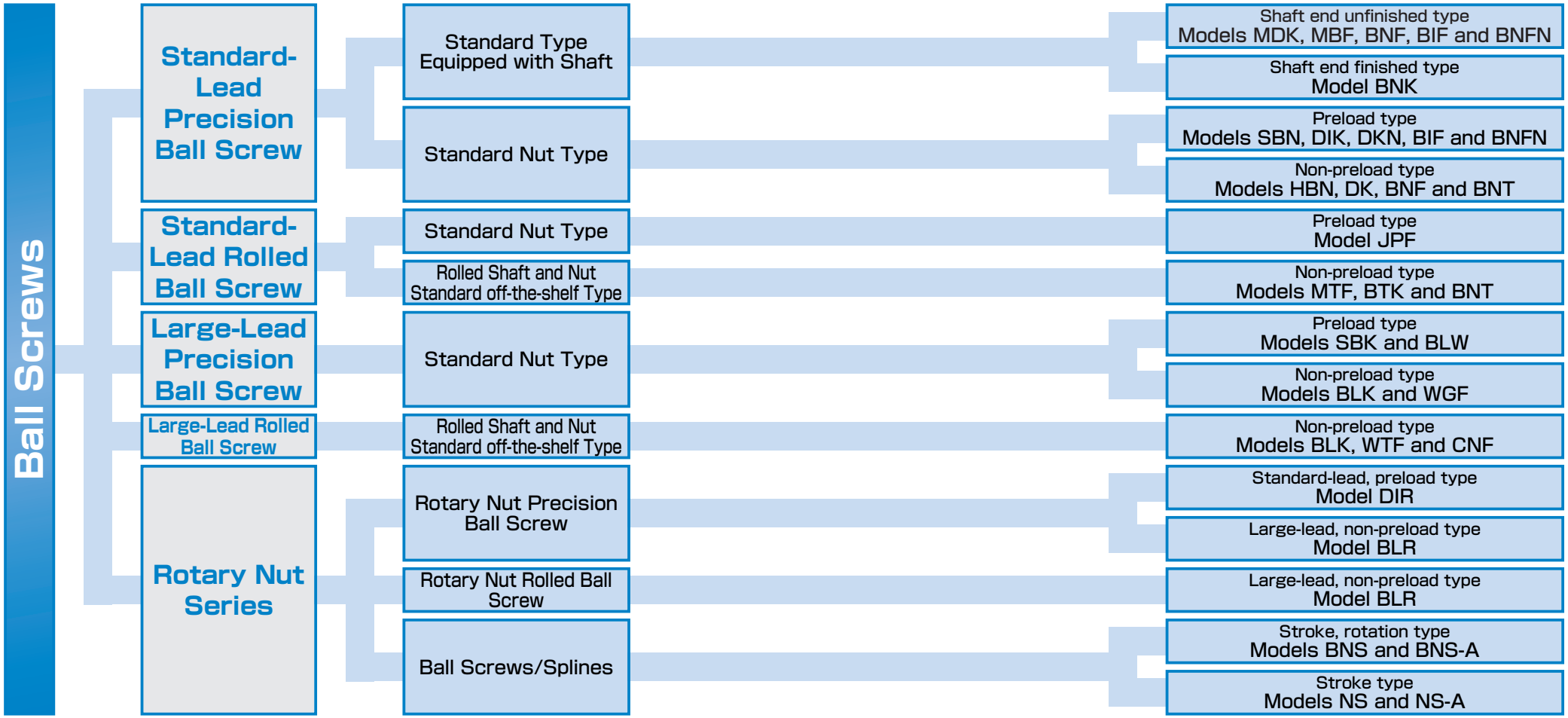
1. Types of Ball Screws

Classification of Ball Screws

For THK Ball Screws, a broad array of types are offered as standard so that the optimal product can be selected to meet diversified applications. By ball circulation method, the Ball Screws are divided into return-pipe type, deflector type and end-cap type. And by preloading method, fixed-point preloading (double-nut method, offset preloading) and constant-pressure preloading are selectable.
By screw shaft, they are divided into precision Ball Screws, which are ground with precision (six accuracy grades from C7 to C0), and rolled Ball Screws, which are formed through rolling with high accuracy (three accuracy grades from C10 to C7).

Also, a series of nut-rotating Ball Screws, which are optimal for usage based on nut rotation, are also offered in addition to those types designed for conventional use based on axial rotation.
In addition, THK also offers support units, which are incorporated with nut bracket, rock nut and support bearing, as peripherals for Ball Screws as standard.



2. Types of Ball Screw Nuts

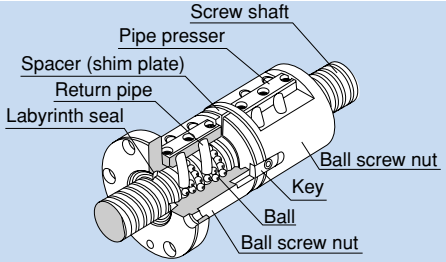
Nuts of Ball Screws are categorized by ball circulation method into return-pipe type, deflector type and end cap type. These three nut types are described as follows.
In addition to circulation methods, Ball Screws are categorized also by preloading method.

2.1. Types by Ball Circulation

Return-pipe Type
(Models SBN, BNF, BNT, BNFN, BIF and BTK)

Return-piece Type
(Model HBN)

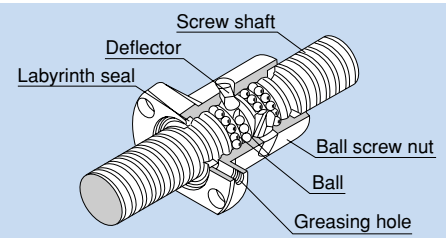
These are most common types of nuts that use a return pipe for ball circulation. The return pipe allows balls to be picked up, pass through the pipe, and return to their original positions to complete infinite motion.



Example of Structure of Return-pipe Nut

Deflector Type: Simple Nut
(Models DK, DKN, DIK, JPF and DIR)

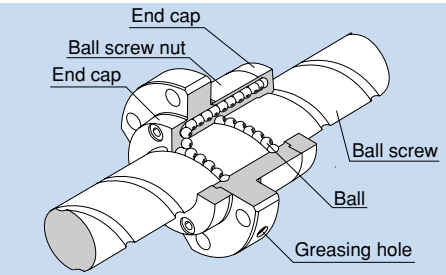
These are the most compact type of nut. Balls change their traveling direction with a deflector, pass over the circumference of the screw shaft, and return to their original positions to complete infinite motion.



Example of Structure of Simple Nut

End-cap Type: Large-lead Nut
(Models SBK, BLK, WGF, BLW, WTF, CNF and BLR)

These nuts are most suitable for fast feed. Balls are picked up with an end cap, pass through the through hole of the nut, and return to their original positions to complete infinite motion.



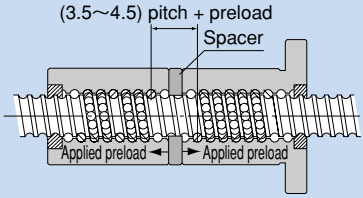
Example of Structure of Large-lead Nut

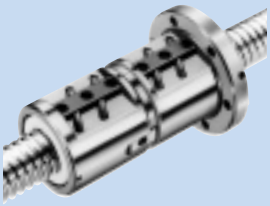
2.2. Types by Preloading Method

Fixed-point Preloading

●Double-nut Method (Models BNFN, DKN and BLW)

A spacer is inserted between two nuts to provide a preload.





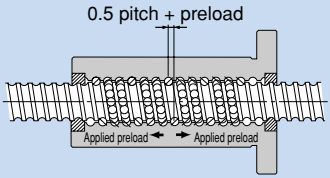
Model BNFN

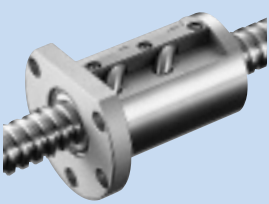
Model DKN

Model BLW

●Offset Preloading (Models SBN, BIF, DIK, SBK and DIR)

It allows more compact design than the double-nut method. This method provides a preload by changing the groove pitch in the middle of the nut without using a spacer.



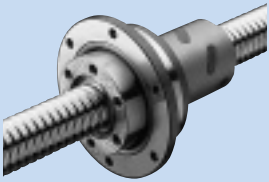


Model SBN

Model BIF

Model DIK

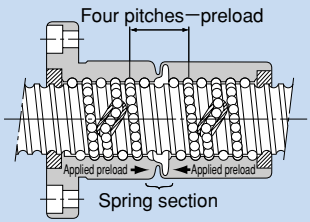
Model SBK



Model DIR

Constant-pressure Preloading (Model JPF)

With this method, a spring structure is installed almost in the middle of the nut, and it provides a preload by changing the groove pitch in the middle of the nut.



Model JPF

3. Accuracy of the Ball Screw

3.1. Lead Accuracy

The accuracy of the Ball Screw in lead is controlled in accordance with JIS standards (JIS B 1192 - 1997). Accuracy grades C0 to C5 are defined in linearity and directional property, and C7 to C10 in travel distance error in relation to 300 mm.

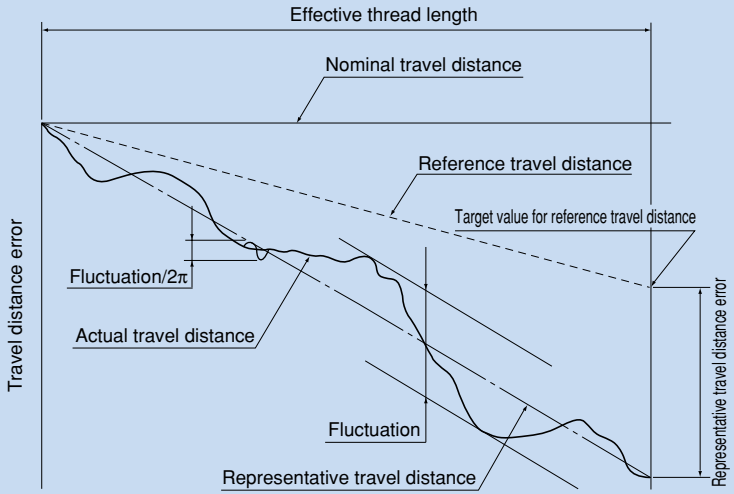


Fig. 1 Terms on Lead Accuracy

●Actual travel distance

An error in travel distance measured with an actual Ball Screw.

●Reference travel distance

Generally, it is the same as nominal travel distance, but can be an intentionally corrected value of nominal travel distance according to the intended use.

●Target value for reference travel distance

You may provide tension in order to prevent the screw shaft from running out, or set the reference travel distance in "negative" or "positive" value in advance given possible expansion/contraction from external load or temperature. In such cases, indicate a target value for the reference travel distance.

●Representative travel distance

It is a straight line representing the tendency in actual travel distance, and obtained with the least squares method from the curb that indicates the actual travel distance.

●Representative travel distance error (in ±)

Difference between the representative travel distance and the reference travel distance.

●Fluctuation

It is the maximum width of the actual travel distance between two straight lines drawn in parallel with the representative travel distance.

●Fluctuation/300

It indicates a fluctuation against a given thread length of 300 mm.

●Fluctuation/2π

It is a fluctuation in one revolution of the screw shaft.

Table 1 Lead Accuracy (Permissible Value)

Unit: μm

		Precision Ball Screw										Rolled Ball Screw		
Accuracy grade		C0		C1		C2		C3		C5		C7	C8	C10
Effective thread length		Represent active travel distance error	Fluc-tuation	Represent active travel distance error	Fluc-tuation	Represent active travel distance error	Fluc-tuation	Represent active travel distance error	Fluc-tuation	Represent active travel distance error	Fluc-tuation	Travel distance error	Travel distance error	Travel distance error
Above	Or less													
—	100	3	3	3.5	5	5	7	8	8	18	18			
100	200	3.5	3	4.5	5	7	7	10	8	20	18			
200	315	4	3.5	6	5	8	7	12	8	23	18			
315	400	5	3.5	7	5	9	7	13	10	25	20			
400	500	6	4	8	5	10	7	15	10	27	20			
500	630	6	4	9	6	11	8	16	12	30	23			
630	800	7	5	10	7	13	9	18	13	35	25			
800	1000	8	6	11	8	15	10	21	15	40	27			
1000	1250	9	6	13	9	18	11	24	16	46	30	±50 / 300mm	±100 / 300mm	±210 / 300mm
1250	1600	11	7	15	10	21	13	29	18	54	35			
1600	2000	—	—	18	11	25	15	35	21	65	40			
2000	2500	—	—	22	13	30	18	41	24	77	46			
2500	3150	—	—	26	15	36	21	50	29	93	54			
3150	4000	—	—	30	18	44	25	60	35	115	65			
4000	5000	—	—	—	—	52	30	72	41	140	77			
5000	6300	—	—	—	—	65	36	90	50	170	93			
6300	8000	—	—	—	—	—	—	110	60	210	115			
8000	10000	—	—	—	—	—	—	—	—	260	140			

Note: Unit of effective thread length: mm

Table 2 Fluctuation in Thread Length of 300 mm and in One Revolution (permissible value)

Unit: μm

Accuracy grade	C0	C1	C2	C3	C5	C7	C8	C10
Fluctuation/300 mm	3.5	5	7	8	18	—	—	—
Fluctuation/2π	3	4	5	6	8	—	—	—

Example: When the lead of a Ball Screw manufactured is measured with a target value for reference travel distance being -9 μm/500 mm, the following data are obtained.

Table 3 Measurement Data on Travel Distance Error

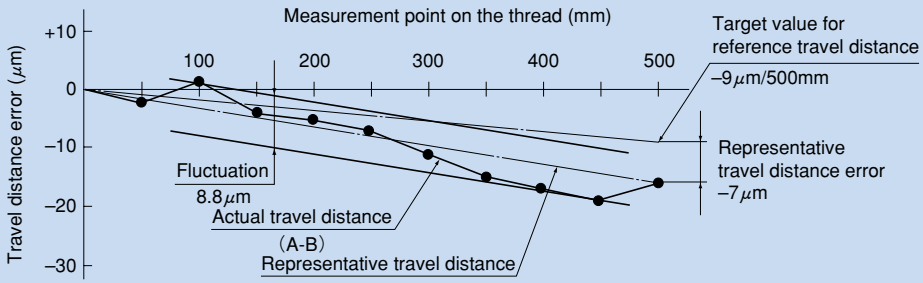
Unit: mm

Command position (A)	0	50	100	150
Travel distance (B)	0	49.998	100.001	149.996
Travel distance error (A-B)	0	–0.002	+0.001	–0.004

200	250	300	350
199.995	249.993	299.989	349.885
–0.005	–0.007	–0.011	–0.015

400	450	500
399.983	449.981	499.984
–0.017	–0.019	–0.016

The measurement data are expressed in a graph as shown in Fig. 2.
The positioning error (A-B) is indicated as the actual travel distance while the straight line representing the tendency of the (A-B) graph refers to the representative travel distance.
The difference between the reference travel distance and the representative travel distance appears as the representative travel distance error.



Measurement result − representative travel distance:−7 μm
Fluctuation:8.8 μm

Fig. 2 Measurement Data on Travel Distance Error

3.2. Accuracy of the Mounting Section

The accuracy of the Ball Screw mounting section complies with JIS standard (JIS B 1192).

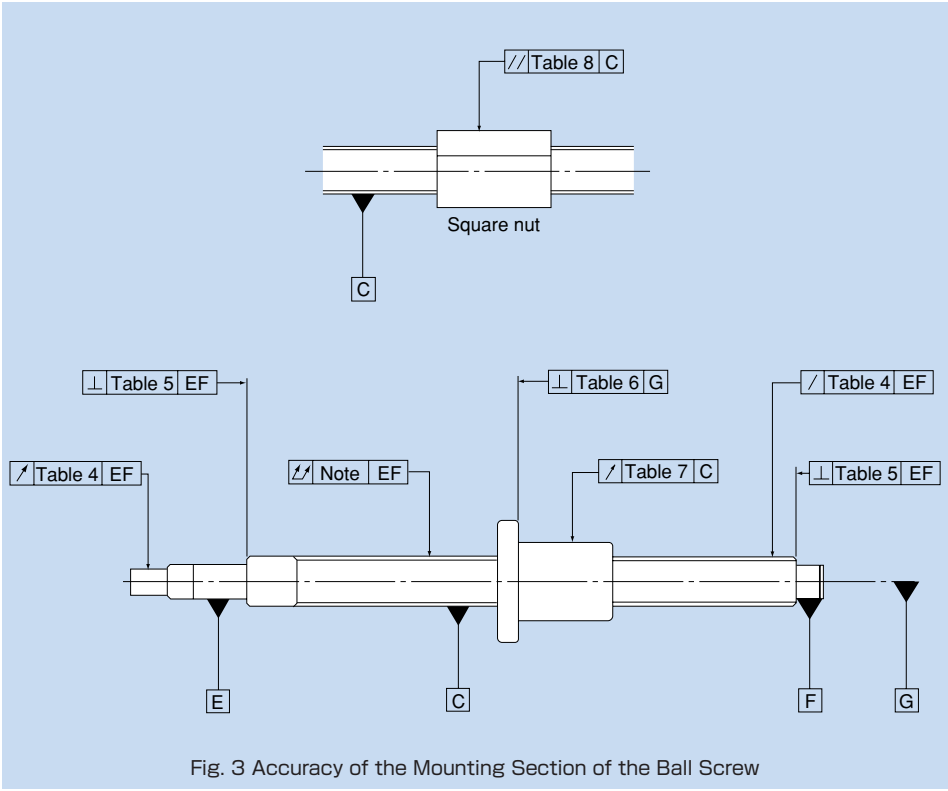


Fig. 3 Accuracy of the Mounting Section of the Ball Screw

Note: For the overall run-out of the screw shaft axis in the radial direction, refer to JIS B 1192.

3.2.1. Accuracy Standards for the Mounting Section

Tables 4 to 8 show accuracy standards for the mounting sections of the precision Ball Screw.

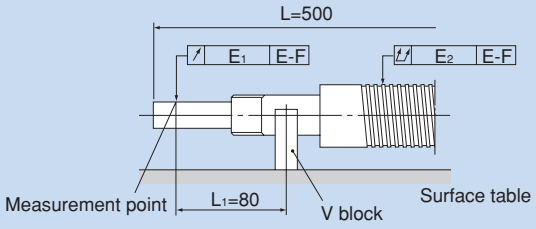
Table 4 Radial Run-out of the Circumference of the Thread Root in Relation to the Support Portion Axis of the Screw Shaft

Unit: μm

Screw shaft outer diameter (mm)		Run-out (Maximum)					
Above	Or less	C0	C1	C2	C3	C5	C7
—	8	3	5	7	8	10	14
8	12	4	5	7	8	11	14
12	20	4	6	8	9	12	14
20	32	5	7	9	10	13	20
32	50	6	8	10	12	15	20
50	80	7	9	11	13	17	20
80	100	—	10	12	15	20	30

Note: The measurements on these items include the effect of the run-out of the screw shaft diameter. Therefore, it is necessary to obtain the correction value from the overall run-out of the screw shaft axis, using the ratio of the distance between the fulcrum and measurement point to the overall screw shaft length, and add the obtained value to the table above.

Example: model No. DIK2005-6RRG0+500LC5



where

$E_1 = e + \Delta e$

e : Standard value in table 4 (0.012)

Δe: Correction value

where

$\Delta e = \frac{L_1}{L} \times E_2$

E_2: Overall radial run-out of the screw shaft axis (0.06)

$= \frac{80}{500} \times 0.06$

$= 0.01$

$E_1 = 0.012 + 0.01$

$= 0.022$

Table 5 Perpendicularity of the Supporting Portion End of the Screw Shaft to the Supporting Portion Axis

Unit: μm

Screw shaft outer diameter (mm)		Perpendicularity (Maximum)					
Above	Or less	C0	C1	C2	C3	C5	C7
—	8	2	3	3	4	5	7
8	12	2	3	3	4	5	7
12	20	2	3	3	4	5	7
20	32	2	3	3	4	5	7
32	50	2	3	3	4	5	8
50	80	3	4	4	5	7	10
80	100	—	4	5	6	8	11

Table 6 Perpendicularity of the Flange Mounting Surface of the Screw Shaft to the Screw Shaft Axis

Unit: μm

Nut outer diameter (mm)		Perpendicularity (Maximum)					
Above	Or less	C0	C1	C2	C3	C5	C7
—	20	5	6	7	8	10	14
20	32	5	6	7	8	10	14
32	50	6	7	8	8	11	18
50	80	7	8	9	10	13	18
80	125	7	9	10	12	15	20
125	160	8	10	11	13	17	20
160	200	—	11	12	14	18	25

Table 7 Radial Run-out of the Nut Circumference in Relation to the Screw Shaft Axis

Unit: μm

Nut outer diameter (mm)		Run-out (Maximum)					
Above	Or less	C0	C1	C2	C3	C5	C7
—	20	5	6	7	9	12	20
20	32	6	7	8	10	12	20
32	50	7	8	10	12	15	30
50	80	8	10	12	15	19	30
80	125	9	12	16	20	27	40
125	160	10	13	17	22	30	40
160	200	—	16	20	25	34	50

Table 8 Parallelism of the Nut Circumference (Flat Mounting Surface) to the Screw Shaft Axis

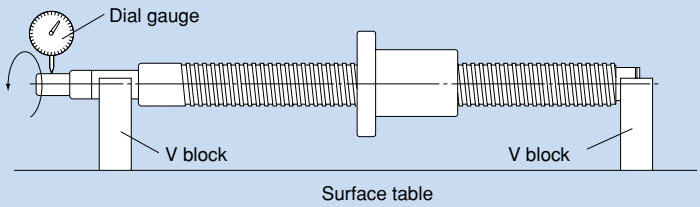
Unit: μm

Mounting reference length (mm)		Parallelism (Maximum)					
Above	Or less	C0	C1	C2	C3	C5	C7
—	50	5	6	7	8	10	17
50	100	7	8	9	10	13	17
100	200	—	10	11	13	17	30

3.2.2. Method for Measuring Accuracy of the Mounting Section

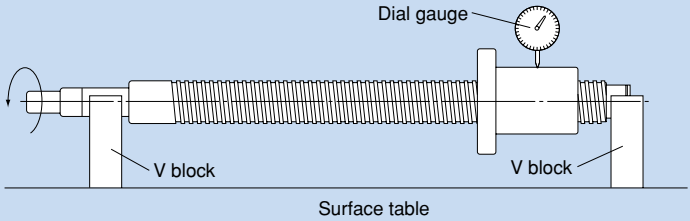
●Radial Run-out of the Circumference of the Part Mounting Section in Relation to the Supporting Portion Axis of the Screw Shaft (Table 4)

Support the supporting portion of the screw shaft with V blocks. Place a probe on the circumference of the part mounting section, and read the largest difference on the dial gauge as a measurement when turning the screw shaft by one revolution.



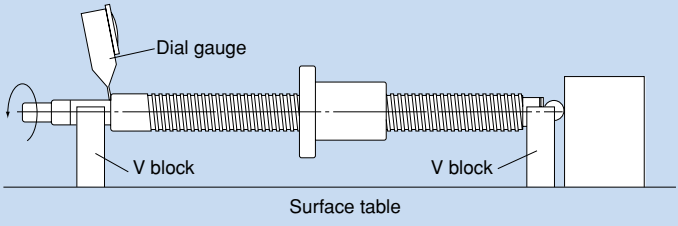
●Radial Run-out of the Circumference of the Thread Root in Relation to the Support Portion Axis of the Screw Shaft (Table 4)

Support the supporting portion of the screw shaft with V blocks. Place a probe on the circumference of the nut, and read the largest difference on the dial gauge as a measurement when turning the screw shaft by one revolution without turning the nut.



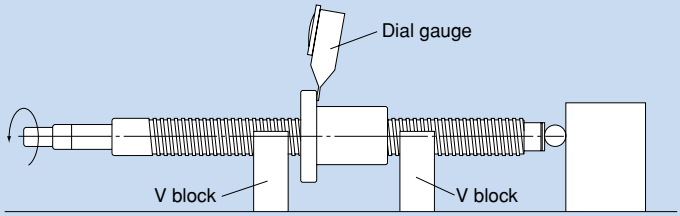
●Perpendicularity of the Supporting Portion End of the Screw Shaft to the Supporting Portion Axis (Table 5)

Support the supporting portion of the screw shaft with V blocks. Place a probe on the screw shaft's supporting portion end, and read the largest difference on the dial gauge as a measurement when turning the screw shaft by one revolution.



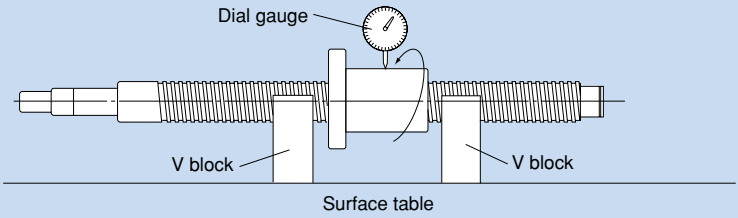
●Perpendicularity of the Flange Mounting Surface of the Screw Shaft to the Screw Shaft Axis (Table 6)

Support the nut of the screw shaft with V blocks. Place a probe on the flange end, and read the largest difference on the dial gauge as a measurement when simultaneously turning the screw shaft and the nut by one revolution.



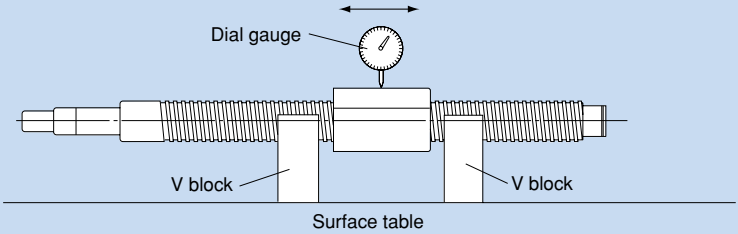
●Radial Run-out of the Nut Circumference in Relation to the Screw Shaft Axis (Table 7)

Support the thread of the screw shaft with V blocks near the nut. Place a probe on the circumference of the nut, and read the largest difference on the dial gauge as a measurement when turning the nut by one revolution without turning the screw shaft.



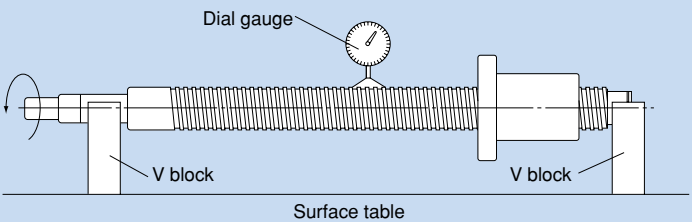
●Parallelism of the Nut Circumference (Flat Mounting Surface) to the Screw Shaft Axis (Table 8)

Support the thread of the screw shaft with V blocks near the nut. Place a probe on the circumference of the nut (flat mounting surface), and read the largest difference on the dial gauge as a measurement when moving the dial gauge in parallel with the screw shaft.



●Overall Radial Run-out of the Screw Shaft Axis

Support the supporting portion of the screw shaft with V blocks. Place a probe on the circumference of the screw shaft, and read the largest difference on the dial gauge at several points in the axial directions as a measurement when turning the screw shaft by one revolution.



Note: For the overall radial run-out of the screw shaft axis, refer to JIS B 1192.

4. Axial Clearance of the Ball Screw

4.1. Axial Clearance of the Precision Ball Screw

Table 1 shows axial clearance of the precision Screw Ball. If the manufacturing length exceeds the value in table 2, the resultant clearance may partially be negative (preload applied).

Table 1 Axial Clearance of the Precision Ball Screw

Unit: mm

Clearance symbol	G0	GT	G1	G2	G3
Axial clearance	0 or less	0 to 0.005	0 to 0.01	0 to 0.02	0 to 0.05

Table 2 Manufacturing-limit Length of the Precision Ball Screw in Axial Clearance

Unit: mm

Screw shaft outer diameter	Overall thread length						
	Clearance GT		Clearance G1		Clearance G2		
	C0 to C3	C5	C0 to C3	C5	C0 to C3	C5	C7
4 to 6	80	100	80	100	80	100	120
8 to 10	250	200	250	250	250	300	300
12 to 16	500	400	500	500	700	600	500
18 to 25	800	700	800	700	1000	1000	1000
28 to 32	900	800	1100	900	1400	1200	1200
36 to 45	1000	800	1300	1000	2000	1500	1500
50 to 70	1200	1000	1600	1300	2500	2000	2000
80 to 100	—	—	1800	1500	4000	3000	3000

* When manufacturing the Ball Screw of precision-grade accuracy with clearance GT or G1, the resultant clearance is partially negative.

4.2. Axial Clearance of the Rolled Ball Screw

Table 3 shows axial clearance of the rolled Ball Screw.

Table 3 Axial Clearance of the Rolled Ball Screw
Unit: mm

Screw shaft outer diameter	Axial clearance (maximum)
6 to 12	0.05
14 to 28	0.1
30 to 32	0.14
36 to 45	0.17
50	0.2

5. Maximum Manufacturing Length of the Ball Screw Shaft

The manufacturing limit length of the precision Ball Screw by accuracy grade is shown in table 1, and that of the rolled Ball Screw in table 2 on page K-38.
If the shaft dimensions exceed the manufacturing limit in table 1 or 2, contact THK.

Table 1 Manufacturing Limit Length of the Precision Ball Screw by Accuracy Grade

Unit: mm

Screw shaft outer diameter	Overall screw shaft length					
	C0	C1	C2	C3	C5	C7
4	90	110	120	120	120	120
6	150	170	210	210	210	210
8	230	270	340	340	340	340
10	350	400	500	500	500	500
12	440	500	630	680	680	680
13	440	500	630	680	680	680
14	530	620	770	870	890	890
15	570	670	830	950	980	1100
16	620	730	900	1050	1100	1400
18	720	840	1050	1220	1350	1600
20	820	950	1200	1400	1600	1800
25	1100	1400	1600	1800	2000	2400
28	1300	1600	1900	2100	2350	2700
30	1450	1700	2050	2300	2570	2950
32	1600	1800	2200	2500	2800	3200
36	2000	2100	2550	2950	3250	3650
40		2400	2900	3400	3700	4300
45		2750	3350	3950	4350	5050
50		3100	3800	4500	5000	5800
55		3450	4150	5300	6050	6500
63		4000	5200	5800	6700	7700
70			6300	6450	7650	9000
80				7900	9000	10000
100				10000	10000	

Table 2 Manufacturing Limit Length of the Rolled Ball Screw by Accuracy Grade

Unit: mm

Screw shaft outer diameter	Overall screw shaft length		
	C7	C8	C10
6 to 8	320	320	—
10 to 12	500	1000	—
14 to 15	1500	1500	1500
16 to 18	1500	1800	1800
20	2000	2200	2200
25	2000	3000	3000
28	3000	3000	3000
30	3000	3000	4000
32 to 36	3000	4000	4000
40	3000	5000	5000
45	3000	5500	5500
50	3000	6000	6000

6. Standard Combinations of Shaft Diameter and Lead for the Precision Ball Screw

Table 1 shows standard combinations of shaft diameter and lead for the precision Ball Screw. If desiring a Ball Screw not covered by the table, contact THK .

Table 1 Standard Combinations of Screw Shaft and Lead (Precision Ball Screw)

Screw shaft outer diameter	Lead																					
	1	2	4	5	6	8	10	12	15	16	20	24	25	30	32	36	40	50	60	80	90	100
4	●																					
5	●																					
6	●																					
8	●	●					●	○														
10		●	●				●		○													
12		●		●		●																
13											○											
14		●	●	●		●																
15							●				●			○			○					
16			○	●	○		○			●												
18							●															
20			○	●	○	○	●	○			●						○		○			
25			○	●	○	○	●	○		○	●		○					○				
28				○	●	○	○															
30																			○		○	
32			○	●	●	○	●	○			○				○							
36					○	○	●	○		○	○	○				○						
40				○	○	○	●	●		○	○			○			○			○		
45					○	○	○	○		○	○											
50				○		○	●	○		○	○			○		○		○				○
55							○	○		○	○			○		○						
63							○	○		○	○											
70							○	○			○											
80							○	○			○											
100											○											

For combinations marked with "●," off-the-shelf products (standard-stock products equipped with standardized screw shafts shaft ends unfinished and finished) are available.

7. Standard Combinations of Shaft Diameter and Lead for the Rolled Ball Screw

Table 1 shows standard combinations of shaft diameter and lead for the rolled Ball Screw.

Table 1 Standard Combinations of Screw Shaft and Lead (Rolled Ball Screw)

Screw shaft outer diameter	Lead																			
	1	2	4	5	6	8	10	12	16	20	24	25	30	32	36	40	50	60	80	100
6	●																			
8		●																		
10		●			○															
12		●				○														
14			●	●																
15							●			●			●							
16				●					●											
18						●														
20				●			●			●						●				
25				●			●					●					●			
28					●															
30																		●		
32							●							●						
36							●			●	●				●					
40							●									●			●	
45								●												
50									●								●			●

For combinations marked with "●," off-the-shelf products are available.

8. Method for Mounting the Ball Screw Shaft

Figures 1 to 4 show representative mounting methods for the screw shaft.
Permissible axial load and permissible rotation speed vary with mounting methods for the screw shaft. Therefore, it is necessary to select an appropriate mounting method according to the service conditions.

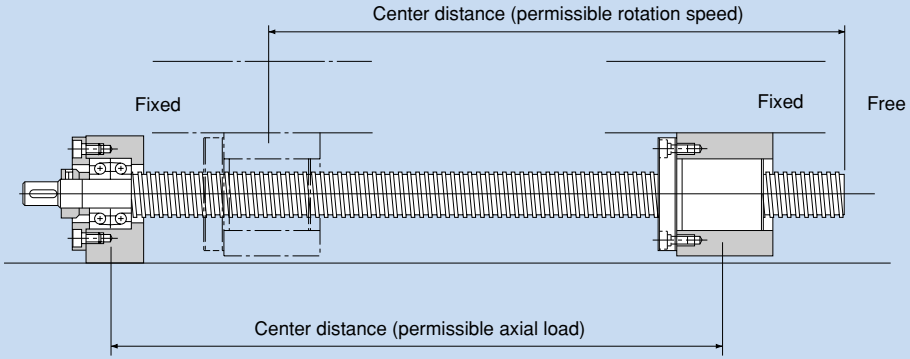


Fig. 1 Screw Shaft Mounting Method: Fixed - Free

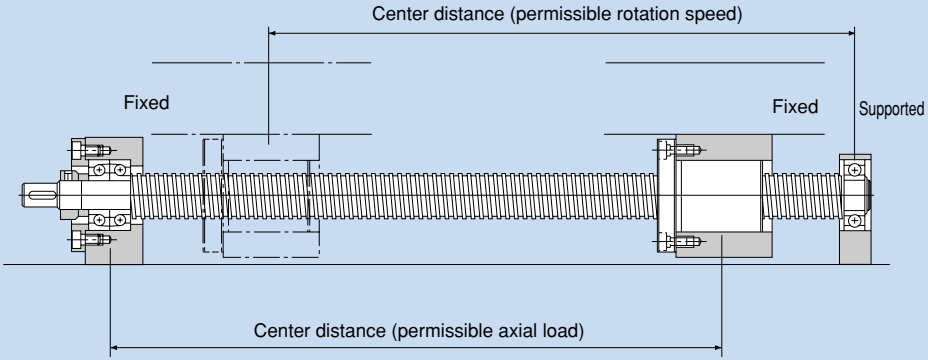


Fig. 2 Screw Shaft Mounting Method: Fixed - Supported

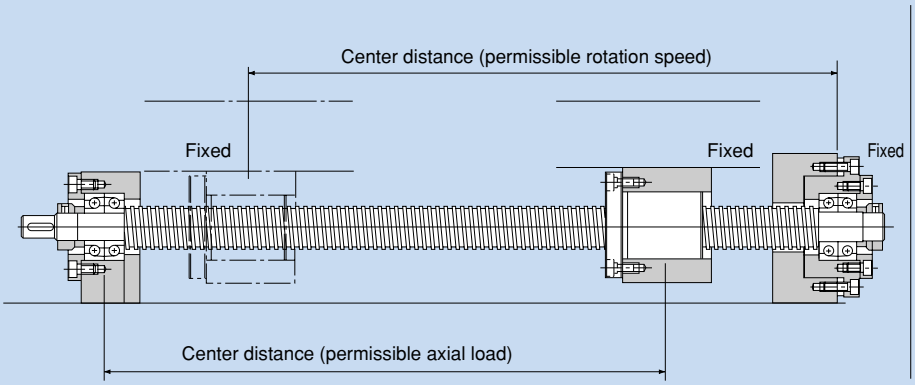


Fig. 3 Screw Shaft Mounting Method: Fixed - Fixed

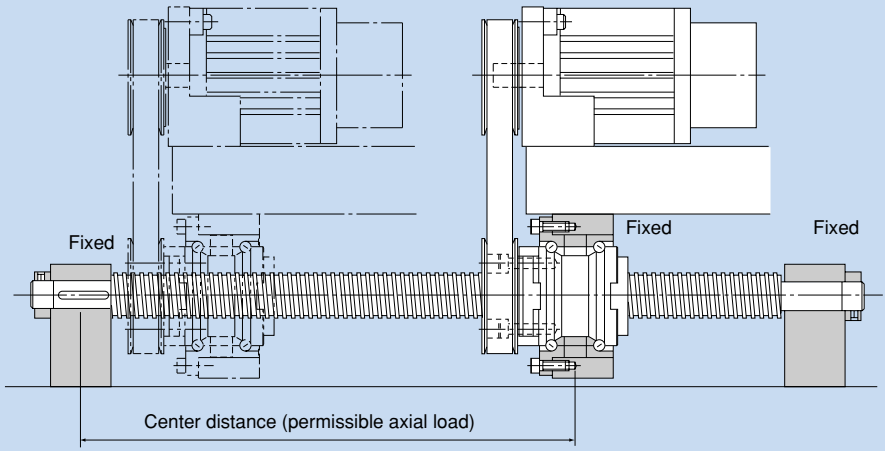


Fig. 4 Screw Shaft Mounting Method for Rotary Nut Ball Screw: Fixed - Fixed

9. Lubrication

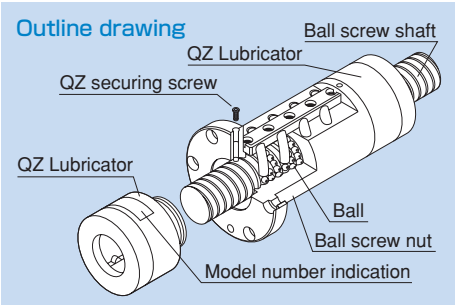
To maximize the performance of the Ball Screw, it is necessary to select a lubricant and a lubrication method according to the service conditions.
For types of lubricants, characteristics of lubricants and lubrication methods, see page a-2.
Also, QZ Lubricator is available as an optional accessory that significantly increases the maintenance interval.

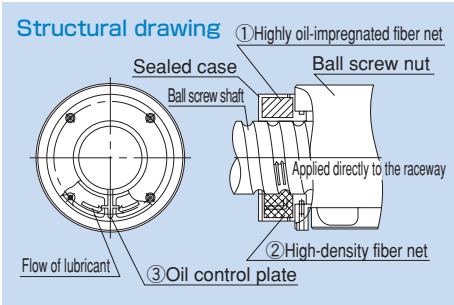
9.1. QZ Lubricator™ for the Ball Screw

Japanese Patent No.: 3288961, 3367911, 3454502

QZ Lubricator feeds a right amount of lubricant to the ball raceway of the ball screw shaft. This allows an oil film to be formed between the balls and the ball raceway and significantly extends the lubrication maintenance interval.

Its structure consists of major three components: ① a highly oil-impregnated fiber net (function to store a lubricant), ② a high-density fiber net (function to apply the lubricant to the raceway) and ③ an oil control plate (function to control the flow of the lubricant). The lubricant contained in QZ Lubricator is fed based on the principle of capillary action, which is used in felt-tip pens and other products.





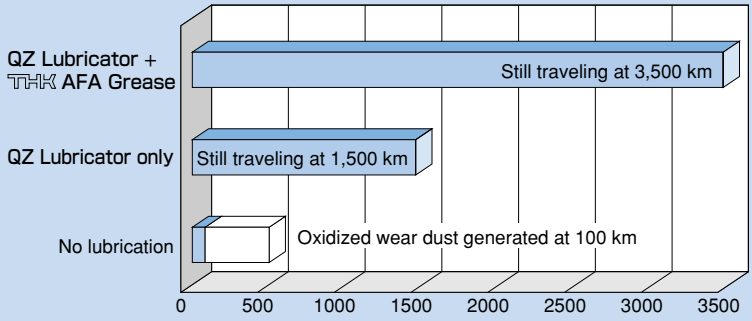
Features

- Since it supplements an oil loss, the lubrication maintenance interval can be significantly extended.
- Since the right amount of lubricant is applied to the ball raceway, an environmentally friendly lubrication system that does not contaminate the surroundings is achieved.
- Enables selection of a lubricant that meets the intended use.

Note: For model numbers supported for QZ Lubricator, see the section on the respective model number.

Significantly extended maintenance interval

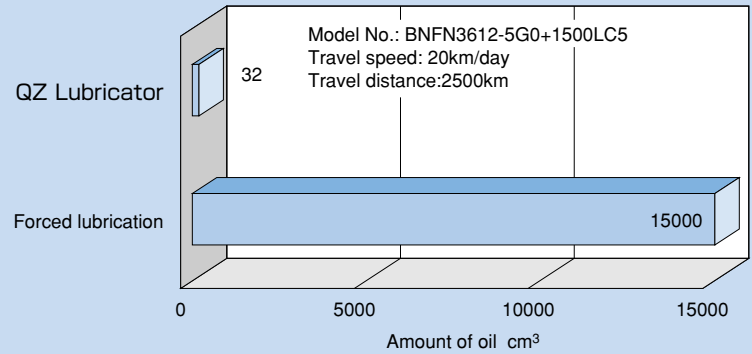
Since QZ Lubricator continuously feed a lubricant over a long period, the maintenance interval can be significantly extended.



Ball Screw	BIF2505-5
Rotation speed	3000min^{-1}
Stroke	500mm
Load	0.46 kN (with an internal preload)

Environmentally friendly lubrication system

Since QZ Lubricator feeds the right amount of lubricant directly to the raceway, the lubricant can effectively be used without waste.



QZ Lubricator + THK AFA Grease
32 cm^3
(QZ Lubricator attached to both ends of the ball screw nut)

Comparison

Forced lubrication
0.25cm^3/3min×24hour×125day
=15000cm^3

9.2. Amount of Lubricant

If the amount of lubricant to the Ball Screw is insufficient, it may cause oil film breakdown, and if it is excessive, it may cause heat to be generated and resistance to be increased. It is necessary to select an amount that meets the service conditions.

Grease

The feed amount of grease is generally approximately one third of the special volume inside the nut.

Oil

Table 1 shows a guideline for the feed amount of oil.
Note, however, that the amount varies according to the stroke, oil type and service conditions (e.g., suppressed heat generation).

Table 1 Guideline for the Feed Amount of Oil
(Interval: 3 minutes)

Shaft diameter (mm)	Amount of lubricant (cc)
4 to 8	0.03
10 to 14	0.05
15 to 18	0.07
20 to 25	0.1
28 to 32	0.15
36 to 40	0.25
45 to 50	0.3
55 to 63	0.4
70 to100	0.5

10. Dust Prevention

Dust and foreign matter that enter the Ball Screw may cause accelerated wear and breakage, as with roller bearings. Therefore, where contamination by dust or foreign matter (e.g., cutting chips) is predicted, screw shafts must always be completely covered by dust prevention devices (e.g., bellows, screw cover, wiper ring).

If the Ball Screw is used in an atmosphere free from foreign matter but with suspended dust, a labyrinth seal (for precision Ball Screw) and a brush seal (for rolled Ball Screw) can be used in place of dust prevention devices. When placing an order, indicate the respective model number.

The labyrinth seal is designed to maintain a slight clearance between the seal and the screw shaft raceway so that torque does not develop and no heat is generated, though its effect in dust prevention is limited.

With Ball Screws except the large-lead and super-lead types, there is no difference in nut dimensions between those with and without a seal.

With the wiper ring, special resin with high wear resistance and low dust generation removes foreign matter while closely contacting the circumference of the ball screw shaft and the screw thread. It is capable of preventing foreign matter from entering the Ball Screw even in harsh environments.

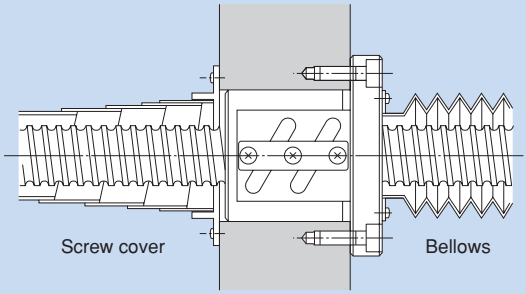
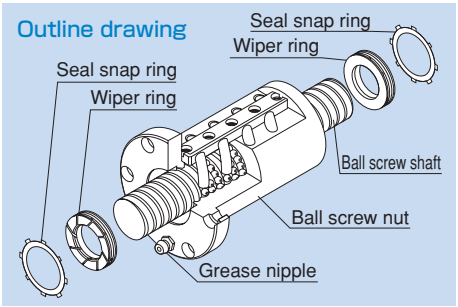
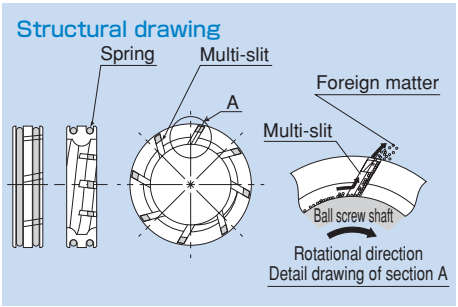


Fig.1 Dust Prevention Cover

10.1. Wiper Ring W for the Ball Screw

With the wiper ring, special resin with high wear resistance and low dust generation removes foreign matter and prevents foreign matter from entering the ball screw nut while elastically contacting the circumference of the ball screw shaft and the screw thread.





Features

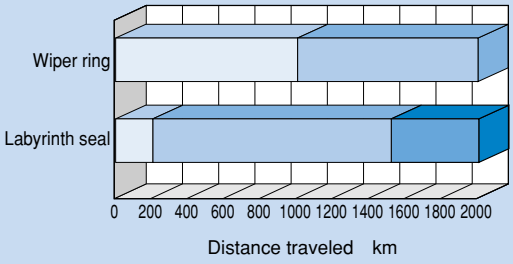
- A total of eight slits on the circumference remove foreign matter in succession, and prevents entrance of foreign matter.
- Contacts the ball screw shaft to reduce the flowing out of grease.
- Contacts the ball screw shaft at a constant pressure level using a spring, thus to minimize heat generation.
- Since the material is highly resistant to wear and chemicals, its performance will not easily be deteriorated even if it is used over a long period.

■Test in an environment exposed to foreign matter

[Test conditions]

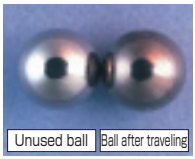
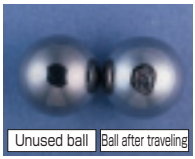
Item	Description
Model No.	BIF3210−5G0+1500LC5
Maximum rotation speed	1000min^{-1}
Maximum speed	10m/min
Maximum circumferential speed	1.8m/s
Time constant	60ms
Dowel	1s
Stroke	900mm
Load (through internal load)	1.31kN
Grease	THK AFG Grease 8cm^3 Initial lubrication to the ball screw nut only.
Foundry dust	FCD400 average particle diameter: 250μm
Volume of foreign matter per shaft	5g/h

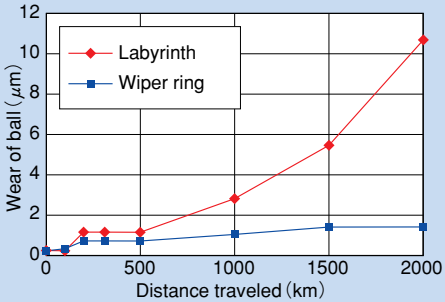
[Test result]



(1) Wiper ring specifications
Slight flaking occurred in the ball screw shaft at travel distant of 1,000 km.

(2) Labyrinth seal specifications
Flaking occurred throughout the circumference of the screw shaft raceway at travel distance of 200 km.
Flaking occurred on the balls after traveling 1,500 km.

	After traveling 2,000 km	
Ball	 ●Discolored, but no breakage	 ●Flaking occurs
	(1) Wiper ring type	(2) Labyrinth seal type



(1) Wiper ring type
Wear of balls at a travel distance of 2,000 km: 1.4 μm.

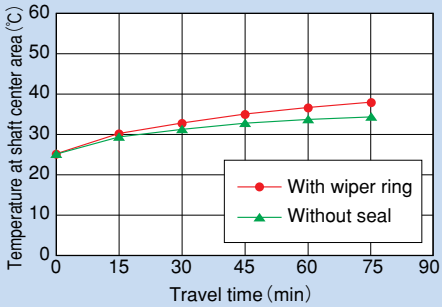
(2) Labyrinth seal type
Starts to be worn rapidly after 500 km, and the ball wear amount at the travel distance of 2,000 km: 11 μm

Heat generation test

[Test conditions]

Item	Description
Model No.	BLK3232DG0+1426LC5
Maximum rotation speed	1000min^{-1}
Maximum speed	32m/min
Maximum circumferential speed	1.7m/s
Time constant	100ms
Stroke	1000mm
Load (through internal load)	0.98kN
Grease	THK AFG Grease 5cm^3 (contained in the ball screw nut)

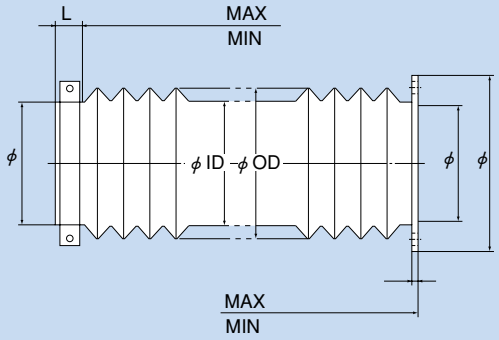
[Test result]



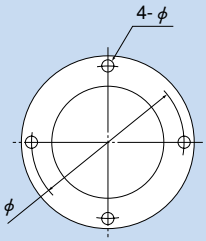
Unit:℃

	With wiper ring	Without wiper ring
Heat generation temperature	37.1	34.5
Temperature rise	12.2	8.9

Bellows Specifications



(Band type)



(Flanged type)

Bellows Dimensions

Stroke [ ] mm MAX. [ ] mm MIN. [ ] mm

Permissible outer diameter [ϕOD] Desired inner diameter [ϕID]

How It Is Used

Orientation (horizontal, vertical, slant) Speed ( ) mm/sec. min.

Motion (reciprocation, vibration)

Service Conditions

Oil/water resistance (necessary, not necessary)

Oil name [ ]

Chemical resistance Name [ ] × [ ] %

Location (indoor, outdoor)

Remarks

Number of units to be manufactured

11. Precautions on Using the Ball Screw

Handling

(1) Disassembling components may cause dust to enter the system or degrade mounting accuracy of parts. Do not disassemble the product.
(2) Tilting the screw shaft and the ball screw nut may cause them to fall by their self-weights.
(3) Dropping or hitting the Ball Screw may damage the ball circulation section, which may cause functional loss. Giving an impact to the product could also cause damage to its function even if the product looks intact.

Lubrication

(1) Thoroughly remove anti-corrosion oil and feed lubricant before using the product.
(2) Do not mix lubricants of different physical properties.
(3) In locations exposed to constant vibrations or in special environments such as clean rooms, vacuum and low/high temperature, normal lubricants may not be used. Contact THK for details.
(4) When planning to use a special lubricant, contact THK before using it.
(5) Lubrication interval varies according to the service conditions. Contact THK for details.

Precautions on Use

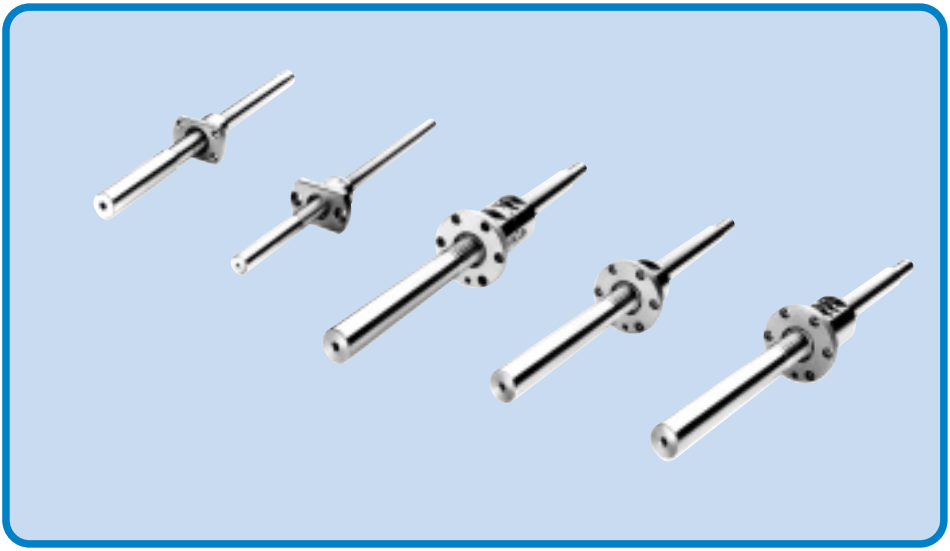
(1) Do not remove the ball screw nut from the ball screw shaft. Doing so may cause the balls or the nut to fall off.
(2) Entrance of foreign matter to the ball screw nut may cause damage to the ball circulating path or functional loss. Prevent foreign matter, such as dust or cutting chips, from entering the system.
(3) If foreign matter adheres to the product, replenish the lubricant after cleaning the product.
(4) When planning to use the product in an environment where the coolant penetrates the spline nut, it may cause trouble to product functions depending on the type of the coolant. Contact THK for details.
(5) Do not use the product at temperature of 80°C or higher. When desiring to use the system at temperature of 80°C or higher, contact THK in advance.
(6) If using the product with vertical mount, the ball screw nut may fall by its self-weight. Attach a mechanism to prevent it from falling.
(7) Using the product at speed exceeding the permissible rotation speed may cause breakage of a component or accident. Be sure to use the product within the specification range designated by THK.
(8) Forcibly driving in the ball screw shaft or the ball screw nut may cause an indentation on the raceway. Use care when mounting components.
(9) If an offset or skewing occurs with the ball screw shaft support and the ball screw nut, it may substantially shorten the service life. Pay much attention to components to be mounted and to the mounting accuracy.
(10) When using the product in locations exposed to constant vibrations or in special environments such as clean rooms, vacuum and low/high temperature, contact THK in advance.
(11) Letting the ball screw nut overrun will cause balls to fall off or the ball-circulating component to be damaged. Be sure not to let it overrun.

Storage

When storing the Ball Screw, enclose it in a package designated by THK and store it in a horizontal orientation while avoiding high temperature, low temperature and high humidity.

Standard-Lead Precision Ball Screw

Standard-Stock Type with Screw Shaft (with Unfinished Shaft Ends)



Structure and Features

This type of Ball Screw is mass manufactured by cutting standardized screw shafts of Precision Ball Screws to regular lengths. Additional machining of the shaft ends can easily be performed.
To meet various intended purposes, THK offers several Ball Screw models with different types of nuts: double-nut type (model BNFN), single-nut type (BNF), offset preload-nut type (model BIF) and miniature Ball Screw (models MDK and MBF).

●Dust Prevention

Nuts of the following model numbers are attached with a labyrinth seal.
●All variations of models BNFN, BNF and BIF
●Model MDK0802/1002/1202/1402/1404/1405
When dust or other foreign matter may enter the Ball Screw, it is necessary to use a dust-prevention device (e.g., bellows) to completely protect the screw shaft.

●Lubrication

Ball screw nuts are supplied with lithium soap-group grease with shipment.
(Model MBF is applied only with anti-corrosion oil.)

●Additional Machining of the Shaft End

Since only the effective thread of the screw shaft is surface-treated with induction hardening (all variations of models BNFN, BNF and BIF; model MDK 1405) or carburizing (all variations of model MBF; model MDK0401 to 1404), the shaft ends can additionally be machined easily either by grinding or milling.
In addition, since both ends of the screw shaft have a center hole, they can be cylindrically ground.

Surface hardness of the effect thread: 58 to 64 HRC
Hardness of the screw shaft ends
All variation of models BNFN, BNF and BIF; model MDK 1405: 22 to 27 HRC
All variations of model MBF; model MDK0401 to 1404: 35 HRC or below
THK has standardized the shapes of the screw shaft ends in order to allow speedy estimation and manufacturing of Ball Screws.
The shapes of shaft ends are divided into those allowing standard support units to be used (symbols H, K and J) and those compliant with JIS B 1192 (symbols A, B and C). See page k-303 for details.

Nut Types and Axial Clearance

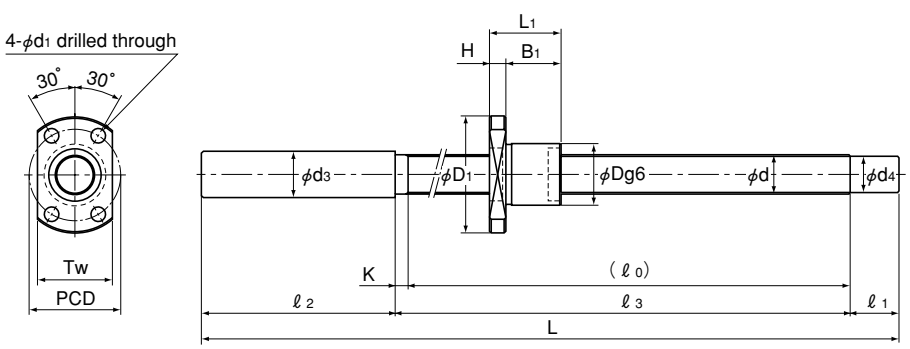
Screw shaft out diameter (mm)	φ4 to 14			
Nut type	Model MDK		Model MBF	
	 Non-preload type		 Non-preload type	
Accuracy grade	C3, C5	C7	C3, C5	C7
Axial clearance (mm)	0.005 or less (GT)	0.02 or less (G2)	0.005 or less (GT)	0.02 or less (G2)
Preload	—		—	

Note: The symbols in the parentheses indicate axial clearance symbols.

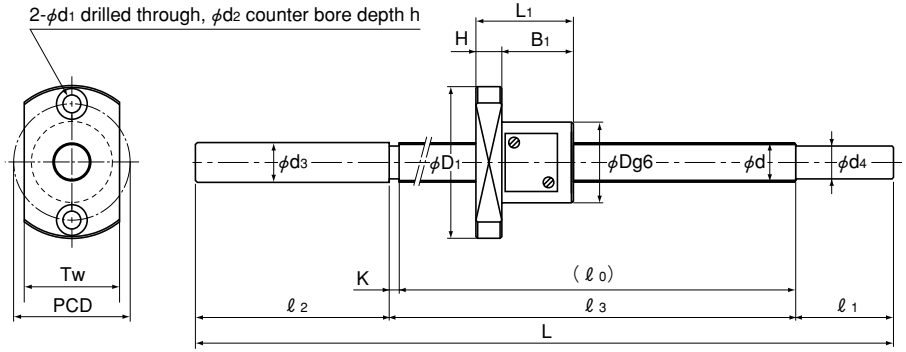
Screw shaft out diameter (mm)	φ16 to 50					
Nut type	Model BIF		Model BNFN		Model BNF	
	 Preload type		 Preload type		 Non-preload type	
Accuracy grade	C5	C7	C5	C7	C5	C7
Axial clearance (mm)	0 or less (G0)	0 or less (G0)	0 or less (G0)	0 or less (G0)	0.01 or less (G1)	0.02 or less (G2)
Preload	0.05Ca	0.05Ca	0.05Ca	0.05Ca	—	—

Note 1: The symbols in the parentheses indicate axial clearance symbols.
Note 2: Symbol "Ca" for preload indicates the basic dynamic load rating.

Type with Unfinished Shaft Ends



Model MDK



Model MBF

Unit: mm

Model No.	Ball Screw specifications							Nut dimensions										Screw shaft dimensions								
	Screw shaft outer diameter d	Lead R	Ball center diameter dp	Thread minor diameter dc	No. of loaded circuits Rows x turns	Basic load rating Ca kN	Basic load rating C0a kN	Outer diameter D	Flange diameter D1	Overall length L1	H	B1	PCD	d1	d2	h	Tw	Standard-stock symbol	Overall length L	ℓ 0	ℓ 1	ℓ 2	ℓ 3	d3	d4	K
MDK 0401-3	4	1	4.15	3.4	3×1	0.29	0.42	9	19	13	3	10	14	2.9	—	—	13	A	95	47	10	35	50	6.2	3.2	3
																			115	67	10	35	70	6.2	3.2	3
																			145	97	10	35	100	6.2	3.2	3
MBF 0401-3.7	4	1	4.15	3.2	1×3.7	0.59	0.93	11	24	18	4	14	17	3.4	6.5	2.5	13	A	90	48	10	30	50	4.3	3.2	2
																			110	68	10	30	70	4.3	3.2	2
																			130	88	10	30	90	4.3	3.2	2
MDK 0601-3	6	1	6.2	5.3	3×1	0.54	1	11	23	14.5	3.5	11	17	3.4	—	—	15	A	120	67	10	40	70	8.2	5.3	3
																			150	97	10	40	100	8.2	5.3	3
																			180	127	10	40	130	8.2	5.3	3
MBF 0601-3.7	6	1	6.15	5.2	1×3.7	0.74	1.5	13	30	21	5	16	21.5	3.4	6.5	3	17	A	131	58	20	50	61	6.3	5.2	3
																			161	88	20	50	91	6.3	5.2	3
																			201	128	20	50	131	6.3	5.2	3

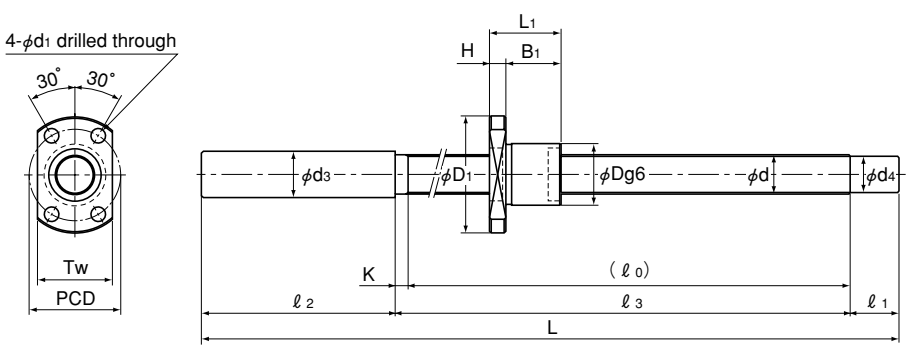
Note Models MDK/MBF 0401 and 0601 are not provided with a labyrinth seal.

Model number coding MDK0401-3 GT +95L C5 A

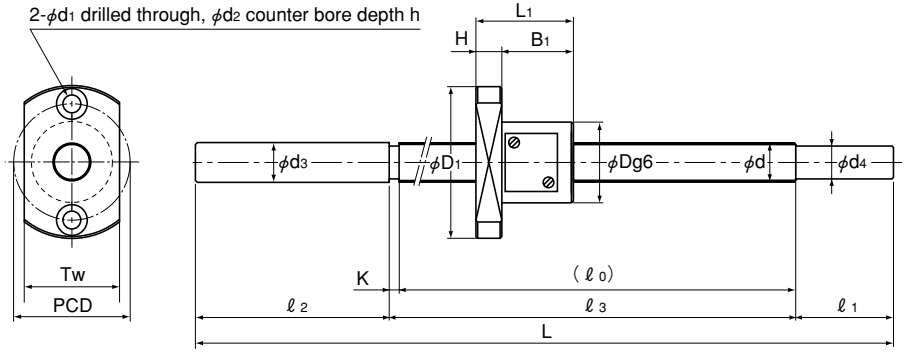
1 2 3 4 5

1 Model number 2 Axial clearance symbol (see page k-15) 3 Overall screw shaft length (in mm)
4 Accuracy symbol (see page k-8) 5 Symbol for standard-stock type (A: with unfinished shaft ends)

Type with Unfinished Shaft Ends



Model MDK



Model MBF

Unit: mm

Model No.	Ball Screw specifications							Nut dimensions										Screw shaft dimensions							
	Screw shaft outer diameter d	Lead R	Ball center diameter dp	Thread minor diameter dc	No. of loaded circuits Rows x turns	Basic load rating Ca kN	Basic load rating C0a kN	Outer diameter D	Flange diameter D1	Overall length L1	H	B1	PCD	d1	d2	h	Tw	Standard-stock symbol	Overall length L	ℓ0	ℓ1	ℓ2	ℓ3	d3	d4	K
MDK 0801-3	8	1	8.2	7.3	3×1	0.64	1.4	13	26	15	4	11	20	3.4	—	—	17	A	130	67	15	45	70	10.2	7.3	3
																			160	97	15	45	100	10.2	7.3	3
																			190	127	15	45	130	10.2	7.3	3
																			240	177	15	45	180	10.2	7.3	3
MDK 0802-3	8	2	8.3	7	3×1	1.4	2.3	15	28	22	5	17	22	3.4	—	—	19	A	140	76	15	45	80	10.2	7	4
																			170	106	15	45	110	10.2	7	4
																			200	136	15	45	140	10.2	7	4
																			250	186	15	45	190	10.2	7	4
MBF 0802-3.7	8	2	8.3	6.4	1×3.7	2.5	4.2	20	40	28	6	22	30	4.5	8	4	24	A	168	85	25	55	88	8.3	6.2	3
																			193	110	25	55	113	8.3	6.2	3
																			218	135	25	55	138	8.3	6.2	3

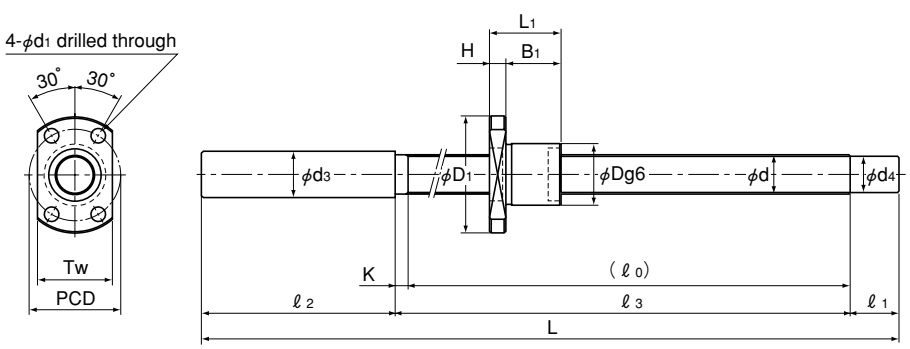
Note Model MDK 0801 is not provided with a labyrinth seal.

Model number coding

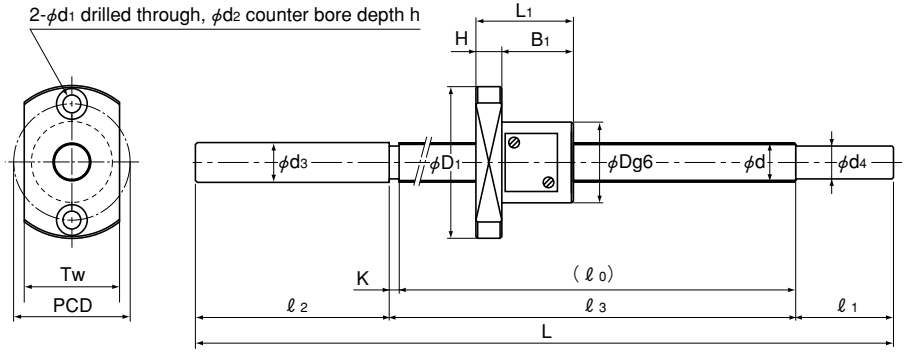
MBF0802-3.7 RR GT +218L C5 A
1 2 3 4 5 6

1 Model number
2 Seal symbol - RR: Labyrinth seal attached to both ends of the ball screw nut (see page k-25)
3 Axial clearance symbol (see page k-15) 4 Overall screw shaft length (in mm)
5 Accuracy symbol (see page k-8) 6 Symbol for standard-stock type (A: with unfinished shaft ends)

Type with Unfinished Shaft Ends



Model MDK



Model MBF

Unit: mm

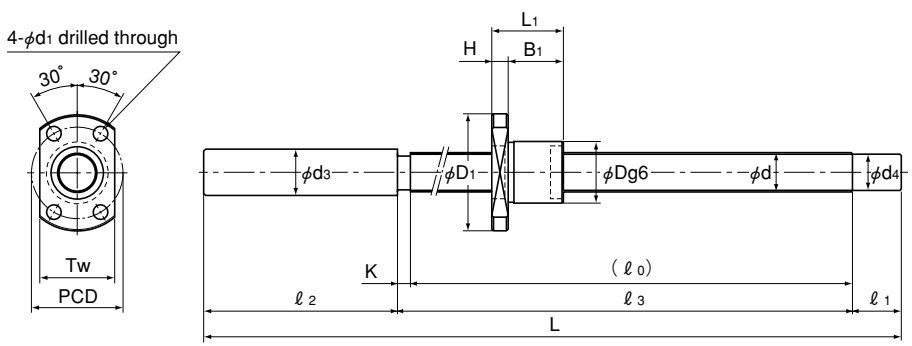
Model No.	Ball Screw specifications							Nut dimensions										Screw shaft dimensions								
	Screw shaft outer diameter d	Lead R	Ball center diameter dp	Thread minor diameter dc	No. of loaded circuits Rows x turns	Basic load rating Ca kN	Basic load rating C0a kN	Outer diameter D	Flange diameter D1	Overall length L1	H	B1	PCD	d1	d2	h	Tw	Standard-stock symbol	Overall length L	ℓ0	ℓ1	ℓ2	ℓ3	d3	d4	K
MDK 1002-3	10	2	10.3	9	3×1	1.5	2.9	17	34	22	5	17	26	4.5	—	—	21	A	160	86	15	55	90	12.2	9	4
																			210	136	15	55	140	12.2	9	4
																			260	186	15	55	190	12.2	9	4
																			310	236	15	55	240	12.2	9	4
MBF 1002-3.7	10	2	10.3	8.6	1×3.7	2.8	5.3	23	43	28	6	22	33	4.5	8	4	27	A	183	95	25	60	98	10.3	8.2	3
																			223	135	25	60	138	10.3	8.2	3
																			273	185	25	60	188	10.3	8.2	3
MDK 1202-3	12	2	12.3	11	3×1	1.7	3.6	19	36	22	5	17	28	4.5	—	—	23	A	165	86	15	60	90	14.2	11	4
																			215	136	15	60	140	14.2	11	4
																			265	186	15	60	190	14.2	11	4
																			315	236	15	60	240	14.2	11	4
																			365	286	15	60	290	14.2	11	4
MBF 1202-3.7	12	2	12.3	10.6	1×3.7	3	6.5	25	47	30	8	22	36	5.5	9.5	5.5	29	A	210	117	30	60	120	12.3	10.2	3
																			235	142	30	60	145	12.3	10.2	3
																			285	192	30	60	195	12.3	10.2	3

Model number coding

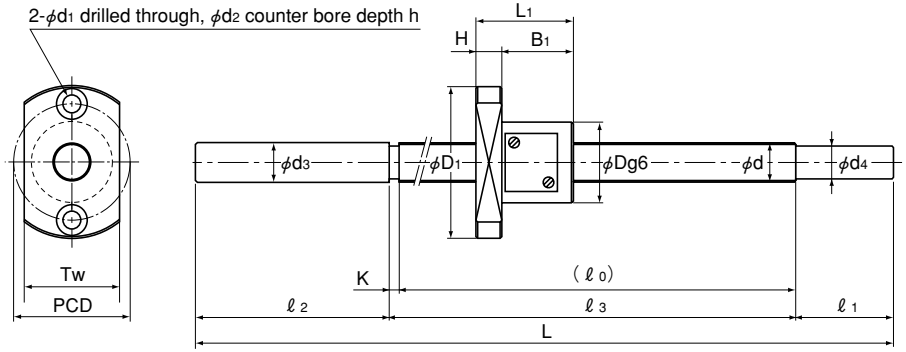
MDK1202-3 RR GT +165L C5 A
1 2 3 4 5 6

1 Model number
2 Seal symbol - RR: Labyrinth seal attached to both ends of the ball screw nut (see page k-25)
3 Axial clearance symbol (see page k-15) 4 Overall screw shaft length (in mm)
5 Accuracy symbol (see page k-8) 6 Symbol for standard-stock type (A: with unfinished shaft ends)

Type with Unfinished Shaft Ends



Model MDK



Model MBF

Unit: mm

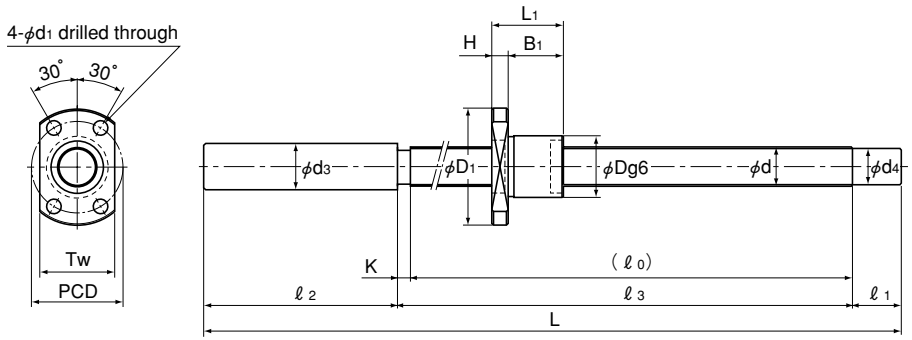
Model No.	Ball Screw specifications							Nut dimensions										Screw shaft dimensions								
	Screw shaft outer diameter d	Lead R	Ball center diameter dp	Thread minor diameter dc	No. of loaded circuits Rows x turns	Basic load rating Ca kN	Basic load rating C0a kN	Outer diameter D	Flange diameter D1	Overall length L1	H	B1	PCD	d1	d2	h	Tw	Standard-stock symbol	Overall length L	ℓ0	ℓ1	ℓ2	ℓ3	d3	d4	K
MDK 1402-3	14	2	14.3	13	3×1	1.8	4.3	21	40	23	6	17	31	5.5	—	—	26	A	175	86	25	60	90	15.2	13	4
																			225	136	25	60	140	15.2	13	4
																			275	186	25	60	190	15.2	13	4
																			325	236	25	60	240	15.2	13	4
																			425	336	25	60	340	15.2	13	4
MBF 1402-3.7	14	2	14.3	12.5	1×3.7	3.3	7.5	26	48	30	8	22	37	5.5	9.5	5.5	32	A	205	102	40	60	105	14.3	12.2	3
																			245	142	40	60	145	14.3	12.2	3
																			295	192	40	60	195	14.3	12.2	3
																			345	242	40	60	245	14.3	12.2	3

Model number coding

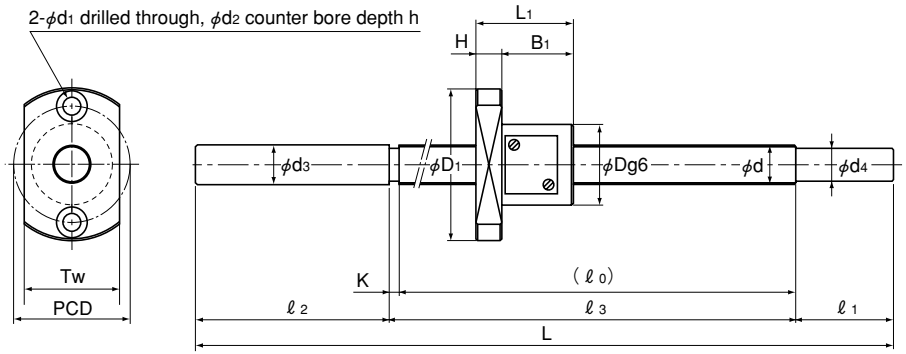
MBF1402-3.7 RR GT +245L C3 A
1 2 3 4 5 6

1 Model number
2 Seal symbol - RR: Labyrinth seal attached to both ends of the ball screw nut (see page k-25)
3 Axial clearance symbol (see page k-15) 4 Overall screw shaft length (in mm)
5 Accuracy symbol (see page k-8) 6 Symbol for standard-stock type (A: with unfinished shaft ends)

Type with Unfinished Shaft Ends



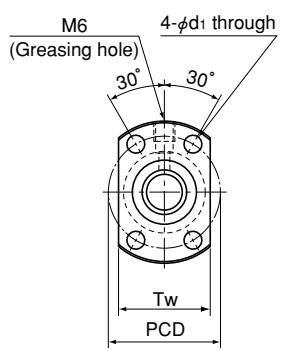
Model MDK

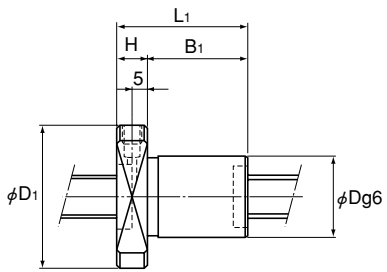


Model MBF

Unit: mm

Model No.	Ball Screw specifications							Nut dimensions									Screw shaft dimensions								
	Screw shaft outer diameter d	Lead R	Ball center diameter dp	Thread minor diameter dc	No. of loaded circuits Rows x turns	Basic load rating Ca kN	Basic load rating C0a kN	Outer diameter D	Flange diameter D1	Overall length L1	H	B1	PCD	d1	d2	h	Tw	Standard-stock symbol	Overall length L	ℓ0	ℓ1	ℓ2	ℓ3	d3	d4	K
MDK 1404-3	14	4	14.65	11.6	3×1	4.2	7.6	26	45	33	6	27	36	5.5	—	—	28	A	240	150	25	60	155	15.2	11.9	5
																			290	200	25	60	205	15.2	11.9	5
																			340	250	25	60	255	15.2	11.9	5
																			440	350	25	60	355	15.2	11.9	5
																			540	450	25	60	455	15.2	11.9	5
MBF 1404-3.7	14	4	14.3	11.8	1×3.7	5.7	11.1	30	54	38	8	30	42	5.5	9.5	5.5	34	A	233	129	40	60	133	14.3	11.2	4
																			293	189	40	60	193	14.3	11.2	4
																			353	249	40	60	253	14.3	11.2	4
																			413	309	40	60	313	14.3	11.2	4
MDK 1405-3	14	5	14.75	11.2	3×1	7	11.6	26	45	42	10	32	36	5.5	—	—	28	A	250	160	25	60	165	14	11.2	5
																			300	210	25	60	215	14	11.2	5
																			350	260	25	60	265	14	11.2	5
																			450	360	25	60	365	14	11.2	5
																			550	460	25	60	465	14	11.2	5





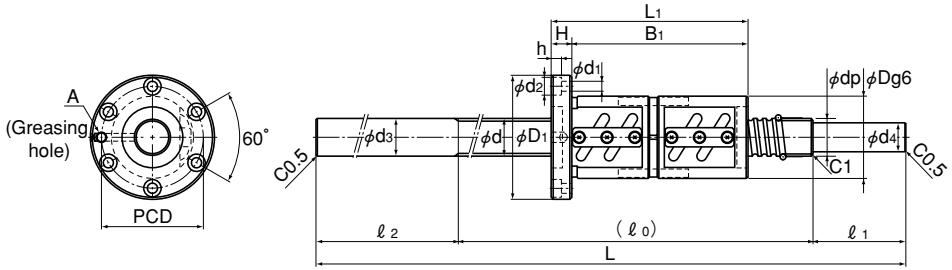
Model MDK 1405

Model number coding

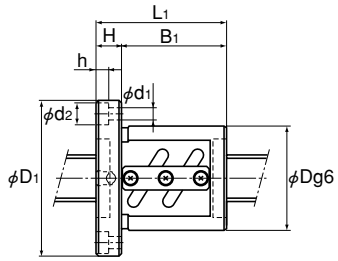
MDK1404-3 RR G2 +240L C7 A
1 2 3 4 5 6

1 Model number
2 Seal symbol - RR: Labyrinth seal attached to both ends of the ball screw nut (see page k-25)
3 Axial clearance symbol (see page k-15) 4 Overall screw shaft length (in mm)
5 Accuracy symbol (see page k-8) 6 Symbol for standard-stock type (A: with unfinished shaft ends)

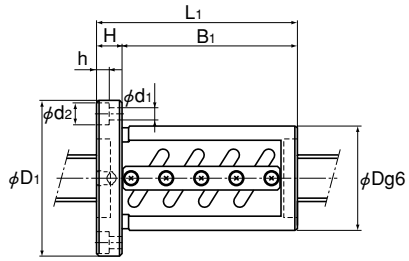
Type with Unfinished Shaft Ends



Model BNFN



Model BNF



Model BIF

Unit: mm

Model No.	Ball Screw specifications								Nut dimensions									Screw shaft dimensions						
	Screw shaft outer diameter d	Lead R	Ball center diameter dp	Thread minor diameter dc	No. of loaded circuits Rows x turns	Basic load rating Ca kN	Basic load rating C0a kN	Applied preload N	Outer diameter D	Flange diameter D1	Overall length L1	H	B1	PCD	d1	d2	h	Greasing hole A	Standard -stock symbol	Overall length L	ℓ0	ℓ1	ℓ2	d3	d4
BNFN 1605-2.5	16	5	16.75	13.2	1X2.5	7.4	13.9	390	40	60	76	10	66	50	4.5	8	4.5	M6	A	410	200	50	160	16	12.8
BNF 1605-2.5								—			41		31							510	300	50	160	16	12.8
BIF 1605-5								390			56		46							610	400	50	160	16	12.8
																				710	500	50	160	16	12.8
BNFN 1810-2.5	18	10	18.8	15.5	1X2.5	7.8	15.9	390	42	65	119	12	107	53	5.5	9.5	5.5	M6	A	410	200	50	160	18	15.3
BNF 1810-2.5					1X2.5	7.8	15.9	—			69		57							510	300	50	160	18	15.3
BIF 1810-3					1X1.5	5.1	9.6	250			75		63							610	400	50	160	18	15.3
																				710	500	50	160	18	15.3
																				810	600	50	160	18	15.3
BNFN 2005-5	20	5	20.75	17.2	2X2.5	15.1	35	740	44	67	106	11	95	55	5.5	9.5	5.5	M6	A	410	200	50	160	20	15.3
																				510	300	50	160	20	15.3
																				610	400	50	160	20	15.3
BNF 2005-5					2X2.5	15.1	35	—			56		45							710	500	50	160	20	15.3
																				810	600	50	160	20	16.8
BIF 2005-5					1X2.5	8.3	17.4	440			56		45							1010	800	50	160	20	16.8
																			B	610	300	50	260	20	16.8
																				710	400	50	260	20	16.8

Model number coding

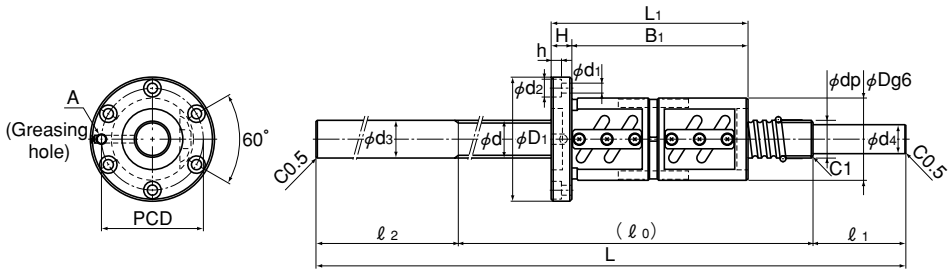
BNFN2005-5 RR G0 +610L C5 A

1 2 3 4 5 6

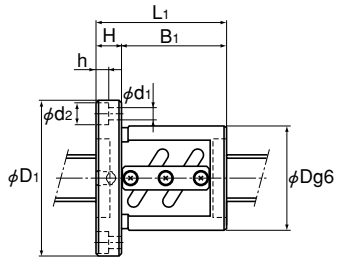
1 Model number
2 Seal symbol - RR: Labyrinth seal attached to both ends of the ball screw nut (see page k-25)
3 Axial clearance symbol (see page k-15) 4 Overall screw shaft length (in mm)
5 Accuracy symbol (see page k-8) 6 Symbol for standard-stock type (symbol A or B)

