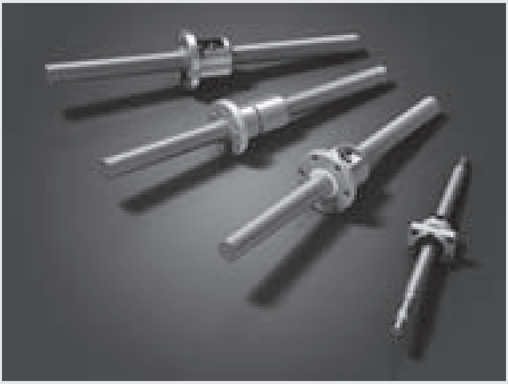


Ball Screw

THK General Catalog

Ball Screw

THK General Catalog

A Product Descriptions

B Support Book (Separate)

Overview of THK Ball Screws

Positioning Ball Screw
A15-72

ISO 3408 compliant

Preload

- **SDAN-V**: Caged Ball / Double nut / High speed / Compact
- **SDAN-VX**: Double nut / High speed / Compact
- **EPB-V**: High speed / Compact

Preload/ no preload

- **SDA-V**: Caged Ball / High speed / Various leads / Compact
- **SDA-VZ**: High speed / Various leads / Compact
- **EBB-V**: High speed / Compact

Positioning Ball Screw
A15-102

Preload

- **SBN-V**: Caged Ball / High speed
- **SBK**: Caged Ball / High speed / Large lead
- **SBKN**: Caged Ball / Double nut / High speed
- **BIF-V**: High speed
- **BNFN-V**: Double nut / High speed
- **DIK**: Compact
- **DKN**: Compact / Double nut
- **BLW**: Double nut / Large lead

Preload/ no preload

- **BNK**: Standard to large lead

No preload

- **MDK**
- **MBF**: Miniature
- **BNF-V**: High speed
- **DK**: Compact
- **WHF**: High speed / Large lead
- **BLK**
- **WGF**: Large lead
- **BNT**: Flat nut

High-Thrust Ball Screw
A15-240

No preload

HBN
Caged Ball
High load
High speed

SBKH
Caged Ball
High load
High speed
Large lead

Transport Ball Screw
A15-258

Preload

JPF
Compact

No preload

BTK-V
High speed

BNT
Flat nut

BLK / WTF / CNF
Large lead

MTF
Miniature

Rotary Nut Ball Screw
A15-278

Preload

DIR
Rotary nut
Compact

Preload/ no preload

BLR
Rotary nut
Large lead

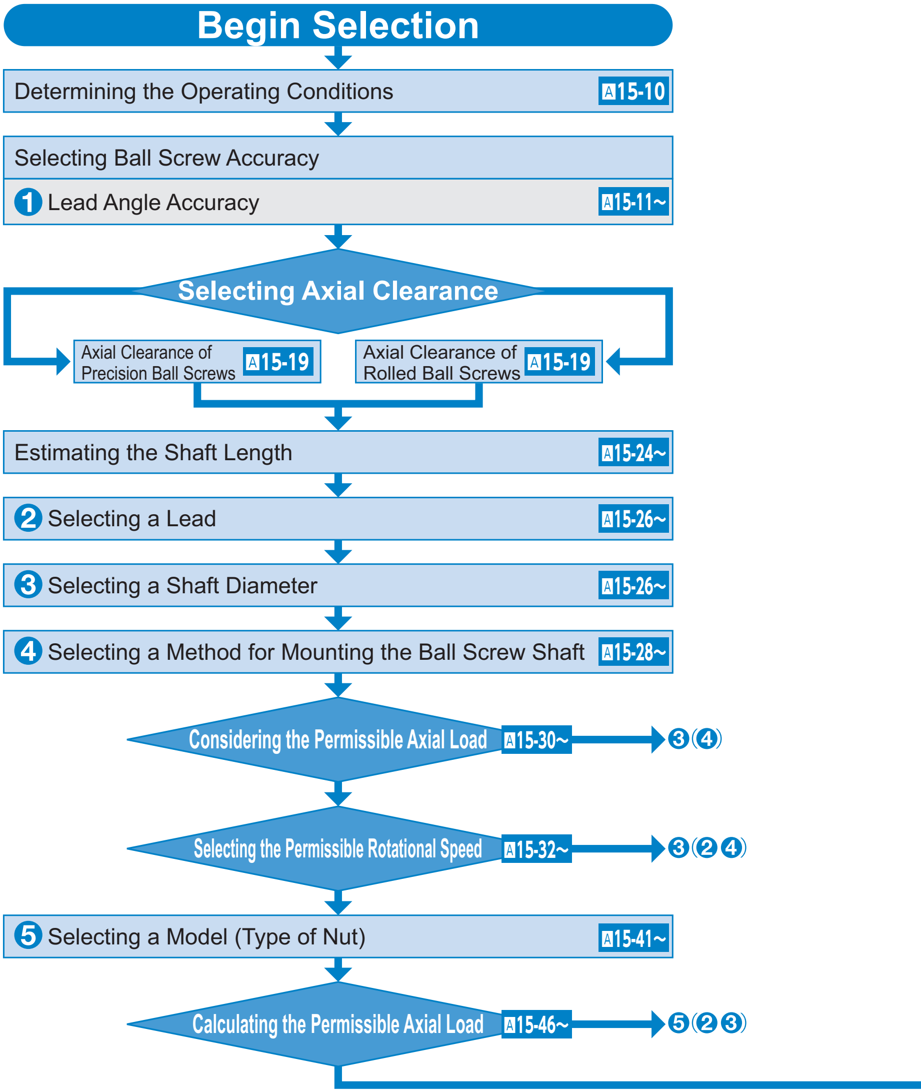
BNS-V/NS-V
Rotary nut
Ball screw/spline
Large lead
Low inertia

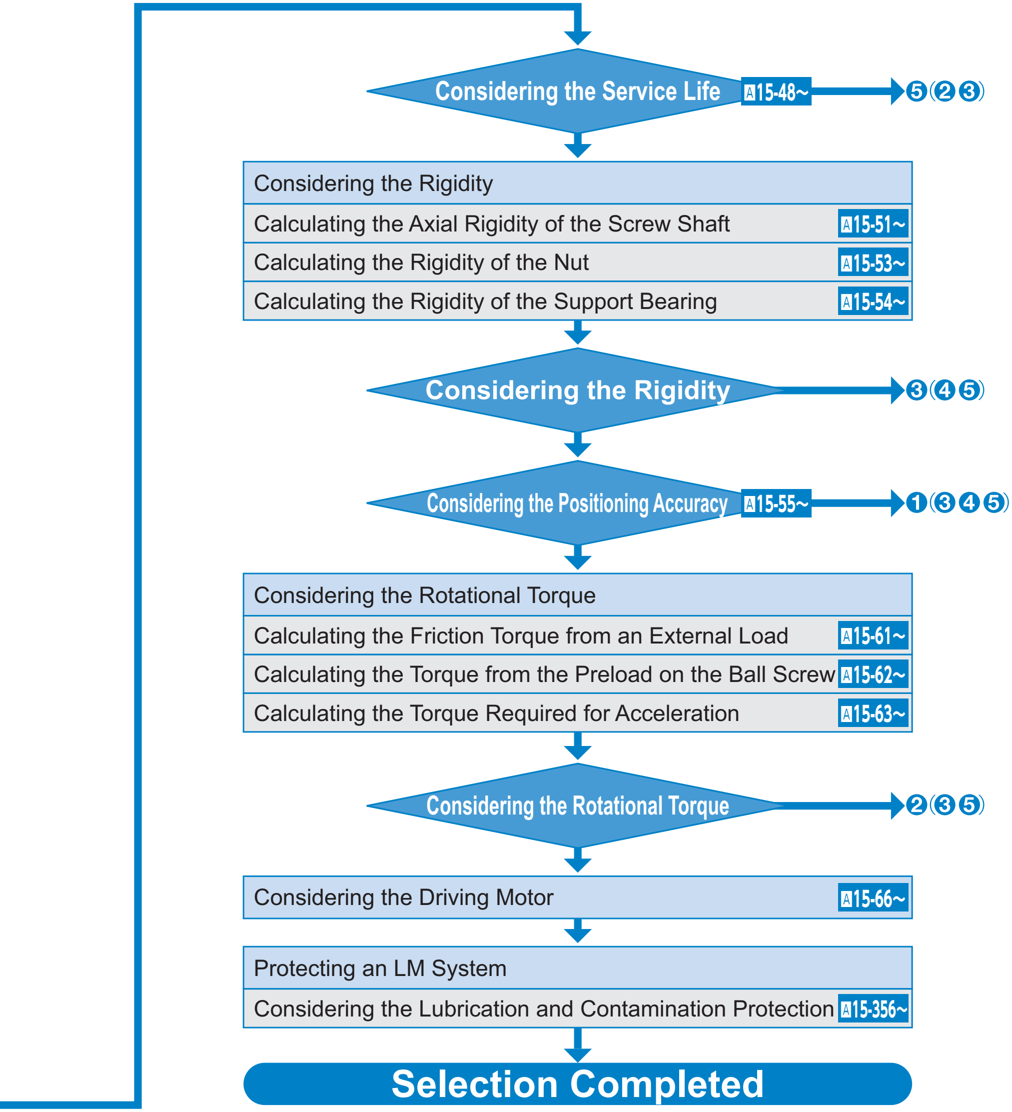
BNS/NS
Rotary nut
Ball screw/spline
Large lead

Flowchart for Selecting a Ball Screw

Ball Screw Selection Procedure

When selecting a ball screw, it is necessary to consider various parameters that depend on the operating conditions. The following is a flowchart for selecting a ball screw.




Considering the Service Life
A15-48~
⑤(②③)
Considering the Rigidity
Calculating the Axial Rigidity of the Screw Shaft
A15-51~
Calculating the Rigidity of the Nut
A15-53~
Calculating the Rigidity of the Support Bearing
A15-54~
Considering the Rigidity
③(④⑤)
Considering the Positioning Accuracy
A15-55~
①(③④⑤)
Considering the Rotational Torque
Calculating the Friction Torque from an External Load
A15-61~
Calculating the Torque from the Preload on the Ball Screw
A15-62~
Calculating the Torque Required for Acceleration
A15-63~
Considering the Rotational Torque
②(③⑤)
Considering the Driving Motor
A15-66~
Protecting an LM System
Considering the Lubrication and Contamination Protection
A15-356~
Selection Completed

Operating Conditions of the Ball Screw

The following operating conditions need to be considered when selecting a ball screw.

Transfer orientation (horizontal, vertical, etc.)
Transferred mass m (kg)
Table guide method (sliding, rolling)
Frictional coefficient of the guide surface μ (—)
Guide surface resistance f (N)
External load in the axial direction F (N)
Desired service life time L_h (h)

Stroke length ℓ_S (mm)
Operating speed V_{max} (m/s)
Acceleration time t_1 (s)
Uniform speed time t_2 (s)
Deceleration time t_3 (s)

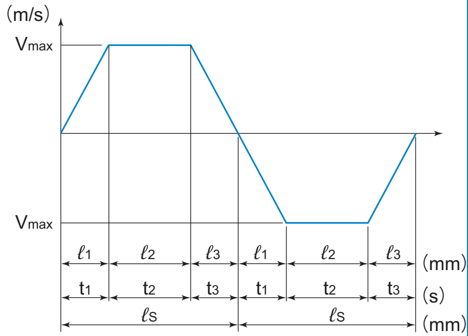
Acceleration

$$\alpha = \frac{V_{max}}{t_1} \quad (\text{m/s}^2)$$

Acceleration distance $\ell_1 = V_{max} \times t_1 \times 1{,}000/2$ (mm)
Uniform speed distance $\ell_2 = V_{max} \times t_2 \times 1{,}000$ (mm)
Deceleration distance $\ell_3 = V_{max} \times t_3 \times 1{,}000/2$ (mm)
Number of reciprocations per minute n (min^{-1})

Positioning accuracy (mm)
Positioning accuracy repeatability (mm)
Backlash (mm)
Minimum feed amount s (mm/pulse)

Driving motor (AC servomotor, stepping motor, etc.)
The rated rotation speed of the motor N_{MO} (min^{-1})
Inertial moment of the motor J_M (kg·m^2)
Motor resolution (pulse/rev)
Reduction ratio A (—)



Velocity Diagram

Accuracy of the Ball Screw

Lead Angle Accuracy

The lead angle accuracy of the ball screw is controlled in accordance with the JIS standard JIS B 1192 (ISO 3408).
Accuracy grades C0 to C5 are defined by linearity and direction, and C7 to C10 by error in relation to a 300 mm travel distance.

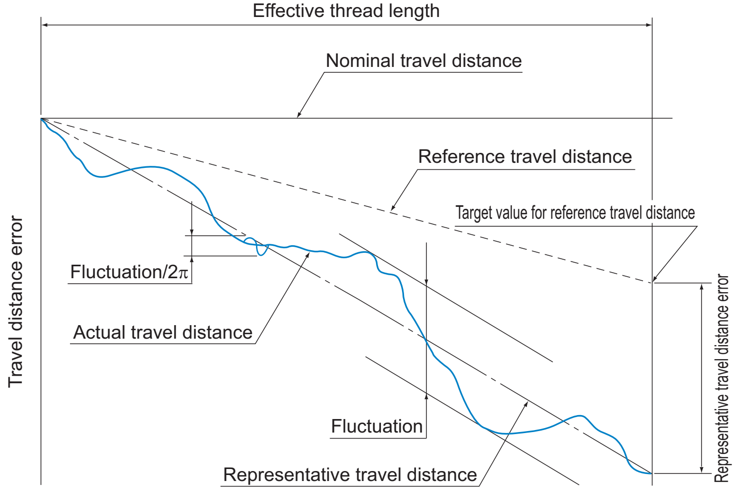


Fig. 1: Lead Angle Accuracy Terminology

Actual Travel Distance
The error in the 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 the nominal travel distance according to the intended use.

Target Value for Reference Travel Distance
You may apply tension in order to prevent screw shaft runout or set a negative or positive reference travel distance value in advance to account for possible expansion or contraction from an external load or temperature change. In such cases, indicate a target value for the reference travel distance.

Representative Travel Distance
It is a straight line representing the trend of the actual travel distance, and obtained with the least squares method from the curve that indicates the actual travel distance.

Representative Travel Distance Error (in ±)
Is the difference between the representative travel distance and the reference travel distance.

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

Fluctuation/300
Indicates the fluctuation in a given threaded portion of length of 300 mm.

Fluctuation/2π
Indicates the fluctuation in one revolution of the screw shaft.

Table 1: Lead Angle Accuracy (Permissible Value)

Unit: μm

		Precision ball screw												
												Rolled ball screw		
Accuracy grades		C0		C1		C2		C3		C5		C7	C8	C10
Effective thread length		Representative travel distance error	Fluctuation	Representative travel distance error	Fluctuation	Representative travel distance error	Fluctuation	Representative travel distance error	Fluctuation	Representative travel distance error	Fluctuation	Travel distance error	Travel distance error	Travel distance error
Above	Up to													
—	100	3	3	3.5	5	5	7	8	8	18	18	±50/ 300 mm	±100/ 300 mm	±210/ 300 mm
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	1,000	8	6	11	8	15	10	21	15	40	27			
1,000	1,250	9	6	13	9	18	11	24	16	46	30			
1,250	1,600	11	7	15	10	21	13	29	18	54	35			
1,600	2,000	—	—	18	11	25	15	35	21	65	40			
2,000	2,500	—	—	22	13	30	18	41	24	77	46			
2,500	3,150	—	—	26	15	36	21	50	29	93	54			
3,150	4,000	—	—	30	18	44	25	60	35	115	65			
4,000	5,000	—	—	—	—	52	30	72	41	140	77			
5,000	6,300	—	—	—	—	65	36	90	50	170	93			
6,300	8,000	—	—	—	—	—	—	110	60	210	115			
8,000	10,000	—	—	—	—	—	—	—	—	260	140			

Note: Unit of effective thread length: mm

Table 2: Fluctuation in a 300 mm Threaded Portion and in One Revolution (Permissible Value)

Unit: μm

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

Table 3: Types and Grades

Type	Grade	Remarks
For positioning	0, 1, 3, 5	ISO compliant
For transport	0, 1, 3, 5, 7, 10	

Example: the following data were obtained by measuring the lead of a ball screw manufactured with a target reference travel distance of –9 μm/500 mm.

Table 4: 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

Command position (A)	200	250	300	350
Travel distance (B)	199.995	249.993	299.989	349.985
Travel distance error (A–B)	–0.005	–0.007	–0.011	–0.015

Command position (A)	400	450	500
Travel distance (B)	399.983	449.981	499.984
Travel distance error (A–B)	–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 the actual travel distance while the straight line representing the trend of the (A-B) graph indicates the representative travel distance.
The difference between the reference travel distance and the representative travel distance appears as the representative travel distance error.

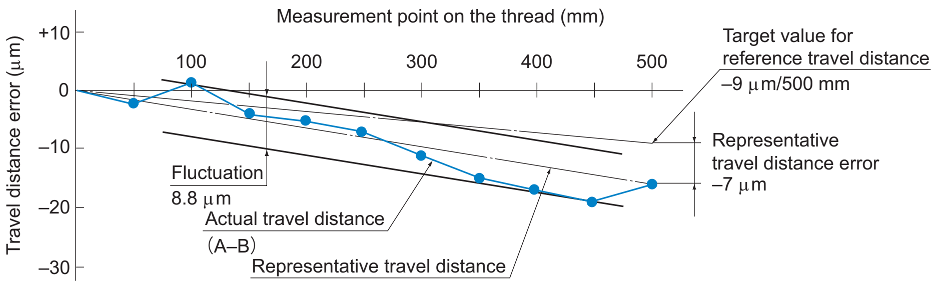
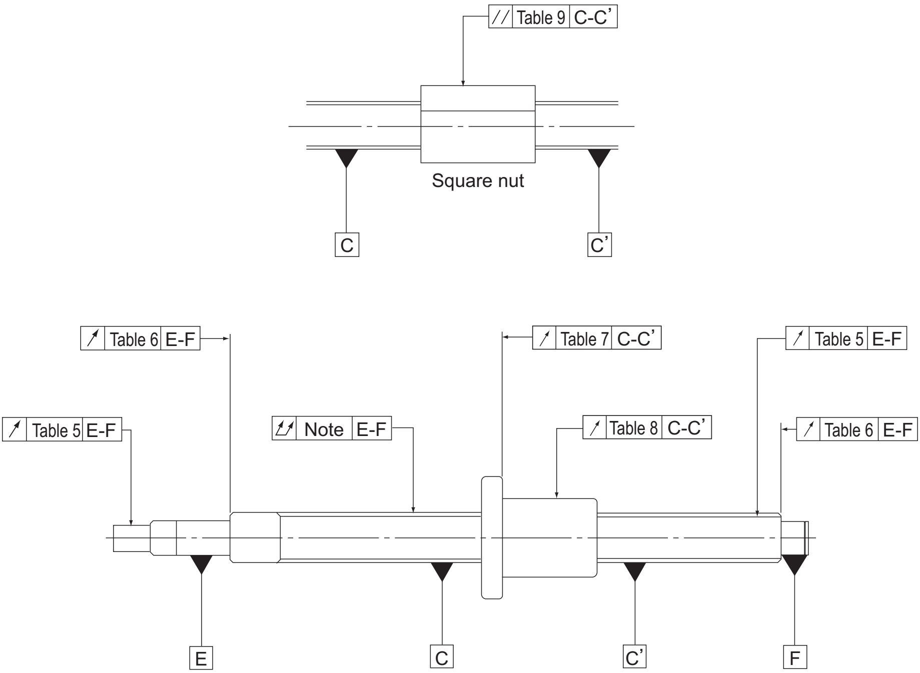


Fig. 2: Measurement Data on Travel Distance Error

Measurements
Representative travel distance error: -7 μm
Fluctuation: 8.8 μm

Accuracy of the Mounting Surface

The accuracy of the ball screw mounting surface complies with the JIS standard JIS B 1192 (ISO 3408).



Note: For the permissible overall radial runout of the outer diameter of the screw in relation to the screw shaft support axis, refer to JIS B 1192 (ISO 3408).

Fig. 3: Accuracy of the Ball Screw Mounting Surface

Accuracy Standards for the Mounting Surface

Table 5 to Table 9 show accuracy standards for the mounting surfaces of the precision ball screw.

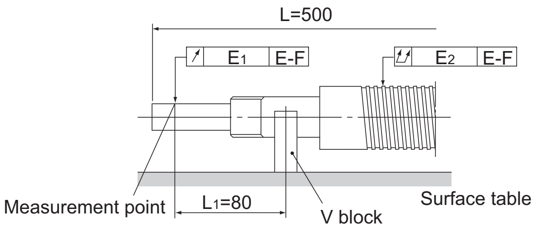
Table 5: Permissible Radial Runout of the Grooved Surface of the Screw and the Motor Coupling Journal in Relation to the Bearing Journals

Unit: μm

Screw shaft outer diameter (mm)		Runout (maximum)					
Above	Up to	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 for these items include the effect of the screw shaft's runout. Therefore, it is necessary to use the ratio of the overall screw shaft length to the distance between the fulcrum and the measurement point to obtain the correction value from the overall runout of the screw shaft axis, and then add that value to the value from the table above.

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



$$E_1 = e + \Delta e$$

e : Standard value in Table 5 (0.012)

Δe : Correction value

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

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

$$= 0.01$$

L : Overall screw shaft length

L_1 : Distance between the fulcrum and the measurement point

E_2 : Overall radial runout of the screw shaft axis (0.06)

$$E_1 = 0.012 + 0.01$$

$$= 0.022$$

Note: For the permissible overall radial runout of the outer diameter of the screw in relation to the screw shaft axis at the journal, refer to JIS B 1192 (ISO 3408).

Table 6: Permissible Axial Runout of the Journal End Face in Relation to the Bearing Journals

Unit: µm

Screw shaft outer diameter (mm)		Permissible axial runout (maximum)					
Above	Up to	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 7: Permissible Axial Runout of the Flange Mounting Surface in Relation to the Screw Shaft Axis

Unit: µm

Nut diameter (mm)		Permissible axial runout (maximum)					
Above	Up to	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 8: Permissible Radial Runout of the Nut Circumference in Relation to the Screw Shaft Axis

Unit: µm

Nut diameter (mm)		Permissible radial runout					
Above	Up to	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 9: Permissible Parallelism of the Nut Circumference (Flat Mounting Surface) to the Screw Shaft Axis

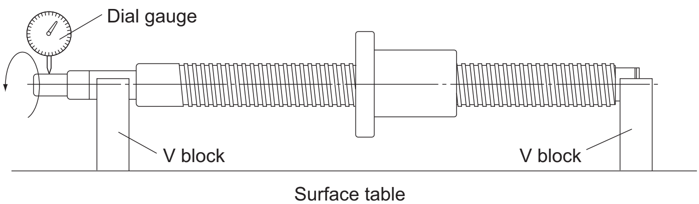
Unit: µm

Mounting reference length (mm)		Permissible parallelism					
Above	Up to	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

Method for Measuring Accuracy of the Mounting Surface

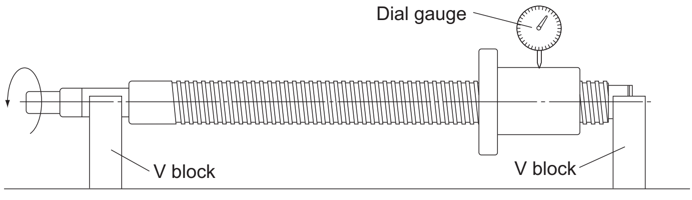
● Radial Runout of the Motor Coupling Journal in Relation to the Bearing Journals (see Table 5 on A15-15)

Support the journals of the screw shaft on V blocks. Place a probe on the circumference of the motor coupling journal, and record the largest difference measured by the dial gauge while rotating the screw shaft through one revolution.



