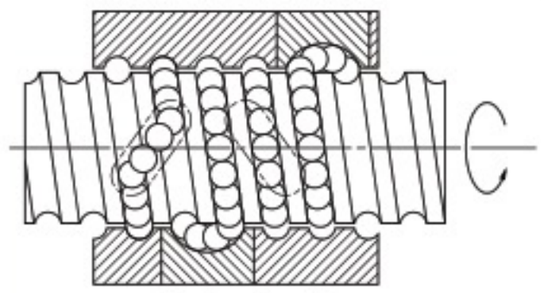
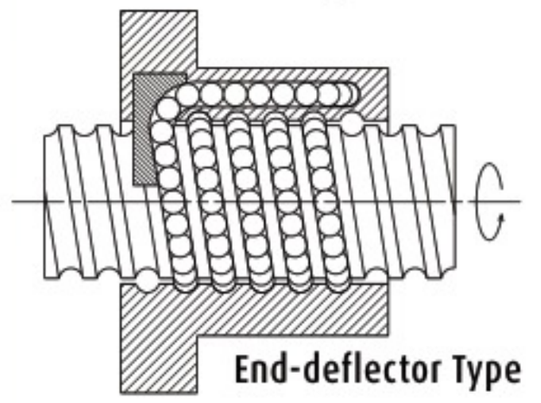
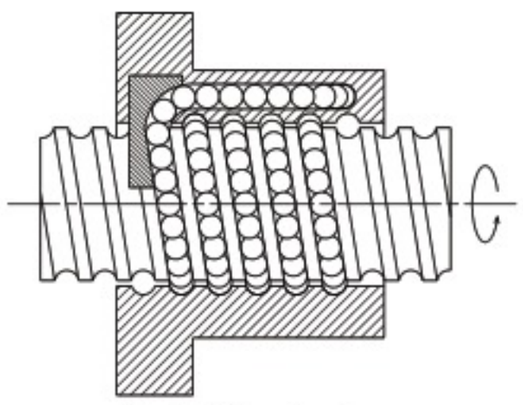
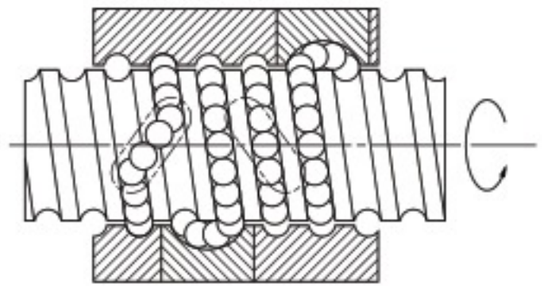
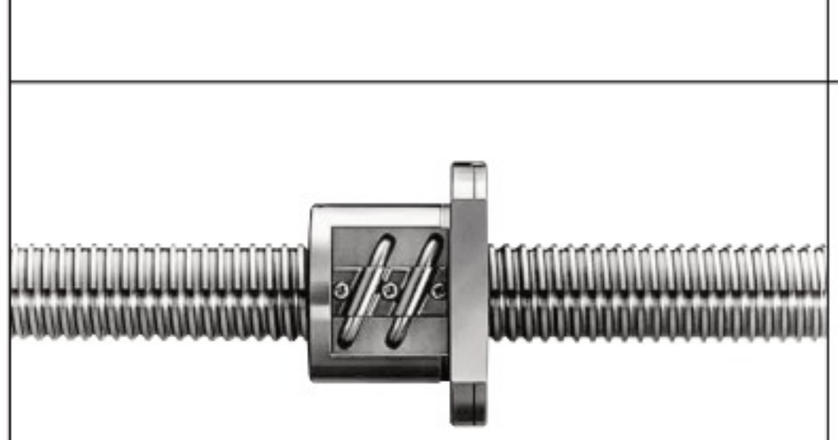
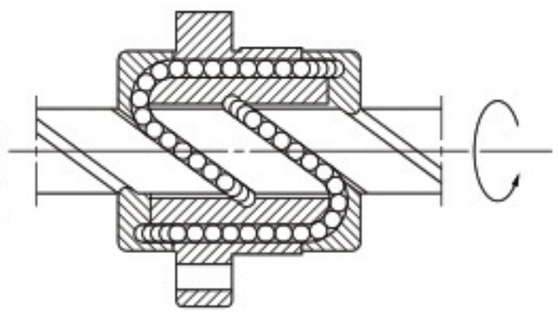
Ball Screws

- High speed, quiet and compact
- Variety of nut types, shaft diameters and screw leads

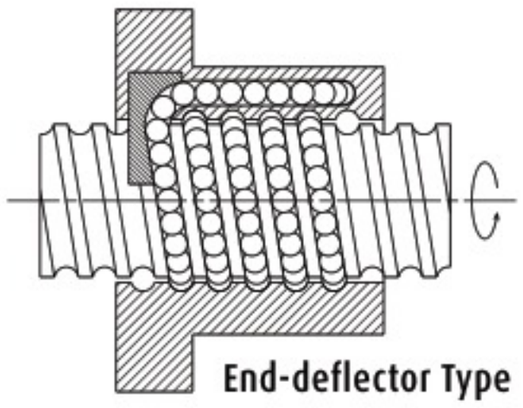
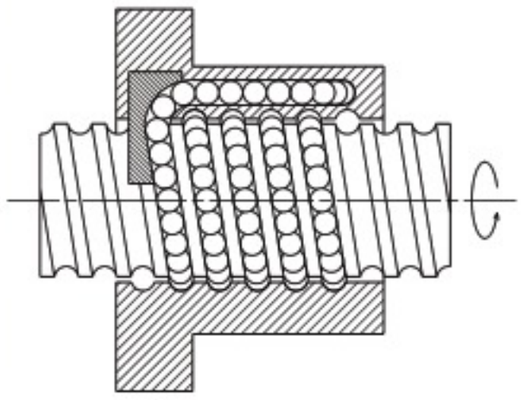
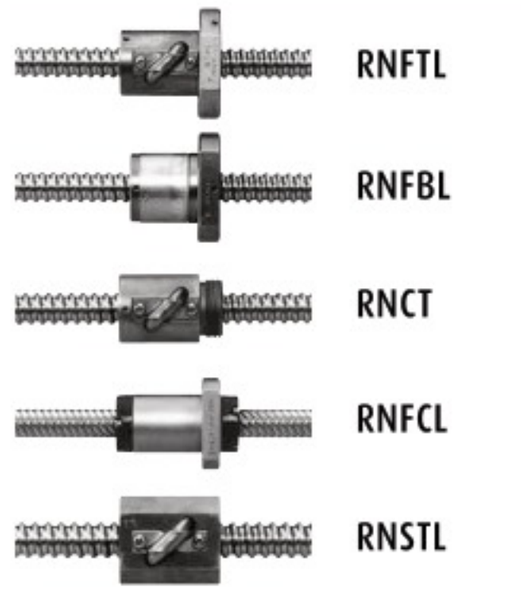
13. Types of Ball Screws

<table>
<tr><th colspan="2">Series
DIN Ball Screw</th><th>Features</th></tr>
<tr><td colspan="2">  </td><td rowspan="2">› High speed capability
› High load capacity
› Low torque variation
› Low noise
› Dimensions according DIN-Norm
› Available from stock for prototypes</td></tr>
<tr><td colspan="2"> 
Deflector Type
 
End-deflector Type</td></tr>
<tr><td colspan="2">Compact FA Series</td><td rowspan="2">› Easy-to-implement and ready-to-use ball screw with finished shaft-end
› Quiet and compact, newly designed series 6 dB noise reduction, 10-30% smaller nut
› High-speed operation of up to 5 000 min-1
› New type of contact seal is equipped.
› Low-profile designed support unit (bearing) is available.
PSS Series: Basic series
FSS Series: Transportation series</td></tr>
<tr><td colspan="2"> 
End-deflector Type
  </td></tr>
<tr><td colspan="2">A and S Series</td><td rowspan="3">› Easy-to-implement and ready-to-use ball screw with finished shaft-end
› Variety of shaft diameter and lead combinations available

› MA Series: Miniature automation series
› FA Series: Factory automation series
› KA Series: Stainless automation series
› SS Series: Blank shaft-end series</td></tr>
<tr><td colspan="2"> 
Deflector Type
  </td></tr>
<tr><td colspan="2"> 
Tube Type
 
End-cap Type
  </td></tr>
</table>

	Type	Specifications						Dimension table
		Accuracy grade	Nut system	Shaft dia.	Lead	Stroke (nominal)	Preload	
	DIN (ZSD)	C5	Deflector Type	32	10	1 200	Z-preload	Page 318 – 323
				32	15	1 200		
				32	20	1 200		
				40	10	1 200		
				40	15	1 200		
				50	10	1 200		
				50	15	1 200		
				50	20	1 100		
				63	10	1 200		
				63	15	1 100		
				63	20	1 100		
				63	30	1 000		
	DIN (ZSS)	C5	End Deflector Type	32	20	1 200	Z-preload	
				40	20	1 200		
				40	25	1 200		
				40	30	1 200		
				40	40	1 200		
				50	25	1 200		
				50	30	1 200		
				50	40	1 200		
	FSS	Ct7	End-deflector	12	10	750	P-preload	Page 176 – 183
				15	10, 20	1 300		
				20	10, 20	1 250		
				25	10, 20, 25	1 250		
	PSS	C5	End-deflector	6	8, 12	80		Page 184 – 207
				8	10, 15	60		
				10	5, 10	400		
				12	5, 10, 20, 30	500		
				15	5, 10, 20, 30	1 000		
				20	5, 10, 20, 30, 40, 60	2 000		
				25	5, 10, 20, 25, 30, 50	2 000		
	MA	C3	Deflector Type	4	1	70	P-preload	Page 208 – 229
				6	1	100		
				8	1, 1.5, 2	150		
				10	2, 2.5	200		
				12	2, 2.5	250		
				16	2, 2.5	300		
	FA	C3	Tube Type	10	4	300	P-preload	Page 230 – 265
		C3, C5		12	5, 10	450		
				14	5, 8	700		
		C5	Tube/End-Cap	15	10, 20	1 000		
				16	5, 16, 32	1 200		
				20	10, 20, 40	1 600		
				25	20, 25, 50	2 000		
			Tube Type	32	25, 32	2 600		
	KA	C3	Deflector Type	6	1	100	P-preload	Page 266 – 289
				8	1, 2	150		
		C3, C5	Deflector/Tube	10	2, 4	300		
				12	2, 5, 10	450		
		C5	Tube/End-Cap	15	10, 20	1 000		
			Deflector Type	16	2	300		
			Tube Type	20	20	1 000		
	SS	C5	Tube Type	20	4, 5	900	P-preload	Page 290 – 317
				25	4, 5, 6, 10	1 400		
			Deflector Type	25	5, 10	1 400	Z-preload	
			Tube Type	28	5, 6	1 100	P-preload	
				32	5, 6, 8, 10	1 600	P/Z/D-preload	
			Deflector Type	32	5, 10,	1 650	Z-preload	
			Tube Type	36	10	1 850	Z/D-preload	
				40	5, 8, 10, 12	2 250		
			Deflector Type	40	10	2 250	Z-preload	
			Tube Type	45	10	2 350		
				50	10	2 400		
			Deflector Type	50	10	2 450		

13. Types of Ball Screws

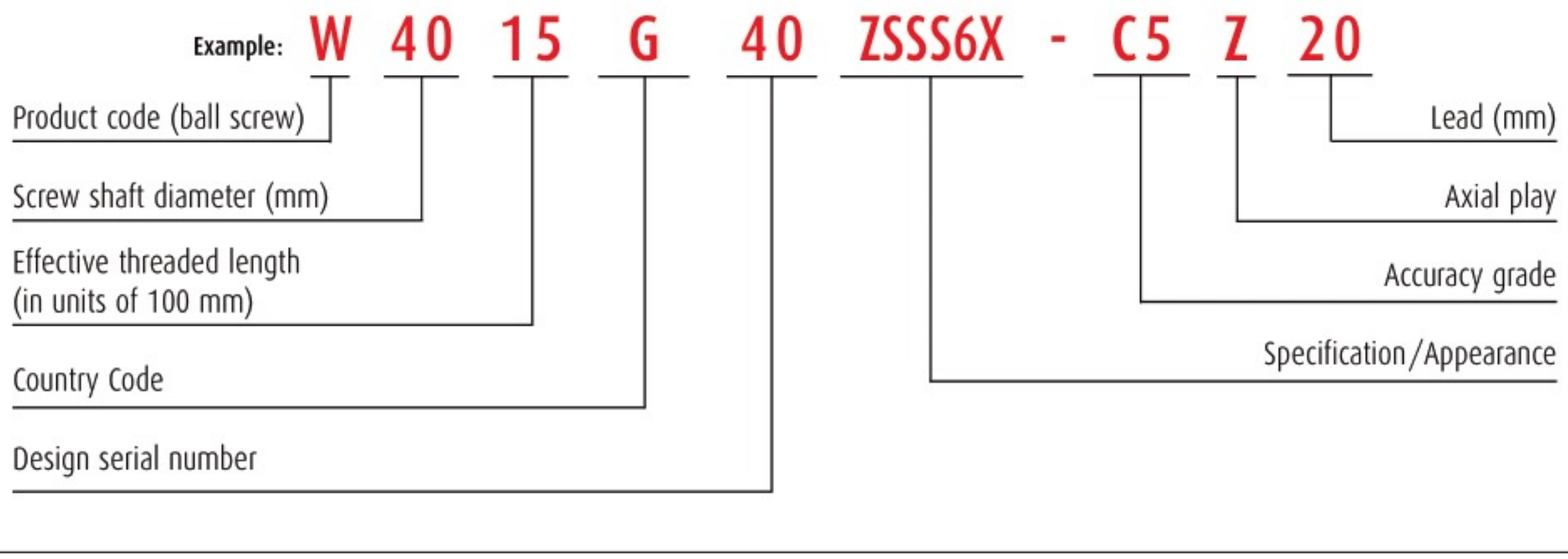
Series	Features
Precision Interchangeable Ball Screw	
  End-deflector Type	› Nut and shaft are completely interchangeable › 100% DIN-compliant › High-speed/low-noise nut design (d·n = 160.000, max 5000 1/min) › NSK provides the support bearing units which go with the ball screw shafts
PR Series/LPR Series	
  End-deflector Type	› Saves assembly space › Suitable for rotating ball nut application because of its low inertia and balanced design › Assists clean environment maintenance due to minimum grease scattering › Superb sealing capabilities in contaminated environments
R Series (Rolled Ball Screw)	
  RNFTL RNFBL RNCT RNFCL RNSTL	› General accuracy grade (Ct10) rolled ball screw series › Compatible with a variety of nut mounting styles › Low-cost and short delivery › Interchangeable screw shaft and ball nut

	Type	Specifications						Dimension table
		Accuracy grade	Nut system	Shaft dia.	Lead	Stroke (nominal)	Preload	
	FCS/ FCN	Ct7	End-deflector	12	5, 10	550	Clearance max. 0.02	Page 166 – 175
				15	5, 10, 20	1 200		
				20	5, 10, 20	1 200		
				25	5, 10, 20, 25	1 200		
				32	5, 10, 20	1 150		
				40	10	1 200		
	VSP(PR)	Ct7	Deflector Type	12	5	400	P-preload	Page 154 – 165
				15	5	500		
				15	10	450		
				20	5	650		
				20	10	650		
				25	5	2 300		
				25	10	2 300		
				32	10	2 300		
				32	20	2 250		
				40	10	1 350		
	VSP(LPR)	Ct7	Deflector Type	20	20	1 400	P-preload	
				25	25	3 000		
				32	32	2 950		
				40	40	4 200		
				50	50	4 200		

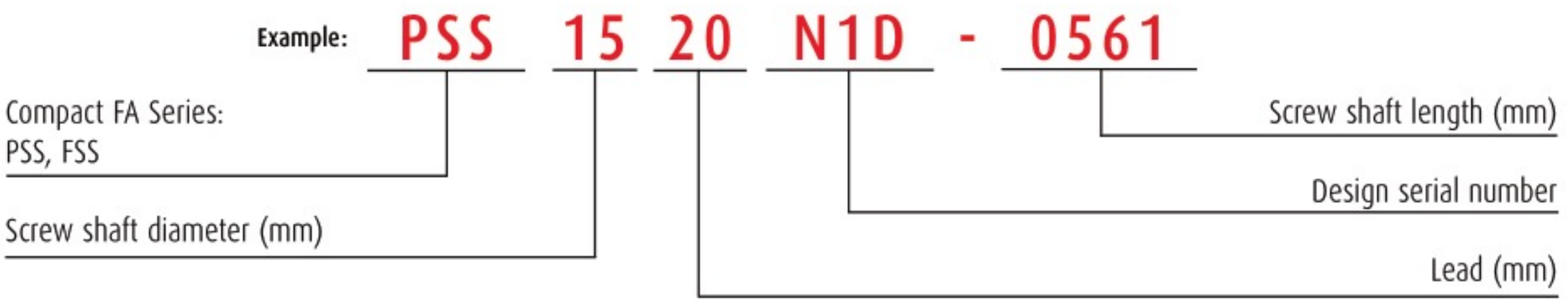
Shaft dia.	Lead					Clearance 0.1 – 0.25	Page 138 - 153
	RNFTL	RNFBL	RNCT	RNFCL	RNSTL		
10	3, 6	6	3	–	–		
12	8, 12	8	–	12	–		
14	4, 5	4, 5	4, 5	–	4, 5		
15	–	–	–	20	–		
16	10, 16	–	–	16, 32	–		
18	8	8	8	–	8		
20	5, 10, 20	5, 10	5	20, 40	5, 10		
25	5, 10, 25	5, 10	5, 10	25, 50	5, 10		
28	6	6	6	–	6		
32	10, 32	10	10	32, 64	10		
36	10	10	10	–	10		
40	10, 40	10	10	40, 80	–		
45	12	–	12	–	12		
50	10, 16	–	10, 16	50	–		

14. Part Number for Ball Screws

Part number for DIN ball screw



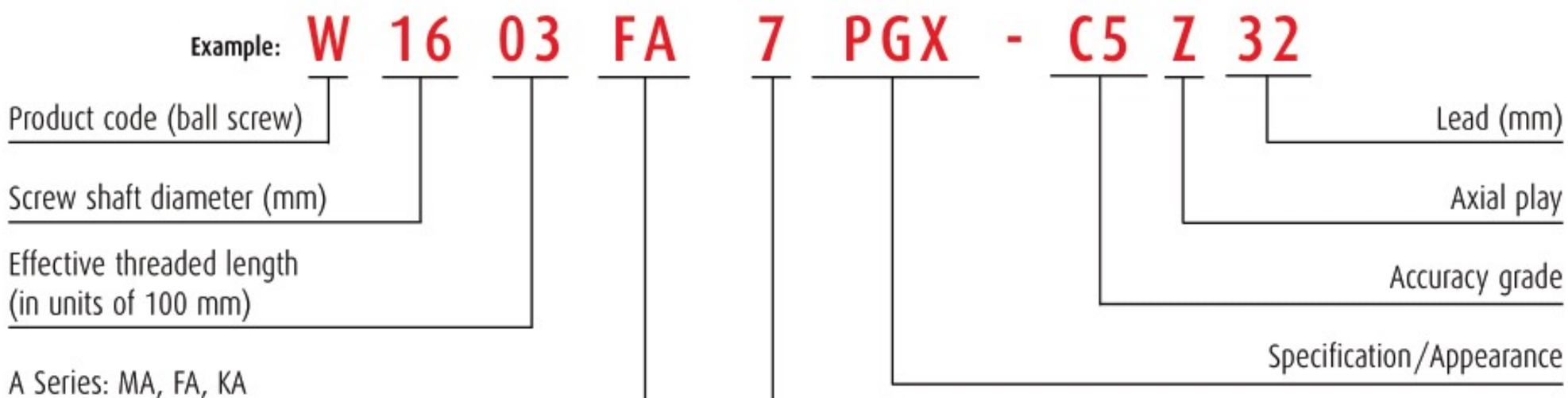
Part number for Compact FA Series ball screw



PSS: Compact , low noise and high speed

FSS: Compact FA for transportation

Part number for A and S Series ball screw



MA: Miniature ball screw

FA: Ball screw for factory automation

KA: Stainless steel ball screw

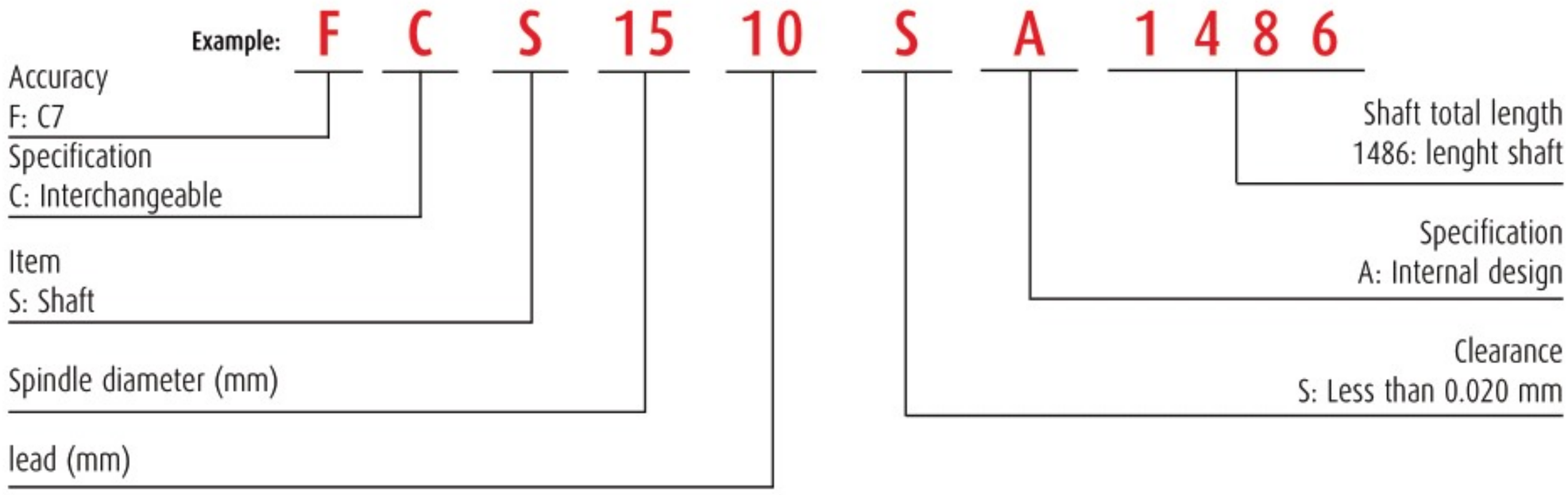
MS: MA series with blank shaft-end

FS: FA series with blank shaft-end

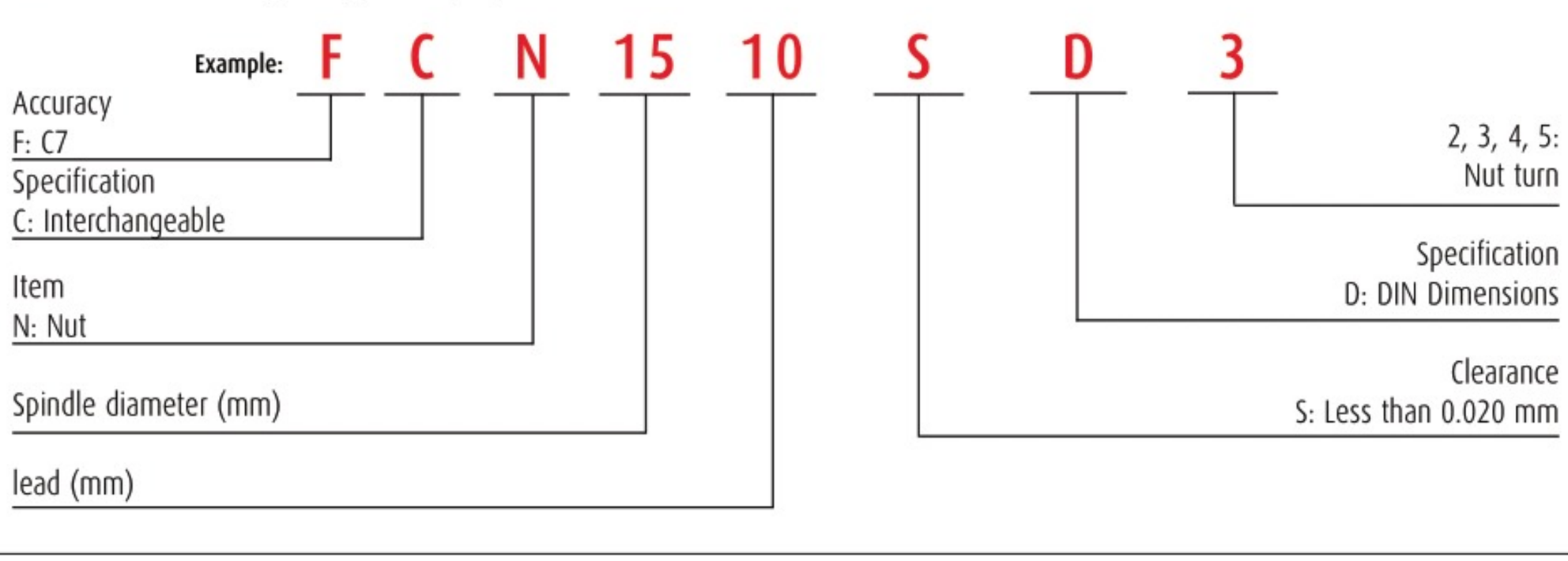
SS: Ball screw for machine tools with blank shaft-end

Part number for Precision Interchageable ball screws

Please use the following designation, if you order a **shaft**:



Please use the following designation, if you order a **nut**:

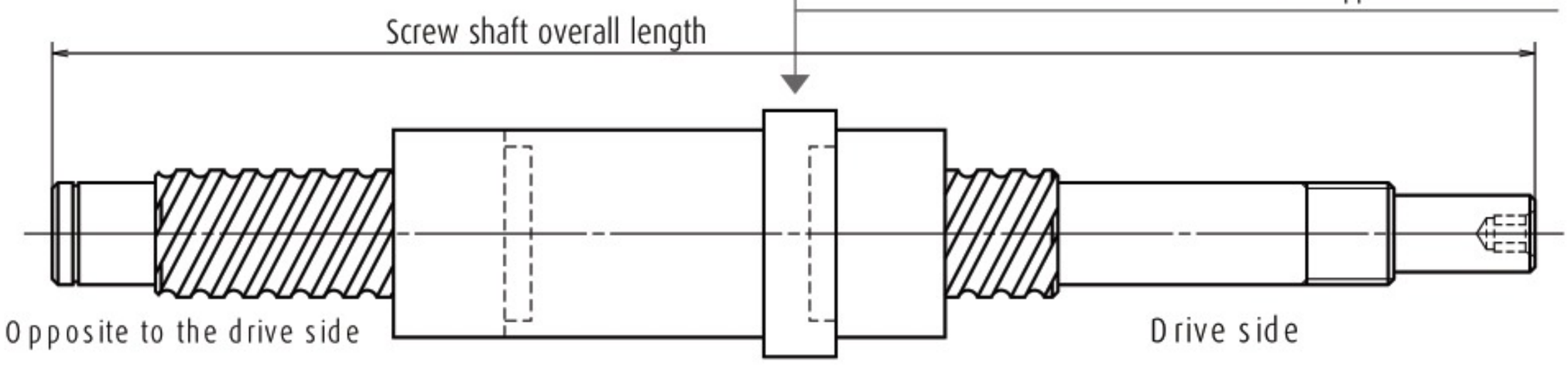


14. Part Number for Ball Screws

Part number for VSP Series ball screw

Example: **V S P 40 40 K 1 D 2002 S A1**

- V S P: Accuracy grade and axial play
  VSP (Ct7, axial play 0 mm)
- 40: Screw shaft diameter (mm)
- 40: Lead (mm)
- K: Equipped with NSK K1 unit
  N: No NSK K1 unit
  (Equipped with grease retaining seal only)
- 1: Number of nut
- D: Position of ball nut flange
  D: Screw shaft drive side S: Opposite to drive side
- 2002: Overall length of screw shaft
  If the length is less than 1000 mm, enter 0 to the forth digit.
- S: Bearing journal for simple support side:
  please refer to the configuration of the screw shaft end outlined in the catalog.
- A1: Bearing journal for fixed support side:
  please refer to the configuration of the screw shaft end outlined in the catalog.



Please indicate the nut assembly and screw shaft part number when ordering.

Part number for R Series rolled ball screw

Example for nut assembly: RN FTL 25 10 A 5 S

- RN — Product code (nut assembly)
- FTL — Nut model: FTL, FBL, STL, CT, FCL
- 25 — Screw shaft diameter (mm)
- 10 — Lead (mm)
- A — Internal design specification code
- 5 — Effective turns of balls (number of turns of balls x number of circuits)
- S — Seal code S: With seal; No code: Without seal

Example for screw shaft: RS 25 10 A 20

- RS — Product code (screw shaft)
- 25 — Screw shaft diameter (mm)
- 10 — Lead (mm)
- A — Internal design specification code
- 20 — Screw shaft length (x 100)

FTL: Flanged tube type

FBL: Flanged tube type (circular)

STL: Square tube type

CT: V-thread (no flange) tube type

FCL: Flanged end-cap type

15. Standard Ball Screw Series

Shaft Diameter and Lead Matrices

NSK provides a variety of standard ball screw series, shown in the following matrices.

Standard ball screws: Shaft diameter and lead matrix

Shaft dia.	Lead								
	1	1.5	2	2.5	4	5	6	8	10
4	P 208 (MA)								
6	P 210 (MA)							P 184 (PSS)	
8	P 212 (MA)	P 214 (MA)	P 216 (MA)						P 186 (PSS)
10			P 218 (MA)	P 220 (MA)	P 230 (FA)	P 188 (PPS)			P 188 (PSS)
12			P 222 (MA)	P 224 (MA)		P 156 (VSP) P 168 (FCN) P 190 (PSS) P 232 (FA)			P 168 (FCN) P 176 (FSS) P 190 (PSS) P 234 (FA)
14						P 236 (FA)		P 238 (FA)	
15						P 156 (VSP) P 168 (FCN) P 192 (PSS)			P 156 (VSP) P 168 (FCN) P 178 (FSS) P 192 (PSS) P 240 (FA)
16			P 226 (MA)	P 228 (MA)		P 244 (FA)			
20					P 290 (SS)	P 156 (VSP) P 168 (FCN) P 196 (PSS) P 290 (SS)			P 156 (VSP) P 168 (FCN) P 180 (FSS) P 196 (PSS) P 250 (FA)
25					P 292 (SS)	P 156 (VSP) P 168 (FCN) P 202 (PSS) P 292,294 (SS)	P 292 (SS)		P 156 (VSP) P 168 (FCN) P 182 (FSS) P 202 (PSS) P 250 (FA) P 294,296 (SS)
28						P 296,298 (SS)	P 296,298 (SS)		
30									
32						P 168 (FCN) P 300,302,304 (SS)	P 300,302 (SS)	P 302 (SS)	P 156 (VSP) P 168 (FCN) P 304,306,308 (SS) P 323 (ZSD)
36									P 306,308 (SS)
40						P 306 (SS)		P 310 (SS) P 323 (ZSD)	P 156 (VSP) P 168 (FCN) P 310,312,314 (SS) P 323 (ZSD)
45									P 316 (SS)
50									P 314,316 (SS) P 323 (ZSD)
63									P 323 (ZSD)

KA Series shaft diameter and lead matrix

Unit: mm

Shaft dia.	Lead					
	1	2	4	5	10	20
6	P 266					
8	P 268	P 270				
10		P 272	P 274			
12		P 276		P 278	P 280	
15					P 282	P 284
16		P 286				
20						P 288

Unit: mm

Lead									
12	15	16	20	25	30	32	40	50	60
P 184 (PSS)									
	P 186 (SS)								
			P 190 (PSS)		P 190 (PSS)				
			P 168 (FCN) P 178 (FSS) P 194 (PSS) P 242 (FA)		P 194 (PSS)				
		P 246 (FA)				P 248 (FA)			
			P 156 (LPR) P 168 (FCN) P 180 (FSS) P 198 (PSS) P 252 (FA)		P 198 (PSS)		P 200 (PSS) P 254 (FA)		P 200 (PSS)
			P 168 (FCN) P 182 (FSS) P 204 (PSS) P 256 (FA)	P 156 (LPR) P 168 (FCN) P 182 (FSS) P 204 (PSS) P 258 (FA)	P 206 (PSS)			P 206 (PSS) P 260 (FA)	
	P 323 (ZSD/ZSS)		P 156 (VSP) P 323 (ZSD/ZSS)	P 262 (FA)		P 156 (LPR) P 264 (FA)			
P 310,312 (SS)	P 323 (ZSD)		P 323 (ZSS)	P 323 (ZSS)	P 323 (ZSS)		P 156 (LPR) P 323 (ZSS)		
	P 323 (ZSD)		P 323 (ZSD)	P 323 (ZSS)	P 323 (ZSS)		P 323 (ZSS)	P 156 (LPR)	
	P 323 (ZSD)		P 323 (ZSD)		P 323 (ZSD)				

15. Standard Ball Screw Series

R Series shaft diameter and lead matrix

Shaft dia.								
	3	4	5	6	8	10	12	
10	P 138,146			P 138,144				
12					P 138,144		P 142,148	
14		P 138,144,146,152	P 138,144,146,152					
15								
16						P 138		
18					P 138,144,146,152			
20			P 138,144,146,152			P 138,144,152		
25			P 138,144,146,152			P 138,144,146,152		
28				P 140,144,146,152				
32						P 140,144,146,152		
36						P 140,144,146,152		
40						P 140,144,146		
45							P 140,146,152	
50						P 140,146		

Unit: mm

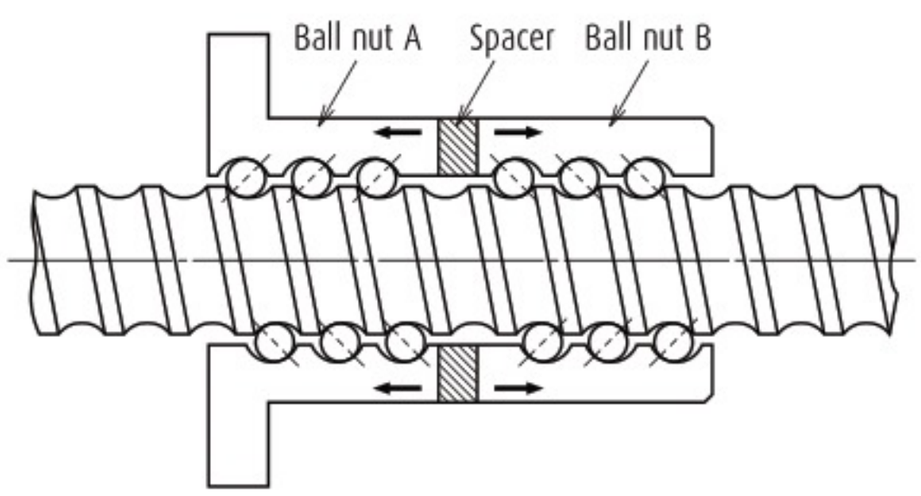
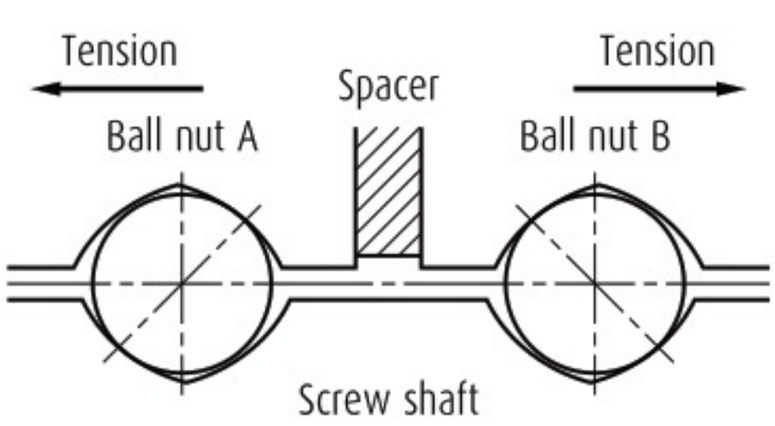
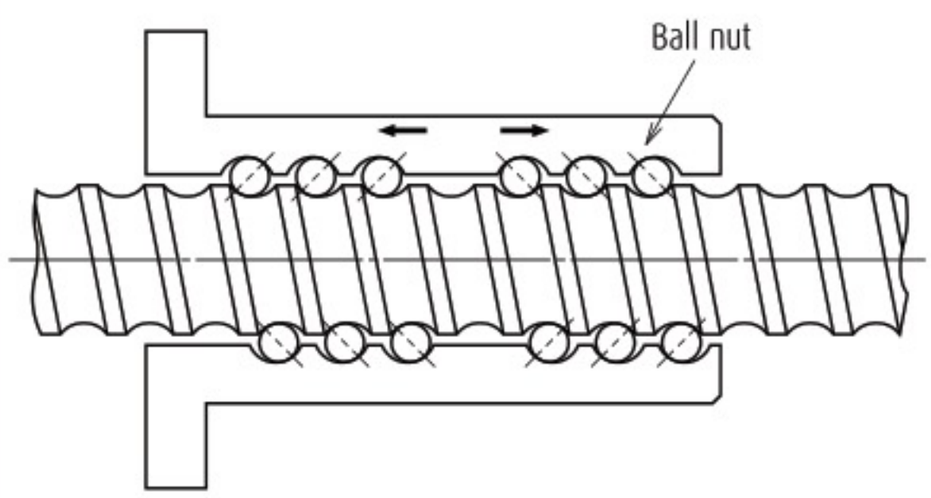
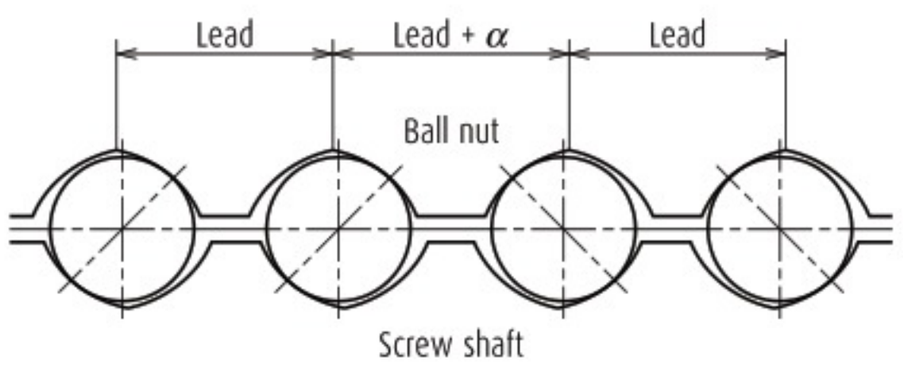
Lead							
16	20	25	32	40	50	64	80
	P 148						
P 142,148			P 150				
	P 142,148			P 150			
		P 142,148			P 150		
			P 142,148			P 150	
				P 142,148			P 150
P 146					P 148		

16. Structure of a Ball Screw

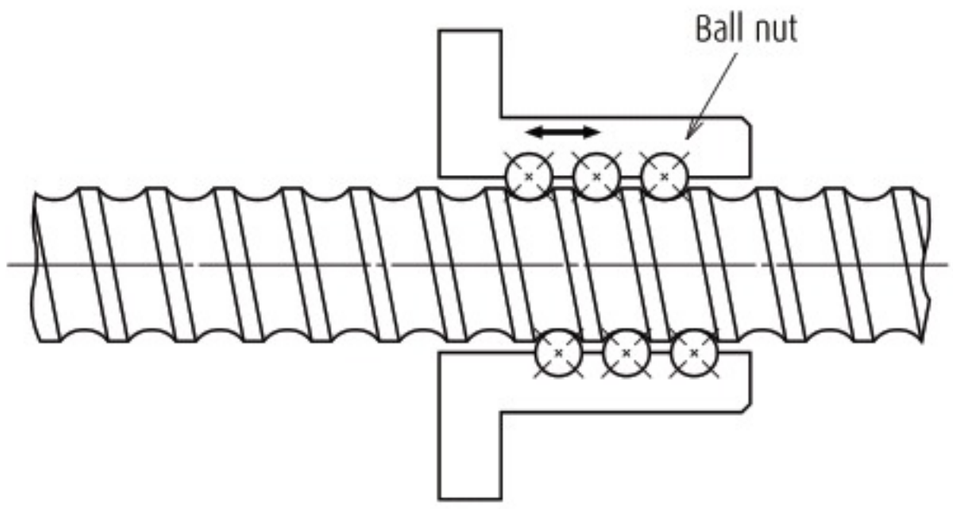
1. Preload system

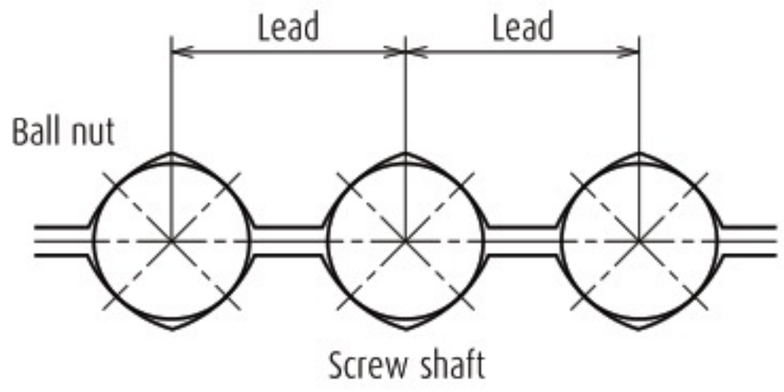
There are three systems to apply preload to NSK ball screws depending on the application.

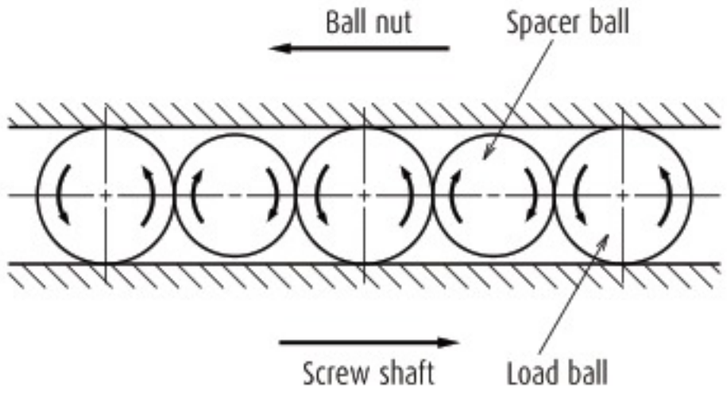
Table 1. Preload system for ball screws

Preload system	Double nut preload (D-Preload)	Offset preload (Z-Preload)
Structure	 	 
Description	Uses two nuts, and inserts a spacer between them to apply the preload. In general, a spacer is thicker (by the deformation equivalent to the preload) than the actual space between two nuts. However, a thin spacer is inserted in some cases.	To apply preload, the lead near the center of the nut is offset by the volume equivalent to preload (α). This method is like to creating a preload system similar to the double nut preload (D-preload) by a single ball nut, thus enabling a compact nut design.
Nut length	Long	Medium
Torque characteristics	○	○
Rigidity	◎	◎

Oversize ball preload (P-Preload)







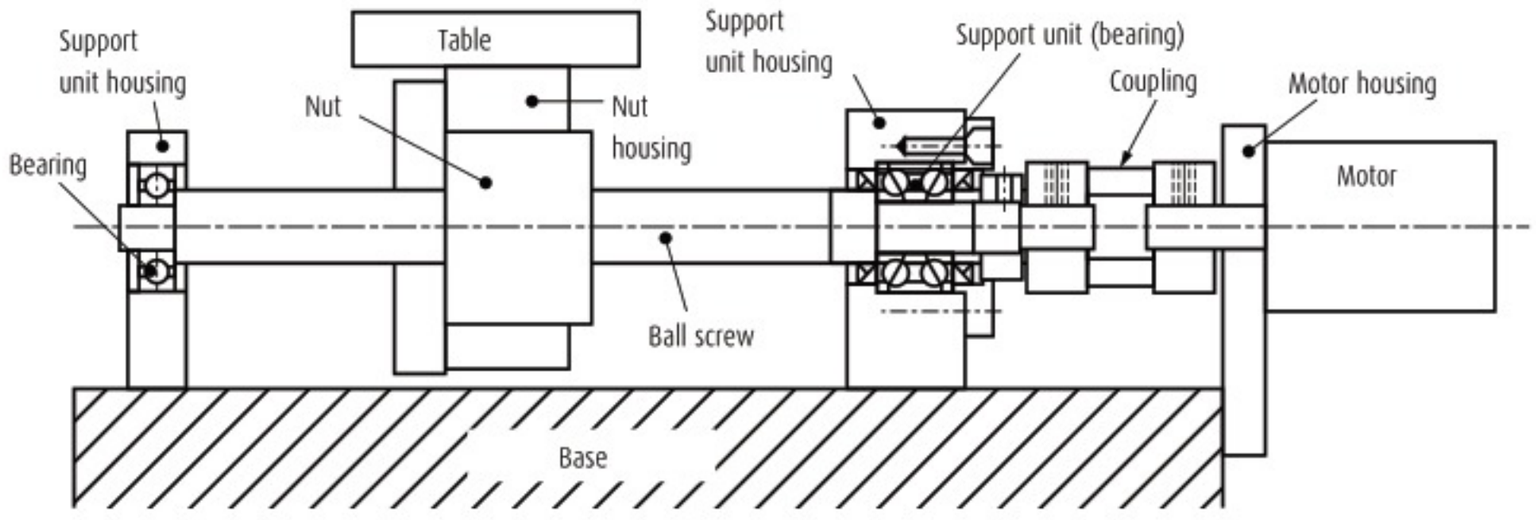
Balls slightly larger than the ball groove space (over-size balls) are inserted to allow them to contact at four points.
Provides better torque characteristics in the low torque range.

Short
○
○

17. Installation of Ball Screw

1. Installation

The following simplified component drawing shows a representative example of a single-axis table.



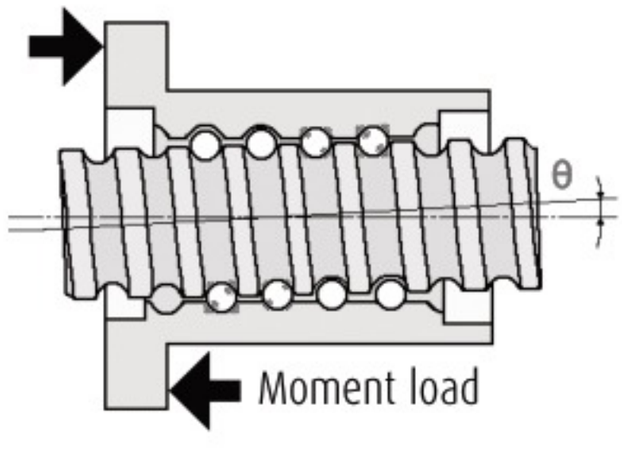
The screw shaft of the ball screw is supported by a nut and bearings, and it is driven by a motor.

It is critically important to complete the centering work to ensure the predetermined operation life, functionality and accuracy of the ball screw. In general, the following accuracy is recommended for precision-class applications.

Inclination of center line: 1/2 000 or less (Target: 1/5 000 or less)

Eccentricity: 0.020 mm or less

<Inclination of center line>



The following problems could occur if an installation error negatively affected the ball screw:

(1) Effects on durability:

→ Lowered flaking life or wearing life.

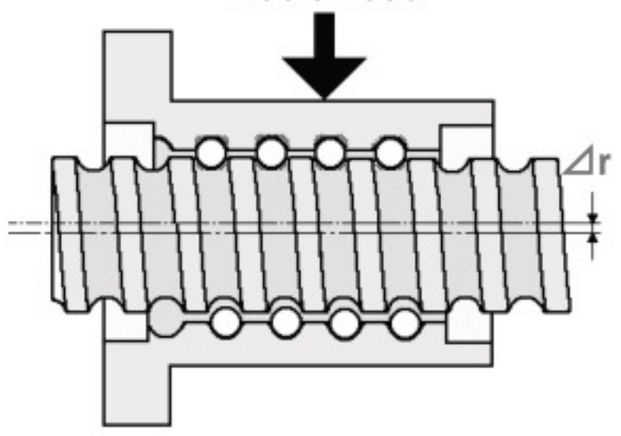
(2) Effects on torque characteristics:

→ Increased friction torque or torque variations.

(3) Effects on feed rate:

→ Decreased accuracy in motion.

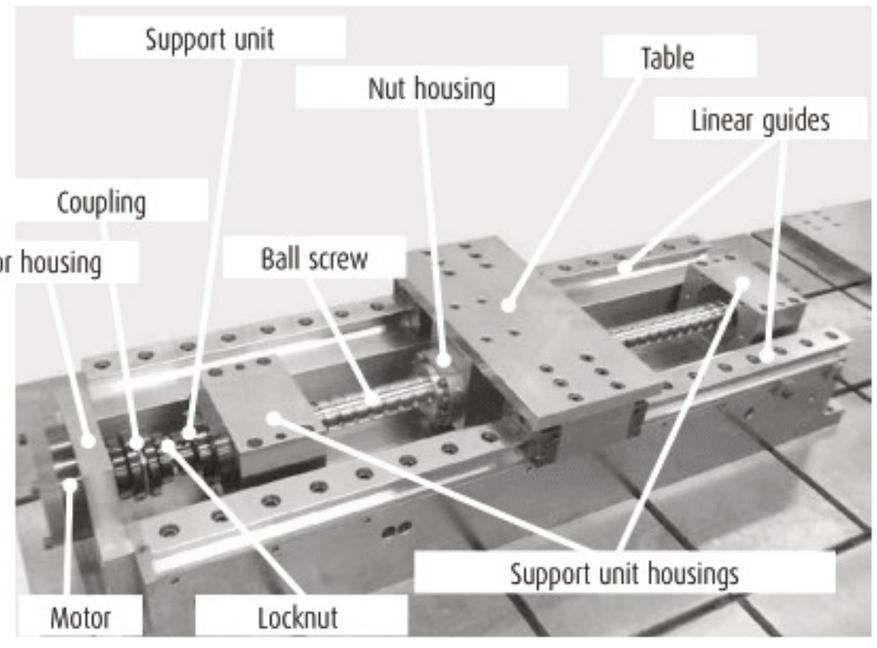
<Eccentricity>



Overall View of Assembled Body

Explanations of the assembling procedure are given below, using the single-axis table as an example:

In this explanation, two different installation procedures are provided: one for machine tools, where high installation accuracy is required, and another for general industrial machinery.



2. Installation Procedure for Machine Tools, Where High Installation Accuracy Is Required

The single-axis table shall be installed according to the following procedure:

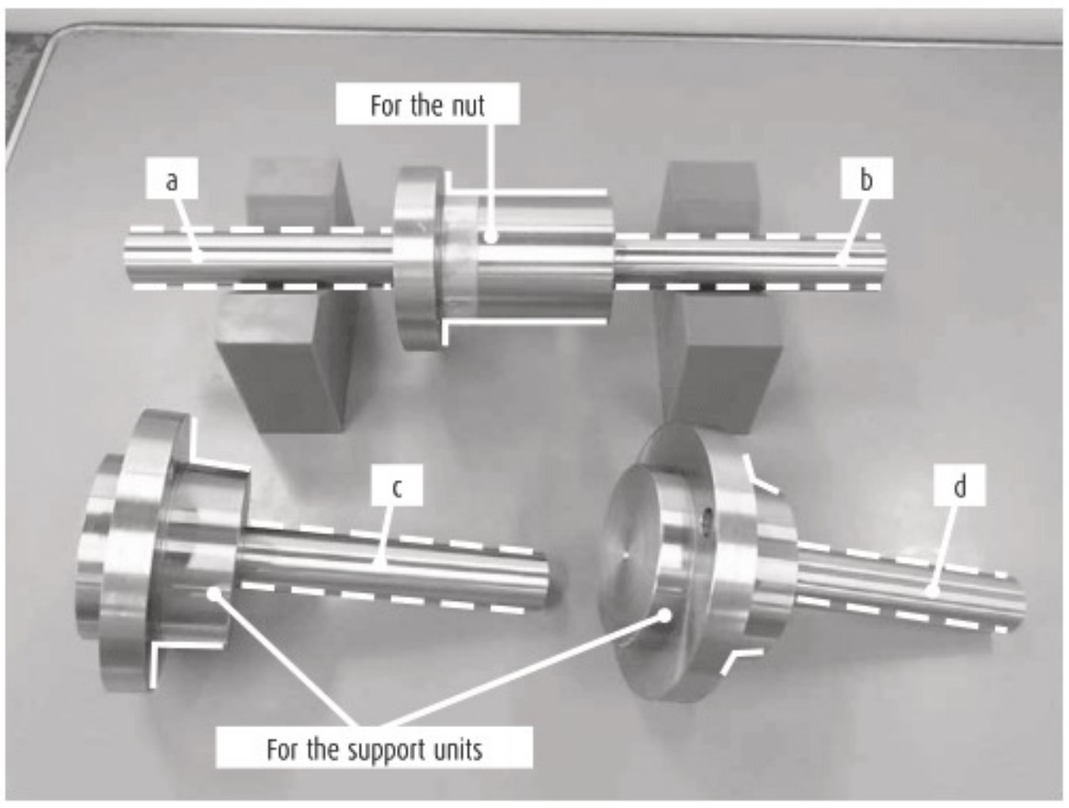
1. Centering of nut housing
2. Centering of support unit housing
3. Installation of ball screw
4. Installation of support unit
5. Adjusting axial runout of screw shaft end and fastening lock nut of support unit
6. Replenishing lubrication grease
7. Verification of functionality
8. Centering of motor housing
9. Installation of coupling and motor
10. Trial operation

I. Jigs required for installation

Test bars:

(For the nut: one piece; for the support units: two pieces)

⇒ For centering and measurement of axial runout. The portions onto which the housing is installed (marked with the solid line) and the portions subject to measurement (a, b, c and d, marked with the broken line) shall be finished to high precision.



Ⅱ. Installation of assembled body

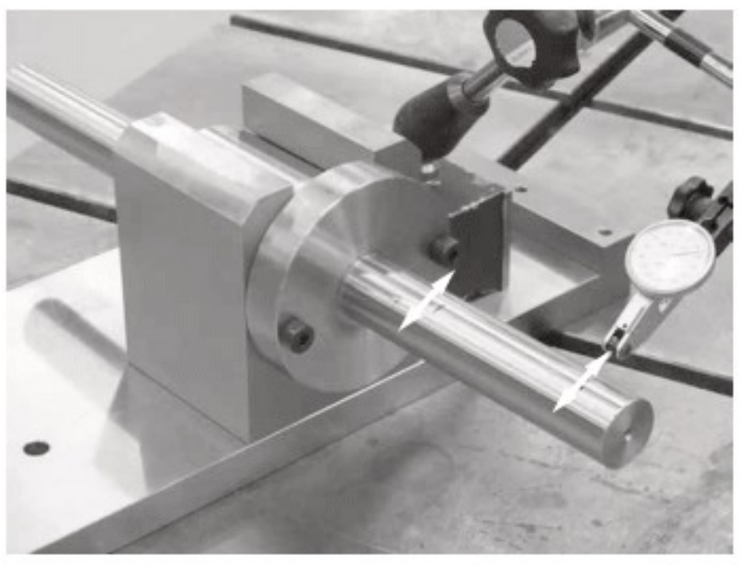
1. Centering of nut housing

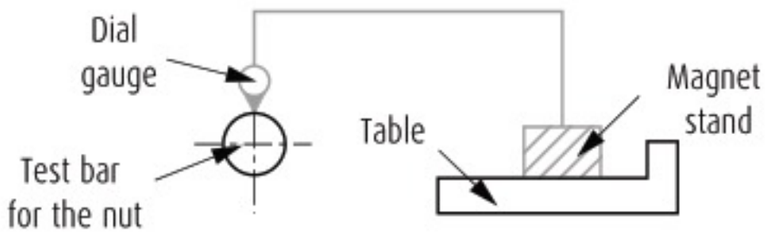
1-1

Turn the table over and mount the nut housing and test bar for the nut onto it.

Set up a magnet stand with a dial gauge attached, taking the rear side of the table as reference. Measure two spots at the top of the test bar for the nut by moving the magnetic stand around to check the inclination in the vertical direction.

If inclination of center line is observed, adjust the surfaces on which the nut housing is installed.

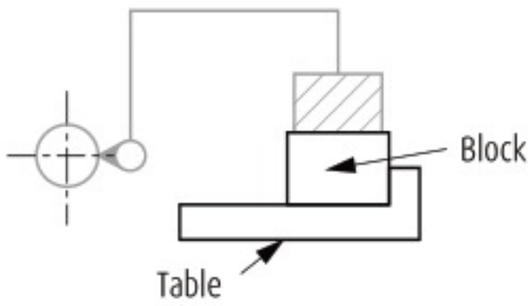


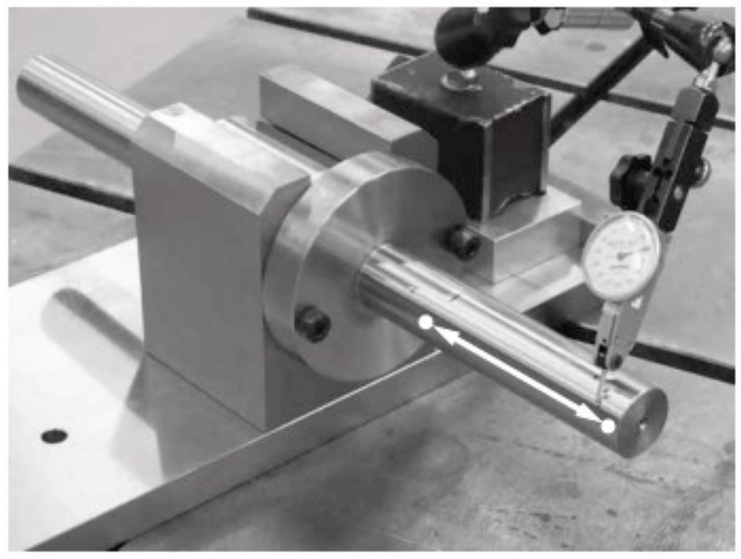


17. Installation of Ball Screw

1-2

Fix the magnetic stand, with the dial gauge attached, onto a block. While pressing the block toward the reference surface of the table, move the magnet stand around. Measure the side surface of the test bar for the nut, check the inclination in the horizontal direction. If inclination of center line is observed, adjust the portion where the nut housing is installed onto the table.



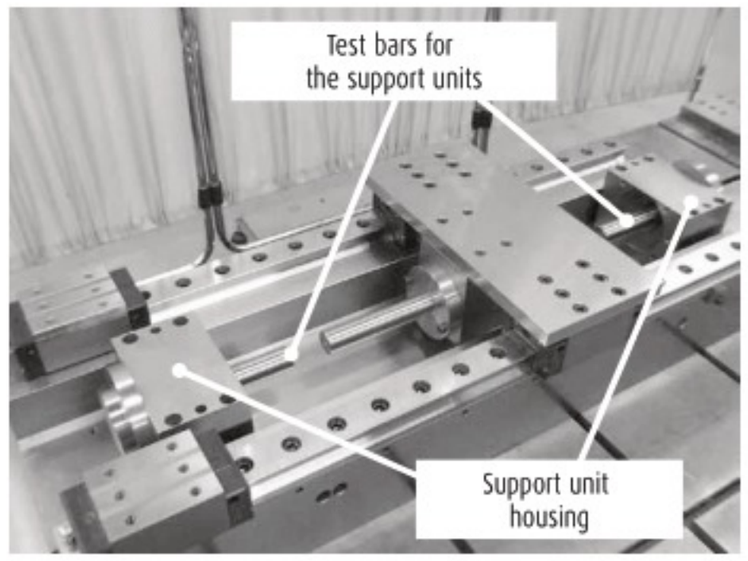


2. Centering of support unit housing

Install the linear guides onto a machine base, and then install the table, which has already been centered. (For installation of linear guides, please refer to page 16.)

2-1

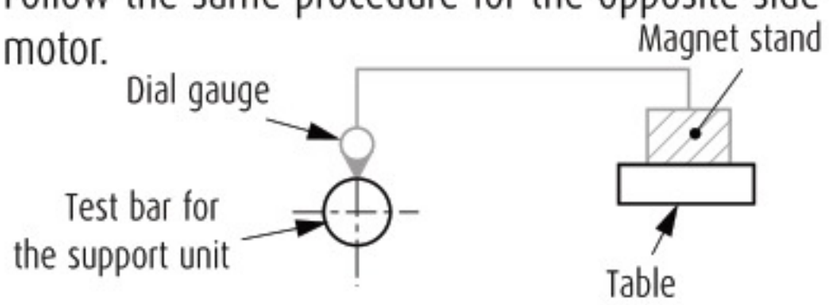
Install the test bar for the support unit onto the support unit housing.

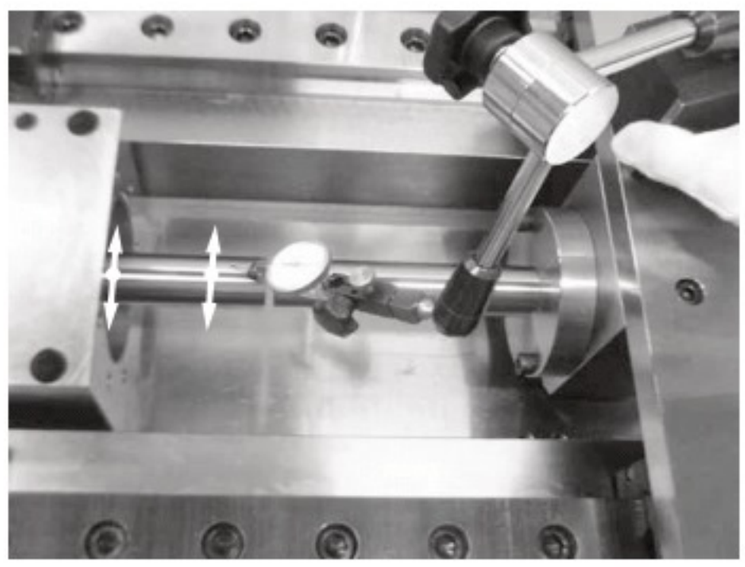


2-2

Install the magnet stand, with the dial gauge attached, using the table as reference. While moving the table, measure the two spots at the top of the test bar for the motor-side support unit to check the inclination in the vertical direction. If inclination of center line is observed, adjust the mounting surfaces of the support unit housing.

Follow the same procedure for the opposite side of the motor.



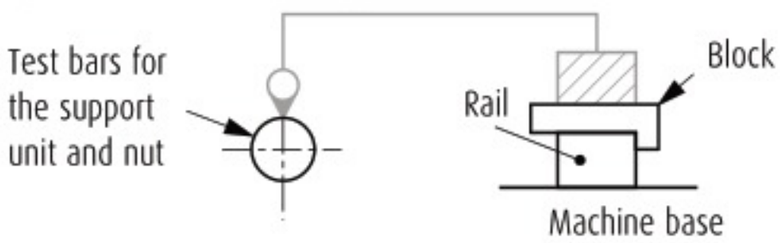


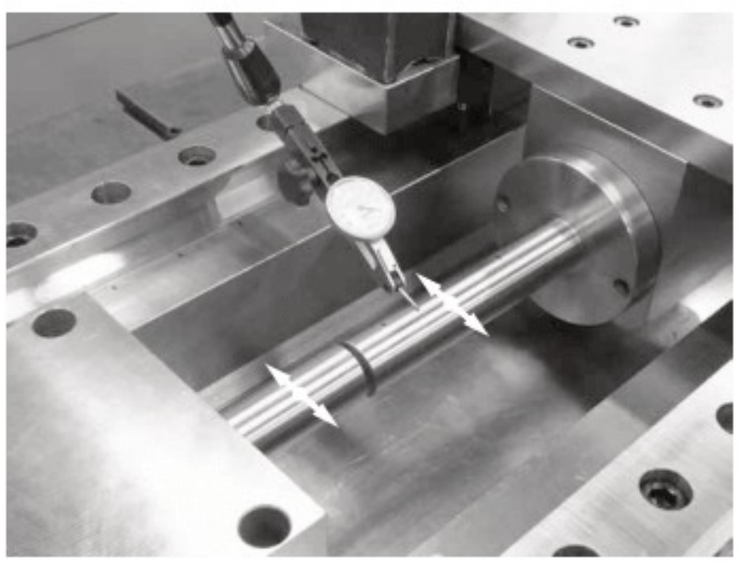
2-3

Fix the magnet stand, with the dial gauge attached, onto a block, and install the block onto the top surface of the linear guide rail. Measure the top points of the test bar for the nut and the support unit to check for eccentricity in the vertical direction.

If eccentricity is observed, adjust the mounting surface of the support unit housing.

Follow the same procedure for the opposite side of the motor.

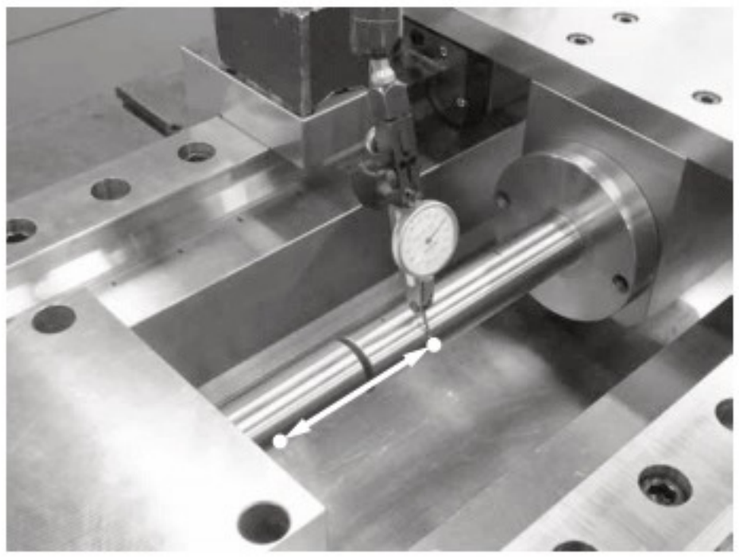


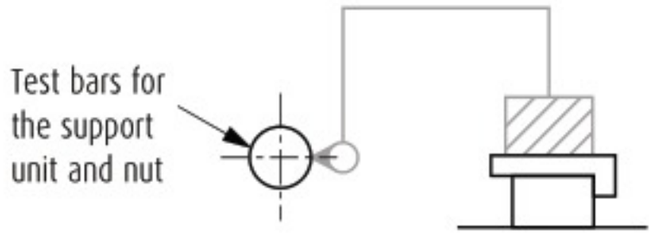


2-4

Fix the magnet stand, with the dial gauge attached, onto a block. While pressing the block toward the top surface of the linear guide rail as reference and moving it, take measurements of the side surfaces of the test bars for the nut and support unit to check for eccentricity in the horizontal direction. If eccentricity is observed, adjust the mounting surface of the support unit housing.

Follow the same procedure for the opposite side of the motor.



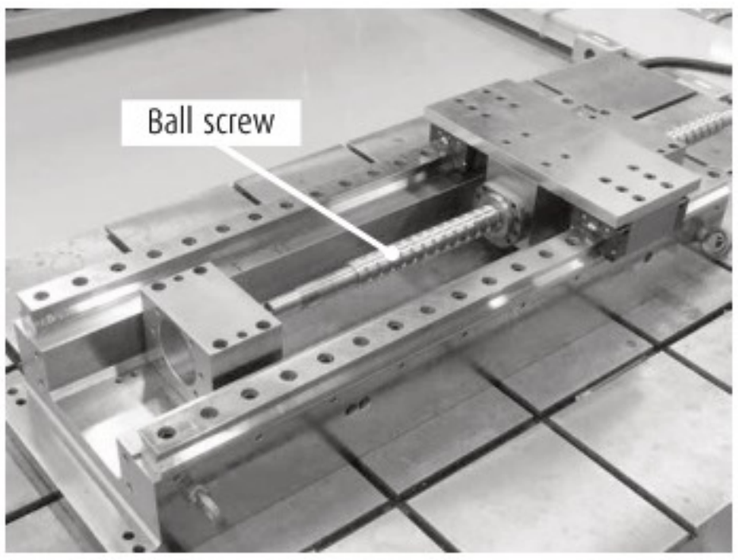


3. Installation of ball screw

Remove all test bars from the housing.

Clean the outside diameter surface of the nut and the inside diameter surface of the housing using a cloth, and install the ball screw.

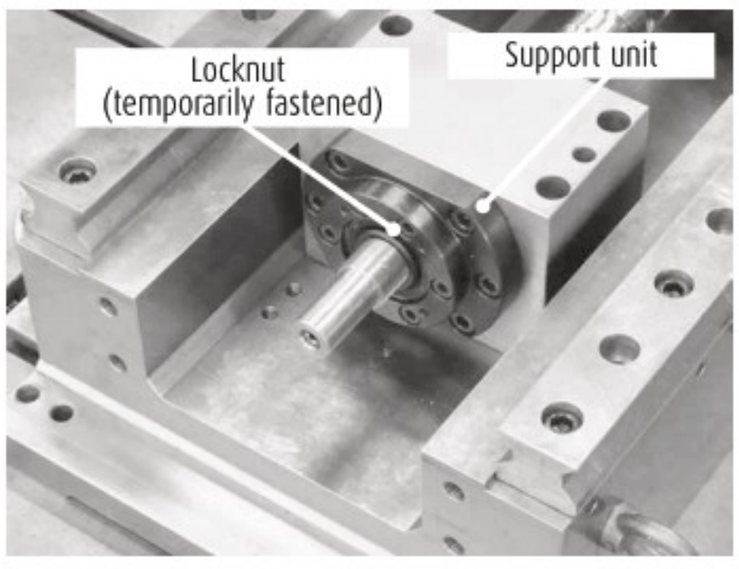
Apply grease to spots with metal-to-metal contact to avoid any scratches or dents. While doing this, be careful not to drop the ball screw or hit it with anything, which might cause malfunction. If the housing must be removed in order to mount the ball screw, use a positioning pin so that the housing can be mounted back in its original position.



4. Installation of support unit

Insert the screw shaft into the support unit housing and mount the support units on both shaft ends. Fix the motor-side support unit to the housing. Fasten the locknut temporarily.

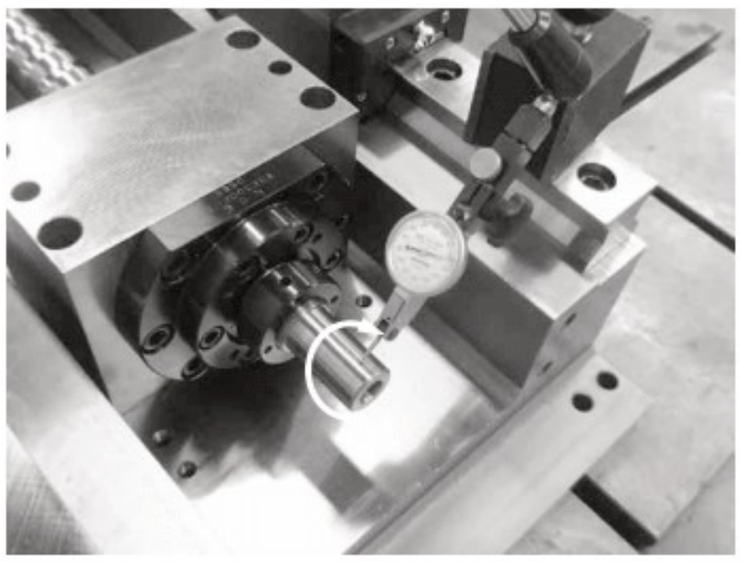
Follow the same procedure for the opposite side of the motor.



5. Adjusting axial runout of screw shaft end and fastening lock nut of support unit

Bring the dial gauge into contact with the top of the shaft end. Then, while rotating the screw shaft, measure the runout of the shaft end. While adjusting the shaft end runout, fasten the locknut to attain the required fastening torque.

Follow the same procedure for the opposite side of the motor.

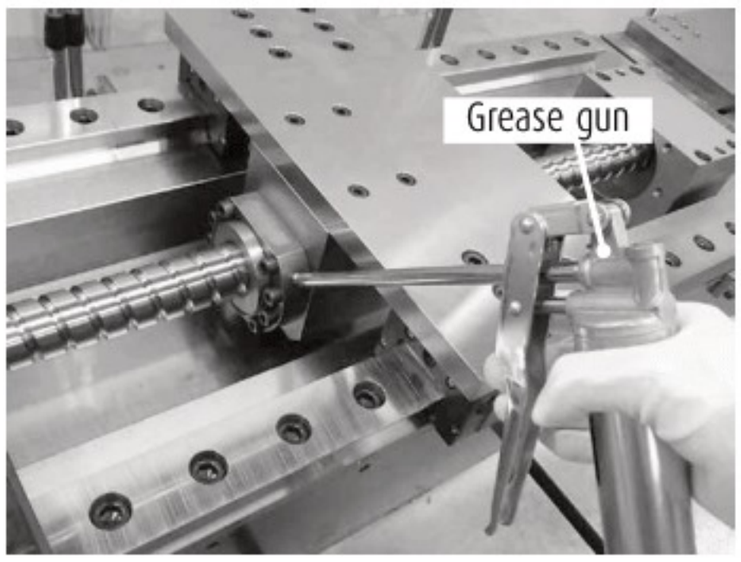


17. Installation of Ball Screw

6. Replenishing lubrication grease

Wipe away the antirust oil from the empty ball screw, to which grease has not been applied, and supply grease through the grease hole to fill the inside. (Supply the grease while rotating the ball screw in the direction that moves grease toward the inside of the nut. This will lubricate the ball screw evenly.)

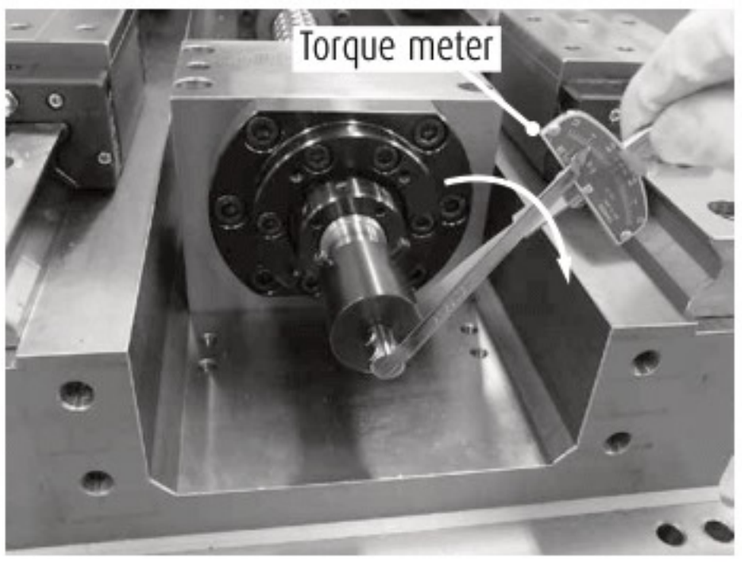
If you use a ball screw already filled with grease, it is not necessary to add more.



7. Verification of functionality

To check whether the ball screw has been installed accurately, verify its functionality. Measure the driving torque with a torque meter over the entire movable range of the screw.

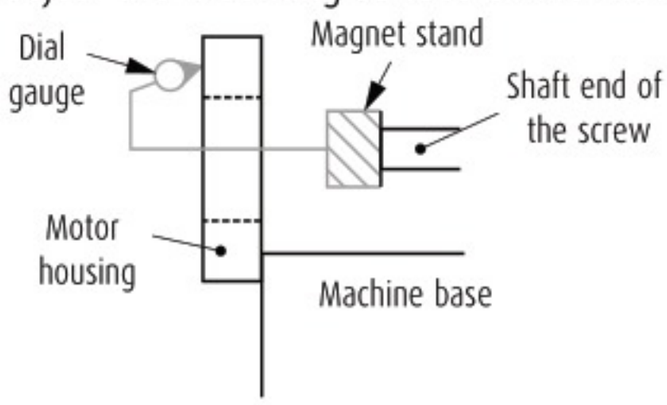
Confirm (including by touch) that there are no abnormalities.



8. Centering of motor housing

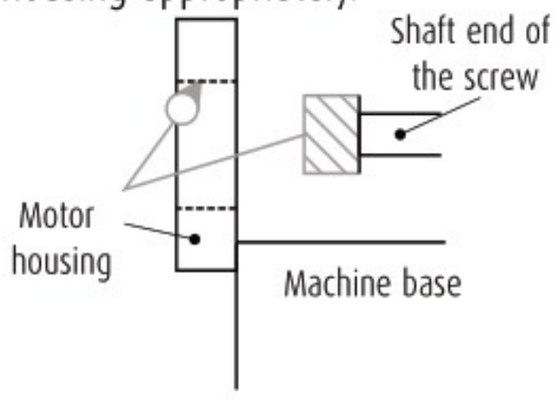
8-1

Install the motor housing, and mount the dial gauge onto the shaft end of the ball screw. Rotate the screw shaft to check the inclination of the motor housing, with the stylus of the dial gauge in contact with the end face of the motor housing. If inclination of the end surface of the motor housing is observed, adjust the mounting surface of the motor housing.



8-2

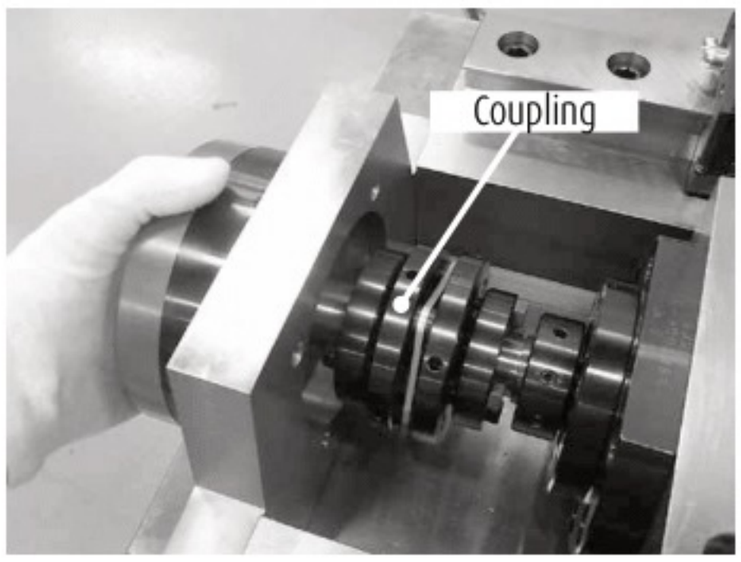
Set up the dial gauge onto the end face of the ball screw. Rotate the screw shaft to check eccentricity, with the stylus touching the inside diameter surface of the motor housing. If eccentricity is observed, adjust it by installing the motor housing appropriately.



9. Installation of coupling and motor

Mount the coupling onto the shaft end of screw, and install motor.

Fasten the bolts of the coupling to connect the shaft end with motor shaft.



10. Trial operation

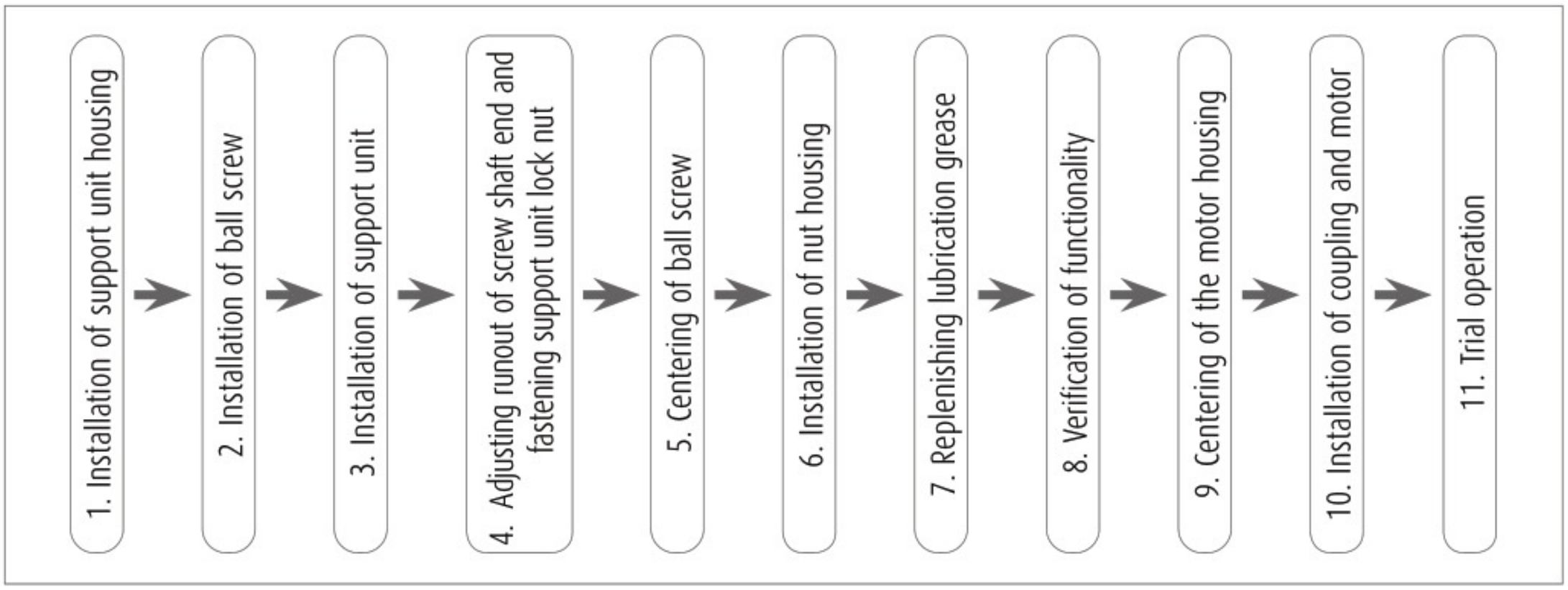
At the beginning, run the assembly at low speed to check for vibrations and noise. Then, run it at moderate speed, and finally at high speed and check for abnormalities. Then run it continuously for approximately two hours, carry out a running-in operation and at the same time check for any abnormalities. During this running-in operation, the excessive grease inside of the nut is pushed out of the nut. Wipe it away.

17. Installation of Ball Screw

3. Installation Procedure for General Industrial Machinery

In this procedure, the ball screw is installed with the accuracy required for the linear guide. The centering of nut and table are adjusted by installing the nut housing appropriately. Since no test bars are required and the inside diameter of the nut housing does not need to be fit with the nut, the ball screw can be installed relatively easily and cheaply.

The installation procedure used for the single-axis table is shown below:



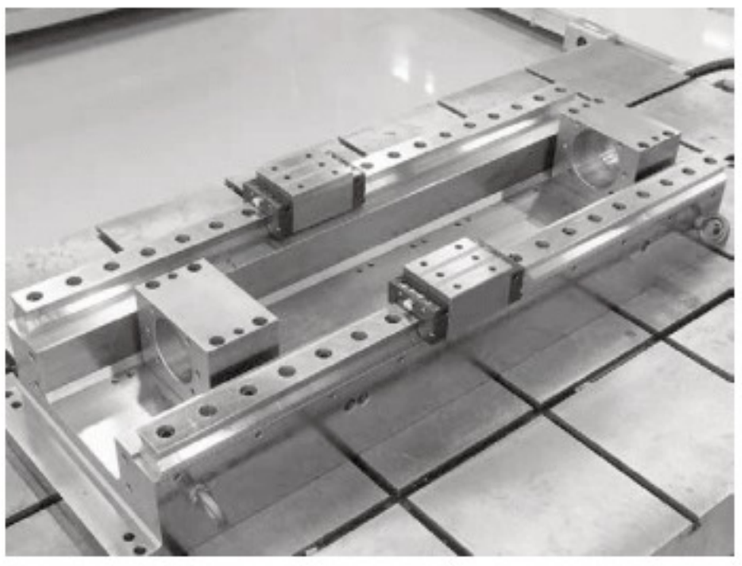
I. Installation of assembled body

1. Installation of support unit housing

Install the linear guide onto the machine base.

(For installation procedure for linear guide, please refer to page 16.)

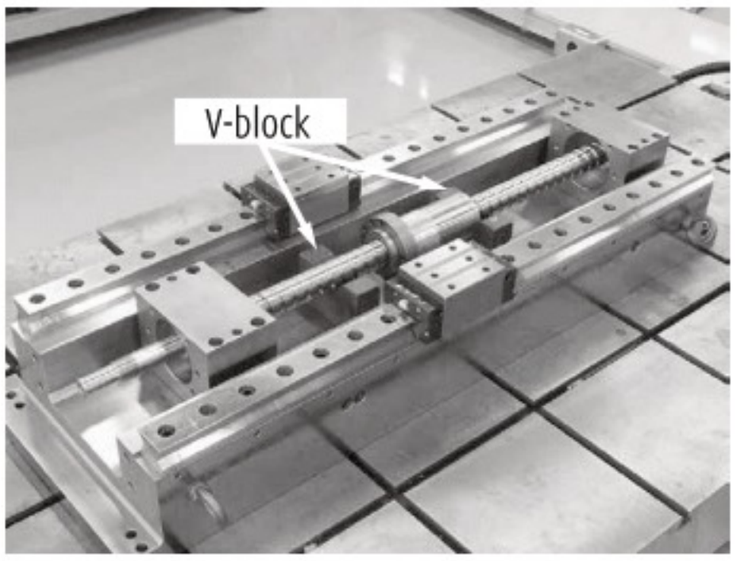
Place the support unit housing at the predetermined position and fasten it temporarily.



2. Installation of ball screw

While doing this, be careful not to drop the ball screw or hit it with anything, which might cause malfunction.

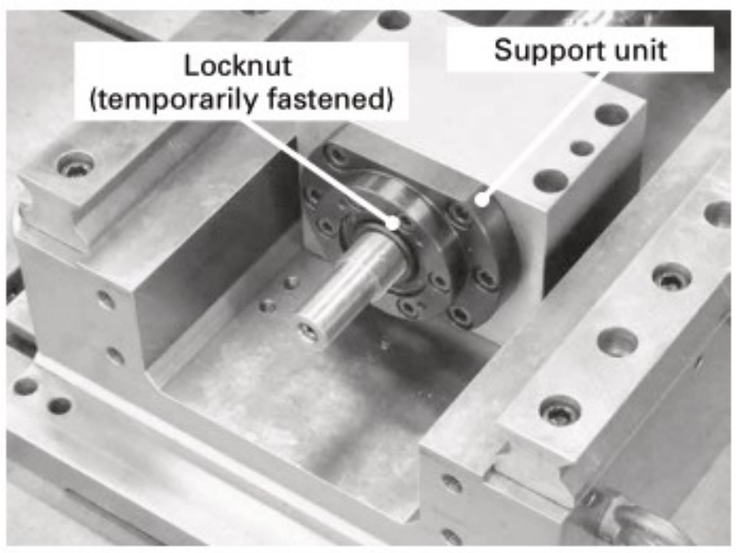
Conduct this task using a V-block to prevent scratches and dents.



3. Installation of support unit

Insert the screw shaft into support unit housing and mount support units on both shaft ends. Fix the motor-side support unit to the housing. Fasten the locknut temporarily.