Selecting a Model Number | Refer to the "THK General Catalog - Technical Descriptions of the Products," provided separately

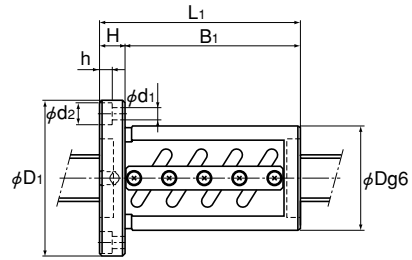
Type with Unfinished Shaft Ends



Model BNFN



Model BNF



Model BIF

Unit: mm

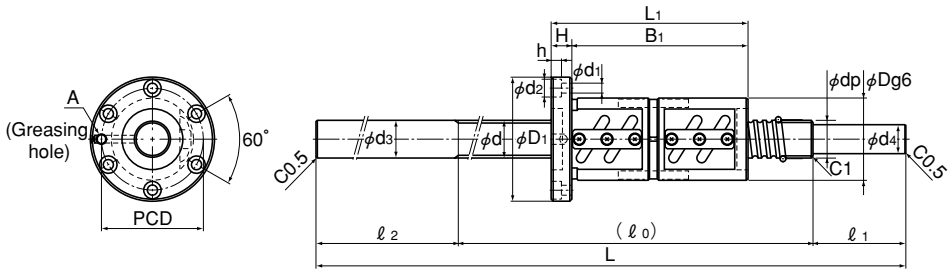
Model No.	Ball Screw specifications: Screw shaft outer diameter d	Lead R	Ball center diameter dp	Thread minor diameter dc	No. of loaded circuits Rows x turns	Basic load rating Ca kN	Basic load rating C0a kN	Applied preload N	Nut dimensions: Outer diameter D	Flange diameter D1	Overall length L1	H	B1	PCD	d1	d2	h	Greasing hole A	Screw shaft dimensions: Standard-stock symbol	Overall length L	ℓ0	ℓ1	ℓ2	d3	d4
BNFN 2505-5					2X2.5	16.7	44	830			105		94							520	300	60	160	25	20.3
																				620	400	60	160	25	20.3
																				720	500	60	160	25	20.3
																				820	600	60	160	25	20.3
BNF 2505-5	25	5	25.75	22.2	2X2.5	16.7	44	—	50	73	55	11	44	61	5.5	9.5	5.5	M6	A	1020	800	60	160	25	21.8
BIF 2505-5					1X2.5	9.2	22	440			55		44							1220	1000	60	160	25	21.8
																				1420	1200	60	160	25	21.8
																			B	720	400	60	260	25	21.8
																				820	500	60	260	25	21.8
BNFN 2510A-2.5								780			120		102							620	400	60	160	25	20.3
																				820	600	60	160	25	20.3
BNF 2510A-2.5	25	10	26.3	21.4	1X2.5	15.8	33	—	58	85	70	18	52	71	6.6	11	6.5	M6	A	1020	800	60	160	25	20.3
BIF 2510A-5								780			100		82							1220	1000	60	160	25	20.3
																				1420	1200	60	160	25	20.3

Model number coding

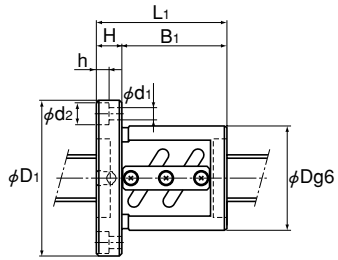
BIF2505-5 RR G0 +720L C5 B
1 2 3 4 5 6

1 Model number
2 Seal symbol - RR: Labyrinth seal attached to both ends of the ball screw nut (see page k-25)
3 Axial clearance symbol (see page k-15) 4 Overall screw shaft length (in mm)
5 Accuracy symbol (see page k-8) 6 Symbol for standard-stock type (Symbol A or B)

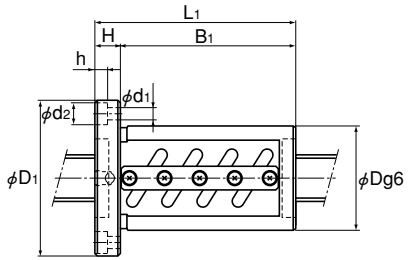
Type with Unfinished Shaft Ends



Model BNFN



Model BNF



Model BIF

Unit: mm

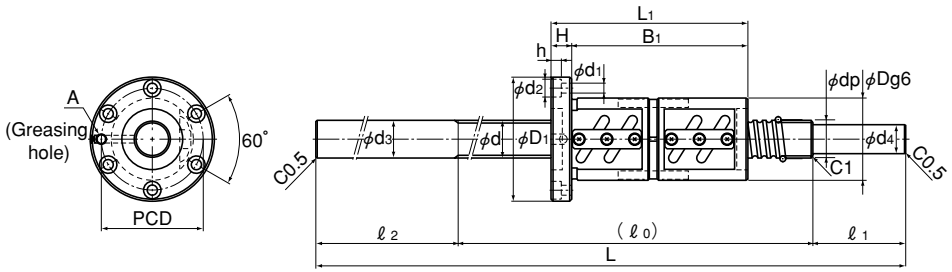
Model No.	Ball Screw specifications								Nut dimensions									Screw shaft dimensions						
	Screw shaft outer diameter d	Lead R	Ball center diameter dp	Thread minor diameter dc	No. of loaded circuits Rows x turns	Basic load rating Ca kN	Basic load rating C0a kN	Applied preload N	Outer diameter D	Flange diameter D1	Overall length L1	H	B1	PCD	d1	d2	h	Greasing hole A	Standard-stock symbol	Overall length L	ℓ0	ℓ1	ℓ2	d3	d4
BNFN 2806-5	28	6	28.75	25.2	2X2.5	17.5	49.4	880	55	85	122	12	110	69	6.6	11	6.5	M6	A	520	300	60	160	28	20.3
																				620	400	60	160	28	20.3
																				720	500	60	160	28	20.3
BNF 2806-5					2X2.5	17.5	49.4	—			68		56							920	700	60	160	28	20.3
BIF 2806-5					1X2.5	9.6	24.6	490			68		56							1020	800	60	160	28	24.8
BIF 2806-10					2X2.5	17.5	49.4	880			104		92							1220	1000	60	160	28	24.8
																				1420	1200	60	160	28	24.8
																			B	720	400	70	250	28	24.8
																				920	500	70	350	28	24.8
																				1100	700	70	330	28	24.8
BNFN 3205-5	32	5	32.75	29.2	2X2.5	18.5	56.4	930	58	85	106	12	94	71	6.6	11	6.5	M6	A	730	500	70	160	32	25.3
																				930	700	70	160	32	25.3
BNF 3205-5					2X2.5	18.5	56.4	—			56		44							1230	1000	70	160	32	25.3
BIF 3205-5					1X2.5	10.2	28.1	490			56		44							1430	1200	70	160	32	25.3
BIF 3205-10					2X2.5	18.5	56.4	930			86		74							1630	1400	70	160	32	27.8
																				1830	1600	70	160	32	27.8

Model number coding

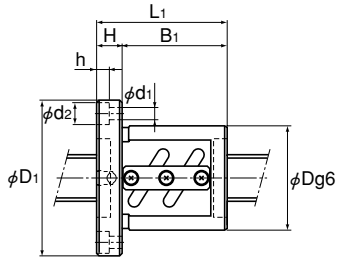
BNFN2806-5 RR G0 +1020L C5 A
1 2 3 4 5 6

1 Model number
2 Seal symbol - RR: Labyrinth seal attached to both ends of the ball screw nut (see page k-25)
3 Axial clearance symbol (see page k-15) 4 Overall screw shaft length (in mm)
5 Accuracy symbol (see page k-8) 6 Symbol for standard-stock type (Symbol A or B)

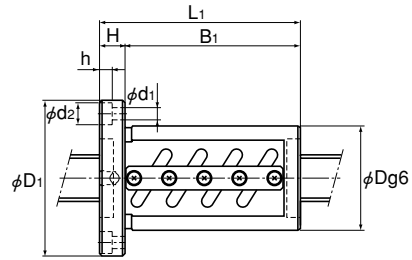
Type with Unfinished Shaft Ends



Model BNFN



Model BNF



Model BIF

Unit: mm

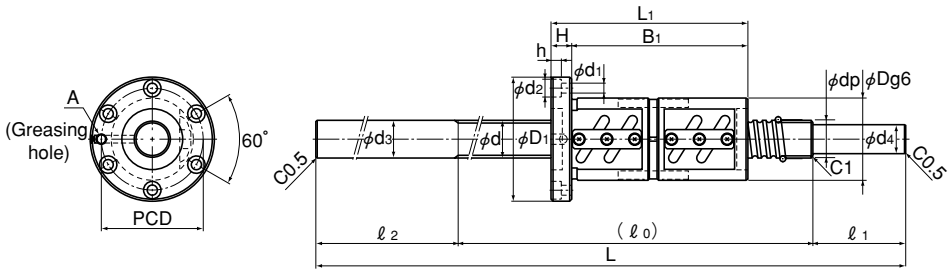
Model No.	Ball Screw specifications								Nut dimensions									Screw shaft dimensions						
	Screw shaft outer diameter d	Lead R	Ball center diameter dp	Thread minor diameter dc	No. of loaded circuits Rows x turns	Basic load rating Ca kN	Basic load rating C0a kN	Applied preload N	Outer diameter D	Flange diameter D1	Overall length L1	H	B1	PCD	d1	d2	h	Greasing hole A	Standard-stock symbol	Overall length L	ℓ0	ℓ1	ℓ2	d3	d4
BNFN 3206-5	32	6	33	28.4	2X2.5	25.2	70.4	1270	62	89	123	12	111	75	6.6	11	6.5	M6	A	730	500	70	160	32	25.3
																				930	700	70	160	32	25.3
																				1230	1000	70	160	32	25.3
																				1430	1200	70	160	32	25.3
BNF 3206-5					2X2.5	25.2	70.4	—			63		51							1630	1400	70	160	32	27.8
																				1830	1600	70	160	32	27.8
BIF 3206-5					1X2.5	13.9	35.2	690			63		51							930	500	70	360	32	27.8
BIF 3206-10					2X2.5	25.2	70.4	1270			99		87						B	1100	700	70	330	32	27.8
																				1430	1000	70	360	32	27.8
BNFN 3210A-5	32	10	33.75	26.4	2X2.5	47.2	112.7	2350	74	108	190	15	175	90	9	14	8.5	M6	A	730	500	70	160	32	25.3
BNF 3210A-5					2X2.5	47.2	112.7	—			100		85							930	700	70	160	32	25.3
																				1430	1200	70	160	32	25.3
BIF 3210A-5					1X2.5	26.1	56.2	1270			100		85							1830	1600	70	160	32	25.3

Model number coding

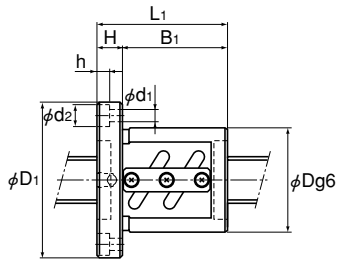
BNFN3206-5 RR G0 +1100L C5 B
1 2 3 4 5 6

1 Model number
2 Seal symbol - RR: Labyrinth seal attached to both ends of the ball screw nut (see page k-25)
3 Axial clearance symbol (see page k-15) 4 Overall screw shaft length (in mm)
5 Accuracy symbol (see page k-8) 6 Symbol for standard-stock type (Symbol A or B)

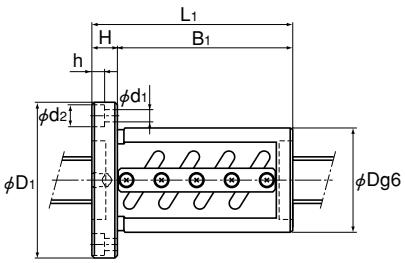
Type with Unfinished Shaft Ends



Model BNFN



Model BNF



Model BIF

Unit: mm

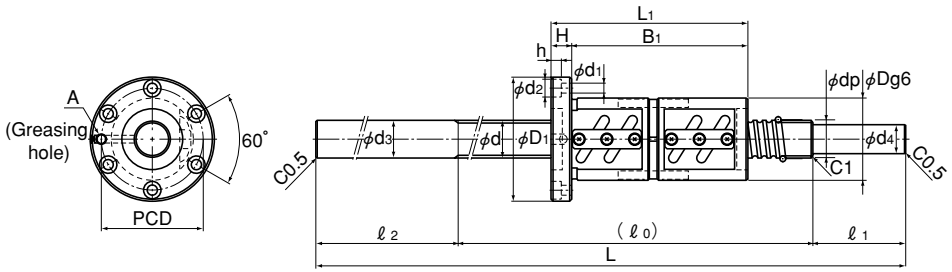
Model No.	Ball Screw specifications: Screw shaft outer diameter d	Lead R	Ball center diameter dp	Thread minor diameter dc	No. of loaded circuits Rows x turns	Basic load rating Ca kN	Basic load rating C0a kN	Applied preload N	Nut dimensions: Outer diameter D	Flange diameter D1	Overall length L1	H	B1	PCD	d1	d2	h	Greasing hole A	Screw shaft dimensions: Standard-stock symbol	Overall length L	ℓ0	ℓ1	ℓ2	d3	d4
BNFN 3610-5	36	10	37.75	30.5	2X2.5	50.1	126.4	2500	75	120	201	18	183	98	11	17.5	11	M6	A	730	500	70	160	36	30.3
																				930	700	70	160	36	30.3
BNF 3610-5					2X2.5	50.1	126.4	—			111		93							1430	1200	70	160	36	30.3
BIF 3610-5					1X2.5	27.6	63.3	1370			111		93							1830	1600	70	160	36	30.3
BIF 3610-10					2X2.5	50.1	126.4	2500			171		153						B	930	500	100	330	36	30.3
																				1100	700	100	300	36	30.3
																				1830	1200	100	530	36	30.3
BNFN 4010-5	40	10	41.75	34.4	2X2.5	52.7	141.1	2650	82	124	193	18	175	102	11	17.5	11	M6	A	1230	1000	70	160	40	30.3
BNF 4010-5					2X2.5	52.7	141.1	—			103		85							1730	1500	70	160	40	30.3
BIF 4010-5					1X2.5	29	70.4	1470			103		85							2030	1800	70	160	40	30.3
BIF 4010-10					2X2.5	52.7	141.1	2650			163		145							2230	2000	70	160	40	30.3

Model number coding

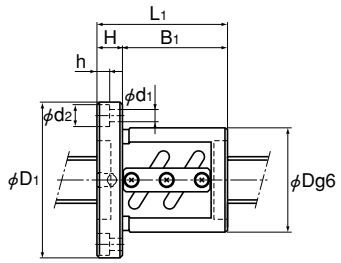
BIF3610-5 RR G0 +1830L C5 A
1 2 3 4 5 6

1 Model number
2 Seal symbol - RR: Labyrinth seal attached to both ends of the ball screw nut (see page k-25)
3 Axial clearance symbol (see page k-15) 4 Overall screw shaft length (in mm)
5 Accuracy symbol (see page k-8) 6 Symbol for standard-stock type (Symbol A or B)

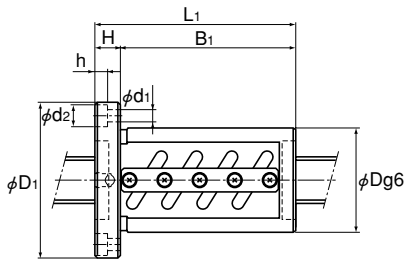
Type with Unfinished Shaft Ends



Model BNFN



Model BNF



Model BIF

Unit: mm

Model No.	Ball Screw specifications								Nut dimensions									Screw shaft dimensions						
	Screw shaft outer diameter d	Lead R	Ball center diameter dp	Thread minor diameter dc	No. of loaded circuits Rows x turns	Basic load rating Ca kN	Basic load rating C0a kN	Applied preload N	Outer diameter D	Flange diameter D1	Overall length L1	H	B1	PCD	d1	d2	h	Greasing hole A	Standard-stock symbol	Overall length L	ℓ0	ℓ1	ℓ2	d3	d4
BNFN 4012-5	40	12	42	34.1	2×2.5	61.6	158.8	3090	84	126	227	18	209	104	11	17.5	11	M6	A	1230	1000	70	160	40	30.3
BNF 4012-5					2×2.5	61.6	158.8	—			119		101							1730	1500	70	160	40	30.3
BIF 4012-5					1×2.5	33.9	79.2	1720			119		101							2030	1800	70	160	40	30.3
BIF 4012-10					2×2.5	61.6	158.8	3090			191		173							2230	2000	70	160	40	30.3
																			B	1730	1200	100	430	40	33.8
																				2030	1200	100	730	40	33.8
BNFN 5010-5	50	10	51.75	44.4	2×2.5	58.2	176.4	2890	93	135	193	18	175	113	11	17.5	11	PT1/8	A	1300	1000	100	200	50	40.3
BNF 5010-5					2×2.5	58.2	176.4	—			103		85							1800	1500	100	200	50	40.3
BIF 5010-5					1×2.5	32	88.2	1620			103		85							2300	2000	100	200	50	40.3
BIF 5010-10					2×2.5	58.2	176.4	2890			163		145							2800	2500	100	200	50	40.3

Model number coding

BNFN4012-5 RR G0 +1230L C5 A
1 2 3 4 5 6

1 Model number
2 Seal symbol - RR: Labyrinth seal attached to both ends of the ball screw nut (see page k-25)
3 Axial clearance symbol (see page k-15) 4 Overall screw shaft length (in mm)
5 Accuracy symbol (see page k-8) 6 Symbol for standard-stock type (Symbol A or B)

Standard-Lead Precision Ball Screw

Standard-Stock Type with Screw Shaft (with Finished Shaft Ends)

To meet the space-saving requirement, this type of Ball Screw has a standardized screw shaft and a ball screw nut. The ends of the screw shaft are standardized to fit the corresponding support unit. The shaft support method with models BNK0401, 0501 and 0601 is "fixed-free," while other models use the "fixed-supported" method with the shaft directly coupled with the motor.
Screw shafts and nuts are compactly designed. When a support unit and a nut bracket are combined with a Ball Screw, the assembly can be mounted on your machine as it is. Thus, a high-accuracy deed mechanism can easily be achieved.

Table of Ball Screw Types with Finished Shaft Ends and the Corresponding Support Units and Nut Brackets

Model No.		BNK 0401	0501	0601	0801	0802	0810	1002	1004	1010	1202	1205	1208	1402	1404	1408	1510	1520	1616	2010	2020	2520
Accuracy grade		C3, C5, C7	C3, C5, C7	C3, C5, C7	C3, C5, C7	C3, C5, C7	C5, C7	C3, C5, C7	C3, C5, C7	C5, C7	C3, C5, C7	C3, C5, C7	C7	C3, C5, C7	C3, C5, C7	C5, C7	C5, C7	C5, C7	C5, C7	C5, C7	C5, C7	C5, C7
Axial clearance*		G0 GT G2	G0 GT G2	G0 GT G2	G0 GT G2	G0 GT G2	— GT G2	G0 GT G2	G0 GT G2	G0 GT G2	G0 GT G2	G0 GT G2	— — G2	G0 GT G2	G0 GT G2	G0 GT G2	G0 GT G2	G0 GT G2	G0 GT G2	G0 GT G2	G0 GT G2	G0 GT G2
Stroke (mm)	20	●	●																			
	30		●																			
	40	●	●	●	●	●																
	50		●					●	●		●	●	●	●								
	60		●																			
	70	●	●	●	●	●							●									
	100			●	●	●	●	●	●	●	●	●	●	●	●							
	120						●						●									
	150				●	●	●	●	●	●	●	●	●	●	●	●	●	●	●			
	170						●						●									
	200						●	●	●	●	●	●	●	●	●	●	●	●	●			
	250						●		●	●	●	●	●			●	●	●	●			
	300						●			●				●	●	●	●	●	●	●	●	
	350															●	●	●	●			
	400														●	●	●	●	●	●	●	
	450															●	●	●	●			
	500															●	●	●	●	●	●	●
	550															●	●	●	●			
	600															●	●	●	●	●	●	●
	700															●	●	●	●	●	●	
	800																●	●	●	●	●	●
	900																			●	●	
	1000																			●	●	●
	1100																			●	●	
	1200																					●
	1400																					●
	1600																					●
Support unit: square on fixed side		EK4	EK4	EK5	EK6	EK6	EK6	EK8	EK10	EK10	EK10	EK10	EK10	EK12	EK12	EK12	EK12	EK12	EK12	EK15	EK15	EK20
Support unit: round on fixed side		FK4	FK4	FK5	FK6	FK6	FK6	FK8	FK10	FK10	FK10	FK10	FK10	FK12	FK12	FK12	FK12	FK12	FK12	FK15	FK15	FK20
Support unit: square on supported side		—	—	—	EF6	EF6	EF6	EF8	EF10	EF10	EF10	EF10	EF10	EF12	EF12	EF12	EF12	EF12	EF12	EF15	EF15	EF20
Support unit: round on supported side		—	—	—	FF6	FF6	FF6	FF6	FF10	FF10	FF10	FF10	FF10	FF12	FF12	FF12	FF12	FF12	FF12	FF15	FF15	FF20
Nut bracket		—	—	—	—	—	—	—	MC1004	MC1004	—	MC1205	MC1205	—	—	MC1408	MC1408	MC1408	MC1408	MC2010	MC2020	—

Note: Axial clearance G0: 0 or less
GT: 0.005 mm or less
G2: 0.02 mm or less

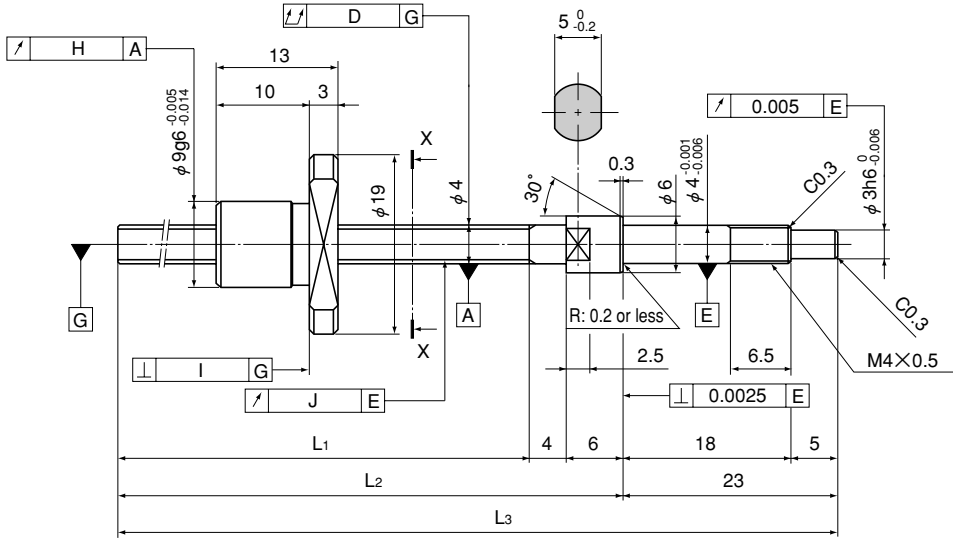
For details of the support unit and the nut bracket, see pages k-274 - and pages k-296 -, respectively.

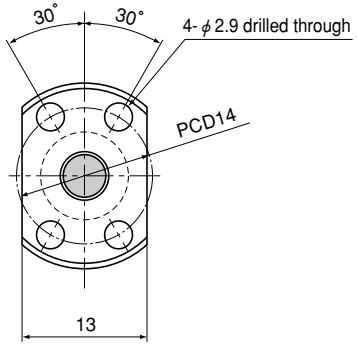
Dust Prevention and Lubrication

Each ball screw nut contains a right amount of grease. In addition, the ball nuts of model BNK0802 or higher contain a labyrinth seal (with models BNK1510, BNK1520, BNK1616, BNK2020 and BNK2520, the end cap also serves as a labyrinth seal).
When foreign matter may enter the screw nut, it is necessary to use a dust-prevention device (e.g., bellows) to completely protect the screw shaft.

Model BNK0401-3

Shaft diameter: 4; lead: 1





X-X arrow view

Ball Screw Specifications			
Lead (mm)	1		
BCD (mm)	4.15		
Thread minor diameter (mm)	3.4		
Threading direction, No. of threaded grooves	Rightward, 1		
No. of circuits	1 turn x 3 rows		
Clearance symbol	G0	GT	G2
Axial clearance (mm)	0	0.005 or less	0.02 or less
Basic dynamic load rating Ca (kN)	0.29	0.29	0.29
Basic static load rating C0a (kN)	0.42	0.42	0.42
Preload torque (N-m)	9.8 x 10^{-3} max	—	—
Spacer ball	None	None	None

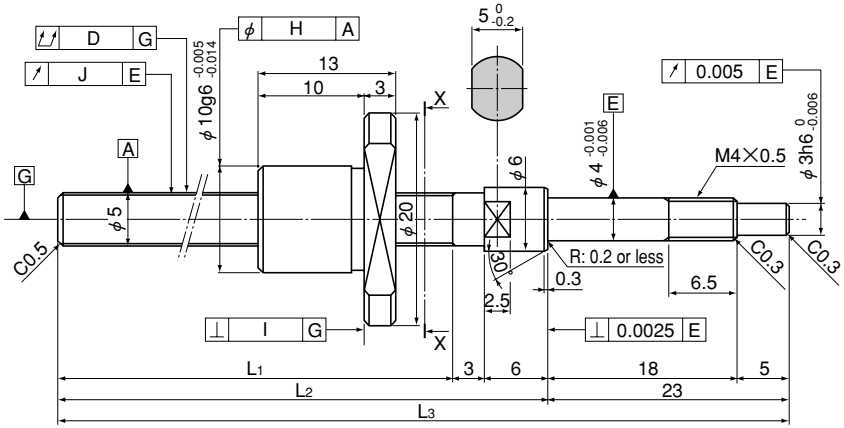
Unit: mm

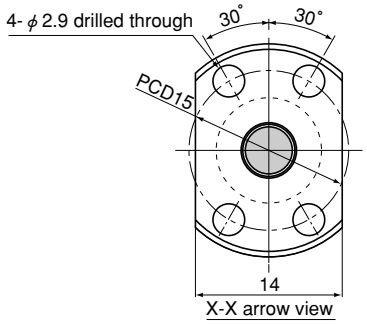
Model No.	Stroke	Screw shaft length L_1	L_2	L_3	Run-out of the screw shaft axis D	Run-out of the nut circumference H	Flange perpendicularity I	Run-out of the thread groove surface J	Lead accuracy: Representative travel distance error	Lead accuracy: Fluctuation
BNK 0401-3G0+77LC3Y	20	44	54	77	0.015	0.009	0.008	0.008	±0.008	0.008
BNK 0401-3G0+77LC5Y					0.025	0.012	0.01	0.01	±0.018	0.018
BNK 0401-3G2+77LC7Y					0.035	0.02	0.014	0.014	Travel distance error: ±0.05/300	
BNK 0401-3G0+97LC3Y	40	64	74	97	0.02	0.009	0.008	0.008	±0.008	0.008
BNK 0401-3G0+97LC5Y					0.025	0.012	0.01	0.01	±0.018	0.018
BNK 0401-3G2+97LC7Y					0.035	0.02	0.014	0.014	Travel distance error: ±0.05/300	
BNK 0401-3G0+127LC3Y	70	94	104	127	0.025	0.009	0.008	0.008	±0.008	0.008
BNK 0401-3G0+127LC5Y					0.035	0.012	0.01	0.01	±0.018	0.018
BNK 0401-3G2+127LC7Y					0.05	0.02	0.014	0.014	Travel distance error: ±0.05/300	

Note A stainless steel type is also available for model BNK0401. When placing an order, add symbol "M" to the end of the model number.
(Example) BNK0401-3G0+77LC3Y M
Symbol for stainless steel type
For accuracy grades C3 and C5, clearance GT is also standardized.

Model BNK0501-3

Shaft diameter: 5; lead: 1





Ball Screw Specifications			
Lead (mm)	1		
BCD (mm)	5.15		
Thread minor diameter (mm)	4.4		
Threading direction, No. of threaded grooves	Rightward, 1		
No. of circuits	1 turn x 3 rows		
Clearance symbol	G0	GT	G2
Axial clearance (mm)	0	0.005 or less	0.02 or less
Basic dynamic load rating Ca (kN)	0.32	0.32	0.32
Basic static load rating C0a (kN)	0.55	0.55	0.55
Preload torque (N-m)	9.8 x 10^{-3} max	—	—
Spacer ball	None	None	None

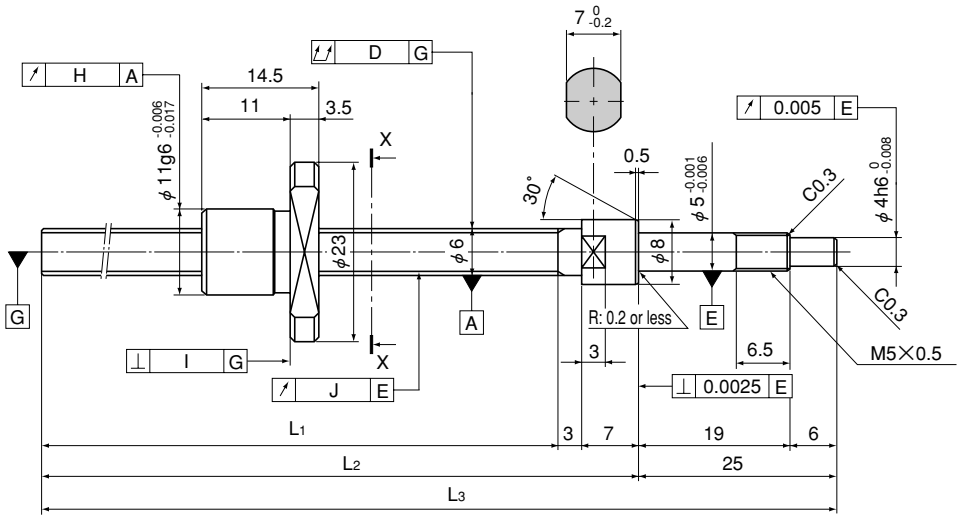
Unit: mm

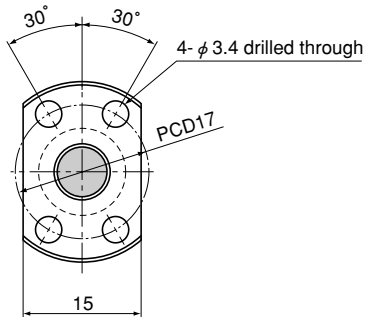
Model No.	Stroke	Screw shaft length			Run-out of the screw shaft axis	Run-out of the nut circumference	Flange perpendicularity	Run-out of the thread groove surface	Lead accuracy	
		L_1	L_2	L_3	D	H	I	J	Representative travel distance error	Fluctuation
BNK 0501-3G0+77LC3Y	20	45	54	77	0.015	0.009	0.008	0.008	±0.008	0.008
BNK 0501-3G0+77LC5Y					0.025	0.012	0.01	0.01	±0.018	0.018
BNK 0501-3G2+77LC7Y					0.035	0.02	0.014	0.014	Travel distance error: ±0.05/300	
BNK 0501-3G0+97LC3Y	40	65	74	97	0.02	0.009	0.008	0.008	±0.008	0.008
BNK 0501-3G0+97LC5Y					0.025	0.012	0.01	0.01	±0.018	0.018
BNK 0501-3G2+97LC7Y					0.035	0.02	0.014	0.014	Travel distance error: ±0.05/300	
BNK 0501-3G0+127LC3Y	70	95	104	127	0.025	0.009	0.008	0.008	±0.008	0.008
BNK 0501-3G0+127LC5Y					0.035	0.012	0.01	0.01	±0.018	0.018
BNK 0501-3G2+127LC7Y					0.05	0.02	0.014	0.014	Travel distance error: ±0.05/300	

Note A stainless steel type is also available for model BNK0501. When placing an order, add symbol "M" to the end of the model number.
(Example) BNK0501-3G0+77LC3Y M
Symbol for stainless steel type
For accuracy grades C3 and C5, clearance GT is also standardized.

Model BNK0601-3

Shaft diameter: 6; lead: 1





X-X arrow view

Ball Screw Specifications			
Lead (mm)	1		
BCD (mm)	6.2		
Thread minor diameter (mm)	5.3		
Threading direction, No. of threaded grooves	Rightward, 1		
No. of circuits	1 turn x 3 rows		
Clearance symbol	G0	GT	G2
Axial clearance (mm)	0	0.005 or less	0.02 or less
Basic dynamic load rating Ca (kN)	0.54	0.54	0.54
Basic static load rating C0a (kN)	0.94	0.94	0.94
Preload torque (N-m)	1.3 x 10⁻³ max	—	—
Spacer ball	None	None	None

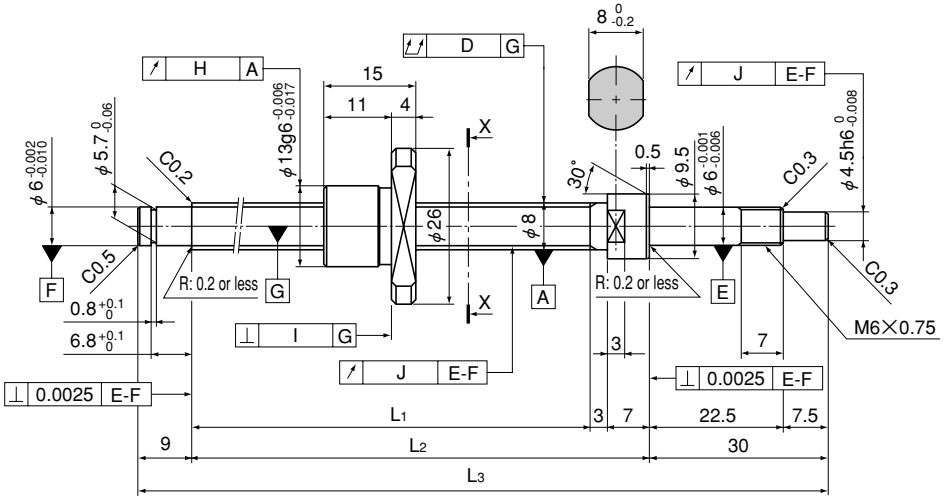
Unit: mm

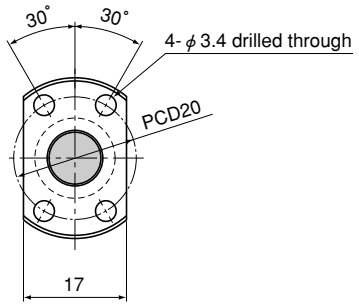
Model No.	Stroke	Screw shaft length			Run-out of the screw shaft axis	Run-out of the nut circumference	Flange perpendicularity	Run-out of the thread groove surface	Lead accuracy	
		L_1	L_2	L_3	D	H	I	J	Representative travel distance error	Fluctuation
BNK 0601-3G0+100LC3Y	40	65	75	100	0.015	0.009	0.008	0.008	±0.008	0.008
BNK 0601-3G0+100LC5Y					0.025	0.012	0.01	0.01	±0.018	0.018
BNK 0601-3G2+100LC7Y					0.035	0.02	0.014	0.014	Travel distance error: ±0.05/300	
BNK 0601-3G0+130LC3Y	70	95	105	130	0.02	0.009	0.008	0.008	±0.008	0.008
BNK 0601-3G0+130LC5Y					0.035	0.012	0.01	0.01	±0.018	0.018
BNK 0601-3G2+130LC7Y					0.05	0.02	0.014	0.014	Travel distance error: ±0.05/300	
BNK 0601-3G0+160LC3Y	100	125	135	160	0.025	0.009	0.008	0.008	±0.01	0.008
BNK 0601-3G0+160LC5Y					0.035	0.012	0.01	0.01	±0.02	0.018
BNK 0601-3G2+160LC7Y					0.05	0.02	0.014	0.014	Travel distance error: ±0.05/300	

Note A stainless steel type is also available for model BNK0601. When placing an order, add symbol "M" to the end of the model number.
(Example) BNK0601-3G0+100LC3Y M
Symbol for stainless steel type
For accuracy grades C3 and C5, clearance GT is also standardized.

Model BNK0801-3

Shaft diameter: 8; lead: 1





X-X arrow view

Ball Screw Specifications			
Lead (mm)	1		
BCD (mm)	8.2		
Thread minor diameter (mm)	7.3		
Threading direction, No. of threaded grooves	Rightward, 1		
No. of circuits	1 turn x 3 rows		
Clearance symbol	G0	GT	G2
Axial clearance (mm)	0	0.005 or less	0.02 or less
Basic dynamic load rating Ca (kN)	0.64	0.64	0.64
Basic static load rating C0a (kN)	1.4	1.4	1.4
Preload torque (N-m)	1.8 x 10⁻³ max	—	—
Spacer ball	None	None	None

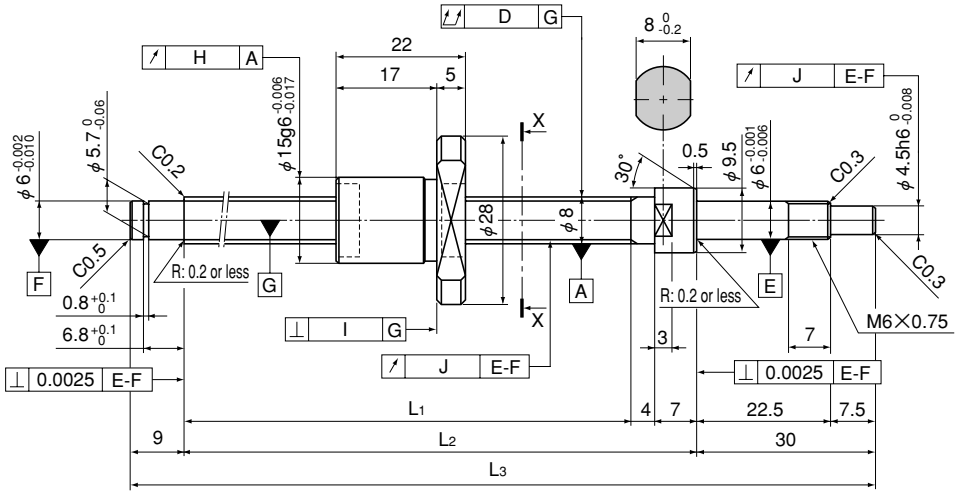
Unit: mm

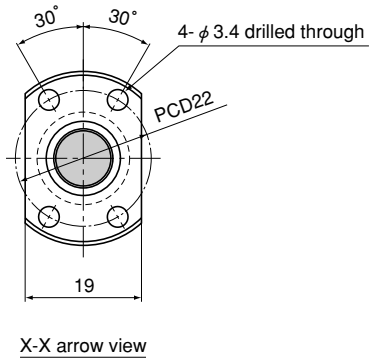
Model No.	Stroke	Screw shaft length L1	Screw shaft length L2	Screw shaft length L3	Run-out of the screw shaft axis D	Run-out of the nut circumference H	Flange perpendicularity I	Run-out of the thread groove surface J	Lead accuracy: Representative travel distance error	Lead accuracy: Fluctuation
BNK 0801-3G0+115LC3Y	40	66	76	115	0.025	0.009	0.008	0.008	±0.008	0.008
BNK 0801-3G0+115LC5Y					0.025	0.012	0.01	0.01	±0.018	0.018
BNK 0801-3G2+115LC7Y					0.035	0.02	0.014	0.014	Travel distance error: ±0.05/300	
BNK 0801-3G0+145LC3Y	70	96	106	145	0.03	0.009	0.008	0.008	±0.008	0.008
BNK 0801-3G0+145LC5Y					0.035	0.012	0.01	0.01	±0.018	0.018
BNK 0801-3G2+145LC7Y					0.05	0.02	0.014	0.014	Travel distance error: ±0.05/300	
BNK 0801-3G0+175LC3Y	100	126	136	175	0.03	0.009	0.008	0.008	±0.01	0.008
BNK 0801-3G0+175LC5Y					0.035	0.012	0.01	0.01	±0.02	0.018
BNK 0801-3G2+175LC7Y					0.05	0.02	0.014	0.014	Travel distance error: ±0.05/300	
BNK 0801-3G0+225LC3Y	150	176	186	225	0.035	0.009	0.008	0.008	±0.01	0.008
BNK 0801-3G0+225LC5Y					0.05	0.012	0.01	0.01	±0.02	0.018
BNK 0801-3G2+225LC7Y					0.065	0.02	0.014	0.014	Travel distance error: ±0.05/300	

Note A stainless steel type is also available for model BNK0801. When placing an order, add symbol "M" to the end of the model number.
(Example) BNK0801-3G0+115LC3Y M
Symbol for stainless steel type
For accuracy grades C3 and C5, clearance GT is also standardized.

Model BNK0802-3

Shaft diameter: 8; lead: 2





X-X arrow view

Ball Screw Specifications			
Lead (mm)	2		
BCD (mm)	8.3		
Thread minor diameter (mm)	7		
Threading direction, No. of threaded grooves	Rightward, 1		
No. of circuits	1 turn x 3 rows		
Clearance symbol	G0	GT	G2
Axial clearance (mm)	0	0.005 or less	0.02 or less
Basic dynamic load rating Ca (kN)	1.4	1.4	1.4
Basic static load rating C0a (kN)	2.3	2.3	2.3
Preload torque (N-m)	2 x 10^{-2} max	—	—
Spacer ball	None	None	None

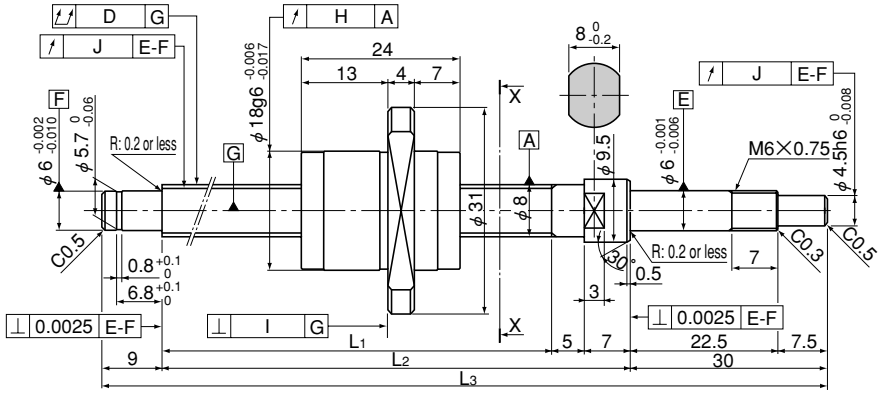
Unit: mm

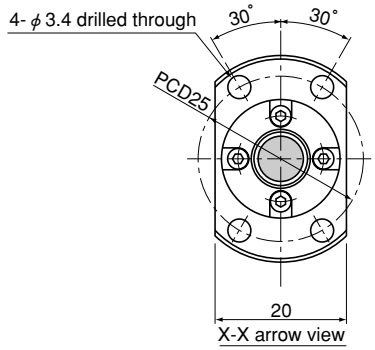
Model No.	Stroke	Screw shaft length L1	L2	L3	Run-out of the screw shaft axis D	Run-out of the nut circumference H	Flange perpendicularity I	Run-out of the thread groove surface J	Lead accuracy: Representative travel distance error	Lead accuracy: Fluctuation
BNK 0802-3RRG0+125LC3Y	40	75	86	125	0.025	0.009	0.008	0.008	±0.008	0.008
BNK 0802-3RRG0+125LC5Y					0.025	0.012	0.01	0.01	±0.018	0.018
BNK 0802-3RRG2+125LC7Y					0.035	0.02	0.014	0.014	Travel distance error: ±0.05/300	
BNK 0802-3RRG0+155LC3Y	70	105	116	155	0.03	0.009	0.008	0.008	±0.01	0.008
BNK 0802-3RRG0+155LC5Y					0.035	0.012	0.01	0.01	±0.02	0.018
BNK 0802-3RRG2+155LC7Y					0.05	0.02	0.014	0.014	Travel distance error: ±0.05/300	
BNK 0802-3RRG0+185LC3Y	100	135	146	185	0.03	0.009	0.008	0.008	±0.01	0.008
BNK 0802-3RRG0+185LC5Y					0.035	0.012	0.01	0.01	±0.02	0.018
BNK 0802-3RRG2+185LC7Y					0.05	0.02	0.014	0.014	Travel distance error: ±0.05/300	
BNK 0802-3RRG0+235LC3Y	150	185	196	235	0.035	0.009	0.008	0.008	±0.01	0.008
BNK 0802-3RRG0+235LC5Y					0.05	0.012	0.01	0.01	±0.02	0.018
BNK 0802-3RRG2+235LC7Y					0.065	0.02	0.014	0.014	Travel distance error: ±0.05/300	

Note A stainless steel type is also available for model BNK0802. When placing an order, add symbol "M" to the end of the model number.
(Example) BNK0802-3RRG0+125LC3Y M
Symbol for stainless steel type
For accuracy grades C3 and C5, clearance GT is also standardized.

Model BNK0810-3

Shaft diameter: 8; lead: 10





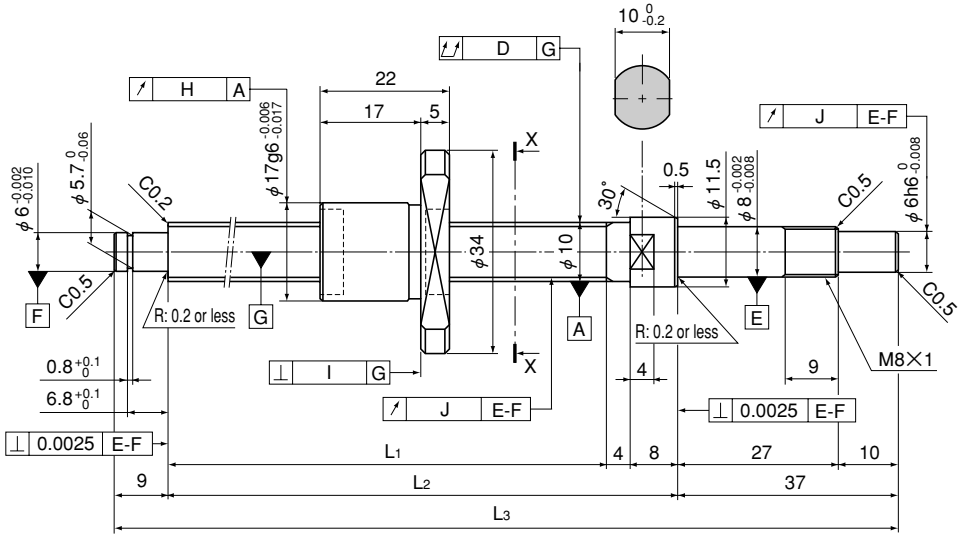
Ball Screw Specifications		
Lead (mm)	10	
BCD (mm)	8.4	
Thread minor diameter (mm)	6.7	
Threading direction, No. of threaded grooves	Rightward, 2	
No. of circuits	1.5 turn x 2 rows	
Clearance symbol	GT	G2
Axial clearance (mm)	0.005 or less	0.02 or less
Basic dynamic load rating Ca (kN)	2.16	2.16
Basic static load rating C0a (kN)	3.82	3.82
Preload torque (N-m)	—	—
Spacer ball	None	None

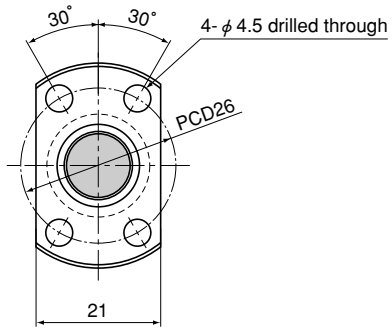
Unit: mm

Model No.	Stroke	Screw shaft length			Run-out of the screw shaft axis	Run-out of the nut circumference	Flange perpendicularity	Run-out of the thread groove surface	Lead accuracy	
		L_1	L_2	L_3	D	H	I	J	Representative travel distance error	Fluctuation
BNK 0810-3GT+205LC5Y	100	154	166	205	0.05	0.012	0.01	0.01	±0.02	0.018
BNK 0810-3G2+205LC7Y					0.065	0.02	0.014	0.014	Travel distance error: ±0.05/300	
BNK 0810-3GT+255LC5Y	150	204	216	255	0.05	0.012	0.01	0.01	±0.023	0.018
BNK 0810-3G2+255LC7Y					0.065	0.02	0.014	0.014	Travel distance error: ±0.05/300	
BNK 0810-3GT+305LC5Y	200	254	266	305	0.05	0.012	0.01	0.01	±0.023	0.018
BNK 0810-3G2+305LC7Y					0.065	0.02	0.014	0.014	Travel distance error: ±0.05/300	
BNK 0810-3GT+355LC5Y	250	304	316	355	0.06	0.012	0.01	0.01	±0.023	0.018
BNK 0810-3G2+355LC7Y					0.075	0.02	0.014	0.014	Travel distance error: ±0.05/300	
BNK 0810-3GT+405LC5Y	300	354	366	405	0.07	0.012	0.01	0.01	±0.025	0.018
BNK 0810-3G2+405LC7Y					0.09	0.02	0.014	0.014	Travel distance error: ±0.05/300	

Model BNK1002-3

Shaft diameter: 10; lead: 2





X-X arrow view

Ball Screw Specifications			
Lead (mm)	2		
BCD (mm)	10.3		
Thread minor diameter (mm)	9		
Threading direction, No. of threaded grooves	Rightward, 1		
No. of circuits	1 turn x 3 rows		
Clearance symbol	G0	GT	G2
Axial clearance (mm)	0	0.005 or less	0.02 or less
Basic dynamic load rating Ca (kN)	1.5	1.5	1.5
Basic static load rating C0a (kN)	2.9	2.9	2.9
Preload torque (N-m)	2.5 x 10⁻³ max	—	—
Spacer ball	None	None	None

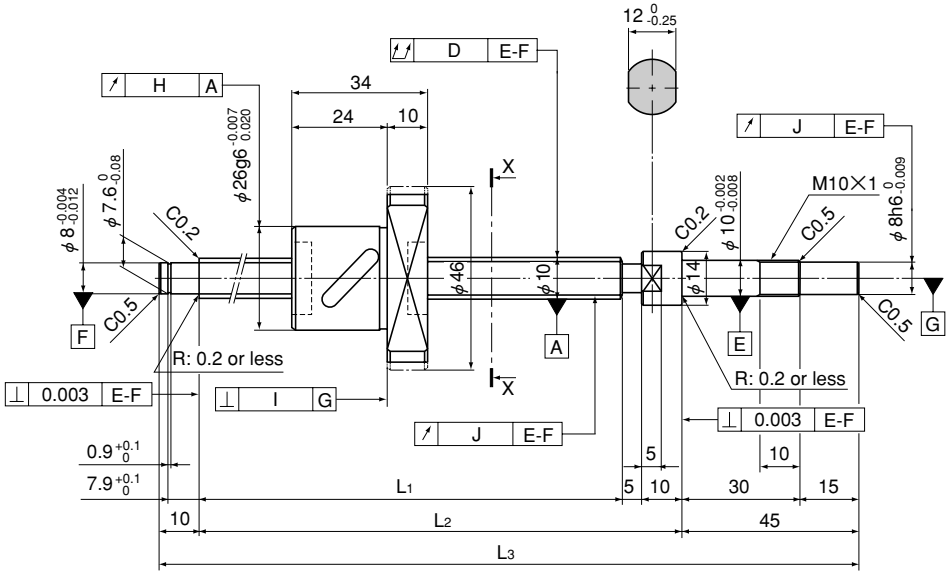
Unit: mm

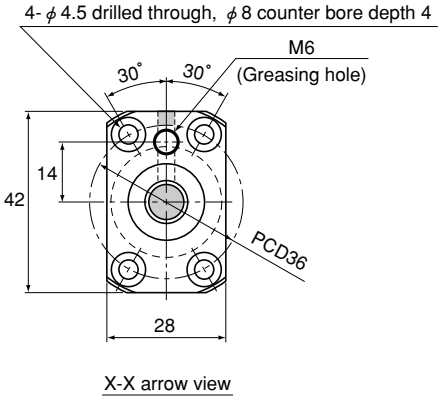
Model No.	Stroke	Screw shaft length L1	L2	L3	Run-out of the screw shaft axis D	Run-out of the nut circumference H	Flange perpendicularity I	Run-out of the thread groove surface J	Lead accuracy: Representative travel distance error	Lead accuracy: Fluctuation
BNK 1002-3RRG0+143LC3Y	50	85	97	143	0.02	0.009	0.008	0.007	±0.008	0.008
BNK 1002-3RRG0+143LC5Y					0.035	0.012	0.01	0.011	±0.018	0.018
BNK 1002-3RRG2+143LC7Y					0.04	0.02	0.014	0.014	Travel distance error: ±0.05/300	
BNK 1002-3RRG0+193LC3Y	100	135	147	193	0.03	0.009	0.008	0.007	±0.01	0.008
BNK 1002-3RRG0+193LC5Y					0.035	0.012	0.01	0.011	±0.02	0.018
BNK 1002-3RRG2+193LC7Y					0.04	0.02	0.014	0.014	Travel distance error: ±0.05/300	
BNK 1002-3RRG0+243LC3Y	150	185	197	243	0.03	0.009	0.008	0.007	±0.01	0.008
BNK 1002-3RRG0+243LC5Y					0.04	0.012	0.01	0.011	±0.02	0.018
BNK 1002-3RRG2+243LC7Y					0.055	0.02	0.014	0.014	Travel distance error: ±0.05/300	
BNK 1002-3RRG0+293LC3Y	200	235	247	293	0.03	0.009	0.008	0.007	±0.012	0.008
BNK 1002-3RRG0+293LC5Y					0.04	0.012	0.01	0.011	±0.023	0.018
BNK 1002-3RRG2+293LC7Y					0.055	0.02	0.014	0.014	Travel distance error: ±0.05/300	

Note A stainless steel type is also available for model BNK1002. When placing an order, add symbol "M" to the end of the model number.
(Example) BNK1002-3RRG0+143LC3Y M
Symbol for stainless steel type
For accuracy grades C3 and C5, clearance GT is also standardized.

Model BNK1004-2.5

Shaft diameter: 10; lead: 4





X-X arrow view

Ball Screw Specifications			
Lead (mm)	4		
BCD (mm)	10.5		
Thread minor diameter (mm)	7.8		
Threading direction, No. of threaded grooves	Rightward, 1		
No. of circuits	2.5 turn x 1 row		
Clearance symbol	G0	GT	G2
Axial clearance (mm)	0	0.005 or less	0.02 or less
Basic dynamic load rating Ca (kN)	2.1	3.4	3.4
Basic static load rating C0a (kN)	2.7	5.4	5.4
Preload torque (N-m)	9.8 x 10⁻³ to 4.9 x 10⁻²	—	—
Spacer ball	1:1	None	None

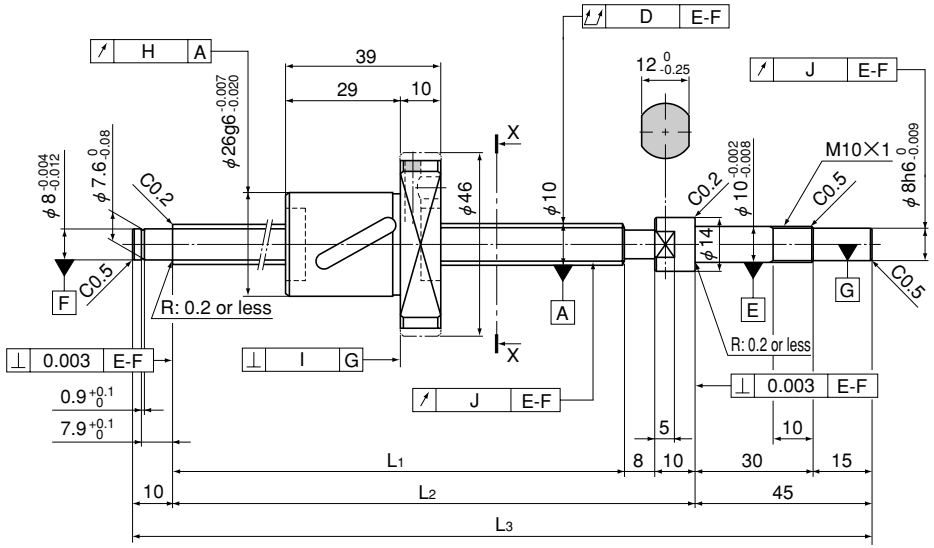
Unit: mm

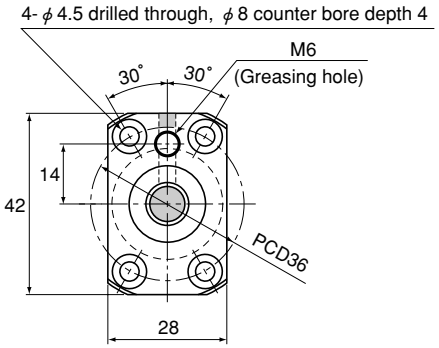
Model No.	Stroke	Screw shaft length L1	Screw shaft length L2	Screw shaft length L3	Run-out of the screw shaft axis D	Run-out of the nut circumference H	Flange perpendicularity I	Run-out of the thread groove surface J	Lead accuracy: Representative travel distance error	Lead accuracy: Fluctuation
BNK 1004-2.5RRG0+180LC3Y	50	110	125	180	0.02	0.009	0.008	0.008	±0.01	0.008
BNK 1004-2.5RRG0+180LC5Y					0.035	0.012	0.01	0.011	±0.02	0.018
BNK 1004-2.5RRG2+180LC7Y					0.04	0.02	0.014	0.014	Travel distance error: ±0.05/300	
BNK 1004-2.5RRG0+230LC3Y	100	160	175	230	0.03	0.009	0.008	0.008	±0.01	0.008
BNK 1004-2.5RRG0+230LC5Y					0.04	0.012	0.01	0.011	±0.02	0.018
BNK 1004-2.5RRG2+230LC7Y					0.055	0.02	0.014	0.014	Travel distance error: ±0.05/300	
BNK 1004-2.5RRG0+280LC3Y	150	210	225	280	0.03	0.009	0.008	0.008	±0.012	0.008
BNK 1004-2.5RRG0+280LC5Y					0.04	0.012	0.01	0.011	±0.023	0.018
BNK 1004-2.5RRG2+280LC7Y					0.055	0.02	0.014	0.014	Travel distance error: ±0.05/300	
BNK 1004-2.5RRG0+330LC3Y	200	260	275	330	0.04	0.009	0.008	0.008	±0.012	0.008
BNK 1004-2.5RRG0+330LC5Y					0.05	0.012	0.01	0.011	±0.023	0.018
BNK 1004-2.5RRG2+330LC7Y					0.065	0.02	0.014	0.014	Travel distance error: ±0.05/300	
BNK 1004-2.5RRG0+380LC3Y	250	310	325	380	0.04	0.009	0.008	0.008	±0.012	0.008
BNK 1004-2.5RRG0+380LC5Y					0.05	0.012	0.01	0.011	±0.023	0.018
BNK 1004-2.5RRG2+380LC7Y					0.065	0.02	0.014	0.014	Travel distance error: ±0.05/300	

Note For accuracy grades C3 and C5, clearance GT is also standardized.

Model BNK1010-1.5

Shaft diameter: 10; lead: 10





X-X arrow view

Ball Screw Specifications			
Lead (mm)	10		
BCD (mm)	10.5		
Thread minor diameter (mm)	7.8		
Threading direction, No. of threaded grooves	Rightward, 1		
No. of circuits	1.5 turn x 1 row		
Clearance symbol	G0	GT	G2
Axial clearance (mm)	0	0.005 or less	0.02 or less
Basic dynamic load rating Ca (kN)	1.3	2.1	2.1
Basic static load rating C0a (kN)	1.6	3.1	3.1
Preload torque (N-m)	9.8×10^{-3} to 4.9×10^{-2}	—	—
Spacer ball	1:1	None	None

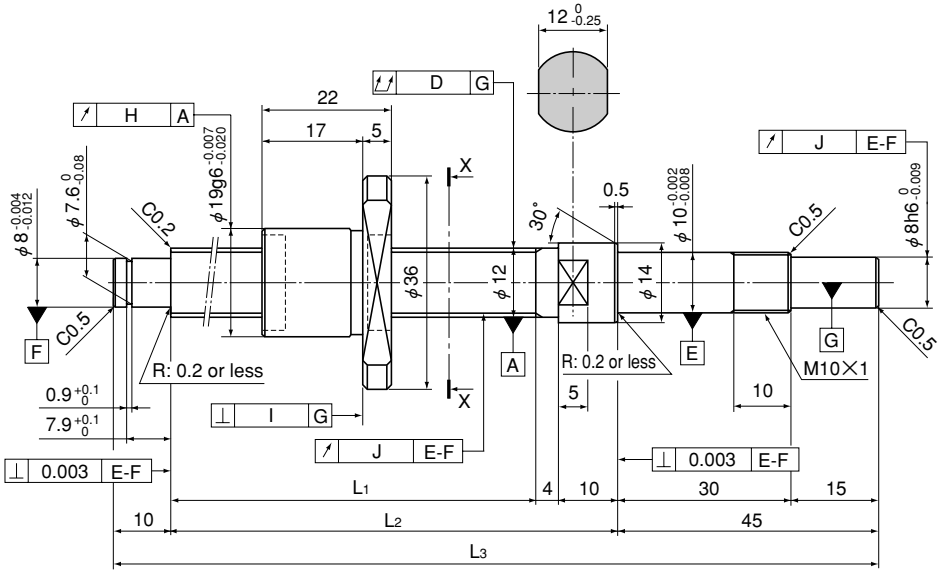
Unit: mm

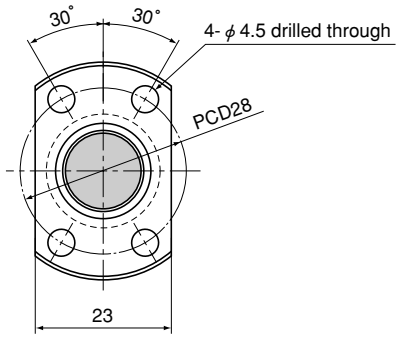
Model No.	Stroke	Screw shaft length L1	L2	L3	Run-out of the screw shaft axis D	Run-out of the nut circumference H	Flange perpendicularity I	Run-out of the thread groove surface J	Lead accuracy: Representative travel distance error	Lead accuracy: Fluctuation
BNK 1010-1.5RRG0+240LC5Y	100	167	185	240	0.04	0.012	0.01	0.011	±0.02	0.018
BNK 1010-1.5RRG2+240LC7Y					0.055	0.02	0.014	0.014	Travel distance error: ±0.05/300	
BNK 1010-1.5RRG0+290LC5Y	150	217	235	290	0.04	0.012	0.01	0.011	±0.023	0.018
BNK 1010-1.5RRG2+290LC7Y					0.055	0.02	0.014	0.014	Travel distance error: ±0.05/300	
BNK 1010-1.5RRG0+340LC5Y	200	267	285	340	0.05	0.012	0.01	0.011	±0.023	0.018
BNK 1010-1.5RRG2+340LC7Y					0.065	0.02	0.014	0.014	Travel distance error: ±0.05/300	
BNK 1010-1.5RRG0+390LC5Y	250	317	335	390	0.05	0.012	0.01	0.011	±0.025	0.02
BNK 1010-1.5RRG2+390LC7Y					0.065	0.02	0.014	0.014	Travel distance error: ±0.05/300	
BNK 1010-1.5RRG0+440LC5Y	300	367	385	440	0.065	0.012	0.01	0.011	±0.025	0.02
BNK 1010-1.5RRG2+440LC7Y					0.08	0.02	0.014	0.014	Travel distance error: ±0.05/300	

Note For accuracy grade C5, clearance GT is also standardized.

Model BNK1202-3

Shaft diameter: 12; lead: 2





X-X arrow view

Ball Screw Specifications			
Lead (mm)	2		
BCD (mm)	12.3		
Thread minor diameter (mm)	11		
Threading direction, No. of threaded grooves	Rightward, 1		
No. of circuits	1 turn x 3 rows		
Clearance symbol	G0	GT	G2
Axial clearance (mm)	0	0.005 or less	0.02 or less
Basic dynamic load rating Ca (kN)	1.7	1.7	1.7
Basic static load rating C0a (kN)	3.6	3.6	3.6
Preload torque (N-m)	3.9 x 10⁻³ to 3.4 x 10⁻²	—	—
Spacer ball	None	None	None

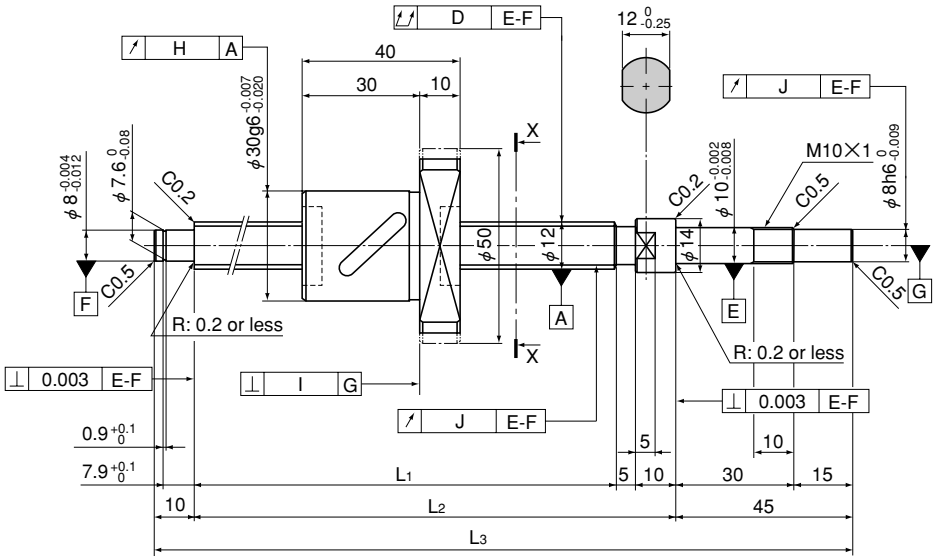
Unit: mm

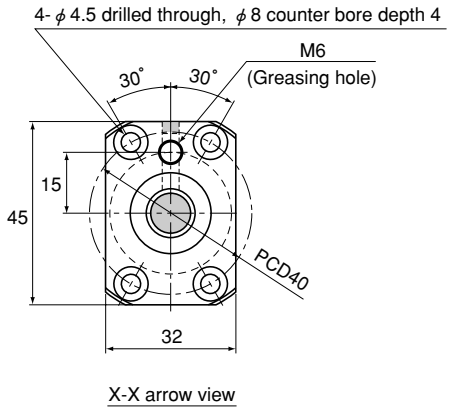
Model No.	Stroke	Screw shaft length			Run-out of the screw shaft axis	Run-out of the nut circumference	Flange perpendicularity	Run-out of the thread groove surface	Lead accuracy	
		L1	L2	L3	D	H	I	J	Representative travel distance error	Fluctuation
BNK 1202-3RRG0+154LC3Y	50	85	99	154	0.02	0.01	0.008	0.007	±0.008	0.008
BNK 1202-3RRG0+154LC5Y					0.035	0.012	0.01	0.011	±0.018	0.018
BNK 1202-3RRG2+154LC7Y					0.04	0.02	0.014	0.014	Travel distance error: ±0.05/300	
BNK 1202-3RRG0+204LC3Y	100	135	149	204	0.03	0.01	0.008	0.007	±0.01	0.008
BNK 1202-3RRG0+204LC5Y					0.04	0.012	0.01	0.011	±0.02	0.018
BNK 1202-3RRG2+204LC7Y					0.055	0.02	0.014	0.014	Travel distance error: ±0.05/300	
BNK 1202-3RRG0+254LC3Y	150	185	199	254	0.03	0.01	0.008	0.007	±0.01	0.008
BNK 1202-3RRG0+254LC5Y					0.04	0.012	0.01	0.011	±0.02	0.018
BNK 1202-3RRG2+254LC7Y					0.055	0.02	0.014	0.014	Travel distance error: ±0.05/300	
BNK 1202-3RRG0+304LC3Y	200	235	249	304	0.04	0.01	0.008	0.007	±0.012	0.008
BNK 1202-3RRG0+304LC5Y					0.05	0.012	0.01	0.011	±0.023	0.018
BNK 1202-3RRG2+304LC7Y					0.055	0.02	0.014	0.014	Travel distance error: ±0.05/300	
BNK 1202-3RRG0+354LC3Y	250	285	299	354	0.04	0.01	0.008	0.007	±0.012	0.008
BNK 1202-3RRG0+354LC5Y					0.05	0.012	0.01	0.011	±0.023	0.018
BNK 1202-3RRG2+354LC7Y					0.065	0.02	0.014	0.014	Travel distance error: ±0.05/300	

Note A stainless steel type is also available for model BNK1202. When placing an order, add symbol "M" to the end of the model number.
(Example) BNK1202-3RRG0+154LC3Y M
Symbol for stainless steel type
For accuracy grades C3 and C5, clearance GT is also standardized.

Model BNK1205-2.5

Shaft diameter: 12; lead: 5





X-X arrow view

Ball Screw Specifications			
Lead (mm)	5		
BCD (mm)	12.3		
Thread minor diameter (mm)	9.6		
Threading direction, No. of threaded grooves	Rightward, 1		
No. of circuits	2.5 turns x 1 row		
Clearance symbol	C0	CT	C2
Axial clearance (mm)	0	0.005 or less	0.02 or less
Basic dynamic load rating Ca (kN)	2.3	3.7	3.7
Basic static load rating C0a (kN)	3.2	6.4	6.4
Preload torque (N-m)	9.8 x 10⁻³ to 4.9 x 10⁻²	—	—
Spacer ball	1:1	None	None

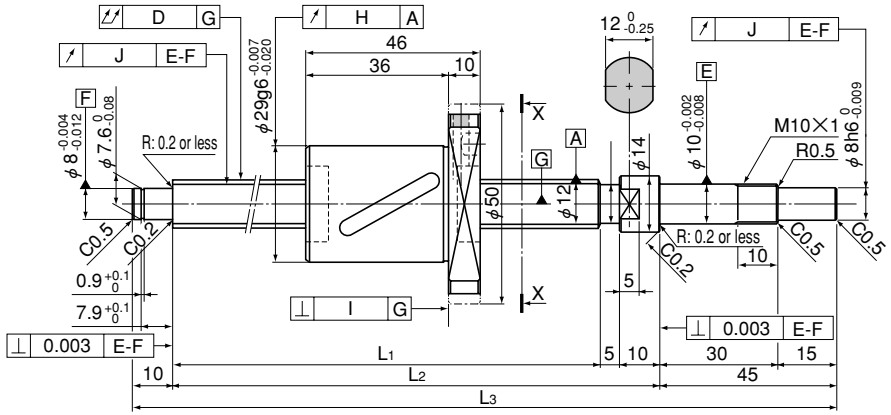
Unit: mm

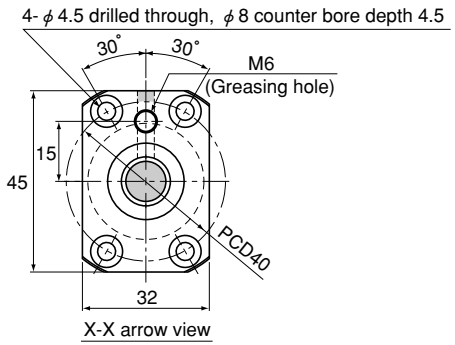
Model No.	Stroke	Screw shaft length L1	L2	L3	Run-out of the screw shaft axis D	Run-out of the nut circumference H	Flange perpendicularity I	Run-out of the thread groove surface J	Lead accuracy: Representative travel distance error	Lead accuracy: Fluctuation
BNK 1205-2.5RRG0+180LC3Y	50	110	125	180	0.02	0.009	0.008	0.008	±0.01	0.008
BNK 1205-2.5RRG0+180LC5Y					0.035	0.012	0.01	0.011	±0.02	0.018
BNK 1205-2.5RRG2+180LC7Y					0.04	0.02	0.014	0.014	Travel distance error: ±0.05/300	
BNK 1205-2.5RRG0+230LC3Y	100	160	175	230	0.03	0.009	0.008	0.008	±0.01	0.008
BNK 1205-2.5RRG0+230LC5Y					0.04	0.012	0.01	0.011	±0.02	0.018
BNK 1205-2.5RRG2+230LC7Y					0.055	0.02	0.014	0.014	Travel distance error: ±0.05/300	
BNK 1205-2.5RRG0+280LC3Y	150	210	225	280	0.03	0.009	0.008	0.008	±0.012	0.008
BNK 1205-2.5RRG0+280LC5Y					0.04	0.012	0.01	0.011	±0.023	0.018
BNK 1205-2.5RRG2+280LC7Y					0.055	0.02	0.014	0.014	Travel distance error: ±0.05/300	
BNK 1205-2.5RRG0+330LC3Y	200	260	275	330	0.04	0.009	0.008	0.008	±0.012	0.008
BNK 1205-2.5RRG0+330LC5Y					0.05	0.012	0.01	0.011	±0.023	0.018
BNK 1205-2.5RRG2+330LC7Y					0.065	0.02	0.014	0.014	Travel distance error: ±0.05/300	
BNK 1205-2.5RRG0+380LC3Y	250	310	325	380	0.04	0.009	0.008	0.008	±0.012	0.008
BNK 1205-2.5RRG0+380LC5Y					0.05	0.012	0.01	0.011	±0.023	0.018
BNK 1205-2.5RRG2+380LC7Y					0.065	0.02	0.014	0.014	Travel distance error: ±0.05/300	

Note For accuracy grades C3 and C5, clearance GT is also standardized.

Model BNK1208-2.6

Shaft diameter: 12; lead: 8





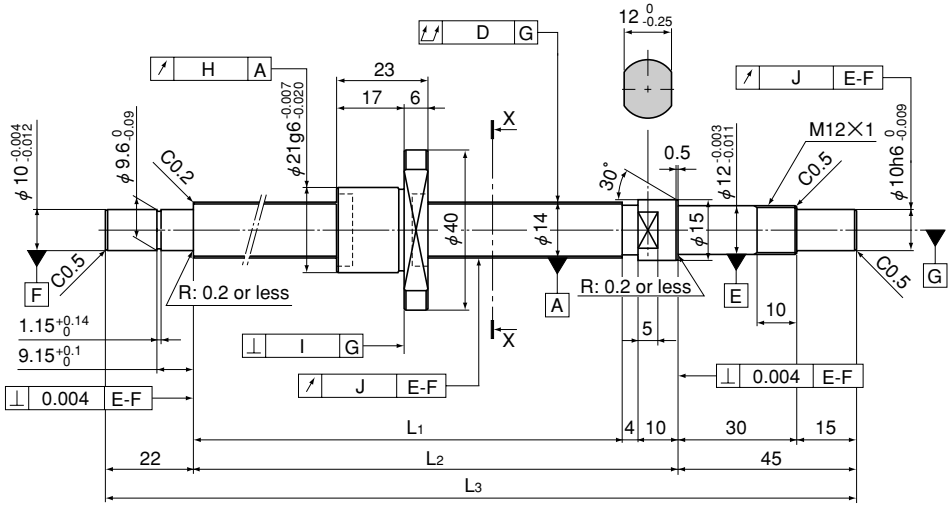
Ball Screw Specifications	
Lead (mm)	8
BCD (mm)	12.65
Thread minor diameter (mm)	9.7
Threading direction, No. of threaded grooves	Rightward, 1
No. of circuits	2.6 turns x 1 row
Clearance symbol	G2
Axial clearance (mm)	0.02 or less
Basic dynamic load rating Ca (kN)	4.7
Basic static load rating C0a (kN)	7.5
Preload torque (N-m)	—
Spacer ball	None

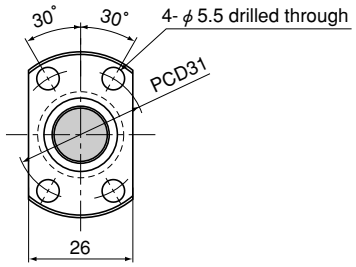
Unit: mm

Model No.	Stroke	Screw shaft length			Run-out of the screw shaft axis	Run-out of the nut circumference	Flange perpendicularity	Run-out of the thread groove surface	Lead accuracy
		L_1	L_2	L_3	D	H	I	J	
BNK 1208-2.6RRG2+180LC7Y	50	110	125	180	0.04	0.02	0.014	0.014	Travel distance error: ±0.05/300
BNK 1208-2.6RRG2+230LC7Y	100	160	175	230	0.055	0.02	0.014	0.014	Travel distance error: ±0.05/300
BNK 1208-2.6RRG2+280LC7Y	150	210	225	280	0.055	0.02	0.014	0.014	Travel distance error: ±0.05/300
BNK 1208-2.6RRG2+330LC7Y	200	260	275	330	0.065	0.02	0.014	0.014	Travel distance error: ±0.05/300
BNK 1208-2.6RRG2+380LC7Y	250	310	325	380	0.065	0.02	0.014	0.014	Travel distance error: ±0.05/300

Model BNK1402-3

Shaft diameter: 14; lead: 2





X-X arrow view

Ball Screw Specifications			
Lead (mm)	2		
BCD (mm)	14.3		
Thread minor diameter (mm)	13		
Threading direction, No. of threaded grooves	Rightward, 1		
No. of circuits	1 turn x 3 rows		
Clearance symbol	G0	GT	G2
Axial clearance (mm)	0	0.005 or less	0.02 or less
Basic dynamic load rating Ca (kN)	1.8	1.8	1.8
Basic static load rating C0a (kN)	4.3	4.3	4.3
Preload torque (N-m)	4.9 x 10⁻³ to 4.9 x 10⁻²	—	—
Spacer ball	None	None	None

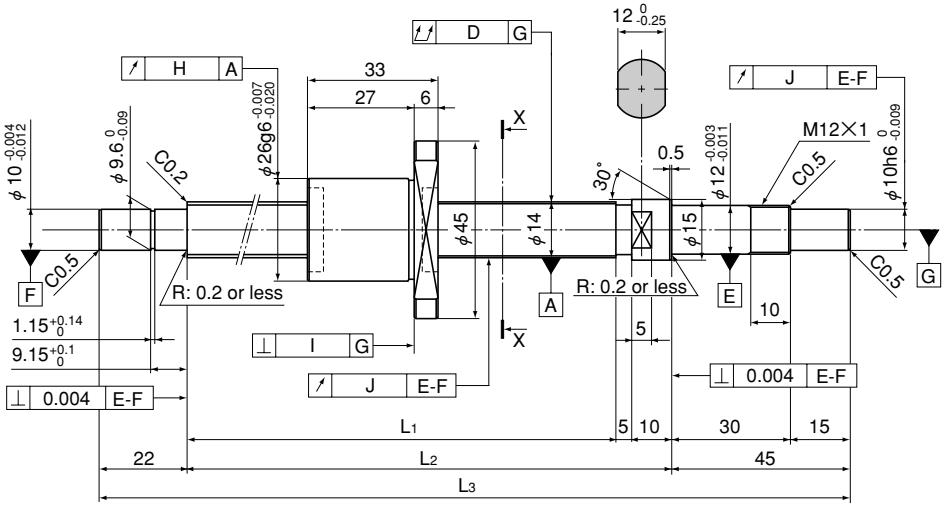
Unit: mm

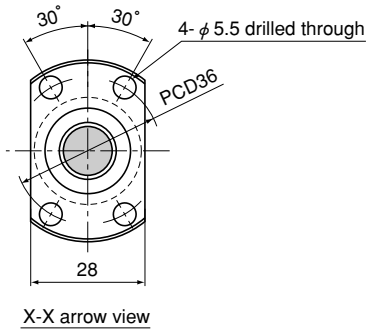
Model No.	Stroke	Screw shaft length			Run-out of the screw shaft axis	Run-out of the nut circumference	Flange perpendicularity	Run-out of the thread groove surface	Lead accuracy	
		L_1	L_2	L_3	D	H	I	J	Representative travel distance error	Fluctuation
BNK 1402-3RRG0+166LC3Y	50	85	99	166	0.02	0.01	0.008	0.009	±0.008	0.008
BNK 1402-3RRG0+166LC5Y					0.025	0.012	0.01	0.012	±0.018	0.018
BNK 1402-3RRG2+166LC7Y					0.04	0.02	0.014	0.014	Travel distance error: ±0.05/300	
BNK 1402-3RRG0+216LC3Y	100	135	149	216	0.025	0.01	0.008	0.009	±0.01	0.008
BNK 1402-3RRG0+216LC5Y					0.03	0.012	0.01	0.012	±0.02	0.018
BNK 1402-3RRG2+216LC7Y					0.045	0.02	0.014	0.014	Travel distance error: ±0.05/300	
BNK 1402-3RRG0+266LC3Y	150	185	199	266	0.025	0.01	0.008	0.009	±0.01	0.008
BNK 1402-3RRG0+266LC5Y					0.03	0.012	0.01	0.012	±0.02	0.018
BNK 1402-3RRG2+266LC7Y					0.045	0.02	0.014	0.014	Travel distance error: ±0.05/300	
BNK 1402-3RRG0+316LC3Y	200	235	249	316	0.03	0.01	0.008	0.009	±0.012	0.008
BNK 1402-3RRG0+316LC5Y					0.04	0.012	0.01	0.012	±0.023	0.018
BNK 1402-3RRG2+316LC7Y					0.055	0.02	0.014	0.014	Travel distance error: ±0.05/300	
BNK 1402-3RRG0+416LC3Y	300	335	349	416	0.04	0.01	0.008	0.009	±0.013	0.01
BNK 1402-3RRG0+416LC5Y					0.05	0.012	0.01	0.012	±0.025	0.02
BNK 1402-3RRG2+416LC7Y					0.06	0.02	0.014	0.014	Travel distance error: ±0.05/300	

Note A stainless steel type is also available for model BNK1402. When placing an order, add symbol "M" to the end of the model number.
(Example) BNK1402-3RRG0+166LC3Y M
Symbol for stainless steel type
For accuracy grades C3 and C5, clearance GT is also standardized.

