less
Spacer ball		None
Factory-packed grease		**See Notes 2.**

Recommended support unit

For drive side (Fixed)
WBK06R-11 (round)

RMA

Unit: mm

Ball screw No.	Stroke		Screw shaft length	
	Nominal	Maximum (L_t-Nut length)	L_t	L_o
RMA0801C7S-180	100	130	146	180
RMA0801C7S-280	200	230	246	280

Lead accuracy			Shaft run-out**	Mass (kg)	Permissible rotational speed N (min^{-1})
Target compensation T	Deviation e_p	Variation v_{300}			
0	0.052	0.052	0.060	0.085	3 000
0	0.085	0.052	0.090	0.12	3 000

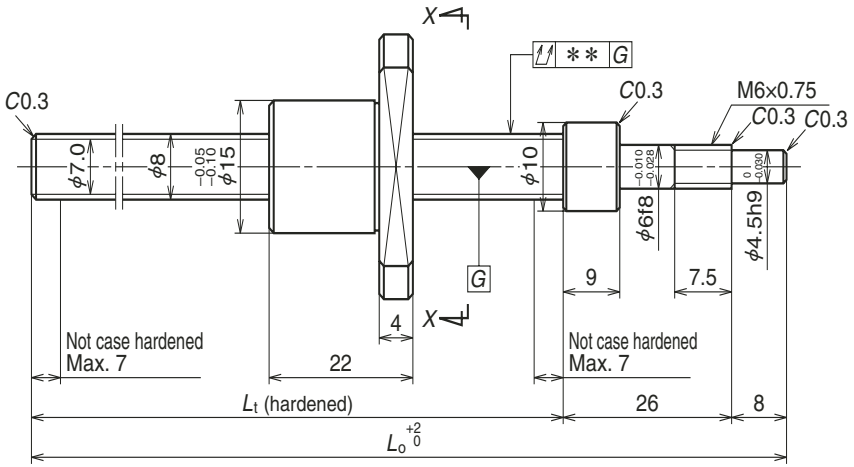
Notes: 1. We recommend NSK support bearing kit (page B389).
2. Only rust preventive oil is applied at time of delivery. Please apply lubricant (oil or grease) before use.
See page D13 for details.
3. Permissible rotational speed is determined by d·n value and critical speed. See pages B47 and B349.

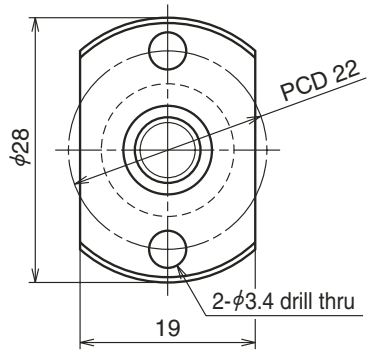
NSK

Screw shaft ø8

Lead 1.5

Unit: mm





View *X-X*

Ball screw specification		
Shaft dia.×Lead / Direction of turn		8 × 1.5 / Right
Ball recirculation		Deflector (bridge)
Ball dia. / Ball circle dia.		1.000 / 8.3
Screw shaft root dia.		7.0
Effective turns of balls		1 × 3
Accuracy grade / Axial play code		Ct7 / S
Basic load rating (N)	Dynamic C_a	810
	Static C_{0a}	1 590
Axial play		0.020 or less
Dynamic friction torque (N·cm)		1.0 or less
Spacer ball		None
Factory-packed grease		**See Notes 2.**

Recommended support unit

For drive side (Fixed)
WBK06R-11 (round)

RMA

Unit: mm

Ball screw No.	Stroke		Screw shaft length	
	Nominal	Maximum (L_t-Nut length)	L_t	L_o
RMA0801.5C7S-180	100	124	146	180
RMA0801.5C7S-280	200	224	246	280

Lead accuracy			Shaft run-out**	Mass (kg)	Permissible rotational speed N (min^{-1})
Target compensation *T*	Deviation e_p	Variation v_{300}			
0	0.052	0.052	0.060	0.093	3 000
0	0.085	0.052	0.090	0.13	3 000

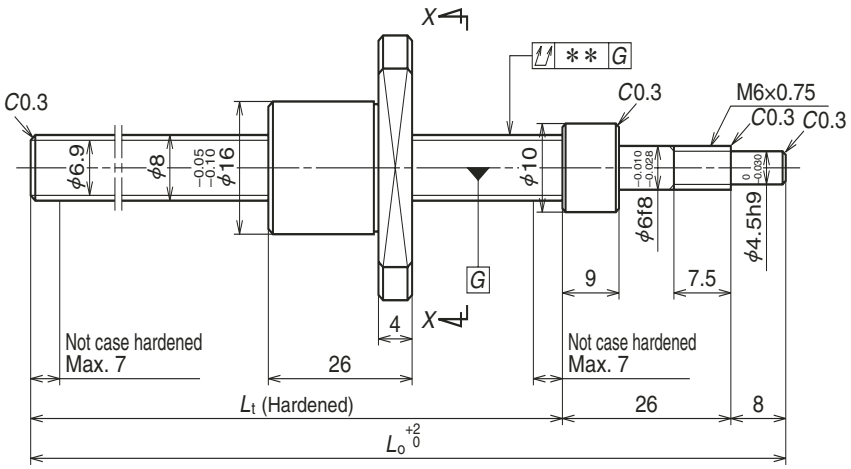
Notes: 1. We recommend NSK support bearing kit (page B389).
2. Only rust preventive oil is applied at time of delivery. Please apply lubricant (oil or grease) before use.
See page D13 for details.
3. Permissible rotational speed is determined by d·n value and critical speed. See pages B47 and B349.

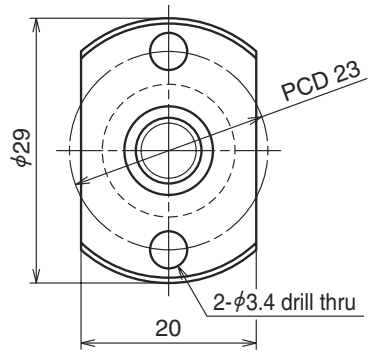
NSK

Screw shaft ø8

Lead 2

Unit: mm





View *X-X*

Ball screw specification		
Shaft dia.xLead / Direction of turn		8 × 2 / Right
Ball recirculation		Deflector (bridge)
Ball dia. / Ball circle dia.		1.200 / 8.3
Screw shaft root dia.		6.9
Effective turns of balls		1 × 3
Accuracy grade / Axial play code		Ct7 / S
Basic load rating (N)	Dynamic C_a	1 070
	Static C_{0a}	1 950
Axial play		0.020 or less
Dynamic friction torque (N·cm)		1.0 or less
Spacer ball		None
Factory-packed grease		**See Notes 2.**

Recommended support unit

For drive side (Fixed)
WBK06R-11 (round)

RMA

Unit: mm

Ball screw No.	Stroke		Screw shaft length	
	Nominal	Maximum (L_t-Nut length)	L_t	L_o
RMA0802C7S-180	100	120	146	180
RMA0802C7S-280	200	220	246	280

Lead accuracy			Shaft run-out**	Mass (kg)	Permissible rotational speed N (min^{-1})
Target compensation T	Deviation e_p	Variation v_{300}			
0	0.052	0.052	0.060	0.10	3 000
0	0.085	0.052	0.090	0.14	3 000

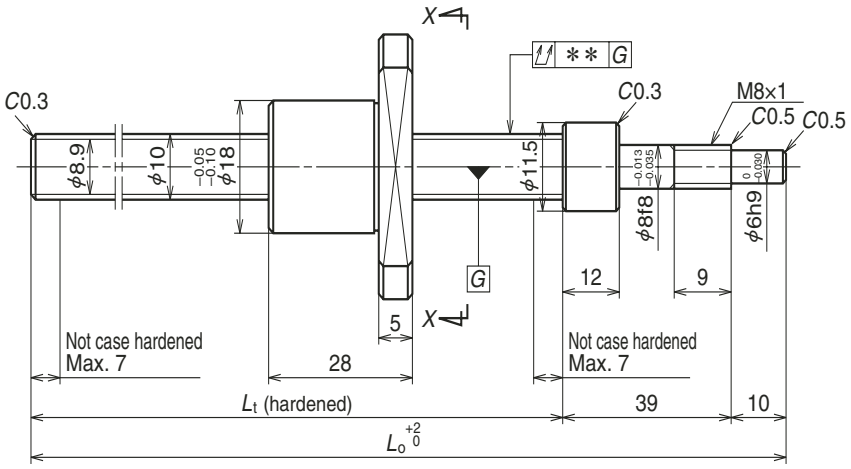
Notes: 1. We recommend NSK support bearing kit (page B389).
2. Only rust preventive oil is applied at time of delivery. Please apply lubricant (oil or grease) before use.
See page D13 for details.
3. Permissible rotational speed is determined by d·n value and critical speed. See pages B47 and B349.