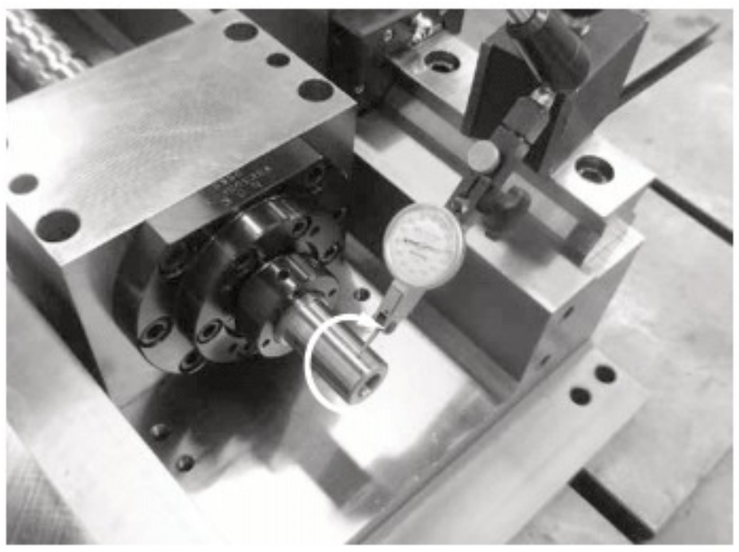
Follow the same procedure for the opposite side of the motor.



4. Adjusting runout of screw shaft end and fastening support unit locknut

Bring the dial gauge into contact with the top of the shaft end. Then, while rotating the screw shaft, measure the runout of the shaft end. While adjusting the shaft end runout, fasten the locknut to attain the required fastening torque.

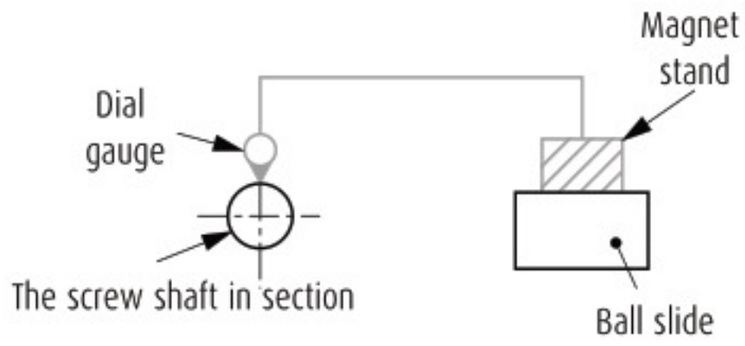
Follow the same procedure for the opposite side of the motor.

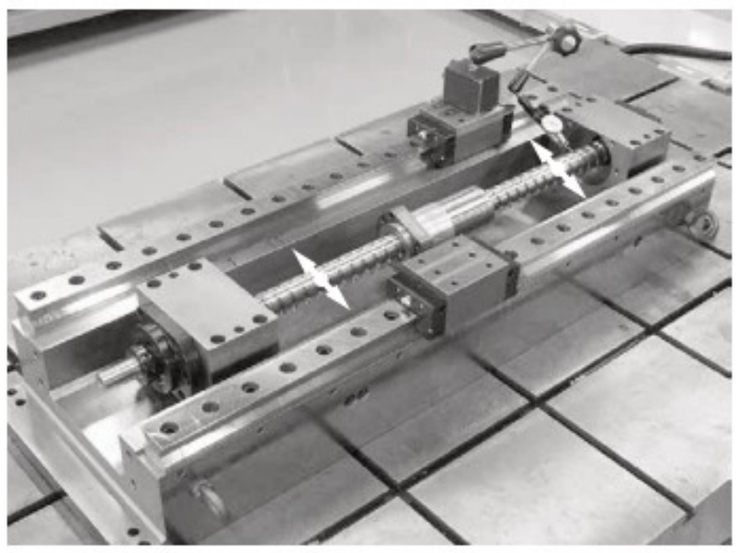


5. Centering of ball screw

5-1

Set up a magnet stand with a dial gauge attached, using the ball slide of the linear guide as reference. Measure the top of the screw shaft in the vicinity of the support unit housing both on the motor and opposite sides to check the inclination in the vertical direction. If inclination of center line is observed, adjust the mounting surface of the support unit housing.

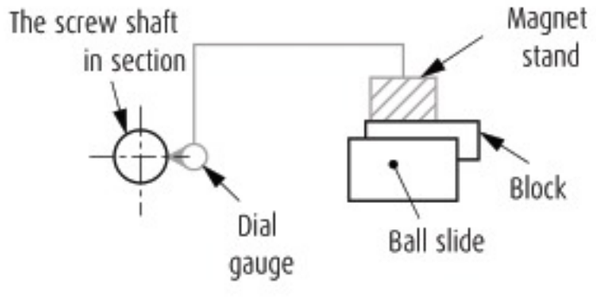


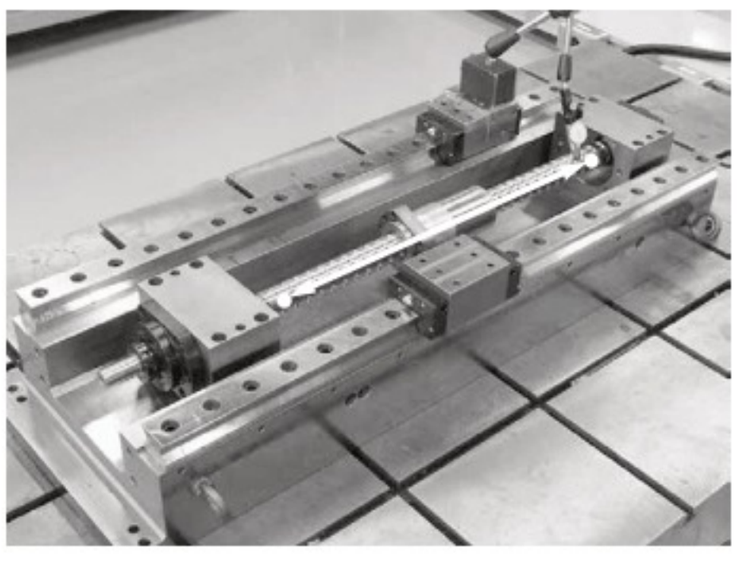


5-2

Fix the magnet stand, with the dial gauge attached, onto a block. While pressing the block toward the ball slide of the linear guide, move the block. Measure the side surface of the screw shaft in the vicinity of the support unit housing both on the motor and opposite sides to check the inclination in the horizontal direction. If inclination of center line is observed, adjust by installing support unit housing appropriately.

After the adjustment, fix the support unit housings of the motor side and the opposite side.





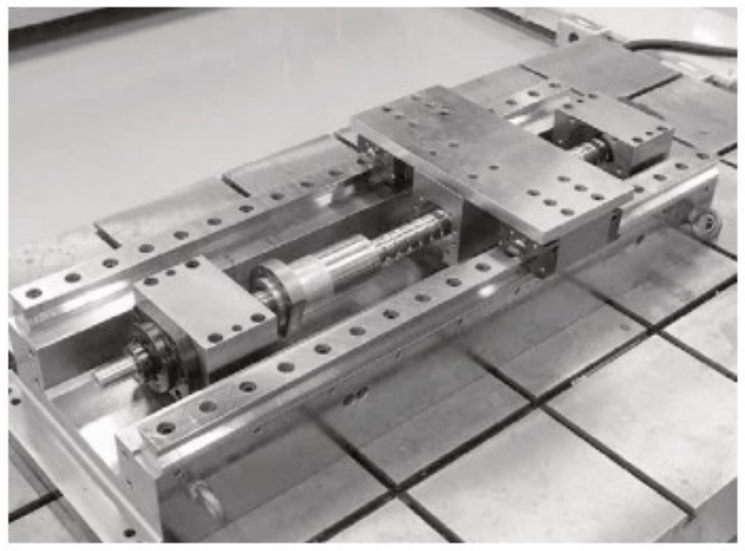
17. Installation of Ball Screw

6. Installation of nut housing

6-1

Temporarily fasten the nut housing onto the table, and fasten the table, using the ball slide of the linear guide as reference surface.

To minimize the bending of the screw shaft caused by the self-weight of the nut, move the nut toward the support unit housing at the shaft end.

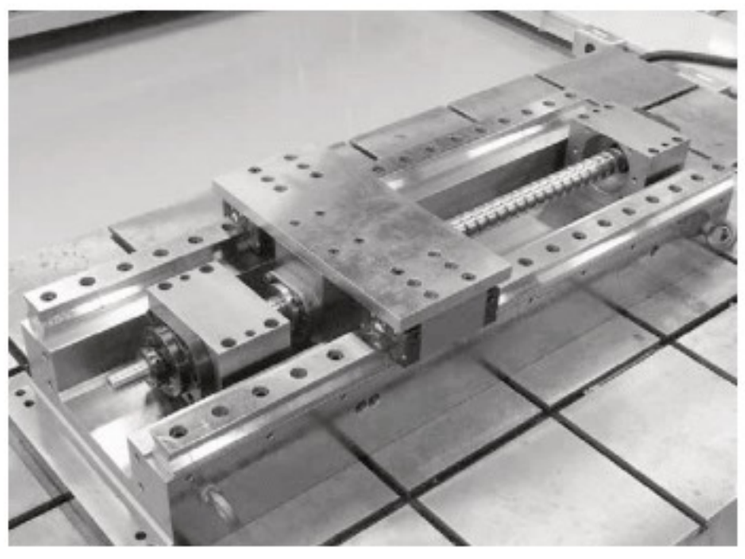


6-2

Move the table toward the nut, and fasten the nut to the nut housing.

Loosen the bolts that fasten the table to the nut housing, and re-fasten them.

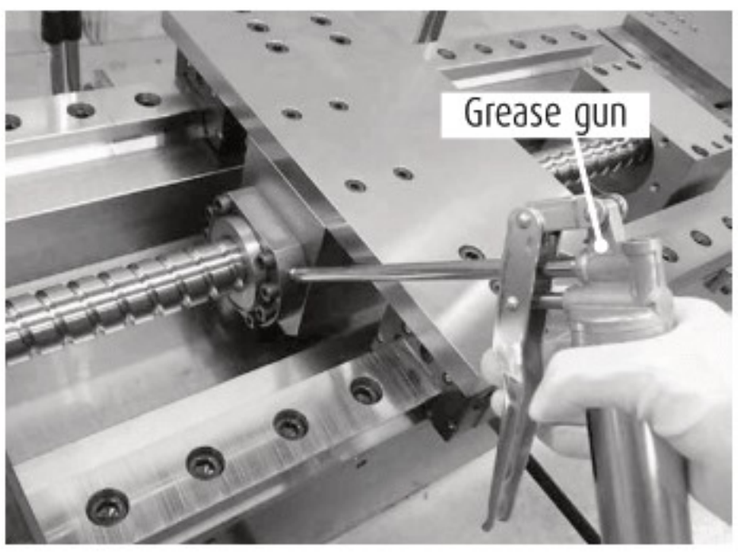
Loosen the bolts that fasten the nut housing and the nut, and re-fasten them.



7. Replenishing lubrication grease

Wipe away the antirust oil from the empty ball screw, to which grease has not been applied, and supply grease through the grease hole to fill the inside. (Supply grease while rotating the ball screw in the direction that moves grease toward the inside of the nut. This will lubricate the ball screw evenly.)

If you use a ball screw already filled with grease, it is not necessary to add more.

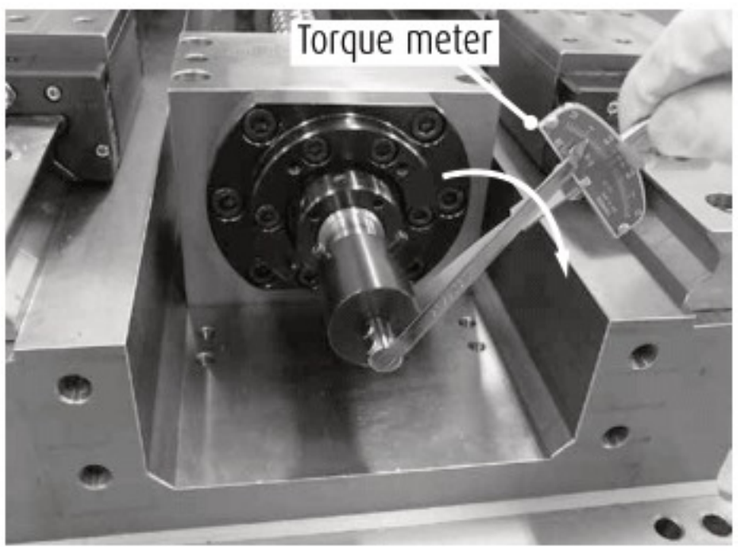


8. Verification of functionality

To check whether the ball screw has been installed accurately, verify its functionality. Measure the driving torque with a torque meter over the entire movable range of the screw.

Confirm (including by touch) that there are no abnormalities.

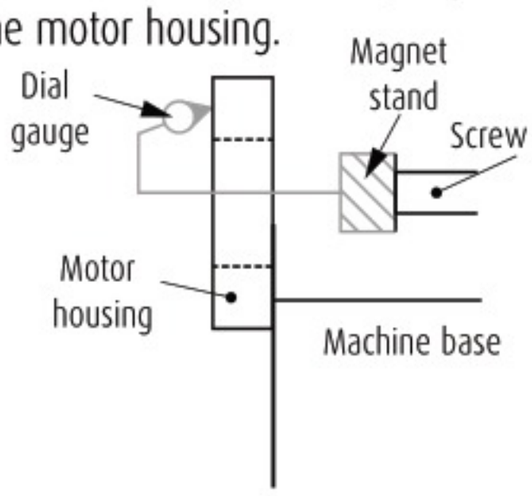
Follow the same procedure for the opposite side of the motor.



9. Installation of nut housing

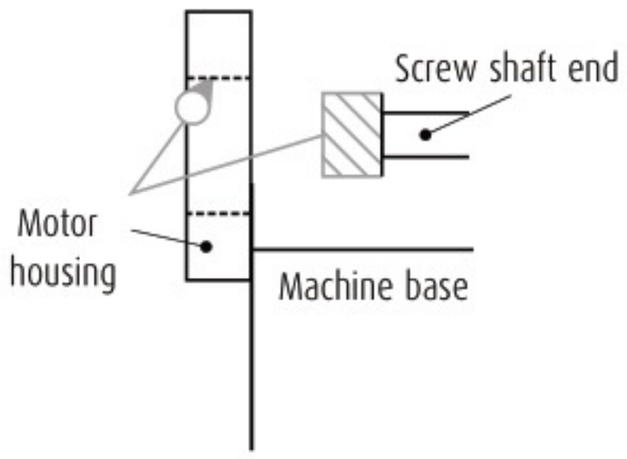
9-1

Install the motor housing, and mount the dial gauge onto the end face of the ball screw. Rotate the screw shaft to check the inclination of the motor housing, with the stylus of the dial gauge in contact with the end face of the motor housing. If inclination of center line is observed, adjust the mounting surface of the motor housing.



9-2

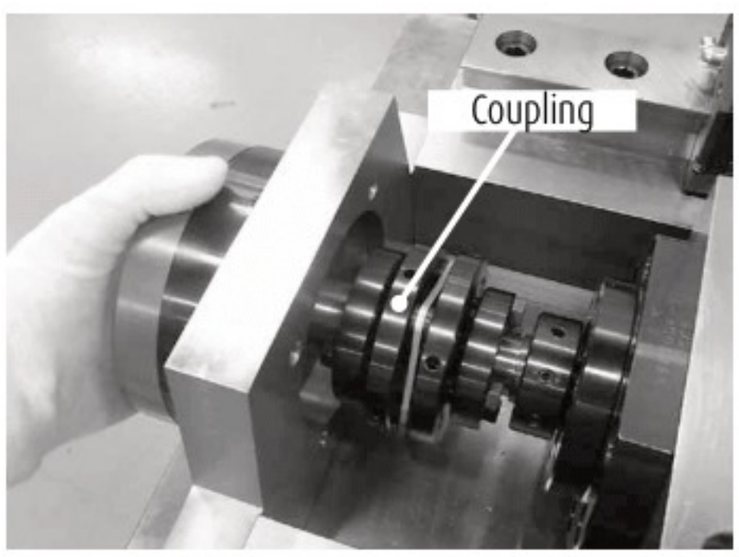
Set up the dial gauge onto the end face of the screw shaft. Rotate the screw shaft to check eccentricity, with the stylus touching the inside-diameter surface of the motor housing. If eccentricity is observed, adjust it by installing the motor housing appropriately.



10. Installation of coupling and motor

Mount the coupling onto the shaft end, and install the motor.

Fasten the bolts of the coupling to connect the shaft end with the motor shaft.



11. Trial operation

At the beginning, run the assembly at low speed to check for vibrations and noise. Then, run it at moderate speed, and finally at high speed and check for abnormalities. Then run it continuously for approximately two hours, carry out a running-in operation and at the same time check for any abnormalities. During this running-in operation, the excessive grease inside of the nut is pushed out of the nut. Wipe it away.

18. Precautions When Handling Ball Screws

Ball screws are precision products. They require careful handling as described below.

Confirm lubrication

Lubrication

1. Confirm the state of lubrication before use. Insufficient lubrication causes loss of ball screw functions in a short period.
2. Do not apply any lubrication if grease is already applied to the ball screws. Remove dust or swarf if they stuck to the greased surface during handling. Wipe the surface with clean white kerosene, and then apply the same type of new lubricant before use. Avoid using different types of grease at the same time.

   Consult NSK for special oil lubricant if it is required to your application.
3. Check the grease after two to three months of operation. Wipe off the old grease if it is excessively contaminated, and apply sufficient volume of a fresh coat of grease. After the initial check, check and replenish the grease approximately every year. Check more often if environment requires.

Note: Refer to page 442 for lubrication.

Do not disassemble

Do not reassemble

Watch out for falling objects

Handle with care

Do not apply shock

Handling

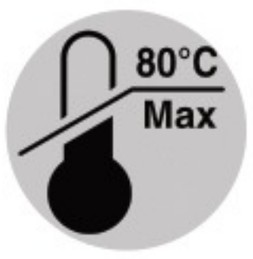
1. Never disassemble ball screw. It invites dust to enter, and lowers precision, or may cause an accident.
2. User should never reassemble ball screw by himself. Loss of ball screw function is apt to occur if a mistake is made. Please send ball screw to NSK for repair or re-assembly. It will be reworked at the minimum service charge.
3. Ball screw shaft or nut may fall due to its own weight. Watch out for such falling object. If it falls, the ball groove or ball recirculation component may be damaged and the function might have been lost. Make certain to return such item to NSK for check. There will be the minimum charge for this service.
4. If the recirculation component, the shaft outside, or the ball groove is scratched or damaged by impact, recirculation operation becomes deficient, and may cause a loss of function.

Note: Refer to page 126 for assembling components.

Prevent dust

Rotational speed limitation

Do not overrun



Temperature limitation

Precautions in use

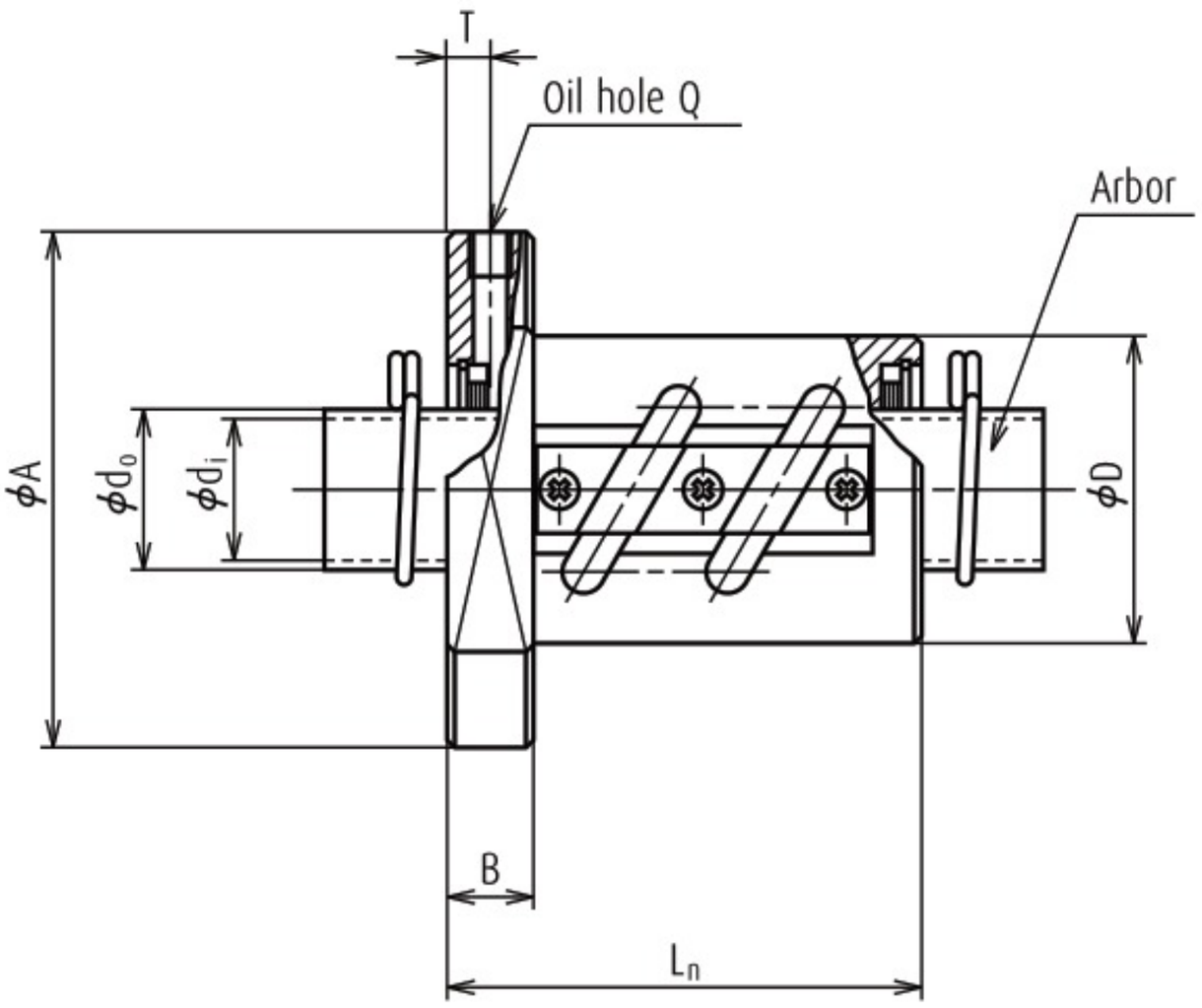
1. Ball screws should be used in a clean environment. Use a dust cover to keep dust and swarf from entering into the system. Insufficient dust protection causes not only the ball screw function to deteriorate but also brings about damage to the recirculation components if dust plugs the system. This may result in more serious accident such as a fall of the table.
2. For rotational speed in operation, refer to the applicable section in this catalog which describes permissible rotational speeds, or to specification drawing furnished by NSK. Exceeding permissible rotational speed damages recirculation components, and may cause the table to fall. A precaution system such as a safety nut is recommended in vertical use of ball screw. Please consult NSK for safety system.
3. Overrunning ball nut (removed from the ball thread) causes the balls to fall out, damages recirculation components, and dent ball groove, resulting in insufficient operation. Continued use under such conditions may cause premature wear, and damages recirculation components. For these reasons, avoid overrun by all means. If overrun occurs, please request NSK to check. There will be a minimum charge for this service.
4. Ball screws are designed to be used at a temperature of less than 80°C. Do not operate at temperatures higher than this limit. Use at a higher temperature may damage recirculation and seal components. Please consult NSK if it is necessary to use at a temperature higher than the limit.
   When using NSK K1 lubrication unit, the operating temperature should be 50°C or less. (Momentary maximum temperature in use: 80°C)

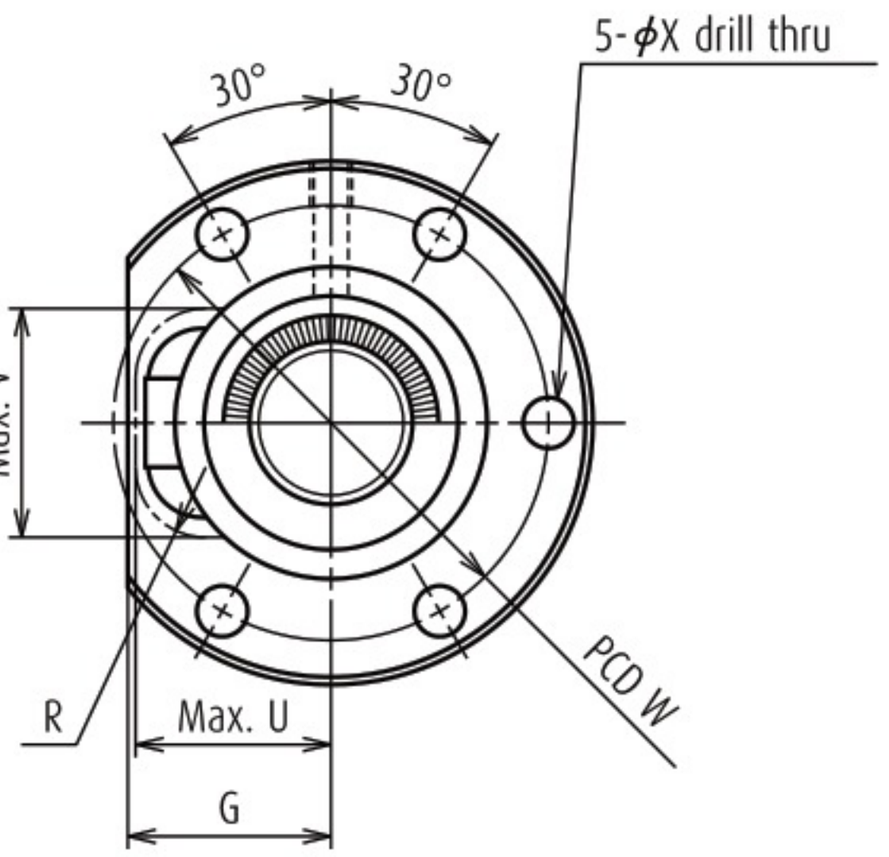
Store in the correct position

Storage

1. Store in the original NSK package. Do not unwrap or tear the inner wrapping if it is not necessary. This allows dust to enter and rust to set in, and may deteriorate functions.
2. The following position is recommended when storing ball screws.
   2.1 Keep in the NSK original package, and place it flat.
   2.2 Place flatly on supports; store in a clean area.
   2.3 Hang vertically in a clean place.

19. Ball screws for transfer equipment Tube type, Flanged nut (Fine, Medium lead)



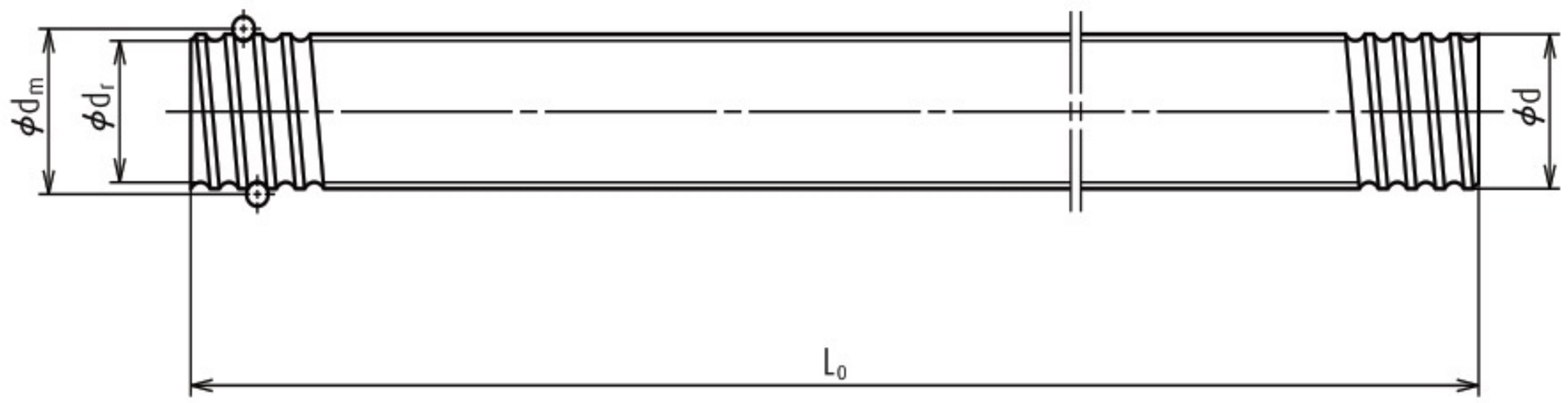


Ball nut No.	Shaft dia. d	Lead l	Ball dia. D_w	Ball circle dia. d_m	Root dia. d_r	Effective balls turns	Basic load rating (N)		Axial play Max.	Ball nut dimensions
						Turns × Circuits	Dynamic C_a	Static C_{0a}		Outside dia. D
RNFTL 1003A3.5	10	3	2.381	10.65	8.1	3.5 × 1	4 440	6 700	0.10	20
RNFTL 1006A2.5S	10	6	2.381	10.65	8.1	2.5 × 1	3 280	4 730	0.10	20
RNFTL 1208A2.5S	12	8	2.778	12.65	9.6	2.5 × 1	4 290	6 610	0.10	25
RNFTL 1404A3.5S	14	4	2.778	14.5	11.5	3.5 × 1	6 310	10 800	0.10	25
RNFTL 1405A2.5S	14	5	3.175	14.5	11.0	2.5 × 1	6 170	9 940	0.10	30
RNFTL 1610A2.5	16	10	3.175	16.75	13.3	2.5 × 1	6 810	11 600	0.10	30
RNFTL 1610A2.5S	16	10	3.175	16.75	13.3	2.5 × 1	6 810	11 600	0.10	30
RNFTL 1808A3.5	18	8	4.762	18.5	13.6	3.5 × 1	15 500	26 200	0.15	34
RNFTL 1808A3.5S	18	8	4.762	18.5	13.6	3.5 × 1	15 500	26 200	0.15	34
RNFTL 2005A2.5	20	5	3.175	20.5	17.0	2.5 × 1	7 500	14 200	0.10	40
RNFTL 2005A2.5S	20	5	3.175	20.5	17.0	2.5 × 1	7 500	14 200	0.10	40
RNFTL 2010A2.5	20	10	4.762	21.25	16.2	2.5 × 1	12 700	21 600	0.15	40
RNFTL 2010A2.5S	20	10	4.762	21.25	16.2	2.5 × 1	12 700	21 600	0.15	40
RNFTL 2505A5	25	5	3.175	25.5	22.0	2.5 × 2	15 100	36 300	0.10	42
RNFTL 2505A5S	25	5	3.175	25.5	22.0	2.5 × 2	15 100	36 300	0.10	42
RNFTL 2510A2.5	25	10	6.35	26	19.0	2.5 × 1	20 500	34 900	0.20	44
RNFTL 2510A2.5S	25	10	6.35	26	19.0	2.5 × 1	20 500	34 900	0.20	44
RNFTL 2510A5	25	10	6.35	26	19.0	2.5 × 2	37 300	69 800	0.20	44
RNFTL 2510A5S	25	10	6.35	26	19.0	2.5 × 2	37 300	69 800	0.20	44

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.

R series RNFTL type

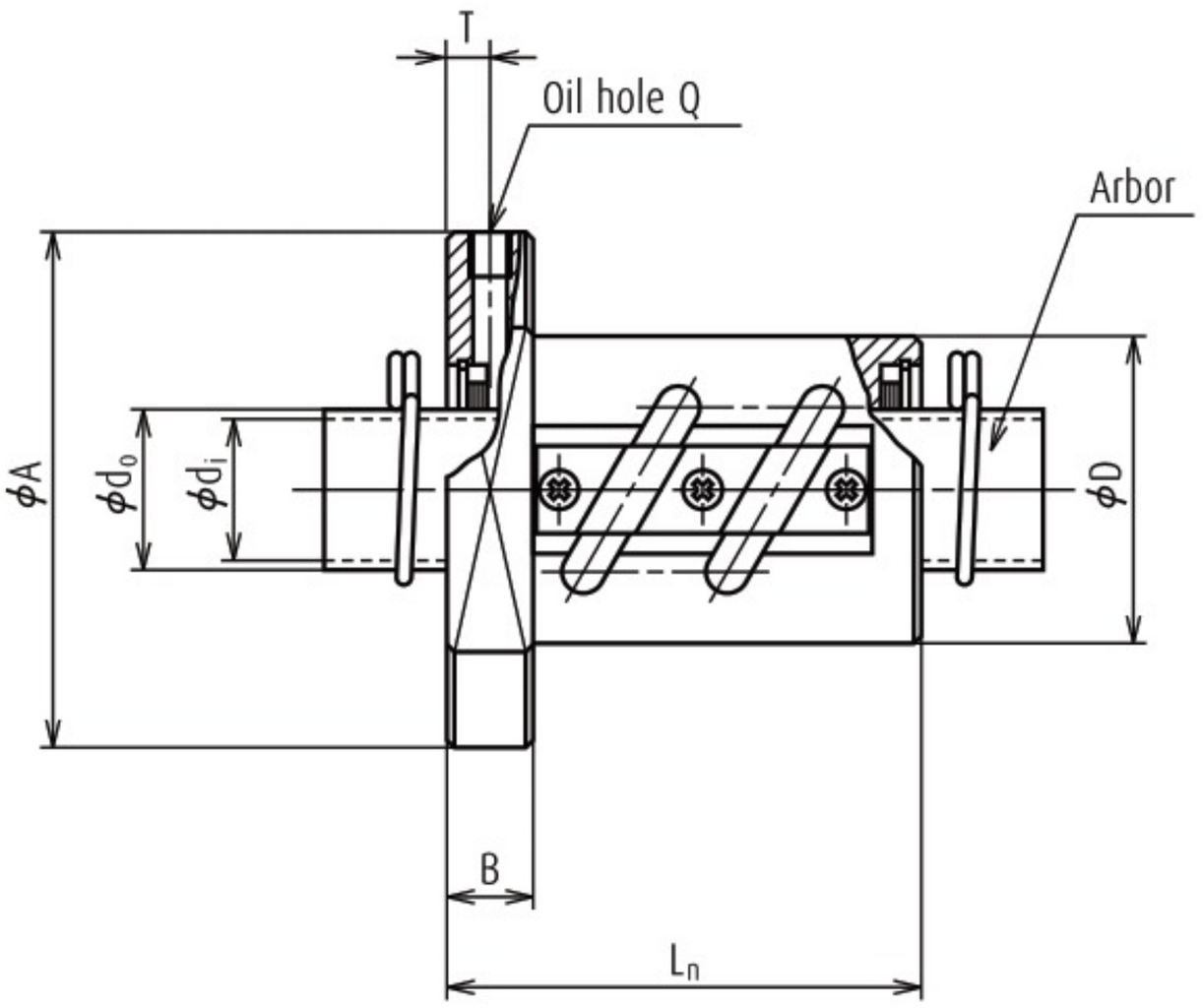


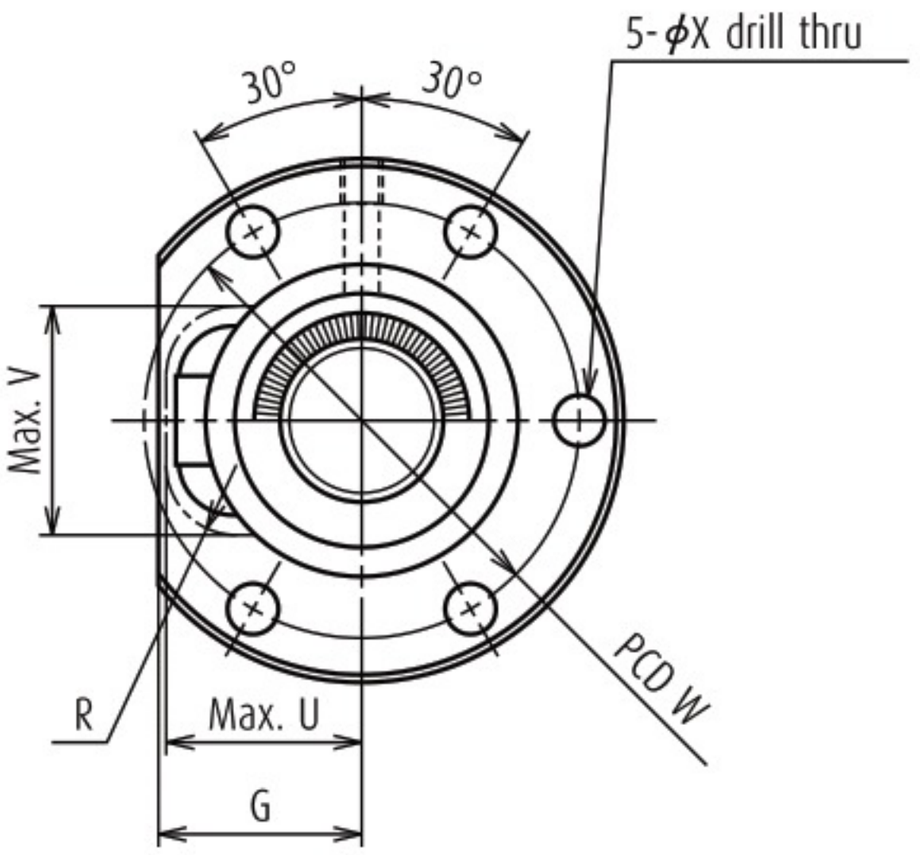
Unit: mm

Ball nut dimensions											Nut Mass.	Arbor		Screw shaft				Shaft mass/m	Internal spatial volume of nut	Standard volume of grease re-plenishing
Flange			Length	Bolt hole		Oil hole		Projecting tube				Out-side dia.	Bore	Standard length			Screw shaft No.			
A	G	B	L_n	W	X	Q	T	U	V	R	(kg)	d_0	d_1	L_0				(kg)	(cm^3)	(cm^3)
40	15	6	34	30	4.5	M3×0.5	3.0	15	15	7	0.092	8.1	6.1	400	400	–	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	RS2501A··	3.13	13	6.5
80	34	15	92	62	9	M6 × 1	7.5	34	37	17	0.75	19.0	16.6	1 000	2 000	2 500	RS2501A··	3.13	18	9.0

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. Only rust preventive agent is applied at time of delivery. Please apply lubricant (oil or grease) before use.
8. 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 445 for details.

19. Ball screws for transfer equipment Tube type, Flanged nut (Fine, Medium lead)



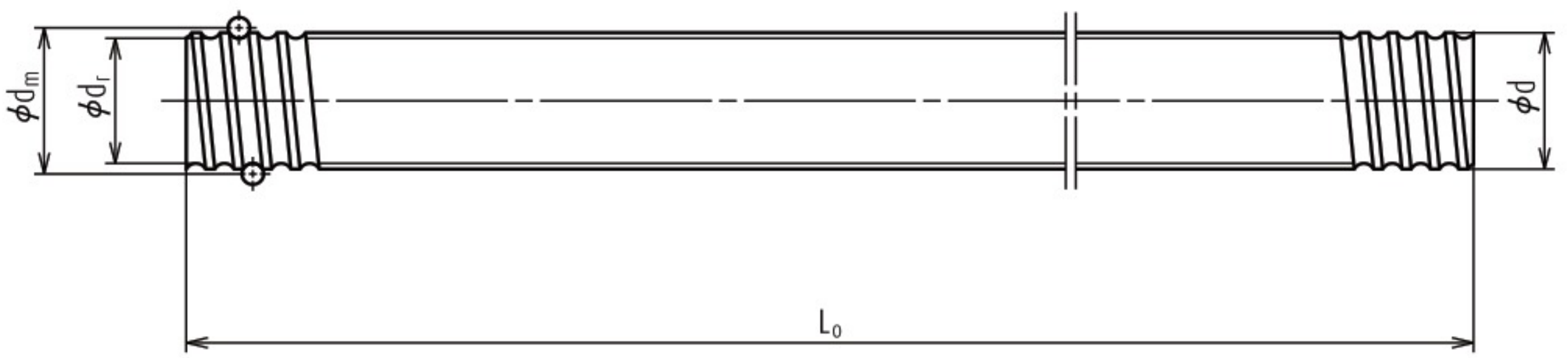


Ball nut No.	Shaft dia. d	Lead l	Ball dia. D_w	Ball circle dia. d_m	Root dia. d_r	Effective balls turns	Basic load rating (N)		Axial play Max.	Ball nut dimensions
						Turns × Circuits	Dynamic C_a	Static C_{0a}		Outside dia. D
RNFTL 2806A2.5	28	6	3.175	28.5	25.0	2.5 × 1	8 760	20 200	0.10	50
RNFTL 2806A2.5S	28	6	3.175	28.5	25.0	2.5 × 1	8 760	20 200	0.10	50
RNFTL 2806A5	28	6	3.175	28.5	25.0	2.5 × 2	15 900	40 500	0.10	50
RNFTL 2806A5S	28	6	3.175	28.5	25.0	2.5 × 2	15 900	40 500	0.10	50
RNFTL 3210A5	32	10	6.35	33.75	27.0	2.5 × 2	42 000	91 800	0.20	55
RNFTL 3210A5S	32	10	6.35	33.75	27.0	2.5 × 2	42 000	91 800	0.20	55
RNFTL 3610A2.5	36	10	6.35	37	30.0	2.5 × 1	24 700	50 800	0.20	60
RNFTL 3610A2.5S	36	10	6.35	37	30.0	2.5 × 1	24 700	50 800	0.20	60
RNFTL 3610A5	36	10	6.35	37	30.0	2.5 × 2	44 900	102 000	0.20	60
RNFTL 3610A5S	36	10	6.35	37	30.0	2.5 × 2	44 900	102 000	0.20	60
RNFTL 4010A7	40	10	6.35	41.75	35.0	3.5 × 2	63 100	164 000	0.20	65
RNFTL 4010A7S	40	10	6.35	41.75	35.0	3.5 × 2	63 100	164 000	0.20	65
RNFTL 4512A5	45	12	7.144	46.5	39.0	2.5 × 2	58 500	147 000	0.23	70
RNFTL 4512A5S	45	12	7.144	46.5	39.0	2.5 × 2	58 500	147 000	0.23	70
RNFTL 5010A7	50	10	6.35	51.75	45.0	3.5 × 2	70 100	205 000	0.20	80
RNFTL 5010A7S	50	10	6.35	51.75	45.0	3.5 × 2	70 100	205 000	0.20	80
RNFTL 5016A5	50	16	9.525	52	42.0	2.5 × 2	117 000	299 000	0.23	85
RNFTL 5016A5S	50	16	9.525	52	42.0	2.5 × 2	117 000	299 000	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_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.

R series RNFTL type

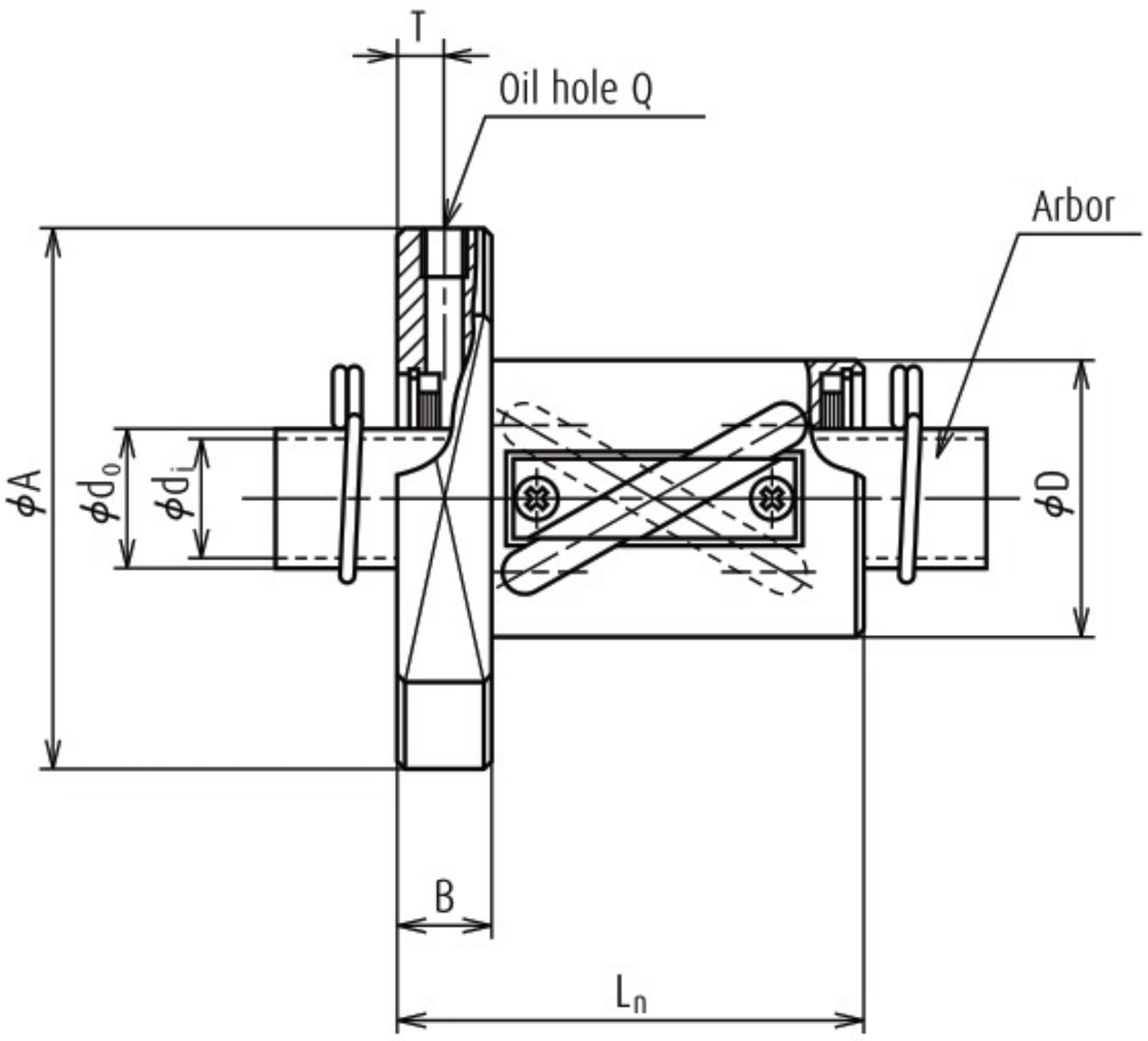


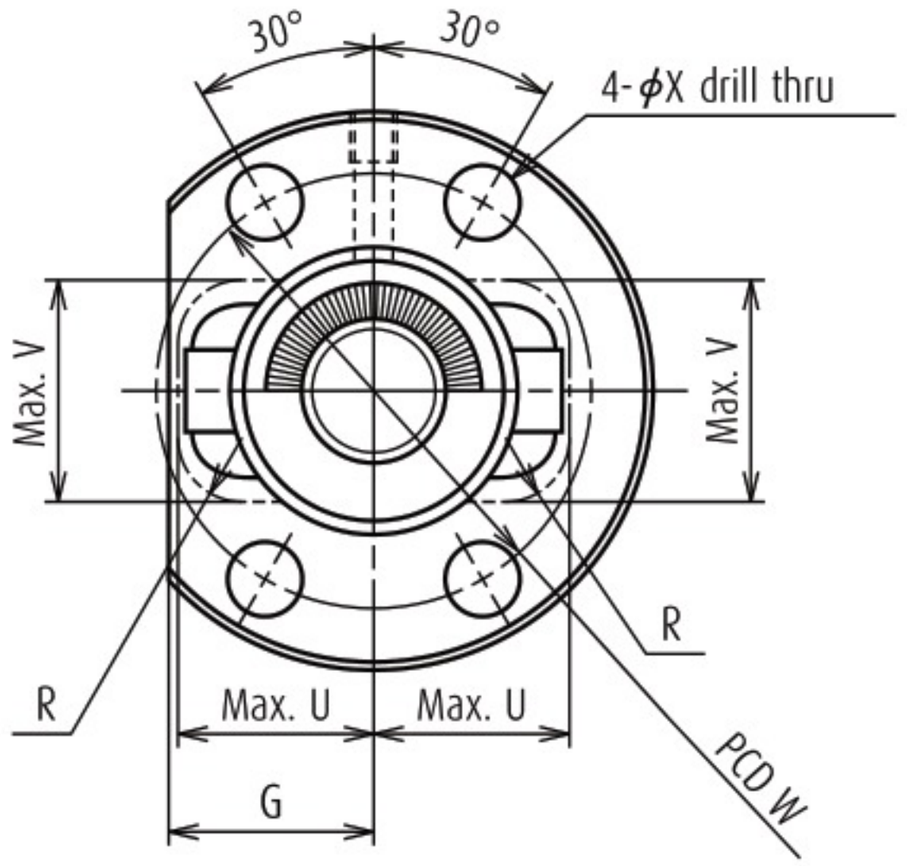
Unit: mm

Ball nut dimensions											Nut Mass.	Arbor		Screw shaft			Shaft mass/m	Internal spatial volume of nut	Standard volume of grease re-plenishing
Flange			Length	Bolt hole		Oil hole		Projecting tube				Out-side dia.	Bore	Standard length			Screw shaft No.			
A	G	B	L_n	W	X	Q	T	U	V	R	(kg)	d_0	d_1	L_0				(kg)	(cm^3)	(cm^3)
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	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	25.0	22.6	1 000	2 000	2 500	RS2806A··	4.47	8.4	4.2
79	33	15	79	65	6.6	M6 × 1	7.5	33	34	10	1.07	25.0	22.6	1 000	2 000	2 500	RS2806A··	4.47	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
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	RS3601A··	6.91	21	11
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	RS3601A··	6.91	21	11
102	42	18	98	80	11	M6 × 1	9.0	42	46	17	1.80	30.0	27.6	1 000	2 000	3 000	RS3601A··	6.91	33	17
102	42	18	98	80	11	M6 × 1	9.0	42	46	17	1.80	30.0	27.6	1 000	2 000	3 000	RS3601A··	6.91	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
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
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
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
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

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. Only rust preventive agent is applied at time of delivery. Please apply lubricant (oil or grease) before use.
8. 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 445 for details.

19. Ball screws for transfer equipment Tube type, Flanged nut (Medium, High helix lead)



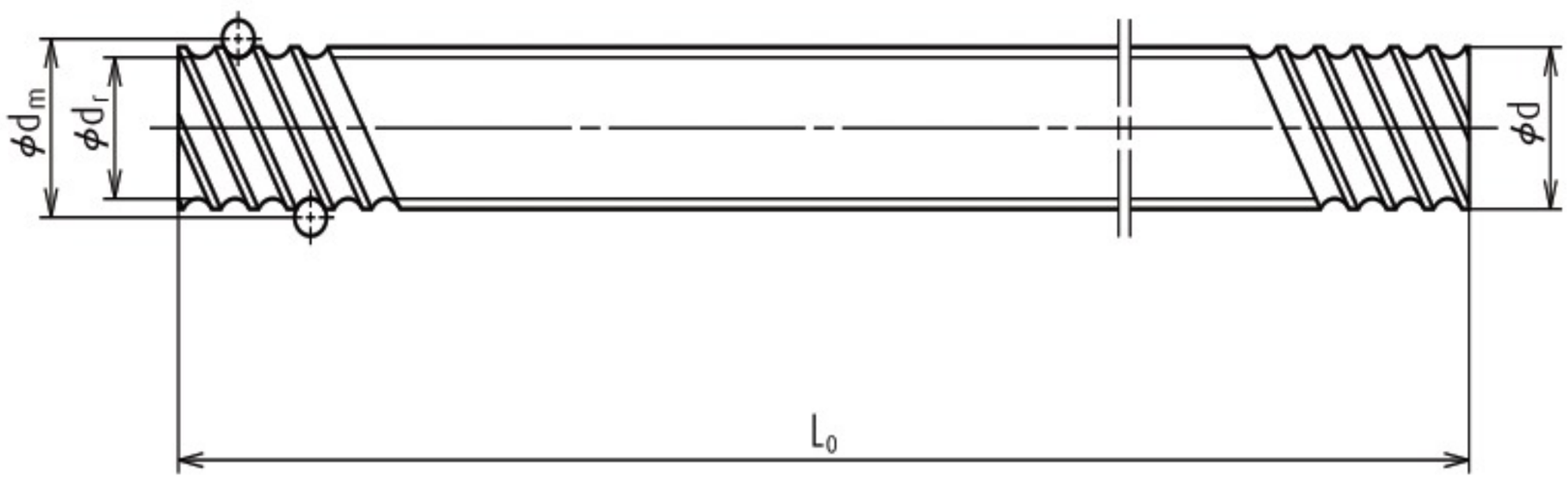


Ball nut No.	Shaft dia. d	Lead l	Ball dia. D_w	Ball circle dia. d_m	Root dia. d_r	Effective balls turns	Basic load rating (N)		Axial play Max.	Ball nut dimensions	
						Turns × Circuits	Dynamic C_a	Static C_{0a}		Outside dia.	D
RNFTL 1212A3	12	12	2.381	12.65	10.1	1.5 × 2	3 900	6 250	0.10	24	
RNFTL 1616A3	16	16	2.778	16.65	13.6	1.5 × 2	5 440	9 550	0.10	30	
RNFTL 1616A3S	16	16	2.778	16.65	13.6	1.5 × 2	5 440	9 550	0.10	30	
RNFTL 2020A3	20	20	3.175	20.75	17.3	1.5 × 2	8 080	15 700	0.10	35	
RNFTL 2020A3S	20	20	3.175	20.75	17.3	1.5 × 2	8 080	15 700	0.10	35	
RNFTL 2525A3	25	25	3.969	26	22.0	1.5 × 2	12 100	24 500	0.12	45	
RNFTL 2525A3S	25	25	3.969	26	22.0	1.5 × 2	12 100	24 500	0.12	45	
RNFTL 3232A3	32	32	4.762	33.25	28.0	1.5 × 2	17 600	37 700	0.15	55	
RNFTL 3232A3S	32	32	4.762	33.25	28.0	1.5 × 2	17 600	37 700	0.15	55	
RNFTL 4040A3	40	40	6.35	41.75	35.0	1.5 × 2	28 100	62 900	0.20	70	
RNFTL 4040A3S	40	40	6.35	41.75	35.0	1.5 × 2	28 100	62 900	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.
4. Nut assembly with arbor and screw shaft are separate at time of delivery.

R series RNFTL type

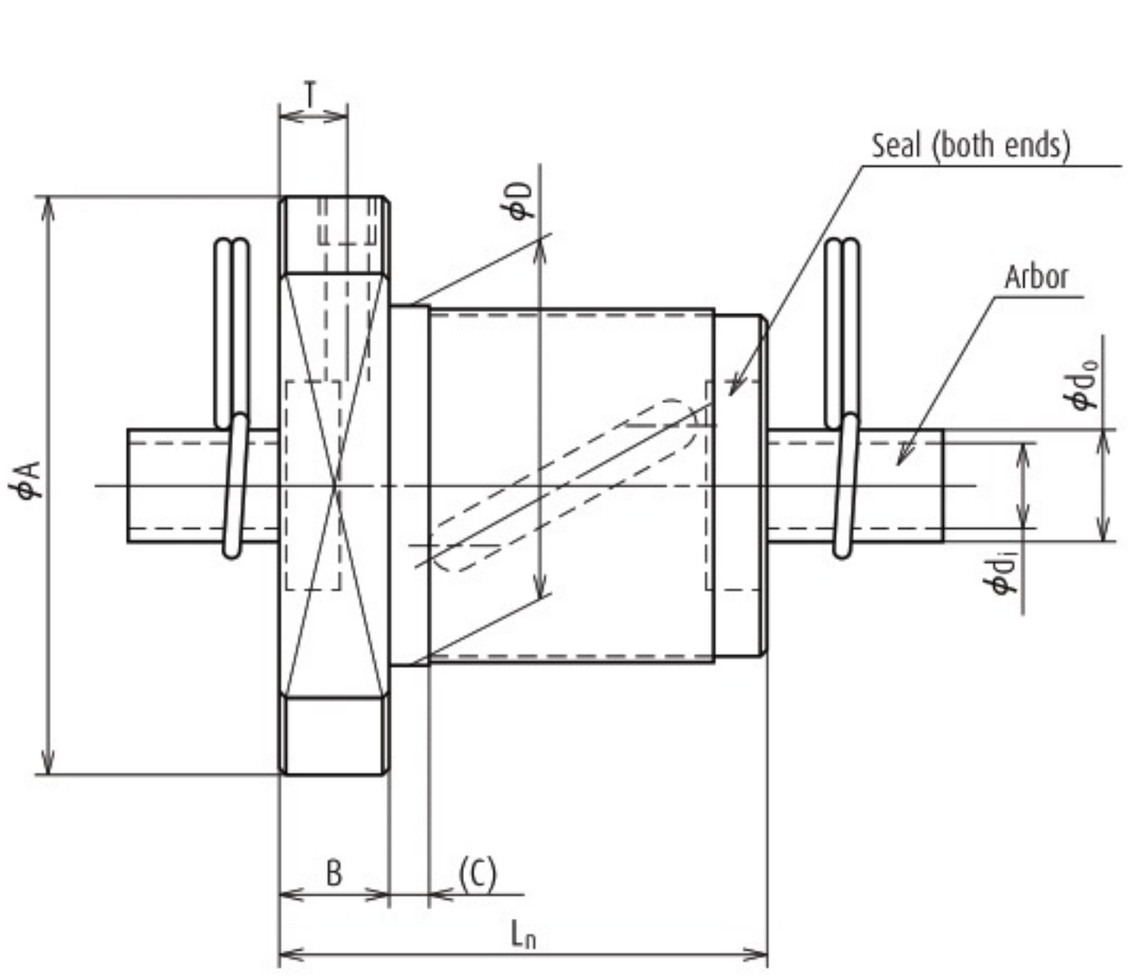


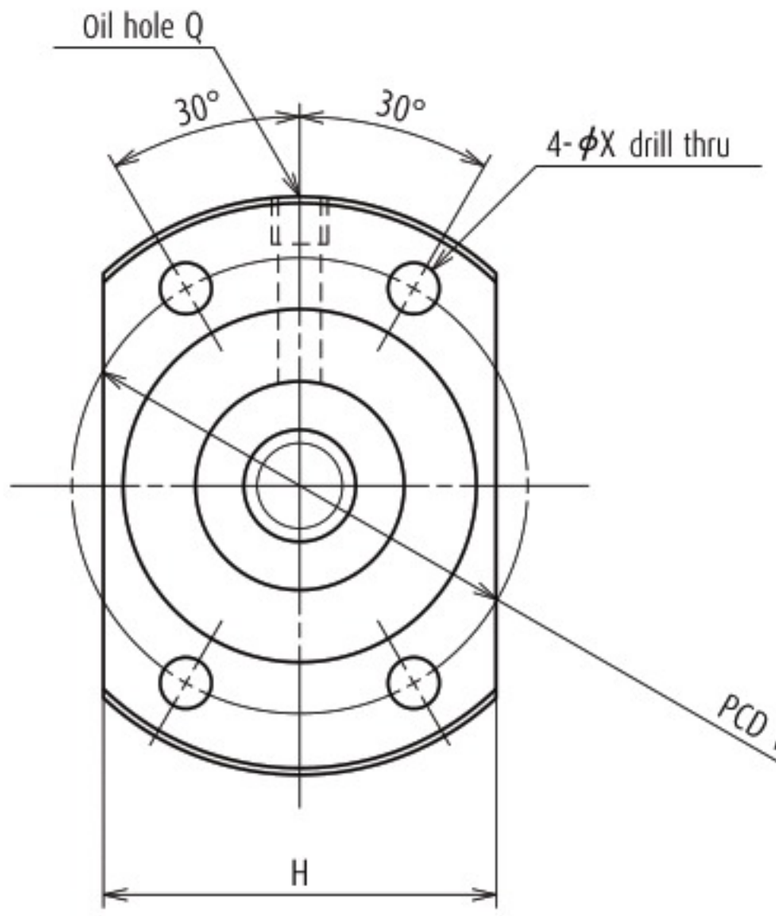
Unit: mm

Ball nut dimensions											Nut Mass.	Arbor		Screw shaft			Shaft mass/m	Internal spatial volume of nut	Standard volume of grease re-plenishing
Flange			Length	Bolt hole		Oil hole		Projecting tube				Out-side dia.	Bore	Standard length		Screw shaft No.			
A	G	B	L_n	W	X	Q	T	U	V	R	(kg)	d_0	d_1	L_0				(kg)	(cm^3)	(cm^3)
44	17	8	44	34	4.5	M6 × 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
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
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
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
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
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

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. Only rust preventive agent is applied at time of delivery. Please apply lubricant (oil or grease) before use.
8. 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 445 for details.

19. Ball screws for transfer equipment
Tube type, embedded -tube, Flanged (Fine, Medium lead)



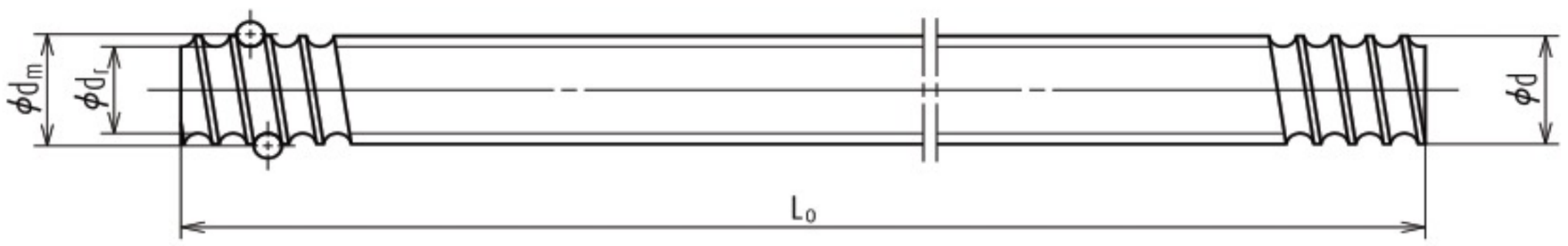


Ball nut No.	Shaft dia. d	Lead l	Ball dia. D_w	Ball circle dia. d_m	Root dia. d_r	Effective balls turns	Basic load rating (N)		Axial play Max.	Ball nut dimensions
						Turns × Circuits	Dynamic C_a	Static C_{0a}		Outside dia. D
RNFBL 1006A2.5S	10	6	2.381	10.65	8.1	2.5 × 1	3 280	4 730	0.10	26
RNFBL 1208A2.5S	12	8	2.778	12.65	9.6	2.5 × 1	4 290	6 610	0.10	29
RNFBL 1404A3.5S	14	4	2.778	14.5	11.5	3.5 × 1	6 310	10 800	0.10	31
RNFBL 1405A2.5S	14	5	3.175	14.5	11.0	2.5 × 1	6 170	9 940	0.10	32
RNFBL 1808A3.5S	18	8	4.762	18.5	13.6	3.5 × 1	15 500	26 200	0.15	50
RNFBL 2005A2.5S	20	5	3.175	20.5	17.0	2.5 × 1	7 500	14 200	0.10	40
RNFBL 2010A2.5S	20	10	4.762	21.25	16.2	2.5 × 1	12 700	21 600	0.15	52
RNFBL 2505A2.5S	25	5	3.175	25.5	22.0	2.5 × 1	8 340	18 100	0.10	43
RNFBL 2505A5S	25	5	3.175	25.5	22.0	2.5 × 2	15 100	36 300	0.10	43
RNFBL 2510A2.5S	25	10	6.35	26	19.0	2.5 × 1	20 500	34 900	0.20	60
RNFBL 2510A5S	25	10	6.35	26	19.0	2.5 × 2	37 300	69 800	0.20	60
RNFBL 2806A2.5S	28	6	3.175	28.5	25.0	2.5 × 1	8 760	20 200	0.10	50
RNFBL 2806A5S	28	6	3.175	28.5	25.0	2.5 × 2	15 900	40 500	0.10	50
RNFBL 3210A2.5S	32	10	6.35	33.75	27.0	2.5 × 1	23 100	45 900	0.20	67
RNFBL 3210A5S	32	10	6.35	33.75	27.0	2.5 × 2	42 000	91 800	0.20	67
RNFBL 3610A2.5S	36	10	6.35	37	30.0	2.5 × 1	24 700	50 800	0.20	70
RNFBL 3610A5S	36	10	6.35	37	30.0	2.5 × 2	44 900	102 000	0.20	70
RNFBL 4010A5S	40	10	6.35	41.75	35.0	2.5 × 2	47 200	116 000	0.20	76

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 ··.

R series RNFBL type

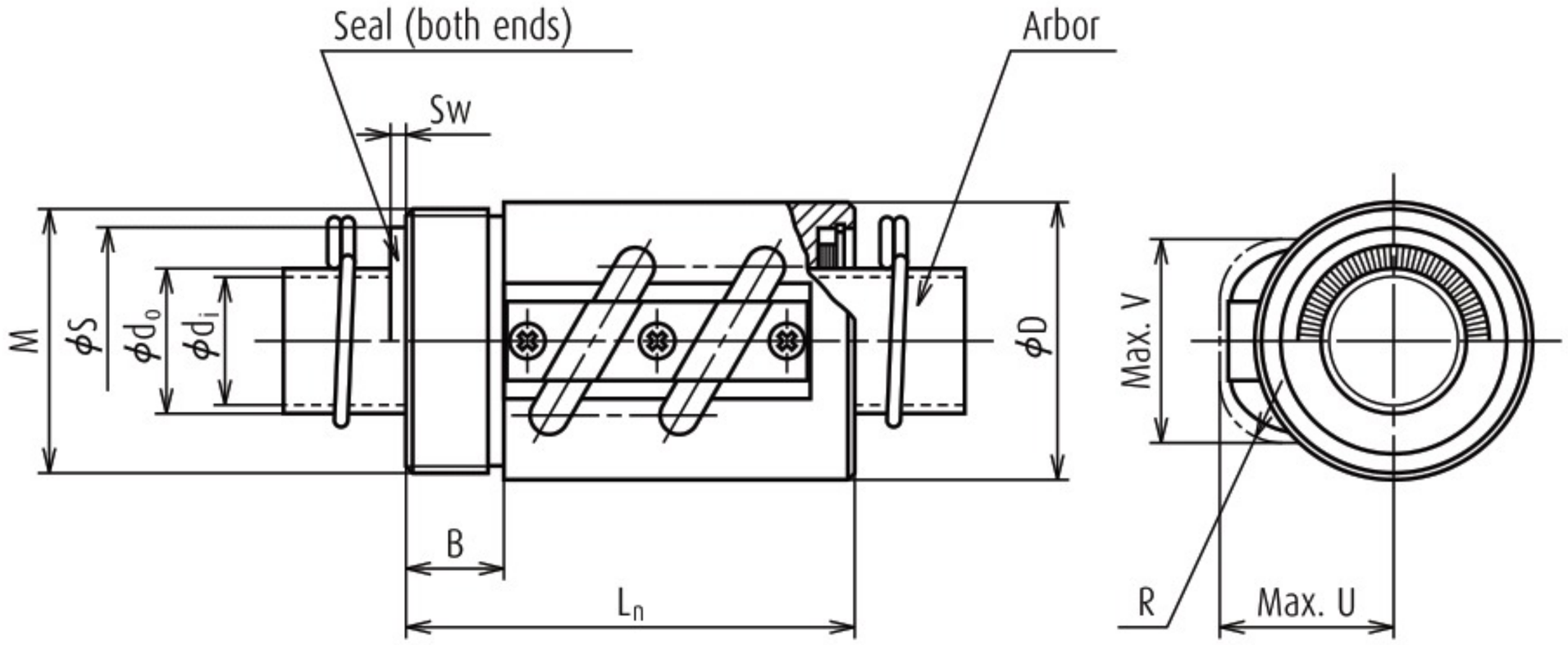


Unit: mm

Ball nut dimensions									Nut Mass.	Arbor		Screw shaft		Shaft mass/m	Internal spatial volume of nut	Standard volume of grease re-plenishing
Flange			Overall length		Bolt hole		Oil hole			Outside dia.	Bore	Standard length	Screw shaft No.			
A	H	B	L_n	(C)	W	X	Q	T	(kg)	d_0	d_1	L_0			(kg)	(cm³)	(cm³)
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
67	50	10	55	4	55	5.5	M6 × 1	5.0	0.50	22.0	19.6	1 000	2 000	2 500	RS2505A··	3.47	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	72	15	96	5	78	9.0	M6 × 1	7.5	1.99	19.0	16.6	1 000	2 000	2 500	RS2510A··	3.13	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
80	60	12	65	5	65	6.6	M6 × 1	6.0	0.87	25.0	22.6	1 000	2 000	2 500	RS2806A··	4.47	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
103	78	15	97	5	85	9.0	M6 × 1	7.5	2.25	27.0	24.6	1 000	2 000	3 000	RS3210A··	5.53	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
110	82	17	99	5	90	11.0	M6 × 1	8.5	2.53	30.0	27.6	1 000	2 000	3 000	RS3610A··	6.91	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

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. Only rust preventive agent is applied at time of delivery. Please apply lubricant (oil or grease) before use.
7. Recommended quantity of grease is about 50% of ball nut's internal space. See page 445 for details.

19. Ball screws for transfer equipment
Return tube type, Nut with V-thread, (Fine lead)

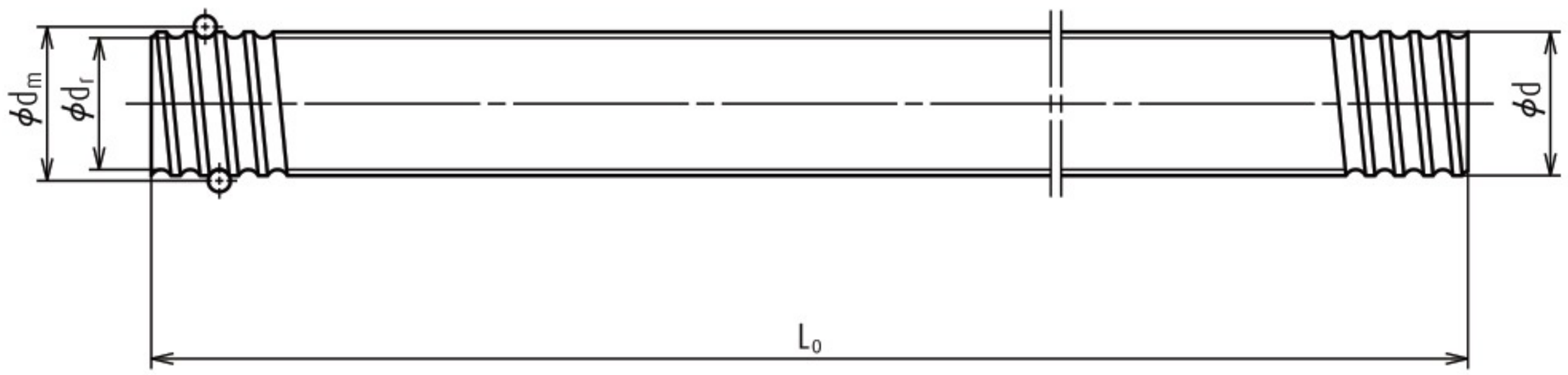


Ball nut No.	Shaft dia. d	Lead l	Ball dia. D_w	Ball circle dia. d_m	Root dia. d_r	Effective balls turns: Turns × Circuits	Basic load rating (N): Dynamic C_a	Basic load rating (N): Static C_{0a}	Axial play Max.	Ball nut dimensions: Outside dia. D
RNCT 1003A3.5	10	3	2.381	10.65	8.1	3.5 × 1	4 440	6 700	0.10	20
RNCT 1404A3.5S	14	4	2.778	14.5	11.5	3.5 × 1	6 310	10 800	0.10	25
RNCT 1405A2.5S	14	5	3.175	14.5	11.0	2.5 × 1	6 170	9 940	0.10	30
RNCT 1808A3.5	18	8	4.762	18.5	13.6	3.5 × 1	15 500	26 200	0.15	34
RNCT 1808A3.5S	18	8	4.762	18.5	13.6	3.5 × 1	15 500	26 200	0.15	34
RNCT 2005A2.5	20	5	3.175	20.5	17.0	2.5 × 1	7 500	14 200	0.10	40
RNCT 2005A2.5S	20	5	3.175	20.5	17.0	2.5 × 1	7 500	14 200	0.10	40
RNCT 2505A5	25	5	3.175	25.5	22.0	2.5 × 2	15 100	36 300	0.10	42
RNCT 2505A5S	25	5	3.175	25.5	22.0	2.5 × 2	15 100	36 300	0.10	42
RNCT 2510A5	25	10	6.35	26	19.0	2.5 × 2	37 300	69 800	0.20	44
RNCT 2510A5S	25	10	6.35	26	19.0	2.5 × 2	37 300	69 800	0.20	44
RNCT 2806A5	28	6	3.175	28.5	25.0	2.5 × 2	15 900	40 500	0.10	50
RNCT 2806A5S	28	6	3.175	28.5	25.0	2.5 × 2	15 900	40 500	0.10	50
RNCT 3210A5	32	10	6.35	33.75	27.0	2.5 × 2	42 000	91 800	0.20	55
RNCT 3210A5S	32	10	6.35	33.75	27.0	2.5 × 2	42 000	91 800	0.20	55
RNCT 3610A5	36	10	6.35	37	30.0	2.5 × 2	44 900	102 000	0.20	60
RNCT 3610A5S	36	10	6.35	37	30.0	2.5 × 2	44 900	102 000	0.20	60
RNCT 4010A7	40	10	6.35	41.75	35.0	3.5 × 2	63 100	164 000	0.20	65
RNCT 4010A7S	40	10	6.35	41.75	35.0	3.5 × 2	63 100	164 000	0.20	65
RNCT 4512A5	45	12	7.144	46.5	39.0	2.5 × 2	58 500	147 000	0.23	70
RNCT 4512A5S	45	12	7.144	46.5	39.0	2.5 × 2	58 500	147 000	0.23	70
RNCT 5010A7	50	10	6.35	51.75	45.0	3.5 × 2	70 100	205 000	0.20	80
RNCT 5010A7S	50	10	6.35	51.75	45.0	3.5 × 2	70 100	205 000	0.20	80
RNCT 5016A5	50	16	9.525	52	42.0	2.5 × 2	117 000	299 000	0.23	85
RNCT 5016A5S	50	16	9.525	52	42.0	2.5 × 2	117 000	299 000	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_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.

R series RNCT type

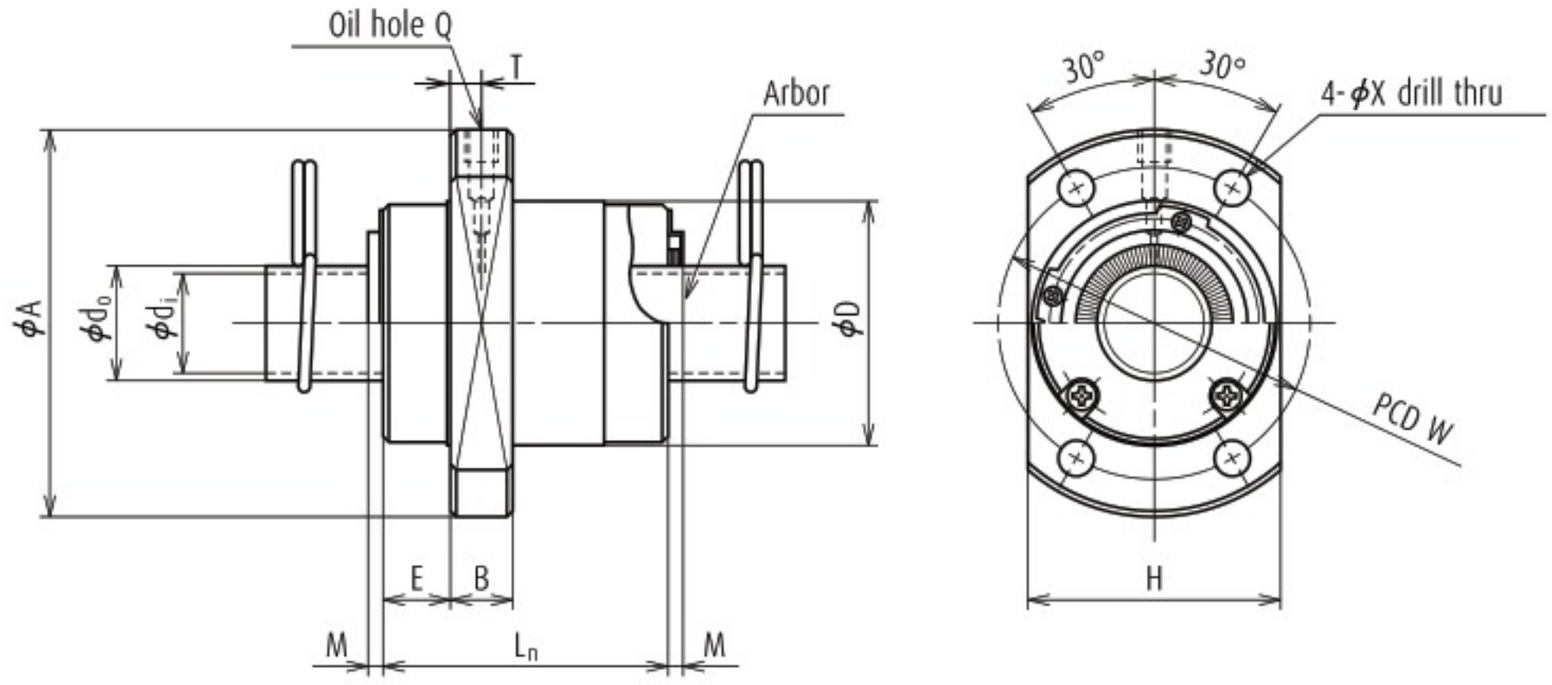


Unit: mm

Ball nut dimensions						Nut Mass.	Seal dimensions		Arbor		Screw shaft				Shaft mass/m	Internal spatial volume of nut	Standard volume of grease re-plenishing
V-thread		Length	Projecting tube				Dia-meter	Thick-ness	Outside dia.	Bore	Standard length			Screw shaft No.			
M	B	L_n	U	V	R	(kg)	S	S_W	d_0	d_1	L_0				(kg)	(cm^3)	(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
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
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
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
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
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
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
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
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
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
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
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

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. Only rust preventive agent is applied at time of delivery. Please apply lubricant (oil or grease) before use.
8. 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 445 for details.

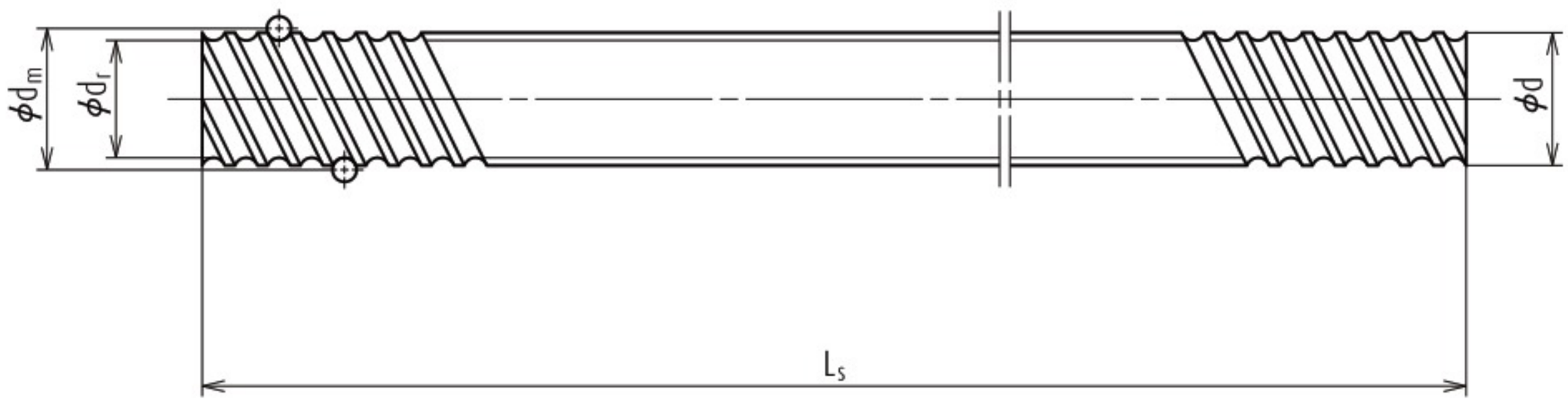
19. Ball screws for transfer equipment
End cap type, Flanged nut (Medium, High helix lead)



Ball nut No.	Shaft dia. d	Lead l	Ball dia. D_w	Ball circle dia. d_m	Root dia. d_r	Effective balls turns: 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
RNFCL 1212A3	12	12	2.381	12.65	10.1	1.7 × 2	4 350	6 580	0.10	26
RNFCL 1212A6	12	12	2.381	12.65	10.1	1.7 × 4	7 890	13 200	0.10	26
RNFCL 1520A3	15	20	3.175	15.5	12.2	1.7 × 2	7 510	12 300	0.10	33
RNFCL 1520A3S	15	20	3.175	15.5	12.2	1.7 × 2	7 510	12 300	0.10	33
RNFCL 1616A3	16	16	2.778	16.65	13.5	1.7 × 2	6 060	10 300	0.10	32
RNFCL 1616A3S	16	16	2.778	16.65	13.5	1.7 × 2	6 060	10 300	0.10	32
RNFCL 1616A6	16	16	2.778	16.65	13.5	2.5 × 1	11 000	20 500	0.10	32
RNFCL 1616A6S	16	16	2.778	16.65	13.5	2.5 × 2	11 000	20 500	0.10	32
RNFCL 2020A3	20	20	3.175	20.75	17.3	1.7 × 2	9 000	16 700	0.10	39
RNFCL 2020A3S	20	20	3.175	20.75	17.3	1.7 × 2	9 000	16 700	0.10	39
RNFCL 2020A6	20	20	3.175	20.75	17.3	1.7 × 4	16 300	33 400	0.10	39
RNFCL 2020A6S	20	20	3.175	20.75	17.3	1.7 × 4	16 300	33 400	0.10	39
RNFCL 2525A3	25	25	3.969	26	22.0	1.7 × 2	13 400	26 100	0.12	47
RNFCL 2525A3S	25	25	3.969	26	22.0	1.7 × 2	13 400	26 100	0.12	47
RNFCL 2525A6	25	25	3.969	26	22.0	1.7 × 4	24 400	52 200	0.12	47
RNFCL 2525A6S	25	25	3.969	26	22.0	1.7 × 4	24 400	52 200	0.12	47
RNFCL 3232A3	32	32	4.762	33.25	28.0	1.7 × 2	19 600	39 800	0.15	58
RNFCL 3232A3S	32	32	4.762	33.25	28.0	1.7 × 2	19 600	39 800	0.15	58
RNFCL 3232A6	32	32	4.762	33.25	28.0	1.7 × 4	35 600	79 600	0.15	58
RNFCL 3232A6S	32	32	4.762	33.25	28.0	1.7 × 4	35 600	79 600	0.15	58
RNFCL 4040A3	40	40	6.35	41.75	35.0	1.7 × 2	31 300	66 800	0.20	73
RNFCL 4040A3S	40	40	6.35	41.75	35.0	1.7 × 2	31 300	66 800	0.20	73
RNFCL 4040A6	40	40	6.35	41.75	35.0	1.7 × 4	56 900	134 000	0.20	73
RNFCL 4040A6S	40	40	6.35	41.75	35.0	1.7 × 4	56 900	134 000	0.23	73
RNFCL 5050A3	50	50	7.938	52.25	44.0	1.7 × 2	46 800	104 000	0.25	90
RNFCL 5050A3S	50	50	7.938	52.25	44.0	1.7 × 2	46 800	104 000	0.25	90
RNFCL 5050A6	50	50	7.938	52.25	44.0	1.7 × 4	85 000	209 000	0.25	90
RNFCL 5050A6S	50	50	7.938	52.25	44.0	1.7 × 4	85 000	209 000	0.25	90

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.

R series RNFCL type

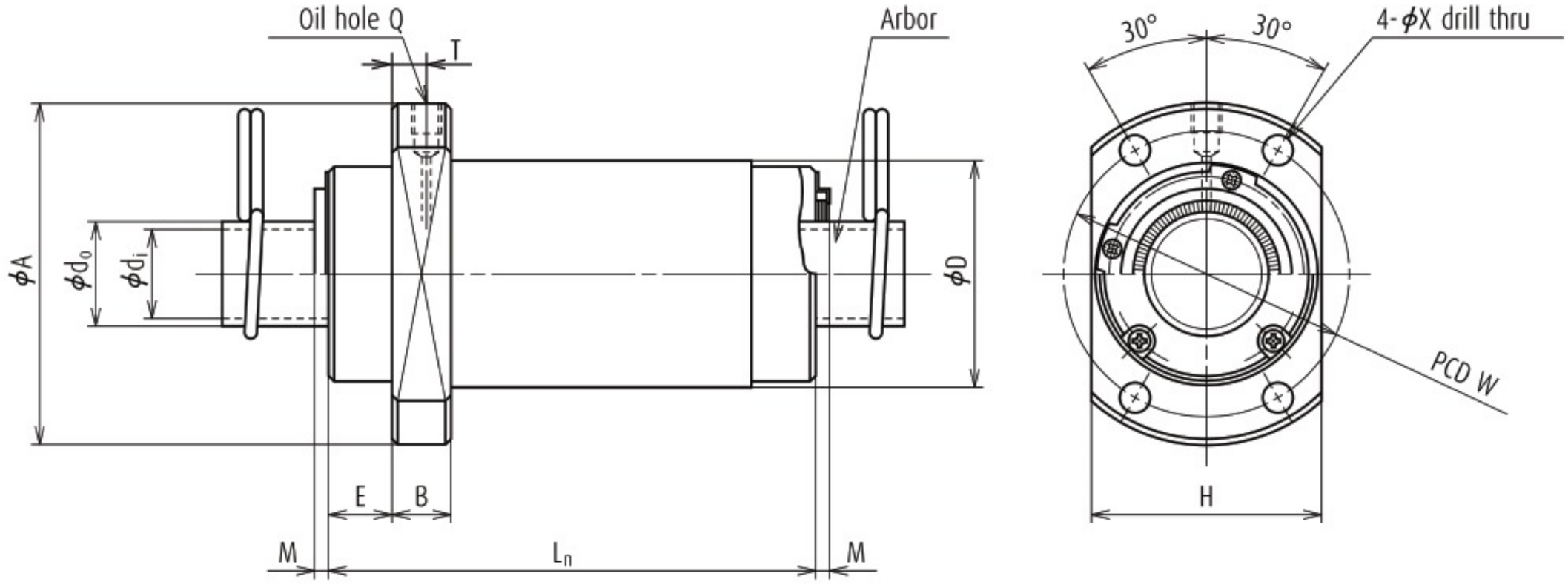


Unit: mm

Ball nut dimensions										Nut Mass.	Arbor		Screw shaft				Shaft mass/m	Internal spatial volume of nut	Standard volume of grease re-plenishing
V-thread			Length			Bolt hole		Oil hole			Outside dia.	Bore	Standard length			Screw shaft No.			
A	H	B	E	L_n	M	W	X	Q	T	(kg)	d_0	d_1	L_0				(kg)	(cm^3)	(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	–	–
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	–	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
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	–	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
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
53	34	10	10	38	–	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
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
62	41	10	11.5	46	–	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
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
62	41	10	11.5	46	–	50	5.5	M6 × 1	5.0	0.37	17.3	14.9	500	1 000	2 000	RS2020A··	2.19	4.9	2.5
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	4.9	2.5
74	49	12	13	55	–	60	6.6	M6 × 1	6.0	0.62	22.0	19.6	1 000	2 000	2 500	RS2806A··	3.43	8.2	4.1
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	RS3210A··	3.43	8.2	4.1
74	49	12	13	55	–	60	6.6	M6 × 1	6.0	0.62	22.0	19.6	1 000	2 000	2 500	RS2525A··	3.43	8.9	4.5
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	8.9	4.5
92	60	12	16	70	–	74	9	M6 × 1	5.5	1.10	28.0	25.6	1 000	2 000	3 000	RS3232A··	5.71	16	8.0
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
92	60	12	16	70	–	74	9	M6 × 1	5.5	1.10	28.0	25.6	1 000	2 000	3 000	RS3232A··	5.71	17	8.5
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	17	8.5
114	75	15	19.5	85	–	93	11	M6 × 1	6.5	2.09	35.0	31.8	2 000	3 000	4 000	RS4040A··	8.82	32	16
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
114	75	15	19.5	85	–	93	11	M6 × 1	6.5	2.09	35.0	31.8	2 000	3 000	4 000	RS4040A··	8.82	33	17
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	33	17
135	92	20	21.5	107	–	112	14	M6 × 1	7.0	3.90	44.0	40.8	2 000	3 000	4 000	RS5050A··	13.81	64	32
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
135	92	20	21.5	107	–	112	14	M6 × 1	7.0	3.90	44.0	40.8	2 000	3 000	4 000	RS5050A··	13.81	68	34
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	68	34

5. Length of nut becomes longer (2 × M) for those with "brush" seals.
6. Only rust preventive agent is applied at time of delivery. Please apply lubricant (oil or grease) before use.
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 445 for details.