Model BNK1404-3

Shaft diameter: 14; lead: 4





X-X arrow view

Ball Screw Specifications			
Lead (mm)	4		
BCD (mm)	14.65		
Thread minor diameter (mm)	11.9		
Threading direction, No. of threaded grooves	Rightward, 1		
No. of circuits	1 turn x 3 rows		
Clearance symbol	G0	GT	G2
Axial clearance (mm)	0	0.005 or less	0.02 or less
Basic dynamic load rating Ca (kN)	4.2	4.2	4.2
Basic static load rating C0a (kN)	7.6	7.6	7.6
Preload torque (N-m)	9.8×10^{-3} to 6.9×10^{-2}	—	—
Spacer ball	None	None	None

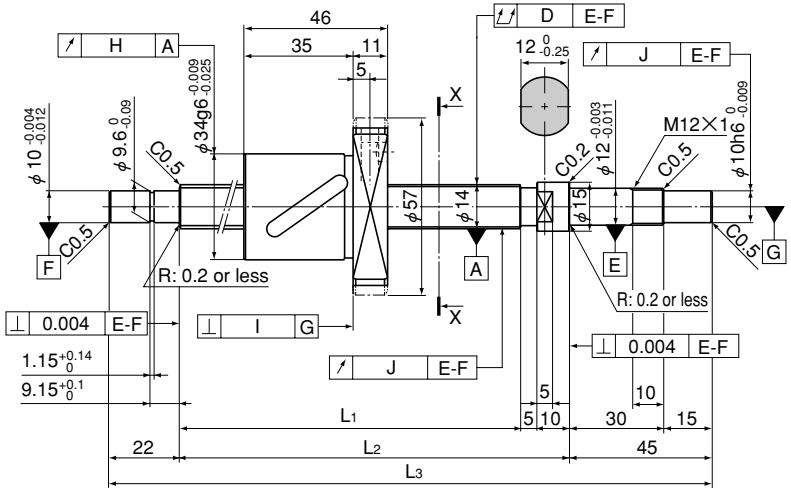
Unit: mm

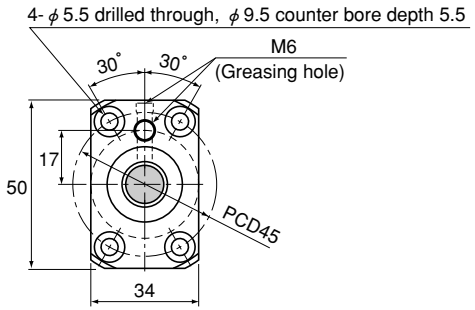
Model No.	Stroke	Screw shaft length			Run-out of the screw shaft axis	Run-out of the nut circumference	Flange perpendicularity	Run-out of the thread groove surface	Lead accuracy	
		L_1	L_2	L_3	D	H	I	J	Representative travel distance error	Fluctuation
BNK 1404-3RRG0+230LC3Y	100	148	163	230	0.025	0.01	0.008	0.009	±0.01	0.008
BNK 1404-3RRG0+230LC5Y					0.03	0.012	0.01	0.012	±0.02	0.018
BNK 1404-3RRG2+230LC7Y					0.045	0.02	0.014	0.014	Travel distance error: ±0.05/300	
BNK 1404-3RRG0+280LC3Y	150	198	213	280	0.025	0.01	0.008	0.009	±0.01	0.008
BNK 1404-3RRG0+280LC5Y					0.03	0.012	0.01	0.012	±0.02	0.018
BNK 1404-3RRG2+280LC7Y					0.045	0.02	0.014	0.014	Travel distance error: ±0.05/300	
BNK 1404-3RRG0+330LC3Y	200	248	263	330	0.03	0.01	0.008	0.009	±0.012	0.008
BNK 1404-3RRG0+330LC5Y					0.04	0.012	0.01	0.012	±0.023	0.018
BNK 1404-3RRG2+330LC7Y					0.055	0.02	0.014	0.014	Travel distance error: ±0.05/300	
BNK 1404-3RRG0+430LC3Y	300	348	363	430	0.04	0.01	0.008	0.009	±0.013	0.01
BNK 1404-3RRG0+430LC5Y					0.05	0.012	0.01	0.012	±0.025	0.02
BNK 1404-3RRG2+430LC7Y					0.06	0.02	0.014	0.014	Travel distance error: ±0.05/300	
BNK 1404-3RRG0+530LC3Y	400	448	463	530	0.045	0.01	0.008	0.009	±0.015	0.01
BNK 1404-3RRG0+530LC5Y					0.055	0.012	0.01	0.012	±0.027	0.02
BNK 1404-3RRG2+530LC7Y					0.075	0.02	0.014	0.014	Travel distance error: ±0.05/300	

Note A stainless steel type is also available for model BNK1404. When placing an order, add symbol "M" to the end of the model number.
(Example) BNK1404-3RRG0+230LC3Y M
Symbol for stainless steel type
For accuracy grades C3 and C5, clearance GT is also standardized.

Model BNK1408-2.5

Shaft diameter: 14; lead: 8





X-X arrow view

Ball Screw Specifications			
Lead (mm)	8		
BCD (mm)	14.75		
Thread minor diameter (mm)	11.2		
Threading direction, No. of threaded grooves	Rightward, 1		
No. of circuits	2.5 turns x 1 row		
Clearance symbol	G0	GT	G2
Axial clearance (mm)	0	0.005 or less	0.02 or less
Basic dynamic load rating Ca (kN)	4.3	6.9	6.9
Basic static load rating C0a (kN)	5.8	11.5	11.5
Preload torque (N-m)	2 x 10⁻² to 7.8 x 10⁻²	—	—
Spacer ball	1:1	None	None

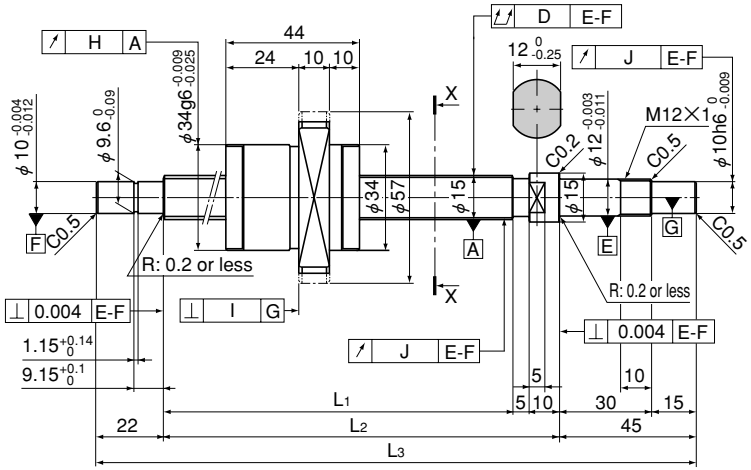
Unit: mm

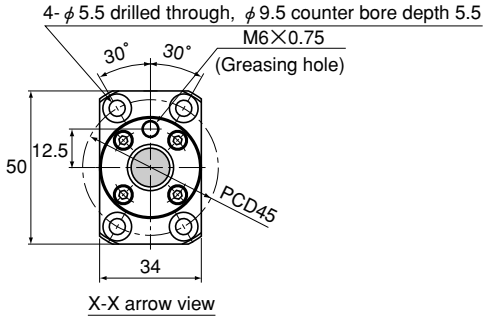
Model No.	Stroke	Screw shaft length			Run-out of the screw shaft axis	Run-out of the nut circumference	Flange perpendicularity	Run-out of the thread groove surface	Lead accuracy	
		L_1	L_2	L_3	D	H	I	J	Representative travel distance error	Fluctuation
BNK 1408-2.5RRG0+321LC5Y	150	239	254	321	0.035	0.015	0.011	0.012	±0.023	0.018
BNK 1408-2.5RRG2+321LC7Y					0.055	0.03	0.018	0.014	Travel distance error: ±0.05/300	
BNK 1408-2.5RRG0+371LC5Y	200	289	304	371	0.035	0.015	0.011	0.012	±0.023	0.018
BNK 1408-2.5RRG2+371LC7Y					0.055	0.03	0.018	0.014	Travel distance error: ±0.05/300	
BNK 1408-2.5RRG0+421LC5Y	250	339	354	421	0.04	0.015	0.011	0.012	±0.025	0.02
BNK 1408-2.5RRG2+421LC7Y					0.06	0.03	0.018	0.014	Travel distance error: ±0.05/300	
BNK 1408-2.5RRG0+471LC5Y	300	389	404	471	0.04	0.015	0.011	0.012	±0.025	0.02
BNK 1408-2.5RRG2+471LC7Y					0.06	0.03	0.018	0.014	Travel distance error: ±0.05/300	
BNK 1408-2.5RRG0+521LC5Y	350	439	454	521	0.05	0.015	0.011	0.012	±0.027	0.02
BNK 1408-2.5RRG2+521LC7Y					0.075	0.03	0.018	0.014	Travel distance error: ±0.05/300	
BNK 1408-2.5RRG0+571LC5Y	400	489	504	571	0.05	0.015	0.011	0.012	±0.027	0.02
BNK 1408-2.5RRG2+571LC7Y					0.075	0.03	0.018	0.014	Travel distance error: ±0.05/300	
BNK 1408-2.5RRG0+621LC5Y	450	539	554	621	0.05	0.015	0.011	0.012	±0.03	0.023
BNK 1408-2.5RRG2+621LC7Y					0.075	0.03	0.018	0.014	Travel distance error: ±0.05/300	
BNK 1408-2.5RRG0+671LC5Y	500	589	604	671	0.065	0.015	0.011	0.012	±0.03	0.023
BNK 1408-2.5RRG2+671LC7Y					0.09	0.03	0.018	0.014	Travel distance error: ±0.05/300	
BNK 1408-2.5RRG0+721LC5Y	550	639	654	721	0.065	0.015	0.011	0.012	±0.035	0.025
BNK 1408-2.5RRG2+721LC7Y					0.09	0.03	0.018	0.014	Travel distance error: ±0.05/300	
BNK 1408-2.5RRG0+771LC5Y	600	689	704	771	0.065	0.015	0.011	0.012	±0.035	0.025
BNK 1408-2.5RRG2+771LC7Y					0.09	0.03	0.018	0.014	Travel distance error: ±0.05/300	
BNK 1408-2.5RRG0+871LC5Y	700	789	804	871	0.085	0.015	0.011	0.012	±0.035	0.025
BNK 1408-2.5RRG2+871LC7Y					0.12	0.03	0.018	0.014	Travel distance error: ±0.05/300	

Note For accuracy grade C5, clearance GT is also standardized.

Model BNK1510-5.6

Shaft diameter: 15; lead: 10





Ball Screw Specifications			
Lead (mm)	10		
BCD (mm)	15.75		
Thread minor diameter (mm)	12.5		
Threading direction, No. of threaded grooves	Rightward, 2		
No. of circuits	2.8 turns x 2 rows		
Clearance symbol	G0	GT	G2
Axial clearance (mm)	0	0.005 or less	0.02 or less
Basic dynamic load rating Ca (kN)	9	14.3	14.3
Basic static load rating C0a (kN)	13.9	27.9	27.9
Preload torque (N-m)	2 x 10⁻² to 9.8 x 10⁻²	—	—
Spacer ball	1:1	None	None

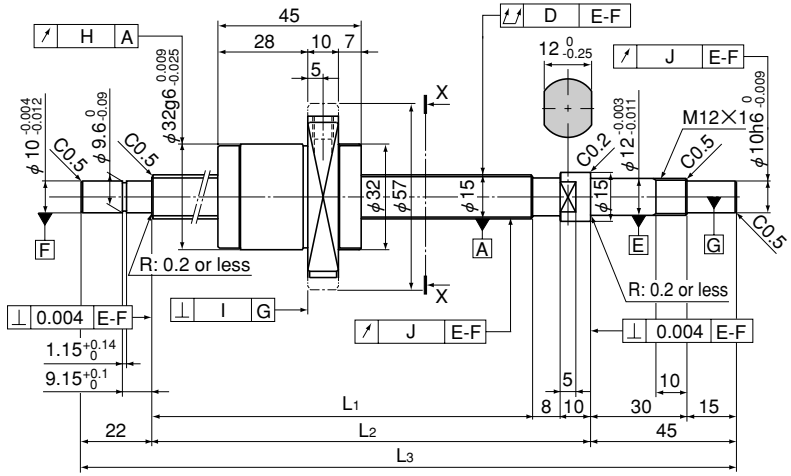
Unit: mm

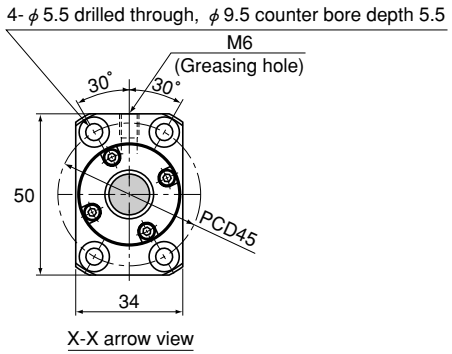
Model No.	Stroke	Screw shaft length			Run-out of the screw shaft axis	Run-out of the nut circumference	Flange perpendicularity	Run-out of the thread groove surface	Lead accuracy	
		L1	L2	L3	D	H	I	J	Representative travel distance error	Fluctuation
BNK 1510-5.6G0+321LC5Y	150	239	254	321	0.035	0.015	0.011	0.012	±0.023	0.018
BNK 1510-5.6G2+321LC7Y					0.055	0.03	0.018	0.014	Travel distance error: ±0.05/300	
BNK 1510-5.6G0+371LC5Y	200	289	304	371	0.035	0.015	0.011	0.012	±0.023	0.018
BNK 1510-5.6G2+371LC7Y					0.055	0.03	0.018	0.014	Travel distance error: ±0.05/300	
BNK 1510-5.6G0+421LC5Y	250	339	354	421	0.04	0.015	0.011	0.012	±0.025	0.02
BNK 1510-5.6G2+421LC7Y					0.06	0.03	0.018	0.014	Travel distance error: ±0.05/300	
BNK 1510-5.6G0+471LC5Y	300	389	404	471	0.04	0.015	0.011	0.012	±0.025	0.02
BNK 1510-5.6G2+471LC7Y					0.06	0.03	0.018	0.014	Travel distance error: ±0.05/300	
BNK 1510-5.6G0+521LC5Y	350	439	454	521	0.05	0.015	0.011	0.012	±0.027	0.02
BNK 1510-5.6G2+521LC7Y					0.075	0.03	0.018	0.014	Travel distance error: ±0.05/300	
BNK 1510-5.6G0+571LC5Y	400	489	504	571	0.05	0.015	0.011	0.012	±0.027	0.02
BNK 1510-5.6G2+571LC7Y					0.075	0.03	0.018	0.014	Travel distance error: ±0.05/300	
BNK 1510-5.6G0+621LC5Y	450	539	554	621	0.05	0.015	0.011	0.012	±0.03	0.023
BNK 1510-5.6G2+621LC7Y					0.075	0.03	0.018	0.014	Travel distance error: ±0.05/300	
BNK 1510-5.6G0+671LC5Y	500	589	604	671	0.065	0.015	0.011	0.012	±0.03	0.023
BNK 1510-5.6G2+671LC7Y					0.09	0.03	0.018	0.014	Travel distance error: ±0.05/300	
BNK 1510-5.6G0+721LC5Y	550	639	654	721	0.065	0.015	0.011	0.012	±0.035	0.025
BNK 1510-5.6G2+721LC7Y					0.09	0.03	0.018	0.014	Travel distance error: ±0.05/300	
BNK 1510-5.6G0+771LC5Y	600	689	704	771	0.065	0.015	0.011	0.012	±0.035	0.025
BNK 1510-5.6G2+771LC7Y					0.09	0.03	0.018	0.014	Travel distance error: ±0.05/300	
BNK 1510-5.6G0+871LC5Y	700	789	804	871	0.085	0.015	0.011	0.012	±0.035	0.025
BNK 1510-5.6G2+871LC7Y					0.12	0.03	0.018	0.014	Travel distance error: ±0.05/300	
BNK 1510-5.6G0+971LC5Y	800	889	904	971	0.085	0.015	0.011	0.012	±0.04	0.027
BNK 1510-5.6G2+971LC7Y					0.12	0.03	0.018	0.014	Travel distance error: ±0.05/300	

Note For accuracy grade C5, clearance GT is also standardized.

Model BNK1520-3

Shaft diameter: 15; lead: 20





Ball Screw Specifications			
Lead (mm)	20		
BCD (mm)	15.75		
Thread minor diameter (mm)	12.5		
Threading direction, No. of threaded grooves	Rightward, 2		
No. of circuits	1.5 turns x 2 rows		
Clearance symbol	G0	GT	G2
Axial clearance (mm)	0	0.005 or less	0.02 or less
Basic dynamic load rating Ca (kN)	5.1	8	8
Basic static load rating C0a (kN)	7.9	15.8	15.8
Preload torque (N-m)	2 x 10⁻² to 9.8 x 10⁻²	—	—
Spacer ball	1:1	None	None

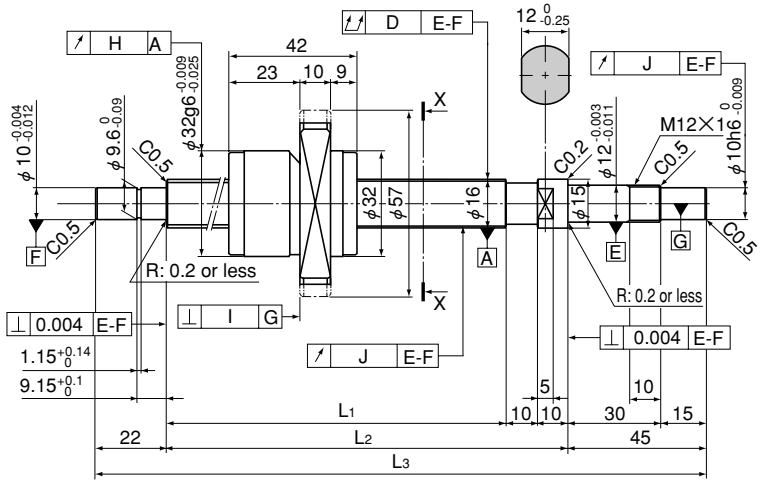
Unit: mm

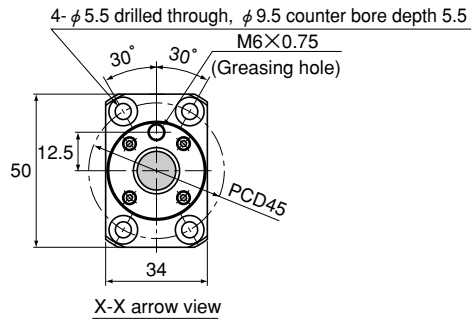
Model No.	Stroke	Screw shaft length			Run-out of the screw shaft axis	Run-out of the nut circumference	Flange perpendicularity	Run-out of the thread groove surface	Lead accuracy	
		L1	L2	L3	D	H	I	J	Representative travel distance error	Fluctuation
BNK 1520-3G0+321LC5Y	150	236	254	321	0.035	0.015	0.011	0.012	±0.023	0.018
BNK 1520-3G2+321LC7Y					0.055	0.03	0.018	0.014	Travel distance error: ±0.05/300	
BNK 1520-3G0+371LC5Y	200	286	304	371	0.035	0.015	0.011	0.012	±0.023	0.018
BNK 1520-3G2+371LC7Y					0.055	0.03	0.018	0.014	Travel distance error: ±0.05/300	
BNK 1520-3G0+421LC5Y	250	336	354	421	0.04	0.015	0.011	0.012	±0.025	0.02
BNK 1520-3G2+421LC7Y					0.06	0.03	0.018	0.014	Travel distance error: ±0.05/300	
BNK 1520-3G0+471LC5Y	300	386	404	471	0.04	0.015	0.011	0.012	±0.025	0.02
BNK 1520-3G2+471LC7Y					0.06	0.03	0.018	0.014	Travel distance error: ±0.05/300	
BNK 1520-3G0+521LC5Y	350	436	454	521	0.05	0.015	0.011	0.012	±0.027	0.02
BNK 1520-3G2+521LC7Y					0.075	0.03	0.018	0.014	Travel distance error: ±0.05/300	
BNK 1520-3G0+571LC5Y	400	486	504	571	0.05	0.015	0.011	0.012	±0.027	0.02
BNK 1520-3G2+571LC7Y					0.075	0.03	0.018	0.014	Travel distance error: ±0.05/300	
BNK 1520-3G0+621LC5Y	450	536	554	621	0.05	0.015	0.011	0.012	±0.03	0.023
BNK 1520-3G2+621LC7Y					0.075	0.03	0.018	0.014	Travel distance error: ±0.05/300	
BNK 1520-3G0+671LC5Y	500	586	604	671	0.065	0.015	0.011	0.012	±0.03	0.023
BNK 1520-3G2+671LC7Y					0.09	0.03	0.018	0.014	Travel distance error: ±0.05/300	
BNK 1520-3G0+721LC5Y	550	636	654	721	0.065	0.015	0.011	0.012	±0.035	0.025
BNK 1520-3G2+721LC7Y					0.09	0.03	0.018	0.014	Travel distance error: ±0.05/300	
BNK 1520-3G0+771LC5Y	600	686	704	771	0.065	0.015	0.011	0.012	±0.035	0.025
BNK 1520-3G2+771LC7Y					0.09	0.03	0.018	0.014	Travel distance error: ±0.05/300	
BNK 1520-3G0+871LC5Y	700	786	804	871	0.085	0.015	0.011	0.012	±0.035	0.025
BNK 1520-3G2+871LC7Y					0.12	0.03	0.018	0.014	Travel distance error: ±0.05/300	
BNK 1520-3G0+971LC5Y	800	886	904	971	0.085	0.015	0.011	0.012	±0.04	0.027
BNK 1520-3G2+971LC7Y					0.12	0.03	0.018	0.014	Travel distance error: ±0.05/300	

Note For accuracy grade C5, clearance GT is also standardized.

Model BNK1616-3.6

Shaft diameter: 16; lead: 16





X-X arrow view

Ball Screw Specifications			
Lead (mm)	16		
BCD (mm)	16.65		
Thread minor diameter (mm)	13.7		
Threading direction, No. of threaded grooves	Rightward, 2		
No. of circuits	1.8 turns x 2 rows		
Clearance symbol	G0	GT	G2
Axial clearance (mm)	0	0.005 or less	0.02 or less
Basic dynamic load rating Ca (kN)	4.4	7.1	7.1
Basic static load rating C0a (kN)	7.2	14.3	14.3
Preload torque (N-m)	2 x 10⁻² to 9.8 x 10⁻²	—	—
Spacer ball	1:1	None	None

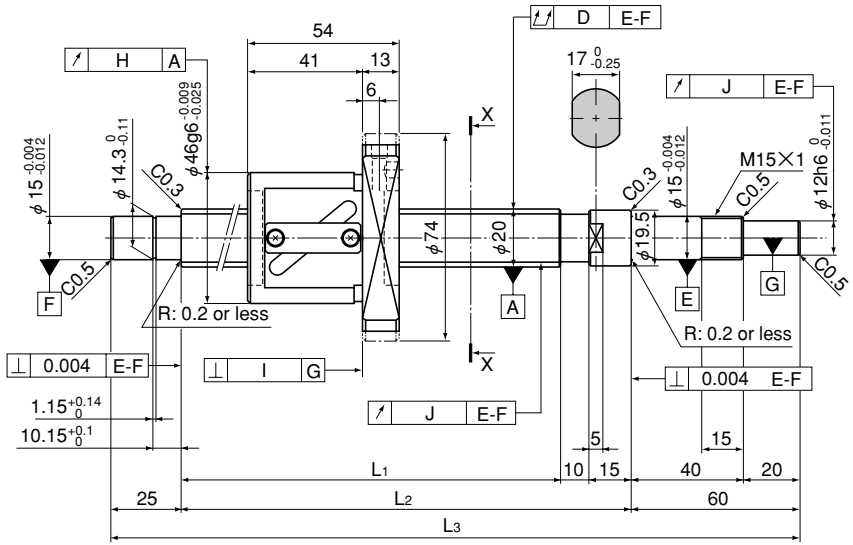
Unit: mm

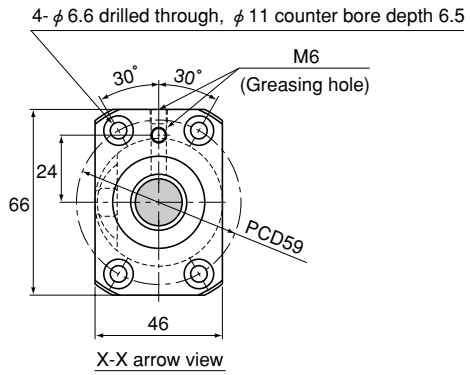
Model No.	Stroke	Screw shaft length			Run-out of the screw shaft axis	Run-out of the nut circumference	Flange perpendicularity	Run-out of the thread groove surface	Lead accuracy	
		L1	L2	L3	D	H	I	J	Representative travel distance error	Fluctuation
BNK 1616-3.6G0+321LC5Y	150	234	254	321	0.035	0.015	0.011	0.012	±0.023	0.018
BNK 1616-3.6G2+321LC7Y					0.055	0.03	0.018	0.014	Travel distance error: ±0.05/300	
BNK 1616-3.6G0+371LC5Y	200	284	304	371	0.035	0.015	0.011	0.012	±0.023	0.018
BNK 1616-3.6G2+371LC7Y					0.055	0.03	0.018	0.014	Travel distance error: ±0.05/300	
BNK 1616-3.6G0+421LC5Y	250	334	354	421	0.04	0.015	0.011	0.012	±0.025	0.02
BNK 1616-3.6G2+421LC7Y					0.06	0.03	0.018	0.014	Travel distance error: ±0.05/300	
BNK 1616-3.6G0+471LC5Y	300	384	404	471	0.04	0.015	0.011	0.012	±0.025	0.02
BNK 1616-3.6G2+471LC7Y					0.06	0.03	0.018	0.014	Travel distance error: ±0.05/300	
BNK 1616-3.6G0+521LC5Y	350	434	454	521	0.05	0.015	0.011	0.012	±0.027	0.02
BNK 1616-3.6G2+521LC7Y					0.075	0.03	0.018	0.014	Travel distance error: ±0.05/300	
BNK 1616-3.6G0+571LC5Y	400	484	504	571	0.05	0.015	0.011	0.012	±0.027	0.02
BNK 1616-3.6G2+571LC7Y					0.075	0.03	0.018	0.014	Travel distance error: ±0.05/300	
BNK 1616-3.6G0+621LC5Y	450	534	554	621	0.05	0.015	0.011	0.012	±0.03	0.023
BNK 1616-3.6G2+621LC7Y					0.075	0.03	0.018	0.014	Travel distance error: ±0.05/300	
BNK 1616-3.6G0+671LC5Y	500	584	604	671	0.065	0.015	0.011	0.012	±0.03	0.023
BNK 1616-3.6G2+671LC7Y					0.09	0.03	0.018	0.014	Travel distance error: ±0.05/300	
BNK 1616-3.6G0+721LC5Y	550	634	654	721	0.065	0.015	0.011	0.012	±0.035	0.025
BNK 1616-3.6G2+721LC7Y					0.09	0.03	0.018	0.014	Travel distance error: ±0.05/300	
BNK 1616-3.6G0+771LC5Y	600	684	704	771	0.065	0.015	0.011	0.012	±0.035	0.025
BNK 1616-3.6G2+771LC7Y					0.09	0.03	0.018	0.014	Travel distance error: ±0.05/300	
BNK 1616-3.6G0+871LC5Y	700	784	804	871	0.085	0.015	0.011	0.012	±0.035	0.025
BNK 1616-3.6G2+871LC7Y					0.12	0.03	0.018	0.014	Travel distance error: ±0.05/300	
BNK 1616-3.6G0+971LC5Y	800	884	904	971	0.085	0.015	0.011	0.012	±0.04	0.027
BNK 1616-3.6G2+971LC7Y					0.12	0.03	0.018	0.014	Travel distance error: ±0.05/300	

Note For accuracy grade C5, clearance GT is also standardized.

Model BNK2010-2.5

Shaft diameter: 20; lead: 10





Ball Screw Specifications			
Lead (mm)	10		
BCD (mm)	21		
Thread minor diameter (mm)	16.4		
Threading direction, No. of threaded grooves	Rightward, 1		
No. of circuits	2.5 turns x 1 row		
Clearance symbol	G0	GT	G2
Axial clearance (mm)	0	0.005 or less	0.02 or less
Basic dynamic load rating Ca (kN)	7	11.1	11.1
Basic static load rating C0a (kN)	11	22	22
Preload torque (N-m)	2 x 10⁻² to 9.8 x 10⁻²	—	—
Spacer ball	1:1	None	None

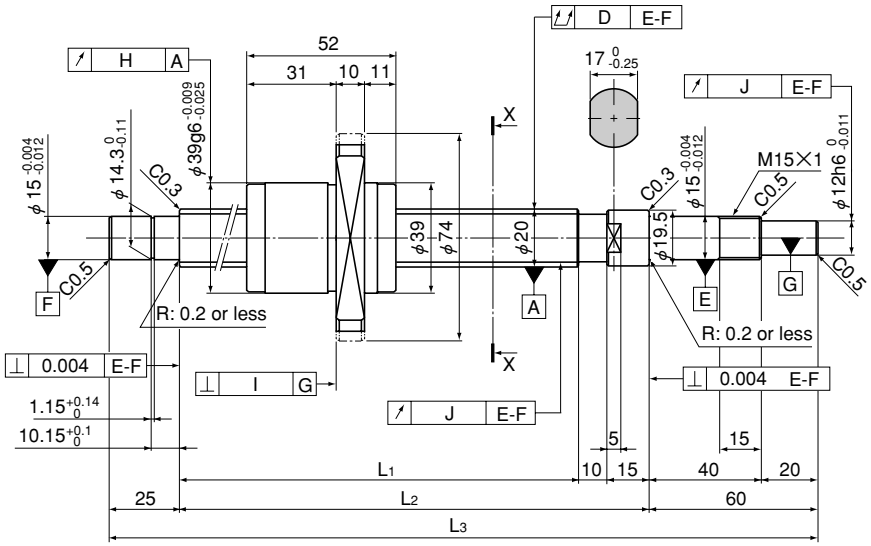
Unit: mm

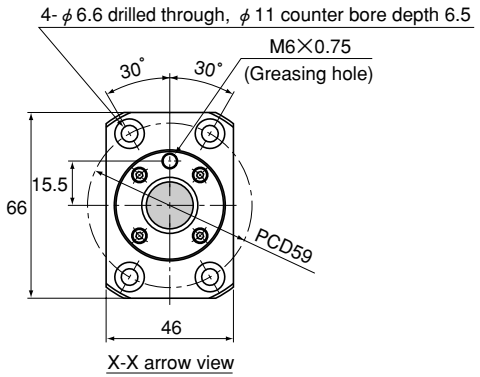
Model No.	Stroke	Screw shaft length L1	L2	L3	Run-out of the screw shaft axis D	Run-out of the nut circumference H	Flange perpendicularity I	Run-out of the thread groove surface J	Lead accuracy: Representative travel distance error	Lead accuracy: Fluctuation
BNK 2010-2.5RRG0+499LC5Y	300	389	414	499	0.04	0.015	0.011	0.012	±0.025	0.02
BNK 2010-2.5RRG2+499LC7Y					0.06	0.03	0.018	0.014	Travel distance error: ±0.05/300	
BNK 2010-2.5RRG0+599LC5Y	400	489	514	599	0.05	0.015	0.011	0.012	±0.027	0.02
BNK 2010-2.5RRG2+599LC7Y					0.075	0.03	0.018	0.014	Travel distance error: ±0.05/300	
BNK 2010-2.5RRG0+699LC5Y	500	589	614	699	0.065	0.015	0.011	0.012	±0.03	0.023
BNK 2010-2.5RRG2+699LC7Y					0.09	0.03	0.018	0.014	Travel distance error: ±0.05/300	
BNK 2010-2.5RRG0+799LC5Y	600	689	714	799	0.065	0.015	0.011	0.012	±0.035	0.025
BNK 2010-2.5RRG2+799LC7Y					0.09	0.03	0.018	0.014	Travel distance error: ±0.05/300	
BNK 2010-2.5RRG0+899LC5Y	700	789	814	899	0.085	0.015	0.011	0.012	±0.035	0.025
BNK 2010-2.5RRG2+899LC7Y					0.12	0.03	0.018	0.014	Travel distance error: ±0.05/300	
BNK 2010-2.5RRG0+999LC5Y	800	889	914	999	0.085	0.015	0.011	0.012	±0.04	0.027
BNK 2010-2.5RRG2+999LC7Y					0.12	0.03	0.018	0.014	Travel distance error: ±0.05/300	
BNK 2010-2.5RRG0+1099LC5Y	900	989	1014	1099	0.11	0.015	0.011	0.012	±0.04	0.027
BNK 2010-2.5RRG2+1099LC7Y					0.15	0.03	0.018	0.014	Travel distance error: ±0.05/300	
BNK 2010-2.5RRG0+1199LC5Y	1000	1089	1114	1199	0.11	0.015	0.011	0.012	±0.046	0.03
BNK 2010-2.5RRG2+1199LC7Y					0.15	0.03	0.018	0.014	Travel distance error: ±0.05/300	
BNK 2010-2.5RRG0+1299LC5Y	1100	1189	1214	1299	0.15	0.015	0.011	0.012	±0.046	0.03
BNK 2010-2.5RRG2+1299LC7Y					0.19	0.03	0.018	0.014	Travel distance error: ±0.05/300	

Note For accuracy grade C5, clearance GT is also standardized.

Model BNK2020-3.6

Shaft diameter: 20; lead: 20





Ball Screw Specifications			
Lead (mm)	20		
BCD (mm)	20.75		
Thread minor diameter (mm)	17.5		
Threading direction, No. of threaded grooves	Rightward, 2		
No. of circuits	1.8 turns x 2 rows		
Clearance symbol	G0	GT	G2
Axial clearance (mm)	0	0.005 or less	0.02 or less
Basic dynamic load rating Ca (kN)	7	11.1	11.1
Basic static load rating C0a (kN)	12.3	24.7	24.7
Preload torque (N-m)	2 x 10⁻² to 9.8 x 10⁻²	—	—
Spacer ball	1:1	None	None

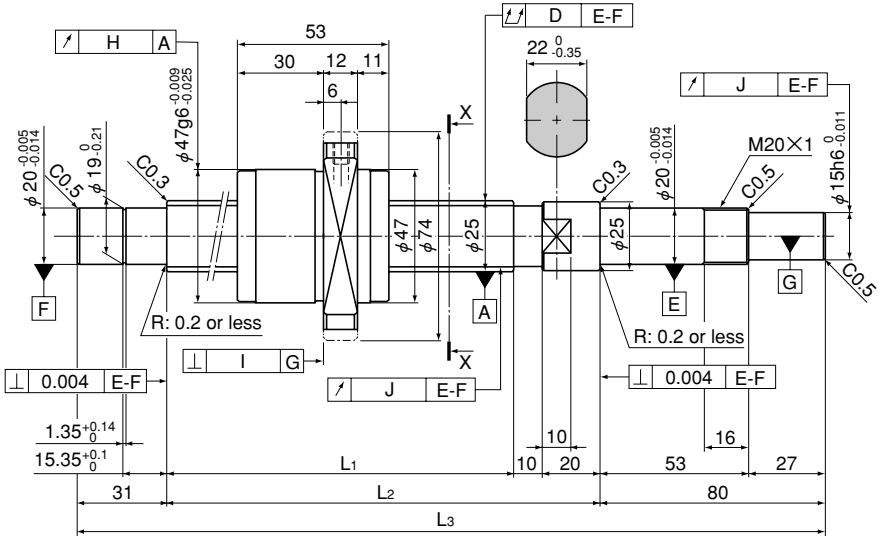
Unit: mm

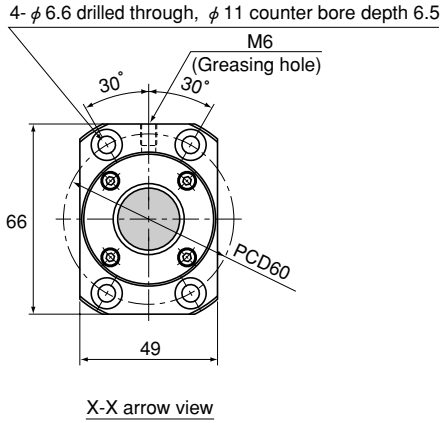
Model No.	Stroke	Screw shaft length L1	L2	L3	Run-out of the screw shaft axis D	Run-out of the nut circumference H	Flange perpendicularity I	Run-out of the thread groove surface J	Lead accuracy: Representative travel distance error	Lead accuracy: Fluctuation
BNK 2020-3.6G0+520LC5Y	300	410	435	520	0.05	0.015	0.011	0.012	±0.027	0.02
BNK 2020-3.6G2+520LC7Y					0.075	0.03	0.018	0.014	Travel distance error: ±0.05/300	
BNK 2020-3.6G0+620LC5Y	400	510	535	620	0.05	0.015	0.011	0.012	±0.03	0.023
BNK 2020-3.6G2+620LC7Y					0.075	0.03	0.018	0.014	Travel distance error: ±0.05/300	
BNK 2020-3.6G0+720LC5Y	500	610	635	720	0.065	0.015	0.011	0.012	±0.03	0.023
BNK 2020-3.6G2+720LC7Y					0.09	0.03	0.018	0.014	Travel distance error: ±0.05/300	
BNK 2020-3.6G0+820LC5Y	600	710	735	820	0.085	0.015	0.011	0.012	±0.035	0.025
BNK 2020-3.6G2+820LC7Y					0.12	0.03	0.018	0.014	Travel distance error: ±0.05/300	
BNK 2020-3.6G0+920LC5Y	700	810	835	920	0.085	0.015	0.011	0.012	±0.04	0.027
BNK 2020-3.6G2+920LC7Y					0.12	0.03	0.018	0.014	Travel distance error: ±0.05/300	
BNK 2020-3.6G0+1020LC5Y	800	910	935	1020	0.11	0.015	0.011	0.012	±0.04	0.027
BNK 2020-3.6G2+1020LC7Y					0.15	0.03	0.018	0.014	Travel distance error: ±0.05/300	
BNK 2020-3.6G0+1120LC5Y	900	1010	1035	1120	0.11	0.015	0.011	0.012	±0.046	0.03
BNK 2020-3.6G2+1120LC7Y					0.15	0.03	0.018	0.014	Travel distance error: ±0.05/300	
BNK 2020-3.6G0+1220LC5Y	1000	1110	1135	1220	0.11	0.015	0.011	0.012	±0.046	0.03
BNK 2020-3.6G2+1220LC7Y					0.15	0.03	0.018	0.014	Travel distance error: ±0.05/300	
BNK 2020-3.6G0+1320LC5Y	1100	1210	1235	1320	0.15	0.015	0.011	0.012	±0.046	0.03
BNK 2020-3.6G2+1320LC7Y					0.19	0.03	0.018	0.014	Travel distance error: ±0.05/300	

Note For accuracy grade C5, clearance GT is also standardized.

Model BNK2520-3.6

Shaft diameter: 25; lead: 20





X-X arrow view

Ball Screw Specifications			
Lead (mm)	20		
BCD (mm)	26		
Thread minor diameter (mm)	21.9		
Threading direction, No. of threaded grooves	Rightward, 2		
No. of circuits	1.8 turns x 2 rows		
Clearance symbol	G0	GT	G2
Axial clearance (mm)	0	0.005 or less	0.02 or less
Basic dynamic load rating Ca (kN)	10.5	16.7	16.7
Basic static load rating C0a (kN)	19	38	38
Preload torque (N-m)	4.9 x 10⁻² to 2.2 x 10⁻²	—	—
Spacer ball	1:1	None	None

Unit: mm

Model No.	Stroke	Screw shaft length			Run-out of the screw shaft axis	Run-out of the nut circumference	Flange perpendicularity	Run-out of the thread groove surface	Lead accuracy	
		L_1	L_2	L_3	D	H	I	J	Representative travel distance error	Fluctuation
BNK 2520-3.6G0+751LC5Y	500	610	640	751	0.055	0.015	0.011	0.013	±0.03	0.023
BNK 2520-3.6G2+751LC7Y					0.07	0.03	0.018	0.02	Travel distance error: ±0.05/300	
BNK 2520-3.6G0+851LC5Y	600	710	740	851	0.065	0.015	0.011	0.013	±0.035	0.025
BNK 2520-3.6G2+851LC7Y					0.085	0.03	0.018	0.02	Travel distance error: ±0.05/300	
BNK 2520-3.6G0+1051LC5Y	800	910	940	1051	0.085	0.015	0.011	0.013	±0.04	0.027
BNK 2520-3.6G2+1051LC7Y					0.1	0.03	0.018	0.02	Travel distance error: ±0.05/300	
BNK 2520-3.6G0+1251LC5Y	1000	1110	1140	1251	0.11	0.015	0.011	0.013	±0.046	0.03
BNK 2520-3.6G2+1251LC7Y					0.13	0.03	0.018	0.02	Travel distance error: ±0.05/300	
BNK 2520-3.6G0+1451LC5Y	1200	1310	1340	1451	0.11	0.015	0.011	0.013	±0.054	0.035
BNK 2520-3.6G2+1451LC7Y					0.13	0.03	0.018	0.02	Travel distance error: ±0.05/300	
BNK 2520-3.6G0+1651LC5Y	1400	1510	1540	1651	0.14	0.015	0.011	0.013	±0.054	0.035
BNK 2520-3.6G2+1651LC7Y					0.17	0.03	0.018	0.02	Travel distance error: ±0.05/300	
BNK 2520-3.6G0+1851LC5Y	1600	1710	1740	1851	0.14	0.015	0.011	0.013	±0.065	0.04
BNK 2520-3.6G2+1851LC7Y					0.17	0.03	0.018	0.02	Travel distance error: ±0.05/300	

Note For accuracy grade C5, clearance GT is also standardized.

High-Speed Ball Screw with Ball Cage Model SBN

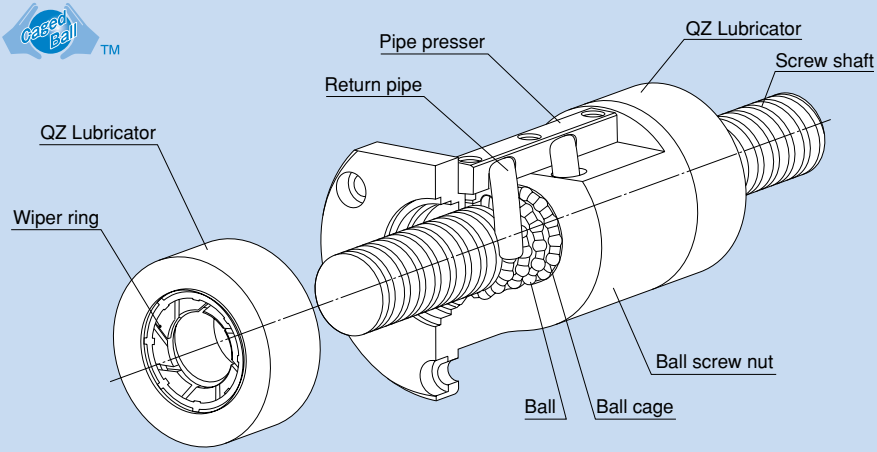


Fig. 1 Structure of High-Speed Ball Screw with Ball Cage Model SBN

Structure and Features

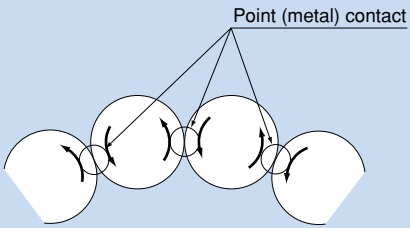
With High-Speed Ball Screw with Ball Cage model SBN, balls are evenly spaced by a ball cage to eliminate friction between the balls.

Additionally, the grease retained in the space between the ball circulation path and the ball cage (grease pocket) is drawn to the contact surface between the balls and the ball cage to form an oil film on the surface of the ball. As a result, an oil film is not easily broken.

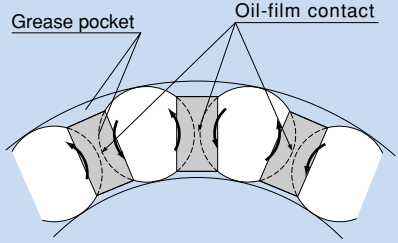
Model SBN has an optimum circulation structure where balls are picked up at the tangential direction by a return pipe (Fig. 2) and is provided with a strengthened circulation path, thus to achieve a DN value* of 130,000 (* DN value = ball center diameter x rotation speed per minute).

As a result of adopting the offset preloading method (Fig. 4), which shifts the lead in the central area of the ball screw nut, its overall ball screw nut length is shorter and its body is more compact than the double-nut type, which uses the spacer-based preloading method.

Optionally, QZ Lubricator for Ball Screws, which has been developed for long-term maintenance-free operation, and a wiper ring, which prevents foreign matter from entering the ball screw nut, are available.



Structure of the conventional type



Structure of the Ball Screw with Ball Cage

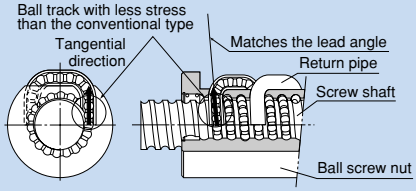


Fig. 2 Circulation Structure of Model SBN

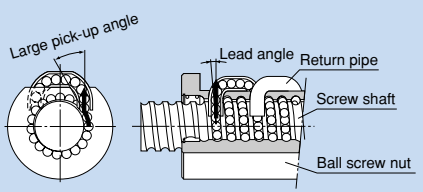


Fig. 3 Circulation Structure of Conventional Type

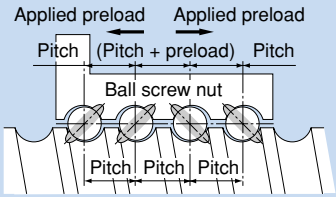


Fig. 4 Offset Preloading Method

Ball Cage Effect

●Low noise, acceptable running sound

Use of a ball cage eliminates collision noise between balls.
In addition, the fact that balls are picked up at the tangential direction also contributes to eliminating collision noise generated from circulating balls.

●Long-term, maintenance-free operation

Since friction between balls is eliminated and grease is retained in the grease pocket, long-term, maintenance-free operation (replenishment of grease is unnecessary for a long period) is achieved.

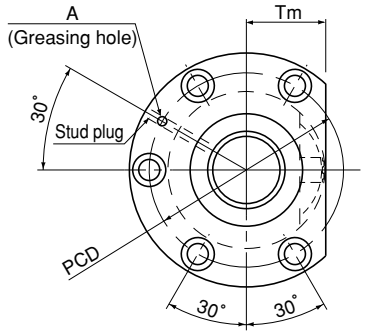
●Smooth motion

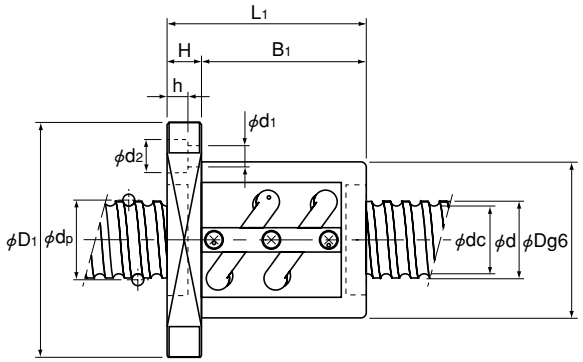
Use of a ball cage eliminates friction between balls and minimizes torque fluctuation, thus allowing smooth motion to be achieved.

Type

Offset-preload Type Model SBN

Model SBN





Unit: mm

Model No.	Screw shaft outer diameter d	Lead R	Ball center diameter dp	Thread minor diameter dc	No. of loaded circuits Rows x turns	Basic load rating Ca kN	Basic load rating C0a kN	Rigidity K N/μm	Nut dimensions Outer diameter D	Flange diameter D1	Overall length L1	H	B1	PCD	d1×d2×h	Tm	Greasing hole A	Screw shaft inertial moment/mm kg·cm²/mm
○ SBN 3210-7	32	10	33.75	26.4	1×3.5	43	73.1	836.7	74	108	120	15	105	90	9×14×8.5	38	M6	8.08×10^{-3}
○ SBN 3212-5	32	12	34	26.1	1×2.5	37.4	58.7	612.2	76	121	117	18	99	98	11×17.5×11	39	M6	8.08×10^{-3}
○ SBN 3610-7	36	10	37.75	30.4	1×3.5	45.6	82.3	920.9	77	120	123	18	105	98	11×17.5×11	40	M6	1.29×10^{-2}
○ SBN 3612-7	36	12	38	30.1	1×3.5	53.2	92.6	934.5	81	124	140	18	122	102	11×17.5×11	42	M6	1.29×10^{-2}
○ SBN 3616-5	36	16	38	30.1	1×2.5	39.7	66.4	676	81	124	140	18	122	102	11×17.5×11	42	M6	1.29×10^{-2}
○ SBN 4012-5	40	12	42	34.1	1×2.5	42	73.6	735.4	84	126	119	18	101	104	11×17.5×11	43	M6	1.97×10^{-2}
○ SBN 4016-5	40	16	42	34.1	1×2.5	41.9	73.8	736.6	84	126	144	18	126	104	11×17.5×11	43	M6	1.97×10^{-2}
○ SBN 4512-5	45	12	47	39.2	1×2.5	44.4	82.9	809.1	90	130	119	18	101	110	11×17.5×11	46	PT 1/8	3.16×10^{-2}
○ SBN 4516-5	45	16	47	39.2	1×2.5	44.3	83.1	810.1	90	130	140	18	122	110	11×17.5×11	46	PT 1/8	3.16×10^{-2}
○ SBN 5012-5	50	12	52	44.1	1×2.5	46.6	92.2	880.9	95	141	119	22	97	117	14×20×13	48	PT 1/8	4.82×10^{-2}
○ SBN 5016-5	50	16	52	44.1	1×2.5	46.6	92.4	881.7	95	141	143	22	121	117	14×20×13	48	PT 1/8	4.82×10^{-2}
○ SBN 5020-5	50	20	52	44.1	1×2.5	46.5	92.6	882.8	95	141	169	22	147	117	14×20×13	48	PT 1/8	4.82×10^{-2}

Note With model SBN, the raising of both ends of the thread groove is not available.
When designing your system this way, contact THK.
Those models marked with ○ can be attached with QZ Lubricator or the wiper ring.
For dimensions of the ball screw nut with either accessory being attached, see page k-110.

Model number coding

SBN4012-5 RR G0 +1400L C5
1 2 3 4 5

1 Model number
2 Seal symbol - RR : Labyrinth seal attached to both ends of the ball screw nut (see page k-25)
WW : Wiper ring attached to both ends of the ball screw nut (see page k-26)
3 Axial clearance symbol (G0 for all SBN variations) (see page k-15) 4 Overall screw shaft length (in mm)
5 Accuracy symbol (see page k-8)

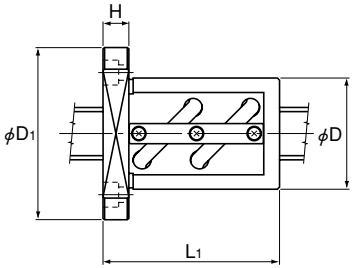
Note The rigidity values in the table represent spring constants each obtained from the rigidity and the elastic displacement when providing a preload 10% of the basic dynamic load rating (Ca) and applying an axial load three times greater than the preload.
These values do not include the rigidity of the components related to mounting the ball screw nut. Therefore, it is normally appropriate to regard roughly 80% of the value in the table as the actual value.
If the applied preload (Fa_0) is not 0.1 Ca, the rigidity value (K_N) is obtained from the following equation.

where

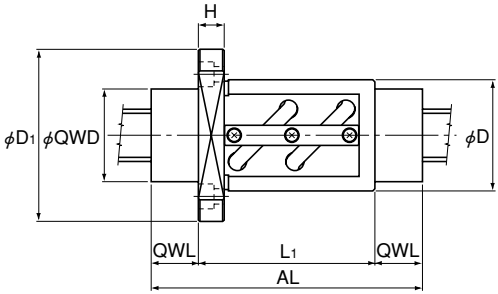
$$K_N = K\left(\frac{Fa_0}{0.1Ca}\right)^{\frac{1}{3}}$$

K: Rigidity value in the dimensional table.

Dimensions of the Ball Screw Nut Attached with Wiper Ring (WW) and QZ Lubricator (QZ)



With WW (without QZ)



With QZ + WW

Unit: mm

Model No.	Dimensions including WW				Dimensions including QZ and WW		
	Nut length	Flange width	Flange diameter	Nut diameter	Length	Outer diameter	Overall length incl. QZ and WW
	L_1	H	D_1	Dg6	QWL	QWD	AL
SBN 3210-7	120	15	108	74	31	73	182
SBN 3212-5	117	18	121	76	33	73	183
SBN 3610-7	123	18	120	77	33	64	189
SBN 3612-7	140	18	124	81	35	64	210
SBN 3616-5	140	18	124	81	32	64	204
SBN 4012-5	119	18	126	84	38	66	195
SBN 4016-5	144	18	126	84	42	66	228
SBN 4512-5	119	18	130	90	35.5	79	190
SBN 4516-5	140	18	130	90	35.5	79	211
SBN 5012-5	119	22	141	95	38.5	79	196
SBN 5016-5	143	22	141	95	38.5	79	220
SBN 5020-5	169	22	141	95	40.5	79	250

Model number coding

SBN3210-7 QZ WW G0 +1200L C5

1 2 3 4 5 6

1 Model number 2 With QZ Lubricator (see page k-22)
3 Seal symbol - RR : Labyrinth seal attached to both ends of the ball screw nut (see page k-25)
WW : Wiper ring attached to both ends of the ball screw nut (see page k-26)
4 Axial clearance symbol (see page k-15) 5 Overall screw shaft length (in mm)
6 Accuracy symbol (see page k-8)

Note QZ Lubricator and wiper ring are not sold alone.

Precautions on Use

THK QZ Lubricator for the Ball Screw

Handling

- Dropping or hitting the product may damage it. Use much care when handling it.
- Unduly disassembling the product may cause foreign matter from entering the product or degrade the accuracy. Do not disassemble the product unless it is inevitable.
- Do not clean the product with an organic solvent or white kerosene.
- Do not leave the product package open over a long period of time.
- Do not block the hole for air vent near the model number indication with grease or the like.

Service Temperature Range

- Use this product within a temperature range of -10℃ to +50℃. When desiring to use the product out of this temperature range, contact THK.

Use in a Special Environment

- When desiring to use the product in a special environment, contact THK.

Corrosion Prevention

- QZ Lubricator is designed to provide the essential minimum amount of a lubricant to the ball raceway. It does not provide a corrosion-prevention effect to the whole Ball Screw.

THK Wiper Ring for the Ball Screw

Handling

- Dropping or hitting the product may damage it. Use much care when handling it.
- Unduly disassembling the product may cause foreign matter from entering the product or degrade the accuracy. Do not disassemble the product unless it is inevitable.
- When using this product in a harsh environment, we recommend using it in combination with QZ Lubricator.

Service Temperature Range

- Use this product within a temperature range of -20℃ to +80℃. When desiring to use the product out of this temperature range, contact THK.

Use in a Special Environment

- When desiring to use the product in a special environment, contact THK.

Chemical Resistance

- Avoid using the product in an atmosphere containing an acid or alkali solvent.

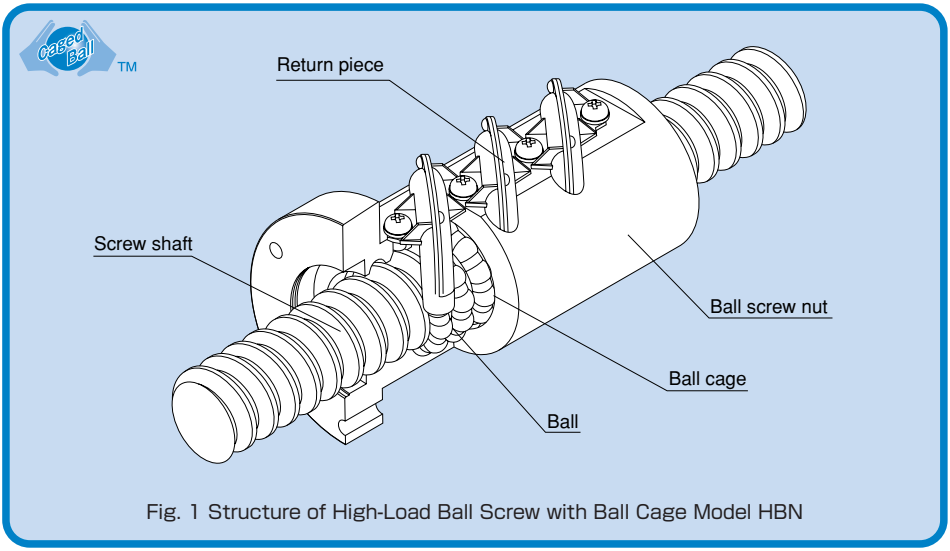


Fig. 1 Structure of High-Load Ball Screw with Ball Cage Model HBN

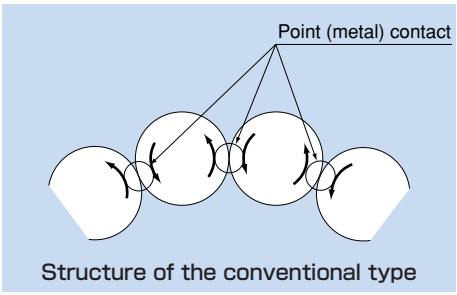
Structure and Features

With High-Load Ball Screw with Ball Cage model HBN, balls are evenly spaced by a ball cage to eliminate friction between the balls.

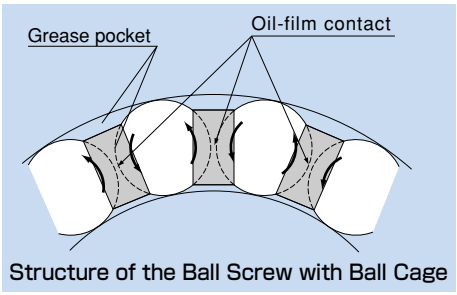
Additionally, the grease retained in the space between the ball circulation path and the ball cage (grease pocket) is drawn to the contact surface between the balls and the ball cage to form an oil film on the surface of the ball. As a result, an oil film is not easily broken.

With the optimal design (ball cage, ball diameter, groove curvature radius, contact angle between the ball and the groove, number of turns, etc.) for high loads, model HBN achieves a rated load more than twice the conventional type.

It has a ball circulation structure where balls are picked up at the tangential direction by a return piece (Fig. 2) and is provided with a strengthened circulation path, thus to enable the Ball Screw to operate at a DN value of 130,000.



Structure of the conventional type



Structure of the Ball Screw with Ball Cage

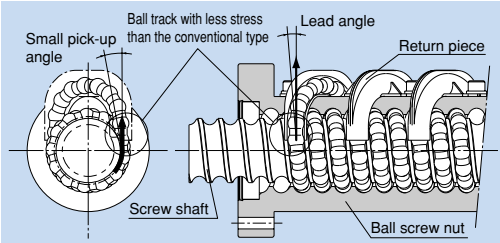


Fig. 2 Circulation Structure of Model HBN

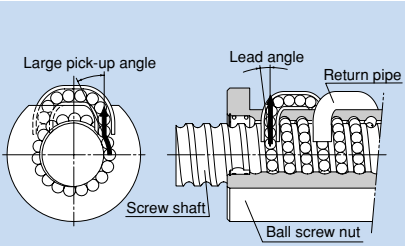


Fig. 3 Circulation Structure of Conventional Type

Ball Cage Effect

●Low noise, acceptable running sound

Use of a ball cage eliminates collision noise between balls.
In addition, the fact that balls are picked up at the tangential direction also contributes to eliminating collision noise generated from circulating balls.

●Long-term maintenance-free operation

Since friction between balls is eliminated and grease is retained in the grease pocket, long-term maintenance-free operation (replenishment of grease is unnecessary for a long period) is achieved.

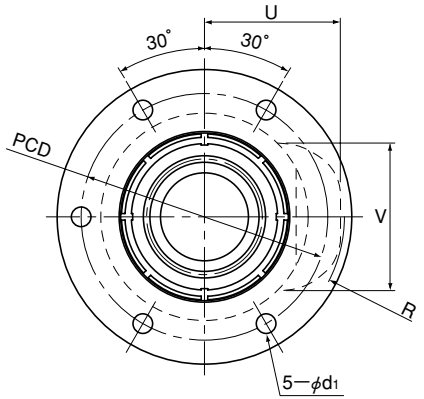
●Smooth motion

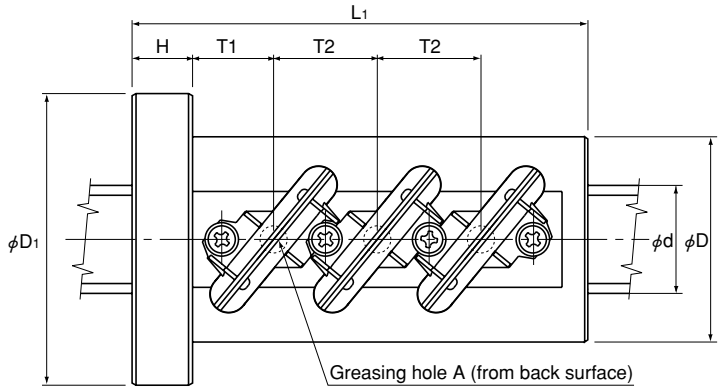
Use of a ball cage eliminates friction between balls and minimizes torque fluctuation, thus allowing smooth motion to be achieved.

Type

Non-preload Type Model HBN

Model HBN





Unit: mm

Model No.	Screw shaft outer diameter d	Lead R	Ball center diameter dp	Thread minor diameter dc	No. of loaded circuits Rows x turns	Basic load rating Ca kN	Basic load rating C0a kN	Permissible load* FP kN	Rigidity K N/μm	Nut dimensions Outer diameter D	Flange diameter D1	Overall length L1	H	PCD	d1	T1	T2	UMAX	VMAX	RMAX	Greasing hole A	Screw shaft inertial moment/mm kg·cm²/mm
HBN 3210-5	32	10	34	26	2×2.5	102.9	191.3	31.9	1077	58	85	98	15	71	6.6	22	30	42	46	43.5	M6	8.08×10^{-3}
HBN 3610-5	36	10	38	30	2×2.5	108.2	220.4	33.5	1176	62	89	98	15	75	6.6	22	30	44	50	46	M6	1.29×10^{-2}
HBN 3612-5	36	12	38.4	29	2×2.5	141.1	267.7	43.7	1207	66	100	116	18	82	9	26	36	48	52.5	50	M6	1.29×10^{-2}
HBN 4010-7.5	40	10	42	34	3×2.5	162.6	336	50.4	1910	66	100	135	18	82	9	23.5	30	45.5	54	48	M6	1.97×10^{-2}
HBN 4012-7.5	40	12	42.4	33	3×2.5	212.4	441.6	65.8	1922	70	104	152	18	86	9	26	36	50	56	52	M6	1.97×10^{-2}
HBN 5010-7.5	50	10	52	44	3×2.5	179.1	462.7	55.5	2279	78	112	135	18	94	9	23.5	30	51	63.5	54.5	M6	4.82×10^{-2}
HBN 5012-7.5	50	12	52.4	43	3×2.5	235.7	572.2	73.1	2345	80	114	152	18	96	9	26	36	55	66	58.5	M6	4.82×10^{-2}
HBN 5016-7.5	50	16	53	39.6	3×2.5	379.6	820.9	117.7	2392	95	135	211	28	113	9	37.5	48	63.4	69.6	65.2	PT 1/8	4.82×10^{-2}
HBN 6316-7.5	63	16	66	52.6	3×2.5	427.1	1043.8	132.4	2898	105	139	211	28	122	9	37.5	48	69.5	82	72.5	PT 1/8	1.21×10^{-1}
HBN 6316-10.5	63	16	66	52.6	3×3.5	577.1	1461.3	178.9	4029	105	139	259	28	122	9	53.5	64	69.5	82	73	PT 1/8	1.21×10^{-1}
HBN 6320-7.5	63	20	66.5	49.6	3×2.5	578.8	1283.1	179.4	3030	117	157	252	32	137	11	44	60	78	86.5	80	PT 1/8	1.21×10^{-1}

Note The permissible load F_P indicates the maxim axial load that the Ball Screw can receive.
This model is capable of achieving a longer service life than the conventional Ball Screw under a high load.
For the axial clearance, this model has clearance G2 as standard. Other clearance is also available at your request. Contact THK for details.

Model number coding HBN3210-5 RR G2 +1200L C7
1 2 3 4 5

1 Model number
2 Seal symbol - RR: Labyrinth seal attached to both ends of the ball screw nut (see page k-25)
3 Axial clearance symbol (see page k-15) 4 Overall screw shaft length (in mm)
5 Accuracy symbol (see page k-8)

Note The rigidity values in the table represent spring constants each obtained from the load and the elastic displacement when providing an axial load 30% of the basic dynamic load rating (Ca).
These values do not include the rigidity of the components related to mounting the ball screw nut. Therefore, it is normally appropriate to regard roughly 80% of the value in the table as the actual value.
If the axial load (Fa) is not 0.3 Ca, the rigidity value (K_N) is obtained from the following equation.

where

$$K_N = K\left(\frac{Fa}{0.3Ca}\right)^{\frac{1}{3}}$$

K: Rigidity value in the dimensional table.

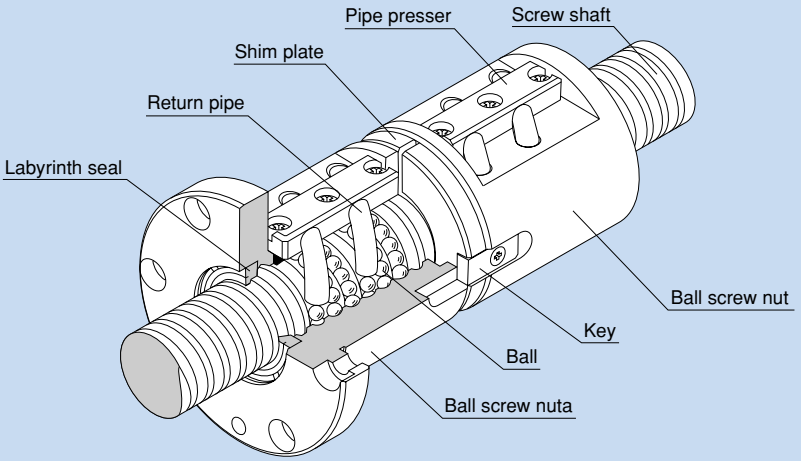


Fig. 1 Structure of the Return-Pipe Nut

Structure and Features

With the Return-Pipe Nut, balls under a load roll around the circumference of the screw shaft, while receiving an axial load on the ball raceways formed between the screw shaft and the ball screw nut, then pass through the return pipe incorporated in the ball screw nut and circulate back to the loaded area, thus to achieve infinite motion. Being the most common type is the series with the broadest range of variations, it can be used in a wide array of applications.

Types and Features

Offset-Preload Type Model BIF

The right and left screws are provided with a phase in the middle of the ball screw nut, and an axial clearance is set at a below-zero value (under a preload). This compact model is capable of smooth motion.

Double-nut Preload Type Model BNFN

The most common type with a preload provided via a spacer between the two combined ball screw nuts to eliminate backlash. It can be mounted using the bolt holes drilled on the flange.

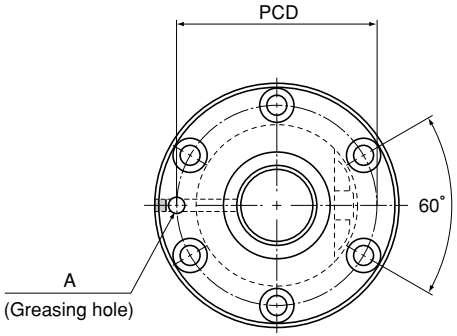
Non-preload Type Model BNF

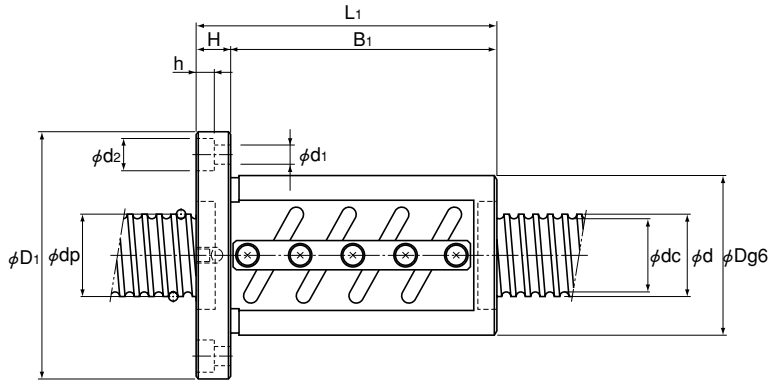
The simplest type with a single ball screw nut. It is designed to be mounted using the bolt holes drilling on the flange.

Non-preload Type with a Square Ball Screw Nut Model BNT

Since mounting screw holes are machined on the square ball screw nut, this model can compactly be mounted on the machine without a housing.

Model BIF
Offset-preload Type





Unit: mm

Model No.	Screw shaft outer diameter d	Lead R	Ball center diameter dp	Thread minor diameter dc	No. of loaded circuits Rows x turns	Basic load rating Ca kN	Basic load rating C0a kN	Rigidity K N/μm	Nut dimensions Outer diameter D	Flange diameter D1	Overall length L1	H	B1	PCD	d1×d2×h	Greasing hole A	Screw shaft inertial moment/mm kg·cm²/mm
BIF 1605-5	16	5	16.75	13.2	1×2.5	7.4	13.9	330	40	60	56	10	46	50	4.5×8×4.5	M6	5.05×10^{-4}
BIF 1606-5		6	16.8	13.2	1×2.5	7.5	14	330	40	60	62	10	52	50	4.5×8×4.5	M6	5.05×10^{-4}
BIF 1810-3	18	10	18.8	15.5	1×1.5	5.1	9.6	230	42	65	75	12	63	53	5.5×9.5×5.5	M6	8.09×10^{-4}
BIF 2004-5	20	4	20.5	17.8	1×2.5	4.8	10.9	360	40	63	53	11	42	51	5.5×9.5×5.5	M6	1.23×10^{-3}
BIF 2005-5		5	20.75	17.2	1×2.5	8.3	17.4	390	44	67	56	11	45	55	5.5×9.5×5.5	M6	1.23×10^{-3}
BIF 2006-3		6	20.75	17.2	1×1.5	5.4	10.5	250	48	71	56	11	45	59	5.5×9.5×5.5	M6	1.23×10^{-3}
BIF 2006-5			20.75	17.2	1×2.5	8.3	17.5	390	48	71	62	11	51	59	5.5×9.5×5.5	M6	1.23×10^{-3}
○ BIF 2505-3	25	5	25.75	22.2	1×1.5	6	13.1	280	50	73	52	11	41	61	5.5×9.5×5.5	M6	3.01×10^{-3}
○ BIF 2505-5			25.75	22.2	1×2.5	9.2	22	470	50	73	55	11	44	61	5.5×9.5×5.5	M6	3.01×10^{-3}
○ BIF 2508-5		8	26.25	20.5	1×2.5	15.8	32.8	500	58	85	82	15	67	71	6.6×11×6.5	M6	3.01×10^{-3}
○ BIF 2510A-5		10	26.3	21.4	1×2.5	15.8	33	500	58	85	100	18	82	71	6.6×11×6.5	M6	3.01×10^{-3}
BIF 2805-5	28	5	28.75	25.2	1×2.5	9.7	24.6	520	55	85	59	12	47	69	6.6×11×6.5	M6	4.74×10^{-3}
BIF 2805-10			28.75	25.2	2×2.5	17.4	49.4	1000	55	85	89	12	77	69	6.6×11×6.5	M6	4.74×10^{-3}
BIF 2806-5		6	28.75	25.2	1×2.5	9.6	24.6	520	55	85	68	12	56	69	6.6×11×6.5	M6	4.74×10^{-3}
BIF 2806-10			28.75	25.2	2×2.5	17.5	49.4	1000	55	85	104	12	92	69	6.6×11×6.5	M6	4.74×10^{-3}
BIF 2810-3		10	29.75	22.4	2×1.5	15.7	29.4	350	65	106	88	18	70	85	11×17.5×11	M6	4.74×10^{-3}

Note The model number in a light face type indicate semi-standard types.
If desiring them, contact THK.
Those models marked with ○ can be attached with QZ Lubricator or the wiper ring.
For dimensions of the ball screw nut with either accessory being attached, see page k-122.

Model number coding

BIF2005-5 RR G0 +1000L C3
1 2 3 4 5

1 Model number
2 Seal symbol - RR : Labyrinth seal attached to both ends of the ball screw nut (see page k-25)
WW : Wiper ring attached to both ends of the ball screw nut (see page k-26)
3 Axial clearance symbol (see page k-15) 4 Overall screw shaft length (in mm)
5 Accuracy symbol (see page k-8)

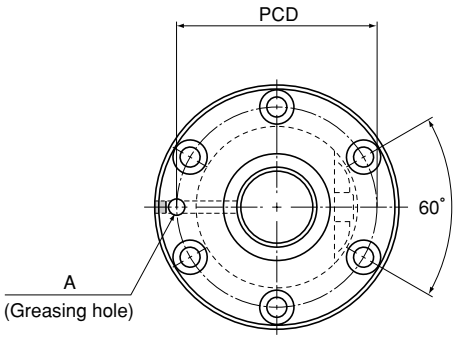
Note The rigidity values in the table represent spring constants each obtained from the load and the elastic displacement when providing a preload 10% of the basic dynamic load rating (Ca) and applying an axial load three times greater than the preload.
These values do not include the rigidity of the components related to mounting the ball screw nut. Therefore, it is normally appropriate to regard roughly 80% of the value in the table as the actual value.
If the applied preload (Fa_0) is not 0.1 Ca, the rigidity value (K_N) is obtained from the following equation.

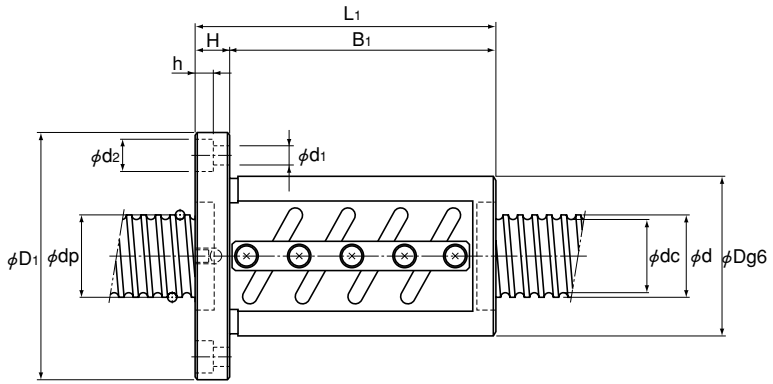
where

$$K_N = K\left(\frac{Fa_0}{0.1Ca}\right)^{\frac{1}{3}}$$

K: Rigidity value in the dimensional table.

Model BIF
Offset-preload Type





Unit: mm

Model No.	Screw shaft outer diameter d	Lead R	Ball center diameter dp	Thread minor diameter dc	No. of loaded circuits Rows x turns	Basic load rating Ca kN	Basic load rating C0a kN	Rigidity K N/μm	Nut dimensions Outer diameter D	Flange diameter D1	Overall length L1	H	B1	PCD	d1×d2×h	Greasing hole A	Screw shaft inertial moment/mm kg·cm²/mm
BIF 3204-10	32	4	32.5	30.1	2×2.5	10.5	35.4	1010	54	81	76	11	65	67	6.6×11×6.5	M6	8.08×10^{-3}
○ BIF 3205-5		5	32.75	29.2	1×2.5	10.2	28.1	570	58	85	56	12	44	71	6.6×11×6.5	M6	8.08×10^{-3}
○ BIF 3205-10			32.75	29.2	2×2.5	18.5	56.4	1110	58	85	86	12	74	71	6.6×11×6.5	M6	8.08×10^{-3}
○ BIF 3206-5		6	33	28.4	1×2.5	13.9	35.2	600	62	89	63	12	51	75	6.6×11×6.5	M6	8.08×10^{-3}
○ BIF 3206-7			33	28.4	1×3.5	18.5	49.2	810	62	89	75	12	63	75	6.6×11×6.5	M6	8.08×10^{-3}
○ BIF 3206-10			33	28.4	2×2.5	25.2	70.4	1150	62	89	99	12	87	75	6.6×11×6.5	M6	8.08×10^{-3}
○ BIF 3208A-5		8	33.25	27.5	1×2.5	17.8	42.2	610	66	100	82	15	67	82	9×14×8.5	M6	8.08×10^{-3}
○ BIF 3208A-7			33.25	27.5	1×3.5	23.8	59.1	840	66	100	98	15	83	82	9×14×8.5	M6	8.08×10^{-3}
○ BIF 3210A-5		10	33.75	26.4	1×2.5	26.1	56.2	640	74	108	100	15	85	90	9×14×8.5	M6	8.08×10^{-3}
○ BIF 3610-5	36	10	37.75	30.5	1×2.5	27.6	63.3	700	75	120	111	18	93	98	11×17.5×11	M6	1.29×10^{-2}
○ BIF 3610-10			37.75	30.5	2×2.5	50.1	126.4	1350	75	120	171	18	153	98	11×17.5×11	M6	1.29×10^{-2}
○ BIF 4010-5	40	10	41.75	34.4	1×2.5	29	70.4	750	82	124	103	18	85	102	11×17.5×11	M6	1.97×10^{-2}
○ BIF 4010-10			41.75	34.4	2×2.5	52.7	141.1	1470	82	124	163	18	145	102	11×17.5×11	M6	1.97×10^{-2}
○ BIF 4012-5		12	42	34.1	1×2.5	33.9	79.2	770	84	126	119	18	101	104	11×17.5×11	M6	1.97×10^{-2}
○ BIF 4012-10			42	34.1	2×2.5	61.6	158.8	1490	84	126	191	18	173	104	11×17.5×11	M6	1.97×10^{-2}
○ BIF 5010-5	50	10	51.75	44.4	1×2.5	32	88.2	900	93	135	103	18	85	113	11×17.5×11	PT 1/8	4.82×10^{-2}
○ BIF 5010-10			51.75	44.4	2×2.5	58.2	176.4	1750	93	135	163	18	145	113	11×17.5×11	PT 1/8	4.82×10^{-2}

Note The model number in a light face type indicate semi-standard types.
If desiring them, contact THK.
Those models marked with ○ can be attached with QZ Lubricator or the wiper ring.
For dimensions of the ball screw nut with either accessory being attached, see page k-122.

Model number coding

BIF3206-10 RR G0 +1200L C3
1 2 3 4 5

1 Model number
2 Seal symbol - RR : Labyrinth seal attached to both ends of the ball screw nut (see page k-25)
WW : Wiper ring attached to both ends of the ball screw nut (see page k-26)
3 Axial clearance symbol (see page k-15) 4 Overall screw shaft length (in mm)
5 Accuracy symbol (see page k-8)

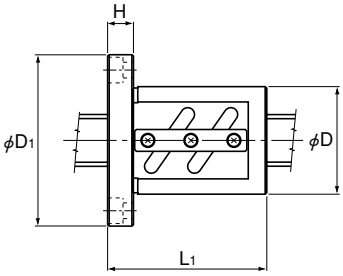
Note The rigidity values in the table represent spring constants each obtained from the load and the elastic displacement when providing a preload 10% of the basic dynamic load rating (Ca) and applying an axial load three times greater than the preload.
These values do not include the rigidity of the components related to mounting the ball screw nut. Therefore, it is normally appropriate to regard roughly 80% of the value in the table as the actual value.
If the applied preload (Fa_0) is not 0.1 Ca, the rigidity value (K_N) is obtained from the following equation.

where

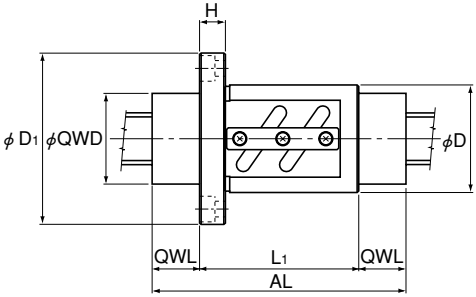
$$K_N = K\left(\frac{Fa_0}{0.1Ca}\right)^{\frac{1}{3}}$$

K: Rigidity value in the dimensional table.

Dimensions of the Ball Screw Nut Attached with Wiper Ring (WW) and QZ Lubricator (QZ)



With WW (without QZ)



With QZ + WW

Unit: mm

Model No.	Dimensions including WW				Dimensions including QZ and WW		
	Nut length	Flange width	Flange diameter	Nut diameter	Length	Outer diameter	Overall length incl. QZ and WW
	L_1	H	D_1	Dg6	QWL	QWD	AL
BIF 2505-3	52	11	73	50	32.5	45	117
BIF 2505-5	55						120
BIF 2508-5	82	15	85	58	34	45	150
BIF 2510A-5	100	18	85	58	37	45	174
BIF 3205-5	56	12	85	58	32	57	120
BIF 3205-10	86						150
BIF 3206-5	63	12	89	62	32	57	127
BIF 3206-7	75						139
BIF 3206-10	99						163
BIF 3208A-5	82	15	100	66	34	57	150
BIF 3208A-7	98						166
BIF 3210A-5	100	15	108	74	31	73	162
BIF 3610-5	111	18	120	75	33	64	177
BIF 3610-10	171						237
BIF 4010-5	103	18	124	82	37	66	177
BIF 4010-10	163						237
BIF 4012-5	119	18	126	84	38	66	195
BIF 4012-10	191						267
BIF 5010-10	163	18	135	93	37.5	79	238

Model number coding

BIF2505-3 QZ WW G0 +1000L C5
1 2 3 4 5 6

1 Model number 2 With QZ Lubricator (see page k-22)
3 Seal symbol - RR : Labyrinth seal attached to both ends of the ball screw nut (see page k-25)
WW : Wiper ring attached to both ends of the ball screw nut (see page k-26)
4 Axial clearance symbol (see page k-15) 5 Overall screw shaft length (in mm)
6 Accuracy symbol (see page k-8)

Note QZ Lubricator and wiper ring are not sold alone.

Precautions on Use

THK QZ Lubricator for the Ball Screw

Handling

- Dropping or hitting the product may damage it. Use much care when handling it.
- Unduly disassembling the product may cause foreign matter from entering the product or degrade the accuracy. Do not disassemble the product unless it is inevitable.
- Do not clean the product with an organic solvent or white kerosene.
- Do not leave the product package open over a long period of time.
- Do not block the hole for air vent near the model number indication with grease or the like.

Service Temperature Range

- Use this product within a temperature range of -10℃ to +50℃. When desiring to use the product out of this temperature range, contact THK.

Use in a Special Environment

- When desiring to use the product in a special environment, contact THK.

Corrosion Prevention

- QZ Lubricator is designed to provide the essential minimum amount of a lubricant to the ball raceway. It does not provide a corrosion-prevention effect to the whole Ball Screw.

THK Wiper Ring for the Ball Screw

Handling

- Dropping or hitting the product may damage it. Use much care when handling it.
- Unduly disassembling the product may cause foreign matter from entering the product or degrade the accuracy. Do not disassemble the product unless it is inevitable.
- When using this product in a harsh environment, we recommend using it in combination with QZ Lubricator.

Service Temperature Range

- Use this product within a temperature range of -20℃ to +80℃. When desiring to use the product out of this temperature range, contact THK.

Use in a Special Environment

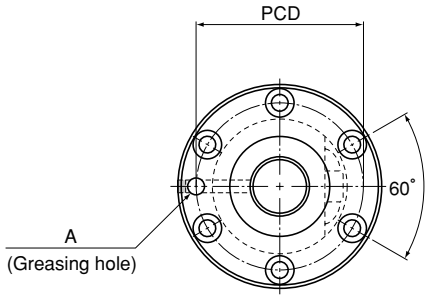
- When desiring to use the product in a special environment, contact THK.

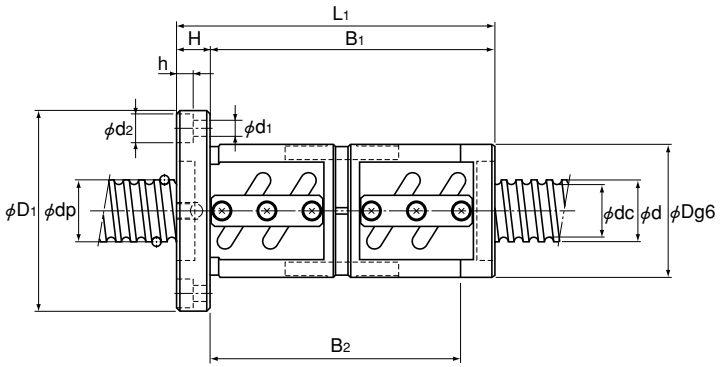
Chemical Resistance

- Avoid using the product in an atmosphere containing an acid or alkali solvent.