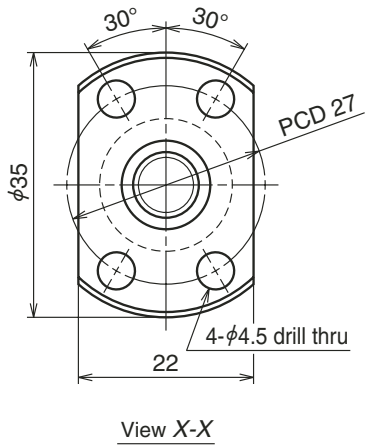
NSK

Screw shaft ø10

Lead 2

Unit: mm





View *X-X*

Ball screw specification		
Shaft dia.xLead / Direction of turn		10 × 2 / Right
Ball recirculation		Deflector (bridge)
Ball dia. / Ball circle dia.		1.200 / 10.3
Screw shaft root dia.		8.9
Effective turns of balls		1 × 3
Accuracy grade / Axial play code		Ct7 / S
Basic load rating (N)	Dynamic C_a	1 210
	Static C_{0a}	2 510
Axial play		0.020 or less
Dynamic friction torque (N·cm)		1.0 or less
Spacer ball		None
Factory-packed grease		**See Notes 2.**

Recommended support unit

For drive side (Fixed)
WBK08-01A (square)
WBK08-11 (round)

RMA

Unit: mm

Ball screw No.	Stroke		Screw shaft length	
	Nominal	Maximum (L_t-Nut length)	L_t	L_o
RMA1002C7S-250	150	173	201	250
RMA1002C7S-350	250	273	301	350

Lead accuracy			Shaft run-out**	Mass (kg)	Permissible rotational speed N (min^{-1})
Target compensation T	Deviation e_p	Variation v_{300}			
0	0.085	0.052	0.070	0.19	3 000
0	0.085	0.052	0.100	0.25	3 000

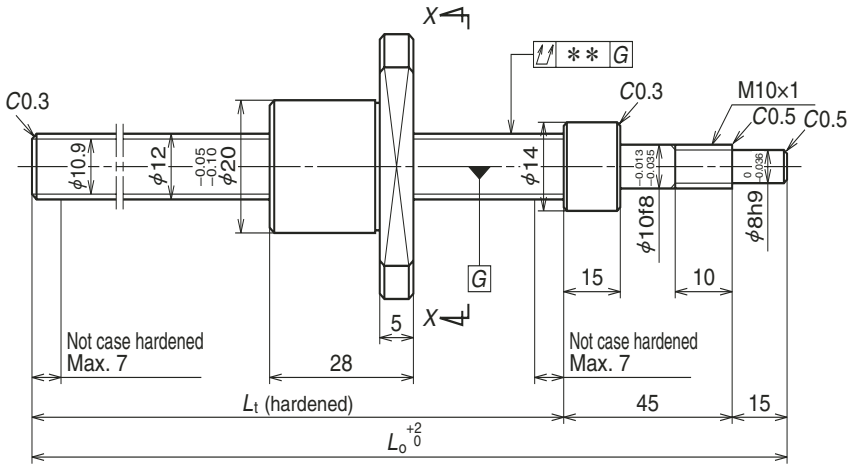
Notes: 1. We recommend NSK support bearing kit (page B389).
2. Only rust preventive oil is applied at time of delivery. Please apply lubricant (oil or grease) before use.
See page D13 for details.
3. Permissible rotational speed is determined by d·n value and critical speed. See pages B47 and B349.

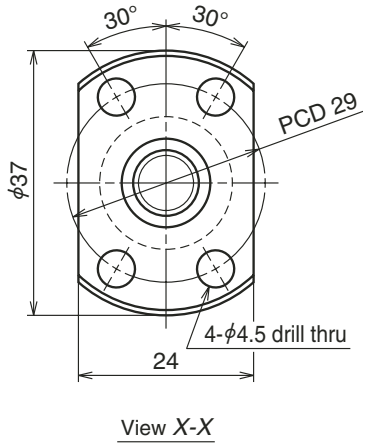
NSK

Screw shaft ø12

Lead 2

Unit: mm





View *X-X*

Ball screw specification		
Shaft dia.xLead / Direction of turn		12 × 2 / Right
Ball recirculation		Deflector (bridge)
Ball dia. / Ball circle dia.		1.200 / 12.3
Screw shaft root dia.		10.9
Effective turns of balls		1 × 3
Accuracy grade / Axial play code		Ct7 / S
Basic load rating (N)	Dynamic C_a	1 350
	Static C_{0a}	3 190
Axial play		0.020 or less
Dynamic friction torque (N·cm)		1.0 or less
Spacer ball		None
Factory-packed grease		**See Notes 2.**

Recommended support unit

For drive side (Fixed)
WBK10-01A (square)
WBK10-11 (round)

RMA

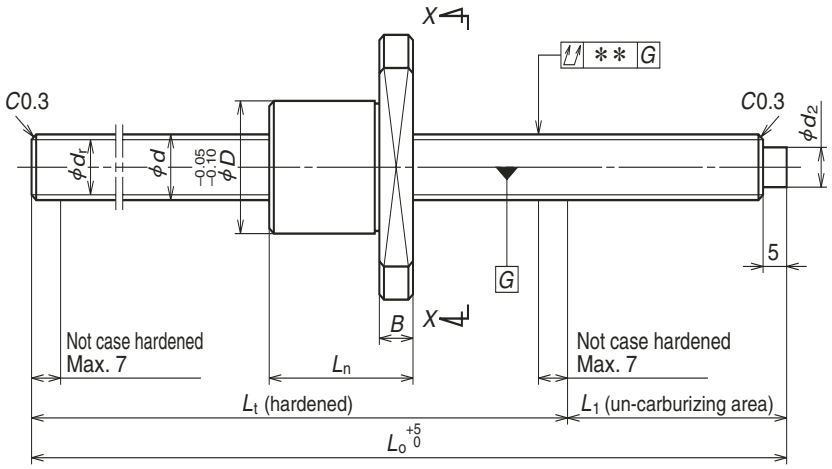
Unit: mm

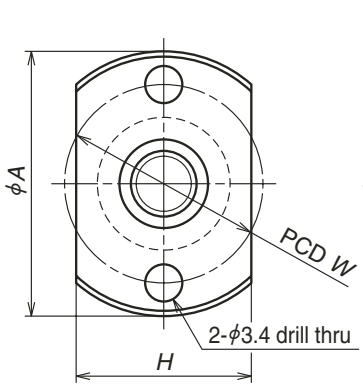
Ball screw No.	Stroke		Screw shaft length	
	Nominal	Maximum (L_t-Nut length)	L_t	L_o
RMA1202C7S-250	150	162	190	250
RMA1202C7S-350	250	262	290	350

Lead accuracy			Shaft run-out**	Mass (kg)	Permissible rotational speed N (min^{-1})
Target compensation T	Deviation e_p	Variation v_{300}			
0	0.060	0.052	0.070	0.26	3 000
0	0.085	0.052	0.100	0.34	3 000

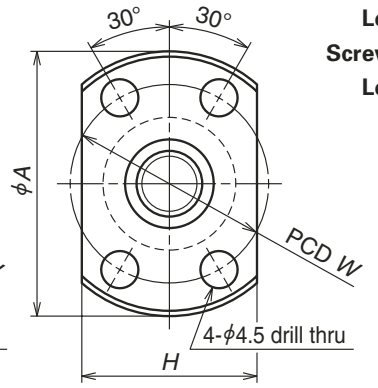
Notes: 1. We recommend NSK support bearing kit (page B389).
2. Only rust preventive oil is applied at time of delivery. Please apply lubricant (oil or grease) before use.
See page D13 for details.
3. Permissible rotational speed is determined by d·n value and critical speed. See pages B47 and B349.

Screw shaft ø6
Lead 1
Screw shaft ø8
Lead 1, 1.5, 2
Screw shaft ø10, ø12
Lead 2





View *X-X*
(for screw shaft of 6 and 8 dia.)



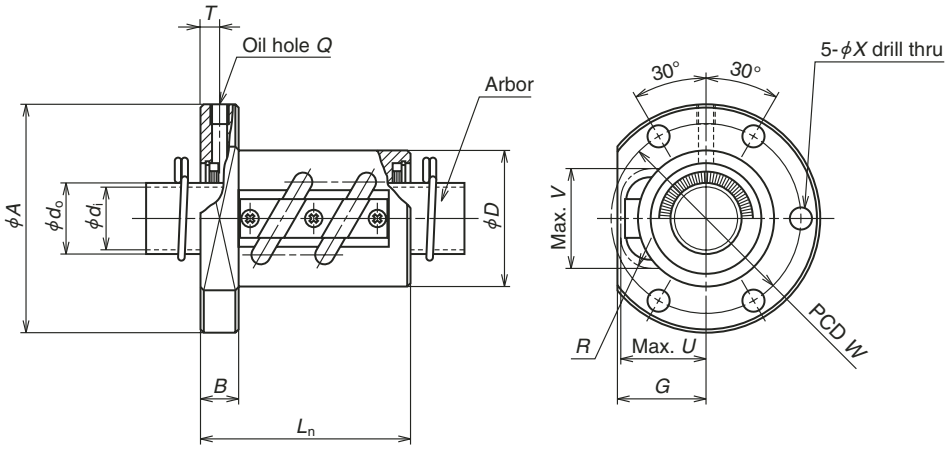
View *X-X*
(for screw shaft of 10 and 12 dia.)