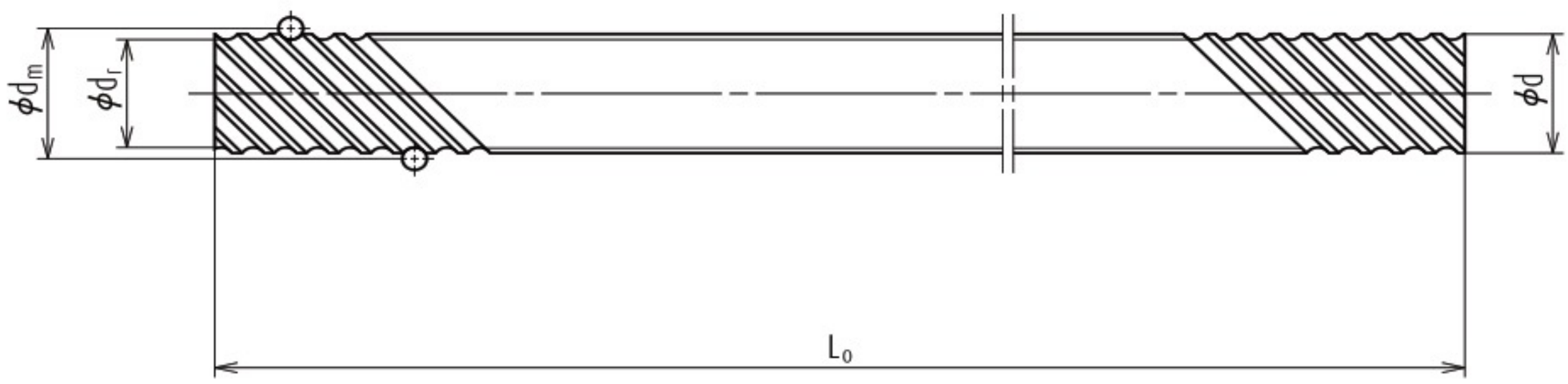
19. Ball screws for transfer equipment
End cap type, Flanged nut (Ultra high helix lead)



Ball nut No.	Shaft dia. d	Lead l	Ball dia. D_w	Ball circle dia. d_m	Root dia. d_r	Effective balls turns: 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
RNFCL 1632A2	16	32	2.778	16.65	13.5	0.7 × 4	4 880	8 330	0.10	32
RNFCL 1632A2S	16	32	2.778	16.65	13.5	0.7 × 4	4 880	8 330	0.10	32
RNFCL 1632A3	16	32	2.778	16.65	13.5	1.7 × 2	5 760	10 300	0.10	32
RNFCL 1632A3S	16	32	2.778	16.65	13.5	1.7 × 2	5 760	10 300	0.10	32
RNFCL 1632A6	16	32	2.778	16.65	13.5	1.7 × 4	10 500	20 500	0.10	32
RNFCL 1632A6S	16	32	2.778	16.65	13.5	1.7 × 4	10 500	20 500	0.10	32
RNFCL 2040A2	20	40	3.175	20.75	17.3	0.7 × 4	7 170	13 200	0.10	38
RNFCL 2040A2S	20	40	3.175	20.75	17.3	0.7 × 4	7 170	13 200	0.10	38
RNFCL 2040A3	20	40	3.175	20.75	17.3	1.7 × 2	8 480	16 500	0.10	38
RNFCL 2040A3S	20	40	3.175	20.75	17.3	1.7 × 2	8 480	16 500	0.10	38
RNFCL 2040A6	20	40	3.175	20.75	17.3	1.7 × 4	15 400	33 100	0.10	38
RNFCL 2040A6S	20	40	3.175	20.75	17.3	1.7 × 4	15 400	33 100	0.10	38
RNFCL 2550A2	25	50	3.969	26	22.0	0.7 × 4	10 700	20 700	0.12	46
RNFCL 2550A2S	25	50	3.969	26	22.0	0.7 × 4	10 700	20 700	0.12	46
RNFCL 2550A3	25	50	3.969	26	22.0	1.7 × 2	12 700	26 500	0.12	46
RNFCL 2550A3S	25	50	3.969	26	22.0	1.7 × 2	12 700	26 500	0.12	46
RNFCL 2550A6	25	50	3.969	26	22.0	1.7 × 4	23 000	53 000	0.12	46
RNFCL 2550A6S	25	50	3.969	26	22.0	1.7 × 4	23 000	53 000	0.12	46
RNFCL 3264A3	32	64	4.762	33.25	28.0	1.7 × 2	17 900	40 200	0.15	58
RNFCL 3264A3S	32	64	4.762	33.25	28.0	1.7 × 2	17 900	40 200	0.15	58
RNFCL 3264A6	32	64	4.762	33.25	28.0	1.7 × 4	32 400	80 300	0.15	58
RNFCL 3264A6S	32	64	4.762	33.25	28.0	1.7 × 4	32 400	80 300	0.15	58
RNFCL 4080A3	40	80	6.350	41.75	35.0	1.7 × 2	29 500	67 900	0.20	73
RNFCL 4080A3S	40	80	6.350	41.75	35.0	1.7 × 2	29 500	67 900	0.20	73
RNFCL 4080A6	40	80	6.350	41.75	35.0	1.7 × 4	53 600	136 000	0.20	73
RNFCL 4080A6S	40	80	6.350	41.75	35.0	1.7 × 4	53 600	136 000	0.20	73

Notes
1. Actual screw shaft length may become slightly longer than nominal length L0 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.

R series RNFCL type

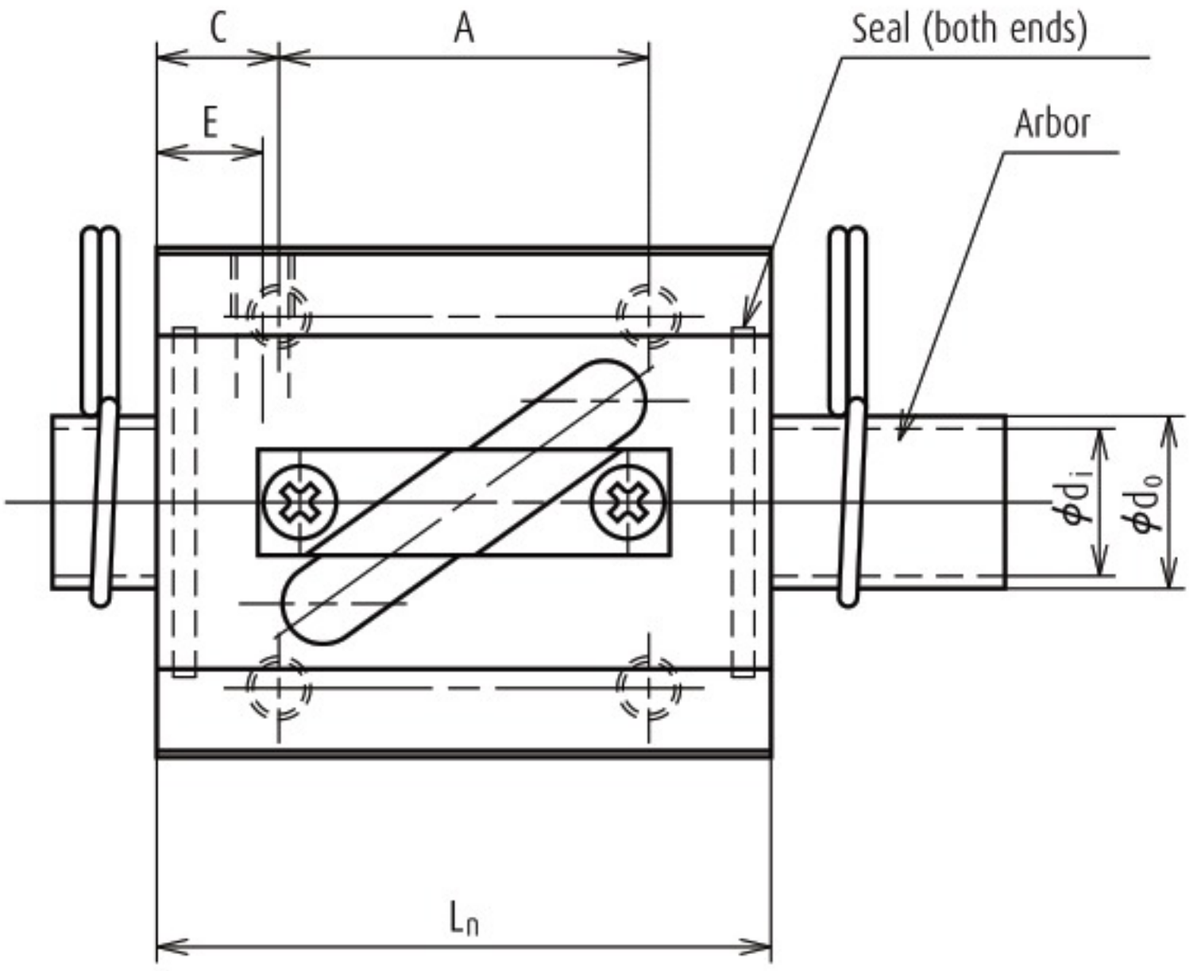


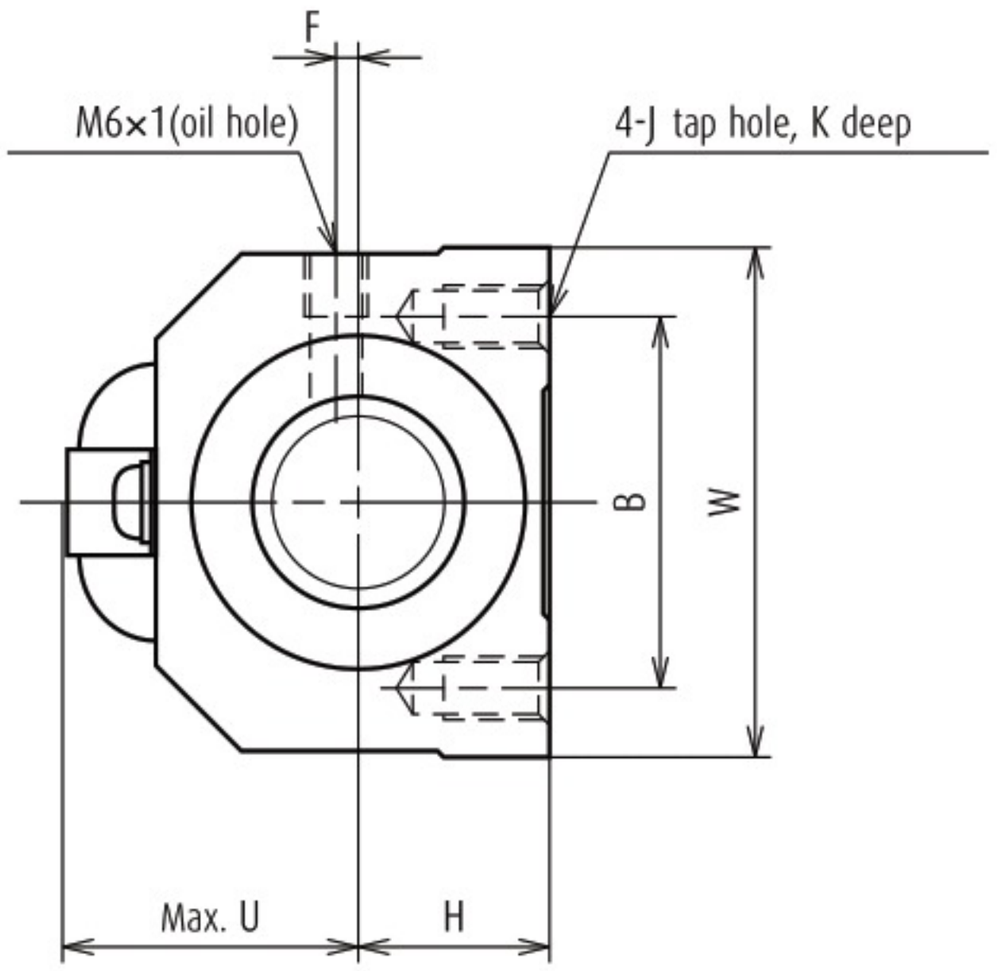
Unit: mm

Ball nut dimensions										Nut Mass.	Arbor		Screw shaft					Shaft mass/m	Internal spatial volume of nut	Standard volume of grease re-plenishing
V-thread			Length			Bolt hole		Oil hole			Outside dia.	Bore	Standard length				Screw shaft No.			
A	H	B	E	L_n	M	W	X	Q	T	(kg)	d_0	d_1	L_0					(kg)	(cm^3)	(cm^3)
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
50	34	10	10	34	3	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
50	34	10	10	66	–	41	4.5	M6 × 1	5.5	0.33	13.5	11.5	500	1 000	1 500	–	RS1632A··	1.34	3.9	2.0
50	34	10	10	66	3	41	4.5	M6 × 1	5.5	0.33	13.5	11.5	500	1 000	1 500	–	RS1632A··	1.34	3.9	2.0
50	34	10	10	66	–	41	4.5	M6 × 1	5.5	0.33	13.5	11.5	500	1 000	1 500	–	RS1632A··	1.34	4.1	2.1
50	34	10	10	66	3	41	4.5	M6 × 1	5.5	0.33	13.5	11.5	500	1 000	1 500	–	RS1632A··	1.34	4.1	2.1
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
58	40	10	11	41	3	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
58	40	10	11	81	–	48	5.5	M6 × 1	5.5	0.53	17.3	14.9	500	1 000	1 500	2 000	RS2040A··	2.15	6.3	3.2
58	40	10	11	81	3	48	5.5	M6 × 1	5.5	0.53	17.3	14.9	500	1 000	1 500	2 000	RS2040A··	2.15	6.3	3.2
58	40	10	11	81	–	48	5.5	M6 × 1	5.5	0.53	17.3	14.9	500	1 000	1 500	2 000	RS2040A··	2.15	7.0	3.5
58	40	10	11	81	3	48	5.5	M6 × 1	5.5	0.53	17.3	14.9	500	1 000	1 500	2 000	RS2040A··	2.15	7.0	3.5
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
70	48	12	13	50	3	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
70	48	12	13	100	–	58	6.6	M6 × 1	7.0	0.91	22.0	19.6	1 000	2 000	2 500	–	RS2550A··	3.37	14	7.0
70	48	12	13	100	3	58	6.6	M6 × 1	7.0	0.91	22.0	19.6	1 000	2 000	2 500	–	RS2550A··	3.37	14	7.0
70	48	12	13	100	–	58	6.6	M6 × 1	7.0	0.91	22.0	19.6	1 000	2 000	2 500	–	RS2550A··	3.37	15	7.5
70	48	12	13	100	3	58	6.6	M6 × 1	7.0	0.91	22.0	19.6	1 000	2 000	2 500	–	RS2550A··	3.37	15	7.5
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
92	60	12	15.5	126	3	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
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	26	13
92	60	12	15.5	126	3	74	9	M6 × 1	7.5	1.76	28.0	25.6	1 000	2 000	3 000	4 000	RS3264A··	5.63	26	13
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
114	75	15	19	158	3.5	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
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	55	28
114	75	15	19	158	3.5	93	11	M6 × 1	10.0	3.44	35.0	31.8	2 000	3 000	4 000	5 000	RS4080A··	8.69	55	28

5. Length of nut becomes longer (2 × M) for those with "brush" seals.
6. Only rust preventive agent is applied at time of delivery. Please apply lubricant (oil or grease) before use.
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 445 for details.

19. Ball screws for transfer equipment
Return tube type, Square nut (Fine, Medium lead)



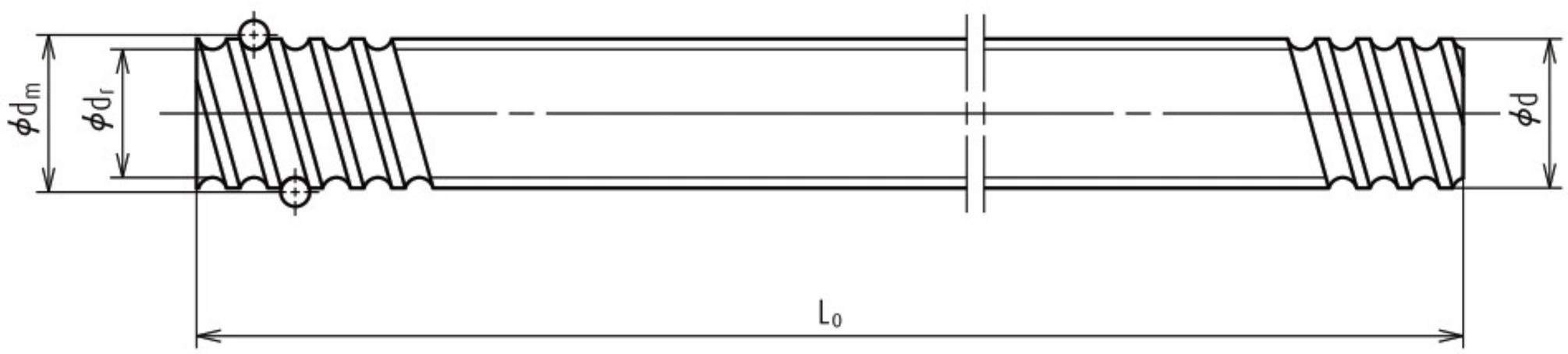


Ball nut No.	Shaft dia. d	Lead l	Ball dia. D_w	Ball circle dia. d_m	Root dia. d_r	Effective balls turns: Turns × Circuits	Basic load rating (N): Dynamic C_a	Basic load rating (N): Static C_{0a}	Axial play Max.	Ball nut dimensions: Length L_n
RNSTL 1404A3.5S	14	4	2.778	14.5	11.5	3.5 × 1	6 310	10 800	0.10	38
RNSTL 1405A2.5S	14	5	3.175	14.5	11.0	2.5 × 1	6 170	9 940	0.10	38
RNSTL 1808A3.5S	18	8	4.762	18.5	13.6	3.5 × 1	15 500	26 200	0.15	56
RNSTL 2005A2.5S	20	5	3.175	20.5	17.0	2.5 × 1	7 500	14 200	0.10	38
RNSTL 2010A2.5S	20	10	4.762	21.25	16.2	2.5 × 1	12 700	21 600	0.15	58
RNSTL 2505A2.5S	25	5	3.175	25.5	22.0	2.5 × 1	8 340	18 100	0.10	35
RNSTL 2510A5S	25	10	6.35	26	19.0	2.5 × 2	37 300	69 800	0.20	94
RNSTL 2806A2.5S	28	6	3.175	28.5	25.0	2.5 × 1	8 760	20 200	0.10	42
RNSTL 2806A5S	28	6	3.175	28.5	25.0	2.5 × 2	15 900	40 500	0.10	67
RNSTL 3210A2.5S	32	10	6.35	33.75	27.0	2.5 × 1	23 100	45 900	0.20	64
RNSTL 3210A5S	32	10	6.35	33.75	27.0	2.5 × 2	42 000	91 800	0.20	94
RNSTL 3610A2.5S	36	10	6.35	37	30.0	2.5 × 1	24 700	50 800	0.20	64
RNSTL 3610A5S	36	10	6.35	37	30.0	2.5 × 2	44 900	102 000	0.20	96
RNSTL 4512A5S	45	12	7.144	46.5	39.0	2.5 × 2	58 500	147 000	0.23	115

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 ··.

R series RNSTL type



Unit: mm

Ball nut dimensions										Nut Mass.	Arbor		Screw shaft			Shaft mass/m	Internal spatial volume of nut	Standard volume of grease re-plenishing
Width	Center height	Bolt hole					Oil hole				Outside dia.	Bore	Standard length			Screw shaft No.		
W	H	A	B	C	J	K	E	F	U	(kg)	d_0	d_1	L_0				(kg)	(cm³)	(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	M8	12	8	0	32	1.04	25.0	22.6	1 000	2 000	2 500	RS2806A··	4.47	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	45	50	17	M8	12	10	0	38	1.75	27.0	24.6	1 000	2 000	3 000	RS3210A··	5.53	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	M10	16	11	0	41	2.64	30.0	27.6	1 000	2 000	3 000	RS3610A··	6.91	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

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. Only rust preventive agent is applied at time of delivery. Please apply lubricant (oil or grease) before use.
7. Recommended quantity of grease is about 50% of ball nut's internal space. See page 445 for details.

20. Precision Rolled Ball Screws

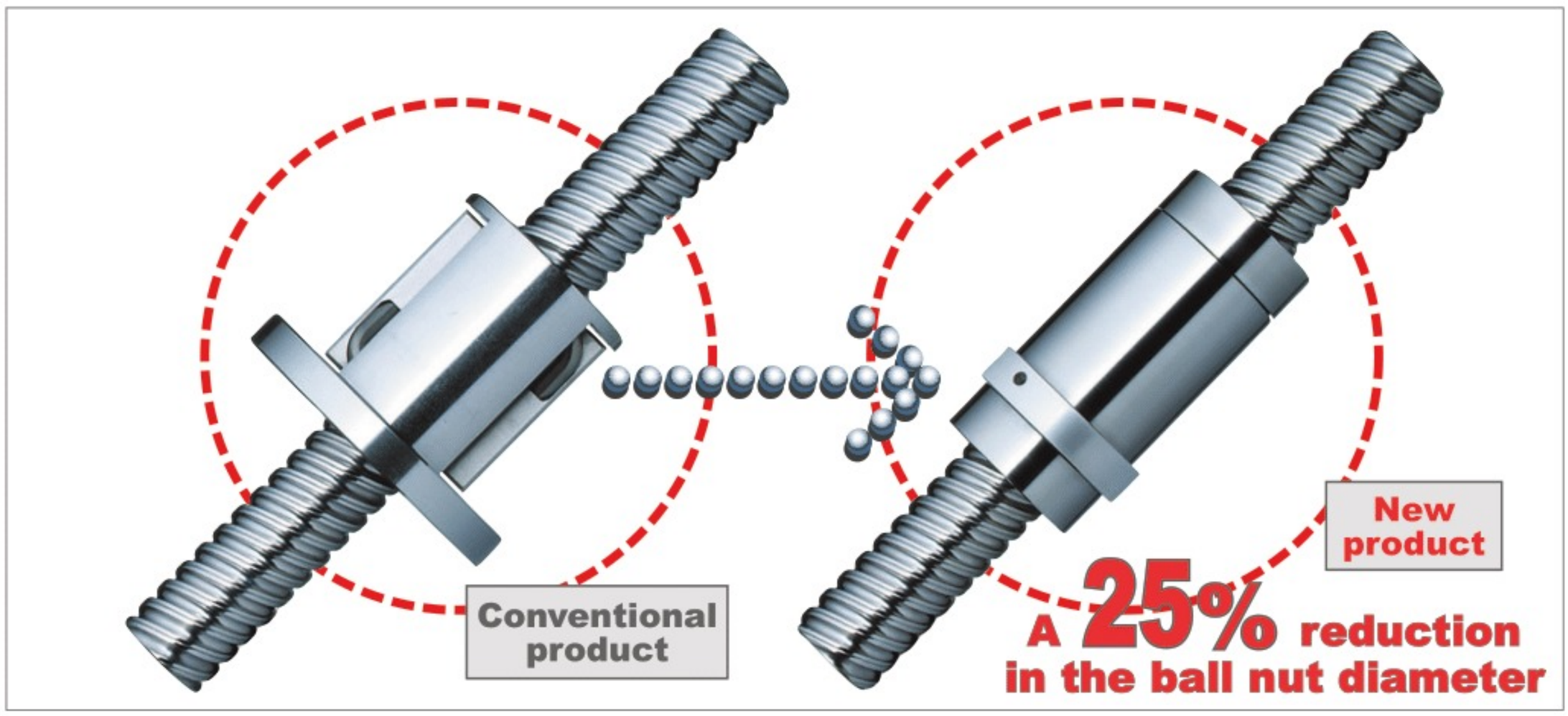
Compact ball nut heralding in the next generation standard.
Extended maintenance free operation with NSK K1 lubrication unit and new grease retaining seal.
Suitable for high speed and long stroke operation.

A 25% reduction in the ball nut diameter compared to the current series

No backslash, high speed and long stroke operation is possible.
Extended maintenance free operation achieved with **NSK K1** lubrication unit and new grease retaining seal, thus contributing to total cost reduction.

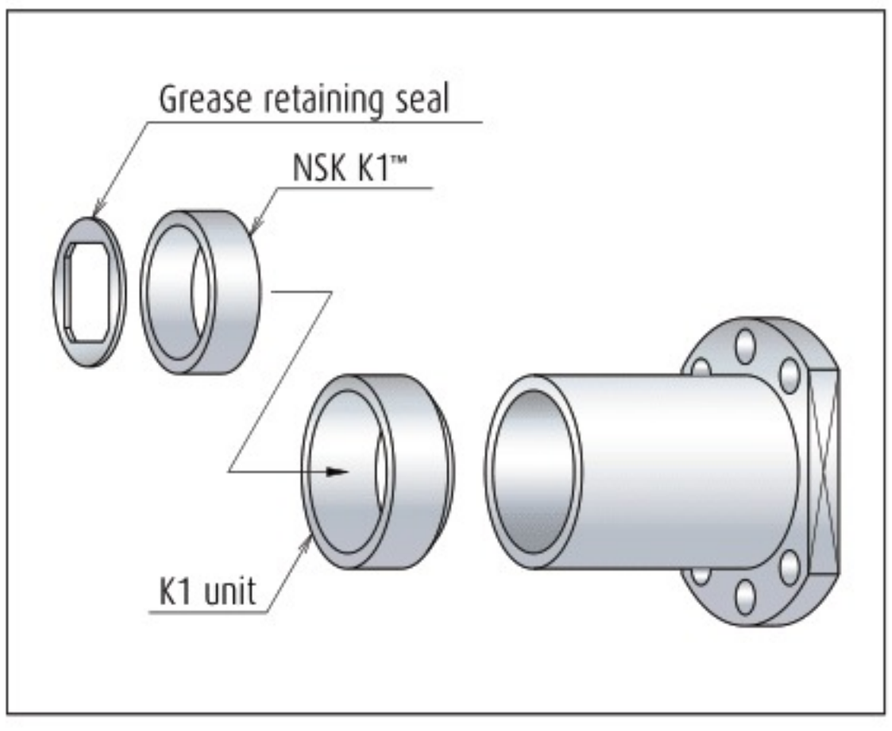
Compact ball nut

› Saves assembly space
› Suitable for rotating ball nut application because of its low inertia and balanced design



Remarkable improvement in sealing performance (introduction of grease retaining seal)

› Grease retention capabilities substantially enhanced
› Assists clean environment maintenance due to minimum grease scattering
› Superb sealing capabilities in contaminated environments

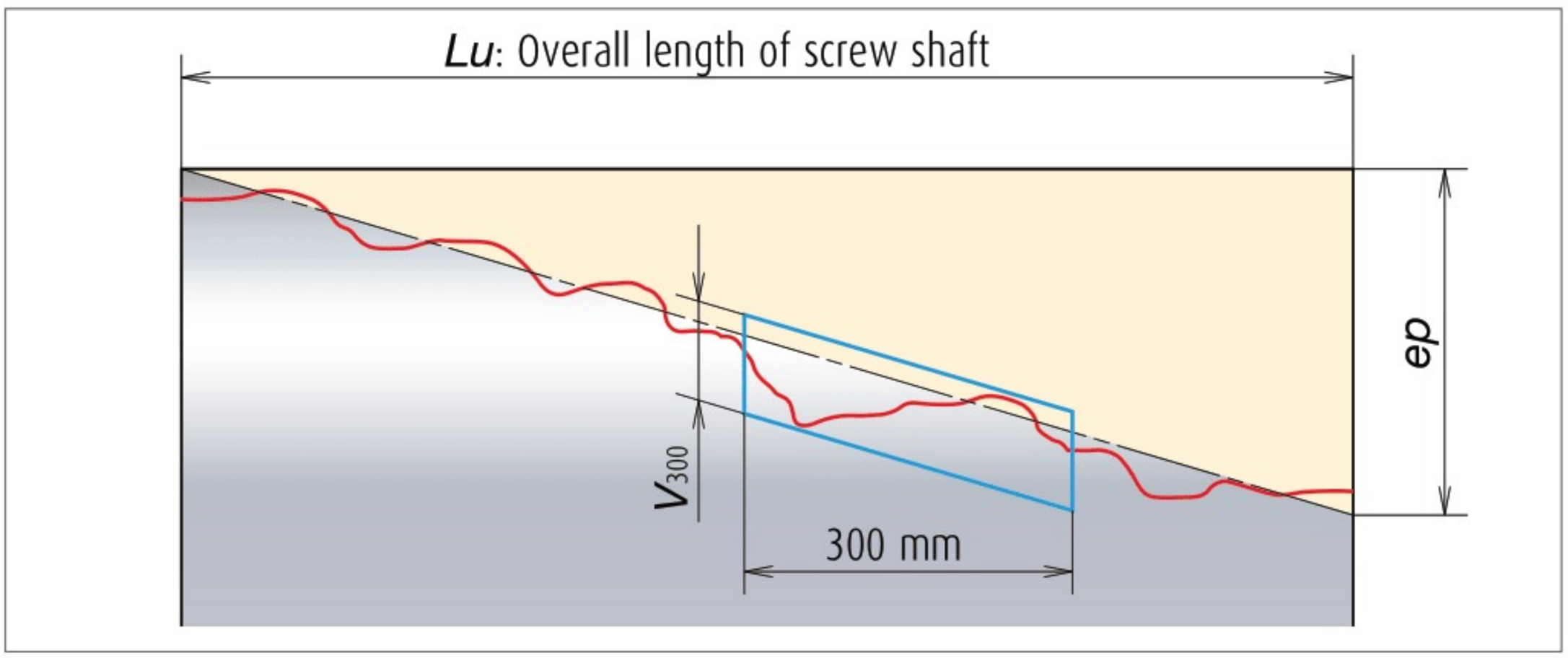


Maintenance free (equipped with NSK K1 lubrication unit as a standard feature)

NSK K1 lubrication unit, that is molded from resin and is impregnated with lubrication oil, supplies fresh oil onto the ball rolling surfaces.
In unison with grease it retains the lubricating ability for an extended period of time. Since its first appearance on the market in 1996, it has been widely accepted in many industrial fields.

Accuracy Grade

Accuracy grade of Ct7 is available.



Grade	Ct7
ep: Tolerance on specified travel	$ep = \pm \frac{2 \cdot Lu}{300} \cdot V_{300}$ (mm) *Lu*: Overall length of screw shaft
Travel variation in a 300 mm range (anywhere in useful travel)	0.052 mm

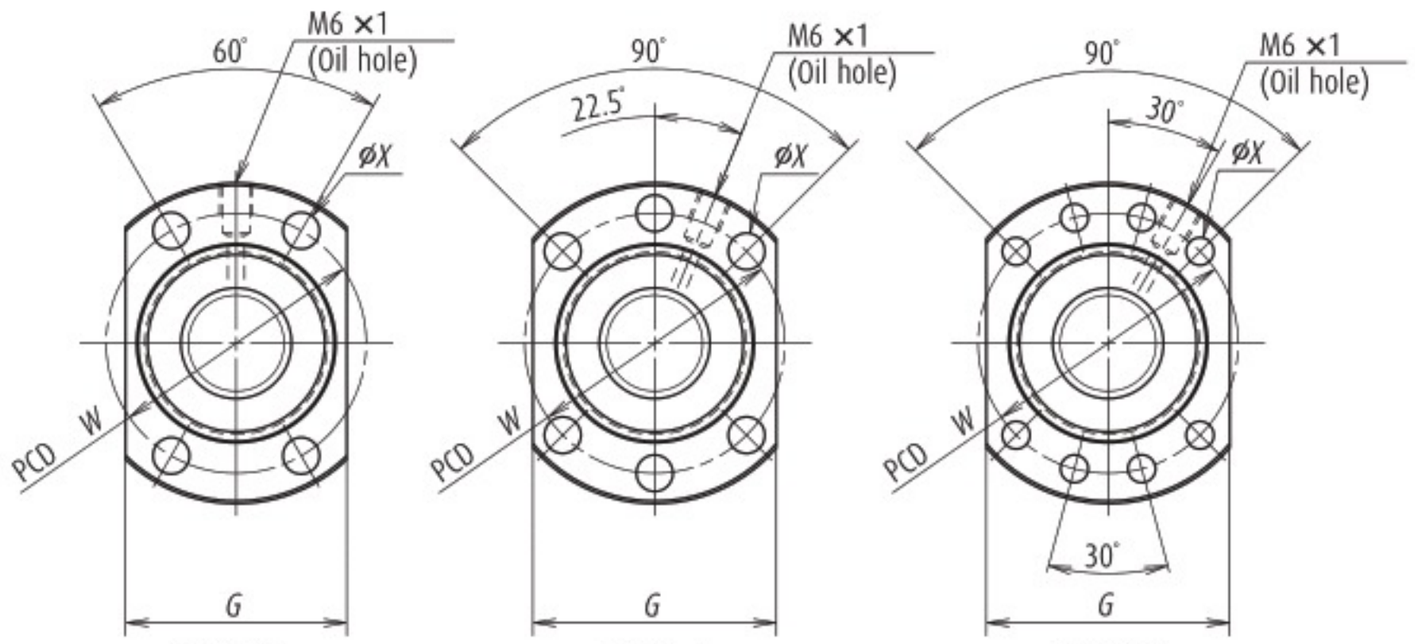
Options

Support unit (sold separately)
NSK provides the support bearing units to accompany the ball screw shafts.
For further details, please refer to the NSK catalog: Precision Machine Components (CAT. No. E3162h).
The bearing journal configurations of the screw shaft are provided on the following pages.

Applications

Woodworking machines, general transporting equipment, feeders, robots, etc.

20. Precision Rolled Ball Screws



TYPE 1

Shaft diameter:
Ø12mm

TYPE 2

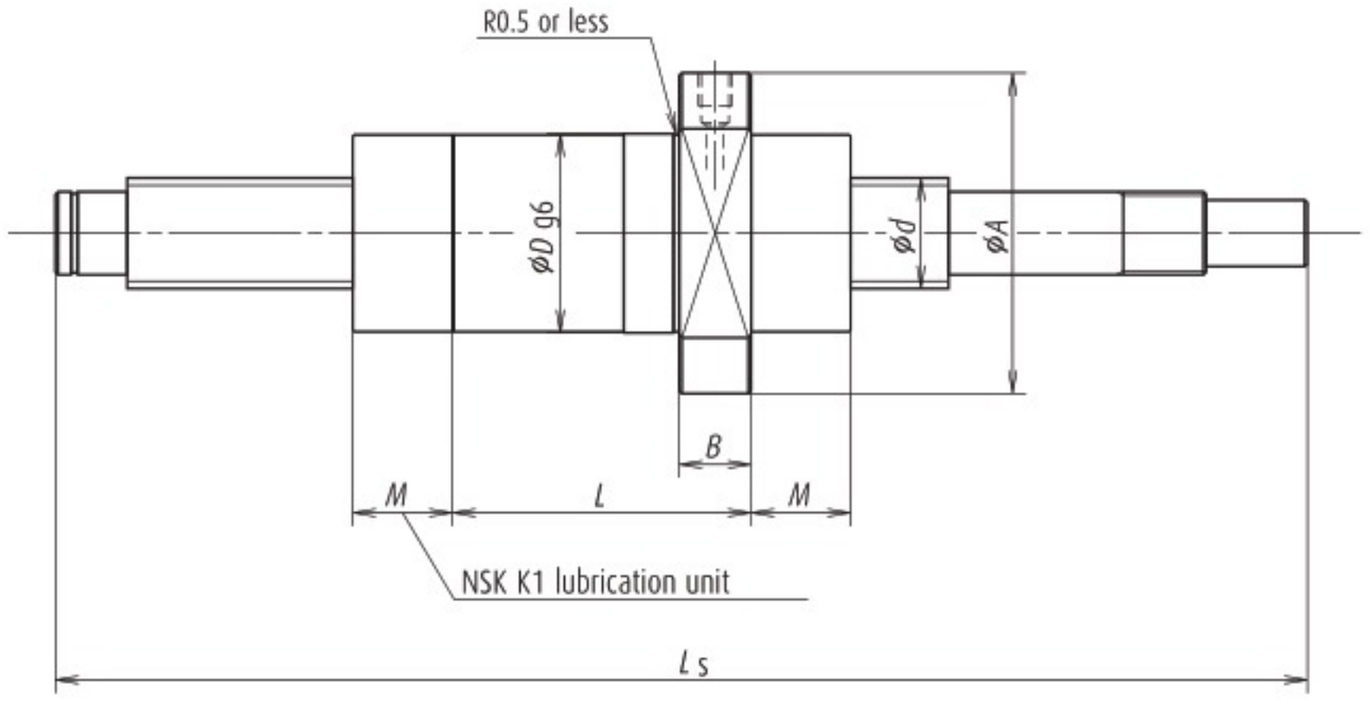
Shaft diameter:
Ø15, Ø20, Ø25 and Ø32mm

TYPE 3

Shaft diameter:
Ø40 and Ø50mm

Modell-No.	Shaft dia. d	Lead l	Effective turns of balls	Basic load rating (N)		Dimensions				
				Dynamic load rating C_a	Static load rating C_{0a}	D	A	G	B	L
PR1205	12	5	2.7x1	3200	5860	24	40	26	11	30
PR1505	15	5	2.7x1	5460	10200	28	48	40	11	30
PR1510	15	10	2.7x1	5460	10200	28	48	40	11	43
PR2005	20	5	2.7x1	8790	18500	36	58	44	13	31
PR2010	20	10	2.7x1	8790	18500	36	58	44	13	45
PR2505	25	5	4.7x1	15700	40900	40	62	48	12	42
PR2510	25	10	3.7x1	12800	32300	40	62	48	12	56
PR3210	32	10	3.7x1	19000	51500	50	80	62	12	59
PR3220	32	20	3.7x1	19000	51500	50	80	62	12	98
PR4010	40	10	3.7x1	33800	89900	63	93	70	14	60

Modell-No.	Shaft dia. d	Lead l	Effective turns of balls	Basic load rating (N)		Dimensions				
				Dynamic load rating C_a	Static load rating C_{0a}	D	A	G	B	L
LPR2020	20	20	1.7x2	9890	21600	36	58	44	13	54
LPR2525	25	25	1.7x2	11000	27500	40	62	48	12	63
LPR3232	32	32	1.7x2	16300	43900	50	80	62	14	79
LPR4040	40	40	1.7x2	29000	76200	63	93	70	16	94
LPR5050	50	50	1.7x2	32200	96200	75	110	85	18	115



Unit: mm

Dimensions				Maximum screw shaft length	
				Ct7	
Type	W	X	M	Standard	On request
1	32	4.5	(18)	200 - 900	-1500
2	38	5.5	(18)	200 - 1200	-1500
2	38	5.5	(18)	200 - 1200	-1500
2	47	6.6	(18)	300 - 1600	-2000
2	47	6.6	(18)	300 - 1600	-2000
2	51	6.6	(21)	300 - 3200	-
2	51	6.6	(21)	300 - 3200	-
2	65	9	(21)	300 - 3200	-4000
2	65	9	(21)	300 - 3200	-4000
3	78	9	(21)	500 - 3200	-

Unit: mm

Dimensions				Maximum screw shaft length	
				Ct7	
Type	W	X	M	Standard	On request
2	47	6.6	(18)	300 - 1600	-2000
2	51	6.6	(21)	300 - 3200	-
2	65	9	(21)	300 - 3200	-4000
3	78	9	(21)	500 - 4500	-6500
3	93	11	(21)	500 - 4500	-6500

20. Precision Rolled Ball Screws

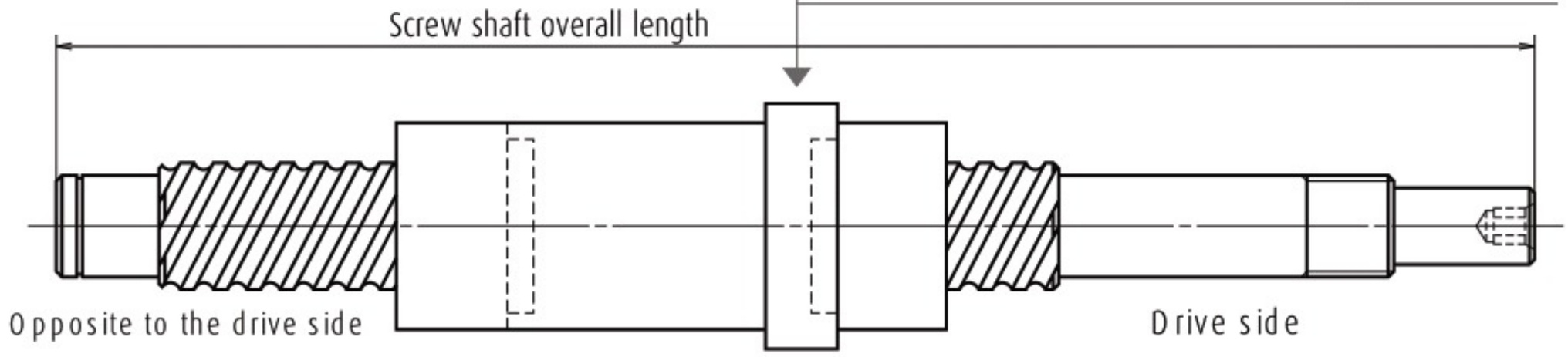
1. Precision Rolled Ball Screws PR Series/LPR Series

1.1 Specification number

For ordering, please quote the specification number.

Reference number: V S P 40 40 K 1 D 2002 S A1

- Accuracy grade and axial play: VSP (Ct7, axial play 0 mm)
- Screw shaft diameter (mm)
- Lead (mm)
- K: Equipped with NSK K1 unit; N: No NSK K1 unit (Equipped with grease retaining seal only)
- Number of nut
- Position of ball nut flange: D: Screw shaft drive side S: Opposite to drive side
- Overall length of screw shaft: If the length is less than 1000 mm, enter 0 to the forth digit.
- Bearing journal for simple support side: please refer to the configuration of the screw shaft end outlined in the catalog.
- Bearing journal for fixed support side: please refer to the configuration of the screw shaft end outlined in the catalog.



1.2 Permissible rotational speed of precision rolled ball screws

We strongly recommend reviewing the allowable speed of the screw shaft.

The allowable rotational speed of the ball screw shall be checked on the following:

› **Permissible d·n value**

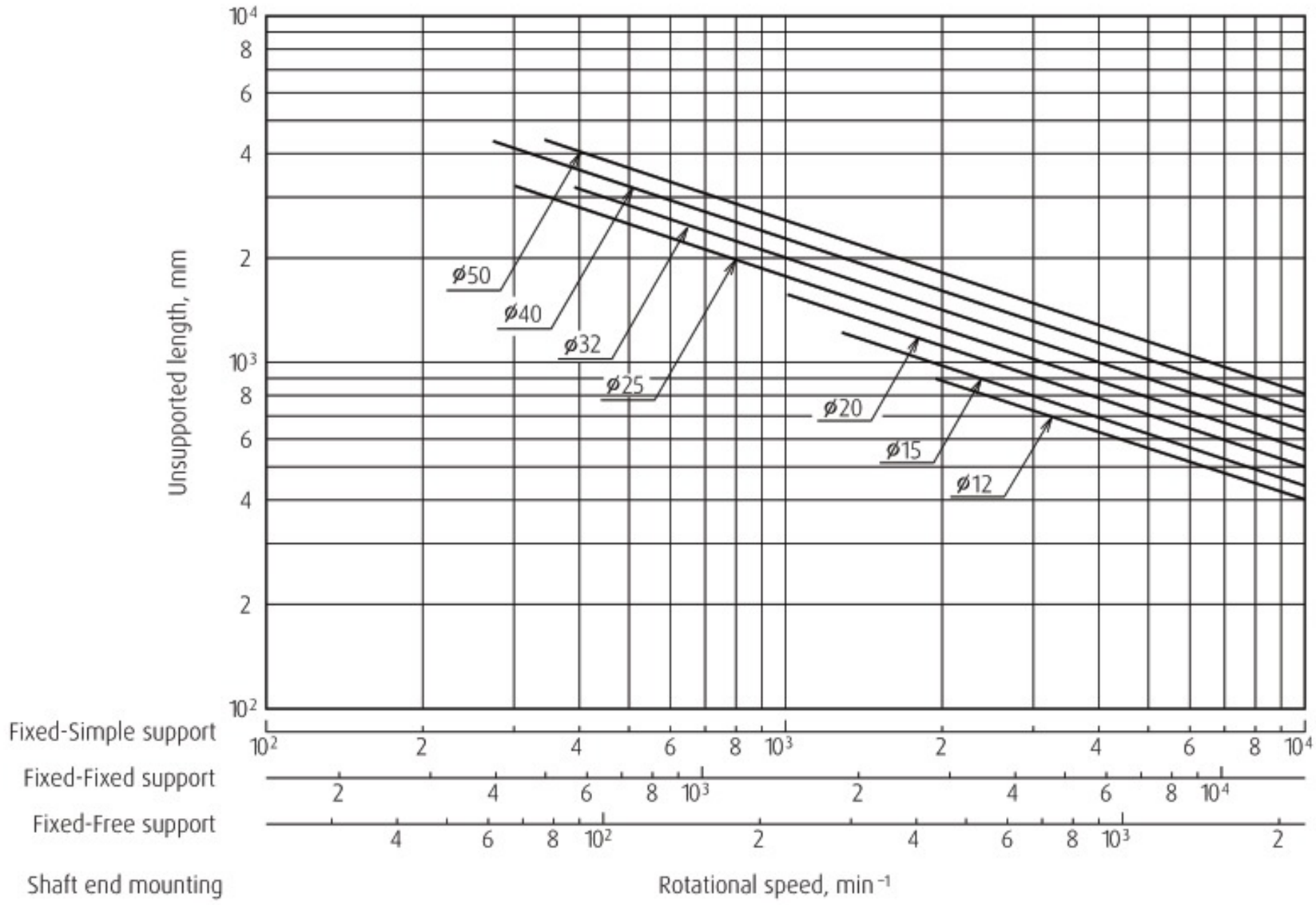
d·n value, which is involved in damaging the ball re-circulation components
(where, d: shaft diameter measured in mm, n: rotational speed measured in min^{-1})
Preferably d·n ≦150 000. Please consult with NSK if your ball screw exceeds the limitation.

› **Critical speed**

Critical speed of the screw shaft (caused by the resonance of the screw shaft)
See the chart below. For detailed calculations, please refer to the catalog: Precision Machine Components (CAT No. E3162h).

Please consult NSK if the maximum rotational speed exceeds 5 000 min^{-1}, even both the critical speed of the screw shaft rotation and the d·n value are in ranges of the allowable limit.

Permissible rotational speed vs. critical speed.

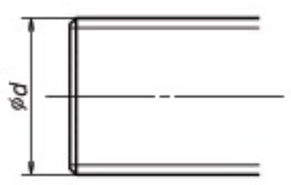


2. Recommendation of Screw Shaft End Configuration

2.1 Opposite to drive side shaft end: P

Unit: mm

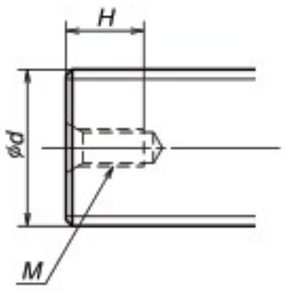
Screw shaft
Diameter d
12
15
20
25
32
40
50



2.2 Opposite to drive side shaft end: R

Unit: mm

Screw shaft	Tap hole	
Diameter d	Size M	Depth H
12	M3x0.5	9
15	M4x0.7	10
20	M6x1	12
25	M6x1	12
32	M6x1	12
40	M8x1.25	16
50	M8x1.25	16

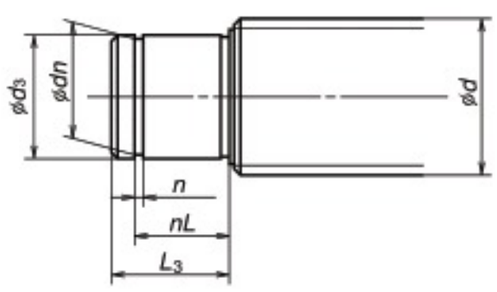


2.3 Opposite to drive side shaft end: S

Unit: mm

Support unit	Screw shaft	Bearing journal		Snap ring groove		
Reference No.	Diameter d	Diameter d_3 g6	Length L_3	Width n Tolerance	Diameter dn Tolerance	Position nL
WBK08S-01	12	6	9	$0.8^{+0.1}_{0}$	$5.7^{0}_{-0.06}$	6.8
WBK12S-01	15	10	12	$1.15^{+0.14}_{0}$	$9.6^{0}_{-0.09}$	9.15
WBK15S-01	20	15	13	$1.15^{+0.14}_{0}$	$14.3^{0}_{-0.11}$	10.15
WBK20S-01	25	20	19	$1.35^{+0.14}_{0}$	$19^{0}_{-0.21}$	15.35
WBK25S-01	32	25	20	$1.35^{+0.14}_{0}$	$23.9^{0}_{-0.21}$	16.35
(6206)	40	30	22	$1.75^{+0.14}_{0}$	$28.6^{0}_{-0.21}$	17.75
(6207)	50	35	25	$1.75^{+0.14}_{0}$	$33^{0}_{-0.21}$	18.75

( ): Reference number of bearing



2.4 Opposite to drive side shaft end: T

Unit: mm

Support unit	Screw shaft	Bearing journal		Snap ring groove			Tap hole	
Reference No.	Diameter d	Diameter d_3 g6	Length L_3	Width n Tolerance	Diameter dn Tolerance	Position nL	Size M	Depth H
WBK08S-01	12	6	9	$0.8^{+0.1}_{0}$	$5.7^{0}_{-0.06}$	6.8	-	-
WBK12S-01	15	10	12	$1.15^{+0.14}_{0}$	$9.6^{0}_{-0.09}$	9.15	M3x0.5	9
WBK15S-01	20	15	13	$1.15^{+0.14}_{0}$	$14.3^{0}_{-0.11}$	10.15	M5x0.8	10
WBK20S-01	25	20	19	$1.35^{+0.14}_{0}$	$19^{0}_{-0.21}$	15.35	M6x1	12
WBK25S-01	32	25	20	$1.35^{+0.14}_{0}$	$23.9^{0}_{-0.21}$	16.35	M6x1	12
(6206)	40	30	22	$1.75^{+0.14}_{0}$	$28.6^{0}_{-0.21}$	17.75	M8x1.25	16
(6207)	50	35	25	$1.75^{+0.14}_{0}$	$33^{0}_{-0.21}$	18.75	M8x1.25	16

( ): Reference number of bearing

2.5 Opposite to drive side shaft end: U

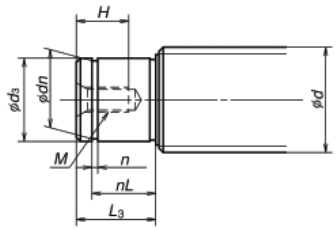
Unit: mm

Support unit		Spacer	Screw shaft	Bearing journal	
Reference No.		Reference No.	Diameter d	Diameter d_3 g6	Length L_3
WBK08-01A	**WBK08-11**	**WBK08K**	12	8	32
WBK12-01A	**WBK12-11**	**WBK12K**	15	12	35
WBK15-01A	**WBK15-11**	**WBK15K**	20	15	50
WBK20-01	**WBK20-11**	**WBK20K**	25	20	64
WBK25-01	**WBK25-11**	**WBK25K**	32	25	76
WBK30DF-31		–	40	30	89
WBK35DF-31		–	50	35	92

2.6 Opposite to drive side shaft end: V

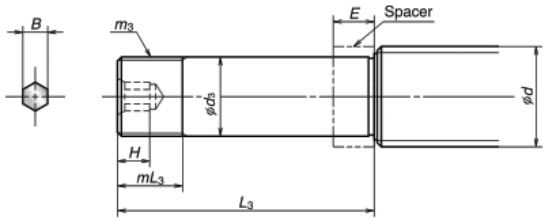
Unit: mm

Support unit		Screw shaft	Bearing journal	
Reference No.		Diameter d	Diameter d_3 g6	Length L_3
WBK08-01A	**WBK08-11**	12	8	32
WBK12-01A	**WBK12-11**	15	12	35
WBK15-01A	**WBK15-11**	20	15	50
WBK20-01	**WBK20-11**	25	20	64
WBK25-01	**WBK25-11**	32	25	76
WBK30DF-31		40	30	89
WBK35DF-31		50	35	92



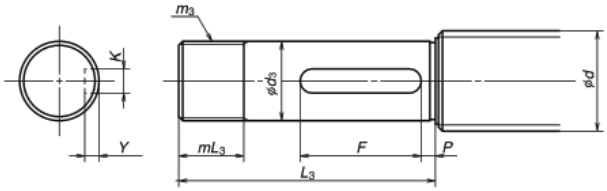
Unit: mm

Lock nut thread		Hexagon hole	
Nominal m_3	Length mL_3	Width across the flats $B\ ^{+0.2}_{0}$	Depth H
M8x1	9	-	-
M12x1	10	4	6
M15x1	15	5	7
M20x1	16	6	8
M25x1.5	20	8	10
M30x1.5	26	10	12
M35x1.5	30	12	14



Unit: mm

Lock nut thread		Key seat			
Nominal m_3	Length mL_3	Width K N9	Position P	Depth $Y\ ^{+0.1}_{0}$	Length F
M8x1	9	2	3	1.2	14
M12x1	10	4	3	2.5	20
M15x1	15	5	3	3	25
M20x1	16	6	4	3.5	30
M25x1.5	20	8	4	4	40
M30x1.5	26	8	5	4	40
M35x1.5	30	10	5	5	50



2.7 Drive side shaft end: A1

Unit: mm

Support unit		Spacer	Screw shaft	Bearing journal		Lock nut thread	
Reference No.		Reference No.	Diameter d	Diameter d_1 g6	Length L_1	Nominal m_1	Length mL_1
WBK08-01A	WBK08-11	WBK08K	12	8	32	M8x1	9
WBK12-01A	WBK12-11	WBK12K	15	12	35	M12x1	10
WBK15-01A	WBK15-11	WBK15K	20	15	50	M15x1	15
WBK20-01	WBK20-11	WBK20K	25	20	64	M20x1	16
WBK25-01	WBK25-11	WBK25K	32	25	76	M25x1.5	20
WBK30DF-31		–	40	30	89	M30x1.5	26
WBK35DF-31		–	50	35	92	M35x1.5	30

2.8 Drive side shaft end: A3

Unit: mm

Support unit		Spacer	Screw shaft	Bearing journal		Lock nut thread		Drive section		D	
Reference No.		Reference No.	Diameter d	Diameter d_1 g6	Length L_1	Nominal m_1	Length mL_1	Diameter d_2 h_7	Length L_2	Position P	Depth W
WBK08-01A	WBK08-11	WBK08K	12	8	32	M8x1	9	6	10	2	5.5
WBK12-01A	WBK12-11	WBK12K	15	12	35	M12x1	10	10	15	3	9
WBK15-01A	WBK15-11	WBK15K	20	15	50	M15x1	15	12	20	3	11
WBK20-01	WBK20-11	WBK20K	25	20	64	M20x1	16	15	27	4	14
WBK25-01	WBK25-11	WBK25K	32	25	76	M25x1.5	20	20	33	4	19
WBK30DF-31		–	40	30	89	M30x1.5	26	25	61	5	24
WBK35DF-31		–	50	35	92	M35x1.5	30	30	63	5	29

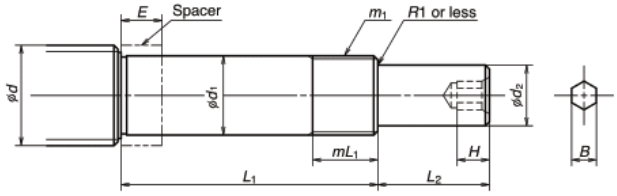
2.9 Drive side shaft end: A4

Unit: mm

Support unit		Spacer	Screw shaft	Bearing journal		Lock nut thread		Drive section		Key seat		
Reference No.		Reference No.	Diameter d	Diameter d_1 g6	Length L_1	Nominal m_1	Length mL_1	Diameter d_2 h_7	Length L_2	Width K N9	Position P	Depth $Y^{+0.1}_{0}$
WBK08-01A	WBK08-11	WBK08K	12	8	32	M8x1	9	6	10	-	-	-
WBK12-01A	WBK12-11	WBK12K	15	12	35	M12x1	10	10	15	2	3	1.2
WBK15-01A	WBK15-11	WBK15K	20	15	50	M15x1	15	12	20	4	3	2.5
WBK20-01	WBK20-11	WBK20K	25	20	64	M20x1	16	15	27	5	4	3
WBK25-01	WBK25-11	WBK25K	32	25	76	M25x1.5	20	20	33	6	4	3.5
WBK30DF-31		–	40	30	89	M30x1.5	26	25	61	8	5	4
WBK35DF-31		–	50	35	92	M35x1.5	30	30	63	8	5	4

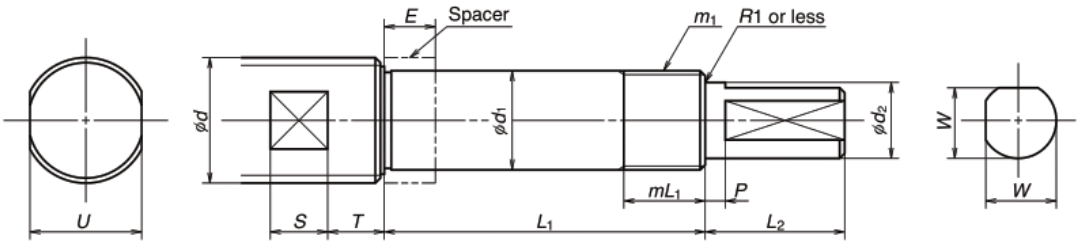
Unit: mm

Drive section		Hexagon hole	
Diameter d_2 h_7	Length L_2	Width across the flats $B^{+0.2}_{0}$	Depth H
6	10	-	-
10	15	4	6
12	20	5	7
15	27	6	8
20	33	8	10
25	61	10	12
30	63	12	14



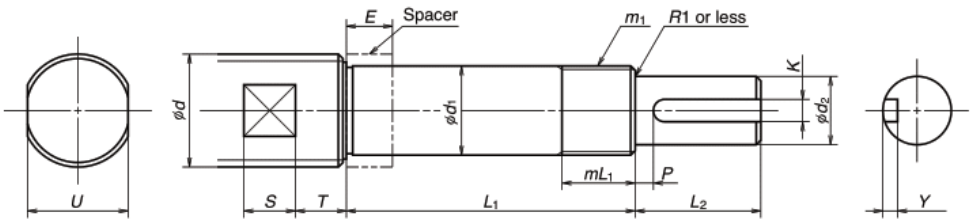
Unit: mm

Wrench flats		
Width across the flats U Tolerance	Position T	Length S
10 $^{0}_{-0.2}$	4	5.5
12 $^{0}_{-0.25}$	6	6.5
17 $^{0}_{-0.25}$	6	8.5
22 $^{0}_{-0.3}$	10	11
32 $^{0}_{-0.3}$	10	15
36 $^{0}_{-0.3}$	16	16
41 $^{0}_{-0.3}$	16	18



Unit: mm

Wrench flats		
Width across the flats U Tolerance	Position T	Length S
10 $^{0}_{-0.2}$	4	5.5
12 $^{0}_{-0.25}$	6	6.5
17 $^{0}_{-0.25}$	6	8.5
22 $^{0}_{-0.3}$	10	11
32 $^{0}_{-0.3}$	10	15
36 $^{0}_{-0.3}$	16	16
41 $^{0}_{-0.3}$	16	18



2.10 Drive side shaft end: A5

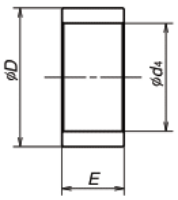
Unit: mm

Support unit		Spacer	Screw shaft	Bearing journal		Lock nut thread		Drive section	
Reference No.		Reference No.	Diameter d	Diameter d_1 g6	Length L_1	Nominal m_1	Length mL_1	Diameter d_2 h_7	Length L_2
WBK08-01A	WBK08-11	WBK08K	12	8	32	M8x1	9	6	10
WBK12-01A	WBK12-11	WBK12K	15	12	35	M12x1	10	10	15
WBK15-01A	WBK15-11	WBK15K	20	15	50	M15x1	15	12	20
WBK20-01	WBK20-11	WBK20K	25	20	64	M20x1	16	15	27
WBK25-01	WBK25-11	WBK25K	32	25	76	M25x1.5	20	20	33
WBK30DF-31		–	40	30	89	M30x1.5	26	25	61
WBK35DF-31		–	50	35	92	M35x1.5	30	30	63

2.11 Spacer

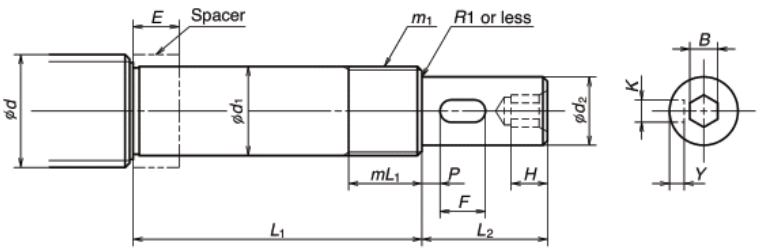
Unit: mm

Reference No.	Bearing journal	Spacer dimensions		
	Diameter d	Bore d_4	Diameter D	Width E
WBK08K	8	8	11.5	5.5
WBK12K	12	12	14.5	5.5
WBK15K	15	15	19.5	10
WBK20K	20	20	25.5	11
WBK25K	25	25	32	14



Unit: mm

Key seat				Wrench flats	
Width K N9	Position P	Depth $Y^{+0.1}_{0}$	Length F	Width across the flats $B^{+0.2}_{0}$	Depth H
-	-	-	-	-	-
-	-	-	-	4	6
4	3	2.5	7	5	7
5	4	3	10	6	8
6	4	3.5	15	8	10
8	5	4	40	10	12
8	5	4	40	12	14



21. Ball Screws – Interchangeable

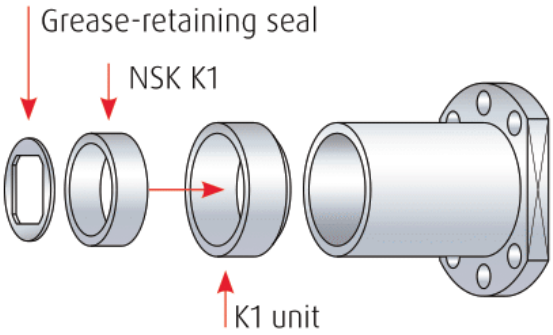
NSK developed the 'Ball screws – interchangeable' series based on many years of experience and with the help of the most advanced technology. The series complies 100% with DIN 69051. The spindle nut and spindle shaft are available separately and are universally exchangeable. The new 'Ball screws – interchangeable' series features an extreme reduction in noise and can be used in high-speed applications. As an option, the NSK K1 lubrication unit, proven in use over many years, can be integrated.

Features

- Nut and shaft are completely interchangeable
- 100% DIN-compliant
- High-speed/low-noise nut design (d·n = 160.000, max 5000 1/min)

Remarkable improvement in sealing performance (introduction of grease-retaining seal)

- Grease retention capabilities substantially enhanced
- Assists clean environment maintenance due to minimum grease scattering
- Superb sealing capabilities in contaminated environments

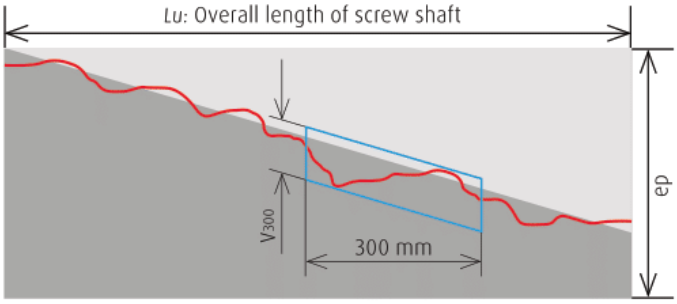


Maintenance-free long-term with NSK K1 lubrication unit (sold separately)

- NSK K1 is a lubrication unit which combines oil and resin in a single unit
- The porous resin contains a large amount of lubrication oil
- The NSK K1 contacts the shaft raceway, giving a constant supply of fresh oil which seeps from the resin
- NSK K1 lubrication has been accepted in many industrial fields since 1996

Accuracy grade

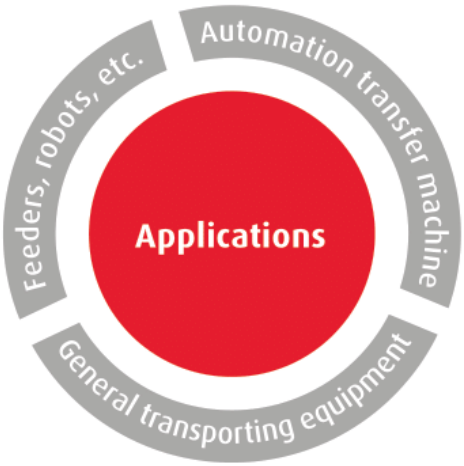
- An accuracy grade of Ct7 is available

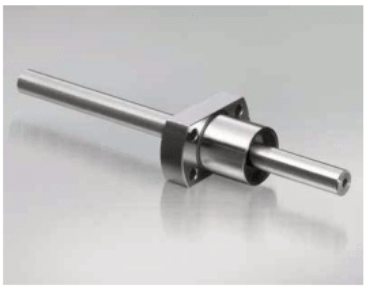


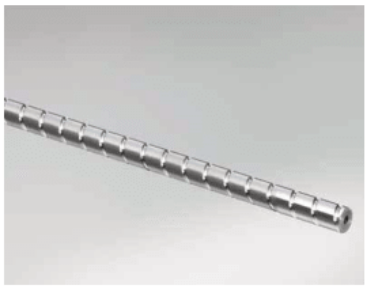
ep: Tolerance on specified travel	$ep = \pm \frac{Lu}{300} \cdot V_{300}$ (mm) Lu: Overall length of screw shaft
Travel variation in a 300 mm range (anywhere in useful travel)	0.052 mm
Clearance	0.020 mm

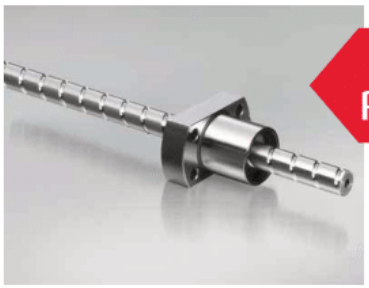
Options

- NSK provides the support bearing units which go with the ball screw shafts, which are sold separately.
- Possible bearing journal configurations of the shaft are provided on the following pages as suggestion









New Product

Please use the following designation, if you order a **shaft**:

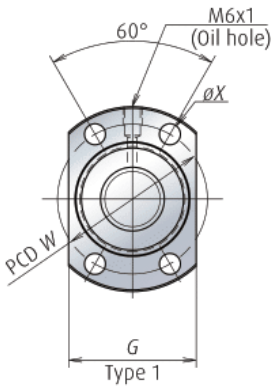
Reference No.:	F	C	S	15	10	S	A	1 4 8 6
	Accuracy F: C7	Specification C: Interchangeable	Item S: Shaft	Spindle diameter (mm)	lead (mm)	Clearance S: Less than 0.020 mm	Specification A: Internal design	Shaft total length 1486: lenght shaft

Please use the following designation, if you order a **nut**:

Reference No.:	F	C	N	15	10	S	D	3
	Accuracy F: C7	Specification C: Interchangeable	Item N: Nut	Spindle diameter (mm)	lead (mm)	Clearance S: Less than 0.020 mm	Specification D: DIN Dimensions	2, 3, 4, 5: Nut turn

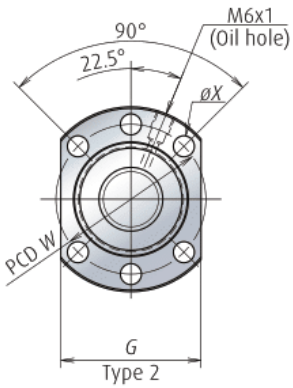
21. Ball Screws – Interchangeable

Ball nut dimensions



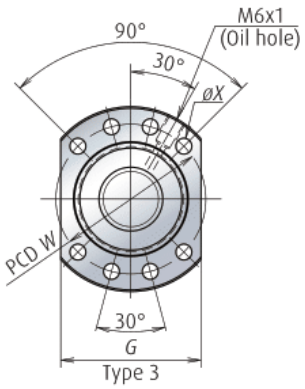
Type 1

Shaft diameter:
ø12 mm



Type 2

Shaft diameter:
ø15, ø20 ø25 and ø32 mm

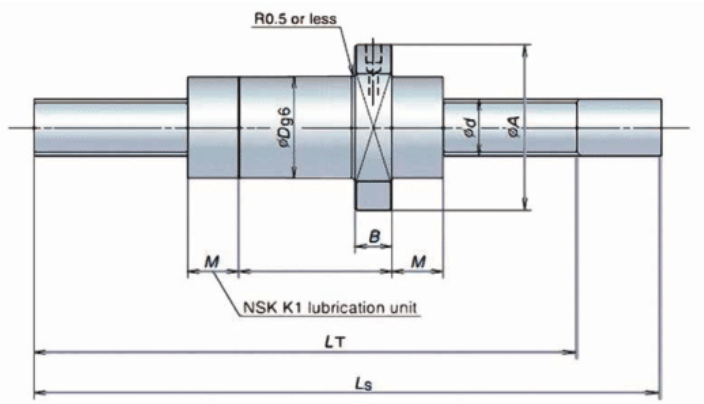


Type 3

Shaft diameter:
ø40 and ø50 mm

Specification number

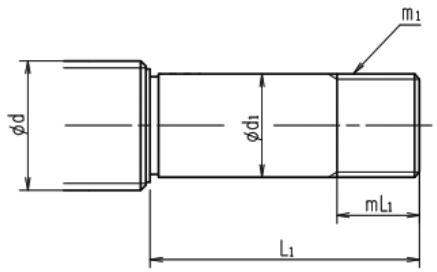
Model No.	Shaft OD [mm]	lead [mm]	Turns	Ca [N]	Coa [N]	D [mm]	A [mm]	G [mm]	B [mm]	L [mm]
FCN1205	12	5	3	3 750	5 810	24	40	26	11	30
FCN1210	12	10	3	3 750	5 780	24	40	26	11	43
FCN1505	15	5	3	6 410	10 100	28	48	40	11	30
FCN1510	15	10	3	6 530	10 200	28	48	40	11	43
FCN1520	15	20	2	5 660	8 700	32	48	40	11	51
FCN2005	20	5	3	10 400	18 500	36	58	44	13	31
FCN2010	20	10	3	10 200	18 600	36	58	44	13	45
FCN2020	20	20	2	6 790	11 800	36	58	44	13	54
FCN2505	25	5	5	18 500	40 900	40	62	48	12	42
FCN2510	25	10	4	15 000	32 400	40	62	48	12	56
FCN2520	25	20	2	7 650	14 800	40	62	48	12	54
FCN2525	25	25	2	7 490	14 600	40	62	48	12	63
FCN3205	32	5	4	16 800	41 700	50	80	62	12	41
FCN3210	32	10	4	23 000	51 300	50	80	62	12	59
FCN3220	32	20	4	22 600	51 100	50	80	62	12	98
FCN4010	40	10	4	39 800	90 700	63	93	70	14	60



Type No.	W [mm]	X [mm]	M [mm]	Short Version (on stock available)		Long Version (on demand)	
				Thread length LT	Total length LS	Thread length LT	Total length LS
1	32	4.5	(18)	617	800	–	–
1	32	4.5	(18)	617	800	–	–
2	38	5.5	(18)	1303	1486	1760	1900
2	38	5.5	(18)	1303	1486	1760	1900
2	42	5.5	(18)	1293	1476	1760	1900
2	47	6.6	(18)	1303	1486	1760	1900
2	47	6.6	(18)	1303	1486	1760	1900
2	47	6.6	(18)	1293	1476	1760	1900
2	51	6.6	(21)	1303	1486	1760	1900
2	51	6.6	(21)	1303	1486	1760	1900
2	51	6.6	(21)	1293	1476	1760	1900
2	51	6.6	(21)	1288	1471	1760	1900
2	65	9	(21)	1303	1486	1760	1900
2	65	9	(21)	1303	1486	1760	1900
2	65	9	(21)	1293	1476	1760	1900
3	78	9	(21)	1303	1486	1760	1900

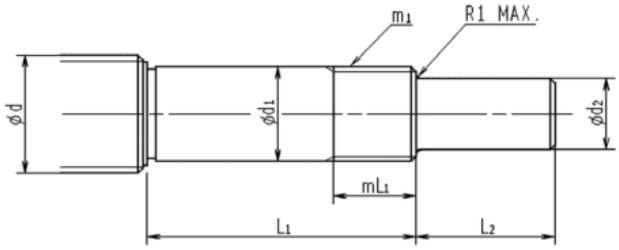
21. Ball Screws – Interchangeable

Basic 1



to use WBK							
Screw shaft d	lead l	Support unit		Bearing journal		Lock nut thread	
		fix side	support side	d_1 g6	L_1	m_1	mL_1
12	all	WBK08-01A	WBK08-11	8	27	M8x1	9
15	all	WBK12-01A	WBK12-11	12	30	M12x1	10
20	all	WBK15-01A	WBK15-11	15	40	M15x1	15
25	all	WBK20-01	WBK20-11	20	53	M20x1	16
32	all	WBK25-01	WBK25-11	25	89	M25x1.5	20
40	10	WBK30DFD-31H	6206	30	104	M30x1.5	30

Basic 2

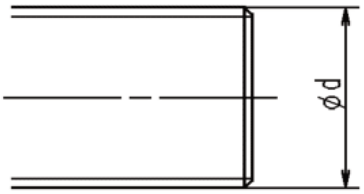


to use WBK							
Screw shaft d	lead l	Support unit		Bearing journal		Lock nut thread	
		fix side	support side	d_1 g6	L_1	m_1	mL_1
12	all	WBK08-01A	WBK08-11	8	27	M8x1	9
15	all	WBK12-01A	WBK12-11	12	30	M12x1	10
20	all	WBK15-01A	WBK15-11	15	40	M15x1	15
25	all	WBK20-01	WBK20-11	20	53	M20x1	16
32	all	WBK25-01	WBK25-11	25	89	M25x1.5	20
40	10	WBK30DFD-31H	6206	30	104	M30x1.5	30

to use BSBD						
Screw shaft d	lead l	Bearing journal			Lock nut thread	
		d_1 g6	L_1 (single BSF/BSN)	L_1 (DT BSF/BSN)	m_1	mL_1
12	all	–	–	–	–	–
15	all	12	33	–	M12x1	10
20	all	15	38	–	M15x1	15
25	all	20	42	–	M20x1	16
32	all	25	46	–	M25x1.5	20
40	10	30	52	80	M30x1.5	26

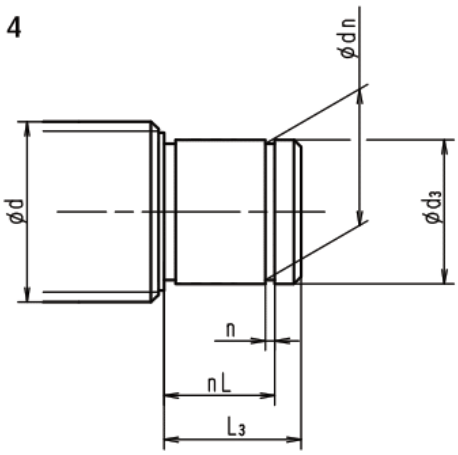
to use BSBD								
Screw shaft d	lead l	Bearing journal			Lock nut thread		Drive section	
		d_1 g6	L_1 (single BSF/BSN)	L_1 (DT BSF/BSN)	m_1	mL_1	d_2 h7	L_2
12	all	–	–	–	–	–	–	–
15	all	12	33	–	M12x1	10	10	15
20	all	15	38	–	M15x1	15	12	20
25	all	20	42	–	M20x1	16	15	27
32	all	25	46	–	M25x1.5	20	20	33
40	10	30	52	80	M30x1.5	26	25	61

Basic 3



Screw shaft d
12
15
20
25
32
40

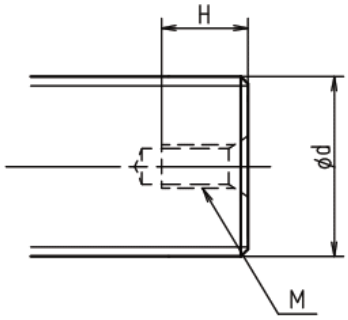
Basic 4



Screw shaft	Snap ring groove			Bearing journal	
d	n	dn	nL	d_3 g6	L_3
12	$0.8\ ^{+0.1}_{0}$	$5.7\ ^{0}_{-0.06}$	6.8	6	9
15	$1.15\ ^{+0.14}_{0}$	$9.6\ ^{0}_{-0.09}$	9.15	10	12
20	$1.15\ ^{+0.14}_{0}$	$14.3\ ^{0}_{-0.11}$	10.15	15	13
25	$1.35\ ^{+0.14}_{0}$	$19\ ^{0}_{-0.21}$	15.35	20	19
32	$1.35\ ^{+0.14}_{0}$	$23.9\ ^{0}_{-0.21}$	16.35	25	20
40	$1.75\ ^{+0.14}_{0}$	$28.6\ ^{0}_{-0.21}$	17.75	30	22

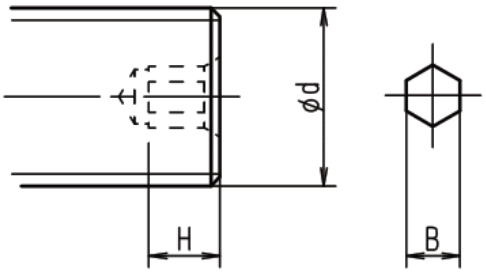
Recommended screw shaft end configuration

Option 1



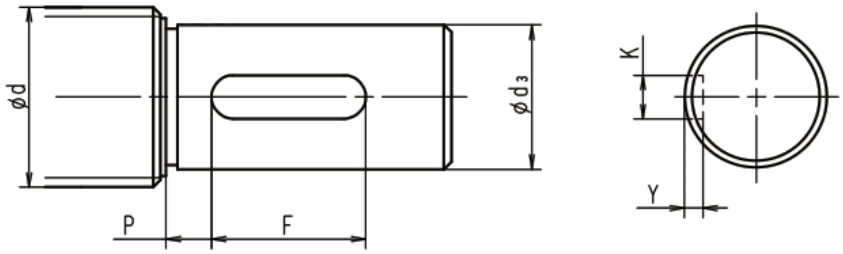
d	M	H
12	M3x0.5	9
15	M4x0.7	10
20	M6x1	12
25	M6x1	12
32	M6x1	12
40	M8x1.25	16

Option 2



Screw shaft	Hexagon hole	
d	$B^{+0.2}_{0}$	H
12	–	–
15	4	6
20	5	7
25	6	8
32	8	10
40	10	12

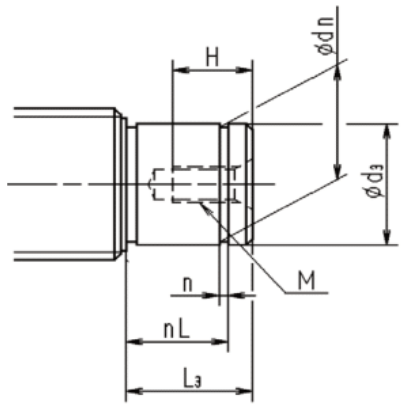
Option 3



Screw shaft	Key way				
d	K N9	$P^{+0.1}_{0}$	Y	F	d_3 g6
12	–	–	–	–	–
15	4	3	2.5	20	12
20	5	3	3	25	15
25	6	4	3.5	30	20
32	8	4	4	40	25
40	8	5	4	40	30

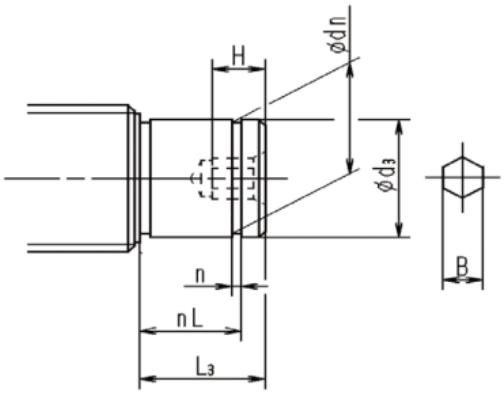
21. Ball Screws – Interchangeable

Option 4



Screw shaft	Bearing journal	Snap ring groove			Tap hole		
d	d_3 g6	n	dn	nL	M	H	L_3
12	6	$0.8\ ^{+0.1}_{0}$	$5.7\ ^{0}_{-0.06}$	6.8	M3x0.5	9	9
15	10	$1.15\ ^{+0.14}_{0}$	$9.6\ ^{0}_{-0.09}$	9.15	M4x0.7	10	12
20	15	$1.15\ ^{+0.14}_{0}$	$14.3\ ^{0}_{-0.11}$	10.15	M6x1	12	13
25	20	$1.35\ ^{+0.14}_{0}$	$19\ ^{0}_{-0.21}$	15.35	M6x1	12	19
32	25	$1.35\ ^{+0.14}_{0}$	$23.9\ ^{0}_{-0.21}$	16.35	M6x1	12	20
40	30	$1.75\ ^{+0.14}_{0}$	$28.6\ ^{0}_{-0.21}$	17.75	M8x1.25	16	22

Option 5



Screw shaft	Bearing Journal	Snap ring groove			Hexagon hole		
d	d_3 g6	n	dn	nL	B $^{+0.2}_{0}$	H	L_3
12	6	$0.8\ ^{+0.1}_{0}$	$5.7\ ^{0}_{-0.06}$	6.8	–	–	9
15	10	$1.15\ ^{+0.14}_{0}$	$9.6\ ^{0}_{-0.09}$	9.15	4	6	12
20	15	$1.15\ ^{+0.14}_{0}$	$14.3\ ^{0}_{-0.11}$	10.15	5	7	13
25	20	$1.35\ ^{+0.14}_{0}$	$19\ ^{0}_{-0.21}$	15.35	6	8	19
32	25	$1.35\ ^{+0.14}_{0}$	$23.9\ ^{0}_{-0.21}$	16.35	8	10	20
40	30	$1.75\ ^{+0.14}_{0}$	$28.6\ ^{0}_{-0.21}$	17.75	10	12	22

Recommended screw shaft end configuration

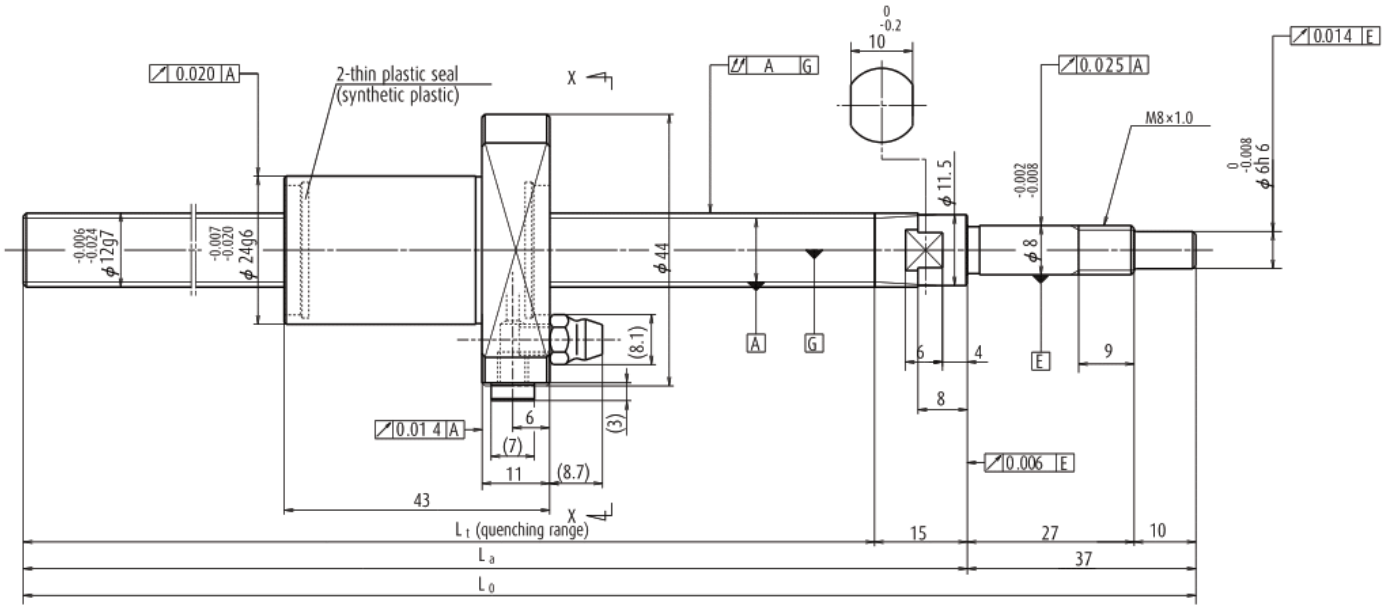
Screw shaft end configuration service

It is possible to have customised modifications of our ball screws implemented quickly and reliably by our service.

The following services can be provided as an alternative:

- Modification of ball screws based on a desired configuration
- End machining
- Change in preload
- Fitting of wipers and lubrication systems
- Fit holes
- Tap holes
- Coatings
- Special packing
- Production even in the smallest lot sizes of 1–50 units
- Individual and special production

Please request these optional services from NSK separately.