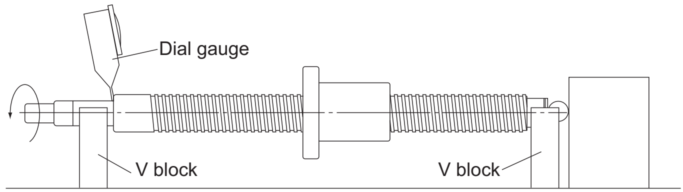
● Radial Runout of the Grooved Surface of the Screw in Relation to the Bearing Journals (see Table 5 on A15-15)

Support the journals of the screw shaft on V blocks. Place a probe on the circumference of the nut, and record the largest difference measured by the dial gauge while rotating the screw shaft by one revolution without rotating the nut.



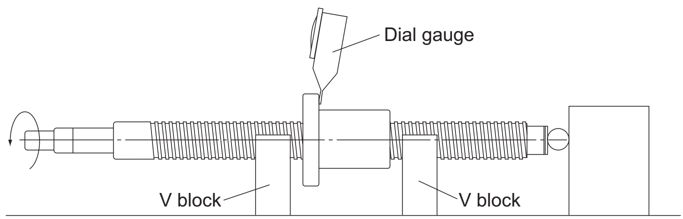
● Axial Runout of the Journal End Face in Relation to the Bearing Journals (see Table 6 on A15-16)

Support the journals of the screw shaft on V blocks. Place a probe on the screw shaft's journal end face, and record the largest difference measured by the dial gauge while rotating the screw shaft through one revolution.



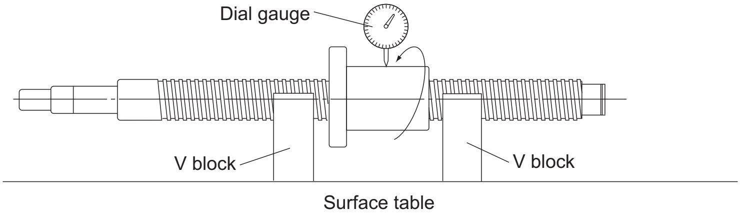
● Axial Runout of the Flange Mounting Surface in Relation to the Screw Shaft Axis (see Table 7 on A15-16)

Support the threaded portion of the screw shaft on V blocks near the nut. Place a probe on the flange end, and record the largest difference measured by the dial gauge while simultaneously rotating the screw shaft and the nut through one revolution.



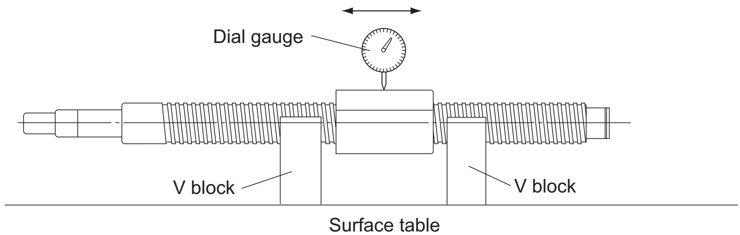
● Radial Runout of the Nut Circumference in Relation to the Screw Shaft Axis (see Table 8 on A15-16)

Support the threaded portion of the screw shaft on V blocks near the nut. Place a probe on the circumference of the nut, and record the largest difference measured by the dial gauge while rotating the nut through one revolution without rotating the screw shaft.



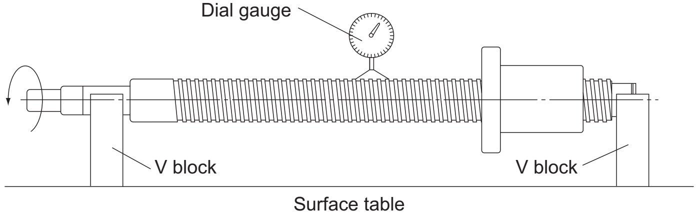
● Parallelism of the Nut Circumference (Flat Mounting Surface) to the Screw Shaft Axis (see Table 9 on A15-16)

Support the threaded portion of the screw shaft on V blocks near the nut. Place a probe on the circumference of the nut (flat mounting surface), and record the largest difference measured by the dial gauge while moving the dial gauge in parallel with the screw shaft.



● Overall Radial Runout of the Screw Diameter Relative to the Bearing Journals

Support the journals of the screw shaft on V blocks. Place a probe on the circumference of the screw shaft, and record the largest difference in the axial direction measured by the dial gauge at several points while rotating the screw shaft through one revolution.



Note: For the permissible overall radial runout of the outer diameter of the screw in relation to the screw shaft axis at the journal, refer to JIS B 1192 (ISO 3408).

Axial Clearance

Axial Clearance of Precision Ball Screws

Table 10 shows the axial clearance of the precision ball screw. If the manufacturing length exceeds the value in Table 11, the resultant clearance may partially be negative (preload applied).

The manufacturing limit lengths of the ball screws compliant with the ISO standard are provided in Table 12.

For the axial clearance of precision Caged Ball ball screws, see **A15-76** to **A15-93**, **A15-112** to **A15-119**, **A15-246** to **A15-257**.

Table 10: 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 11: Maximum Manufacturing Length of Precision Ball Screws by Axial Clearance and Accuracy Grade

Unit: mm

Screw shaft outer diameter	GT clearance				G1 clearance				G2 clearance					
	C0	C1	C2, C3	C5	C0	C1	C2, C3	C5	C0	C1	C2	C3	C5	C7
4, 6	80	80	80	100	80	80	80	100	80	80	80	80	100	120
8	230	250	250	200	230	250	250	250	230	250	250	250	300	300
10	250	250	250	200	250	250	250	250	250	250	250	250	300	300
12, 13	440	500	500	400	440	500	500	500	440	500	630	680	600	500
14	500	500	500	400	500	500	500	500	530	620	700	700	600	500
15	500	500	500	400	500	500	500	500	570	670	700	700	600	500
16	500	500	500	400	500	500	500	500	620	700	700	700	600	500
18	720	800	800	700	720	800	800	700	720	840	1,000	1,000	1,000	1,000
20	800	800	800	700	800	800	800	700	820	950	1,000	1,000	1,000	1,000
25	800	800	800	700	800	800	800	700	1,000	1,000	1,000	1,000	1,000	1,000
28	900	900	900	800	1,100	1,100	1,100	900	1,300	1,400	1,400	1,400	1,200	1,200
30, 32	900	900	900	800	1,100	1,100	1,100	900	1,400	1,400	1,400	1,400	1,200	1,200
36, 40, 45	1,000	1,000	1,000	800	1,300	1,300	1,300	1,000	2,000	2,000	2,000	2,000	1,500	1,500
50, 55, 63, 70	1,200	1,200	1,200	1,000	1,600	1,600	1,600	1,300	2,000	2,500	2,500	2,500	2,000	2,000
80, 100	—	—	—	—	1,800	1,800	1,800	1,500	2,000	4,000	4,000	4,000	3,000	3,000

Notes: When manufacturing a ball screw of accuracy grade C7 with clearance GT or G1, the resultant clearance is partially negative.
G0 clearance is not available for models HBN-V, HBN-K (KA), HBN, and SBKH.
Accuracy grade C7 is not available when manufacturing a miniature ball screw (screw shaft outer diameter ϕ14 mm or less) with a G0 clearance.

Table 12: Manufacturing Limit Lengths of Precision Ball Screws with Axial Clearances (ISO Standard-Compliant Ball Screws)

Unit: mm

Shaft diameter	GT clearance		G1 clearance		G2 clearance		
	C3, Cp3	C5, Cp5, Ct5	C3, Cp3	C5, Cp5, Ct5	C3, Cp3	C5, Cp5, Ct5	C7, Cp7
16	500	400	500	500	700	600	500
20, 25	800	700	800	700	1,000	1,000	1,000
32	900	800	1,100	900	1,400	1,200	1,200
40	1,000	800	1,300	1,000	2,000	1,500	1,500
50, 63	1,200	1,000	1,600	1,300	2,500	2,000	2,000

Note: When manufacturing a ball screw of accuracy grade C7 (Ct7) with clearance GT or G1, the resultant clearance is partially negative.

Axial Clearance of Rolled Ball Screws

Table 13 shows axial clearance of rolled ball screws.

Table 13: Axial Clearance of Rolled Ball Screws

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

Preload

A preload is applied in order to eliminate the axial clearance and minimize the displacement under an axial load.
A preload is generally used in applications requiring highly accurate positioning.

Rigidity of the Ball Screw under a Preload

When a preload is applied to a ball screw, the rigidity of the nut is increased.
Fig. 4 shows elastic displacement curves of a ball screw under a preload and without a preload.

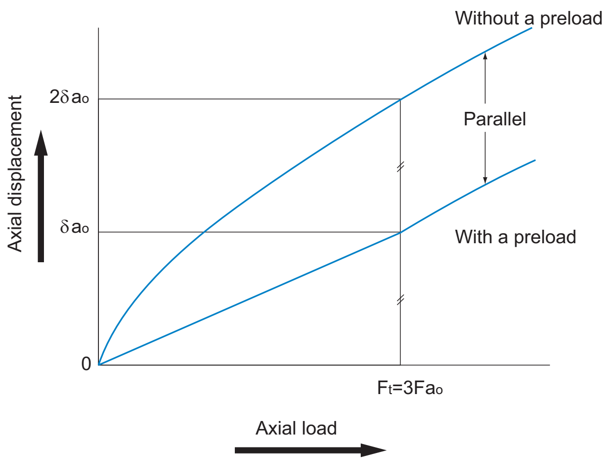


Fig. 4: Elastic Displacement Curve of the Ball Screw

Fig. 5 shows a single-nut type of the ball screw.

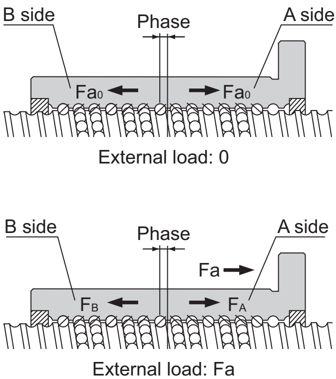


Fig. 5

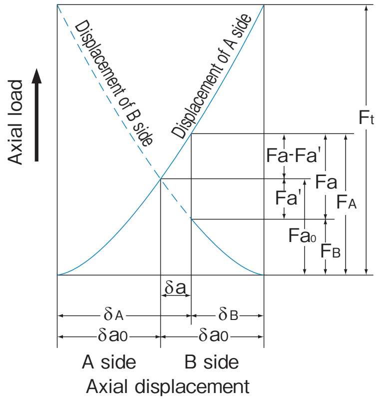


Fig. 6

The A and B sides are provided with preload Fa_0 by changing the groove pitch in the center of the nut to create a phase. Because of the preload, the A and B sides are elastically displaced by δa_0 each. If an axial load (Fa) is applied from outside in this state, the displacement of the A and B sides is calculated as follows.

$$\delta_A = \delta a_0 + \delta a \qquad \delta_B = \delta a_0 - \delta a$$

In other words, the loads on the A and B sides are expressed as follows:

$$F_A = Fa_0 + (Fa - Fa') \qquad F_B = Fa_0 - Fa'$$

Therefore, under a preload, the load that the A side receives equals Fa–Fa'. This means that the displacement of the A side is smaller because load Fa', which is applied when the A side receives no preload, is deducted from Fa.
This effect extends to the point where the displacement (δa_0) caused by the preload applied on the B side reaches zero.
To what extent is the elastic displacement reduced? The relationship between the axial load on the ball screw under no preload and the elastic displacement can be expressed by $\delta a \propto Fa^{2/3}$. From Fig. 6, the following equations are established.

$$\delta a_0 = KFa_0^{2/3} \qquad (K\text{: constant})$$

$$2\delta a_0 = KF_t^{2/3}$$

$$\left(\frac{F_t}{Fa_0}\right)^{\frac{2}{3}} = 2 \qquad F_t = 2^{3/2} \times Fa_0 = 2.8Fa_0 \fallingdotseq 3Fa_0$$

Thus, the ball screw under a preload is displaced by δa_0 when an axial load (F_t) approximately three times greater than the preload is provided from outside. As a result, the displacement of the ball screw under a preload is half the displacement ($2\delta a_0$) of the ball screw without a preload.
As stated above, since the preloading is effective up to approximately three times the applied preload, the optimum preload is one third of the maximum axial load.
Note that an excessive preload adversely affects the service life and heat generation. The maximum preload should be set at 10% of the basic dynamic load rating (Ca) in the axial direction.

Preload Torque

The preload torque of the ball screw is controlled in accordance with the JIS standard JIS B 1192 (ISO 3408).

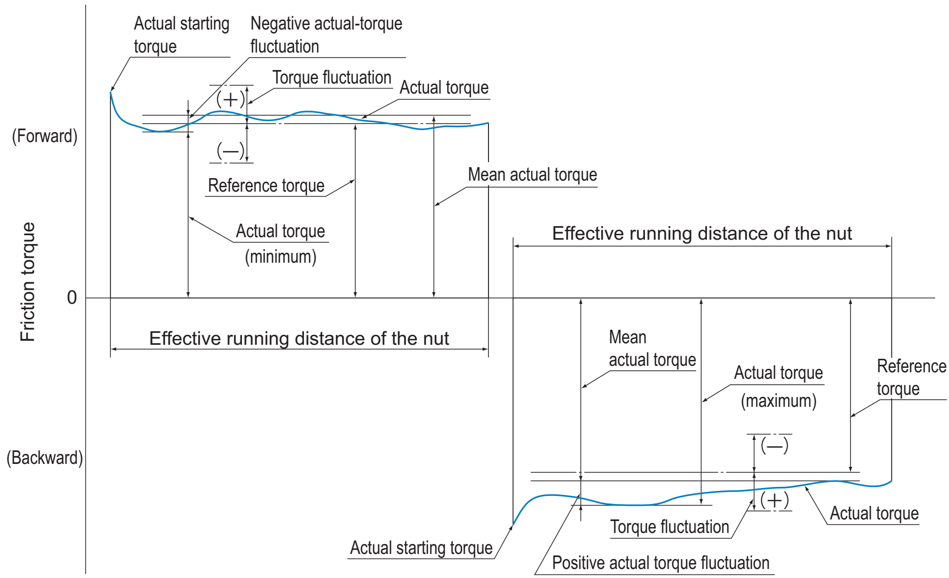


Fig. 7: Preload Torque Terminology

● Dynamic Preload Torque

A torque required to continuously rotate the screw shaft of a ball screw under a given preload without an external load applied.

● Actual Torque

A dynamic preload torque measured with an actual ball screw.

● Torque Fluctuation

Variation in a dynamic preload torque set at a target value. It can be positive or negative in relation to the reference torque.

● Coefficient of Torque Fluctuation

Ratio of torque fluctuation to the reference torque.

● Reference Torque

A dynamic preload torque set as a target.

● Calculating the Reference Torque

The reference torque of a ball screw provided with a preload is obtained in the following equation (4).

$$T_p = 0.05\ (\tan\beta)^{-0.5}\ \frac{Fa_0 \cdot Ph}{2\pi} \quad \cdots\cdots\cdots (4)$$

T_p	: Reference torque	(N·mm)
β	: Lead angle	
Fa_0	: Applied preload	(N)
Ph	: Lead	(mm)

Note: The values listed above and the preload indicated on the delivery specification drawing are without retainers, grease, or seals.

Example: When a preload of 3,000 N is provided to the Ball Screw Model BIF4010-10G0 + 1500LC3 with a thread length of 1,300 mm (shaft diameter: 40 mm; ball center-to-center diameter: 41.75 mm; lead: 10 mm), the preload torque of the ball screw is calculated in the steps below.

■Calculating the Reference Torque

β : Lead angle

$$\tan\beta = \frac{\text{lead}}{\pi \times \text{ball center-to-center diameter}} = \frac{10}{\pi \times 41.75} = 0.0762$$

Fa_0 : Applied preload = 3,000 N

Ph : Lead = 10 mm

$$T_p = 0.05\,(\tan\beta)^{-0.5}\,\frac{Fa_0 \cdot Ph}{2\pi} = 0.05\,(0.0762)^{-0.5}\,\frac{3{,}000 \times 10}{2\pi} = 865\ \text{N·mm}$$

■Calculating the Torque Fluctuation

$$\frac{\text{thread length}}{\text{screw shaft outer diameter}} = \frac{1{,}300}{40} = 32.5 \leqq 40$$

Thus, with the reference torque in Table 14 being between 600 and 1,000 N·mm, effective thread length 4,000 mm or less, and accuracy grade C3, the coefficient of torque fluctuation is obtained as ±30%.

As a result, the torque fluctuation is calculated as follows.

865×(1±0.3) = 606 N·mm to 1,125 N·mm

■Result

Reference torque : 865 N·mm

Torque fluctuation : 606 N·mm to 1,125 N·mm

Table 14: Tolerance Range in Torque Fluctuation

Reference torque N·mm		Effective thread length												
		4,000 mm or less										Above 4,000 mm and up to 10,000 mm		
		$\frac{\text{thread length}}{\text{screw shaft outer diameter}} \leqq 40$					$40 < \frac{\text{thread length}}{\text{screw shaft outer diameter}} < 60$					—		
		Accuracy grades					Accuracy grades					Accuracy grades		
Above	Up to	C0	C1	C3	C5	C7	C0	C1	C3	C5	C7	C3	C5	C7
200	400	±30%	±35%	±40%	±50%	—	±40%	±40%	±50%	±60%	—	—	—	—
400	600	±25%	±30%	±35%	±40%	—	±35%	±35%	±40%	±45%	—	—	—	—
600	1,000	±20%	±25%	±30%	±35%	±40%	±30%	±30%	±35%	±40%	±45%	±40%	±45%	±50%
1,000	2,500	±15%	±20%	±25%	±30%	±35%	±25%	±25%	±30%	±35%	±40%	±35%	±40%	±45%
2,500	6,300	±10%	±15%	±20%	±25%	±30%	±20%	±20%	±25%	±30%	±35%	±30%	±35%	±40%
6,300	10,000	—	—	±15%	±20%	±30%	—	—	±20%	±25%	±35%	±25%	±30%	±35%

Selecting a Screw Shaft

Maximum Manufacturing Lengths of Screw Shafts

Table 15 shows the maximum manufacturing lengths of precision ball screws by accuracy grade, Table 16 shows the maximum manufacturing lengths of precision ball screws compliant with ISO standards by accuracy grade, and Table 17 shows the maximum manufacturing lengths of rolled ball screws by accuracy grade.
If the shaft dimensions exceed the maximum manufacturing lengths in Table 15, Table 16, or Table 17, contact THK.

Table 15: Maximum Manufacturing Lengths of Precision Ball Screws 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	1,100
16	620	730	900	1,050	1,100	1,400
18	720	840	1,050	1,220	1,350	1,600
20	820	950	1,200	1,400	1,600	1,800
25	1,100	1,400	1,600	1,800	2,000	2,400
28	1,300	1,600	1,900	2,100	2,350	2,700
30	1,450	1,700	2,050	2,300	2,570	2,950
32	1,600	1,800	2,200	2,500	2,800	3,200
36	2,000	2,100	2,550	2,950	3,250	3,650
40	2,000	2,400	2,900	3,400	3,700	4,300
45	2,000	2,750	3,350	3,950	4,350	5,050
50	2,000	3,100	3,800	4,500	5,000	5,800
55	2,000	3,450	4,150	5,300	6,050	6,500
63	2,000	4,000	5,200	5,800	6,700	7,700
70	2,000	4,000	6,300	6,450	7,650	9,000
80	2,000	4,000	6,300	7,900	9,000	11,000
100	2,000	4,000	6,300	11,000	11,000	11,000

Notes: For ball screw models HBN-V, HBN-K (KA), HBN, and SBKH, the standard maximum length of the screw shaft is 3,000 mm.
For lengths greater than this, please contact THK.
For details, refer to A**15-316**.

Table 16: Maximum Manufacturing Length of Precision Ball Screws (ISO Standard-Compliant Ball Screws)

Unit: mm

Shaft diameter	Ground shaft			CES shaft			
	C3	C5	C7	Cp3	Cp5	Ct5	Ct7
16	1,050	1,100	1,400	1,050	1,100	1,100	1,400
20	1,400	1,600	1,800	1,400	1,600	1,600	1,800
25	1,800	2,000	2,400	1,800	2,000	2,000	2,400
32	2,500	2,800	3,200	2,500	2,800	2,800	3,200
40	3,400	3,700	4,300	3,400	3,700	3,700	4,300
50	4,500	5,000	5,800	—	—	—	—
63	5,800	6,700	7,700	—	—	—	—

Table 17: Maximum Manufacturing Length of Rolled Ball Screws 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	1,000	—
14 to 15	1,500	1,500	1,500
16 to 18	1,500	1,800	1,800
20	2,000	2,200	2,200
25	2,000	3,000	3,000
28	3,000	3,000	3,000
30	3,000	3,000	4,000
32 to 36	3,000	4,000	4,000
40	3,000	5,000	5,000
45	3,000	5,500	5,500
50	3,000	6,000	6,000

Note: For details, refer to A**15-316**.

Combinations of Shaft Diameter and Lead for Precision Ball Screws

Table 18 shows combinations of shaft diameters and leads of precision ball screws, and Table 19 shows combinations of shaft diameters and leads of precision ball screws compliant with ISO standards.
If a ball screw not covered by the table is required, contact THK.