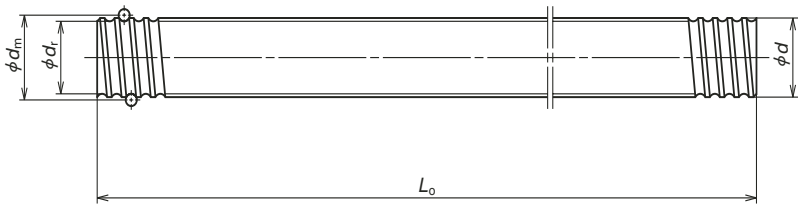
Unit: mm

Ball screw No.	Stroke Max. L_t-L_n	Shaft dia. d	Lead l	Ball dia. D_w	Ball circle dia. d_m	Root dia. d_r	Effective turns of balls	Basic load rating (N) Dynamic C_a	Basic load rating (N) Static C_{0a}	Axial play Max.
RMS0601C7S-300	235	6	1	0.800	6.2	5.3	3	520	925	0.02
RMS0801C7S-300	234	8	1	0.800	8.2	7.3	3	600	1 290	0.02
RMS0801.5C7S-300	228		1.5	1.000	8.3	7.2		810	1 590	
RMS0802C7S-300	224		2	1.200	8.3	7.0		1 070	1 950	
RMS1002C7S-350	262	10	2	1.200	10.3	9.0	3	1 210	2 510	0.02
RMS1202C7S-350	262	12	2	1.200	12.3	11.0	3	1 350	3 190	0.02

Nut dimensions D	A	H	B	L_n	W	Screw shaft dimensions Effective thread length L_t	Shaft end L_1	Shaft end d_2	Overall length L_o	Lead accuracy Target compensation T	Deviation e_p	Variation v_{300}	Shaft run-out**	Mass (Kg)	Permissible rotational speed N (min^{-1})
12	24	16	3.5	15	18	250	50	4	300	0	0.085	0.052	0.09	0.075	
14	27	18		16	21									0.13	
15	28	19	4	22	22	250	50	6	300	0	0.085	0.052	0.09	0.14	3 000
16	29	20		26	23									0.15	
18	35	22	5	28	27	290	60	8	350	0	0.085	0.052	0.10	0.25	
20	37	24	5	28	29	290	60	10	350	0	0.085	0.052	0.10	0.35	

Notes: 1. We recommend NSK support unit (page B389) or support kit (page B401).
2. Only rust preventive agent is applied at time of delivery. Please apply lubricant (oil or grease) before use.
See page D13 for details.
3. Seal is not installed.
4. Permissible rotational speed is determined by d·n value and critical speed. See pages B47 and B349.



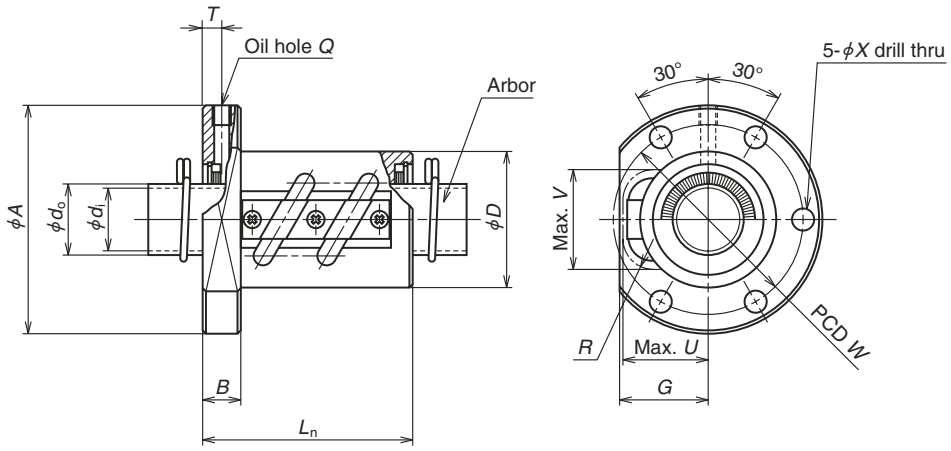


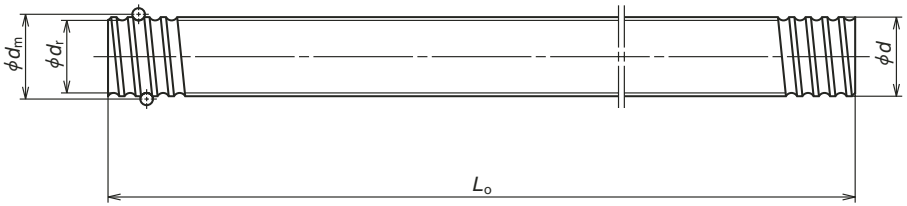
Unit: mm

Ball nut No.	Shaft dia. d	Lead l	Ball dia. D_w	Ball circle dia. d_m	Root dia. d_r	Effective turns of balls: Turns × Circuits	Basic load rating (N): Dynamic C_a	Basic load rating (N): Static C_{0a}	Axial play Max.	Ball nut dimensions: Outside dia. D
RNFTL 1003A3.5	10	3	2.381	10.65	8.1	3.5×1	3 780	6 730	0.10	20
RNFTL 1006A2.5S	10	6	2.381	10.65	8.1	2.5×1	2 830	4 810	0.10	20
RNFTL 1208A2.5S	12	8	2.778	12.65	9.6	2.5×1	3 730	6 560	0.10	25
RNFTL 1404A3.5S	14	4	2.778	14.5	11.5	3.5×1	5 370	10 800	0.10	25
RNFTL 1405A2.5S	14	5	3.175	14.5	11.0	2.5×1	5 260	9 720	0.10	30
RNFTL 1610A2.5 **RNFTL 1610A2.5S**	16	10	3.175	16.75	13.3	2.5×1	5 660	11 500	0.10	30
RNFTL 1808A3.5 **RNFTL 1808A3.5S**	18	8	4.762	18.5	13.6	3.5×1	13 200	25 800	0.15	34
RNFTL 2005A2.5 **RNFTL 2005A2.5S**	20	5	3.175	20.5	17.0	2.5×1	6 360	14 200	0.10	40
RNFTL 2010A2.5 **RNFTL 2010A2.5S**	20	10	4.762	21.25	16.2	2.5×1	10 900	21 800	0.15	40
RNFTL 2505A5 **RNFTL 2505A5S**	25	5	3.175	25.5	22.0	2.5×2	12 800	36 300	0.10	42
RNFTL 2510A2.5 **RNFTL 2510A2.5S**	25	10	6.35	26	19.0	2.5×1	17 500	35 200	0.20	44
RNFTL 2510A5 **RNFTL 2510A5S**						2.5×2	31 800	70 300		44

Ball nut dimensions: Flange A	G	B	Length L_1	Bolt hole W	X	Oil hole Q	Projecting tube T	U	V	R	Nut Mass. (kg)	Arbor: Outside dia. d_0	Bore d_i	Screw shaft: Standard length L_0			Screw shaft No.	Shaft mass/m (kg)	Internal spatial volume of nut (cm^3)	Standard volume of grease replenishing (cm^3)
40	15	6	34	30	4.5	M3×0.5	3.0	15	15	7	0.092	8.1	6.1	400	800	–	RS1003A··	0.50	–	–
40	15	6	36	30	4.5	M3×0.5	3.5	15	15	5	0.095	8.1	6.1	400	800	–	RS1006A··	0.56	1.1	0.6
45	19	8	46	35	4.5	M3×0.5	5.5	19	18	7	0.18	9.6	7.6	400	800	–	RS1208A··	0.74	1.8	0.9
50	19	10	43	40	4.5	M6×1	5.0	19	20	7	0.20	11.5	9.5	500	1 000	–	RS1404A··	1.02	2.0	1.0
50	22	10	45	40	4.5	M6×1	5.0	22	21	8	0.26	11.0	9.0	500	1 000	–	RS1405A··	1.00	2.4	1.2
53	23	10	54	41	5.5	M6×1	5.5	23	22.5	8	0.28	13.3	11.3	500	1 000	1 500	RS1610A··	1.37	2.7	1.4
63	27	12	58	49	6.6	M6×1	6.0	27	27	8	0.43	13.6	11.6	500	1 000	1 500	RS1808A··	1.60	5.2	2.6
60	28	10	46	50	4.5	M6×1	5.0	28	27	10	0.42	17.0	14.6	500	1 000	2 000	RS2005A··	2.17	3.5	1.8
67	30	12	59	53	6.6	M6×1	6.0	30	29	12	0.55	16.2	13.8	500	1 000	2 000	RS2010A··	2.18	7.1	3.6
71	28	12	66	57	6.6	M6×1	6.0	28	31	10	0.62	22.0	19.6	1 000	2 000	2 500	RS2505A··	3.47	6.5	3.3
80	34	15	62	62	9	M6×1	7.5	34	37	17	0.75	19.0	16.6	1 000	2 000	2 500	RS2510A··	3.13	13	6.5
80	34	15	92	62	9	M6×1	7.5	34	37	17									18	9.0

Notes: 1. Protruding portion of tube does not interfere with ball nut housing if its dimensions corresponding to U and V are large enough.
2. Actual screw shaft length may become slightly longer than nominal length L_0 due to manufacturing tolerance.
3. Only ball nut part numbers ending "S" are equipped with seals. External dimensions of those with seals are the same as those without.
In ball nut side view drawing, above the center line there is a seal, and beneath it there is no seal.
Seal for those with shaft diameter of 14 mm or less is made of synthetic resin. Seal for those of 16 mm or more is a "Brush" seal.
4. Nut assembly with arbor and screw shaft are separate at time of delivery.
5. Value obtained by diving standard screw shaft length by 100 mm will be entered at end of the part number where marked with ··.
6. Items in stock do not have surface treatment. For details of standard stock products, contact NSK.
7. Internal spatial volume of nut and volume of grease to be replenished are values for ball screws with seals.
Recommended amount for replenishing is approximately 50% of nut's internal space. For ball screws without seals, apply grease to screw shaft surface or move ball nut by hand while filling them with grease so that grease permeates all areas.
See page D16 for details.