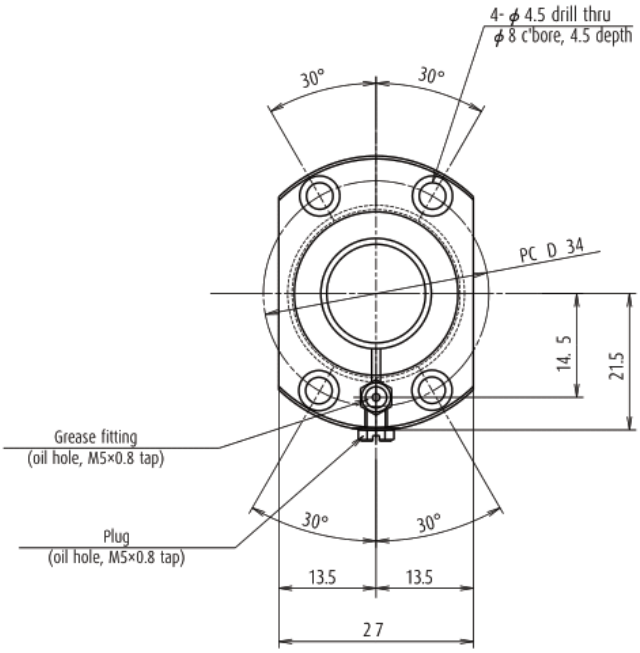
Ball screw No.	Screw shaft diameter d	Lead l	Basic load ratings (N)		Stroke		Nut length	Screw shaft dimensiones			
			Dynamic C_a	Static C_{0a}	Nominal	Max.	L	L_t	L_a	L_0	L_1
FSS1210N1D0400	12	10	3 760	5 780	250	287	43	348	363	400	15
FSS1210N1D0600	12	10	3 760	5 780	450	487	43	548	563	600	15
FSS1210N1D0900	12	10	3 760	5 780	750	787	43	848	863	900	15

Notes

1. Indicates ball screw preload control value. Approximately 2.0 N·cm of torque is added due to thin plastic seals.
2. Service temperature range is 0 to 80°C.
3. Use of NSK support unit is recommended. Refer to page 324 for details.

Screw shaft ϕ12
Lead 10

Unit: mm



Ball screw specification	
Ball diameter/ screw shaft root diameter	2.000 / 10.2
Accuracy grade/axial play	Ct7 / 0.010 or less
Factory-packed grease	NSK grease LR3

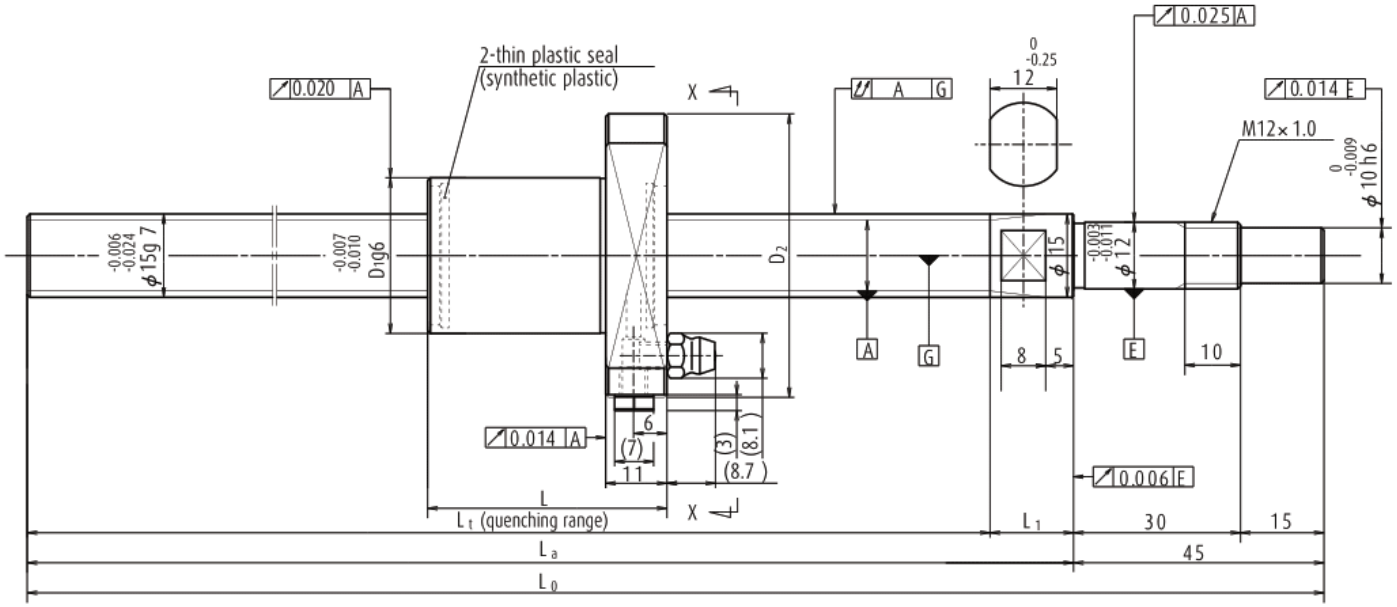
Recommended support unit

For drive side (Fixed)	For opposite to drive side (Simple)
WBK08-01B (low-profile, square)	WBK12SF-01B (low-profile, square)

Unit: mm

Lead accuracy			Shaft run-out	Dynamic preload torque	Mass	Permissible rotational speed (min^{-1}) *5	Internal spatial volume of nut	Standard volume of grease replenishing
Target value T	Error e_p	Variation V_{300}	A	(N·cm)	(kg)	Fixed-Simple	(cm^3)	(cm^3)
0	0.120	0.052	0.080	—	0.5	5 000	1.0	0.5
0	0.195	0.052	0.120	—	0.7	5 000	1.0	0.5
0	0.310	0.052	0.180	—	1.0	2 300	1.0	0.5

4. The stroke and permissible rotational speed shown in the table are the values when the support unit recommended by NSK is used and Fixed-Supported (ball screw mounting method) is selected.
5. Permissible rotational speed varies when using cut screw shaft. It is necessary to calculate two items below, and whichever smaller is the permissible rotational speed.
*Maximum rotational speed 5 000 min^{-1}

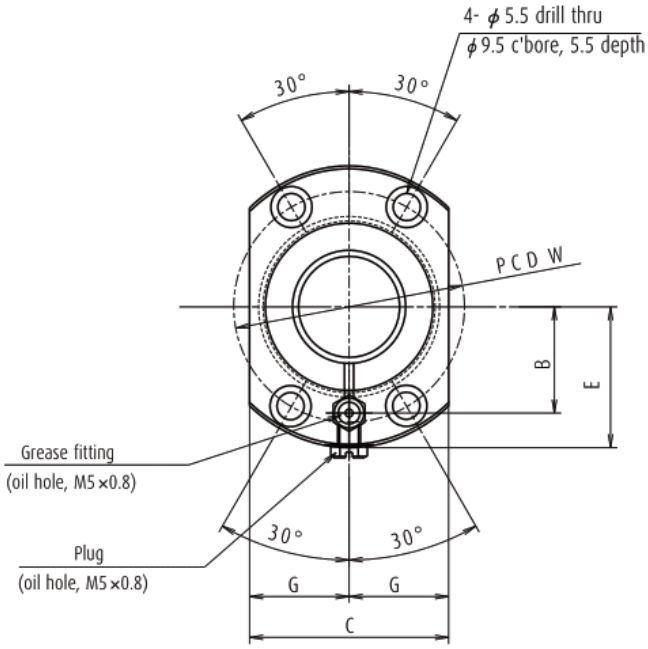


Ball screw No.	Screw shaft diameter d	Lead l	Basic load ratings (N)		Stroke		Screw shaft dimensiones				Lead accuracy		
			Dynamic C_a	Static C_{0a}	Nominal	Max.	L_t	L_a	L_o	L_1	Target value T	Error e_p	Variation V_{300}
FSS1510N1D0500	15	10	6 530	10 200	440	379	440	455	500	15	0	0.155	0.052
FSS1510N1D1000	15	10	6 530	10 200	850	879	940	955	1 000	15	0	0.310	0.052
FSS1510N1D1450	15	10	6 530	10 200	1 300	1 390	1 390	1 405	1 450	15	0	0.490	0.052
FSS1520N1D0500	15	20	5 660	8 700	350	437	437	455	500	18	0	0.155	0.052
FSS1520N1D1000	15	20	5 660	8 700	850	937	937	955	1 000	18	0	0.310	0.052
FSS1520N1D1450	15	20	5 660	8 700	1 300	1 387	1 387	1 405	1 450	18	0	0.490	0.052

Notes
1. Indicates ball screw preload control value. Approximately 2.0 N·cm of torque is added due to thin plastic seals.
2. Service temperature range is 0 to 80˚C.
3. Use of NSK support unit is recommended. Refer to page 324 for details.

Screw shaft ϕ15
Lead 10, 20

Unit: mm



Ball screw specification		
Lead	10	20
Ball diameter/ screw shaft root diameter	2.778 / 12.6	3.175 / 12.2
Accuracy grade/axial play	Ct7 / 0.010 or less	
Factory-packed grease	NSK grease LR3	

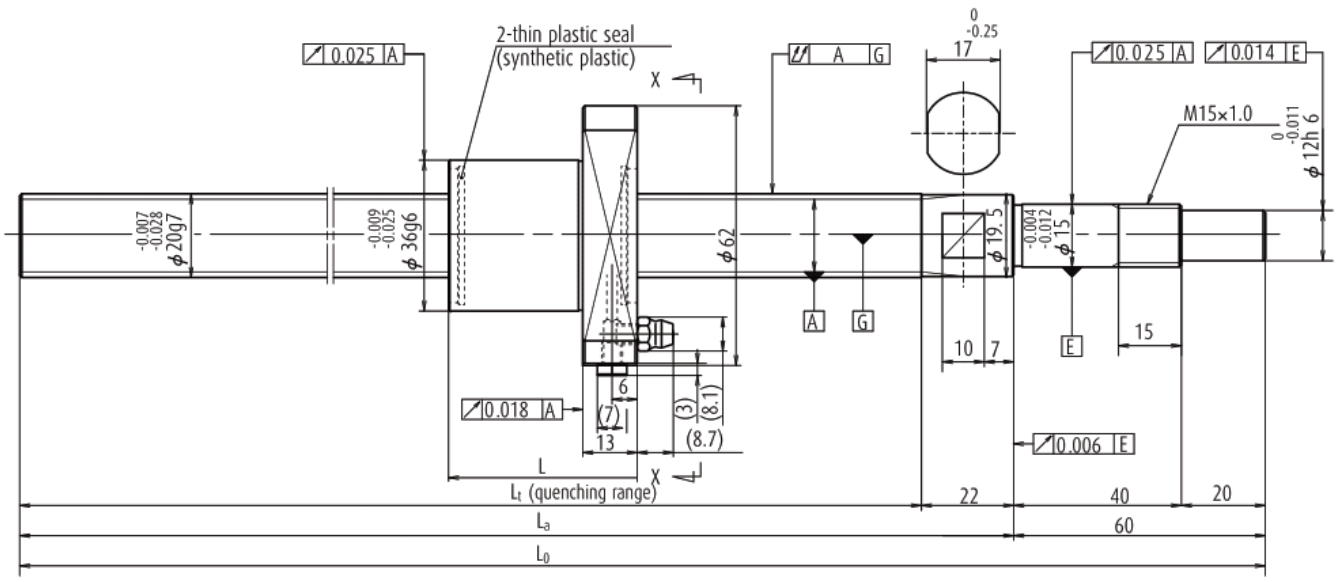
Recommended support unit

For drive side (Fixed)	For opposite to drive side (Simple)
WBK12-01B (low-profile, square)	WBK15SF-01B (low-profile, square)

Unit: mm

Nut dimensions								Shaft run-out	Dynamic preload torque	Mass	Permissible rotational speed (min^{-1}) *5	Internal spatial volume of nut (cm^3)	Standard volume of grease replenishing (cm^3)
L	D_1	D_2	W	B	C	E	G	C	(N·cm)	(kg)	Fixed-Simple		
43	28	51	39	18	31	25	15.5	0.070	—	0.9	5 000	2.0	1.0
43	28	51	39	18	31	25	15.5	0.125	—	1.7	2 300	2.0	1.0
43	28	51	39	18	31	25	15.5	0.200	—	2.3	1 020	2.0	1.0
51	32	55	43	20	33	27	16.5	0.070	—	1.0	5 000	2.8	1.4
51	32	55	43	20	33	27	16.5	0.125	—	1.7	2 260	2.8	1.4
51	32	55	43	20	33	27	16.5	0.200	—	2.3	1 000	2.8	1.4

4. The stroke and permissible rotational speed shown in the table are the values when the support unit recommended by NSK is used and Fixed-Supported (ball screw mounting method) is selected.
5. Permissible rotational speed varies when using cut screw shaft. It is necessary to calculate two items below, and whichever smaller is the permissible rotational speed.
*Maximum rotational speed 5 000 min^{-1}



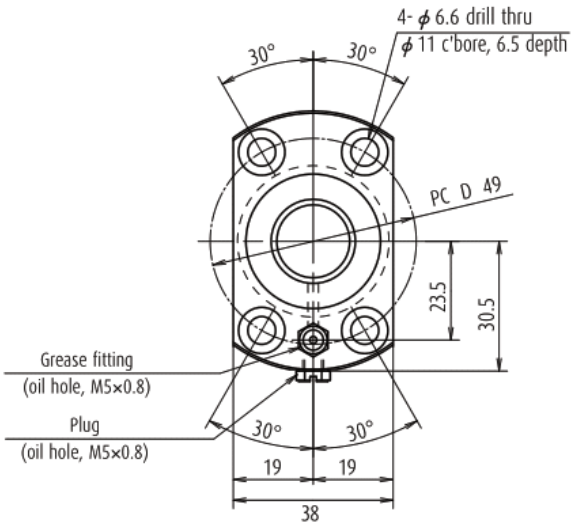
Ball screw No.	Screw shaft diameter d	Lead l	Basic load ratings (N)		Stroke		Nut length	Screw shaft dimensiones			
			Dynamic C_a	Static C_{0a}	Nominal	Max.	L	L_t	L_a	L_o	L_1
FSS2010N1D0600	20	10	10 200	18 600	400	451	45	518	540	600	22
FSS2010N1D1000	20	10	10 200	18 600	800	851	45	918	940	1 000	22
FSS2010N1D1450	20	10	10 200	18 600	1 250	1 301	45	1 368	1 390	1 450	22
FSS2020N1D0600	20	20	6 790	11 800	400	442	54	518	540	600	22
FSS2020N1D1000	20	20	6 790	11 800	800	842	54	918	940	1 000	22
FSS2020N1D1450	20	20	6 790	11 800	1 250	1 292	54	1 368	1 390	1 450	22

Notes

1. Indicates ball screw preload control value. Approximately 2.0 N·cm of torque is added due to thin plastic seals.
2. Service temperature range is 0 to 80°C.
3. Use of NSK support unit is recommended. Refer to page 324 for details.

Screw shaft ϕ20
Lead 10, 20

Unit: mm



Ball screw specification	
Ball diameter/ screw shaft root diameter	3.175 / 17.2
Accuracy grade/axial play	Ct7 / 0.010 or less
Factory-packed grease	NSK grease LR3

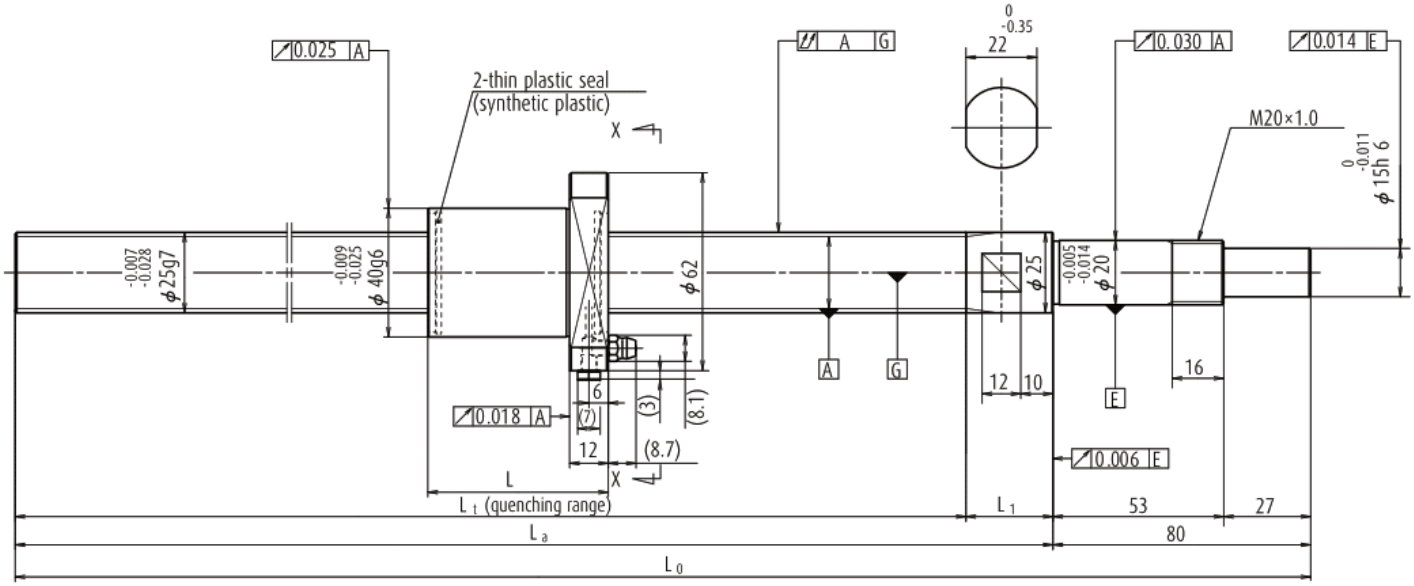
Recommended support unit

For drive side (Fixed)	For opposite to drive side (Simple)
WBK15-01B (low-profile, square)	WBK20SF-01B (low-profile, square)

Unit: mm

Lead accuracy			Shaft run-out	Dynamic preload torque	Mass	Permissible rotational speed (min^{-1}) *5	Internal spatial volume of nut	Standard volume of grease replenishing
Target value T	Error e_p	Variation V_{300}	C	(N·cm)	(kg)	Fixed-Simple	(cm^3)	(cm^3)
0	0.195	0.052	0.085	—	1.7	5 000	3.2	1.6
0	0.310	0.052	0.125	—	2.6	3 310	3.2	1.6
0	0.490	0.052	0.200	—	3.6	1 450	3.2	1.6
0	0.195	0.052	0.085	—	1.8	5 000	3.2	1.6
0	0.310	0.052	0.125	—	2.7	3 350	3.2	1.6
0	0.490	0.052	0.200	—	3.8	1 460	3.2	1.6

4. The stroke and permissible rotational speed shown in the table are the values when the support unit recommended by NSK is used and Fixed-Supported (ball screw mounting method) is selected.
5. Permissible rotational speed varies when using cut screw shaft. It is necessary to calculate two items below, and whichever smaller is the permissible rotational speed.
*Maximum rotational speed 5 000 min^{-1}



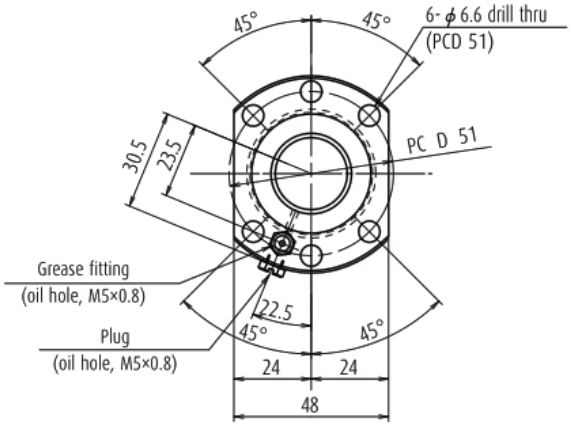
Ball screw No.	Screw shaft diameter d	Lead l	Basic load ratings (N)		Stroke		Nut length	Screw shaft dimensiones			
			Dynamic C_a	Static C_{0a}	Nominal	Max.	L	L_t	L_a	L_o	L_1
FSS2510N1D0600	25	10	15 000	32 400	400	415	56	493	520	600	27
FSS2510N1D1000	25	10	15 000	32 400	800	815	56	893	920	1 000	27
FSS2510N1D1450	25	10	15 000	32 400	1 250	1 265	56	1 343	1 370	1 450	27
FSS2520N1D0600	25	20	7 650	14 800	400	418	54	494	520	600	26
FSS2520N1D1000	25	20	7 650	14 800	800	818	54	894	920	1 000	26
FSS2520N1D1450	25	20	7 650	14 800	1 250	1 268	54	1 344	1 370	1 450	26
FSS2525N1D0600	25	25	7 490	14 600	400	405	63	490	520	600	30
FSS2525N1D1000	25	25	7 490	14 600	800	805	63	890	920	1 000	30
FSS2525N1D1450	25	25	7 490	14 600	1 250	1 255	63	1 340	1 370	1 450	30

Notes

1. Indicates ball screw preload control value. Approximately 2.0 N·cm of torque is added due to thin plastic seals.
2. Service temperature range is 0 to 80˚C.
3. Use of NSK support unit is recommended. Refer to page 324 for details.

Screw shaft ϕ25
Lead 10, 20, 25

Unit: mm



Ball screw specification	
Ball diameter/ screw shaft root diameter	3.175 / 22.2
Accuracy grade/axial play	Ct7 / 0.010 or less
Factory-packed grease	NSK grease LR3

Recommended support unit

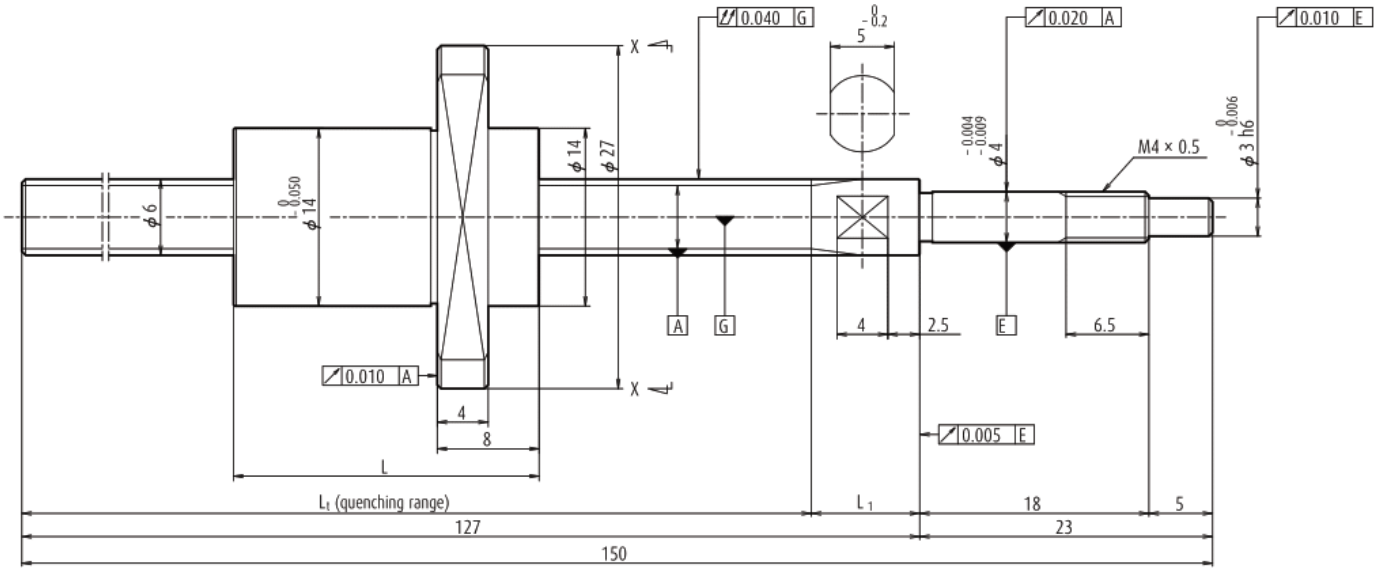
For drive side (Fixed)	For opposite to drive side (Simple)
WBK20-01 (square)	WBK25SF-01 (square)

Unit: mm

Lead accuracy			Shaft run-out	Dynamic preload torque	Mass	Permissible rotational speed (min^{-1}) *5	Internal spatial volume of nut	Standard volume of grease replenishing
Target value T	Error e_p	Variation V_{300}	C	(N·cm)	(kg)	Fixed-Simple	(cm^3)	(cm^3)
0	0.155	0.052	0.065	—	2.6	5 000	4.7	2.4
0	0.310	0.052	0.090	—	4.0	4 590	4.7	2.4
0	0.490	0.052	0.130	—	5.8	1 970	4.7	2.4
0	0.155	0.052	0.065	—	2.6	5 000	3.9	2.0
0	0.310	0.052	0.090	—	4.0	4 570	3.9	2.0
0	0.490	0.052	0.130	—	5.8	1 960	3.9	2.0
0	0.155	0.052	0.065	—	2.6	5 000	4.3	2.2
0	0.310	0.052	0.090	—	4.1	4 660	4.3	2.2
0	0.490	0.052	0.130	—	5.8	1 990	4.3	2.2

4. The stroke and permissible rotational speed shown in the table are the values when the support unit recommended by NSK is used and Fixed-Supported (ball screw mounting method) is selected.
5. Permissible rotational speed varies when using cut screw shaft. It is necessary to calculate two items below, and whichever smaller is the permissible rotational speed.
*Maximum rotational speed 5 000 min^{-1}

23. Compact FA PSS Type

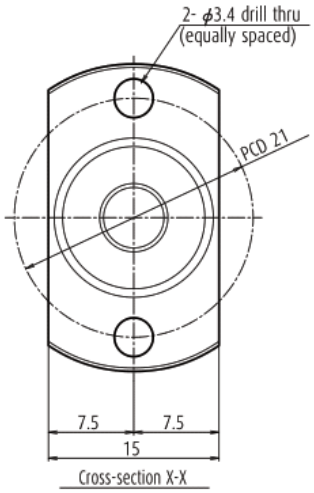


Ball screw No.	Screw shaft diameter d	Lead l	Effective tums of balls	Basic load ratings (N)		Maximum stroke	Nut length L	Screw shaft dimensiones	
				Dynamic C_a	Static C_{0a}			L_t	L_1
PSS0608NAD0150	6	8	2	690	805	97.5	16	118.5	8.5
PSS0608NBD0150	6	8	4	1 480	1 940	89.5	24	118.5	8.5
PSS0612NAD0150	6	12	2	665	800	92	20	117	10
PSS0612NBD0150	6	12	4	1 430	1 970	80	32	117	10

Note 1. Contact NSK if permissible rotational speed is to be exceeded.

Screw shaft ϕ6
Lead 8, 12

Unit: mm



Ball screw specification	
Ball diameter/screw shaft root diameter	1.2 / 4.9
Ball circle dia.	6.2
Accuracy grade/axial play	C5 / 0.005 or less
Factory-packed grease	NSK grease PS2

Recommended

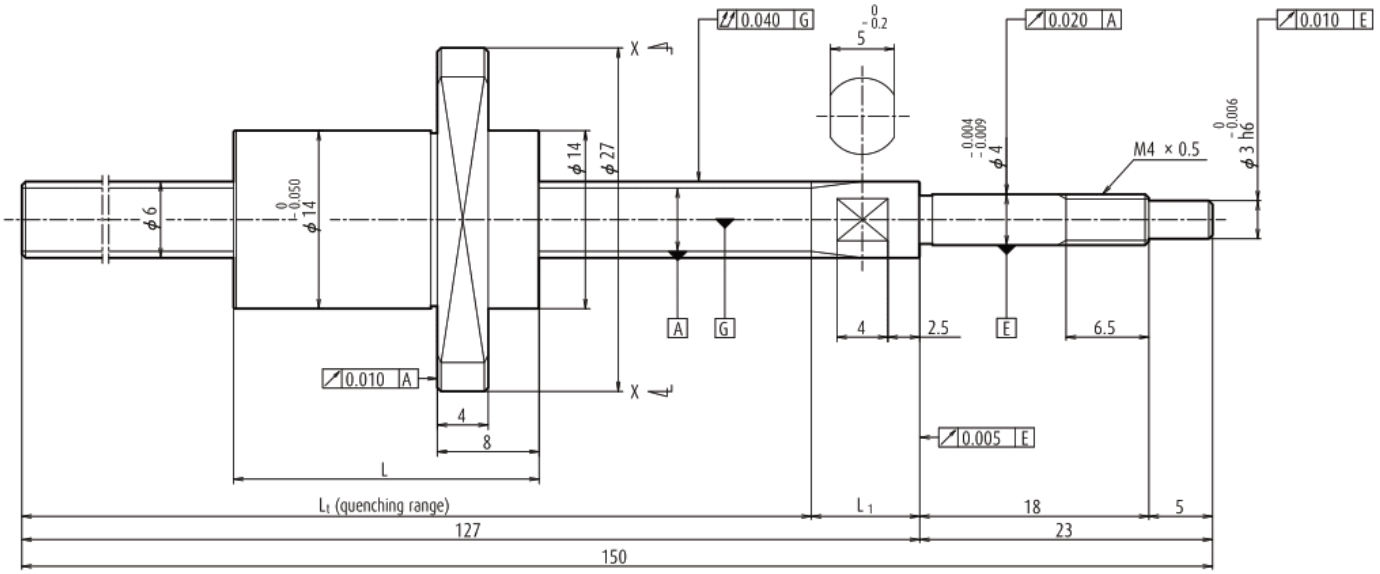
For drive side (Fixed)
WBK04-01M (square)
WBK04-11M (round)

Unit: mm

Lead accuracy			Dynamic preload torque	Mass	Permissible rotational speed	Internal spatial volume of nut	Standard volume of grease replenishing
Target value T	Error e_p	Variation v_u	(N·cm)	(kg)	(min^{-1}) *1	(cm^3)	(cm^3)
0	0.020	18	~0.5	0.06	5 000	0.2	0.1
0	0.020	18	~0.5	0.06	5 000	0.3	0.2
0	0.020	18	~0.5	0.06	5 000	0.2	0.1
0	0.020	18	~0.5	0.07	5 000	0.3	0.2

2. Service temperature range is 0 to 80°C.
3. Use of NSK support unit is recommended. Refer to page 324 for details.

23. Compact FA PSS Type

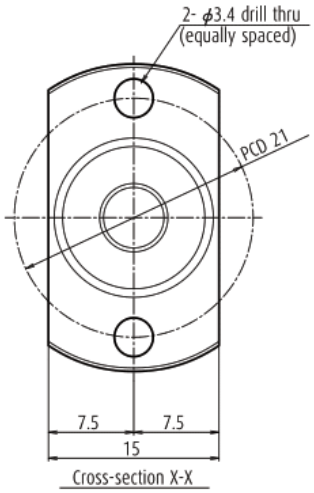


Ball screw No.	Screw shaft diameter d	Lead l	Effective tums of balls	Basic load ratings (N)		Maximum stroke	Nut length L	Screw shaft dimensiones	
				Dynamic C_a	Static C_{0a}			L_t	L_1
PSS0810NAD0150	8	10	2	1 150	1 420	86.5	18	109.5	10.5
PSS0810NBD0150	8	10	4	2 470	3 430	76.5	28	109.5	10.5
PSS0815NAD0150	8	15	2	1 130	1 430	80	22	107	13
PSS0815NBD0150	8	15	4	2 410	3 520	65	37	107	13

Note 1. Contact NSK if permissible rotational speed is to be exceeded.

Screw shaft ϕ8
Lead 10, 15

Unit: mm



Ball screw specification	
Ball diameter/screw shaft root diameter	1.588 / 6.6
Ball circle dia.	8.3
Accuracy grade/axial play	C5 / 0.005 or less
Factory-packed grease	NSK grease PS2

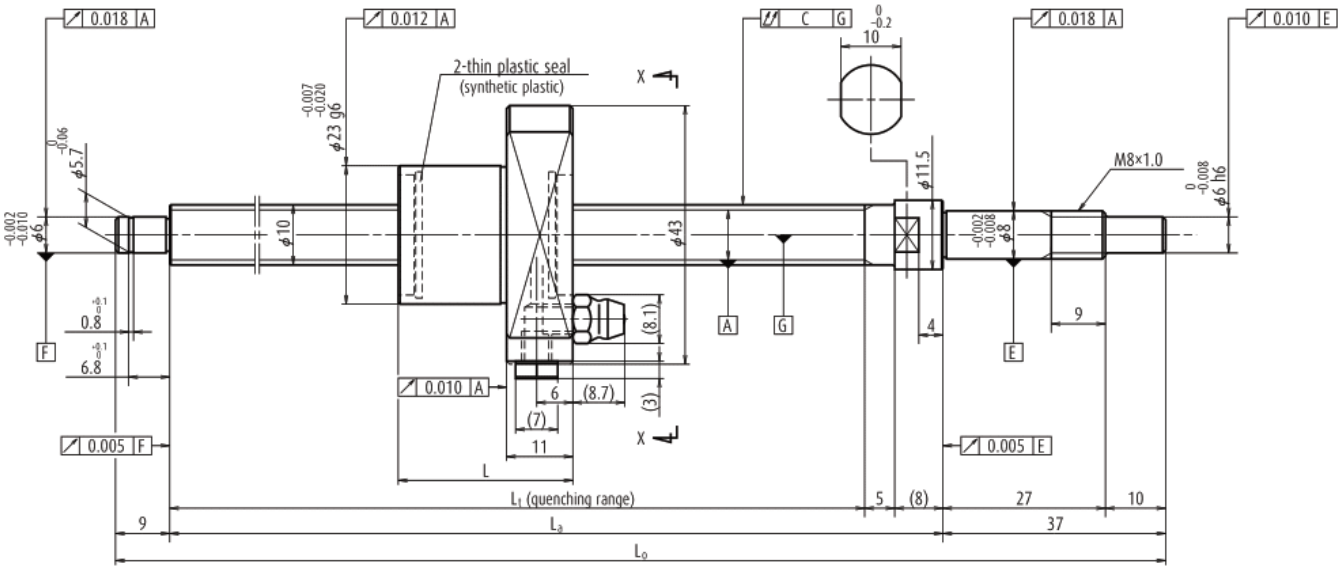
Recommended

For drive side (Fixed)
WBK06-01M (square)
WBK06-11M (round)

Unit: mm

Lead accuracy			Dynamic preload torque	Mass	Permissible rotational speed	Internal spatial volume of nut	Standard volume of grease replenishing
Target value T	Error e_p	Variation v_u	(N·cm)	(kg)	(min^{-1}) *1	(cm^3)	(cm^3)
0	0.020	18	~0.5	0.09	5 000	0.4	0.2
0	0.020	18	~0.5	0.11	5 000	0.5	0.3
0	0.020	18	~0.5	0.1	5 000	0.4	0.2
0	0.020	18	~0.5	0.12	5 000	0.6	0.3

2. Service temperature range is 0 to 80°C.
3. Use of NSK support unit is recommended. Refer to page 324 for details.



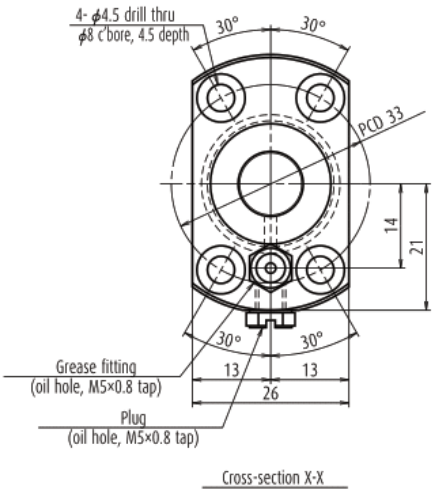
Ball screw No.	Screw shaft diameter d	Lead l	Basic load ratings (N)		Stroke		Nut length L	Screw shaft dimensiones		
			Dynamic C_a	Static C_{0a}	Nominal	MAX.		L_t	L_a	L_o
PSS1005N1D0171	10	5	3 420	4 840	50	78	29	112	125	171
PSS1005N1D0221	10	5	3 420	4 840	100	128	29	162	175	221
PSS1005N1D0321	10	5	3 420	4 840	200	228	29	262	275	321
PSS1005N1D0421	10	5	3 420	4 840	300	328	29	362	375	421
PSS1005N1D0521	10	5	3 420	4 840	400	428	29	462	475	521
PSS1010N1D0221	10	10	2 290	2 980	100	125	32	162	175	221
PSS1010N1D0321	10	10	2 290	2 980	200	225	32	262	275	321
PSS1010N1D0421	10	10	2 290	2 980	300	325	32	362	375	421
PSS1010N1D0521	10	10	2 290	2 980	400	425	32	462	475	521

Notes

1. Indicates ball screw preload control value. Approximately 2.0 N·cm of torque is added due to thin plastic seals.
2. Contact NSK if permissible rotational speed is to be exceeded.
3. Service temperature range is 0 to 80˚C.

Screw shaft ϕ10
Lead 5, 10

Unit: mm



Ball screw specification	
Preload type	Oversize ball preload (P-preload)
Ball diameter/screw shaft root diameter	2.000 / 8.2
Ball circle dia.	10.3
Accuracy grade/axial play	C5 / 0
Factory-packed grease	NSK grease PS2

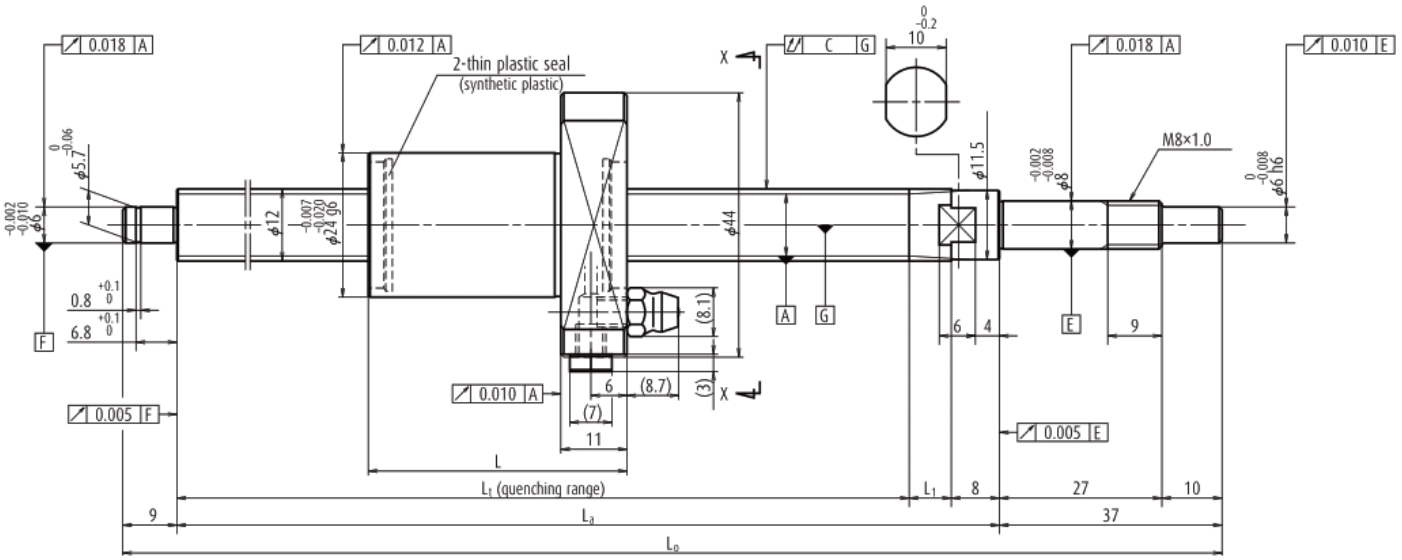
Recommended support unit

For drive side (Fixed)	For opposite to drive side (Simple)
WBK08-01B (low-profile, square)	WBK08S-01B (low-profile, square)
WBK08-11 (round)	
WBK08-11B (round, light load)	

Unit: mm

Lead accuracy			Shaft run-out	Dynamic preload torque	Mass	Permissible rotational speed (min^{-1}) *2	Internal spatial volume of nut	Standard volume of grease replenishing
Target value T	Error e_p	Variation v_u	C	(N·cm) *1	(kg)	Fixed-Simple	(cm^3)	(cm^3)
0	0.020	0.018	0.030	0.7 – 3.3	0.3	5 000	0.8	0.4
0	0.020	0.018	0.045	0.7 – 3.3	0.3	5 000	0.8	0.4
0	0.023	0.018	0.060	0.6 – 4.3	0.3	5 000	0.8	0.4
0	0.025	0.020	0.070	0.6 – 4.3	0.4	5 000	0.8	0.4
0	0.027	0.020	0.085	0.4 – 4.9	0.5	5 000	0.8	0.4
0	0.020	0.018	0.045	0.7 – 3.3	0.3	5 000	0.7	0.4
0	0.023	0.018	0.060	0.6 – 4.3	0.4	5 000	0.7	0.4
0	0.025	0.020	0.070	0.6 – 4.3	0.4	5 000	0.7	0.4
0	0.027	0.020	0.085	0.4 – 4.9	0.5	5 000	0.7	0.4

4. Use of NSK support unit is recommended. Refer to page 324 for details.
5. Recommended quantity of grease is about 50% of ball nut's internal space. See page 445 for details.

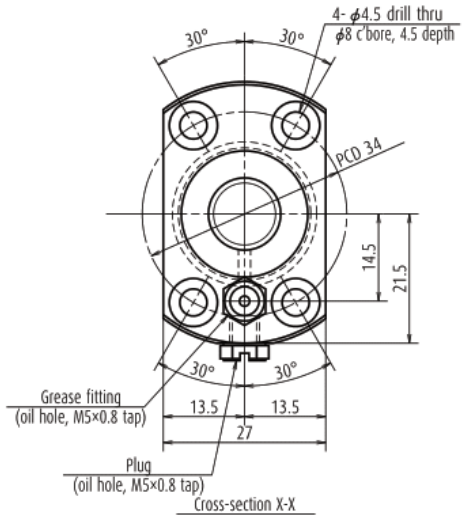


Ball screw No.	Screw shaft diameter d	Lead l	Basic load ratings (N)		Stroke		Nut length L	Screw shaft dimensiones			
			Dynamic C_a	Static C_{0a}	Nominal	MAX.		L_t	L_a	L_o	L_1
PSS1205N1D0171	12	5	3 750	5 810	50	75	30	110	125	171	7
PSS1205N1D0221	12	5	3 750	5 810	100	125	30	160	175	221	7
PSS1205N1D0321	12	5	3 750	5 810	200	225	30	260	275	321	7
PSS1205N1D0421	12	5	3 750	5 810	300	325	30	360	375	421	7
PSS1205N1D0521	12	5	3 750	5 810	400	425	30	460	475	521	7
PSS1205N1D0621	12	10	3 750	5 810	500	525	30	560	575	621	7
PSS1210N1D0221	12	10	3 760	5 780	100	112	43	160	175	221	7
PSS1210N1D0321	12	10	3 760	5 780	200	212	43	260	275	321	7
PSS1210N1D0421	12	10	3 760	5 780	300	312	43	360	375	421	7
PSS1210N1D0521	12	10	3 760	5 780	400	412	43	460	475	521	7
PSS1210N1D0621	12	10	3 760	5 780	500	512	43	560	575	621	7
PSS1220N1D0271	12	20	2 330	3 600	100	153	50	208	225	271	9
PSS1220N1D0371	12	20	2 330	3 600	200	253	50	308	325	371	9
PSS1220N1D0471	12	20	2 330	3 600	300	353	50	408	425	471	9
PSS1220N1D0571	12	20	2 330	3 600	400	453	50	508	525	571	9
PSS1220N1D0671	12	20	2 330	3 600	500	553	50	608	625	671	9
PSS1230N1D0271	12	30	2 190	3 650	100	128	70	203	225	271	14
PSS1230N1D0371	12	30	2 190	3 650	200	228	70	303	325	371	14
PSS1230N1D0471	12	30	2 190	3 650	300	328	70	403	425	471	14
PSS1230N1D0571	12	30	2 190	3 650	400	428	70	503	525	571	14
PSS1230N1D0671	12	30	2 190	3 650	500	528	70	603	625	671	14

Notes

1. Indicates ball screw preload control value. Approximately 2.0 N·cm of torque is added due to thin plastic seals.
2. Contact NSK if permissible rotational speed is to be exceeded.
3. Service temperature range is 0 to 80°C.

Nut model: BSS



Screw shaft ϕ12
Lead 5, 10, 20, 30

Unit: mm

Ball screw specification	
Preload type	Oversize ball preload (P-preload)
Ball diameter/screw shaft root diameter	2.000 / 10.2
Ball circle dia.	12.3
Accuracy grade/axial play	C5 / 0
Factory-packed grease	NSK grease PS2

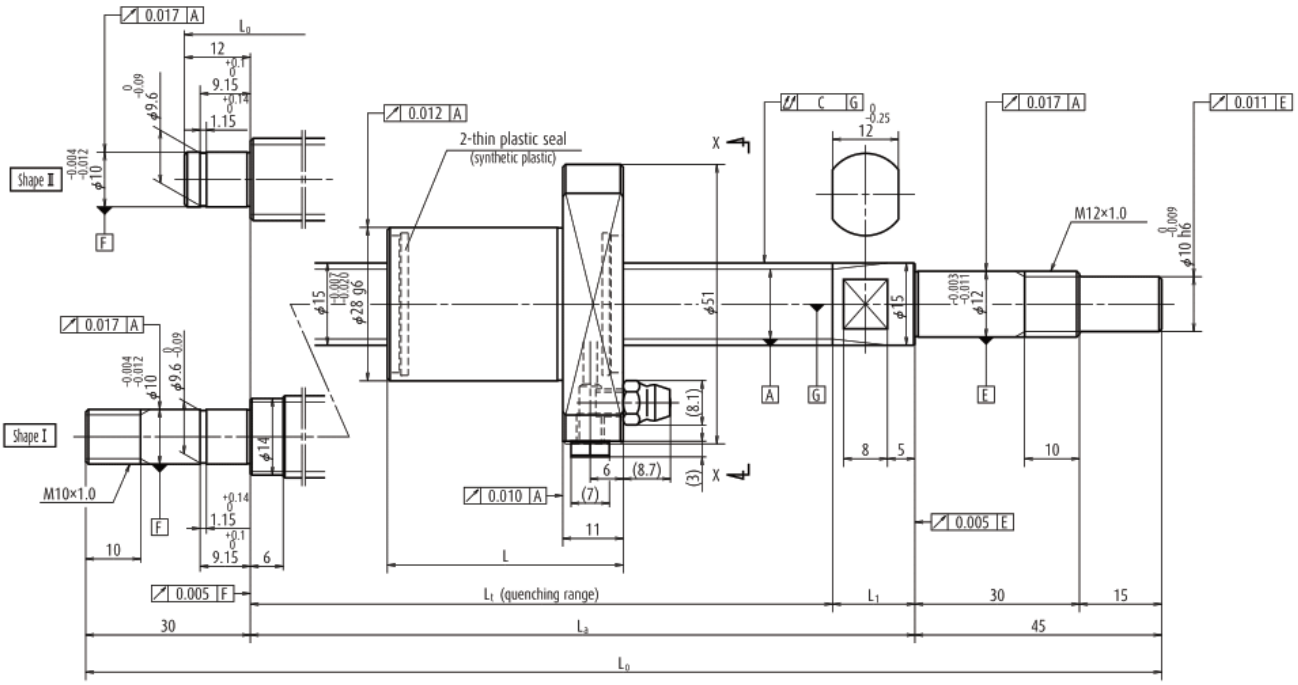
Recommended support unit

For drive side (Fixed)	For opposite to drive side (Simple)
WBK08-01B (low-profile, square)	WBK08S-01B (low-profile, square)
WBK08-11 (round)	
WBK08-11B (round, light load)	

Unit: mm

Lead accuracy			Shaft run-out	Dynamic preload torque	Mass	Permissible rotational speed (min^{-1}) *2	Internal spatial volume of nut	Standard volume of grease replenishing
Target value T	Error e_p	Variation v_u	C	(N·cm) *1	(kg)	Fixed-Simple	(cm^3)	(cm^3)
0	0.020	0.018	0.030	0.7 – 3.3	0.3	5 000	1.0	0.5
0	0.020	0.018	0.045	0.7 – 3.3	0.3	5 000	1.0	0.5
0	0.023	0.018	0.060	0.6 – 4.3	0.3	5 000	1.0	0.5
0	0.025	0.020	0.070	0.6 – 4.3	0.4	5 000	1.0	0.5
0	0.027	0.020	0.085	0.6 – 4.3	0.5	5 000	1.0	0.5
0	0.030	0.023	0.085	0.4 – 4.9	0.3	5 000	1.0	0.5
0	0.020	0.018	0.045	0.7 – 3.3	0.4	5 000	1.0	0.5
0	0.023	0.020	0.060	0.6 – 4.3	0.5	5 000	1.0	0.5
0	0.025	0.020	0.070	0.6 – 4.3	0.5	5 000	1.0	0.5
0	0.027	0.020	0.085	0.6 – 4.3	0.6	5 000	1.0	0.5
0	0.030	0.023	0.085	0.4 – 4.9	0.7	5 000	1.0	0.5
0	0.023	0.018	0.045	1.4 – 4.5	0.4	5 000	1.2	0.6
0	0.023	0.018	0.060	0.9 – 4.9	0.5	5 000	1.2	0.6
0	0.027	0.020	0.070	0.9 – 4.9	0.6	5 000	1.2	0.6
0	0.030	0.023	0.085	0.6 – 5.9	0.7	5 000	1.2	0.6
0	0.030	0.023	0.110	0.6 – 5.9	0.8	4 480	1.2	0.6
0	0.023	0.018	0.045	1.4 – 4.5	0.5	5 000	1.5	0.8
0	0.023	0.018	0.060	0.9 – 4.9	0.6	5 000	1.5	0.8
0	0.027	0.020	0.070	0.9 – 4.9	0.7	5 000	1.5	0.8
0	0.030	0.023	0.085	0.6 – 5.9	0.7	5 000	1.5	0.8
0	0.030	0.023	0.110	0.6 – 5.9	0.8	4 720	1.5	0.8

4. Use of NSK support unit is recommended. Refer to page 324 for details.
5. Recommended quantity of grease is about 50% of ball nut's internal space. See page 445 for details.



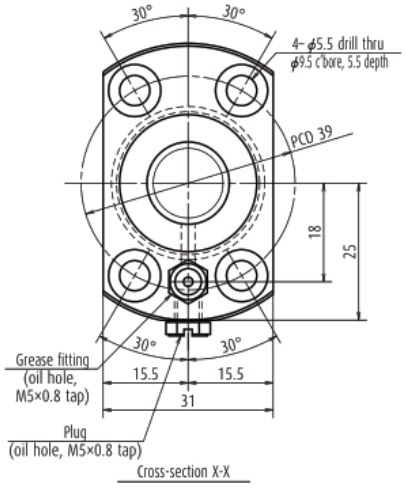
Ball screw No.	Screw shaft dia-meter d	Lead l	Basic load ratings (N)		Stroke		Nut length L	Screw shaft dimensiones			
			Dynamic C_a	Static C_{0a}	Nominal	MAX.		L_t	L_a	L_o	L_1
PSS1505N1D0211	15	5	6 410	10 100	50	103	30	139	154	211	15
PSS1505N1D0261	15	5	6 410	10 100	100	153	30	189	204	261	15
PSS1505N1D0361	15	5	6 410	10 100	200	253	30	289	304	361	15
PSS1505N1D0461	15	5	6 410	10 100	300	353	30	389	404	461	15
PSS1505N1D0561	15	5	6 410	10 100	400	453	30	489	504	561	15
PSS1505N1D0661	15	5	6 410	10 100	500	553	30	589	604	661	15
PSS1505N1D0761	15	5	6 410	10 100	600	653	30	689	704	761	15
PSS1510N1D0261	15	10	6 530	10 200	100	140	43	189	204	261	15
PSS1510N1D0361	15	10	6 530	10 200	200	240	43	289	304	361	15
PSS1510N1D0461	15	10	6 530	10 200	300	340	43	389	404	461	15
PSS1510N1D0561	15	10	6 530	10 200	400	440	43	489	504	561	15
PSS1510N1D0661	15	10	6 530	10 200	500	540	43	589	604	661	15
PSS1510N1D0761	15	10	6 530	10 200	600	640	43	689	704	761	15
PSS1510N1D0879	15	10	6 530	10 200	700	740	43	789	804	879	15
PSS1510N1D0979	15	10	6 530	10 200	800	846	43	889	904	979	15
PSS1510N1D1179	15	10	6 530	10 200	1 000	1 040	43	1 089	1 104	1 179	15

Notes

1. Indicates ball screw preload control value. Approximately 2.0 N·cm of torque is added due to thin plastic seals.
2. Contact NSK if permissible rotational speed is to be exceeded.
3. Service temperature range is 0 to 80˚C.

Screw shaft ϕ 15
Lead 5, 10

Unit: mm



Ball screw specification	
Preload type	Oversize ball preload (P-preload)
Ball diameter/screw shaft root diameter	2.778 / 12.6
Ball circle dia.	15.5
Accuracy grade/axial play	C5 / 0
Factory-packed grease	NSK grease LR3

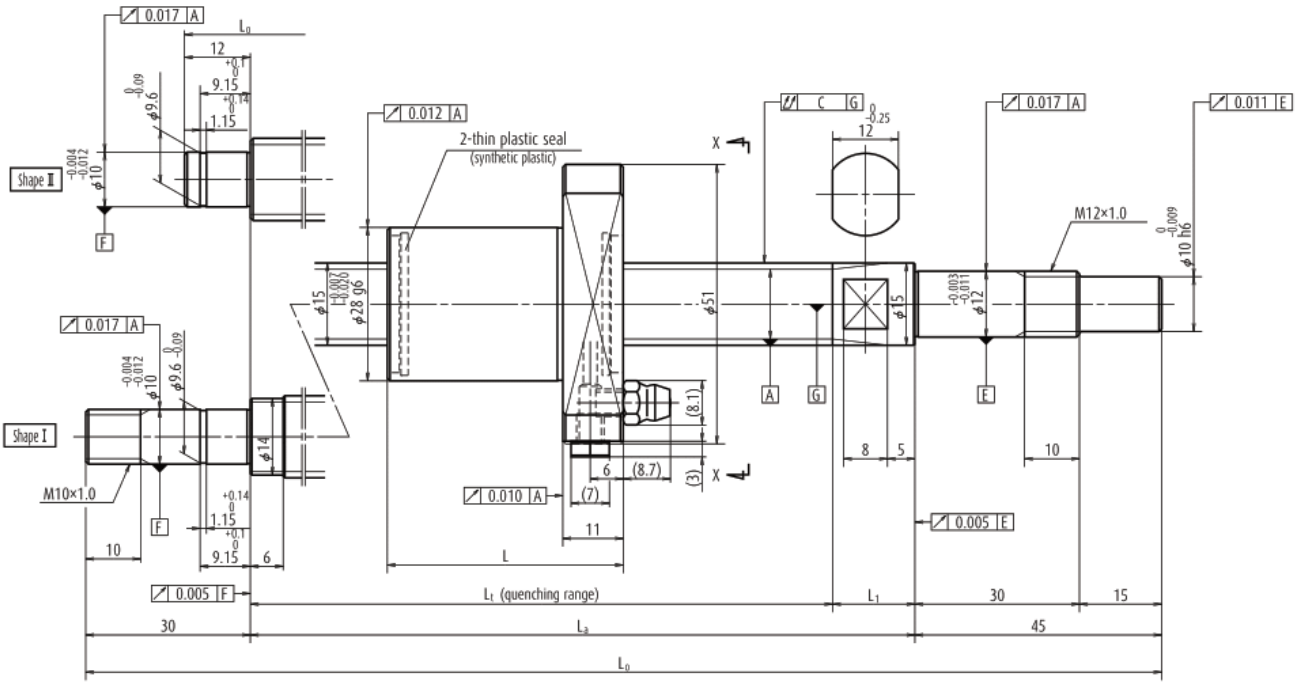
Recommended support unit

For drive side (Fixed)	For opposite to drive side	
	(Fixed)	(Simple)
WBK12-01B (low-profile, square)	WBK10-01B (low-profile, square)	WBK12S-01B (low-profile, square)
WBK12-11B (round)	WBK10-11 (round)	

Unit: mm

Left shaft end (opposite driven side)	Lead accuracy			Shaft run-out	Dynamic preload torque	Mass	Permissible rotational speed (min^{-1}) *2		Internal spatial volume of nut (cm^3)	Standard volume of grease replenishing (cm^3)
	Target value T	Error e_p	Variation v_u	C	(N·cm) *1	(kg)	Fixed-Simple	Fixed-Fixed		
Ⅱ	0	0.020	0.018	0.035	0.2 – 6.9	0.5	5 000	–	2.0	1.0
Ⅱ	0	0.020	0.018	0.035	0.2 – 6.9	0.5	5 000	–	2.0	1.0
Ⅱ	0	0.023	0.018	0.045	0.2 – 6.9	0.6	5 000	–	2.0	1.0
Ⅱ	0	0.025	0.020	0.050	0.4 – 9.8	0.8	5 000	–	2.0	1.0
Ⅱ	0	0.027	0.020	0.060	0.4 – 9.8	0.9	5 000	–	2.0	1.0
Ⅱ	0	0.030	0.023	0.075	0.4 – 9.8	1.0	5 000	–	2.0	1.0
Ⅱ	0	0.035	0.025	0.075	0.4 – 11.8	1.1	4 130	–	2.0	1.0
Ⅱ	0	0.020	0.018	0.035	0.6 – 7.4	0.6	5 000	–	2.0	1.0
Ⅱ	0	0.023	0.018	0.045	0.6 – 7.4	0.7	5 000	–	2.0	1.0
Ⅱ	0	0.025	0.020	0.050	0.4 – 9.8	0.8	5 000	–	2.0	1.0
Ⅱ	0	0.027	0.020	0.060	0.4 – 9.8	1.0	5 000	–	2.0	1.0
Ⅱ	0	0.030	0.023	0.075	0.4 – 9.8	1.1	5 000	–	2.0	1.0
Ⅱ	0	0.035	0.025	0.075	0.4 – 11.8	1.2	4 210	–	2.0	1.0
Ⅰ	0	0.035	0.025	0.095	0.4 – 11.8	1.4	3 190	4 410	2.0	1.0
Ⅰ	0	0.040	0.027	0.095	0.4 – 11.8	1.5	2 500	3 470	2.0	1.0
Ⅰ	0	0.046	0.030	0.120	0.4 – 11.8	1.7	1 650	2 320	2.0	1.0

4. Use of NSK support unit is recommended. Refer to page 324 for details.
5. Recommended quantity of grease is about 50% of ball nut's internal space. See page 445 for details.



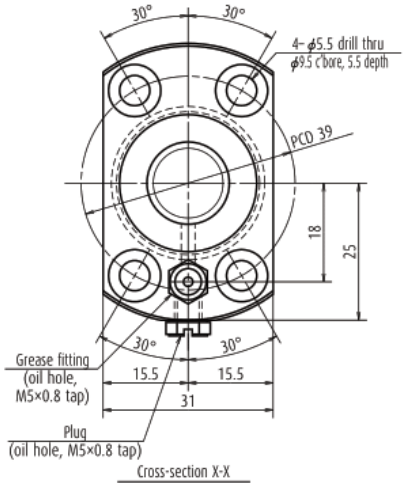
Ball screw No.	Screw shaft dia-meter d	Lead l	Basic load ratings (N)		Stroke		Nut length L	Screw shaft dimensiones			
			Dynamic C_a	Static C_{0a}	Nominal	MAX.		L_t	L_a	L_o	L_1
PSS1520N1D0261	15	20	5 660	8 700	100	129	51	186	204	261	18
PSS1520N1D0361	15	20	5 660	8 700	200	229	51	286	304	361	18
PSS1520N1D0461	15	20	5 660	8 700	300	329	51	386	404	461	18
PSS1520N1D0561	15	20	5 660	8 700	400	429	51	486	504	561	18
PSS1520N1D0661	15	20	5 660	8 700	500	529	51	586	604	661	18
PSS1520N1D0761	15	20	5 660	8 700	600	629	51	686	704	761	18
PSS1520N1D0879	15	20	5 660	8 700	700	729	51	786	804	879	18
PSS1520N1D0979	15	20	5 660	8 700	800	829	51	886	904	979	18
PSS1520N1D1179	15	20	5 660	8 700	1 000	1 029	51	1 086	1 104	1 179	18
PSS1530N1D0311	15	30	5 500	8 580	100	153	71	230	254	311	24
PSS1530N1D0411	15	30	5 500	8 580	200	253	71	330	354	411	24
PSS1530N1D0511	15	30	5 500	8 580	300	353	71	430	454	511	24
PSS1530N1D0611	15	30	5 500	8 580	400	453	71	530	554	611	24
PSS1530N1D0711	15	30	5 500	8 580	500	553	71	630	654	711	24
PSS1530N1D0811	15	30	5 500	8 580	600	653	71	730	754	811	24
PSS1530N1D0929	15	30	5 500	8 580	700	753	71	830	854	929	24
PSS1530N1D1029	15	30	5 500	8 580	800	853	71	930	954	1 029	24
PSS1530N1D1229	15	30	5 500	8 580	1 000	1 053	71	1 130	1 154	1 229	24

Notes

1. Indicates ball screw preload control value. Approximately 2.0 N·cm of torque is added due to thin plastic seals.
2. Contact NSK if permissible rotational speed is to be exceeded.
3. Service temperature range is 0 to 80˚C.

Screw shaft ϕ15
Lead 20, 30

Unit: mm



Ball screw specification	
Preload type	Oversize ball preload (P-preload)
Ball diameter/screw shaft root diameter	3.175 / 12.2
Ball circle dia.	15.5
Accuracy grade/axial play	C5 / 0
Factory-packed grease	NSK grease LR3

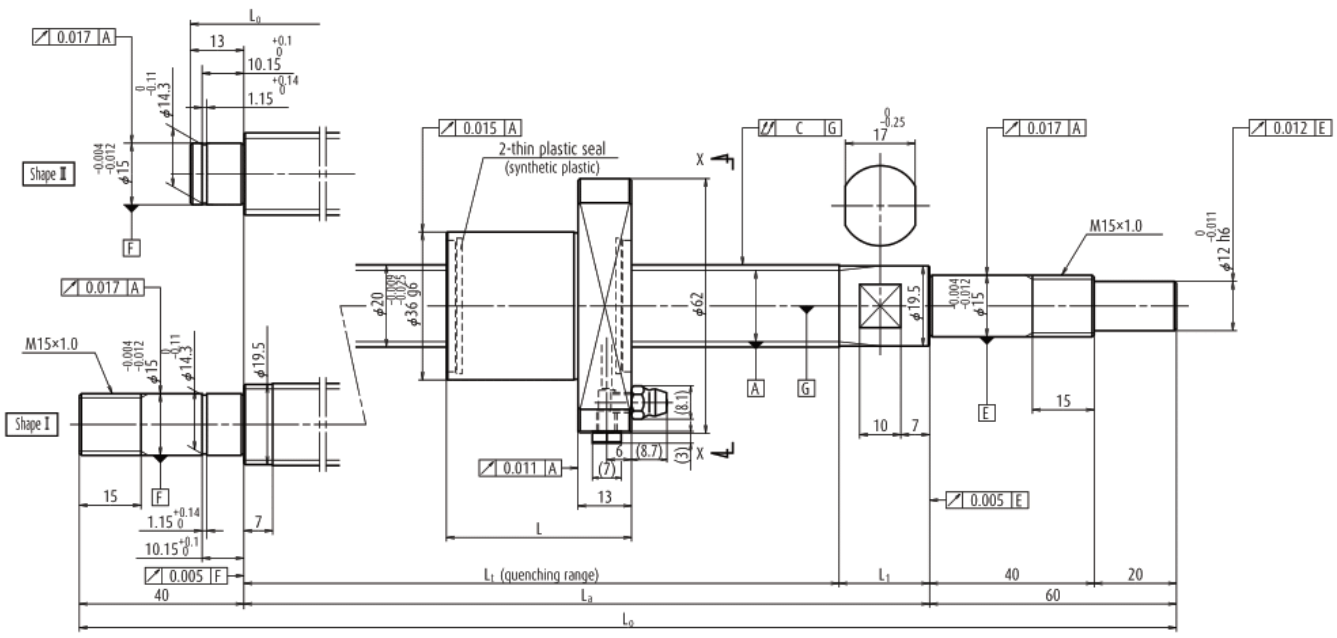
Recommended support unit

For drive side (Fixed)	For opposite to drive side	
	(Fixed)	(Simple)
WBK12-01B (low-profile, square)	WBK10-01B (low-profile, square)	WBK12S-01B (low-profile, square)
WBK12-11 (round)	WBK10-11 (round)	

Unit: mm

Left shaft end (opposite driven side)	Lead accuracy			Shaft run-out	Dynamic preload torque	Mass	Permissible rotational speed (min^{-1}) *2		Internal spatial volume of nut (cm^3)	Standard volume of grease replenishing (cm^3)
	Target value T	Error e_p	Variation v_u	C	(N·cm) *1	(kg)	Fixed-Simple	Fixed-Fixed		
Ⅱ	0	0.020	0.018	0.035	0.8 – 8.8	0.7	5 000	—	2.8	1.4
Ⅱ	0	0.023	0.018	0.045	0.8 – 8.8	0.8	5 000	—	2.8	1.4
Ⅱ	0	0.025	0.020	0.050	0.8 – 10.8	0.9	5 000	—	2.8	1.4
Ⅱ	0	0.027	0.020	0.060	0.8 – 10.8	1.1	5 000	—	2.8	1.4
Ⅱ	0	0.030	0.023	0.075	0.8 – 10.8	1.2	5 000	—	2.8	1.4
Ⅱ	0	0.035	0.025	0.075	0.8 – 13.8	1.3	4 170	—	2.8	1.4
Ⅰ	0	0.035	0.025	0.095	0.8 – 13.8	1.5	3 150	4 310	2.8	1.4
Ⅰ	0	0.040	0.027	0.095	0.8 – 13.8	1.6	2 460	3 390	2.8	1.4
Ⅰ	0	0.046	0.030	0.120	0.8 – 13.8	1.9	1 620	2 260	2.8	1.4
Ⅱ	0	0.023	0.018	0.035	1.2 – 9.3	0.8	5 000	—	3.4	1.7
Ⅱ	0	0.025	0.020	0.050	0.8 – 10.8	1.0	5 000	—	3.4	1.7
Ⅱ	0	0.027	0.020	0.060	0.8 – 10.8	1.1	5 000	—	3.4	1.7
Ⅱ	0	0.030	0.023	0.060	0.8 – 10.8	1.2	5 000	—	3.4	1.7
Ⅱ	0	0.030	0.023	0.075	0.8 – 13.8	1.4	5 000	—	3.4	1.7
Ⅱ	0	0.035	0.025	0.095	0.8 – 13.8	1.5	3 770	—	3.4	1.7
Ⅰ	0	0.040	0.027	0.095	0.8 – 13.8	1.6	2 880	3 910	3.4	1.7
Ⅰ	0	0.040	0.027	0.120	0.8 – 13.8	1.8	2 310	3 110	3.4	1.7
Ⅰ	0	0.046	0.030	0.120	0.8 – 13.8	2.0	1 540	2 100	3.4	1.7

4. Use of NSK support unit is recommended. Refer to page 324 for details.
5. Recommended quantity of grease is about 50% of ball nut's internal space. See page 445 for details.



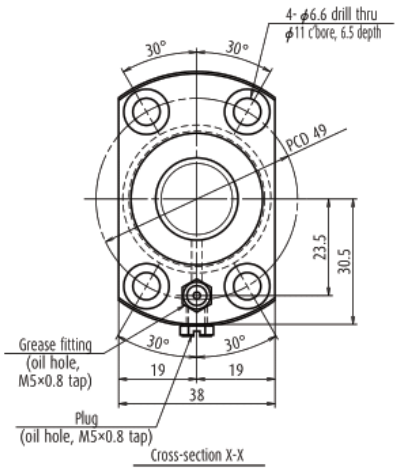
Ball screw No.	Screw shaft dia-meter d	Lead l	Basic load ratings (N)		Stroke		Nut length L	Screw shaft dimensiones			
			Dynamic C_a	Static C_{0a}	Nominal	MAX.		L_t	L_a	L_o	L_1
PSS2005N1D0323	20	5	10 400	18 500	150	191	31	228	250	323	22
PSS2005N1D0373	20	5	10 400	18 500	200	241	31	278	300	373	22
PSS2005N1D0473	20	5	10 400	18 500	300	341	31	378	400	473	22
PSS2005N1D0573	20	5	10 400	18 500	400	441	31	478	500	573	22
PSS2005N1D0673	20	5	10 400	18 500	500	541	31	578	600	673	22
PSS2005N1D0773	20	5	10 400	18 500	600	641	31	678	700	773	22
PSS2005N1D0873	20	5	10 400	18 500	700	741	31	778	800	873	22
PSS2005N1D1000	20	5	10 400	18 500	800	839	31	878	900	1 000	22
PSS2010N1D0387	20	10	10 200	18 600	200	241	45	292	314	387	22
PSS2010N1D0487	20	10	10 200	18 600	300	341	45	392	414	487	22
PSS2010N1D0587	20	10	10 200	18 600	400	441	45	492	514	587	22
PSS2010N1D0687	20	10	10 200	18 600	500	541	45	592	614	687	22
PSS2010N1D0787	20	10	10 200	18 600	600	641	45	692	714	787	22
PSS2010N1D0887	20	10	10 200	18 600	700	741	45	792	814	887	22
PSS2010N1D1014	20	10	10 200	18 600	800	839	45	892	914	1 014	22
PSS2010N1D1214	20	10	10 200	18 600	1 000	1 039	45	1 092	1 114	1 214	22
PSS2010N1D1414	20	10	10 200	18 600	1 200	1 239	45	1 292	1 314	1 414	22

Notes

1. Indicates ball screw preload control value. Approximately 2.0 N·cm of torque is added due to thin plastic seals.
2. Contact NSK if permissible rotational speed is to be exceeded.
3. Service temperature range is 0 to 80˚C.

Screw shaft ϕ20
Lead 5, 10

Unit: mm



Ball screw specification	
Preload type	Oversize ball preload (P-preload)
Ball diameter/screw shaft root diameter	3.175 / 17.2
Ball circle dia.	20.5
Accuracy grade/axial play	C5 / 0
Factory-packed grease	NSK grease LR3

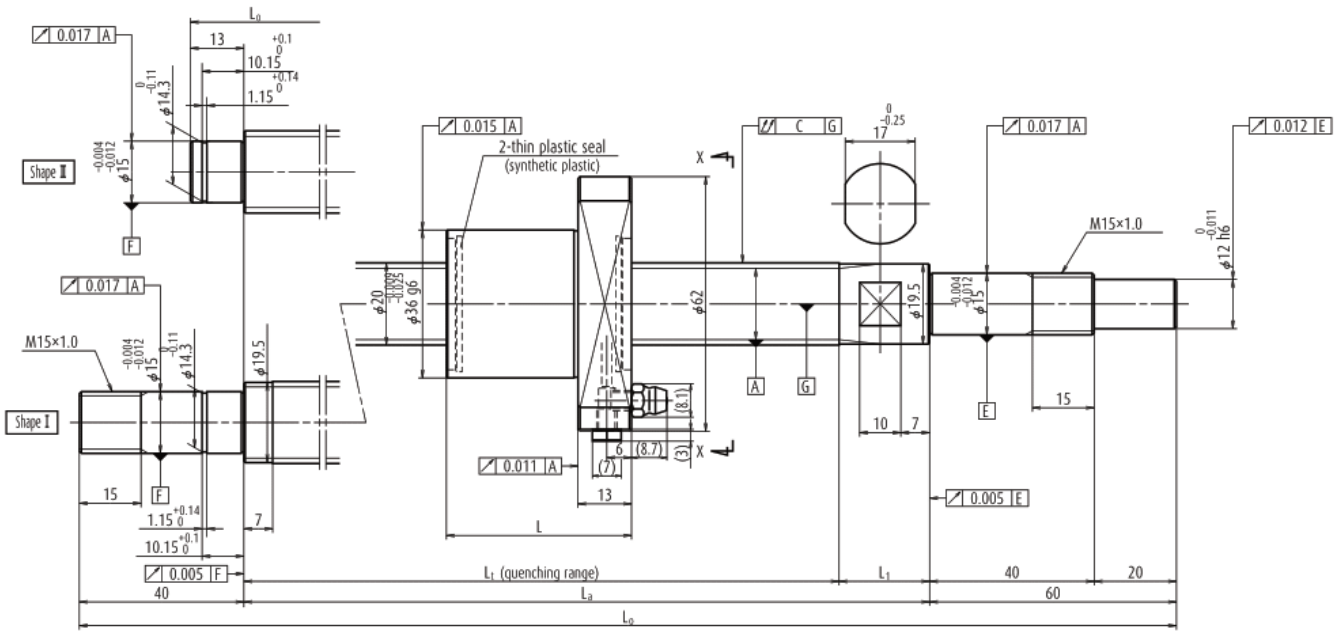
Recommended support unit

For drive side (Fixed)	For opposite to drive side	
	(Fixed)	(Simple)
WBK15-01B (low-profile, square)	WBK15-01B (low-profile, square)	WBK15S-01B (low-profile, square)
WBK15-11 (round)	WBK15-11 (round)	

Unit: mm

Left shaft end (opposite driven side)	Lead accuracy			Shaft run-out	Dynamic preload torque	Mass	Permissible rotational speed (min^{-1}) *2		Internal spatial volume of nut (cm^3)	Standard volume of grease replenishing (cm^3)
	Target value T	Error e_p	Variation v_u	C	(N·cm) *1	(kg)	Fixed-Simple	Fixed-Fixed		
Ⅱ	0	0.023	0.018	0.045	0.6 – 7.4	1.0	5 000	—	3.4	1.7
Ⅱ	0	0.023	0.018	0.045	0.6 – 7.4	1.1	5 000	—	3.4	1.7
Ⅱ	0	0.025	0.020	0.050	0.6 – 7.4	1.3	5 000	—	3.4	1.7
Ⅱ	0	0.027	0.020	0.060	0.4 – 9.8	1.5	5 000	—	3.4	1.7
Ⅱ	0	0.030	0.023	0.075	0.4 – 9.8	1.7	5 000	—	3.4	1.7
Ⅱ	0	0.035	0.025	0.075	0.4 – 9.8	1.9	5 000	—	3.4	1.7
Ⅱ	0	0.035	0.025	0.095	0.4 – 9.8	2.2	4 410	—	3.4	1.7
Ⅰ	0	0.040	0.027	0.095	0.4 – 11.8	2.4	3 450	4 710	3.4	1.7
Ⅱ	0	0.023	0.018	0.045	1.2 – 9.3	1.2	5 000	—	3.2	1.6
Ⅱ	0	0.025	0.020	0.050	1.2 – 9.3	1.4	5 000	—	3.2	1.6
Ⅱ	0	0.027	0.020	0.060	0.8 – 10.8	1.7	5 000	—	3.2	1.6
Ⅱ	0	0.030	0.023	0.075	0.8 – 10.8	1.9	5 000	—	3.2	1.6
Ⅱ	0	0.035	0.025	0.075	0.8 – 10.8	2.1	5 000	—	3.2	1.6
Ⅱ	0	0.035	0.025	0.095	0.8 – 10.8	2.4	4 330	—	3.2	1.6
Ⅰ	0	0.040	0.027	0.120	0.8 – 13.8	2.6	3 400	4 640	3.2	1.6
Ⅰ	0	0.046	0.030	0.120	0.8 – 13.8	3.1	2 250	3 110	3.2	1.6
Ⅰ	0	0.054	0.035	0.160	0.8 – 13.8	3.6	1 600	2 220	3.2	1.6

4. Use of NSK support unit is recommended. Refer to page 324 for details.
5. Recommended quantity of grease is about 50% of ball nut's internal space. See page 445 for details.



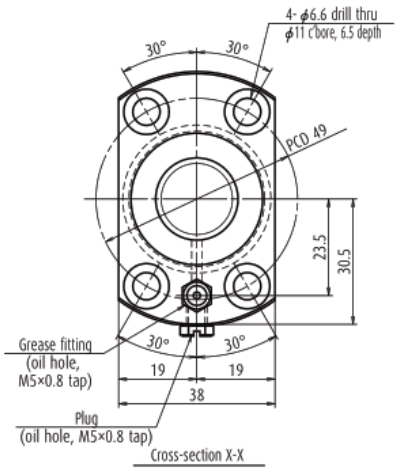
Ball screw No.	Screw shaft dia-meter d	Lead l	Basic load ratings (N)		Stroke		Nut length L	Screw shaft dimensiones			
			Dynamic C_a	Static C_{0a}	Nominal	MAX.		L_t	L_a	L_o	L_1
PSS2020N1D0508	20	20	6 790	11 800	300	353	54	413	435	508	22
PSS2020N1D0608	20	20	6 790	11 800	400	453	54	513	535	608	22
PSS2020N1D0708	20	20	6 790	11 800	500	553	54	613	635	708	22
PSS2020N1D0808	20	20	6 790	11 800	600	653	54	713	735	808	22
PSS2020N1D0908	20	20	6 790	11 800	700	753	54	813	835	908	22
PSS2020N1D1035	20	20	6 790	11 800	800	851	54	913	935	1 035	22
PSS2020N1D1235	20	20	6 790	11 800	1 000	1 051	54	1 113	1 135	1 235	22
PSS2020N1D1435	20	20	6 790	11 800	1 200	1 251	54	1 313	1 335	1 435	22
PSS2020N1D1835	20	20	6 790	11 800	1 600	1 651	54	1 713	1 735	1 835	22
PSS2030N1D0408	20	30	6 550	11 800	200	228	74	308	335	408	27
PSS2030N1D0508	20	30	6 550	11 800	300	328	74	408	435	508	27
PSS2030N1D0608	20	30	6 550	11 800	400	428	74	508	535	608	27
PSS2030N1D0708	20	30	6 550	11 800	500	528	74	608	635	708	27
PSS2030N1D0808	20	30	6 550	11 800	600	628	74	708	735	808	27
PSS2030N1D0908	20	30	6 550	11 800	700	728	74	808	835	908	27
PSS2030N1D1035	20	30	6 550	11 800	800	826	74	908	935	1 035	27
PSS2030N1D1235	20	30	6 550	11 800	1 000	1 026	74	1 108	1 135	1 235	27
PSS2030N1D1435	20	30	6 550	11 800	1 200	1 226	74	1 308	1 335	1 435	27

Notes

1. Indicates ball screw preload control value. Approximately 2.0 N·cm of torque is added due to thin plastic seals.
2. Contact NSK if permissible rotational speed is to be exceeded.
3. Service temperature range is 0 to 80˚C.

Screw shaft ϕ20
Lead 20, 30

Unit: mm



Ball screw specification	
Preload type	Oversize ball preload (P-preload)
Ball diameter/screw shaft root diameter	3.175 / 17.2
Ball circle dia.	20.5
Accuracy grade/axial play	C5 / 0
Factory-packed grease	NSK grease LR3

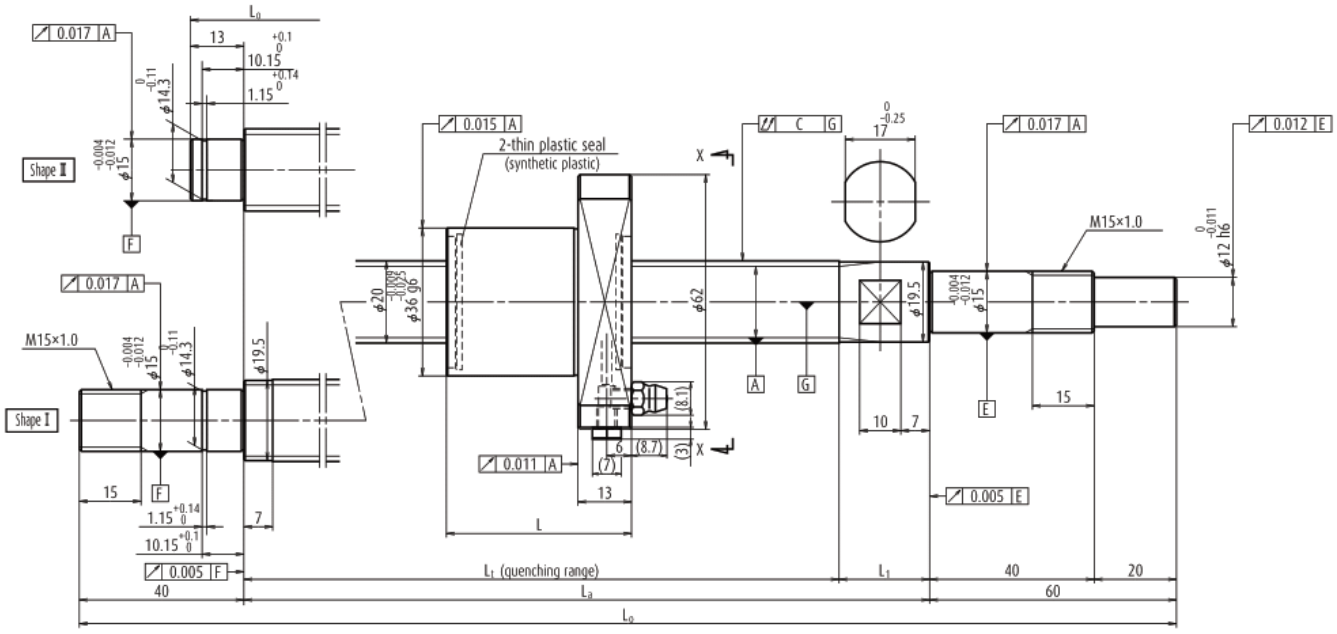
Recommended support unit

For drive side (Fixed)	For opposite to drive side	
	(Fixed)	(Simple)
WBK15-01B (low-profile, square)	WBK15-01B (low-profile, square)	WBK15S-01B (low-profile, square)
WBK15-11 (round)	WBK15-11 (round)	

Unit: mm

Left shaft end (opposite driven side)	Lead accuracy			Shaft run-out	Dynamic preload torque	Mass	Permissible rotational speed (min^{-1}) *2		Internal spatial volume of nut (cm^3)	Standard volume of grease replenishing (cm^3)
	Target value T	Error e_p	Variation v_u	C	(N·cm) *1	(kg)	Fixed-Simple	Fixed-Fixed		
Ⅱ	0	0.027	0.020	0.060	1.4 – 11.8	1.6	5 000	—	3.2	1.6
Ⅱ	0	0.030	0.023	0.060	1.4 – 11.8	1.8	5 000	—	3.2	1.6
Ⅱ	0	0.030	0.023	0.075	1.4 – 11.8	2.0	5 000	—	3.2	1.6
Ⅱ	0	0.035	0.025	0.095	1.4 – 11.8	2.3	5 000	—	3.2	1.6
Ⅱ	0	0.040	0.027	0.095	0.8 – 13.8	2.5	4 150	—	3.2	1.6
Ⅰ	0	0.040	0.027	0.120	0.8 – 13.8	2.8	3 270	4 470	3.2	1.6
Ⅰ	0	0.046	0.030	0.120	0.8 – 13.8	3.3	2 180	3 010	3.2	1.6
Ⅰ	0	0.054	0.035	0.160	0.8 – 13.8	3.8	1 550	2 170	3.2	1.6
Ⅰ	0	0.065	0.040	0.200	0.8 – 13.8	4.7	900	1 270	3.2	1.6
Ⅱ	0	0.023	0.018	0.050	1.6 – 9.8	1.4	5 000	—	4.6	2.3
Ⅱ	0	0.027	0.020	0.060	1.4 – 11.8	1.7	5 000	—	4.6	2.3
Ⅱ	0	0.030	0.023	0.060	1.4 – 11.8	1.9	5 000	—	4.6	2.3
Ⅱ	0	0.030	0.023	0.075	1.4 – 11.8	2.1	5 000	—	4.6	2.3
Ⅱ	0	0.035	0.025	0.095	1.4 – 11.8	2.4	5 000	—	4.6	2.3
Ⅱ	0	0.040	0.027	0.095	0.8 – 13.8	2.6	4 310	—	4.6	2.3
Ⅰ	0	0.040	0.027	0.120	0.8 – 13.8	2.9	3 380	4 570	4.6	2.3
Ⅰ	0	0.046	0.030	0.120	0.8 – 13.8	3.4	2 240	3 070	4.6	2.3
Ⅰ	0	0.054	0.035	0.160	0.8 – 13.8	3.9	1 590	2 200	4.6	2.3

4. Use of NSK support unit is recommended. Refer to page 324 for details.
5. Recommended quantity of grease is about 50% of ball nut's internal space. See page 445 for details.



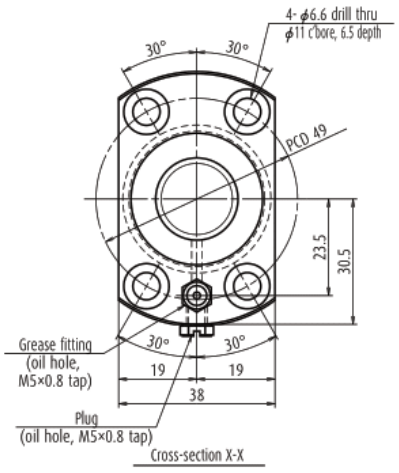
Ball screw No.	Screw shaft dia-meter d	Lead l	Basic load ratings (N)		Stroke		Nut length L	Screw shaft dimensiones			
			Dynamic C_a	Static C_{0a}	Nominal	MAX.		L_t	L_a	L_o	L_1
PSS2040N1D0658	20	40	6 380	11 600	400	455	92	553	585	658	32
PSS2040N1D0758	20	40	6 380	11 600	500	555	92	653	685	758	32
PSS2040N1D0858	20	40	6 380	11 600	600	655	92	753	785	858	32
PSS2040N1D0958	20	40	6 380	11 600	700	755	92	853	885	958	32
PSS2040N1D1085	20	40	6 380	11 600	800	853	92	953	985	1 085	32
PSS2040N1D1285	20	40	6 380	11 600	1 000	1 053	92	1 153	1 185	1 285	32
PSS2040N1D1485	20	40	6 380	11 600	1 200	1 253	92	1 353	385	1 485	32
PSS2040N1D1885	20	40	6 380	11 600	1 600	1 653	92	1 753	1 785	1 885	32
PSS2040N1D2285	20	40	6 380	11 600	2 000	2 053	92	2 153	2 185	2 285	32
PSS2060N1D0708	20	60	5 680	11 800	400	458	129	593	635	708	42
PSS2060N1D0808	20	60	5 680	11 800	500	558	129	693	735	808	42
PSS2060N1D0908	20	60	5 680	11 800	600	658	129	793	835	908	42
PSS2060N1D1008	20	60	5 680	11 800	700	758	129	893	935	1 008	42
PSS2060N1D1135	20	60	5 680	11 800	800	856	129	993	1 035	1 135	42
PSS2060N1D1335	20	60	5 680	11 800	1 000	1 056	129	1 193	1 235	1 335	42
PSS2060N1D1535	20	60	5 680	11 800	1 200	1 256	129	1 393	1 435	1 535	42
PSS2060N1D1935	20	60	5 680	11 800	1 600	1 656	129	1 793	1 835	1 935	42
PSS2060N1D2335	20	60	5 680	11 800	2 000	2 056	129	2 193	2 235	2 335	42

Notes

1. Indicates ball screw preload control value. Approximately 2.0 N·cm of torque is added due to thin plastic seals.
2. Contact NSK if permissible rotational speed is to be exceeded.
3. Service temperature range is 0 to 80˚C.