Table 18: Combinations of Screw Shaft Diameter and Lead (Precision Ball Screw)

Unit: mm

Screw shaft outer diameter	Lead																										
	1	1.5	2	2.5	3	4	5	6	8	10	12	15	16	20	24	25	30	32	35	36	40	42	50	60	80	90	100
4	●																										
5	●																										
6	●		●	●					●																		
8	●	●	●	●	●	●			●	●	●																
10	●	●	●	●	●	●	●	●		●		●															
12			●	●	●	●	●		●	●				●			●										
13														●													
14			●			●	●		●																		
15							●			●				●			●				●						
16						●	●			●			●														
18									●	●																	
20						●	●	●	●	●				●		●	●				●			●			
25						●	●	●	●	●				●		●	●						●				
28							●	●		●																	
30																								●		●	
31										●	●		●	●				●									
32						●	●	●	●	●	●		●	●				●									
36										●	●		●	●	●					●							
38										●	●	●	●	●		●	●				●						
40									●	●	●	●	●	●		●	●				●				●		
45										●	●		●	●		●	●				●						
50										●	●		●	●		●	●			●	●		●				●
55										●	●		●	●			●			●							
63										●	●		●	●		●	●	●	●		●	●	●				
70										●	●			●													
80										●	●		●	●		●					●		●	●			
100													●	●		●							●	●			
120														●		●								●			
140																●		●			●						

Table 19: Standard Combinations of Outer Diameters and Leads of the Screw Shafts (ISO Standard-Compliant Ball Screws)

Unit: mm

Shaft diameter	Lead		
	5	10	20
16	●	—	—
20	●	—	—
25	●	●	—
32	●	●	—
40	○	●	○[1]
50	—	○	○[1]
63	—	○	○[1]

●: Ground shaft, CES shaft ○: Ground shaft only
[1] Model EBB-V (no preload) only

Combinations of Shaft Diameter and Lead for Rolled Ball Screws

Table 20 shows the combinations of shaft diameter and lead for the rolled ball screw.

Table 20: Combinations of Screw Shaft Diameter and Lead (Rolled Ball Screw)

Unit: mm

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									●								●			●

Mounting Procedure for the Ball Screw Shaft

Fig. 8 to Fig. 11 show the representative mounting methods for the screw shaft.
The permissible axial load and the permissible rotational speed vary with mounting methods for the screw shaft. Therefore, it is necessary to select an appropriate mounting method according to the operating conditions.

Determining the Permissible Axial Load (Buckling Load on the Screw Shaft)

● **For Fixed-Fixed Configuration (see Fig. 10, Fig. 11)**

A15-30 Calculate the buckling load for A and B (the distances between mounting surfaces) using formula 5, and use the smaller value as the screw shaft buckling load.

● **For Fixed-Free, Fixed-Supported Configuration (see Fig. 8, Fig. 9)**

A15-30 Use B in formula 5 to calculate the screw shaft buckling load.

Determining the Permissible Screw Shaft Rotational Speed (Critical Speed of the Screw Shaft)

A15-32 Calculate the critical speed for A and B (the distances between mounting surfaces) using formula 7, and use the smaller value as the screw shaft critical speed.

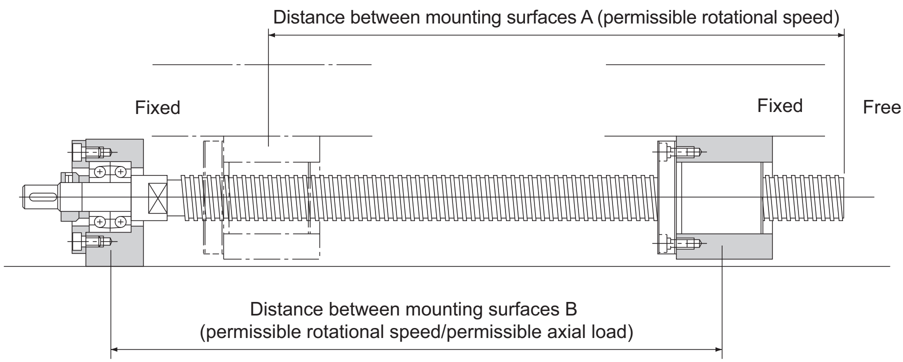


Fig. 8: Screw Shaft Mounting Method: Fixed - Free

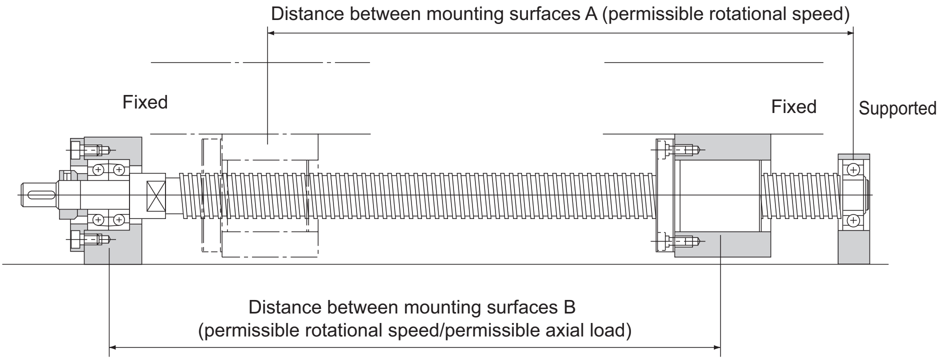


Fig. 9: Screw Shaft Mounting Method: Fixed - Supported

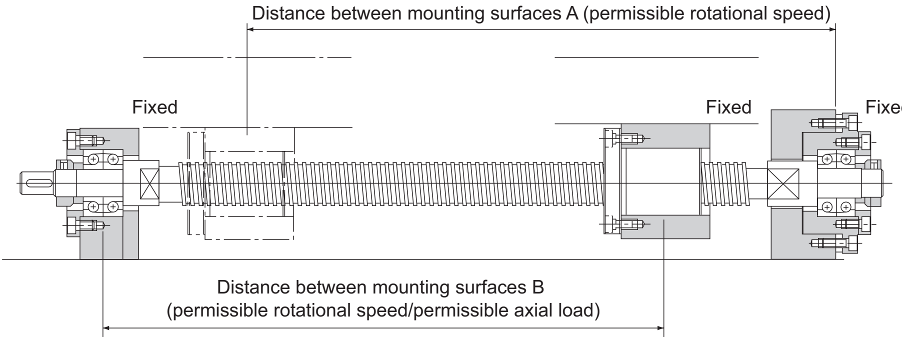


Fig. 10: Screw Shaft Mounting Method: Fixed - Fixed

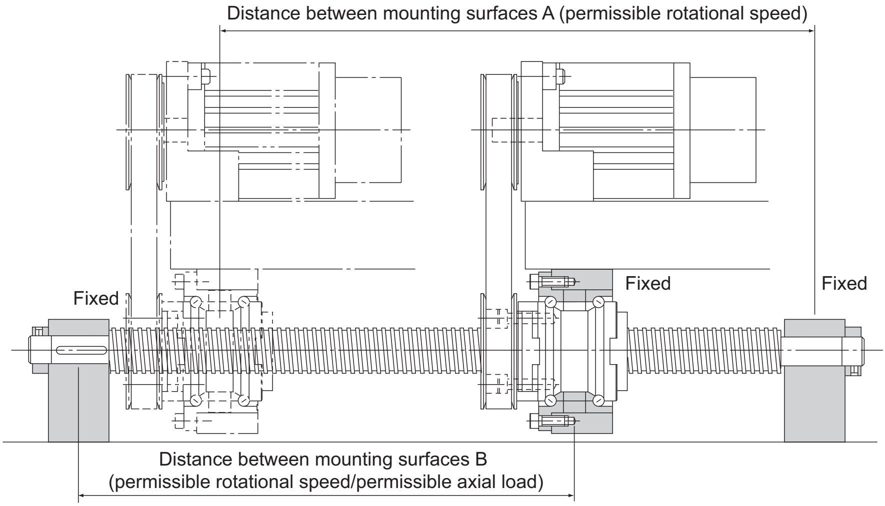


Fig. 11: Screw Shaft Mounting Method for Rotary Nut Ball Screw: Fixed - Fixed

Permissible Axial Load

Buckling Load on the Screw Shaft

With the ball screw, it is necessary to select a screw shaft so that it will not buckle when the maximum compressive load is applied in the axial direction.

Fig. 12 on A15-31 shows the relationship between the screw shaft diameter and a buckling load.

The buckling load can be calculated by equation (5) below. Note that in this equation, the result is multiplied by a safety factor of 0.5.

$$P_1 = \frac{\eta_1 \cdot \pi^2 \cdot E \cdot I}{\ell_a^{\,2}} 0.5 = \eta_2 \frac{d_1^{\,4}}{\ell_a^{\,2}} 10^4 \quad \cdots\cdots\cdots (5)$$

P_1 : Buckling load (N)

ℓ_a : Distance between two mounting surfaces (mm)

E : Young's modulus (2.06×10^5 N/mm^2)

I : Minimum geometric moment of inertia of the shaft (mm^4)

$I = \frac{\pi}{64} d_1^{\,4}$ d_1: Screw-shaft thread minor diameter (mm)

η_1, η_2 = Factor according to the mounting method

Fixed - free	$\eta_1 = 0.25$	$\eta_2 = 1.3$
Fixed - supported	$\eta_1 = 2$	$\eta_2 = 10$
Fixed - fixed	$\eta_1 = 4$	$\eta_2 = 20$

Permissible Tensile Compressive Load on the Screw Shaft

If an axial load is applied to the ball screw, it is necessary to take into account not only the buckling load but also the permissible tensile compressive load in relation to the yielding stress on the screw shaft.

The permissible tensile compressive load is obtained from equation (6).

$$P_2 = \sigma \frac{\pi}{4} d_1^{\,2} = 116 d_1^{\,2} \quad \cdots\cdots\cdots (6)$$

P_2 : Permissible tensile compressive load (N)

σ : Permissible tensile compressive stress (147 MPa)

d_1 : Screw-shaft thread minor diameter (mm)

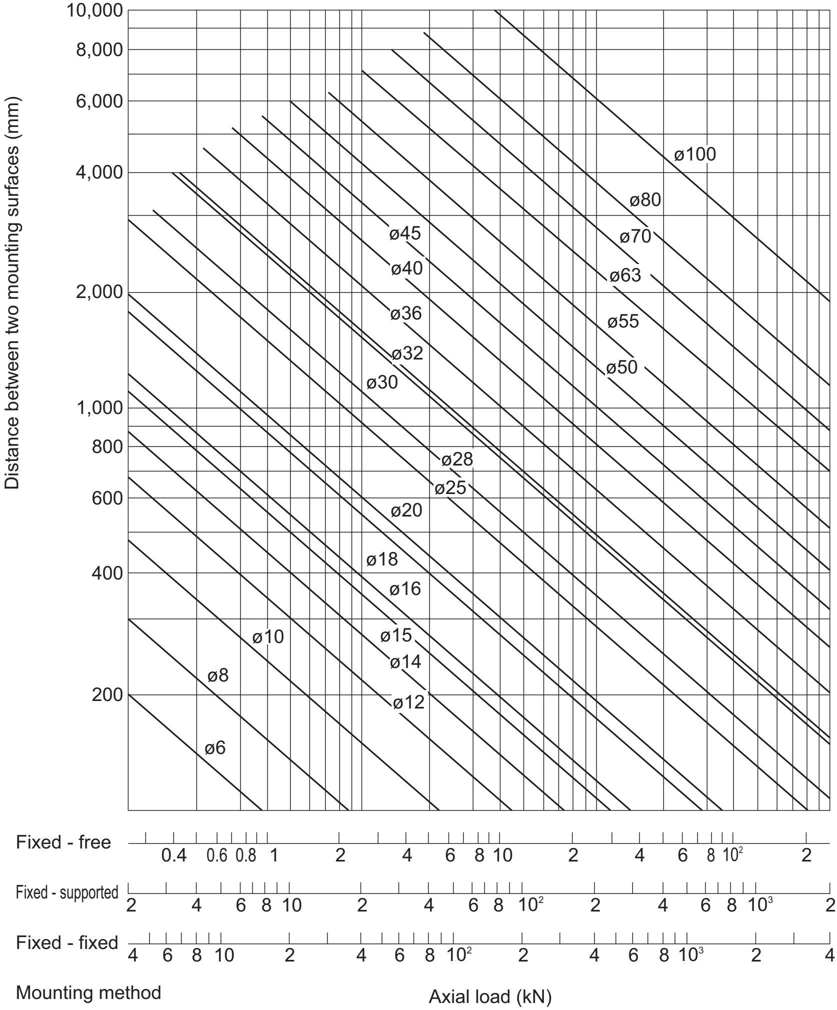


Fig. 12: Permissible Tensile Compressive Load Diagram

Permissible Rotational Speed

The permissible rotational speed of the ball screw must be obtained from the critical speed of the screw shaft and the DN value.

Critical Speed of the Screw Shaft

At high rotational speeds, the ball screw may resonate due to the screw shaft's natural frequency and eventually become unable to operate. Therefore, it is necessary to select a model that can be used below the resonance point (critical speed).

Fig. 13 on A15-34 shows the relationship between the screw shaft diameter and the critical speed.

The critical speed can be calculated by equation (7) below. Note that in this equation, the result is multiplied by a safety factor of 0.8.

$$N_1 = \frac{60 \cdot \lambda_1^2}{2\pi \cdot \ell_b^2} \times \sqrt{\frac{E \times 10^3 \cdot I}{\gamma \cdot A}} \times 0.8 = \lambda_2 \cdot \frac{d_1}{\ell_b^2} \cdot 10^7 \quad \cdots\cdots\cdots (7)$$

N_1 : Permissible rotational speed determined by the critical speed (min^{-1})

ℓ_b : Distance between two mounting surfaces (mm)

E : Young's modulus (2.06×10^5 N/mm^2)

I : Minimum geometric moment of inertia of the shaft (mm^4)

$$I = \frac{\pi}{64} d_1^4$$ d_1: Screw-shaft thread minor diameter (mm)

γ : Density (specific gravity) (7.85×10^{-6} kg/mm^3)

A : Screw shaft cross-sectional area (mm^2)

$$A = \frac{\pi}{4} d_1^2$$

λ_1, λ_2 : Factor according to the mounting method

Fixed - free	$\lambda_1 = 1.875$	$\lambda_2 = 3.4$
Supported - supported	$\lambda_1 = 3.142$	$\lambda_2 = 9.7$
Fixed - supported	$\lambda_1 = 3.927$	$\lambda_2 = 15.1$
Fixed - fixed	$\lambda_1 = 4.73$	$\lambda_2 = 21.9$

DN Value

The permissible rotational speed determined by the DN value is obtained using equations (8) to (17) below.

Model No.				Permissible rotational speed determined by the DN value N_2
Precision	Caged Ball	Models SDAN-V and SDA-V	Standard lead to super lead	$N_2 = \frac{160,000}{D}$ ……(8)
		Model SBK (medium) (SBK3636, SBK4040, and SBK5050)	Large lead	$N_2 = \frac{210,000}{D}$ ……(9-1)
		Model SBK (medium) (Other than the above model numbers and the small Model SBK), Model SBKN		$N_2 = \frac{160,000}{D}$ ……(9-2)
		Model SBK (small)		$N_2 = \frac{130,000}{D}$ ……(9-3)
		Models SBN-V (medium), HBN-V	Standard lead	$N_2 = \frac{160,000}{D}$ ……(10-1)
		Models SBN-V (small), HBN, and SBKH		$N_2 = \frac{130,000}{D}$ ……(10-2)
		Models HBN-K and HBN-KA		$N_2 = \frac{120,000}{D}$ ……(10-3)
	Full-Ball	Models SDAN-VX and SDA-VZ (shaft diameters ϕ28 to 63)	Standard lead to super lead	$N_2 = \frac{130,000}{D}$ ……(11-1)
		Model SDA-VZ (shaft diameters ϕ10 to 25)		$N_2 = \frac{100,000}{D}$ ……(11-2)
		Model WHF	Super lead	$N_2 = \frac{120,000}{D}$ ……(12-1)
		Model WGF		$N_2 = \frac{70,000}{D}$ ……(12-2)
		Models BNS-V and NS-V	Large lead	$N_2 = \frac{100,000}{D}$ ……(13-1)
		Models BLW, BLK, BLR, BNS-A, BNS, NS-A, and NS		$N_2 = \frac{70,000}{D}$ ……(13-2)
		Models BIF-V (medium), BNFN-V (medium), and BNF-V (medium)	Standard lead	$N_2 = \frac{130,000}{D}$ ……(14-1)
		Models BIF-V (small), BNFN-V (small), and BNF-V (small)		$N_2 = \frac{100,000}{D}$ ……(14-2)
		Models BIF, DIK, BNFN, DKN, BNF, BNT, DK, MDK, MBF, BNK, and DIR		$N_2 = \frac{70,000}{D}$ ……(14-3)
	Full-Ball (ISO standard compliant)	Models EPB-V, EBB-V (2806 to 8020) / Models EPB-V, EBB-V (1605 to 2512)	Standard lead	$N_2 = \frac{130,000}{D}$ ……(14-4)
Rolled	Full-Ball	Models WTF and CNF	Super lead	$N_2 = \frac{70,000}{D}$ ……(15)
		Models BLK and BLR	Large lead	$N_2 = \frac{70,000}{D}$ ……(16)
		Model BTK-V	Standard lead	$N_2 = \frac{100,000}{D}$ ……(17-1)
		Models JPF, BNT, and MTF		$N_2 = \frac{50,000}{D}$ ……(17-2)

N_2 : Permissible rotational speed determined by the DN value (min^{-1})
D : Ball center-to-center diameter
(indicated in the dimensional tables of the respective model numbers)

When considering the rotational speed, the permissible rotational speed is regarded as the lower of the following rotational speed guidelines: the critical speed of the screw shaft (N_1) or the permissible rotational speed determined by the DN value (N_2). Refer to the dimensional tables of the respective model numbers for the permissible rotational speed.

If the service rotational speed exceeds the maximum rotational speed, contact THK.

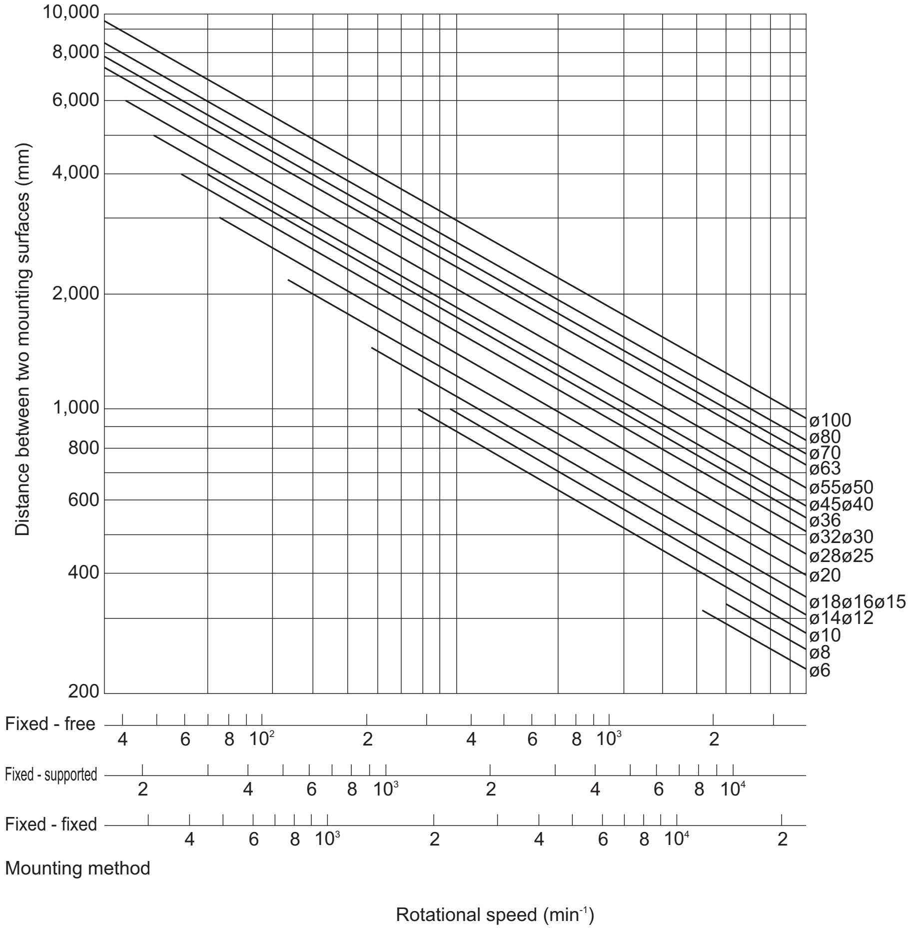
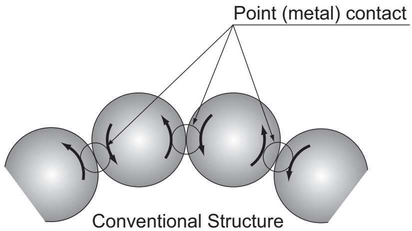


Fig. 13: Permissible Rotational Speed Diagram

Advantages of Caged Ball Technology

Low Noise and Reduced Running Sound

The use of the ball cage eliminates the sound of collision between the balls. Additionally, because balls are picked up in the tangential direction, the collision noise from ball circulation is also eliminated.



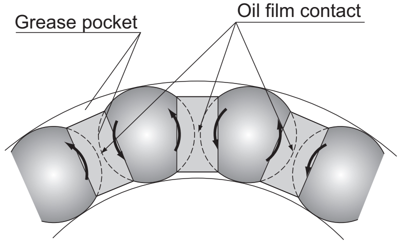
Conventional Structure

Long-Term Maintenance-Free Operation

The absence of friction between balls and the retention of lubrication in grease pockets enable long-term maintenance-free operation (i.e., lubrication is unnecessary over a long period).

Smooth Motion

Use of a ball cage eliminates friction between balls and minimizes torque fluctuation, allowing for smooth motion.



Structure of the Ball Screw with Ball Cage

Low Noise

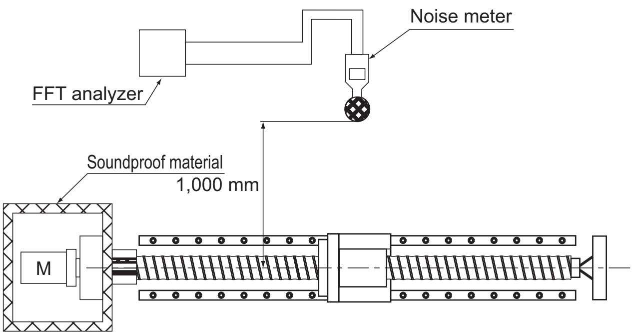
● Noise Level Data

Since the balls in a ball screw with a ball cage do not collide with each other, they do not produce a metallic sound and a low noise level is achieved.

■Noise Measurement

Conditions

Item	Description
Sample	Caged ball screw HBN3210-5 Conventional type: Model BNF3210-5
Stroke	600 mm
Lubrication	Grease lubrication (lithium-based grease containing extreme pressure agent)



Noise measurement instrument

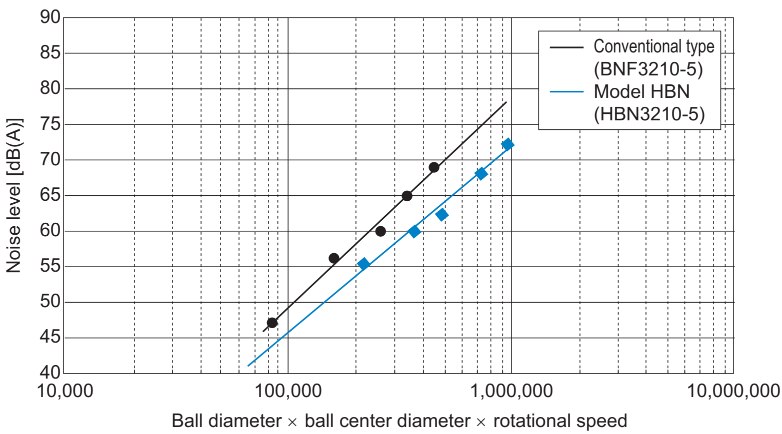


Fig. 14: Ball Screw Noise Level

Long-Term Maintenance-Free Operation

● High Speed, Load Durability

Thanks to high-speed ball circulation and the effects of Caged Ball technology, a ball screw with a ball cage excels in speed and durability while bearing a load.