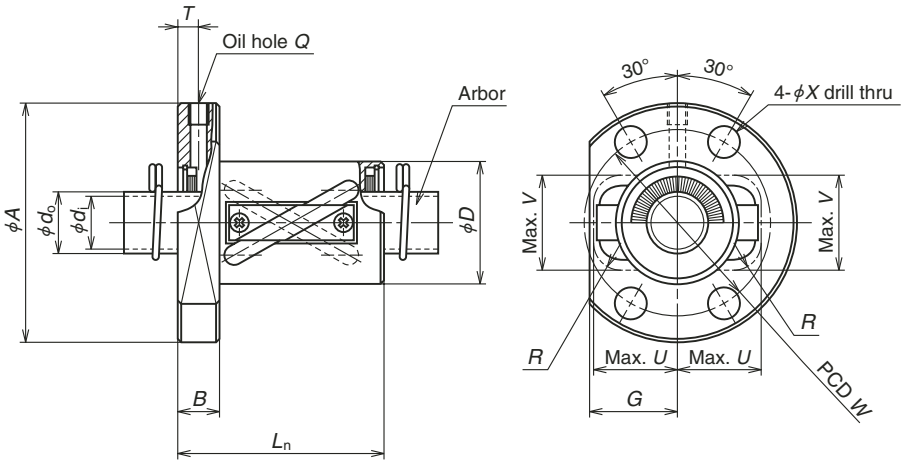
Unit: mm

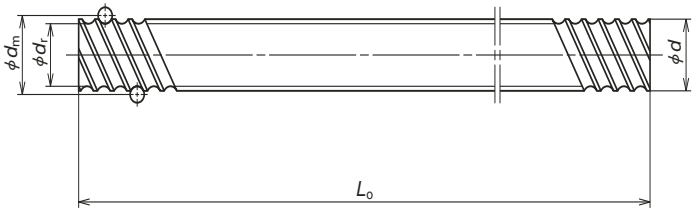
Ball nut No.	Shaft dia. d	Lead l	Ball dia. D_w	Ball circle dia. d_m	Root dia. d_r	Effective turns of balls: Turns × Circuits	Basic load rating (N): Dynamic C_a	Basic load rating (N): Static C_{0a}	Axial play Max.	Ball nut dimensions: Outside dia. D
RNFTL 2806A2.5 **RNFTL 2806A2.5S**	28	6	3.175	28.5	25.0	2.5×1	7 430	20 300	0.10	50
RNFTL 2806A5 **RNFTL 2806A5S**						2.5×2	13 500	40 600		50
RNFTL 3210A5 **RNFTL 3210A5S**	32	10	6.35	33.75	27.0	2.5×2	35 700	92 200	0.20	55
RNFTL 3610A2.5 **RNFTL 3610A2.5S**	36	10	6.35	37	30.0	2.5×1	21 000	51 000	0.20	60
RNFTL 3610A5 **RNFTL 3610A5S**						2.5×2	38 100	102 000		60
RNFTL 4010A7 **RNFTL 4010A7S**	40	10	6.35	41.75	35.0	3.5×2	53 500	164 000	0.20	65
RNFTL 4512A5 **RNFTL 4512A5S**	45	12	7.144	46.5	39.0	2.5×2	49 600	147 000	0.23	70
RNFTL 5010A7 **RNFTL 5010A7S**	50	10	6.35	51.75	45.0	3.5×2	59 500	205 000	0.20	80
RNFTL 5016A5 **RNFTL 5016A5S**	50	16	9.525	52	42.0	2.5×2	99 900	293 000	0.23	85

Notes: 1. Protruding portion of tube does not interfere with ball nut housing if its dimensions corresponding to U and V are large enough.
2. Actual screw shaft length may become slightly longer than nominal length L_n due to manufacturing tolerance.
3. Only ball nut part numbers ending "S" are equipped with seals. External dimensions of those with seals are the same as those without.
In ball nut side view drawing, above the center line there is a seal, and beneath it there is no seal.
Seal for those with shaft diameter of 14 mm or less is made of synthetic resin. Seal for those of 16 mm or more is a "Brush" seal.

Ball nut dimensions: Flange A	G	B	Length L_n	Bolt hole W	X	Oil hole Q	T	Projecting tube U	V	R	Nut Mass. (kg)	Arbor: Outside dia. d_o	Bore d_i	Screw shaft: Standard length L_o			Screw shaft No.	Shaft mass/m (kg)	Internal spatial volume of nut (cm³)	Standard volume of grease replenishing (cm³)
79	33	15	55	65	6.6	M6×1	7.5	33	34	10	0.85	25.0	22.6	1 000	2 000	2 500	RS2806A··	4.47	5.9	3.0
79	33	15	79	65	6.6	M6×1	7.5	33	34	10	1.07								8.4	4.2
97	39	18	97	75	11	M6×1	9.0	39	42	17	1.55	27.0	24.6	1 000	2 000	3 000	RS3210A··	5.53	29	15
102	42	18	68	80	11	M6×1	9.0	42	46	17	1.47	30.0	27.6	1 000	2 000	3 000	RS3610A··	6.91	21	11
102	42	18	98	80	11	M6×1	9.0	42	46	17	1.80								33	17
114	44	20	120	90	14	M6×1	10.0	44	50	20	2.49	35.0	31.8	2 000	3 000	4 000	RS4010A··	8.87	42	21
130	47	22	116	100	18	M6×1	11.0	47	55	20	3.07	39.0	35.8	2 000	3 000	4 000	RS4512A··	11.16	49	25
140	52	22	122	110	18	M6×1	11.0	52	59	20	4.06	45.0	41.8	2 000	3 000	4 000	RS5010A··	14.15	53	27
163	57	28	146	125	22	M6×1	14.0	57	63	25	6.42	42.0	38.8	2 000	3 000	4 000	RS5016A··	13.48	94	47

4. Nut assembly with arbor and screw shaft are separate at time of delivery.
5. Value obtained by diving standard screw shaft length by 100 mm will be entered at end of the part number where marked with ··.
6. Items in stock do not have surface treatment. For details of standard stock products, contact NSK.
7. Internal spatial volume of nut and volume of grease to be replenished are values for ball screws with seals. Recommended amount for replenishing is approximately 50% of nut's internal space. For ball screws without seals, apply grease to screw shaft surface or move ball nut by hand while filling them with grease so that grease permeates all areas. See page D16 for details.





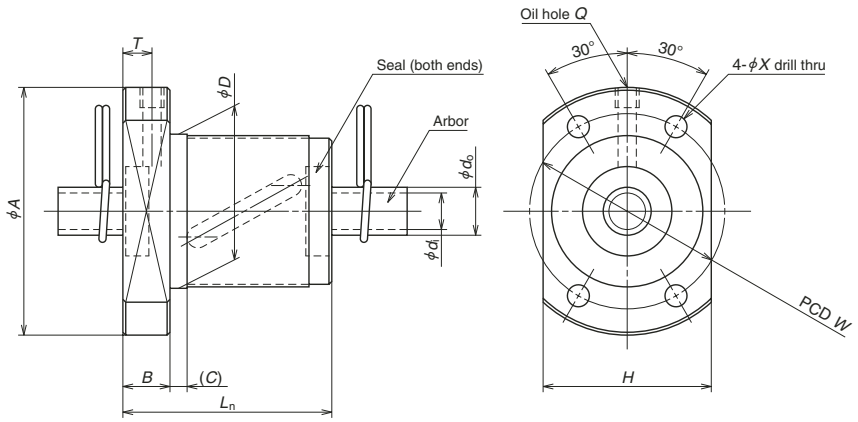
Unit: mm

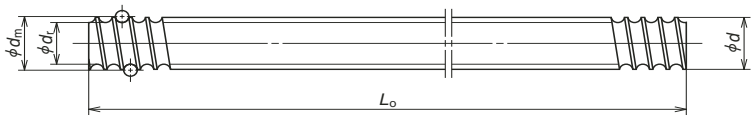
Ball nut No.	Shaft dia. d	Lead l	Ball dia. D_w	Ball circle dia. d_m	Root dia. d_r	Effective turns of balls: Turns × Circuits	Basic load rating (N): Dynamic C_a	Basic load rating (N): Static C_{0a}	Axial play Max.	Ball nut dimensions: Outside dia. D
RNFTL 1212A3	12	12	2.381	12.65	10.1	1.5 × 2	3 360	6 270	0.10	24
RNFTL 1616A3 **RNFTL 1616A3S**	16	16	2.778	16.65	13.6	1.5 × 2	4 880	9 650	0.10	30
RNFTL 2020A3 **RNFTL 2020A3S**	20	20	3.175	20.75	17.3	1.5 × 2	7 010	15 400	0.10	35
RNFTL 2525A3 **RNFTL 2525A3S**	25	25	3.969	26	22.0	1.5 × 2	10 500	24 100	0.12	45
RNFTL 3232A3 **RNFTL 3232A3S**	32	32	4.762	33.25	28.0	1.5 × 2	15 300	37 100	0.15	55
RNFTL 4040A3 **RNFTL 4040A3S**	40	40	6.35	41.75	35.0	1.5 × 2	24 400	61 600	0.20	70