Screw shaft ϕ 20
Lead 40, 60

Unit: mm



Ball screw specification	
Preload type	Oversize ball preload (P-preload)
Ball diameter/screw shaft root diameter	3.175 / 17.2
Ball circle dia.	20.5
Accuracy grade/axial play	C5 / 0
Factory-packed grease	NSK grease LR3

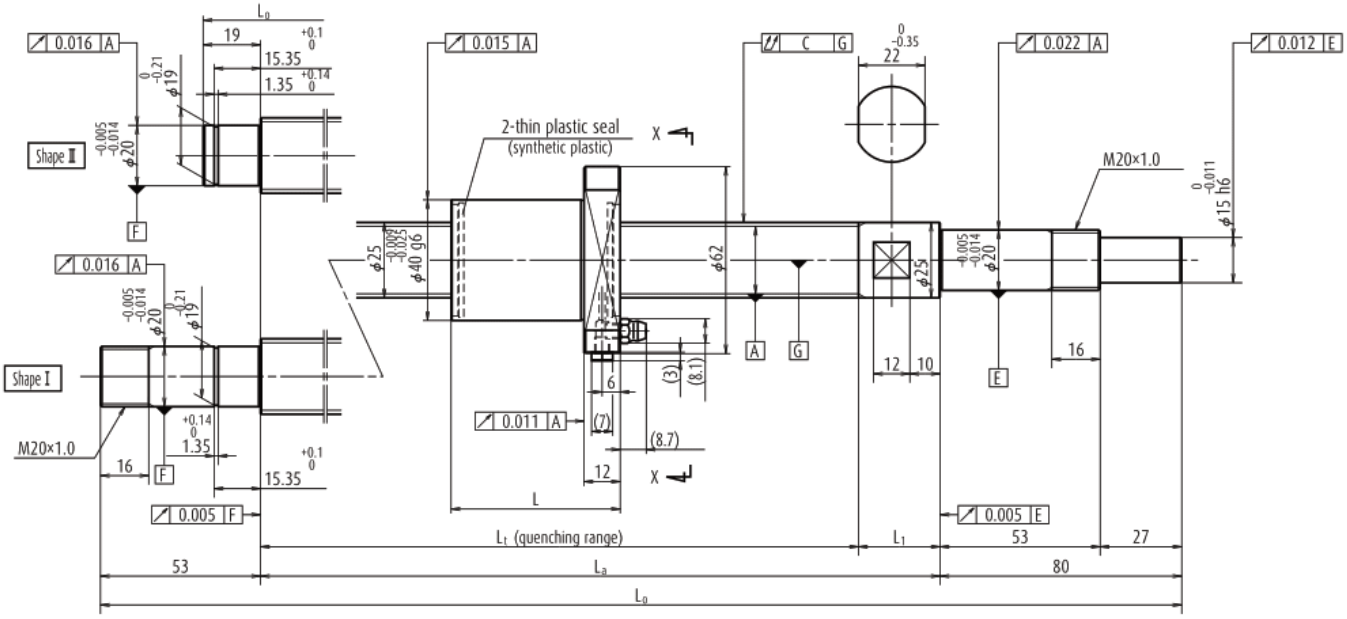
Recommended support unit

For drive side (Fixed)	For opposite to drive side	
	(Fixed)	(Simple)
WBK15-01B (low-profile, square)	WBK15-01B (low-profile, square)	WBK15S-01B (low-profile, square)
WBK15-11 (round)	WBK15-11 (round)	

Unit: mm

Left shaft end (opposite driven side)	Lead accuracy			Shaft run-out	Dynamic preload torque	Mass	Permissible rotational speed (min^{-1}) *2		Internal spatial volume of nut (cm^3)	Standard volume of grease replenishing (cm^3)
	Target value T	Error e_p	Variation v_u	C	(N·cm) *1	(kg)	Fixed-Simple	Fixed-Fixed		
Ⅱ	0	0.030	0.023	0.075	2.2 – 12.8	2.1	5 000	—	5.3	2.7
Ⅱ	0	0.035	0.025	0.075	2.2 – 12.8	2.4	5 000	—	5.3	2.7
Ⅱ	0	0.035	0.025	0.095	2.2 – 12.8	2.6	5 000	—	5.3	2.7
Ⅱ	0	0.040	0.027	0.095	1.8 – 14.8	2.8	3 940	—	5.3	2.7
Ⅰ	0	0.040	0.027	0.120	1.8 – 14.8	3.1	3 120	4 190	5.3	2.7
Ⅰ	0	0.046	0.030	0.160	1.8 – 14.8	3.6	2 100	2 850	5.3	2.7
Ⅰ	0	0.054	0.035	0.160	1.8 – 14.8	4.1	1 500	2 070	5.3	2.7
Ⅰ	0	0.065	0.040	0.200	1.8 – 14.8	5.1	880	1 230	5.3	2.7
Ⅰ	0	0.077	0.046	0.240	1.8 – 14.8	6.0	580	810	5.3	2.7
Ⅱ	0	0.030	0.023	0.075	2.7 – 13.8	2.4	5 000	—	7.0	3.5
Ⅱ	0	0.035	0.025	0.095	2.7 – 13.8	2.6	5 000	—	7.0	3.5
Ⅱ	0	0.035	0.025	0.095	2.7 – 13.8	2.9	4 830	—	7.0	3.5
Ⅱ	0	0.040	0.027	0.120	1.8 – 14.8	3.1	3 740	—	7.0	3.5
Ⅰ	0	0.040	0.027	0.120	1.8 – 14.8	3.4	2 980	3 920	7.0	3.5
Ⅰ	0	0.046	0.030	0.160	1.8 – 14.8	3.9	2 020	2 700	7.0	3.5
Ⅰ	0	0.054	0.035	0.160	1.8 – 14.8	4.4	1 460	1 970	7.0	3.5
Ⅰ	0	0.065	0.040	0.200	1.8 – 14.8	5.4	860	1 180	7.0	3.5
Ⅰ	0	0.077	0.046	0.240	1.8 – 14.8	6.3	570	790	7.0	3.5

4. Use of NSK support unit is recommended. Refer to page 324 for details.
5. Recommended quantity of grease is about 50% of ball nut's internal space. See page 445 for details.



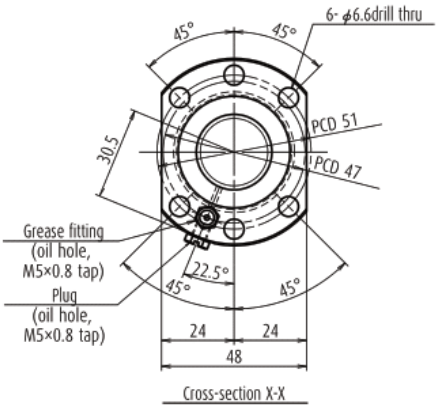
Ball screw No.	Screw shaft dia-meter d	Lead l	Basic load ratings (N)		Stroke		Nut length L	Screw shaft dimensiones			
			Dynamic C_a	Static C_{0a}	Nominal	MAX.		L_t	L_a	L_o	L_1
PSS2505N1D0349	25	5	11 500	23 500	150	185	32	223	250	658	27
PSS2505N1D0399	25	5	11 500	23 500	200	235	32	273	300	758	27
PSS2505N1D0499	25	5	11 500	23 500	300	335	32	373	400	858	27
PSS2505N1D0599	25	5	11 500	23 500	400	435	32	473	500	958	27
PSS2505N1D0699	25	5	11 500	23 500	500	535	32	573	600	1 085	27
PSS2505N1D0899	25	5	11 500	23 500	700	735	32	773	800	1 285	27
PSS2505N1D0999	25	5	11 500	23 500	800	835	32	873	900	1 485	27
PSS2505N1D1233	25	5	11 500	23 500	1 000	1 027	32	1 073	1 100	1 885	27
PSS2510N1D0549	25	10	15 000	32 400	300	361	56	423	450	2 285	27
PSS2510N1D0649	25	10	15 000	32 400	400	461	56	523	550	708	27
PSS2510N1D0749	25	10	15 000	32 400	500	561	56	623	650	808	27
PSS2510N1D0849	25	10	15 000	32 400	600	661	56	723	750	908	27
PSS2510N1D0949	25	10	15 000	32 400	700	761	56	823	850	1 008	27
PSS2510N1D1049	25	10	15 000	32 400	800	861	56	923	950	1 135	27
PSS2510N1D1283	25	10	15 000	32 400	1 000	1 053	56	1 123	1 150	1 335	27
PSS2510N1D1883	25	10	15 000	32 400	1 600	1 653	56	1 723	1 750	1 535	27

Notes

1. Indicates ball screw preload control value. Approximately 2.0 N·cm of torque is added due to thin plastic seals.
2. Contact NSK if permissible rotational speed is to be exceeded.
3. Service temperature range is 0 to 80˚C.

Screw shaft ϕ25
Lead 5, 10

Unit: mm



Ball screw specification	
Preload type	Oversize ball preload (P-preload)
Ball diameter/screw shaft root diameter	3.175 / 22.2
Ball circle dia.	25.5
Accuracy grade/axial play	C5 / 0
Factory-packed grease	NSK grease LR3

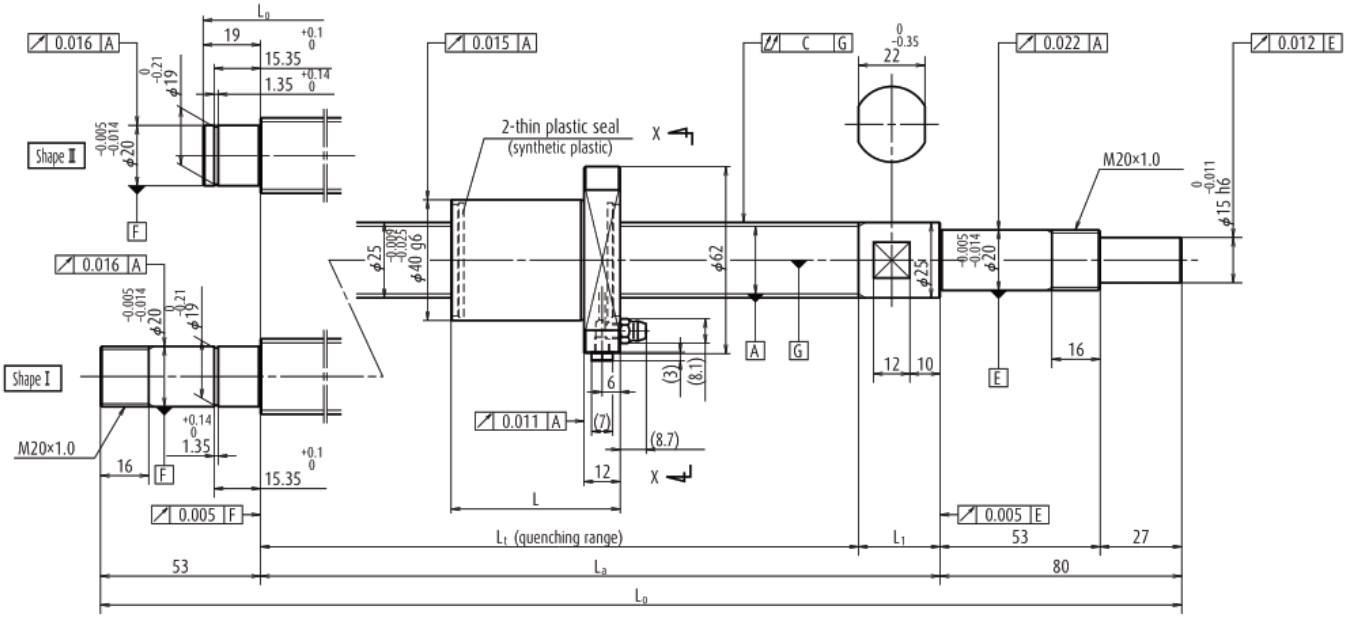
Recommended support unit

For drive side (Fixed)	For opposite to drive side	
	(Fixed)	(Simple)
WBK20-01 (square)	WBK20-01 (square)	WBK20S-01 (square)
WBK20-11 (round)	WBK20-11 (round)	

Unit: mm

Left shaft end (opposite driven side)	Lead accuracy			Shaft run-out	Dynamic preload torque	Mass	Permissible rotational speed (min^{-1}) *2		Internal spatial volume of nut (cm^3)	Standard volume of grease replenishing (cm^3)
	Target value T	Error e_p	Variation v_u	C	(N·cm) *1	(kg)	Fixed-Simple	Fixed-Fixed		
Ⅱ	0	0.023	0.018	0.035	1.2 – 9.3	1.5	5 000	—	4.4	2.2
Ⅱ	0	0.023	0.018	0.035	1.2 – 9.3	1.6	5 000	—	4.4	2.2
Ⅱ	0	0.025	0.020	0.040	1.2 – 9.3	2.0	5 000	—	4.4	2.2
Ⅱ	0	0.027	0.020	0.045	1.2 – 9.3	2.3	5 000	—	4.4	2.2
Ⅱ	0	0.030	0.023	0.055	0.8 – 10.8	2.7	5 000	—	4.4	2.2
Ⅱ	0	0.035	0.025	0.065	0.8 – 10.8	3.4	5 000	—	4.4	2.2
Ⅱ	0	0.040	0.027	0.065	0.8 – 10.8	3.7	4 490	—	4.4	2.2
Ⅰ	0	0.046	0.030	0.080	0.8 – 13.8	4.5	2 960	4 060	4.4	2.2
Ⅱ	0	0.027	0.020	0.045	3.1 – 11.8	2.4	5 000	—	4.7	2.4
Ⅱ	0	0.030	0.023	0.055	2.2 – 12.8	2.7	5 000	—	4.7	2.4
Ⅱ	0	0.030	0.023	0.055	2.2 – 12.8	3.1	5 000	—	4.7	2.4
Ⅱ	0	0.035	0.025	0.065	2.2 – 12.8	3.5	5 000	—	4.7	2.4
Ⅱ	0	0.040	0.027	0.065	2.2 – 12.8	3.8	5 000	—	4.7	2.4
Ⅰ	0	0.040	0.027	0.080	2.2 – 12.8	4.2	4 120	—	4.7	2.4
Ⅰ	0	0.046	0.030	0.100	1.8 – 14.8	5.0	2 760	3 790	4.7	2.4
Ⅰ	0	0.065	0.040	0.130	1.8 – 14.8	7.2	1 150	1 620	4.7	2.4

4. Use of NSK support unit is recommended. Refer to page 324 for details.
5. Recommended quantity of grease is about 50% of ball nut's internal space. See page 445 for details.



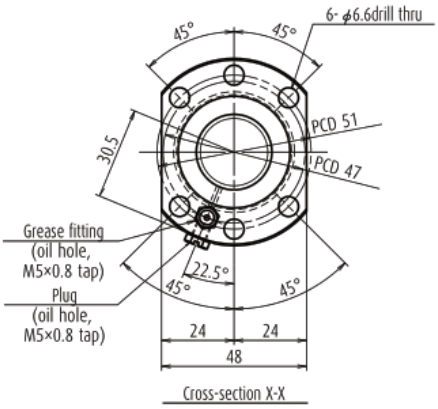
Ball screw No.	Screw shaft dia-meter d	Lead l	Basic load ratings (N)		Stroke		Nut length L	Screw shaft dimensiones			
			Dynamic C_a	Static C_{0a}	Nominal	MAX.		L_t	L_a	L_o	L_1
PSS2520N1D0729	25	20	7 650	14 800	500	544	54	604	630	729	26
PSS2520N1D0829	25	20	7 650	14 800	600	644	54	704	730	829	26
PSS2520N1D0929	25	20	7 650	14 800	700	744	54	804	830	929	26
PSS2520N1D1029	25	20	7 650	14 800	800	844	54	904	930	1 029	26
PSS2520N1D1263	25	20	7 650	14 800	1 000	1 036	54	1 104	1 130	1 263	26
PSS2520N1D1463	25	20	7 650	14 800	1 200	1 236	54	1 304	1 330	1 463	26
PSS2520N1D1863	25	20	7 650	14 800	1 600	1 636	54	1 704	1 730	1 863	26
PSS2520N1D2263	25	20	7 650	14 800	2 000	2 036	54	2 104	2 130	2 263	26
PSS2525N1D0779	25	25	7 490	14 600	500	581	63	650	680	779	30
PSS2525N1D0879	25	25	7 490	14 600	600	681	63	750	780	879	30
PSS2525N1D0979	25	25	7 490	14 600	700	781	63	850	880	979	30
PSS2525N1D1079	25	25	7 490	14 600	800	887	63	950	890	1 079	30
PSS2525N1D1313	25	25	7 490	14 600	1 000	1 073	63	1 150	1 180	1 313	30
PSS2525N1D1513	25	25	7 490	14 600	1 200	1 273	63	1 350	1 380	1 513	30
PSS2525N1D1913	25	25	7 490	14 600	1 600	1 673	63	1 750	1 780	1 913	30
PSS2525N1D2313	25	25	7 490	14 600	2 000	2 073	63	2 150	2 180	2 313	30

Notes

1. Indicates ball screw preload control value. Approximately 2.0 N·cm of torque is added due to thin plastic seals.
2. Contact NSK if permissible rotational speed is to be exceeded.
3. Service temperature range is 0 to 80˚C.

Screw shaft ϕ25
Lead 20, 25

Unit: mm



Ball screw specification	
Preload type	Oversize ball preload (P-preload)
Ball diameter/screw shaft root diameter	3.175 / 22.2
Ball circle dia.	25.5
Accuracy grade/axial play	C5 / 0
Factory-packed grease	NSK grease LR3

Recommended support unit

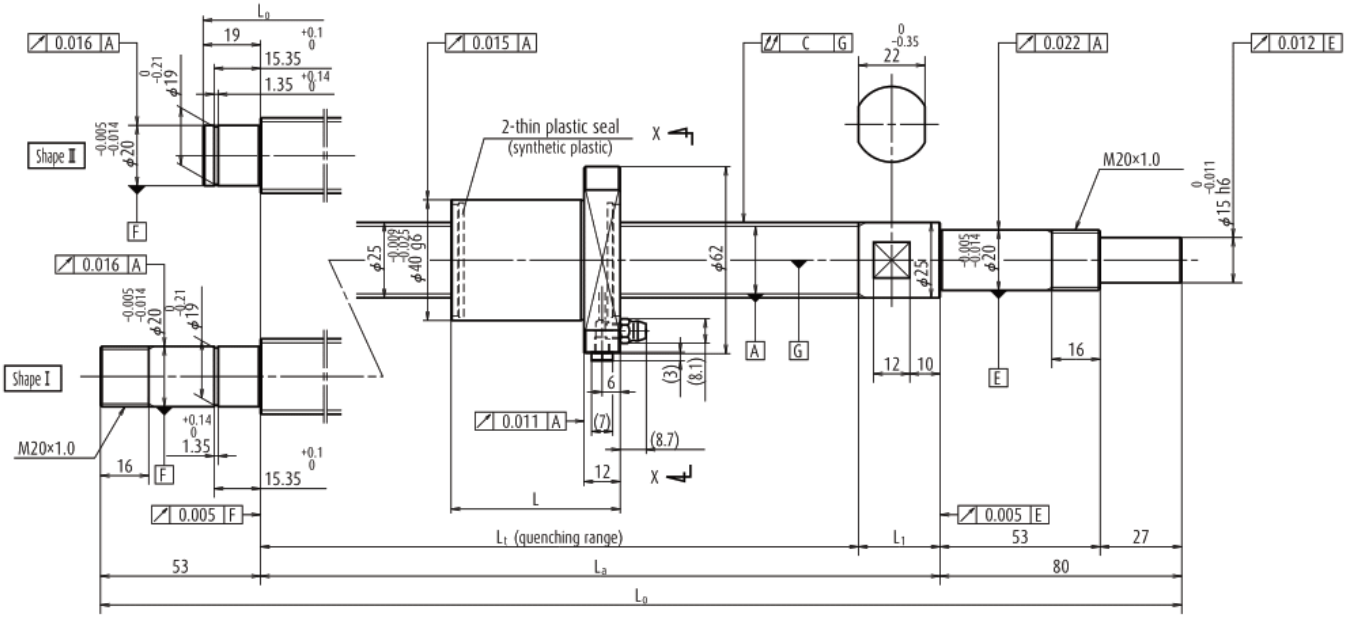
For drive side (Fixed)	For opposite to drive side	
	(Fixed)	(Simple)
WBK20-01 (square)	WBK20-01 (square)	WBK20S-01 (square)
WBK20-11 (round)	WBK20-11 (round)	

Unit: mm

Left shaft end (opposite driven side)	Lead accuracy			Shaft run-out	Dynamic preload torque	Mass	Permissible rotational speed (min^{-1}) *2		Internal spatial volume of nut (cm^3)	Standard volume of grease replenishing (cm^3)
	Target value T	Error e_p	Variation v_u	C	(N·cm) *1	(kg)	Fixed-Simple	Fixed-Fixed		
Ⅱ	0	0.030	0.023	0.055	2.2 – 12.8	3.1	5 000	—	3.9	2.0
Ⅱ	0	0.035	0.025	0.065	2.2 – 12.8	3.4	5 000	—	3.9	2.0
Ⅱ	0	0.040	0.027	0.065	2.2 – 12.8	3.8	5 000	—	3.9	2.0
Ⅱ	0	0.040	0.027	0.080	2.2 – 12.8	4.2	4 280	—	3.9	2.0
Ⅰ	0	0.046	0.030	0.100	1.8 – 14.8	5.0	2 850	3 920	3.9	2.0
Ⅰ	0	0.054	0.035	0.100	1.8 – 14.8	5.8	2 030	2 820	3.9	2.0
Ⅰ	0	0.065	0.040	0.130	1.8 – 14.8	7.3	1 180	1 650	3.9	2.0
Ⅰ	0	0.077	0.046	0.170	1.8 – 14.8	8.8	770	1 080	3.9	2.0
Ⅱ	0	0.035	0.025	0.055	2.7 – 13.8	3.3	5 000	—	4.3	2.2
Ⅱ	0	0.035	0.025	0.065	2.7 – 13.8	3.7	5 000	—	4.3	2.2
Ⅱ	0	0.040	0.027	0.065	2.7 – 13.8	4.1	4 910	—	4.3	2.2
Ⅱ	0	0.040	0.027	0.080	2.7 – 13.8	4.4	3 910	—	4.3	2.2
Ⅰ	0	0.046	0.030	0.100	1.8 – 14.8	5.3	2 640	3 620	4.3	2.2
Ⅰ	0	0.054	0.035	0.100	1.8 – 14.8	6.0	1 900	2 630	4.3	2.2
Ⅰ	0	0.065	0.040	0.130	1.8 – 14.8	7.5	1 120	1 570	4.3	2.2
Ⅰ	0	0.077	0.046	0.170	1.8 – 14.8	9.1	740	1 040	4.3	2.2

4. Use of NSK support unit is recommended. Refer to page 324 for details.
5. Recommended quantity of grease is about 50% of ball nut's internal space. See page 445 for details.

23. Compact FA PSS Type (High helix, Ultra high helix lead)



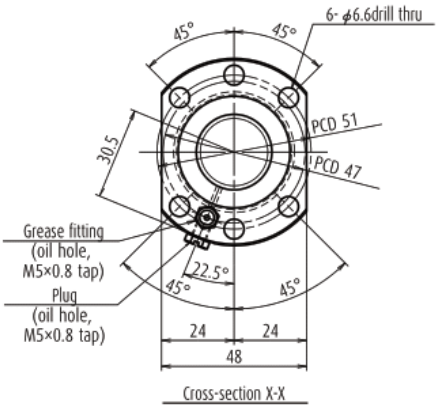
Ball screw No.	Screw shaft dia-meter d	Lead l	Basic load ratings (N)		Stroke		Nut length L	Screw shaft dimensiones			
			Dynamic C_a	Static C_{0a}	Nominal	MAX.		L_t	L_a	L_o	L_1
PSS2530N1D0779	25	30	7 490	14 600	500	570	74	650	680	779	30
PSS2530N1D0879	25	30	7 490	14 600	600	670	74	750	780	879	30
PSS2530N1D0979	25	30	7 490	14 600	700	770	74	850	880	979	30
PSS2530N1D1079	25	30	7 490	14 600	800	870	74	950	980	1 079	30
PSS2530N1D1313	25	30	7 490	14 600	1 000	1 062	74	1 150	1 180	1 313	30
PSS2530N1D1513	25	30	7 490	14 600	1 200	1 262	74	1 350	1 380	1 513	30
PSS2530N1D1913	25	30	7 490	14 600	1 600	1 662	74	1 750	1 780	1 913	30
PSS2530N1D2313	25	30	7 490	14 600	2 000	2 062	74	2 150	2 180	2 313	30
PSS2550N1D0829	25	50	6 910	14 700	500	570	114	690	730	829	40
PSS2550N1D0929	25	50	6 910	14 700	600	670	114	790	830	929	40
PSS2550N1D1029	25	50	6 910	14 700	700	770	114	890	930	1 029	40
PSS2550N1D1129	25	50	6 910	14 700	800	870	114	990	1 030	1 129	40
PSS2550N1D1363	25	50	6 910	14 700	1 000	1 062	114	1 190	1 230	1 363	40
PSS2550N1D1563	25	50	6 910	14 700	1 200	1 262	114	1 390	1 430	1 563	40
PSS2550N1D1963	25	50	6 910	14 700	1 600	1 662	114	1 790	1 830	1 963	40
PSS2550N1D2363	25	50	6 910	14 700	2 000	2 062	114	2 190	2 230	2 363	40

Notes

1. Indicates ball screw preload control value. Approximately 2.0 N·cm of torque is added due to thin plastic seals.
2. Contact NSK if permissible rotational speed is to be exceeded.
3. Service temperature range is 0 to 80˚C.

Screw shaft ϕ25
Lead 30, 50

Unit: mm



Ball screw specification	
Preload type	Oversize ball preload (P-preload)
Ball diameter/screw shaft root diameter	3.175 / 22.2
Ball circle dia.	25.5
Accuracy grade/axial play	C5 / 0
Factory-packed grease	NSK grease LR3

Recommended support unit

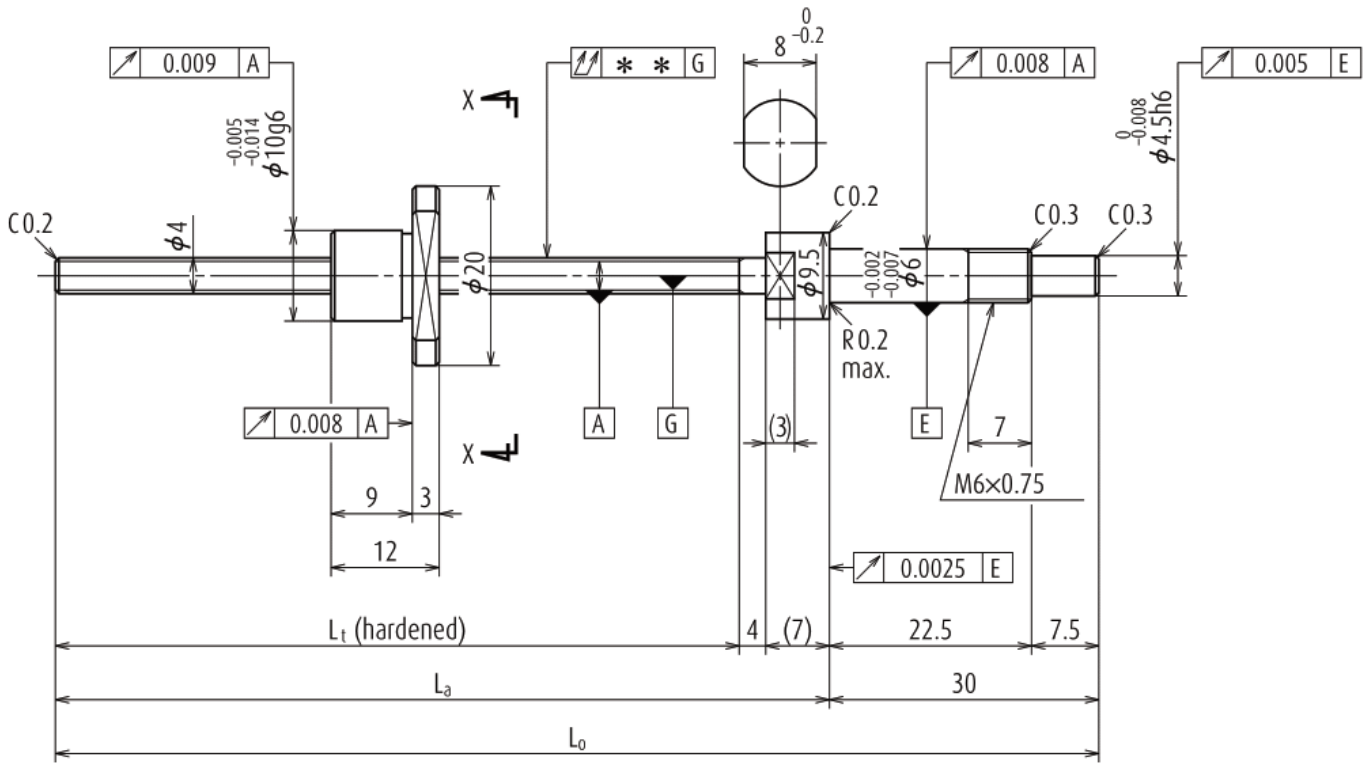
For drive side (Fixed)	For opposite to drive side	
	(Fixed)	(Simple)
WBK20-01 (square)	WBK20-01 (square)	WBK20S-01 (square)
WBK20-11 (round)	WBK20-11 (round)	

Unit: mm

Left shaft end (opposite driven side)	Lead accuracy			Shaft run-out	Dynamic preload torque	Mass	Permissible rotational speed (min^{-1}) *2		Internal spatial volume of nut (cm^3)	Standard volume of grease replenishing (cm^3)
	Target value T	Error e_p	Variation v_u	C	(N·cm) *1	(kg)	Fixed-Simple	Fixed-Fixed		
Ⅱ	0	0.035	0.025	0.055	2.7 – 13.8	3.4	5 000	—	5.5	2.8
Ⅱ	0	0.035	0.025	0.065	2.7 – 13.8	3.7	5 000	—	5.5	2.8
Ⅱ	0	0.040	0.027	0.065	2.7 – 13.8	4.1	4 980	—	5.5	2.8
Ⅱ	0	0.040	0.027	0.080	2.7 – 13.8	4.5	3 960	—	5.5	2.8
Ⅰ	0	0.046	0.030	0.100	1.8 – 14.8	5.3	2 670	3 650	5.5	2.8
Ⅰ	0	0.054	0.035	0.100	1.8 – 14.8	6.1	1 920	2 650	5.5	2.8
Ⅰ	0	0.065	0.040	0.130	1.8 – 14.8	7.6	1 130	1 580	5.5	2.8
Ⅰ	0	0.077	0.046	0.170	1.8 – 14.8	9.1	740	1 040	5.5	2.8
Ⅱ	0	0.035	0.025	0.065	5.4 – 17.6	3.8	5 000	—	7.7	3.9
Ⅱ	0	0.035	0.025	0.065	5.4 – 17.6	4.1	5 000	—	7.7	3.9
Ⅱ	0	0.040	0.027	0.080	5.4 – 17.6	4.5	4 750	—	7.7	3.9
Ⅱ	0	0.040	0.027	0.080	5.4 – 17.6	4.9	3 790	—	7.7	3.9
Ⅰ	0	0.046	0.030	0.100	4.1 – 19.6	5.8	2 570	3 470	7.7	3.9
Ⅰ	0	0.054	0.035	0.100	4.1 – 19.6	6.5	1 860	2 540	7.7	3.9
Ⅰ	0	0.065	0.040	0.130	4.1 – 19.6	8.0	1 100	1 520	7.7	3.9
Ⅰ	0	0.077	0.046	0.170	4.1 – 19.6	9.6	730	1 020	7.7	3.9

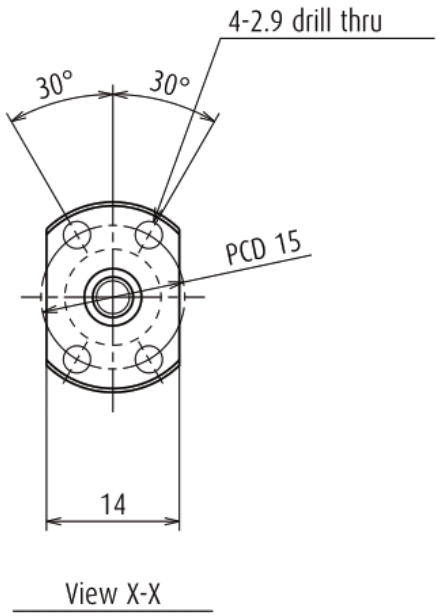
4. Use of NSK support unit is recommended. Refer to page 324 for details.
5. Recommended quantity of grease is about 50% of ball nut's internal space. See page 445 for details.

24. Finished shaft end MA Type (Fine lead)



Ball screw No.		Stroke	
Preloaded (MPFD)	Precise clearance (MSFD)	Nominal	Maximum
W0400MA-1PY-C3Z1	W0400MA-2Y-C3T1	20	32
W0400MA-3PY-C3Z1	W0400MA-4Y-C3T1	40	52
W0401MA-1PY-C3Z1	W0401MA-2Y-C3T1	70	82

Notes
1. We recommend NSK support unit. See page 324 for details.
2. Use of NSK grease PS2 is recommended. Apply to screw shaft surface when replenishing. See page 445 for details.
3. Ball nut does not have seal.
4. Contact NSK if the permissible rotational speed is to be exceeded.



Screw shaft ϕ4
Lead 1

Unit: mm

Ball screw specifications			
Product classification		Preloaded	Precise clearance
Shaft dia. × Lead / Direction of turn		4 × 1 / Right	
Preload / Ball recirculation		P-preload / Deflector (bridge type)	
Ball dia. / Ball circle dia.		0.800 / 4.2	
Screw shaft root diameter		3.2	
Effective turns of balls		1 × 2	
Accuracy grade / Preload / Axial play		C3 / Z	C3 / T
Basic load rating (N)	Dynamic C_a	370	
	Static C_{0a}	370	
Axial play		0	0.005 or less
Preload (N)		19.6	-
Dynamic friction torque, (N·cm)		1.0 or less	0.3 or less
Spacer ball		None	
Factory-packed grease		NSK grease PS2	

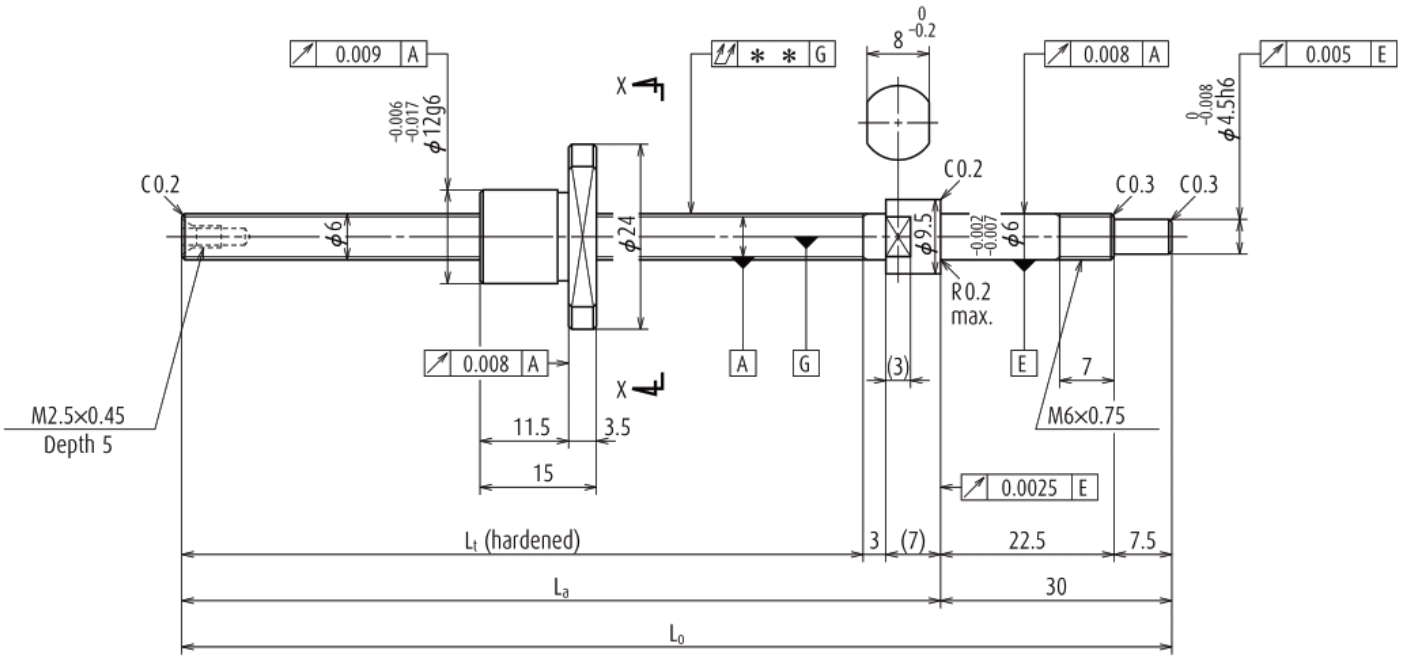
Recommended support unit

For drive side (Fixed)
WBK06-01A (square)
WBK06-11 (round)

Unit: mm

Screw shaft length			Lead accuracy			Shaft run-out **	Mass (kg)	Permissible rotational speed N (min^{-1})
								Supporting condition
L_t	L_a	L_o	T	e_p	v_u			Fixed - Free
44	55	85	0	0.008	0.008	0.015	0.024	3 000
64	75	105	0	0.008	0.008	0.020	0.026	3 000
94	105	135	0	0.008	0.008	0.025	0.028	3 000

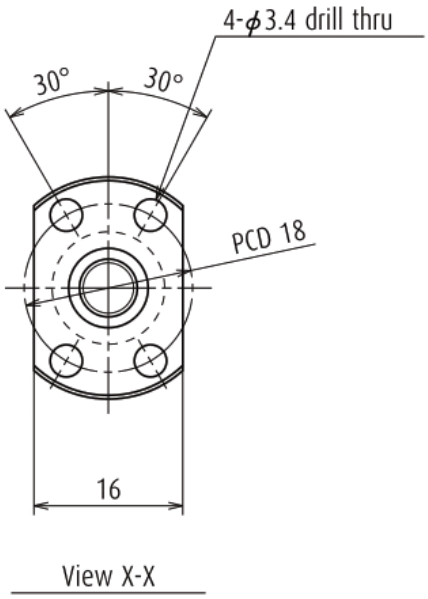
24. Finished shaft end MA Type (Fine lead)



Ball screw No.		Stroke	
Preloaded (MPFD)	Precise clearance (MSFD)	Nominal	Maximum
W0600MA-1PY-C3Z1	W0600MA-2Y-C3T1	40	50
W0601MA-1PY-C3Z1	W0601MA-2Y-C3T1	70	80
W0601MA-3PY-C3Z1	W0601MA-4Y-C3T1	100	110

Notes

1. We recommend NSK support unit. See page 324 for details.
2. Use of NSK grease PS2 is recommended. Apply to screw shaft surface when replenishing. See page 445 for details.
3. Ball nut does not have seal.
4. Contact NSK if the permissible rotational speed is to be exceeded.



Screw shaft ϕ6
Lead 1

Unit: mm

Ball screw specifications			
Product classification		Preloaded	Precise clearance
Shaft dia. × Lead / Direction of turn		6 × 1 / Right	
Preload / Ball recirculation		P-preload / Deflector (bridge)	
Ball dia. / Ball circle dia.		0.800 / 6.2	
Screw shaft root diameter		5.2	
Effective turns of balls		1 × 3	
Accuracy grade / Preload / Axial play		C3 / Z	C3 / T
Basic load rating (N)	Dynamic C_a	680	
	Static C_{0a}	920	
Axial play		0	0.005 or less
Preload (N)		24.5	–
Dynamic friction torque, (N·cm)		1.3 or less	0.3 or less
Spacer ball		None	
Factory-packed grease		NSK grease PS2	

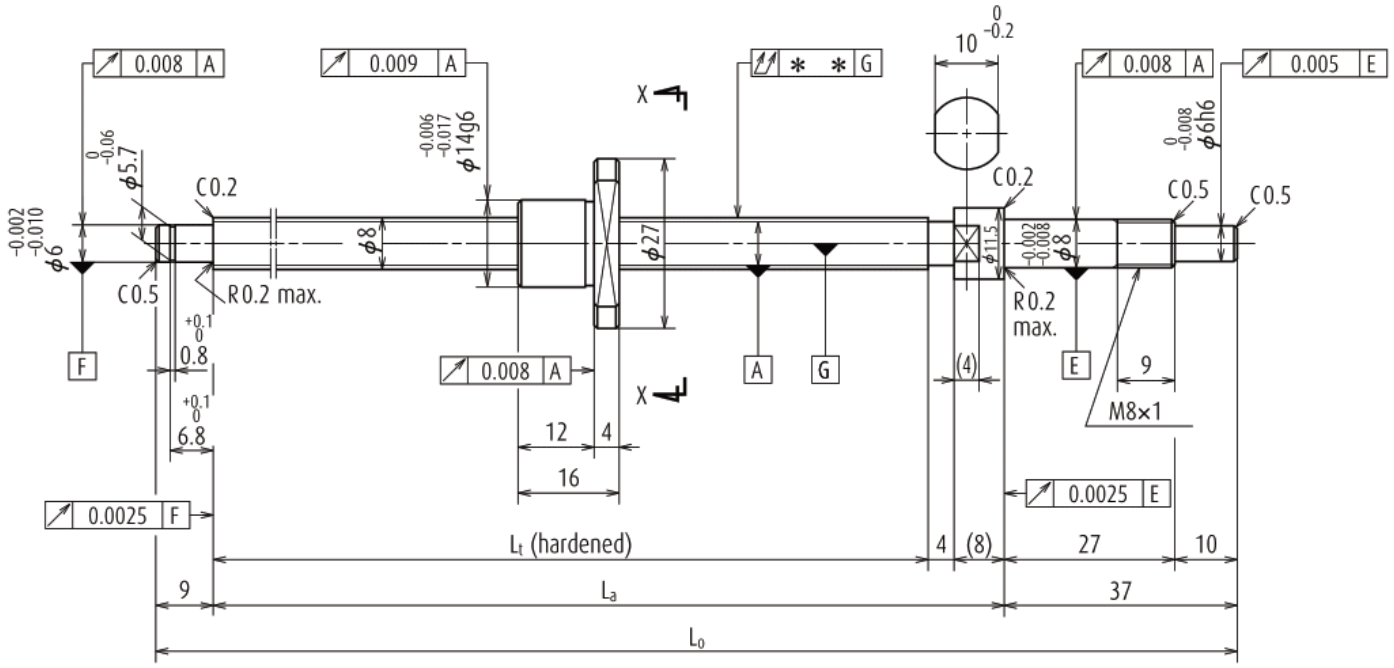
Recommended support unit

For drive side (Fixed)
WBK06-01A (square)
WBK06-11 (round)

Unit: mm

Screw shaft length			Lead accuracy			Shaft run-out **	Mass (kg)	Permissible rotational speed N (min^{-1})
								Supporting condition
L_t	L_a	L_o	T	e_p	v_u			Fixed - Free
65	75	105	0	0.008	0.008	0.015	0.039	3 000
95	105	135	0	0.008	0.008	0.020	0.045	3 000
125	135	165	0	0.010	0.008	0.025	0.051	3 000

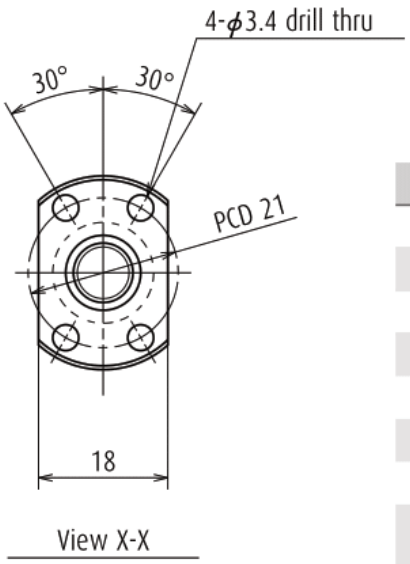
24. Finished shaft end MA Type (Fine lead)



Ball screw No.		Stroke	
Preloaded (MPFD)	Precise clearance (MSFD)	Nominal	Maximum
W0800MA-1PY-C3Z1	W0800MA-2Y-C3T1	40	59
W0801MA-1PY-C3Z1	W0801MA-2Y-C3T1	70	89
W0801MA-3PY-C3Z1	W0801MA-4Y-C3T1	100	119
W0802MA-1PY-C3Z1	W0802MA-2Y-C3T1	150	169

Notes

1. We recommend NSK support unit. See page 324 for details.
2. Use of NSK grease PS2 is recommended. Apply to screw shaft surface when replenishing. See page 445 for details.
3. Ball nut does not have seal.
4. Contact NSK if the permissible rotational speed is to be exceeded.



Screw shaft ϕ8
Lead 1

Unit: mm

Ball screw specifications			
Product classification		Preloaded	Precise clearance
Shaft dia. × Lead / Direction of turn		8 × 1 / Right	
Preload / Ball recirculation		P-preload / Deflector (bridge)	
Ball dia. / Ball circle dia.		0.800 / 8.2	
Screw shaft root diameter		7.2	
Effective turns of balls		1 × 3	
Accuracy grade / Preload / Axial play		C3 / Z	C3 / T
Basic load rating (N)	Dynamic C_a	790	
	Static C_{0a}	1 290	
Axial play		0	0.005 or less
Preload (N)		29.4	–
Dynamic friction torque, (N·cm)		1.8 or less	0.5 or less
Spacer ball		None	
Factory-packed grease		NSK grease PS2	

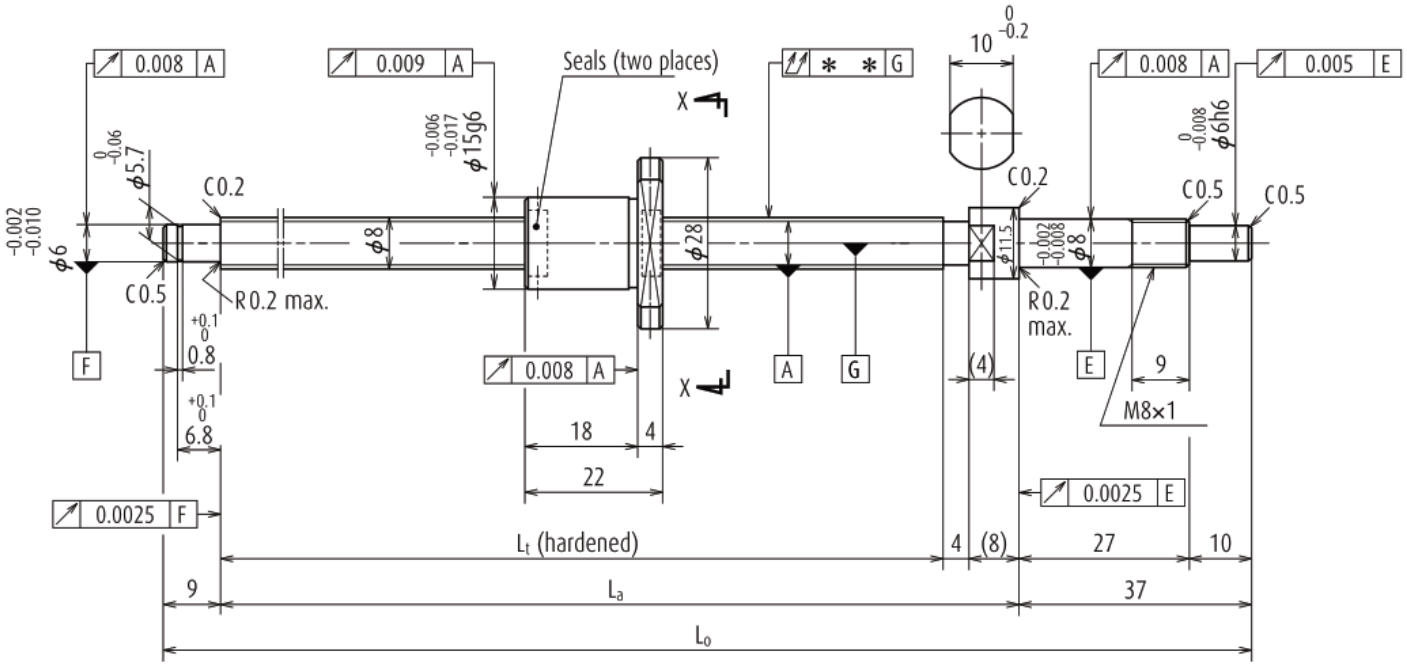
Recommended support unit

For drive side (Fixed)	For opposite to drive side (Simple)
WBK08-01A (square)	WBK08S-01 (square)
WBK08-11 (round)	

Unit: mm

Screw shaft length			Lead accuracy			Shaft run-out **	Mass (kg)	Permissible rotational speed N (min^{-1})
								Supporting condition
L_t	L_a	L_o	T	e_p	v_u			Fixed - Simple support
80	92	138	0	0.008	0.008	0.025	0.073	3 000
110	122	168	0	0.010	0.008	0.030	0.084	3 000
140	152	198	0	0.010	0.008	0.030	0.095	3 000
190	202	248	0	0.010	0.008	0.035	0.11	3 000

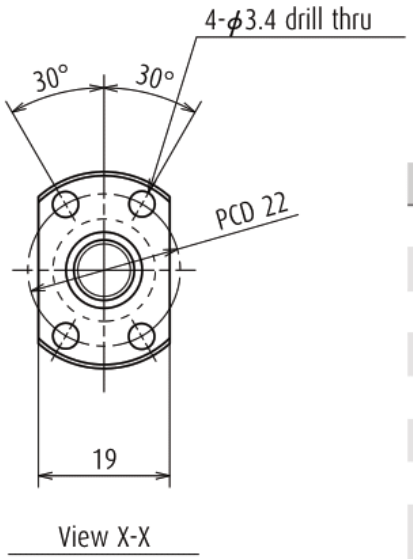
24. Finished shaft end MA Type (Fine lead)



Ball screw No.		Stroke	
Preloaded (MPFD)	Precise clearance (MSFD)	Nominal	Maximum
W0800MA-3PY-C3Z1.5	W0800MA-4Y-C3T1.5	40	53
W0801MA-5PY-C3Z1.5	W0801MA-6Y-C3T1.5	70	83
W0801MA-7PY-C3Z1.5	W0801MA-8Y-C3T1.5	100	113
W0802MA-3PY-C3Z1.5	W0802MA-4Y-C3T1.5	150	163

Notes

1. We recommend NSK support unit. See page 324 for details.
2. Use of NSK grease PS2 is recommended. Apply to screw shaft surface when replenishing. See page 445 for details.
3. Contact NSK if the permissible rotational speed is to be exceeded.



Screw shaft ϕ8
Lead 1.5

Unit: mm

Ball screw specifications			
Product classification		Preloaded	Precise clearance
Shaft dia. × Lead / Direction of turn		8 × 1.5 / Right	
Preload / Ball recirculation		P-preload / Deflector (bridge)	
Ball dia. / Ball circle dia.		1.000 / 8.3	
Screw shaft root diameter		7.0	
Effective turns of balls		1 × 3	
Accuracy grade / Preload / Axial play		C3 / Z	C3 / T
Basic load rating (N)	Dynamic C_a	1 270	
	Static C_{0a}	1 970	
Axial play		0	0.005 or less
Preload (N)		49.0	–
Dynamic friction torque, (N·cm)		2.0 or less	0.5 or less
Spacer ball		None	
Factory-packed grease		NSK grease PS2	

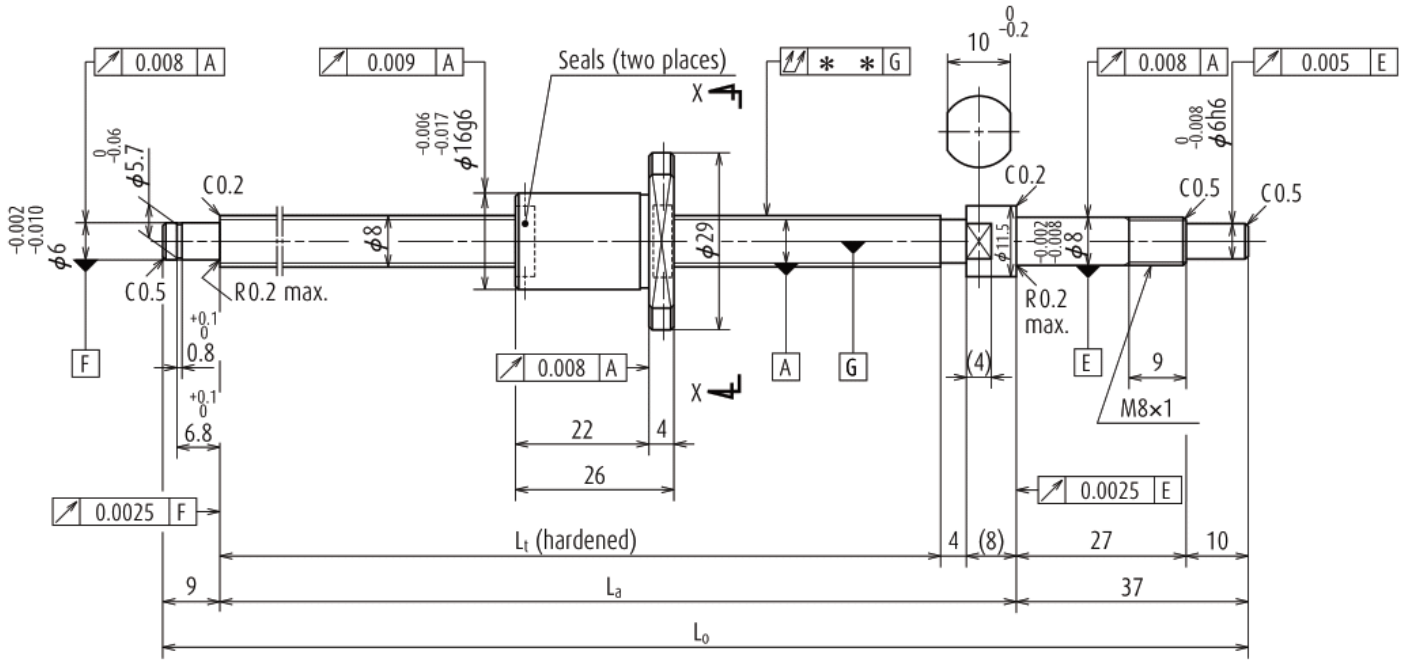
Recommended support unit

For drive side (Fixed)	For opposite to drive side (Simple)
WBK08-01A (square)	WBK08S-01 (square)
WBK08-11 (round)	

Unit: mm

Screw shaft length			Lead accuracy			Shaft run-out **	Mass (kg)	Permissible rotational speed N (min^{-1})
								Supporting condition
L_t	L_a	L_o	T	e_p	v_u			Fixed - Simple support
80	92	138	0	0.008	0.008	0.025	0.082	3 000
110	122	168	0	0.010	0.008	0.030	0.093	3 000
140	152	198	0	0.010	0.008	0.030	0.10	3 000
190	202	248	0	0.010	0.008	0.035	0.12	3 000

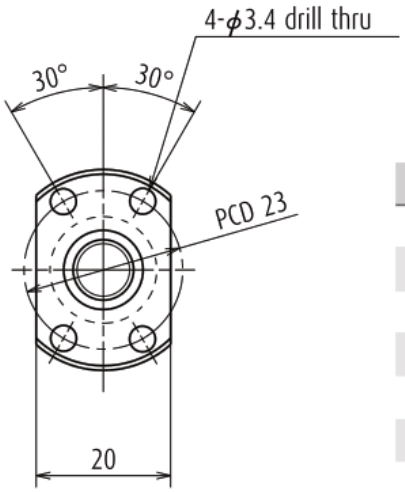
24. Finished shaft end MA Type (Fine lead)



Ball screw No.		Stroke	
Preloaded (MPFD)	Precise clearance (MSFD)	Nominal	Maximum
W0800MA-5PY-C3Z2	W0800MA-6Y-C3T2	40	49
W0801MA-9PY-C3Z2	W0801MA-10Y-C3T2	70	79
W0801MA-11PY-C3Z2	W0801MA-12Y-C3T2	100	109
W0802MA-5PY-C3Z2	W0802MA-6Y-C3T2	150	159

Notes

1. We recommend NSK support unit. See page 324 for details.
2. Use of NSK grease PS2 is recommended. Apply to screw shaft surface when replenishing. See page 445 for details.
3. Contact NSK if the permissible rotational speed is to be exceeded.



View X-X

Screw shaft ϕ8
Lead 2

Unit: mm

Ball screw specifications			
Product classification		Preloaded	Precise clearance
Shaft dia. × Lead / Direction of turn		8 × 2 / Right	
Preload / Ball recirculation		P-preload / Deflector (bridge)	
Ball dia. / Ball circle dia.		1.200 / 8.3	
Screw shaft root diameter		6.9	
Effective turns of balls		1 × 3	
Accuracy grade / Preload / Axial play		C3 / Z	C3 / T
Basic load rating (N)	Dynamic C_a	1 560	
	Static C_{0a}	2 200	
Axial play		0	0.005 or less
Preload (N)		49.0	–
Dynamic friction torque, (N·cm)		2.0 or less	0.5 or less
Spacer ball		None	
Factory-packed grease		NSK grease PS2	

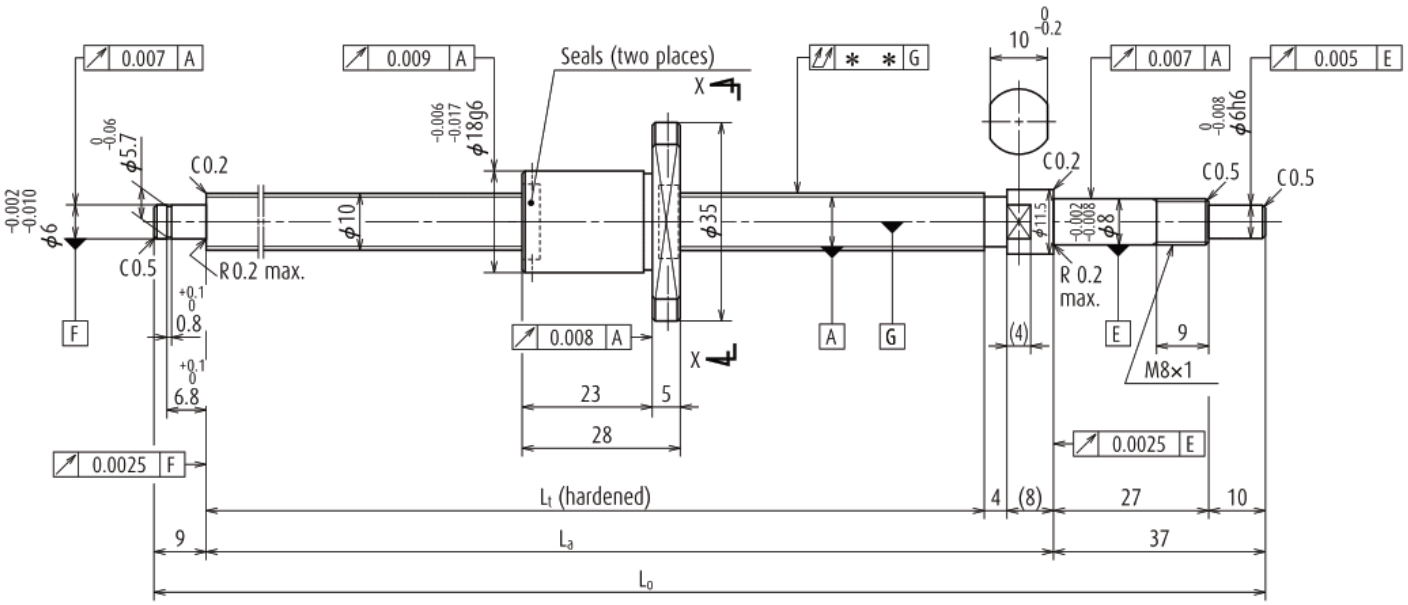
Recommended support unit

For drive side (Fixed)	For opposite to drive side (Simple)
WBK08-01A (square)	WBK08S-01 (square)
WBK08-11 (round)	

Unit: mm

Screw shaft length			Lead accuracy			Shaft run-out **	Mass (kg)	Permissible rotational speed N (min^{-1})
								Supporting condition
L_t	L_a	L_o	T	e_p	v_u			Fixed - Simple support
80	92	138	0	0.008	0.008	0.025	0.09	3 000
110	122	168	0	0.010	0.008	0.030	0.10	3 000
140	152	198	0	0.010	0.008	0.030	0.11	3 000
190	202	248	0	0.010	0.008	0.035	0.13	3 000

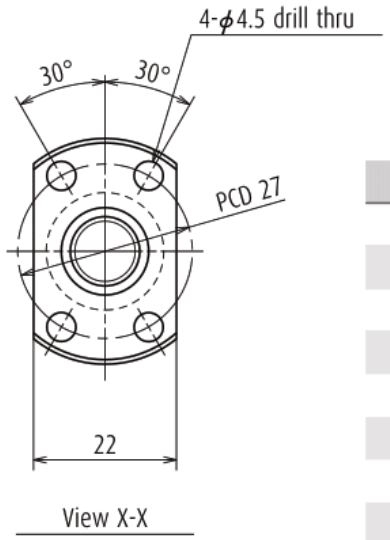
24. Finished shaft end MA Type (Fine lead)



Ball screw No.		Stroke	
Preloaded (MPFD)	Precise clearance (MSFD)	Nominal	Maximum
W1001MA-1PY-C3Z2	W1001MA-2Y-C3T2	50	67
W1001MA-3PY-C3Z2	W1001MA-4Y-C3T2	100	117
W1002MA-1PY-C3Z2	W1002MA-2Y-C3T2	150	167
W1002MA-3PY-C3Z2	W1002MA-4Y-C3T2	200	217

Notes

1. We recommend NSK support unit. See page 324 for details.
2. Use of NSK grease PS2 is recommended. Apply to screw shaft surface when replenishing. See page 445 for details.
3. Contact NSK if the permissible rotational speed is to be exceeded.



View X-X

Screw shaft ϕ10
Lead 2

Unit: mm

Ball screw specifications			
Product classification		Preloaded	Precise clearance
Shaft dia. × Lead / Direction of turn		10 × 2 / Right	
Preload / Ball recirculation		P-preload / Deflector (bridge)	
Ball dia. / Ball circle dia.		1.200 / 10.3	
Screw shaft root diameter		8.9	
Effective turns of balls		1 × 3	
Accuracy grade / Preload / Axial play		C3 / Z	C3 / T
Basic load rating (N)	Dynamic C_a	1 800	
	Static C_{0a}	2 970	
Axial play		0	0.005 or less
Preload (N)		58.8	–
Dynamic friction torque, (N·cm)		0.1 – 2.4	0.5 or less
Spacer ball		None	
Factory-packed grease		NSK grease PS2	

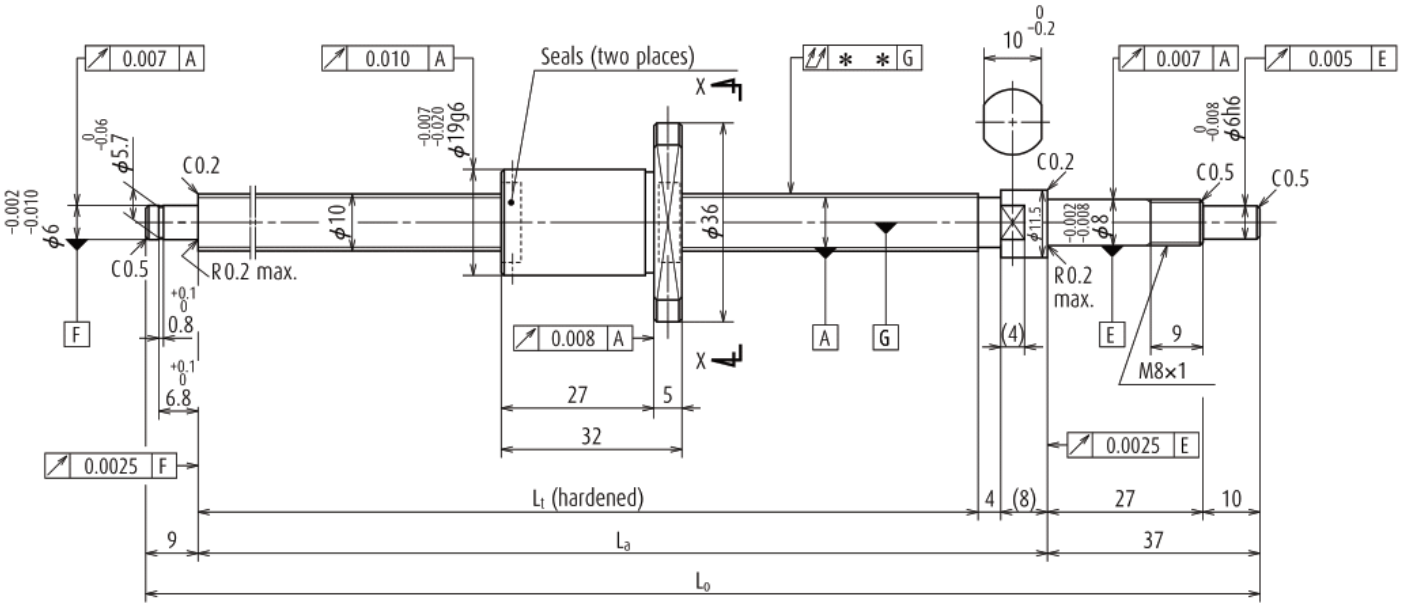
Recommended support unit

For drive side (Fixed)	For opposite to drive side (Simple)
WBK08-01A (square)	WBK08S-01 (square)
WBK08-11 (round)	

Unit: mm

Screw shaft length			Lead accuracy			Shaft run-out **	Mass (kg)	Permissible rotational speed N (min^{-1})
								Supporting condition
L_t	L_a	L_o	T	e_p	v_u			Fixed - Simple support
100	112	158	0	0.008	0.008	0.020	0.13	3 000
150	162	208	0	0.010	0.008	0.030	0.16	3 000
200	212	258	0	0.010	0.008	0.030	0.19	3 000
250	262	308	0	0.012	0.008	0.035	0.22	3 000

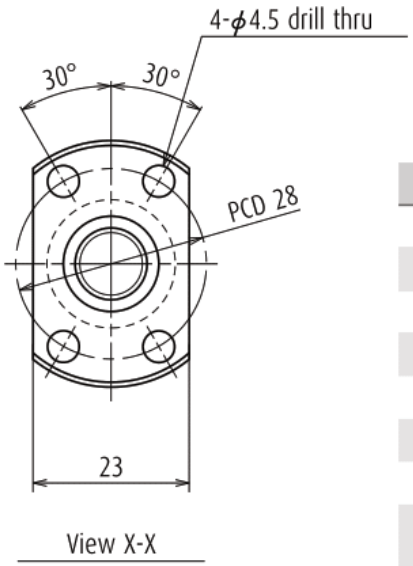
24. Finished shaft end MA Type (Fine lead)



Ball screw No.		Stroke	
Preloaded (MPFD)	Precise clearance (MSFD)	Nominal	Maximum
W1001MA-5PY-C3Z2.5	W1001MA-6Y-C3T2.5	50	63
W1001MA-7PY-C3Z2.5	W1001MA-8Y-C3T2.5	100	113
W1002MA-5PY-C3Z2.5	W1002MA-6Y-C3T2.5	150	163
W1002MA-7PY-C3Z2.5	W1002MA-8Y-C3T2.5	200	213

Notes

1. We recommend NSK support unit. See page 324 for details.
2. Use of NSK grease PS2 is recommended. Apply to screw shaft surface when replenishing. See page 445 for details.
3. Contact NSK if the permissible rotational speed is to be exceeded.



Screw shaft ϕ10
Lead 2.5

Unit: mm

Ball screw specifications			
Product classification		Preloaded	Precise clearance
Shaft dia. × Lead / Direction of turn		10 × 2.5 / Right	
Preload / Ball recirculation		P-preload / Deflector (bridge)	
Ball dia. / Ball circle dia.		1.588 / 10.4	
Screw shaft root diameter		8.6	
Effective turns of balls		1 × 3	
Accuracy grade / Preload / Axial play		C3 / Z	C3 / T
Basic load rating (N)	Dynamic C_a	2 500	
	Static C_{0a}	3 630	
Axial play		0	0.005 or less
Preload (N)		98.1	–
Dynamic friction torque, (N·cm)		0.2 – 2.9	0.5 or less
Spacer ball		None	
Factory-packed grease		NSK grease PS2	

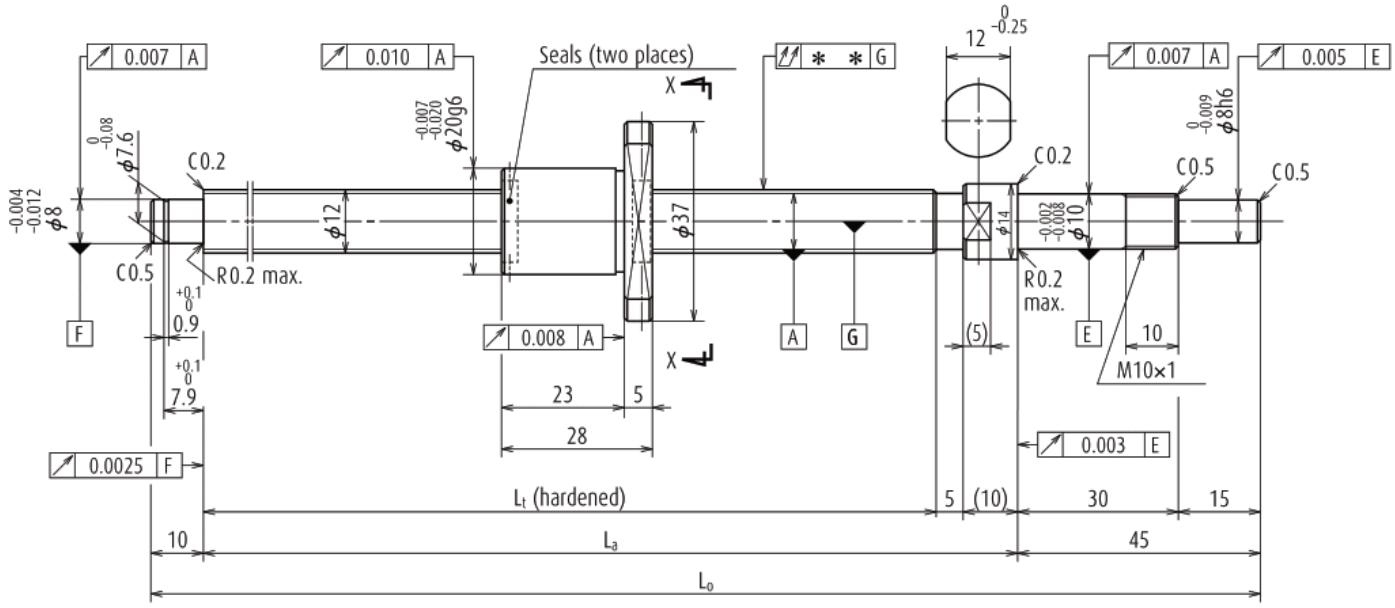
Recommended support unit

For drive side (Fixed)	For opposite to drive side (Simple)
WBK08-01A (square)	WBK08S-01 (square)
WBK08-11 (round)	

Unit: mm

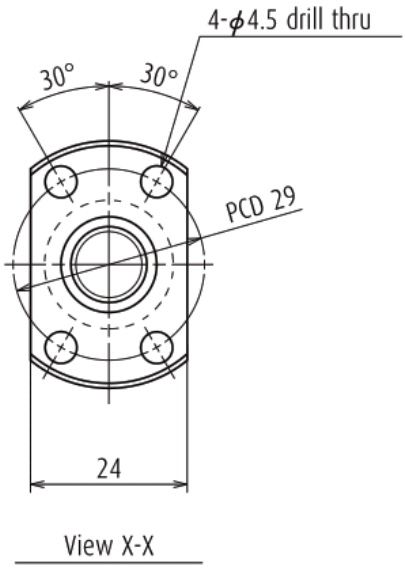
Screw shaft length			Lead accuracy			Shaft run-out **	Mass (kg)	Permissible rotational speed N (min^{-1})
								Supporting condition
L_t	L_a	L_o	T	e_p	v_u			Fixed - Simple support
100	112	158	0	0.008	0.008	0.020	0.14	3 000
150	162	208	0	0.010	0.008	0.030	0.17	3 000
200	212	258	0	0.010	0.008	0.030	0.20	3 000
250	262	308	0	0.012	0.008	0.030	0.23	3 000

24. Finished shaft end MA Type (Fine lead)



Ball screw No.		Stroke	
Preloaded (MPFD)	Precise clearance (MSFD)	Nominal	Maximum
W1201MA-1PY-C3Z2	W1201MA-2Y-C3T2	50	75
W1201MA-3PY-C3Z2	W1201MA-4Y-C3T2	100	125
W1202MA-1PY-C3Z2	W1202MA-2Y-C3T2	150	175
W1202MA-3PY-C3Z2	W1202MA-4Y-C3T2	200	225
W1203MA-1PY-C3Z2	W1203MA-2Y-C3T2	250	275

Notes
1. We recommend NSK support unit. See page 324 for details.
2. Use of NSK grease PS2 is recommended. Apply to screw shaft surface when replenishing. See page 445 for details.
3. Contact NSK if the permissible rotational speed is to be exceeded.



Screw shaft ϕ12
Lead 2

Unit: mm

Ball screw specifications			
Product classification		Preloaded	Precise clearance
Shaft dia. × Lead / Direction of turn		12 × 2 / Right	
Preload / Ball recirculation		P-preload / Deflector (bridge)	
Ball dia. / Ball circle dia.		1.200 / 12.3	
Screw shaft root diameter		10.9	
Effective turns of balls		1 × 3	
Accuracy grade / Preload / Axial play		C3 / Z	C3 / T
Basic load rating (N)	Dynamic C_a	1 960	
	Static C_{0a}	3 620	
Axial play		0	0.005 or less
Preload (N)		98.1	–
Dynamic friction torque, (N·cm)		0.4 – 3.4	1.0 or less
Spacer ball		None	
Factory-packed grease		NSK grease PS2	

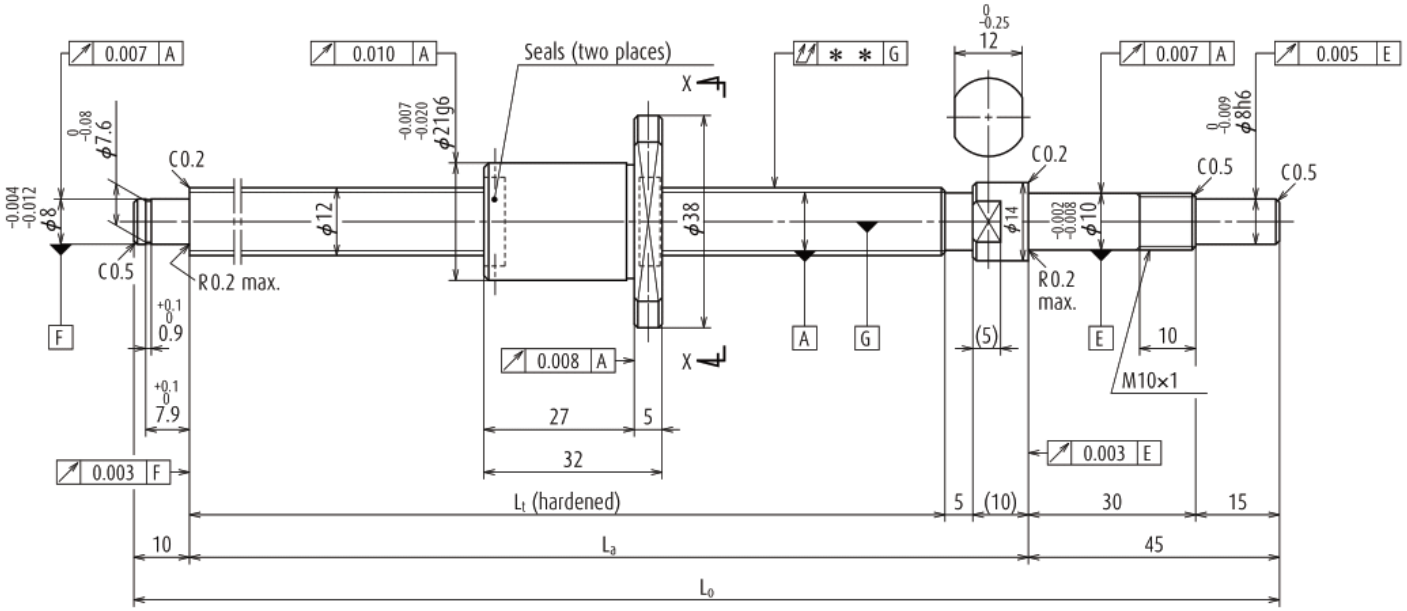
Recommended support unit

For drive side (Fixed)	For opposite to drive side (Simple)
WBK10-01A (square)	WBK10S-01 (square)
WBK10-11 (round)	

Unit: mm

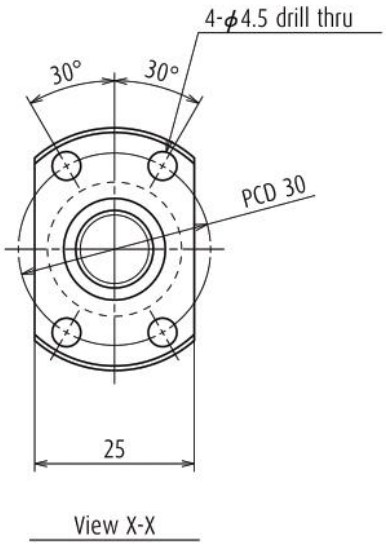
Screw shaft length			Lead accuracy			Shaft run-out **	Mass (kg)	Permissible rotational speed N (min^{-1})
								Supporting condition
L_t	L_a	L_o	T	e_p	v_u			Fixed - Simple support
110	125	180	0	0.010	0.008	0.020	0.20	3 000
160	175	230	0	0.010	0.008	0.030	0.24	3 000
210	225	280	0	0.012	0.008	0.030	0.28	3 000
260	275	330	0	0.012	0.008	0.040	0.32	3 000
310	325	380	0	0.012	0.008	0.040	0.36	3 000

24. Finished shaft end MA Type (Fine lead)



Ball screw No.		Stroke	
Preloaded (MPFD)	Precise clearance (MSFD)	Nominal	Maximum
W1201MA-5PY-C3Z2.5	W1201MA-6Y-C3T2.5	50	71
W1201MA-7PY-C3Z2.5	W1201MA-8Y-C3T2.5	100	121
W1202MA-5PY-C3Z2.5	W1202MA-6Y-C3T2.5	150	171
W1202MA-7PY-C3Z2.5	W1202MA-8Y-C3T2.5	200	221
W1203MA-3PY-C3Z2.5	W1203MA-4Y-C3T2.5	250	271

Notes
1. We recommend NSK support unit. See page 324 for details.
2. Use of NSK grease PS2 is recommended. Apply to screw shaft surface when replenishing. See page 445 for details.
3. Contact NSK if the permissible rotational speed is to be exceeded.



Screw shaft ϕ 12
Lead 2.5

Unit: mm

Ball screw specifications			
Product classification		Preloaded	Precise clearance
Shaft dia. × Lead / Direction of turn		12 × 2.5 / Right	
Preload / Ball recirculation		P-preload / Deflector (bridge)	
Ball dia. / Ball circle dia.		1.588 / 12.4	
Screw shaft root diameter		10.6	
Effective turns of balls		1 × 3	
Accuracy grade / Preload / Axial play		C3 / Z	C3 / T
Basic load rating (N)	Dynamic C_a	2 790	
	Static C_{0a}	4 530	
Axial play		0	0.005 or less
Preload (N)		98.1	-
Dynamic friction torque, (N·cm)		0.4 – 3.4	1.0 or less
Spacer ball		None	
Factory-packed grease		NSK grease PS2	

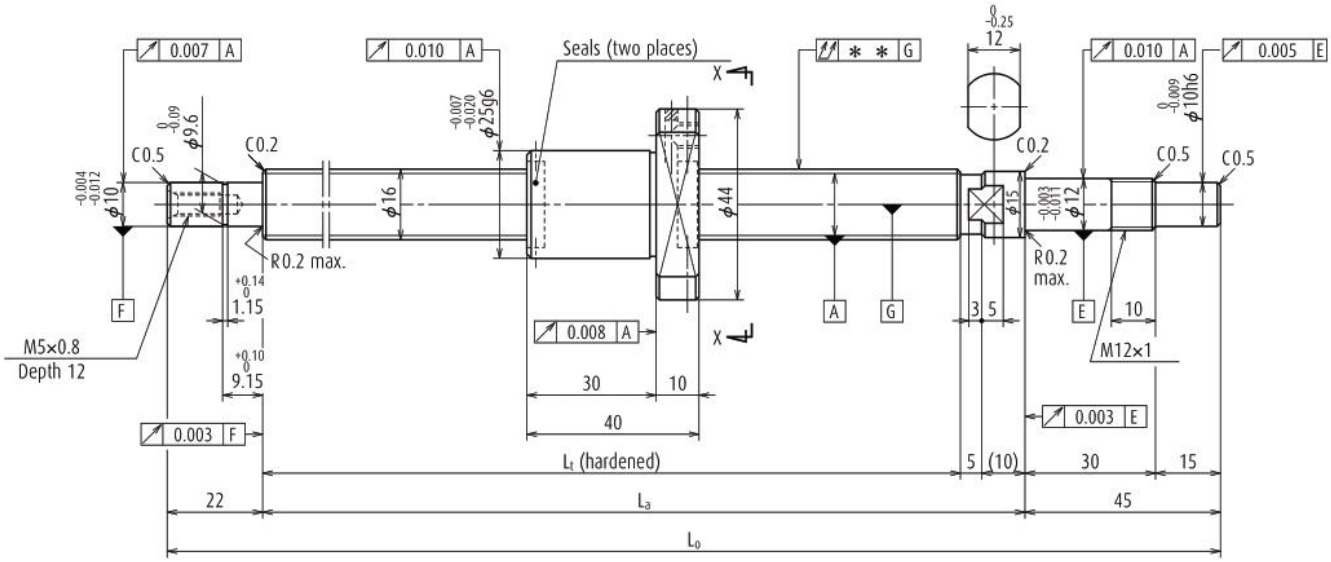
Recommended support unit

For drive side (Fixed)	For opposite to drive side (Simple)
WBK10-01A (square)	WBK10S-01 (square)
WBK10-11 (round)	

Unit: mm

Screw shaft length			Lead accuracy			Shaft run-out **	Mass (kg)	Permissible rotational speed N (min^{-1})
								Supporting condition
L_t	L_a	L_o	T	e_p	v_u			Fixed - Simple support
110	125	180	0	0.010	0.008	0.020	0.21	3 000
160	175	230	0	0.010	0.008	0.030	0.25	3 000
210	225	280	0	0.012	0.008	0.030	0.29	3 000
260	275	330	0	0.012	0.008	0.040	0.33	3 000
310	325	380	0	0.012	0.008	0.040	0.37	3 000

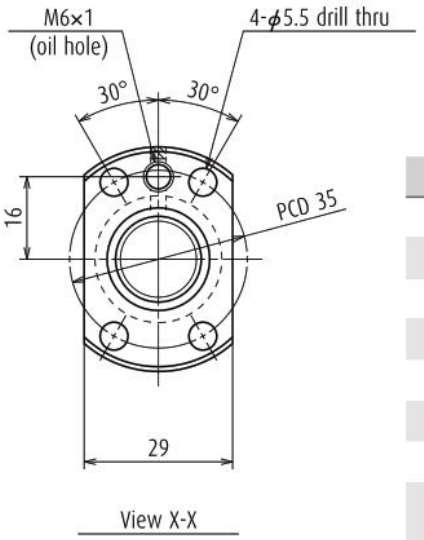
24. Finished shaft end MA Type (Fine lead)



Ball screw No.		Stroke	
Preloaded (MPFD)	Precise clearance (MSFD)	Nominal	Maximum
W1601MA-1PY-C3Z2	W1601MA-2Y-C3T2	50	93
W1601MA-3PY-C3Z2	W1601MA-4Y-C3T2	100	143
W1602MA-1PY-C3Z2	W1602MA-2Y-C3T2	150	193
W1602MA-3PY-C3Z2	W1602MA-4Y-C3T2	200	243
W1603MA-1PY-C3Z2	W1603MA-2Y-C3T2	300	343

Notes

1. We recommend NSK support unit. See page 324 for details.
2. Use of NSK grease PS2 is recommended. Recommended quantity of grease is about 50% of ball nut's internal space. See page 445 for details.
3. Contact NSK if the permissible rotational speed is to be exceeded.
4. If Fixed is used for opposite driven side, configuration of support bearing area is designed by the customer.