■High Speed Durability Test

Test Conditions

Item	Description
Sample	High-speed ball screw with ball cage SDA3110V-5
Speed	5,000 min^{-1} (DN value[1]: 160,000)
Stroke	500 mm
Lubricant	THK AFJ Grease
Quantity	4 cm^3 (lubricated every 500 km)
Applied load	1.27 kN
Acceleration	0.5 G

[1] DN value: Ball center-to-center diameter x revolutions per minute

Test results

Shows no deviation after running 6,000 km.

■Load Durability Test

Test Conditions

Item	Description
Sample	High-speed ball screw with ball cage SBN5016V-5
Speed	1,500 min^{-1} (DN value[1]: 79,000)
Stroke	400 mm
Lubricant	THK AFG Grease
Quantity	57.7 cm^3 (Lubricated every 100 km)
Applied load	36.1 kN (0.38 Ca)
Acceleration	0.5 G

Test results

Shows no deviation after running for the calculated service life

Smooth Motion

● Low Torque Fluctuation

The Caged Ball technology allows smoother motion than the conventional type and reduces torque fluctuation.

Conditions

Item	Description
Shaft diameter/lead	25/5 mm
Shaft rotational speed	100 min^{-1}

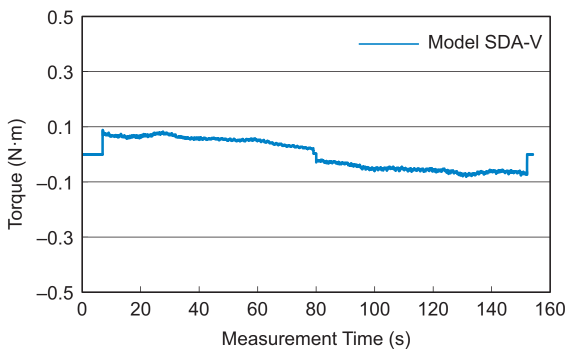


Fig. 15: Torque Fluctuation Data

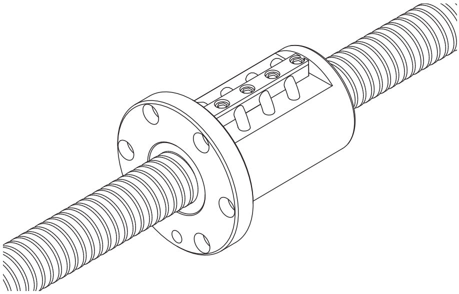
Types and Features

Preload Type

Model SBN-V

Dimensional Table⇒A15-112

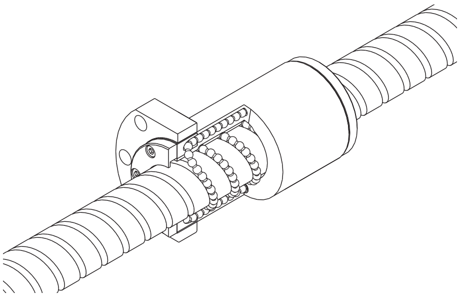
The circulation structure feature allows the balls to be picked up in a direction tangential to the shaft. The circulation components have been strengthened, increasing the DN value to 160,000 (small type: 130,000).



Model SBK

Dimensional Table⇒A15-116

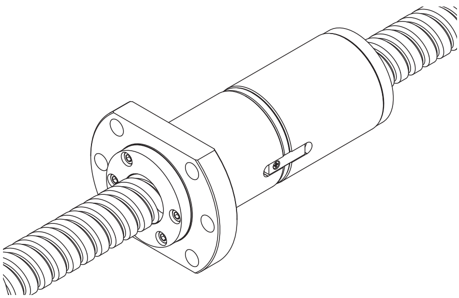
A compact structure is achieved by adopting the offset preload method, which shifts two rows of grooves of the ball screw nut.



Model SBKN

Dimensional Table⇒A15-120

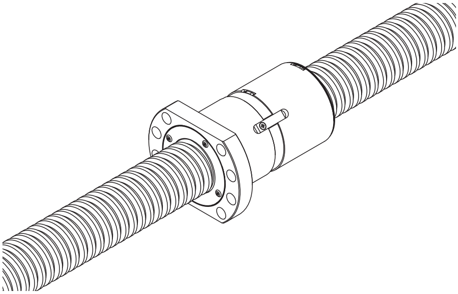
The preload method utilizes a combination of two ball screw nuts preloaded with spacers to eliminate backlash.
This type has improved load capacity in comparison with the Model SBK.



Model SDAN-V

Dimensional Table⇒A15-76

The preload method utilizes a combination of two ball screw nuts preloaded with spacers to eliminate backlash. The nut dimensions conform to ISO standards (ISO 3408). This type has improved axial rigidity in comparison with the Model SDA-V.



Model SDAN-VX

Dimensional Table⇒A15-76

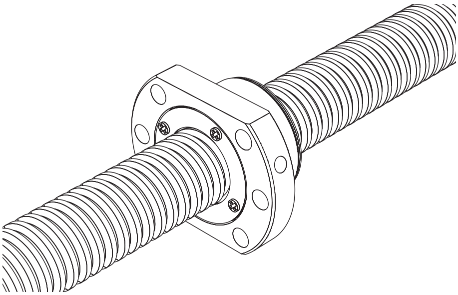
Full-Ball types are also available. (DN value: 130,000)

Preload/No Preload Type

Model SDA-V

Dimensional Table⇒A15-82

A ball screw with newly developed circulation components that give it an ideal ball circulation structure. (DN value: 160,000)
The nut dimensions conform to ISO standards (ISO 3408). Furthermore, the use of the newly developed thin film seal reduces the length of the nut, achieving a more compact design for the device.



Model SDA-VZ

Dimensional Table⇒A15-82

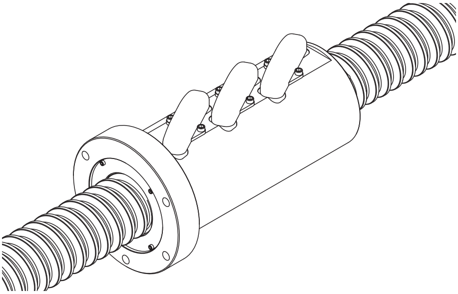
Full-Ball types are also available. (MAX DN value: 130,000)

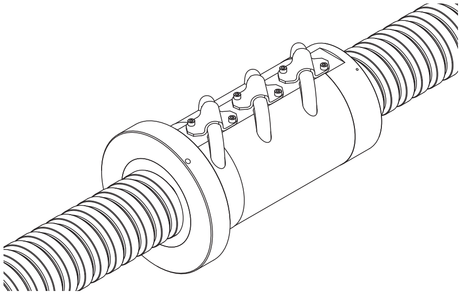
No Preload Type

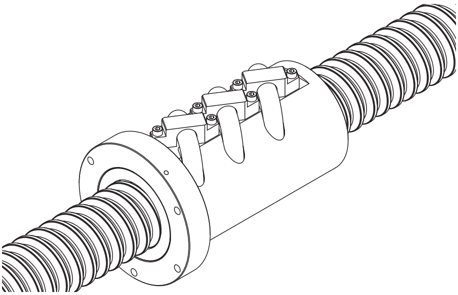
Models HBN-V/HBN-K/HBN-KA/HBN

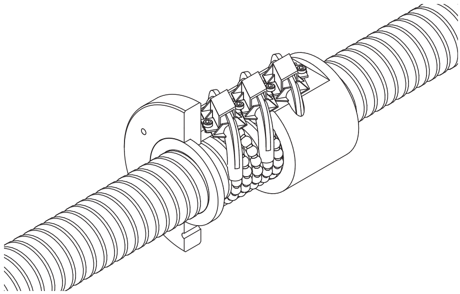
Dimensional Table⇒A15-246

With the optimal design for high loads, this ball screw model achieves a load rating more than twice the conventional type.





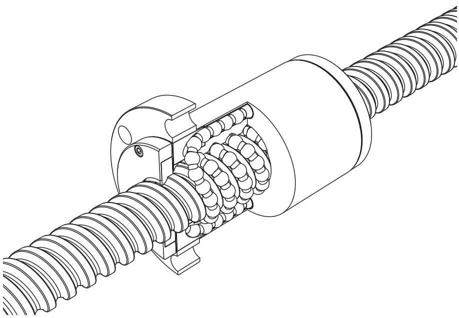




Model SBKH

Dimensional Table⇒A15-256

Model SBKH is a ball screw that achieves a high load carrying capacity and is capable of high-speed operation (92 m/min at a maximum).



Selecting a Nut

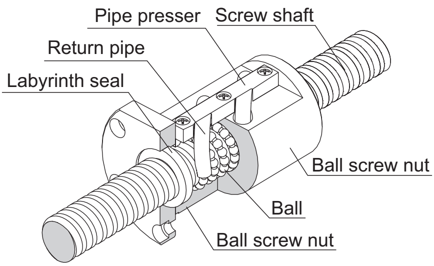
Types of Nuts

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

Types by Ball Circulation Method

- **Return-Pipe Type (Models SBN-V (Medium), BIF-V (Medium), BIF, BNF-V (Medium), BNF, BNFN-V (Medium), BNFN, BNT, BTK-V), Return-Piece Type (Models SBN-V (Small), HBN, BIF-V (Small), BNF-V (Small), BNFN-V (Small))**

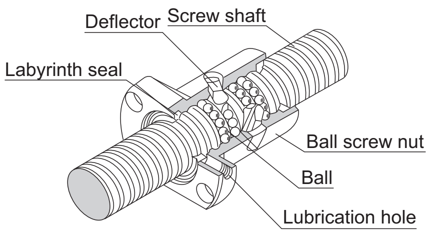
These are the most common types of nuts, which use a return pipe for ball circulation. The return pipe allows balls to be picked up, pass through the pipe and return piece, and return to their original positions to circulate endlessly.



Example of Return-Pipe Nut Structure

- **Deflector Type (Models EBB-V, EPB-V, DK, DKN, DIK, JPF, DIR, and MDK)**

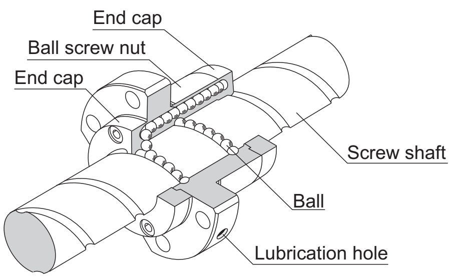
These are the most compact type of nut. The balls change their travel direction with a deflector, pass over the circumference of the screw shaft, and return to their original positions to circulate endlessly.



Example of Simple Nut Structure

- **End-Cap Type: Large Lead Nut (Models SBK, SBKN, SBKH, WHF, BLK, WGF, BLW, WTF, CNF, and BLR)**

These nuts are the most suitable for fast feed. The balls are picked up with an end cap, pass through a hole in the nut, and return to their original positions to circulate endlessly.



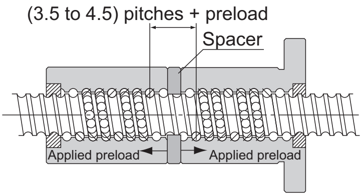
Example Large-Lead Nut Structure

Types by Preloading Method

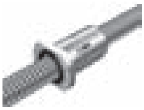
● Fixed-Point Preloading

■Double-Nut Preload (Models SBKN, SDAN-V, BNFN-V, BNFN, DKN, and BLW)

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



Model SBKN



Model SDAN-V

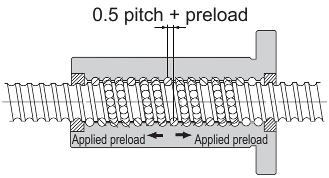
Models BNFN-V and BNFN

Model DKN

Model BLW

■Offset Preload (Models SBK, SBN-V, BIF-V, BIF, EPB-V, DIK, and DIR)

More compact than the double-nut method, offset preloading provides a preload by changing the groove pitch of the nut without using a spacer.



Model SBK (two rows between phases)

Model SBN-V

Models BIF-V and BIF

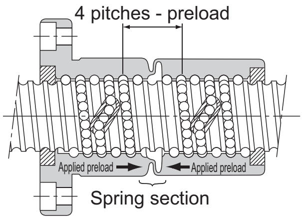
Model EPB-V

Model DIK

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.

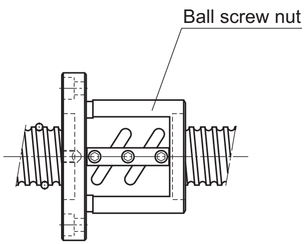
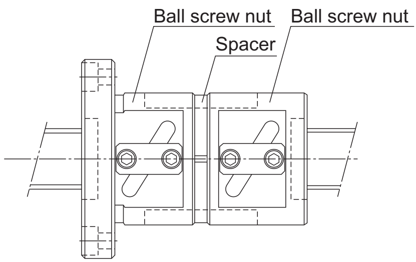
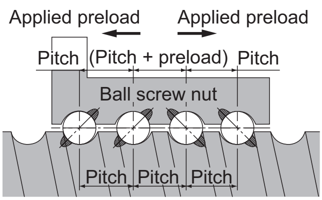
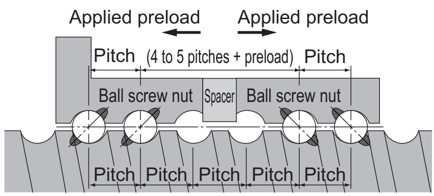


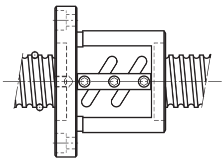
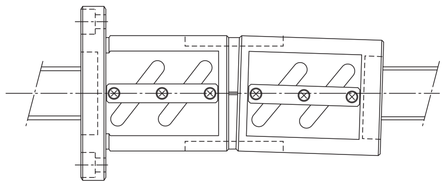
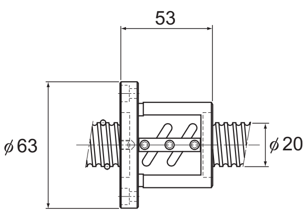
Model JPF

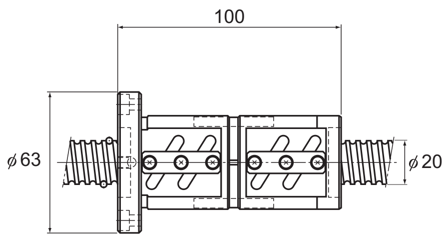
Structure and Features of Offset-Preload Simple-Nut Ball Screws

The simple-nut ball screw 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).
The simple-nut ball screw 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 Nut

Simple-nut ball screw	Conventional double-nut ball screw
	
Preload structure	
 Screw shaft	 Screw shaft

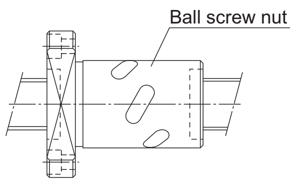
<table>
<tr><th>Simple-nut ball screw</th><th>Conventional double-nut ball screw</th></tr>
<tr><td colspan="2">Rotational performance</td></tr>
<tr><td>The offset preload of simple-nut ball screws is adjusted by changing the ball diameter. This eliminates the inconsistency in the contact angle, which is the most important factor in ball screw performance. It also ensures high rigidity, smooth motion, and high wobbling accuracy.
</td><td>In double-nut ball screws, poor flatness in the spacer surface and inaccurate perpendicularity in the nut can cause inconsistency in the contact angle. This results in a non-uniform ball contact, inferior rotational performance, and low wobbling accuracy.
</td></tr>
<tr><td colspan="2">Dimensions</td></tr>
<tr><td>Since simple-nut ball screws are 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 designed to be light and compact.


Simple-Nut</td><td>

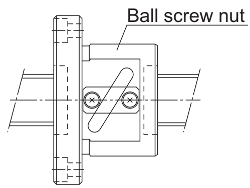
Double-Nut</td></tr>
</table>

Comparison between Simple-Nut Offset Preload and Oversized-Ball Preload

Simple-nut ball screw Model DIK

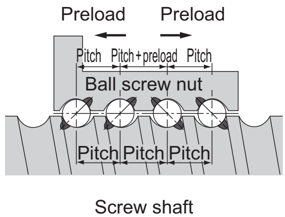


Conventional oversized-ball-preload-nut ball screw Model BNF

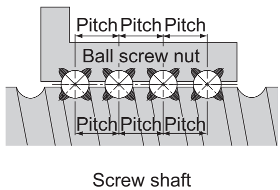


Preload structure

Simple-nut ball screw Model DIK



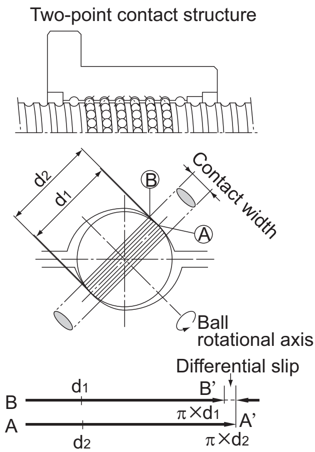
Conventional oversized-ball-preload-nut ball screw Model BNF



Accuracy life

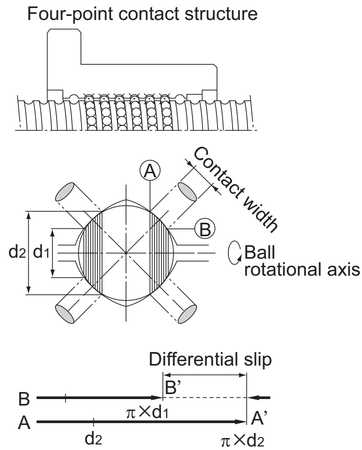
Simple-nut ball screw Model DIK

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



Conventional oversized-ball-preload-nut ball screw Model BNF

With an oversized-ball-preload nut, preload is provided through each of the balls in contact with the raceway at four points. This causes differential slip and spin which increase the rotational torque, resulting in accelerated wear and heat generation. Therefore, the accuracy deteriorates in a short period.



Ball Screw

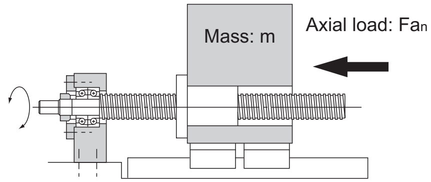
Selecting a Model Number

Calculating the Axial Load

Mounted Horizontally

With ordinary conveyance systems, the axial load (Fa_n) applied when horizontally reciprocating the work is obtained by the equations below.

$$Fa_1 = \mu \cdot mg + f + m\alpha \quad \cdots\cdots (18)$$
$$Fa_2 = \mu \cdot mg + f \quad \cdots\cdots (19)$$
$$Fa_3 = \mu \cdot mg + f - m\alpha \quad \cdots\cdots (20)$$
$$Fa_4 = -\mu \cdot mg - f - m\alpha \quad \cdots\cdots (21)$$
$$Fa_5 = -\mu \cdot mg - f \quad \cdots\cdots (22)$$
$$Fa_6 = -\mu \cdot mg - f + m\alpha \quad \cdots\cdots (23)$$



V_{max} : Maximum speed (m/s)
t_1 : Acceleration time (s)

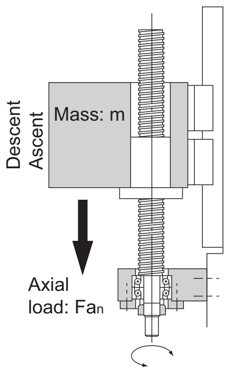
$\alpha = \dfrac{V_{max}}{t_1}$: Acceleration (m/s²)

Fa_1 : Axial load during forward acceleration (N)
Fa_2 : Axial load during uniform forward motion (N)
Fa_3 : Axial load during forward deceleration (N)
Fa_4 : Axial load during backward acceleration (N)
Fa_5 : Axial load during uniform backward motion (N)
Fa_6 : Axial load during backward deceleration (N)
m : Transferred mass (kg)
μ : Frictional coefficient of the guide surface (–)
f : Guide surface resistance (without load) (N)

Mounted Vertically

With ordinary conveyance systems, the axial load (Fa_n) applied when vertically reciprocating the work is obtained by the equations below.

$$Fa_1 = mg + f + m\alpha \quad \cdots\cdots (24)$$
$$Fa_2 = mg + f \quad \cdots\cdots (25)$$
$$Fa_3 = mg + f - m\alpha \quad \cdots\cdots (26)$$
$$Fa_4 = mg - f - m\alpha \quad \cdots\cdots (27)$$
$$Fa_5 = mg - f \quad \cdots\cdots (28)$$
$$Fa_6 = mg - f + m\alpha \quad \cdots\cdots (29)$$



V_{max} : Maximum speed (m/s)
t_1 : Acceleration time (s)

$\alpha = \dfrac{V_{max}}{t_1}$: Acceleration (m/s²)

Fa_1 : Axial load during upward acceleration (N)
Fa_2 : Axial load during uniform upward motion (N)
Fa_3 : Axial load during upward deceleration (N)
Fa_4 : Axial load during downward acceleration (N)
Fa_5 : Axial load during uniform downward motion (N)
Fa_6 : Axial load during downward deceleration (N)
m : Transferred mass (kg)
f : Guide surface resistance (without load) (N)

Static Safety Factor

Static Safety Factor per Basic Static Load Rating (Excluding Models HBN-V, HBN-K (KA), HBN, and SBKH)

For ball screws, a static safety factor as defined by formula 30 based on the calculated maximum axial load and static load rating must be considered. Vibrations, impacts, or inertia due to starting and stopping may result in an unexpectedly large load. Therefore, please confirm that a sufficient static safety factor has been ensured when selecting a model. Table 21 shows guideline values for the static safety factor.

$$f_S = \frac{C_0a}{Fa_{max}} \quad \cdots\cdots\cdots(30)$$

f_S : Static safety factor (see Table 21)
C_0a : Basic static load rating[1] (kN)
Fa_{max} : Maximum axial load[2] (kN)

Table 21: Guideline for the Static Safety Factor (f_S)

Load conditions[3]	Lower Limit of f_S
Without vibrations or impacts	2
With vibrations or impacts	5

Permissible Load Safety Margin (Models HBN-V, HBN-K (KA), HBN, and SBKH)

The permissible load Fp in the axial direction is fixed for high-load ball screw models HBN-V, HBN-K (KA), HBN, and SBKH. Therefore, please select a model with a calculated maximum axial load (Fa_{max}) that does not exceed the permissible load (Fp). Permissible load (Fp) indicates the maximum axial load that the high-load ball screw can receive, and this range should not be exceeded.

$$\frac{Fp}{Fa_{max}} > 1 \quad \cdots\cdots\cdots(31)$$

Fp : Permissible axial load (kN)
Fa_{max} : Maximum axial load[2] (kN)

[1] The basic static load rating (C_0a) is a static load with a constant direction and magnitude whereby the sum of the permanent deformation of the rolling element and that of the raceway on the contact area under the maximum stress is 0.0001 times the rolling element diameter. With the ball screw, it is defined as the axial load. (Specific values for each ball screw model are indicated in the dimensional tables for the corresponding model.)
[2] The maximum load in the axial direction calculated on A15-46 is applied to the maximum axial load (Fa_{max}).
[3] Vibrations and impacts are typically caused by factors such as acceleration and deceleration, sudden starting and stopping, vibrations and impacts from an external machine, and changes in processing power over time.