Notes: 1. Protruding portion of tube does not interfere with ball nut housing if its dimensions corresponding to U and V are large enough.
2. Actual screw shaft length may become slightly longer than nominal length L_0 due to manufacturing tolerance.
3. Only ball nut part numbers ending "S" are equipped with seals. External dimensions of those with seals are the same as those without.
In ball nut side view drawing, above the center line there is a seal, and beneath it there is no seal.
Seal for those with shaft diameter of 14 mm or less is made of synthetic resin. Seal for those of 16 mm or more is a "Brush" seal.

Ball nut dimensions: Flange A	Flange G	Flange B	Length L_n	Bolt hole W	Bolt hole X	Oil hole Q	Oil hole T	Projecting tube U	Projecting tube V	Projecting tube R	Nut Mass. (kg)	Arbor: Outside dia. d_0	Arbor: Bore d_i	Screw shaft: Standard length L_0			Screw shaft No.	Shaft mass/m (kg)	Internal spatial volume of nut (cm^3)	Standard volume of grease replenishing (cm^3)
44	17	8	44	34	4.5	M3 × 0.5	4.0	17	16	5	0.16	10.1	8.1	400	800	–	RS1212A··	0.74	1.7	0.9
55	22	10	50	43	6.6	M6 × 1	5.0	22	22	7	0.29	13.6	11.6	500	1 000	1 500	RS1616A··	1.37	2.8	1.4
68	25	12	59	52	9	M6 × 1	6.0	25	27	8	0.49	17.3	14.9	500	1 000	2 000	RS2020A··	2.19	4.9	2.5
80	31	12	69	63	9	M6 × 1	6.0	31	32	10	0.80	22.0	19.6	1 000	2 000	2 500	RS2525A··	3.43	9.1	4.6
100	37	15	84	80	11	M6 × 1	7.5	37	40	12	1.46	28.0	25.6	1 000	2 000	3 000	RS3232A··	5.71	19	9.5
120	46	18	103	95	14	M6 × 1	9.0	46	49	15	2.69	35.0	31.8	2 000	3 000	4 000	RS4040A··	8.82	39	20

4. Nut assembly with arbor and screw shaft are separate at time of delivery.
5. Value obtained by diving standard screw shaft length by 100 mm will be entered at end of the part number where marked with ··.
6. Items in stock do not have surface treatment. For details of standard stock products, contact NSK.
7. Internal spatial volume of nut and volume of grease to be replenished are values for ball screws with seals.
Recommended amount for replenishing is approximately 50% of nut's internal space. For ball screws without seals, apply grease to screw shaft surface or move ball nut by hand while filling them with grease so that grease permeates all areas.
See page D16 for details.



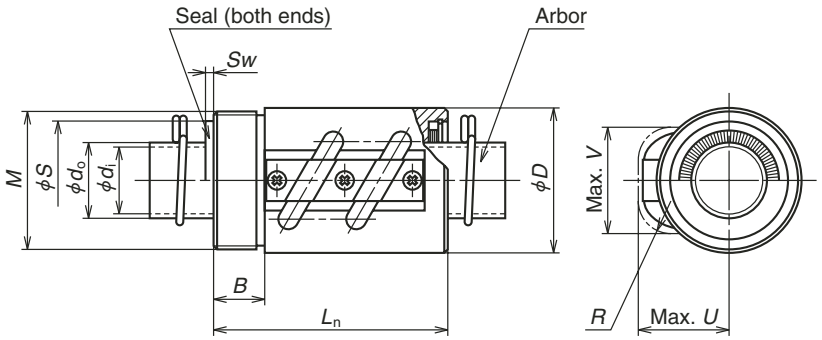


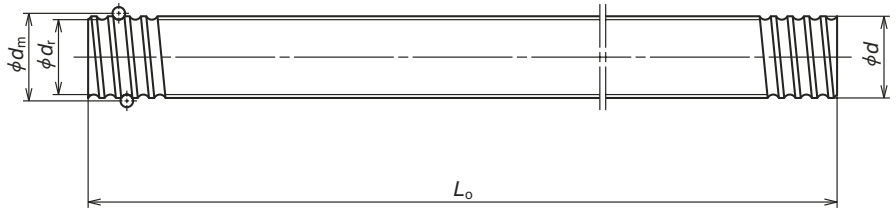
Unit: mm

Ball nut No.	Shaft dia. d	Lead l	Ball dia. D_w	Ball circle dia. d_m	Root dia. d_r	Effective turns of balls: Turns × Circuits	Basic load rating (N): Dynamic C_a	Basic load rating (N): Static C_{oa}	Axial play Max.	Ball nut dimensions: Outside dia. D
RNFBL 1006A2.5S	10	6	2.381	10.65	8.1	2.5×1	2 830	4 810	0.10	26
RNFBL 1208A2.5S	12	8	2.778	12.65	9.6	2.5×1	3 730	6 560	0.10	29
RNFBL 1404A3.5S	14	4	2.778	14.5	11.5	3.5×1	5 370	10 800	0.10	31
RNFBL 1405A2.5S	14	5	3.175	14.5	11.0	2.5×1	5 260	9 720	0.10	32
RNFBL 1808A3.5S	18	8	4.762	18.5	13.6	3.5×1	13 200	25 800	0.15	50
RNFBL 2005A2.5S	20	5	3.175	20.5	17.0	2.5×1	6 360	14 200	0.10	40
RNFBL 2010A2.5S	20	10	4.762	21.25	16.2	2.5×1	10 900	21 800	0.15	52
RNFBL 2505A2.5S	25	5	3.175	25.5	22.0	2.5×1	7 070	18 200	0.10	43
RNFBL 2505A5S						2.5×2	12 800	36 300		
RNFBL 2510A2.5S	25	10	6.35	26	19.0	2.5×1	17 500	35 200	0.20	60
RNFBL 2510A5S						2.5×2	31 800	70 300		
RNFBL 2806A2.5S	28	6	3.175	28.5	25.0	2.5×1	7 430	20 300	0.10	50
RNFBL 2806A5S						2.5×2	13 500	40 600		
RNFBL 3210A2.5S	32	10	6.35	33.75	27.0	2.5×1	19 700	46 100	0.20	67
RNFBL 3210A5S						2.5×2	35 700	92 200		
RNFBL 3610A2.5S	36	10	6.35	37	30.0	2.5×1	21 000	51 000	0.20	70
RNFBL 3610A5S						2.5×2	38 100	102 000		
RNFBL 4010A5S	40	10	6.35	41.75	35.0	2.5×2	40 100	116 000	0.20	76

Ball nut dimensions: Flange A	Flange H	Flange B	Length: Overall length L_n	Length (C)	Bolt hole W	Bolt hole X	Oil hole Q	Oil hole T	Nut Mass. (kg)	Arbor: Outside dia. d_0	Arbor: Bore d_i	Screw shaft: Standard length L_o			Screw shaft No.	Shaft mass/m (kg)	Internal spatial volume of nut (cm^3)	Standard volume of grease replenishing (cm^3)
42	29	8	36	3	34	4.5	M3×0.5	5.0	0.16	8.1	6.1	400	800	–	RS1006A··	0.56	1.1	0.6
45	32	8	44	3	37	4.5	M3×0.5	5.5	0.21	9.6	7.6	400	800	–	RS1208A··	0.81	1.6	0.8
50	37	10	40	4	40	4.5	M6×1	5.0	0.25	11.5	9.5	500	1 000	–	RS1404A··	1.02	2.4	1.2
50	38	10	40	4	40	4.5	M6×1	5.0	0.26	11.0	9.0	500	1 000	–	RS1405A··	1.00	1.9	1.0
80	60	12	61	4	65	6.6	M6×1	6.0	1.00	13.6	11.6	500	1 000	1 500	RS1808A··	1.60	5.8	2.9
60	46	10	40	4	50	4.5	M6×1	5.0	0.37	17.0	14.6	500	1 000	2 000	RS2005A··	2.17	2.8	1.4
82	64	12	61	5	67	6.6	M6×1	6.0	1.05	16.2	13.8	500	1 000	2 000	RS2010A··	2.18	7.6	3.8
67	50	10	40	4	55	5.5	M6×1	5.0	0.40	22.0	19.6	1 000	2 000	2 500	RS2505A··	3.47	3.5	1.8
			55						0.50								4.7	2.4
96	72	15	66	5	78	9.0	M6×1	7.5	1.52	19.0	16.6	1 000	2 000	2 500	RS2510A··	3.13	14	7.0
			96						1.99								19	9.5
80	60	12	47	5	65	6.6	M6×1	6.0	0.70	25.0	22.6	1 000	2 000	2 500	RS2806A··	4.47	4.5	2.3
			65						0.87								7.6	3.8
103	78	15	67	5	85	9.0	M6×1	7.5	1.72	27.0	24.6	1 000	2 000	3 000	RS3210A··	5.53	20	10
			97						2.25								28	14
110	82	17	69	5	90	11.0	M6×1	8.5	1.97	30.0	27.6	1 000	2 000	3 000	RS3610A··	6.91	21	11
			99						2.53								29	15
116	88	17	99	5	96	11.0	M6×1	8.5	2.86	35.0	31.8	2 000	3 000	4 000	RS4010A··	8.87	36	18