Model BNFN

Double-nut Preload Type





Unit: mm

Model No.	Screw shaft outer diameter d	Lead R	Ball center diameter dp	Thread minor diameter dc	No. of loaded circuits Rows x turns	Basic load rating Ca kN	Basic load rating C0a kN	Rigidity K N/μm	Nut dimensions Outer diameter D	Flange diameter D1	Overall length L1	H	B1	B2	PCD	d1×d2×h	Greasing hole A	Screw shaft inertial moment/mm kg·cm²/mm
BNFN 1604-3	16	4	16.5	13.8	2×1.5	5.1	10.5	350	36	59	85	11	74	—	47	5.5×9.5×5.5	M6	5.05×10^{-4}
BNFN 1605-2.5		5	16.75	13.2	1×2.5	7.4	13.9	330	40	60	76	10	66	55	50	4.5×8×4.5	M6	5.05×10^{-4}
BNFN 1605-3			16.75	13.2	2×1.5	8.7	16.8	390	40	60	96	10	86	75	50	4.5×8×4.5	M6	5.05×10^{-4}
BNFN 1605-5			16.75	13.2	2×2.5	13.5	27.8	640	40	60	106	10	96	85	50	4.5×8×4.5	M6	5.05×10^{-4}
BNFN 1610-1.5		10	16.8	13.2	1×1.5	4.8	8.5	210	40	63	72	11	61	—	51	5.5×9.5×5.5	M6	5.05×10^{-4}
BNFN 1810-2.5	18	10	18.8	15.5	1×2.5	7.8	15.9	360	42	65	119	12	107	94	53	5.5×9.5×5.5	M6	8.09×10^{-4}
BNFN 1810-3			18.8	15.5	2×1.5	9.2	19.1	430	42	65	135	12	123	110	53	5.5×9.5×5.5	M6	8.09×10^{-4}
BNFN 2004-2.5	20	4	20.5	17.8	1×2.5	4.8	10.9	360	40	63	69	11	58	—	51	5.5×9.5×5.5	M6	1.23×10^{-3}
BNFN 2004-5			20.5	17.8	2×2.5	8.6	21.8	700	40	63	93	11	82	—	51	5.5×9.5×5.5	M6	1.23×10^{-3}
BNFN 2005-2.5		5	20.75	17.2	1×2.5	8.3	17.4	390	44	67	76	11	65	53	55	5.5×9.5×5.5	M6	1.23×10^{-3}
BNFN 2005-3			20.75	17.2	2×1.5	9.7	21	470	44	67	97	11	86	74	55	5.5×9.5×5.5	M6	1.23×10^{-3}
BNFN 2005-3.5			20.75	17.2	1×3.5	11.1	24.5	550	44	67	85	11	74	62	55	5.5×9.5×5.5	M6	1.23×10^{-3}
BNFN 2005-5			20.75	17.2	2×2.5	15.1	35	760	44	67	106	11	95	83	55	5.5×9.5×5.5	M6	1.23×10^{-3}
BNFN 2006-2.5		6	20.75	17.2	1×2.5	8.3	17.5	390	48	71	86	11	75	—	59	5.5×9.5×5.5	M6	1.23×10^{-3}
BNFN 2006-3			20.75	17.2	2×1.5	9.7	21	470	48	71	110	11	99	—	59	5.5×9.5×5.5	M6	1.23×10^{-3}
BNFN 2006-3.5			20.75	17.2	1×3.5	11.1	24.5	550	48	71	98	11	87	—	59	5.5×9.5×5.5	M6	1.23×10^{-3}
BNFN 2006-5			20.75	17.2	2×2.5	15.1	35	760	48	71	122	11	111	—	59	5.5×9.5×5.5	M6	1.23×10^{-3}
BNFN 2008-2.5		8	21	16.4	1×2.5	15.1	35	760	46	74	100	15	85	—	59	5.5×9.5×5.5	M6	1.23×10^{-3}
BNFN 2010A-1.5		10	21	16.4	1×1.5	7.2	13.2	250	46	74	98	15	83	67	59	5.5×9.5×5.5	M6	1.23×10^{-3}
BNFN 2012-1.5		12	21	16.4	1×1.5	7.1	12.5	250	48	71	100	18	82	—	59	5.5×9.5×5.5	M6	1.23×10^{-3}

Note The model number in a light face type indicate semi-standard types.
If desiring them, contact THK.

Model number coding

BNFN1810-2.5 RR G0 +900L C3
1 2 3 4 5

1 Model number
2 Seal symbol - RR: Labyrinth seal attached to both ends of the ball screw nut (see page k-25)
3 Axial clearance symbol (see page k-15) 4 Overall screw shaft length (in mm)
5 Accuracy symbol (see page k-8)

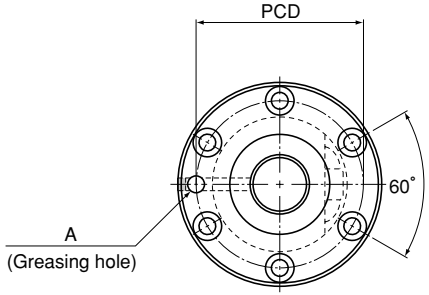
Note The rigidity values in the table represent spring constants each obtained from the load and the elastic displacement when providing a preload 10% of the basic dynamic load rating (Ca) and applying an axial load three times greater than the preload.
These values do not include the rigidity of the components related to mounting the ball screw nut. Therefore, it is normally appropriate to regard roughly 80% of the value in the table as the actual value.
If the applied preload (F_{a0}) is not 0.1 Ca, the rigidity value (K_N) is obtained from the following equation.

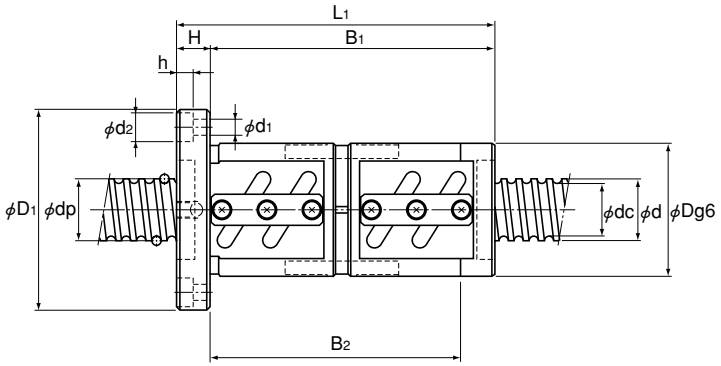
where

$$K_N = K\left(\frac{F_{a0}}{0.1Ca}\right)^{\frac{1}{3}}$$

K: Rigidity value in the dimensional table.

Model BNFN
Double-nut Preload Type





Unit: mm

Model No.	Screw shaft outer diameter d	Lead R	Ball center diameter dp	Thread minor diameter dc	No. of loaded circuits Rows x turns	Basic load rating Ca kN	Basic load rating C0a kN	Rigidity K N/μm	Nut dimensions Outer diameter D	Flange diameter D1	Overall length L1	H	B1	B2	PCD	d1×d2×h	Greasing hole A	Screw shaft inertial moment/mm kg·cm²/mm
○ BNFN 2504-2.5	25	4	25.5	22.8	1×2.5	5.2	13.7	420	46	69	68	11	57	—	57	5.5×9.5×5.5	M6	3.01×10⁻³
○ BNFN 2504-5			25.5	22.8	2×2.5	9.5	27.3	820	46	69	92	11	81	—	57	5.5×9.5×5.5	M6	3.01×10⁻³
○ BNFN 2505-2.5		5	25.75	22.2	1×2.5	9.2	22	470	50	73	75	11	64	52	61	5.5×9.5×5.5	M6	3.01×10⁻³
○ BNFN 2505-3			25.75	22.2	2×1.5	10.8	26.4	560	50	73	102	11	91	79	61	5.5×9.5×5.5	M6	3.01×10⁻³
○ BNFN 2505-3.5			25.75	22.2	1×3.5	12.3	30.7	650	50	73	85	11	74	62	61	5.5×9.5×5.5	M6	3.01×10⁻³
○ BNFN 2505-5			25.75	22.2	2×2.5	16.7	44	910	50	73	105	11	94	82	61	5.5×9.5×5.5	M6	3.01×10⁻³
○ BNFN 2506-2.5		6	26	21.4	1×2.5	12.5	27.3	490	53	76	86	11	75	—	64	5.5×9.5×5.5	M6	3.01×10⁻³
○ BNFN 2506-3			26	21.4	2×1.5	14.6	32.8	580	53	76	110	11	99	—	64	5.5×9.5×5.5	M6	3.01×10⁻³
○ BNFN 2506-3.5			26	21.4	1×3.5	15.1	35.9	670	53	76	98	11	87	—	64	5.5×9.5×5.5	M6	3.01×10⁻³
○ BNFN 2506-5			26	21.4	2×2.5	22.5	54.8	940	53	76	122	11	111	—	64	5.5×9.5×5.5	M6	3.01×10⁻³
○ BNFN 2508-2.5		8	26.25	20.5	1×2.5	15.8	32.8	500	58	85	106	15	91	—	71	6.6×11×6.5	M6	3.01×10⁻³
○ BNFN 2508-3			26.25	20.5	2×1.5	18.5	39.4	600	58	85	135	15	120	—	71	6.6×11×6.5	M6	3.01×10⁻³
○ BNFN 2508-3.5			26.25	20.5	1×3.5	21.2	46	690	58	85	122	15	107	—	71	6.6×11×6.5	M6	3.01×10⁻³
○ BNFN 2508-5			26.25	20.5	2×2.5	28.7	65.8	970	58	85	154	15	139	—	71	6.6×11×6.5	M6	3.01×10⁻³
○ BNFN 2510A-2.5		10	26.3	21.4	1×2.5	15.8	33	500	58	85	120	18	102	83	71	6.6×11×6.5	M6	3.01×10⁻³
○ BNFN 2512-2.5		12	26	21.9	1×2.5	12.3	27.6	490	53	76	108	11	97	—	64	5.5×9.5×5.5	M6	3.01×10⁻³
○ BNFN 2516-1.5		16	26	21.4	1×1.5	7.9	16.7	300	53	76	108	11	97	—	64	5.5×9.5×5.5	M6	3.01×10⁻³
BNFN 2805-2.5	28	5	28.75	25.2	1×2.5	9.7	24.6	520	55	85	74	12	62	49	69	6.6×11×6.5	M6	4.74×10⁻³
BNFN 2805-3			28.75	25.2	2×1.5	11.3	29.5	620	55	85	94	12	82	69	69	6.6×11×6.5	M6	4.74×10⁻³
BNFN 2805-3.5			28.75	25.2	1×3.5	12.9	34.4	720	55	85	84	12	72	59	69	6.6×11×6.5	M6	4.74×10⁻³

Note The model number in a light face type indicate semi-standard types.
If desiring them, contact THK.
Those models marked with ○ can be attached with QZ Lubricator or the wiper ring.
For dimensions of the ball screw nut with either accessory being attached, see pages k-142 and k-143.

Model number coding

BNFN2505-5 RR G0 +1000L C5
1 2 3 4 5

1 Model number
2 Seal symbol - RR : Labyrinth seal attached to both ends of the ball screw nut (see page k-25)
WW : Wiper ring attached to both ends of the ball screw nut (see page k-26)
3 Axial clearance symbol (see page k-15) 4 Overall screw shaft length (in mm)
5 Accuracy symbol (see page k-8)

Note The rigidity values in the table represent spring constants each obtained from the load and the elastic displacement when providing a preload 10% of the basic dynamic load rating (Ca) and applying an axial load three times greater than the preload.
These values do not include the rigidity of the components related to mounting the ball screw nut. Therefore, it is normally appropriate to regard roughly 80% of the value in the table as the actual value.
If the applied preload (Fa_0) is not 0.1 Ca, the rigidity value (K_N) is obtained from the following equation.

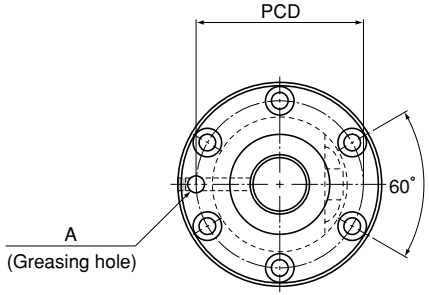
where

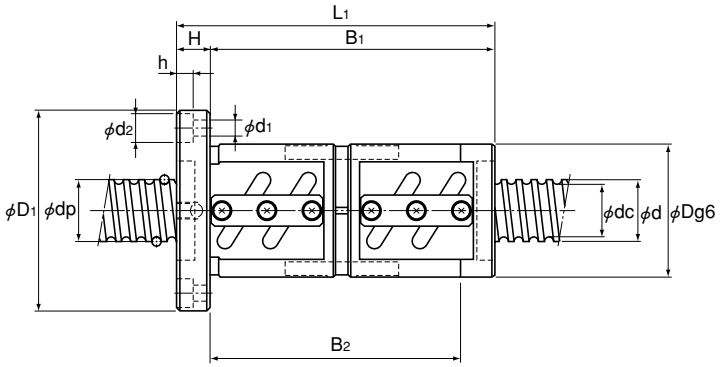
$$K_N = K\left(\frac{Fa_0}{0.1Ca}\right)^{\frac{1}{3}}$$

K: Rigidity value in the dimensional table.

Model BNFN

Double-nut Preload Type





Unit: mm

Model No.	Screw shaft outer diameter d	Lead R	Ball center diameter dp	Thread minor diameter dc	No. of loaded circuits Rows x turns	Basic load rating Ca kN	Basic load rating C0a kN	Rigidity K N/μm	Nut dimensions Outer diameter D	Flange diameter D1	Overall length L1	H	B1	B2	PCD	d1×d2×h	Greasing hole A	Screw shaft inertial moment/mm kg·cm²/mm
BNFN 2805-5	28	5	28.75	25.2	2×2.5	17.5	49.4	1000	55	85	104	12	92	79	69	6.6×11×6.5	M6	4.74×10⁻³
BNFN 2805-7.5			28.75	25.2	3×2.5	24.8	73.8	1470	55	85	134	12	122	109	69	6.6×11×6.5	M6	4.74×10⁻³
BNFN 2806-2.5		6	28.75	25.2	1×2.5	9.6	24.6	520	55	85	86	12	74	61	69	6.6×11×6.5	M6	4.74×10⁻³
BNFN 2806-3.5			28.75	25.2	1×3.5	12.9	34.5	710	55	85	98	12	86	73	69	6.6×11×6.5	M6	4.74×10⁻³
BNFN 2806-5			28.75	25.2	2×2.5	17.5	49.4	1000	55	85	122	12	110	97	69	6.6×11×6.5	M6	4.74×10⁻³
BNFN 2806-7.5			28.75	25.2	3×2.5	24.8	73.8	1470	55	85	158	12	146	133	69	6.6×11×6.5	M6	4.74×10⁻³
BNFN 2808-2.5		8	29.25	23.6	1×2.5	16.8	36.8	550	60	104	116	18	98	—	82	11×17.5×11	M6	4.74×10⁻³
BNFN 2808-3			29.25	23.6	2×1.5	19.6	44.2	660	60	104	144	18	126	—	82	11×17.5×11	M6	4.74×10⁻³
BNFN 2808-5			29.25	23.6	2×2.5	30.4	73.7	1060	60	104	164	18	146	—	82	11×17.5×11	M6	4.74×10⁻³
BNFN 2810-2.5		10	29.75	22.4	1×2.5	24	48.2	560	65	106	146	18	128	—	85	11×17.5×11	M6	4.74×10⁻³
○ BNFN 3205-2.5	32	5	32.75	29.2	1×2.5	10.2	28.1	570	58	85	76	12	64	51	71	6.6×11×6.5	M6	8.08×10⁻³
○ BNFN 3205-3			32.75	29.2	2×1.5	12	33.8	690	58	85	103	12	91	78	71	6.6×11×6.5	M6	8.08×10⁻³
○ BNFN 3205-4.5			32.75	29.2	3×1.5	17	50.7	1000	58	85	123	12	111	98	71	6.6×11×6.5	M6	8.08×10⁻³
○ BNFN 3205-5			32.75	29.2	2×2.5	18.5	56.4	1110	58	85	106	12	94	81	71	6.6×11×6.5	M6	8.08×10⁻³
○ BNFN 3205-7.5			32.75	29.2	3×2.5	26.3	84.5	1640	58	85	136	12	124	111	71	6.6×11×6.5	M6	8.08×10⁻³
○ BNFN 3206-2.5		6	33	28.4	1×2.5	13.9	35.2	600	62	89	87	12	75	62	75	6.6×11×6.5	M6	8.08×10⁻³
○ BNFN 3206-3			33	28.4	2×1.5	16.3	42.2	710	62	89	111	12	99	86	75	6.6×11×6.5	M6	8.08×10⁻³
○ BNFN 3206-5			33	28.4	2×2.5	25.2	70.4	1150	62	89	123	12	111	98	75	6.6×11×6.5	M6	8.08×10⁻³
○ BNFN 3208A-2.5		8	33.25	27.5	1×2.5	17.8	42.2	610	66	100	106	15	91	—	82	9×14×8.5	M6	8.08×10⁻³
○ BNFN 3208A-3			33.25	27.5	2×1.5	20.9	50.7	730	66	100	135	15	120	—	82	9×14×8.5	M6	8.08×10⁻³

Note The model number in a light face type indicate semi-standard types.
If desiring them, contact THK.
Those models marked with ○ can be attached with QZ Lubricator or the wiper ring.
For dimensions of the ball screw nut with either accessory being attached, see pages k-142 and k-143.

Model number coding

BNFN2805-5 RR G0 +1200L C5
1 2 3 4 5

1 Model number
2 Seal symbol - RR : Labyrinth seal attached to both ends of the ball screw nut (see page k-25)
WW : Wiper ring attached to both ends of the ball screw nut (see page k-26)
3 Axial clearance symbol (see page k-15) 4 Overall screw shaft length (in mm)
5 Accuracy symbol (see page k-8)

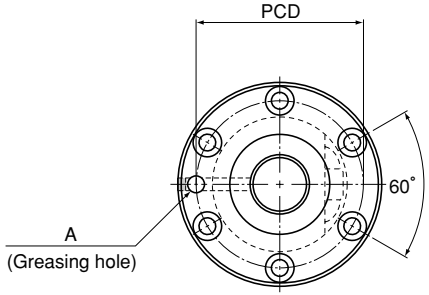
Note The rigidity values in the table represent spring constants each obtained from the load and the elastic displacement when providing a preload 10% of the basic dynamic load rating (Ca) and applying an axial load three times greater than the preload.
These values do not include the rigidity of the components related to mounting the ball screw nut. Therefore, it is normally appropriate to regard roughly 80% of the value in the table as the actual value.
If the applied preload (Fa_0) is not 0.1 Ca, the rigidity value (K_N) is obtained from the following equation.

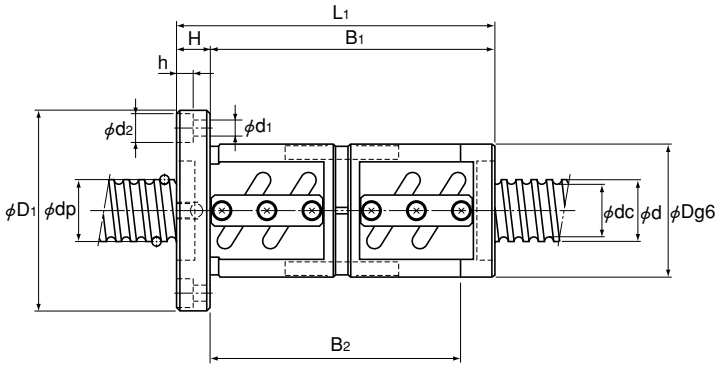
where

$$K_N = K \left(\frac{Fa_0}{0.1Ca} \right)^{\frac{1}{3}}$$

K: Rigidity value in the dimensional table.

Model BNFN
Double-nut Preload Type





Unit: mm

Model No.	Screw shaft outer diameter d	Lead R	Ball center diameter dp	Thread minor diameter dc	No. of loaded circuits Rows x turns	Basic load rating Ca kN	Basic load rating C0a kN	Rigidity K N/μm	Nut dimensions Outer diameter D	Flange diameter D1	Overall length L1	H	B1	B2	PCD	d1×d2×h	Greasing hole A	Screw shaft inertial moment/mm kg·cm²/mm
○ BNFN 3208A-4.5	32	8	33.25	27.5	3×1.5	29.5	76	1070	66	100	167	15	152	—	82	9×14×8.5	M6	8.08×10⁻³
○ BNFN 3208A-5			33.25	27.5	2×2.5	32.3	84.4	1180	66	100	154	15	139	—	82	9×14×8.5	M6	8.08×10⁻³
○ BNFN 3210A-2.5		10	33.75	26.4	1×2.5	26.1	56.2	640	74	108	130	15	115	99	90	9×14×8.5	M6	8.08×10⁻³
○ BNFN 3210A-3			33.75	26.4	2×1.5	30.5	67.4	750	74	108	167	15	152	136	90	9×14×8.5	M6	8.08×10⁻³
○ BNFN 3210A-3.5			33.75	26.4	1×3.5	34.8	78.6	870	74	108	150	15	135	119	90	9×14×8.5	M6	8.08×10⁻³
○ BNFN 3210A-5			33.75	26.4	2×2.5	47.2	112.7	1230	74	108	190	15	175	159	90	9×14×8.5	M6	8.08×10⁻³
○ BNFN 3212-3.5		12	34	26.1	1×3.5	40.4	88.5	890	76	121	170	18	152	—	98	11×17.5×11	M6	8.08×10⁻³
○ BNFN 3606-2.5	36	6	36.75	33.2	1×2.5	10.7	31.8	630	65	100	89	15	74	58	82	9×14×8.5	M6	1.29×10⁻²
○ BNFN 3606-3			36.75	33.2	2×1.5	12.5	38	740	65	100	110	15	95	79	82	9×14×8.5	M6	1.29×10⁻²
○ BNFN 3606-5			36.75	33.2	2×2.5	19.4	63.4	1220	65	100	125	15	110	94	82	9×14×8.5	M6	1.29×10⁻²
○ BNFN 3606-7.5			36.75	33.2	3×2.5	27.5	95.2	1790	65	100	161	15	146	130	82	9×14×8.5	M6	1.29×10⁻²
○ BNFN 3608-2.5		8	37.25	31.6	1×2.5	18.8	47.5	670	70	114	116	18	98	—	92	11×17.5×11	M6	1.29×10⁻²
○ BNFN 3608-5			37.25	31.6	2×2.5	34.1	95.1	1290	70	114	164	18	146	—	92	11×17.5×11	M6	1.29×10⁻²
○ BNFN 3608-7.5			37.25	31.6	3×2.5	48.3	142.1	1910	70	114	212	18	194	—	92	11×17.5×11	M6	1.29×10⁻²
○ BNFN 3610-2.5		10	37.75	30.5	1×2.5	27.6	63.3	700	75	120	141	18	123	104	98	11×17.5×11	M6	1.29×10⁻²
○ BNFN 3610-5			37.75	30.5	2×2.5	50.1	126.4	1350	75	120	201	18	183	164	98	11×17.5×11	M6	1.29×10⁻²
○ BNFN 3610-7.5			37.75	30.5	3×2.5	71.1	190.1	1990	75	120	261	18	243	224	98	11×17.5×11	M6	1.29×10⁻²
○ BNFN 3612-2.5		12	38	30.1	1×2.5	32.1	71.4	720	78	123	147	18	129	—	100	11×17.5×11	M6	1.29×10⁻²
○ BNFN 3612-5			38	30.1	2×2.5	58.4	142.1	1370	78	123	219	18	201	—	100	11×17.5×11	M6	1.29×10⁻²
○ BNFN 3616-2.5		16	38	30.1	1×2.5	32.1	71.4	720	78	123	172	18	154	—	100	11×17.5×11	M6	1.29×10⁻²

Note The model number in a light face type indicate semi-standard types.
If desiring them, contact THK.
Those models marked with ○ can be attached with QZ Lubricator or the wiper ring.
For dimensions of the ball screw nut with either accessory being attached, see pages k-142 and k-143.

Model number coding

BNFN3610-5 RR G0 +1400L C5
1 2 3 4 5

1 Model number
2 Seal symbol - RR : Labyrinth seal attached to both ends of the ball screw nut (see page k-25)
WW : Wiper ring attached to both ends of the ball screw nut (see page k-26)
3 Axial clearance symbol (see page k-15) 4 Overall screw shaft length (in mm)
5 Accuracy symbol (see page k-8)

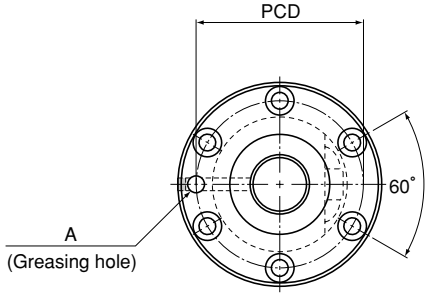
Note The rigidity values in the table represent spring constants each obtained from the load and the elastic displacement when providing a preload 10% of the basic dynamic load rating (Ca) and applying an axial load three times greater than the preload.
These values do not include the rigidity of the components related to mounting the ball screw nut. Therefore, it is normally appropriate to regard roughly 80% of the value in the table as the actual value.
If the applied preload (Fa_0) is not 0.1 Ca, the rigidity value (K_N) is obtained from the following equation.

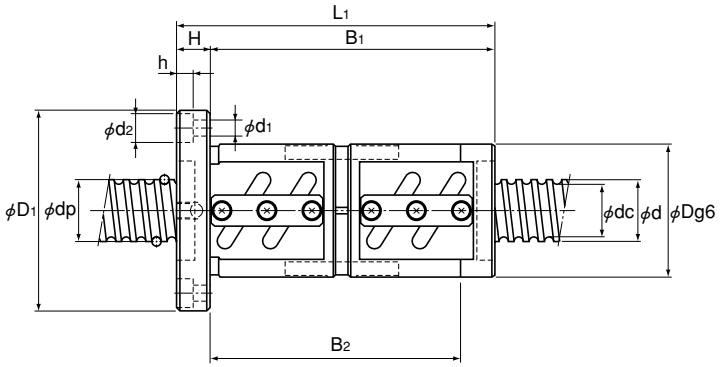
where

$$K_N = K \left(\frac{Fa_0}{0.1Ca} \right)^{\frac{1}{3}}$$

K: Rigidity value in the dimensional table.

Model BNFN
Double-nut Preload Type





Unit: mm

Model No.	Screw shaft outer diameter d	Lead R	Ball center diameter dp	Thread minor diameter dc	No. of loaded circuits Rows x turns	Basic load rating Ca kN	Basic load rating C0a kN	Rigidity K N/μm	Nut dimensions Outer diameter D	Flange diameter D1	Overall length L1	H	B1	B2	PCD	d1×d2×h	Greasing hole A	Screw shaft inertial moment/mm kg·cm²/mm
○ BNFN 3616-5	36	16	38	30.1	2×2.5	58.3	143.1	1380	78	123	268	18	250	—	100	11×17.5×11	M6	1.29×10⁻²
○ BNFN 3620-1.5		20	37.75	30.5	1×1.5	17.6	38.3	430	70	103	135	15	120	—	85	9×14×8.5	M6	1.29×10⁻²
○ BNFN 4005-3	40	5	40.75	37.2	2×1.5	13	42.3	810	67	101	106	15	91	—	83	9×14×8.5	M6	1.97×10⁻²
○ BNFN 4005-4.5			40.75	37.2	3×1.5	18.5	63.5	1200	67	101	126	15	111	—	83	9×14×8.5	M6	1.97×10⁻²
○ BNFN 4005-5			40.75	37.2	2×2.5	20.3	70.6	1320	67	101	109	15	94	—	83	9×14×8.5	M6	1.97×10⁻²
○ BNFN 4005-6			40.75	37.2	4×1.5	23.7	84.7	1580	67	101	156	15	141	—	83	9×14×8.5	M6	1.97×10⁻²
○ BNFN 4006-2.5		6	41	36.4	1×2.5	15.3	44.1	710	70	104	90	15	75	—	86	9×14×8.5	M6	1.97×10⁻²
○ BNFN 4006-5			41	36.4	2×2.5	27.7	88.1	1360	70	104	126	15	111	—	86	9×14×8.5	M6	1.97×10⁻²
○ BNFN 4006-7.5			41	36.4	3×2.5	39.2	132.3	2010	70	104	162	15	147	—	86	9×14×8.5	M6	1.97×10⁻²
○ BNFN 4008-2.5		8	41.25	35.5	1×2.5	19.6	52.8	730	74	108	106	15	91	—	90	9×14×8.5	M6	1.97×10⁻²
○ BNFN 4008-3			41.25	35.5	2×1.5	22.9	63.4	860	74	108	135	15	120	—	90	9×14×8.5	M6	1.97×10⁻²
○ BNFN 4008-5			41.25	35.5	2×2.5	35.7	105.8	1410	74	108	154	15	139	—	90	9×14×8.5	M6	1.97×10⁻²
○ BNFN 4010-2.5		10	41.75	34.4	1×2.5	29	70.4	750	82	124	133	18	115	96	102	11×17.5×11	M6	1.97×10⁻²
○ BNFN 4010-3			41.75	34.4	2×1.5	33.8	84.5	900	82	124	170	18	152	133	102	11×17.5×11	M6	1.97×10⁻²
○ BNFN 4010-3.5			41.75	34.4	1×3.5	38.8	99	1050	82	124	153	18	135	116	102	11×17.5×11	M6	1.97×10⁻²
○ BNFN 4010-5			41.75	34.4	2×2.5	52.7	141.1	1470	82	124	193	18	175	156	102	11×17.5×11	M6	1.97×10⁻²
○ BNFN 4012-2.5		12	42	34.1	1×2.5	33.9	79.2	770	84	126	155	18	137	118	104	11×17.5×11	M6	1.97×10⁻²
○ BNFN 4012-3.5			42	34.1	1×3.5	45.4	110.7	1070	84	126	179	18	161	142	104	11×17.5×11	M6	1.97×10⁻²
○ BNFN 4012-5			42	34.1	2×2.5	61.6	158.8	1490	84	126	227	18	209	190	104	11×17.5×11	M6	1.97×10⁻²
○ BNFN 4016-5		16	42	34.1	2×2.5	61.4	158.8	1500	84	126	280	22	258	—	104	11×17.5×11	M6	1.97×10⁻²

Note The model number in a light face type indicate semi-standard types.
If desiring them, contact THK.
Those models marked with ○ can be attached with QZ Lubricator or the wiper ring.
For dimensions of the ball screw nut with either accessory being attached, see pages k-142 and k-143.

Model number coding

BNFN4006-5 RR G0 +2000L C3
1 2 3 4 5

1 Model number
2 Seal symbol - RR : Labyrinth seal attached to both ends of the ball screw nut (see page k-25)
WW : Wiper ring attached to both ends of the ball screw nut (see page k-26)
3 Axial clearance symbol (see page k-15) 4 Overall screw shaft length (in mm)
5 Accuracy symbol (see page k-8)

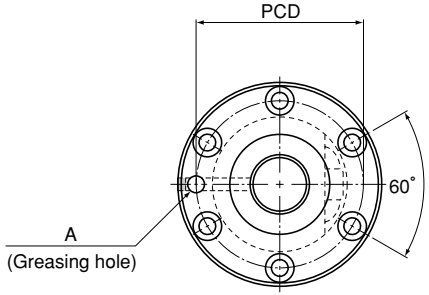
Note The rigidity values in the table represent spring constants each obtained from the load and the elastic displacement when providing a preload 10% of the basic dynamic load rating (Ca) and applying an axial load three times greater than the preload.
These values do not include the rigidity of the components related to mounting the ball screw nut. Therefore, it is normally appropriate to regard roughly 80% of the value in the table as the actual value.
If the applied preload (Fa_0) is not 0.1 Ca, the rigidity value (K_N) is obtained from the following equation.

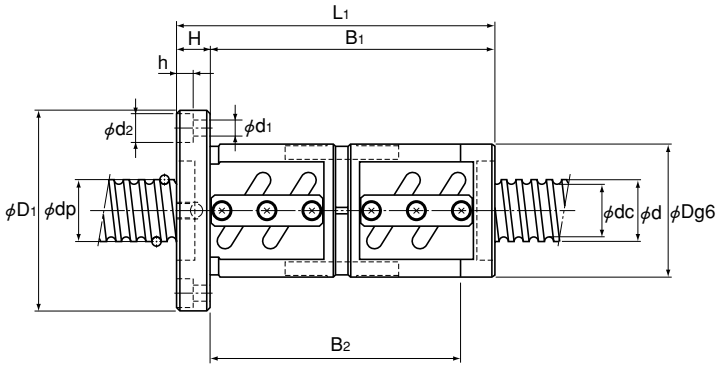
where

$$K_N = K\left(\frac{Fa_0}{0.1Ca}\right)^{\frac{1}{3}}$$

K: Rigidity value in the dimensional table.

Model BNFN
Double-nut Preload Type





Unit: mm

Model No.	Screw shaft outer diameter d	Lead R	Ball center diameter dp	Thread minor diameter dc	No. of loaded circuits Rows x turns	Basic load rating Ca kN	Basic load rating C0a kN	Rigidity K N/μm	Nut dimensions Outer diameter D	Flange diameter D1	Overall length L1	H	B1	B2	PCD	d1×d2×h	Greasing hole A	Screw shaft inertial moment/mm kg·cm²/mm
BNFN 4506A-2.5	45	6	46	41.4	1×2.5	16	49.6	770	80	114	89	15	74	—	96	9×14×8.5	PT 1/8	3.16×10⁻²
BNFN 4506A-5			46	41.4	2×2.5	29	99	1500	80	114	125	15	110	—	96	9×14×8.5	PT 1/8	3.16×10⁻²
BNFN 4506A-7.5			46	41.4	3×2.5	41.2	150	2210	80	114	161	15	146	—	96	9×14×8.5	PT 1/8	3.16×10⁻²
BNFN 4508-2.5		8	46.25	40.6	1×2.5	20.7	59.5	790	85	127	116	18	98	—	105	11×17.5×11	PT 1/8	3.16×10⁻²
BNFN 4508-5			46.25	40.6	2×2.5	37.4	118.6	1540	85	127	164	18	146	—	105	11×17.5×11	PT 1/8	3.16×10⁻²
BNFN 4508-7.5			46.25	40.6	3×2.5	53.1	178.4	2270	85	127	212	18	194	—	105	11×17.5×11	PT 1/8	3.16×10⁻²
BNFN 4510-2.5		10	46.75	39.5	1×2.5	30.7	79.3	830	88	132	141	18	123	104	110	11×17.5×11	PT 1/8	3.16×10⁻²
BNFN 4510-3			46.75	39.5	2×1.5	35.9	95.2	990	88	132	164	18	146	127	110	11×17.5×11	PT 1/8	3.16×10⁻²
BNFN 4510-5			46.75	39.5	2×2.5	55.6	158.8	1610	88	132	201	18	183	164	110	11×17.5×11	PT 1/8	3.16×10⁻²
BNFN 4510-7.5			46.75	39.5	3×2.5	78.8	238.1	2370	88	132	261	18	243	224	110	11×17.5×11	PT 1/8	3.16×10⁻²
BNFN 4512-5		12	47	39.2	2×2.5	65.2	178.4	1640	90	130	227	18	209	—	110	11×17.5×11	PT 1/8	3.16×10⁻²
BNFN 4520-1.5		20	47.7	37.9	1×1.5	44.2	99	690	98	142	175	20	155	—	120	11×17.5×11	PT 1/8	3.16×10⁻²
○ BNFN 5005-3	50	5	50.75	47.2	2×1.5	14.2	53	970	80	114	108	15	93	—	96	9×14×8.5	PT 1/8	4.82×10⁻²
○ BNFN 5005-4.5			50.75	47.2	3×1.5	20.2	79.5	1420	80	114	128	15	113	—	96	9×14×8.5	PT 1/8	4.82×10⁻²
○ BNFN 5008-2.5		8	51.25	45.5	1×2.5	21.6	66.2	860	87	129	109	18	91	—	107	11×17.5×11	PT 1/8	4.82×10⁻²
○ BNFN 5008-5			51.25	45.5	2×2.5	39.1	132.3	1680	87	129	157	18	139	—	107	11×17.5×11	PT 1/8	4.82×10⁻²
○ BNFN 5008-7.5			51.25	45.5	3×2.5	55.4	198.9	2470	87	129	205	18	187	—	107	11×17.5×11	PT 1/8	4.82×10⁻²
○ BNFN 5010-2.5		10	51.75	44.4	1×2.5	32	88.2	900	93	135	133	18	115	96	113	11×17.5×11	PT 1/8	4.82×10⁻²
○ BNFN 5010-3			51.75	44.4	2×1.5	37.5	105.8	1080	93	135	170	18	152	133	113	11×17.5×11	PT 1/8	4.82×10⁻²

Note The model number in a light face type indicate semi-standard types.
If desiring them, contact THK.
Those models marked with ○ can be attached with QZ Lubricator or the wiper ring.
For dimensions of the ball screw nut with either accessory being attached, see pages k-142 and k-143.

Model number coding

BNFN5005-4.5 RR G0 +2500L C3
1 2 3 4 5

1 Model number
2 Seal symbol - RR : Labyrinth seal attached to both ends of the ball screw nut (see page k-25)
WW : Wiper ring attached to both ends of the ball screw nut (see page k-26)
3 Axial clearance symbol (see page k-15) 4 Overall screw shaft length (in mm)
5 Accuracy symbol (see page k-8)

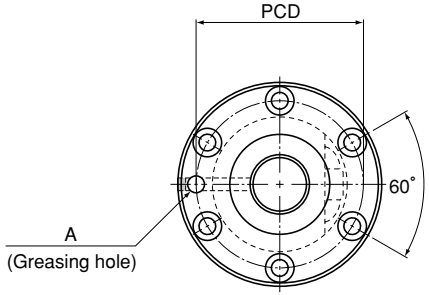
Note The rigidity values in the table represent spring constants each obtained from the load and the elastic displacement when providing a preload 10% of the basic dynamic load rating (Ca) and applying an axial load three times greater than the preload.
These values do not include the rigidity of the components related to mounting the ball screw nut. Therefore, it is normally appropriate to regard roughly 80% of the value in the table as the actual value.
If the applied preload (Fa_0) is not 0.1 Ca, the rigidity value (K_N) is obtained from the following equation.

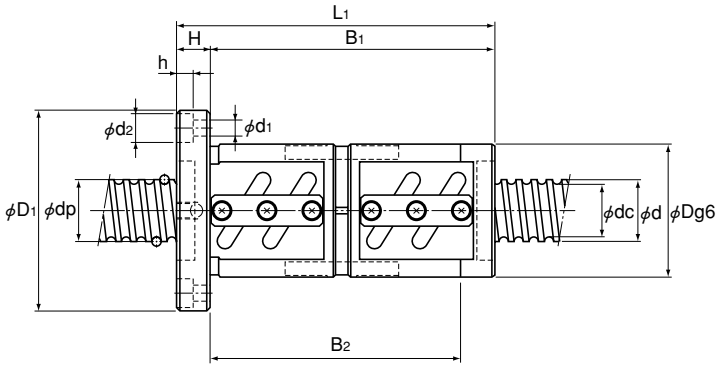
where

$$K_N = K\left(\frac{Fa_0}{0.1Ca}\right)^{\frac{1}{3}}$$

K: Rigidity value in the dimensional table.

Model BNFN
Double-nut Preload Type





Unit: mm

Model No.	Screw shaft outer diameter d	Lead R	Ball center diameter dp	Thread minor diameter dc	No. of loaded circuits Rows x turns	Basic load rating Ca kN	Basic load rating C0a kN	Rigidity K N/μm	Nut dimensions Outer diameter D	Flange diameter D1	Overall length L1	H	B1	B2	PCD	d1×d2×h	Greasing hole A	Screw shaft inertial moment/mm kg·cm²/mm
○ BNFN 5010-3.5	50	10	51.75	44.4	1×3.5	42.8	123.5	1240	93	135	153	18	135	116	113	11×17.5×11	PT 1/8	4.82×10⁻²
○ BNFN 5010-5			51.75	44.4	2×2.5	58.2	176.4	1750	93	135	193	18	175	156	113	11×17.5×11	PT 1/8	4.82×10⁻²
○ BNFN 5010-7.5			51.75	44.4	3×2.5	82.5	264.6	2580	93	135	253	18	235	216	113	11×17.5×11	PT 1/8	4.82×10⁻²
○ BNFN 5012-2.5		12	52.25	43.3	1×2.5	43.4	109.8	930	100	146	159	22	137	114	122	14×20×13	PT 1/8	4.82×10⁻²
○ BNFN 5012-3.5			52.25	43.3	1×3.5	58	153.9	1280	100	146	183	22	161	138	122	14×20×13	PT 1/8	4.82×10⁻²
○ BNFN 5012-5			52.25	43.3	2×2.5	78.8	220.5	1810	100	146	231	22	209	186	122	14×20×13	PT 1/8	4.82×10⁻²
○ BNFN 5016-2.5		16	52.7	42.9	1×2.5	72.6	183.3	1230	105	152	196	25	171	—	128	14×20×13	PT 1/8	4.82×10⁻²
○ BNFN 5016-5			52.7	42.9	2×2.5	132.3	366.5	2360	105	152	292	25	267	—	128	14×20×13	PT 1/8	4.82×10⁻²
○ BNFN 5020-2.5		20	52.7	42.9	1×2.5	72.5	183.3	1230	105	152	241	28	213	—	128	14×20×13	PT 1/8	4.82×10⁻²
BNFN 5510-2.5	55	10	56.75	49.5	1×2.5	33.4	97	970	102	144	141	18	123	—	122	11×17.5×11	PT 1/8	7.05×10⁻²
BNFN 5510-5			56.75	49.5	2×2.5	60.7	194	1890	102	144	201	18	183	—	122	11×17.5×11	PT 1/8	7.05×10⁻²
BNFN 5510-7.5			56.75	49.5	3×2.5	85.9	291.1	2770	102	144	261	18	243	—	122	11×17.5×11	PT 1/8	7.05×10⁻²
BNFN 5512-2.5		12	57	49.2	1×2.5	39.3	108.8	990	105	147	165	18	147	—	125	11×17.5×11	PT 1/8	7.05×10⁻²
BNFN 5512-3			57	49.2	2×1.5	46	131.3	1180	105	147	191	18	173	—	125	11×17.5×11	PT 1/8	7.05×10⁻²
BNFN 5512-3.5			57	49.2	1×3.5	52.4	152.9	1360	105	147	189	18	171	—	125	11×17.5×11	PT 1/8	7.05×10⁻²
BNFN 5512-5			57	49.2	2×2.5	71.3	218.5	1920	105	147	237	18	219	—	125	11×17.5×11	PT 1/8	7.05×10⁻²
BNFN 5512-7.5			57	49.2	3×2.5	100.9	327.3	2830	105	147	309	18	291	—	125	11×17.5×11	PT 1/8	7.05×10⁻²
BNFN 5516-2.5		16	57.7	47.9	1×2.5	76.1	201.9	1310	110	158	196	25	171	—	133	14×20×13	PT 1/8	7.05×10⁻²
BNFN 5516-5			57.7	47.9	2×2.5	138.2	402.8	2550	110	158	292	25	267	—	133	14×20×13	PT 1/8	7.05×10⁻²
BNFN 5520-2.5		20	57.7	47.9	1×2.5	76	201.9	1320	112	158	227	28	199	—	134	14×20×13	PT 1/8	7.05×10⁻²

Note The model number in a light face type indicate semi-standard types.
If desiring them, contact THK.
Those models marked with ○ can be attached with QZ Lubricator or the wiper ring.
For dimensions of the ball screw nut with either accessory being attached, see pages k-142 and k-143.

Model number coding

BNFN5510-2.5 RR G0 +2500L C3
1 2 3 4 5

1 Model number
2 Seal symbol - RR : Labyrinth seal attached to both ends of the ball screw nut (see page k-25)
WW : Wiper ring attached to both ends of the ball screw nut (see page k-26)
3 Axial clearance symbol (see page k-15) 4 Overall screw shaft length (in mm)
5 Accuracy symbol (see page k-8)

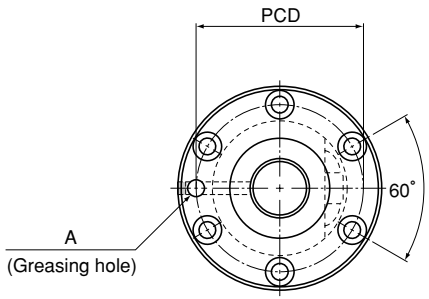
Note The rigidity values in the table represent spring constants each obtained from the load and the elastic displacement when providing a preload 10% of the basic dynamic load rating (Ca) and applying an axial load three times greater than the preload.
These values do not include the rigidity of the components related to mounting the ball screw nut. Therefore, it is normally appropriate to regard roughly 80% of the value in the table as the actual value.
If the applied preload (Fa_0) is not 0.1 Ca, the rigidity value (K_N) is obtained from the following equation.

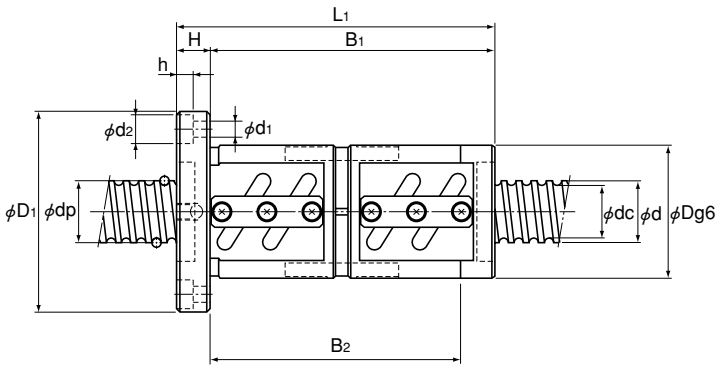
where

$$K_N = K\left(\frac{Fa_0}{0.1Ca}\right)^{\frac{1}{3}}$$

K: Rigidity value in the dimensional table.

Model BNFN
Double-nut Preload Type





Unit: mm

Model No.	Screw shaft outer diameter d	Lead R	Ball center diameter dp	Thread minor diameter dc	No. of loaded circuits Rows x turns	Basic load rating Ca kN	Basic load rating C0a kN	Rigidity K N/μm	Nut dimensions Outer diameter D	Flange diameter D1	Overall length L1	H	B1	B2	PCD	d1×d2×h	Greasing hole A	Screw shaft inertial moment/mm kg·cm²/mm
BNFN 5520-5	55	20	57.7	47.9	2X2.5	138.2	403.8	2550	112	158	347	28	319	—	134	14X20X13	PT 1/8	$7.05X10^{-2}$
BNFN 6310-2.5	63	10	64.75	57.7	1X2.5	35.4	111.7	1090	108	154	137	22	115	—	130	14X20X13	PT 1/8	$1.21X10^{-1}$
BNFN 6310-5			64.75	57.7	2X2.5	64.2	222.5	2100	108	154	197	22	175	—	130	14X20X13	PT 1/8	$1.21X10^{-1}$
BNFN 6310-7.5			64.75	57.7	3X2.5	90.9	334.2	3090	108	154	257	22	235	—	130	14X20X13	PT 1/8	$1.21X10^{-1}$
BNFN 6312A-2.5		12	65.25	56.3	1X2.5	48.1	139.2	1120	115	161	159	22	137	—	137	14X20X13	PT 1/8	$1.21X10^{-1}$
BNFN 6312A-5			65.25	56.3	2X2.5	87.4	278.3	2160	115	161	231	22	209	—	137	14X20X13	PT 1/8	$1.21X10^{-1}$
BNFN 6316-2.5		16	65.7	55.9	1X2.5	81.1	231.3	1470	122	184	208	24	184	—	152	18X26X17.5	PT 1/8	$1.21X10^{-1}$
BNFN 6316-5			65.7	55.9	2X2.5	147	462.6	2840	122	184	304	24	280	—	152	18X26X17.5	PT 1/8	$1.21X10^{-1}$
BNFN 6320-2.5		20	65.7	55.9	1X2.5	81	231.3	1470	122	180	227	28	199	—	150	18X26X17.5	PT 1/8	$1.21X10^{-1}$
BNFN 6320-5			65.7	55.9	2X2.5	147	463.5	2640	122	180	347	28	319	—	150	18X26X17.5	PT 1/8	$1.21X10^{-1}$
BNFN 7010-2.5	70	10	71.75	64.5	1X2.5	36.8	123.5	1180	125	167	141	18	123	—	145	11X17.5X11	PT 1/8	$1.85X10^{-1}$
BNFN 7010-5			71.75	64.5	2X2.5	66.9	247	2280	125	167	201	18	183	—	145	11X17.5X11	PT 1/8	$1.85X10^{-1}$
BNFN 7010-7.5			71.75	64.5	3X2.5	94.9	371.4	3350	125	167	261	18	243	—	145	11X17.5X11	PT 1/8	$1.85X10^{-1}$
BNFN 7012-2.5		12	72	64.2	1X2.5	43.5	139.2	1200	128	170	165	18	147	—	148	11X17.5X11	PT 1/8	$1.85X10^{-1}$
BNFN 7012-5			72	64.2	2X2.5	78.9	278.3	2320	128	170	237	18	219	—	148	11X17.5X11	PT 1/8	$1.85X10^{-1}$
BNFN 7012-7.5			72	64.2	3X2.5	111.7	417.5	3420	128	170	309	18	291	—	148	11X17.5X11	PT 1/8	$1.85X10^{-1}$
BNFN 7020-5		20	72.7	62.9	2X2.5	153.9	514.5	3090	130	186	325	28	297	—	158	18X26X17.5	PT 1/8	$1.85X10^{-1}$
BNFN 8010-2.5	80	10	81.75	75.2	1X2.5	38.9	141.1	1300	130	176	137	22	115	—	152	14X20X13	PT 1/8	$3.16X10^{-1}$
BNFN 8010-5			81.75	75.2	2X2.5	70.6	283.2	2530	130	176	197	22	175	—	152	14X20X13	PT 1/8	$3.16X10^{-1}$
BNFN 8010-7.5			81.75	75.2	3X2.5	100	424.3	3720	130	176	257	22	235	—	152	14X20X13	PT 1/8	$3.16X10^{-1}$

Note The model number in a light face type indicate semi-standard types.
If desiring them, contact THK.

Model number coding

BNFN6320-5 RR G0 +3500L C3
1 2 3 4 5

1 Model number
2 Seal symbol - RR: Labyrinth seal attached to both ends of the ball screw nut (see page k-25)
3 Axial clearance symbol (see page k-15) 4 Overall screw shaft length (in mm)
5 Accuracy symbol (see page k-8)

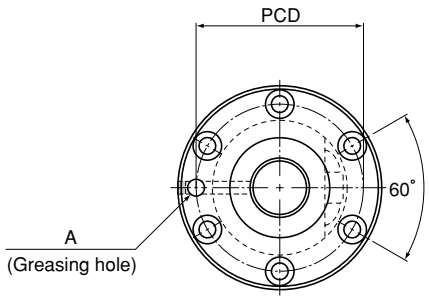
Note The rigidity values in the table represent spring constants each obtained from the load and the elastic displacement when providing a preload 10% of the basic dynamic load rating (Ca) and applying an axial load three times greater than the preload.
These values do not include the rigidity of the components related to mounting the ball screw nut. Therefore, it is normally appropriate to regard roughly 80% of the value in the table as the actual value.
If the applied preload (Fa_0) is not 0.1 Ca, the rigidity value (K_N) is obtained from the following equation.

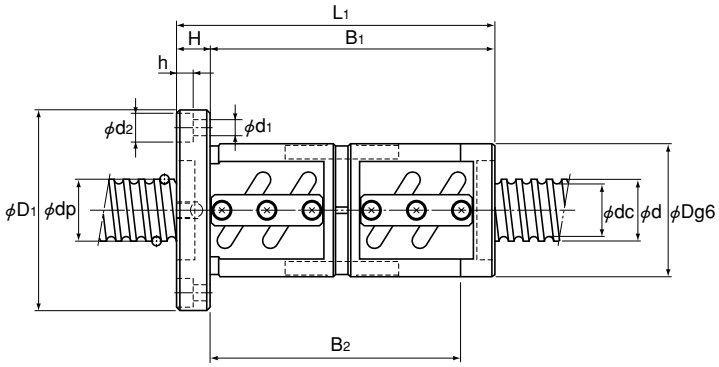
where

$$K_N = K\left(\frac{Fa_0}{0.1Ca}\right)^{\frac{1}{3}}$$

K: Rigidity value in the dimensional table.

Model BNFN
Double-nut Preload Type





Unit: mm

Model No.	Screw shaft outer diameter d	Lead R	Ball center diameter dp	Thread minor diameter dc	No. of loaded circuits Rows x turns	Basic load rating Ca kN	Basic load rating C0a kN	Rigidity K N/μm	Nut dimensions Outer diameter D	Flange diameter D1	Overall length L1	H	B1	B2	PCD	d1×d2×h	Greasing hole A	Screw shaft inertial moment/mm kg·cm²/mm
BNFN 8012-5	80	12	82.3	74.1	2×2.5	96.5	353.8	2620	135	181	231	22	209	—	157	14×20×13	PT 1/8	3.16×10^{-1}
BNFN 8020A-2.5		20	82.7	72.9	1×2.5	90.1	294	1770	143	204	227	28	199	—	172	18×26×17.5	PT 1/8	3.16×10^{-1}
BNFN 8020A-5			82.7	72.9	2×2.5	163.7	589	3430	143	204	347	28	319	—	172	18×26×17.5	PT 1/8	3.16×10^{-1}
BNFN 10020A-2.5	100	20	102.7	92.9	1×2.5	99	368.5	2110	170	243	231	32	199	—	205	22×32×21.5	PT 1/8	7.71×10^{-1}
BNFN 10020A-5			102.7	92.9	2×2.5	179.3	737	4080	170	243	351	32	319	—	205	22×32×21.5	PT 1/8	7.71×10^{-1}
BNFN 10020A-7.5			102.7	92.9	3×2.5	253.8	1105.4	6010	170	243	471	32	439	—	205	22×32×21.5	PT 1/8	7.71×10^{-1}

Note The model number in a light face type indicate semi-standard types.
If desiring them, contact THK.

Model number coding

BNFN8012-5 RR G0 +4800L C5
1 2 3 4 5

1 Model number
2 Seal symbol - RR: Labyrinth seal attached to both ends of the ball screw nut (see page k-25)
3 Axial clearance symbol (see page k-15) 4 Overall screw shaft length (in mm)
5 Accuracy symbol (see page k-8)

Note The rigidity values in the table represent spring constants each obtained from the load and the elastic displacement when providing a preload 10% of the basic dynamic load rating (Ca) and applying an axial load three times greater than the preload.
These values do not include the rigidity of the components related to mounting the ball screw nut. Therefore, it is normally appropriate to regard roughly 80% of the value in the table as the actual value.
If the applied preload (Fa_0) is not 0.1 Ca, the rigidity value (K_N) is obtained from the following equation.

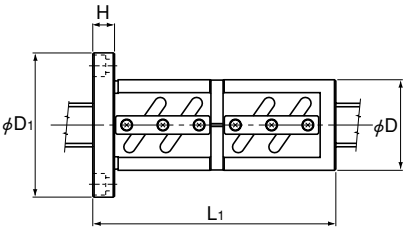
where

$$K_N = K\left(\frac{Fa_0}{0.1Ca}\right)^{\frac{1}{3}}$$

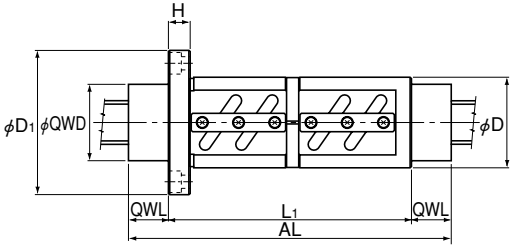
K: Rigidity value in the dimensional table.

Model BNFN

Dimensions of the Ball Screw Nut Attached with Wiper Ring (WW) and QZ Lubricator (QZ)



With WW (without QZ)



With QZ + WW

Unit: mm

Model No.	Dimensions including WW				Dimensions including QZ and WW		
	Nut length	Flange width	Flange diameter	Nut diameter	Length	Outer diameter	Overall length incl. QZ and WW
	L_1	H	D_1	Dg6	QWL	QWD	AL
BNFN 2504-2.5	68	11	69	46	32.5	45	133
BNFN 2504-5	92						157
BNFN 2505-2.5	75	11	73	50	32.5	45	140
BNFN 2505-3	102						167
BNFN 2505-3.5	85						150
BNFN 2505-5	105						170
BNFN 2506-2.5	86	11	76	53	33	45	152
BNFN 2506-3	110						176
BNFN 2506-3.5	98						164
BNFN 2506-5	122						188
BNFN 2508-2.5	106	15	85	58	34	45	174
BNFN 2508-3	135						203
BNFN 2508-3.5	122						190
BNFN 2508-5	154						222
BNFN 2510A-2.5	120	18	85	58	37	45	194
BNFN 2512-2.5	108	11	76	53	33	45	174
BNFN 2516-1.5	108	11	76	53	35	45	178
BNFN 3205-2.5	76	12	85	58	32	57	140
BNFN 3205-3	103						167
BNFN 3205-4.5	123						187
BNFN 3205-5	106						170
BNFN 3205-7.5	136						200
BNFN 3206-2.5	87	12	89	62	32	57	151
BNFN 3206-3	111						175
BNFN 3206-5	123						187
BNFN 3208A-2.5	106	15	100	66	34	57	174
BNFN 3208A-3	135						203
BNFN 3208A-4.5	167						235
BNFN 3208A-5	154						222

Model number coding BNFN2505-5 QZ WW G0 +1000L C5

1 2 3 4 5 6

1 Model number 2 With QZ Lubricator (see page k-22)
3 Seal symbol - RR : Labyrinth seal attached to both ends of the ball screw nut (see page k-25)
WW : Wiper ring attached to both ends of the ball screw nut (see page k-26)
4 Axial clearance symbol (see page k-15) 5 Overall screw shaft length (in mm)
6 Accuracy symbol (see page k-8)

Note QZ Lubricator and wiper ring are not sold alone.

Unit: mm

Model No.	Dimensions including WW				Dimensions including QZ and WW		
	Nut length	Flange width	Flange diameter	Nut diameter	Length	Outer diameter	Overall length incl. QZ and WW
	L_1	H	D_1	Dg6	QWL	QWD	AL
BNFN 3210A-2.5	130	15	108	74	31	73	192
BNFN 3210A-3	167						229
BNFN 3210A-3.5	150						212
BNFN 3210A-5	190						252
BNFN 3212-3.5	170	18	121	76	33	73	236
BNFN 3606-2.5	89	15	100	65	30	64	149
BNFN 3606-3	110						170
BNFN 3606-5	125						185
BNFN 3606-7.5	161						221
BNFN 3608-2.5	116	18	114	70	31	64	178
BNFN 3608-5	164						226
BNFN 3608-7.5	212						274
BNFN 3610-2.5	141	18	120	75	33	64	207
BNFN 3610-5	201						267
BNFN 3610-7.5	261						327
BNFN 3612-2.5	147	18	123	78	35	64	217
BNFN 3612-5	219						289
BNFN 3616-2.5	172	18	123	78	32	64	236
BNFN 3616-5	268						332
BNFN 3620-1.5	135	15	103	70	32	64	199
BNFN 4005-3	106	15	101	67	33	66	172
BNFN 4005-4.5	126						192
BNFN 4005-5	109						175
BNFN 4005-6	156						222
BNFN 4006-2.5	90	15	104	70	35	66	160
BNFN 4006-5	126						196
BNFN 4006-7.5	162						232
BNFN 4008-2.5	106	15	108	74	35	66	176
BNFN 4008-3	135						205
BNFN 4008-5	154						224
BNFN 4010-2.5	133	18	124	82	37	66	207
BNFN 4010-3	170						244
BNFN 4010-3.5	153						227
BNFN 4010-5	193						267
BNFN 4012-2.5	155	18	126	84	38	66	231
BNFN 4012-3.5	179						255
BNFN 4012-5	227						303
BNFN 4016-5	280	22	126	84	42	66	364
BNFN 5005-3	108	15	114	80	35.5	79	179
BNFN 5005-4.5	128						199
BNFN 5008-2.5	109	18	129	87	36.5	79	182
BNFN 5008-5	157						230
BNFN 5008-7.5	205						278
BNFN 5010-2.5	133	18	135	93	37.5	79	208
BNFN 5010-3	170						245
BNFN 5010-3.5	153						228
BNFN 5010-5	193						268
BNFN 5010-7.5	253						328
BNFN 5012-2.5	159	22	146	100	38.5	79	236
BNFN 5012-3.5	183						260
BNFN 5012-5	231						308
BNFN 5016-2.5	196	25	152	105	38.5	79	273
BNFN 5016-5	292						369
BNFN 5020-2.5	241	28	152	105	40.5	79	322

Precautions on Use

■THK QZ Lubricator for the Ball Screw

Handling

●Dropping or hitting the product may damage it. Use much care when handling it.
●Unduly disassembling the product may cause foreign matter from entering the product or degrade the accuracy. Do not disassemble the product unless it is inevitable.
●Do not clean the product with an organic solvent or white kerosene.
●Do not leave the product package open over a long period of time.
●Do not block the hole for air vent near the model number indication with grease or the like.

Service Temperature Range

●Use this product within a temperature range of -10℃ to +50℃. When desiring to use the product out of this temperature range, contact THK .

Use in a Special Environment

●When desiring to use the product in a special environment, contact THK .

Corrosion Prevention

●QZ Lubricator is designed to provide the essential minimum amount of a lubricant to the ball raceway. It does not provide a corrosion-prevention effect to the whole Ball Screw.

■THK Wiper Ring for the Ball Screw

Handling

●Dropping or hitting the product may damage it. Use much care when handling it.
●Unduly disassembling the product may cause foreign matter from entering the product or degrade the accuracy. Do not disassemble the product unless it is inevitable.
●When using this product in a harsh environment, we recommend using it in combination with QZ Lubricator.

Service Temperature Range

●Use this product within a temperature range of -20℃ to +80℃. When desiring to use the product out of this temperature range, contact THK .

Use in a Special Environment

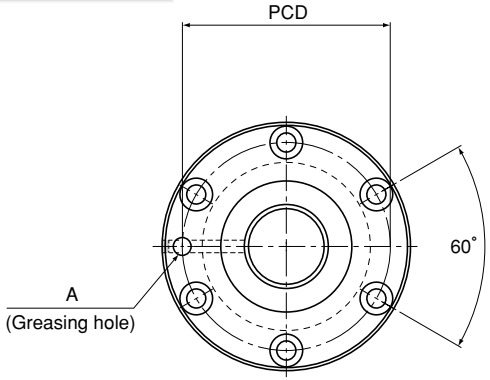
●When desiring to use the product in a special environment, contact THK .

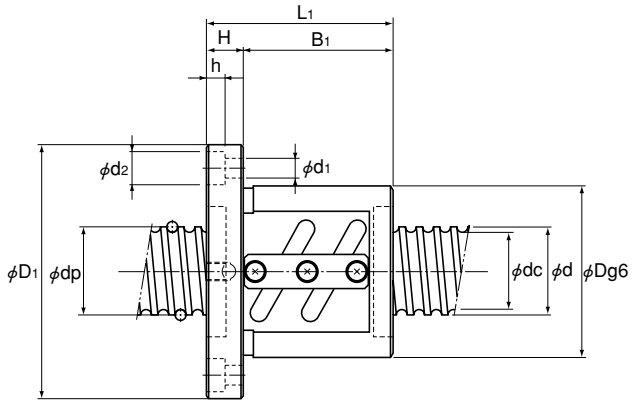
Chemical Resistance

●Avoid using the product in an atmosphere containing an acid or alkali solvent.

Model BNF

Single-nut Non-preload Type





Unit: mm

Model No.	Screw shaft outer diameter d	Lead R	Ball center diameter dp	Thread minor diameter dc	No. of loaded circuits Rows x turns	Basic load rating Ca kN	Basic load rating C0a kN	Rigidity K N/μm	Nut dimensions Outer diameter D	Flange diameter D1	Overall length L1	H	B1	PCD	d1×d2×h	Greasing hole A	Screw shaft inertial moment/mm kg·cm²/mm
BNF 1604-3	16	4	16.5	13.8	2×1.5	5.1	10.5	180	36	59	45	11	34	47	5.5×9.5×5.5	M6	5.05×10^{-4}
BNF 1605-2.5		5	16.75	13.2	1×2.5	7.4	13.9	170	40	60	41	10	31	50	4.5×8×4.5	M6	5.05×10^{-4}
BNF 1605-3			16.75	13.2	2×1.5	8.7	16.8	200	40	60	51	10	41	50	4.5×8×4.5	M6	5.05×10^{-4}
BNF 1605-5			16.75	13.2	2×2.5	13.5	27.8	320	40	60	56	10	46	50	4.5×8×4.5	M6	5.05×10^{-4}
BNF 1606-2.5		6	16.8	13.2	1×2.5	7.5	14	170	40	60	44	10	34	50	4.5×8×4.5	M6	5.05×10^{-4}
BNF 1606-5			16.8	13.2	2×2.5	13.5	28	320	40	60	62	10	52	50	4.5×8×4.5	M6	5.05×10^{-4}
BNF 1610-1.5		10	16.8	13.5	1×1.5	4.8	8.5	100	40	63	42	11	31	51	5.5×9.5×5.5	M6	5.05×10^{-4}
BNF 1810-2.5	18	10	18.8	15.5	1×2.5	7.8	15.9	190	42	65	69	12	57	53	5.5×9.5×5.5	M6	8.09×10^{-4}
BNF 1810-3			18.8	15.5	2×1.5	9.2	19.1	220	42	65	75	12	63	53	5.5×9.5×5.5	M6	8.09×10^{-4}
BNF 2004-2.5	20	4	20.5	17.8	1×2.5	4.8	10.9	180	40	63	37	11	26	51	5.5×9.5×5.5	M6	1.23×10^{-3}
BNF 2004-5			20.5	17.8	2×2.5	8.6	21.8	350	40	63	49	11	38	51	5.5×9.5×5.5	M6	1.23×10^{-3}
BNF 2005-2.5		5	20.75	17.2	1×2.5	8.3	17.4	200	44	67	41	11	30	55	5.5×9.5×5.5	M6	1.23×10^{-3}
BNF 2005-3			20.75	17.2	2×1.5	9.7	21	240	44	67	52	11	41	55	5.5×9.5×5.5	M6	1.23×10^{-3}
BNF 2005-3.5			20.75	17.2	1×3.5	11.1	24.5	270	44	67	45	11	34	55	5.5×9.5×5.5	M6	1.23×10^{-3}
BNF 2005-5			20.75	17.2	2×2.5	15.1	35	380	44	67	56	11	45	55	5.5×9.5×5.5	M6	1.23×10^{-3}
BNF 2006-2.5		6	20.75	17.2	1×2.5	8.3	17.5	200	48	71	44	11	33	59	5.5×9.5×5.5	M6	1.23×10^{-3}
BNF 2006-3			20.75	17.2	2×1.5	9.7	21	240	48	71	56	11	45	59	5.5×9.5×5.5	M6	1.23×10^{-3}
BNF 2006-3.5			20.75	17.2	1×3.5	11.1	24.5	270	48	71	50	11	39	59	5.5×9.5×5.5	M6	1.23×10^{-3}
BNF 2006-5			20.75	17.2	2×2.5	15.1	35	380	48	71	62	11	51	59	5.5×9.5×5.5	M6	1.23×10^{-3}
BNF 2008-2.5		8	21	16.4	1×2.5	11.1	21.9	210	46	74	60	15	45	59	5.5×9.5×5.5	M6	1.23×10^{-3}

Note The model number in a light face type indicate semi-standard types.
If desiring them, contact THK.

Model number coding

BNF1810-2.5 RR G1 +900L C5
1 2 3 4 5

1 Model number
2 Seal symbol - RR: Labyrinth seal attached to both ends of the ball screw nut (see page k-25)
3 Axial clearance symbol (see page k-15) 4 Overall screw shaft length (in mm)
5 Accuracy symbol (see page k-8)

Note The rigidity values in the table represent spring constants each obtained from the load and the elastic displacement when providing an axial load 30% of the basic dynamic load rating (Ca). These values do not include the rigidity of the components related to mounting the ball screw nut. Therefore, it is normally appropriate to regard roughly 80% of the value in the table as the actual value.
If the axial load (Fa) is not 0.3 Ca, the rigidity value (K_N) is obtained from the following equation.

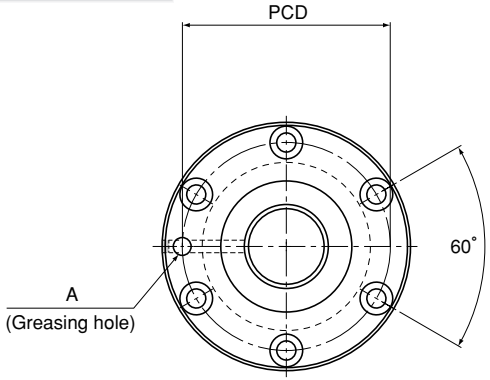
where

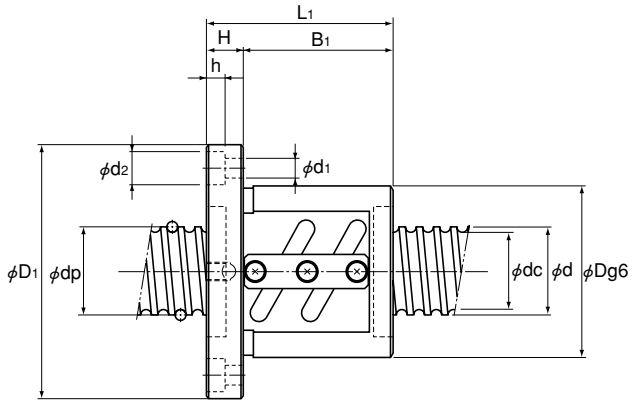
$$K_N = K\left(\frac{Fa}{0.3Ca}\right)^{\frac{1}{3}}$$

K: Rigidity value in the dimensional table.

Model BNF

Single-nut Non-Preload Type





Unit: mm

Model No.	Screw shaft outer diameter d	Lead R	Ball center diameter dp	Thread minor diameter dc	No. of loaded circuits Rows x turns	Basic load rating Ca kN	Basic load rating C0a kN	Rigidity K N/μm	Nut dimensions Outer diameter D	Flange diameter D1	Overall length L1	H	B1	PCD	d1×d2×h	Greasing hole A	Screw shaft inertial moment/mm kg·cm²/mm
BNF 2010A-1.5	20	10	21	16.4	1×1.5	7.2	13.2	130	46	74	58	15	43	59	5.5×9.5×5.5	M6	1.23×10⁻³
BNF 2012-1.5		12	21	16.4	1×1.5	7.1	13.2	130	48	71	64	18	46	59	5.5×9.5×5.5	M6	1.23×10⁻³
○ BNF 2504-2.5	25	4	25.5	22.8	1×2.5	5.2	13.7	210	46	69	36	11	25	57	5.5×9.5×5.5	M6	3.01×10⁻³
○ BNF 2504-5			25.5	22.8	2×2.5	9.5	27.3	410	46	69	48	11	37	57	5.5×9.5×5.5	M6	3.01×10⁻³
○ BNF 2505-2.5		5	25.75	22.2	1×2.5	9.2	22	240	50	73	40	11	29	61	5.5×9.5×5.5	M6	3.01×10⁻³
○ BNF 2505-3			25.75	22.2	2×1.5	10.8	26.4	280	50	73	52	11	41	61	5.5×9.5×5.5	M6	3.01×10⁻³
○ BNF 2505-3.5			25.75	22.2	1×3.5	12.3	30.7	320	50	73	45	11	34	61	5.5×9.5×5.5	M6	3.01×10⁻³
○ BNF 2505-5			25.75	22.2	2×2.5	16.7	44	460	50	73	55	11	44	61	5.5×9.5×5.5	M6	3.01×10⁻³
○ BNF 2506-2.5		6	26	21.4	1×2.5	12.5	27.3	250	53	76	44	11	33	64	5.5×9.5×5.5	M6	3.01×10⁻³
○ BNF 2506-3			26	21.4	2×1.5	14.6	32.8	290	53	76	56	11	45	64	5.5×9.5×5.5	M6	3.01×10⁻³
○ BNF 2506-3.5			26	21.4	1×3.5	15.1	35.9	330	53	76	50	11	39	64	5.5×9.5×5.5	M6	3.01×10⁻³
○ BNF 2506-5			26	21.4	2×2.5	22.5	54.8	470	53	76	62	11	51	64	5.5×9.5×5.5	M6	3.01×10⁻³
○ BNF 2508-2.5		8	26.25	20.5	1×2.5	15.8	32.8	250	58	85	58	15	43	71	6.6×11×6.5	M6	3.01×10⁻³
○ BNF 2508-3			26.25	20.5	2×1.5	18.5	39.4	290	58	85	71	15	56	71	6.6×11×6.5	M6	3.01×10⁻³
○ BNF 2508-3.5			26.25	20.5	1×3.5	21.2	46	340	58	85	66	15	51	71	6.6×11×6.5	M6	3.01×10⁻³
○ BNF 2508-5			26.25	20.5	2×2.5	28.7	65.8	480	58	85	82	15	67	71	6.6×11×6.5	M6	3.01×10⁻³
○ BNF 2510A-2.5		10	26.3	21.4	1×2.5	15.8	33	250	58	85	70	18	52	71	6.6×11×6.5	M6	3.01×10⁻³
○ BNF 2512-2.5		12	26	21.9	1×2.5	12.3	27.6	250	53	76	60	11	49	64	5.5×9.5×5.5	M6	3.01×10⁻³
○ BNF 2516-1.5		16	26	21.4	1×1.5	7.9	16.7	150	53	76	60	11	49	64	5.5×9.5×5.5	M6	3.01×10⁻³

Note The model number in a light face type indicate semi-standard types.
If desiring them, contact THK.
Those models marked with ○ can be attached with QZ Lubricator or the wiper ring.
For dimensions of the ball screw nut with either accessory being attached, see pages k-164 and k-165.

Model number coding

BNF2505-5 RR G1 +1200L C5
1 2 3 4 5

1 Model number
2 Seal symbol - RR : Labyrinth seal attached to both ends of the ball screw nut (see page k-25)
WW : Wiper ring attached to both ends of the ball screw nut (see page k-26)
3 Axial clearance symbol (see page k-15) 4 Overall screw shaft length (in mm)
5 Accuracy symbol (see page k-8)

Note The rigidity values in the table represent spring constants each obtained from the load and the elastic displacement when providing an axial load 30% of the basic dynamic load rating (Ca).
These values do not include the rigidity of the components related to mounting the ball screw nut. Therefore, it is normally appropriate to regard roughly 80% of the value in the table as the actual value.
If the axial load (Fa) is not 0.3 Ca, the rigidity value (K_N) is obtained from the following equation.

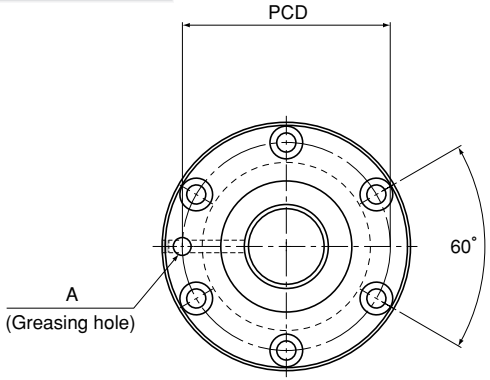
where

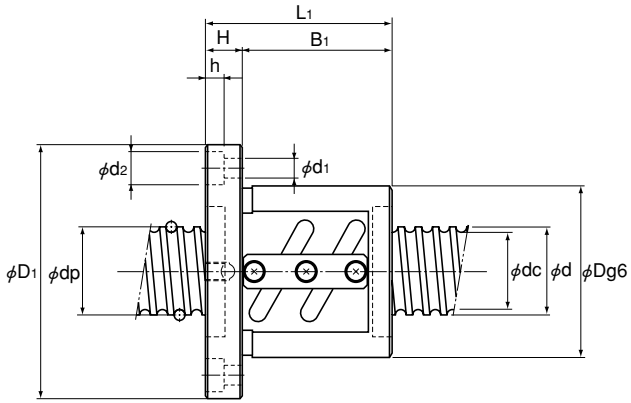
$$K_N = K\left(\frac{Fa}{0.3Ca}\right)^{\frac{1}{3}}$$

K: Rigidity value in the dimensional table.

Model BNF

Single-nut Non-Preload Type





Unit: mm

Model No.	Screw shaft outer diameter d	Lead R	Ball center diameter dp	Thread minor diameter dc	No. of loaded circuits Rows x turns	Basic load rating Ca kN	Basic load rating C0a kN	Rigidity K N/μm	Nut dimensions Outer diameter D	Flange diameter D1	Overall length L1	H	B1	PCD	d1×d2×h	Greasing hole A	Screw shaft inertial moment/mm kg·cm²/mm
BNF 2805-2.5	28	5	28.75	25.2	1×2.5	9.7	24.6	250	55	85	44	12	32	69	6.6×11×6.5	M6	4.74×10^{-3}
BNF 2805-3			28.75	25.2	2×1.5	11.3	29.5	300	55	85	54	12	42	69	6.6×11×6.5	M6	4.74×10^{-3}
BNF 2805-3.5			28.75	25.2	1×3.5	12.9	34.4	350	55	85	49	12	37	69	6.6×11×6.5	M6	4.74×10^{-3}
BNF 2805-5			28.75	25.2	2×2.5	17.5	49.4	500	55	85	59	12	47	69	6.6×11×6.5	M6	4.74×10^{-3}
BNF 2805-7.5			28.75	25.2	3×2.5	24.8	73.8	740	55	85	74	12	62	69	6.6×11×6.5	M6	4.74×10^{-3}
BNF 2806-2.5		6	28.75	25.2	1×2.5	9.6	24.6	250	55	85	50	12	38	69	6.6×11×6.5	M6	4.74×10^{-3}
BNF 2806-3.5			28.75	25.2	1×3.5	12.9	34.5	350	55	85	56	12	44	69	6.6×11×6.5	M6	4.74×10^{-3}
BNF 2806-5			28.75	25.2	2×2.5	17.5	49.4	500	55	85	68	12	56	69	6.6×11×6.5	M6	4.74×10^{-3}
BNF 2806-7.5			28.75	25.2	3×2.5	24.8	73.8	740	55	85	86	12	74	69	6.6×11×6.5	M6	4.74×10^{-3}
BNF 2808-2.5		8	29.25	23.6	1×2.5	16.8	36.8	270	60	104	68	18	50	82	11×17.5×11	M6	4.74×10^{-3}
BNF 2808-3			29.25	23.6	2×1.5	19.6	44.2	320	60	104	80	18	62	82	11×17.5×11	M6	4.74×10^{-3}
BNF 2808-5			29.25	23.6	2×2.5	30.4	73.7	530	60	104	92	18	74	82	11×17.5×11	M6	4.74×10^{-3}
BNF 2810-2.5		10	29.75	22.4	1×2.5	24	48.2	280	65	106	86	18	68	85	11×17.5×11	M6	4.74×10^{-3}
BNF 3204-7.5	32	4	32.5	30	3×2.5	14.8	52.7	740	54	81	60	11	49	67	6.6×11×6.5	M6	8.08×10^{-3}
○ BNF 3205-2.5		5	32.75	29.2	1×2.5	10.2	28.1	280	58	85	41	12	29	71	6.6×11×6.5	M6	8.08×10^{-3}
○ BNF 3205-3			32.75	29.2	2×1.5	12	33.8	340	58	85	53	12	41	71	6.6×11×6.5	M6	8.08×10^{-3}
○ BNF 3205-4.5			32.75	29.2	3×1.5	17	50.7	500	58	85	63	12	51	71	6.6×11×6.5	M6	8.08×10^{-3}
○ BNF 3205-5			32.75	29.2	2×2.5	18.5	56.4	560	58	85	56	12	44	71	6.6×11×6.5	M6	8.08×10^{-3}
○ BNF 3205-7.5			32.75	29.2	3×2.5	26.3	84.5	810	58	85	71	12	59	71	6.6×11×6.5	M6	8.08×10^{-3}

Note The model number in a light face type indicate semi-standard types.
If desiring them, contact THK.
Those models marked with ○ can be attached with QZ Lubricator or the wiper ring.
For dimensions of the ball screw nut with either accessory being attached, see pages k-164 and k-165.

Model number coding

BNF2806-5 RR G1 +1200L C5
1 2 3 4 5

1 Model number
2 Seal symbol - RR : Labyrinth seal attached to both ends of the ball screw nut (see page k-25)
WW : Wiper ring attached to both ends of the ball screw nut (see page k-26)
3 Axial clearance symbol (see page k-15) 4 Overall screw shaft length (in mm)
5 Accuracy symbol (see page k-8)

Note The rigidity values in the table represent spring constants each obtained from the load and the elastic displacement when providing an axial load 30% of the basic dynamic load rating (Ca).
These values do not include the rigidity of the components related to mounting the ball screw nut. Therefore, it is normally appropriate to regard roughly 80% of the value in the table as the actual value.
If the axial load (Fa) is not 0.3 Ca, the rigidity value (K_N) is obtained from the following equation.

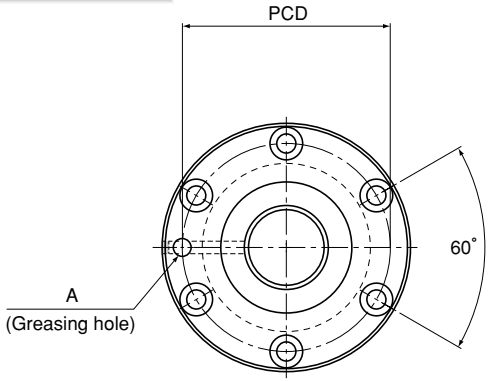
where

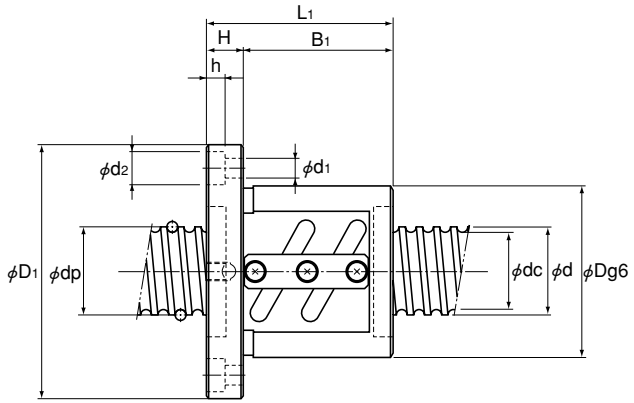
$$K_N = K\left(\frac{Fa}{0.3Ca}\right)^{\frac{1}{3}}$$

K: Rigidity value in the dimensional table.