Screw shaft ϕ 16
Lead 2

Unit: mm

Ball screw specifications			
Product classification		Preloaded	Precise clearance
Shaft dia. × Lead / Direction of turn		16 × 2 / Right	
Preload / Ball recirculation		P-preload / Deflector (bridge)	
Ball dia. / Ball circle dia.		1.588 / 16.4	
Screw shaft root diameter		14.6	
Effective turns of balls		1 × 4	
Accuracy grade / Preload / Axial play		C3 / Z	C3 / T
Basic load rating (N)	Dynamic C_a	4 150	
	Static C_{0a}	8 450	
Axial play		0	0.005 or less
Preload (N)		147	-
Dynamic friction torque, (N·cm)		0.5 – 4.9	1.5 or less
Spacer ball		None	
Factory-packed grease		NSK grease PS2	
Internal spatial volume of nut (cm^3)		1.6	
Standard volume of grease replenishing (cm^3)		0.8	

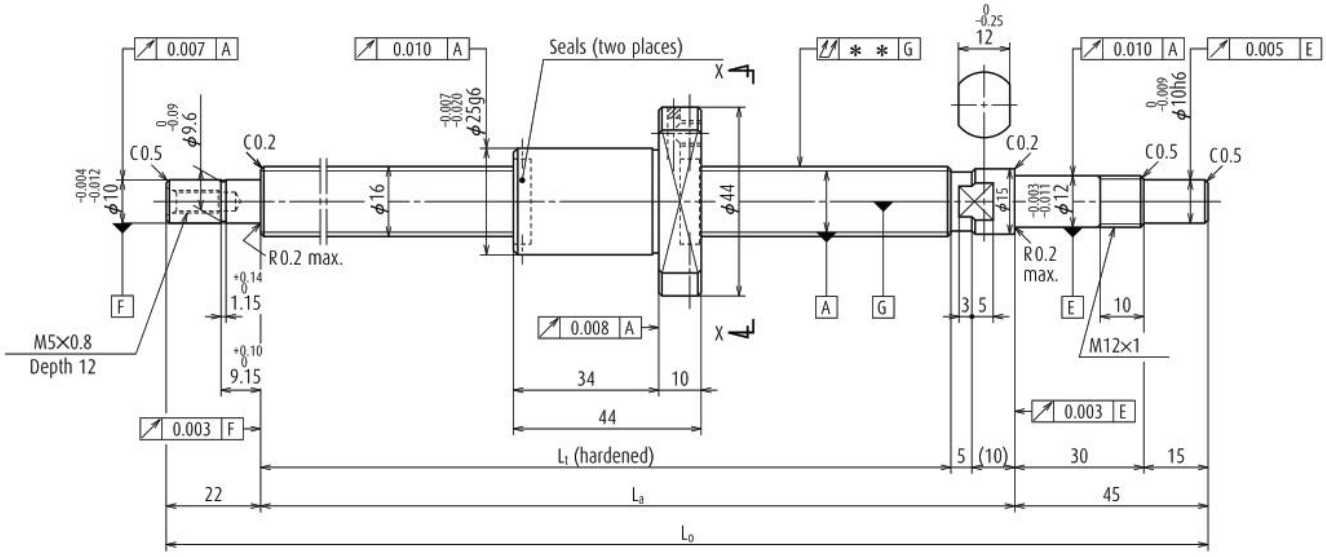
Recommended support unit

For drive side (Fixed)	For opposite to drive side (Simple)
WBK12-01A (square)	WBK12S-01 (square)
WBK12-11 (round)	

Unit: mm

Screw shaft length			Lead accuracy			Shaft run-out **	Mass (kg)	Permissible rotational speed N (min^{-1})	
								Supporting condition	
L_t	L_a	L_o	T	e_p	v_u			Fixed - Simple support	Fixed - Fixed
139	154	221	0	0.010	0.008	0.020	0.41	3 000	3 000
189	204	271	0	0.010	0.008	0.030	0.48	3 000	3 000
239	254	321	0	0.012	0.008	0.030	0.55	3 000	3 000
289	304	371	0	0.012	0.008	0.030	0.62	3 000	3 000
389	404	471	0	0.013	0.010	0.035	0.77	3 000	3 000

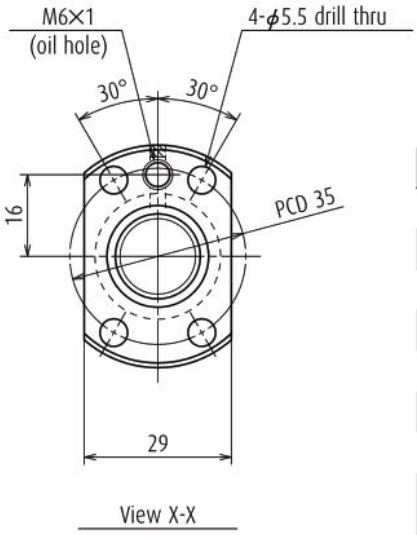
24. Finished shaft end MA Type (Fine lead)



Ball screw No.		Stroke	
Preloaded (MPFD)	Precise clearance (MSFD)	Nominal	Maximum
W1601MA-5PY-C3Z2.5	W1601MA-6Y-C3T2.5	50	89
W1601MA-7PY-C3Z2.5	W1601MA-8Y-C3T2.5	100	139
W1602MA-5PY-C3Z2.5	W1602MA-6Y-C3T2.5	150	189
W1602MA-7PY-C3Z2.5	W1602MA-8Y-C3T2.5	200	239
W1603MA-3PY-C3Z2.5	W1603MA-4Y-C3T2.5	300	339

Notes

1. We recommend NSK support unit. See page 324 for details.
2. Use of NSK grease PS2 is recommended. Recommended quantity of grease is about 50% of ball nut's internal space. See page 445 for details.
3. Contact NSK if the permissible rotational speed is to be exceeded.
4. If Fixed is used for opposite driven side, configuration of support bearing area is designed by the customer.



Screw shaft ϕ 16
Lead 2.5

Unit: mm

Ball screw specifications			
Product classification		Preloaded	Precise clearance
Shaft dia. × Lead / Direction of turn		16 × 2.5 / Right	
Preload / Ball recirculation		P-preload / Deflector (bridge)	
Ball dia. / Ball circle dia.		1.588 / 16.4	
Screw shaft root diameter		14.6	
Effective turns of balls		1 × 4	
Accuracy grade / Preload / Axial play		C3 / Z	C3 / T
Basic load rating (N)	Dynamic C_a	4 150	
	Static C_{0a}	8 440	
Axial play		0	0.005 or less
Preload (N)		147	-
Dynamic friction torque, (N·cm)		0.5 – 4.9	1.5 or less
Spacer ball		None	
Factory-packed grease		NSK grease PS2	
Internal spatial volume of nut (cm^3)		1.6	
Standard volume of grease replenishing (cm^3)		0.8	

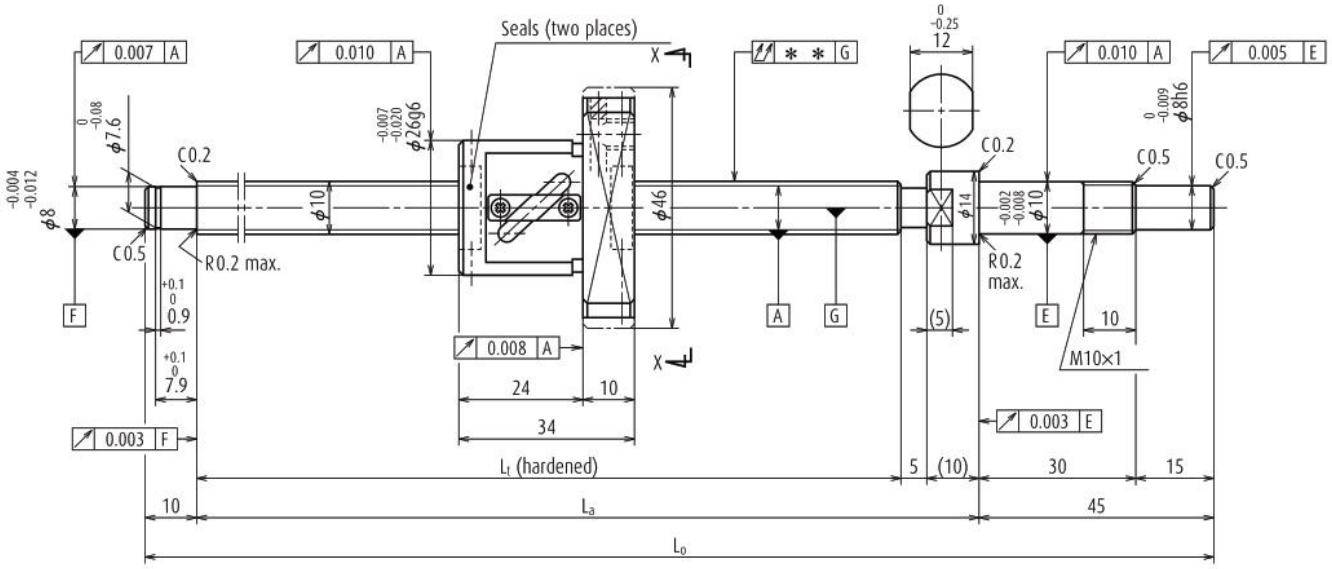
Recommended support unit

For drive side (Fixed)	For opposite to drive side (Simple)
WBK12-01A (square)	WBK12S-01 (square)
WBK12-11 (round)	

Unit: mm

Screw shaft length			Lead accuracy			Shaft run-out **	Mass (kg)	Permissible rotational speed N (min^{-1})	
								Supporting condition	
L_t	L_a	L_o	T	e_p	v_u			Fixed - Simple support	Fixed - Fixed
139	154	221	0	0.010	0.008	0.020	0.42	3 000	3 000
189	204	271	0	0.010	0.008	0.020	0.49	3 000	3 000
239	254	321	0	0.012	0.008	0.030	0.57	3 000	3 000
289	304	371	0	0.012	0.008	0.030	0.64	3 000	3 000
389	404	471	0	0.013	0.010	0.035	0.79	3 000	3 000

24. Finished shaft end FA Type (Fine lead)

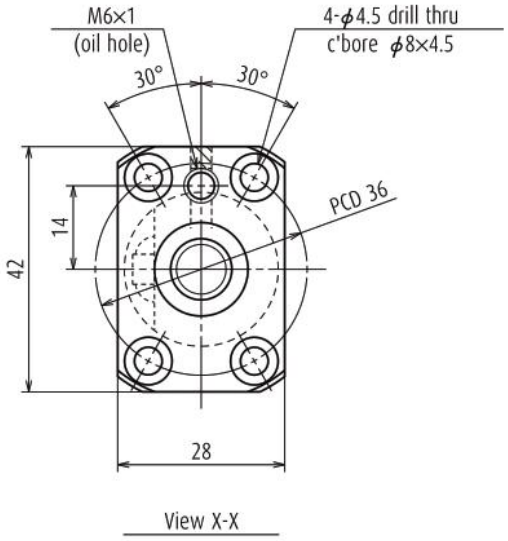


Ball screw No.		Stroke	
Preloaded (PFT)	Precise clearance (SFT)	Nominal	Maximum
W1001FA-1P-C3Z4	W1001FA-2-C3T4	50	69
W1001FA-3P-C3Z4	W1001FA-4-C3T4	100	119
W1002FA-1P-C3Z4	W1002FA-2-C3T4	150	169
W1002FA-3P-C3Z4	W1002FA-4-C3T4	200	219
W1003FA-1P-C3Z4	W1003FA-2-C3T4	250	269
W1003FA-3P-C3Z4	W1003FA-4-C3T4	300	319

Notes

1. We recommend NSK support unit. See page 324 for details.
2. Use of NSK grease PS2 is recommended. Recommended quantity of grease is about 50% of ball nut's internal space. See page 445 for details.
3. Contact NSK if the permissible rotational speed is to be exceeded.

Nut models: PFT, SFT



Screw shaft ϕ 10
Lead 4

Unit: mm

Ball screw specifications			
Product classification		Preloaded	Precise clearance
Shaft dia. × Lead / Direction of turn		10 × 4 / Right	
Preload / Ball recirculation		P-preload / Return tube	
Ball dia. / Ball circle dia.		2.000 / 10.3	
Screw shaft root diameter		8.2	
Effective turns of balls		2.5 × 1	
Accuracy grade / Preload / Axial play		C3 / Z	C3 / T
Basic load rating (N)	Dynamic C_a	2 020	3 210
	Static C_{0a}	2 210	4 420
Axial play		0	0.005 or less
Preload (N)		98.1	-
Dynamic friction torque, (N·cm)		0.5 – 3.9	1.0 or less
Spacer ball		Yes	None
Factory-packed grease		NSK grease PS2	
Internal spatial volume of nut (cm^3)		0.8	
Standard volume of grease replenishing (cm^3)		0.4	

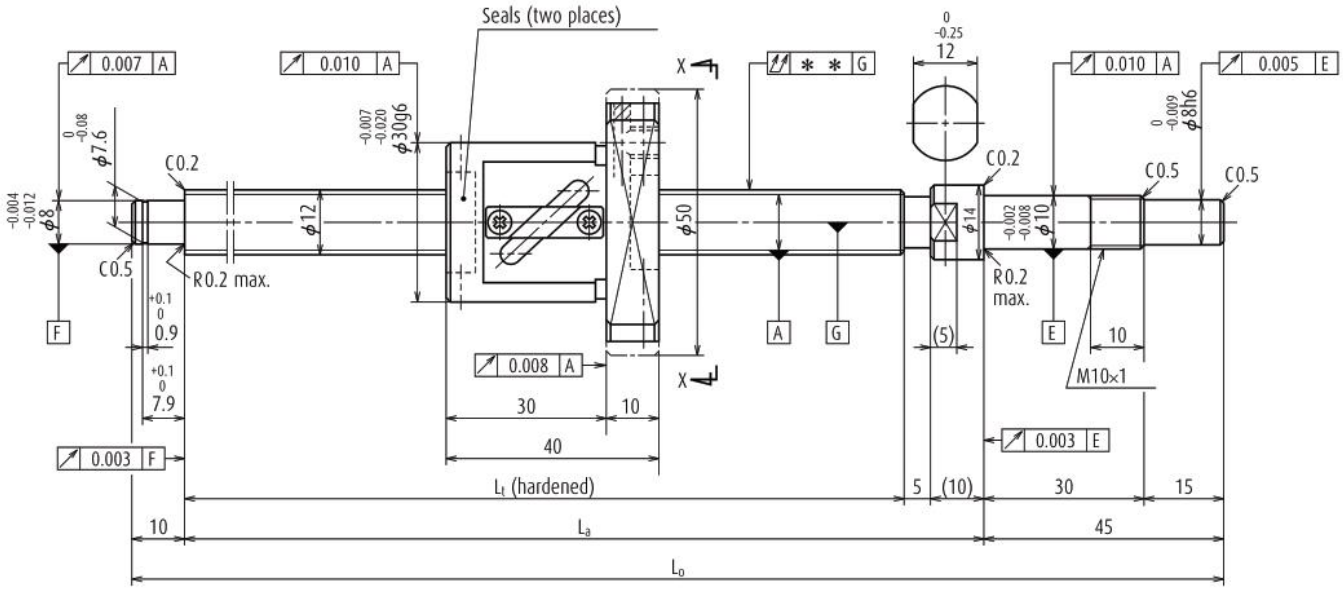
Recommended support unit

For drive side (Fixed)	For opposite to drive side (Simple)
WBK10-01A (square)	WBK10S-01 (square)
WBK10-11 (round)	

Unit: mm

Screw shaft length			Lead accuracy			Shaft run-out **	Mass (kg)	Permissible rotational speed N (min^{-1})
								Supporting condition
L_t	L_a	L_o	T	e_p	v_u			Fixed - Simple support
110	125	180	0	0.010	0.008	0.020	0.26	3 000
160	175	230	0	0.010	0.008	0.030	0.28	3 000
210	225	280	0	0.012	0.008	0.030	0.31	3 000
260	275	330	0	0.012	0.008	0.040	0.34	3 000
310	325	380	0	0.012	0.008	0.040	0.37	3 000
360	375	430	0	0.013	0.010	0.050	0.39	3 000

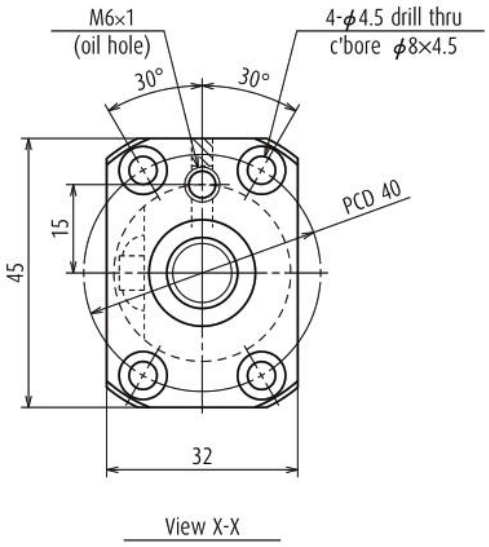
24. Finished shaft end FA Type (Fine lead)



Ball screw No.		Stroke	
Preloaded (PFT)	Precise clearance (SFT)	Nominal	Maximum
W1201FA-1P-C3Z5	W1201FA-2-C3T5	50	63
W1201FA-3P-C3Z5	W1201FA-4-C3T5	100	113
W1202FA-1P-C3Z5	W1202FA-2-C3T5	150	163
W1202FA-3P-C3Z5	W1202FA-4-C3T5	200	213
W1203FA-1P-C3Z5	W1203FA-2-C3T5	250	263
W1204FA-1P-C3Z5	W1204FA-2-C3T5	350	363
W1205FA-1P-C3Z5	W1205FA-2-C3T5	450	463

Notes

1. We recommend NSK support unit. See page 324 for details.
2. Use of NSK grease PS2 is recommended. Recommended quantity of grease is about 50% of ball nut's internal space. See page 445 for details.
3. Contact NSK if the permissible rotational speed is to be exceeded.



Screw shaft ϕ12
Lead 5

Unit: mm

Ball screw specifications			
Product classification		Preloaded	Precise clearance
Shaft dia. × Lead / Direction of turn		12 × 5 / Right	
Preload / Ball recirculation		P-preload / Return tube	
Ball dia. / Ball circle dia.		2.381 / 12.3	
Screw shaft root diameter		9.8	
Effective turns of balls		2.5 × 1	
Accuracy grade / Preload / Axial play		C3 / Z	C3 / T
Basic load rating (N)	Dynamic C_a	2 770	4 390
	Static C_{0a}	3 130	6 260
Axial play		0	0.005 or less
Preload (N)		98.1	-
Dynamic friction torque, (N·cm)		1.0 – 4.4	1.0 or less
Spacer ball		Yes	None
Factory-packed grease		NSK grease PS2	
Internal spatial volume of nut (cm^3)		1.2	
Standard volume of grease replenishing (cm^3)		0.6	

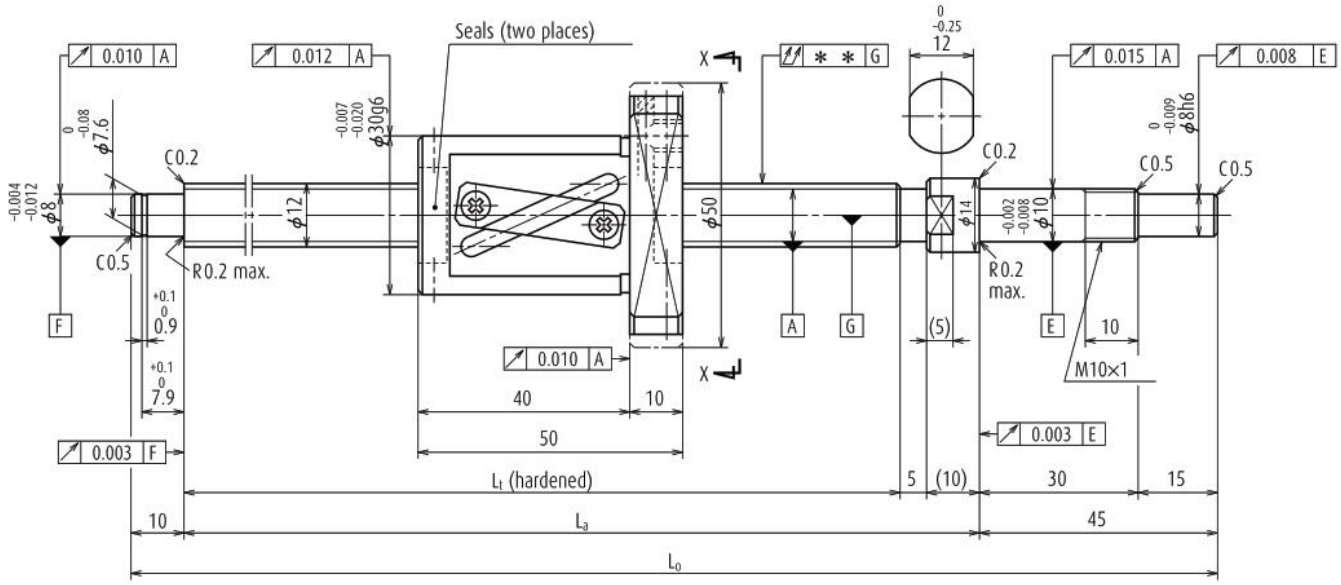
Recommended support unit

For drive side (Fixed)	For opposite to drive side (Simple)
WBK10-01A (square)	WBK10S-01 (square)
WBK10-11 (round)	

Unit: mm

Screw shaft length			Lead accuracy			Shaft run-out **	Mass (kg)	Permissible rotational speed N (min^{-1})
								Supporting condition
L_t	L_a	L_o	T	e_p	v_u			Fixed - Simple support
110	125	180	0	0.010	0.008	0.020	0.35	3 000
160	175	230	0	0.010	0.008	0.030	0.38	3 000
210	225	280	0	0.012	0.008	0.030	0.42	3 000
260	275	330	0	0.012	0.008	0.040	0.46	3 000
310	325	380	0	0.012	0.008	0.040	0.50	3 000
410	425	480	0	0.015	0.010	0.050	0.58	3 000
510	525	580	0	0.016	0.012	0.065	0.66	3 000

24. Finished shaft end FA Type (Medium lead)

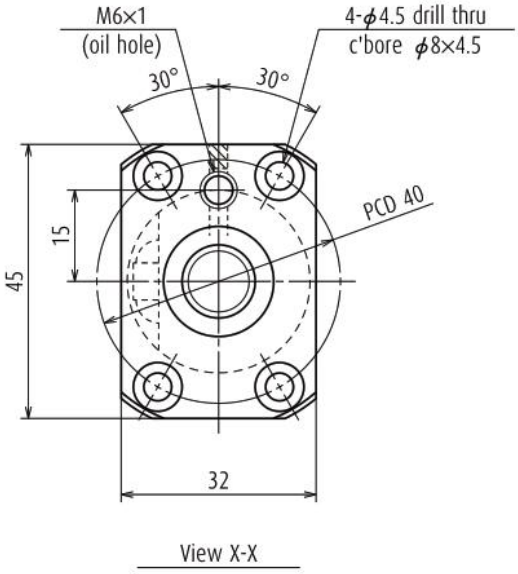


Ball screw No.		Stroke	
Preloaded (LPFT)	Precise clearance (LSFT)	Nominal	Maximum
W1201FA-5P-C5Z10	W1201FA-6-C5T10	100	103
W1202FA-5P-C5Z10	W1202FA-6-C5T10	150	153
W1203FA-3P-C5Z10	W1203FA-4-C5T10	250	253
W1204FA-3P-C5Z10	W1204FA-4-C5T10	350	353
W1205FA-3P-C5Z10	W1205FA-4-C5T10	450	453

Notes

1. We recommend NSK support unit. See page 324 for details.
2. Use of NSK grease LR3 is recommended. Recommended quantity of grease is about 50% of ball nut's internal space. See page 445 for details.
3. Contact NSK if the permissible rotational speed is to be exceeded.

Nut models: LPFT, LSFT



Screw shaft ϕ 12
Lead 10

Unit: mm

Ball screw specifications			
Product classification		Preloaded	Precise clearance
Shaft dia. × Lead / Direction of turn		12 ×10 / Right	
Preload / Ball recirculation		P-preload / Return tube	
Ball dia. / Ball circle dia.		2.381 / 12.5	
Screw shaft root diameter		10.0	
Effective turns of balls		2.5 × 1	
Accuracy grade / Preload / Axial play		C3 / Z	C3 / T
Basic load rating (N)	Dynamic C_a	2 790	4 430
	Static C_{0a}	3 220	6 430
Axial play		0	0.005 or less
Preload (N)		98.1	-
Dynamic friction torque, (N·cm)		1.0 – 4.9	1.5 or less
Spacer ball		Yes	None
Factory-packed grease		NSK grease LR3	
Internal spatial volume of nut (cm^3)		1.4	
Standard volume of grease replenishing (cm^3)		0.7	

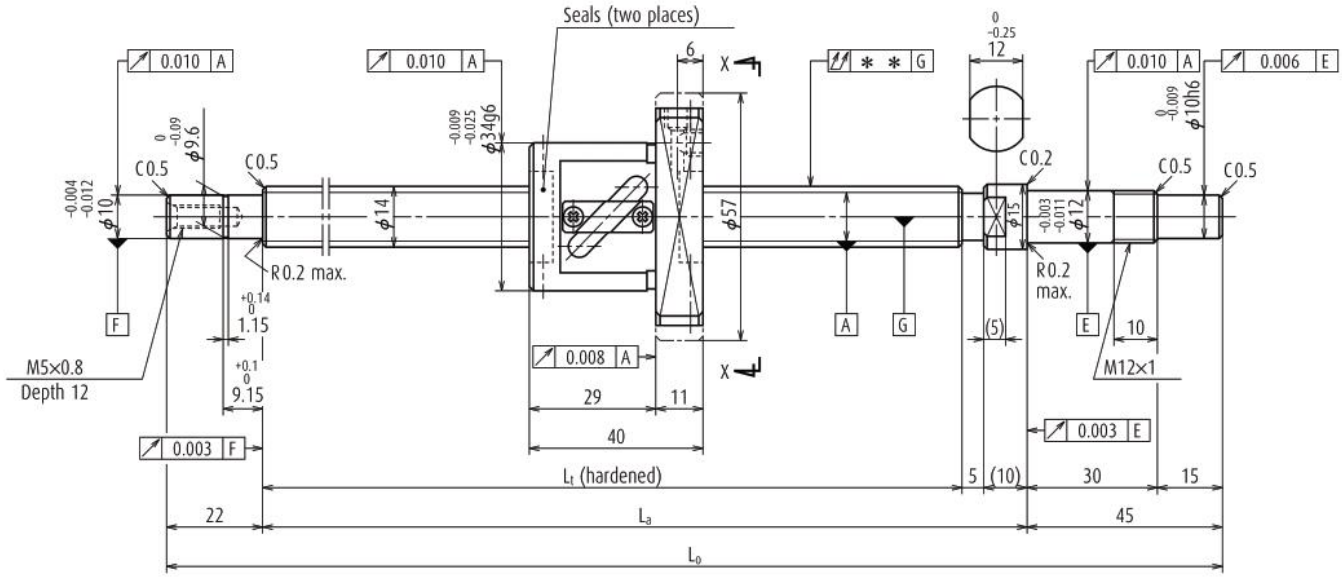
Recommended support unit

For drive side (Fixed)	For opposite to drive side (Simple)
WBK10-01A (square)	WBK10S-01 (square)
WBK10-11 (round)	

Unit: mm

Screw shaft length			Lead accuracy			Shaft run-out **	Mass (kg)	Permissible rotational speed N (min^{-1})
								Supporting condition
L_t	L_a	L_o	T	e_p	v_u			Fixed - Simple support
160	175	230	0	0.020	0.018	0.035	0.43	3 000
210	225	280	0	0.023	0.018	0.035	0.47	3 000
310	325	380	0	0.023	0.018	0.050	0.56	3 000
410	425	480	0	0.027	0.020	0.060	0.64	3 000
510	525	580	0	0.030	0.023	0.075	0.72	3 000

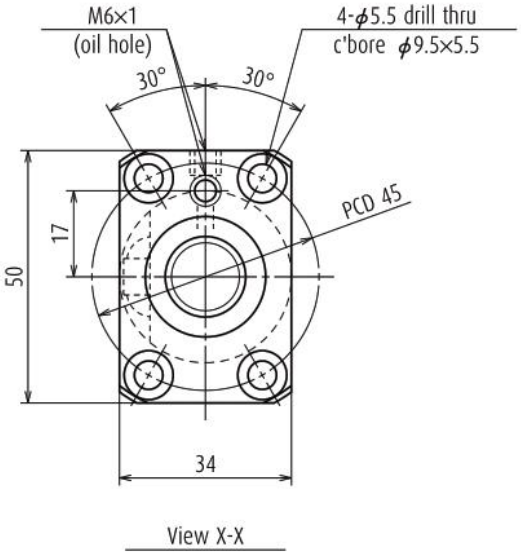
24. Finished shaft end FA Type (Fine lead)



Ball screw No.		Stroke	
Preloaded (PFT)	Precise clearance (SFT)	Nominal	Maximum
W1401FA-1P-C3Z5	W1401FA-2-C3T5	100	143
W1402FA-1P-C3Z5	W1402FA-2-C3T5	150	193
W1403FA-1P-C3Z5	W1403FA-2-C3T5	250	293
W1404FA-1P-C3Z5	W1404FA-2-C3T5	350	393
W1405FA-1P-C3Z5	W1405FA-2-C3T5	450	493
W1406FA-1P-C3Z5	W1406FA-2-C3T5	600	643

Notes

1. We recommend NSK support unit. See page 324 for details.
2. Use of NSK grease PS2 is recommended. Recommended quantity of grease is about 50% of ball nut's internal space. See page 445 for details.
3. Contact NSK if the permissible rotational speed is to be exceeded.



Screw shaft ϕ 14
Lead 5

Unit: mm

Ball screw specifications			
Product classification		Preloaded	Precise clearance
Shaft dia. × Lead / Direction of turn		14 × 5 / Right	
Preload / Ball recirculation		P-preload / Return tube	
Ball dia. / Ball circle dia.		3.175 / 14.5	
Screw shaft root diameter		11.2	
Effective turns of balls		2.5 × 1	
Accuracy grade / Preload / Axial play		C3 / Z	C3 / T
Basic load rating (N)	Dynamic C_a	5 020	7 970
	Static C_{0a}	5 970	11 900
Axial play		0	0.005 or less
Preload (N)		147	-
Dynamic friction torque, (N·cm)		1.5 – 6.9	2.0 or less
Spacer ball		Yes	None
Factory-packed grease		NSK grease LR3	
Internal spatial volume of nut (cm^3)		2.2	
Standard volume of grease replenishing (cm^3)		1.1	

Recommended support unit

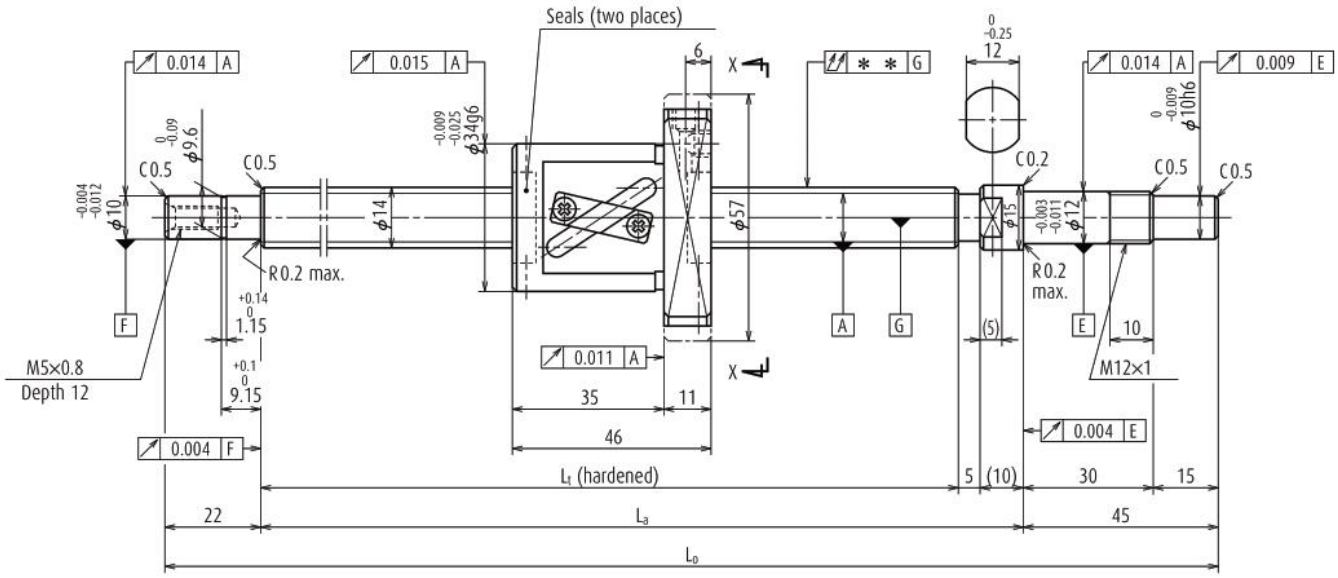
For drive side (Fixed)	For opposite to drive side (Simple)
WBK12-01A (square)	WBK12S-01 (square)
WBK12-11 (round)	

Unit: mm

Screw shaft length			Lead accuracy			Shaft run-out **	Mass (kg)	Permissible rotational speed N (min^{-1})	
								Supporting condition	
L_t	L_a	L_o	T	e_p	v_u			Fixed - Simple support	Fixed - Fixed
189	204	271	0	0.010	0.008	0.020	0.52	3 000	3 000
239	254	321	0	0.012	0.008	0.030	0.57	3 000	3 000
339	354	421	0	0.013	0.010	0.035	0.67	3 000	3 000
439	454	521	0	0.015	0.010	0.045	0.77	3 000	3 000
539	554	621	0	0.016	0.012	0.045	0.87	3 000	3 000
689	704	771	0	0.018	0.013	0.055	1.0	3 000	3 000

Notes 4. If Fixed is used for opposite driven side, configuration of support bearing area is designed by the customer.

24. Finished shaft end FA Type (Medium lead)

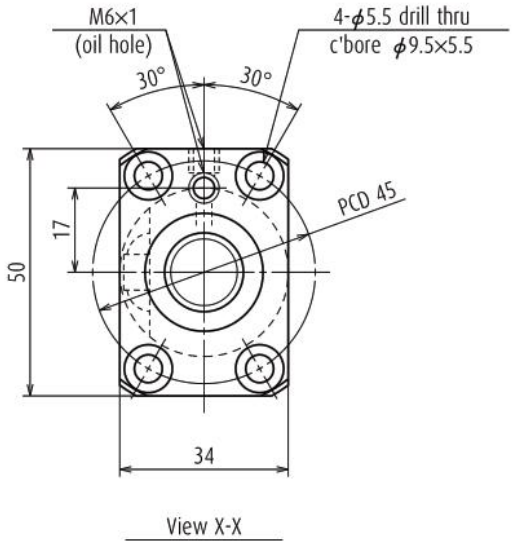


Ball screw No.		Stroke	
Preloaded (LPFT)	Precise clearance (LSFT)	Nominal	Maximum
W1401FA-3P-C5Z8	W1401FA-4-C5T8	100	137
W1402FA-3P-C5Z8	W1402FA-4-C5T8	150	187
W1402FA-5P-C5Z8	W1402FA-6-C5T8	200	237
W1403FA-3P-C5Z8	W1403FA-4-C5T8	250	287
W1403FA-5P-C5Z8	W1403FA-6-C5T8	300	337
W1404FA-3P-C5Z8	W1404FA-4-C5T8	350	387
W1404FA-5P-C5Z8	W1404FA-6-C5T8	400	437
W1405FA-3P-C5Z8	W1405FA-4-C5T8	450	487
W1405FA-5P-C5Z8	W1405FA-6-C5T8	500	537
W1406FA-3P-C5Z8	W1406FA-4-C5T8	550	587
W1406FA-5P-C5Z8	W1406FA-6-C5T8	600	637
W1407FA-1P-C5Z8	W1407FA-2-C5T8	700	737

Notes

1. We recommend NSK support unit. See page 324 for details.
2. Use of NSK grease LR3 is recommended. Recommended quantity of grease is about 50% of ball nut's internal space. See page 445 for details.
3. Contact NSK if the permissible rotational speed is to be exceeded.

Nut models: LPFT, LSFT



Screw shaft ϕ 14
Lead 8

Unit: mm

Ball screw specifications			
Product classification		Preloaded	Precise clearance
Shaft dia. × Lead / Direction of turn		14 × 8 / Right	
Preload / Ball recirculation		P-preload / Return tube	
Ball dia. / Ball circle dia.		3.175 / 14.5	
Screw shaft root diameter		11.2	
Effective turns of balls		2.5 × 1	
Accuracy grade / Preload / Axial play		C5 / Z	C5 / T
Basic load rating (N)	Dynamic C_a	4 960	7 880
	Static C_{0a}	5 920	11 800
Axial play		0	0.005 or less
Preload (N)		147	–
Dynamic friction torque, (N·cm)		1.5 – 7.8	2.4 or less
Spacer ball		Yes	None
Factory-packed grease		NSK grease LR3	
Internal spatial volume of nut (cm³)		2.1	
Standard volume of grease replenishing (cm³)		1.1	

Recommended support unit

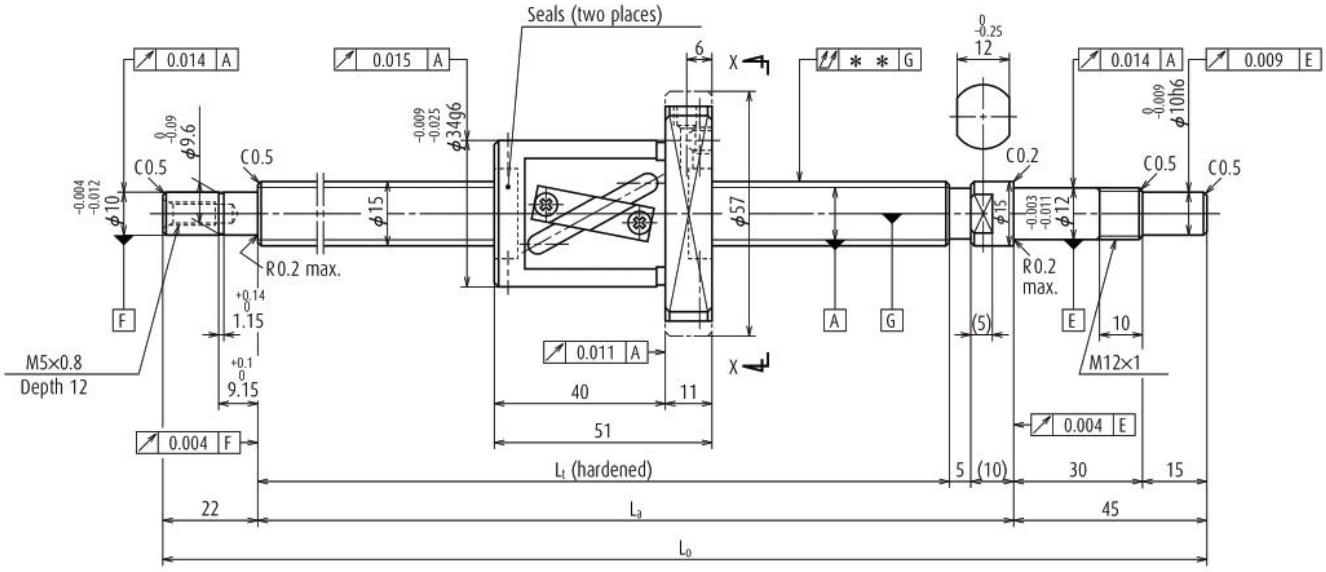
For drive side (Fixed)	For opposite to drive side (Simple)
WBK12-01A (square)	WBK12S-01 (square)
WBK12-11 (round)	

Unit: mm

Screw shaft length			Lead accuracy			Shaft run-out **	Mass (kg)	Permissible rotational speed N (min⁻¹)	
								Supporting condition	
L_t	L_a	L_o	T	e_p	v_u			Fixed - Simple support	Fixed - Fixed
189	204	271	0	0.020	0.018	0.025	0.56	3 000	3 000
239	254	321	0	0.023	0.018	0.035	0.61	3 000	3 000
289	304	371	0	0.023	0.018	0.035	0.67	3 000	3 000
339	354	421	0	0.025	0.020	0.040	0.72	3 000	3 000
389	404	471	0	0.025	0.020	0.040	0.78	3 000	3 000
439	454	521	0	0.027	0.020	0.050	0.83	3 000	3 000
489	504	571	0	0.027	0.020	0.050	0.88	3 000	3 000
539	554	621	0	0.030	0.023	0.050	0.94	3 000	3 000
589	604	671	0	0.030	0.023	0.065	0.99	3 000	3 000
639	654	721	0	0.035	0.025	0.065	1.0	3 000	3 000
689	704	771	0	0.035	0.025	0.065	1.1	3 000	3 000
789	804	871	0	0.035	0.025	0.085	1.2	2 830	3 000

Notes 4. If Fixed is used for opposite driven side, configuration of support bearing area is designed by the customer.

24. Finished shaft end FA Type (Medium lead)

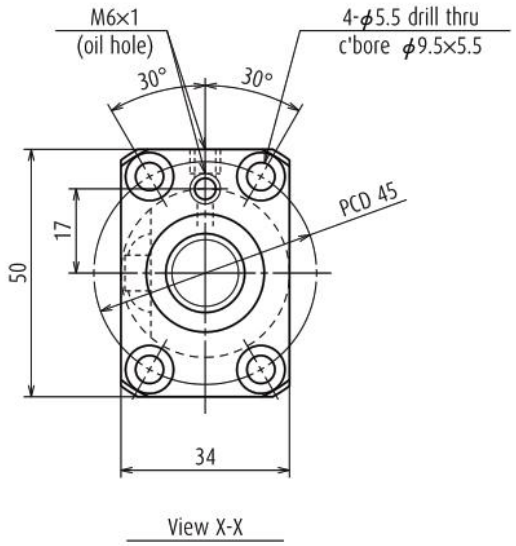


Ball screw No.		Stroke	
Preloaded (LPFT)	Precise clearance (LSFT)	Nominal	Maximum
W1501FA-1P-C5Z10	W1501FA-2-C5T10	100	132
W1502FA-1P-C5Z10	W1502FA-2-C5T10	150	182
W1502FA-3P-C5Z10	W1502FA-4-C5T10	200	232
W1503FA-1P-C5Z10	W1503FA-2-C5T10	250	282
W1503FA-3P-C5Z10	W1503FA-4-C5T10	300	332
W1504FA-1P-C5Z10	W1504FA-2-C5T10	350	382
W1504FA-3P-C5Z10	W1504FA-4-C5T10	400	432
W1505FA-1P-C5Z10	W1505FA-2-C5T10	450	482
W1505FA-3P-C5Z10	W1505FA-4-C5T10	500	532
W1506FA-1P-C5Z10	W1506FA-2-C5T10	550	582
W1506FA-3P-C5Z10	W1506FA-4-C5T10	600	632
W1507FA-1P-C5Z10	W1507FA-2-C5T10	700	732
W1508FA-1P-C5Z10	W1508FA-2-C5T10	800	832
W1510FA-1P-C5Z10	W1510FA-2-C5T10	1 000	1 032

Notes

1. We recommend NSK support unit. See page 324 for details.
2. Use of NSK grease LR3 is recommended. Recommended quantity of grease is about 50% of ball nut's internal space. See page 445 for details.
3. Contact NSK if the permissible rotational speed is to be exceeded.

Nut models: LPFT, LSFT



Screw shaft ϕ15
Lead 10

Unit: mm

Ball screw specifications			
Product classification		Preloaded	Precise clearance
Shaft dia. × Lead / Direction of turn		15 × 10 / Right	
Preload / Ball recirculation		P-preload / Return tube	
Ball dia. / Ball circle dia.		3.175 / 15.5	
Screw shaft root diameter		12.2	
Effective turns of balls		2.5 × 1	
Accuracy grade / Preload / Axial play		C5 / Z	C5 / T
Basic load rating (N)	Dynamic C_a	5 130	8 140
	Static C_{0a}	6 420	12 800
Axial play		0	0.005 or less
Preload (N)		147	–
Dynamic friction torque, (N·cm)		1.5 – 7.8	2.4 or less
Spacer ball		Yes	None
Factory-packed grease		NSK grease LR3	
Internal spatial volume of nut (cm^3)		2.3	
Standard volume of grease replenishing (cm^3)		1.2	

Recommended support unit

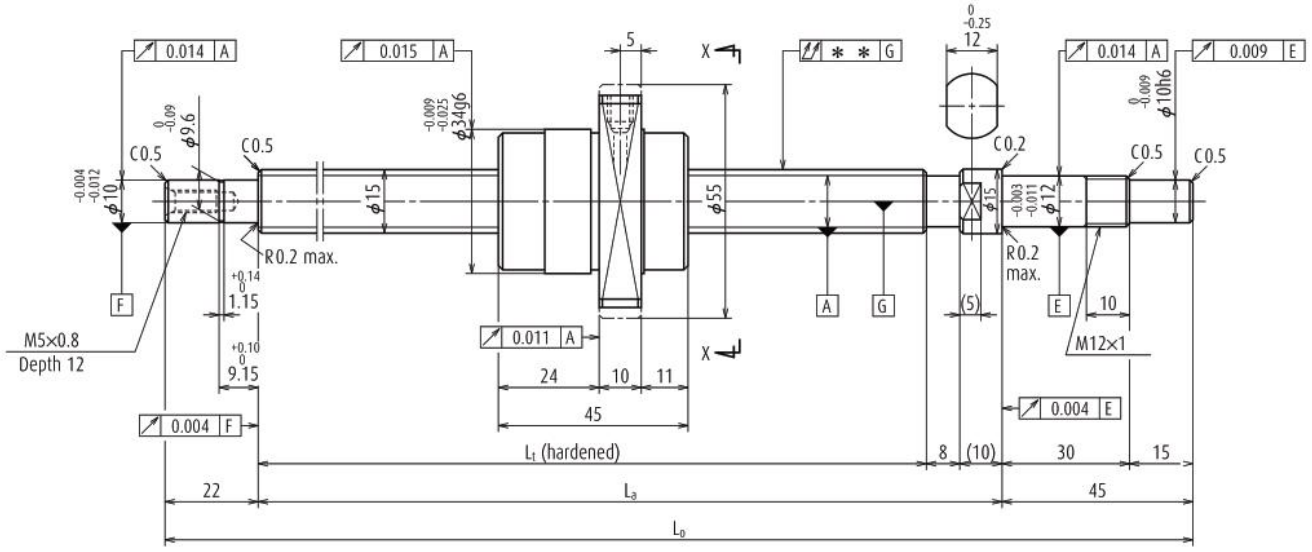
For drive side (Fixed)	For opposite to drive side (Simple)
WBK12-01A (square)	WBK12S-01 (square)
WBK12-11 (round)	

Unit: mm

Screw shaft length			Lead accuracy			Shaft run-out **	Mass (kg)	Permissible rotational speed N (min^{-1})	
								Supporting condition	
L_t	L_a	L_o	T	e_p	v_u			Fixed - Simple support	Fixed - Fixed
189	204	271	0	0.020	0.018	0.025	0.61	3 000	3 000
239	254	321	0	0.023	0.018	0.035	0.67	3 000	3 000
289	304	371	0	0.023	0.018	0.035	0.74	3 000	3 000
339	354	421	0	0.025	0.020	0.040	0.80	3 000	3 000
389	404	471	0	0.025	0.020	0.040	0.86	3 000	3 000
439	454	521	0	0.027	0.020	0.050	0.93	3 000	3 000
489	504	571	0	0.027	0.020	0.050	1.0	3 000	3 000
539	554	621	0	0.030	0.023	0.050	1.1	3 000	3 000
589	604	671	0	0.030	0.023	0.065	1.1	3 000	3 000
639	654	721	0	0.035	0.025	0.065	1.2	3 000	3 000
689	704	771	0	0.035	0.025	0.065	1.2	3 000	3 000
789	804	871	0	0.035	0.025	0.085	1.4	3 000	3 000
889	904	971	0	0.040	0.027	0.085	1.5	2 430	3 000
1 089	1 104	1 171	0	0.046	0.030	0.110	1.8	1 600	2 250

Notes 4. If Fixed is used for opposite driven side, configuration of support bearing area is designed by the customer.

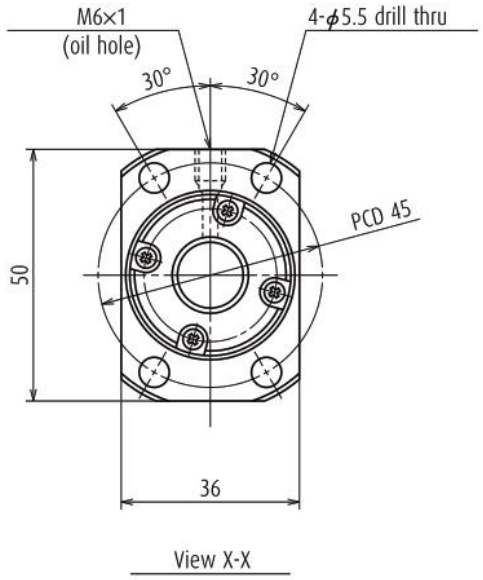
24. Finished shaft end FA Type (Medium lead)



Ball screw No.		Stroke	
Preloaded (UPFC)	Precise clearance (USFC)	Nominal	Maximum
W1501FA-3PG-C5Z20	W1501FA-4G-C5T20	100	135
W1502FA-5PG-C5Z20	W1502FA-6G-C5T20	150	185
W1502FA-7PG-C5Z20	W1502FA-8G-C5T20	200	235
W1503FA-5PG-C5Z20	W1503FA-6G-C5T20	250	285
W1503FA-7PG-C5Z20	W1503FA-8G-C5T20	300	335
W1504FA-5PG-C5Z20	W1504FA-6G-C5T20	350	385
W1504FA-7PG-C5Z20	W1504FA-8G-C5T20	400	435
W1505FA-5PG-C5Z20	W1505FA-6G-C5T20	450	485
W1505FA-7PG-C5Z20	W1505FA-8G-C5T20	500	535
W1506FA-5PG-C5Z20	W1506FA-6G-C5T20	550	585
W1506FA-7PG-C5Z20	W1506FA-8G-C5T20	600	635
W1507FA-3PG-C5Z20	W1507FA-4G-C5T20	700	735
W1508FA-3PG-C5Z20	W1508FA-4G-C5T20	800	835
W1510FA-3PG-C5Z20	W1510FA-4G-C5T20	1 000	1 035

Notes

1. We recommend NSK support unit. See page 324 for details.
2. Use of NSK grease LR3 is recommended. Recommended quantity of grease is about 50% of ball nut's internal space. See page 445 for details.
3. Contact NSK if the permissible rotational speed is to be exceeded.



Screw shaft ϕ15
Lead 20

Unit: mm

Ball screw specifications			
Product classification		Preloaded	Precise clearance
Shaft dia. × Lead / Direction of turn		15 × 20 / Right	
Preload / Ball recirculation		P-preload / Return tube	
Ball dia. / Ball circle dia.		3.175 / 15.5	
Screw shaft root diameter		12.2	
Effective turns of balls		1.7 × 1	
Accuracy grade / Preload / Axial play		C5 / Z	C5 / T
Basic load rating (N)	Dynamic C_a	4 320	5 660
	Static C_{0a}	5 800	8 700
Axial play		0	0.005 or less
Preload (N)		147	–
Dynamic friction torque, (N·cm)		1.5 – 7.8	2.4 or less
Spacer ball		Yes	None
Factory-packed grease		NSK grease LR3	
Internal spatial volume of nut (cm^3)		1.9	
Standard volume of grease replenishing (cm^3)		1.0	

Recommended support unit

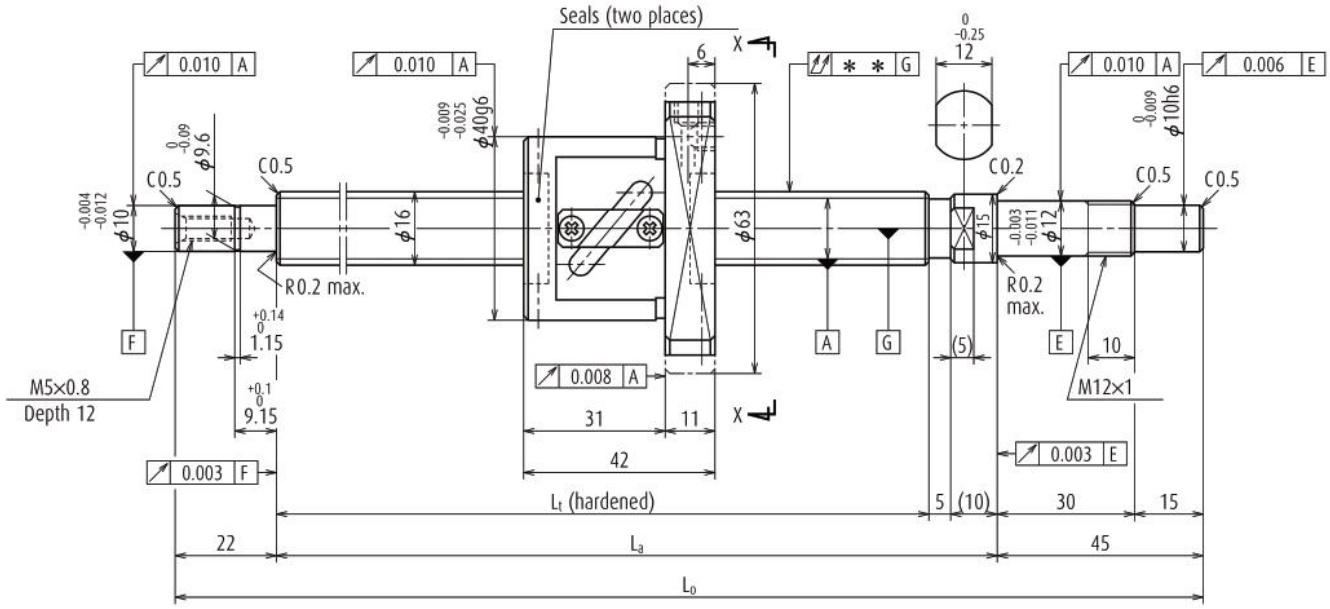
For drive side (Fixed)	For opposite to drive side (Simple)
WBK12-01A (square)	WBK12S-01 (square)
WBK12-11 (round)	

Unit: mm

Screw shaft length			Lead accuracy			Shaft run-out **	Mass (kg)	Permissible rotational speed N (min^{-1})	
								Supporting condition	
L_t	L_a	L_o	T	e_p	v_u			Fixed - Simple support	Fixed - Fixed
186	204	271	0	0.020	0.018	0.025	0.61	3 000	3 000
236	254	321	0	0.023	0.018	0.035	0.68	3 000	3 000
286	304	371	0	0.023	0.018	0.035	0.75	3 000	3 000
336	354	421	0	0.025	0.020	0.040	0.81	3 000	3 000
386	404	471	0	0.025	0.020	0.040	0.88	3 000	3 000
436	454	521	0	0.027	0.020	0.050	0.95	3 000	3 000
486	504	571	0	0.027	0.020	0.050	1.0	3 000	3 000
536	554	621	0	0.030	0.023	0.050	1.1	3 000	3 000
586	604	671	0	0.030	0.023	0.065	1.1	3 000	3 000
636	654	721	0	0.035	0.025	0.065	1.2	3 000	3 000
686	704	771	0	0.035	0.025	0.065	1.3	3 000	3 000
786	804	871	0	0.035	0.025	0.085	1.4	3 000	3 000
886	904	971	0	0.040	0.027	0.085	1.5	2 440	3 000
1 086	1 104	1 171	0	0.046	0.030	0.110	1.8	1 610	2 240

Notes 4. If Fixed is used for opposite driven side, configuration of support bearing area is designed by the customer.

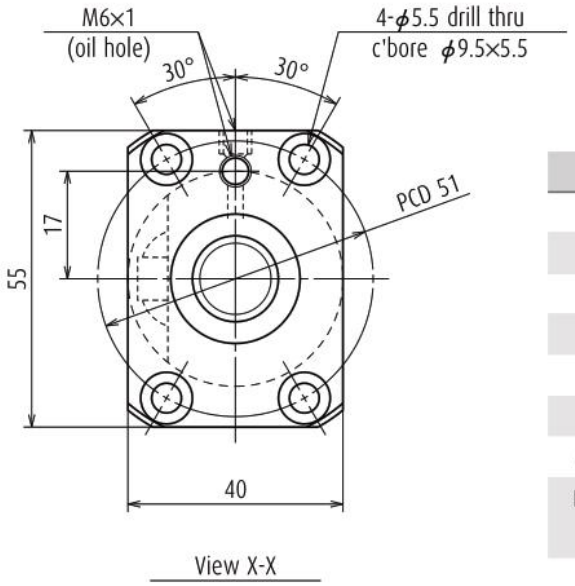
24. Finished shaft end FA Type (Fine lead)



Ball screw No.		Stroke	
Preloaded (PFT)	Precise clearance (SFT)	Nominal	Maximum
W1601FA-1P-C3Z5	W1601FA-2-C3T5	100	141
W1602FA-1P-C3Z5	W1602FA-2-C3T5	200	241
W1603FA-1P-C3Z5	W1603FA-2-C3T5	300	341
W1604FA-1P-C3Z5	W1604FA-2-C3T5	400	441
W1606FA-1P-C3Z5	W1606FA-2-C3T5	600	641
W1608FA-1P-C3Z5	W1608FA-2-C3T5	800	841

Notes

1. We recommend NSK support unit. See page 324 for details.
2. Use of NSK grease LR3 is recommended. Recommended quantity of grease is about 50% of ball nut's internal space. See page 445 for details.
3. Contact NSK if the permissible rotational speed is to be exceeded.



Screw shaft ϕ 16
Lead 5

Unit: mm

Ball screw specifications			
Product classification		Preloaded	Precise clearance
Shaft dia. × Lead / Direction of turn		16 × 5 / Right	
Preload / Ball recirculation		P-preload / Return tube	
Ball dia. / Ball circle dia.		3.175 / 16.5	
Screw shaft root diameter		13.2	
Effective turns of balls		2.5 × 1	
Accuracy grade / Preload / Axial play		C3 / Z	C3 / T
Basic load rating (N)	Dynamic C_a	5 430	8 620
	Static C_{0a}	6 890	13 800
Axial play		0	0.005 or less
Preload (N)		147	-
Dynamic friction torque, (N·cm)		1.5 – 7.8	2.0 or less
Spacer ball		Yes	None
Factory-packed grease		NSK grease LR3	
Internal spatial volume of nut (cm^3)		2.6	
Standard volume of grease replenishing (cm^3)		1.3	

Recommended support unit

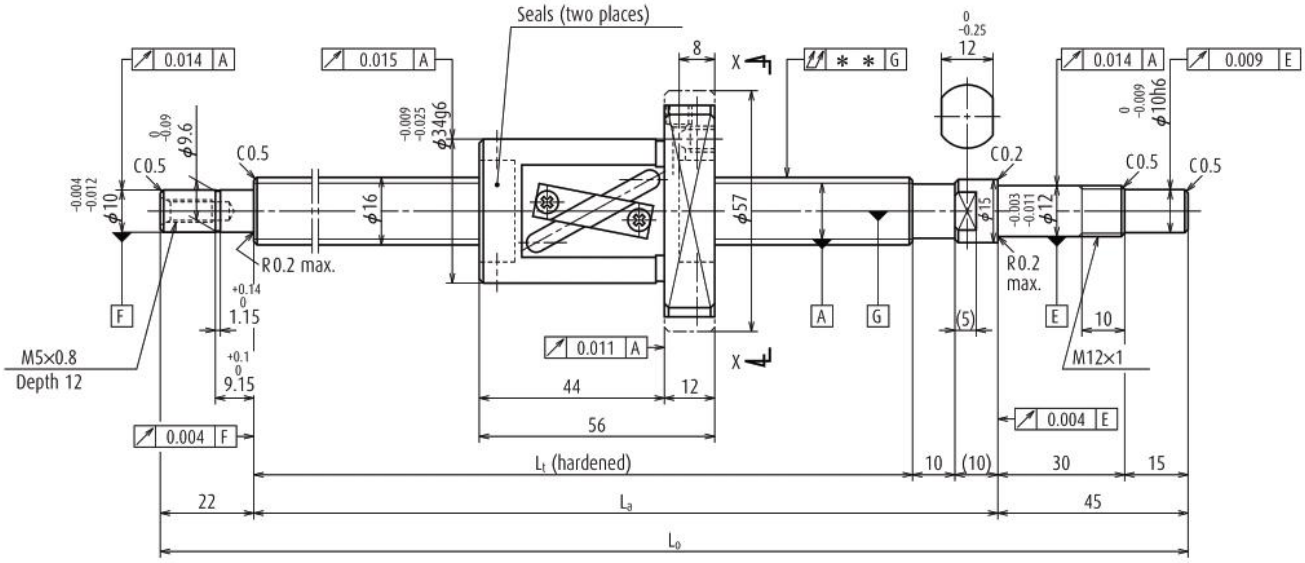
For drive side (Fixed)	For opposite to drive side (Simple)
WBK12-01A (square)	WBK12S-01 (square)
WBK12-11 (round)	

Unit: mm

Screw shaft length			Lead accuracy			Shaft run-out **	Mass (kg)	Permissible rotational speed N (min^{-1})	
								Supporting condition	
L_t	L_a	L_o	T	e_p	v_u			Fixed - Simple support	Fixed - Fixed
189	204	271	0	0.010	0.008	0.020	0.70	3 000	3 000
289	304	371	0	0.012	0.008	0.030	0.83	3 000	3 000
389	404	471	0	0.013	0.010	0.035	0.97	3 000	3 000
489	504	571	0	0.015	0.010	0.045	1.1	3 000	3 000
689	704	771	0	0.018	0.013	0.055	1.4	3 000	3 000
889	904	971	0	0.021	0.015	0.075	1.6	2 570	3 000

Notes 4. If Fixed is used for opposite driven side, configuration of support bearing area is designed by the customer.

24. Finished shaft end FA Type (High helix lead)



Ball screw No.		Stroke	
Preloaded (LPFT)	Precise clearance (LSFT)	Nominal	Maximum
W1601FA-3P-C5Z16	W1601FA-4-C5T16	100	122
W1602FA-3P-C5Z16	W1602FA-4-C5T16	150	172
W1602FA-5P-C5Z16	W1602FA-6-C5T16	200	222
W1603FA-3P-C5Z16	W1603FA-4-C5T16	250	272
W1603FA-5P-C5Z16	W1603FA-6-C5T16	300	322
W1604FA-3P-C5Z16	W1604FA-4-C5T16	350	372
W1604FA-5P-C5Z16	W1604FA-6-C5T16	400	422
W1605FA-1P-C5Z16	W1605FA-2-C5T16	450	472
W1605FA-3P-C5Z16	W1605FA-4-C5T16	500	522
W1606FA-3P-C5Z16	W1606FA-4-C5T16	550	572
W1606FA-5P-C5Z16	W1606FA-6-C5T16	600	622
W1607FA-1P-C5Z16	W1607FA-2-C5T16	700	722
W1608FA-3P-C5Z16	W1608FA-4-C5T16	800	822
W1610FA-1P-C5Z16	W1610FA-2-C5T16	1 000	1 022

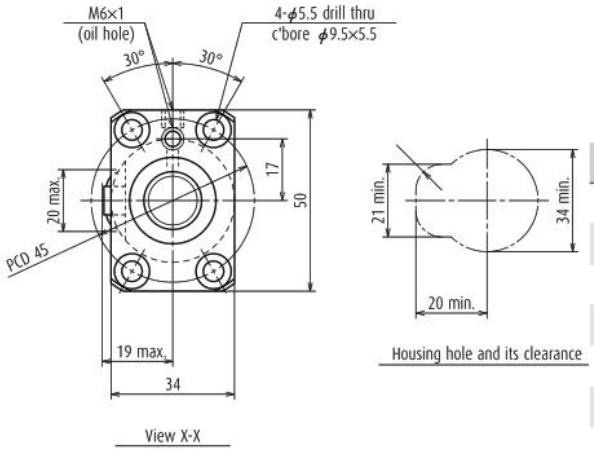
Notes

1. We recommend NSK support unit. See page 324 for details.
2. Use of NSK grease LR3 is recommended. Recommended quantity of grease is about 50% of ball nut's internal space. See page 445 for details.
3. Contact NSK if the permissible rotational speed is to be exceeded.

Nut models: LPFT, LSFT

Screw shaft ϕ 16
Lead 16

Unit: mm



Ball screw specifications			
Product classification		Preloaded	Precise clearance
Shaft dia. × Lead / Direction of turn		16 × 16 / Right	
Preload / Ball recirculation		P-preload / Return tube	
Ball dia. / Ball circle dia.		3.175 / 16.75	
Screw shaft root diameter		13.4	
Effective turns of balls		1.5 × 1	
Accuracy grade / Preload / Axial play		C5 / Z	C5 / T
Basic load rating (N)	Dynamic C_a	4 180	5 480
	Static C_{0a}	5 390	8 080
Axial play		0	0.005 or less
Preload (N)		147	-
Dynamic friction torque, (N·cm)		1.5 – 7.8	2.4 or less
Spacer ball		Yes	None
Factory-packed grease		NSK grease LR3	
Internal spatial volume of nut (cm^3)		2.1	
Standard volume of grease replenishing (cm^3)		1.1	

Recommended support unit

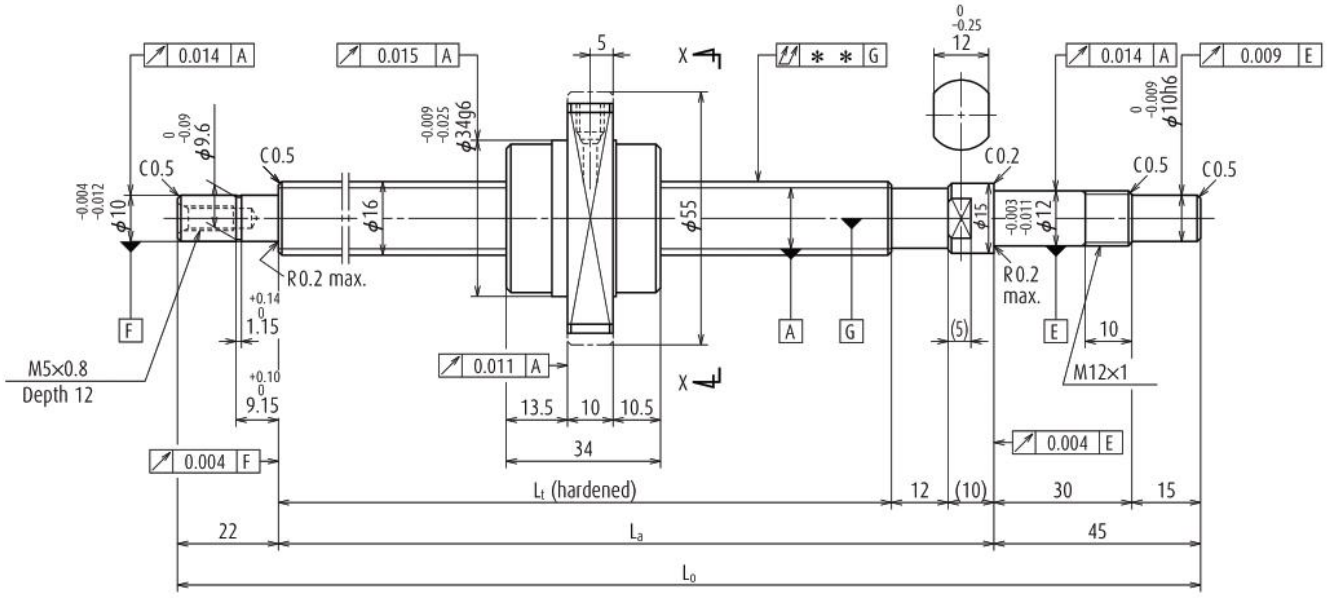
For drive side (Fixed)	For opposite to drive side (Simple)
WBK12-01A (square)	WBK12S-01 (square)
WBK12-11 (round)	

Unit: mm

Screw shaft length			Lead accuracy			Shaft run-out **	Mass (kg)	Permissible rotational speed N (min^{-1})	
								Supporting condition	
L_t	L_a	L_o	T	e_p	U_u			Fixed - Simple support	Fixed - Fixed
184	204	271	0	0.020	0.018	0.025	0.69	3 000	3 000
234	254	321	0	0.023	0.018	0.035	0.77	3 000	3 000
284	304	371	0	0.023	0.018	0.035	0.84	3 000	3 000
334	354	421	0	0.025	0.020	0.040	0.92	3 000	3 000
384	404	471	0	0.025	0.020	0.040	0.99	3 000	3 000
434	454	521	0	0.027	0.020	0.050	1.1	3 000	3 000
484	504	571	0	0.027	0.020	0.050	1.1	3 000	3 000
534	554	621	0	0.030	0.023	0.050	1.2	3 000	3 000
584	604	671	0	0.030	0.023	0.065	1.3	3 000	3 000
634	654	721	0	0.035	0.025	0.065	1.4	3 000	3 000
684	704	771	0	0.035	0.025	0.065	1.4	3 000	3 000
784	804	871	0	0.035	0.025	0.085	1.6	3 000	3 000
884	904	971	0	0.040	0.027	0.085	1.7	2 720	3 000
1 084	1 104	1 171	0	0.046	0.030	0.110	2.0	1 790	2 480

Notes 4. If Fixed is used for opposite driven side, configuration of support bearing area is designed by the customer.

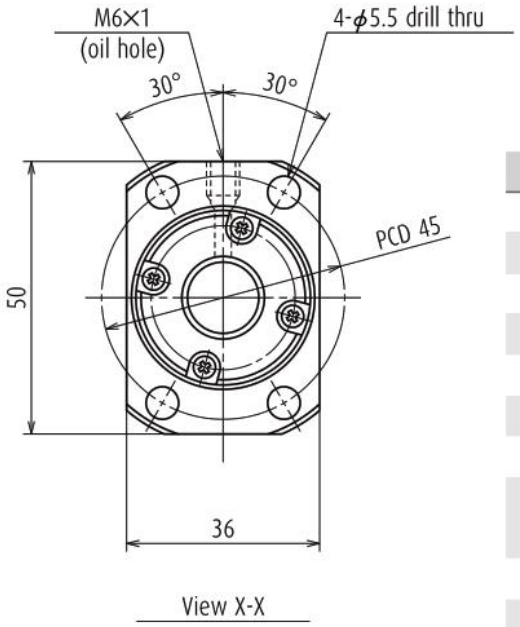
24. Finished shaft end FA Type (Ultra high helix lead)



Ball screw No.		Stroke	
Preloaded (UPFC)	Precise clearance (USFC)	Nominal	Maximum
W1603FA-7PGX-C5Z32	W1603FA-8GX-C5T32	300	342
W1605FA-5PGX-C5Z32	W1605FA-6GX-C5T32	500	542
W1608FA-5PGX-C5Z32	W1608FA-6GX-C5T32	800	842
W1612FA-1PGX-C5Z32	W1612FA-2GX-C5T32	1 200	1 242

Notes
1. We recommend NSK support unit. See page 324 for details.
2. Use of NSK grease LR3 is recommended. Recommended quantity of grease is about 50% of ball nut's internal space. See page 445 for details.
3. Ball nut does not have seal.
4. Contact NSK if the permissible rotational speed is to be exceeded.

Nut models: UPFC, USFC



Screw shaft ϕ16
Lead 32

Unit: mm

Ball screw specifications			
Product classification		Preloaded	Precise clearance
Shaft dia. × Lead / Direction of turn		16 × 32 / Right	
Preload / Ball recirculation		P-preload / Return tube	
Ball dia. / Ball circle dia.		3.175 / 16.75	
Screw shaft root diameter		13.4	
Effective turns of balls		0.7 × 2	
Accuracy grade / Preload / Axial play		C5 / Z	C5 / T
Basic load rating (N)	Dynamic C_a	4 800	
	Static C_{0a}	7 510	
Axial play		0	0.005 or less
Preload (N)		118	-
Dynamic friction torque, (N·cm)		1.5 – 9.8	2.4 or less
Spacer ball		Yes	None
Factory-packed grease		NSK grease LR3	
Internal spatial volume of nut (cm^3)		2.0	
Standard volume of grease replenishing (cm^3)		1.0	

Recommended support unit

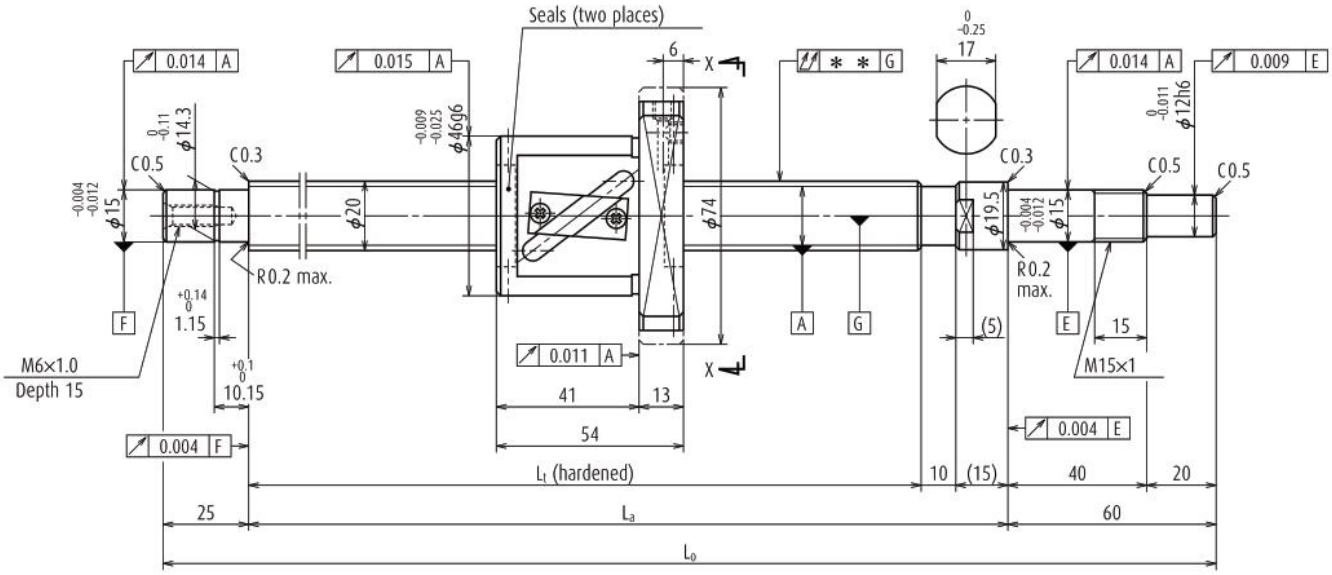
For drive side (Fixed)	For opposite to drive side (Simple)
WBK12-01A (square)	WBK12S-01 (square)
WBK12-11 (round)	

Unit: mm

Screw shaft length			Lead accuracy			Shaft run-out **	Mass	Permissible rotational speed N (min^{-1})	
								Supporting condition	
L_t	L_a	L_o	T	e_p	v_u			Fixed - Simple support	Fixed - Fixed
382	404	471	0	0.025	0.020	0.040	0.90	3 000	3 000
582	604	671	0	0.030	0.023	0.065	1.2	3 000	3 000
882	904	971	0	0.040	0.027	0.085	1.7	2 670	3 000
1 282	1 304	1 371	0	0.054	0.035	0.150	2.3	1 250	1 740

Notes 5. If Fixed is used for opposite driven side, configuration of support bearing area is designed by the customer.

24. Finished shaft end FA Type (Medium lead)

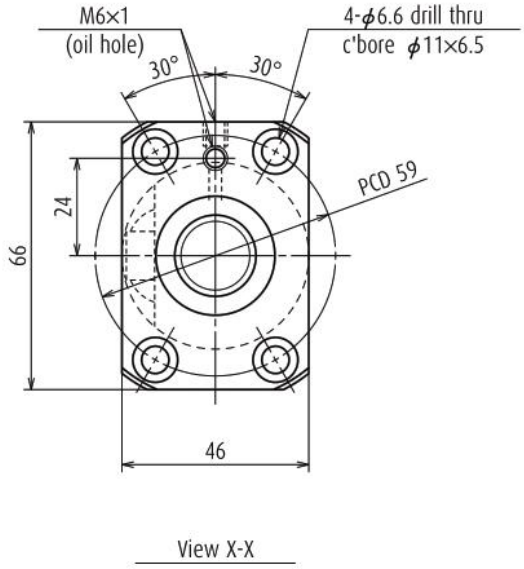


Ball screw No.		Stroke	
Preloaded (LPFT)	Precise clearance (LSFT)	Nominal	Maximum
W2002FA-1P-C5Z10	W2002FA-2-C5T10	200	229
W2003FA-1P-C5Z10	W2003FA-2-C5T10	300	329
W2004FA-1P-C5Z10	W2004FA-2-C5T10	400	429
W2005FA-1P-C5Z10	W2005FA-2-C5T10	500	529
W2006FA-1P-C5Z10	W2006FA-2-C5T10	600	629
W2007FA-1P-C5Z10	W2007FA-2-C5T10	700	729
W2008FA-1P-C5Z10	W2008FA-2-C5T10	800	829
W2009FA-1P-C5Z10	W2009FA-2-C5T10	900	929
W2010FA-1P-C5Z10	W2010FA-2-C5T10	1 000	1 029
W2011FA-1P-C5Z10	W2011FA-2-C5T10	1 100	1 129
W2012FA-1P-C5Z10	W2012FA-2-C5T10	1 200	1 229

Notes

1. We recommend NSK support unit. See page 324 for details.
2. Use of NSK grease LR3 is recommended. Recommended quantity of grease is about 50% of ball nut's internal space. See page 445 for details.
3. Contact NSK if the permissible rotational speed is to be exceeded.

Nut models: LPFT, LSFT



View X-X

Screw shaft ϕ 20
Lead 10

Unit: mm

Ball screw specifications			
Product classification		Preloaded	Precise clearance
Shaft dia. × Lead / Direction of turn		20 × 10 / Right	
Preload / Ball recirculation		P-preload / Return tube	
Ball dia. / Ball circle dia.		3.969 / 21	
Screw shaft root diameter		16.9	
Effective turns of balls		2.5 × 1	
Accuracy grade / Preload / Axial play		C5 / Z	C5 / T
Basic load rating (N)	Dynamic C_a	8 350	13 300
	Static C_{0a}	11 000	21 900
Axial play		0	0.005 or less
Preload (N)		196	–
Dynamic friction torque, (N·cm)		2.0 – 11.8	2.9 or less
Spacer ball		Yes	None
Factory-packed grease		NSK grease LR3	
Internal spatial volume of nut (cm³)		4.7	
Standard volume of grease replenishing (cm³)		2.4	

Recommended support unit

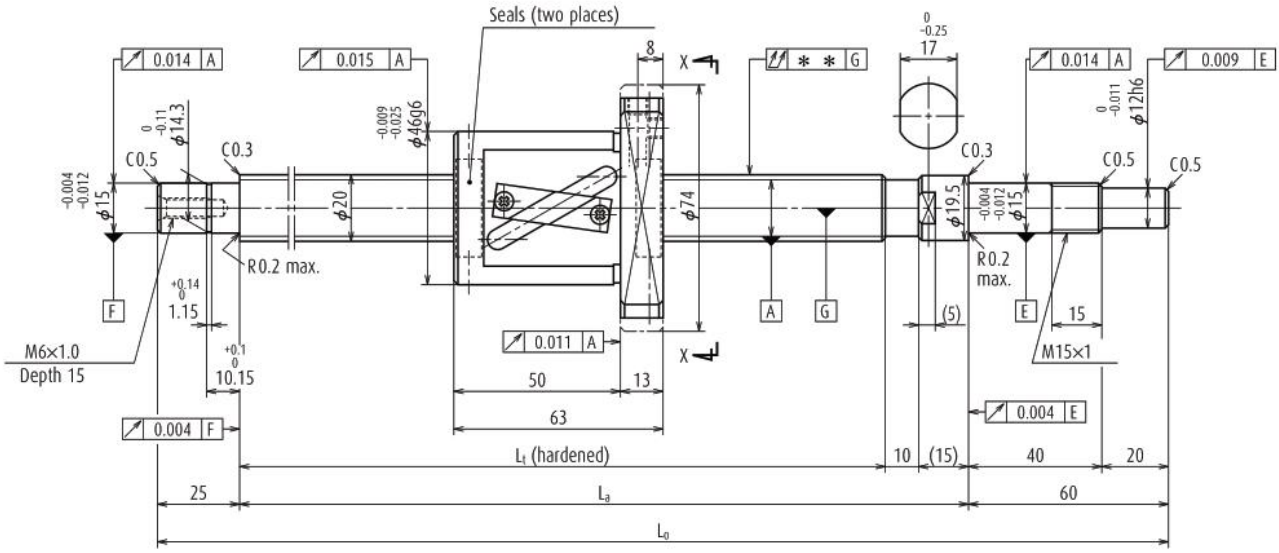
For drive side (Fixed)	For opposite to drive side (Simple)
WBK15-01A (square)	WBK15S-01 (square)
WBK15-11 (round)	

Unit: mm

Screw shaft length			Lead accuracy			Shaft run-out **	Mass (kg)	Permissible rotational speed N (min⁻¹)	
								Supporting condition	
L_t	L_a	L_o	T	e_p	v_u			Fixed - Simple support	Fixed - Fixed
289	314	399	0	0.023	0.018	0.035	1.4	3 000	3 000
389	414	499	0	0.025	0.020	0.040	1.6	3 000	3 000
489	514	599	0	0.027	0.020	0.050	1.9	3 000	3 000
589	614	699	0	0.030	0.023	0.065	2.1	3 000	3 000
689	714	799	0	0.035	0.025	0.065	2.3	3 000	3 000
789	814	899	0	0.035	0.025	0.085	2.5	3 000	3 000
889	914	999	0	0.040	0.027	0.085	2.8	3 000	3 000
989	1 014	1 099	0	0.040	0.027	0.110	3.0	2 710	3 000
1 089	1 114	1 199	0	0.046	0.030	0.110	3.2	2 220	3 000
1 189	1 214	1 299	0	0.046	0.030	0.150	3.4	1 860	2 570
1 289	1 314	1 399	0	0.054	0.035	0.150	3.7	1 580	2 190

Notes 4. If Fixed is used for opposite driven side, configuration of support bearing area is designed by the customer.

24. Finished shaft end FA Type (High helix lead)

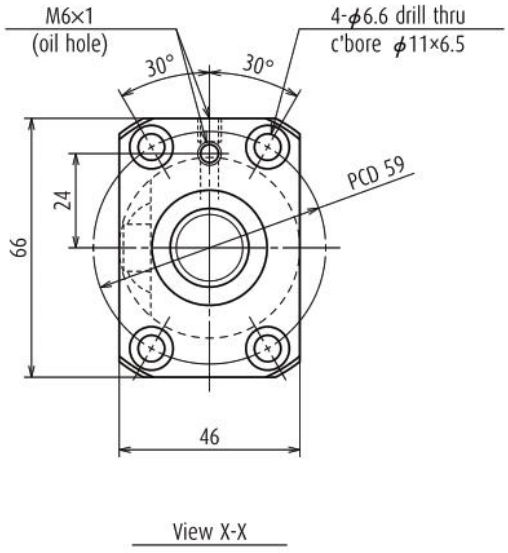


Ball screw No.		Stroke	
Preloaded (LPFT)	Precise clearance (LSFT)	Nominal	Maximum
W2003FA-3P-C5Z20	W2003FA-4-C5T20	200	241
W2004FA-3P-C5Z20	W2004FA-4-C5T20	300	341
W2005FA-3P-C5Z20	W2005FA-4-C5T20	400	441
W2006FA-3P-C5Z20	W2006FA-4-C5T20	500	541
W2007FA-3P-C5Z20	W2007FA-4-C5T20	600	641
W2008FA-3P-C5Z20	W2008FA-4-C5T20	700	741
W2009FA-3P-C5Z20	W2009FA-4-C5T20	800	841
W2010FA-3P-C5Z20	W2010FA-4-C5T20	900	941
W2011FA-3P-C5Z20	W2011FA-4-C5T20	1 000	1 041
W2012FA-3P-C5Z20	W2012FA-4-C5T20	1 100	1 141
W2015FA-1P-C5Z20	W2015FA-2-C5T20	1 400	1 441

Notes

1. We recommend NSK support unit. See page 324 for details.
2. Use of NSK grease LR3 is recommended. Recommended quantity of grease is about 50% of ball nut's internal space. See page 445 for details.
3. Contact NSK if the permissible rotational speed is to be exceeded.

Nut models: LPFT, LSFT



Screw shaft ϕ 20
Lead 20

Unit: mm

Ball screw specifications			
Product classification		Preloaded	Precise clearance
Shaft dia. × Lead / Direction of turn		20 × 20 / Right	
Preload / Ball recirculation		P-preload / Return tube	
Ball dia. / Ball circle dia.		3.969 / 21	
Screw shaft root diameter		16.9	
Effective turns of balls		1.5 × 1	
Accuracy grade / Preload / Axial play		C5 / Z	C5 / T
Basic load rating (N)	Dynamic C_a	6 250	8 190
	Static C_{0a}	8 760	13 100
Axial play		0	0.005 or less
Preload (N)		196	–
Dynamic friction torque, (N·cm)		2.0 – 11.8	2.9 or less
Spacer ball		Yes	None
Factory-packed grease		NSK grease LR3	
Internal spatial volume of nut (cm³)		4.2	
Standard volume of grease replenishing (cm³)		2.1	

Recommended support unit

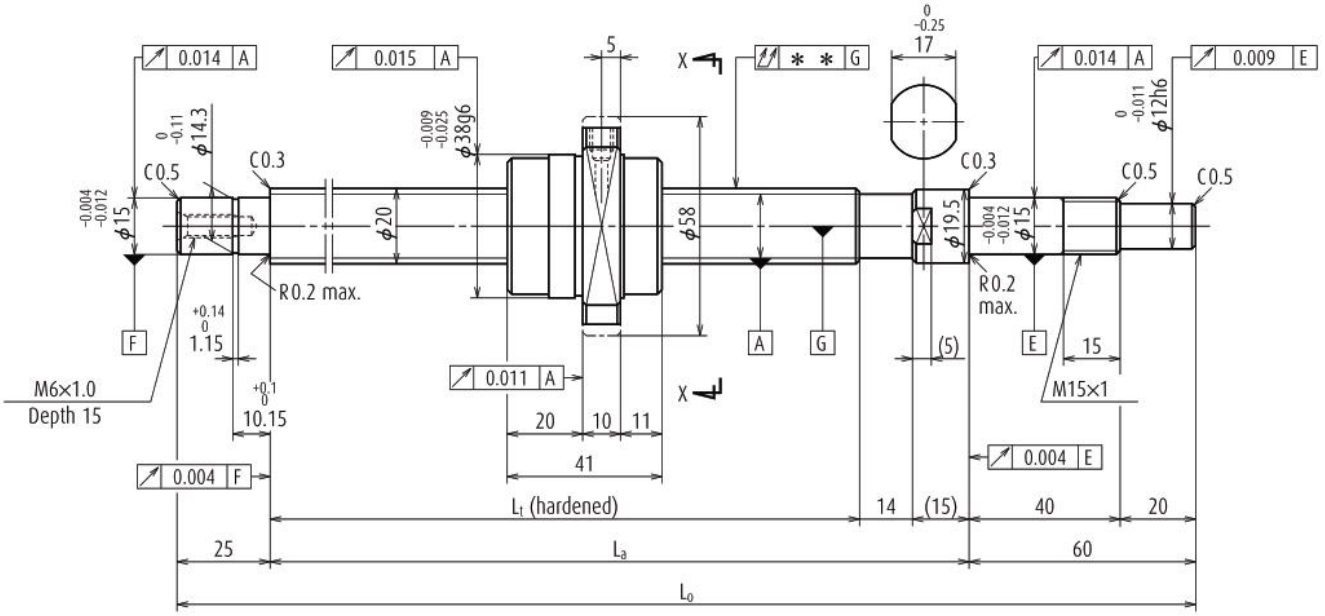
For drive side (Fixed)	For opposite to drive side (Simple)
WBK15-01A (square)	WBK15S-01 (square)
WBK15-11 (round)	

Unit: mm

Screw shaft length			Lead accuracy			Shaft run-out **	Mass (kg)	Permissible rotational speed N (min⁻¹)	
								Supporting condition	
L_t	L_a	L_o	T	e_p	v_u			Fixed - Simple support	Fixed - Fixed
310	335	420	0	0.023	0.018	0.040	1.6	3 000	3 000
410	435	520	0	0.027	0.020	0.050	1.8	3 000	3 000
510	535	620	0	0.030	0.023	0.050	2.0	3 000	3 000
610	635	720	0	0.030	0.023	0.065	2.3	3 000	3 000
710	735	820	0	0.035	0.025	0.085	2.5	3 000	3 000
810	835	920	0	0.040	0.027	0.085	2.7	3 000	3 000
910	935	1 020	0	0.040	0.027	0.110	3.0	3 000	3 000
1 010	1 035	1 120	0	0.046	0.030	0.110	3.2	2 630	3 000
1 110	1 135	1 220	0	0.046	0.030	0.110	3.4	2 160	2 970
1 210	1 235	1 320	0	0.046	0.030	0.150	3.7	1 810	2 500
1 510	1 535	1 620	0	0.054	0.035	0.180	4.4	1 150	1 610

Notes 4. If Fixed is used for opposite driven side, configuration of support bearing area is designed by the customer.