Considering the Service Life

Service Life of the Ball Screw

A ball screw in motion under an external load receives repeated stress on its raceways and balls. When the stress reaches the limit, the raceways break from fatigue, and their surfaces flake like scales. This phenomenon is called flaking. The service life of the ball screw is the total number of revolutions until the first flaking occurs on any of the raceways or the balls as a result of rolling fatigue of the material.

The nominal life defined below is used as a guideline for the service life of a ball screw.

Nominal life is the total number of revolutions that 90% of a group of identical ball screws independently operating under the same conditions can achieve without flaking.

Calculating the Rated Life

The service life of the ball screw is calculated from formula (32) below using the basic dynamic load rating (Ca) and the applied axial load.

● Calculating the Nominal Life

The nominal life (L_{10}) is obtained from the following formula using the basic dynamic load rating (Ca) and the applied load in the axial direction (Fa).

$$L_{10} = \left(\frac{Ca}{Fa}\right)^3 \times 10^6 \quad \cdots\cdots\cdots (32\text{-}1)$$

L_{10}	: Nominal life	(rev.)
Ca	: Basic dynamic load rating	(N)
Fa	: Applied axial load	(N)

● Calculating the Modified Nominal Life

During use, a ball screw may be subjected to vibrations and shocks as well as fluctuating loads, which are difficult to detect. Taking these factors into account, the modified nominal life (L_{10m}) can be calculated by formula (32-2) below.

•Modified factor α

$$\alpha = \frac{1}{f_W}$$

α	: Modified factor	
f_W	: Load factor	(see Table 22)

•Modified nominal life L_{10m}

$$L_{10m} = \left(\alpha \times \frac{Ca}{Fa}\right)^3 \times 10^6 \quad \cdots\cdots\cdots (32\text{-}2)$$

L_{10m}	: Modified nominal life	(rev.)
Ca	: Basic dynamic load rating	(N)
Fa	: Applied axial load	(N)

Table 22: Load Factor (f_W)

Vibrations and impacts	Speed (V)	f_W
Faint	Very low V ≦ 0.25 m/s	1 to 1.2
Weak	Slow 0.25 < V ≦ 1 m/s	1.2 to 1.5
Medium	Medium 1 < V ≦ 2 m/s	1.5 to 2
Strong	High V > 2 m/s	2 to 3.5

Notes: The basic dynamic load rating (Ca) is used in calculations of service life when the ball screw is under an axial load. The basic dynamic load rating is defined as a load rating based on the movement of a set of identical ball screws with a rated life (L) of 10^6 revolutions, using a load applied in the axial direction that does not vary in either magnitude or direction. (The basic dynamic load ratings (Ca) for each model number are indicated in the dimensional tables.)
The rated service life is estimated by calculating the load on the premise that the product is set up in ideal mounting conditions with the assurance of good lubrication. The service life can be affected by the precision of the mounting materials used and any distortion.

● Service Life Time

If the revolutions per minute is determined, the service life time can be calculated from equation (33) below using the nominal life (L_{10}).

$$L_h = \frac{L_{10}}{60 \times N} = \frac{L_{10} \times Ph}{2 \times 60 \times n \times \ell_S} \quad \cdots\cdots\cdots(33)$$

L_h : Service life time (h)
N : Revolutions per minute (min^{-1})
n : Number of reciprocations per minute (min^{-1})
Ph : Ball screw lead (mm)
ℓ_S : Stroke length (mm)

● Service Life in Travel Distance

The service life in travel distance can be calculated from equation (34) below using the nominal life (L_{10}) and the ball screw lead.

$$L_S = \frac{L_{10} \times Ph}{10^6} \quad \cdots\cdots\cdots(34)$$

L_S : Service life in travel distance (km)
Ph : Ball screw lead (mm)

● Applied Load and Service Life with a Preload Taken into Account

If the ball screw is used under a preload (medium preload), it is necessary to consider the applied preload in calculating the service life since the ball screw nut already receives an internal load. For details on applied preload for a specific model number, contact THK.

● Average Axial Load

If the axial load acting on the ball screw fluctuates, it is necessary to calculate the service life by determining the average axial load.
The average axial load (F_m) refers to a constant load that results in a service life equal to the service life under fluctuating load conditions.
If the load changes in steps, the average axial load can be obtained from the equation below.

$$F_m = \sqrt[3]{\frac{1}{\ell}\left(Fa_1{}^3\ell_1 + Fa_2{}^3\ell_2 + \cdot\cdot\cdot\cdot + Fa_n{}^3\ell_n\right)} \quad \cdots\cdots\cdots(35)$$

F_m : Average axial load (N)
Fa_n : Varying load (N)
ℓ_n : Distance traveled under load (F_n)
ℓ : Total travel distance

To determine the average axial load using rotational speed and time instead of distance, calculate the average axial load by determining the distance in the equation below.

$\ell = \ell_1 + \ell_2 + \bullet\bullet\bullet \ell_n$

$\ell_1 = N_1 \bullet t_1$

$\ell_2 = N_2 \bullet t_2$

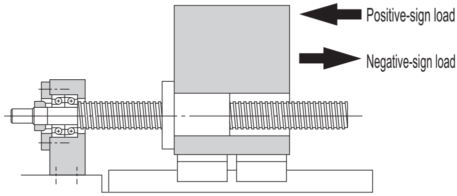
$\ell_n = N_n \bullet t_n$

N: Rotational speed

t: Time

■When the Applied Load Sign Changes

If the sign (positive or negative) used for variable load is always the same, there are no problems with formula (35). However, if the variable load sign changes depending on the type of operation, calculate the average axial load for either positive or negative load, allowing for the load direction. (If the average axial load for positive load is calculated, the negative load is taken to be zero.) The larger of the two average axial loads is taken as the average axial load when the service life is calculated.



Example: Calculate the average axial load with the following load conditions.

Operation No.	Varying load Fa_n (N)	Travel distance ℓ_n (mm)
No. 1	10	10
No. 2	50	50
No. 3	–40	10
No. 4	–10	70

Note: The subscripts of the fluctuating load symbol and the travel distance symbol indicate operation numbers.

● Average axial load of positive-sign load

$$F_{m1} = \sqrt[3]{\frac{Fa_1^3 \times \ell_1 + Fa_2^3 \times \ell_2}{\ell_1 + \ell_2 + \ell_3 + \ell_4}} = 35.5\ \text{N}$$

Note: To calculate the average axial load of the positive-sign load, assume Fa_3 and Fa_4 to be zero.

● Average axial load of negative-sign load

$$F_{m2} = \sqrt[3]{\frac{|Fa_3|^3 \times \ell_3 + |Fa_4|^3 \times \ell_4}{\ell_1 + \ell_2 + \ell_3 + \ell_4}} = 17.2\ \text{N}$$

Note: To calculate the average axial load of the negative-sign load, assume Fa_1 and Fa_2 to be zero.

Accordingly, the average axial load of the positive-sign load (F_{m1}) is adopted as the average axial load (F_m) for calculating the service life.

Considering the Rigidity

To increase the positioning accuracy of feed screws in NC machine tools or precision machines, or to reduce the displacement caused by the cutting force, it is necessary to design the rigidity of the components in a well-balanced manner.

Axial Rigidity of the Feed Screw System

When the axial rigidity of a feed screw system is K, the elastic displacement in the axial direction can be obtained using equation (36) below.

$$\delta = \frac{Fa}{K} \quad \cdots\cdots\cdots (36)$$

δ : Elastic displacement of a feed screw system in the axial direction (μm)
Fa : Applied axial load (N)

The axial rigidity (K) of the feed screw system is obtained using equation (37) below.

$$\frac{1}{K} = \frac{1}{K_S} + \frac{1}{K_N} + \frac{1}{K_B} + \frac{1}{K_H} \quad \cdots\cdots\cdots (37)$$

K : Axial rigidity of the feed screw system (N/μm)
K_S : Axial rigidity of the screw shaft (N/μm)
K_N : Axial rigidity of the nut (N/μm)
K_B : Axial rigidity of the support bearing (N/μm)
K_H : Rigidity of the nut bracket and the support bearing bracket (N/μm)

Axial Rigidity of the Screw Shaft

The axial rigidity of a screw shaft varies depending on the method for mounting the shaft.

● **For Fixed-Supported or Fixed-Free Configuration**

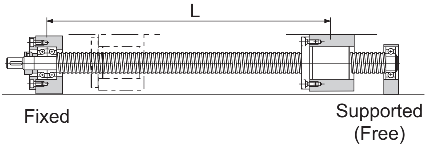
$$K_S = \frac{A \cdot E}{1000 \cdot L} \quad \cdots\cdots\cdots (38)$$

A : Screw shaft cross-sectional area (mm^2)

$$A = \frac{\pi}{4} d_1^2$$

d_1 : Screw-shaft thread minor diameter (mm)
E : Young's modulus (2.06×10^5 N/mm^2)
L : Distance between two mounting surfaces (mm)

Fig. 16 on A15-52 shows an axial rigidity diagram for the screw shaft.



● For Fixed-Fixed Configuration

$$K_s = \frac{A \cdot E \cdot L}{1{,}000 \cdot a \cdot b} \quad \cdots\cdots\cdots (39)$$

Ks becomes the lowest and the elastic displacement in the axial direction is the greatest at the position of $a = b = \frac{L}{2}$.

$$K_s = \frac{4A \cdot E}{1{,}000L}$$

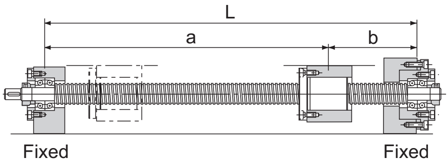


Fig. 17 on A**15-53** shows an axial rigidity diagram of the screw shaft in this configuration.

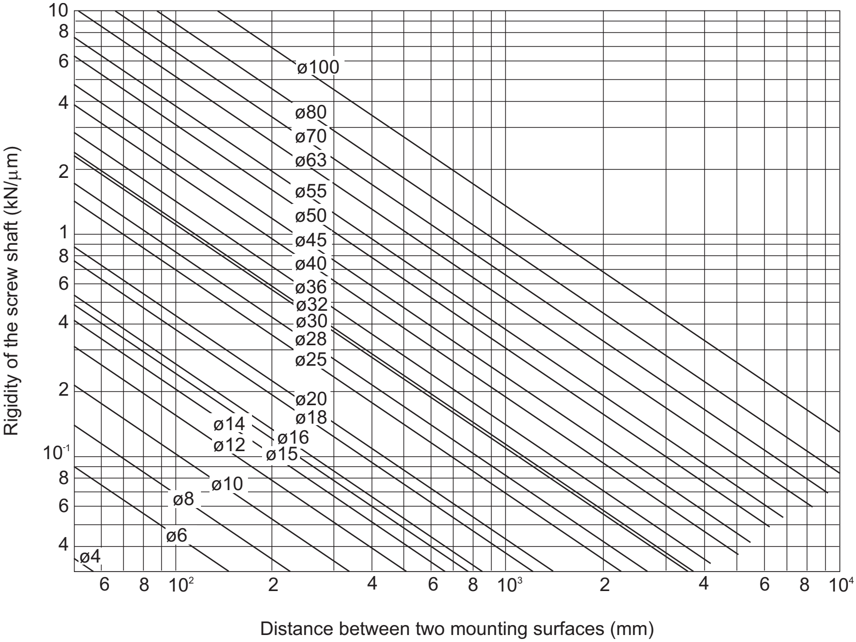


Fig. 16: Axial Rigidity of the Screw Shaft (Fixed-Free, Fixed-Supported)

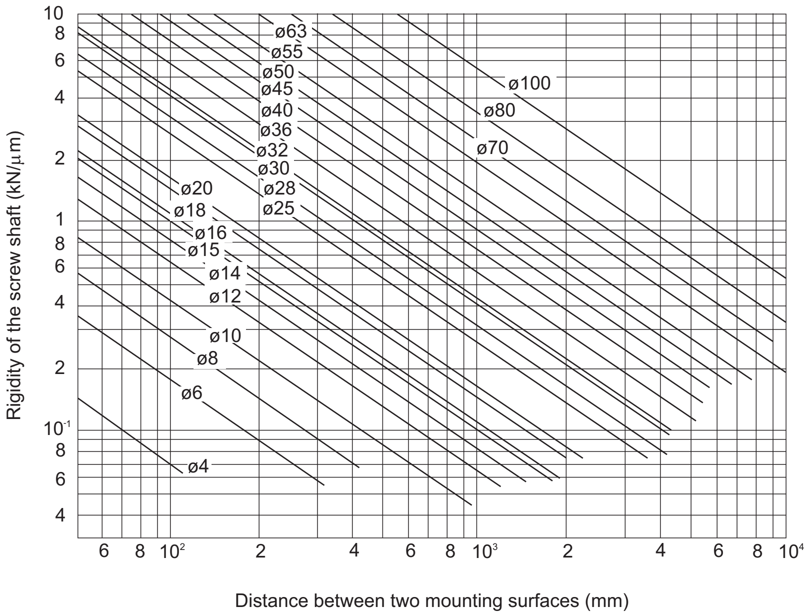


Fig. 17: Axial Rigidity of the Screw Shaft (Fixed-Fixed)

Axial Rigidity of the Nut

The axial rigidity of the nut varies widely with preloads.

● Without Preload

The theoretical axial rigidity with an axial load accounting for 30% of the basic dynamic load rating (Ca) applied is indicated in the dimensional tables of the corresponding model number. This value does not include the rigidity of the components related to the nut-mounting bracket. In general, set the rigidity at roughly 80% of the value in the table.

The rigidity when the applied axial load is not 30% of the basic dynamic load rating (Ca) is calculated using equation (40) below.

$$K_N = K\left(\frac{Fa}{0.3Ca}\right)^{\frac{1}{3}} \times 0.8 \quad \cdots\cdots\cdots(40)$$

K_N : Axial rigidity of the nut (N/µm)

K : Rigidity value in the dimensional tables (N/µm)

Fa : Applied axial load (N)

Ca : Basic dynamic load rating (N)

● With Preload

The theoretical axial rigidity with a preload accounting for 10% of the basic dynamic load rating (Ca) applied is indicated in the dimensional tables of the corresponding model number.This value does not include the rigidity of the components related to the nut-mounting bracket. In general, set the rigidity at roughly 80% of the value in the table.
The rigidity when the applied preload is not 10% of the basic dynamic load rating (Ca) is calculated using equation (41) below.

$$K_N = K\left(\frac{Fa_0}{0.1Ca}\right)^{\frac{1}{3}} \times 0.8 \quad \cdots\cdots\cdots(41)$$

K_N : Axial rigidity of the nut (N/μm)
K : Rigidity value in the dimensional tables (N/μm)
Fa_0 : Applied preload (N)
Ca : Basic dynamic load rating (N)

Axial Rigidity of the Support Bearing

The rigidity of the ball screw support bearing varies depending on the support bearing used.
The calculation of the rigidity with a representative angular contact ball bearing is shown in equation (42) below.

$$K_B \fallingdotseq \frac{3Fa_0}{\delta a_0} \quad \cdots\cdots\cdots(42)$$

K_B : Axial rigidity of the support bearing (N/μm)
Fa_0 : Applied preload of the support bearing (N)
δa_0 : Axial displacements (μm)

$$\delta a_0 = \frac{0.45}{\sin\alpha}\left(\frac{Q^2}{Da}\right)^{\frac{1}{3}}$$

$$Q = \frac{Fa_0}{Z\sin\alpha}$$

Q : Axial load (N)
Da : Ball diameter of the support bearing (mm)
α : Initial contact angle of the support bearing (°)
Z : Number of balls

For details of a specific support bearing, contact its manufacturer.

Axial Rigidity of the Nut Bracket and the Support Bearing Bracket

Take this factor into consideration when designing your machine. Set the rigidity as high as possible.

Considering the Positioning Accuracy

Causes of Error in the Positioning Accuracy

The causes of error in the positioning accuracy include the lead angle accuracy, the axial clearance and the axial rigidity of the feed screw system. Other important factors include thermal displacement from heat generation and the orientation change of the guide system during travel.

Considering the Lead Angle Accuracy

To satisfy required positioning accuracy, it is necessary to select the correct accuracy grade of the ball screw from the table of ball screw accuracies (Table 1 on A**15-12**). Table 23 on A**15-56** shows examples of selecting the accuracy grades by the application.

Considering the Axial Clearance

The axial clearance is not a factor of positioning accuracy in single-directional feed. However, it will cause backlash when the feed direction or the axial load is inverted. Select an axial clearance that meets the required backlash from Table 10 and Table 13 on A**15-19**.

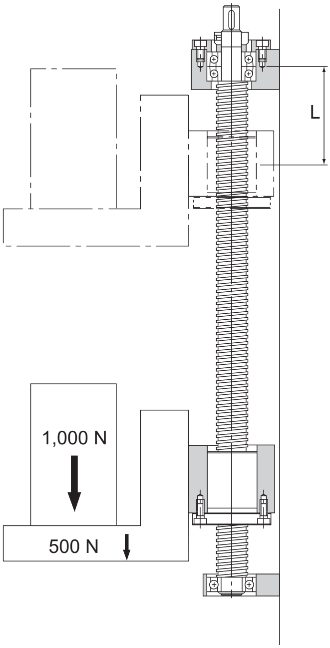
Table 23: Examples of Selecting Accuracy Grades by Application

Applications		Axes	Accuracy grades							
			C0	C1	C2	C3	C5	C7	C8	C10
NC machine tools	Lathe	X		●	●	●	●			
		Z				●	●			
	Machining center	XY			●	●	●			
		Z			●	●	●			
	Drilling machine	XY				●	●			
		Z					●	●		
	Jig borer	XY	●	●						
		Z	●	●						
	Surface grinder	X				●	●			
		Y		●	●	●	●			
		Z		●	●	●	●			
	Cylindrical grinder	X	●	●	●					
		Z		●	●	●				
	Electric discharge machine	XY	●	●	●					
		Z		●	●	●	●			
	Electric discharge machine Wire cutting machine	XY	●	●	●					
		Z	●	●	●	●				
		UV		●	●	●				
	Punching press	XY				●	●	●		
	Laser beam machine	X				●	●	●		
		Z				●	●	●		
	Woodworking machine						●	●	●	●
General-purpose machine, dedicated machine						●	●	●	●	●
Industrial robots	Cartesian coordinate	Assembly				●	●	●	●	
		Other					●	●	●	●
	Vertical articulated type	Assembly					●	●	●	
		Other						●	●	
	Cylindrical coordinate					●	●	●		
Semiconductor manufacturing machines	Photolithography machine		●	●						
	Chemical treatment machine				●	●	●	●	●	●
	Wire bonding machine			●	●					
	Prober		●	●	●	●				
	Printed circuit board drilling machine			●	●	●	●	●		
	Electronic component inserter				●	●	●	●		
3D measuring instrument			●	●	●					
Image processing machine			●	●	●					
Injection molding machine								●	●	●
Office equipment							●	●	●	●

Considering the Axial Rigidity in the Feed Screw System

Of the axial rigidities of the feed screw system, the axial rigidity of the screw shaft fluctuates according to the stroke position. When the axial rigidity is large, such change in the axial rigidity of the screw shaft will affect the positioning accuracy. Therefore, it is necessary to take into account the rigidity of the feed screw system (A**15-51** to A**15-54**).

Example: Positioning error due to the axial rigidity of the feed screw system during a vertical transfer



Operating Conditions
Transferred weight: 1,000 N; table weight: 500 N
Ball screw used: Model BNF2512–2.5 (screw-shaft thread minor diameter d_1 = 21.9 mm)
Stroke length: 600 mm (L = 100 mm to 700 mm)
Screw shaft mounting type: fixed-supported

Consideration

The difference in axial rigidity between L = 100 mm and L = 700 mm applied only to the axial rigidity of the screw shaft.
Therefore, positioning error due to the axial rigidity of the feed screw system equals to the difference in the axial displacement of the screw shaft between L = 100 mm and L = 700 mm.

Axial Rigidity of the Screw Shaft (see A15-51 and A15-52)

$$K_S = \frac{A \cdot E}{1{,}000L} = \frac{376.5 \times 2.06 \times 10^5}{1{,}000 \times L} = \frac{77.6 \times 10^3}{L}$$

$$A = \frac{\pi}{4} d_1^2 = \frac{\pi}{4} \times 21.9^2 = 376.5 \text{ mm}^2$$

$$E = 2.06 \times 10^5 \text{ N/mm}^2$$

(1) When L = 100 mm

$$K_{S1} = \frac{77.6 \times 10^3}{100} = 776 \text{ N/}\mu\text{m}$$

(2) When L = 700 mm

$$K_{S2} = \frac{77.6 \times 10^3}{700} = 111 \text{ N/}\mu\text{m}$$

Axial Displacement due to Axial Rigidity of the Screw Shaft

(1) When L = 100 mm

$$\delta_1 = \frac{Fa}{K_{S1}} = \frac{1{,}000+500}{776} = 1.9 \ \mu\text{m}$$

(2) When L = 700 mm

$$\delta_2 = \frac{Fa}{K_{S2}} = \frac{1{,}000+500}{111} = 13.5 \ \mu\text{m}$$

Positioning Error due to Axial Rigidity of the Feed Screw System

Positioning accuracy = $\delta_1 - \delta_2$ = 1.9–13.5

= –11.6 μm

Therefore, the positioning error due to the axial rigidity of the feed screw system is 11.6 μm.

Considering the Thermal Displacement through Heat Generation

If the temperature of the screw shaft rises during operation, the screw shaft will elongate due to heat, thereby lowering the positioning accuracy. The expansion and contraction of the screw shaft is calculated using equation (43) below.

$$\Delta \ell = \rho \times \Delta t \times \ell \quad \cdots\cdots\cdots(43)$$

$\Delta \ell$	: Axial expansion/contraction of the screw shaft	(mm)
ρ	: Thermal expansion coefficient	(12×10^{-6}/℃)
Δt	: Temperature change in the screw shaft	(℃)
ℓ	: Effective thread length	(mm)

Thus, if the temperature of the screw shaft increases by 1℃, the screw shaft is elongated by 12 μm per meter. Therefore, as the ball screw travels faster, more heat is generated, and as the temperature increases, the positioning accuracy lowers. Accordingly, if high accuracy is required, it is necessary to take measures to cope with the temperature increase.

Measures to Cope with the Temperature Increase

● Minimize the Heat Generation

- Minimize the preloads on the ball screw and the support bearing.
- Increase the ball screw lead and reduce the rotational speed.
- Select an appropriate lubricant. (See Lubrication Accessories on **A24-2**.)
- Cool the circumference of the screw shaft with a lubricant or air.