Model BNF

Single-nut Non-Preload Type





Unit: mm

Model No.	Screw shaft outer diameter d	Lead R	Ball center diameter dp	Thread minor diameter dc	No. of loaded circuits Rows x turns	Basic load rating Ca kN	Basic load rating C0a kN	Rigidity K N/μm	Nut dimensions Outer diameter D	Flange diameter D1	Overall length L1	H	B1	PCD	d1×d2×h	Greasing hole A	Screw shaft inertial moment/mm kg·cm²/mm
○ BNF 3206-2.5	32	6	33	28.4	1×2.5	13.9	35.2	290	62	89	45	12	33	75	6.6×11×6.5	M6	8.08×10^{-3}
○ BNF 3206-3			33	28.4	2×1.5	16.3	42.2	350	62	89	57	12	45	75	6.6×11×6.5	M6	8.08×10^{-3}
○ BNF 3206-5			33	28.4	2×2.5	25.2	70.4	580	62	89	63	12	51	75	6.6×11×6.5	M6	8.08×10^{-3}
○ BNF 3208A-2.5		8	33.25	27.5	1×2.5	17.8	42.2	300	66	100	58	15	43	82	9×14×8.5	M6	8.08×10^{-3}
○ BNF 3208A-3			33.25	27.5	2×1.5	20.9	50.7	360	66	100	71	15	56	82	9×14×8.5	M6	8.08×10^{-3}
○ BNF 3208A-4.5			33.25	27.5	3×1.5	29.5	76	530	66	100	87	15	72	82	9×14×8.5	M6	8.08×10^{-3}
○ BNF 3208A-5			33.25	27.5	2×2.5	32.3	84.4	590	66	100	82	15	67	82	9×14×8.5	M6	8.08×10^{-3}
○ BNF 3210A-2.5		10	33.75	26.4	1×2.5	26.1	56.2	310	74	108	70	15	55	90	9×14×8.5	M6	8.08×10^{-3}
○ BNF 3210A-3			33.75	26.4	2×1.5	30.5	67.4	380	74	108	87	15	72	90	9×14×8.5	M6	8.08×10^{-3}
○ BNF 3210A-3.5			33.75	26.4	1×3.5	34.8	78.6	440	74	108	80	15	65	90	9×14×8.5	M6	8.08×10^{-3}
○ BNF 3210A-5			33.75	26.4	2×2.5	47.2	112.7	620	74	108	100	15	85	90	9×14×8.5	M6	8.08×10^{-3}
○ BNF 3212-3.5		12	34	26.1	1×3.5	40.4	88.5	440	76	121	98	18	80	98	11×17.5×11	M6	8.08×10^{-3}
○ BNF 3606-2.5	36	6	36.75	33.2	1×2.5	10.7	31.8	310	65	100	53	15	38	82	9×14×8.5	M6	1.29×10^{-2}
○ BNF 3606-3			36.75	33.2	2×1.5	12.5	38	370	65	100	62	15	47	82	9×14×8.5	M6	1.29×10^{-2}
○ BNF 3606-5			36.75	33.2	2×2.5	19.4	63.4	610	65	100	71	15	56	82	9×14×8.5	M6	1.29×10^{-2}
○ BNF 3606-7.5			36.75	33.2	3×2.5	27.5	95.2	890	65	100	89	15	74	82	9×14×8.5	M6	1.29×10^{-2}
○ BNF 3608-2.5		8	37.25	31.6	1×2.5	18.8	47.5	330	70	114	68	18	50	92	11×17.5×11	M6	1.29×10^{-2}
○ BNF 3608-5			37.25	31.6	2×2.5	34.1	95.1	650	70	114	92	18	74	92	11×17.5×11	M6	1.29×10^{-2}
○ BNF 3608-7.5			37.25	31.6	3×2.5	48.3	142.1	950	70	114	116	18	98	92	11×17.5×11	M6	1.29×10^{-2}

Note The model number in a light face type indicate semi-standard types.
If desiring them, contact THK.
Those models marked with ○ can be attached with QZ Lubricator or the wiper ring.
For dimensions of the ball screw nut with either accessory being attached, see pages k-164 and k-165.

Model number coding

BNF3206-5 RR G2 +1500L C7
1 2 3 4 5

1 Model number
2 Seal symbol - RR : Labyrinth seal attached to both ends of the ball screw nut (see page k-25)
WW : Wiper ring attached to both ends of the ball screw nut (see page k-26)
3 Axial clearance symbol (see page k-15) 4 Overall screw shaft length (in mm)
5 Accuracy symbol (see page k-8)

Note The rigidity values in the table represent spring constants each obtained from the load and the elastic displacement when providing an axial load 30% of the basic dynamic load rating (Ca).
These values do not include the rigidity of the components related to mounting the ball screw nut. Therefore, it is normally appropriate to regard roughly 80% of the value in the table as the actual value.
If the axial load (Fa) is not 0.3 Ca, the rigidity value (K_N) is obtained from the following equation.

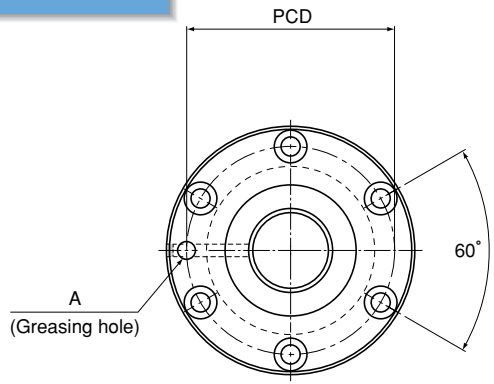
where

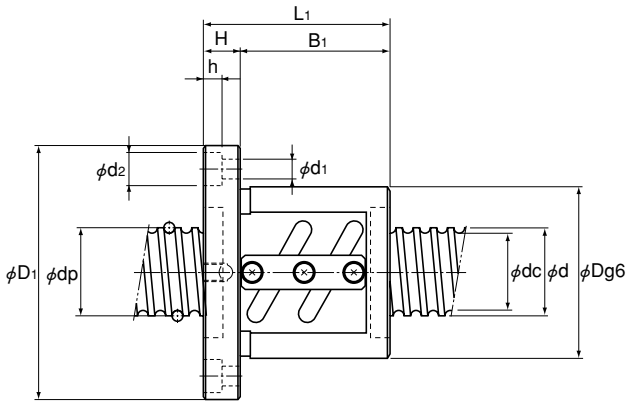
$$K_N = K\left(\frac{Fa}{0.3Ca}\right)^{\frac{1}{3}}$$

K: Rigidity value in the dimensional table.

Model BNF

Single-nut Non-Preload Type





Unit: mm

Model No.	Screw shaft outer diameter d	Lead R	Ball center diameter dp	Thread minor diameter dc	No. of loaded circuits Rows x turns	Basic load rating Ca kN	Basic load rating C0a kN	Rigidity K N/μm	Nut dimensions Outer diameter D	Flange diameter D1	Overall length L1	H	B1	PCD	d1×d2×h	Greasing hole A	Screw shaft inertial moment/mm kg·cm²/mm
○ BNF 3610-2.5	36	10	37.75	30.5	1×2.5	27.6	63.3	350	75	120	81	18	63	98	11×17.5×11	M6	1.29×10⁻²
○ BNF 3610-5			37.75	30.5	2×2.5	50.1	126.4	680	75	120	111	18	93	98	11×17.5×11	M6	1.29×10⁻²
○ BNF 3610-7.5			37.75	30.5	3×2.5	71.1	190.1	990	75	120	141	18	123	98	11×17.5×11	M6	1.29×10⁻²
○ BNF 3612-2.5		12	38	30.1	1×2.5	32.1	71.4	350	78	123	87	18	69	100	11×17.5×11	M6	1.29×10⁻²
○ BNF 3612-5			38	30.1	2×2.5	58.4	142.1	690	78	123	123	18	105	100	11×17.5×11	M6	1.29×10⁻²
○ BNF 3616-2.5		16	38	30.1	1×2.5	32.1	71.4	350	78	123	92	18	74	100	11×17.5×11	M6	1.29×10⁻²
○ BNF 3620-1.5		20	37.75	30.5	1×1.5	17.6	38.3	220	70	103	75	15	60	85	9×14×8.5	M6	1.29×10⁻²
○ BNF 4005-3	40	5	40.75	37.2	2×1.5	13	42.3	400	67	101	56	15	41	83	9×14×8.5	M6	1.97×10⁻²
○ BNF 4005-4.5			40.75	37.2	3×1.5	18.5	63.5	600	67	101	66	15	51	83	9×14×8.5	M6	1.97×10⁻²
○ BNF 4005-6			40.75	37.2	4×1.5	23.7	84.7	780	67	101	81	15	66	83	9×14×8.5	M6	1.97×10⁻²
○ BNF 4006-2.5		6	41	36.4	1×2.5	15.3	44.1	350	70	104	48	15	33	86	9×14×8.5	M6	1.97×10⁻²
○ BNF 4006-5			41	36.4	2×2.5	27.7	88.1	690	70	104	66	15	51	86	9×14×8.5	M6	1.97×10⁻²
○ BNF 4006-7.5			41	36.4	3×2.5	39.2	132.3	1010	70	104	84	15	69	86	9×14×8.5	M6	1.97×10⁻²
○ BNF 4008-2.5		8	41.25	35.5	1×2.5	19.6	52.8	360	74	108	58	15	43	90	9×14×8.5	M6	1.97×10⁻²
○ BNF 4008-3			41.25	35.5	2×1.5	22.9	63.4	430	74	108	71	15	56	90	9×14×8.5	M6	1.97×10⁻²
○ BNF 4008-5			41.25	35.5	2×2.5	35.7	105.8	710	74	108	82	15	67	90	9×14×8.5	M6	1.97×10⁻²
○ BNF 4010-2.5		10	41.75	34.4	1×2.5	29	70.4	380	82	124	73	18	55	102	11×17.5×11	M6	1.97×10⁻²
○ BNF 4010-3			41.75	34.4	2×1.5	33.8	84.5	450	82	124	90	18	72	102	11×17.5×11	M6	1.97×10⁻²
○ BNF 4010-3.5			41.75	34.4	1×3.5	38.8	99	520	82	124	83	18	65	102	11×17.5×11	M6	1.97×10⁻²
○ BNF 4010-5			41.75	34.4	2×2.5	52.7	141.1	740	82	124	103	18	85	102	11×17.5×11	M6	1.97×10⁻²

Note The model number in a light face type indicate semi-standard types.
If desiring them, contact THK.
Those models marked with ○ can be attached with QZ Lubricator or the wiper ring.
For dimensions of the ball screw nut with either accessory being attached, see pages k-164 and k-165.

Model number coding

BNF3610-5 RR G1 +1800L C5
1 2 3 4 5

1 Model number
2 Seal symbol - RR : Labyrinth seal attached to both ends of the ball screw nut (see page k-25)
WW : Wiper ring attached to both ends of the ball screw nut (see page k-26)
3 Axial clearance symbol (see page k-15) 4 Overall screw shaft length (in mm)
5 Accuracy symbol (see page k-8)

Note The rigidity values in the table represent spring constants each obtained from the load and the elastic displacement when providing an axial load 30% of the basic dynamic load rating (Ca).
These values do not include the rigidity of the components related to mounting the ball screw nut. Therefore, it is normally appropriate to regard roughly 80% of the value in the table as the actual value.
If the axial load (Fa) is not 0.3 Ca, the rigidity value (K_N) is obtained from the following equation.

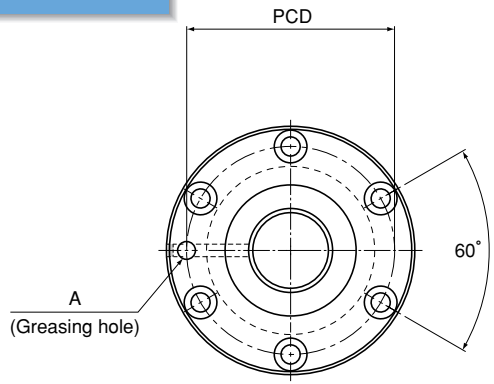
where

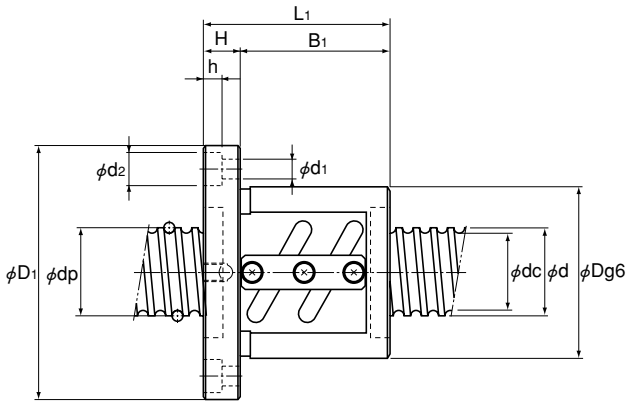
$$K_N = K\left(\frac{Fa}{0.3Ca}\right)^{\frac{1}{3}}$$

K: Rigidity value in the dimensional table.

Model BNF

Single-nut Non-Preload Type





Unit: mm

Model No.	Screw shaft outer diameter d	Lead R	Ball center diameter dp	Thread minor diameter dc	No. of loaded circuits Rows x turns	Basic load rating Ca kN	Basic load rating C0a kN	Rigidity K N/μm	Nut dimensions Outer diameter D	Flange diameter D1	Overall length L1	H	B1	PCD	d1×d2×h	Greasing hole A	Screw shaft inertial moment/mm kg·cm²/mm
○ BNF 4012-2.5	40	12	42	34.1	1×2.5	33.9	79.2	390	84	126	83	18	65	104	11×17.5×11	M6	1.97×10⁻²
○ BNF 4012-3.5			42	34.1	1×3.5	45.4	110.7	530	84	126	95	18	77	104	11×17.5×11	M6	1.97×10⁻²
○ BNF 4012-5			42	34.1	2×2.5	61.6	158.3	750	84	126	119	18	101	104	11×17.5×11	M6	1.97×10⁻²
○ BNF 4016-5		16	42	34.1	2×2.5	61.4	158.8	740	84	126	152	22	130	104	11×17.5×11	M6	1.97×10⁻²
BNF 4506A-2.5	45	6	46	41.4	1×2.5	16	49.6	390	80	114	53	15	38	96	9×14×8.5	PT 1/8	3.16×10⁻²
BNF 4506A-5			46	41.4	2×2.5	29	99	750	80	114	71	15	56	96	9×14×8.5	PT 1/8	3.16×10⁻²
BNF 4506A-7.5			46	41.4	3×2.5	41.2	150	1100	80	114	89	15	74	96	9×14×8.5	PT 1/8	3.16×10⁻²
BNF 4508-2.5		8	46.25	40.6	1×2.5	20.7	59.5	400	85	127	68	18	50	105	11×17.5×11	PT 1/8	3.16×10⁻²
BNF 4508-5			46.25	40.6	2×2.5	37.4	118.6	770	85	127	92	18	74	105	11×17.5×11	PT 1/8	3.16×10⁻²
BNF 4508-7.5			46.25	40.6	3×2.5	53.1	178.4	1140	85	127	116	18	98	105	11×17.5×11	PT 1/8	3.16×10⁻²
BNF 4510-2.5		10	46.75	39.5	1×2.5	30.7	79.3	420	88	132	81	18	63	110	11×17.5×11	PT 1/8	3.16×10⁻²
BNF 4510-3			46.75	39.5	2×1.5	35.9	95.2	500	88	132	94	18	76	110	11×17.5×11	PT 1/8	3.16×10⁻²
BNF 4510-5			46.75	39.5	2×2.5	55.6	158.8	800	88	132	111	18	93	110	11×17.5×11	PT 1/8	3.16×10⁻²
BNF 4510-7.5			46.75	39.5	3×2.5	78.8	238.1	1190	88	132	141	18	123	110	11×17.5×11	PT 1/8	3.16×10⁻²
BNF 4512-5		12	47	39.2	2×2.5	65.2	178.4	820	90	130	119	18	101	110	11×17.5×11	PT 1/8	3.16×10⁻²
BNF 4520-1.5		20	47.7	37.9	1×1.5	44.2	99	350	98	142	95	20	75	120	11×17.5×11	PT 1/8	3.16×10⁻²
○ BNF 5005-4.5	50	5	50.75	47.2	3×1.5	20.2	79.5	710	80	114	68	15	53	96	9×14×8.5	PT 1/8	4.82×10⁻²
○ BNF 5008-2.5		8	51.25	45.5	1×2.5	21.6	66.2	430	87	129	61	18	43	107	11×17.5×11	PT 1/8	4.82×10⁻²
○ BNF 5008-5			51.25	45.5	2×2.5	39.1	132.3	840	87	129	85	18	67	107	11×17.5×11	PT 1/8	4.82×10⁻²
○ BNF 5008-7.5			51.25	45.5	3×2.5	55.4	198.9	1230	87	129	109	18	91	107	11×17.5×11	PT 1/8	4.82×10⁻²

Note The model number in a light face type indicate semi-standard types.
If desiring them, contact THK.
Those models marked with ○ can be attached with QZ Lubricator or the wiper ring.
For dimensions of the ball screw nut with either accessory being attached, see pages k-164 and k-165.

Model number coding

BNF4510-5 RR G1 +2000L C5
1 2 3 4 5

1 Model number
2 Seal symbol - RR : Labyrinth seal attached to both ends of the ball screw nut (see page k-25)
WW : Wiper ring attached to both ends of the ball screw nut (see page k-26)
3 Axial clearance symbol (see page k-15) 4 Overall screw shaft length (in mm)
5 Accuracy symbol (see page k-8)

Note The rigidity values in the table represent spring constants each obtained from the load and the elastic displacement when providing an axial load 30% of the basic dynamic load rating (Ca).
These values do not include the rigidity of the components related to mounting the ball screw nut. Therefore, it is normally appropriate to regard roughly 80% of the value in the table as the actual value.
If the axial load (Fa) is not 0.3 Ca, the rigidity value (K_N) is obtained from the following equation.

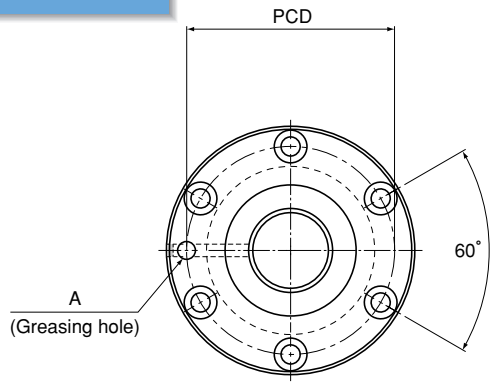
where

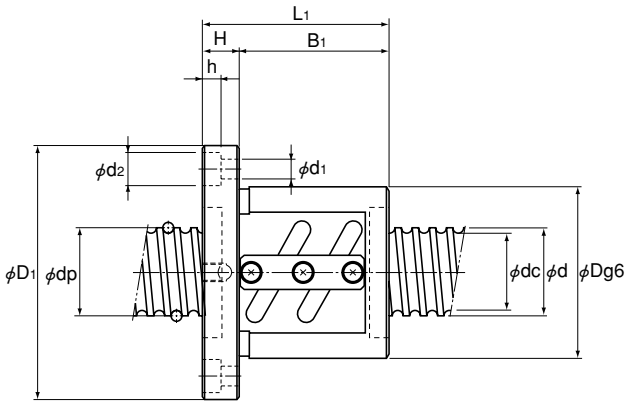
$$K_N = K\left(\frac{Fa}{0.3Ca}\right)^{\frac{1}{3}}$$

K: Rigidity value in the dimensional table.

Model BNF

Single-nut Non-Preload Type





Unit: mm

Model No.	Screw shaft outer diameter d	Lead R	Ball center diameter dp	Thread minor diameter dc	No. of loaded circuits Rows x turns	Basic load rating Ca kN	Basic load rating C0a kN	Rigidity K N/μm	Nut dimensions Outer diameter D	Flange diameter D1	Overall length L1	H	B1	PCD	d1×d2×h	Greasing hole A	Screw shaft inertial moment/mm kg·cm²/mm
○ BNF 5010-2.5	50	10	51.75	44.4	1×2.5	32	88.2	450	93	135	73	18	55	113	11×17.5×11	PT 1/8	4.82×10⁻²
○ BNF 5010-3			51.75	44.4	2×1.5	37.5	105.8	540	93	135	90	18	72	113	11×17.5×11	PT 1/8	4.82×10⁻²
○ BNF 5010-3.5			51.75	44.4	1×3.5	42.8	123.5	620	93	135	83	18	65	113	11×17.5×11	PT 1/8	4.82×10⁻²
○ BNF 5010-5			51.75	44.4	2×2.5	58.2	176.4	880	93	135	103	18	85	113	11×17.5×11	PT 1/8	4.82×10⁻²
○ BNF 5010-7.5			51.75	44.4	3×2.5	82.5	264.6	1290	93	135	133	18	115	113	11×17.5×11	PT 1/8	4.82×10⁻²
○ BNF 5012-2.5		12	52.25	43.3	1×2.5	43.4	109.8	470	100	146	87	22	65	122	14×20×13	PT 1/8	4.82×10⁻²
○ BNF 5012-3.5			52.25	43.3	1×3.5	58	153.9	640	100	146	99	22	77	122	14×20×13	PT 1/8	4.82×10⁻²
○ BNF 5012-5			52.25	43.3	2×2.5	78.8	220.5	910	100	146	123	22	101	122	14×20×13	PT 1/8	4.82×10⁻²
○ BNF 5016-2.5		16	52.7	42.9	1×2.5	72.6	183.3	620	105	152	116	25	91	128	14×20×13	PT 1/8	4.82×10⁻²
○ BNF 5016-5			52.7	42.9	2×2.5	132.3	366.5	1180	105	152	164	25	139	128	14×20×13	PT 1/8	4.82×10⁻²
○ BNF 5020-2.5		20	52.7	42.9	1×2.5	72.5	183.3	620	105	152	141	28	113	128	14×20×13	PT 1/8	4.82×10⁻²
BNF 5510-2.5	55	10	56.75	49.5	1×2.5	33.4	97	490	102	144	81	18	63	122	11×17.5×11	PT 1/8	7.05×10⁻²
BNF 5510-5			56.75	49.5	2×2.5	60.7	194	950	102	144	111	18	93	122	11×17.5×11	PT 1/8	7.05×10⁻²
BNF 5510-7.5			56.75	49.5	3×2.5	85.9	291.1	1390	102	144	141	18	123	122	11×17.5×11	PT 1/8	7.05×10⁻²
BNF 5512-2.5		12	57	49.2	1×2.5	39.3	108.8	500	105	147	93	18	75	125	11×17.5×11	PT 1/8	7.05×10⁻²
BNF 5512-3			57	49.2	2×1.5	46	131.3	590	105	147	107	18	89	125	11×17.5×11	PT 1/8	7.05×10⁻²
BNF 5512-3.5			57	49.2	1×3.5	52.4	152.9	680	105	147	105	18	87	125	11×17.5×11	PT 1/8	7.05×10⁻²
BNF 5512-5			57	49.2	2×2.5	71.3	218.5	960	105	147	129	18	111	125	11×17.5×11	PT 1/8	7.05×10⁻²
BNF 5512-7.5			57	49.2	3×2.5	100.9	327.3	1420	105	147	165	18	147	125	11×17.5×11	PT 1/8	7.05×10⁻²

Note The model number in a light face type indicate semi-standard types.
If desiring them, contact THK.
Those models marked with ○ can be attached with QZ Lubricator or the wiper ring.
For dimensions of the ball screw nut with either accessory being attached, see pages k-164 and k-165.

Model number coding

BNF5010-5 RR G1 +2500L C5
1 2 3 4 5

1 Model number
2 Seal symbol - RR : Labyrinth seal attached to both ends of the ball screw nut (see page k-25)
WW : Wiper ring attached to both ends of the ball screw nut (see page k-26)
3 Axial clearance symbol (see page k-15) 4 Overall screw shaft length (in mm)
5 Accuracy symbol (see page k-8)

Note The rigidity values in the table represent spring constants each obtained from the load and the elastic displacement when providing an axial load 30% of the basic dynamic load rating (Ca).
These values do not include the rigidity of the components related to mounting the ball screw nut. Therefore, it is normally appropriate to regard roughly 80% of the value in the table as the actual value.
If the axial load (Fa) is not 0.3 Ca, the rigidity value (K_N) is obtained from the following equation.

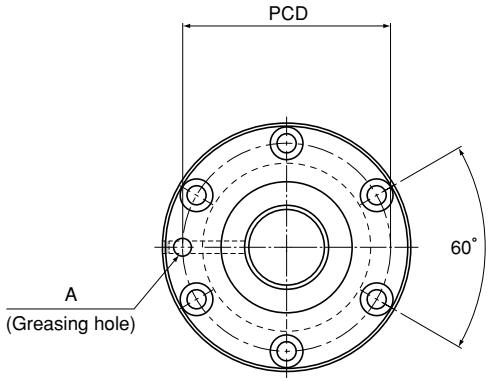
where

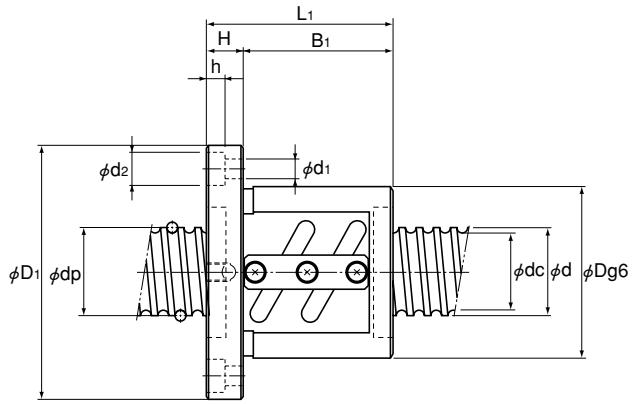
$$K_N = K\left(\frac{Fa}{0.3Ca}\right)^{\frac{1}{3}}$$

K: Rigidity value in the dimensional table.

Model BNF

Single-nut Non-Preload Type





Unit: mm

Model No.	Screw shaft outer diameter d	Lead R	Ball center diameter dp	Thread minor diameter dc	No. of loaded circuits Rows x turns	Basic load rating Ca kN	Basic load rating C0a kN	Rigidity K N/μm	Nut dimensions Outer diameter D	Flange diameter D1	Overall length L1	H	B1	PCD	d1×d2×h	Greasing hole A	Screw shaft inertial moment/mm kg·cm²/mm
BNF 5516-2.5	55	16	57.7	47.9	1×2.5	76.1	201.9	650	110	158	116	25	91	133	14×20×13	PT 1/8	7.05×10^{-2}
BNF 5516-5			57.7	47.9	2×2.5	138.2	402.8	1280	110	158	164	25	139	133	14×20×13	PT 1/8	7.05×10^{-2}
BNF 5520-2.5		20	57.7	47.9	1×2.5	76	201.9	660	112	158	127	28	99	134	14×20×13	PT 1/8	7.05×10^{-2}
BNF 5520-5			57.7	47.9	2×2.5	138.2	403.8	1280	112	158	187	28	159	134	14×20×13	PT 1/8	7.05×10^{-2}
BNF 6310-2.5	63	10	64.75	57.7	1×2.5	35.4	111.7	550	108	154	77	22	55	130	14×20×13	PT 1/8	1.21×10^{-1}
BNF 6310-5			64.75	57.7	2×2.5	64.2	222.5	1050	108	154	107	22	85	130	14×20×13	PT 1/8	1.21×10^{-1}
BNF 6310-7.5			64.75	57.7	3×2.5	90.9	334.2	1550	108	154	137	22	115	130	14×20×13	PT 1/8	1.21×10^{-1}
BNF 6312A-2.5		12	65.25	56.3	1×2.5	48.1	139.2	560	115	161	87	22	65	137	14×20×13	PT 1/8	1.21×10^{-1}
BNF 6312A-5			65.25	56.3	2×2.5	87.4	278.3	1090	115	161	123	22	101	137	14×20×13	PT 1/8	1.21×10^{-1}
BNF 6316-5		16	65.7	55.9	2×2.5	147	462.6	1420	122	184	160	24	136	152	18×26×17.5	PT 1/8	1.21×10^{-1}
BNF 6320-2.5		20	65.7	55.9	1×2.5	81	231.3	740	122	180	127	28	99	150	18×26×17.5	PT 1/8	1.21×10^{-1}
BNF 6320-5			65.7	55.9	2×2.5	147	463.5	1420	122	180	187	28	159	150	18×26×17.5	PT 1/8	1.21×10^{-1}
BNF 7010-2.5	70	10	71.75	64.5	1×2.5	36.8	123.5	590	125	167	81	18	63	145	11×17.5×11	PT 1/8	1.85×10^{-1}
BNF 7010-5			71.75	64.5	2×2.5	66.9	247	1140	125	167	111	18	93	145	11×17.5×11	PT 1/8	1.85×10^{-1}
BNF 7010-7.5			71.75	64.5	3×2.5	94.9	371.4	1680	125	167	141	18	123	145	11×17.5×11	PT 1/8	1.85×10^{-1}
BNF 7012-2.5		12	72	64.2	1×2.5	43.5	139.2	600	128	170	93	18	75	148	11×17.5×11	PT 1/8	1.85×10^{-1}
BNF 7012-5			72	64.2	2×2.5	78.9	278.3	1160	128	170	129	18	111	148	11×17.5×11	PT 1/8	1.85×10^{-1}
BNF 7012-7.5			72	64.2	3×2.5	111.7	417.5	1710	128	170	165	18	147	148	11×17.5×11	PT 1/8	1.85×10^{-1}
BNF 7020-5		20	72.7	62.9	2×2.5	153.9	514.5	1550	130	186	185	28	157	158	18×26×17.5	PT 1/8	1.85×10^{-1}

Note The model number in a light face type indicate semi-standard types.
If desiring them, contact THK.

Model number coding

BNF6310-5 RR G2 +3500L C7
1 2 3 4 5

1 Model number
2 Seal symbol - RR: Labyrinth seal attached to both ends of the ball screw nut (see page k-25)
3 Axial clearance symbol (see page k-15) 4 Overall screw shaft length (in mm)
5 Accuracy symbol (see page k-8)

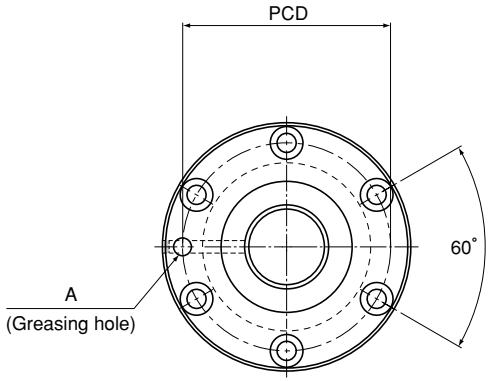
Note The rigidity values in the table represent spring constants each obtained from the load and the elastic displacement when providing an axial load 30% of the basic dynamic load rating (Ca).
These values do not include the rigidity of the components related to mounting the ball screw nut. Therefore, it is normally appropriate to regard roughly 80% of the value in the table as the actual value.
If the axial load (Fa) is not 0.3 Ca, the rigidity value (K_N) is obtained from the following equation.

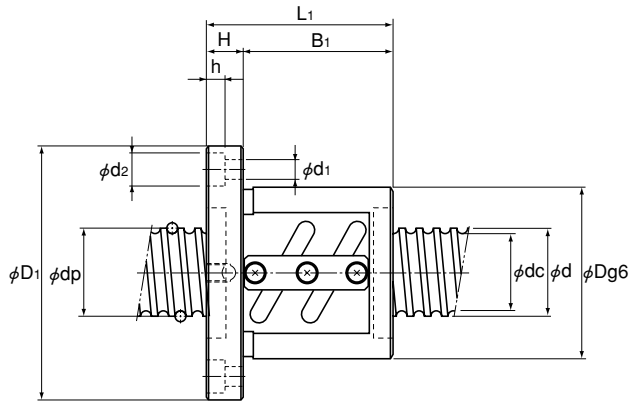
where

$$K_N = K\left(\frac{Fa}{0.3Ca}\right)^{\frac{1}{3}}$$

K: Rigidity value in the dimensional table.

Model BNF
Single-nut Non-Preload Type





Unit: mm

Model No.	Screw shaft outer diameter d	Lead R	Ball center diameter dp	Thread minor diameter dc	No. of loaded circuits Rows x turns	Basic load rating Ca kN	Basic load rating C0a kN	Rigidity K N/μm	Nut dimensions Outer diameter D	Flange diameter D1	Overall length L1	H	B1	PCD	d1×d2×h	Greasing hole A	Screw shaft inertial moment/mm kg·cm²/mm
BNF 8010-2.5	80	10	81.75	75.2	1×2.5	38.9	141.1	650	130	176	77	22	55	152	14×20×13	PT 1/8	3.16×10^{-1}
BNF 8010-5			81.75	75.2	2×2.5	70.6	283.2	1270	130	176	107	22	85	152	14×20×13	PT 1/8	3.16×10^{-1}
BNF 8010-7.5			81.75	75.2	3×2.5	100	424.3	1860	130	176	137	22	115	152	14×20×13	PT 1/8	3.16×10^{-1}
BNF 8020A-2.5		20	82.7	72.9	1×2.5	90.1	294	890	143	204	127	28	99	172	18×26×17.5	PT 1/8	3.16×10^{-1}
BNF 8020A-5			82.7	72.9	2×2.5	163.7	589	1720	143	204	187	28	159	172	18×26×17.5	PT 1/8	3.16×10^{-1}
BNF 8020A-7.5			82.7	72.9	3×2.5	231.6	883.2	2520	143	204	247	28	219	172	18×26×17.5	PT 1/8	3.16×10^{-1}
BNF 10020A-2.5	100	20	102.7	92.9	1×2.5	99	368.5	2110	170	243	131	32	99	205	22×32×21.5	PT 1/8	7.71×10^{-1}
BNF 10020A-5			102.7	92.9	2×2.5	179.3	737	4080	170	243	191	32	159	205	22×32×21.5	PT 1/8	7.71×10^{-1}
BNF 10020A-7.5			102.7	92.9	3×2.5	253.8	1105.4	6010	170	243	251	32	219	205	22×32×21.5	PT 1/8	7.71×10^{-1}

Note The model number in a light face type indicate semi-standard types.
If desiring them, contact THK.

Model number coding BNF8010-5 RR G2 +5000L C7
1 2 3 4 5

1 Model number
2 Seal symbol - RR: Labyrinth seal attached to both ends of the ball screw nut (see page k-25)
3 Axial clearance symbol (see page k-15) 4 Overall screw shaft length (in mm)
5 Accuracy symbol (see page k-8)

Note The rigidity values in the table represent spring constants each obtained from the load and the elastic displacement when providing an axial load 30% of the basic dynamic load rating (Ca).
These values do not include the rigidity of the components related to mounting the ball screw nut. Therefore, it is normally appropriate to regard roughly 80% of the value in the table as the actual value.
If the axial load (Fa) is not 0.3 Ca, the rigidity value (K_N) is obtained from the following equation.

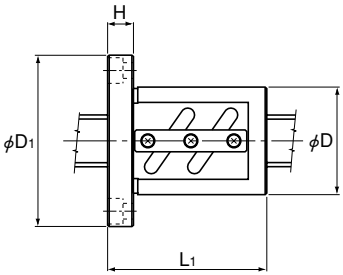
where

$$K_N = K\left(\frac{Fa}{0.3Ca}\right)^{\frac{1}{3}}$$

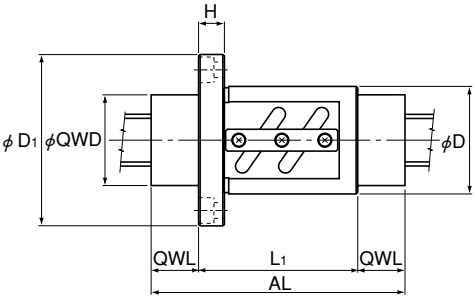
K: Rigidity value in the dimensional table.

Model BNF

Dimensions of the Ball Screw Nut Attached with Wiper Ring (WW) and QZ Lubricator (QZ)



With WW (without QZ)



With QZ + WW

Unit: mm

Model No.	Dimensions including WW				Dimensions including QZ and WW		
	Nut length	Flange width	Flange diameter	Nut diameter	Length	Outer diameter	Overall length incl. QZ and WW
	L_1	H	D_1	Dg6	QWL	QWD	AL
BNF 2504-2.5	36	11	69	46	32.5	45	101
BNF 2504-5	48						113
BNF 2505-2.5	40	11	73	50	32.5	45	105
BNF 2505-3	52						117
BNF 2505-3.5	45						110
BNF 2505-5	55						120
BNF 2506-2.5	44	11	76	53	33	45	110
BNF 2506-3	56						122
BNF 2506-3.5	50						116
BNF 2506-5	62						128
BNF 2508-2.5	58	15	85	58	34	45	126
BNF 2508-3	71						139
BNF 2508-3.5	66						134
BNF 2508-5	82						150
BNF 2510A-2.5	70	18	85	58	37	45	144
BNF 2512-2.5	60	11	76	53	33	45	126
BNF 2516-1.5	60	11	76	53	35	45	130
BNF 3205-2.5	41	12	85	58	32	57	105
BNF 3205-3	53						117
BNF 3205-4.5	63						127
BNF 3205-5	56						120
BNF 3205-7.5	71						135
BNF 3206-2.5	45	12	89	62	32	57	109
BNF 3206-3	57						121
BNF 3206-5	63						127
BNF 3208A-2.5	58	15	100	66	34	57	126
BNF 3208A-3	71						139
BNF 3208A-4.5	87						155
BNF 3208A-5	82						150

Model number coding

BNF2505-5 QZ WW G1 +1000L C5

1 2 3 4 5 6

1 Model number 2 With QZ Lubricator (see page k-22)
3 Seal symbol - RR : Labyrinth seal attached to both ends of the ball screw nut (see page k-25)
WW : Wiper ring attached to both ends of the ball screw nut (see page k-26)
4 Axial clearance symbol (see page k-15) 5 Overall screw shaft length (in mm)
6 Accuracy symbol (see page k-8)

Note QZ Lubricator and wiper ring are not sold alone.

Unit: mm

Model No.	Dimensions including WW				Dimensions including QZ and WW		
	Nut length	Flange width	Flange diameter	Nut diameter	Length	Outer diameter	Overall length incl. QZ and WW
	L_1	H	D_1	Dg6	QWL	QWD	AL
BNF 3210A-2.5	70	15	108	74	31	73	132
BNF 3210A-3	87						149
BNF 3210A-3.5	80						142
BNF 3210A-5	100						162
BNF 3212-3.5	98	18	121	76	33	73	164
BNF 3606-2.5	53	15	100	65	30	64	113
BNF 3606-3	62						122
BNF 3606-5	71						131
BNF 3606-7.5	89						149
BNF 3608-2.5	68	18	114	70	31	64	130
BNF 3608-5	92						154
BNF 3608-7.5	116						178
BNF 3610-2.5	81	18	120	75	33	64	147
BNF 3610-5	111						177
BNF 3610-7.5	141						207
BNF 3612-2.5	87	18	123	78	35	64	157
BNF 3612-5	123						193
BNF 3616-2.5	92	18	123	78	32	64	156
BNF 3620-1.5	75	15	103	70	32	64	139
BNF 4005-3	56	15	101	67	33	66	122
BNF 4005-4.5	66						132
BNF 4005-6	81						147
BNF 4006-2.5	48	15	104	70	35	66	118
BNF 4006-5	66						136
BNF 4006-7.5	84						154
BNF 4008-2.5	58	15	108	74	35	66	128
BNF 4008-3	71						141
BNF 4008-5	82						152
BNF 4010-2.5	73	18	124	82	37	66	147
BNF 4010-3	90						164
BNF 4010-3.5	83						157
BNF 4010-5	103						177
BNF 4012-2.5	83	18	126	84	38	66	159
BNF 4012-3.5	95						171
BNF 4012-5	119						195
BNF 4016-5	152	22	126	84	42	66	236
BNF 5005-4.5	68	15	114	80	35.5	79	139
BNF 5008-2.5	61	18	129	87	36.5	79	134
BNF 5008-5	85						158
BNF 5008-7.5	109						182
BNF 5010-2.5	73	18	135	93	37.5	79	148
BNF 5010-3	90						165
BNF 5010-3.5	83						158
BNF 5010-5	103						178
BNF 5010-7.5	133						208
BNF 5012-2.5	87	22	146	100	38.5	79	164
BNF 5012-3.5	99						176
BNF 5012-5	123						200
BNF 5016-2.5	116	25	152	105	38.5	79	193
BNF 5016-5	164						241
BNF 5020-2.5	141	28	152	105	40.5	79	222

Precautions on Use

■THK QZ Lubricator for the Ball Screw

Handling

- ●Dropping or hitting the product may damage it. Use much care when handling it.
- ●Unduly disassembling the product may cause foreign matter from entering the product or degrade the accuracy. Do not disassemble the product unless it is inevitable.
- ●Do not clean the product with an organic solvent or white kerosene.
- ●Do not leave the product package open over a long period of time.
- ●Do not block the hole for air vent near the model number indication with grease or the like.

Service Temperature Range

- ●Use this product within a temperature range of -10℃ to +50℃. When desiring to use the product out of this temperature range, contact THK .

Use in a Special Environment

- ●When desiring to use the product in a special environment, contact THK .

Corrosion Prevention

- ●QZ Lubricator is designed to provide the essential minimum amount of a lubricant to the ball raceway. It does not provide a corrosion-prevention effect to the whole Ball Screw.

■THK Wiper Ring for the Ball Screw

Handling

- ●Dropping or hitting the product may damage it. Use much care when handling it.
- ●Unduly disassembling the product may cause foreign matter from entering the product or degrade the accuracy. Do not disassemble the product unless it is inevitable.
- ●When using this product in a harsh environment, we recommend using it in combination with QZ Lubricator.

Service Temperature Range

- ●Use this product within a temperature range of -20℃ to +80℃. When desiring to use the product out of this temperature range, contact THK .

Use in a Special Environment

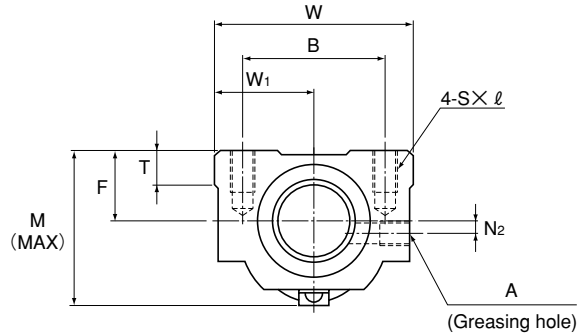
- ●When desiring to use the product in a special environment, contact THK .

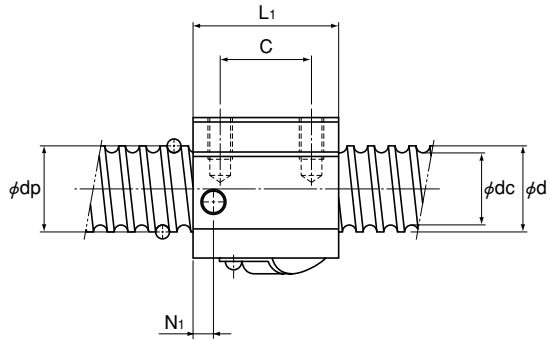
Chemical Resistance

- ●Avoid using the product in an atmosphere containing an acid or alkali solvent.

Model BNT

Non-preload Type with a Square Ball Screw Nut





Unit: mm

Model No.	Screw shaft outer diameter d	Lead R	Ball center diameter dp	Thread minor diameter dc	No. of loaded circuits Rows x turns	Basic load rating Ca kN	Basic load rating C0a kN	Rigidity K N/μm	Nut dimensions Outer diameter W	Center height F	Overall length L1	Mounting hole B	Mounting hole C	Mounting hole S× ℓ	W1	T	M	N1	N2	Greasing hole A	Screw shaft inertial moment/mm kg·cm²/mm
BNT 1404-3.6	14	4	14.4	11.5	1×3.65	6.8	12.6	190	34	13	35	26	22	M4×7	17	6	30	6	2	M6	2.96×10^{-4}
BNT 1405-2.6		5	14.5	11.2	1×2.65	7.2	12.6	150	34	13	35	26	22	M4×7	17	6	31	6	2	M6	2.96×10^{-4}
BNT 1605-2.6	16	5	16.75	13.5	1×2.65	7.8	14.7	170	42	16	36	32	22	M5×8	21	21.5	32.5	6	2	M6	5.05×10^{-4}
BNT 1808-3.6	18	8	19.3	14.4	1×3.65	18.2	34.4	270	48	17	56	35	35	M6×10	24	10	44	8	3	M6	8.09×10^{-4}
BNT 2005-2.6	20	5	20.5	17.2	1×2.65	8.7	18.3	200	48	17	35	35	22	M6×10	24	9	39	5	3	M6	1.23×10^{-3}
BNT 2010-2.6		10	21.25	16.4	1×2.65	14.7	27.8	220	48	18	58	35	35	M6×10	24	9	46	10	2	M6	1.23×10^{-3}
BNT 2505-2.6	25	5	25.5	22.2	1×2.65	9.6	23	240	60	20	35	40	22	M8×12	30	9.5	45	7	5	M6	3.01×10^{-3}
BNT 2510-5.3		10	26.8	20.2	2×2.65	43.4	92.8	520	60	23	94	40	60	M8×12	30	10	55	10	—	M6	3.01×10^{-3}
BNT 2806-2.6	28	6	28.5	25.2	1×2.65	10.1	25.8	270	60	22	42	40	18	M8×12	30	10	50	8	—	M6	4.74×10^{-3}
BNT 2806-5.3			28.5	25.2	2×2.65	18.3	51.6	510	60	22	67	40	40	M8×12	30	10	50	8	—	M6	4.74×10^{-3}
BNT 3210-2.6	32	10	33.75	27.2	1×2.65	27.3	59.5	330	70	26	64	50	45	M8×12	35	12	62	10	—	M6	8.08×10^{-3}
BNT 3210-5.3			33.75	27.2	2×2.65	49.6	118.9	640	70	26	94	50	60	M8×12	35	12	62	10	—	M6	8.08×10^{-3}
BNT 3610-2.6	36	10	37	30.5	1×2.65	28.7	65.6	360	86	29	64	60	45	M10×16	43	17	67	11	—	M6	1.29×10^{-2}
BNT 3610-5.3			37	30.5	2×2.65	52.1	131.2	700	86	29	96	60	60	M10×16	43	17	67	11	—	M6	1.29×10^{-2}
BNT 4512-5.3	45	12	46.5	39.2	2×2.65	68.1	186.7	860	100	36	115	75	75	M12×20	50	20.5	80	13	—	M6	3.16×10^{-2}

Note The rigidity values in the table represent spring constants each obtained from the load and the elastic displacement when providing an axial load 30% of the basic dynamic load rating (Ca). These values do not include the rigidity of the components related to mounting the ball screw nut. Therefore, it is normally appropriate to regard roughly 80% of the value in the table as the actual value.
If the axial load (Fa) is not 0.3 Ca, the rigidity value (K_N) is obtained from the following equation.

where

$$K_N = K\left(\frac{Fa}{0.3Ca}\right)^{\frac{1}{3}}$$

K: Rigidity value in the dimensional table.

Model number coding

BNT2510-5.3 RR G2 +1000L C5
1 2 3 4 5

1 Model number
2 Seal symbol - RR: Labyrinth seal attached to both ends of the ball screw nut (see page k-25)
3 Axial clearance symbol (see page k-15) 4 Overall screw shaft length (in mm)
5 Accuracy symbol (see page k-8)

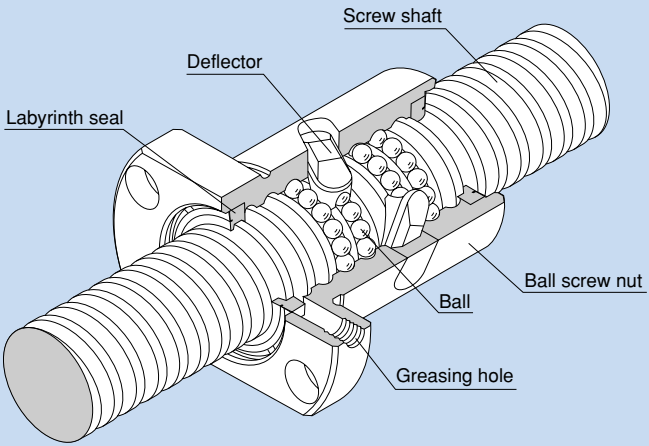


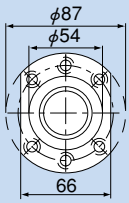
Fig. 1 Structure of the Simple Nut

Structure and Features

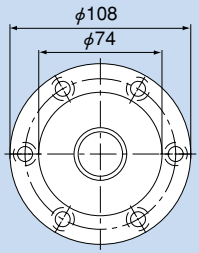
With the Simple Nut, balls under a load roll while receiving an axial load on the ball raceways formed between the screw shaft and the ball screw nut, then pass along the groove of a deflector incorporated in the ball screw nut and circulate back to the loaded area, thus to achieve infinite motion.

●Compact

Because of the internal circulation mechanism using a deflector, the outer diameter of the Simple Nut is only 70 to 80% of that of the Return-pipe Nut.



Model DIK 3210-6 (Simple Nut)



Model BNFN 3210 A-3 (Return-pipe Nut)

Fig. 2 Comparison of the Simple Nut with the Return-pipe Nut Unit: mm

●More than 50% Lighter Mass

Because of the compact structure, the ball screw nut mass is approximately 50% (model DK), and approximately 70% (model DIK), less than that of the Return-pipe Nut, thus to reduce the inertia during acceleration and deceleration.

●Well Balanced

Since the deflector is evenly placed along the circumference, superb balance is ensured while the ball screw nut is rotating.

●Pipe-less Design

The absence of a return pipe eliminates the possibility of damaging a pipe due to unexpected external impact.

Types and Features

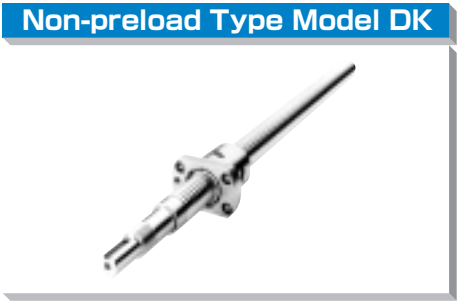
Double-nut Preload Type Model DKN

A preload is provided via a spacer between the two combined ball screw nuts to achieve a below-zero axial clearance (under a preload).

Offset-Preload Type Model DIK

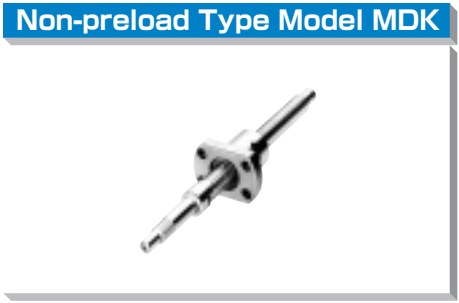
The right and left screws are provided with a phase in the middle of the ball screw nut, and an axial clearance is set at a below-zero value (under a preload). This compact model is capable of smooth motion.

Non-preload Type Model DK



The most compact type, with a ball screw nut diameter 70 to 80% of that of the return-pipe nut.

Non-preload Type Model MDK



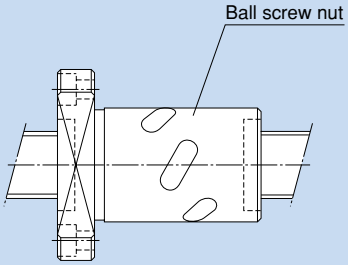
This model is a miniature nut with a screw shaft diameter of ϕ4 to 14 mm and a lead of 1 to 5 mm.

Structure and Features of Offset-Preload Type Simple-Nut Ball Screw Model DIK

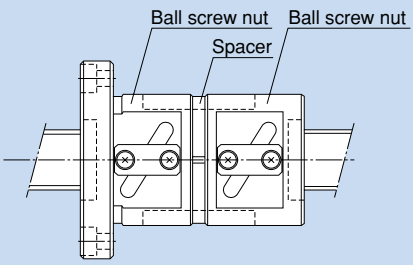
Simple-Nut Ball Screw model DIK is an offset-preload type in which a phase is provided in the middle of a single ball screw nut, and an axial clearance is set at a below-zero value (under a preload).
Model DIK has a more compact structure and allows smoother motion than the conventional double-nut type (spacer inserted between two nuts).

Comparison between the Simple Nut and the Double Nuts

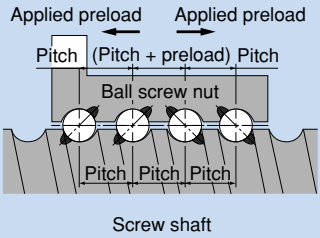
Simple-Nut Ball Screw Model DIK

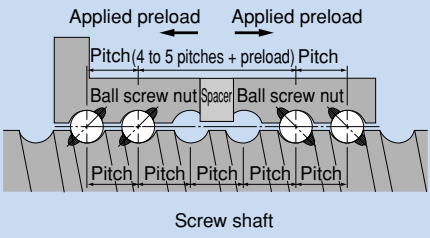


Conventional Double-Nut Type Ball Screw Model BNFN



Preloading Structure



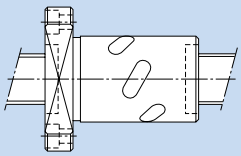


Simple-Nut Ball Screw Model DIK

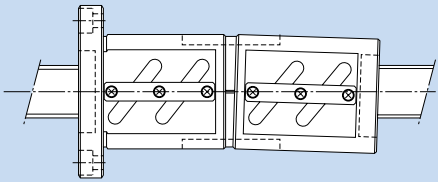
Conventional Double-Nut Type Ball Screw Model BNFN

Rotational performance

The preload adjustment with Simple-Nut Ball Screw model DIK is performed not according to the thickness of a spacer, but according to the ball diameter. This eliminates inconsistency in the contact angle, which is the most important factor Ball Screw performance. It also ensures high rigidity, smooth motion and high wobbling accuracy.

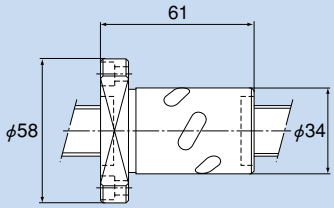


Use of a spacer in the double nuts tends to cause inconsistency in the contact angle due to inaccurate flatness of the spacer surface and inaccurate perpendicularity of the nut. This results in non-uniform ball contact, inferior rotation performance and low wobbling accuracy.

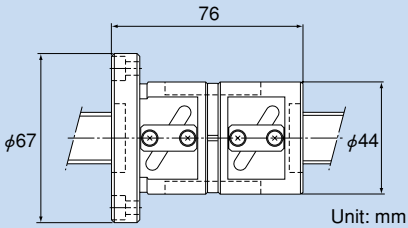


Dimensions

Since Simple-Nut Ball Screw model DIK is based on a preloading mechanism that does not require a spacer, the overall nut length can be kept short.
As a result, the whole nut can be lightly and compactly designed.



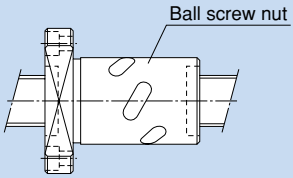
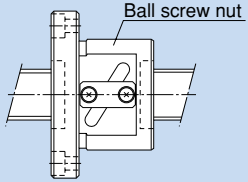
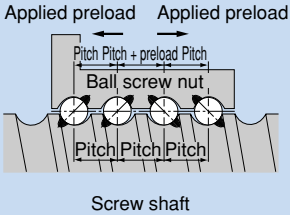
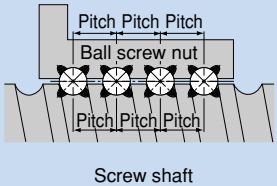
Model DIK 2005-6



Unit: mm

Model BNFN 2005-2.5

Comparison between the Offset Preload Type of Simple-Nut Ball Screw and the Oversize Preload Nut Ball Screw

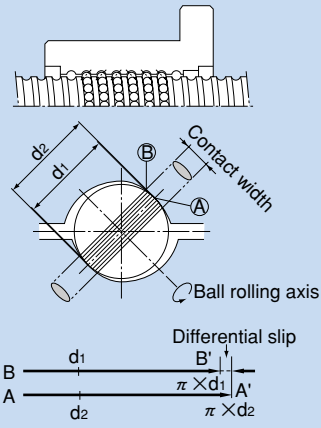
Simple-Nut Ball Screw Model DIK	Conventional Oversize Preload Nut Ball Screw Model BNF
	
Preloading Structure	
	

Accuracy life

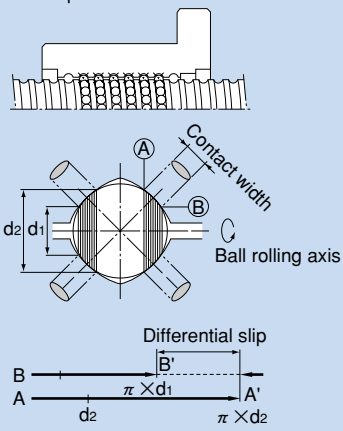
Simple-Nut Ball Screw model DIK has a similar preloading structure to that of the double-nut type although the former has only one ball screw shaft. As a result, no differential slip or spin occurs, thus to minimize the increase in the rotation torque and the generation of heat. Accordingly, a high level of accuracy can be maintained over a long period.

With the oversize preload nut Ball Screw, a preload is provided through the balls each in contact with the raceway at four points. This causes differential slip and spin to increase the rotation torque, resulting in accelerated wear and heat generation. Therefore, the accuracy deteriorates in a short period.

Two-point contact structure



Four-point contact structure

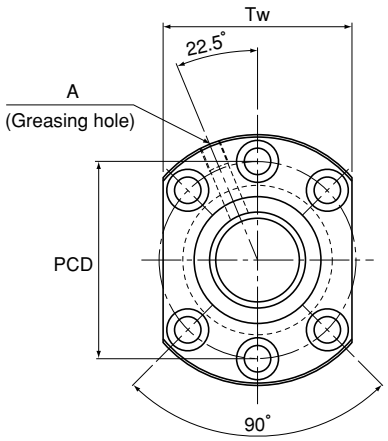


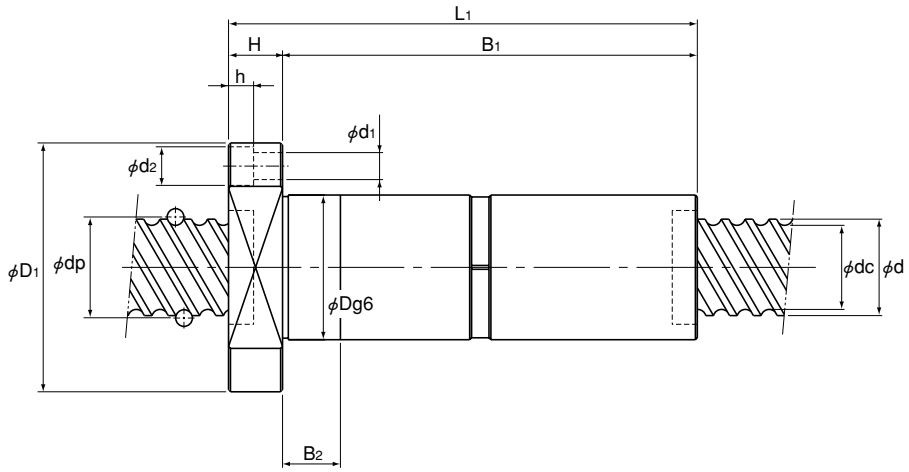
Precautions

1) The Simple-Nut Ball Screw cannot be manufactured unless either end of the screw shaft is cut off or the screw shaft end diameter is smaller than the thread minor diameter.
2) A labyrinth seal cannot be attached to models MDK0401, 0601 and 0801.

Model DKN

Double-nut preload type





Unit: mm

Model No.	Screw shaft outer diameter d	Lead R	Ball center diameter dp	Thread minor diameter dc	No. of loaded circuits Rows x turns	Basic load rating Ca kN	Basic load rating C0a kN	Rigidity K N/μm	Nut dimensions Outer diameter D	Flange diameter D1	Overall length L1	H	B1	B2	PCD	d1×d2×h	Tw	Greasing hole A	Screw shaft inertial moment/mm kg·cm²/mm
○ DKN 4020-3	40	20	41.75	34.7	3×1	29.4	69.3	750	62	104	223	18	205	25	82	11×17.5×11	79	PT 1/8	1.97×10^{-2}
DKN 5020-3	50	20	52.25	43.6	3×1	44.2	108.8	930	75	129	243	28	215	30	105	14×20×13	98	PT 1/8	4.82×10^{-2}
DKN 6320-3	63	20	65.7	55.9	3×1	83.5	229.3	1470	95	159	243	28	215	30	129	18×26×17.5	121	PT 1/8	1.21×10^{-1}

Note Those models marked with ○ can be attached with QZ Lubricator or the wiper ring.
For dimensions of the ball screw nut with either accessory being attached, see page k-184.

Model number coding DKN4020-3 RR G0 +1400L C3
1 2 3 4 5

1 Model number
2 Seal symbol - RR : Labyrinth seal attached to both ends of the ball screw nut (see page k-25)
WW : Wiper ring attached to both ends of the ball screw nut (see page k-26)
3 Axial clearance symbol (see page k-15) 4 Overall screw shaft length (in mm)
5 Accuracy symbol (see page k-8)

Note The rigidity values in the table represent spring constants each obtained from the load and the elastic displacement when providing a preload 10% of the basic dynamic load rating (Ca) and applying an axial load three times greater than the preload.
These values do not include the rigidity of the components related to mounting the ball screw nut. Therefore, it is normally appropriate to regard roughly 80% of the value in the table as the actual value.
If the applied preload (Fa_0) is not 0.1 Ca, the rigidity value (K_N) is obtained from the following equation.

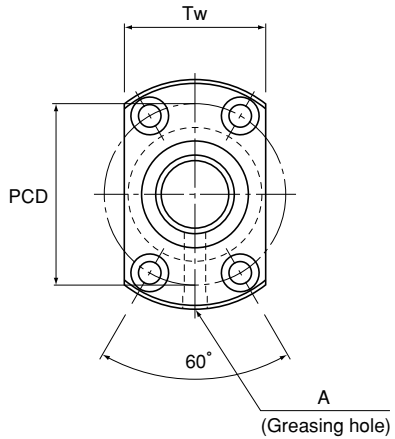
where

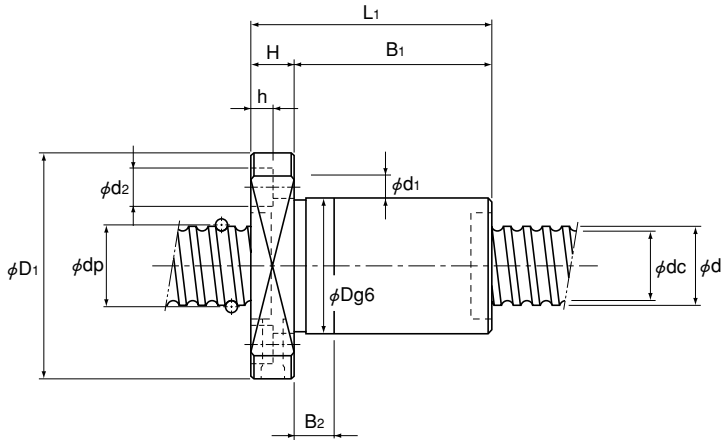
$$K_N = K\left(\frac{Fa_0}{0.1Ca}\right)^{\frac{1}{3}}$$

K: Rigidity value in the dimensional table.

Model DIK

Simple-nut preload type





Unit: mm

Model No.	Screw shaft outer diameter d	Lead R	Ball center diameter dp	Thread minor diameter dc	No. of loaded circuits Rows x turns	Basic load rating Ca kN	Basic load rating C0a kN	Rigidity K N/μm	Nut dimensions Outer diameter D	Flange diameter D1	Overall length L1	H	B1	B2	PCD	d1×d2×h	Tw	Greasing hole A	Screw shaft inertial moment/mm kg·cm²/mm
DIK 1404-4	14	4	14.5	11.8	2×1	3	5.1	190	26	45	48	10	38	10	35	4.5×8×4.5	29	M6	2.96×10^{-4}
DIK 1404-6			14.5	11.8	3×1	4.2	7.7	280	26	45	60	10	50	10	35	4.5×8×4.5	29	M6	2.96×10^{-4}
DIK 1605-6	16	5	16.75	13.2	3×1	7.4	13	310	30	49	60	10	50	10	39	4.5×8×4.5	31	M6	5.05×10^{-4}
DIK 2004-6	20	4	20.5	17.8	3×1	5.2	11.6	380	32	56	62	11	51	15	44	5.5×9.5×5.5	35	M6	1.23×10^{-3}
DIK 2004-8			20.5	17.8	4×1	6.6	15.5	510	32	56	70	11	59	15	44	5.5×9.5×5.5	35	M6	1.23×10^{-3}
DIK 2005-6		5	20.75	17.2	3×1	8.5	17.3	310	34	58	61	11	50	10	46	5.5×9.5×5.5	36	M6	1.23×10^{-3}
DIK 2006-6		6	21	16.4	3×1	11.4	21.5	410	35	58	76	11	65	15	46	5.5×9.5×5.5	36	M6	1.23×10^{-3}
DIK 2008-4		8	21	16.4	2×1	8.1	14.4	280	35	58	69	11	58	15	46	5.5×9.5×5.5	36	M6	1.23×10^{-3}
DIK 2504-6	25	4	25.5	22.8	3×1	5.7	15	470	38	63	63	11	52	15	51	5.5×9.5×5.5	39	M6	3.01×10^{-3}
DIK 2504-8			25.5	22.8	4×1	7.4	19.9	620	38	63	71	11	60	15	51	5.5×9.5×5.5	39	M6	3.01×10^{-3}
DIK 2505-6		5	25.75	22.2	3×1	9.7	22.6	490	40	63	61	11	50	10	51	5.5×9.5×5.5	41	M6	3.01×10^{-3}
DIK 2506-4		6	26	21.4	2×1	9.1	18	330	40	63	60	11	49	10	51	5.5×9.5×5.5	41	M6	3.01×10^{-3}
DIK 2506-6			26	21.4	3×1	12.8	27	490	40	63	72	11	61	15	51	5.5×9.5×5.5	41	M6	3.01×10^{-3}
DIK 2508-4		8	26	21.4	2×1	9.2	18.8	340	40	63	71	12	59	15	51	5.5×9.5×5.5	41	M6	3.01×10^{-3}
DIK 2508-6			26	21.4	3×1	13.1	28.1	500	40	63	94	12	82	25	51	5.5×9.5×5.5	41	M6	3.01×10^{-3}
DIK 2510-4		10	26	21.6	2×1	9	18	330	40	63	85	15	70	20	51	5.5×9.5×5.5	41	M6	3.01×10^{-3}

Model number coding

DIK1404-4 RR G0 +700L C3

1 2 3 4 5

1 Model number
2 Seal symbol - RR: Labyrinth seal attached to both ends of the ball screw nut (see page k-25)
3 Axial clearance symbol (see page k-15) 4 Overall screw shaft length (in mm)
5 Accuracy symbol (see page k-8)

Note The rigidity values in the table represent spring constants each obtained from the load and the elastic displacement when providing a preload 10% of the basic dynamic load rating (Ca) and applying an axial load three times greater than the preload. These values do not include the rigidity of the components related to mounting the ball screw nut. Therefore, it is normally appropriate to regard roughly 80% of the value in the table as the actual value.
If the applied preload (F_{a0}) is not 0.1 Ca, the rigidity value (K_N) is obtained from the following equation.

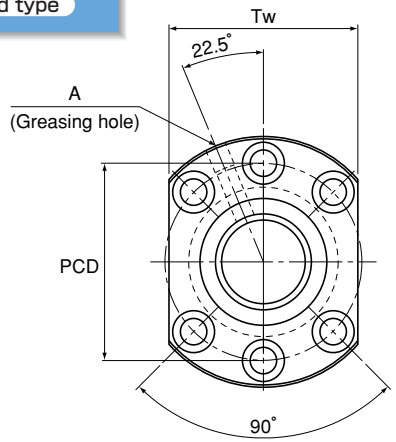
where

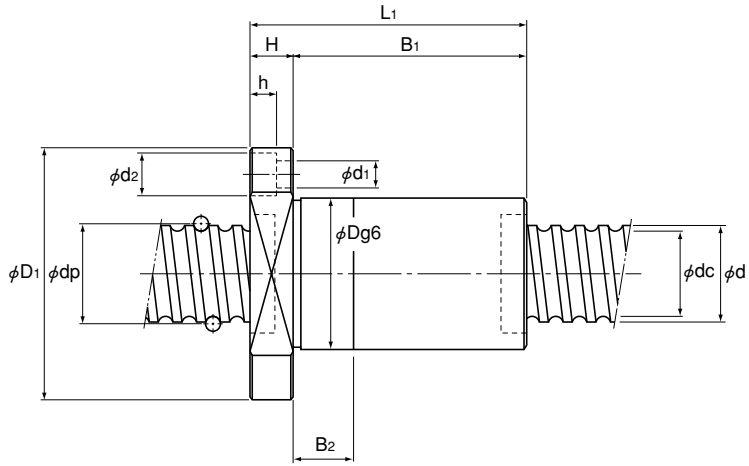
$$K_N = K\left(\frac{F_{a0}}{0.1Ca}\right)^{\frac{1}{3}}$$

K: Rigidity value in the dimensional table.

Model DIK

Simple-nut preload type





Unit: mm

Model No.	Screw shaft outer diameter d	Lead R	Ball center diameter dp	Thread minor diameter dc	No. of loaded circuits Rows x turns	Basic load rating Ca kN	Basic load rating C0a kN	Rigidity K N/μm	Nut dimensions Outer diameter D	Flange diameter D1	Overall length L1	H	B1	B2	PCD	d1×d2×h	Tw	Greasing hole A	Screw shaft inertial moment/mm kg·cm²/mm
DIK 2805-6	28	5	28.75	25.2	3×1	10.5	26.4	560	43	71	69	12	57	15	57	6.6×11×6.5	55	M6	4.74×10^{-3}
DIK 2805-8			28.75	25.2	4×1	13.4	35.2	730	43	71	79	12	67	20	57	6.6×11×6.5	55	M6	4.74×10^{-3}
DIK 2806-6		6	29	24.4	3×1	14	32	530	43	71	73	12	61	15	57	6.6×11×6.5	55	M6	4.74×10^{-3}
DIK 2810-4		10	29.25	23.6	2×1	12.3	25	380	45	71	84	15	69	20	57	6.6×11×6.5	55	M6	4.74×10^{-3}
DIK 3204-6	32	4	32.5	30.1	3×1	6.4	19.6	580	45	76	64	11	53	15	63	6.6×11×6.5	59	M6	8.08×10^{-3}
DIK 3204-8			32.5	30.1	4×1	8.2	26.1	760	45	76	72	11	61	15	63	6.6×11×6.5	59	M6	8.08×10^{-3}
DIK 3204-10			32.5	30.1	5×1	10	32.7	940	45	76	80	11	69	20	63	6.6×11×6.5	59	M6	8.08×10^{-3}
DIK 3205-6		5	32.75	29.2	3×1	11.1	30.2	620	46	76	62	12	50	10	63	6.6×11×6.5	59	M6	8.08×10^{-3}
DIK 3205-8			32.75	29.2	4×1	14.2	40.3	810	46	76	73	12	61	15	63	6.6×11×6.5	59	M6	8.08×10^{-3}
DIK 3206-6		6	33	28.4	3×1	14.9	37.1	630	48	76	73	12	61	15	63	6.6×11×6.5	59	M6	8.08×10^{-3}
DIK 3206-8			33	28.4	4×1	19.1	49.5	820	48	76	87	12	75	20	63	6.6×11×6.5	59	M6	8.08×10^{-3}
DIK 3210-6		10	33.75	26.4	3×1	25.7	52.2	600	54	87	110	15	95	25	69	9×14×8.5	66	M6	8.08×10^{-3}
DIK 3212-4		12	33.75	26.4	2×1	18.8	37	430	54	87	98	15	83	25	69	9×14×8.5	66	M6	8.08×10^{-3}
DIK 3610-6	36	10	37.75	30.5	3×1	28.8	63.8	710	58	98	122	18	104	30	77	11×17.5×11	75	M6	1.29×10^{-2}
DIK 3610-8			37.75	30.5	4×1	36.8	85	940	58	98	143	18	125	35	77	11×17.5×11	75	M6	1.29×10^{-2}
DIK 3610-10			37.75	30.5	5×1	44.6	106.3	1160	58	98	164	18	146	45	77	11×17.5×11	75	M6	1.29×10^{-2}
○ DIK 4010-6	40	10	41.75	34.7	3×1	29.8	69.3	750	62	104	113	18	95	25	82	11×17.5×11	79	PT 1/8	1.97×10^{-2}
○ DIK 4010-8			41.75	34.7	4×1	38.1	92.4	1000	62	104	137	18	119	35	82	11×17.5×11	79	PT 1/8	1.97×10^{-2}
○ DIK 4012-6		12	41.75	34.4	3×1	30.6	72.3	790	62	104	138	18	120	35	82	11×17.5×11	79	PT 1/8	1.97×10^{-2}
○ DIK 4012-8			41.75	34.4	4×1	39.2	96.4	1030	62	104	163	18	145	45	82	11×17.5×11	79	PT 1/8	1.97×10^{-2}
○ DIK 4016-4		16	41.75	34.4	2×1	21.5	68.4	540	62	104	120	18	102	30	82	11×17.5×11	79	PT 1/8	1.97×10^{-2}

Note Those models marked with ○ can be attached with QZ Lubricator or the wiper ring.
For dimensions of the ball screw nut with either accessory being attached, see page k-184.

Model number coding

DIK2810-4 RR G0 +1500L C3
1 2 3 4 5

1 Model number
2 Seal symbol - RR : Labyrinth seal attached to both ends of the ball screw nut (see page k-25)
WW : Wiper ring attached to both ends of the ball screw nut (see page k-26)
3 Axial clearance symbol (see page k-15) 4 Overall screw shaft length (in mm)
5 Accuracy symbol (see page k-8)

Note The rigidity values in the table represent spring constants each obtained from the rigidity and the elastic displacement when providing a preload 10% of the basic dynamic load rating (Ca) and applying an axial load three times greater than the preload. These values do not include the rigidity of the components related to mounting the ball screw nut. Therefore, it is normally appropriate to regard roughly 80% of the value in the table as the actual value.
If the applied preload (Fa_0) is not 0.1 Ca, the rigidity value (K_N) is obtained from the following equation.

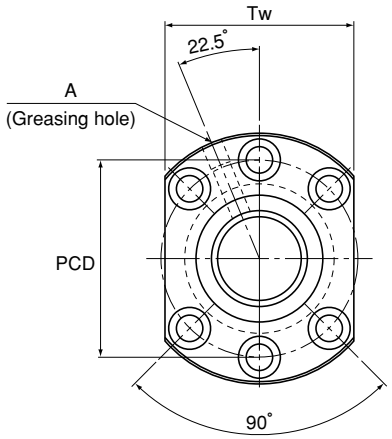
where

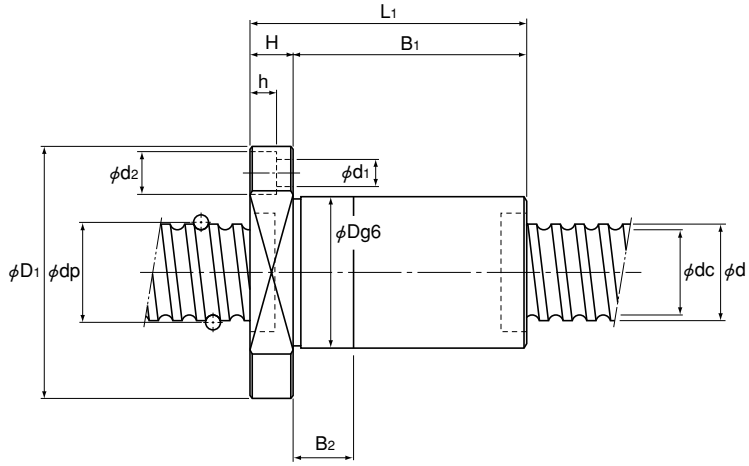
$$K_N = K\left(\frac{Fa_0}{0.1Ca}\right)^{\frac{1}{3}}$$

K: Rigidity value in the dimensional table.

Model DIK

Simple-nut preload type





Unit: mm

Model No.	Screw shaft outer diameter d	Lead R	Ball center diameter dp	Thread minor diameter dc	No. of loaded circuits Rows x turns	Basic load rating Ca kN	Basic load rating C0a kN	Rigidity K N/μm	Nut dimensions Outer diameter D	Flange diameter D1	Overall length L1	H	B1	B2	PCD	d1×d2×h	Tw	Greasing hole A	Screw shaft inertial moment/mm kg·cm²/mm
DIK 5010-6	50	10	51.75	44.4	3×1	33.9	90.7	940	72	123	114	18	96	30	101	11×17.5×11	92	PT 1/8	4.82×10^{-2}
DIK 5010-8			51.75	44.4	4×1	43.4	120.5	1230	72	123	137	18	119	35	101	11×17.5×11	92	PT 1/8	4.82×10^{-2}
DIK 5010-10			51.75	44.4	5×1	52.5	150.9	1530	72	123	160	18	142	45	101	11×17.5×11	92	PT 1/8	4.82×10^{-2}
DIK 5012-6		12	52.25	43.3	3×1	45.8	113	970	75	129	145	22	123	35	105	14×20×13	98	PT 1/8	4.82×10^{-2}
DIK 5012-8			52.25	43.3	4×1	58.6	150.6	1270	75	129	170	22	148	45	105	14×20×13	98	PT 1/8	4.82×10^{-2}
DIK 5016-4		16	52.25	43.3	2×1	32.3	75.5	660	75	129	129	22	107	30	105	14×20×13	98	PT 1/8	4.82×10^{-2}
DIK 5016-6			52.25	43.3	3×1	45.7	113.3	970	75	129	175	22	153	45	105	14×20×13	98	PT 1/8	4.82×10^{-2}
DIK 6310-8	63	10	64.75	57.7	4×1	49.5	160.7	1550	85	146	141	22	119	35	122	14×20×13	110	PT 1/8	1.21×10^{-1}
DIK 6312-6		12	65.25	56.3	3×1	51.9	147.4	1200	90	146	146	22	124	35	122	14×20×13	110	PT 1/8	1.21×10^{-1}
DIK 6312-8			65.25	56.3	4×1	66.4	196.6	1570	90	146	171	22	149	45	122	14×20×13	110	PT 1/8	1.21×10^{-1}

Note The rigidity values in the table represent spring constants each obtained from the rigidity and the elastic displacement when providing a preload 10% of the basic dynamic load rating (Ca) and applying an axial load three times greater than the preload.
These values do not include the rigidity of the components related to mounting the ball screw nut. Therefore, it is normally appropriate to regard roughly 80% of the value in the table as the actual value.
If the applied preload (F_{a0}) is not 0.1 Ca, the rigidity value (K_N) is obtained from the following equation.

where

$$K_N = K\left(\frac{F_{a0}}{0.1Ca}\right)^{\frac{1}{3}}$$

K: Rigidity value in the dimensional table.

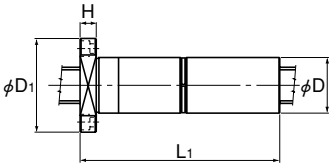
Model number coding

DIK6312-6 RR G0 +3500L C3
1 2 3 4 5

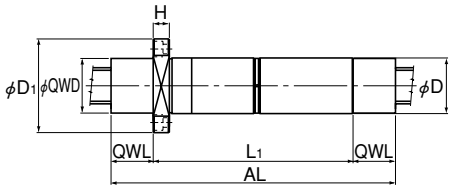
1 Model number
2 Seal symbol - RR: Labyrinth seal attached to both ends of the ball screw nut (see page k-25)
3 Axial clearance symbol (see page k-15) 4 Overall screw shaft length (in mm)
5 Accuracy symbol (see page k-8)

Dimensions of the Ball Screw Nut Attached with Wiper Ring (WW) and QZ Lubricator (QZ)

Model DKN



Model DKN



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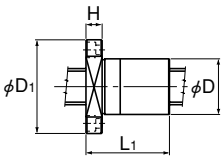
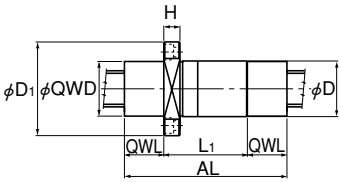


Model DIK



With WW (without QZ)

With QZ + WW

Unit: mm

Model No.	Dimensions including WW				Dimensions including QZ and WW		
	Nut length	Flange width	Flange diameter	Nut outer diameter	Length	Outer diameter	Overall length incl. QZ and WW
	L_1	H	D_1	Dg6	QWL	QWD	AL
DKN 4020-3	223	18	104	62	47	61	317
DIK 4010-6	113	18	104	62	44	61	201
DIK 4010-8	137						225
DIK 4012-6	138						226
DIK 4012-8	163						251
DIK 4016-4	120						208

Model number coding

DKN4020-3 QZ WW G0 +1800L C3

1 2 3 4 5 6

1 Model number 2 With QZ Lubricator (see page k-22)
3 Seal symbol - RR : Labyrinth seal attached to both ends of the ball screw nut (see page k-25)
WW : Wiper ring attached to both ends of the ball screw nut (see page k-26)
4 Axial clearance symbol (see page k-15) 5 Overall screw shaft length (in mm)
6 Accuracy symbol (see page k-8)

Note QZ Lubricator and wiper ring are not sold alone.

Precautions on Use

THK QZ Lubricator for the Ball Screw

Handling

- Dropping or hitting the product may damage it. Use much care when handling it.
- Unduly disassembling the product may cause foreign matter from entering the product or degrade the accuracy. Do not disassemble the product unless it is inevitable.
- Do not clean the product with an organic solvent or white kerosene.
- Do not leave the product package open over a long period of time.
- Do not block the hole for air vent near the model number indication with grease or the like.

Service Temperature Range

- Use this product within a temperature range of -10℃ to +50℃. When desiring to use the product out of this temperature range, contact THK .

Use in a Special Environment

- When desiring to use the product in a special environment, contact THK .

Corrosion Prevention

- QZ Lubricator is designed to provide the essential minimum amount of a lubricant to the ball raceway. It does not provide a corrosion-prevention effect to the whole Ball Screw.

THK Wiper Ring for the Ball Screw

Handling

- Dropping or hitting the product may damage it. Use much care when handling it.
- Unduly disassembling the product may cause foreign matter from entering the product or degrade the accuracy. Do not disassemble the product unless it is inevitable.
- When using this product in a harsh environment, we recommend using it in combination with QZ Lubricator.

Service Temperature Range

- Use this product within a temperature range of -20℃ to +80℃. When desiring to use the product out of this temperature range, contact THK .

Use in a Special Environment

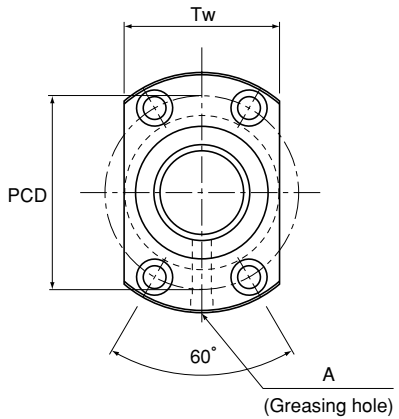
- When desiring to use the product in a special environment, contact THK .

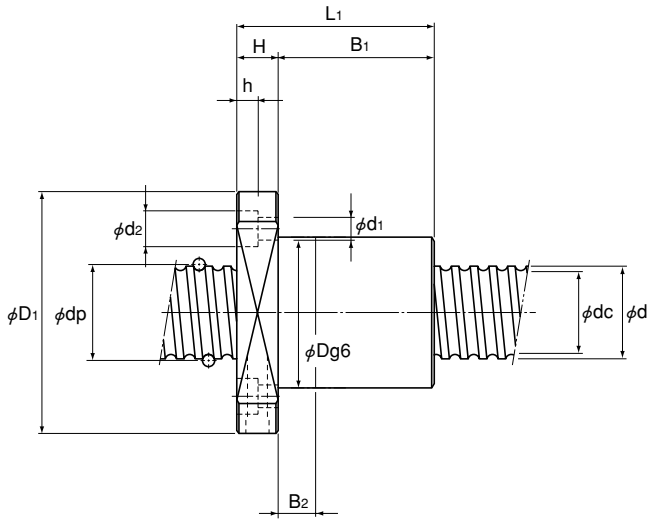
Chemical Resistance

- Avoid using the product in an atmosphere containing an acid or alkali solvent.