Notes: 1. Actual screw shaft length may become slightly longer than nominal length L_0 due to manufacturing tolerance.
2. Nut assembly with arbor and screw shaft are separate at time of delivery.
3. Value obtained by diving standard screw shaft length by 100 mm will be entered at end of the part number where marked with ··.
4. Items in stock do not have surface treatment. For details of standard stock products, contact NSK.
5. Seal for those with shaft diameter of 14 mm or less is made of synthetic resin. Seal for those of 16 mm or more is a "Brush" seal.
6. Recommended quantity of grease is about 50% of ball nut's internal space. See page D16 for details.



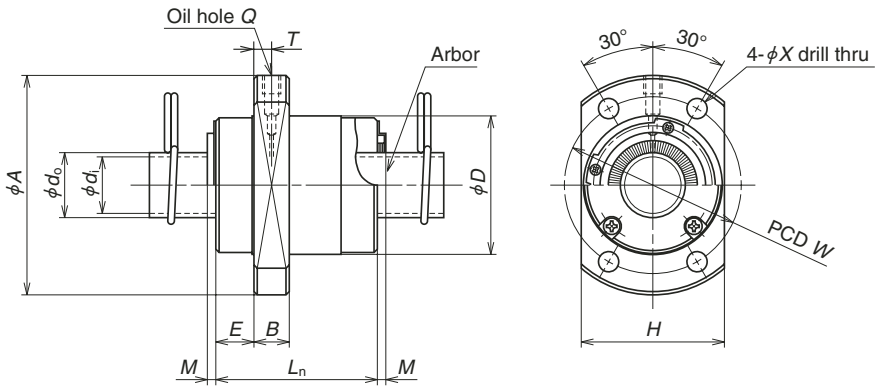


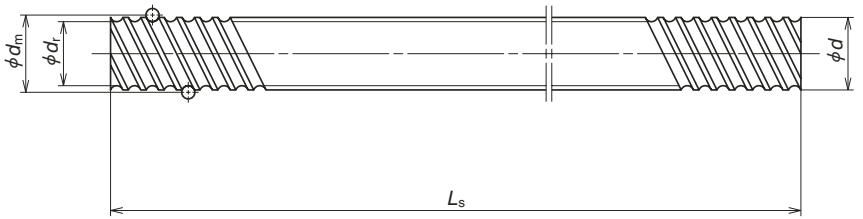
Unit: mm

Ball nut No.	Shaft dia. d	Lead l	Ball dia. D_w	Ball circle dia. d_m	Root dia. d_r	Effective turns of balls: Turns × Circuits	Basic load rating (N): Dynamic C_a	Basic load rating (N): Static C_{oa}	Axial play Max.	Ball nut dimensions: Outside dia. D
RNCT 1003A3.5	10	3	2.381	10.65	8.1	3.5 × 1	3 780	6 730	0.10	20
RNCT 1404A3.5S	14	4	2.778	14.5	11.5	3.5 × 1	5 370	10 800	0.10	25
RNCT 1405A2.5S	14	5	3.175	14.5	11.0	2.5 × 1	5 260	9 720	0.10	30
RNCT 1808A3.5 **RNCT 1808A3.5S**	18	8	4.762	18.5	13.6	3.5 × 1	13 200	25 800	0.15	34
RNCT 2005A2.5 **RNCT 2005A2.5S**	20	5	3.175	20.5	17.0	2.5 × 1	6 360	14 200	0.10	40
RNCT 2505A5 **RNCT 2505A5S**	25	5	3.175	25.5	22.0	2.5 × 2	12 800	36 300	0.10	42
RNCT 2510A5 **RNCT 2510A5S**	25	10	6.35	26	19.0	2.5 × 2	31 800	70 300	0.20	44
RNCT 2806A5 **RNCT 2806A5S**	28	6	3.175	28.5	25.0	2.5 × 2	13 500	40 600	0.10	50
RNCT 3210A5 **RNCT 3210A5S**	32	10	6.35	33.75	27.0	2.5 × 2	35 700	92 200	0.20	55
RNCT 3610A5 **RNCT 3610A5S**	36	10	6.35	37	30.0	2.5 × 2	38 100	102 000	0.20	60
RNCT 4010A7 **RNCT 4010A7S**	40	10	6.35	41.75	35.0	3.5 × 2	53 500	164 000	0.20	65
RNCT 4512A5 **RNCT 4512A5S**	45	12	7.144	46.5	39.0	2.5 × 2	49 600	147 000	0.23	70
RNCT 5010A7 **RNCT 5010A7S**	50	10	6.35	51.75	45.0	3.5 × 2	59 500	205 000	0.20	80
RNCT 5016A5 **RNCT 5016A5S**	50	16	9.525	52	42.0	2.5 × 2	99 900	293 000	0.23	85

Ball nut dimensions: V-thread M	B	Length L_n	Projecting tube U	V	R	Nut Mass. (kg)	Seal dimensions: Diameter S	Thickness Sw	Arbor: Outside dia. d_o	Bore d_i	Screw shaft: Standard length L_o			Screw shaft No.	Shaft mass/m (kg)	Internal spatial volume of nut (cm^3)	Standard volume of grease replenishing (cm^3)
M18 × 1	10	38	15	15	7	0.049	–	–	8.1	6.1	400	800	–	RS1003A··	0.50	–	–
M24 × 1	10	43	19	20	7	0.083	–	–	11.5	9.5	500	1 000	–	RS1404A··	1.02	2.7	1.4
M26 × 1.5	10	45	22	21	8	0.15	–	–	11.0	9.0	500	1 000	–	RS1405A··	1.00	3.1	1.6
M32 × 1.5	12	58	27	27	8	0.21	28.5	2.5	13.6	11.6	500	1 000	1 500	RS1808A··	1.60	6.6	3.3
M36 × 1.5	12	48	28	27	10	0.28	29.5	2.5	17.0	14.6	500	1 000	2 000	RS2005A··	2.17	4.8	2.4
M40 × 1.5	15	69	28	31	10	0.38	34.5	2.5	22.0	19.6	1 000	2 000	2 500	RS2505A··	3.47	8.4	4.2
M42 × 1.5	15	92	34	37	17	0.49	38.5	2.5	19.0	16.6	1 000	2 000	2 500	RS2510A··	3.13	21	1
M45 × 1.5	15	79	33	34	10	0.68	37.5	2.5	25.0	22.6	1 000	2 000	2 500	RS2806A··	4.47	9.7	4.9
M50 × 1.5	18	97	39	42	17	0.79	45.5	2.5	27.0	24.6	1 000	2 000	3 000	RS3210A··	5.53	32	16
M55 × 2	18	98	42	46	17	0.97	50.5	3.0	30.0	27.6	1 000	2 000	3 000	RS3610A··	6.91	32	16
M60 × 2	25	125	44	50	20	1.37	54.5	3.0	35.0	31.8	2 000	3 000	4 000	RS4010A··	8.87	51	26
M65 × 2	30	124	47	55	20	1.42	60.5	3.0	39.0	35.8	2 000	3 000	4 000	RS4512A··	11.16	60	30
M75 × 2	40	140	52	59	20	2.41	64.5	3.0	45.0	41.8	2 000	3 000	4 000	RS5010A··	14.15	76	38
M80 × 2	40	158	57	63	25	3.14	68.5	3.0	42.0	38.8	2 000	3 000	4 000	RS5016A··	13.48	114	57

Notes: 1. Protruding portion of tube does not interfere with ball nut housing if its dimensions corresponding to U and V are large enough.
2. Actual screw shaft length may become slightly longer than nominal length L_o due to manufacturing tolerance.
3. Only ball nut part numbers ending "S" are equipped with seals. External dimensions of those with seals are the same as those without.
In ball nut side view drawing, above the center line there is a seal, and beneath it there is no seal.
Seal for those with shaft diameter of 14 mm or less is made of synthetic resin. Seal for those of 16 mm or more is a "Brush" seal.
4. Nut assembly with arbor and screw shaft are separate at time of delivery.
5. Value obtained by diving standard screw shaft length by 100 mm will be entered at end of the part number where marked with ··.
6. Items in stock do not have surface treatment. For details of standard stock products, contact NSK.
7. Internal spatial volume of nut and volume of grease to be replenished are values for ball screws with seals.
Recommended amount for replenishing is approximately 50% of nut's internal space. For ball screws without seals, apply grease to screw shaft surface or move ball nut by hand while filling them with grease so that grease permeates all areas.
See page D16 for details.