● Avoid the Effects of Increasing Temperature through Heat Generation

- Set a negative target value for the reference travel distance of the ball screw.
  Generally, set a negative target value for the reference travel distance assuming a temperature increase of 2℃ to 5℃ by heat.
  (–0.02 mm to –0.06 mm/m)
- Preload the shaft screw with tension. (See Fig. 10 of the structure on **A15-29**.)

Considering the Orientation Change during Travel

The lead angle accuracy of the ball screw equals the positioning accuracy of the center of the shaft of the ball screw. Normally, the point where the highest positioning accuracy is required changes according to the ball screw center and the vertical or horizontal direction. Therefore, orientation change during travel affects the positioning accuracy.
The largest factor of orientation change affecting the positioning accuracy is pitching if the change occurs in the ball screw center and the vertical direction, and yawing if the change occurs in the horizontal direction.
Accordingly, it is necessary to study the orientation change (accuracy in pitching, yawing, etc.) during travel on the basis of the distance from the ball screw center to the location where positioning accuracy is required.
Positioning error due to pitching and yawing is obtained using equation (44) below.

$$\mathbf{A = \ell \times \sin\theta} \quad \cdots\cdots\cdots(44)$$

A : Positioning accuracy due to pitching (or yawing) (mm)
ℓ : Vertical (or horizontal) distance from the ball screw center (mm) (see Fig. 18)
θ : Pitching (or yawing) (°)

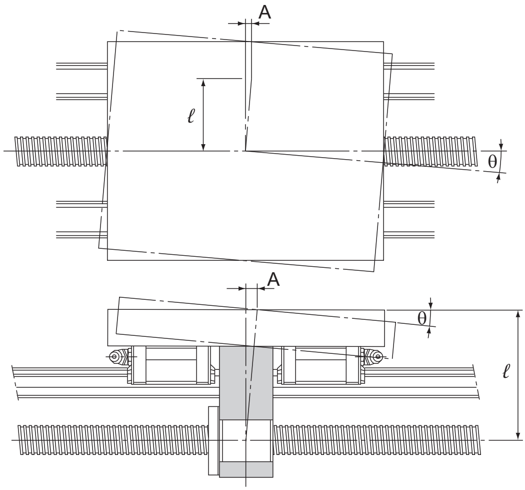


Fig. 18

Considering the Rotational Torque

The rotational torque required to convert rotational motion of the ball screw into straight motion is obtained using equation (45) below.

During Uniform Motion

$$T_t = (T_1 + T_2 + T_4) \cdot A \quad \cdots\cdots\cdots (45)$$

T_t : Rotation torque required during uniform motion (N·mm)
T_1 : Friction torque due to an external load (N·mm)
T_2 : Preload torque of the ball screw (N·mm)
T_4 : Other torque (N·mm)
(frictional torque of the support bearing and oil seal)
A : Reduction ratio

During Acceleration

$$T_K = T_t + T_3 \quad \cdots\cdots\cdots (46)$$

T_K : Rotation torque required during acceleration (N·mm)
T_3 : Torque required for acceleration (N·mm)

During Deceleration

$$T_g = T_t - T_3 \quad \cdots\cdots\cdots (47)$$

T_g : Rotational torque required for deceleration (N·mm)

Frictional Torque Due to an External Load

Of the turning forces required for the ball screw, the rotational torque needed for an external load (guide surface resistance or external force) is obtained using equation (48) below.

$$T_1 = \frac{Fa \cdot Ph}{2\pi \cdot \eta} \quad \cdots\cdots\cdots (48)$$

T_1 : Friction torque due to an external load (N·mm)
Fa : Applied load (N)
Ph : Ball screw lead (mm)
η : Ball screw efficiency (0.9 to 0.95)

Torque Due to a Preload on the Ball Screw

For a preload on the ball screw, see “Preload Torque” on A15-22.

Torque Required for Acceleration

$$\mathbf{T_3 = J \times \omega' \times 10^3} \quad \cdots\cdots\cdots (49)$$

T_3 : Torque required for acceleration (N·mm)
J : Inertial moment ($kg \cdot m^2$)
ω' : Angular acceleration (rad/s^2)

$$J = m\left(\frac{Ph}{2\pi}\right)^2 \cdot A^2 \cdot 10^{-6} + J_S \cdot A^2 + J_A \cdot A^2 + J_B$$

m : Transferred mass (kg)
Ph : Ball screw lead (mm)
J_S : Inertial moment of the screw shaft ($kg \cdot m^2$)
(indicated in the dimensional tables of the respective model number)
A : Reduction ratio
J_A : Inertial moment of gears, etc. attached to the screw shaft side ($kg \cdot m^2$)
J_B : Inertial moment of gears, etc. attached to the motor side ($kg \cdot m^2$)

$$\omega' = \frac{2\pi \cdot Nm}{60t}$$

Nm : Motor revolutions per minute (min^{-1})
t : Acceleration time (s)

Reference: Inertial moment of a round object

$$J = \frac{m \cdot D^2}{8 \cdot 10^6}$$

J : Inertial moment ($kg \cdot m^2$)
m : Mass of the round object (kg)
D : Screw shaft outer diameter (mm)

Considering the Strength of Ball Screw Shaft Ends

When torque is conveyed through the screw shaft in a ball screw, the strength of the screw shaft must be taken into consideration since it experiences both torsion load and bending load.

Screw Shaft Subjected to Torsion

When torsion load is applied to the end of a ball screw shaft, use equation (50) to obtain the end diameter of the screw shaft.

$$\mathbf{T = \tau_a \cdot Z_P} \quad \text{and} \quad \mathbf{Z_P = \frac{T}{\tau_a}} \quad \cdots\cdots\cdots(50)$$

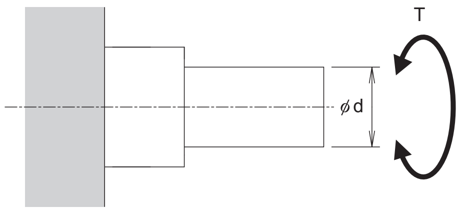
T : Maximum torsion moment (N·mm)

τ_a : Permissible torsion stress of the screw shaft (49 N/mm²)

Z_P : Section modulus (mm³)

$$Z_P = \frac{\pi \cdot d^3}{16}$$

T: Torsion moment



Screw Shaft Subjected to Bending

When a bending load is applied to the end of a ball screw shaft, use equation (51) to obtain the end diameter of the screw shaft.

$$\mathbf{M = \sigma \cdot Z} \quad \text{and} \quad \mathbf{Z = \frac{M}{\sigma}} \quad \cdots\cdots\cdots(51)$$

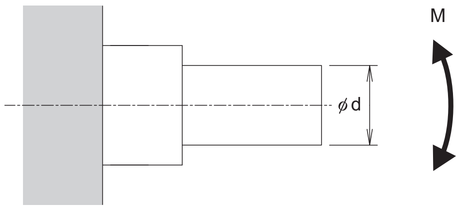
M : Maximum bending moment (N·mm)

σ : Permissible bending stress of the screw shaft (98 N/mm²)

Z : Section modulus (mm³)

$$Z = \frac{\pi \cdot d^3}{32}$$

M: Bending moment



Screw Shaft Subjected to Both Torsion and Bending

When torsion load and bending load are both applied simultaneously to the end of a ball screw shaft, calculate the diameter of the screw shaft separately for each, taking into consideration the corresponding bending moment (M_e) and the corresponding torsion moment (T_e). Then calculate the thickness of the screw shaft and use the largest of the values.

Equivalent bending moment

$$M_e = \frac{M + \sqrt{M^2 + T^2}}{2} = \frac{M}{2}\left\{1 + \sqrt{1 + \left(\frac{T}{M}\right)^2}\right\}$$

$M_e = \sigma \cdot Z$

Equivalent torsion moment

$$T_e = \sqrt{M^2 + T^2} = M \cdot \sqrt{1 + \left(\frac{T}{M}\right)^2}$$

$T_e = \tau_a \cdot Z_P$

Ball Screw

Considering the Driving Motor

When selecting a driving motor required to rotate the ball screw, normally take into account the rotational speed, rotational torque, and minimum feed amount.

When Using a Servomotor

Rotational Speed

The rotation speed required for the motor is obtained using equation (52) based on the feed speed, ball screw lead, and reduction ratio.

$$N_M = \frac{V \times 1{,}000 \times 60}{Ph} \times \frac{1}{A} \quad \cdots\cdots\cdots(52)$$

N_M : Required rotation speed of the motor (min^{-1})
V : Feeding speed (m/s)
Ph : Ball screw lead (mm)
A : Reduction ratio
The rated rotational speed of the motor must be equal to or above the calculated value (N_M) above.
$N_M \leqq N_R$
N_R : The rated rotation speed of the motor (min^{-1})

Required Resolution

Resolutions required for the encoder and the driver are obtained using equation (53) based on the minimum feed amount, ball screw lead, and reduction ratio.

$$B = \frac{Ph \cdot A}{S} \quad \cdots\cdots\cdots(53)$$

B : Resolution required for the encoder and the driver (p/rev)
Ph : Ball screw lead (mm)
A : Reduction ratio
S : Minimum feed amount (mm)

Motor Torque

The torque required for the motor differs between uniform motion, acceleration, and deceleration. To calculate the rotational torque, see “Considering the Rotational Torque” on A15-61.

a. Maximum torque

The maximum torque required for the motor must be equal to or below the maximum peak torque of the motor.

$T_{max} \leqq Tp_{max}$

T_{max} : Maximum torque acting on the motor

Tp_{max} : Maximum peak torque of the motor

b. Effective torque value

The effective value of the torque required for the motor must be calculated. The effective value of the torque is obtained using equation (54).

$$T_{rms} = \sqrt{\frac{T_1^2 \times t_1 + T_2^2 \times t_2 + T_3^2 \times t_3}{t}} \quad \cdots\cdots\cdots (54)$$

T_{rms} : Effective torque value (N·mm)

T_n : Fluctuating torque (N·mm)

t_n : Time during which the torque T_n is applied (s)

t : Cycle time (s)

$(t = t_1+t_2+t_3)$

The calculated effective value of the torque must be equal to or below the rated torque of the motor.

$T_{rms} \leqq T_R$

T_R : Rated torque of the motor (N·mm)

Inertial Moment

The inertial moment required for the motor is obtained using equation (55).

$$J_M = \frac{J}{C} \quad \cdots\cdots\cdots (55)$$

J_M : Inertial moment required for the motor (kg·m²)

C : Factor determined by the motor and the driver

(It is normally between 3 and 10. However, it varies depending on the motor and the driver. Check the specific value in the motor manufacturer's catalog.)

The inertial moment of the motor must be equal to or above the calculated J_M value.

When Using a Stepping Motor (Pulse Motor)

Minimal Feed Amount (per Step)

The step angle required for the motor and the driver is obtained using equation (56) based on the minimum feed amount, ball screw lead, and reduction ratio.

$$E = \frac{360S}{Ph \cdot A} \quad \cdots\cdots\cdots(56)$$

E : Step angle required for the motor and the driver (°)
S : Minimum feed amount (per step) (mm)
Ph : Ball screw lead (mm)
A : Reduction ratio

Pulse Speed and Motor Torque

a. Pulse speed

The pulse speed is obtained using equation (57) based on the feed speed and the minimum feed amount.

$$f = \frac{V \times 1{,}000}{S} \quad \cdots\cdots\cdots(57)$$

f : Pulse speed (Hz)
V : Feeding speed (m/s)
S : Minimum feed amount (mm)

b. Torque required for the motor

The torque required for the motor differs between the uniform motion, the acceleration and the deceleration. To calculate the rotational torque, see "Considering the Rotational Torque" on A15-61.

Thus, the pulse speed required for the motor and the required torque can be calculated in the manner described above.

Although the torque varies depending on the motors, normally the calculated torque should be doubled to ensure safety. Check if the torque can be used in the motor's speed-torque curve.

Ball Screw

Features of Each Model

Overview of THK Ball Screws

Positioning Ball Screw

A15-72

ISO 3408 compliant

Preload

- **SDAN-V**
  - Caged Ball
  - Double nut
  - High speed
  - Compact
- **SDAN-VX**
  - Double nut
  - High speed
  - Compact
- **EPB-V**
  - High speed
  - Compact

Preload/ no preload

- **SDA-V**
  - Caged Ball
  - High speed
  - Various leads
  - Compact
- **SDA-VZ**
  - High speed
  - Various leads
  - Compact
- **EBB-V**
  - High speed
  - Compact

Positioning Ball Screw

A15-102

Preload

- **SBN-V**
  - Caged Ball
  - High speed
- **SBK**
  - Caged Ball
  - High speed
  - Large lead
- **SBKN**
  - Caged Ball
  - Double nut
  - High speed
- **BIF-V**
  - High speed
- **BNFN-V**
  - Double nut
  - High speed
- **DIK**
  - Compact
- **DKN**
  - Compact
  - Double nut
- **BLW**
  - Double nut
  - Large lead

Preload/ no preload

- **BNK**
  - Standard to large lead

No preload

- **MDK**
- **MBF**
  - Miniature
- **BNF-V**
  - High speed
- **DK**
  - Compact
- **WHF**
  - High speed
  - Large lead
- **BLK**
- **WGF**
  - Large lead
- **BNT**
  - Flat nut

High-Thrust Ball Screw
A15-240

No preload

HBN
- Caged Ball
- High load
- High speed

SBKH
- Caged Ball
- High load
- High speed
- Large lead

Transport Ball Screw
A15-258

Preload

JPF
- Compact

No preload

BTK-V
- High speed

BNT
- Flat nut

BLK
WTF
CNF
- Large lead

MTF
- Miniature

Rotary Nut Ball Screw
A15-278

Preload

DIR
- Rotary nut
- Compact

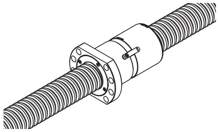
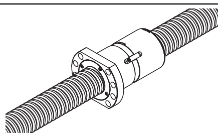
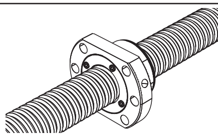
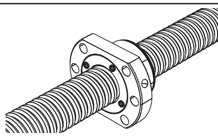
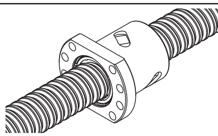
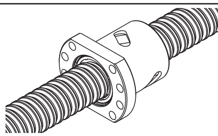
Preload/ no preload

BLR
- Rotary nut
- Large lead

BNS-V/NS-V
- Rotary nut
- Ball screw/spline
- Large lead
- Low inertia

BNS/NS
- Rotary nut
- Ball screw/spline
- Large lead

Positioning, ISO 3408 compliant

Series	Model		Features	
Positioning	SDAN-V		Double nut, compact nut, high DN value	
	SDAN-VX		Double nut, compact nut, high DN value	
	SDA-V		Compact nut, high DN value, standard to super lead	
	SDA-VZ		Compact nut, high DN value, standard to super lead	
	EPB-V		Compact nut	
	EBB-V		Compact nut	

	Caged Ball	Compact nut	Miniature	High load capacity	Offset preload	Double-nut preload	DN value	Shaft diameter (mm)	Lead (mm)	Page No.
	✓	✓				✓	160,000	31 to 50	10 to 40	A15-76
		✓				✓	130,000	31 to 63	10 to 40	A15-76
	✓	✓					160,000	14 to 50	4 to 60	A15-82
		✓					100,000	10 to 25	4 to 60	A15-82
							130,000	28 to 50	5 to 50	A15-82
		✓			✓		130,000	16 to 63	4 to 12	A15-94
		✓					130,000	16 to 80	4 to 20	A15-98

Standard Combinations of Outer Diameters and Leads of the Screw Shafts

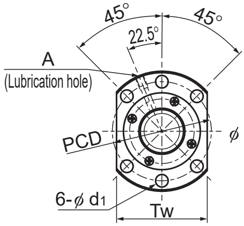
Shaft diameter	Lead							
	4	5	6	8	10	12	15	16
10	SDA-VZ	SDA-VZ			SDA-VZ			
12		SDA-VZ			SDA-VZ			
14		SDA-V						
15		SDA-V			SDA-V			
16		SDA-V EBB-V EPB-V			SDA-V			SDA-V
20	SDA-V EBB-V EPB-V	SDA-V EBB-V EPB-V	EBB-V EPB-V	EBB-V EPB-V	SDA-V EBB-V EPB-V	EBB-V EPB-V		
25	EBB-V EPB-V	SDA-V EBB-V EPB-V	SDA-V EBB-V EPB-V	EBB-V EPB-V	SDA-V EBB-V EPB-V	EBB-V EPB-V		
28			SDA-V EBB-V EPB-V					
31					SDA-V SDAN-V	SDA-V SDAN-V		SDA-V SDAN-V
32	EBB-V EPB-V	SDA-V SDAN-V EBB-V EPB-V	SDA-V SDAN-V EBB-V EPB-V	SDA-V SDAN-V EBB-V EPB-V	SDA-V SDAN-V EBB-V EPB-V	SDA-V SDAN-V EBB-V EPB-V		SDA-V SDAN-V
36	EBB-V EPB-V		SDAN-V EBB-V EPB-V	EBB-V EPB-V	SDA-V SDAN-V	SDA-V SDAN-V		SDA-V SDAN-V
38					SDA-V SDAN-V	SDA-V SDAN-V	SDA-V	SDA-V SDAN-V
40	EBB-V EPB-V	EBB-V EPB-V	EBB-V EPB-V	SDA-VZ SDAN-VX EBB-V EPB-V	SDA-V SDAN-V EBB-V EPB-V	SDA-V SDAN-V EBB-V EPB-V	SDA-V	SDA-V SDAN-V
45					SDA-V SDAN-V	SDA-V SDAN-V		SDA-V SDAN-V
50		EBB-V EPB-V		EBB-V EPB-V	SDA-V SDAN-V EBB-V EPB-V	SDA-V SDAN-V		SDA-V SDAN-V
55					SDAN-VX	SDAN-VX		SDAN-VX
63					SDAN-VX EBB-V EPB-V	SDAN-VX EBB-V		SDAN-VX EBB-V
80					EBB-V	EBB-V		EBB-V

Unit: mm

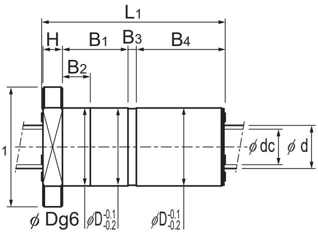
	Lead							
	20	25	30	32	36	40	50	60
	SDA-VZ		SDA-VZ					
	SDA-V		SDA-V					
	SDA-V		SDA-V			SDA-V		SDA-V
	SDA-V	SDA-V	SDA-V				SDA-V	
	SDA-V SDAN-V			SDA-V				
	SDA-V SDAN-V			SDA-V				
	SDA-V SDAN-V				SDA-V			
	SDA-V SDAN-V	SDA-V	SDA-V			SDA-V		
	SDA-V SDAN-V EBB-V	SDA-V	SDA-V			SDA-V		
	SDA-V SDAN-V	SDA-V	SDA-V			SDA-V		
	SDA-V SDAN-V EBB-V	SDA-V SDAN-V	SDA-V SDAN-V			SDA-V SDAN-V	SDA-V	
	SDAN-VX							
	SDAN-VX EBB-V	SDAN-VX	SDAN-VX			SDAN-VX		
	EBB-V							

SDAN-V With Preload

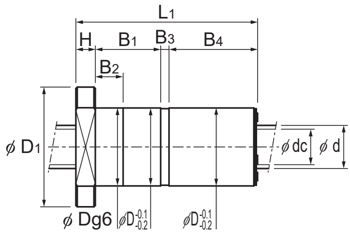
DN value	SDAN-V (Caged Ball)	160,000
	SDAN-VX (Full-Ball)	130,000



SDAN31V to 32V



Nut type Ⅰ



Nut type Ⅱ

Model No.	Screw shaft outer diameter	Lead	Ball center-to-center diameter	Thread minor diameter	No. of loaded circuits	Basic load rating				Rigidity	
						SDAN-V (Caged Ball)		SDAN-VX (Full-Ball)		SDAN-V (Caged Ball)	SDAN-VX (Full-Ball)
						Ca	C0a	Ca	C0a	K	K
	d	Ph	dp	dc	Rows × turns	kN	kN	kN	kN	N/μm	N/μm
SDAN 3110V-5	31	10	32	25.4	1×5	57.1	94.7	54.4	99.7	1,059	1,108
SDAN 3112V-5	31	12	32	25.4	1×5	57	94.7	54.3	99.9	1,058	1,109
SDAN 3116V-5	31	16	32	25.4	1×5	56.8	96	54.1	100.5	1,068	1,112
SDAN 3120V-5	31	20	32	25.4	1×5	56.6	90.3	53.9	95.1	1,065	1,116
SDAN 3205V-4	32	5	32.75	29.5	1×4	18.8	38.5	17.9	41.7	776	832
SDAN 3206V-5	32	6	33	28.9	1×5	31.4	62.4	29.9	66.1	1,027	1,082
SDAN 3208V-5	32	8	33	28.9	1×5	31.4	62.4	29.9	66.2	1,026	1,082
SDAN 3210V-5	32	10	33	28.9	1×5	31.3	62.9	29.8	66.3	1,033	1,083
SDAN 3210VA-5	32	10	33	26.4	1×5	58.1	98.9	55.3	103.1	1,097	1,138
SDAN 3212VA-5	32	12	33	26.4	1×5	58	98.9	55.3	103.3	1,096	1,139
SDAN 3216VA-5	32	16	33	26.4	1×5	57.8	98.9	55.1	103.8	1,094	1,141
SDAN 3220VA-5	32	20	33	26.4	1×5	57.6	94.3	54.9	98.2	1,104	1,145
SDAN 3606V-4	36	6	37	32.9	1×4	26.9	55.6	25.6	58.6	902	945
SDAN 3610V-5	36	10	37	30.4	1×5	61.7	110.6	58.8	116.4	1,196	1,252
SDAN 3612V-5	36	12	37	30.4	1×5	61.7	110.6	58.7	116.6	1,195	1,253
SDAN 3616V-5	36	16	37	30.4	1×5	61.5	111.9	58.6	117.1	1,206	1,255
SDAN 3620V-5	36	20	37	30.4	1×5	61.3	105.2	58.4	110.6	1,203	1,258
SDAN 3810V-5	38	10	39	32.4	1×5	63.4	117.7	60.4	123.1	1,257	1,308
SDAN 3812V-5	38	12	39	32.4	1×5	63.4	117.7	60.3	123.3	1,256	1,309
SDAN 3816V-5	38	16	39	32.4	1×5	63.2	117.7	60.2	123.7	1,254	1,311
SDAN 3820V-5	38	20	39	32.4	1×5	63.0	111.9	60.0	116.9	1,265	1,314
○ SDAN 4008VX-5	40	8	41.25	36.3	1×5	—	—	42.2	99.4	—	1,326
SDAN 4010VA-5	40	10	41.75	35.2	1×5	65.6	126.4	62.5	132.3	1,329	1,384
SDAN 4012VA-5	40	12	41.75	35.2	1×5	65.5	126.4	62.4	132.5	1,328	1,385
SDAN 4016VA-5	40	16	41.75	35.2	1×5	65.4	126.4	62.3	132.9	1,326	1,387
SDAN 4020VA-5	40	20	41.75	35.2	1×5	65.2	127.7	62.1	133.4	1,336	1,389

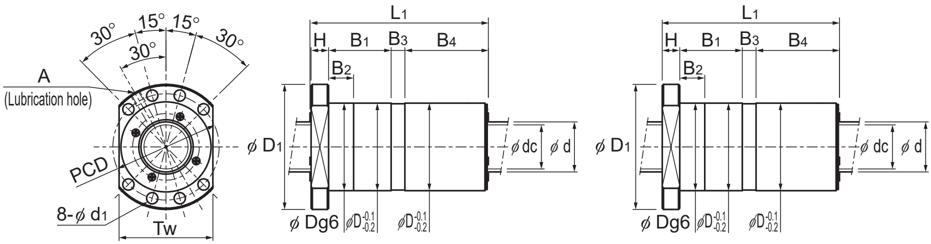
○: Indicates model numbers that are only compatible with Model SDAN-VX (Full-Ball type).