24. Finished shaft end FA Type (Ultra high helix lead)

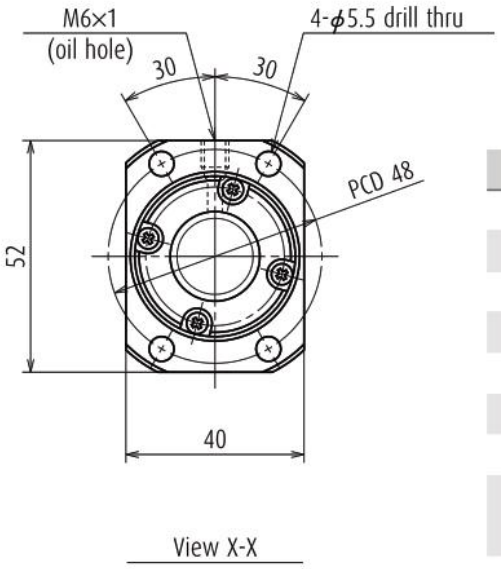


Ball screw No.		Stroke	
Preloaded (UPFC)	Precise clearance (USFC)	Nominal	Maximum
W2005FA-5PGX-C5Z40	W2005FA-6GX-C5T40	400	459
W2007FA-5PGX-C5Z40	W2007FA-6GX-C5T40	600	659
W2009FA-5PGX-C5Z40	W2009FA-6GX-C5T40	800	859
W2011FA-5PGX-C5Z40	W2011FA-6GX-C5T40	1 000	1 059
W2013FA-1PGX-C5Z40	W2013FA-2GX-C5T40	1 200	1 259
W2017FA-1PGX-C5Z40	W2017FA-2GX-C5T40	1 600	1 659

Notes

1. We recommend NSK support unit. See page 324 for details.
2. Use of NSK grease LR3 is recommended. Recommended quantity of grease is about 50% of ball nut's internal space. See page 445 for details.
3. Ball nut does not have seal.
4. Contact NSK if the permissible rotational speed is to be exceeded.

Nut models: UPFC, USFC



Screw shaft ϕ 20
Lead 40

Unit: mm

Ball screw specifications			
Product classification		Preloaded	Precise clearance
Shaft dia. × Lead / Direction of turn		20 × 40 / Right	
Preload / Ball recirculation		P-preload / End cap	
Ball dia. / Ball circle dia.		3.175 / 20.75	
Screw shaft root diameter		17.4	
Effective turns of balls		0.7 × 2	
Accuracy grade / Preload / Axial play		C5 / Z	C5 / T
Basic load rating (N)	Dynamic C_a	5 410	
	Static C_{0a}	9 360	
Axial play		0	0.005 or less
Preload (N)		148	-
Dynamic friction torque, (N·cm)		2.0 - 11.8	2.9 or less
Spacer ball		Yes	None
Factory-packed grease		NSK grease LR3	
Internal spatial volume of nut (cm^3)		2.8	
Standard volume of grease replenishing (cm^3)		1.4	

Recommended support unit

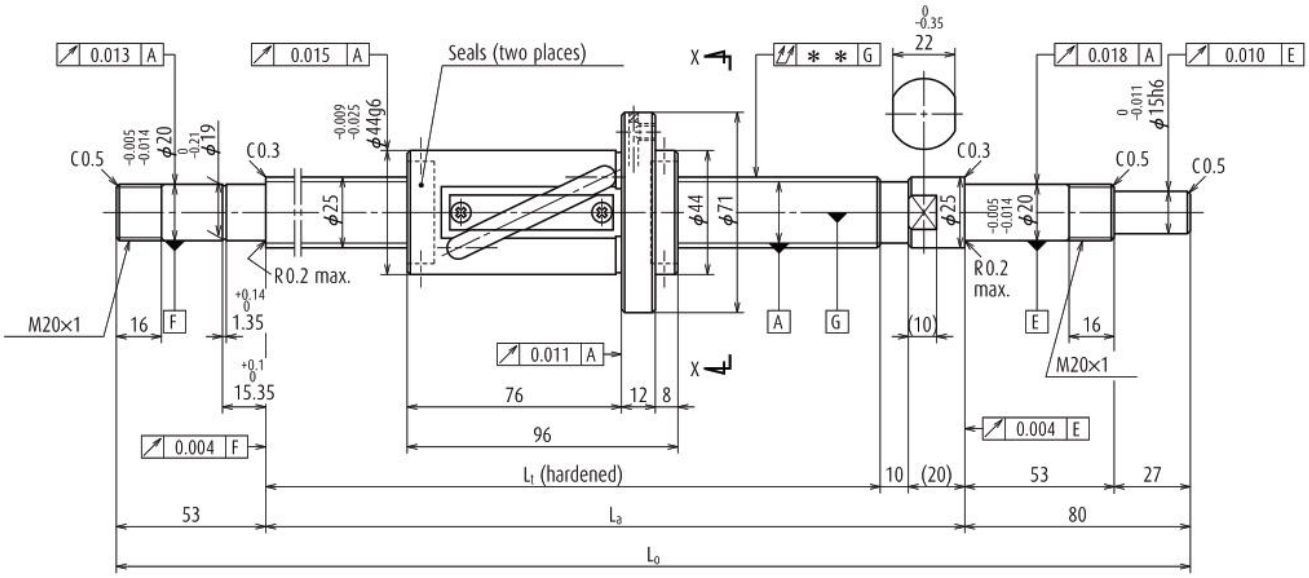
For drive side (Fixed)	For opposite to drive side (Simple)
WBK15-01A (square)	WBK15S-01 (square)
WBK15-11 (round)	

Unit: mm

Screw shaft length			Lead accuracy			Shaft run-out **	Mass (kg)	Permissible rotational speed N (min^{-1})	
								Supporting condition	
L_t	L_a	L_o	T	e_p	v_u			Fixed - Simple support	Fixed - Fixed
506	535	620	0	0.030	0.023	0.050	1.7	3 000	3 000
706	735	820	0	0.035	0.025	0.085	2.2	3 000	3 000
906	935	1 020	0	0.040	0.027	0.110	2.7	3 000	3 000
1 106	1 135	1 220	0	0.046	0.030	0.110	3.1	2 210	3 000
1 306	1 335	1 420	0	0.054	0.035	0.150	3.6	1 570	2 160
1 706	1 735	1 820	0	0.065	0.040	0.230	4.6	910	1 270

Notes 5. If Fixed is used for opposite driven side, configuration of support bearing area is designed by the customer.

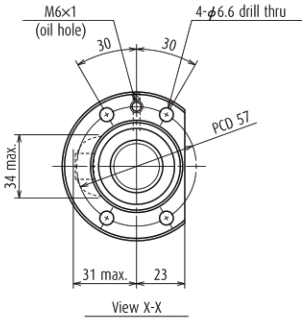
24. Finished shaft end FA Type (Medium lead)

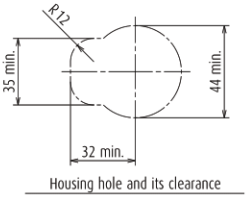


Ball screw No.		Stroke	
Preloaded (LPFT)	Precise clearance (LSFT)	Nominal	Maximum
W2507FA-1P-C5Z20	W2507FA-2-C5T20	600	640
W2509FA-1P-C5Z20	W2509FA-2-C5T20	800	840
W2511FA-1P-C5Z20	W2511FA-2-C5T20	1 000	1 040
W2513FA-1P-C5Z20	W2513FA-2-C5T20	1 200	1 240
W2515FA-1P-C5Z20	W2515FA-2-C5T20	1 400	1 440
W2517FA-1P-C5Z20	W2517FA-2-C5T20	1 600	1 640
W2521FA-1P-C5Z20	W2521FA-2-C5T20	2 000	2 040

Notes

1. We recommend NSK support unit. See page 324 for details.
2. Use of NSK grease LR3 is recommended. Recommended quantity of grease is about 50% of ball nut's internal space. See page 445 for details.
3. Contact NSK if the permissible rotational speed is to be exceeded.





Screw shaft ϕ25
Lead 20

Unit: mm

Ball screw specifications			
Product classification		Preloaded	Precise clearance
Shaft dia. × Lead / Direction of turn		25 × 20 / Right	
Preload / Ball recirculation		P-preload / Return tube	
Ball dia. / Ball circle dia.		4.762 / 26.25	
Screw shaft root diameter		21.3	
Effective turns of balls		2.5 × 1	
Accuracy grade / Preload / Axial play		C5 / Z	C5 / T
Basic load rating (N)	Dynamic C_a	11 700	18 600
	Static C_{0a}	16 300	32 600
Axial play		0	0.005 or less
Preload (N)		343	-
Dynamic friction torque, (N·cm)		3.9 – 24.5	4.9 or less
Spacer ball		Yes	None
Factory-packed grease		NSK grease LR3	
Internal spatial volume of nut (cm^3)		12	
Standard volume of grease replenishing (cm^3)		6	

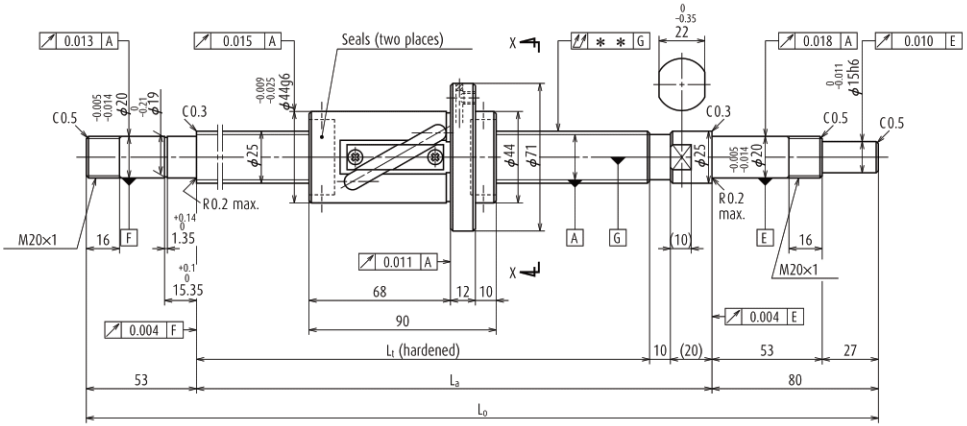
Recommended support unit

For drive side (Fixed)	For opposite to drive side	
	(Fixed)	(Simple)
WBK20-01 (square)	WBK20-01 (square)	WBK20S-01 (square)
WBK20-11 (round)	WBK20-11 (round)	

Unit: mm

Screw shaft length			Lead accuracy			Shaft run-out **	Mass (kg)	Permissible rotational speed N (min^{-1})	
								Supporting condition	
L_t	L_a	L_0	T	e_p	v_u			Fixed - Simple support	Fixed - Fixed
750	780	913	0	0.035	0.025	0.055	4.0	2 800	2 800
950	980	1 113	0	0.040	0.027	0.070	4.7	2 800	2 800
1 150	1 180	1 313	0	0.046	0.030	0.090	5.4	2 590	2 800
1 350	1 380	1 513	0	0.054	0.035	0.090	6.2	1 860	2 550
1 550	1 580	1 713	0	0.054	0.035	0.120	6.9	1 400	1 940
1 750	1 780	1 913	0	0.065	0.040	0.120	7.6	1 090	1 520
2 150	2 180	2 313	0	0.077	0.046	0.160	9.1	720	1 000

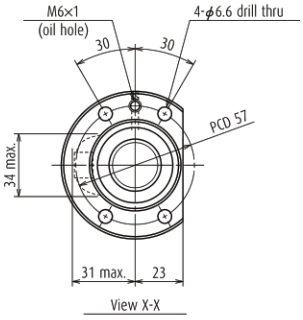
24. Finished shaft end FA Type (High helix lead)

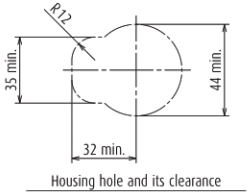


Ball screw No.		Stroke	
Preloaded (LPFT)	Precise clearance (LSFT)	Nominal	Maximum
W2507FA-3P-C5Z25	W2507FA-4-C5T25	600	646
W2509FA-3P-C5Z25	W2509FA-4-C5T25	800	846
W2511FA-3P-C5Z25	W2511FA-4-C5T25	1 000	1 046
W2513FA-3P-C5Z25	W2513FA-4-C5T25	1 200	1 246
W2515FA-3P-C5Z25	W2515FA-4-C5T25	1 400	1 446
W2517FA-3P-C5Z25	W2517FA-4-C5T25	1 600	1 646
W2521FA-3P-C5Z25	W2521FA-4-C5T25	2 000	2 046

Notes

1. We recommend NSK support unit. See page 324 for details.
2. Use of NSK grease LR3 is recommended. Recommended quantity of grease is about 50% of ball nut's internal space. See page 445 for details.
3. Contact NSK if the permissible rotational speed is to be exceeded.





Screw shaft ϕ 25
Lead 25

Unit: mm

Ball screw specifications			
Product classification		Preloaded	Precise clearance
Shaft dia. × Lead / Direction of turn		25 × 25 / Right	
Preload / Ball recirculation		P-preload / Return tube	
Ball dia. / Ball circle dia.		4.762 / 26.25	
Screw shaft root diameter		21.3	
Effective turns of balls		1.5 × 1	
Accuracy grade / Preload / Axial play		C5 / Z	C5 / T
Basic load rating (N)	Dynamic C_a	8 970	11 700
	Static C_{0a}	13 100	19 700
Axial play		0	0.005 or less
Preload (N)		294	-
Dynamic friction torque, (N·cm)		3.9 – 24.5	4.9
Spacer ball		Yes	None
Factory-packed grease		NSK grease LR3	
Internal spatial volume of nut (cm^3)		7.5	
Standard volume of grease replenishing (cm^3)		3.8	

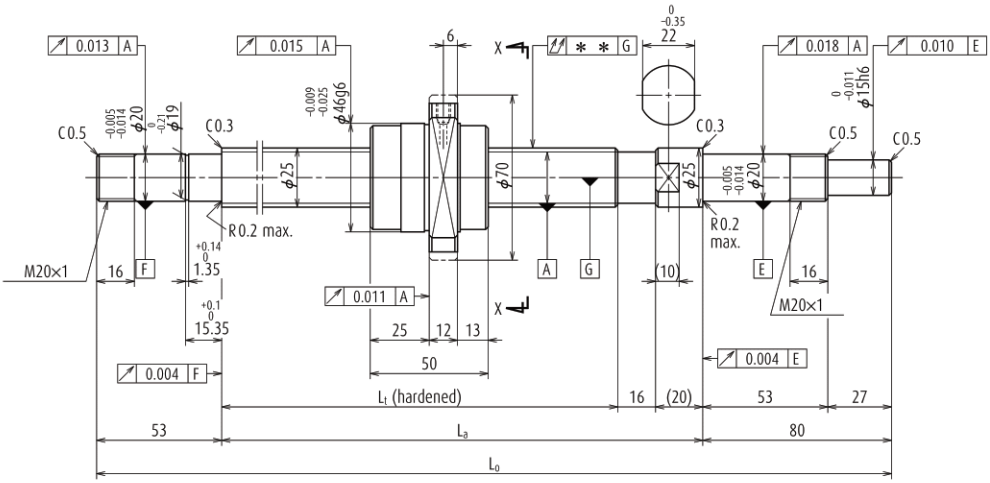
Recommended support unit

For drive side (Fixed)	For opposite to drive side	
	(Fixed)	(Simple)
WBK20-01 (square)	WBK20-01 (square)	WBK20S-01 (square)
WBK20-11 (round)	WBK20-11 (round)	

Unit: mm

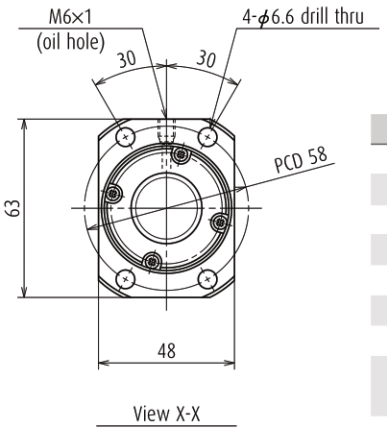
Screw shaft length			Lead accuracy			Shaft run-out **	Mass (kg)	Permissible rotational speed N (min^{-1})	
								Supporting condition	
L_t	L_a	L_0	T	e_p	v_{u}			Fixed - Simple support	Fixed - Fixed
750	780	913	0	0.035	0.025	0.055	4.0	2 800	2 800
950	980	1 113	0	0.040	0.027	0.070	4.7	2 800	2 800
1 150	1 180	1 313	0	0.046	0.030	0.090	5.4	2 580	2 800
1 350	1 380	1 513	0	0.054	0.035	0.090	6.2	1 850	2 540
1 550	1 580	1 713	0	0.054	0.035	0.120	7.0	1 400	1 930
1 750	1 780	1 913	0	0.065	0.040	0.120	7.7	1 090	1 510
2 150	2 180	2 313	0	0.077	0.046	0.160	9.1	710	1 000

24. Finished shaft end FA Typ (Ultra high helix lead)



Ball screw No.		Stroke	
Preloaded (UPFC)	Precise clearance (USFC)	Nominal	Maximum
W2508FA-1PGX-C5Z50	W2508FA-2GX-C5T50	700	780
W2511FA-5PGX-C5Z50	W2511FA-6GX-C5T50	1 000	1 080
W2516FA-1PGX-C5Z50	W2516FA-2GX-C5T50	1 500	1 580
W2521FA-5PGX-C5Z50	W2521FA-6GX-C5T50	2 000	2 080

Notes
1. We recommend NSK support unit. See page 324 for details.
2. Use of NSK grease LR3 is recommended. Recommended quantity of grease is about 50% of ball nut's internal space. See page 445 for details.
3. Ball nut does not have seal.
4. Contact NSK if the permissible rotational speed is to be exceeded.



Screw shaft ϕ25
Lead 50

Unit: mm

Ball screw specifications			
Product classification		Preloaded	Precise clearance
Shaft dia. × Lead / Direction of turn		25 × 50 / Right	
Preload / Ball recirculation		P-preload / Return tube	
Ball dia. / Ball circle dia.		3.969 / 26	
Screw shaft root diameter		21.9	
Effective turns of balls		0.7 × 2	
Accuracy grade / Preload / Axial play		C5 / Z	C5 / T
Basic load rating (N)	Dynamic C_a	8 090	
	Static C_{0a}	14 600	
Axial play		0	0.005 or less
Preload (N)		196	–
Dynamic friction torque, (N·cm)		2.9 – 21.5	4.9 or less
Spacer ball		Yes	None
Factory-packed grease		NSK grease LR3	
Internal spatial volume of nut (cm^3)		4.2	
Standard volume of grease replenishing (cm^3)		2.1	

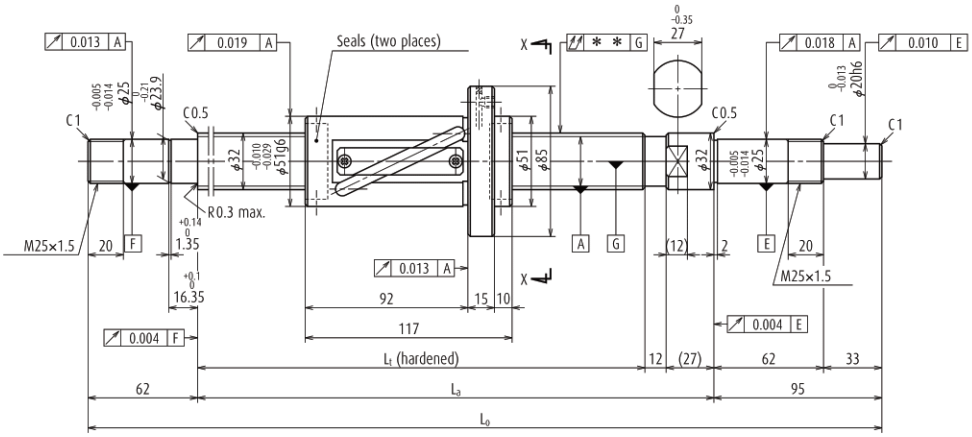
Recommended support unit

For drive side (Fixed)	For opposite to drive side	
	(Fixed)	(Simple)
WBK20-01 (square)	WBK20-01 (square)	WBK20S-01 (square)
WBK20-11 (round)	WBK20-11 (round)	

Unit: mm

Screw shaft length			Lead accuracy			Shaft run-out **	Mass (kg)	Permissible rotational speed N (min^{-1})	
								Supporting condition	
L_t	L_a	L_0	T	e_p	v_u			Fixed - Simple support	Fixed - Fixed
844	880	1 013	0	0.040	0.027	0.070	4.1	2 800	2 800
1 144	1 180	1 313	0	0.046	0.030	0.090	5.3	2 600	2 800
1 644	1 680	1 813	0	0.065	0.040	0.120	7.2	1 250	1 710
2 144	2 180	2 313	0	0.077	0.046	0.160	9.1	730	1 010

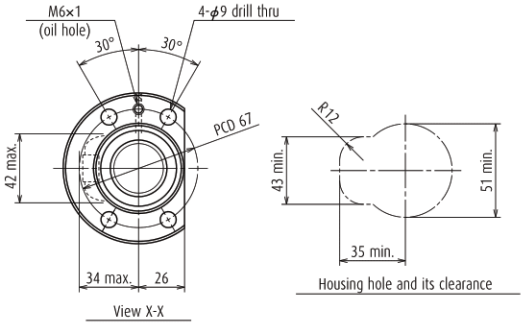
24. Finished shaft end FA Type (Medium lead)



Ball screw No.		Stroke	
Preloaded (UPFC)	Precise clearance (USFC)	Nominal	Maximum
W3211FA-1P-C5Z25	W3211FA-2-C5T25	1 000	1 046
W3216FA-1P-C5Z25	W3216FA-2-C5T25	1 500	1 546
W3221FA-1P-C5Z25	W3221FA-2-C5T25	2 000	2 046
W3227FA-1P-C5Z25	W3227FA-2-C5T25	2 600	2 646

Notes

1. We recommend NSK support unit. See page 324 for details.
2. Use of NSK grease LR3 is recommended. Recommended quantity of grease is about 50% of ball nut's internal space. See page 445 for details.
3. Contact NSK if the permissible rotational speed is to be exceeded.



Screw shaft ϕ 32
Lead 25

Unit: mm

Ball screw specifications			
Product classification		Preloaded	Precise clearance
Shaft dia. × Lead / Direction of turn		32 × 25 / Right	
Preload / Ball recirculation		P-preload / Return tube	
Ball dia. / Ball circle dia.		4.762 / 33.25	
Screw shaft root diameter		28.3	
Effective turns of balls		2.5 × 1	
Accuracy grade / Preload / Axial play		C5 / Z	C5 / T
Basic load rating (N)	Dynamic C_a	12 900	20 400
	Static C_{0a}	21 100	42 200
Axial play		0	0.005 or less
Preload (N)		441	-
Dynamic friction torque, (N·cm)		6.8 - 31.5	7.8 or less
Spacer ball		Yes	None
Factory-packed grease		NSK grease LR3	
Internal spatial volume of nut (cm³)		17.5	
Standard volume of grease replenishing (cm³)		8.8	

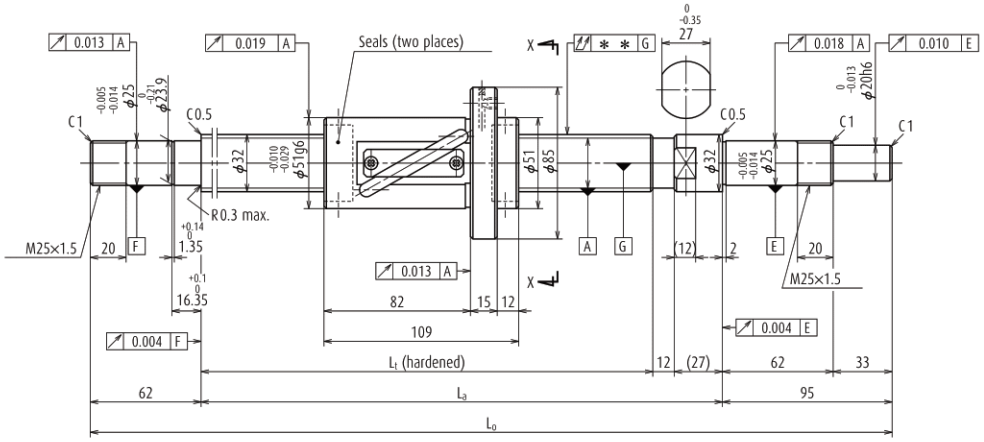
Recommended support unit

For drive side (Fixed)	For opposite to drive side	
	(Fixed)	(Simple)
WBK25-01W (square)	WBK25-01W (square)	WBK25S-01W (square)
WBK25-11 (round)	WBK25-11 (round)	

Unit: mm

Screw shaft length			Lead accuracy			Shaft run-out **	Mass (kg)	Permissible rotational speed N (min⁻¹)	
								Supporting condition	
L_t	L_a	L_0	T	e_p	U_{ll}			Fixed - Simple support	Fixed - Fixed
1 180	1 219	1 376	0	0.046	0.030	0.090	9.3	2 180	2 180
1 680	1 719	1 876	0	0.065	0.040	0.120	12.3	1 600	2 180
2 180	2 219	2 376	0	0.077	0.046	0.160	15.4	930	1 300
2 780	2 819	2 976	0	0.093	0.054	0.200	19.1	570	800

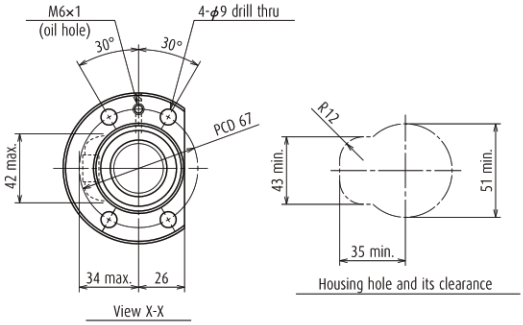
24. Finished shaft end FA Type (High helix lead)



Ball screw No.		Stroke	
Preloaded (LPFT)	Precise clearance (LSFT)	Nominal	Maximum
W3211FA-3P-C5Z32	W3211FA-4-C5T32	1 000	1 054
W3216FA-3P-C5Z32	W3216FA-4-C5T32	1 500	1 554
W3221FA-3P-C5Z32	W3221FA-4-C5T32	2 000	2 054
W3227FA-3P-C5Z32	W3227FA-4-C5T32	2 600	2 654

Notes

1. We recommend NSK support unit. See page 324 for details.
2. Use of NSK grease LR3 is recommended. Recommended quantity of grease is about 50% of ball nut's internal space. See page 445 for details.
3. Contact NSK if the permissible rotational speed is to be exceeded.



Screw shaft ϕ 32
Lead 32

Unit: mm

Ball screw specifications			
Product classification		Preloaded	Precise clearance
Shaft dia. × Lead / Direction of turn		32 × 32 / Right	
Preload / Ball recirculation		P-preload / Return tube	
Ball dia. / Ball circle dia.		4.762 / 33.25	
Screw shaft root diameter		28.3	
Effective turns of balls		1.5 × 1	
Accuracy grade / Preload / Axial play		C5 / Z	C5 / T
Basic load rating (N)	Dynamic C_a	10 100	13 300
	Static C_{0a}	16 800	25 200
Axial play		0	0.005 or less
Preload (N)		392	-
Dynamic friction torque, (N·cm)		6.9 – 31.5	7.8 or less
Spacer ball		Yes	None
Factory-packed grease		NSK grease LR3	
Internal spatial volume of nut (cm³)		14	
Standard volume of grease replenishing (cm³)		7	

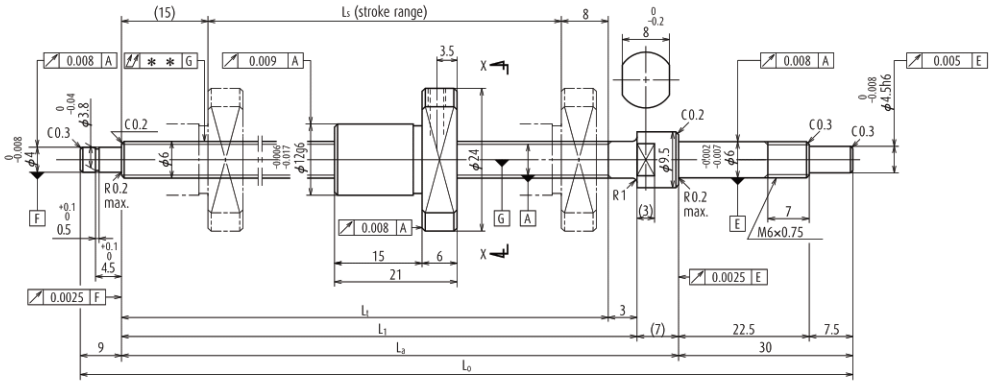
Recommended support unit

For drive side (Fixed)	For opposite to drive side	
	(Fixed)	(Simple)
WBK25-01W (square)	WBK25-01W (square)	WBK25S-01W (square)
WBK25-11 (round)	WBK25-11 (round)	

Unit: mm

Screw shaft length			Lead accuracy			Shaft run-out **	Mass (kg)	Permissible rotational speed N (min⁻¹)	
								Supporting condition	
L_t	L_a	L_0	T	e_p	U_{ll}			Fixed - Simple support	Fixed - Fixed
1 180	1 219	1 376	0	0.046	0.030	0.090	9.3	2 180	2 180
1 680	1 719	1 876	0	0.065	0.040	0.120	12.3	1 590	2 180
2 180	2 219	2 376	0	0.077	0.046	0.160	15.4	930	1 290
2 780	2 819	2 976	0	0.093	0.054	0.200	19.1	570	790

25. Finished shaft end stainless steel product KA Type (Fine lead)

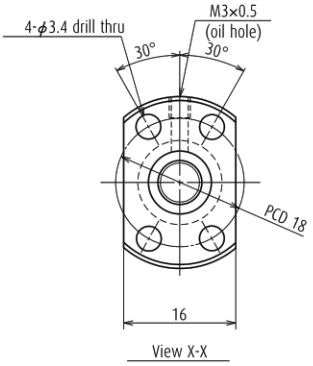


Ball screw No.	Stroke L_s		Thread length			
	Nominal	Maximum	L_t	L_1	L_a	L_o
W0601KA-3PY-C3Z1	100	102	125	128	135	174

Notes

1. **Only rust preventive agent is applied at time of delivery. Please apply lubricant (oil or grease) before use.**
   See page 442 for details.
   Use of NSK Clean Grease LG2 is recommended.
2. Ball nut does not have seal.
3. Contact NSK if the permissible rotational speed is to be exceeded.

Screw shaft ϕ 6
Lead 1



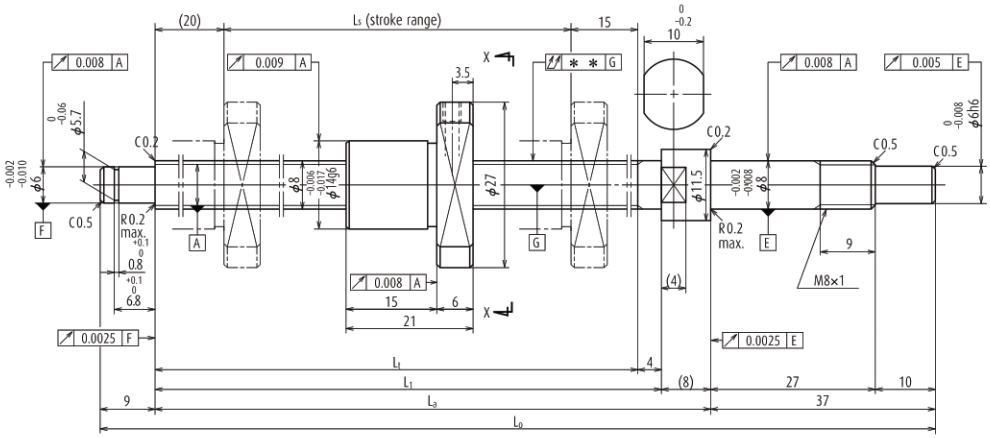
Unit: mm

Ball screw specifications		
Shaft dia. × Lead / Direction of turn		6 × 1 / Right
Preload / Ball recirculation		P-preload / Deflector (bridge)
Ball dia. / Ball circle dia.		0.800 / 6.2
Screw shaft root diameter		5.2
Effective turns of balls		1 × 3
Accuracy grade / Preload		C3 / Z
Basic load rating (N)	Dynamic C_a	555
	Static C_{0a}	680
Axial play		0
Preload (N)		24.5
Dynamic friction torque, (N·cm)		1.3 or less
Spacer ball		None
Factory-packed grease		**Refer to Notes 1.**

Unit: mm

Lead accuracy			Shaft run-out **	Mass (kg)	Permissible rotational speed N (min^{-1})
T	e_p	v_u			Supporting condition
					Fixed - Simple Support
0	0.010	0.008	0.025	0.06	3 000

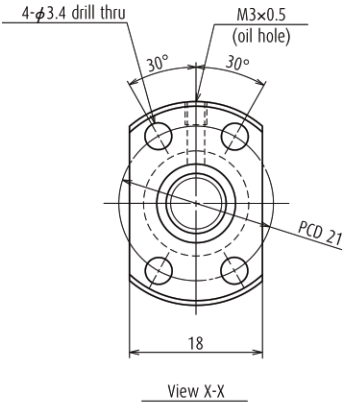
25. Finished shaft end stainless steel product KA Type (Fine lead)



Ball screw No.	Stroke L_s		Thread length			
	Nominal	Maximum	L_t	L_1	L_a	L_0
W0802KA-1PY-C3Z1	150	155	190	194	202	248

Notes

1. **Only rust preventive agent is applied at time of delivery. Please apply lubricant (oil or grease) before use.**
   See page 442 for details.
   Use of NSK Clean Grease LG2 is recommended.
2. Ball nut does not have seal.
3. Contact NSK if the permissible rotational speed is to be exceeded.



Screw shaft ϕ 8
Lead 1

Unit: mm

Ball screw specifications		
Shaft dia. × Lead / Direction of turn		8 × 1 / Right
Preload / Ball recirculation		P-preload / Deflector (bridge)
Ball dia. / Ball circle dia.		0.800 / 8.2
Screw shaft root diameter		7.2
Effective turns of balls		1 × 3
Accuracy grade / Preload		C3 / Z
Basic load rating (N)	Dynamic C_a	645
	Static C_{0a}	955
Axial play		0
Preload (N)		29.4
Dynamic friction torque, (N·cm)		1.8 or less
Spacer ball		None
Factory-packed grease		**Refer to Notes 1.**

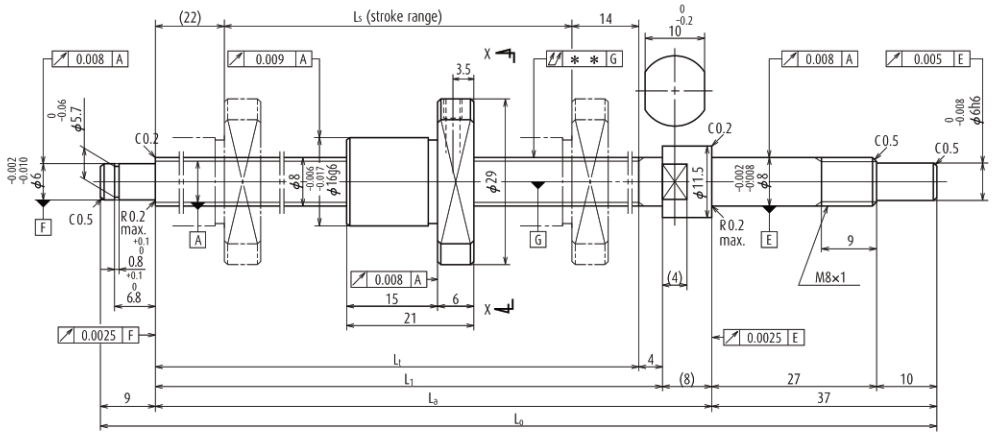
Recommended support unit

For drive side (Fixed)	For opposite to drive side (Free)
WBK08-01C (square, clean)	WBK08S-01C (square, clean)
WBK08-11C (round, clean)	

Unit: mm

Lead accuracy			Shaft run-out **	Mass (kg)	Permissible rotational speed N (min^{-1})
					Supporting condition
T	e_p	v_u			Fixed - Simple Support
0	0.010	0.008	0.035	0.12	3 000

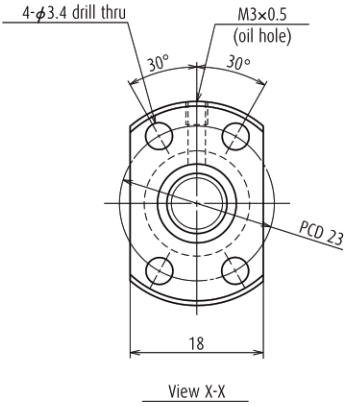
25. Finished shaft end stainless steel product KA Type (Fine lead)



Ball screw No.	Stroke L_s		Thread length			
	Nominal	Maximum	L_t	L_1	L_a	L_0
W0802KA-5PY-C3Z2	150	154	190	194	202	248

Notes

1. **Only rust preventive agent is applied at time of delivery. Please apply lubricant (oil or grease) before use.**
   See page 442 for details.
   Use of NSK Clean Grease LG2 is recommended.
2. Contact NSK if the permissible rotational speed is to be exceeded.



Screw shaft ϕ 8
Lead 2

Unit: mm

Ball screw specifications		
Shaft dia. × Lead / Direction of turn		8 × 2 / Right
Preload / Ball recirculation		P-preload / Deflector (bridge)
Ball dia. / Ball circle dia.		1.200 / 8.3
Screw shaft root diameter		6.9
Effective turns of balls		1 × 3
Accuracy grade / Preload		C3 / Z
Basic load rating (N)	Dynamic C_a	1 270
	Static C_{0a}	1 630
Axial play		0
Preload (N)		49.0
Dynamic friction torque, (N·cm)		2.0 or less
Spacer ball		None
Factory-packed grease		**Refer to Notes 1.**
Internal spatial volume of nut (cm^3)		0.34
Standard volume of grease replenishing (cm^3)		0.17

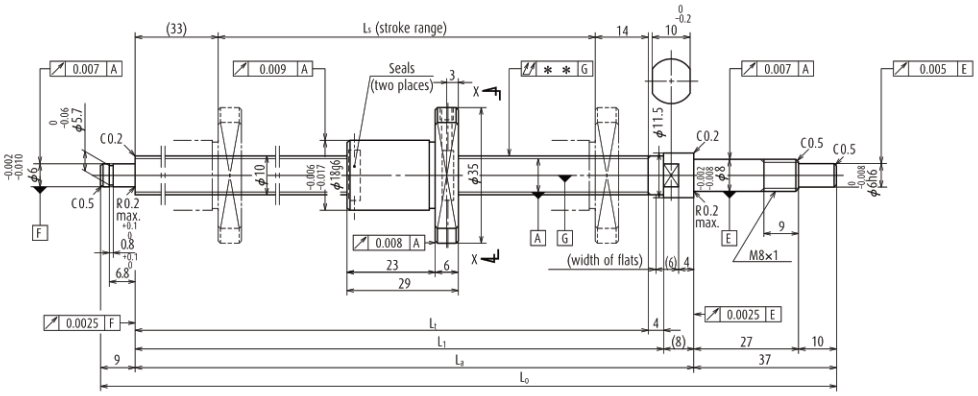
Recommended support unit

For drive side (Fixed)	For opposite to drive side (Free)
WBK08-01C (square, clean)	WBK08S-01C (square, clean)
WBK08-11C (round, clean)	

Unit: mm

Lead accuracy			Shaft run-out **	Mass (kg)	Permissible rotational speed N (min^{-1})
T	e_p	v_u	↑↑		Supporting condition: Fixed - Simple Support
0	0.010	0.008	0.035	0.13	3 000

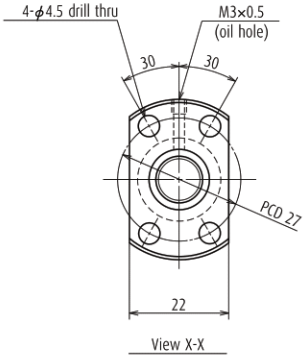
25. Finished shaft end stainless steel product KA Type (Fine lead)



Ball screw No.	Stroke L_s		Thread length			
	Nominal	Maximum	L_t	L_1	L_a	L_o
W1002KA-3PY-C3Z2	200	203	250	254	262	308

Notes

1. **Only rust preventive agent is applied at time of delivery. Please apply lubricant (oil or grease) before use.**
   See page 442 for details.
   Use of NSK Clean Grease LG2 is recommended.
2. Contact NSK if the permissible rotational speed is to be exceeded.



Screw shaft ϕ 10
Lead 2

Unit: mm

Ball screw specifications		
Shaft dia. × Lead / Direction of turn		10 × 2 / Right
Preload / Ball recirculation		P-preload / Deflector (bridge)
Ball dia. / Ball circle dia.		1.200 / 10.3
Screw shaft root diameter		8.9
Effective turns of balls		1 × 3
Accuracy grade / Preload		C3 / Z
Basic load rating (N)	Dynamic C_a	1 470
	Static C_{0a}	2 190
Axial play		0
Preload (N)		58.8
Dynamic friction torque, (N·cm)		0.10 – 2.5
Spacer ball		None
Factory-packed grease		**Refer to Notes 1.**
Internal spatial volume of nut (cm^3)		0.44
Standard volume of grease replenishing (cm^3)		0.22

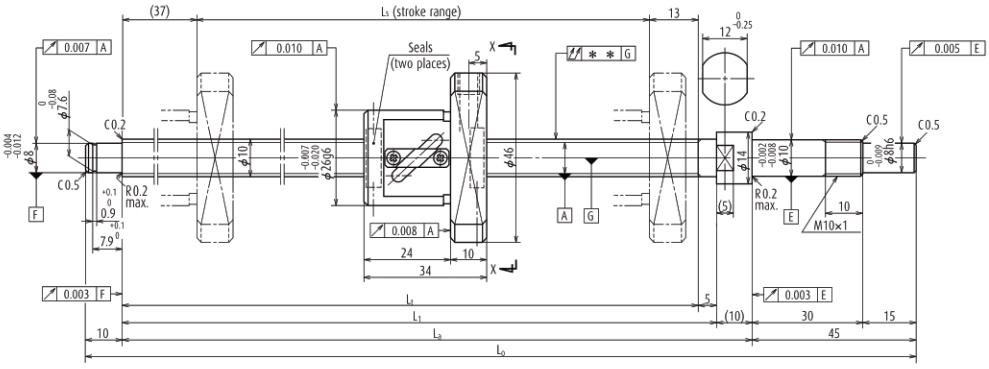
Recommended support unit

For drive side (Fixed)	For opposite to drive side (Free)
WBK08-01C (square, clean)	WBK08S-01C (square, clean)
WBK08-11C (round, clean)	

Unit: mm

Lead accuracy			Shaft run-out **	Mass (kg)	Permissible rotational speed N (min^{-1})
					Supporting condition
T	e_p	u			Fixed - Simple Support
0	0.012	0.008	0.030	0.22	3 000

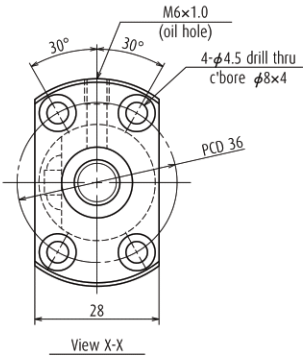
25. Finished shaft end stainless steel product KA Type (Fine lead)



Ball screw No.	Stroke L_s		Thread length			
	Nominal	Maximum	L_t	L_1	L_a	L_o
W1001KA-3P-C3Z4	100	110	160	165	175	230
W1003KA-3P-C3Z4	300	310	360	365	375	430

Notes

1. **Only rust preventive agent is applied at time of delivery. Please apply lubricant (oil or grease) before use.**
   See page 442 for details.
   Use of NSK Clean Grease LG2 is recommended.
2. Contact NSK if the permissible rotational speed is to be exceeded.



Screw shaft ϕ 10
Lead 4

Unit: mm

Ball screw specifications		
Shaft dia. × Lead / Direction of turn		10 × 4 / Right
Preload / Ball recirculation		P-preload / Return tube
Ball dia. / Ball circle dia.		2.000 / 10.3
Screw shaft root diameter		8.2
Effective turns of balls		2.5 × 1
Accuracy grade / Preload		C3 / Z
Basic load rating (N)	Dynamic C_a	2 630
	Static C_{0a}	3 270
Axial play		0
Preload (N)		98.1
Dynamic friction torque, (N·cm)		0.5 – 3.9
Spacer ball		None
Factory-packed grease		**Refer to Notes 1.**
Internal spatial volume of nut (cm³)		0.8
Standard volume of grease replenishing (cm³)		0.4

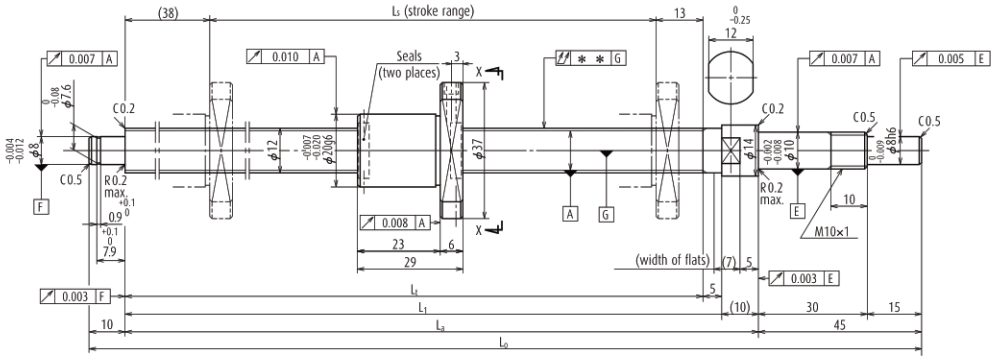
Recommended support unit

For drive side (Fixed)	For opposite to drive side (Free)
WBK10-01C (square, clean)	WBK10S-01C (square, clean)
WBK10-11C (round, clean)	

Unit: mm

Lead accuracy			Shaft run-out **	Mass (kg)	Permissible rotational speed N (min⁻¹)
					Supporting condition
T	e_p	v_u	↑↑		Fixed - Simple Support
0	0.010	0.008	0.030	0.29	3 000
0	0.013	0.008	0.050	0.39	3 000

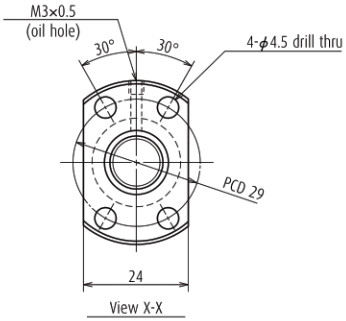
25. Finished shaft end stainless steel product KA Type (Fine lead)



Ball screw No.	Stroke L_s		Thread length			
	Nominal	Maximum	L_t	L_1	L_a	L_o
W1201KA-3PY-C3Z2	100	109	160	165	175	230
W1203KA-1PY-C3Z2	250	259	310	315	325	380

Notes

1. **Only rust preventive agent is applied at time of delivery. Please apply lubricant (oil or grease) before use.**
   See page 442 for details.
   Use of NSK Clean Grease LG2 is recommended.
2. Contact NSK if the permissible rotational speed is to be exceeded.



Screw shaft ϕ 12
Lead 2

Unit: mm

Ball screw specifications		
Shaft dia. × Lead / Direction of turn		12 × 2 / Right
Preload / Ball recirculation		P-preload / Deflector (bridge)
Ball dia. / Ball circle dia.		1.200 / 12.3
Screw shaft root diameter		10.9
Effective turns of balls		1 × 3
Accuracy grade / Preload		C3 / Z
Basic load rating (N)	Dynamic C_a	1 600
	Static C_{0a}	2 670
Axial play		0
Preload (N)		98.1
Dynamic friction torque, (N·cm)		0.4 – 3.4
Spacer ball		None
Factory-packed grease		**Refer to Notes 1.**
Internal spatial volume of nut (cm³)		0.53
Standard volume of grease replenishing (cm³)		0.27

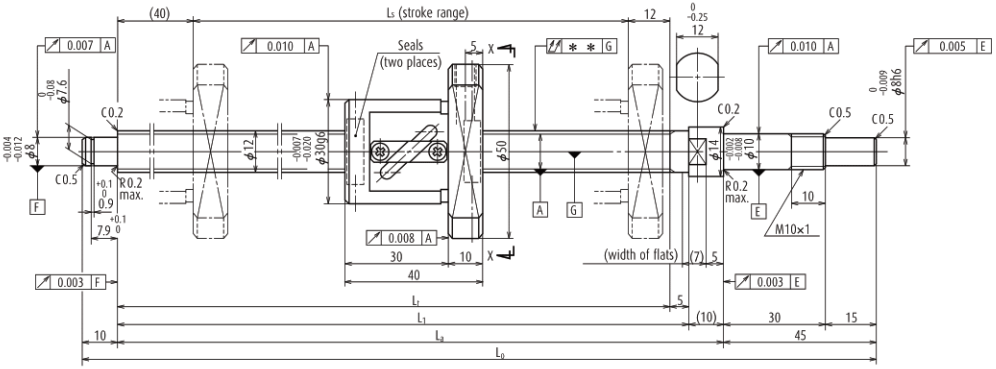
Recommended support unit

For drive side (Fixed)	For opposite to drive side (Free)
WBK10-01C (square, clean)	WBK10S-01C (square, clean)
WBK10-11C (round, clean)	

Unit: mm

Lead accuracy			Shaft run-out **	Mass (kg)	Permissible rotational speed N (min⁻¹)
					Supporting condition
T	e_p	U_U	↑↑		Fixed - Simple Support
0	0.010	0.008	0.030	0.24	3 000
0	0.012	0.008	0.040	0.36	3 000

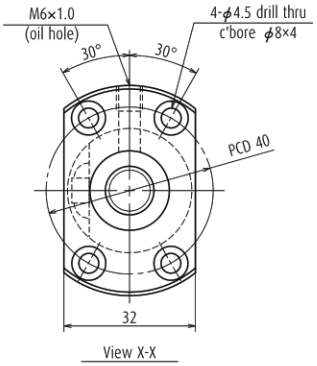
25. Finished shaft end stainless steel product KA Type (Fine lead)



Ball screw No.	Stroke L_s		Thread length			
	Nominal	Maximum	L_t	L_1	L_a	L_o
W1202KA-3P-C3Z5	200	208	260	265	275	330
W1205KA-1P-C3Z5	450	458	510	515	525	580

Notes

1. **Only rust preventive agent is applied at time of delivery. Please apply lubricant (oil or grease) before use.**
   See page 442 for details.
   Use of NSK Clean Grease LG2 is recommended.
2. Contact NSK if the permissible rotational speed is to be exceeded.



Screw shaft ϕ 12
Lead 5

Unit: mm

Ball screw specifications		
Shaft dia. × Lead / Direction of turn		12 × 5 / Right
Preload / Ball recirculation		P-preload / Return tube
Ball dia. / Ball circle dia.		2.381 / 12.3
Screw shaft root diameter		9.8
Effective turns of balls		2.5 × 1
Accuracy grade / Preload		C3 / Z
Basic load rating (N)	Dynamic C_a	3 590
	Static C_{0a}	4 630
Axial play		0
Preload (N)		98.1
Dynamic friction torque, (N·cm)		1.0 – 4.4
Spacer ball		None
Factory-packed grease		**Refer to Notes 1.**
Internal spatial volume of nut (cm³)		1.2
Standard volume of grease replenishing (cm³)		0.6

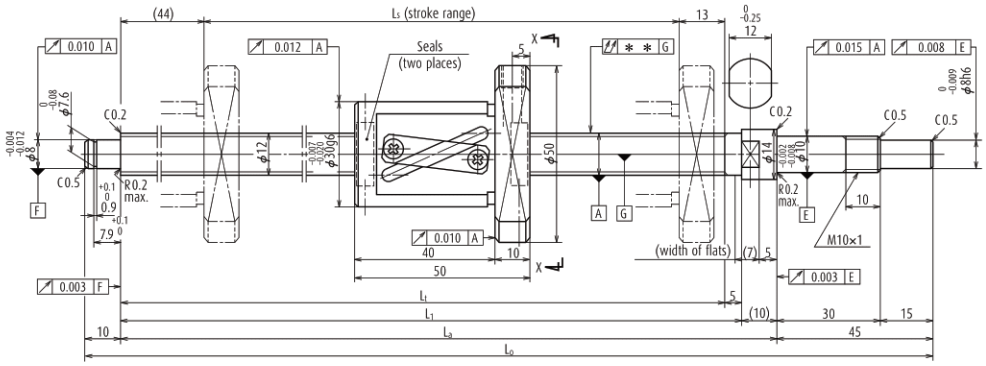
Recommended support unit

For drive side (Fixed)	For opposite to drive side (Free)
WBK10-01C (square, clean)	WBK10S-01C (square, clean)
WBK10-11C (round, clean)	

Unit: mm

Lead accuracy			Shaft run-out **	Mass (kg)	Permissible rotational speed N (min⁻¹)
T	e_p	v_u			Supporting condition: Fixed - Simple Support
0	0.012	0.008	0.040	0.47	3 000
0	0.016	0.012	0.065	0.66	3 000

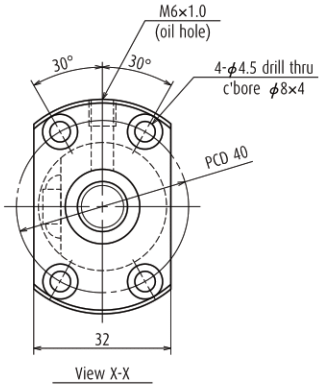
25. Finished shaft end stainless steel product KA Type (Medium lead)



Ball screw No.	Stroke L_s		Thread length			
	Nominal	Maximum	L_t	L_1	L_a	L_o
W1203KA-3P-C5Z10	250	253	310	315	325	380
W1205KA-3P-C5Z10	450	453	510	515	525	580

Notes

1. **Only rust preventive agent is applied at time of delivery. Please apply lubricant (oil or grease) before use.**
   See page 442 for details.
   Use of NSK Clean Grease LG2 is recommended.
2. Contact NSK if the permissible rotational speed is to be exceeded.



Screw shaft ϕ 12
Lead 10

Unit: mm

Ball screw specifications		
Shaft dia. × Lead / Direction of turn		12 × 10 / Right
Preload / Ball recirculation		P-preload / Return tube
Ball dia. / Ball circle dia.		2.381 / 12.5
Screw shaft root diameter		10.0
Effective turns of balls		2.5 × 1
Accuracy grade / Preload		C5 / Z
Basic load rating (N)	Dynamic C_a	3 620
	Static C_{0a}	4 750
Axial play		0
Preload (N)		98.1
Dynamic friction torque, (N·cm)		1.0 – 4.9
Spacer ball		None
Factory-packed grease		**Refer to Notes 1.**
Internal spatial volume of nut (cm³)		1.4
Standard volume of grease replenishing (cm³)		0.7

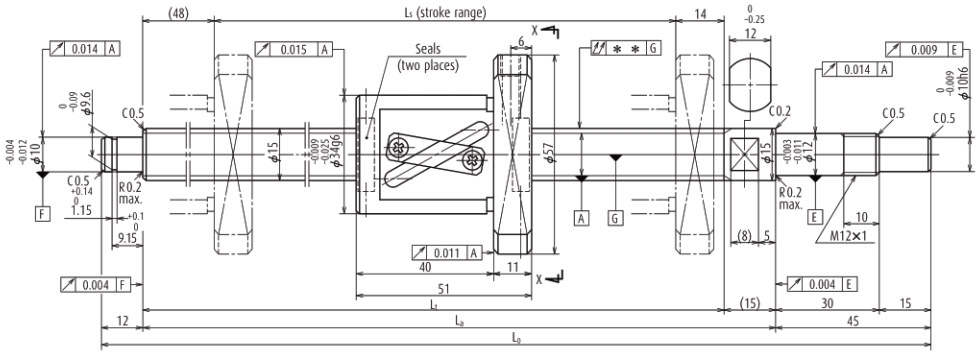
Recommended support unit

For drive side (Fixed)	For opposite to drive side (Free)
WBK10-01C (square, clean)	WBK10S-01C (square, clean)
WBK10-11C (round, clean)	

Unit: mm

Lead accuracy			Shaft run-out **	Mass (kg)	Permissible rotational speed N (min⁻¹)
T	e_p	v_u	↑↑		Supporting condition: Fixed - Simple Support
0	0.023	0.018	0.050	0.56	3 000
0	0.030	0.023	0.075	0.72	3 000

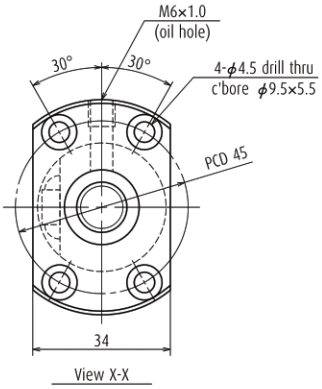
25. Finished shaft end stainless steel product KA Type (Medium lead)



Ball screw No.	Stroke L_s		Thread length		
	Nominal	Maximum	L_t	L_a	L_o
W1504KA-3P-C5Z10	400	427	489	504	561
W1506KA-3P-C5Z10	600	627	689	704	761
W1510KA-1P-C5Z10	1 000	1 027	1 089	1 104	1 161

Notes

1. **Only rust preventive agent is applied at time of delivery. Please apply lubricant (oil or grease) before use.**
   See page 442 for details.
   Use of NSK Clean Grease LG2 is recommended.
2. Contact NSK if the permissible rotational speed is to be exceeded.



Screw shaft ϕ 15
Lead 10

Unit: mm

Ball screw specifications		
Shaft dia. × Lead / Direction of turn		15 × 10 / Right
Preload / Ball recirculation		P-preload / Return tube
Ball dia. / Ball circle dia.		3.175 / 15.5
Screw shaft root diameter		12.2
Effective turns of balls		2.5 × 1
Accuracy grade / Preload		C5 / Z
Basic load rating (N)	Dynamic C_a	6 660
	Static C_{0a}	9 480
Axial play		0
Preload (N)		147
Dynamic friction torque, (N·cm)		1.5 – 7.9
Spacer ball		None
Factory-packed grease		**Refer to Notes 1.**
Internal spatial volume of nut (cm³)		2.3
Standard volume of grease replenishing (cm³)		1.4

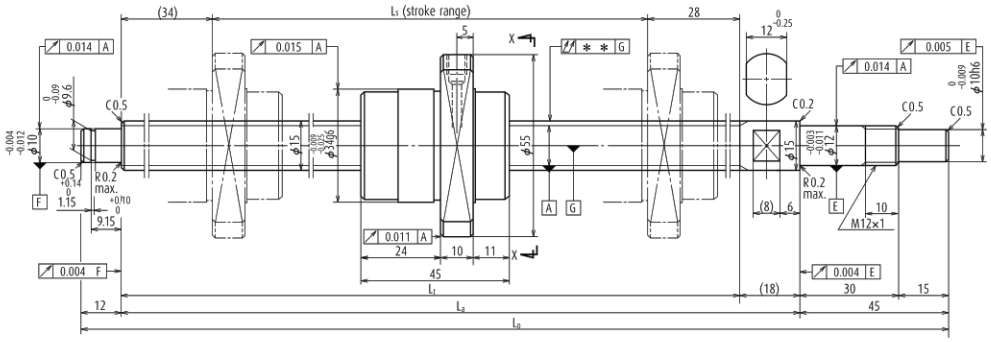
Recommended support unit

For drive side (Fixed)	For opposite to drive side (Free)
WBK12-01C (square, clean)	WBK12S-01C (square, clean)
WBK12-11C (round, clean)	

Unit: mm

Lead accuracy			Shaft run-out **	Mass (kg)	Permissible rotational speed N (min⁻¹)
					Supporting condition
T	e_p	v_u	↑↑		Fixed - Simple Support
0	0.027	0.020	0.050	0.99	3 000
0	0.035	0.025	0.065	1.2	3 000
0	0.046	0.030	0.110	1.7	1 610

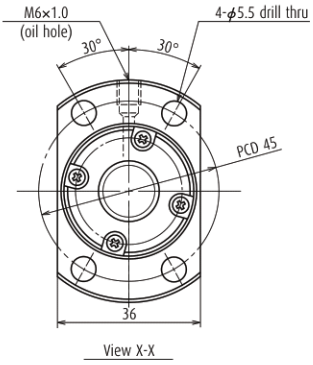
25. Finished shaft end stainless steel product KA Type (Medium lead)



Ball screw No.	Stroke L_s		Thread length		
	Nominal	Maximum	L_t	L_a	L_o
W1504KA-7PG-C5Z20	400	424	486	504	561
W1506KA-7PG-C5Z20	600	624	686	704	761
W1510KA-3PG-C5Z20	1 000	1 024	1 086	1 104	1 161

Notes

1. **Only rust preventive agent is applied at time of delivery. Please apply lubricant (oil or grease) before use.**
   See page 442 for details.
   Use of NSK Clean Grease LG2 is recommended.
2. Contact NSK if the permissible rotational speed is to be exceeded.



Screw shaft ϕ 15
Lead 20

Unit: mm

Ball screw specifications		
Shaft dia. × Lead / Direction of turn		15 × 20 / Right
Preload / Ball recirculation		P-preload / End cap
Ball dia. / Ball circle dia.		3.175 / 15.5
Screw shaft root diameter		12.2
Effective turns of balls		1.7 × 1
Accuracy grade / Preload		C5 / Z
Basic load rating (N)	Dynamic C_a	4 630
	Static C_{0a}	6 430
Axial play		0
Preload (N)		147
Dynamic friction torque, (N·cm)		1.5 – 7.9
Spacer ball		None
Factory-packed grease		**Refer to Notes 1.**
Internal spatial volume of nut (cm³)		1.9
Standard volume of grease replenishing (cm³)		1.0

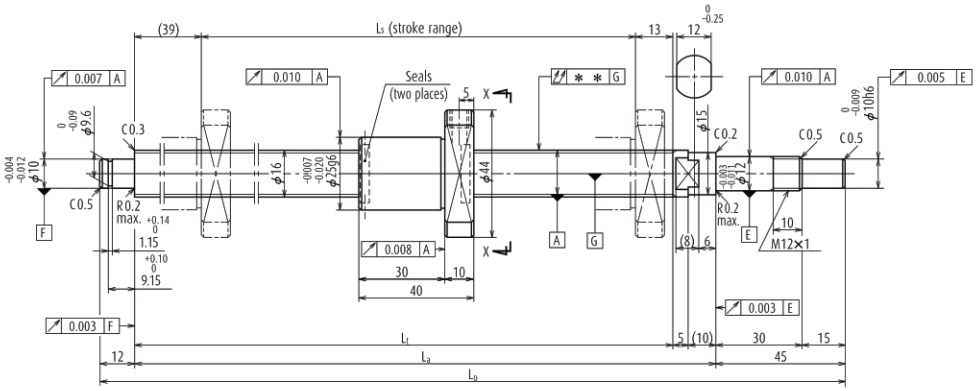
Recommended support unit

For drive side (Fixed)	For opposite to drive side (Free)
WBK12-01C (square, clean)	WBK12S-01C (square, clean)
WBK12-11C (round, clean)	

Unit: mm

Lead accuracy			Shaft run-out **	Mass (kg)	Permissible rotational speed N (min⁻¹)
T	e_p	v_u	↑↑		Supporting condition: Fixed - Simple Support
0	0.027	0.020	0.050	1.0	3 000
0	0.035	0.025	0.065	1.3	3 000
0	0.046	0.030	0.110	1.8	1 610

25. Finished shaft end stainless steel product KA Type (Fine lead)



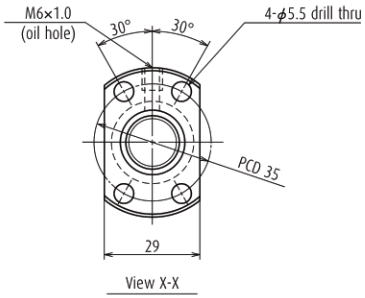
Ball screw No.	Stroke L_s		Thread length		
	Nominal	Maximum	L_t	L_a	L_0
W1601KA-3PY-C3Z2	100	137	189	204	261
W1603KA-1PY-C3Z2	300	337	389	404	461

Notes

1. **Only rust preventive agent is applied at time of delivery. Please apply lubricant (oil or grease) before use.**
   See page 442 for details.
   Use of NSK Clean Grease LG2 is recommended.
2. Contact NSK if the permissible rotational speed is to be exceeded.

Screw shaft ϕ 16
Lead 2

Unit: mm



Ball screw specifications		
Shaft dia. × Lead / Direction of turn		16 × 2 / Right
Preload / Ball recirculation		P-preload / Deflector (bridge)
Ball dia. / Ball circle dia.		1.588 / 16.4
Screw shaft root diameter		14.6
Effective turns of balls		1 × 4
Accuracy grade / Preload		C3 / Z
Basic load rating (N)	Dynamic C_a	3 400
	Static C_{0a}	6 240
Axial play		0
Preload (N)		147
Dynamic friction torque, (N·cm)		0.5 – 4.9
Spacer ball		None
Factory-packed grease		**Refer to Notes 1.**
Internal spatial volume of nut (cm^3)		1.6
Standard volume of grease replenishing (cm^3)		0.8

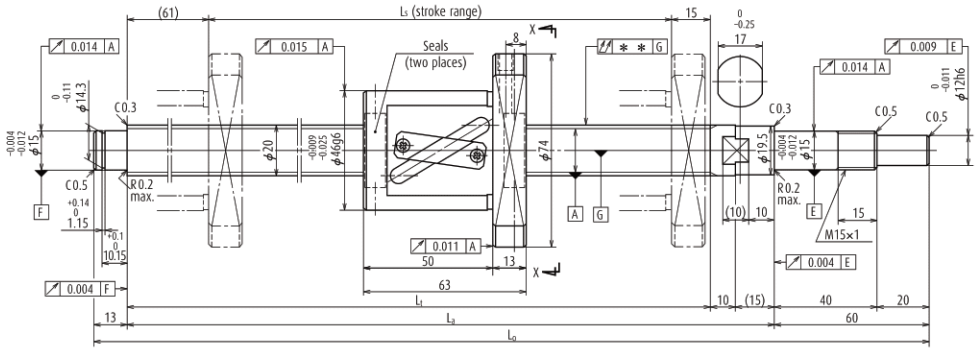
Recommended support unit

For drive side (Fixed)	For opposite to drive side (Free)
WBK12-01C (square, clean)	WBK12S-01C (square, clean)
WBK12-11C (round, clean)	

Unit: mm

Lead accuracy			Shaft run-out **	Mass (kg)	Permissible rotational speed N (min^{-1})
					Supporting condition
T	e_p	v_u	↑↑		Fixed - Simple Support
0	0.010	0.008	0.020	0.46	3 000
0	0.013	0.010	0.035	0.75	3 000

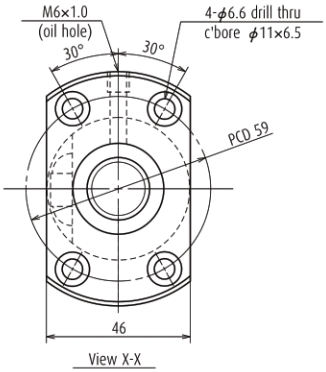
25. Finished shaft end stainless steel product KA Type (High helix lead)



Ball screw No.	Stroke L_s		Thread length		
	Nominal	Maximum	L_t	L_a	L_o
W2005KA-3P-C5Z20	400	434	510	535	608
W2007KA-3P-C5Z20	600	634	710	735	808
W2011KA-3P-C5Z20	1 000	1 034	1 110	1 135	1 208

Notes

1. **Only rust preventive agent is applied at time of delivery. Please apply lubricant (oil or grease) before use.**
   See page 442 for details.
   Use of NSK Clean Grease LG2 is recommended.
2. Contact NSK if the permissible rotational speed is to be exceeded.



Screw shaft ϕ 20
Lead 20

Unit: mm

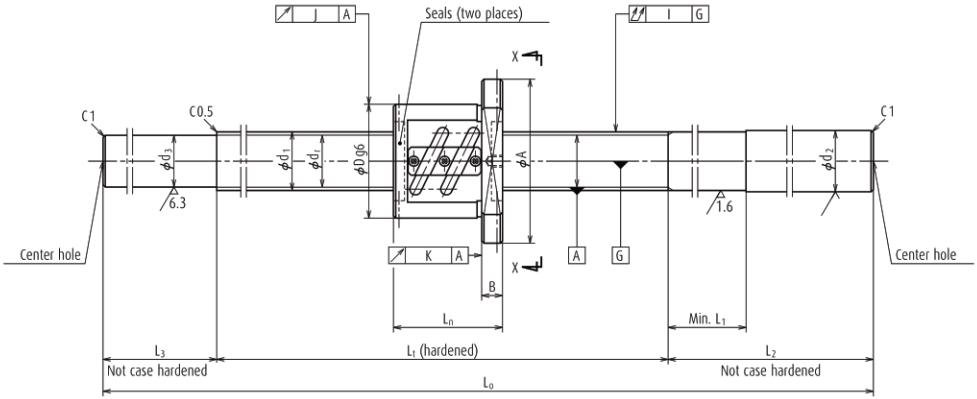
Ball screw specifications		
Shaft dia. × Lead / Direction of turn		20 × 20 / Right
Preload / Ball recirculation		P-preload / Return tube
Ball dia. / Ball circle dia.		3.969 / 21
Screw shaft root diameter		16.9
Effective turns of balls		1.5 × 1
Accuracy grade / Preload		C5 / Z
Basic load rating (N)	Dynamic C_a	6 700
	Static C_{0a}	9 710
Axial play		0
Preload (N)		196
Dynamic friction torque, (N·cm)		2.0 – 11.8
Spacer ball		None
Factory-packed grease		**Refer to Notes 1.**
Internal spatial volume of nut (cm³)		4.2
Standard volume of grease replenishing (cm³)		2.1

Recommended support unit

For drive side (Fixed)	For opposite to drive side (Free)
WBK15-01C (square, clean)	WBK15S-01C (square, clean)
WBK15-11C (round, clean)	

Unit: mm

Lead accuracy			Shaft run-out **	Mass (kg)	Permissible rotational speed N (min⁻¹)
T	e_p	v_u	↑↑		Supporting condition: Fixed - Simple Support
0	0.030	0.023	0.050	2.0	3 000
0	0.035	0.025	0.085	2.5	3 000
0	0.046	0.030	0.110	3.4	2 160



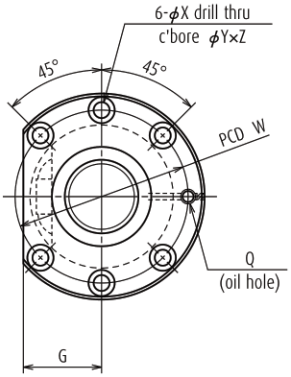
Nut type code: PFT

Ball screw No.	Stroke Max. L_t-L_n	Screw shaft dia. d_1	Lead l	Ball dia. D_w	Ball circle dia. d_m	Root dia. d_r	Effective ball turns: Turns × Circuits	Basic load rating (N): Dynamic C_a	Basic load rating (N): Static C_{0a}	Preload (N)	Dynamic friction torque, median (N·cm)	Nut: Outside dia. D	Nut: Flange A	Nut: Flange G	Nut: Flange B	Nut: Overall length L_n	Nut: Bolt hole W	Nut: Bolt hole X
W2003SS-1P-C5Z4	251	20	4	2.381	20.3	17.8	2.5×2	6 550	10 900	290	3.9	40	63	24	11	49	51	5.5
W2005SS-1P-C5Z4	451	20	4	2.381	20.3	17.8	2.5×2	6 550	10 900	290	3.9	40	63	24	11	49	51	5.5
W2008SS-1P-C5Z4	751	20	4	2.381	20.3	17.8	2.5×2	6 550	10 900	290	3.9	40	63	24	11	49	51	5.5
W2003SS-2P-C5Z5	244	20	5	3.175	20.5	17.2	2.5×2	11 100	17 100	490	7.8	44	67	26	11	56	55	5.5
W2005SS-2P-C5Z5	444	20	5	3.175	20.5	17.2	2.5×2	11 100	17 100	490	7.8	44	67	26	11	56	55	5.5
W2007SS-1P-C5Z5	644	20	5	3.175	20.5	17.2	2.5×2	11 100	17 100	490	7.8	44	67	26	11	56	55	5.5
W2010SS-1P-C5Z5	944	20	5	3.175	20.5	17.2	2.5×2	11 100	17 100	490	7.8	44	67	26	11	56	55	5.5

Notes

1. Use of NSK support unit is recommend. See page 324 for details.
2. **Only rust preventive agent is applied at time of delivery. Please apply lubricant (oil or grease) before use.** See page 442 for details.
3. The permissible rotational speed is determined by d·n value, critical speed and maximum rotational speed. The permissible rotational speed shown in the table is the value when the ball screw mounting method is fixed-fixed.

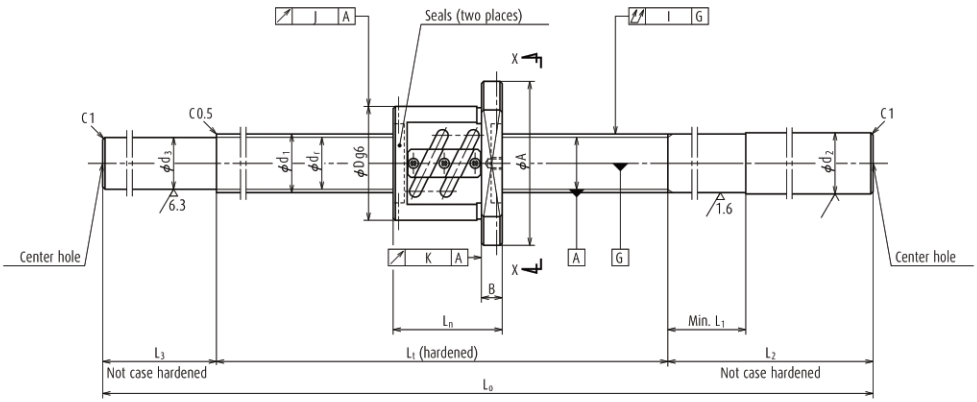
Screw shaft ϕ 20
Lead 4, 5



View X-X

Unit: mm

dimensions			Screw shaft dimensions							Lead accuracy			Run-out			Mass	Per-missible rotational speed	Internal spatial volume of nut	Standard volume of grease replenishing
Bolt hole		Oil hole	Threaded length	Shaft end right			Shaft end left		Overall length	Travel compen-sation	Deviation	Variation	Shaft straight-ness	Radial run-out					
Y	Z	Q	L_t	d_2	L_1	L_2	d_3	L_3	L_0	T	e_p	υ_u	I	J	K	(kg)	N (min^{-1})	(cm^3)	(cm^3)
9.5	5.5	M6×1	300	20.2	40	150	17.8	—	450	-0.007	0.023	0.018	0.055	0.015	0.011	1.5	3 000	2.7	1.4
9.5	5.5	M6×1	500	20.2	40	150	17.8	50	700	-0.012	0.027	0.020	0.085	0.015	0.011	2.0	3 000	2.7	1.4
9.5	5.5	M6×1	800	20.2	40	200	17.8	100	1 100	-0.019	0.035	0.025	0.140	0.015	0.011	2.9	3 000	2.7	1.4
9.5	5.5	M6×1	300	20.2	40	150	17.2	—	450	-0.007	0.023	0.018	0.055	0.015	0.011	1.6	3 000	4.3	2.2
9.5	5.5	M6×1	500	20.2	40	150	17.2	50	700	-0.012	0.027	0.020	0.085	0.015	0.011	2.2	3 000	4.3	2.2
9.5	5.5	M6×1	700	20.2	40	200	17.2	100	1 000	-0.017	0.035	0.025	0.110	0.015	0.011	2.8	3 000	4.3	2.2
9.5	5.5	M6×1	1 000	20.2	40	200	17.2	100	1 300	-0.024	0.040	0.027	0.180	0.015	0.011	3.5	3 000	4.3	2.2



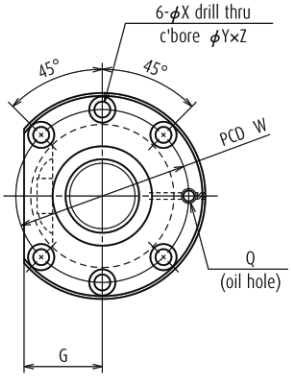
Nut type code: PFT

Ball screw No.	Stroke Max. L_t-L_n	Screw shaft dia. d_1	Lead l	Ball dia. D_w	Ball circle dia. d_m	Root dia. d_r	Effective ball turns Turns × Circuits	Basic load rating (N) Dynamic C_a	Basic load rating (N) Static C_{0a}	Preload (N)	Dynamic friction torque, median (N·cm)	Nut Outside dia. D	Nut Flange A	Nut Flange G	Nut Flange B	Nut Overall length L_n	Nut Bolt hole W	Nut Bolt hole X
W2503SS-1P-C5Z4	252	25	4	2.381	25.3	22.8	2.5×2	7 110	13 600	290	4.9	46	69	26	11	48	57	5.5
W2506SS-1P-C5Z4	552	25	4	2.381	25.3	22.8	2.5×2	7 110	13 600	290	4.9	46	69	26	11	48	57	5.5
W2510SS-1P-C5Z4	952	25	4	2.381	25.3	22.8	2.5×2	7 110	13 600	290	4.9	46	69	26	11	48	57	5.5
W2503SS-2P-C5Z5	245	25	5	3.175	25.5	22.2	2.5×2	12 300	21 800	540	8.8	50	73	28	11	55	61	5.5
W2505SS-1P-C5Z5	445	25	5	3.175	25.5	22.2	2.5×2	12 300	21 800	540	8.8	50	73	28	11	55	61	5.5
W2508SS-1P-C5Z5	745	25	5	3.175	25.5	22.2	2.5×2	12 300	21 800	540	8.8	50	73	28	11	55	61	5.5
W2512SS-1P-C5Z5	1 145	25	5	3.175	25.5	22.2	2.5×2	12 300	21 800	540	8.8	50	73	28	11	55	61	5.5
W2504SS-1P-C5Z6	338	25	6	3.969	25.5	21.4	2.5×2	16 600	26 700	690	13.8	53	76	29	11	62	64	5.5
W2508SS-2P-C5Z6	738	25	6	3.969	25.5	21.4	2.5×2	16 600	26 700	690	13.8	53	76	29	11	62	64	5.5
W2512SS-2P-C5Z6	1 138	25	6	3.969	25.5	21.4	2.5×2	16 600	26 700	690	13.8	53	76	29	11	62	64	5.5

Notes

1. Use of NSK support unit is recommend. See page 324 for details.
2. **Only rust preventive agent is applied at time of delivery. Please apply lubricant (oil or grease) before use.** See page 442 for details.
3. The permissible rotational speed is determined by d·n value, critical speed and maximum rotational speed. The permissible rotational speed shown in the table is the value when the ball screw mounting method is fixed-fixed.

Screw shaft ϕ 25
Lead 4, 5, 6

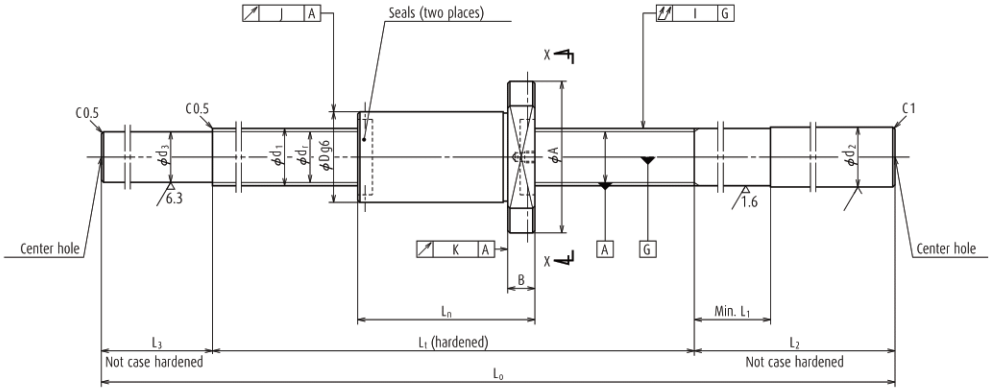


View X-X

Unit: mm

dimensions			Screw shaft dimensions							Lead accuracy			Run-out			Mass	Per-missible rotational speed	Internal spatial volume of nut	Standard volume of grease replenishing
Bolt hole		Oil hole	Threaded length	Shaft end right			Shaft end left		Overall length	Travel compen-sation	Deviation	Variation	Shaft straight-ness	Radial run-out					
Y	Z	Q	L_t	d_2	L_1	L_2	d_3	L_3	L_0	T	e_p	υ_u	I	J	K	(kg)	N (min^{-1})	(cm^3)	(cm^3)
9.5	5.5	M6×1	300	25.2	40	150	22.8	—	450	-0.007	0.023	0.018	0.040	0.015	0.011	2.2	2 800	3.2	1.6
9.5	5.5	M6×1	600	25.2	40	200	22.8	100	900	-0.014	0.030	0.023	0.075	0.015	0.011	3.8	2 800	3.2	1.6
9.5	5.5	M6×1	1 000	25.2	40	200	22.8	100	1 300	-0.024	0.040	0.027	0.120	0.015	0.011	5.2	2 800	3.2	1.6
9.5	5.5	M6×1	300	25.2	40	200	22.2	—	500	-0.007	0.023	0.018	0.040	0.015	0.011	2.5	2 800	5.2	2.6
9.5	5.5	M6×1	500	25.2	40	200	22.2	50	750	-0.012	0.027	0.020	0.060	0.015	0.011	3.4	2 800	5.2	2.6
9.5	5.5	M6×1	800	25.2	40	250	22.2	100	1 150	-0.019	0.035	0.025	0.090	0.015	0.011	4.8	2 800	5.2	2.6
9.5	5.5	M6×1	1 200	25.2	40	300	22.2	100	1 600	-0.029	0.046	0.030	0.120	0.015	0.011	6.3	2 800	5.2	2.6
9.5	5.5	M6×1	400	25.2	40	200	21.4	—	600	-0.010	0.025	0.020	0.050	0.019	0.013	3.0	2 800	7.0	3.5
9.5	5.5	M6×1	800	25.2	40	250	21.4	100	1 150	-0.019	0.035	0.025	0.090	0.019	0.013	4.8	2 800	7.0	3.5
9.5	5.5	M6×1	1 200	25.2	40	300	21.4	100	1 600	-0.029	0.046	0.030	0.120	0.019	0.013	6.3	2 800	7.0	3.5

26. Blank shaft end SS type (Fine lead: Deflector (bridge) type)



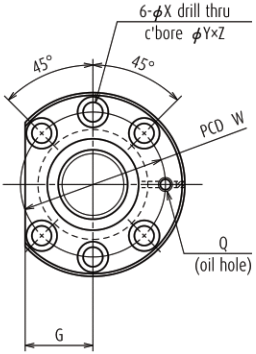
Nut type code: ZFD

Ball screw No.	Stroke Max. L_t-L_n	Screw shaft dia. d_1	Lead l	Ball dia. D_w	Ball circle dia. d_m	Root dia. d_r	Effective ball turns Turns × Circuits	Basic load rating (N) Dynamic C_a	Basic load rating (N) Static C_{0a}	Preload (N)	Dynamic friction torque, median (N·cm)	Nut Outside dia. D	Nut Flange A	Nut Flange G	Nut Flange B	Nut Overall length L_n	Nut Bolt hole W	Nut Bolt hole X
W2502SS-1ZY-C5Z5	184	25	5	3.175	25.75	22.4	1×3	11 600	22 900	740	13.8	40	63	24	11	66	51	5.5
W2504SS-3ZY-C5Z5	334	25	5	3.175	25.75	22.4	1×3	11 600	22 900	740	13.8	40	63	24	11	66	51	5.5
W2506SS-2ZY-C5Z5	534	25	5	3.175	25.75	22.4	1×3	11 600	22 900	740	13.8	40	63	24	11	66	51	5.5
W2509SS-1ZY-C5Z5	834	25	5	3.175	25.75	22.4	1×3	11 600	22 900	740	13.8	40	63	24	11	66	51	5.5
W2512SS-3ZY-C5Z5	1 134	25	5	3.175	25.75	22.4	1×3	11 600	22 900	740	13.8	40	63	24	11	66	51	5.5
W2504SS-4ZY-C5Z10	312	25	10	4.762	26.25	21.3	1×2	13 300	21 200	880	21.5	42	69	26	15	88	55	6.6
W2506SS-3ZY-C5Z10	512	25	10	4.762	26.25	21.3	1×2	13 300	21 200	880	21.5	42	69	26	15	88	55	6.6
W2508SS-3ZY-C5Z10	712	25	10	4.762	26.25	21.3	1×2	13 300	21 200	880	21.5	42	69	26	15	88	55	6.6
W2511SS-1ZY-C5Z10	1 012	25	10	4.762	26.25	21.3	1×2	13 300	21 200	880	21.5	42	69	26	15	88	55	6.6
W2515SS-2ZY-C5Z10	1 412	25	10	4.762	26.25	21.3	1×2	13 300	21 200	880	21.5	42	69	26	15	88	55	6.6

Notes

1. Use of NSK support unit is recommend. See page 324 for details.
2. **Only rust preventive agent is applied at time of delivery. Please apply lubricant (oil or grease) before use.** See page 442 for details.
3. The permissible rotational speed is determined by d·n value, critical speed and maximum rotational speed. The permissible rotational speed shown in the table is the value when the ball screw mounting method is fixed-fixed.