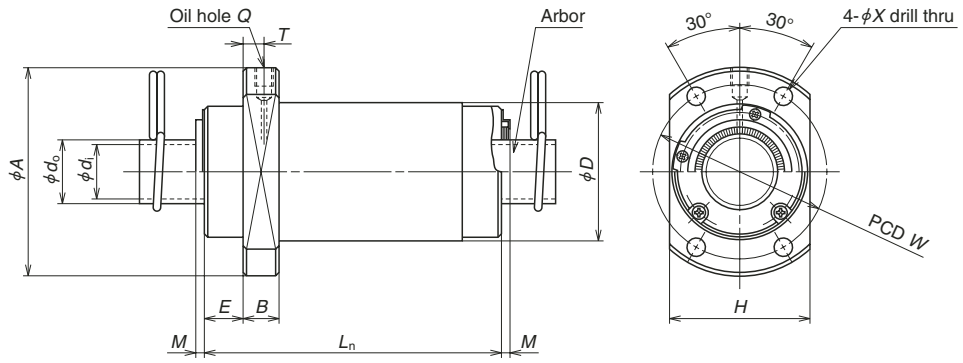


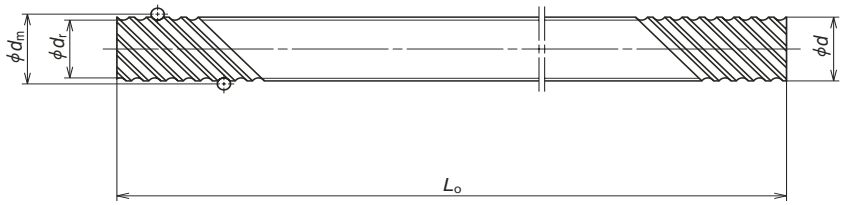
Unit: mm

Ball nut No.	Shaft dia. d	Lead l	Ball dia. D_w	Ball circle dia. d_m	Root dia. d_r	Effective turns of balls Turns × Circuits	Basic load rating (N) Dynamic C_a	Basic load rating (N) Static C_{oa}	Axial play Max.	Ball nut dimensions Outside dia. D
RNFCL 1212A3	12	12	2.381	12.65	10.1	1.7 × 2	3 740	6 640	0.10	26
RNFCL 1212A6						1.7 × 4	6 780	13 300		
RNFCL 1520A3 **RNFCL 1520A3S**	15	20	3.175	15.5	12.2	1.7 × 2	6 730	12 300	0.10	33
RNFCL 1616A3 **RNFCL 1616A3S**	16	16	2.778	16.65	13.5	1.7 × 2	5 430	10 400	0.10	32
RNFCL 1616A6 **RNFCL 1616A6S**						1.7 × 4	9 860	20 800		
RNFCL 2020A3 **RNFCL 2020A3S**	20	20	3.175	20.75	17.3	1.7 × 2	7 810	16 500	0.10	39
RNFCL 2020A6 **RNFCL 2020A6S**						1.7 × 4	14 200	33 000		
RNFCL 2525A3 **RNFCL 2525A3S**	25	25	3.969	26	22.0	1.7 × 2	11 700	25 800	0.12	47
RNFCL 2525A6 **RNFCL 2525A6S**						1.7 × 4	21 200	51 500		
RNFCL 3232A3 **RNFCL 3232A3S**	32	32	4.762	33.25	28.0	1.7 × 2	17 100	40 500	0.15	58
RNFCL 3232A6 **RNFCL 3232A6S**						1.7 × 4	31 000	81 000		
RNFCL 4040A3 **RNFCL 4040A3S**	40	40	6.35	41.75	35.0	1.7 × 2	27 200	67 900	0.20	73
RNFCL 4040A6 **RNFCL 4040A6S**						1.7 × 4	49 300	136 000		
RNFCL 5050A3 **RNFCL 5050A3S**	50	50	7.938	52.25	44.0	1.7 × 2	40 600	106 000	0.25	90
RNFCL 5050A6 **RNFCL 5050A6S**						1.7 × 4	73 700	212 000		

Ball nut dimensions: Flange A	Flange H	Flange B	Length E	Length L_n	Bolt hole M	Bolt hole W	Bolt hole X	Oil hole Q	Oil hole T	Nut Mass (kg)	Arbor d_o	Arbor d_i	Screw shaft L_o			Screw shaft No.	Shaft mass/m (kg)	Internal spatial volume of nut (cm^3)	Standard volume of grease replenishing (cm^3)
44	28	6	9	30	–	35	4.5	M3 × 0.5	3.0	0.12	10.1	8.1	400	800	–	RS1212A··	0.74	–	–
51	35	10	11	45	– 3	42	4.5	M6 × 1	5.0	0.28	12.2	10.2	500	1 000	1 500	RS1520A··	1.15	3.3	1.7
53	34	10	10	38	– 3	42	4.5	M6 × 1	5.0	0.23	13.5	11.5	500	1 000	1 500	RS1616A··	1.37	2.6	1.3
					– 3													2.6	1.3
62	41	10	11.5	46	– 3	50	5.5	M6 × 1	5.0	0.37	17.3	14.9	500	1 000	2 000	RS2020A··	2.19	4.4	2.2
					– 3													4.9	2.5
74	49	12	13	55	– 3	60	6.6	M6 × 1	6.0	0.62	22.0	19.6	1 000	2 000	2 500	RS2525A··	3.43	8.2	4.1
					– 3													8.9	4.5
92	60	12	16	70	– 3	74	9	M6 × 1	5.5	1.10	28.0	25.6	1 000	2 000	3 000	RS3232A··	5.71	16	8.0
					– 3													17	8.5
114	75	15	19.5	85	– 3.5	93	11	M6 × 1	6.5	2.09	35.0	31.8	2 000	3 000	4 000	RS4040A··	8.82	32	16
					– 3.5													33	17
135	92	20	21.5	107	– 3.5	112	14	M6 × 1	7.0	3.90	44.0	40.8	2 000	3 000	4 000	RS5050A··	13.81	64	32
					– 3.5													68	34

Notes: 1. Actual screw shaft length may become slightly longer than nominal length L_0 due to manufacturing tolerance.
2. Nut assembly with arbor and screw shaft are separate at time of delivery.
3. Value obtained by diving the standard screw shaft length by 100 mm will be entered at end of the part number where marked with ··.
4. Items in stock do not have surface treatment. For details of standard stock products, contact NSK.
5. Length of nut becomes longer (2 x M) for those with "brush" seals.
6. Internal spatial volume of nut and volume of grease to be replenished are values for ball screws with seals. Recommended amount for replenishing is approximately 50% of nut's internal space. For ball screws without seals, apply grease to screw shaft surface or move ball nut by hand while filling them with grease so that grease permeates all areas. See page D16 for details.