Model number coding

SDAN3110V X -5 TT G0 +830L C5

- SDAN3110V: Model No.
- X: Full-ball type code (No code for caged ball type)
- -5: Number of turns
- TT: Contamination protection accessory symbol[1]
- G0: Symbol for clearance in the axial direction (G0 for all SDAN-V variations)
- +830L: Overall screw shaft length (in mm)
- C5: Accuracy symbol[2]

[1] See A15-356. [2] See A15-12.



SDAN36V to 40V   Nut type Ⅰ   Nut type Ⅱ

Unit: mm

Nut type	Outer diameter D	Flange diameter D_1	Overall length L_1	H	B_1	B_2	Spacer thickness B_3	B_4	PCD	d_1	T_W	Lubrication hole A	Screw shaft inertial moment/mm (kg·m²/mm)	Nut mass (kg)	Shaft mass (kg/m)	Permissible rotational speed SDAN-V (Caged Ball) (min^{-1})	Permissible rotational speed SDAN-VX (Full-Ball) (min^{-1})
Ⅰ	56	86	135	14	47	20	11	62	71	9	65	M6	7.07×10^{-7}	1.83	5.02	5,000	4,060
Ⅰ	56	86	158	14	56	20	15.6	72	71	9	65	M6	7.07×10^{-7}	2.1	5.17	5,000	4,060
Ⅰ	56	86	189	14	75	20	8.9	90	71	9	65	M6	7.07×10^{-7}	2.5	5.36	5,000	4,060
Ⅰ	56	86	232	14	94	20	14.1	109	71	9	65	M6	7.07×10^{-7}	3.01	5.48	5,000	4,060
Ⅱ	50	80	62	12	16.5	16.5	4.5	29	65	9	62	M6	8.08×10^{-7}	0.66	5.89	4,880	3,960
Ⅱ	50	80	84	12	27.2	27.2	5.8	39	65	9	62	M6	8.08×10^{-7}	0.85	5.79	4,840	3,930
Ⅱ	50	80	108	12	37	20	10.4	49	65	9	62	M6	8.08×10^{-7}	1.03	5.87	4,840	3,930
Ⅱ	50	80	121	12	46	20	5	58	65	9	62	M6	8.08×10^{-7}	1.17	6	4,840	3,930
Ⅰ	57	87	135	14	47	20	11	62	72	9	66	M6	8.08×10^{-7}	1.87	5.38	4,840	3,930
Ⅰ	57	87	158	14	56	20	15.6	72	72	9	66	M6	8.08×10^{-7}	2.14	5.54	4,840	3,930
Ⅰ	57	87	189	14	75	20	8.7	90	72	9	66	M6	8.08×10^{-7}	2.56	5.73	4,840	3,930
Ⅰ	57	87	232	14	94	20	13.9	109	72	9	66	M6	8.08×10^{-7}	3.08	5.85	4,840	3,930
Ⅱ	54	84	72	14	19.2	19.2	5.8	33	69	9	66	M6	1.29×10^{-6}	0.84	7.4	4,320	3,510
Ⅰ	61	91	135	14	47	20	11	62	76	9	68	M8×1	1.29×10^{-6}	2	6.93	4,320	3,510
Ⅰ	61	91	158	14	56	20	15.6	72	76	9	68	M8×1	1.29×10^{-6}	2.31	7.11	4,320	3,510
Ⅰ	61	91	189	14	75	20	8.8	90	76	9	68	M8×1	1.29×10^{-6}	2.77	7.34	4,320	3,510
Ⅰ	61	91	232	14	94	20	14	109	76	9	68	M8×1	1.29×10^{-6}	3.33	7.47	4,320	3,510
Ⅰ	63	93	135	14	47	20	11.1	62	78	9	70	M8×1	1.60×10^{-6}	2.08	7.79	4,100	3,330
Ⅰ	63	93	158	14	56	20	15.7	71	78	9	70	M8×1	1.60×10^{-6}	2.4	7.97	4,100	3,330
Ⅰ	63	93	189	14	75	20	8.9	90	78	9	70	M8×1	1.60×10^{-6}	2.89	8.21	4,100	3,330
Ⅰ	63	93	232	14	94	20	14.2	109	78	9	70	M8×1	1.60×10^{-6}	3.44	8.35	4,100	3,330
Ⅱ	61	91	111	14	38	20	7.4	52	76	9	68	M8×1	1.97×10^{-6}	1.47	9.08	—	3,150
Ⅰ	70	100	135	14	47	20	10.9	62	85	9	75	M8×1	1.97×10^{-6}	2.68	8.9	3,830	3,110
Ⅰ	70	100	158	14	56	20	15.5	72	85	9	75	M8×1	1.97×10^{-6}	3.1	9.06	3,830	3,110
Ⅰ	70	100	189	14	75	20	8.7	90	85	9	75	M8×1	1.97×10^{-6}	3.7	9.27	3,830	3,110
Ⅰ	70	100	232	14	94	20	13.9	109	85	9	75	M8×1	1.97×10^{-6}	4.45	9.39	3,830	3,110

Axial Clearance

Unit: mm

Clearance symbol	G0
Axial clearance	0 or less

Note: L_1 and B_4 dimensions in the dimensional table are those when a thin film seal has been installed.
At least one end of the shaft must accommodate the insertion of the nut onto the ball screw threads for assembly. Please contact THK if this impacts your desired system design.

The rigidity values in the table represent spring constants, each obtained from the load and the elastic deformation under an axial load equal to 3 times the applied preload, which itself is 10% of the basic axial 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 rigidity value in the table as the actual value.
If the axial load (Fa_0) is not 10% of Ca, the rigidity value (K_N) is obtained from the following formula.

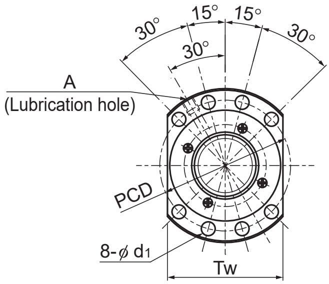
$$K_N = K\left(\frac{Fa_0}{0.1Ca}\right)^{\frac{1}{3}}$$

K: Rigidity value in the dimensional table

Options⇒A15-355

SDAN-V
With Preload

DN value	SDAN-V (Caged Ball)	160,000
	SDAN-VX (Full-Ball)	130,000



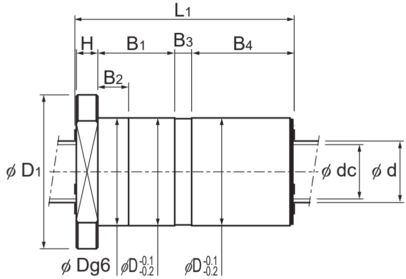
Model No.	Screw shaft outer diameter d	Lead Ph	Ball center-to-center diameter dp	Thread minor diameter dc	No. of loaded circuits Rows × turns	Basic load rating SDAN-V (Caged Ball) Ca kN	Basic load rating SDAN-V (Caged Ball) C_0a kN	Basic load rating SDAN-VX (Full-Ball) Ca kN	Basic load rating SDAN-VX (Full-Ball) C_0a kN	Rigidity SDAN-V (Caged Ball) K N/μm	Rigidity SDAN-VX (Full-Ball) K N/μm
SDAN 4510V-5	45	10	46	39.4	1×5	68.7	139.4	65.4	146.5	1,434	1,499
SDAN 4510VA-5	45	10	46.75	40.2	1×5	69.2	142.2	65.9	149	1,457	1,519
SDAN 4512V-5	45	12	46	39.4	1×5	68.6	139.4	65.4	146.7	1,433	1,500
SDAN 4512VA-5	45	12	46.75	40.2	1×5	69.2	142.2	65.9	149.2	1,457	1,519
SDAN 4516V-5	45	16	46	39.4	1×5	68.5	140.7	65.3	147	1,444	1,501
SDAN 4516VA-5	45	16	46.75	40.2	1×5	69	142.2	65.8	149.5	1,455	1,521
SDAN 4520V-5	45	20	46	39.4	1×5	68.4	140.7	65.1	147.5	1,442	1,504
SDAN 4520VA-5	45	20	46.75	40.2	1×5	68.9	143.6	65.6	150	1,465	1,524
SDAN 5010V-5	50	10	51	44.4	1×5	72	155.2	68.6	163.2	1,559	1,630
SDAN 5010VA-5	50	10	51.75	45.2	1×5	72.5	158.1	69	165.7	1,582	1,650
SDAN 5012V-5	50	12	51	44.4	1×5	72	155.2	68.5	163.3	1,559	1,631
SDAN 5012VA-5	50	12	51.75	45.2	1×5	72.4	158.1	69	165.9	1,582	1,651
SDAN 5016V-5	50	16	51	44.4	1×5	71.9	156.6	68.4	163.7	1,570	1,633
SDAN 5016VA-5	50	16	51.75	45.2	1×5	72.3	158.1	68.9	166.2	1,580	1,652
SDAN 5020V-5	50	20	51	44.4	1×5	71.7	156.6	68.3	164.2	1,568	1,635
SDAN 5020VA-5	50	20	51.75	45.2	1×5	72.2	159.4	68.8	166.7	1,591	1,654
SDAN 5025V-4	50	25	51	44.4	1×4	58.2	123.6	55.5	129.8	1,249	1,304
SDAN 5025VA-4	50	25	51.75	45.2	1×4	58.6	125.1	55.8	131.7	1,260	1,319
SDAN 5030V-4	50	30	51	44.4	1×4	58	117.5	55.3	122.6	1,258	1,307
SDAN 5030VA-4	50	30	51.75	45.2	1×4	58.4	118.9	55.7	124.5	1,269	1,322
SDAN 5040V-3	50	40	51	44.4	1×3	43.9	86.5	41.8	90.7	934	974
SDAN 5040VA-3	50	40	51.75	45.2	1×3	44.2	87.9	42.1	92	946	985

Model number coding

SDAN4510V X -5 TT G0 +830L C5

- SDAN4510V: Model No.
- X: Full-ball type code (No code for caged ball type)
- -5: Number of turns
- TT: Contamination protection accessory symbol [1]
- G0: Symbol for clearance in the axial direction (G0 for all SDAN-V variations)
- +830L: Overall screw shaft length (in mm)
- C5: Accuracy symbol[2]

[1] See A15-356. [2] See A15-12.



Unit: mm

Nut dimensions												Screw shaft inertial moment/mm	Nut mass	Shaft mass	Permissible rotational speed	
Outer diameter	Flange diameter	Overall length				Spacer thickness					Lubrication hole				SDAN-V (Caged Ball)	SDAN-VX (Full-Ball)
D	D_1	L_1	H	B_1	B_2	B_3	B_4	PCD	d_1	T_W	A	$kg\cdot m^2/mm$	kg	kg/m	min^{-1}	min^{-1}
70	105	135	16	45	20	11	62	88	11	80	M8×1	3.16×10^{-6}	2.47	11.16	3,470	2,820
75	110	135	16	45	20	11	62	93	11	85	M8×1	3.16×10^{-6}	3.05	11.4	3,420	2,780
70	105	158	16	54	20	15.6	72	88	11	80	M8×1	3.16×10^{-6}	2.84	11.38	3,470	2,820
75	110	158	16	54	20	15.6	72	93	11	85	M8×1	3.16×10^{-6}	3.5	11.58	3,420	2,780
70	105	189	16	73	20	8.8	90	88	11	80	M8×1	3.16×10^{-6}	3.36	11.67	3,470	2,820
75	110	189	16	73	20	8.8	90	93	11	85	M8×1	3.16×10^{-6}	4.15	11.82	3,420	2,780
70	105	232	16	92	20	14	109	88	11	80	M8×1	3.16×10^{-6}	4.03	11.84	3,470	2,820
75	110	232	16	92	20	14	109	93	11	85	M8×1	3.16×10^{-6}	5	11.96	3,420	2,780
75	110	135	16	45	20	11	62	93	11	85	M8×1	4.82×10^{-6}	2.69	13.93	3,130	2,540
82	118	135	16	45	20	11	62	100	11	92	M8×1	4.82×10^{-6}	3.58	14.2	3,090	2,510
75	110	158	16	54	20	15.6	72	93	11	85	M8×1	4.82×10^{-6}	3.08	14.19	3,130	2,540
82	118	158	16	54	20	15.6	72	100	11	92	M8×1	4.82×10^{-6}	4.12	14.41	3,090	2,510
75	110	189	16	73	20	8.8	90	93	11	85	M8×1	4.82×10^{-6}	3.65	14.5	3,130	2,540
82	118	189	16	73	20	8.8	90	100	11	92	M8×1	4.82×10^{-6}	4.89	14.67	3,090	2,510
75	110	232	16	92	20	14	109	93	11	85	M8×1	4.82×10^{-6}	4.39	14.69	3,130	2,540
82	118	232	16	92	20	14	109	100	11	92	M8×1	4.82×10^{-6}	5.89	14.83	3,090	2,510
75	110	235	16	90	20	20.5	108	93	11	85	M8×1	4.82×10^{-6}	4.41	14.82	3,130	2,540
82	118	235	16	90	20	20.5	108	100	11	92	M8×1	4.82×10^{-6}	5.93	14.95	3,090	2,510
75	110	265	16	110	20	10.7	128	93	11	85	M8×1	4.82×10^{-6}	4.96	14.92	3,130	2,540
82	118	265	16	110	20	10.6	128	100	11	92	M8×1	4.82×10^{-6}	6.67	15.03	3,090	2,510
75	110	268	16	108	20	17.5	126	93	11	85	M8×1	4.82×10^{-6}	4.98	15.06	3,130	2,540
82	118	269	16	108	20	17.3	126	100	11	92	M8×1	4.82×10^{-6}	6.72	15.13	3,090	2,510

Axial Clearance

Unit: mm

Clearance symbol	G0
Axial clearance	0 or less

Note: L_1 and B_4 dimensions in the dimensional table are those when a thin film seal has been installed.
At least one end of the shaft must accommodate the insertion of the nut onto the ball screw threads for assembly.
Please contact THK if this impacts your desired system design.

The rigidity values in the table represent spring constants, each obtained from the load and the elastic deformation under an axial load equal to 3 times the applied preload, which itself is 10% of the basic axial 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 rigidity value in the table as the actual value.
If the axial load (Fa_0) is not 10% of Ca, the rigidity value (K_N) is obtained from the following formula.

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

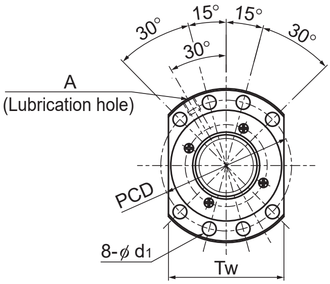
K: Rigidity value in the dimensional table

Options⇒A15-355

Ball Screw

SDAN-V With Preload

DN value	SDAN-VX (Full-Ball)	130,000



Model No.	Screw shaft outer diameter d	Lead Ph	Ball center-to-center diameter dp	Thread minor diameter dc	No. of loaded circuits Rows × turns	Basic load rating SDAN-V (Caged Ball) Ca kN	Basic load rating SDAN-V (Caged Ball) C_0a kN	Basic load rating SDAN-VX (Full-Ball) Ca kN	Basic load rating SDAN-VX (Full-Ball) C_0a kN	Rigidity SDAN-V (Caged Ball) K N/μm	Rigidity SDAN-VX (Full-Ball) K N/μm
○ SDAN 5510VX-4	55	10	56	49.4	1×4	—	—	58.2	141.6	—	1,400
○ SDAN 5510VAX-4	55	10	56.75	50.2	1×4	—	—	58.5	143.6	—	1,416
○ SDAN 5512VX-4	55	12	56	49.4	1×4	—	—	58.1	141.7	—	1,401
○ SDAN 5512VAX-4	55	12	56.75	50.2	1×4	—	—	58.5	143.7	—	1,416
○ SDAN 5516VX-4	55	16	56	49.4	1×4	—	—	58.1	142	—	1,402
○ SDAN 5516VAX-4	55	16	56.75	50.2	1×4	—	—	58.4	144	—	1,417
○ SDAN 5520VX-4	55	20	56	49.4	1×4	—	—	58	142.3	—	1,403
○ SDAN 5520VAX-4	55	20	56.75	50.2	1×4	—	—	58.3	144.3	—	1,419
○ SDAN 6310VX-4	63	10	64	57.4	1×4	—	—	61.6	162.7	—	1,560
○ SDAN 6312VX-4	63	12	65	57.6	1×4	—	—	72.9	185.2	—	1,603
○ SDAN 6316VX-4	63	16	65	57.6	1×4	—	—	72.8	185.5	—	1,604
○ SDAN 6320VX-4	63	20	65	57.6	1×4	—	—	72.7	185.8	—	1,606
○ SDAN 6325VX-4	63	25	65	57.6	1×4	—	—	72.6	186.3	—	1,607
○ SDAN 6330VX-4	63	30	65	57.6	1×4	—	—	72.5	186.9	—	1,610
○ SDAN 6340VX-3	63	40	65	57.6	1×3	—	—	55	129.2	—	1,197

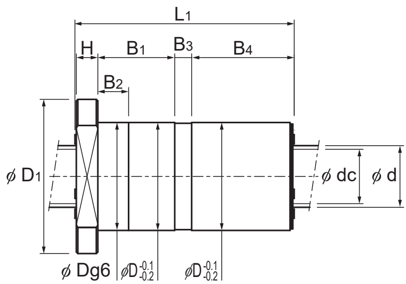
○: Indicates model numbers that are only compatible with Model SDAN-VX (Full-Ball type).

Model number coding

SDAN5510V X -4 TT G0 +830L C5

- SDAN5510V: Model No.
- X: Full-ball type code (No code for caged ball type)
- -4: Number of turns
- TT: Contamination protection accessory symbol[1]
- G0: Symbol for clearance in the axial direction (G0 for all SDAN-V variations)
- +830L: Overall screw shaft length (in mm)
- C5: Accuracy symbol[2]

[1] See A15-356. [2] See A15-12.



Unit: mm

Nut dimensions												Screw shaft inertial moment/mm	Nut mass	Shaft mass	Permissible rotational speed	
Outer diameter	Flange diameter	Overall length				Spacer thickness					Lubrication hole				SDAN-V (Caged Ball)	SDAN-VX (Full-Ball)
D	D_1	L_1	H	B_1	B_2	B_3	B_4	PCD	d_1	T_w	A	$kg\cdot m^2/mm$	kg	kg/m	min^{-1}	min^{-1}
80	118	115	18	33	20	11	52	100	11	92	M8×1	7.05×10^{-6}	2.54	17.02	—	2,320
82	120	115	18	33	20	11	52	102	11	94	M8×1	7.05×10^{-6}	2.73	17.32	—	2,290
80	118	134	18	40	20	15.6	60	100	11	92	M8×1	7.05×10^{-6}	2.89	17.3	—	2,320
82	120	134	18	40	20	15.6	60	102	11	94	M8×1	7.05×10^{-6}	3.11	17.55	—	2,290
80	118	157	18	55	20	8.8	74	100	11	92	M8×1	7.05×10^{-6}	3.35	17.65	—	2,320
82	120	157	18	55	20	8.8	74	102	11	94	M8×1	7.05×10^{-6}	3.6	17.84	—	2,290
80	118	192	18	70	20	14	89	100	11	92	M8×1	7.05×10^{-6}	4	17.86	—	2,320
82	120	192	18	70	20	14	89	102	11	94	M8×1	7.05×10^{-6}	4.3	18.01	—	2,290
90	125	115	18	33	20	11	52	108	11	95	M8×1	1.21×10^{-5}	2.97	22.61	—	2,030
95	135	135	20	39	25	14.6	61	115	13.5	100	M8×1	1.21×10^{-5}	4.18	22.89	—	2,000
95	135	158	20	54	25	7.8	75	115	13.5	100	M8×1	1.21×10^{-5}	4.84	23.3	—	2,000
95	135	193	20	69	25	13	90	115	13.5	100	M8×1	1.21×10^{-5}	5.8	23.55	—	2,000
95	135	237	20	88	25	19.3	109	115	13.5	100	M8×1	1.21×10^{-5}	7.02	23.74	—	2,000
95	135	266	20	107	25	10.2	128	115	13.5	100	M8×1	1.21×10^{-5}	7.84	23.87	—	2,000
95	135	269	20	105	25	17.2	126	115	13.5	100	M8×1	1.21×10^{-5}	7.87	24.04	—	2,000

Axial Clearance

Unit: mm

Clearance symbol	G0
Axial clearance	0 or less

Note: L_1 and B_4 dimensions in the dimensional table are those when a thin film seal has been installed.
At least one end of the shaft must accommodate the insertion of the nut onto the ball screw threads for assembly. Please contact THK if this impacts your desired system design.

The rigidity values in the table represent spring constants, each obtained from the load and the elastic deformation under an axial load equal to 3 times the applied preload, which itself is 10% of the basic axial 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 rigidity value in the table as the actual value.
If the axial load (Fa_0) is not 10% of Ca, the rigidity value (K_N) is obtained from the following formula.