Screw shaft ϕ 25
Lead 5, 10

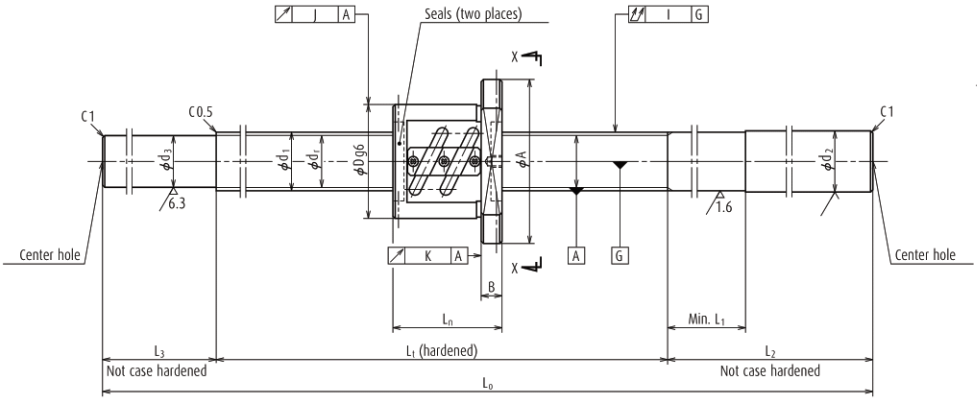


View X-X

Unit: mm

dimensions			Screw shaft dimensions							Lead accuracy			Run-out			Mass	Per-missible rotational speed	Internal spatial volume of nut	Standard volume of grease replenishing
Bolt hole		Oil hole	Threaded length	Shaft end right			Shaft end left		Overall length	Travel compen-sation	Deviation	Variation	Shaft straight-ness	Radial run-out					
Y	Z	Q	L_t	d_2	L_1	L_2	d_3	L_3	L_0	T	e_p	υ_u	I	J	K	(kg)	N (min^{-1})	(cm^3)	(cm^3)
9.5	5.5	M6×1	250	25.2	40	200	22.4	—	450	-0.005	0.023	0.018	0.040	0.015	0.011	2.1	2 800	5.4	2.7
9.5	5.5	M6×1	400	25.2	40	200	22.4	50	650	-0.009	0.025	0.020	0.060	0.015	0.011	2.8	2 800	5.4	2.7
9.5	5.5	M6×1	600	25.2	40	250	22.4	100	950	-0.013	0.030	0.023	0.075	0.015	0.011	3.9	2 800	5.4	2.7
9.5	5.5	M6×1	900	25.2	40	250	22.4	100	1 250	-0.021	0.040	0.027	0.090	0.015	0.011	4.9	2 800	5.4	2.7
9.5	5.5	M6×1	1 200	25.2	40	300	22.4	100	1 600	-0.028	0.046	0.030	0.120	0.015	0.011	6.2	2 800	5.4	2.7
11	6.5	M6×1	400	25.2	60	200	21.3	50	650	-0.008	0.025	0.020	0.060	0.015	0.011	3.0	2 800	9.0	4.5
11	6.5	M6×1	600	25.2	60	250	21.3	100	950	-0.012	0.030	0.023	0.075	0.015	0.011	4.1	2 800	9.0	4.5
11	6.5	M6×1	800	25.2	60	250	21.3	100	1 150	-0.017	0.035	0.025	0.090	0.015	0.011	4.8	2 800	9.0	4.5
11	6.5	M6×1	1 100	25.2	60	300	21.3	100	1 500	-0.024	0.046	0.030	0.120	0.015	0.011	6.0	2 800	9.0	4.5
11	6.5	M6×1	1 500	25.2	60	300	21.3	100	1 900	-0.034	0.054	0.035	0.150	0.015	0.011	7.4	2 800	9.0	4.5

26. Blank shaft end SS type (Fine lead: Tube type)

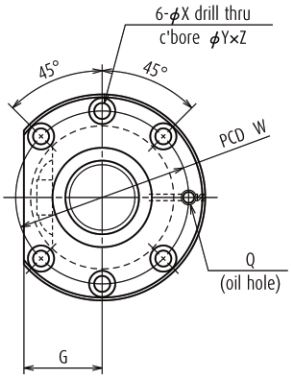


Nut type code: PFT

Ball screw No.	Stroke Max.	Screw shaft dia.	Lead	Ball dia.	Ball circle dia.	Root dia.	Effective ball turns	Basic load rating (N)		Preload	Dynamic friction torque, median	Nut						
								Dynamic	Static			Outside dia.	Flange			Overall length	Bolt hole	
	L_t-L_n	d_1	l	D_w	d_m	d_r	Turns × Circuits	C_a	C_{0a}	(N)	(N·cm)	D	A	G	B	L_n	W	X
W2504SS-2P-C5Z10	319	25	10	4.762	25.5	20.5	1.5×2	13 600	18 900	590	13.8	58	85	32	15	81	71	6.6
W2507SS-1P-C5Z10	619	25	10	4.762	25.5	20.5	1.5×2	13 600	18 900	590	13.8	58	85	32	15	81	71	6.6
W2510SS-2P-C5Z10	919	25	10	4.762	25.5	20.5	1.5×2	13 600	18 900	590	13.8	58	85	32	15	81	71	6.6
W2515SS-1P-C5Z10	1 419	25	10	4.762	25.5	20.5	1.5×2	13 600	18 900	590	13.8	58	85	32	15	81	71	6.6
W2804SS-1P-C5Z5	344	28	5	3.175	28.5	25.2	2.5×2	13 000	24 400	540	9.8	55	85	31	12	56	69	6.6
W2806SS-1P-C5Z5	544	28	5	3.175	28.5	25.2	2.5×2	13 000	24 400	540	9.8	55	85	31	12	56	69	6.6
W2808SS-1P-C5Z5	744	28	5	3.175	28.5	25.2	2.5×2	13 000	24 400	540	9.8	55	85	31	12	56	69	6.6
W2812SS-1P-C5Z5	1 144	28	5	3.175	28.5	25.2	2.5×2	13 000	24 400	540	9.8	55	85	31	12	56	69	6.6
W2804SS-3P-C5Z6	337	28	6	3.175	28.5	25.2	2.5×2	12 900	24 300	540	10.8	55	85	31	12	63	69	6.6
W2806SS-3P-C5Z6	537	28	6	3.175	28.5	25.2	2.5×2	12 900	24 300	540	10.8	55	85	31	12	63	69	6.6
W2808SS-3P-C5Z6	737	28	6	3.175	28.5	25.2	2.5×2	12 900	24 300	540	10.8	55	85	31	12	63	69	6.6
W2812SS-3P-C5Z6	1 137	28	6	3.175	28.5	25.2	2.5×2	12 900	24 300	540	10.8	55	85	31	12	63	69	6.6

Notes

1. Use of NSK support unit is recommend. See page 324 for details.
2. **Only rust preventive agent is applied at time of delivery. Please apply lubricant (oil or grease) before use.** See page 442 for details.
3. The permissible rotational speed is determined by d·n value, critical speed and maximum rotational speed. The permissible rotational speed shown in the table is the value when the ball screw mounting method is fixed-fixed.



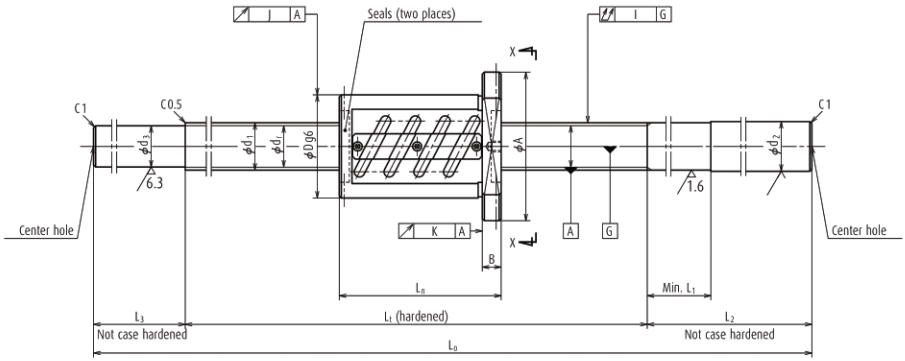
View X-X

Screw shaft ϕ 25
Lead 5, 10
Screw shaft ϕ 28
Lead 5, 6

Unit: mm

dimensions			Screw shaft dimensions							Lead accuracy			Run-out			Mass	Permissible rotational speed	Internal spatial volume of nut	Standard volume of grease replenishing
Bolt hole		Oil hole	Threaded length	Shaft end right			Shaft end left		Overall length	Travel compensation	Deviation	Variation	Shaft straightness	Radial run-out					
Y	Z	Q	L_t	d_2	L_1	L_2	d_3	L_3	L_0	T	e_p	υ_u	I	J	K	(kg)	N (min^{-1})	(cm^3)	(cm^3)
11	6.5	M6×1	400	25.2	60	200	20.5	50	650	-0.010	0.025	0.020	0.060	0.019	0.013	3.8	2 800	9.7	4.9
11	6.5	M6×1	700	25.2	60	250	20.5	100	1 050	-0.017	0.035	0.025	0.090	0.019	0.013	5.1	2 800	9.7	4.9
11	6.5	M6×1	1 000	25.2	60	250	20.5	100	1 350	-0.024	0.040	0.027	0.120	0.019	0.013	6.1	2 800	9.7	4.9
11	6.5	M6×1	1 500	25.2	60	300	20.5	100	1 900	-0.036	0.054	0.035	0.150	0.019	0.013	8.0	2 050	9.7	4.9
11	6.5	M6×1	400	28.2	40	200	25.2	—	600	-0.010	0.025	0.020	0.050	0.019	0.013	3.7	2 500	6.1	3.1
11	6.5	M6×1	600	28.2	40	250	25.2	100	950	-0.014	0.030	0.023	0.075	0.019	0.013	5.2	2 500	6.1	3.1
11	6.5	M6×1	800	28.2	40	250	25.2	100	1 150	-0.019	0.035	0.025	0.090	0.019	0.013	6.1	2 500	6.1	3.1
11	6.5	M6×1	1 200	28.2	40	300	25.2	100	1 600	-0.029	0.046	0.030	0.120	0.019	0.013	8.1	2 500	6.1	3.1
11	6.5	M6×1	400	28.2	40	200	25.2	—	600	-0.010	0.025	0.020	0.050	0.019	0.013	3.8	2 500	6.1	3.1
11	6.5	M6×1	600	28.2	40	250	25.2	100	950	-0.014	0.030	0.023	0.075	0.019	0.013	5.3	2 500	6.1	3.1
11	6.5	M6×1	800	28.2	40	250	25.2	100	1 150	-0.019	0.035	0.025	0.090	0.019	0.013	6.2	2 500	6.1	3.1
11	6.5	M6×1	1 200	28.2	40	300	25.2	100	1 600	-0.029	0.046	0.030	0.120	0.019	0.013	8.2	2 500	6.1	3.1

26. Blank shaft end SS type (Fine lead: Tube type)



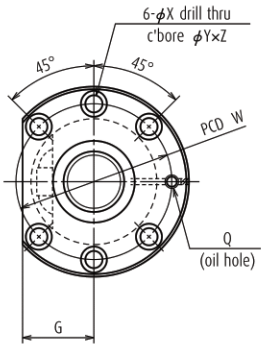
Nut type code: ZFT

Ball screw No.	Stroke Max. L_t-L_n	Screw shaft dia. d_1	Lead l	Ball dia. D_w	Ball circle dia. d_m	Root dia. d_r	Effective ball turns Turns × Circuits	Basic load rating (N) Dynamic C_a	Basic load rating (N) Static C_{0a}	Preload (N)	Dynamic friction torque, median (N·cm)	Nut Outside dia. D	Nut Flange A	Nut Flange G	Nut Flange B	Nut Overall length L_n	Nut Bolt hole W	Nut Bolt hole X
W2804SS-2Z-C5Z5	314	28	5	3.175	28.5	25.2	2.5×2	20 600	48 700	1 225	21.5	55	85	31	12	86	69	6.6
W2806SS-2Z-C5Z5	514	28	5	3.175	28.5	25.2	2.5×2	20 600	48 700	1 225	21.5	55	85	31	12	86	69	6.6
W2808SS-2Z-C5Z5	714	28	5	3.175	28.5	25.2	2.5×2	20 600	48 700	1 225	21.5	55	85	31	12	86	69	6.6
W2812SS-2Z-C5Z5	1 114	28	5	3.175	28.5	25.2	2.5×2	20 600	48 700	1 225	21.5	55	85	31	12	86	69	6.6
W2804SS-4Z-C5Z6	301	28	6	3.175	28.5	25.2	2.5×2	20 600	48 700	1 225	22.5	55	85	31	12	99	69	6.6
W2806SS-4Z-C5Z6	501	28	6	3.175	28.5	25.2	2.5×2	20 600	48 700	1 225	22.5	55	85	31	12	99	69	6.6
W2808SS-4Z-C5Z6	701	28	6	3.175	28.5	25.2	2.5×2	20 600	48 700	1 225	22.5	55	85	31	12	99	69	6.6
W2812SS-4Z-C5Z6	1 101	28	6	3.175	28.5	25.2	2.5×2	20 600	48 700	1 225	22.5	55	85	31	12	99	69	6.6

Notes

1. Use of NSK support unit is recommend. See page 324 for details.
2. **Only rust preventive agent is applied at time of delivery. Please apply lubricant (oil or grease) before use.** See page 442 for details.
3. The permissible rotational speed is determined by d·n value, critical speed and maximum rotational speed. The permissible rotational speed shown in the table is the value when the ball screw mounting method is fixed-fixed.

Screw shaft ϕ 28
Lead 5, 6

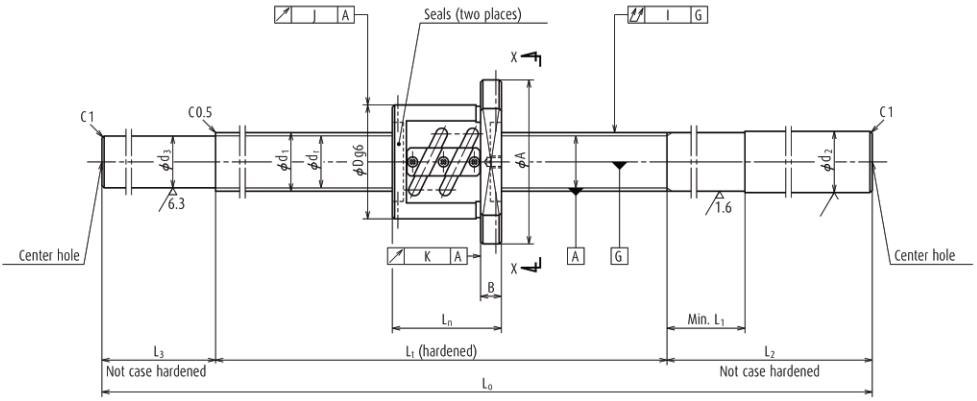


View X-X

Unit: mm

dimensions			Screw shaft dimensions							Lead accuracy			Run-out			Mass	Per-missible rotational speed	Internal spatial volume of nut	Standard volume of grease replenishing
Bolt hole		Oil hole	Threaded length	Shaft end right			Shaft end left		Overall length	Travel compen-sation	Deviation	Variation	Shaft straight-ness	Radial run-out					
Y	Z	Q	L_t	d_2	L_1	L_2	d_3	L_3	L_0	T	e_p	υ_u	I	J	K	(kg)	N (min^{-1})	(cm^3)	(cm^3)
11	6.5	M6×1	400	28.2	40	200	25.2	—	600	-0.010	0.025	0.020	0.050	0.019	0.013	4.7	2 500	9.2	4.6
11	6.5	M6×1	600	28.2	40	250	25.2	100	950	-0.014	0.030	0.023	0.075	0.019	0.013	5.5	2 500	9.2	4.6
11	6.5	M6×1	800	28.2	40	250	25.2	100	1 150	-0.019	0.035	0.025	0.090	0.019	0.013	6.4	2 500	9.2	4.6
11	6.5	M6×1	1 200	28.2	40	300	25.2	100	1 600	-0.029	0.046	0.030	0.120	0.019	0.013	8.4	2 500	9.2	4.6
11	6.5	M6×1	400	28.2	40	200	25.2	—	600	-0.010	0.025	0.020	0.050	0.019	0.013	4.2	2 500	9.5	4.8
11	6.5	M6×1	600	28.2	40	250	25.2	100	950	-0.014	0.030	0.023	0.075	0.019	0.013	5.7	2 500	9.5	4.8
11	6.5	M6×1	800	28.2	40	250	25.2	100	1 150	-0.019	0.035	0.025	0.090	0.019	0.013	6.6	2 500	9.5	4.8
11	6.5	M6×1	1 200	28.2	40	300	25.2	100	1 600	-0.029	0.046	0.030	0.120	0.019	0.013	8.6	2 500	9.5	4.8

26. Blank shaft end SS type (Fine lead: Tube type)



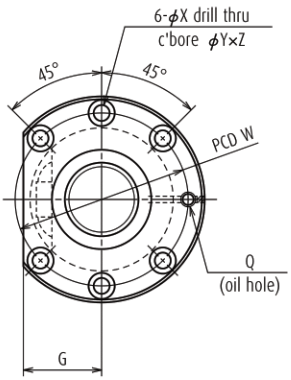
Nut type code: PFT

Ball screw No.	Stroke Max. L_t-L_n	Screw shaft dia. d_1	Lead l	Ball dia. D_w	Ball circle dia. d_m	Root dia. d_r	Effective ball turns Turns × Circuits	Basic load rating (N) Dynamic C_a	Basic load rating (N) Static C_{0a}	Preload (N)	Dynamic friction torque, median (N·cm)	Nut Outside dia. D	Nut Flange A	Nut Flange G	Nut Flange B	Nut Overall length L_n
W3204SS-1P-C5Z5	344	32	5	3.175	32.5	29.2	2.5×2	13 700	28 000	590	10.8	58	85	32	12	56
W3206SS-1P-C5Z5	544	32	5	3.175	32.5	29.2	2.5×2	13 700	28 000	590	10.8	58	85	32	12	56
W3208SS-1P-C5Z5	744	32	5	3.175	32.5	29.2	2.5×2	13 700	28 000	590	10.8	58	85	32	12	56
W3212SS-1P-C5Z5	1 144	32	5	3.175	32.5	29.2	2.5×2	13 700	28 000	590	10.8	58	85	32	12	56
W3215SS-1P-C5Z5	1 144	32	5	3.175	32.5	29.2	2.5×2	13 700	28 000	590	10.8	58	85	32	12	56
W3206SS-3P-C5Z6	537	32	6	3.969	32.5	28.4	2.5×2	18 300	34 700	780	15.6	62	89	34	12	63
W3210SS-1P-C5Z6	937	32	6	3.969	32.5	28.4	2.5×2	18 300	34 700	780	15.6	62	89	34	12	63
W3215SS-3P-C5Z6	1 437	32	6	3.969	32.5	28.4	2.5×2	18 300	34 700	780	15.6	62	89	34	12	63

Notes

1. Use of NSK support unit is recommend. See page 324 for details.
2. **Only rust preventive agent is applied at time of delivery. Please apply lubricant (oil or grease) before use.** See page 442 for details.
3. The permissible rotational speed is determined by d·n value, critical speed and maximum rotational speed. The permissible rotational speed shown in the table is the value when the ball screw mounting method is fixed-fixed.

Screw shaft ϕ 32
Lead 5, 6

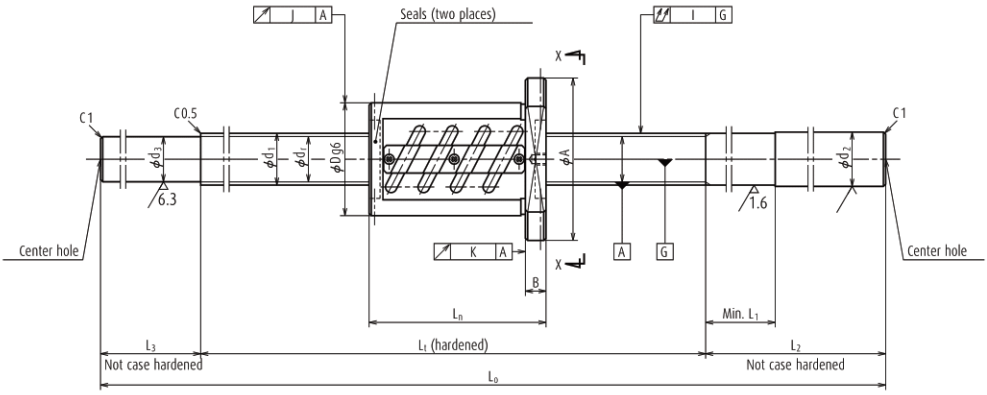


View X-X

Unit: mm

dimensions					Screw shaft dimensions							Lead accuracy			Run-out			Mass	Permissible rotational speed	Internal spatial volume of nut	Standard volume of grease replenishing
Bolt hole				Oil hole	Threaded length	Shaft end right			Shaft end left		Overall length	Travel compensation	Deviation	Variation	Shaft straightness	Radial run-out					
W	X	Y	Z	Q	L_t	d_2	L_1	L_2	d_3	L_3	L_0	T	e_p	U_u	I	J	K	(kg)	N (min^{-1})	(cm^3)	(cm^3)
71	6.6	11	6.5	M6×1	400	32.3	40	200	29.2	50	650	-0.010	0.025	0.020	0.060	0.019	0.013	4.8	2 180	6.9	3.5
71	6.6	11	6.5	M6×1	600	32.3	40	250	29.2	100	950	-0.014	0.030	0.023	0.075	0.019	0.013	6.5	2 180	6.9	3.5
71	6.6	11	6.5	M6×1	800	32.3	40	250	29.2	100	1 150	-0.019	0.035	0.025	0.090	0.019	0.013	7.7	2 180	6.9	3.5
71	6.6	11	6.5	M6×1	1 200	32.3	40	300	29.2	100	1 600	-0.029	0.046	0.030	0.120	0.019	0.013	10.3	2 180	6.9	3.5
71	6.6	11	6.5	M6×1	1 500	32.3	40	300	29.2	100	1 900	-0.036	0.054	0.035	0.150	0.019	0.013	12.1	2 180	6.9	3.5
75	6.6	11	6.5	M6×1	600	32.3	40	250	28.4	100	950	-0.014	0.030	0.023	0.075	0.019	0.013	6.7	2 180	9.4	4.7
75	6.6	11	6.5	M6×1	1 000	32.3	40	300	28.4	100	1 400	-0.024	0.040	0.027	0.120	0.019	0.013	9.2	2 180	9.4	4.7
75	6.6	11	6.5	M6×1	1 500	32.3	40	300	28.4	100	1 900	-0.036	0.054	0.035	0.150	0.019	0.013	12.1	2 180	9.4	4.7

26. Blank shaft end SS type (Fine lead: Tube type)



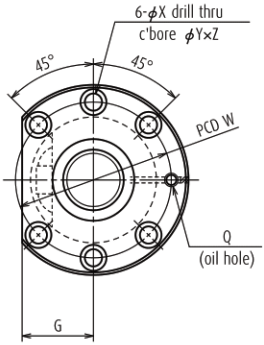
Nut type code: ZFT

Ball screw No.	Stroke Max. L_t-L_n	Screw shaft dia. d_1	Lead l	Ball dia. D_w	Ball circle dia. d_m	Root dia. d_r	Effective ball turns Turns × Circuits	Basic load rating (N) Dynamic C_a	Basic load rating (N) Static C_{0a}	Preload (N)	Dynamic friction torque, median (N·cm)	Nut Outside dia. D	Nut Flange A	Nut Flange G	Nut Flange B	Nut Overall length L_n
W3204SS-2Z-C5Z5	314	32	5	3.175	32.5	29.2	2.5×2	21 800	56 000	1 270	22.5	58	85	32	12	86
W3206SS-2Z-C5Z5	514	32	5	3.175	32.5	29.2	2.5×2	21 800	56 000	1 270	22.5	58	85	32	12	86
W3208SS-2Z-C5Z5	714	32	5	3.175	32.5	29.2	2.5×2	21 800	56 000	1 270	22.5	58	85	32	12	86
W3212SS-2Z-C5Z5	1 114	32	5	3.175	32.5	29.2	2.5×2	21 800	56 000	1 270	22.5	58	85	32	12	86
W3215SS-2Z-C5Z5	1 414	32	5	3.175	32.5	29.2	2.5×2	21 800	56 000	1 270	22.5	58	85	32	12	86
W3206SS-4Z-C5Z6	501	32	6	3.969	32.5	28.4	2.5×2	29 100	69 300	1 720	34.5	62	89	34	12	99
W3210SS-2Z-C5Z6	901	32	6	3.969	32.5	28.4	2.5×2	29 100	69 300	1 720	34.5	62	89	34	12	99
W3215SS-4Z-C5Z6	1 401	32	6	3.969	32.5	28.4	2.5×2	29 100	69 300	1 720	34.5	62	89	34	12	99
W3206SS-5Z-C5Z8	518	32	8	4.762	32.5	27.5	2.5×1	20 600	40 900	1 320	30.5	66	100	38	15	82
W3210SS-3Z-C5Z8	918	32	8	4.762	32.5	27.5	2.5×1	20 600	40 900	1 320	30.5	66	100	38	15	82
W3215SS-5Z-C5Z8	1 418	32	8	4.762	32.5	27.5	2.5×1	20 600	40 900	1 320	30.5	66	100	38	15	82

Notes

1. Use of NSK support unit is recommend. See page 324 for details.
2. **Only rust preventive agent is applied at time of delivery. Please apply lubricant (oil or grease) before use.** See page 442 for details.
3. The permissible rotational speed is determined by d·n value, critical speed and maximum rotational speed. The permissible rotational speed shown in the table is the value when the ball screw mounting method is fixed-fixed.

Screw shaft ϕ 32
Lead 5, 6, 8

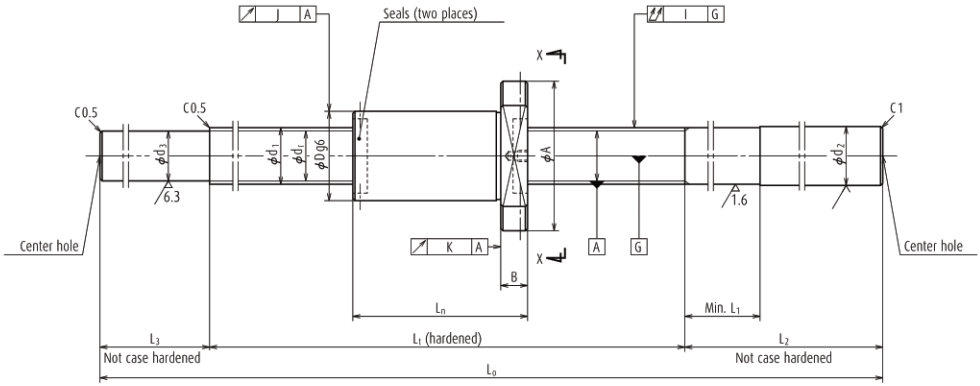


View X-X

Unit: mm

dimensions					Screw shaft dimensions							Lead accuracy			Run-out			Mass	Permissible rotational speed	Internal spatial volume of nut	Standard volume of grease replenishing
Bolt hole				Oil hole	Threaded length	Shaft end right			Shaft end left		Overall length	Travel compensation	Deviation	Variation	Shaft straightness	Radial run-out					
W	X	Y	Z	Q	L_t	d_2	L_1	L_2	d_3	L_3	L_0	T	e_p	υ_u	I	J	K	(kg)	N (min^{-1})	(cm^3)	(cm^3)
71	6.6	11	6.5	M6×1	400	32.3	40	200	29.2	50	650	-0.010	0.025	0.020	0.060	0.019	0.013	5.1	2 180	10	5.0
71	6.6	11	6.5	M6×1	600	32.3	40	250	29.2	100	950	-0.014	0.030	0.023	0.075	0.019	0.013	6.9	2 180	10	5.0
71	6.6	11	6.5	M6×1	800	32.3	40	250	29.2	100	1 150	-0.019	0.035	0.025	0.090	0.019	0.013	8.0	2 180	10	5.0
71	6.6	11	6.5	M6×1	1 200	32.3	40	300	29.2	100	1 600	-0.029	0.046	0.030	0.120	0.019	0.013	10.1	2 180	10	5.0
71	6.6	11	6.5	M6×1	1 500	32.3	40	300	29.2	100	1 900	-0.036	0.054	0.035	0.150	0.019	0.013	12.4	2 180	10	5.0
75	6.6	11	6.5	M6×1	600	32.3	40	250	28.4	—	950	-0.014	0.030	0.023	0.075	0.019	0.013	7.1	2 180	15	7.5
75	6.6	11	6.5	M6×1	1 000	32.3	40	300	28.4	100	1 400	-0.024	0.040	0.027	0.120	0.019	0.013	9.7	2 180	15	7.5
75	6.6	11	6.5	M6×1	1 500	32.3	40	300	28.4	—	1 900	-0.036	0.054	0.035	0.150	0.019	0.013	12.6	2 180	15	7.5
82	9	14	8.5	M6×1	600	32.3	50	250	27.5	—	950	-0.014	0.030	0.023	0.075	0.019	0.013	7.3	2 180	7.9	4.0
82	9	14	8.5	M6×1	1 000	32.3	50	300	27.5	100	1 400	-0.024	0.040	0.027	0.120	0.019	0.013	9.8	2 180	7.9	4.0
82	9	14	8.5	M6×1	1 500	32.3	50	300	27.5	—	1 900	-0.036	0.054	0.035	0.150	0.019	0.013	12.6	2 180	7.9	4.0

26. Blank shaft end SS type (Fine lead: Deflector (bridge) type)



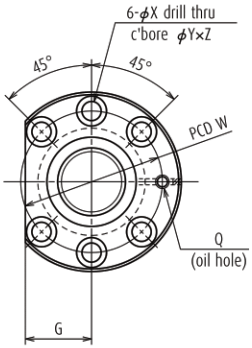
Nut type code: ZFD

Ball screw No.	Stroke Max. L_t-L_n	Screw shaft dia. d_1	Lead l	Ball dia. D_w	Ball circle dia. d_m	Root dia. d_r	Effective ball turns Turns × Circuits	Basic load rating (N) Dynamic C_a	Basic load rating (N) Static C_{0a}	Preload (N)	Dynamic friction torque, median (N·cm)	Nut Outside dia. D	Nut Flange A	Nut Flange G	Nut Flange B	Nut Overall length L_n
W3204SS-3ZY-C5Z5	323	32	5	3.175	32.75	29.4	4	16 800	40 600	1 080	19.6	48	75	29	12	77
W3206SS-6ZY-C5Z5	523	32	5	3.175	32.75	29.4	4	16 800	40 600	1 080	19.6	48	75	29	12	77
W3209SS-1ZY-C5Z5	823	32	5	3.175	32.75	29.4	4	16 800	40 600	1 080	19.6	48	75	29	12	77
W3212SS-3ZY-C5Z5	1 123	32	5	3.175	32.75	29.4	4	16 800	40 600	1 080	19.6	48	75	29	12	77
W3216SS-1ZY-C5Z5	1 523	32	5	3.175	32.75	29.4	4	16 800	40 600	1 080	19.6	48	75	29	12	77
W3205SS-3ZY-C5Z10	380	32	10	6.35	33.75	27.1	3	30 500	52 500	1 860	49.0	54	88	34	15	120
W3207SS-3ZY-C5Z10	580	32	10	6.35	33.75	27.1	3	30 500	52 500	1 860	49.0	54	88	34	15	120
W3210SS-6ZY-C5Z10	880	32	10	6.35	33.75	27.1	3	30 500	52 500	1 860	49.0	54	88	34	15	120
W3214SS-3ZY-C5Z10	1 280	32	10	6.35	33.75	27.1	3	30 500	52 500	1 860	49.0	54	88	34	15	120
W3218SS-3ZY-C5Z10	1 680	32	10	6.35	33.75	27.1	3	30 500	52 500	1 860	49.0	54	88	34	15	120

Notes

1. Use of NSK support unit is recommend. See page 324 for details.
2. **Only rust preventive agent is applied at time of delivery. Please apply lubricant (oil or grease) before use.** See page 442 for details.
3. The permissible rotational speed is determined by d·n value, critical speed and maximum rotational speed. The permissible rotational speed shown in the table is the value when the ball screw mounting method is fixed-fixed.

Screw shaft ϕ 32
Lead 5, 10

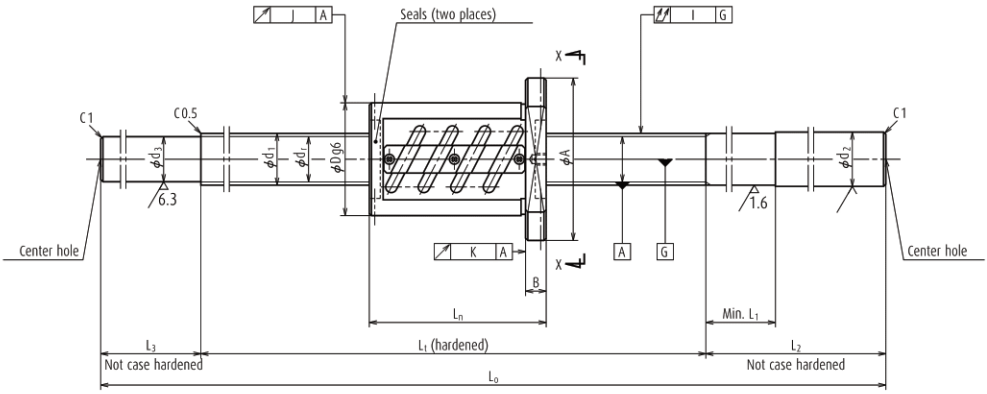


View X-X

Unit: mm

dimensions					Screw shaft dimensions							Lead accuracy			Run-out			Mass	Permissible rotational speed	Internal spatial volume of nut	Standard volume of grease replenishing
Bolt hole				Oil hole	Threaded length	Shaft end right			Shaft end left		Overall length	Travel compensation	Deviation	Variation	Shaft straightness	Radial run-out					
W	X	Y	Z	Q	L_t	d_2	L_1	L_2	d_3	L_3	L_0	T	e_p	v_u	I	J	K	(kg)	N (min^{-1})	(cm^3)	(cm^3)
61	6.6	11	6.5	M6×1	400	32.3	40	200	29.4	50	650	-0.009	0.025	0.020	0.060	0.015	0.011	4.6	2 180	22	11
61	6.6	11	6.5	M6×1	600	32.3	40	250	29.4	100	950	-0.013	0.030	0.023	0.075	0.015	0.011	6.4	2 180	22	11
61	6.6	11	6.5	M6×1	900	32.3	40	250	29.4	100	1 250	-0.021	0.040	0.027	0.090	0.015	0.011	8.1	2 180	22	11
61	6.6	11	6.5	M6×1	1 200	32.3	40	300	29.4	100	1 600	-0.028	0.046	0.030	0.120	0.015	0.011	10.2	2 180	22	11
61	6.6	11	6.5	M6×1	1 600	32.3	40	300	29.4	100	2 000	-0.037	0.054	0.035	0.150	0.015	0.011	12.6	2 180	22	11
70	9	14	8.5	M6×1	500	32.3	60	250	27.1	100	850	-0.010	0.027	0.020	0.075	0.019	0.013	6.2	2 180	23	12
70	9	14	8.5	M6×1	700	32.3	60	250	27.1	100	1 050	-0.015	0.035	0.025	0.090	0.019	0.013	7.3	2 180	23	12
70	9	14	8.5	M6×1	1 000	32.3	60	300	27.1	100	1 400	-0.022	0.040	0.027	0.120	0.019	0.013	9.3	2 180	23	12
70	9	14	8.5	M6×1	1 400	32.3	60	350	27.1	120	1 870	-0.032	0.054	0.035	0.150	0.019	0.013	11.9	2 180	23	12
70	9	14	8.5	M6×1	1 800	32.3	60	350	27.1	120	2 270	-0.041	0.065	0.040	0.200	0.019	0.013	14.1	2 180	23	12

26. Blank shaft end SS type (Fine lead: Tube type)



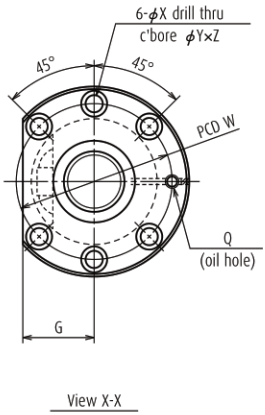
Nut type code: ZFT

Ball screw No.	Stroke Max. L_t-L_n	Screw shaft dia. d_1	Lead l	Ball dia. D_w	Ball circle dia. d_m	Root dia. d_r	Effective ball turns Turns × Circuits	Basic load rating (N) Dynamic C_a	Basic load rating (N) Static C_{0a}	Preload (N)	Dynamic friction torque, median (N·cm)	Nut Outside dia. D	Nut Flange A	Nut Flange G	Nut Flange B	Nut Overall length L_n
W3205SS-1Z-C5Z10	400	32	10	6.350	33	26.4	2.5×1	30 000	55 100	1 960	50	74	108	41	15	100
W3207SS-1Z-C5Z10	600	32	10	6.350	33	26.4	2.5×1	30 000	55 100	1 960	50	74	108	41	15	100
W3210SS-4Z-C5Z10	900	32	10	6.350	33	26.4	2.5×1	30 000	55 100	1 960	50	74	108	41	15	100
W3214SS-1Z-C5Z10	1 300	32	10	6.350	33	26.4	2.5×1	30 000	55 100	1 960	50	74	108	41	15	100
W3218SS-1Z-C5Z10	1 700	32	10	6.350	33	26.4	2.5×1	30 000	55 100	1 960	50	74	108	41	15	100
W3607SS-1Z-C5Z10	597	36	10	6.350	37	30.4	2.5×1	32 000	61 100	2 060	56	75	120	45	18	103
W3612SS-1Z-C5Z10	1 097	36	10	6.350	37	30.4	2.5×1	32 000	61 100	2 060	56	75	120	45	18	103
W3620SS-1Z-C5Z10	1 897	36	10	6.350	37	30.4	2.5×1	32 000	61 100	2 060	56	75	120	45	18	103
W4006SS-1Z-C5Z5	511	40	5	3.175	40.5	37.2	2.5×2	23 900	70 500	1 420	28.5	67	101	39	15	89
W4010SS-1Z-C5Z5	911	40	5	3.175	40.5	37.2	2.5×2	23 900	70 500	1 420	28.5	67	101	39	15	89
W4016SS-1Z-C5Z5	1 511	40	5	3.175	40.5	37.2	2.5×2	23 900	70 500	1 420	28.5	67	101	39	15	89

Notes

1. Use of NSK support unit is recommend. See page 324 for details.
2. **Only rust preventive agent is applied at time of delivery. Please apply lubricant (oil or grease) before use.** See page 442 for details.
3. The permissible rotational speed is determined by d·n value, critical speed and maximum rotational speed. The permissible rotational speed shown in the table is the value when the ball screw mounting method is fixed-fixed.

Nut model: ZFT



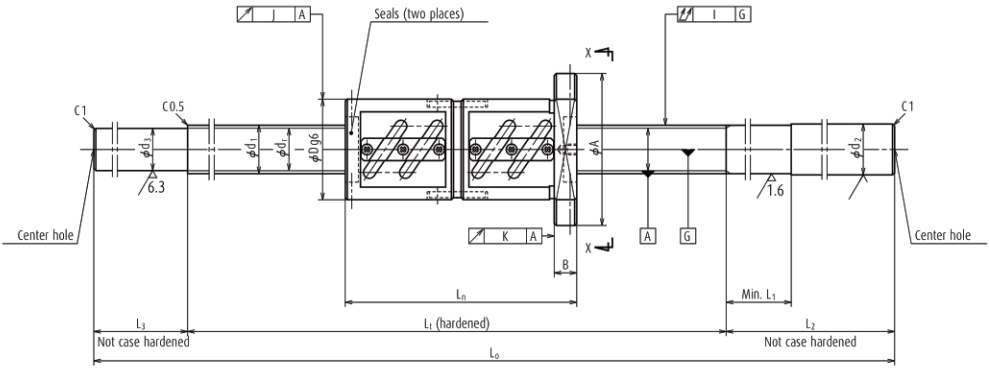
View X-X

Screw shaft ϕ 32, ϕ 36
Lead 10
Screw shaft ϕ 40
Lead 5

Unit: mm

dimensions					Screw shaft dimensions							Lead accuracy			Run-out			Mass	Permissible rotational speed	Internal spatial volume of nut	Standard volume of grease replenishing
Bolt hole				Oil hole	Threaded length	Shaft end right			Shaft end left		Overall length	Travel compensation	Deviation	Variation	Shaft straightness	Radial run-out					
W	X	Y	Z	Q	L_t	d_2	L_1	L_2	d_3	L_3	L_0	T	e_p	U_u	I	J	K	(kg)	N (min^{-1})	(cm^3)	(cm^3)
90	9	14	8.5	M6×1	500	32.3	60	250	26.4	100	850	-0.012	0.027	0.020	0.075	0.019	0.013	7.5	2 180	22	11
90	9	14	8.5	M6×1	700	32.3	60	250	26.4	100	1 050	-0.017	0.035	0.025	0.090	0.019	0.013	8.5	2 180	22	11
90	9	14	8.5	M6×1	1 000	32.3	60	300	26.4	100	1 400	-0.024	0.040	0.027	0.120	0.019	0.013	10.5	2 180	22	11
90	9	14	8.5	M6×1	1 400	32.3	60	350	26.4	120	1 870	-0.034	0.054	0.035	0.150	0.019	0.013	13.1	2 180	22	11
90	9	14	8.5	M6×1	1 800	32.3	60	350	26.4	120	2 270	-0.043	0.065	0.040	0.200	0.019	0.013	15.2	1 820	22	11
98	11	17.5	11	M6×1	700	36.3	60	300	30.4	100	1 100	-0.017	0.035	0.025	0.065	0.019	0.013	10.9	1 940	27	14
98	11	17.5	11	M6×1	1 200	36.3	60	350	30.4	120	1 670	-0.029	0.046	0.030	0.100	0.019	0.013	14.9	1 940	27	14
98	11	17.5	11	M6×1	2 000	36.3	60	350	30.4	120	2 470	-0.048	0.065	0.040	0.130	0.019	0.013	20.4	1 940	27	14
83	9	14	8.5	Rc1/8	600	40.3	50	300	37.2	100	1 000	-0.014	0.030	0.023	0.050	0.019	0.013	11.1	1 750	14	7.0
83	9	14	8.5	Rc1/8	1 000	40.3	50	300	37.2	100	1 400	-0.024	0.040	0.027	0.080	0.019	0.013	14.8	1 750	14	7.0
83	9	14	8.5	Rc1/8	1 600	40.3	50	350	37.2	100	2 050	-0.038	0.054	0.035	0.130	0.019	0.013	20.8	1 750	14	7.0

26. Blank shaft end SS type (Fine lead: Tube type)



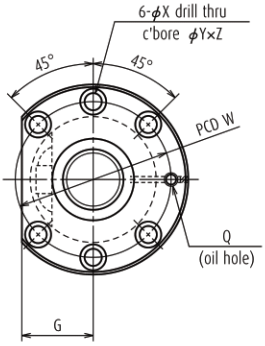
Nut type code: DFT

Ball screw No.	Stroke Max. L_t-L_n	Screw shaft dia. d_1	Lead l	Ball dia. D_w	Ball circle dia. d_m	Root dia. d_r	Effective ball turns Turns × Circuits	Basic load rating (N) Dynamic C_a	Basic load rating (N) Static C_{0a}	Preload (N)	Dynamic friction torque, median (N·cm)	Nut Outside dia. D	Nut Flange A	Nut Flange G	Nut Flange B	Nut Overall length L_n
W3205SS-2D-C5Z10	310	32	10	6.350	33	26.4	2.5×2	54 500	110 000	3 240	83	74	108	41	15	190
W3207SS-2D-C5Z10	510	32	10	6.350	33	26.4	2.5×2	54 500	110 000	3 240	83	74	108	41	15	190
W3210SS-5D-C5Z10	810	32	10	6.350	33	26.4	2.5×2	54 500	110 000	3 240	83	74	108	41	15	190
W3214SS-2D-C5Z10	1 210	32	10	6.350	33	26.4	2.5×2	54 500	110 000	3 240	83	74	108	41	15	190
W3218SS-2D-C5Z10	1 610	32	10	6.350	33	26.4	2.5×2	54 500	110 000	3 240	83	74	108	41	15	190
W3607SS-2D-C5Z10	507	36	10	6.350	37	30.4	2.5×2	58 000	122 000	3 430	93	75	120	45	18	193
W3612SS-2D-C5Z10	1 007	36	10	6.350	37	30.4	2.5×2	58 000	122 000	3 430	93	75	120	45	18	193
W3620SS-2D-C5Z10	1 807	36	10	6.350	37	30.4	2.5×2	58 000	122 000	3 430	93	75	120	45	18	193

Notes

1. Use of NSK support unit is recommend. See page 324 for details.
2. **Only rust preventive agent is applied at time of delivery. Please apply lubricant (oil or grease) before use.** See page 442 for details.
3. The permissible rotational speed is determined by d·n value, critical speed and maximum rotational speed. The permissible rotational speed shown in the table is the value when the ball screw mounting method is fixed-fixed.

Screw shaft ϕ32, ϕ36
Lead 10

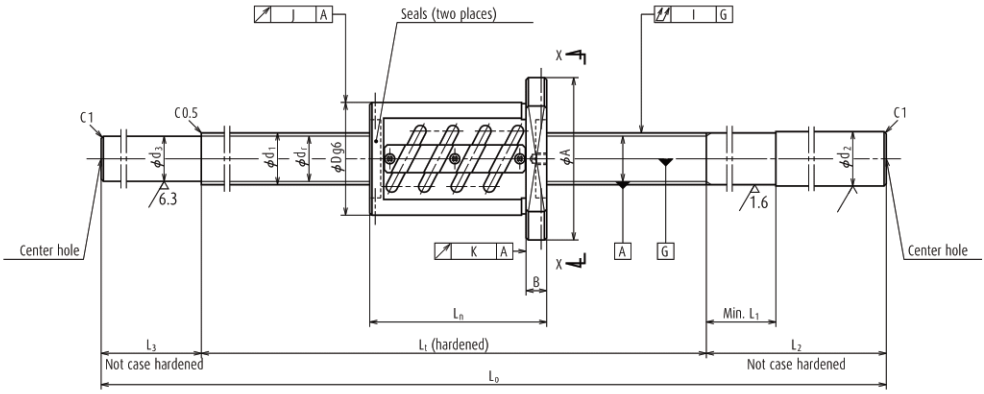


View X-X

Unit: mm

dimensions					Screw shaft dimensions							Lead accuracy			Run-out			Mass	Permissible rotational speed	Internal spatial volume of nut	Standard volume of grease replenishing
Bolt hole				Oil hole	Threaded length	Shaft end right			Shaft end left		Overall length	Travel compensation	Deviation	Variation	Shaft straightness	Radial run-out					
W	X	Y	Z	Q	L_t	d_2	L_1	L_2	d_3	L_3	L_0	T	e_p	U_u	I	J	K	(kg)	N (min^{-1})	(cm^3)	(cm^3)
90	9	14	8.5	M6×1	500	32.3	60	250	26.4	100	850	-0.012	0.027	0.020	0.075	0.019	0.013	9.5	2 180	57	29
90	9	14	8.5	M6×1	700	32.3	60	250	26.4	100	1 050	-0.017	0.035	0.025	0.090	0.019	0.013	10.6	2 180	57	29
90	9	14	8.5	M6×1	1 000	32.3	60	300	26.4	100	1 400	-0.024	0.040	0.027	0.120	0.019	0.013	12.5	2 180	57	29
90	9	14	8.5	M6×1	1 400	32.3	60	350	26.4	120	1 870	-0.034	0.054	0.035	0.150	0.019	0.013	15.1	2 180	57	29
90	9	14	8.5	M6×1	1 800	32.3	60	350	26.4	120	2 270	-0.043	0.065	0.040	0.200	0.019	0.013	17.2	1 910	57	29
98	11	17.5	11	M6×1	700	36.3	60	300	30.4	100	1 100	-0.017	0.035	0.025	0.065	0.019	0.013	12.8	1 940	67	34
98	11	17.5	11	M6×1	1 200	36.3	60	350	30.4	120	1 670	-0.029	0.046	0.030	0.100	0.019	0.013	16.8	1 940	67	34
98	11	17.5	11	M6×1	2 000	36.3	60	350	30.4	120	2 470	-0.048	0.065	0.040	0.130	0.019	0.013	22.3	1 940	67	34

26. Blank shaft end SS type (Fine lead: Tube type)



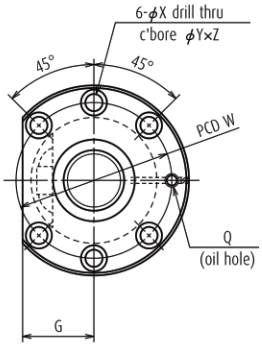
Nut type code: ZFT

Ball screw No.	Stroke Max. L_t-L_n	Screw shaft dia. d_1	Lead l	Ball dia. D_w	Ball circle dia. d_m	Root dia. d_r	Effective ball turns Turns × Circuits	Basic load rating (N) Dynamic C_a	Basic load rating (N) Static C_{0a}	Preload (N)	Dynamic friction torque, median (N·cm)	Nut Outside dia. D	Nut Flange A	Nut Flange G	Nut Flange B	Nut Overall length L_n
W4007SS-1Z-C5Z8	570	40	8	4.762	40.5	35.5	2.5×2	41 100	103 000	2 450	64	74	108	41	15	130
W4012SS-1Z-C5Z8	1 070	40	8	4.762	40.5	35.5	2.5×2	41 100	103 000	2 450	64	74	108	41	15	130
W4018SS-1Z-C5Z8	1 670	40	8	4.762	40.5	35.5	2.5×2	41 100	103 000	2 450	64	74	108	41	15	130
W4007SS-2Z-C5Z10	597	40	10	6.350	41	34.4	2.5×1	33 700	68 300	2 160	64	82	124	47	18	103
W4010SS-2Z-C5Z10	897	40	10	6.350	41	34.4	2.5×1	33 700	68 300	2 160	64	82	124	47	18	103
W4014SS-1Z-C5Z10	1 297	40	10	6.350	41	34.4	2.5×1	33 700	68 300	2 160	64	82	124	47	18	103
W4018SS-2Z-C5Z10	1 697	40	10	6.350	41	34.4	2.5×1	33 700	68 300	2 160	64	82	124	47	18	103
W4024SS-1Z-C5Z10	2 297	40	10	6.350	41	34.4	2.5×1	33 700	68 300	2 160	64	82	124	47	18	103
W4010SS-4Z-C5Z12	883	40	12	7.144	41.5	34.1	2.5×1	39 500	77 200	2 550	83	86	128	48	18	117
W4016SS-2Z-C5Z12	1 483	40	12	7.144	41.5	34.1	2.5×1	39 500	77 200	2 550	83	86	128	48	18	117
W4025SS-1Z-C5Z12	2 383	40	12	7.144	41.5	34.1	2.5×1	39 500	77 200	2 550	83	86	128	48	18	117

Notes

1. Use of NSK support unit is recommend. See page 324 for details.
2. **Only rust preventive agent is applied at time of delivery. Please apply lubricant (oil or grease) before use.** See page 442 for details.
3. The permissible rotational speed is determined by d·n value, critical speed and maximum rotational speed. The permissible rotational speed shown in the table is the value when the ball screw mounting method is fixed-fixed.

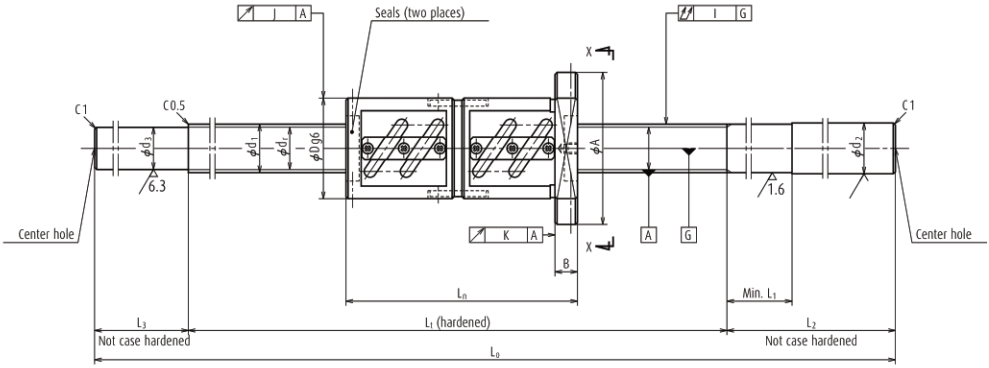
Screw shaft ϕ 40
Lead 8, 10, 12



View X-X

Unit: mm

dimensions					Screw shaft dimensions							Lead accuracy			Run-out			Mass	Permissible rotational speed	Internal spatial volume of nut	Standard volume of grease replenishing
Bolt hole				Oil hole	Threaded length	Shaft end right			Shaft end left		Overall length	Travel compensation	Deviation	Variation	Shaft straightness	Radial run-out					
W	X	Y	Z	Q	L_t	d_2	L_1	L_2	d_3	L_3	L_0	T	e_p	U_u	I	J	K	(kg)	N (min^{-1})	(cm^3)	(cm^3)
90	9	14	8.5	Rc1/8	700	40.3	50	300	35.5	100	1 100	-0.017	0.035	0.025	0.065	0.019	0.013	13.0	1 750	27	14
90	9	14	8.5	Rc1/8	1 200	40.3	50	350	35.5	100	1 650	-0.029	0.046	0.030	0.100	0.019	0.013	18.0	1 750	27	14
90	9	14	8.5	Rc1/8	1 800	40.3	50	350	35.5	120	2 270	-0.043	0.065	0.040	0.130	0.019	0.013	23.5	1 750	27	14
102	11	17.5	11	Rc1/8	700	40.3	60	300	34.4	100	1 100	-0.017	0.035	0.025	0.065	0.025	0.015	13.3	1 750	30	15
102	11	17.5	11	Rc1/8	1 000	40.3	60	300	34.4	100	1 400	-0.024	0.040	0.027	0.080	0.025	0.015	15.9	1 750	30	15
102	11	17.5	11	Rc1/8	1 400	40.3	60	350	34.4	120	1 870	-0.034	0.054	0.035	0.100	0.025	0.015	20.0	1 750	30	15
102	11	17.5	11	Rc1/8	1 800	40.3	60	350	34.4	120	2 270	-0.043	0.065	0.040	0.130	0.025	0.015	23.4	1 750	30	15
102	11	17.5	11	Rc1/8	2 400	40.3	60	400	34.4	150	2 950	-0.058	0.077	0.046	0.170	0.025	0.015	29.4	1 750	30	15
106	11	17.5	11	Rc1/8	1 000	40.3	70	300	34.1	100	1 400	-0.024	0.040	0.027	0.080	0.025	0.015	16.7	1 750	35	18
106	11	17.5	11	Rc1/8	1 600	40.3	70	350	34.1	150	2 100	-0.038	0.054	0.035	0.130	0.025	0.015	22.9	1 750	35	18
106	11	17.5	11	Rc1/8	2 500	40.3	70	400	34.1	150	3 050	-0.060	0.077	0.046	0.170	0.025	0.015	31.1	1 220	35	18



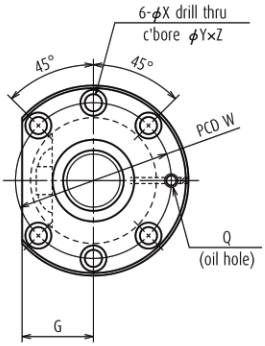
Nut type code: DFT

Ball screw No.	Stroke Max. L_t-L_n	Screw shaft dia. d_1	Lead l	Ball dia. D_w	Ball circle dia. d_m	Root dia. d_r	Effective ball turns Turns × Circuits	Basic load rating (N) Dynamic C_a	Basic load rating (N) Static C_{0a}	Preload (N)	Dynamic friction torque, median (N·cm)	Nut Outside dia. D	Nut Flange A	Nut Flange G	Nut Flange B	Nut Overall length L_n
W4007SS-3D-C5Z10	507	40	10	6.350	41	34.4	2.5×2	61 200	137 000	3 630	108	82	124	47	18	193
W4010SS-3D-C5Z10	807	40	10	6.350	41	34.4	2.5×2	61 200	137 000	3 630	108	82	124	47	18	193
W4014SS-2D-C5Z10	1 207	40	10	6.350	41	34.4	2.5×2	61 200	137 000	3 630	108	82	124	47	18	193
W4018SS-3D-C5Z10	1 607	40	10	6.350	41	34.4	2.5×2	61 200	137 000	3 630	108	82	124	47	18	193
W4024SS-2D-C5Z10	2 207	40	10	6.350	41	34.4	2.5×2	61 200	137 000	3 630	108	82	124	47	18	193
W4010SS-5D-C5Z12	775	40	12	7.144	41.5	34.1	2.5×2	71 700	154 000	4 310	138	86	128	48	18	225
W4016SS-3D-C5Z12	1 375	40	12	7.144	41.5	34.1	2.5×2	71 700	154 000	4 310	138	86	128	48	18	225
W4025SS-2D-C5Z12	2 275	40	12	7.144	41.5	34.1	2.5×2	71 700	154 000	4 310	138	86	128	48	18	225

Notes

1. Use of NSK support unit is recommend. See page 324 for details.
2. **Only rust preventive agent is applied at time of delivery. Please apply lubricant (oil or grease) before use.** See page 442 for details.
3. The permissible rotational speed is determined by d·n value, critical speed and maximum rotational speed. The permissible rotational speed shown in the table is the value when the ball screw mounting method is fixed-fixed.

Screw shaft ϕ 40
Lead 10, 12

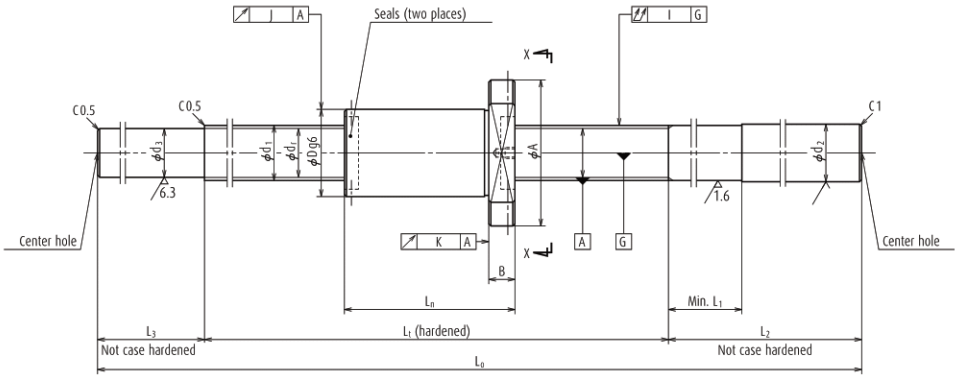


View X-X

Unit: mm

dimensions					Screw shaft dimensions							Lead accuracy			Run-out			Mass	Permissible rotational speed	Internal spatial volume of nut	Standard volume of grease replenishing
Bolt hole				Oil hole	Threaded length	Shaft end right			Shaft end left		Overall length	Travel compensation	Deviation	Variation	Shaft straightness	Radial run-out					
W	X	Y	Z	Q	L_t	d_2	L_1	L_2	d_3	L_3	L_0	T	e_p	υ_u	I	J	K	(kg)	N (min^{-1})	(cm^3)	(cm^3)
102	11	17.5	11	Rc1/8	700	40.3	60	300	34.4	100	1 100	-0.017	0.035	0.025	0.065	0.025	0.015	15.5	1 750	74	37
102	11	17.5	11	Rc1/8	1 000	40.3	60	300	34.4	100	1 400	-0.024	0.040	0.027	0.080	0.025	0.015	18.1	1 750	74	37
102	11	17.5	11	Rc1/8	1 400	40.3	60	350	34.4	120	1 870	-0.034	0.054	0.035	0.100	0.025	0.015	22.5	1 750	74	37
106	11	17.5	11	Rc1/8	1 800	40.3	60	350	34.4	120	2 270	-0.043	0.065	0.040	0.130	0.025	0.015	25.6	1 750	74	37
106	11	17.5	11	Rc1/8	2 400	40.3	60	400	34.4	150	2 950	-0.058	0.077	0.046	0.170	0.025	0.015	31.6	1 370	74	37
106	11	17.5	11	Rc1/8	1 000	40.3	70	300	34.1	100	1 400	-0.024	0.040	0.027	0.080	0.025	0.015	19.7	1 750	93	47
106	11	17.5	11	Rc1/8	1 600	40.3	70	350	34.1	150	2 100	-0.038	0.054	0.035	0.130	0.025	0.015	25.8	1 750	93	47
106	11	17.5	11	Rc1/8	2 500	40.3	70	400	34.1	150	3 050	-0.060	0.077	0.046	0.170	0.025	0.015	34.0	1 260	93	47

26. Blank shaft end SS type (Fine lead: Deflector (bridge) type)



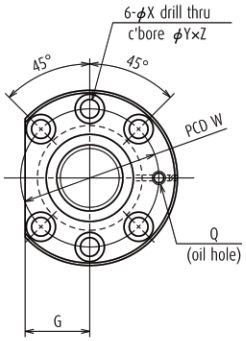
Nut type code: ZFD

Ball screw No.	Stroke Max. L_t-L_n	Screw shaft dia. d_1	Lead l	Ball dia. D_w	Ball circle dia. d_m	Root dia. d_r	Effective ball turns	Basic load rating (N) Dynamic C_a	Basic load rating (N) Static C_{0a}	Preload (N)	Dynamic friction torque, median (N·cm)	Nut Outside dia. D	Nut Flange A	Nut Flange G	Nut Flange B	Nut Overall length L_n
W4007SS-4ZY-C5Z10	557	40	10	6.350	41.75	35.1	4	45 200	93 100	2 840	83	62	104	40	18	143
W4010SS-6ZY-C5Z10	857	40	10	6.350	41.75	35.1	4	45 200	93 100	2 840	83	62	104	40	18	143
W4014SS-3ZY-C5Z10	1 257	40	10	6.350	41.75	35.1	4	45 200	93 100	2 840	83	62	104	40	18	143
W4018SS-4ZY-C5Z10	1 657	40	10	6.350	41.75	35.1	4	45 200	93 100	2 840	83	62	104	40	18	143
W4024SS-3ZY-C5Z10	2 257	40	10	6.350	41.75	35.1	4	45 200	93 100	2 840	83	62	104	40	18	143
W5007SS-1ZY-C5Z10	557	50	10	6.350	51.75	45.1	4	51 500	122 000	3 240	108	72	114	44	18	143
W5010SS-3ZY-C5Z10	857	50	10	6.350	51.75	45.1	4	51 500	122 000	3 240	108	72	114	44	18	143
W5015SS-3ZY-C5Z10	1 357	50	10	6.350	51.75	45.1	4	51 500	122 000	3 240	108	72	114	44	18	143
W5020SS-3ZY-C5Z10	1 857	50	10	6.350	51.75	45.1	4	51 500	122 000	3 240	108	72	114	44	18	143
W5026SS-3ZY-C5Z10	2 457	50	10	6.350	51.75	45.1	4	51 500	122 000	3 240	108	72	114	44	18	143

Notes

1. Use of NSK support unit is recommend. See page 324 for details.
2. **Only rust preventive agent is applied at time of delivery. Please apply lubricant (oil or grease) before use.** See page 442 for details.
3. The permissible rotational speed is determined by d·n value, critical speed and maximum rotational speed. The permissible rotational speed shown in the table is the value when the ball screw mounting method is fixed-fixed.

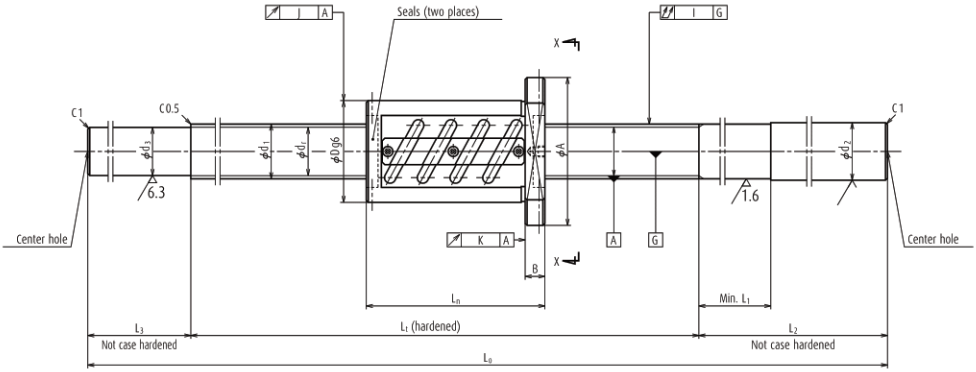
Screw shaft ϕ 40, ϕ 50
Lead 10



View X-X

Unit: mm

dimensions					Screw shaft dimensions							Lead accuracy			Run-out			Mass	Permissible rotational speed	Internal spatial volume of nut	Standard volume of grease replenishing
Bolt hole				Oil hole	Threaded length	Shaft end right			Shaft end left		Overall length	Travel compensation	Deviation	Variation	Shaft straightness	Radial run-out					
W	X	Y	Z	Q	L_t	d_2	L_1	L_2	d_3	L_3	L_0	T	e_p	U_u	I	J	K	(kg)	N (min^{-1})	(cm^3)	(cm^3)
82	11	17.5	11	Rc1/8	700	40.3	60	300	35.1	100	1 100	-0.015	0.035	0.025	0.065	0.019	0.013	12.1	1 750	32	16
82	11	17.5	11	Rc1/8	1 000	40.3	60	300	35.1	100	1 400	-0.022	0.040	0.027	0.080	0.019	0.013	14.7	1 750	32	16
82	11	17.5	11	Rc1/8	1 400	40.3	60	350	35.1	120	1 870	-0.032	0.054	0.035	0.100	0.019	0.013	18.9	1 750	32	16
82	11	17.5	11	Rc1/8	1 800	40.3	60	350	35.1	120	2 270	-0.041	0.065	0.040	0.130	0.019	0.013	22.5	1 750	32	16
82	11	17.5	11	Rc1/8	2 400	40.3	60	400	35.1	150	2 950	-0.056	0.077	0.046	0.170	0.019	0.013	28.5	1 320	32	16
92	11	17.5	11	Rc1/8	700	50.3	60	300	45.1	100	1 100	-0.015	0.035	0.025	0.065	0.019	0.013	18.3	1 400	39	20
92	11	17.5	11	Rc1/8	1 000	50.3	60	300	45.1	100	1 400	-0.022	0.040	0.027	0.080	0.019	0.013	22.5	1 400	39	20
92	11	17.5	11	Rc1/8	1 500	50.3	60	400	45.1	150	2 050	-0.034	0.054	0.035	0.130	0.019	0.013	31.8	1 400	39	20
92	11	17.5	11	Rc1/8	2 000	50.3	60	400	45.1	150	2 550	-0.046	0.065	0.040	0.170	0.019	0.013	38.9	1 400	39	20
92	11	17.5	11	Rc1/8	2 600	50.3	60	500	45.1	200	3 300	-0.060	0.093	0.054	0.220	0.019	0.013	49.5	1 400	39	20



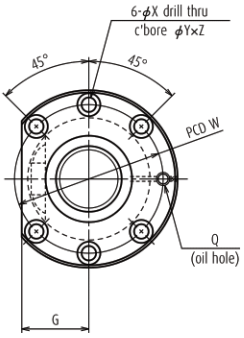
Nut type code: ZFT

Ball screw No.	Stroke Max. L_t-L_n	Screw shaft dia. d_1	Lead l	Ball dia. D_w	Ball circle dia. d_m	Root dia. d_r	Effective ball turns Turns × Circuits	Basic load rating (N) Dynamic C_a	Basic load rating (N) Static C_{0a}	Preload (N)	Dynamic friction torque, median (N·cm)	Nut Outside dia. D	Nut Flange A	Nut Flange G	Nut Flange B	Nut Overall length L_n
W4510SS-1Z-C5Z10	897	45	10	6.350	46	39.4	2.5×1	36 300	78 500	2 260	69	88	132	50	18	103
W4516SS-1Z-C5Z10	1 497	45	10	6.350	46	39.4	2.5×1	36 300	78 500	2 260	69	88	132	50	18	103
W4525SS-1Z-C5Z10	2 397	45	10	6.350	46	39.4	2.5×1	36 300	78 500	2 260	69	88	132	50	18	103
W5010SS-1Z-C5Z10	897	50	10	6.350	51	44.4	2.5×1	37 500	87 200	2 450	78	93	135	51	18	103
W5015SS-1Z-C5Z10	1 397	50	10	6.350	51	44.4	2.5×1	37 500	87 200	2 450	78	93	135	51	18	103
W5020SS-1Z-C5Z10	1 897	50	10	6.350	51	44.4	2.5×1	37 500	87 200	2 450	78	93	135	51	18	103
W5026SS-1Z-C5Z10	2 497	50	10	6.350	51	44.4	2.5×1	37 500	87 200	2 450	78	93	135	51	18	103
W5010SS-2Z-C5Z10	837	50	10	6.350	51	44.4	2.5×2	68 100	174 000	4 020	138	93	135	51	18	163
W5015SS-2Z-C5Z10	1 337	50	10	6.350	51	44.4	2.5×2	68 100	174 000	4 020	138	93	135	51	18	163
W5020SS-2Z-C5Z10	1 837	50	10	6.350	51	44.4	2.5×2	68 100	174 000	4 020	138	93	135	51	18	163
W5026SS-2Z-C5Z10	2 437	50	10	6.350	51	44.4	2.5×2	68 100	174 000	4 020	138	93	135	51	18	163

Notes

1. Use of NSK support unit is recommend. See page 324 for details.
2. **Only rust preventive agent is applied at time of delivery. Please apply lubricant (oil or grease) before use.** See page 442 for details.
3. The permissible rotational speed is determined by d·n value, critical speed and maximum rotational speed. The permissible rotational speed shown in the table is the value when the ball screw mounting method is fixed-fixed.

Screw shaft ϕ 45, ϕ 50
Lead 10

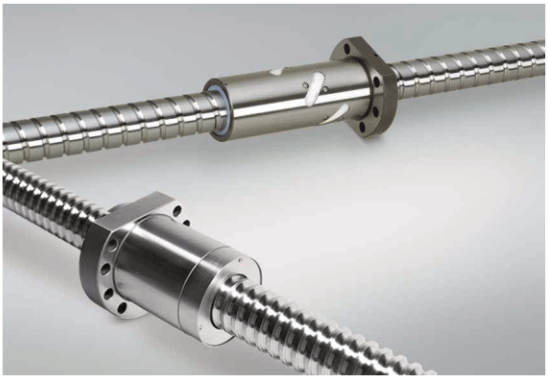


View X-X

Unit: mm

dimensions					Screw shaft dimensions							Lead accuracy			Run-out			Mass	Permissible rotational speed	Internal spatial volume of nut	Standard volume of grease replenishing
Bolt hole				Oil hole	Threaded length	Shaft end right			Shaft end left		Overall length	Travel compensation	Deviation	Variation	Shaft straightness	Radial run-out					
W	X	Y	Z	Q	L_t	d_2	L_1	L_2	d_3	L_3	L_0	T	e_p	v_u	I	J	K	(kg)	N (min^{-1})	(cm^3)	(cm^3)
110	11	17.5	11	Rc1/8	1 000	45.3	60	300	39.4	100	1 400	-0.024	0.040	0.027	0.080	0.025	0.015	19.7	1 550	34	17
110	11	17.5	11	Rc1/8	1 600	45.3	60	400	39.4	150	2 150	-0.038	0.054	0.035	0.130	0.025	0.015	28.1	1 550	34	17
110	11	17.5	11	Rc1/8	2 500	45.3	60	450	39.4	150	3 100	-0.060	0.077	0.046	0.170	0.025	0.015	38.8	1 400	34	17
113	11	17.5	11	Rc1/8	1 000	50.3	60	300	44.4	100	1 400	-0.024	0.040	0.027	0.080	0.025	0.015	23.8	1 400	37	19
113	11	17.5	11	Rc1/8	1 500	50.3	60	400	44.4	150	2 050	-0.036	0.054	0.035	0.130	0.025	0.015	32.9	1 400	37	19
113	11	17.5	11	Rc1/8	2 000	50.3	60	400	44.4	150	2 550	-0.048	0.065	0.040	0.170	0.025	0.015	39.8	1 400	37	19
113	11	17.5	11	Rc1/8	2 600	50.3	60	450	44.4	150	3 200	-0.062	0.093	0.054	0.220	0.025	0.015	48.9	1 400	37	19
113	11	17.5	11	Rc1/8	1 000	50.3	60	300	44.4	100	1 400	-0.024	0.040	0.027	0.080	0.025	0.015	25.5	1 400	59	30
113	11	17.5	11	Rc1/8	1 500	50.3	60	400	44.4	150	2 050	-0.036	0.054	0.035	0.130	0.025	0.015	34.6	1 400	59	30
113	11	17.5	11	Rc1/8	2 000	50.3	60	400	44.4	150	2 550	-0.048	0.065	0.040	0.170	0.025	0.015	41.5	1 400	59	30
113	11	17.5	11	Rc1/8	2 600	50.3	60	450	44.4	150	3 200	-0.062	0.093	0.054	0.220	0.025	0.015	50.7	1 400	59	30

27. DIN Ball Screws for Machine Tool Industry

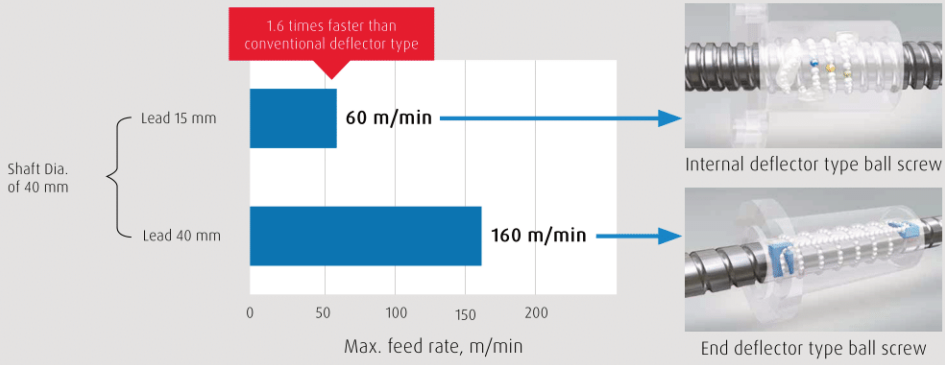


Features

- High speed capability
- High load capacity
- Low torque variation
- Low noise
- Dimensions according DIN-Norm
- Available from stock for prototypes

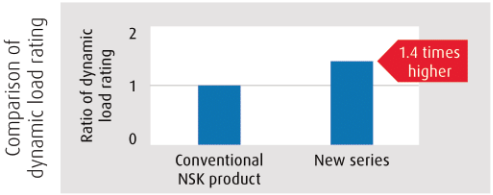
High-speed operation

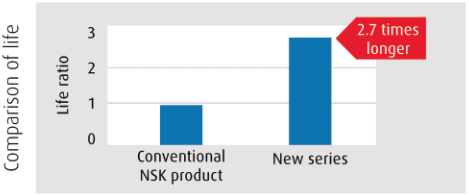
Depending on shaft diameter and lead combination, two types of recirculation system are used.
One option is the newly developed internal deflector which is chosen for smaller leads (10 – 30 mm).
The other is the end-deflector for higher leads between 20 and 40 mm.
Both allow a high d·n value of 150.000 ~ 160.000.



High load capacity

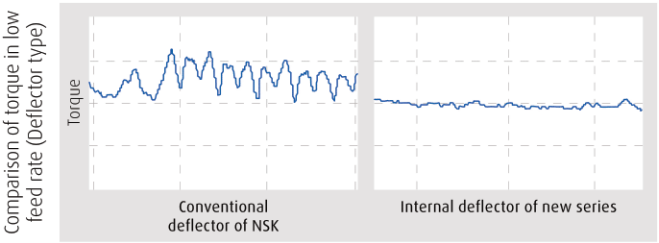
1.4 times dynamic load rating is achieved by applying special TF bearing steel with dedicated heat treatment to ball screws for machine tools. This TF material has already been applied in the bearing industry several years ago and as well as to our high load capacity ball screws for injection molding machines. It contributes to high cycle operation with long life of ball screws.

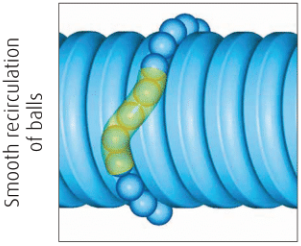




Newly developed internal deflector for low torque variation

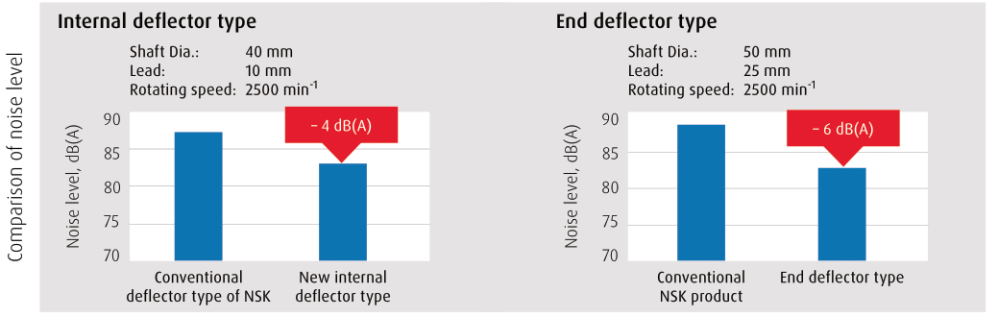
By using our own simulation technology for ball motion NSK has developed improved ball recirculation systems. The low torque variation contributes to the improvement of the surface profile of machined work pieces.





Low noise

Low noise technology that has previously been used for the end deflector type has now been applied to the new internal deflector type. Other low noise technology that reduces the noise from raceway can be applied to this series when the specified accuracy grade is C3 or higher. Please contact NSK when this feature is needed for accuracy grade C5.



TF Steel technology now used for BS series

We are applying our existing TF bearing steel technology to increase the robustness and lifespan of our new DIN ball screw series. Using this material enables us to extend our ball screw life by avoiding external early flaking due to stress at impressions.

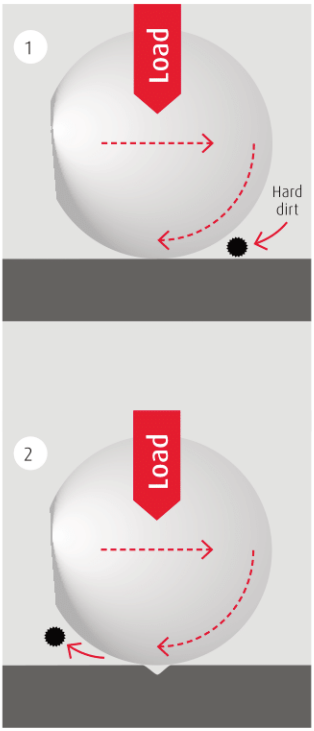
Properties of the TF material

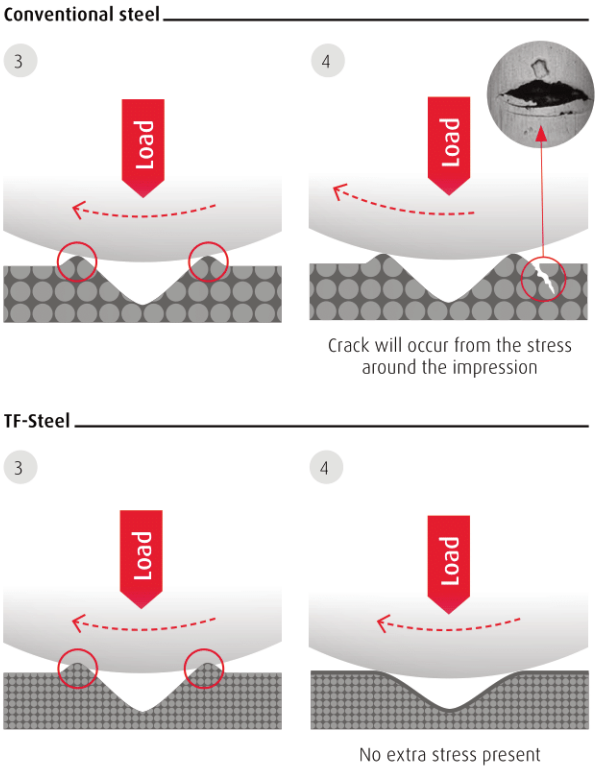
- Fine distribution of carbides and carbonatite particles
- Remaining austenite is checked properly to have the best combination of hardness and strength
- Due to this fact, excess material can be pushed back into the surface and thus avoids recurring tensions

Advantages of the TF material

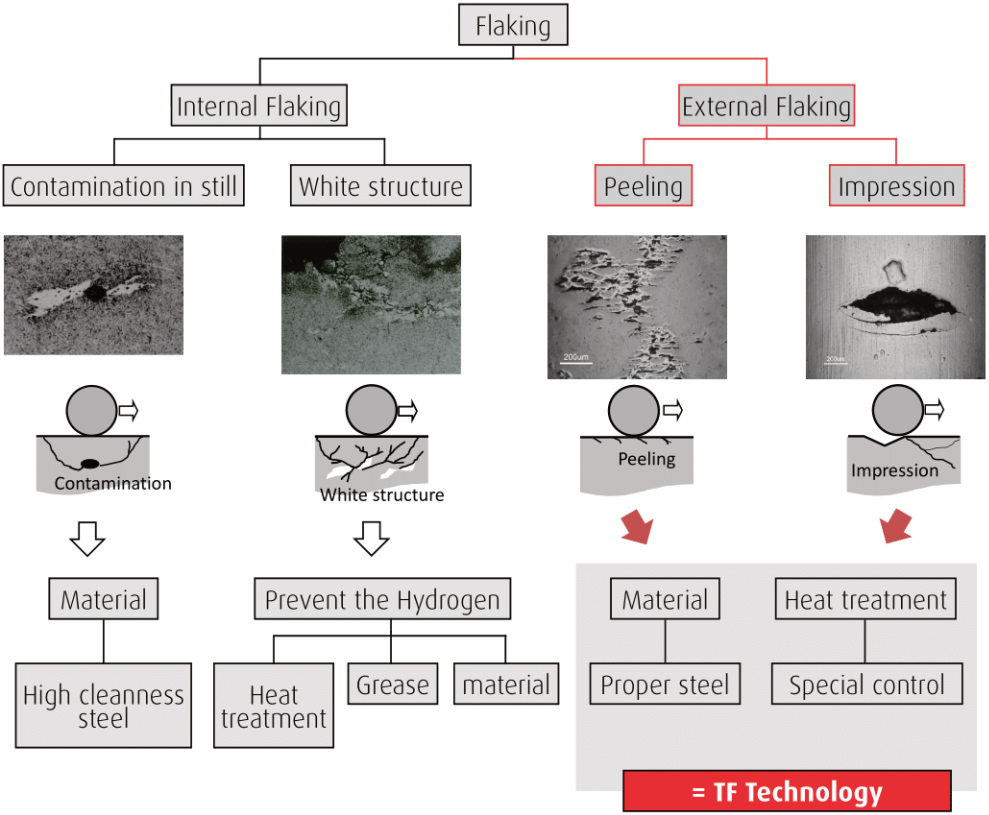
- Far better lifespan in polluted environments
- Longer life even under normal conditions
- Better resistance against surface damage
- Reduced failure caused by broken parts released from impressions

TF steel relieves the stress concentration due to hardness and toughness





Theory of decreasing the stress concentration around the impression



~ Long life technology by material and heat treatment ~

27. DIN Ball Screws for Machine Tool Industry

Series range and allowable feed rate

DIN standard nut Dia. range

Unit: m/min

Shaft Diameter	Lead					
	10 mm	15 mm	20 mm	25 mm	30 mm	40 mm
32 mm	50	75	100	—	—	—
40 mm	40	60	80	100	120	160
50 mm	32	48	64	—	—	—
63 mm	23	35	47	—	71	—

DIN extended nut Dia. range

Unit: m/min

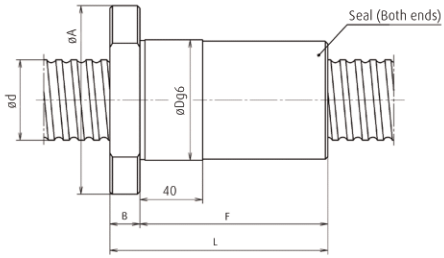
Shaft Diameter	Lead					
	10 mm	15 mm	20 mm	25 mm	30 mm	40 mm
32 mm	—	—	100	—	—	—
40 mm	—	—	80	100	120	160
50 mm	—	—	—	80	96	128
63 mm	—	—	—	—	—	—

Remarks Maximum allowable feed rate (m/min) is calculated from allowable rotating speed. Review of critical speed is required. Please contact NSK when the speed exceeds the maximum allowable d·n value Ø 32 ~ Ø 50: 160.000, Ø 63: 150.000.

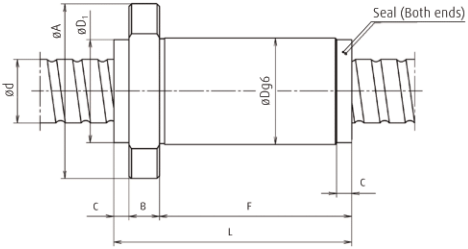
Preload system

The standard preload system is offset preload.

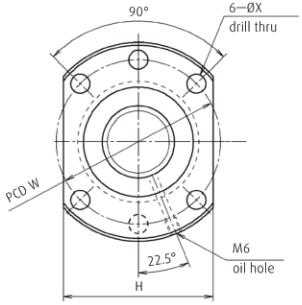
Dimensions



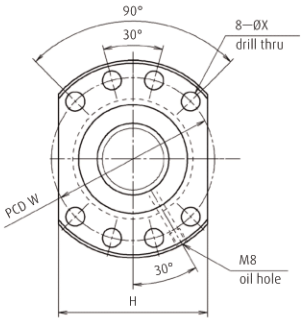
ZSD (Internal deflector type)



ZSS (End deflector type)



Shape I (Shaft Dia. = 32)



Shape II (Shaft Dia. > 32)

Unit: mm

Model No.	Shaft dia. d	Lead l	Effective ball turns Turns × Circuits	Basic load rating (N)		Ball nut dimensions										DIN standard nut Dia.	DIN extended nut Dia.
				Dynamic Ca	Static C0a	L	D	D1	A	B	C	F	W	X	H		
ZSD3210-10	32	10	1×5	58700	83 200	156	50	-	80	12	-	144	65	9	62	•	
ZSD3215-6	32	15	1×3	37500	49 700	148	50	-	80	12	-	136	65	9	62	•	
ZSD3220-4	32	20	1×2	26200	32 900	132	50	-	80	12	-	120	65	9	62	•	
ZSS3220-4E	32	20	3.7×1	50000	71 800	121	56	55	86	14	10,5	96,5	71	9	65		•
ZSD4010-8	40	10	1×4	73400	103 000	137	63	-	93	14	-	123	78	9	70	•	
ZSD4015-6	40	15	1×3	57000	77 100	155	63	-	93	14	-	141	78	9	70	•	
ZSS4020-4ES	40	20	3.7×1	55000	89 900	102	63	62	93	14	5	83	78	9	70	•	
ZSS4020-4E	40	20	3.7×1	65400	102 000	126	70	69	100	14	10,5	101,5	85	9	75		•
ZSS4025-4ES	40	25	3.7×1	54600	90 300	122	63	-	93	14	5	103	78	9	70	•	
ZSS4025-4E	40	25	3.7×1	64900	102 000	145	70	69	100	14	10,5	120,5	85	9	75		•
ZSS4030-4ES	40	30	3.7×1	55500	90 700	141	63	-	93	14	5	122	78	9	70	•	
ZSS4030-4E	40	30	3.7×1	66300	103 000	164	70	69	100	14	10,5	139,5	85	9	75		•
ZSS4040-3ES	40	40	2.7×1	41300	65 700	134	63	-	93	14	-	120	78	9	70	•	
ZSS4040-3E	40	40	2.7×1	49300	74 600	150	70	69	100	14	10,5	125,5	85	9	75		•
ZSD5010-8	50	10	1×4	82700	133 000	140	75	-	110	16	-	124	93	11	85	•	
ZSD5015-8	50	15	1×4	94400	145 000	191	75	-	110	16	-	175	93	11	85	•	
ZSD5020-8	50	20	1×4	94000	145 000	240	75	-	110	16	-	224	93	11	85	•	
ZSS5025-4E	50	25	3.7×1	72600	129 000	145	82	81	118	16	10,5	118,5	100	11	92		•
ZSS5030-4E	50	30	3.7×1	72100	128 000	164	82	81	118	16	10,5	137,5	100	11	92		•
ZSS5040-3E	50	40	2.7×1	55500	94 200	142	82	81	118	16	10,5	115,5	100	11	92		•
ZSD6310-10	63	10	1×5	115000	220 000	164	90	-	125	18	-	146	108	11	95	•	
ZSD6315-8	63	15	1×4	177000	309 000	198	95	-	135	20	-	178	115	13,5	100	•	
ZSD6320-10	63	20	1×5	214000	385 000	286	95	-	135	20	-	266	115	13,5	100	•	
ZSD6330-6	63	30	1×3	137000	230 000	269	95	-	135	20	-	249	115	13,5	100	•	