Model DK

Single-nut non-preload type





Unit: mm

Model No.	Screw shaft outer diameter d	Lead R	Ball center diameter dp	Thread minor diameter dc	No. of loaded circuits Rows x turns	Basic load rating Ca kN	Basic load rating C0a kN	Rigidity K N/μm	Nut dimensions Outer diameter D	Flange diameter D1	Overall length L1	H	B1	B2	PCD	d1×d2×h	Tw	Greasing hole A	Screw shaft inertial moment/mm kg·cm²/mm
DK 1404-4	14	4	14.5	11.8	4×1	5.4	10.2	180	26	45	48	10	38	10	35	4.5×8×4.5	29	M6	2.96×10⁻⁴
DK 1404-6			14.5	11.8	6×1	7.7	15.4	270	26	45	60	10	50	10	35	4.5×8×4.5	29	M6	2.96×10⁻⁴
DK 1605-3	16	5	16.75	13.1	3×1	7.4	13	160	30	49	45	10	35	10	39	4.5×8×4.5	31	M6	5.05×10⁻⁴
DK 1605-4			16.75	13.1	4×1	9.5	17.4	210	30	49	50	10	40	10	39	4.5×8×4.5	31	M6	5.05×10⁻⁴
DK 2004-3	20	4	20.5	17.8	3×1	5.2	11.6	190	32	56	42	11	31	10	44	5.5×9.5×5.5	35	M6	1.23×10⁻³
DK 2004-4			20.5	17.8	4×1	6.6	15.5	250	32	56	46	11	35	10	44	5.5×9.5×5.5	35	M6	1.23×10⁻³
DK 2005-3		5	20.75	17.1	3×1	8.5	17.3	200	34	58	46	11	35	10	46	5.5×9.5×5.5	36	M6	1.23×10⁻³
DK 2005-4			20.75	17.1	4×1	11	23.1	260	34	58	51	11	40	10	46	5.5×9.5×5.5	36	M6	1.23×10⁻³
DK 2006-3		6	21	16.4	3×1	11.4	21.5	410	35	58	52	11	41	10	46	5.5×9.5×5.5	36	M6	1.23×10⁻³
DK 2006-4			21	16.4	4×1	14.6	28.6	540	35	58	59	11	48	10	46	5.5×9.5×5.5	36	M6	1.23×10⁻³
DK 2008-4		8	21	16.4	4×1	14.6	28.8	270	35	58	69	11	58	15	46	5.5×9.5×5.5	36	M6	1.23×10⁻³
DK 2504-3	25	4	25.5	22.8	3×1	5.7	15	230	38	63	43	11	32	10	51	5.5×9.5×5.5	39	M6	3.01×10⁻³
DK 2504-4			25.5	22.8	4×1	7.4	19.9	310	38	63	47	11	36	10	51	5.5×9.5×5.5	39	M6	3.01×10⁻³
DK 2505-3		5	25.75	22.1	3×1	9.7	22.6	250	40	63	46	11	35	10	51	5.5×9.5×5.5	41	M6	3.01×10⁻³
DK 2505-4			25.75	22.1	4×1	12.4	30.3	320	40	63	51	11	40	10	51	5.5×9.5×5.5	41	M6	3.01×10⁻³
DK 2506-3		6	26	21.4	3×1	12.8	27	250	40	63	52	11	41	10	51	5.5×9.5×5.5	41	M6	3.01×10⁻³
DK 2506-4			26	21.4	4×1	16.8	37.4	330	40	63	60	11	49	10	51	5.5×9.5×5.5	41	M6	3.01×10⁻³
DK 2508-3		8	26	21.4	3×1	13.1	28.1	500	40	63	62	12	50	10	51	5.5×9.5×5.5	41	M6	3.01×10⁻³
DK 2508-4			26	21.4	4×1	16.8	37.5	330	40	63	71	12	59	15	51	5.5×9.5×5.5	41	M6	3.01×10⁻³
DK 2510-3		10	26	21.6	3×1	12.7	27	250	40	63	80	15	65	15	51	5.5×9.5×5.5	41	M6	3.01×10⁻³
DK 2510-4			26	21.6	4×1	16.7	37.6	330	40	63	85	15	70	20	51	5.5×9.5×5.5	41	M6	3.01×10⁻³

Model number coding

DK1605-4 RR G1 +900L C5
1 2 3 4 5

1 Model number
2 Seal symbol - RR: Labyrinth seal attached to both ends of the ball screw nut (see page k-25)
3 Axial clearance symbol (see page k-15) 4 Overall screw shaft length (in mm)
5 Accuracy symbol (see page k-8)

Note The rigidity values in the table represent spring constants each obtained from the load and the elastic displacement when providing an axial load 30% of the basic dynamic load rating (Ca). These values do not include the rigidity of the components related to mounting the ball screw nut. Therefore, it is normally appropriate to regard roughly 80% of the value in the table as the actual value.
If the axial load (Fa) is not 0.3 Ca, the rigidity value (K_N) is obtained from the following equation.

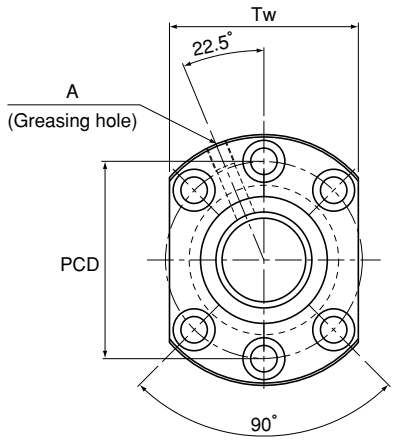
where

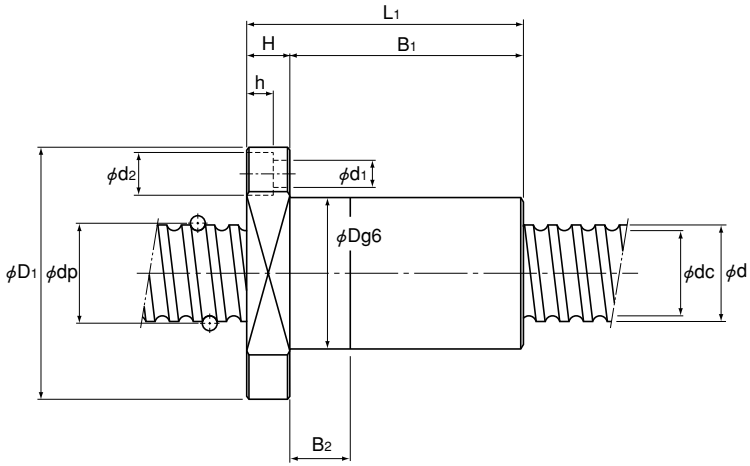
$$K_N = K\left(\frac{Fa}{0.3Ca}\right)^{\frac{1}{3}}$$

K: Rigidity value in the dimensional table.

Model DK

Single-nut non-preload type





Unit: mm

Model No.	Screw shaft outer diameter d	Lead R	Ball center diameter dp	Thread minor diameter dc	No. of loaded circuits Rows x turns	Basic load rating Ca kN	Basic load rating C0a kN	Rigidity K N/μm	Nut dimensions Outer diameter D	Flange diameter D1	Overall length L1	H	B1	B2	PCD	d1×d2×h	Tw	Greasing hole A	Screw shaft inertial moment/mm kg·cm²/mm
DK 2805-3	28	5	28.75	25.2	3×1	10.5	26.4	270	43	71	49	12	37	10	57	6.6×11×6.5	55	M6	4.74×10^{-3}
DK 2805-4			28.75	25.2	4×1	13.4	35.2	360	43	71	54	12	42	10	57	6.6×11×6.5	55	M6	4.74×10^{-3}
DK 2806-3		6	29	24.4	3×1	14	32	280	43	71	53	12	41	10	57	6.6×11×6.5	55	M6	4.74×10^{-3}
DK 2806-4			29	24.4	4×1	13.5	35.5	370	43	71	61	12	49	10	57	6.6×11×6.5	55	M6	4.74×10^{-3}
DK 2810-4		10	29.25	23.6	4×1	22.4	50	370	45	71	84	15	69	20	57	6.6×11×6.5	55	M6	4.74×10^{-3}
DK 3204-3	32	4	32.5	30.1	3×1	6.4	19.6	290	45	76	44	11	33	10	63	6.6×11×6.5	59	M6	8.08×10^{-3}
DK 3204-4			32.5	30.1	4×1	8.2	26.1	380	45	76	48	11	37	10	63	6.6×11×6.5	59	M6	8.08×10^{-3}
DK 3205-3		5	32.75	29.2	3×1	11.1	30.2	300	46	76	47	12	35	10	63	6.6×11×6.5	59	M6	8.08×10^{-3}
DK 3205-4			32.75	29.2	4×1	14.2	40.3	400	46	76	52	12	40	10	63	6.6×11×6.5	59	M6	8.08×10^{-3}
DK 3205-6			32.75	29.2	6×1	20.1	60.4	600	46	76	62	12	50	10	63	6.6×11×6.5	59	M6	8.08×10^{-3}
DK 3206-3		6	33	28.4	3×1	14.9	37.1	310	48	76	53	12	41	10	63	6.6×11×6.5	59	M6	8.08×10^{-3}
DK 3206-4			33	28.4	4×1	19.1	49.5	410	48	76	61	12	49	10	63	6.6×11×6.5	59	M6	8.08×10^{-3}
DK 3210-3		10	33.75	26.4	3×1	25.7	52.2	300	54	87	80	15	65	15	69	9×14×8.5	66	M6	8.08×10^{-3}
DK 3210-4			33.75	26.4	4×1	33	69.7	390	54	87	90	15	75	20	69	9×14×8.5	66	M6	8.08×10^{-3}
DK 3212-4		12	33.75	26.4	4×1	34.2	73.9	420	54	87	98	15	83	25	69	9×14×8.5	66	M6	8.08×10^{-3}
DK 3610-3	36	10	37.75	30.5	3×1	28.8	63.8	350	58	98	82	18	64	15	77	11×17.5×11	75	M6	1.29×10^{-2}
DK 3610-4			37.75	30.5	4×1	36.8	85	470	58	98	93	18	75	20	77	11×17.5×11	75	M6	1.29×10^{-2}

Model number coding

DK3204-4 RR G1 +1800L C5

1 2 3 4 5

1 Model number
2 Seal symbol - RR: Labyrinth seal attached to both ends of the ball screw nut (see page k-25)
3 Axial clearance symbol (see page k-15) 4 Overall screw shaft length (in mm)
5 Accuracy symbol (see page k-8)

Note The rigidity values in the table represent spring constants each obtained from the load and the elastic displacement when providing an axial load 30% of the basic dynamic load rating (Ca). These values do not include the rigidity of the components related to mounting the ball screw nut. Therefore, it is normally appropriate to regard roughly 80% of the value in the table as the actual value.
If the axial load (Fa) is not 0.3 Ca, the rigidity value (K_N) is obtained from the following equation.

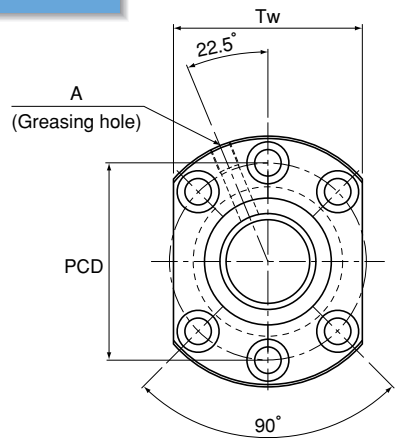
where

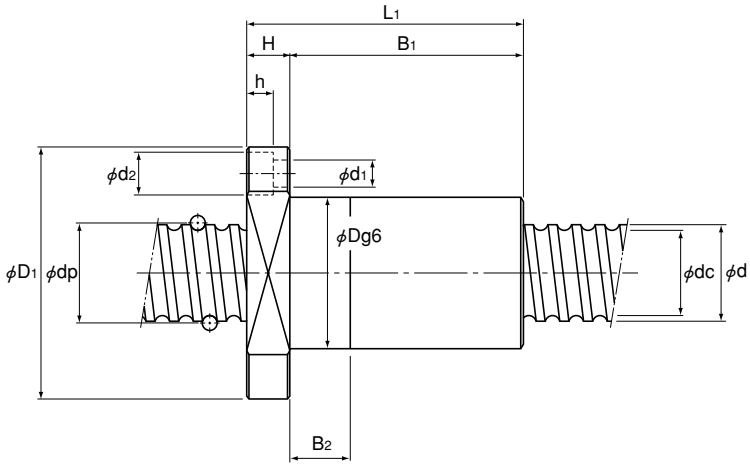
$$K_N = K\left(\frac{Fa}{0.3Ca}\right)^{\frac{1}{3}}$$

K: Rigidity value in the dimensional table.

Model DK

Single-nut non-preload type





Unit: mm

Model No.	Screw shaft outer diameter d	Lead R	Ball center diameter dp	Thread minor diameter dc	No. of loaded circuits Rows x turns	Basic load rating Ca kN	Basic load rating C0a kN	Rigidity K N/μm	Nut dimensions Outer diameter D	Flange diameter D1	Overall length L1	H	B1	B2	PCD	d1×d2×h	Tw	Greasing hole A	Screw shaft inertial moment/mm kg·cm²/mm
○ DK 4010-3	40	10	41.75	34.4	3×1	29.8	69.3	380	62	104	83	18	65	15	82	11×17.5×11	79	PT 1/8	1.97×10⁻²
○ DK 4010-4			41.75	34.4	4×1	38.1	92.4	500	62	104	93	18	75	20	82	11×17.5×11	79	PT 1/8	1.97×10⁻²
○ DK 4012-3		12	41.75	34.4	3×1	30.6	72.3	390	62	104	90	18	72	20	82	11×17.5×11	79	PT 1/8	1.97×10⁻²
○ DK 4012-4			41.75	34.4	4×1	39.2	96.4	520	62	104	103	18	85	25	82	11×17.5×11	79	PT 1/8	1.97×10⁻²
○ DK 4016-4		16	41.75	34.4	4×1	39.1	96.8	520	62	104	120	18	102	30	82	11×17.5×11	79	PT 1/8	1.97×10⁻²
○ DK 4020-3		20	41.75	34.7	3×1	29.4	69.3	750	62	104	123	18	105	30	82	11×17.5×11	79	PT 1/8	1.97×10⁻²
DK 5010-3	50	10	51.75	44.4	3×1	33.9	90.7	470	72	123	83	18	65	15	101	11×17.5×11	92	PT 1/8	4.82×10⁻²
DK 5010-4			51.75	44.4	4×1	43.4	120.5	610	72	123	93	18	75	20	101	11×17.5×11	92	PT 1/8	4.82×10⁻²
DK 5010-6			51.75	44.4	6×1	62.7	186.8	930	72	123	114	18	96	30	101	11×17.5×11	92	PT 1/8	4.82×10⁻²
DK 5012-3		12	52.25	43.3	3×1	45.8	113	490	75	129	97	22	75	20	105	14×20×13	98	PT 1/8	4.82×10⁻²
DK 5012-4			52.25	43.3	4×1	58.6	150.6	640	75	129	110	22	88	25	105	14×20×13	98	PT 1/8	4.82×10⁻²
DK 5016-3		16	52.25	43.3	3×1	45.7	113.3	490	75	129	111	22	89	25	105	14×20×13	98	PT 1/8	4.82×10⁻²
DK 5016-4			52.25	43.3	4×1	58.5	151	640	75	129	129	22	107	30	105	14×20×13	98	PT 1/8	4.82×10⁻²
DK 5020-3		20	52.25	43.6	3×1	44.2	108.8	470	75	129	136	28	108	30	105	14×20×13	98	PT 1/8	4.82×10⁻²
DK 6310-4	63	10	64.75	57.7	4×1	49.5	160.7	780	85	146	97	22	75	20	122	14×20×13	110	PT 1/8	1.21×10⁻¹
DK 6310-6			64.75	57.7	6×1	70.3	242.1	1140	85	146	118	22	96	30	122	14×20×13	110	PT 1/8	1.21×10⁻¹
DK 6312-3		12	65.25	56.3	3×1	51.9	147.4	600	90	146	98	22	76	20	122	14×20×13	110	PT 1/8	1.21×10⁻¹
DK 6312-4			65.25	56.3	4×1	66.4	196.6	785	90	146	111	22	89	25	122	14×20×13	110	PT 1/8	1.21×10⁻¹
DK 6320-3		20	65.7	55.9	3×1	83.5	229.3	1470	95	159	136	28	108	30	129	18×26×17.5	121	PT 1/8	1.21×10⁻¹

Note Those models marked with ○ can be attached with QZ Lubricator or the wiper ring.
For dimensions of the ball screw nut with either accessory being attached, see page k-192.

Model number coding

DK4020-3 RR GT +2000L C5
1 2 3 4 5

1 Model number
2 Seal symbol - RR : Labyrinth seal attached to both ends of the ball screw nut (see page k-25)
WW : Wiper ring attached to both ends of the ball screw nut (see page k-26)
3 Axial clearance symbol (see page k-15) 4 Overall screw shaft length (in mm)
5 Accuracy symbol (see page k-8)

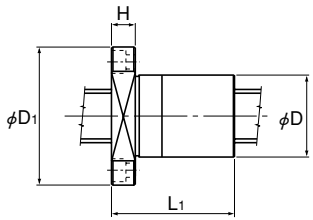
Note The rigidity values in the table represent spring constants each obtained from the load and the elastic displacement when providing an axial load 30% of the basic dynamic load rating (Ca). These values do not include the rigidity of the components related to mounting the ball screw nut. Therefore, it is normally appropriate to regard roughly 80% of the value in the table as the actual value.
If the axial load (Fa) is not 0.3 Ca, the rigidity value (K_N) is obtained from the following equation.

where

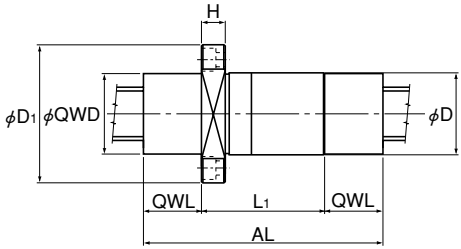
$$K_N = K\left(\frac{Fa}{0.3Ca}\right)^{\frac{1}{3}}$$

K: Rigidity value in the dimensional table.

Dimensions of the Ball Screw Nut Attached with Wiper Ring (WW) and QZ Lubricator (QZ)



With WW (without QZ)



With QZ + WW

Unit: mm

Model No.	Dimensions including WW				Dimensions including QZ and WW		
	Nut length	Flange width	Flange diameter	Nut outer diameter	Length	Outer diameter	Overall length incl. QZ and WW
	L_1	H	D_1	Dg6	QWL	QWD	AL
DK 4010-3	83	18	104	62	44	61	171
DK 4010-4	93						181
DK 4012-3	90						178
DK 4012-4	103						191
DK 4016-4	120						208
DK 4020-3	123	18	104	62	47	61	217

Model number coding

DK4010-3 QZ WW G1 +1500L C5
1 2 3 4 5 6

1 Model number 2 With QZ Lubricator (see page k-22)
3 Seal symbol - RR : Labyrinth seal attached to both ends of the ball screw nut (see page k-25)
WW : Wiper ring attached to both ends of the ball screw nut (see page k-26)
4 Axial clearance symbol (see page k-15) 5 Overall screw shaft length (in mm)
6 Accuracy symbol (see page k-8)

Note QZ Lubricator and wiper ring are not sold alone.

Precautions on Use

THK QZ Lubricator for the Ball Screw

Handling

- Dropping or hitting the product may damage it. Use much care when handling it.
- Unduly disassembling the product may cause foreign matter from entering the product or degrade the accuracy. Do not disassemble the product unless it is inevitable.
- Do not clean the product with an organic solvent or white kerosene.
- Do not leave the product package open over a long period of time.
- Do not block the hole for air vent near the model number indication with grease or the like.

Service Temperature Range

- Use this product within a temperature range of -10℃ to +50℃. When desiring to use the product out of this temperature range, contact THK .

Use in a Special Environment

- When desiring to use the product in a special environment, contact THK .

Corrosion Prevention

- QZ Lubricator is designed to provide the essential minimum amount of a lubricant to the ball raceway. It does not provide a corrosion-prevention effect to the whole Ball Screw.

THK Wiper Ring for the Ball Screw

Handling

- Dropping or hitting the product may damage it. Use much care when handling it.
- Unduly disassembling the product may cause foreign matter from entering the product or degrade the accuracy. Do not disassemble the product unless it is inevitable.
- When using this product in a harsh environment, we recommend using it in combination with QZ Lubricator.

Service Temperature Range

- Use this product within a temperature range of -20℃ to +80℃. When desiring to use the product out of this temperature range, contact THK .

Use in a Special Environment

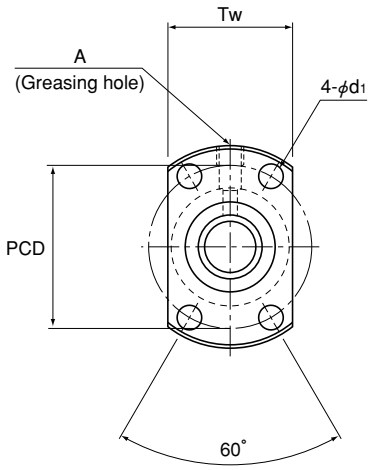
- When desiring to use the product in a special environment, contact THK .

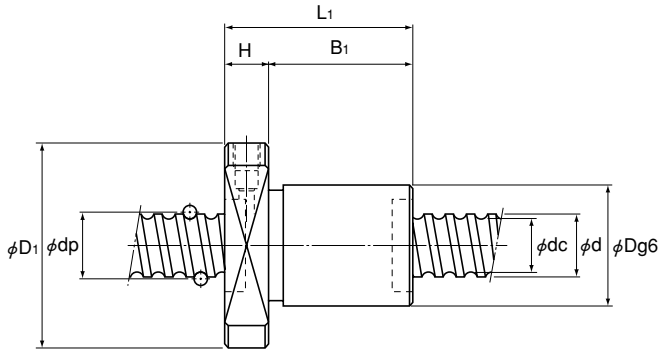
Chemical Resistance

- Avoid using the product in an atmosphere containing an acid or alkali solvent.

Model MDK

Miniature-nut non-preload type





Unit: mm

Model No.	Screw shaft outer diameter d	Lead R	Ball center diameter dp	Thread minor diameter dc	No. of loaded circuits Rows x turns	Basic load rating Ca kN	Basic load rating C0a kN	Rigidity K N/μm	Nut dimensions Outer diameter D	Flange diameter D1	Overall length L1	H	B1	PCD	d1	Tw	Greasing hole A	Screw shaft inertial moment/mm kg·cm²/mm
MDK 0401-3	4	1	4.15	3.4	3×1	0.29	0.42	35	9	19	13	3	10	14	2.9	13	—	1.97×10^{-6}
MDK 0601-3	6	1	6.2	5.3	3×1	0.54	0.94	60	11	23	14.5	3.5	11	17	3.4	15	—	9.99×10^{-6}
MDK 0801-3	8	1	8.2	7.3	3×1	0.64	1.4	80	13	26	15	4	11	20	3.4	17	—	3.16×10^{-5}
MDK 0802-3		2	8.3	7	3×1	1.4	2.3	80	15	28	22	5	17	22	3.4	19	—	3.16×10^{-5}
MDK 1002-3	10	2	10.3	9	3×1	1.5	2.9	100	17	34	22	5	17	26	4.5	21	—	7.71×10^{-5}
MDK 1202-3	12	2	12.3	11	3×1	1.7	3.6	120	19	36	22	5	17	28	4.5	23	—	1.6×10^{-4}
MDK 1402-3	14	2	14.3	13	3×1	1.8	4.3	190	21	40	23	6	17	31	5.5	26	—	2.96×10^{-4}
MDK 1404-3		4	14.65	11.9	3×1	4.2	7.6	190	26	45	33	6	27	36	5.5	28	—	2.96×10^{-4}
MDK 1405-3		5	14.75	11.2	3×1	7	11.6	140	26	45	42	10	32	36	5.5	28	M6	2.96×10^{-4}

Note A labyrinth seal cannot be attached to models MDK0401, 0601 and 0801.

Model number coding MDK1405-3 RR GT +450L C5

1 2 3 4 5

1 Model number
2 Seal symbol - RR: Labyrinth seal attached to both ends of the ball screw nut (see page k-25)
3 Axial clearance symbol (see page k-15) 4 Overall screw shaft length (in mm)
5 Accuracy symbol (see page k-8)

Note The rigidity values in the table represent spring constants each obtained from the load and the elastic displacement when providing an axial load 30% of the basic dynamic load rating (Ca).
These values do not include the rigidity of the components related to mounting the ball screw nut. Therefore, it is normally appropriate to regard roughly 80% of the value in the table as the actual value.
If the axial load (Fa) is not 0.3 Ca, the rigidity value (K_N) is obtained from the following equation.

where

$$K_N = K\left(\frac{Fa}{0.3Ca}\right)^{\frac{1}{3}}$$

K: Rigidity value in the dimensional table.

Large-Lead Precision Ball Screw

High-Speed Ball Screw with Ball Cage Model SBK

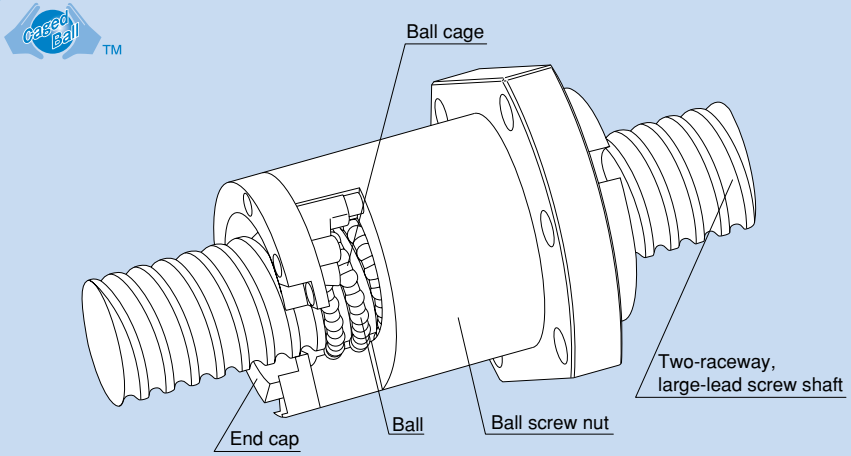


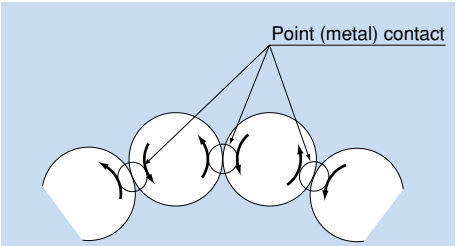
Fig. 1 Structure of High-Speed Ball Screw with Ball Cage Model SBK

Structure and Features

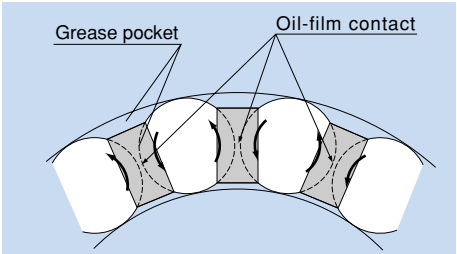
With High-Speed Ball Screw with Ball Cage model SBK, balls are evenly spaced by a ball cage to eliminate collision and friction between the balls ensure and a high level of grease retention. As a result, low noise, low torque fluctuation and long-term maintenance-free operation are achieved.

In addition, this model has a circulation structure where balls are picked up at the tangential direction by a return pipe (Fig. 2), thus to achieve a DN value* of 160,000 (* DN value = ball center diameter x rotation speed per minute) in high-speed operation.

As a result of adopting the offset preloading method, which shifts the lead in the central area of the ball screw nut, its overall ball screw nut length is shorter and its body is more compact than the double-nut type, which uses the spacer-based preloading method.



Structure of the conventional type



Structure of the Ball Screw with Ball Cage

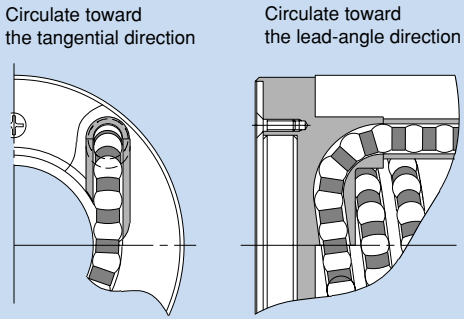


Fig. 2 Circulation Structure of Model SBK

Ball Cage Effect

●Low noise, acceptable running sound

Use of a ball cage eliminates collision noise between balls.
In addition, the fact that balls are picked up at the tangential direction also contributes to eliminating collision noise generated from circulating balls.

●Long-term maintenance-free operation

Since friction between balls is eliminated and grease is retained in the grease pocket, long-term maintenance-free operation (replenishment of grease is unnecessary for a long period) is achieved.

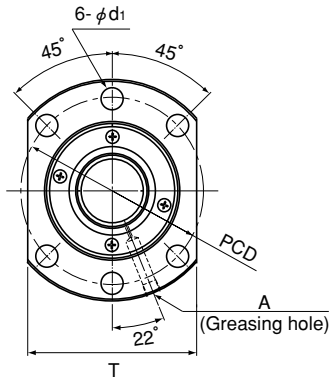
●Smooth motion

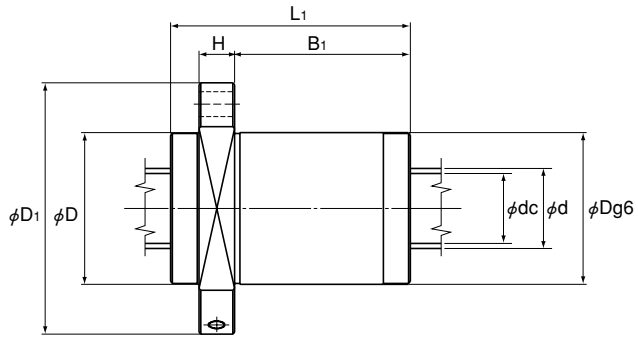
Use of a ball cage eliminates friction between balls and minimizes torque fluctuation, thus allowing smooth motion to be achieved.

Type

Offset-preload Type Model SBK

Model SBK





Unit: mm

Model No.	Screw shaft outer diameter d	Lead R	Ball center diameter dp	Thread minor diameter dc	No. of loaded circuits Rows x turns	Basic load rating Ca kN	Basic load rating C0a kN	Rigidity K N/μm	Nut dimensions Outer diameter D	Flange diameter D1	Overall length L1	H	B1	PCD	d1	T	Greasing hole A	Screw shaft inertial moment/mm kg·cm²/mm
SBK 3620-7.6	36	20	37.75	30.4	2×3.8	48.5	85	870	73	114	110	18	81	93	11	86	PT1/8	1.29×10^{-2}
SBK 4020-7.6	40	20	42	34.1	2×3.8	59.7	112.7	970	80	136	110	20	79	112	14	103	PT1/8	1.97×10^{-2}
SBK 4030-7.6	40	30	42	34.1	2×3.8	59.2	107.5	970	80	136	148	20	117	112	14	103	PT1/8	1.97×10^{-2}
SBK 5030-7.6	50	30	52	44.1	2×3.8	66.5	135	1170	90	146	149	22	116	122	14	110	PT1/8	4.82×10^{-2}
SBK 5036-7.6	50	36	52	44.1	2×3.8	65.9	135	1170	90	146	172	22	139	122	14	110	PT1/8	4.82×10^{-2}
SBK 5530-7.6	55	30	57	49.1	2×3.8	69.2	147	1250	96	152	149	22	116	128	14	114	PT1/8	7.05×10^{-2}
SBK 5536-7.6	55	36	57	49.1	2×3.8	69.1	148.7	1260	96	152	172	22	139	128	14	114	PT1/8	7.05×10^{-2}

Model number coding SBK3620-7.6 RR G0 +1500L C5
1 2 3 4 5

1 Model number
2 Seal symbol - RR : Labyrinth seal attached to both ends of the ball screw nut (see page k-25)
WW : Wiper ring attached to both ends of the ball screw nut (see page k-26)
3 Axial clearance symbol (see page k-15) 4 Overall screw shaft length (in mm)
5 Accuracy symbol (see page k-8)

Note The rigidity values in the table represent spring constants each obtained from the load and the elastic displacement when providing a preload 10% of the basic dynamic load rating (Ca) and applying an axial load three times greater than the preload.
These values do not include the rigidity of the components related to mounting the ball screw nut. Therefore, it is normally appropriate to regard roughly 80% of the value in the table as the actual value.
If the applied preload (F_{a0}) is not 0.1 Ca, the rigidity value (K_N) is obtained from the following equation.

where

$$K_N = K\left(\frac{F_{a0}}{0.1Ca}\right)^{\frac{1}{3}}$$

K: Rigidity value in the dimensional table.

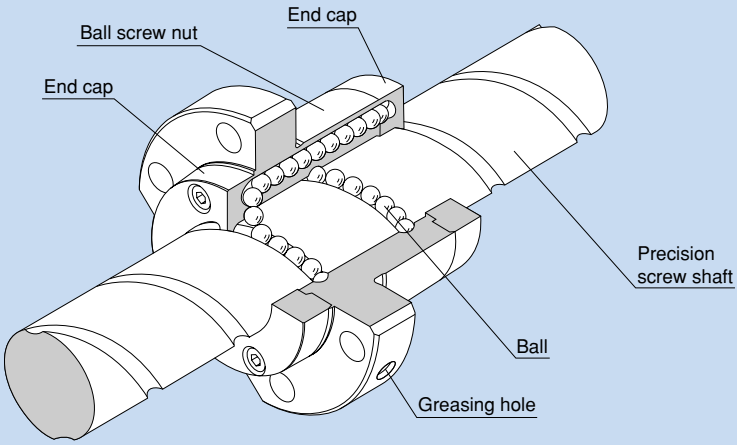


Fig. 1 Structure of the Large-Lead Precision Ball Screw

Structure and Features

With the Large-Lead Precision Ball Screw, balls under a load roll in the raceways formed on the screw shaft and the ball screw nut while receiving an axial load, are picked up with an end cap attached to the ball screw nut ends, and then fed from the other end cap to the loaded area again after passing through the ball screw nut, thus to complete infinite rotary motion.
These models have either one ball raceway or two raceways.

●Optimal for Fast Feed

Use of the end cap increases the strength of the ball pick-up section in comparison to the conventional return-pipe type, and achieves stable motion even in high-speed rotation. In addition, the double-nut type is capable of fast feed with no backlash because it is provided with a preload.

●Quiet Running Sound

Use of the end cap minimizes the level of noise produced when the balls are picked up. In addition, the balls pass inside the ball screw nut, thus to achieve very low noise even in high-speed rotation.

●A Long-size Type Can be Used with a Thin Ball Screw Shaft

Replacing a standard Ball Screw, used in a location where high-speed operation is required, with one of these models will allow the rotation speed of the screw shaft to be decreased. Therefore, it eliminates the need to use a thicker screw shaft given the critical speed of the screw shaft and the need for choosing a difficult method for securing the screw shaft, thus to reduce the cost.

●Compact Installation

The end cap attached to the ball screw nut ends serves also as a ball circulation guide and a seal. This allows the ball screw nut to be shortened. In addition, the absence of a return pipe minimizes the outer diameter of the ball screw shaft and enables compact installation.
Moreover, since the flange circumference is cut flat at the top and bottom, the Ball Screw center height is lower than the round-flange type and the overall machine height is kept low.

Types and Features

Preload Type Model BLW

A preload is provided through a spacer between two combined nuts.

Non-preload Type Models BLK and WGF

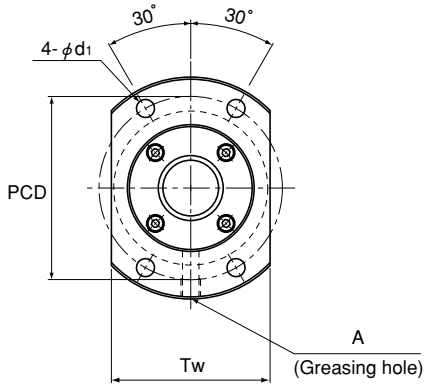
With model BLK, the shaft diameter is equal to the lead dimension. Model WGF has a lead dimension 1.5 to 3 times longer than the shaft diameter.

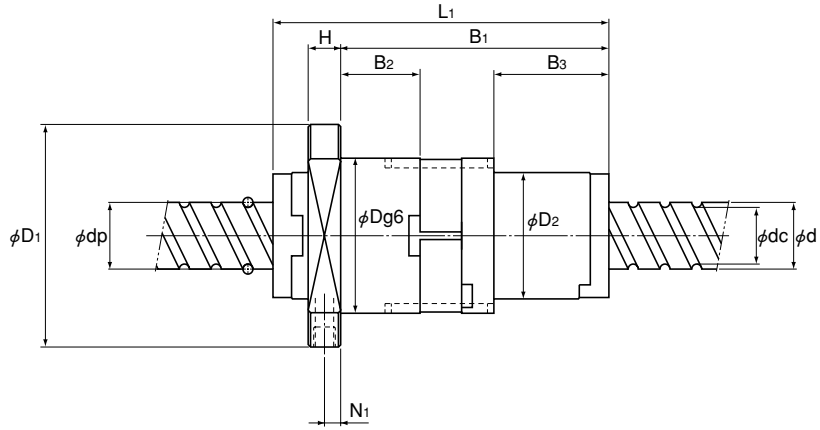
Precautions

The Large-Lead Precision Ball Screw cannot be manufactured unless either end of the screw shaft is cut off or the screw shaft end diameter is smaller than the thread minor diameter.

Model BLW

Large-lead double-nut preload type





Unit: mm

Model No.	Screw shaft outer diameter d	Lead R	Ball center diameter dp	Thread minor diameter dc	No. of loaded circuits Rows x turns	Basic load rating Ca kN	Basic load rating C0a kN	Rigidity K N/μm	Nut dimensions Outer diameter D	Flange diameter D1	Overall length L1	H	B1	B2	D2	B3	PCD	d1	Tw	N1	Greasing hole A	Screw shaft inertial moment/mm kg·cm²/mm
BLW 1510-5.6	15	10	15.75	12.5	2×2.8	14.3	27.8	680	43	64	89	10	69	18.7	34	28.6	52	5.5	46	5	M6	3.9×10^{-4}
BLW 1616-3.6	16	16	16.65	13.7	2×1.8	7.1	14.3	440	41	60	84.5	10	65.5	18.1	32	27.1	49	4.5	44	6	M6	5.05×10^{-4}
BLW 2020-3.6	20	20	20.75	17.5	2×1.8	11.1	24.7	570	48	69	105	10	84	25	39	36	57	5.5	50	5	M6	1.23×10^{-3}
BLW 2525-3.6	25	25	26	22	2×1.8	16.6	38.7	700	57	82	124.5	12	101.5	33	47	44	68	6.6	60	5	M6	3.01×10^{-3}
BLW 3232-3.6	32	32	33.25	28.3	2×1.8	23.7	59.5	880	68	99	155	15	127	42.4	58	55.4	81	9	70	6	M6	8.08×10^{-3}
BLW 3636-3.6	36	36	37.4	31.7	2×1.8	30.8	78	980	79	116	181	17	147.9	49.4	66	65.4	95	11	82	7	M6	1.29×10^{-2}
BLW 4040-3.6	40	40	41.75	35.2	2×1.8	38.7	99.2	1090	84	121	191	17	158	54.5	73	70.5	100	11	87	7	M6	1.97×10^{-2}
BLW 5050-3.6	50	50	52.2	44.1	2×1.8	57.8	155	1340	106	149	245	20	203.8	70.7	90	91.7	126	14	108	8	M6	4.82×10^{-2}

Note The rigidity values in the table represent spring constants each obtained from the load and the elastic displacement when providing a preload 10% of the basic dynamic load rating (Ca) and applying an axial load three times greater than the preload.
These values do not include the rigidity of the components related to mounting the ball screw nut. Therefore, it is normally appropriate to regard roughly 80% of the value in the table as the actual value.
If the applied preload (F_{a0}) is not 0.1 Ca, the rigidity value (K_N) is obtained from the following equation.

where

$$K_N = K\left(\frac{F_{a0}}{0.1Ca}\right)^{\frac{1}{3}}$$

K: Rigidity value in the dimensional table.

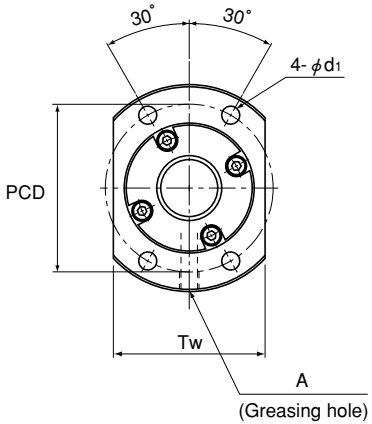
Model number coding BLW1616-3.6 G0 +900L C3
1 2 3 4

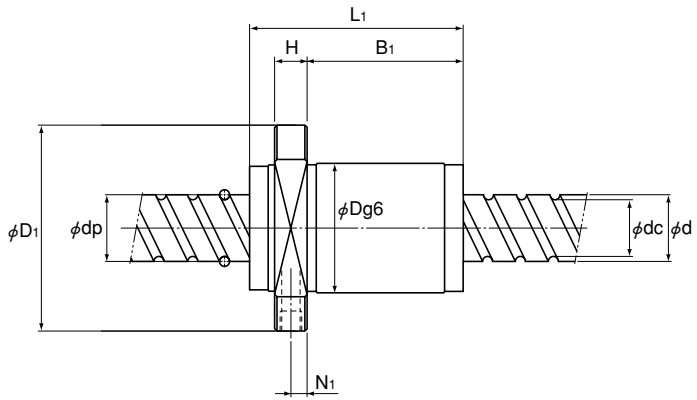
1 Model number 2 Axial clearance symbol (see page k-15) 3 Overall screw shaft length (in mm)
4 Accuracy symbol (see page k-8)

Note A seal cannot be attached to model BLW.

Model BLK

Large-lead non-preload type





Unit: mm

Model No.	Screw shaft outer diameter d	Lead R	Ball center diameter dp	Thread minor diameter dc	No. of loaded circuits Rows x turns	Basic load rating Ca kN	Basic load rating C0a kN	Rigidity K N/μm	Nut dimensions Outer diameter D	Flange diameter D1	Overall length L1	H	B1	PCD	d1	Tw	N1	Greasing hole A	Screw shaft inertial moment/mm kg·cm²/mm
BLK 1510-5.6	15	10	15.75	12.5	2×2.8	14.3	27.8	340	34	57	44	10	24	45	5.5	40	5	M6	3.9×10^{-4}
BLK 1616-2.8	16	16	16.65	13.7	1×2.8	5.2	9.9	180	32	53	54	10	37.5	42	4.5	38	5	M6	5.05×10^{-4}
BLK 1616-3.6			16.65	13.7	2×1.8	7.1	14.3	220	32	53	38	10	21.5	42	4.5	38	5	M6	5.05×10^{-4}
BLK 2020-2.8	20	20	20.75	17.5	1×2.8	8.1	17.2	230	39	62	65	10	47.5	50	5.5	46	5	M6	1.23×10^{-3}
BLK 2020-3.6			20.75	17.5	2×1.8	11.1	24.7	290	39	62	45	10	27.5	50	5.5	46	5	M6	1.23×10^{-3}
BLK 2525-2.8	25	25	26	22	1×2.8	12.2	26.9	270	47	74	80	12	60	60	6.6	56	6	M6	3.01×10^{-3}
BLK 2525-3.6			26	22	2×1.8	16.6	38.7	350	47	74	55	12	35	60	6.6	56	6	M6	3.01×10^{-3}
BLK 3232-2.8	32	32	33.25	28.3	1×2.8	17.3	41.4	340	58	92	102	15	77	74	9	68	7.5	M6	8.08×10^{-3}
BLK 3232-3.6			33.25	28.3	2×1.8	23.7	59.5	440	58	92	70	15	45	74	9	68	7.5	M6	8.08×10^{-3}
BLK 3620-5.6	36	20	37.75	31.2	2×2.8	54.9	134.3	760	70	110	78	17	45	90	11	80	8.5	M6	1.29×10^{-2}
BLK 3624-5.6		24	38	30.7	2×2.8	63.8	151.9	770	75	115	94	18	59	94	11	86	9	M6	1.29×10^{-2}
BLK 3636-2.8		36	37.4	31.7	1×2.8	22.4	54.1	390	66	106	113	17	86	85	11	76	8.5	M6	1.29×10^{-2}
BLK 3636-3.6			37.4	31.7	2×1.8	30.8	78	490	66	106	77	17	50	85	11	76	8.5	M6	1.29×10^{-2}
BLK 4040-2.8	40	40	41.75	35.2	1×2.8	28.2	68.9	430	73	114	125	17	96.5	93	11	84	8.5	M6	1.97×10^{-2}
BLK 4040-3.6			41.75	35.2	2×1.8	38.7	99.2	550	73	114	85	17	56.5	93	11	84	8.5	M6	1.97×10^{-2}
BLK 5050-2.8	50	50	52.2	44.1	1×2.8	42.2	107.8	530	90	135	156	20	122	112	14	104	10	M6	4.82×10^{-2}
BLK 5050-3.6			52.2	44.1	2×1.8	57.8	155	670	90	135	106	20	72	112	14	104	10	M6	4.82×10^{-2}

Model number coding BLK2525-3.6 G2 +1500L C5

1 2 3 4

1 Model number 2 Axial clearance symbol (see page k-15) 3 Overall screw shaft length (in mm)
4 Accuracy symbol (see page k-8)

Note A seal cannot be attached to Large-Lead Precision Ball Screw model BLK.

Note The rigidity values in the table represent spring constants each obtained from the load and the elastic displacement when providing an axial load 30% of the basic dynamic load rating (Ca).
These values do not include the rigidity of the components related to mounting the ball screw nut. Therefore, it is normally appropriate to regard roughly 80% of the value in the table as the actual value.
If the axial load (Fa) is not 0.3 Ca, the rigidity value (K_N) is obtained from the following equation.

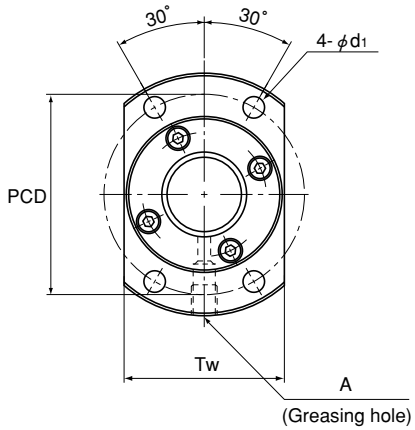
where

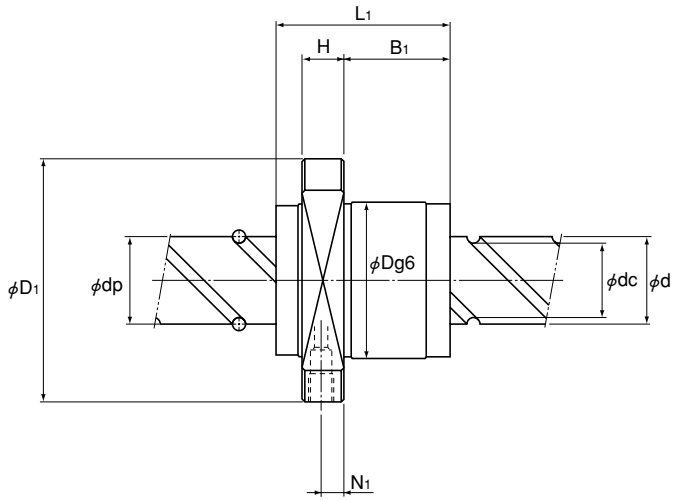
$$K_N = K\left(\frac{Fa}{0.3Ca}\right)^{\frac{1}{3}}$$

K: Rigidity value in the dimensional table.

Model WGF

Super-lead non-preload type





Unit: mm

Model No.	Screw shaft outer diameter d	Lead R	Ball center diameter dp	Thread minor diameter dc	No. of loaded circuits Rows x turns	Basic load rating Ca kN	Basic load rating C0a kN	Rigidity K N/μm	Nut dimensions Outer diameter D	Flange diameter D1	Overall length L1	H	B1	PCD	d1	Tw	N1	Greasing hole A	Screw shaft inertial moment/mm kg·cm²/mm
WGF 0812-3	8	12	8.4	6.6	2×1.65	2.2	3.9	110	18	31	27	4	17	25	3.4	20	—	—	3.16×10⁻⁵
WGF 1015-3	10	15	10.5	8.3	2×1.65	3.3	6.2	140	23	40	33	5	22	32	4.5	25	—	—	7.71×10⁻⁵
WGF 1320-3	13	20	13.5	10.8	2×1.65	4.7	9.6	180	28	45	43	5	29	37	4.5	30	—	—	2.2×10⁻⁴
WGF 1520-1.5	15	20	15.75	12.5	1×1.5	4.4	7.9	100	32	53	45	10	28	43	5.5	33	5	M6	3.9×10⁻⁴
WGF 1520-3			15.75	12.5	2×1.5	8.1	15.8	190	32	53	45	10	28	43	5.5	33	5	M6	3.9×10⁻⁴
WGF 1530-1		30	15.75	12.5	2×0.6	3.5	5.4	90	32	53	33	10	17	43	5.5	33	5	M6	3.9×10⁻⁴
WGF 1530-3			15.75	12.5	2×1.6	8.1	14.6	220	32	53	63	10	47	43	5.5	33	5	M6	3.9×10⁻⁴
WGF 1540-1.5		40	15.75	12.5	2×0.75	3.9	7.4	110	32	53	42	10	26.3	43	5.5	33	5	M6	3.9×10⁻⁴
WGF 2040-1	20	40	20.75	17.5	2×0.65	4.3	8	110	37	57	41	10	25	47	5.5	38	5.5	M6	1.23×10⁻³
WGF 2040-3			20.75	17.5	2×1.65	9.5	20.2	280	37	57	81	10	65	47	5.5	38	5.5	M6	1.23×10⁻³
WGF 2060-1.5		60	20.75	17.5	2×0.75	4.5	11	140	37	57	60	10	40.1	47	5.5	38	5	M6	1.23×10⁻³
WGF 2550-1	25	50	26	21.9	2×0.65	6.4	12.5	140	45	69	52	12	31.5	57	6.6	46	7	M6	3.01×10⁻³
WGF 2550-3			26	21.9	2×1.65	14.3	31.7	340	45	69	102	12	81.5	57	6.6	46	7	M6	3.01×10⁻³
WGF 3060-1	30	60	31.25	26.4	2×0.65	8.9	18	170	55	89	62	15	37	71	9	56	9	M6	6.24×10⁻³
WGF 3060-3			31.25	26.4	2×1.65	19.9	45.7	410	55	89	122	15	97	71	9	56	9	M6	6.24×10⁻³
WGF 3090-1.5		90	31.25	26.4	2×0.75	9.7	25.8	200	55	89	92	15	61.3	71	9	56	9	M6	6.24×10⁻³
WGF 4080-1	40	80	41.75	35.2	2×0.65	15	32.1	220	73	114	79	17	50.5	93	11	74	8.5	M6	1.97×10⁻²
WGF 4080-3			41.75	35.2	2×1.65	33.4	81.4	530	73	114	159	17	130.5	93	11	74	8.5	M6	1.97×10⁻²
WGF 50100-1	50	100	52.2	44.1	2×0.65	22.4	50.1	270	90	135	98	20	64	112	14	92	10	M6	4.82×10⁻²
WGF 50100-3			52.2	44.1	2×1.65	49.9	127.2	650	90	135	198	20	164	112	14	92	10	M6	4.82×10⁻²

Model number coding WGF1540-1.5 G2 +900L C7

1 2 3 4

1 Model number 2 Axial clearance symbol (see page k-15) 3 Overall screw shaft length (in mm)
4 Accuracy symbol (see page k-8)

Note A seal cannot be attached to model WGF.

Note The rigidity values in the table represent spring constants each obtained from the load and the elastic displacement when providing an axial load 30% of the basic dynamic load rating (Ca).
These values do not include the rigidity of the components related to mounting the ball screw nut. Therefore, it is normally appropriate to regard roughly 80% of the value in the table as the actual value.
If the axial load (Fa) is not 0.3 Ca, the rigidity value (K_N) is obtained from the following equation.

where

$$K_N = K\left(\frac{Fa}{0.3Ca}\right)^{\frac{1}{3}}$$

K: Rigidity value in the dimensional table.

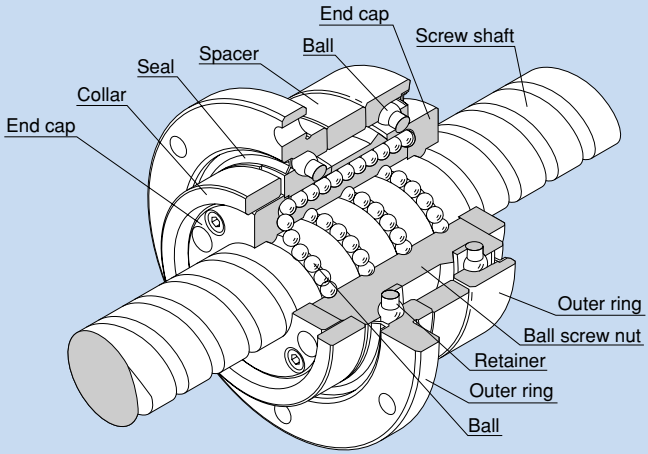


Fig. 1 Structure of Large-Lead Rotary Nut Ball Screw Model BLR

Structure and Features

The Rotary Ball Screw is a nut-rotating ball screw unit that has an integrated structure consisting of a ball screw nut and a support bearing. The support bearing is an angular bearing that has a contact angle of 60°, contains an increased number of balls and achieves large axial rigidity.
Model BLR is divided into two types: Precision Ball Screw and Roller Screw Ball.

●Capable of Fast Feed

Since the ball screw nut rotates with the screw shaft being secured, it can be fed at high speed with a thin screw shaft. It allows a small driving motor to be used.

●Smooth Motion

It achieves smoother motion than rack-and-pinion based linear motion. Also, since the screw shaft does not rotate because of the ball screw nut drive, this model does not show skipping, produces low noise and generates little heat.

●Low Noise even in High-speed Rotation

Model BLR produces very low noise when the balls are picked up along the end cap. In addition, the balls circulate by passing through the ball screw nut, allowing this model to be used at high speed.

●High Rigidity

The support bearing of this model is larger than that of the screw shaft rotation type. Thus, it axial rigidity is significantly increased.

●Compact

Since the nut and the support bearing are integrated, highly accurate, compact design is achieved.

●Easy Installation

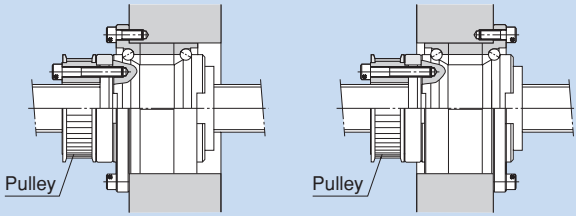
By simply mounting this model to the housing using bolts, a ball screw nut rotating mechanism can be obtained (for the housing's inner-diameter tolerance, H7 is recommended).

Types

Rotary Ball Screw Model BLR (Precision Type)

Rotary Ball Screw Model BLR (Rolled Type)

Example of Mounting Ball Screw Nut Model BLR



Standard installation method　　Flange inverted

Note: If the flange is to be inverted, indicate "K" in the model number (applicable only to model BLR).
Example: BLR 2020-3.6 K UU
Symbol for inverted flange
(No symbol for standard flange orientation)

Example of Mounting Model BLR on the Table

(1) Screw shaft free, ball screw nut fixed
(Suitable for a long table)

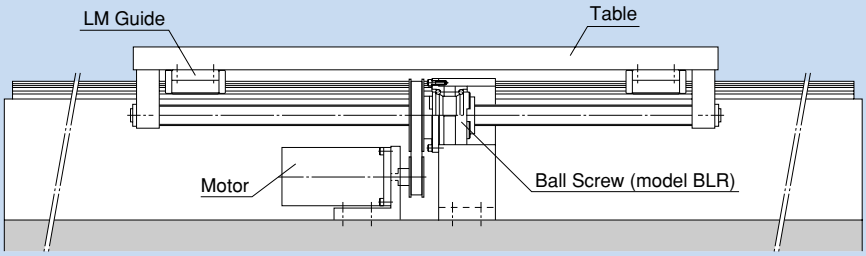


Fig. 2 Example of Installation on the Table (Ball Screw Nut Fixed)

(2) Ball screw nut free, screw shaft fixed
(Suitable for a short table and a long stroke)

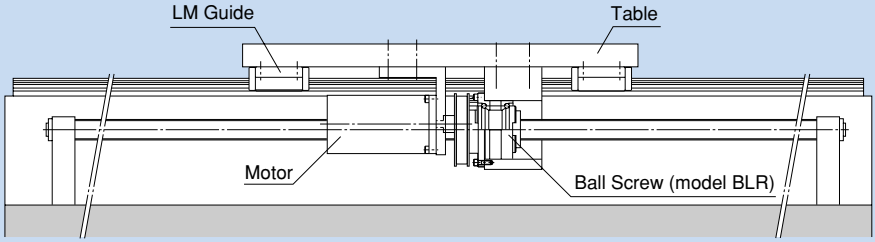
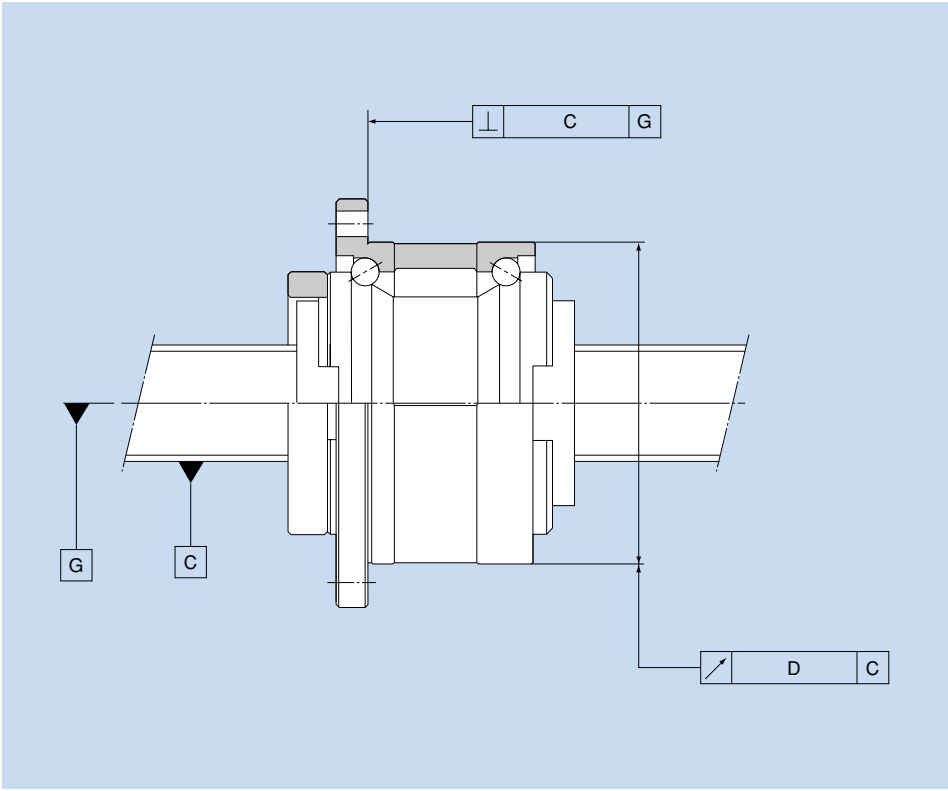


Fig. 3 Example of Installation on the Table (Screw Shaft Fixed)

Accuracy Standard for Model BLR

The accuracy of model BLR is compliant with a JIS standard (JIS B 1192) except for the radial run-out of the circumference of the ball screw nut from the screw axis (D) and the perpendicularity of the flange-mounting surface against the screw axis (C).

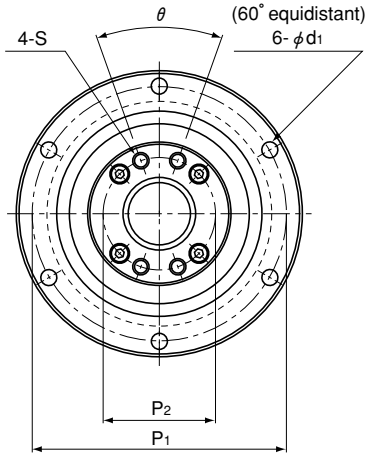


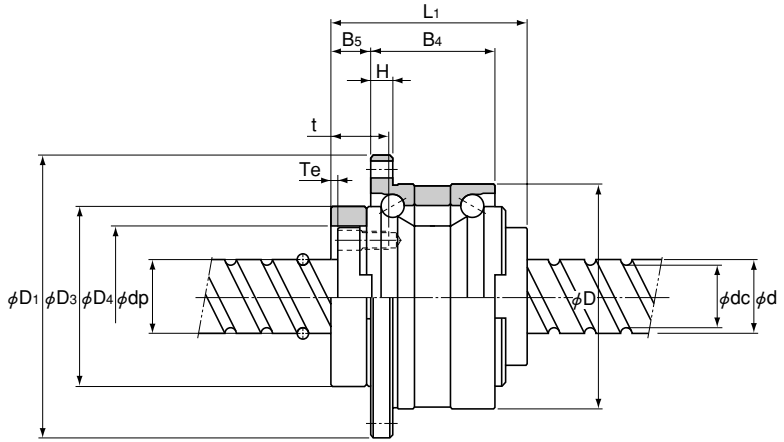
Unit: mm

Accuracy grade	C3		C5		C7		C10	
Model No.	C	D	C	D	C	D	C	D
BLR 1616	0.013	0.017	0.016	0.020	0.023	0.035	0.035	0.065
BLR 2020	0.013	0.017	0.016	0.020	0.023	0.035	0.035	0.065
BLR 2525	0.015	0.020	0.018	0.024	0.023	0.035	0.035	0.065
BLR 3232	0.015	0.020	0.018	0.024	0.023	0.035	0.035	0.065
BLR 3636	0.016	0.021	0.019	0.025	0.024	0.036	0.036	0.066
BLR 4040	0.018	0.026	0.021	0.033	0.026	0.046	0.046	0.086
BLR 5050	0.018	0.026	0.021	0.033	0.026	0.046	0.046	0.086

Model BLR

Large-Lead Rotary Nut Precision Ball Screw





Unit: mm

Model No.	Screw shaft outer diameter d	Thread minor diameter dc	Lead R	Ball center diameter dp	Basic load rating Ca kN	Basic load rating C0a kN	Ball screw dimensions: Outer diameter D	Flange diameter D1	Overall length L1	D3	D4	H	B4	B5	Te	P1	P2	S	t	d1	θ°	Support bearing basic load rating Ca kN	Support bearing basic load rating C0a kN	Nut inertial moment kg·cm²
BLR 1616-3.6	16	13.7	16	16.65	7.1	14.3	52 $^{0}_{-0.007}$	68	43.5	40 $^{0}_{-0.025}$	32 $^{+0.025}_{0}$	5	27.5	9	2	60	25	M4	12	4.5	40	19.4	19.2	0.48
BLR 2020-3.6	20	17.5	20	20.75	11.1	24.7	62 $^{0}_{-0.007}$	78	54	50 $^{0}_{-0.025}$	39 $^{+0.025}_{0}$	6	34	11	2	70	31	M5	16	4.5	40	26.8	29.3	1.44
BLR 2525-3.6	25	22	25	26	16.6	38.7	72 $^{0}_{-0.007}$	92	65	58 $^{0}_{-0.03}$	47 $^{+0.025}_{0}$	8	43	12.5	3	81	38	M6	19	5.5	40	28.2	33.3	3.23
BLR 3232-3.6	32	28.3	32	33.25	23.7	59.5	80 $^{0}_{-0.007}$	105	80	66 $^{0}_{-0.03}$	58 $^{+0.03}_{0}$	9	55	14	3	91	48	M6	19	6.6	40	30	39	6.74
BLR 3636-3.6	36	31.7	36	37.4	30.8	78	100 $^{0}_{-0.008}$	130	93	80 $^{0}_{-0.03}$	66 $^{+0.03}_{0}$	11	62	17	3	113	54	M8	22	9	40	56.4	65.2	16.8
BLR 4040-3.6	40	35.2	40	41.75	38.7	99.2	110 $^{0}_{-0.008}$	140	98	90 $^{0}_{-0.035}$	73 $^{+0.03}$	11	68	16.5	3	123	61	M8	22	9	50	59.3	74.1	27.9
BLR 5050-3.6	50	44.1	50	52.2	57.8	155	120 $^{0}_{-0.008}$	156	126	100 $^{0}_{-0.035}$	90 $^{+0.035}_{0}$	12	80	25	4	136	75	M10	28	11	50	62.2	83	58.2

Model number coding

BLR2020-3.6 K UU G1 +1000L C5

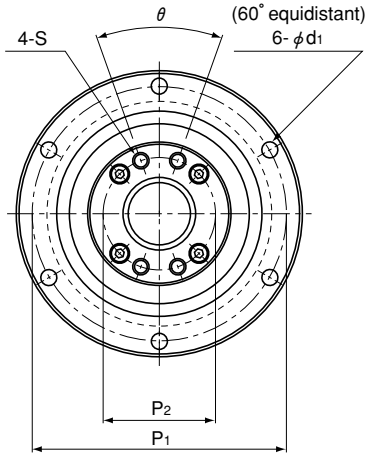
1 2 3 4 5 6

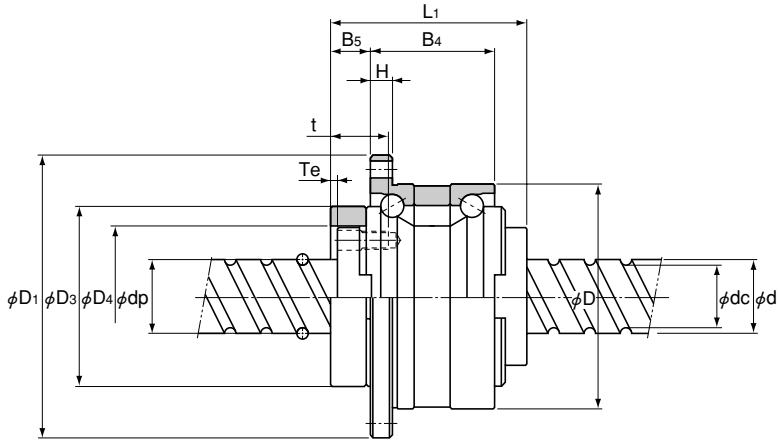
1 Model number 2 Flange orientation symbol (see page k-210) - K: Flange inversed
No symbol: Standard
3 Symbol for support bearing seal - UU: Seal attached on both ends
No symbol: Without seal
4 Symbol for axial clearance (see page k-15) 5 Overall screw shaft (in mm)
6 Accuracy symbol (see page k-8)

Selecting a Model Number Refer to the "THK General Catalog - Technical Descriptions of the Products," provided separately

Model BLR

Large-Lead Rotary Nut Rolled Ball Screw





Unit: mm

Model No.	Screw shaft outer diameter d	Thread minor diameter dc	Lead R	Ball center diameter dp	Basic load rating Ca kN	Basic load rating C0a kN	Ball screw dimensions: Outer diameter D	Flange diameter D1	Overall length L1	D3	D4	H	B4	B5	Te	P1	P2	S	t	d1	θ°	Support bearing basic load rating Ca kN	Support bearing basic load rating C0a kN	Nut inertial moment kg·cm²
BLR 1616-3.6	16	13.7	16	16.65	5.8	12.9	52 $^{0}_{-0.007}$	68	43.5	40 $^{0}_{-0.025}$	32 $^{+0.025}_{0}$	5	27.5	9	2	60	25	M4	12	4.5	40	19.4	19.2	0.48
BLR 2020-3.6	20	17.5	20	20.75	7.7	22.3	62 $^{0}_{-0.007}$	78	54	50 $^{0}_{-0.025}$	39 $^{+0.025}_{0}$	6	34	11	2	70	31	M5	16	4.5	40	26.8	29.3	1.44
BLR 2525-3.6	25	22	25	26	12.1	35	72 $^{0}_{-0.007}$	92	65	58 $^{0}_{-0.03}$	47 $^{+0.025}_{0}$	8	43	12.5	3	81	38	M6	19	5.5	40	28.2	33.3	3.23
BLR 3232-3.6	32	28.3	32	33.25	17.3	53.9	80 $^{0}_{-0.007}$	105	80	66 $^{0}_{-0.03}$	58 $^{+0.03}_{0}$	9	55	14	3	91	48	M6	19	6.6	40	30	39	6.74
BLR 3636-3.6	36	31.7	36	37.4	22.4	70.5	100 $^{0}_{-0.008}$	130	93	80 $^{0}_{-0.03}$	66 $^{+0.03}_{0}$	11	62	17	3	113	54	M8	22	9	40	56.4	65.2	16.8
BLR 4040-3.6	40	35.2	40	41.75	28.1	89.8	110 $^{0}_{-0.008}$	140	98	90 $^{0}_{-0.035}$	73 $^{+0.03}$	11	68	16.5	3	123	61	M8	22	9	50	59.3	74.1	27.9
BLR 5050-3.6	50	44.1	50	52.2	42.1	140.4	120 $^{0}_{-0.008}$	156	126	100 $^{0}_{-0.035}$	90 $^{+0.035}_{0}$	12	80	25	4	136	75	M10	28	11	50	62.2	83	58.2

Model number coding

BLR2020-3.6 K UU +1000L C7 T

1 2 3 4 5 6

1 Model number 2 Flange orientation symbol (see page k-210) - K: Flange inversed
No symbol: Standard
3 Symbol for support bearing seal - UU: Seal attached on both ends
No symbol: Without seal
4 Overall screw shaft (in mm) 5 Accuracy symbol (see page k-8) (no symbol for class C10)
6 Symbol for rolled Ball Screw

Note For axial clearance, see page k-15.

Dust Prevention and Lubrication

Dust Prevention

For the outer ring of the support bearing, a highly wear-resistant special synthetic rubber seal is available in order to prevent foreign matter from entering the bearing system and the lubricant from leaking (type BLR···UU).
Every THK Precision Ball Screw has labyrinth seals attached on both ends of the ball screw nut to prevent foreign matter such as cutting chips from entering the nut.
A slight clearance is secured between the labyrinth seal and the screw shaft to maintain the efficiency of the seal. For a bellows and a screw cover, contact THK .

Lubrication

When lubricating the Rotary Ball Screw, attach the greasing plate to the housing in advance.
THK Precision Ball Screws require appropriate lubrication in order to maintain their efficiencies, service lives and accuracies and to protect them from temperature rise. In particular, when the heat generation of the ball screw unit would affect the accuracy due to high-speed rotation and a heavy load, it is also important to consider selecting a lubricant and cooling the system by forced lubrication.

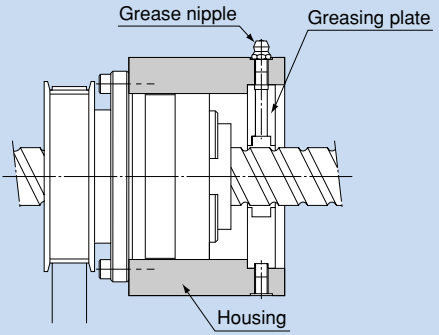


Fig. 4 Lubrication Method

Precautions on Use

Do not separate the ball screw nut of THK Precision Ball Screw from the screw shaft. In the event you have separated the nut from the shaft, check the serial number and the model number indicated on the ball screw nut, and then contact THK .
Note that the screw shaft cannot be assembled unless either end is cut off or its diameter is smaller than the thread minor diameter.

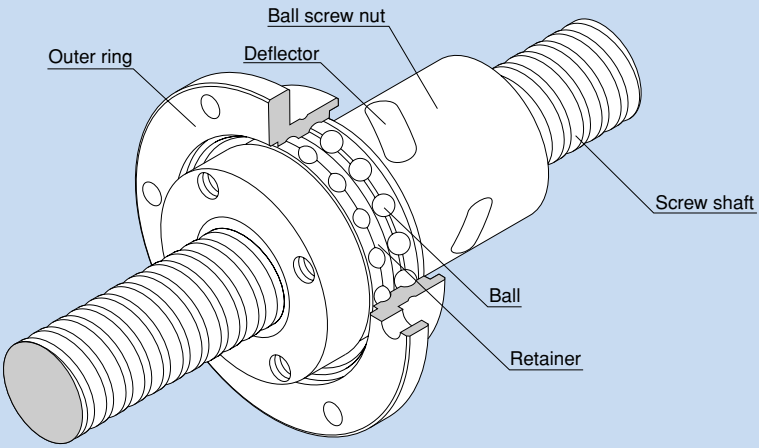


Fig. 1 Structure of Standard-Lead Rotary-Nut Ball Screw Model DIR

Structure and Features

Standard-Lead Rotary-Nut Ball Screw model DIR is rotary nut Ball Screw that has a structure where a simple-nut Ball Screw is integrated with a support bearing.

Its ball screw nut serves as a ball circulation mechanism using deflectors. Balls travel along the groove of the deflector mounted in the ball screw nut to the adjacent raceway, and then circulate back to the loaded area to complete infinite rolling motion.

Being an offset preload nut, the single ball screw nut provides different phases to the right and left thread in the middle of the nut, thus to set the axial clearance below zero (a preload is provided). This allows more compact, smoother motion to be achieved than the conventional double-nut type (a spacer is inserted between two nuts).

The support bearing comprises two rows of DB type angular bearings with a contact angle of 45° to provide a preload. The collar, previously used to mount a pulley, is integrated with the ball screw nut.

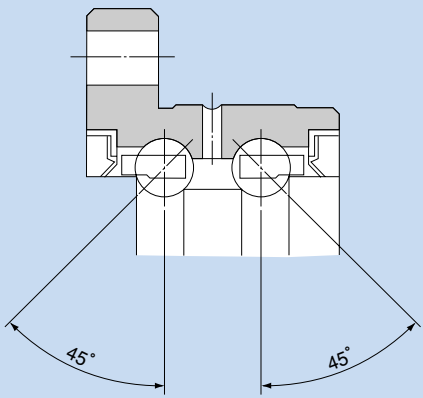


Fig. 2 Structure of the Support Bearing

●Compact

Because of the internal circulation mechanism using a deflector, the outer diameter is only 70 to 80%, and the overall length is 60 to 80%, of that of the Return-pipe Nut, thus to reduce the weight and decrease the inertia during acceleration.
Since the ball screw nut is integrated with the support bearing, highly accurate, compact design is allowed. In addition, small inertia because of the lightweight ball screw nut ensures high responsiveness.

●Capable of High-speed Rotation

Since the screw shaft is fixed and the ball screw nut is free, the Ball Screw is capable of rotating at high speed even if the shaft diameter is small. It allows a small driving motor to be used.

●Capable of Fine Positioning

Being a Standard-Lead Ball Screw, it is capable of fine positioning despite that the ball screw nut rotates.

●Accuracy can Easily be Established

As the support bearing is integrated with the outer ring, the bearing can be assembled with the nut housing on the end face of the outer ring flange. This makes it easy to center the ball screw nut and establish accuracy.

●Well Balanced

Since the deflector is evenly placed along the circumference, superb balance is ensured while the ball screw nut is rotating.

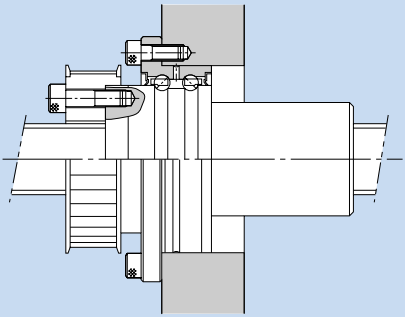
●Stability in the Low-speed Range

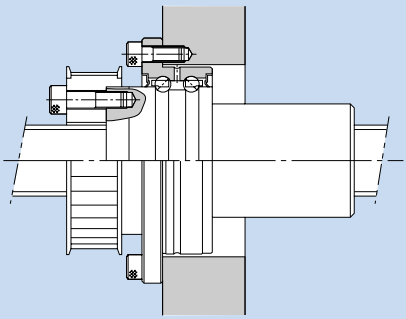
Traditionally, motors tend to have uneven torque and speed in the low-speed range due to external causes. With model DIR, the motor can be connected independently with the screw shaft and the ball screw nut, thus to allow fine feed within the motor's stable rotation range.

Types

Rotary Ball Screw Model DIR

Example of Mounting Ball Screw Nut Model DIR

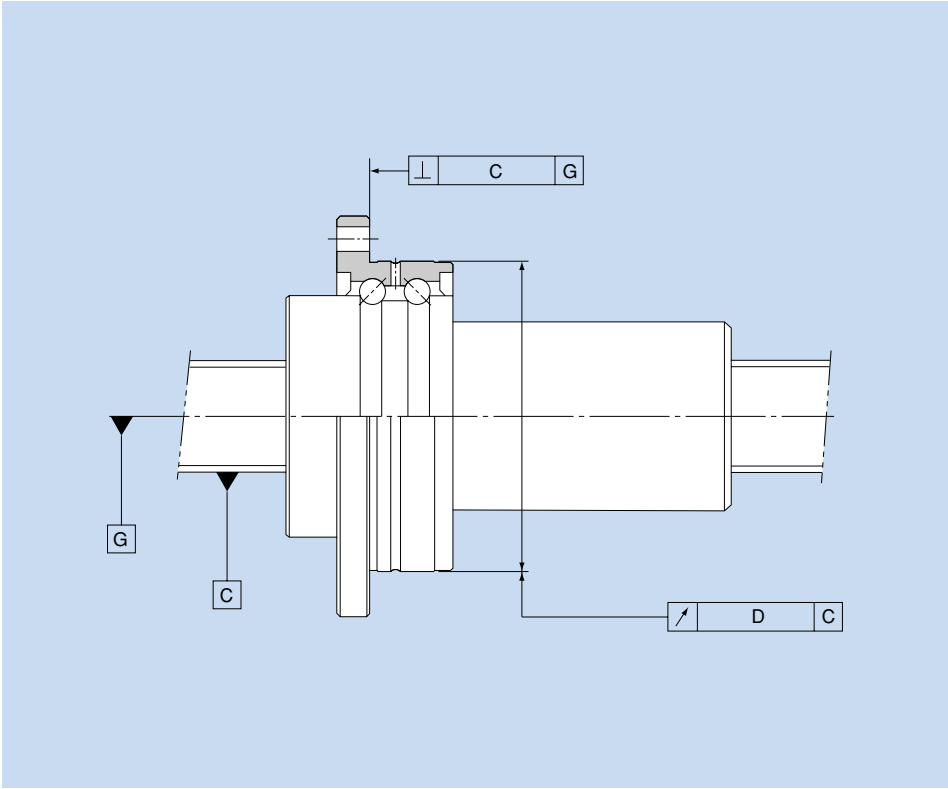




Installation to the housing can be performed on the end face of the outer ring flange.

Accuracy Standards for Model DIR

The accuracy of model DIR is compliant with a JIS standard (JIS B 1192) except for the radial run-out of the circumference of the ball screw nut from the screw axis (D) and the perpendicularity of the flange-mounting surface against the screw axis (C).

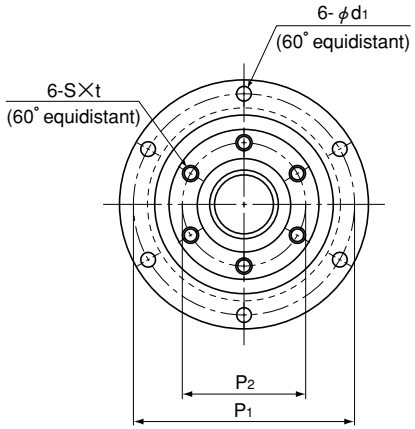


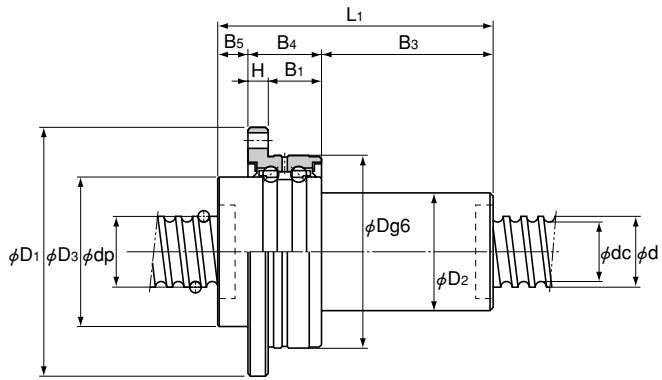
Unit: mm

Accuracy grade	C3		C5		C7	
Model No.	C	D	C	D	C	D
DIR 16□□	0.013	0.017	0.016	0.020	0.023	0.035
DIR 20□□	0.013	0.017	0.016	0.020	0.023	0.035
DIR 25□□	0.015	0.020	0.018	0.024	0.023	0.035
DIR 32□□	0.015	0.020	0.018	0.024	0.023	0.035
DIR 36□□	0.016	0.021	0.019	0.025	0.024	0.036
DIR 40□□	0.018	0.026	0.021	0.033	0.026	0.036

Model DIR

Standard-Lead Rotary Nut Ball Screw





Unit: mm

Model No.	Screw shaft outer diameter d	Thread minor diameter dc	Lead R	Ball center diameter dp	Basic load rating Ca kN	Basic load rating C0a kN	Rigidity K N/μm	Ball screw dimensions: Outer diameter D	Flange diameter D1	Overall length L1	D3 h7	D2	B5	B4	B3	P1	P2	H	B1	S	t	d1	Support bearing basic load rating Ca kN	Support bearing basic load rating C0a kN	Nut inertial moment kg·cm²
DIR 1605-6	16	13.2	5	16.75	7.4	13	310	48	64	79	36	30	8	21	50	56	30	6	15	M4	6	4.5	8.7	10.5	0.61
DIR 2005-6	20	17.2	5	20.75	8.5	17.3	310	56	72	80	43.5	34	9	21	50	64	36	6	15	M5	8	4.5	9.7	13.4	1.18
DIR 2505-6	25	22.2	5	25.75	9.7	22.6	490	66	86	88	52	40	13	25	50	75	43	7	18	M6	10	5.5	12.7	18.2	2.65
DIR 2510-4		21.6	10	26	9	18	330	66	86	106	52	40	11	25	70	75	43	7	18	M6	10	5.5	12.7	18.2	2.84
DIR 3205-6	32	29.2	5	32.75	11.1	30.2	620	78	103	86	63	46	11	25	50	89	53	8	17	M6	10	6.6	13.6	22.3	5.1
DIR 3206-6		28.4	6	33	14.9	37.1	630	78	103	97	63	48	11	25	61	89	53	8	17	M6	10	6.6	13.6	22.3	5.68
DIR 3210-6		26.4	10	33.75	25.7	52.2	600	78	103	131	63	54	11	25	95	89	53	8	17	M6	10	6.6	13.6	22.3	8.13
DIR 3610-6	36	30.5	10	37.75	28.8	63.8	710	92	122	151	72	58	14	33	104	105	61	10	23	M8	12	9	20.4	32.3	14.7
DIR 4010-6	40	34.7	10	41.75	29.8	69.3	750	100	130	142	79.5	62	14	33	95	113	67	10	23	M8	12	9	21.5	36.8	20.6
DIR 4012-6		34.4	12	41.75	30.6	72.3	790	100	130	167	79.5	62	14	33	120	113	67	10	23	M8	12	9	21.5	36.8	22.5

Model number coding

DIR2005-6 RR G0 +520L C1
1 2 3 4 5

1 Model number
2 Seal symbol - RR: Labyrinth seal attached to both ends of the ball screw nut (see page k-25)
3 Symbol for axial clearance (see page k-15) 4 Overall screw shaft (in mm)
5 Accuracy symbol (see page k-8)

Note The rigidity values in the table represent spring constants each obtained from the load and the elastic displacement when providing a preload 10% of the basic dynamic load rating (Ca) and applying an axial load three times greater than the preload.
These values do not include the rigidity of the components related to mounting the ball screw nut. Therefore, it is normally appropriate to regard roughly 80% of the value in the table as the actual value.
If the applied preload (Fa_0) is not 0.1 Ca, the rigidity value (K_N) is obtained from the following equation.

where

$$K_N = K\left(\frac{Fa_0}{0.1Ca}\right)^{\frac{1}{3}}$$

K: Rigidity value in the dimensional table.

Dust Prevention and Lubrication

Dust Prevention

Every THK Precision Ball Screw has labyrinth seals attached on both ends of the ball screw nut to prevent foreign matter such as cutting chips from entering the nut.
A slight clearance is secured between the labyrinth seal and the screw shaft to maintain the efficiency of the seal.
For a bellows and a screw cover, contact THK .

Lubrication

When lubricating the Rotary Ball Screw, attach the greasing plate to the housing in advance.
THK Precision Ball Screws require appropriate lubrication in order to maintain their efficiencies, service lives and accuracies and to protect them from temperature rise. In particular, when the heat generation of the ball screw unit would affect the accuracy due to high-speed rotation and a heavy load, it is also important to consider selecting a lubricant and cooling the system by forced lubrication.