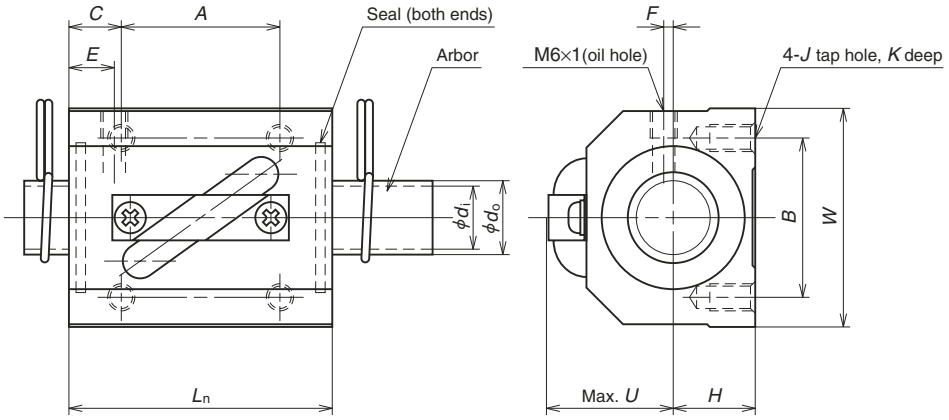


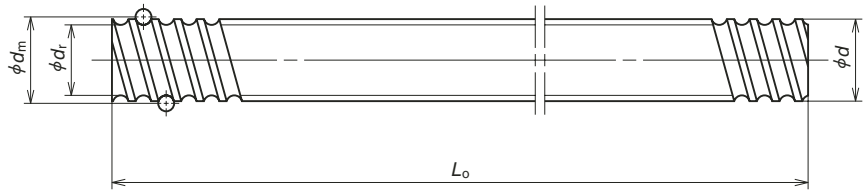
Unit: mm

Ball nut No.	Shaft dia. d	Lead l	Ball dia. D_w	Ball circle dia. d_m	Root dia. d_r	Effective turns of balls: Turns × Circuits	Basic load rating (N): Dynamic C_a	Basic load rating (N): Static C_{oa}	Axial play Max.	Ball nut dimensions: Outside dia. D
RNFCL 1632A2	16	32	2.778	16.65	13.5	0.7 × 4	4 600	8 460	0.10	32
RNFCL 1632A2S										
RNFCL 1632A3						1.7 × 2	5 430	10 400		
RNFCL 1632A3S										
RNFCL 1632A6						1.7 × 4	9 860	20 800		
RNFCL 1632A6S										
RNFCL 2040A2	20	40	3.175	20.75	17.3	0.7 × 4	6 610	13 600	0.10	38
RNFCL 2040A2S										
RNFCL 2040A3						1.7 × 2	7 810	16 500		
RNFCL 2040A3S										
RNFCL 2040A6						1.7 × 4	14 200	33 000		
RNFCL 2040A6S										
RNFCL 2550A2	25	50	3.969	26	22.0	0.7 × 4	9 870	21 200	0.12	46
RNFCL 2550A2S										
RNFCL 2550A3						1.7 × 2	11 700	25 800		
RNFCL 2550A3S										
RNFCL 2550A6						1.7 × 4	21 200	51 500		
RNFCL 2550A6S										
RNFCL 3264A3	32	64	4.762	33.25	28.0	1.7 × 2	17 100	40 500	0.15	58
RNFCL 3264A3S										
RNFCL 3264A6						1.7 × 4	31 000	81 000		
RNFCL 3264A6S										
RNFCL 4080A3	40	80	6.350	41.75	35.0	1.7 × 2	27 200	67 900	0.20	73
RNFCL 4080A3S										
RNFCL 4080A6						1.7 × 4	49 300	136 000		
RNFCL 4080A6S										

Ball nut dimensions: Flange A	H	B	Length E	L_n	M	Bolt hole W	X	Oil hole Q	T	Nut Mass. (kg)	Arbor: Outside dia. d_b	Bore d_i	Screw shaft: Standard length L_o				Screw shaft No.	Shaft mass/m (kg)	Internal spatial volume of nut (cm³)	Standard volume of grease replenishing (cm³)
50	34	10	10	34	–	41	4.5	M6 × 1	5.5	0.21	13.5	11.5	500	1 000	1 500	–	RS1632A··	1.34	2.4	1.2
					3															
				66	–					0.33									3.9	2.0
					3															
				66	–					0.33									4.1	2.1
					3															
58	40	10	11	41	–	48	5.5	M6 × 1	5.5	0.31	17.3	14.9	500	1 000	1 500	2 000	RS2040A··	2.15	4.1	2.1
					3															
				81	–					0.53									6.3	3.2
					3															
				81	–					0.53									7.0	3.5
					3															
70	48	12	13	50	–	58	6.6	M6 × 1	7.0	0.53	22.0	19.6	1 000	2 000	2 500	–	RS2550A··	3.37	8.4	4.2
					3															
				100	–					0.91									14	7.0
					3															
				100	–					0.91									15	7.5
					3															
92	60	12	15.5	126	–	74	9	M6 × 1	7.5	1.76	28.0	25.6	1 000	2 000	3 000	4 000	RS3264A··	5.63	24	12
					3															
					–														26	13
					3															
114	75	15	19	158	–	93	11	M6 × 1	10.0	3.44	35.0	31.8	2 000	3 000	4 000	5 000	RS4080A··	8.69	52	26
					3.5															
					–														55	28
					3.5															

Notes: 1. Actual screw shaft length may become slightly longer than nominal length L_o due to manufacturing tolerance.
2. Nut assembly with arbor and screw shaft are separate at time of delivery.
3. Value obtained by diving the standard screw shaft length by 100 mm will be entered at end of the part number where marked with ··.
4. Items in stock do not have surface treatment. For details of standard stock products, contact NSK.
5. Length of nut becomes longer (2 x M) for those with "brush" seals.
6. Internal spatial volume of nut and volume of grease to be replenished are values for ball screws with seals. Recommended amount for replenishing is approximately 50% of nut's internal space. For ball screws without seals, apply grease to screw shaft surface or move ball nut by hand while filling them with grease so that grease permeates all areas. See page D16 for details.





Unit: mm

Ball nut No.	Shaft dia. d	Lead l	Ball dia. D_w	Ball circle dia. d_m	Root dia. d_r	Effective turns of balls: Turns × Circuits	Basic load rating (N): Dynamic C_a	Basic load rating (N): Static C_{oa}	Axial play Max.	Ball nut dimensions: Length L_n
RNSTL 1404A3.5S	14	4	2.778	14.5	11.5	3.5 × 1	5 370	10 800	0.10	38
RNSTL 1405A2.5S	14	5	3.175	14.5	11.0	2.5 × 1	5 260	9 720	0.10	38
RNSTL 1808A3.5S	18	8	4.762	18.5	13.6	3.5 × 1	13 200	25 800	0.15	56
RNSTL 2005A2.5S	20	5	3.175	20.5	17.0	2.5 × 1	6 360	14 200	0.10	38
RNSTL 2010A2.5S	20	10	4.762	21.25	16.2	2.5 × 1	10 900	21 800	0.15	58
RNSTL 2505A2.5S	25	5	3.175	25.5	22.0	2.5 × 1	7 070	18 200	0.10	35
RNSTL 2510A5S	25	10	6.35	26	19.0	2.5 × 2	31 800	70 300	0.20	94
RNSTL 2806A2.5S	28	6	3.175	28.5	25.0	2.5 × 1	7 430	20 300	0.10	42
RNSTL 2806A5S						2.5 × 2	13 500	40 600		67
RNSTL 3210A2.5S	32	10	6.35	33.75	27.0	2.5 × 1	19 700	46 100	0.20	64
RNSTL 3210A5S						2.5 × 2	35 700	92 200		94
RNSTL 3610A2.5S	36	10	6.35	37	30.0	2.5 × 1	21 000	51 000	0.20	64
RNSTL 3610A5S						2.5 × 2	38 100	102 000		96
RNSTL 4512A5S	45	12	7.144	46.5	39.0	2.5 × 2	49 600	147 000	0.23	115

Ball nut dimensions: Width W	Center height H	Bolt hole A	Bolt hole B	Bolt hole C	Bolt hole J	Bolt hole K	Oil hole E	Oil hole F	Oil hole U	Nut Mass. (kg)	Arbor: Outside dia. d_0	Arbor: Bore d_1	Screw shaft: Standard length L_o			Screw shaft No.	Shaft mass/m (kg)	Internal spatial volume of nut (cm³)	Standard volume of grease replenishing (cm³)
34	13	22	26	8	M4	7	7	3	20	0.20	11.5	9.5	500	1 000	–	RS1404A··	1.02	1.6	0.8
34	13	22	26	8	M4	7	7	3	21	0.20	11.0	9.0	500	1 000	–	RS1405A··	1.00	1.8	0.9
48	17	35	35	10.5	M6	10	8	3	26	0.31	13.6	11.6	500	1 000	1 500	RS1808A··	1.60	3.4	1.7
48	17	22	35	8	M6	9	6	2	27	0.24	17.0	14.6	500	1 000	2 000	RS2005A··	2.17	2.5	1.3
48	18	35	35	11.5	M6	10	10	2	28	0.35	16.2	13.8	500	1 000	2 000	RS2010A··	2.18	6.3	3.2
60	20	22	40	6.5	M8	10	6	0	27	0.31	22.0	19.6	1 000	2 000	2 500	RS2505A··	3.47	2.6	1.3
60	23	60	40	17	M8	12	10	0	32	1.32	19.0	16.6	1 000	2 000	2 500	RS2510A··	3.13	18	9.0
60	22	18	40	12	M8	12	8	0	32	0.65	25.0	22.6	1 000	2 000	2 500	RS2806A··	4.47	3.5	1.8
60	22	40	40	13.5						1.04								7.0	3.5
70	26	45	50	9.5	M8	12	10	0	38	1.12	27.0	24.6	1 000	2 000	3 000	RS3210A··	5.53	18	9.0
70	26	60	50	17						1.75								27	14
86	29	45	60	9.5	M10	16	11	0	41	1.76	30.0	27.6	1 000	2 000	3 000	RS3610A··	6.91	18	9.0
86	29	60	60	18						2.64								27	14
100	36	75	75	20	M12	20	13	0	46	1.22	39.0	35.8	2 000	3 000	4 000	RS4512A··	11.16	47	24

Notes: 1. Actual screw shaft length may become slightly longer than nominal length L_o due to manufacturing tolerance.
2. Nut assembly with arbor and screw shaft are separate at time of delivery.
3. Value obtained by diving the standard screw shaft length by 100 mm will be entered at end of the part number where marked with ··
4. Items in stock do not have surface treatment. For details of standard stock products, contact NSK.
5. Seal for those with shaft diameter of 14 mm or less is made of synthetic resin. Seal for those of 16 mm or more is a "Brush" seal.
6. Recommended quantity of grease is about 50% of ball nut's internal space. See page D16 for details.