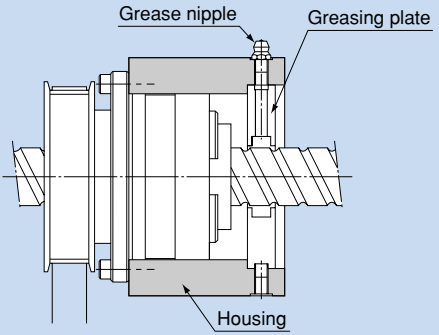


Fig. 3 Lubrication Method

Precautions on Use

Do not separate the ball screw nut of THK Precision Ball Screw from the screw shaft. In the event you have separated the nut from the shaft, check the serial number and the model number indicated on the ball screw nut, and then contact THK .
Note that the screw shaft cannot be assembled unless either end is cut off or its diameter is smaller than the thread minor diameter.

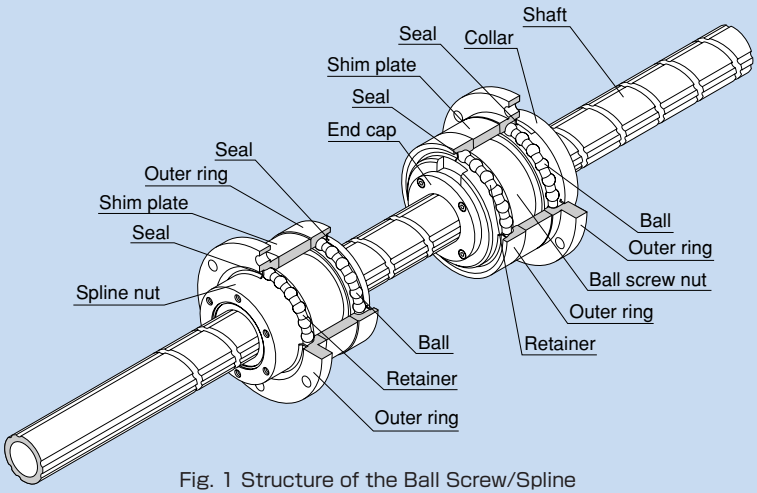


Fig. 1 Structure of the Ball Screw/Spline

Structure and Features

The Ball Screw/Spline contains Ball Screw grooves and Ball Spline groove crossing one another. The nuts of the Ball Screw and the Ball Spline have dedicated support bearings directly embedded on the circumference of the nuts.
The Ball Screw/Spline is capable of performing three (rotational, linear and spiral) modes of motion with a single shaft by rotating or stopping the spline nut.
It is optimal for machines using a combination of rotary and linear motions, such as scholar robot's Z-axis, assembly robot, automatic loader, and machining center's ATC equipment.

●Zero Axial Clearance

The Ball Spline has an angular-contact structure that causes no backlash in the rotational direction, enabling highly accurate positioning.

●Lightweight and Compact

Since the ball screw nut is integrated with the support bearing, highly accurate, compact design is allowed. In addition, small inertia because of the lightweight ball screw nut ensures high responsiveness.

●Easy Installation

The Ball Spline nut is designed so that balls do not fall off even if the spline nut is removed from the shaft, making installation easy. The Ball Screw/Spline can easily be mounted simply by securing it to the housing with bolts (for the housing's inner-diameter tolerance, H7 is recommended).

●Smooth Motion with Low Noise

As the Ball Screw is based on an end-cap mechanism, smooth motion with low noise is achieved.

●Highly Rigid Support Bearing

The support bearing on the Ball Screw has a contact angle of 60° in the axial direction while that on the Ball Spline has a contact angle of 30° in the moment direction, thus to provide a highly rigid shaft support.
In addition, a dedicated rubber seal is attached as standard to prevent entry of foreign matter.

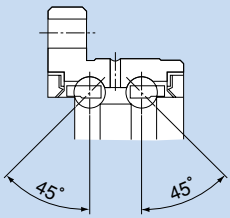


Fig. 2 Structure of Support Bearing Model BNS-A

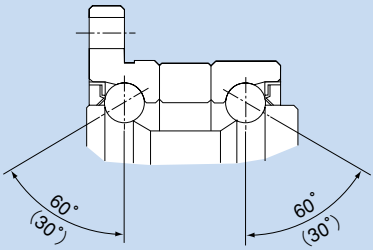


Fig. 3 Structure of Support Bearing Model BNS

Types

Model BNS-A

(Compact type: linear motion + rotary motion)

Model BNS

(Heavy-load type: linear motion + rotary motion)

Model NS-A

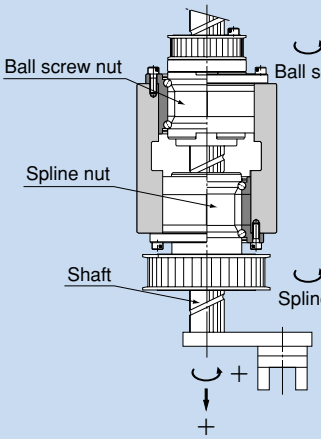
(Compact type: linear motion)

Model NS

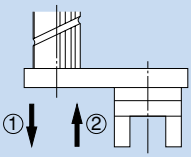
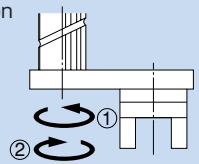
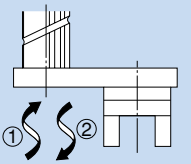
(Heavy-load type: linear motion)

Action Patterns

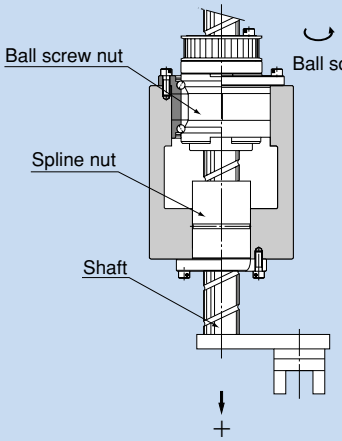
Model BNS Basic Actions



ℓ : Ball screw lead (mm)
N_1: Ball screw nut rotation speed (min^{-1})
N_2: Spline nut rotation speed (min^{-1})

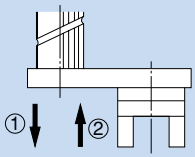
Motion		Action direction	Input: Ball screw pulley	Input: Ball spline pulley	Shaft motion: Vertical direction (speed)	Shaft motion: Rotational direction (rotation speed)
1. Vertical 	①	Vertical direction → down Rotational direction → 0	N_1 (Forward)	0	$V=N_1 \cdot \ell$ ($N_1 \neq 0$)	0
	②	Vertical direction → up Rotational direction → 0	$-N_1$ (Reverse)	0	$V=-N_1 \cdot \ell$ ($N_1 \neq 0$)	0
2. Rotation 	①	Vertical direction → 0 Rotational direction → forward	N_1	N_2 (Forward)	0	N_2 (Forward) ($N_1=N_2 \neq 0$)
	②	Vertical direction → 0 Rotational direction → reverse	$-N_1$	$-N_2$ (Reverse)	0	$-N_2$ (Reverse) ($-N_1=-N_2 \neq 0$)
3. Spiral 	①	Vertical direction → up Rotational direction → forward	0	N_2 ($N_2 \neq 0$)	$V=N_2 \cdot \ell$	N_2 (Forward)
	②	Vertical direction → down Rotational direction → reverse	0	$-N_2$ ($-N_2 \neq 0$)	$V=-N_2 \cdot \ell$	$-N_2$ (Reverse)

Model NS Basic Actions

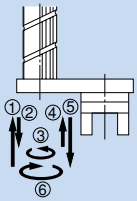
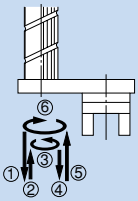
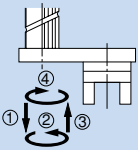
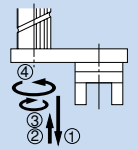


ℓ : Ball screw lead (mm)

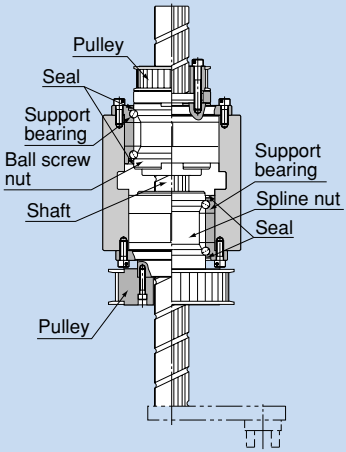
N_1: Ball screw nut rotation speed (min^{-1})

Motion		Action direction	Input Ball screw pulley	Shaft motion Vertical direction (speed)
1. Vertical 	①	Vertical direction → down	N_1 (Forward)	$V=N_1 \cdot \ell$ ($N_1 \neq 0$)
	②	Vertical direction → up	$-N_1$ (Reverse)	$V=-N_1 \cdot \ell$ ($N_1 \neq 0$)

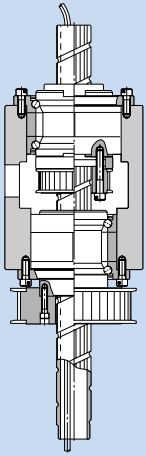
Model BNS Extended Actions

Motion		Action direction	Input: Ball screw pulley	Input: Ball spline pulley	Shaft motion: Vertical direction (speed)	Shaft motion: Rotational direction (rotation speed)
1. Up → down → forward → up → down → reverse 	①	Vertical direction → up	$-N_1$ (Reverse)	0	$V=-N_1 \cdot \ell$ $(N_1 \neq 0)$	0
	②	Vertical direction → down	N_1 (Forward)	0	$V=N_1 \cdot \ell$ $(N_1 \neq 0)$	0
	③	Rotational direction → forward	N_1	N_2 (Forward)	0	N_2(Forward) $(N_1=N_2 \neq 0)$
	④	Vertical direction → up	$-N_1$	0	$V=-N_1 \cdot \ell$ $(N_1 \neq 0)$	0
	⑤	Vertical direction → down	N_1	0	$V=N_1 \cdot \ell$ $(N_1 \neq 0)$	0
	⑥	Rotational direction → reverse	$-N_1$	$-N_2$ (Reverse)	0	$-N_2$(Reverse) $(-N_1=N_2 \neq 0)$
2. Down → up → forward → down → up → reverse 	①	Vertical direction → down	N_1	0	$V=N_1 \cdot \ell$ $(N_1 \neq 0)$	0
	②	Vertical direction → up	$-N_1$	0	$V=-N_1 \cdot \ell$ $(N_1 \neq 0)$	0
	③	Rotational direction → forward	N_1	N_2	0	N_2 $(N_1=N_2 \neq 0)$
	④	Vertical direction → up	N_1	0	$V=N_1 \cdot \ell$ $(N_1 \neq 0)$	0
	⑤	Vertical direction → down	$-N_1$	0	$V=-N_1 \cdot \ell$ $(N_1 \neq 0)$	0
	⑥	Rotational direction → reverse	$-N_1$	$-N_2$	0	$-N_2$ $(-N_1=N_2 \neq 0)$
3. Down → forward → up → reverse 	①	Vertical direction → down	N_1	0	$V=N_1 \cdot \ell$ $(N_1 \neq 0)$	0
	②	Rotational direction → forward	N_1	N_2	0	N_2 $(N_1=N_2 \neq 0)$
	③	Vertical direction → up	$-N_1$	0	$V=-N_1 \cdot \ell$ $(N_1 \neq 0)$	0
	④	Rotational direction → reverse	$-N_1$	$-N_2$	0	$-N_2$ $(-N_1=N_2 \neq 0)$
4. Down → up → forward → reverse 	①	Vertical direction → down	N_1	0	$V=N_1 \cdot \ell$ $(N_1 \neq 0)$	0
	②	Vertical direction → up	$-N_1$	0	$V=-N_1 \cdot \ell$ $(N_1 \neq 0)$	0
	③	Rotational direction → reverse	$-N_1$	$-N_2$	0	$-N_2$ $(-N_1=N_2 \neq 0)$
	④	Rotational direction → forward	N_1	N_2	0	N_2 $(N_1=N_2 \neq 0)$

Example of Assembly

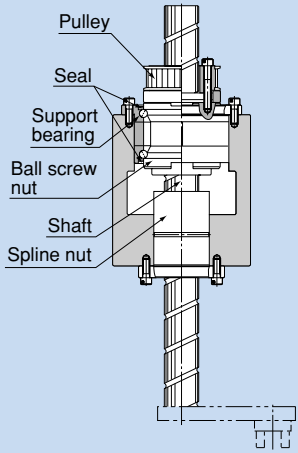


●Example of installing the ball screw nut and the spline nut input pulley both outside the housing. The housing length is minimized.

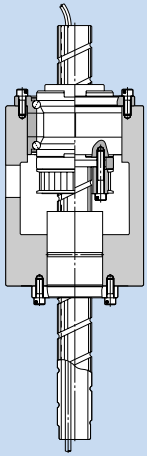


●Example of installing the ball screw nut pulley inside the housing.

Fig. 4 Example of Assembling Model BNS



●Example of installing the ball screw nut pulley outside the housing. The housing length is minimized.



●Example of installing the ball screw nut pulley inside the housing.

Fig. 5 Example of Assembling Model NS

Accuracy

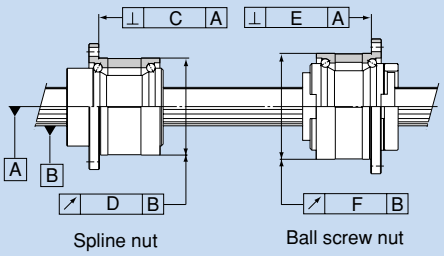
The Ball Screw/Spline is manufactured with the following specifications.

Ball Screw

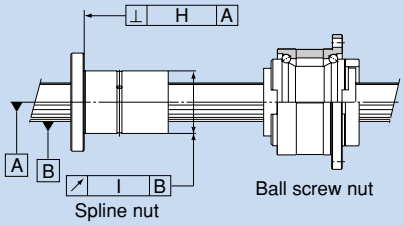
Axial clearance: 0 or less
Lead accuracy : C5
(For detailed specifications, see page k-8.)

Ball Spline

Axial clearance: 0 or less (CL: light preload)
(For detailed specifications, see page b-4.)
Lead accuracy : class H
(For detailed specifications, see page b-5.)



Model BNS



Model NS

Unit: mm

Model No.	C	D	E	F	H	I
BNS 0812 NS 0812	0.014	0.017	0.014	0.016	0.010	0.013
BNS 1015 NS 1015	0.014	0.017	0.014	0.016	0.010	0.013
BNS 1616 NS 1616	0.018	0.021	0.016	0.020	0.013	0.016
BNS 2020 NS 2020	0.018	0.021	0.016	0.020	0.013	0.016
BNS 2525 NS 2525	0.021	0.021	0.018	0.024	0.016	0.016
BNS 3232 NS 3232	0.021	0.021	0.018	0.024	0.016	0.016
BNS 4040 NS 4040	0.025	0.025	0.021	0.033	0.019	0.019
BNS 5050 NS 5050	0.025	0.025	0.021	0.033	0.019	0.019

Example of Use

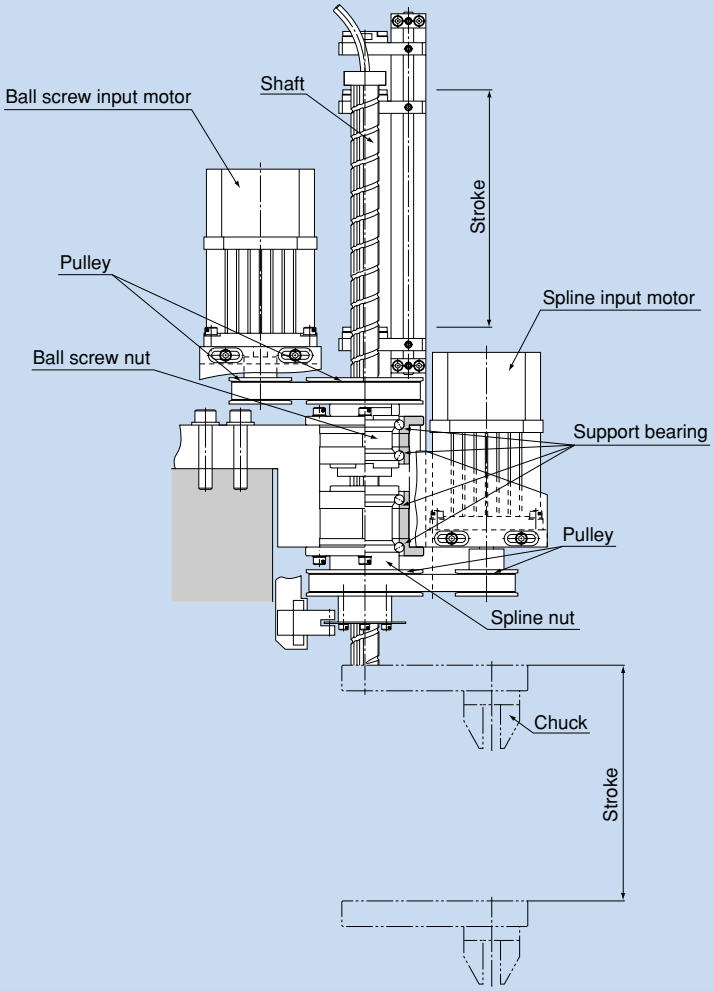


Fig. 6 Example of Using Model BNS

Precautions on Use

Lubrication

When lubricating the Ball Screw/Spline, attach the greasing plate to the housing in advance.

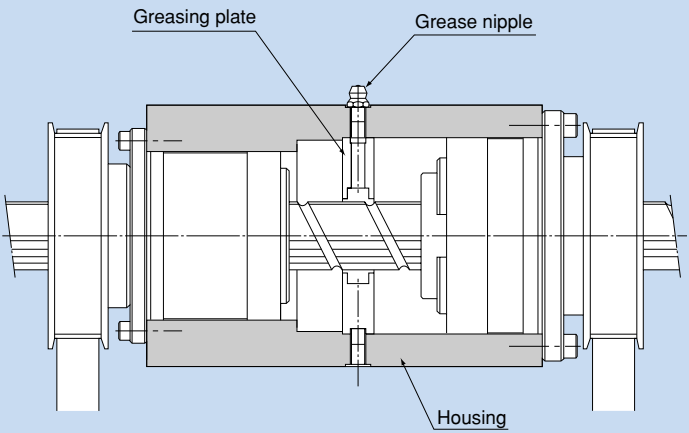
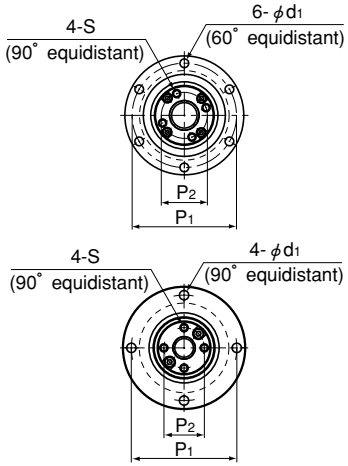


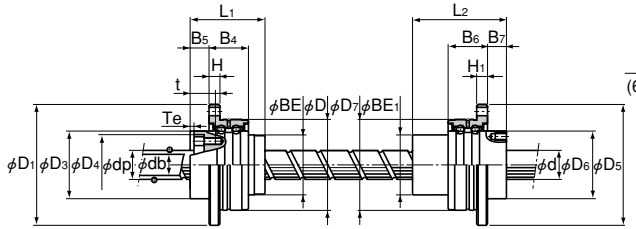
Fig. 7 Lubrication Method

Model BNS-A

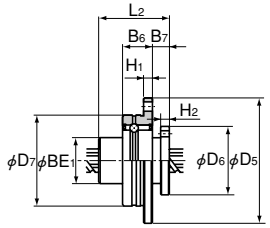
Compact Type: Linear Motion + Rotary Motion

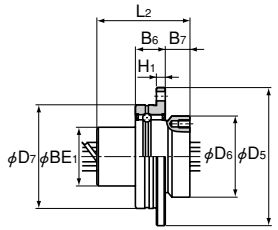


Models BNS 0812A and 1015A

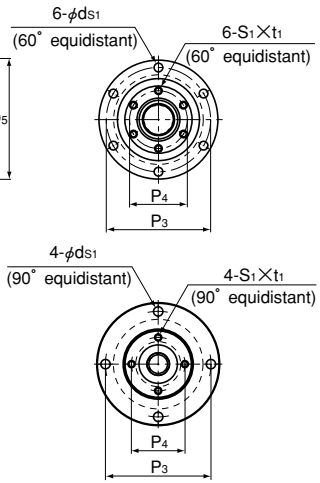


Model BNS 0812A





Model BNS 1015A



Models BNS 0812A and 1015A

Unit: mm

Model No.	Screw shaft outer diameter d	Screw shaft inner diameter dp	Lead R	Ball screw dimensions: Basic load rating Ca kN	Basic load rating C0a kN	Ball center diameter dp	Thread minor diameter dc	Outer diameter D g6	Flange diameter D1	Overall length L1	D3 h7	D4 H7	BE	H	B4	B5	Te	P1	P2	S	t	d1	Support bearing basic load rating Ca kN	Support bearing basic load rating C0a kN	Nut inertial moment kg·cm²	Screw shaft inertial moment J kg·cm²/mm
BNS 0812A	8	—	12	1.1	1.8	8.4	6.6	32	44	28.5	22	19	19	3	10.5	7	1.5	38	14.5	M2.6	10	3.4	0.8	0.5	0.03	3.16×10^{-5}
BNS 1015A	10	—	15	1.7	2.7	10.5	8.3	36	48	34.5	26	23	23	3	10.5	8	1.5	42	18	M3	11.5	3.4	0.9	0.7	0.08	7.71×10^{-5}
BNS 1616A	16	11	16	3.9	7.2	16.65	13.7	48	64	40	36	32	32	6	21	10	2	56	25	M4	13.5	4.5	8.7	10.5	0.35	3.92×10^{-4}
BNS 2020A	20	14	20	6.1	12.3	20.75	17.5	56	72	48	43.5	39	39	6	21	11	2.5	64	31	M5	16.5	4.5	9.7	13.4	0.85	9.37×10^{-4}
BNS 2525A	25	18	25	9.1	19.3	26	22	66	86	58	52	47	47	7	25	13	3	75	38	M6	20	5.5	12.7	18.2	2.12	2.2×10^{-3}
BNS 3232A	32	23	32	13	29.8	33.25	28.3	78	103	72	63	58	58	8	25	14	3	89	48	M6	21	6.6	13.6	22.3	5.42	5.92×10^{-3}
BNS 4040A	40	29	40	21.4	49.7	41.75	35.2	100	130	88	79.5	73	73	10	33	16.5	3	113	61	M8	24.5	9	21.5	36.8	17.2	1.43×10^{-2}

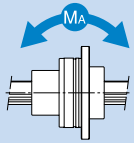
Model No.	Ball spline dimensions: Basic load rating C kN	Basic load rating C0 kN	Permissible static moment MA N·m	Basic torque rating CT N·m	Basic torque rating C0T N·m	Outer diameter D7 g6	Flange diameter D5	Overall length L2	D6 h7	BE1	H1	B6	B7	H2	P3	P4	S1×t1	ds1	Support bearing basic load rating C kN	Support bearing basic load rating C0 kN	Nut inertial moment kg·cm²
BNS 0812A	1.5	2.6	5.9	2	2.9	32	44	25	24	16	3	10.5	6	3	38	19	M2.6×3	3.4	0.6	0.2	0.03
BNS 1015A	2.7	4.9	15.7	3.9	7.8	36	48	33	28	21	3	10.5	9	—	42	23	M3×4	3.4	0.8	0.3	0.08
BNS 1616A	7.1	12.6	67.6	31.4	34.3	48	64	50	36	31	6	21	10	—	56	30	M4×6	4.5	6.7	6.4	0.44
BNS 2020A	10.2	17.8	118	56.8	55.8	56	72	63	43.5	35	6	21	12	—	64	36	M5×8	4.5	7.4	7.8	0.99
BNS 2525A	15.2	25.8	210	105	103	66	86	71	52	42	7	25	13	—	75	44	M5×8	5.5	9.7	10.6	2.2
BNS 3232A	20.5	34	290	180	157	78	103	80	63	52	8	25	17	—	89	54	M6×10	6.6	10.5	12.5	5.17
BNS 4040A	37.8	60.5	687	418	377	100	130	100	79.5	64	10	33	20	—	113	68	M6×10	9	16.5	20.7	16.1

Model number coding

BNS2020A +500L

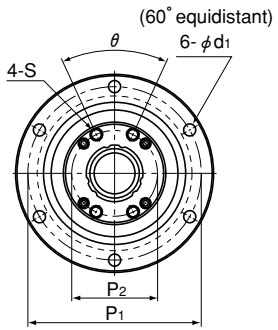
1 2

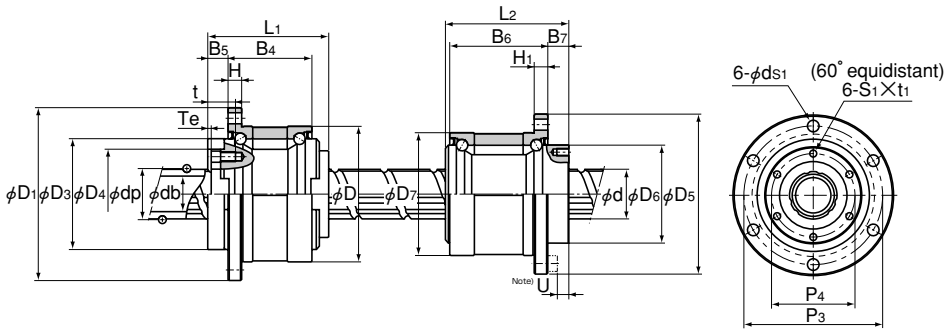
1 Model number 2 Overall shaft length (in mm)



Model BNS

Heavy-load Type: Linear Motion + Rotary Motion



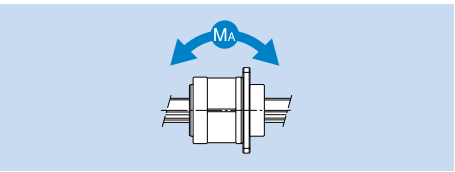


Unit: mm

Model No.	Screw shaft outer diameter d	Screw shaft inner diameter dp	Lead R	Ball screw dimensions: Basic load rating Ca kN	Basic load rating C0a kN	Ball center diameter dp	Thread minor diameter dc	Outer diameter D	Flange diameter D1	Overall length L1	D3 h7	D4 H7	H	B4	B5	Te	P1	P2	S	t	d1	θ°	Support bearing basic load rating Ca kN	Support bearing basic load rating C0a kN	Nut inertial moment kg·cm²	Screw shaft inertial moment J kg·cm²/mm
BNS 1616	16	11	16	3.9	7.2	16.65	13.7	52 $_{-0.007}^{0}$	68	43.5	40	32	5	27.5	9	2	60	25	M4	12	4.5	40	19.4	19.2	0.48	3.92×10^{-4}
BNS 2020	20	14	20	6.1	12.3	20.75	17.5	62 $_{-0.007}^{0}$	78	54	50	39	6	34	11	2	70	31	M5	16	4.5	40	26.8	29.3	1.44	9.37×10^{-4}
BNS 2525	25	18	25	9.1	19.3	26	22	72 $_{-0.007}^{0}$	92	65	58	47	8	43	12.5	3	81	38	M6	19	5.5	40	28.2	33.3	3.23	2.2×10^{-3}
BNS 3232	32	23	32	13	29.8	33.25	28.3	80 $_{-0.007}^{0}$	105	80	66	58	9	55	14	3	91	48	M6	19	6.6	40	30	39	6.74	5.92×10^{-3}
BNS 4040	40	29	40	21.4	49.7	41.75	35.2	110 $_{-0.008}^{0}$	140	98	90	73	11	68	16.5	3	123	61	M8	22	9	50	59.3	74.1	27.9	1.43×10^{-2}
BNS 5050	50	36	50	31.8	77.6	52.2	44.1	120 $_{-0.008}^{0}$	156	126	100	90	12	80	25	4	136	75	M10	28	11	50	62.2	83	58.2	3.52×10^{-2}

Model No.	Ball spline dimensions: Basic load rating C kN	Basic load rating C0 kN	Permissible static moment MA N·m	Basic torque rating CT N·m	Basic torque rating C0T N·m	Outer diameter D7	Flange diameter D5	Overall length L2	D6 h7	H1	B6	B7	P3	P4	S1×t1	ds1	U	Support bearing basic load rating C kN	Support bearing basic load rating C0 kN	Nut inertial moment kg·cm²
BNS 1616	7.1	12.6	67.6	31.4	34.3	52 $_{-0.007}^{0}$	68	50	39.5	5	37	10	60	32	M5×8	4.5	5	12.7	11.8	0.52
BNS 2020	10.2	17.8	118	56.8	55.8	56 $_{-0.007}^{0}$	72	63	43.5	6	48	12	64	36	M5×8	4.5	7	16.2	15.5	0.87
BNS 2525	15.2	25.8	210	105	103	62 $_{-0.007}^{0}$	78	71	53	6	55	13	70	45	M6×8	4.5	8	17.6	18	1.72
BNS 3232	20.5	34	290	180	157	80 $_{-0.007}^{0}$	105	80	65.5	9	60	17	91	55	M6×10	6.6	10	20.1	24	5.61
BNS 4040	37.8	60.5	687	418	377	100 $_{-0.008}^{0}$	130	100	79.5	11	74	23	113	68	M6×10	9	13	37.2	42.5	14.7
BNS 5050	60.9	94.5	1340	842	768	120 $_{-0.008}^{0}$	156	125	99.5	12	97	25	136	85	M10×15	11	13	41.6	54.1	62.5

Note Dimension U indicates the length from the head of the hexagon socket bolt to the ball screw nut end.



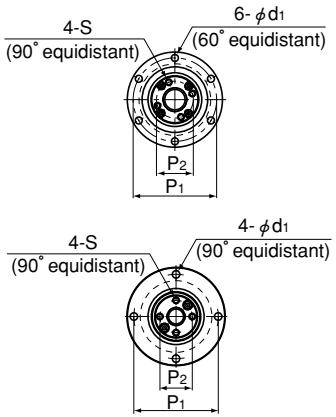
Model number coding

BNS2525 +600L

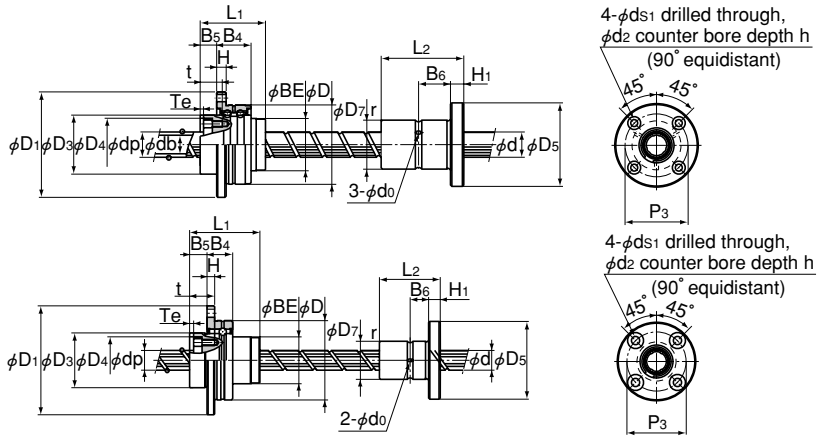
1 2

1 Model number 2 Overall shaft length (in mm)

Selecting a Model Number | Refer to the "THK General Catalog - Technical Descriptions of the Products," provided separately



Models NS 0812A and 1015A



Models NS 0812A and 1015A

Unit: mm

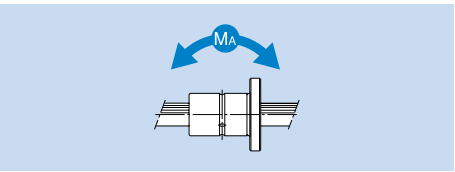
Model No.	Screw shaft outer diameter d	Screw shaft inner diameter dp	Lead R	Ball screw dimensions: Basic load rating Ca kN	Basic load rating C0a kN	Ball center diameter dp	Thread minor diameter dc	Outer diameter D g6	Flange diameter D1	Overall length L1	D3 h7	D4 H7	BE	H	B4	B5	Te	P1	P2	S	t	d1	Support bearing basic load rating Ca kN	Support bearing basic load rating C0a kN	Nut inertial moment kg·cm²	Screw shaft inertial moment J kg·cm²/mm
NS 0812A	8	—	12	1.1	1.8	8.4	6.6	32	44	28.5	22	19	19	3	10.5	7	1.5	38	14.5	M2.6	10	3.4	0.8	0.5	0.03	3.16×10^{-5}
NS 1015A	10	—	15	1.7	2.7	10.5	8.3	36	48	34.5	26	23	23	3	10.5	8	1.5	42	18	M3	11.5	3.4	0.9	0.7	0.08	7.71×10^{-5}
NS 1616A	16	11	16	3.9	7.2	16.65	13.7	48	64	40	36	32	32	6	21	10	2	56	25	M4	13.5	4.5	8.7	10.5	0.35	3.92×10^{-4}
NS 2020A	20	14	20	6.1	12.3	20.75	17.5	56	72	48	43.5	39	39	6	21	11	2.5	64	31	M5	16.5	4.5	9.7	13.4	0.85	9.37×10^{-4}
NS 2525A	25	18	25	9.1	19.3	26	22	66	86	58	52	47	47	7	25	13	3	75	38	M6	20	5.5	12.7	18.2	2.12	2.2×10^{-3}
NS 3232A	32	23	32	13	29.8	33.25	28.3	78	103	72	63	58	58	8	25	14	3	89	48	M6	21	6.6	13.6	22.3	5.42	5.92×10^{-3}
NS 4040A	40	29	40	21.4	49.7	41.75	35.2	100	130	88	79.5	73	73	10	33	16.5	3	113	61	M8	24.5	9	21.5	36.8	17.2	1.43×10^{-2}

Model No.	Ball spline dimensions: Basic load rating C kN	Basic load rating C0 kN	Permissible static moment MA N·m	Basic torque rating CT N·m	Basic torque rating C0T N·m	Outer diameter D7	Flange diameter D5 -0.2	Overall length L2	H1	B6	r	Greasing hole d0	P3	Mounting hole ds1	Mounting hole d2	Mounting hole h
NS 0812A	1.5	2.6	5.9	2	2.9	16 $^{0}_{-0.011}$	32	25	5	7.5	0.5	1.5	24	3.4	6.5	3.3
NS 1015A	2.8	4.9	15.7	3.9	7.8	21 $^{0}_{-0.013}$	42	33	6	10.5	0.5	1.5	32	4.5	8	4.4
NS 1616A	7.1	12.6	67.6	31.4	34.3	31 $^{0}_{-0.013}$	51	50 $^{0}_{-0.2}$	7	18	0.5	2	40	4.5	8	4.4
NS 2020A	10.2	17.8	118	56.8	55.8	35 $^{0}_{-0.016}$	58	63 $^{0}_{-0.2}$	9	22.5	0.5	2	45	5.5	9.5	5.4
NS 2525A	15.2	25.8	210	105	103	42 $^{0}_{-0.016}$	65	71 $^{0}_{-0.3}$	9	26.5	0.5	3	52	5.5	9.5	5.4
NS 3232A	20.5	34	290	180	157	49 $^{0}_{-0.016}$	77	80 $^{0}_{-0.3}$	10	30	0.5	3	62	6.6	11	6.5
NS 4040A	37.8	60.5	687	418	377	64 $^{0}_{-0.019}$	100	100 $^{0}_{-0.3}$	14	36	0.5	4	82	9	14	8.6

Model number coding

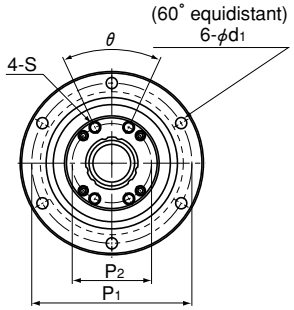
NS2020A +500L
1 2

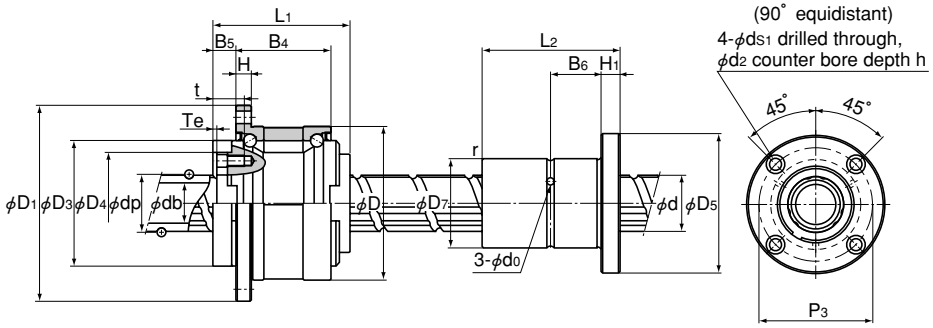
1 Model number 2 Overall shaft length (in mm)



Model NS

Heavy-load Type: Linear Motion





Unit: mm

Model No.	Screw shaft outer diameter d	Screw shaft inner diameter dp	Lead R	Ball screw dimensions: Basic load rating Ca kN	Basic load rating C0a kN	Ball center diameter dp	Thread minor diameter dc	Outer diameter D	Flange diameter D1	Overall length L1	D3 h7	D4 H7	H	B4	B5	Te	P1	P2	S	t	d1	θ°	Support bearing basic load rating Ca kN	Support bearing basic load rating C0a kN	Nut inertial moment kg·cm²	Screw shaft inertial moment J kg·cm²/mm
NS 1616	16	11	16	3.9	7.2	16.65	13.7	52 $^{0}_{-0.007}$	68	43.5	40	32	5	27.5	9	2	60	25	M4	12	4.5	40	19.4	19.2	0.48	3.92×10^{-4}
NS 2020	20	14	20	6.1	12.3	20.75	17.5	62 $^{0}_{-0.007}$	78	54	50	39	6	34	11	2	70	31	M5	16	4.5	40	26.8	29.3	1.44	9.37×10^{-4}
NS 2525	25	18	25	9.1	19.3	26	22	72 $^{0}_{-0.007}$	92	65	58	47	8	43	12.5	3	81	38	M6	19	5.5	40	28.2	33.3	3.23	2.2×10^{-3}
NS 3232	32	23	32	13	29.8	33.25	28.3	80 $^{0}_{-0.007}$	105	80	66	58	9	55	14	3	91	48	M6	19	6.6	40	30	39	6.74	5.92×10^{-3}
NS 4040	40	29	40	21.4	49.7	41.75	35.2	110 $^{0}_{-0.008}$	140	98	90	73	11	68	16.5	3	123	61	M8	22	9	50	59.3	74.1	27.9	1.43×10^{-2}
NS 5050	50	36	50	31.8	77.6	52.2	44.1	120 $^{0}_{-0.008}$	156	126	100	90	12	80	25	4	136	75	M10	28	11	50	62.2	83	58.2	3.52×10^{-2}

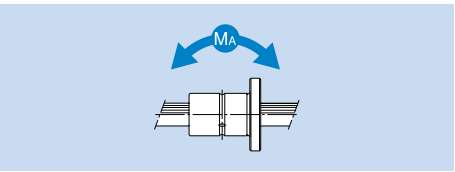
Model No.	Ball spline dimensions: Basic load rating C kN	Basic load rating C0 kN	Permissible static moment MA N·m	Basic torque rating CT N·m	Basic torque rating C0T N·m	Outer diameter D7	Flange diameter D5	Overall length L2	H1	B6	r	Greasing hole d0	P3	Mounting hole ds1	Mounting hole d2	Mounting hole h
NS 1616	7.1	12.6	67.6	31.4	34.3	31 $^{0}_{-0.013}$	51	50 $^{0}_{-0.2}$	7	18	0.5	2	40	4.5	8	4.4
NS 2020	10.2	17.8	118	56.9	55.9	35 $^{0}_{-0.016}$	58	63 $^{0}_{-0.2}$	9	22.5	0.5	2	45	5.5	9.5	5.4
NS 2525	15.2	25.8	210	105	103	42 $^{0}_{-0.016}$	65	71 $^{0}_{-0.3}$	9	26.5	0.5	3	52	5.5	9.5	5.4
NS 3232	20.5	34	290	180	157	49 $^{0}_{-0.016}$	77	80 $^{0}_{-0.3}$	10	30	0.5	3	62	6.6	11	6.5
NS 4040	37.8	60.5	687	419	377	64 $^{0}_{-0.019}$	100	100 $^{0}_{-0.3}$	14	36	0.5	4	82	9	14	8.6
NS 5050	60.9	94.5	1340	842	769	80 $^{0}_{-0.019}$	124	125 $^{0}_{-0.3}$	16	46.5	1	4	102	11	17.5	11

Model number coding

NS2525 +600L

1 2

1 Model number 2 Overall shaft length (in mm)



Rolled Ball Screw

THK Rolled Ball Screws are low-priced feed screws that use a screw shaft rolled with high accuracy and specially surface-ground, instead of an expensive thread-ground shaft used in Precision Ball Screws.
The ball raceways of the ball screw nut are all thread-ground, thus to achieve a smaller axial clearance and smoother motion than the conventional rolled ball screw.
In addition, a wide array of types are offered as standard in order to allow optimal products to be selected according to the application.

Structure and Features

●Achieves Lead Accuracy of Class C7

Screw shafts with travel distance error of classes C7 and C8 are also manufactured as standard in addition to class C10 to meet a broad range of applications.

Travel distance error: C7 :±0.05/300(mm)
C8 :±0.10/300(mm)
C10 :±0.21/300(mm)

(For manufacturing length limits of screw shaft by accuracy grade, see page k-17.)

●Achieves Roughness of the Ball Raceways of the Screw Shaft at 0.20 a or Less

The surface of the screw shaft's ball raceways is specially ground after the shaft is rolled to ensure surface roughness of 0.20 a or less, which is equal to that of the ground thread of Precision Ball Screw.

●The Ball Raceways of the Ball Screw Nut are All Finished by Grinding

THK finishes the ball raceways of Rolled Ball Screw nuts by grinding, just as Precision Ball Screws, to secure durability and smooth motion.

●Low Price

The screw shaft is induction-hardened or carburized after being rolled, and its surface is then specially ground. This allows the rolled Ball Screw to be priced lower than the Precision Ball Screw with a ground thread.

●High Dust-prevention Effect

The ball screw nut is incorporated with a compact labyrinth seal or a brush seal. This achieves low friction, high dust-prevention effect and a longer service life of the Ball Screw.

Machining of the Screw Shaft Ends

To facilitate additional machining of the screw shaft of the Rolled Ball Screw after it is delivered, the screw shaft is separated from the ball screw nut, which is installed on a temporary shaft, when delivered.
However, model MTF is delivered with the nut installed on the screw shaft as shown in Fig. 1.
A part (ℓ_1) of the end section of the shaft on the flange side of the nut is not hardened so that it can additionally be machined easily through lathe turning, milling or the like.
When setting a stroke, be sure it is within the hardened area shown in Fig. 1

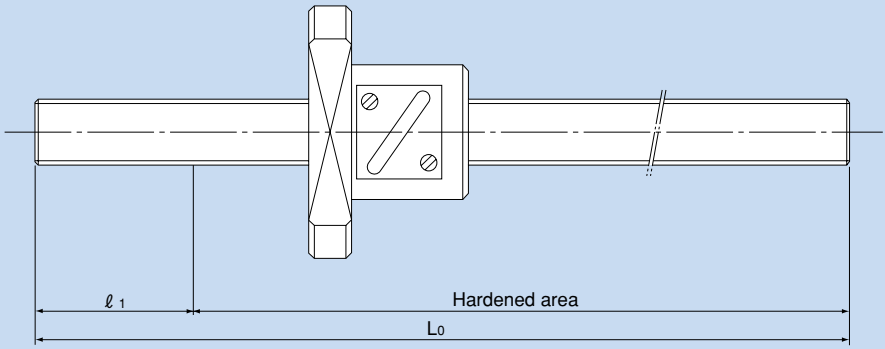


Fig. 1

Model No.	Standard shaft length L_0	ℓ_1
MTF 0601-3.7	150, 250	50
MTF 0802-3.7	150, 250	55
MTF 1002-3.7	200, 300	60
MTF 1202-3.7	200, 300	60

Procedure for Additionally Machining the Screw Shaft Ends

For model MTF, follow the procedure below before performing the additional machining.

Steps for Additional Machining (Lathe Turning, Cylindrical Grinding)

1. Firmly fasten the ball screw nut in place by binding both ends with a tape or the like together with the plastic wrapping so that the nut does not move when the shaft is rotated.
2. Slide the plastic wrapping covering the portion to be additionally machined toward the ball screw nut, and secure the wrapping with a tape or the like to prevent cutting chips or other foreign matter from entering the wrapping.

When additionally machining the screw shaft ends, identify the center from the screw shaft outer diameter before performing the additional machining.

The screw surface is surface-hardened (58 to 64 HRC) by induction or carburizing. Removing the hardened surface through lathing (using a carbide tool) or grinding will facilitate the additional machining of the end section.

Alternatively, the shaft ends can be annealed. When annealing the shaft end, be sure to keep the remaining portion of the shaft cool using water or the like to prevent the heat on the shaft end from transmitting to the area of the shaft where the ball screw nut will rotate.

Adjusting the tool feed to the lead will facilitate the lathing or grinding.

Make sure the outer diameter of the shaft end must be smaller than the thread minor diameter indicated in the dimensional table.

* THK will perform the additional machining of the screw shaft ends at your request.
  Contact THK for details.

Assembly

When transferring the nut of the Rolled Ball Screw from the temporary shaft to the screw shaft, make sure the dimensions and the shape of the linking section are appropriate. If they are not, an accident such as falling balls may occur.

When butting the temporary shaft directly against the screw shaft end, firmly hold the temporary shaft against the screw shaft so that the centers of both shafts are matched, then lightly pressing the nut against the screw shaft and turn it in the advancing direction to move the nut onto the screw shaft (Fig. 2). If the nut does not transfer to the screw shaft smoothly or is blocked halfway, do not force the screw shaft into the nut, and recheck the status.

If the temporary shaft cannot be butted directly against the screw shaft as a result of additionally machining the shaft ends, wrap the newly machined section of the shaft with a tape or the like so that the diameter of the screw shaft end including the tape match that of the temporary shaft, and then follow the steps above to transfer the nut to the screw shaft (Fig. 3).

If there is a groove or notch in the screw shaft end, fill the recess before transferring the nut.

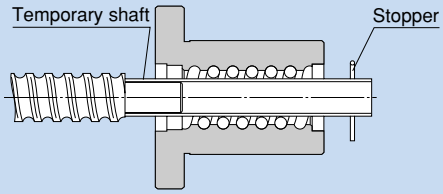


Fig. 2

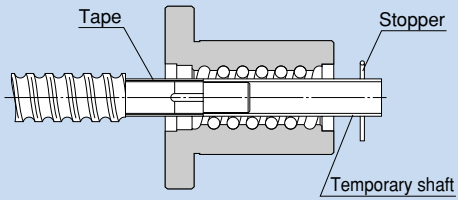


Fig. 3

Examples of Assembling the Ball Screw

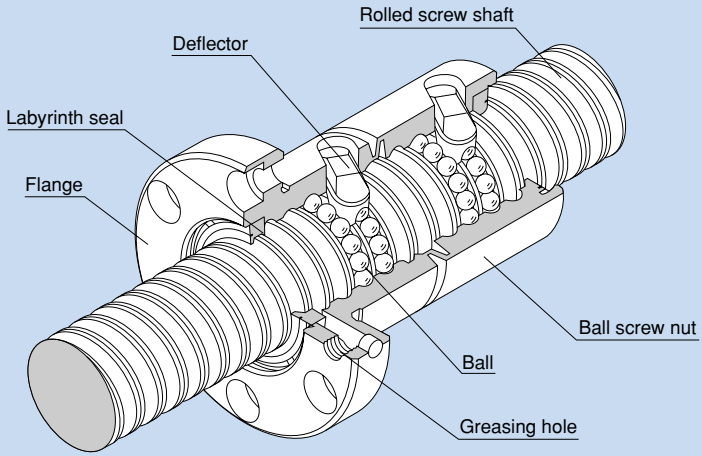


Fig. 1 Structure of Model JPF

Structure and Features

With Constant-Pressure Preload Type Ball Screw model JPF, a phase difference is provided between the right and left threads of the ball screw nut, which are precision-ground, and a rolled screw shaft is installed into the ball screw nut. Since it adopts the constant-pressure preloading method based on a spring structure formed in the middle of the ball screw nut, model JPF is capable of absorbing a pitch error and eccentricity of the ball screw nut and the screw shaft. As a result, this model achieves no torque fluctuation and no backlash.

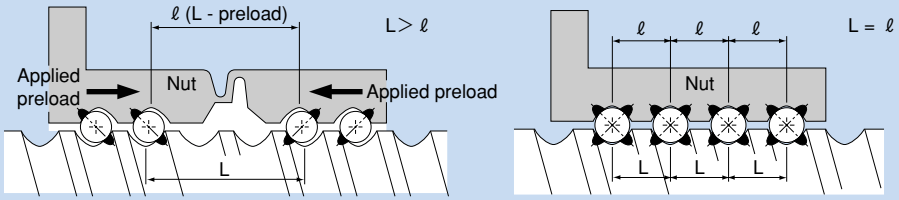


Fig. 2 Preloading Mechanisms

●No Backlash

The spring structure incorporated into the nut absorbs the pitch error between the ball screw nut and the screw shaft, the taper of the screw shaft and the eccentricity of the screw shaft, thus allowing zero-backlash to be achieved despite a low-price rolled shaft.

Backlash Measurements

[Sample model] JPF2505-6
Shaft diameter: 25mm
Lead: 5mm

[Measurement procedure]

① Mount model JPF onto a single-axis table.
② Place a laser displacement meter, and measure the table position at that time as the origin (reset the laser displacement meter to zero).
③ Apply an axial load to the table from the positive direction, then release the axial load and measure the table position at that time with the laser displacement meter.
④ Apply an axial load to the table from the negative direction, then release the axial load and measure the table position at that time with the laser displacement meter.

The maximum difference between the measurements obtained in steps ③ and ④ is regarded as the backlash.

[Measurements]

Table 1 Backlash Measurements

Unit: mm

Item	Position measurement
Origin	+0.0000
Load applied in the positive direction, then released	+0.0003
Load applied in the negative direction, then released	−0.0001
Backlash	0.0004

●Smooth Motion Even under a Preload

The spring structure incorporated in the nut provides a constant preload thereby to absorb the pitch error between the ball screw nut and the screw shaft, the taper of the screw shaft and the eccentricity of the screw shaft. Thus, smooth motion without a backlash is achieved.

Rotation Torque Measurements

[Sample model] JPF2505-6G0+500LT
Shaft diameter: 25mm
Lead: 5mm
Stroke length: 450mm

[Measurement conditions]
Measurement method: Torque measurement machine
Rotation speed per minute: 100min^{-1}
Lubrication method: Grease lubrication
[Measurement result]
Forward rotation: 0.07 to 0.10 N-m
Reverse rotation: 0.07 to 0.11 N-m

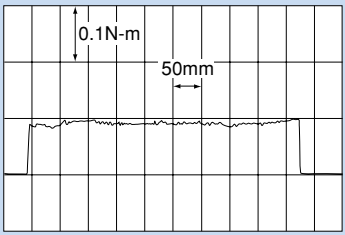


Fig. 3 Rotation Torque Measurements (Forward Rotation)

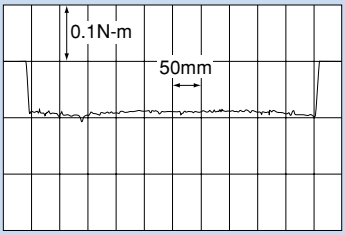


Fig. 4 Rotation Torque Measurements (Reverse Rotation)

●Highly Accurate Positioning Repeatability

Since model JPF has no axial clearance, using THK LM Guide on the guide surface will achieve highly accurate positioning repeatability without stick slip.

Positioning Repeatability Measurements

[Sample model] JPF2505-6
Shaft diameter: 25mm
Lead: 5mm
Guide surface: LM Guide model SR25W

[Measurement procedure]

① Mount model JPF onto a single-axis table.
② Place a laser displacement meter.
③ Move the table 50 mm from the motor side, and reset the laser displacement meter to zero as the origin.
④ Move the table 50 mm toward the motor and move back the table 50 mm toward the motor. Measure the position of the table using the laser displacement meter.
⑤ Repeat steps ③ and ④ seven times.

Divide the maximum difference in the measurements above by two; the result obtained is the positioning repeatability.

[Measurement result]

Table 2 Positioning Repeatability Measurements

Unit: mm

Item	Position measurement
After 1 reciprocation	+0.0000
After 2 reciprocations	+0.0002
After 3 reciprocations	+0.0000
After 4 reciprocations	−0.0001
After 5 reciprocations	−0.0001
After 6 reciprocations	−0.0002
After 7 reciprocations	−0.0001
Positioning repeatability	±0.0002

●High Wobbling (Fluctuation/2π) Accuracy

Since the screw shaft raceways are rolled with highly accuracy, high wobbling (fluctuation/2π) accuracy is achieved although the screw shaft is rolled.
Wobbling (fluctuation/2π): fluctuation in lead accuracy during one rotation of the screw shaft

Wobbling (Fluctuation/2π) Measurements

[Sample model] JPF2505-6
Shaft diameter: 25mm
Lead: 5mm

[Measurement procedure]

① Mount model JPF onto a single-axis table.
② Place a laser displacement meter.
③ Move the table 50 mm from the motor side, and reset the laser displacement meter to zero as the origin.
④ Rotate the motor by 1/10 revolution (equivalent to 0.5 mm) at a time. Measure the difference between the position of the table and the designated value using the laser displacement meter.
⑤ Repeat step ④ until the motor rotates one revolution.

The fluctuation in the measurements above is the wobbling (fluctuation/2π).

[Measurement result]

Table 3 Wobbling Accuracy Measurements

Unit: mm

Stroke position	Position error measurement
Origin	+0.0000
+0.500	+0.0002
+1.000	+0.0009
+1.500	+0.0015
+2.000	+0.0023
+2.500	+0.0021
+3.000	+0.0013
+3.500	+0.0004
+4.000	−0.0005
+4.500	−0.0002
+5.000	+0.0000
Wobbling	0.0028

●Absorbs Misalignment

Since the ball screw nut contacts the balls in DF (face-to-face duplex) configuration, the moment load on the ball screw nut caused by misalignment in mounting accuracy (e.g., perpendicularity of the flange mounting surface and misalignment between the LM Guide and the screw shaft) is minimized to suppress the torque fluctuation after assembly.

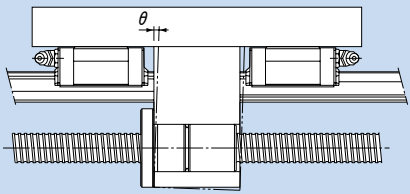


Fig. 5 Misalignment of the Flange Mounting Surface

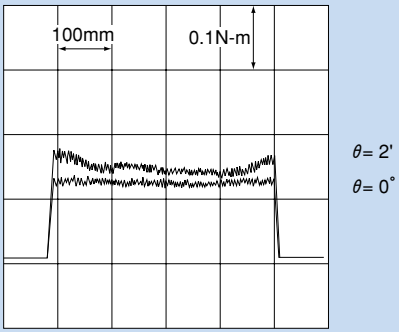


Fig. 6 Torque Fluctuation with DF Configuration (Model JPF)

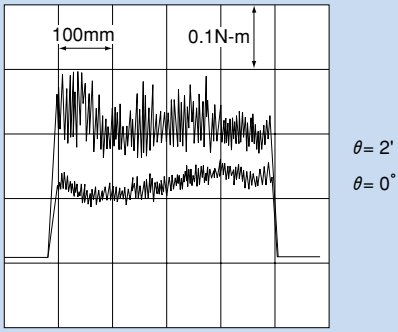


Fig. 7 Torque Fluctuation of a Ball Screw with DB Configuration

●Compact

The internal circulation structure using a deflector reduces the outer diameter of the ball screw nut to 70 to 80% of a return-pipe type Ball Screw.

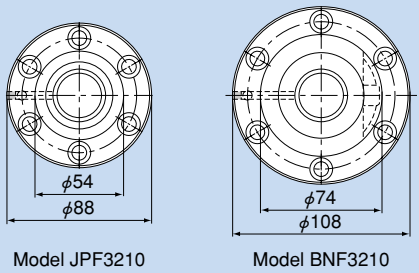


Fig. 8 Comparison of Outer Diameter of the Ball Screw Nut

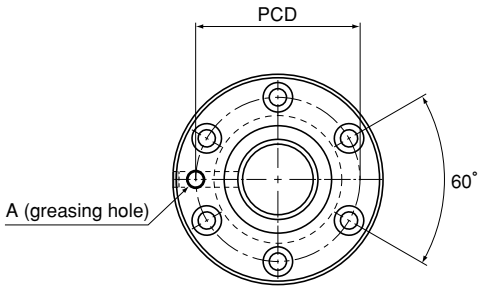
Type

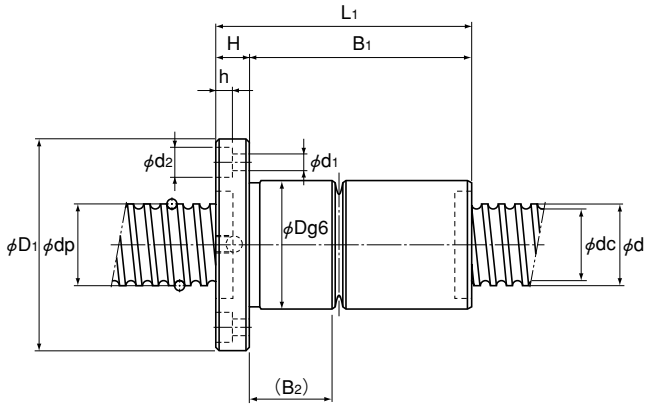
Constant-Pressure Preload Type Model JPF

Axial clearance: 0 or less

Model JPF

Constant-Pressure Preload Type Rolled Ball Screw





Unit: mm

Model No.	Screw shaft outer diameter d	Lead R	Ball center diameter dp	Thread minor diameter dc	No. of loaded circuits Rows x turns	Basic load rating Ca kN	Basic load rating C0a kN	Nut dimensions Outer diameter D	Flange diameter D1	Overall length L1	H	B1	B2	PCD	d1×d2×h	Greasing hole A	Screw shaft inertial moment/mm kg·cm²/mm
JPF 1404-4	14	4	14.4	11.5	2×1	2.8	5.1	26	46	52	10	42	16.5	36	4.5×8×4.5	M6	2.96×10^{-4}
JPF 1405-4		5	14.5	11.2	2×1	3.9	8.6	26	46	60	10	50	20	36	4.5×8×4.5	M6	2.96×10^{-4}
JPF 1605-4	16	5	16.75	13.5	2×1	3.7	8.2	30	49	60	10	50	19.5	39	4.5×8×4.5	M6	5.05×10^{-4}
JPF 2005-6	20	5	20.5	17.2	3×1	6	16	34	57	80	11	69	26.5	45	5.5×9.5×5.5	M6	1.23×10^{-3}
JPF 2505-6	25	5	25.5	22.2	3×1	6.9	20.8	40	66	80	11	69	26	51	5.5×9.5×5.5	M6	3.01×10^{-3}
JPF 2510-4		10	26.8	20.2	2×1	11.4	24.5	47	72	112	12	100	42	58	6.6×11×6.5	M6	3.01×10^{-3}
JPF 2805-6	28	5	28.75	25.2	3×1	7.3	23.9	43	69	80	12	68	25	55	6.6×11×6.5	M6	4.74×10^{-3}
JPF 2806-6		6	28.5	25.2	3×1	7.3	23.9	43	69	90	12	78	35	55	6.6×11×6.5	M6	4.74×10^{-3}
JPF 3210-6	32	10	33.75	27.2	3×1	19.3	49.9	54	88	135	15	120	53.5	70	9×14×8.5	M6	8.08×10^{-3}
JPF 3610-6	36	10	37	30.5	3×1	20.6	56.2	58	98	138	18	120	53.5	77	11×17.5×11	M6	1.29×10^{-2}
JPF 4010-6	40	10	41.75	35.2	3×1	22.2	65.3	62	104	138	18	120	53.5	82	11×17.5×11	PT 1/8	1.97×10^{-2}

Note The ball screw nut and the screw shaft of model JPF are not sold alone.

Model number coding

JPF2005-6 RR G0 +500L C7 T

1 2 3 4 5 6

1 Model number
2 Seal symbol - RR: Labyrinth seal attached to both ends of the ball screw nut (see page k-25)
3 Axial clearance symbol (see page k-15) 4 Overall screw shaft length (mm)
5 Accuracy symbol (see page k-8) (no symbol for class C10) 6 Symbol for rolled shaft

Selecting a Model Number Refer to the "THK General Catalog - Technical Descriptions of the Products," provided separately

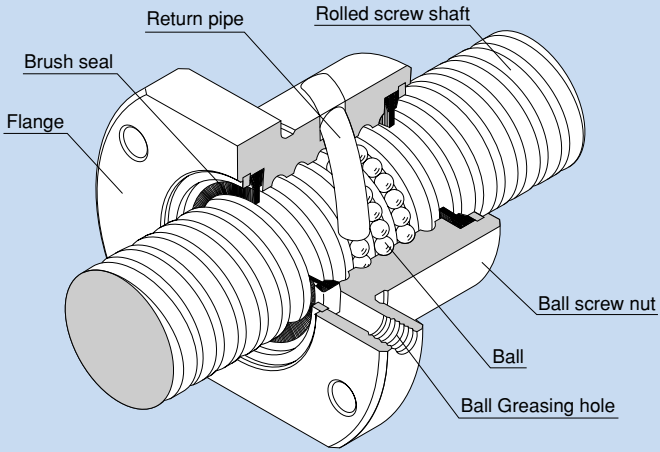


Fig. 1 Structure of the Return-Pipe Nut

Structure and Features

With the Return-Pipe Nut, balls under a load roll around the circumference of the screw shaft, while receiving an axial load on the ball raceways formed between the screw shaft and the ball screw nut, then pass through the return pipe incorporated in the ball screw nut and circulate back to the loaded area, thus to achieve infinite motion.

●Allows Easy Machining of the Ball Screw Nut Mounting Holes

Since model BTK has a return pipe incorporated in the ball screw nut, its exterior is compact and space saving. As opposed to the conventional model whose return pipe sticks out of the circumference, the mounting holes on the housing of model BTK can easily be formed through simple lathing because it is unnecessary to cut a recess for the return pipe by milling. As a result, the required man-hours can be reduced.

●Allows Low Shaft Center Position

With models BTK and MTF, the flange circumference is cut flat at the top and bottom, allowing the shaft center to be positioned lower than the conventional type with a round flange.

●Easy Installation

Model BNT has a square ball screw nut equipped with screw holes for installation to eliminate the need for a housing and allows compact design.

●High Dust Prevention Effect

The ball screw nut of models BTK and BNT is incorporated with a highly dust preventive brush seal.

Types and Features

Non-preload Type Model BTK

A compact type with a round nut incorporated with a return pipe. The flange circumference is cut flat at the top and bottom, allowing the shaft center to be positioned low.

Non-preload Type Model MTF

A miniature type with a screw shaft diameter of ϕ6 to ϕ12 mm and a lead of 1 to 2 mm.

Square Ball Screw Nut, Non-preload Type Model BNT

Since it has a square ball screw nut equipped with screw holes for installation, this model can compactly be installed directly to the machine body without a housing.

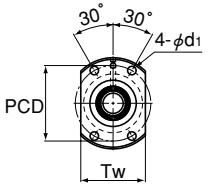
Model BTK
Rolled Ball Screw

Note The rigidity values in the table represent spring constants each obtained from the load and the elastic displacement when providing an axial load 30% of the basic dynamic load rating (Ca).
These values do not include the rigidity of the components related to mounting the ball screw nut. Therefore, it is normally appropriate to regard roughly 80% of the value in the table as the actual value.
If the axial load (Fa) is not 0.3 Ca, the rigidity value (K_N) is obtained from the following equation.

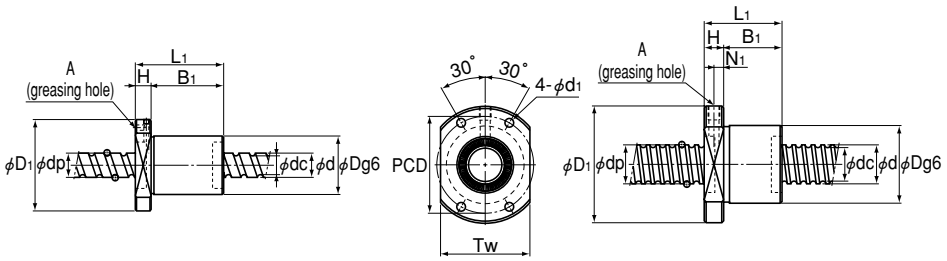
where

$$K_N = K\left(\frac{Fa}{0.3Ca}\right)^{\frac{1}{3}}$$

K: Rigidity value in the dimensional table.



Models BTK 1006 and 1208



Models BTK 1404 to 5016

Unit: mm

Model No.	Screw shaft outer diameter d	Lead R	Ball center diameter dp	Thread minor diameter dc	No. of loaded circuits Rows x turns	Basic load rating Ca kN	Basic load rating C0a kN	Rigidity K N/μm	Nut dimensions: Outer diameter D	Flange diameter D1	Overall length L1	H	B1	PCD	d1	Tw	Greasing hole N1	Greasing hole A	Axial clearance	Standard shaft length	Screw shaft inertial moment/mm kg·cm²/mm
BTK 1006-2.6	10	6	10.5	7.8	1×2.65	2.8	4.9	88	26	42	36	8	28	34	4.5	29	—	3	0.05	200,300	7.71×10^{-5}
BTK 1208-2.6	12	8	12.65	9.7	1×2.65	3.8	6.8	108	29	45	44	8	36	37	4.5	32	—	3	0.05		1.6×10^{-4}
BTK 1404-3.6	14	4	14.4	11.5	1×3.65	5.5	11.5	150	31	50	40	10	30	40	4.5	37	5	M6	0.1	500,1000	2.96×10^{-4}
BTK 1405-2.6		5	14.5	11.2	1×2.65	5	11.4	116	32	50	40	10	30	40	4.5	38	5	M6	0.1		2.96×10^{-4}
BTK 1605-2.6	16	5	16.75	13.5	1×2.65	5.4	13.3	130	34	54	40	10	30	44	4.5	40	5	M6	0.1		5.05×10^{-4}
BTK 1808-3.6	18	8	19.3	14.4	1×3.65	13.1	31	210	50	80	61	12	49	65	6.6	60	5	M6	0.1		8.09×10^{-4}
BTK 2005-2.6	20	5	20.5	17.2	1×2.65	6	16.5	150	40	60	40	10	30	50	4.5	46	5	M6	0.1	500,1000 1500	1.23×10^{-3}
BTK 2010-2.6		10	21.25	16.4	1×2.65	10.6	25.1	160	52	82	61	12	49	67	6.6	64	5	M6	0.1		1.23×10^{-3}
BTK 2505-2.6	25	5	25.5	22.2	1×2.65	6.7	20.8	180	43	67	40	10	30	55	5.5	50	5	M6	0.1		3.01×10^{-3}
○ BTK 2510-5.3		10	26.8	20.2	2×2.65	31.2	83.7	400	60	96	98	15	83	78	9	72	5	M6	0.1		3.01×10^{-3}
BTK 2806-2.6	28	6	28.5	25.2	1×2.65	7	23.4	200	50	80	47	12	35	65	6.6	60	6	M6	0.1	500,1000 2000,2500	4.74×10^{-3}
BTK 2806-5.3			28.5	25.2	2×2.65	12.8	46.8	390	50	80	65	12	53	65	6.6	60	6	M6	0.1		4.74×10^{-3}
○ BTK 3210-2.6	32	10	33.75	27.2	1×2.65	19.8	53.8	250	67	103	68	15	53	85	9	78	5	M6	0.14		8.08×10^{-3}
○ BTK 3210-5.3			33.75	27.2	2×2.65	36	107.5	490	67	103	98	15	83	85	9	78	5	M6	0.14		8.08×10^{-3}
○ BTK 3610-2.6	36	10	37	30.5	1×2.65	20.8	59.8	270	70	110	70	17	53	90	11	82	7	M6	0.17	500,1000,2000, 2500,3000	1.29×10^{-2}
○ BTK 3610-5.3			37	30.5	2×2.65	37.8	118.7	530	70	110	100	17	83	90	11	82	7	M6	0.17		1.29×10^{-2}
○ BTK 4010-5.3	40	10	41.75	35.2	2×2.65	40.3	134.9	590	76	116	100	17	83	96	11	88	7	M6	0.17	1000,1500	1.97×10^{-2}
BTK 4512-5.3	45	12	46.5	39.2	2×2.65	49.5	169	650	82	128	118	20	98	104	14	94	8	M6	0.17	2000,3000	3.16×10^{-2}
○ BTK 5016-5.3	50	16	52.7	42.9	2×2.65	93.8	315.2	930	102	162	145	25	120	132	18	104	12.5	PT 1/8	0.2	3500	4.82×10^{-2}

Note Those models marked with ○ can be attached with QZ Lubricator or the wiper ring.
For dimensions of the ball screw nut with either accessory being attached, see page k-260.

Model number coding BTK1405-2.6 ZZ
Ball Screw Nut
1 2

1 Model number
2 Seal symbol - no symbol: without seal;
ZZ: brush seal attached to both ends of the ball screw nut (see page k-25)

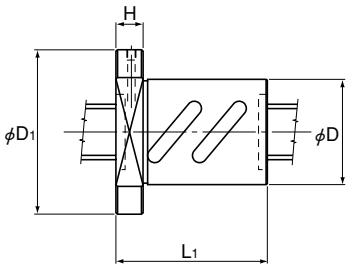
Model number coding TS 14 05 +500L C7
Screw Shaft
1 2 3 4 5

1 Symbol for rolled ball screw shaft
2 Screw shaft outer diameter (in mm)
3 Lead (in mm) 4 Overall screw shaft length (in mm)
5 Accuracy symbol (see page k-8) (no symbol for class C10)

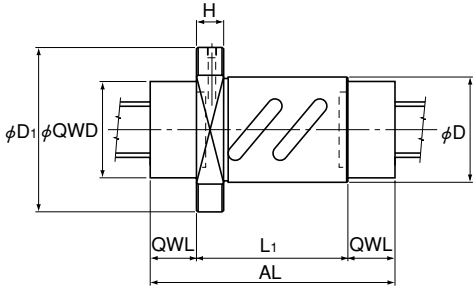
Model number coding BTK1405-2.6 ZZ +500L C7 T
Combination of the Ball Screw Nut and the Screw Shaft
1 2 3 4 5

1 Model number
2 Seal symbol - no symbol: without seal;
ZZ: brush seal attached to both ends of the ball screw nut (see page k-25)
3 Overall shaft length (in mm) 4 Accuracy symbol (see page k-8) (no symbol for class C10)
5 Symbol for rolled shaft

Dimensions of the Ball Screw Nut Attached with Wiper Ring (WW) and QZ Lubricator (QZ)



With WW (without QZ)



With QZ + WW

Unit: mm

Model No.	Dimensions including WW				Dimensions including QZ and WW		
	Nut length	Flange width	Flange diameter	Nut diameter	Length	Outer diameter	Overall length incl. QZ and WW
	L_1	H	D_1	Dg6	QWL	QWD	AL
BTK 2510-5.3	98	15	96	60	32.5	45	163
BTK 3210-2.6	68	15	103	67	32	57	132
BTK 3210-5.3	98						162
BTK 3610-2.6	70	17	110	70	31	64	132
BTK 3610-5.3	100						162
BTK 4010-5.3	100	17	116	76	34	66	168
BTK 5016-5.3	145	25	162	102	35	79	215

Model number coding

BTK2510-5.3 QZ WW +1000L C7 T

1 2 3 4 5 6

1 Model number 2 With QZ Lubricator (see page k-22)
3 Seal symbol - RR : Labyrinth seal attached to both ends of the ball screw nut (see page k-25)
WW : Wiper ring attached to both ends of the ball screw nut (see page k-26)
4 Overall screw shaft length (mm) 5 Accuracy symbol (see page k-8) (no symbol for class C10)
6 Symbol for rolled shaft

Note QZ Lubricator and wiper ring are not sold alone.

Precautions on Use

THK QZ Lubricator for the Ball Screw

Handling

- Dropping or hitting the product may damage it. Use much care when handling it.
- Unduly disassembling the product may cause foreign matter from entering the product or degrade the accuracy. Do not disassemble the product unless it is inevitable.
- Do not clean the product with an organic solvent or white kerosene.
- Do not leave the product package open over a long period of time.
- Do not block the hole for air vent near the model number indication with grease or the like.

Service Temperature Range

- Use this product within a temperature range of -10℃ to +50℃. When desiring to use the product out of this temperature range, contact THK .

Use in a Special Environment

- When desiring to use the product in a special environment, contact THK .

Corrosion Prevention

- QZ Lubricator is designed to provide the essential minimum amount of a lubricant to the ball raceway. It does not provide a corrosion-prevention effect to the whole Ball Screw.

THK Wiper Ring for the Ball Screw

Handling

- Dropping or hitting the product may damage it. Use much care when handling it.
- Unduly disassembling the product may cause foreign matter from entering the product or degrade the accuracy. Do not disassemble the product unless it is inevitable.
- When using this product in a harsh environment, we recommend using it in combination with QZ Lubricator.

Service Temperature Range

- Use this product within a temperature range of -20℃ to +80℃. When desiring to use the product out of this temperature range, contact THK .

Use in a Special Environment

- When desiring to use the product in a special environment, contact THK .

Chemical Resistance

- Avoid using the product in an atmosphere containing an acid or alkali solvent.

Model MTF

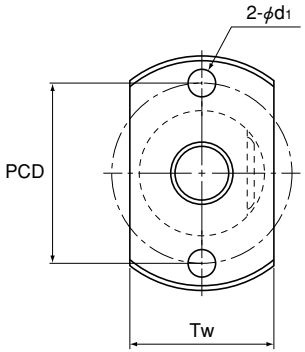
Miniature Rolled Ball Screw

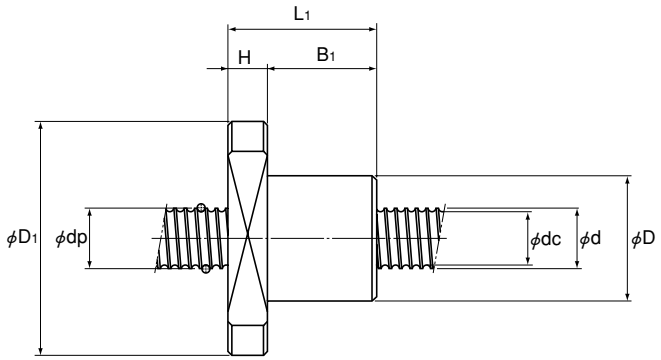
Note The rigidity values in the table represent spring constants each obtained from the load and the elastic displacement when providing an axial load 30% of the basic dynamic load rating (Ca).
These values do not include the rigidity of the components related to mounting the ball screw nut. Therefore, it is normally appropriate to regard roughly 80% of the value in the table as the actual value.
If the axial load (Fa) is not 0.3 Ca, the rigidity value (K_N) is obtained from the following equation.

where

$$K_N = K\left(\frac{Fa}{0.3Ca}\right)^{\frac{1}{3}}$$

K: Rigidity value in the dimensional table.





Unit: mm

Model No.	Screw shaft outer diameter d	Lead R	Ball center diameter dp	Thread minor diameter dc	No. of loaded circuits Rows x turns	Basic load rating Ca kN	Basic load rating C0a kN	Rigidity K N/μm	Outer diameter $D^{-0.05}_{-0.10}$	Nut dimensions Flange diameter D1	Overall length L1	H	B1	PCD	d1	Tw	Axial clearance	Standard shaft length	Screw shaft inertial moment/mm kg·cm²/mm
MTF 0601-3.7	6	1	6.15	5.3	1×3.7	0.7	1.2	70	13	30	21	5	16	21.5	3.4	17	0.05	150,250	9.99×10^{-6}
MTF 0802-3.7	8	2	8.3	6.6	1×3.7	2.1	3.8	90	20	40	28	6	22	30	4.5	24	0.05		3.16×10^{-5}
MTF 1002-3.7	10	2	10.3	8.6	1×3.7	2.3	4.8	110	23	43	28	6	22	33	4.5	27	0.05	200,300	7.71×10^{-5}
MTF 1202-3.7	12	2	12.3	10.6	1×3.7	2.5	5.8	130	25	47	30	8	22	36	5.5	29	0.05		1.6×10^{-4}

Note Model MTF cannot be attached with a seal.

Note The ball screw nut and the screw shaft of model MTF are not sold alone.
Model MTF is applied only with anti-corrosive oil.

Model number coding MTF0601-3.7 +250L C7 T
1 2 3 4

1 Model number 2 Overall screw shaft length (in mm)
3 Accuracy symbol (see page k-8) (no symbol for class C10) 4 Symbol for rolled shaft

Selecting a Model Number Refer to the "THK General Catalog - Technical Descriptions of the Products," provided separately

Model BNT

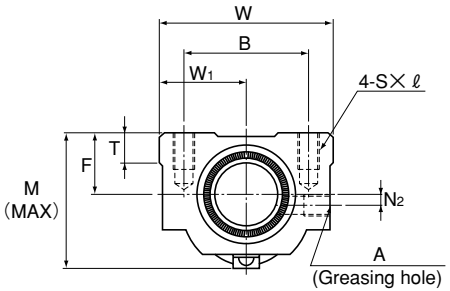
Square-nut, Non-preload Type

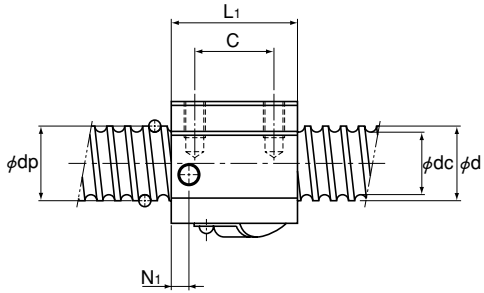
Note The rigidity values in the table represent spring constants each obtained from the load and the elastic displacement when providing an axial load 30% of the basic dynamic load rating (Ca).
These values do not include the rigidity of the components related to mounting the ball screw nut. Therefore, it is normally appropriate to regard roughly 80% of the value in the table as the actual value.
If the axial load (Fa) is not 0.3 Ca, the rigidity value (K_N) is obtained from the following equation.

where

$$K_N = K\left(\frac{Fa}{0.3Ca}\right)^{\frac{1}{3}}$$

K: Rigidity value in the dimensional table.





Unit: mm

Model No.	Screw shaft outer diameter d	Lead R	Ball center diameter dp	Thread minor diameter dc	No. of loaded circuits Rows x turns	Basic load rating Ca kN	Basic load rating C0a kN	Rigidity K N/μm	Nut dimensions Width W	Center height F	Overall length L1	Mounting hole B	C	S× ℓ	W1	T	M	N1	N2	A	Axial clearance	Screw shaft inertial moment/mm kg·cm²/mm
BNT 1404-3.6	14	4	14.4	11.5	1×3.65	5.5	11.5	150	34	13	35	26	22	M4×7	17	6	30	6	2	M6	0.1	2.96×10^{-4}
BNT 1405-2.6		5	14.5	11.2	1×2.65	5	11.4	110	34	13	35	26	22	M4×7	17	6	31	6	2	M6	0.1	2.96×10^{-4}
BNT 1605-2.6	16	5	16.75	13.5	1×2.65	5.4	13.3	130	42	16	36	32	22	M5×8	21	21.5	32.5	6	2	M6	0.1	5.05×10^{-4}
BNT 1808-3.6	18	8	19.3	14.4	1×3.65	13.1	31	210	48	17	56	35	35	M6×10	24	10	44	8	3	M6	0.1	8.09×10^{-4}
BNT 2005-2.6	20	5	20.5	17.2	1×2.65	6	16.5	150	48	17	35	35	22	M6×10	24	9	39	5	3	M6	0.1	1.23×10^{-3}
BNT 2010-2.6		10	21.25	16.4	1×2.65	10.6	25.1	160	48	18	58	35	35	M6×10	24	9	46	10	2	M6	0.1	1.23×10^{-3}
BNT 2505-2.6	25	5	25.5	22.2	1×2.65	6.7	20.8	180	60	20	35	40	22	M8×12	30	9.5	45	7	5	M6	0.1	3.01×10^{-3}
BNT 2510-5.3		10	26.8	20.2	2×2.65	31.2	83.7	400	60	23	94	40	60	M8×12	30	10	55	10	—	M6	0.1	3.01×10^{-3}
BNT 2806-2.6	28	6	28.5	25.2	1×2.65	7	23.4	200	60	22	42	40	18	M8×12	30	10	50	8	—	M6	0.1	4.74×10^{-3}
BNT 2806-5.3			28.5	25.2	2×2.65	12.8	46.8	390	60	22	67	40	40	M8×12	30	10	50	8	—	M6	0.1	4.74×10^{-3}
BNT 3210-2.6	32	10	33.75	27.2	1×2.65	19.8	53.8	250	70	26	64	50	45	M8×12	35	12	62	10	—	M6	0.14	8.08×10^{-3}
BNT 3210-5.3			33.75	27.2	2×2.65	36	107.5	490	70	26	94	50	60	M8×12	35	12	62	10	—	M6	0.14	8.08×10^{-3}
BNT 3610-2.6	36	10	37	30.5	1×2.65	20.8	59.3	270	86	29	64	60	45	M10×16	43	17	67	11	—	M6	0.17	1.29×10^{-2}
BNT 3610-5.3			37	30.5	2×2.65	37.8	118.7	530	86	29	96	60	60	M10×16	43	17	67	11	—	M6	0.17	1.29×10^{-2}
BNT 4512-5.3	45	12	46.5	39.2	2×2.65	49.5	169	650	100	36	115	75	75	M12×20	50	20.5	80	13	—	M6	0.2	3.16×10^{-2}

Model number coding BNT1405-2.6 ZZ
Ball Screw Nut
1 2

1 Model number
2 Seal symbol - no symbol: without seal;
ZZ: brush seal attached to both ends of the ball screw nut (see page k-25)

Model number coding TS 14 05 +500L C7
Screw Shaft
1 2 3 4 5

1 Symbol for rolled ball screw shaft
2 Screw shaft outer diameter (in mm) 3 Lead (in mm)
4 Overall screw shaft length (in mm)
5 Accuracy symbol (see page k-8) (no symbol for class C10)

Model number coding BNT1405-2.6 ZZ +500L C7 T
Combination of the Ball Screw Nut and the Screw Shaft
1 2 3 4 5

1 Model number
2 Seal symbol - no symbol: without seal;
ZZ: brush seal attached to both ends of the ball screw nut (see page k-25)
3 Overall shaft length (in mm) 4 Accuracy symbol (see page k-8) (no symbol for class C10)
5 Symbol for rolled shaft

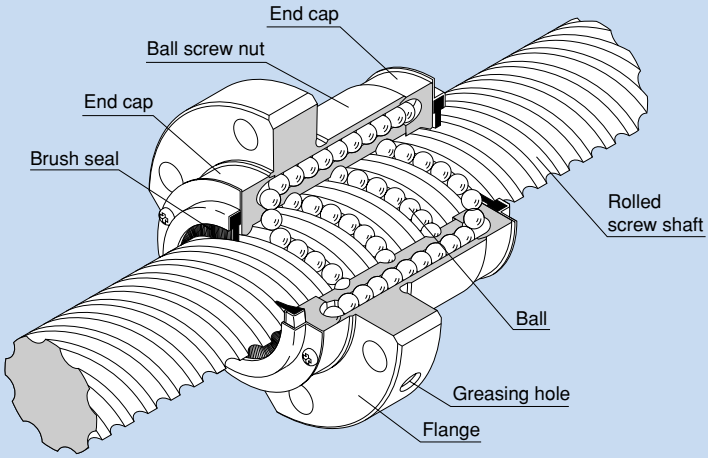


Fig. 1 Structure of the Large-Lead Nut Rolled Ball Screw

Structure and Features

With the Large-Lead Rolled Ball Screw, balls under a load roll along the circumference of the screw shaft and in the raceways formed on the screw shaft and the ball screw nut while receiving an axial load, are picked up with an end cap attached to the ball screw nut ends, and then circulate from the other end cap to the loaded area again after passing through the ball screw nut, thus to complete infinite rotary motion.
This model has two, four or eight raceway grooves formed by rolling into right-hand threads. Balls roll in the second or fourth groove.

●Optimal for Fast Feed

Use of the end cap increases the strength of the ball pick-up section in comparison to the conventional return-pipe type, and achieves stable motion even in high-speed rotation.

●Quiet Running Sound

Use of the end cap minimizes the level of noise produced when the balls are picked up. In addition, the balls pass inside the ball screw nut, thus to achieve low noise even in high-speed rotation.

●A Long-size Type Can be Used with a Thin Ball Screw Shaft

Replacing a standard Ball Screw, used in a location where high-speed operation is required, with one of these models will allow the rotation speed of the screw shaft to be decreased. Therefore, it eliminates the need to use a thicker screw shaft given the critical speed of the screw shaft and the need for choosing a difficult method for securing the screw shaft, thus to reduce the cost.

●Compact

Use of a ball circulation structure based on end caps allows the ball screw nut to be shortened and minimizes the outer diameter. Moreover, since the flange circumference is cut flat at the top and bottom, the center height is lowered and the structure is compactly made.

●Greater Turning Force with Small Thrust

The turning force generated when a thrust is given to the screw shaft or the ball screw nut is more than three times greater than a small-lead ball screw. Therefore, the Large-Lead Rolled Ball Screw is optimal for applications such as an actuator.

●High Dust Prevention Effect

It is incorporated with a highly dust preventive brush seal.

●Achieves Lead Accuracy of Class C7

Thanks to the rolling process for precision threads, screw shafts with travel distance error of classes C7 and C8 are also manufactured as standard in addition to class C10 to meet a broad range of applications.

Travel distance error: C7 :±0.05/300(mm)
C8 :±0.10/300(mm)
C10 :±0.21/300(mm)

(For manufacturing length limits of screw shaft by accuracy grade, see page k-17.)

Types and Features

Non-preload Type Models BLK and WTF

Non-preload Type Model CNF

Model BLK

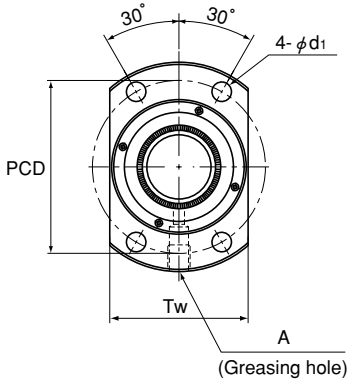
Large-Lead Rolled Ball Screw

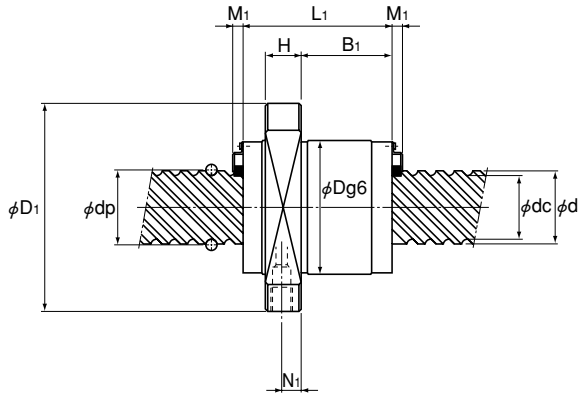
Note The rigidity values in the table represent spring constants each obtained from the load and the elastic displacement when providing an axial load 30% of the basic dynamic load rating (Ca).
These values do not include the rigidity of the components related to mounting the ball screw nut. Therefore, it is normally appropriate to regard roughly 80% of the value in the table as the actual value.
If the axial load (Fa) is not 0.3 Ca, the rigidity value (K_N) is obtained from the following equation.

where

$$K_N = K\left(\frac{Fa}{0.3Ca}\right)^{\frac{1}{3}}$$

K: Rigidity value in the dimensional table.





Unit: mm

Model No.	Screw shaft outer diameter d	Lead R	Ball center diameter dp	Thread minor diameter dc	No. of loaded circuits Rows x turns	Basic load rating Ca kN	Basic load rating C0a kN	Rigidity K N/μm	Nut dimensions Outer diameter D	Flange diameter D1	Overall length L1	H	B1	PCD	d1	Tw	Greasing hole N1	Greasing hole A	Seal M1	Axial clearance	Standard shaft length	Screw shaft inertial moment/mm kg·cm²/mm
BLK 1510-5.6	15	10	15.75	12.5	2×2.8	9.8	25.2	260	34	57	44	10	24	45	5.5	40	5	M6	3.5	0.1		3.9×10⁻⁴
BLK 1616-3.6	16	16	16.65	13.7	2×1.8	5.8	12.9	170	32	53	38	10	21.5	42	4.5	38	5	M6	3.5	0.1	500,1000	5.05×10⁻⁴
BLK 1616-7.2			16.65	13.7	4×1.8	10.5	25.9	340	32	53	38	10	21.5	42	4.5	38	5	M6	3.5	0.1		5.05×10⁻⁴
BLK 2020-3.6	20	20	20.75	17.5	2×1.8	7.7	22.3	210	39	62	45	10	27.5	50	5.5	46	5	M6	3.5	0.1	500,1000	1.23×10⁻³
BLK 2020-7.2			20.75	17.5	4×1.8	13.9	44.6	410	39	62	45	10	27.5	50	5.5	46	5	M6	3.5	0.1	1500	1.23×10⁻³
BLK 2525-3.6	25	25	26	22	2×1.8	12.1	35	270	47	74	55	12	35	60	6.6	56	6	M6	3.5	0.1	1000,1500	3.01×10⁻³
BLK 2525-7.2			26	22	4×1.8	21.9	69.9	520	47	74	55	12	35	60	6.6	56	6	M6	3.5	0.1	2000	3.01×10⁻³
BLK 3232-3.6	32	32	33.25	28.3	2×1.8	17.3	53.9	330	58	92	70	15	45	74	9	68	7.5	M6	3.8	0.14	1000,1500	8.08×10⁻³
BLK 3232-7.2			33.25	28.3	4×1.8	31.3	107.8	650	58	92	70	15	45	74	9	68	7.5	M6	3.8	0.14	2000,2500	8.08×10⁻³
BLK 3620-5.6	36	20	37.75	31.2	2×2.8	39.8	121.7	570	70	110	78	17	45	90	11	80	8.5	M6	5	0.17		1.29×10⁻²
BLK 3624-5.6		24	38	30.7	2×2.8	46.2	137.4	590	75	115	94	18	59	94	11	86	9	M6	5	0.17		1.29×10⁻²
BLK 3636-3.6		36	37.4	31.7	2×1.8	22.4	70.5	370	66	106	77	17	50	85	11	76	8.5	M6	5	0.17		1.29×10⁻²
BLK 3636-7.2			37.4	31.7	4×1.8	40.6	141.1	730	66	106	77	17	50	85	11	76	8.5	M6	5	0.17	1000,1500	1.29×10⁻²
BLK 4040-3.6	40	40	41.75	35.2	2×1.8	28.1	89.8	420	73	114	85	17	56.5	93	11	84	8.5	M6	5.4	0.17	2000,3000	1.97×10⁻²
BLK 4040-7.2			41.75	35.2	4×1.8	51.1	179.6	810	73	114	85	17	56.5	93	11	84	8.5	M6	5.4	0.17		1.97×10⁻²
BLK 5050-3.6	50	50	52.2	44.1	2×1.8	42.1	140.4	510	90	135	106	20	72	112	14	104	10	M6	5.4	0.2		4.82×10⁻²
BLK 5050-7.2			52.2	44.1	4×1.8	76.3	280.7	1000	90	135	106	20	72	112	14	104	10	M6	5.4	0.2		4.82×10⁻²

Model number coding BLK1510-5.6 ZZ
Ball Screw Nut
1 2

1 Model number
2 Seal symbol - no symbol: without seal;
ZZ: brush seal attached to both ends of the ball screw nut (see page k-25)

Model number coding TS 15 10 +1000L C7
Screw Shaft
1 2 3 4 5

1 Symbol for rolled ball screw shaft
2 Screw shaft outer diameter (in mm) 3 Lead (in mm)
4 Overall screw shaft length (in mm)
5 Accuracy symbol (see page k-8) (no symbol for class C10)

Model number coding BLK1510-5.6 ZZ +1000L C7 T
Combination of the Ball Screw Nut and the Screw Shaft
1 2 3 4 5

1 Model number
2 Seal symbol - no symbol: without seal;
ZZ: brush seal attached to both ends of the ball screw nut (see page k-25)
3 Overall shaft length (in mm) 4 Accuracy symbol (see page k-8) (no symbol for class C10)
5 Symbol for rolled shaft

Model WTF

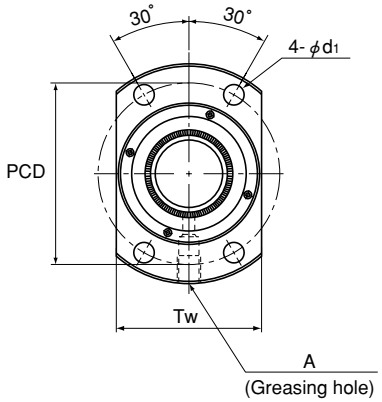
Super-Lead Rolled Ball Screw

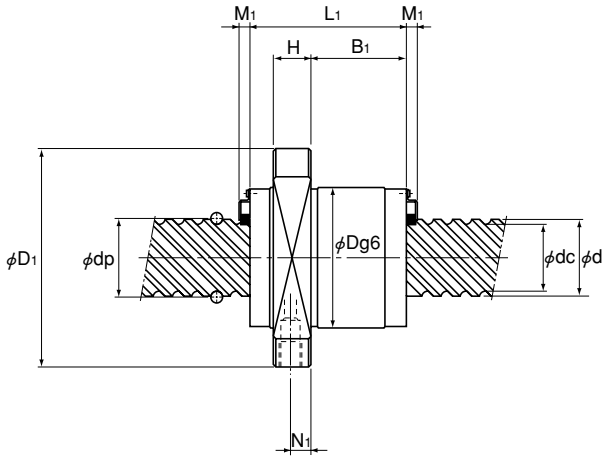
Note The rigidity values in the table represent spring constants each obtained from the load and the elastic displacement when providing an axial load 30% of the basic dynamic load rating (Ca).
These values do not include the rigidity of the components related to mounting the ball screw nut. Therefore, it is normally appropriate to regard roughly 80% of the value in the table as the actual value.
If the axial load (Fa) is not 0.3 Ca, the rigidity value (K_N) is obtained from the following equation.

where

$$K_N = K\left(\frac{Fa}{0.3Ca}\right)^{\frac{1}{3}}$$

K: Rigidity value in the dimensional table.





Unit: mm

Model No.	Screw shaft outer diameter d	Lead R	Ball center diameter dp	Thread minor diameter dc	No. of loaded circuits Rows x turns	Basic load rating Ca kN	Basic load rating C0a kN	Rigidity K N/μm	Nut dimensions Outer diameter D	Flange diameter D1	Overall length L1	H	B1	PCD	d1	Tw	Greasing hole N1	Greasing hole A	Seal M1	Axial clearance	Standard shaft length	Screw shaft inertial moment/mm kg·cm²/mm
WTF 1520-3	15	20	15.75	12.5	2×1.5	5.5	14.2	140	32	53	45	10	28	43	5.5	33	5	M6	3.5	0.1	500,1000	3.9×10^{-4}
WTF 1520-6			15.75	12.5	4×1.5	10.1	28.5	280	32	53	45	10	28	43	5.5	33	5	M6	3.5	0.1		3.9×10^{-4}
WTF 1530-2		30	15.75	12.5	4×0.6	4.3	9.3	120	32	53	33	10	17	43	5.5	33	5	M6	3.5	0.1		3.9×10^{-4}
WTF 1530-3			15.75	12.5	2×1.6	5.6	12.4	160	32	53	63	10	47	43	5.5	33	5	M6	3.5	0.1		3.9×10^{-4}
WTF 2040-2	20	40	20.75	17.5	4×0.65	5.4	13.6	160	37	57	41.5	10	25.5	47	5.5	38	5.5	M6	3.5	0.1	500,1000	1.23×10^{-3}
WTF 2040-3			20.75	17.5	2×1.65	6.6	17.2	200	37	57	81.5	10	65.5	47	5.5	38	5.5	M6	3.5	0.1	1500	1.23×10^{-3}
WTF 2550-2	25	50	26	21.9	4×0.65	8.5	21.2	200	45	69	52	12	31.5	57	6.6	46	7	M6	3.5	0.1	1000,1500	3.01×10^{-3}
WTF 2550-3			26	21.9	2×1.65	10.4	26.9	260	45	69	102	12	81.5	57	6.6	46	7	M6	3.5	0.1	2000	3.01×10^{-3}
WTF 3060-2	30	60	31.25	26.4	4×0.65	11.8	30.6	240	55	89	62.5	15	37.5	71	9	56	9	M6	3.8	0.14	1000,2000	6.24×10^{-3}
WTF 3060-3			31.25	26.4	2×1.65	14.5	38.9	310	55	89	122.5	15	97.5	71	9	56	9	M6	3.8	0.14	3000,4000	6.24×10^{-3}
WTF 4080-2	40	80	41.75	35.2	4×0.65	19.8	54.5	320	73	114	79	17	50.5	93	11	74	8.5	M6	5.4	0.17		1.97×10^{-2}
WTF 4080-3			41.75	35.2	2×1.65	24.3	69.2	400	73	114	159	17	130.5	93	11	74	8.5	M6	5.4	0.17	1000,1500	1.97×10^{-2}
WTF 50100-2	50	100	52.2	44.1	4×0.65	29.6	85.2	390	90	135	98	20	64	112	14	92	10	M6	5.4	0.2	2000,3000	4.82×10^{-2}
WTF 50100-3			52.2	44.1	2×1.65	36.3	108.1	500	90	135	198	20	164	112	14	92	10	M6	5.4	0.2		4.82×10^{-2}

Model number coding Ball Screw Nut — WTF1520-3 ZZ (1 2)

1 Model number
2 Seal symbol - no symbol: without seal;
ZZ: brush seal attached to both ends of the ball screw nut (see page k-25)

Model number coding Screw Shaft — TS 15 20 +1000L C7 (1 2 3 4 5)

1 Symbol for rolled ball screw shaft
2 Screw shaft outer diameter (in mm)
3 Lead (in mm) 4 Overall screw shaft length (in mm)
5 Accuracy symbol (see page k-8) (no symbol for class C10)

Model number coding Combination of the Ball Screw Nut and the Screw Shaft — WTF1520-3 ZZ +1000L C7 T (1 2 3 4 5)

1 Model number
2 Seal symbol - no symbol: without seal;
ZZ: brush seal attached to both ends of the ball screw nut (see page k-25)
3 Overall shaft length (in mm) 4 Accuracy symbol (see page k-8) (no symbol for class C10)
5 Symbol for rolled shaft

Selecting a Model Number | Refer to the "THK General Catalog - Technical Descriptions of the Products," provided separately

Model CNF

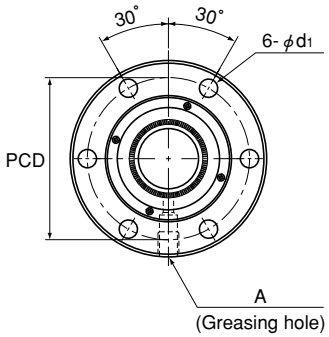
Change-Nut Rolled Ball Screw

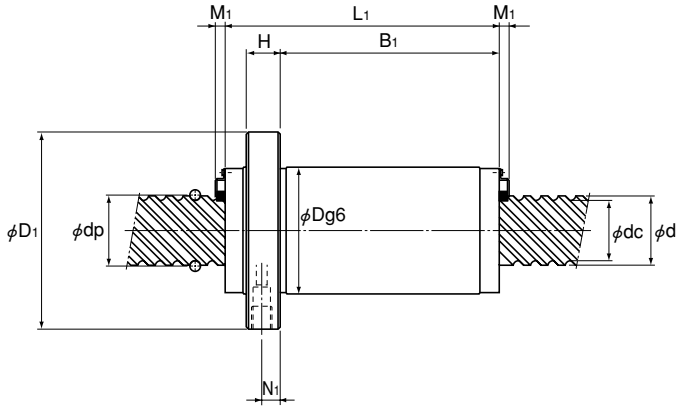
Note The rigidity values in the table represent spring constants each obtained from the load and the elastic displacement when providing an axial load 30% of the basic dynamic load rating (Ca).
These values do not include the rigidity of the components related to mounting the ball screw nut. Therefore, it is normally appropriate to regard roughly 80% of the value in the table as the actual value.
If the axial load (Fa) is not 0.3 Ca, the rigidity value (K_N) is obtained from the following equation.

where

$$K_N = K\left(\frac{Fa}{0.3Ca}\right)^{\frac{1}{3}}$$

K: Rigidity value in the dimensional table.





Unit: mm

Model No.	Screw shaft outer diameter d	Lead R	Ball center diameter dp	Thread minor diameter dc	No. of loaded circuits Rows x turns	Basic load rating Ca kN	Basic load rating C0a kN	Rigidity K N/μm	Nut dimensions Outer diameter D	Flange diameter D1	Overall length L1	H	B1	PCD	d1	Greasing hole N1	Greasing hole A	Seal M1	Axial clearance	Standard shaft length	Screw shaft inertial moment/mm kg·cm²/mm
CNF 1530-6	15	30	15.75	12.5	4×1.6	10.1	24.7	310	32	53	63	10	47	43	5.5	5	M6	3.5	0.1	500,1000	3.9×10^{-4}
CNF 2040-6	20	40	20.75	17.5	4×1.65	12	34.4	400	37	57	81	10	65	47	5.5	5.5	M6	3.5	0.1	500,1000,1500	1.23×10^{-3}
CNF 2550-6	25	50	26	21.9	4×1.65	18.9	53.9	460	45	69	102	12	81.5	57	6.6	7	M6	3.5	0.1	1000,1500,2000	3.01×10^{-3}
CNF 3060-6	30	60	31.25	26.4	4×1.65	26.2	77.7	600	55	89	122	15	97	71	9	9	M6	3.8	0.14	1000,2000 3000,4000	6.24×10^{-3}

Model number coding Ball Screw Nut — CNF1530-6 ZZ (1, 2)

1 Model number
2 Seal symbol - no symbol: without seal;
ZZ: brush seal attached to both ends of the ball screw nut (see page k-25)

Model number coding Screw Shaft — TS 15 30 +1000L C7 (1, 2, 3, 4, 5)

1 Symbol for rolled ball screw shaft
2 Screw shaft outer diameter (in mm)
3 Lead (in mm) 4 Overall screw shaft length (in mm)
5 Accuracy symbol (see page k-8) (no symbol for class C10)

Model number coding Combination of the Ball Screw Nut and the Screw Shaft — CNF1530-6 ZZ +1000L C7 T (1, 2, 3, 4, 5)

1 Model number
2 Seal symbol - no symbol: without seal;
ZZ: brush seal attached to both ends of the ball screw nut (see page k-25)
3 Overall shaft length (in mm) 4 Accuracy symbol (see page k-8) (no symbol for class C10)
5 Symbol for rolled shaft

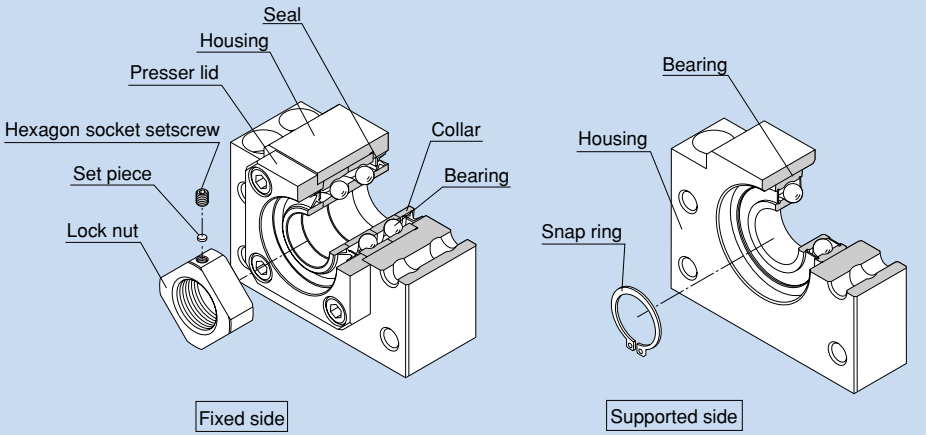


Fig. 1 Structure of the Support Unit

Structure and Features

The Support Unit comes in six types: models EK, FK, EF, and FF, which are standardized for standard-stock Ball Screws provided with finished shaft ends, and models BK and BF, which are standardized for ball screws in general.
The Support Unit on the fixed side contains a JIS Class 5-compliant angular bearing provided with an adjusted preload. The miniature type Support Unit models EK/FK 4, 5, 6 and 8, in particular, incorporate a miniature bearing with a contact angle of 45° developed exclusively for miniature Ball Screws. This provides stable rotation performance with high rigidity and accuracy.
The Support Unit on the supported side uses a deep-groove ball bearing.
The internal bearings of Support Unit models EK, FK and BK contain an appropriate amount of lithium soap-group grease that is sealed with a special seal. Thus, these models are capable of operating over a long period.

●Uses the Optimal Bearing

To ensure rigidity balance with the Ball Screw, the Support Unit uses an angular bearing (contact angle: 30° ; DF configuration) with high rigidity and low torque. Miniature Support Unit models EK/FK 4, 5, 6 and 8 are incorporated with a miniature angular bearing with a contact angle of 45° developed exclusively for miniature Ball Screws. This bearing has a greater contact angle of 45° and an increased number of balls with a smaller diameter. The high rigidity and accuracy of the miniature angular bearing provides stable rotation performance.

●Support Unit Shapes

Square and round shapes are available for the Support Unit to allow selection according to the intended use.

●Compact and Easy Installation

The Support Unit is compactly designed to accommodate the space in the installation site. As the bearing is provided with an appropriately adjusted preload, the Support Unit can be assembled with a Ball Screw unit with no further machining. Accordingly, the required man-hours in assembly can be reduced and the assembly accuracy can be increased.

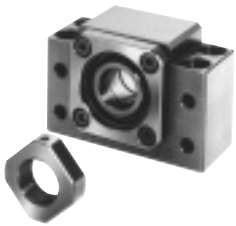
Types

For the Fixed Side

Square Type Model EK

(Inner diameter: ϕ4 to ϕ20)

Square Type Model BK



(Inner diameter: ϕ10 to ϕ40)

Round Type Model FK

(Inner diameter: ϕ4 to ϕ30)

For the Supported Side

Square Type Model EF

(Inner diameter: ϕ6 to ϕ20)

Square Type Model BF

(Inner diameter: ϕ8 to ϕ40)

Round Type Model FF

(Inner diameter: ϕ6 to ϕ30)

Types of Support Units and Applicable Screw Shaft Outer Diameters

Inner diameter of the fixed-side Support Unit (mm)	Applicable model No. of the fixed-side Support Unit	Inner diameter of the supported-side Support Unit (mm)	Applicable model No. of the supported-side Support Unit	Applicable screw shaft outer diameter (mm)
4	EK 4 FK 4	—	—	ø4
5	EK 5 FK 5	—	—	ø6
6	EK 6 FK 6	6	EF 6 FF 6	ø8
8	EK 8 FK 8	6	EF 8 FF 6	ø10
10	EK 10 FK 10 BK 10	8	EF 10 FF 10 BF 10	ø10, ø12, ø14
12	EK 12 FK 12 BK 12	10	EF 12 FF 12 BF 12	ø14, ø15, ø16
15	EK 15 FK 15 BK 15	15	EF 15 FF 15 BF 15	ø20
17	BK 17	17	BF 17	ø20, ø25
20	EK 20 FK 20 BK 20	20	EF 20 FF 20 BF 20	ø25, ø28, ø32
25	FK 25 BK 25	25	FF 25 BF 25	ø36
30	FK 30 BK 30	30	FF 30 BF 30	ø40, ø45
35	BK 35	35	BF 35	ø45
40	BK 40	40	BF 40	ø50

Note: The Supports Units in this table apply only to those Ball Screw models with recommended shaft ends shapes H, J and K, indicated in page k-302.

Model Numbers of Bearings and Characteristic Values

Angular ball bearing on the fixed side					Deep-groove ball bearing on the supported side			
Support Unit model No.	Bearing model No.	Axial direction			Support Unit model No.	Bearing model No.	Radial direction	
		Basic dynamic load rating Ca(kN)	*Permissible load (kN)	Rigidity (N/μm)			Basic dynamic load rating C(kN)	Basic static load rating C_0 (kN)
EK 4 FK 4	AC4-12P5	0.93	1.1	27	—	—	—	—
EK 5 FK 5	AC5-14P5	1	1.24	29	—	—	—	—
EK 6 FK 6	AC6-16P5	1.38	1.76	35	EF 6 FF 6	606ZZ	2.19	0.87
EK 8 FK 8	79M8DF GMP5	3.6	2.15	49	EF 8	606ZZ	2.19	0.87
EK10 FK10 BK10	7000HTDF GMP5	6.08	3.1	65	EF10 FF10 BF10	608ZZ	3.35	1.4
EK12 FK12 BK12	7001HTDF GMP5	6.66	3.25	88	EF12 FF12 BF12	6000ZZ	4.55	1.96
EK15 FK15 BK15	7002HTDF GMP5	7.6	4	100	EF15 FF15 BF15	6002ZZ	5.6	2.84
BK17	7203HTDF GMP5	13.7	5.85	125	BF17	6203ZZ	9.6	4.6
EK20 FK20	7204HTDF GMP5	17.9	9.5	170	EF20 FF20	6204ZZ	12.8	6.65
BK20	7004HTDF GMP5	12.7	7.55	140	BF20	6004ZZ	9.4	5.05
FK25 BK25	7205HTDF GMP5	20.2	11.5	190	FF25 BF25	6205ZZ	14	7.85
FK30 BK30	7206HTDF GMP5	28	16.3	195	FF30 BF30	6206ZZ	19.5	11.3
BK35	7207DF GMP5	37.2	5.83	255	BF35	6207ZZ	25.7	15.3
BK40	7208HTDF GMP5	44.1	27.1	270	BF40	6208ZZ	29.1	17.8

* Note: "Permissible load" indicates the static permissible load.

Examples of Installation

Square Type Support Unit

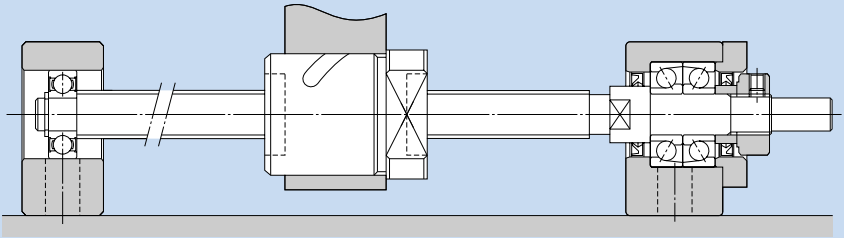


Fig. 2 Example of Installing a Square Type Support Unit

Round Type Support Unit

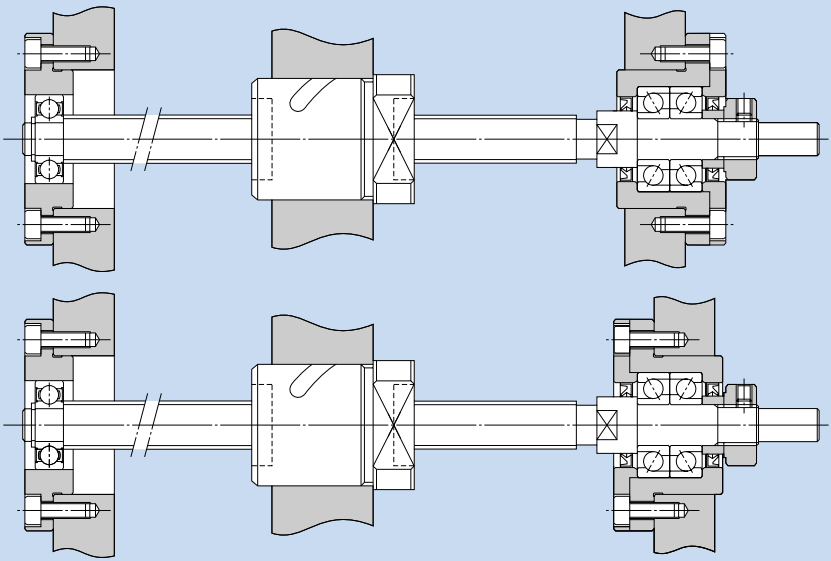


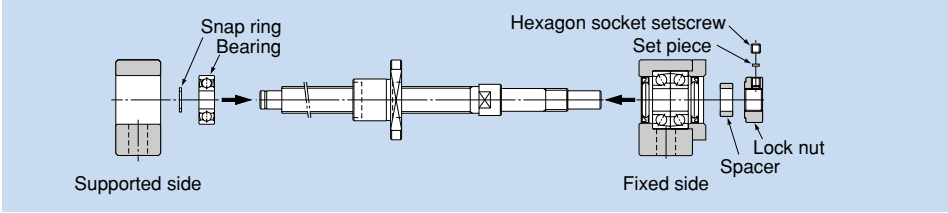
Fig. 3 Example of Installing a Round Type Support Unit

Mounting Procedure

Installing the Support Unit

① Install the fixed-side Support Unit with the screw shaft.
② After inserting the fixed-side Support Unit, secure the lock nut using the fastening set piece and hexagon socket setscrews.
③ Attach the supported-side bearing to the screw shaft and secure the bearing using the snap ring, and then install the assembly to the housing on the supported side.

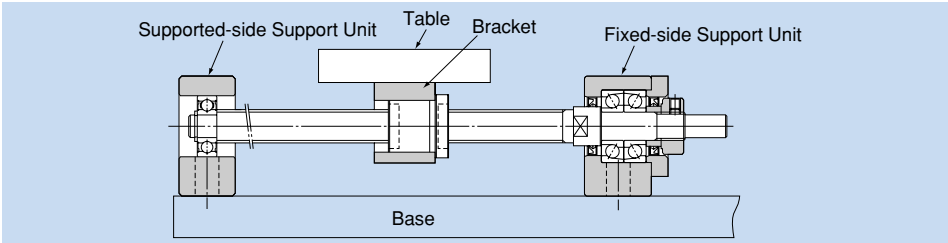
Note 1: Do no disassemble the Support Unit.
Note 2: When inserting the screw shaft to the Support Unit, take care not to let the oil seal lip turn outward.
Note 3: When securing the set piece with a hexagon socket screw, apply an adhesive to the hexagon socket screw before tightening it in order to prevent the screw from loosening. If planning to use the product in a harsh environment, it is also necessary to take a measure to prevent other components/parts from loosening. Contact THK for details.



Installation onto the Table and the Base

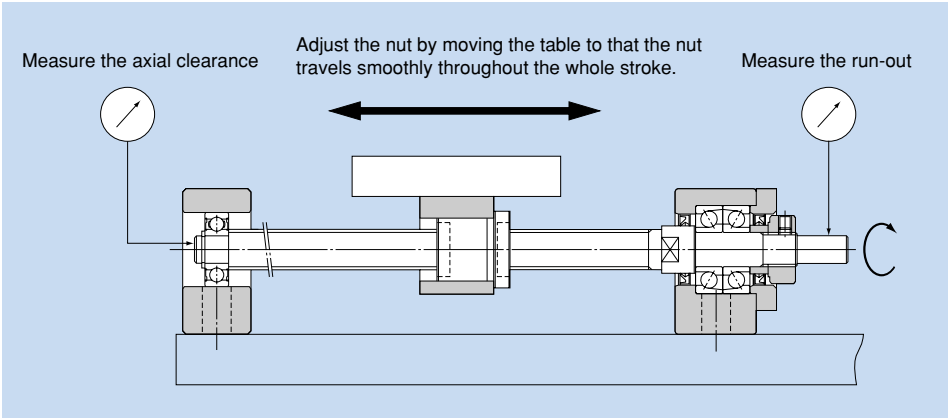
① If using a bracket when mounting the ball screw nut to the table, insert the nut into the bracket and temporarily secure it.
② Temporarily secure the fixed-side Support Unit to the base.
In doing so, press the table toward the fixed-side Support Unit to align the axial center, and adjust the table so that it can freely travel.
- If using the fixed-side Support Unit as the reference point, secure a clearance between the ball screw nut and the table or inside the bracket when making adjustment.
- If using the table as the reference point, make adjustment either by using the shim (for a square type Support Unit), or securing a clearance between the outer surface of the nut and the inner surface of the mounting section (for a round type Support Unit).

③ Press the table toward the fixed-side Support Unit to align the axial center. Make adjustment by reciprocating the table several times so that the nut travels smoothly throughout the whole stroke, and temporarily secure the Support Unit to the base.



Checking the Accuracy and Fully Tightening the Support Unit

While checking the run-out of the ball screw shaft end and the axial clearance using a dial gauge, fully tighten the ball screw nut, the nut bracket, the fixed-side Support Unit and the supported-side Support Unit, in this order.

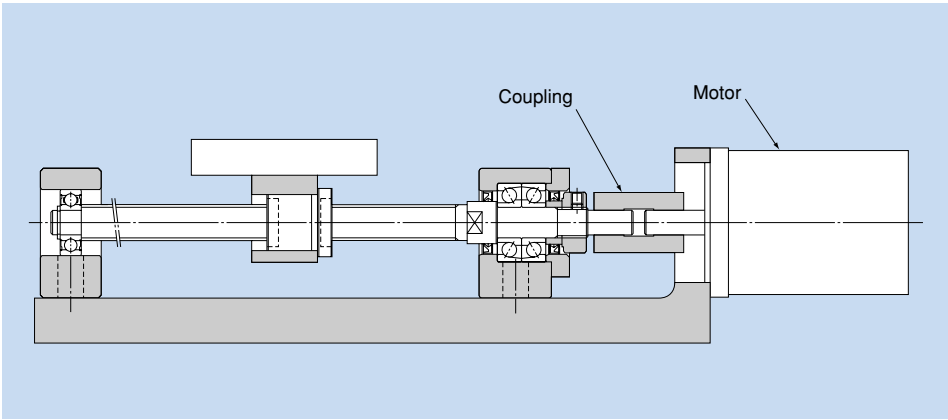


Connection with the Motor

① Mount the motor bracket to the base.

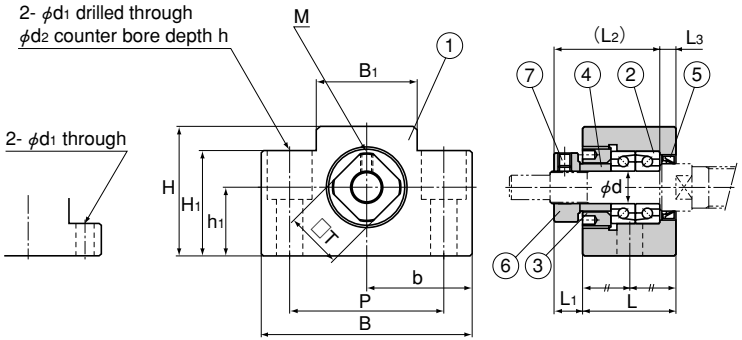
② Connect the motor and the ball screw using a coupling.
Note: Make sure the mounting accuracy is maintained.

③ Thoroughly perform break-in of the system.

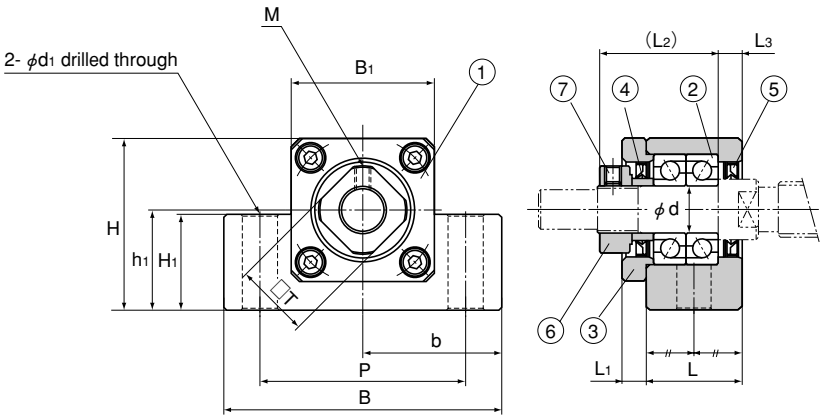


Model EK

Square Type Support Unit on the Fixed Side



Models EK 4 and 5　　Models EK 6 and 8



Models EK 10 to 20

Unit: mm

Model No.	Shaft diameter d	L	L_1	L_2	L_3	B	H	b ±0.02	h_1 ±0.02	B_1	H_1	P	d_1	d_2	h	M	T	Bearing used
EK 4	4	15	5.5	17.5	3	34	19	17	10	18	7	26	4.5	—	—	M2.6	10	AC4-12P5
EK 5	5	16.5	5.5	18.5	3.5	36	21	18	11	20	8	28	4.5	—	—	M2.6	11	AC5-14P5
EK 6	6	20	5.5	22	3.5	42	25	21	13	18	20	30	5.5	9.5	11	M3	12	AC6-16P5
EK 8	8	23	7	26	4	52	32	26	17	25	26	38	6.6	11	12	M3	14	79M8DFGMP5
EK 10	10	24	6	29.5	6	70	43	35	25	36	24	52	9	—	—	M3	16	7000HTDFGMP5
EK 12	12	24	6	29.5	6	70	43	35	25	36	24	52	9	—	—	M3	19	7001HTDFGMP5
EK 15	15	25	6	36	5	80	49	40	30	41	25	60	11	—	—	M3	22	7002HTDFGMP5
EK 20	20	42	10	50	10	95	58	47.5	30	56	25	75	11	—	—	M4	30	7204HTDFGMP5

Models EK 4 to 8

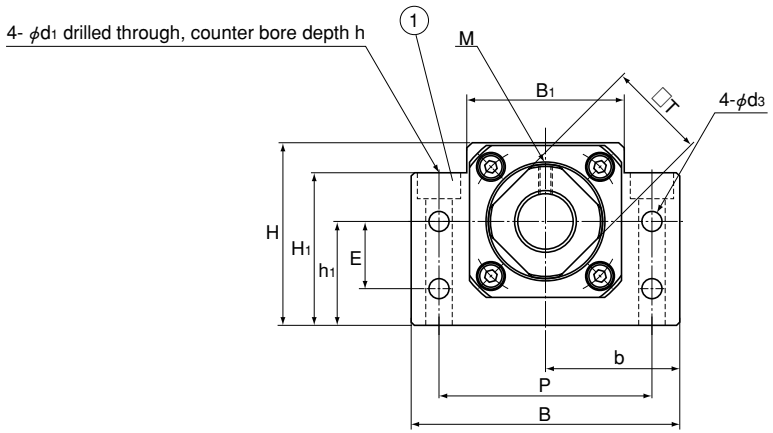
Part No.	Part name	No. of units
①	Housing	1
②	Bearing	1 set
③	Presser nut	1
④	Collar	2
⑤	Seal	1
⑥	Lock nut	1
⑦	Hexagon socket setscrew (with a set piece)	1

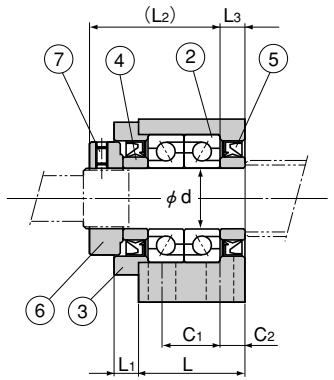
Models EK 10 to 20

Part No.	Part name	No. of units
①	Housing	1
②	Bearing	1 set
③	Presser lid	1
④	Collar	2
⑤	Seal	2
⑥	Lock nut	1
⑦	Hexagon socket setscrew (with a set piece)	1

Model BK

Square Type Support Unit on the Fixed Side





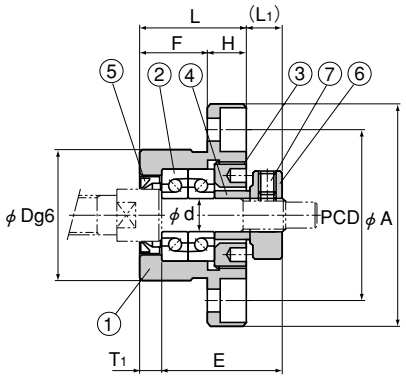
Unit: mm

Model No.	Shaft diameter d	L	L1	L2	L3	B	H	b ±0.02	h1 ±0.02	B1	H1	E	P	C1	C2	d3	d1	d2	h	M	T	Bearing used
BK 10	10	25	5	29	5	60	39	30	22	34	32.5	15	46	13	6	5.5	6.6	10.8	5	M3	16	7000HTDFGMP5
BK 12	12	25	5	29	5	60	43	30	25	35	32.5	18	46	13	6	5.5	6.6	10.8	1.5	M3	19	7001HTDFGMP5
BK 15	15	27	6	32	6	70	48	35	28	40	38	18	54	15	6	5.5	6.6	11	6.5	M3	22	7002HTDFGMP5
BK 17	17	35	9	44	7	86	64	43	39	50	55	28	68	19	8	6.6	9	14	8.5	M4	24	7203HTDFGMP5
BK 20	20	35	8	43	8	88	60	44	34	52	50	22	70	19	8	6.6	9	14	8.5	M4	30	7004HTDFGMP5
BK 25	25	42	12	54	9	106	80	53	48	64	70	33	85	22	10	9	11	17.5	11	M5	35	7205HTDFGMP5
BK 30	30	45	14	61	9	128	89	64	51	76	78	33	102	23	11	11	14	20	13	M6	40	7206HTDFGMP5
BK 35	35	50	14	67	12	140	96	70	52	88	79	35	114	26	12	11	14	20	13	M8	50	7207DFGMP5
BK 40	40	61	18	76	15	160	110	80	60	100	90	37	130	33	14	14	18	26	17.5	M8	50	7208HTDFGMP5

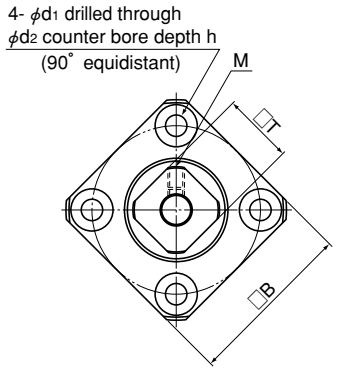
Part No.	Part name	No. of units
①	Housing	1
②	Bearing	1 set
③	Presser lid	1
④	Collar	2
⑤	Seal	2
⑥	Lock nut	1
⑦	Hexagon socket setscrew (with a set piece)	1

Model FK

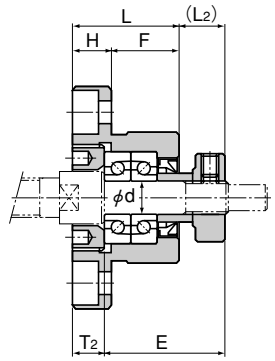
Round Type Support Unit on the Fixed Side



Mounting method A



Models FK 4 to 8



Mounting method B

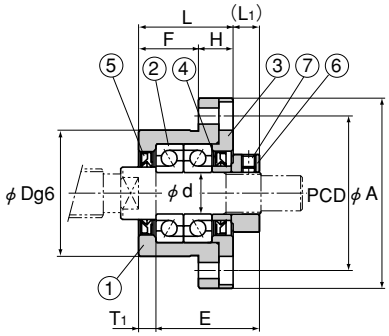
Unit: mm

Model No.	Shaft diameter d	L	H	F	E	D	A	PCD	B	Mounting method A L1	Mounting method A T1	Mounting method B L2	Mounting method B T2	d1	d2	h	M	T	Bearing used
FK 4	4	15	6	9	17.5	18 $^{-0.006}_{-0.017}$	32	24	25	5.5	3	6.5	4	3.4	6.5	4	M2.6	10	AC4-12P5
FK 5	5	16.5	6	10.5	18.5	20 $^{-0.007}_{-0.02}$	34	26	26	5.5	3.5	7	5	3.4	6.5	4	M2.6	11	AC5-14P5
FK 6	6	20	7	13	22	22 $^{-0.007}_{-0.02}$	36	28	28	5.5	3.5	8.5	6.5	3.4	6.5	4	M3	12	AC6-16P5
FK 8	8	23	9	14	26	28 $^{-0.007}_{-0.02}$	43	35	35	7	4	10	7	3.4	6.5	4	M3	14	79M8DFGMP5

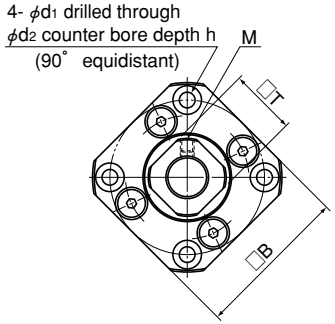
Part No.	Part name	No. of units
①	Housing	1
②	Bearing	1 set
③	Presser nut	1
④	Collar	2
⑤	Seal	1
⑥	Lock nut	1
⑦	Hexagon socket setscrew (with a set piece)	1

Model FK

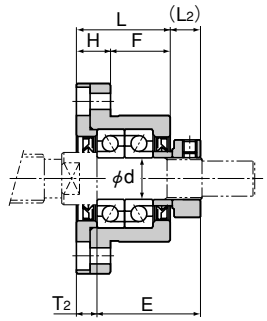
Round Type Support Unit on the Fixed Side



Mounting method A



Models FK 10 to 30



Mounting method B

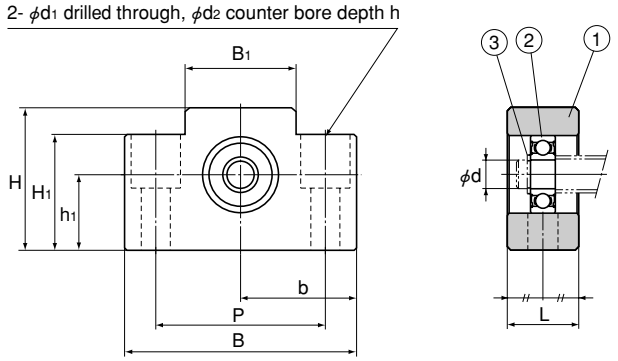
Unit: mm

Model No.	Shaft diameter d	L	H	F	E	D	A	PCD	B	Mounting method A L1	Mounting method A T1	Mounting method B L2	Mounting method B T2	d1	d2	h	M	T	Bearing used
FK 10	10	27	10	17	29.5	34 $^{-0.009}_{-0.025}$	52	42	42	7.5	5	8.5	6	4.5	8	4	M3	16	7000HTDFGMP5
FK 12	12	27	10	17	29.5	36 $^{-0.009}_{-0.025}$	54	44	44	7.5	5	8.5	6	4.5	8	4	M3	19	7001HTDFGMP5
FK 15	15	32	15	17	36	40 $^{-0.009}_{-0.025}$	63	50	52	10	6	12	8	5.5	9.5	6	M3	22	7002HTDFGMP5
FK 20	20	52	22	30	50	57 $^{-0.01}_{-0.029}$	85	70	68	8	10	12	14	6.6	11	10	M4	30	7204HTDFGMP5
FK 25	25	57	27	30	60	63 $^{-0.01}_{-0.029}$	98	80	79	13	10	20	17	9	15	13	M5	35	7205HTDFGMP5
FK 30	30	62	30	32	61	75 $^{-0.01}_{-0.029}$	117	95	93	11	12	17	18	11	17.5	15	M6	40	7206HTDFGMP5

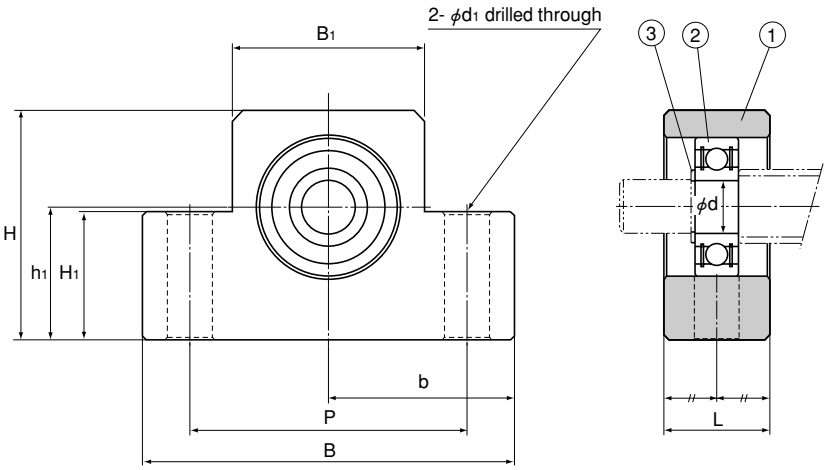
Part No.	Part name	No. of units
①	Housing	1
②	Bearing	1 set
③	Presser lid	1
④	Collar	2
⑤	Seal	2
⑥	Lock nut	1
⑦	Hexagon socket setscrew (with a set piece)	1

Model EF

Square Type Support Unit on the Supported Side



Models EF 6 and 8



Models EF 10 to 20

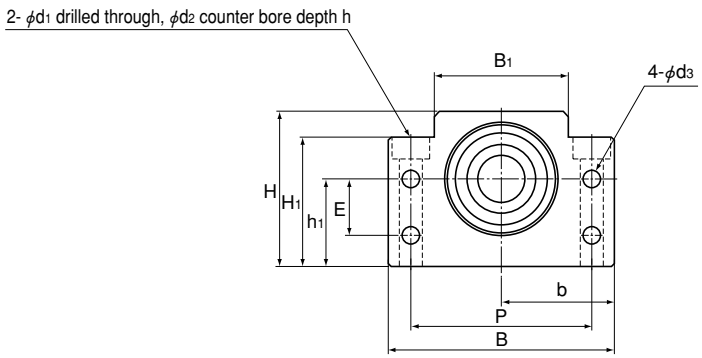
Unit: mm

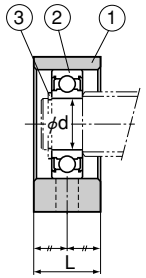
Model No.	Shaft diameter d	L	B	H	b ±0.02	h_1 ±0.02	B_1	H_1	P	d_1	d_2	h	Bearing used	Snap ring used
EF 6	6	12	42	25	21	13	18	20	30	5.5	9.5	11	606ZZ	C6
EF 8	6	14	52	32	26	17	25	26	38	6.6	11	12	606ZZ	C6
EF 10	8	20	70	43	35	25	36	24	52	9	—	—	608ZZ	C8
EF 12	10	20	70	43	35	25	36	24	52	9	—	—	6000ZZ	C10
EF 15	15	20	80	49	40	30	41	25	60	9	—	—	6002ZZ	C15
EF 20	20	26	95	58	47.5	30	56	25	75	11	—	—	6204ZZ	C20

Part No.	Part name	No. of units
①	Housing	1
②	Bearing	1
③	Snap ring	1

Model BF

Square Type Support Unit on the Supported Side





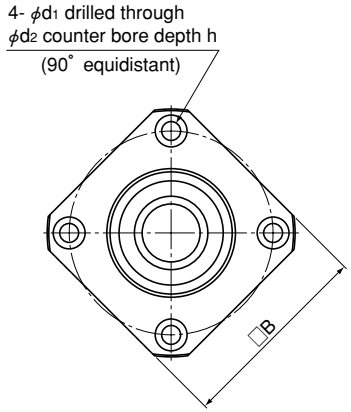
Unit: mm

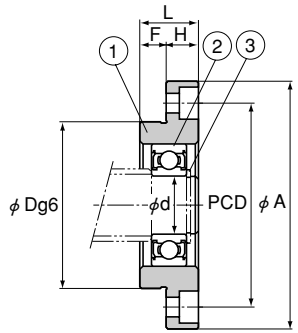
Model No.	Shaft diameter d	L	B	H	b ±0.02	h1 ±0.02	B1	H1	E	P	d3	d1	d2	h	Bearing used	Snap ring used
BF 10	8	20	60	39	30	22	34	32.5	15	46	5.5	6.6	10.8	5	608ZZ	C8
BF 12	10	20	60	43	30	25	35	32.5	18	46	5.5	6.6	10.8	1.5	6000ZZ	C10
BF 15	15	20	70	48	35	28	40	38	18	54	5.5	6.6	11	6.5	6002ZZ	C15
BF 17	17	23	86	64	43	39	50	55	28	68	6.6	9	14	8.5	6203ZZ	C17
BF 20	20	26	88	60	44	34	52	50	22	70	6.6	9	14	8.5	6004ZZ	C20
BF 25	25	30	106	80	53	48	64	70	33	85	9	11	17.5	11	6205ZZ	C25
BF 30	30	32	128	89	64	51	76	78	33	102	11	14	20	13	6206ZZ	C30
BF 35	35	32	140	96	70	52	88	79	35	114	11	14	20	13	6207ZZ	C35
BF 40	40	37	160	110	80	60	100	90	37	130	14	18	26	17.5	6208ZZ	C40

Part No.	Part name	No. of units
①	Housing	1
②	Bearing	1
③	Snap ring	1

Model FF

Round Type Support Unit on the Supported Side





Unit: mm

Model No.	Shaft diameter d	L	H	F	D	A	PCD	B	d_1	d_2	h	Bearing used	Snap ring used
FF 6	6	10	6	4	$22\ ^{-0.007}_{-0.02}$	36	28	28	3.4	6.5	4	606ZZ	C6
FF 10	8	12	7	5	$28\ ^{-0.007}_{-0.02}$	43	35	35	3.4	6.5	4	608ZZ	C8
FF 12	10	15	7	8	$34\ ^{-0.009}_{-0.025}$	52	42	42	4.5	8	4	6000ZZ	C10
FF 15	15	17	9	8	$40\ ^{-0.009}_{-0.025}$	63	50	52	5.5	9.5	5.5	6002ZZ	C15
FF 20	20	20	11	9	$57\ ^{-0.01}_{-0.029}$	85	70	68	6.6	11	6.5	6204ZZ	C20
FF 25	25	24	14	10	$63\ ^{-0.01}_{-0.029}$	98	80	79	9	14	8.5	6205ZZ	C25
FF 30	30	27	18	9	$75\ ^{-0.01}_{-0.029}$	117	95	93	11	17.5	11	6206ZZ	C30

Part No.	Part name	No. of units
①	Housing	1
②	Bearing	1
③	Snap ring	1

Nut Bracket

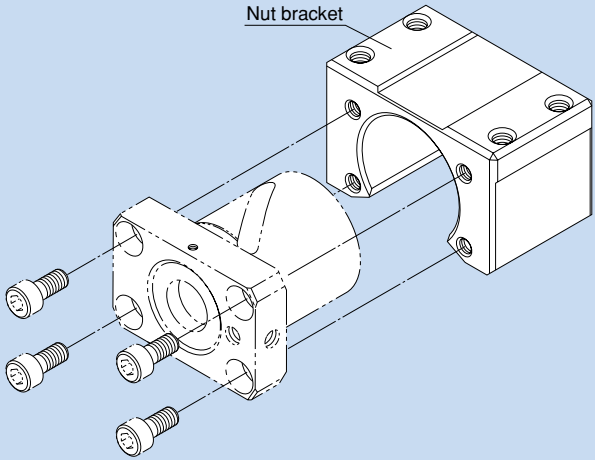


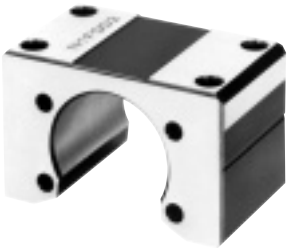
Fig. 1 Structure of the Nut Bracket

Structure and Features

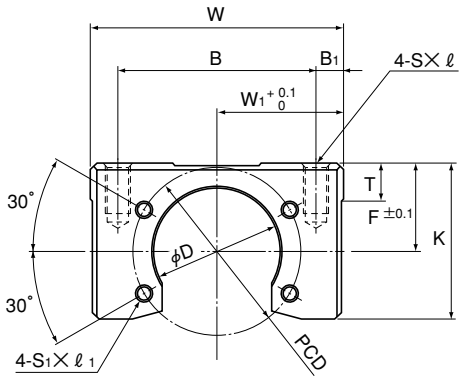
The Nut Bracket is standardized for standard-stock Ball Screws provided with finished shaft ends. It is designed to be secured directly on the table using bolts. Since the height is low, it can be mounted on the table only using bolts.

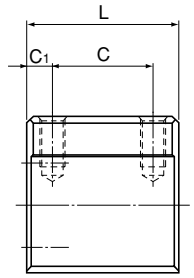
Type

Nut Bracket Model MC



Nut Bracket





Unit: mm

Model No.	Width W	W1	B	B1	Overall length L	C	C1	F	K	T	D	PCD	S× ℓ	S1× ℓ 1	For factory automation equipment Supported Ball Screw models
MC 1004	48	24	40	4	32	16	10	20	32.5	9	26.4	36	M5×10	M4×7	BNK1004,BNK1010
MC 1205	60	30	47	6.5	36	24	6	21	37	9	30.4	40	M6×12	M4×7	BNK1205
MC 1408	60	30	50	5	36	20	10	21.5	37	9	34.4	45	M6×12	M5×7	BNK1408,BNK1510,BNK1520,BNK1616
MC 2010	86	43	70	8	50	30	10	31	54	16	46.4	59	M10×20	M6×10	BNK2010
MC 2020	86	43	70	8	40	24	8	28	51	16	39.4	59	M10×20	M6×10	BNK2020

Lock Nut

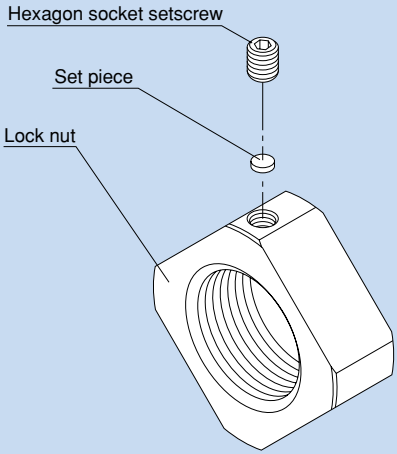


Fig. 1 Structure of the Lock Nut

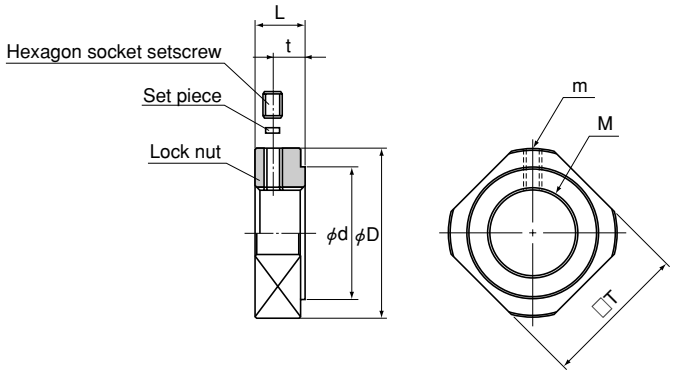
Structure and Features

The Lock Nut for Ball Screws is capable of fastening the screw shaft and the bearing with high accuracy.
The provided hexagon socket setscrew and the set piece prevent the Lock Nut from loosening and ensure firm fastening.
The Lock Nut comes in various types ranging from model M4 to model M40.

Type

Lock Nut Model RN

Lock Nut



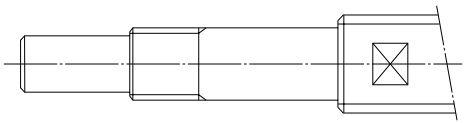
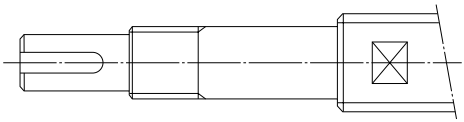
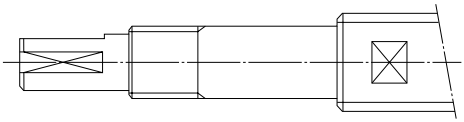
Unit: mm

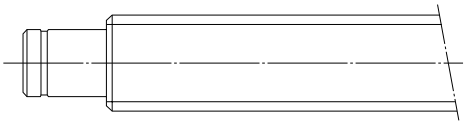
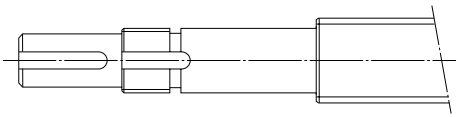
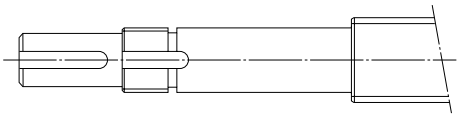
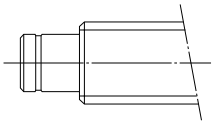
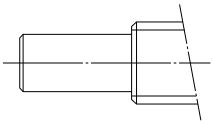
Model No.	M	m	D	d	L	t	T
RN 4	M4×0.5	M2.6	11.5	8	5	2.7	10
RN 5	M5×0.5	M2.6	13.5	9	5	2.7	11
RN 6	M6×0.75	M3	14.5	10	5	2.7	12
RN 8	M8×1	M3	17	13	6.5	4	14
RN 10	M10×1	M3	20	15	8	5.5	16
RN 12	M12×1	M3	22	17	8	5.5	19
RN 15	M15×1	M3	25	21	8	4.5	22
RN 17	M17×1	M4	30	25	13	9	24
RN 20	M20×1	M4	35	26	11	7	30
RN 25	M25×1.5	M5	43	33	15	10	35
RN 30	M30×1.5	M6	48	39	20	14	40
RN 35	M35×1.5	M8	60	46	21	14	50
RN 40	M40×1.5	M8	63	51	25	18	50

Recommended Shapes of Shaft Ends

To ensure speedy estimate and manufacturing of Ball Screws, THK has standardized the shaft end shapes of the screw shafts.
The recommended shaft end shapes are divided into two groups: shapes H, K and J, which allow standard Support Units to be used, and shapes A, B and C, which are compliant with JIS B 1192.

Types of Recommended Shapes of the Shaft Ends

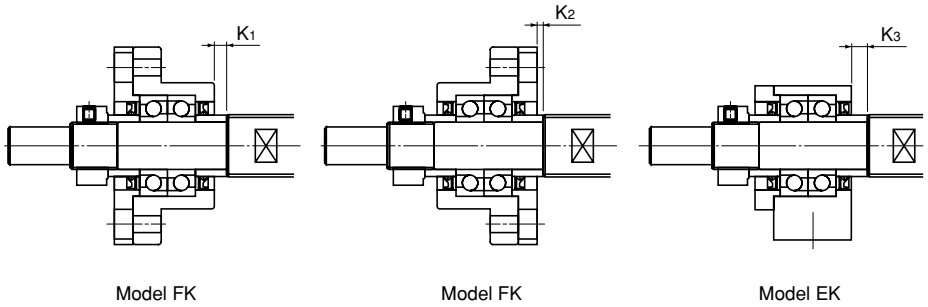
Mounting method	Symbol for shaft end shape		Shape	Supported Support Unit
Fixed	H	H1		FK EK
		J1		BK
	J	H2		FK EK
		J2		BK
		H3		FK EK
		J3		BK

Mounting method	Symbol for shaft end shape	Shape	Supported Support Unit
Supported	K		FF EF BF
Fixed	A		—
	B		—
Supported	C	 Screw shaft diameter: 20 to 45 mm  Screw shaft diameter: 14 to 18 mm	—

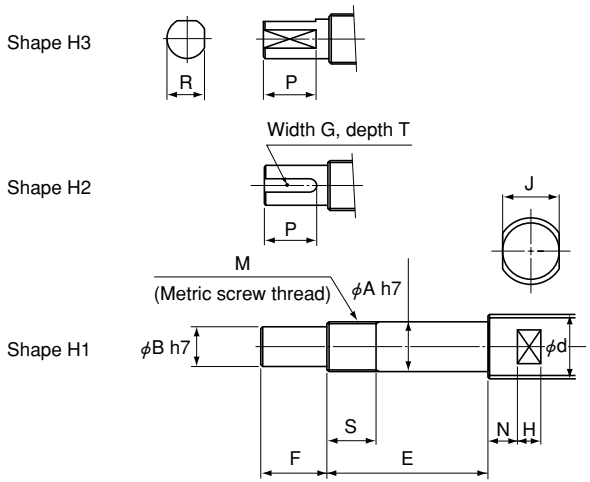
Note: For the dimensions of Support Units, see page k-282.

Recommended Shapes of Shaft Ends - Shape H (H1, H2 and H3)

For Support Unit Models FK and EK



Model FK　　Model FK　　Model EK



Unit: mm

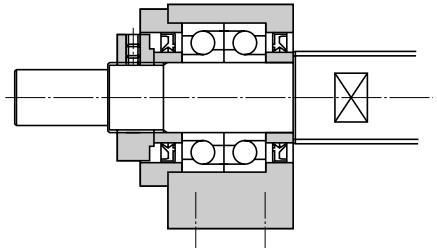
Support Unit model No.		Ball screw shaft outer diameter	Shaft outer diameter of the bearing				Metric screw thread		Width across flat			Shape H2 Keyway			Shape H3 Cut flat on two sides		Support Unit position Model FK		Support Unit position Model EK
Model FK	Model EK	d	A	B	E	F	M	S	J	N	H	G N9	T +0.1 0	P	R	P	K_1	K_2	K_3
FK 4	EK 4	6	4	3	23	5	M4×0.5	7	4	4	4	—	—	—	2.7	4	1.5	0.5	1.5
FK 5	EK 5	8	5	4	25	6	M5×0.5	7	5	4	4	—	—	—	3.7	5	2	0.5	2
FK 6	EK 6	8	6	4	30	8	M6×0.75	8	5	4	4	—	—	—	3.7	6	3.5	0.5	3.5
FK 8	EK 8	12	8	6	35	9	M8×1	10	8	5	5	—	—	—	5.6	7	3.5	0.5	3.5
FK 10	EK 10	14	10	8	36	15	M10×1	11	10	5	7	2	1.2	11	7.5	11	0.5	–0.5	–0.5
FK 10	EK 10	15	10	8	36	15	M10×1	11	10	5	7	2	1.2	11	7.5	11	0.5	–0.5	–0.5
FK 12	EK 12	16	12	10	36	15	M12×1	11	13	6	8	3	1.8	12	9.5	12	0.5	–0.5	–0.5
FK 12	EK 12	18	12	10	36	15	M12×1	11	13	6	8	3	1.8	12	9.5	12	0.5	–0.5	–0.5
FK 15	EK 15	20	15	12	49	20	M15×1	13	16	6	9	4	2.5	16	11.3	16	4	2	5
FK 15	EK 15	25	15	12	49	20	M15×1	13	18	7	10	4	2.5	16	11.3	16	4	2	5
FK 20	EK 20	28	20	17	64	25	M20×1	17	21	8	11	5	3	21	16	21	1	–3	1
FK 20	EK 20	30	20	17	64	25	M20×1	17	24	8	12	5	3	21	16	21	1	–3	1
FK 20	EK 20	32	20	17	64	25	M20×1	17	27	9	13	5	3	21	16	21	1	–3	1
FK 25	—	36	25	20	76	30	M25×1.5	20	27	10	13	6	3.5	25	19	25	5	–2	—
FK 30	—	40	30	25	72	38	M30×1.5	25	32	10	15	8	4	32	23.5	32	–3	–9	—

Note Support Units are designed to have dimensions so that combinations of models FK and FF, models EK and EF or models BK and BF are used on the same shaft.
If desiring the shaft end to be machined at THK, add the shape symbol in the end of the Ball Screw model number.
(Example) TS2505+500L-H2K
(Shape H2 on the fixed side; shape K on the supported side)
For the perpendicularity of the end face of the bearing, refer to JIS B 1192.

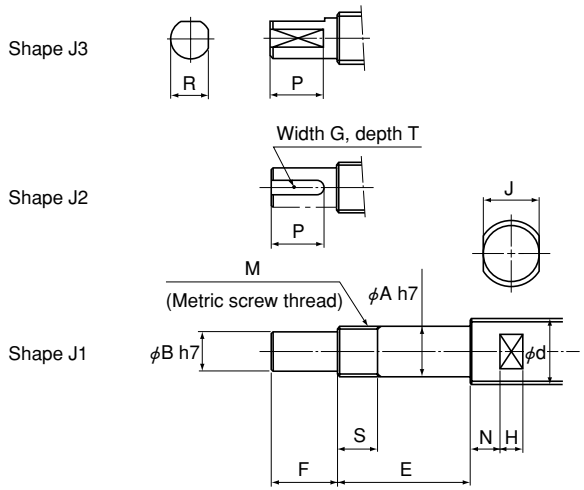
Note The flange of ball screw nut faces the fixed side unless otherwise specified.
If desiring the flange to face the supported side, add symbol G in the end of the Ball Screw model number when placing an order.
(Example) BNFN2505-5RRGO+420LC5-H2KG

Recommended Shapes of Shaft Ends - Shape J (J1, J2 and J3)

For Support Unit Model BK



Model BK



Unit: mm

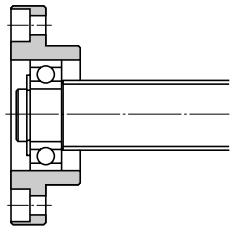
Support Unit model No.	Ball screw shaft outer diameter	Shaft outer diameter of the bearing				Metric screw thread		Width across flat			Shape J2 Keyway			Shape J3 Cut flat on two sides	
Model BK	d	A	B	E	F	M	S	J	N	H	G N9	T +0.1 0	P	R	P
BK 10	14	10	8	39	15	M10×1	16	10	5	7	2	1.2	11	7.5	11
BK 10	15	10	8	39	15	M10×1	16	10	5	7	2	1.2	11	7.5	11
BK 12	16	12	10	39	15	M12×1	14	13	6	8	3	1.8	12	9.5	12
BK 12	18	12	10	39	15	M12×1	14	13	6	8	3	1.8	12	9.5	12
BK 15	20	15	12	40	20	M15×1	12	16	6	9	4	2.5	16	11.3	16
BK 17	25	17	15	53	23	M17×1	17	18	7	10	5	3	21	14.3	21
BK 20	28	20	17	53	25	M20×1	15	21	8	11	5	3	21	16	21
BK 20	30	20	17	53	25	M20×1	15	24	8	12	5	3	21	16	21
BK 20	32	20	17	53	25	M20×1	15	27	9	13	5	3	21	16	21
BK 25	36	25	20	65	30	M25×1.5	18	27	10	13	6	3.5	25	19	25
BK 30	40	30	25	72	38	M30×1.5	25	32	10	15	8	4	32	23.5	32
BK 35	45	35	30	83	45	M35×1.5	28	36	12	15	8	4	40	28.5	40
BK 40	50	40	35	98	50	M40×1.5	35	41	14	19	10	5	45	33	45
BK 40	55	40	35	98	50	M40×1.5	35	46	14	20	10	5	45	33	45

Note Support Units are designed to have dimensions so that combinations of models FK and FF, models EK and EF or models BK and BF are used on the same shaft.
If desiring the shaft end to be machined at THK, add the shape symbol in the end of the Ball Screw model number.
(Example) TS2505+500L-J2K
(Shape J2 on the fixed side; shape K on the supported side)
For the perpendicularity of the end face of the bearing, refer to JIS B 1192.

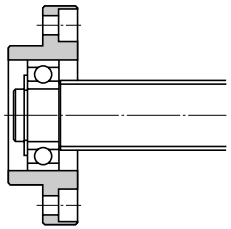
Note The ball nut flange faces the fixed side unless otherwise specified.
If desiring the flange to face the supported side, add symbol G in the end of the Ball Screw model number when placing an order.
(Example) BNFN2505-5RRGO+420LC5-J2KG

Recommended Shapes of Shaft Ends - Shape K

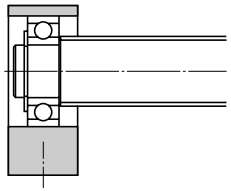
For Support Unit Models FF, EF and BF



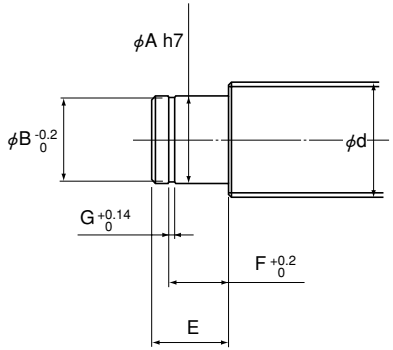
Model FF



Model FF



Model EF
Model BF



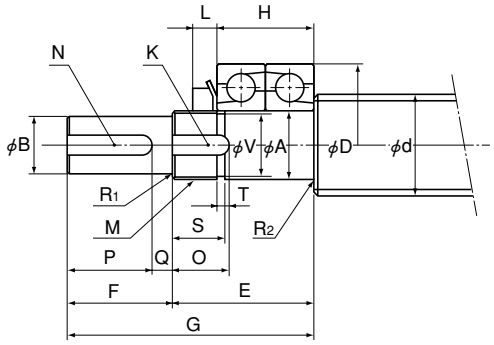
Unit: mm

Support Unit model No.			Ball screw shaft outer diameter	Shaft outer diameter of the bearing		Snap ring groove		
Model FF	Model EF	Model BF	d	A	E	B	F	G
FF 10	EF 10	BF 10	14	8	10	7.6	7.9	0.9
FF 10	EF 10	BF 10	15	8	10	7.6	7.9	0.9
FF 12	EF 12	BF 12	16	10	11	9.6	9.15	1.15
FF 12	EF 12	BF 12	18	10	11	9.6	9.15	1.15
FF 15	EF 15	BF 15	20	15	13	14.3	10.15	1.15
FF 15	EF 15	BF 15	25	15	13	14.3	10.15	1.15
—	—	BF 17*	25	17	16	16.2	13.15	1.15
FF 20	EF 20	BF 20**	28	20	19 (16)	19	15.35 (13.35)	1.35
FF 20	EF 20	BF 20**	30	20	19 (16)	19	15.35 (13.35)	1.35
FF 20	EF 20	BF 20**	32	20	19 (16)	19	15.35 (13.35)	1.35
FF 25	—	BF 25	36	25	20	23.9	16.35	1.35
FF 30	—	BF 30	40	30	21	28.6	17.75	1.75
—	—	BF 35	45	35	22	33	18.75	1.75
—	—	BF 40	50	40	23	38	19.95	1.95
—	—	BF 40	55	40	23	38	19.95	1.95

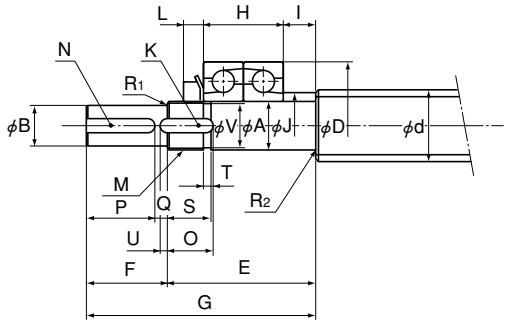
Note Support Units are designed to have dimensions so that combinations of models FK and FF, models EK and EF or models BK and BF are used on the same shaft.
If desiring the shaft end to be machined at THK, add the shape symbol in the end of the Ball Screw model number.
(Example) TS2505+500L-H2K
(Shape H2 on the fixed side; shape K on the supported side)
For the perpendicularity of the end face of the bearing, refer to JIS B 1192.

Note * When model BK17 (shaft end shape: J) is used on the fixed side for a Ball Screw with a shaft outer diameter of 25 mm, the shaft end shape on the supported side is that for model BF17.
** The dimensions in the parentheses in the table above are that of model BF20. They differ from those of models FF20 and EF20. When placing an order, be sure to specify the model number of the Support Unit to be used.

Recommended Shapes of Shaft Ends - Shape A



Shaft diameter: 20 to 45



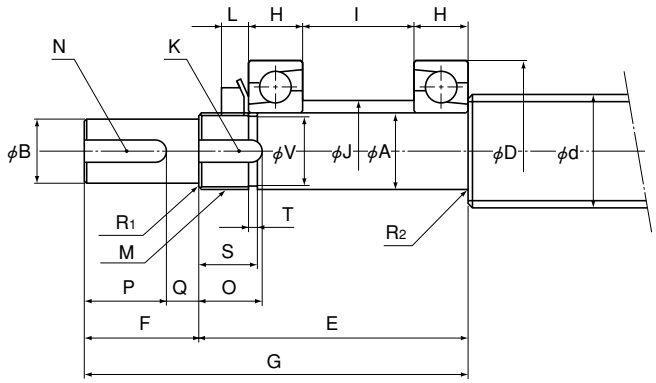
Shaft diameter: 14 to 18

Unit: mm

Screw shaft outer diameter	Shaft end dimensions																	Collar dimensions (Reference values)			Nut for rotary bearing	Washer for rotary bearing	Example of rotary bearing used		
	A	B				Metric screw thread				Washer groove for bearing			Keyway			Corner radius								Outer diameter	Width
d	h6	h7	E	F	G	M	S	T	V	K (width x depth)	O	U	N (width x depth)	P	Q	R_1	R_{2MAX}	J	I	L			Model No.	D	H
14	10	8	34	16	50	M10×0.75	11	2	8.5	3.5×1.5	13	2	—	—	—	0.3	0.2	15	7	5	AN00	AW00	7200	30	18
16	12	10	37	20	57	M12×1	11	2	10.5	3.5×1.5	13	2	3×1.8	17	3	0.3	0.2	17	8	5	AN01	AW01	7201	32	20
18	12	10	37	20	57	M12×1	11	2	10.5	3.5×1.5	13	2	3×1.8	17	3	0.3	0.2	17	8	5	AN01	AW01	7201	32	20
20	15	12	33	25	58	M15×1	13	2	13.5	4.5×1.5	16	—	4×2.5	21	4	0.5	0.2	—	—	6	AN02	AW02	7202	35	22
25	17	14	35	25	60	M17×1	13	2	15.5	4.5×1.5	16	—	5×3	21	4	0.5	0.2	—	—	6	AN03	AW03	7203	40	24
28	20	16	41	28	69	M20×1	15	2	18.5	4.5×1.5	18	—	5×3	24	4	0.5	0.5	—	—	7	AN04	AW04	7204	47	28
32	20	16	41	28	69	M20×1	15	2	18.5	4.5×1.5	18	—	5×3	24	4	0.5	0.5	—	—	7	AN04	AW04	7204	47	28
36	25	20	48	36	84	M25×1.5	21	3	23	5.5×2	24	—	6×3.5	32	4	0.5	0.5	—	—	8.2	AN05	AW05	7205	52	30
40	30	25	50	42	92	M30×1.5	21	3	28	5.5×2.5	24	—	8×4	37	5	0.5	0.5	—	—	8.2	AN06	AW06	7206	62	32
45	35	30	63	58	121	M35×1.5	24	3	33	6.5×2.5	28	—	8×4	53	5	0.5	0.9	—	—	9.2	AN07	AW07	7307	80	42

Note If desiring the shaft end to be machined at THK, add the shape symbol in the end of the Ball Screw model number.
(Example) TS1404+500L-AC
(Shape A on the fixed side; shape C on the supported side)
For the perpendicularity of the end face of the bearing, refer to JIS B 1192.

Recommended Shapes of Shaft Ends - Shape B

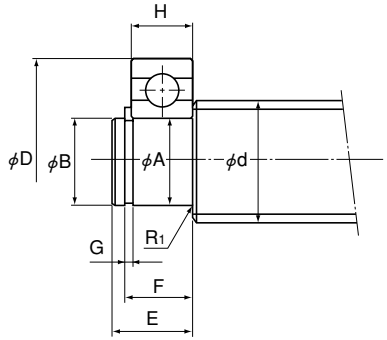


Unit: mm

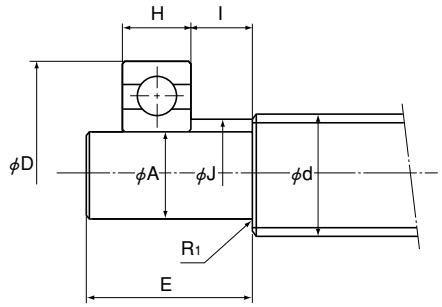
Screw shaft outer diameter	Shaft end dimensions																Collar dimensions (Reference values)			Nut for rotary bearing	Washer for rotary bearing	Example of rotary bearing used		
	A	B				Metric screw thread				Washer groove for bearing		Keyway			Corner radius									Outer diameter	Width
d	h6	h7	E	F	G	M	S	T	V	K (width x depth)	O	N (width x depth)	P	Q	R_1	R_{2MAX}	J	I	L			Model No.	D	H
20	15	12	55	25	80	M15X1	13	2	13.5	4.5X1.5	16	4X2.5	21	4	0.5	0.2	20	22	6	AN02	AW02	7202	35	11
25	17	14	59	25	84	M17X1	13	2	15.5	4.5X1.5	16	5X3	21	4	0.5	0.2	22	24	6	AN03	AW03	7203	40	12
28	20	16	69	28	97	M20X1	15	3	18.5	4.5X1.5	18	5X3	24	4	0.5	0.5	26	28	7	AN04	AW04	7204	47	14
32	20	16	69	28	97	M20X1	15	3	18.5	4.5X1.5	18	5X3	24	4	0.5	0.5	26	28	7	AN04	AW04	7204	47	14
36	25	20	81	36	117	M25X1.5	21	3	23	5.5X2	24	6X3.5	32	4	0.5	0.5	31	33	8.2	AN05	AW05	7205	52	15
40	30	25	88	42	130	M30X1.5	21	3	28	5.5X2.5	24	8X4	37	5	0.5	0.5	36	38	8.2	AN06	AW06	7206	62	16
45	35	30	105	58	163	M35X1.5	24	3	33	6.5X2.5	28	8X4	53	5	0.5	0.9	43.5	42	9.2	AN07	AW07	7307	80	21

Note If desiring the shaft end to be machined at THK, add the shape symbol in the end of the Ball Screw model number.
(Example) TS2005+1000L-BC
(Shape B on the fixed side; shape C on the supported side)
For the perpendicularity of the end face of the bearing, refer to JIS B 1192.

Recommended Shapes of Shaft Ends - Shape C



Shaft diameter: 20 to 45



Shaft diameter: 14 to 18

Unit: mm

Screw shaft outer diameter	Shaft end dimensions						Collar dimensions (Reference values)		Snap ring type C (concentric) for the shaft	Example of rotary bearing used		
	A		Snap ring groove			Corner radius					Outer diameter	Width
d	js7	E	F $^{+0.2}_{0}$	G $^{+0.14}_{0}$	B $^{0}_{-0.2}$	R_1 MAX	J	I		Model No.	D	H
14	10	19	—	—	—	0.5	15	7	—	6200	30	9
16	12	21	—	—	—	0.5	17	8	—	6201	32	10
18	12	21	—	—	—	0.5	17	8	—	6201	32	10
20	15	14	12.1	1.15	14.3	0.5	—	—	15	6202	35	11
25	17	15	13.1	1.15	16.2	0.5	—	—	17	6203	40	12
28	20	18	15.3	1.35	19	0.9	—	—	20	6204	47	14
32	20	18	15.3	1.35	19	0.9	—	—	20	6204	47	14
36	25	19	16.3	1.35	23.9	0.9	—	—	25	6205	52	15
40	30	21	17.6	1.75	28.6	0.9	—	—	30	6206	62	16
45	35	26	18.6	1.75	33	1	—	—	35	6207	72	17

Note If desiring the shaft end to be machined at THK, add the shape symbol in the end of the Ball Screw model number.
(Example) TS2505+1000L-AC
(Shape A on the fixed side; shape C on the supported side)
For the perpendicularity of the end face of the bearing, refer to JIS B 1192.