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

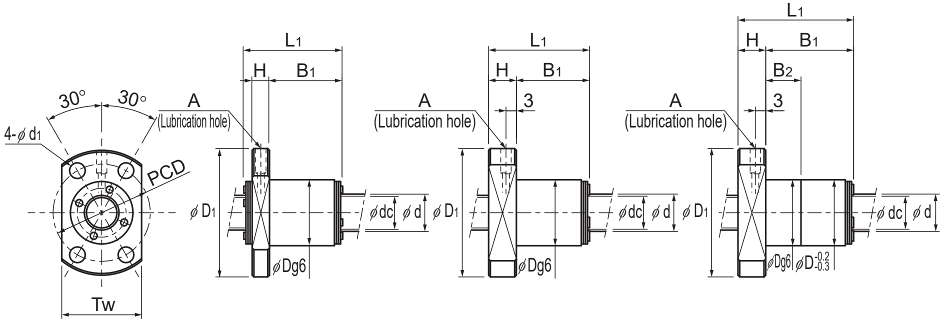
K: Rigidity value in the dimensional table

Ball Screw

Options⇒A15-355

SDA-V/SDA-VZ With Preload/No Preload

DN value	SDA-V (Caged Ball)	160,000
	SDA-VZ (Full-Ball)	100,000



SDA1004VZ/1005VZ/1010VZ

SDA1205VZ/1210VZ

SDA1220VZ/1230VZ

Model No.	Screw shaft outer diameter	Lead	Ball center-to-center diameter	Thread minor diameter	No. of loaded circuits	Basic load rating				Rigidity	
						SDA-V (Caged Ball)		SDA-VZ (Full-Ball)		SDA-V (Caged Ball)	SDA-VZ (Full-Ball)
						Ca	C0a	Ca	C0a	K	K
	d	Ph	dp	dc	Rows × turns	kN	kN	kN	kN	N/μm	N/μm
○ SDA 1004VZ-4	10	4	10.4	8.77	1×4	—	—	3.54	5.42	—	143
○ SDA 1005VZ-4	10	5	10.4	8.77	1×4	—	—	3.53	5.44	—	143
○ SDA 1010VZ-3	10	10	10.4	8.77	1×3	—	—	2.63	3.86	—	108
○ SDA 1205VZ-3	12	5	12.5	10.1	1×3	—	—	4.99	7.02	—	128
○ SDA 1210VZ-2	12	10	12.5	10.1	1×2	—	—	3.31	4.25	—	83
○ SDA 1220VZ-2	12	20	12.5	10.1	1×2	—	—	3.13	4.63	—	87
○ SDA 1230VZ-2	12	30	12.5	10.1	1×2	—	—	2.92	4.14	—	91
SDA 1405V-4	14	5	14.5	12.1	1×4	7.4	10.1	7.1	11.3	178	196
SDA 1505V-3	15	5	15.5	13.1	1×3	5.9	7.9	5.6	8.8	140	153
SDA 1510V-3	15	10	15.5	13.1	1×3	5.8	7.6	5.5	8.4	141	154
SDA 1520V-4	15	20	15.5	13.1	2×2	6.8	10.1	6.5	11.2	181	198
SDA 1530V-4	15	30	15.5	13.1	2×2	6.5	8.8	6.2	9.7	188	205
SDA 1605V-3	16	5	16.5	14.1	1×3	6	8.4	5.8	9.4	147	162
SDA 1610V-3	16	10	16.5	14.1	1×3	6	8.1	5.7	9	148	163
SDA 1616V-3	16	16	16.5	14.1	1×3	5.9	8.4	5.6	9.2	151	165

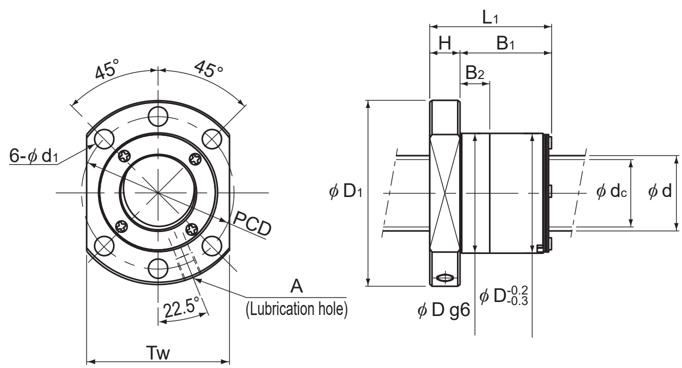
○: Indicates model numbers that are only compatible with Model SDA-VZ (Full-Ball type).

Model number coding

SDA1510V Z -3 TT G0 +600L C5

- SDA1510V: Model No.
- Z: Full-ball type code (No code for caged ball type)
- -3: Number of turns
- TT: Contamination protection accessory symbol[1]
- G0: Axial direction clearance code[2]
- +600L: Overall screw shaft length (in mm)
- C5: Accuracy symbol[3]

[1] See A15-356. [2] See A15-19. [3] See A15-12.



SDA14V to 16V

Unit: mm

Nut dimensions										Screw shaft inertial moment/mm	Nut mass	Shaft mass	Permissible rotational speed	
Outer diameter	Flange diameter	Overall length							Lubrication hole				SDA-V (Caged Ball)	SDA-VZ (Full-Ball)
D	D_1	L_1	H	B_1	B_2	PCD	d_1	T_w	A	$kg \cdot m^2/mm$	kg	kg/m	min^{-1}	min^{-1}
19	36	24	6	16	—	28	4.5	23	φ3	7.71×10^{-9}	0.047	0.577	—	5,000
19	36	28	6	20	—	28	4.5	23	φ3	7.71×10^{-9}	0.052	0.585	—	5,000
19	36	37	6	29	—	28	4.5	23	φ3	7.71×10^{-9}	0.066	0.6	—	5,000
24	40	25	8	17	—	32	4.5	26	φ3	1.60×10^{-8}	0.073	0.796	—	5,000
24	40	29	8	21	—	32	4.5	26	φ3	1.60×10^{-8}	0.082	0.841	—	5,000
24	40	47	8	39	20	32	4.5	26	φ3	1.60×10^{-8}	0.126	0.863	—	5,000
24	40	65	8	57	20	32	4.5	26	φ3	1.60×10^{-8}	0.172	0.869	—	5,000
26	48	30	10	20	10	38	5.5	40	M6	2.96×10^{-8}	0.14	1.1	5,000	5,000
28	48	25	10	15	12.5	38	5.5	40	M6	3.90×10^{-8}	0.13	1.27	5,000	5,000
28	48	38	10	28	25.5	38	5.5	40	M6	3.90×10^{-8}	0.17	1.33	5,000	5,000
28	48	46	10	36	20	38	5.5	40	M6	3.90×10^{-8}	0.19	1.33	5,000	5,000
28	48	65	10	55	20	38	5.5	40	M6	3.90×10^{-8}	0.25	1.34	5,000	5,000
28	48	25	10	15	12.5	38	5.5	40	M6	5.05×10^{-8}	0.13	1.46	5,000	5,000
28	48	39	10	29	26.5	38	5.5	40	M6	5.05×10^{-8}	0.16	1.52	5,000	5,000
28	48	56	10	46	20	38	5.5	40	M6	5.05×10^{-8}	0.21	1.54	5,000	5,000

Notes: L_1 and B_1 dimensions in the dimensional table are those when a thin film seal has been installed.
At least one end of the shaft must accommodate the insertion of the nut onto the ball screw threads for assembly. Please contact THK if this impacts your desired system design.

The rigidity values (K) in the table represent spring constants, each obtained from the load and the elastic deformation under an axial load equal to 30% of the basic axial 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 rigidity value (K) in the table as the actual value.
If the axial load (Fa) is not 30% of Ca, the rigidity value (K_N) is obtained from the following equation.

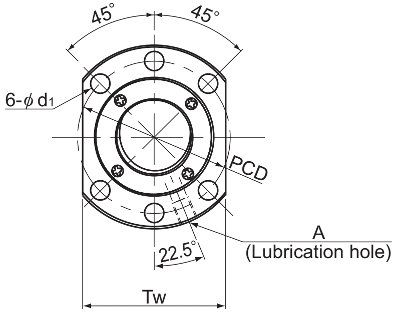
$$K_N = K\left(\frac{Fa}{0.3Ca}\right)^{\frac{1}{3}}$$

K: Rigidity value in the dimensional table

Options⇒A15-355

SDA-V/SDA-VZ With Preload/No Preload

DN value	SDA-V (Caged Ball)	160,000
	SDA-VZ (Full-Ball)	100,000



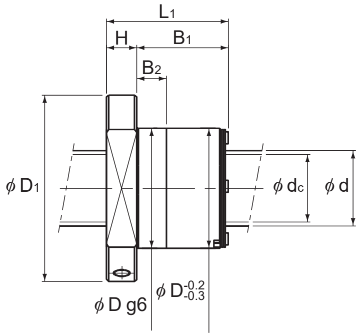
Model No.	Screw shaft outer diameter d	Lead Ph	Ball center-to-center diameter dp	Thread minor diameter dc	No. of loaded circuits Rows X turns	Basic load rating SDA-V (Caged Ball) Ca kN	Basic load rating SDA-V (Caged Ball) C_0a kN	Basic load rating SDA-VZ (Full-Ball) Ca kN	Basic load rating SDA-VZ (Full-Ball) C_0a kN	Rigidity SDA-V (Caged Ball) K N/μm	Rigidity SDA-VZ (Full-Ball) K N/μm
SDA 2004V-4	20	4	20.5	18.1	1×4	8.8	14.7	8.3	16.2	239	260
SDA 2005V-3	20	5	20.75	17.1	1×3	11.7	17.7	11.1	18.9	200	213
SDA 2006V-4	20	6	20.75	17.1	1×4	15.3	24.1	14.5	25.9	269	287
SDA 2010V-3	20	10	20.75	17.1	1×3	11.6	17.7	11	19	200	213
SDA 2010V-6	20	10	20.75	17.1	2×3	21	35.3	20	38.1	386	413
SDA 2020V-3	20	20	20.75	17.1	1×3	11.4	17.2	10.8	18.5	203	217
SDA 2020V-6	20	20	20.75	17.1	2×3	20.6	34.5	19.6	37	394	420
SDA 2030V-2	20	30	20.75	17.1	1×2	7.4	11.5	7	12.3	135	143
SDA 2040V-2	20	40	20.75	17.1	1×2	7.1	9.7	6.8	10.4	137	147
SDA 2060V-2	20	60	20.75	17.1	2×1	5.5	9.2	5.2	9.9	121	131
SDA 2505V-3	25	5	25.75	22.1	1×3	12.9	22	12.3	23.7	237	254
SDA 2510V-3	25	10	25.75	22.1	1×3	12.8	22	12.2	23.8	237	254
SDA 2520V-3	25	20	25.75	22.1	1×3	12.7	21.3	12.1	22.9	241	257
SDA 2525V-3	25	25	25.75	22.1	1×3	12.5	21.6	11.9	23.3	243	259
SDA 2530V-2	25	30	25.75	22.1	1×2	8.3	13.9	7.9	14.9	158	168
SDA 2530V-4	25	30	25.75	22.1	2×2	15.1	27.8	14.4	29.8	305	325
SDA 2550V-2	25	50	25.75	22.1	1×2	7.8	12.1	7.5	13.1	163	176

Model number coding

SDA2005V Z -3 TT G0 +830L C5

- SDA2005V: Model No.
- Z: Full-ball type code (No code for caged ball type)
- -3: Number of turns
- TT: Contamination protection accessory symbol[1]
- G0: Axial direction clearance code[2]
- +830L: Overall screw shaft length (in mm)
- C5: Accuracy symbol[3]

[1] See A15-356. [2] See A15-19. [3] See A15-12.



Unit: mm

	Nut dimensions										Screw shaft inertial moment/mm	Nut mass	Shaft mass	Permissible rotational speed	
	Outer diameter	Flange diameter	Overall length							Lubrication hole				SDA-V (Caged Ball)	SDA-VZ (Full-Ball)
	D	D_1	L_1	H	B_1	B_2	PCD	d_1	T_w	A	kg·m²/mm	kg	kg/m	min^{-1}	min^{-1}
	32	58	27	10	17	14.5	47	6.6	44	M6	1.23×10^{-7}	0.17	2.27	5,000	4,870
	36	58	27	10	17	13.5	47	6.6	44	M6	1.23×10^{-7}	0.18	2.21	5,000	4,810
	36	58	35	10	25	22.2	47	6.6	44	M6	1.23×10^{-7}	0.22	2.23	5,000	4,810
	36	58	40	10	30	27	47	6.6	44	M6	1.23×10^{-7}	0.25	2.34	5,000	4,810
	36	58	40	10	30	27	47	6.6	44	M6	1.23×10^{-7}	0.25	2.18	5,000	4,810
	36	58	67	10	57	20	47	6.6	44	M6	1.23×10^{-7}	0.39	2.4	5,000	4,810
	36	58	67	10	57	20	47	6.6	44	M6	1.23×10^{-7}	0.38	2.31	5,000	4,810
	36	58	66	10	56	20	47	6.6	44	M6	1.23×10^{-7}	0.38	2.42	5,000	4,810
	36	58	84	10	74	20	47	6.6	44	M6	1.23×10^{-7}	0.47	2.43	5,000	4,810
	36	58	63	10	53	20	47	6.6	44	M6	1.23×10^{-7}	0.36	2.39	5,000	4,810
	40	62	27	10	17	13.5	51	6.6	48	M6	3.01×10^{-7}	0.2	3.53	5,000	3,880
	40	62	40	10	30	27	51	6.6	48	M6	3.01×10^{-7}	0.28	3.7	5,000	3,880
	40	62	67	10	57	20	51	6.6	48	M6	3.01×10^{-7}	0.42	3.78	5,000	3,880
	40	62	82	10	72	20	51	6.6	48	M6	3.01×10^{-7}	0.5	3.79	5,000	3,880
	40	62	66	10	56	20	51	6.6	48	M6	3.01×10^{-7}	0.41	3.8	5,000	3,880
	40	62	66	10	56	20	51	6.6	48	M6	3.01×10^{-7}	0.41	3.71	5,000	3,880
	40	62	102	10	92	20	51	6.6	48	M6	3.01×10^{-7}	0.61	3.83	5,000	3,880

Notes: L_1 and B_1 dimensions in the dimensional table are those when a thin film seal has been installed.
At least one end of the shaft must accommodate the insertion of the nut onto the ball screw threads for assembly. Please contact THK if this impacts your desired system design.

The rigidity values (K) in the table represent spring constants, each obtained from the load and the elastic deformation under an axial load equal to 30% of the basic axial 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 rigidity value (K) in the table as the actual value.
If the axial load (Fa) is not 30% of Ca, the rigidity value (K_N) is obtained from the following equation.

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

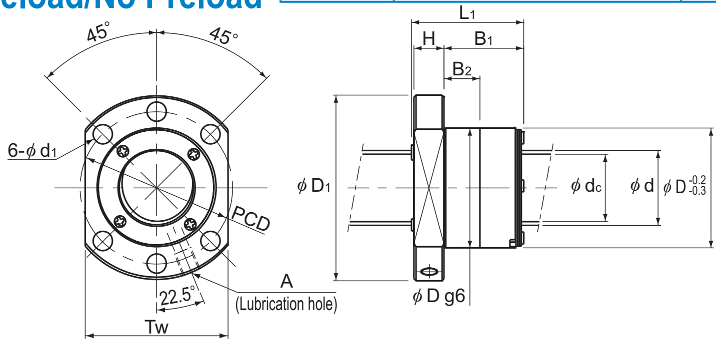
K: Rigidity value in the dimensional table

Ball Screw

Options⇒A15-355

SDA-V/SDA-VZ With Preload/No Preload

DN value	SDA-V (Caged Ball)	160,000
	SDA-VZ (Full-Ball)	130,000



SDA28V to 32VA

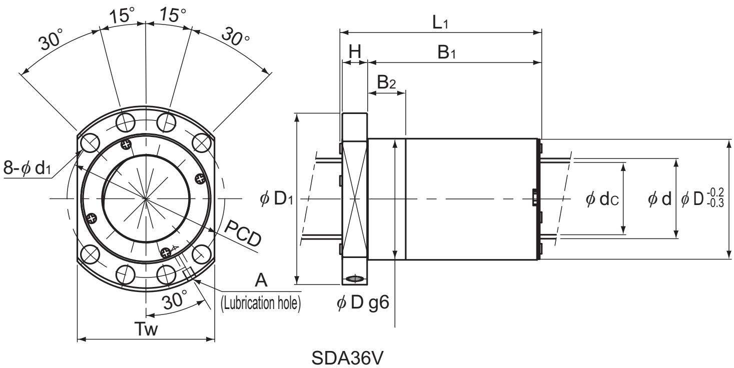
Model No.	Screw shaft outer diameter	Lead	Ball center-to-center diameter	Thread minor diameter	No. of loaded circuits	Basic load rating				Rigidity	
						SDA-V (Caged Ball)		SDA-VZ (Full-Ball)		SDA-V (Caged Ball)	SDA-VZ (Full-Ball)
						C_a	C_{0a}	C_a	C_{0a}	K	K
	d	Ph	dp	dc	Rows × turns	kN	kN	kN	kN	N/μm	N/μm
SDA 2806V-5	28	6	29	24.9	1×5	29.6	54.5	28.2	57.7	462	487
SDA 3110V-5	31	10	32	25.4	1×5	57.1	94.7	54.4	99.7	529	554
SDA 3112V-5	31	12	32	25.4	1×5	57	94.7	54.3	99.9	529	555
SDA 3116V-5	31	16	32	25.4	1×5	56.8	96	54.1	100.5	534	556
SDA 3120V-5	31	20	32	25.4	1×5	56.6	90.3	53.9	95.1	533	558
SDA 3132V-2	31	32	32	25.4	1×2	23.2	33.8	22.1	35.4	206	214
SDA 3205V-4	32	5	32.75	29.1	1×4	18.8	38.5	17.9	41.7	388	416
SDA 3206V-5	32	6	33	28.9	1×5	31.4	62.4	29.9	66.1	513	541
SDA 3208V-5	32	8	33	28.9	1×5	31.4	62.4	29.9	66.2	513	541
SDA 3210V-5	32	10	33	28.9	1×5	31.3	62.9	29.8	66.3	517	541
SDA 3210VA-5	32	10	33	26.4	1×5	58.1	98.9	55.3	103.1	548	569
SDA 3212VA-5	32	12	33	26.4	1×5	58	98.9	55.3	103.3	548	569
SDA 3216VA-5	32	16	33	26.4	1×5	57.8	98.9	55.1	103.8	547	571
SDA 3220VA-5	32	20	33	26.4	1×5	57.6	94.3	54.9	98.2	552	572
SDA 3232VA-2	32	32	33	26.4	1×2	23.6	35.2	22.5	36.5	213	220
SDA 3610V-5	36	10	37	30.4	1×5	61.7	110.6	58.8	116.4	598	626
SDA 3612V-5	36	12	37	30.4	1×5	61.7	110.6	58.7	116.6	598	627
SDA 3616V-5	36	16	37	30.4	1×5	61.5	111.9	58.6	117.1	603	628
SDA 3620V-5	36	20	37	30.4	1×5	61.3	105.2	58.4	110.6	602	629
SDA 3636V-2	36	36	37	30.4	1×2	25.1	39.3	23.9	41.3	232	242

Model number coding

SDA3610V Z -5 TT G0 +830L C5

- SDA3610V: Model No.
- Z: Full-ball type code (No code for caged ball type)
- -5: Number of turns
- TT: Contamination protection accessory symbol[1]
- G0: Axial direction clearance code[2]
- +830L: Overall screw shaft length (in mm)
- C5: Accuracy symbol[3]

[1] See A15-356. [2] See A15-19. [3] See A15-12.



SDA36V

Unit: mm

Nut dimensions										Screw shaft inertial moment/mm	Nut mass	Shaft mass	Permissible rotational speed	
Outer diameter	Flange diameter	Overall length							Lubrication hole				SDA-V (Caged Ball)	SDA-VZ (Full-Ball)
D	D_1	L_1	H	B_1	B_2	PCD	d_1	T_w	A	kg·m²/mm	kg	kg/m	min^{-1}	min^{-1}
46	80	42	12	30	27	65	9	62	M6	4.74×10^{-7}	0.49	4.37	5,000	4,480
56	86	65	14	50	20	71	9	65	M6	7.07×10^{-7}	0.96	5.02	5,000	4,060
56	86	74	14	59	20	71	9	65	M6	7.07×10^{-7}	1.08	5.17	5,000	4,060
56	86	93	14	78	20	71	9	65	M6	7.07×10^{-7}	1.31	5.36	5,000	4,060
56	86	112	14	97	20	71	9	65	M6	7.07×10^{-7}	1.54	5.47	5,000	4,060
56	86	73	14	58	20	71	9	65	M6	7.07×10^{-7}	1.04	5.63	5,000	4,060
50	80	32	12	20	17	65	9	62	M6	8.08×10^{-7}	0.41	5.89	4,880	3,960
50	80	42	12	30	10	65	9	62	M6	8.08×10^{-7}	0.48	5.73	4,840	3,930
50	80	52	12	40	20	65	9	62	M6	8.08×10^{-7}	0.56	5.87	4,840	3,930
50	80	61	12	49	20	65	9	62	M6	8.08×10^{-7}	0.64	6	4,840	3,930
57	87	65	14	50	20	72	9	66	M6	8.08×10^{-7}	0.98	5.38	4,840	3,930
57	87	74	14	59	20	72	9	66	M6	8.08×10^{-7}	1.1	5.54	4,840	3,930
57	87	93	14	78	20	72	9	66	M6	8.08×10^{-7}	1.34	5.73	4,840	3,930
57	87	112	14	97	20	72	9	66	M6	8.08×10^{-7}	1.58	5.85	4,840	3,930
57	87	73	14	58	20	72	9	66	M6	8.08×10^{-7}	1.07	6.01	4,840	3,930
61	91	65	14	50	20	76	9	68	M8×1	1.29×10^{-6}	1.06	6.93	4,320	3,510
61	91	74	14	59	20	76	9	68	M8×1	1.29×10^{-6}	1.19	7.11	4,320	3,510
61	91	93	14	78	20	76	9	68	M8×1	1.29×10^{-6}	1.45	7.34	4,320	3,510
61	91	112	14	97	20	76	9	68	M8×1	1.29×10^{-6}	1.7	7.47	4,320	3,510
61	91	81	14	66	20	76	9	68	M8×1	1.29×10^{-6}	1.24	7.69	4,320	3,510

Notes: L_1 and B_1 dimensions in the dimensional table are those when a thin film seal has been installed.
At least one end of the shaft must accommodate the insertion of the nut onto the ball screw threads for assembly.
Please contact THK if this impacts your desired system design.

The rigidity values (K) in the table represent spring constants, each obtained from the load and the elastic deformation under an axial load equal to 30% of the basic axial 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 rigidity value (K) in the table as the actual value.
If the axial load (Fa) is not 30% of Ca, the rigidity value (K_N) is obtained from the following equation.

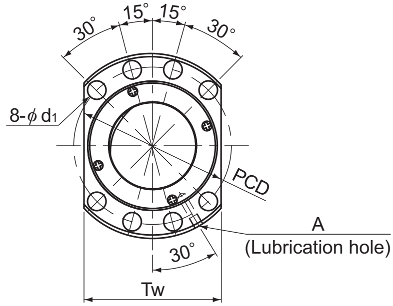
$$K_N = K\left(\frac{Fa}{0.3Ca}\right)^{\frac{1}{3}}$$

K: Rigidity value in the dimensional table

Options⇒A15-355

SDA-V/SDA-VZ With Preload/No Preload

DN value	SDA-V (Caged Ball)	160,000
	SDA-VZ (Full-Ball)	130,000



Model No.	Screw shaft outer diameter	Lead	Ball center-to-center diameter	Thread minor diameter	No. of loaded circuits	Basic load rating				Rigidity	
						SDA-V (Caged Ball)		SDA-VZ (Full-Ball)		SDA-V (Caged Ball)	SDA-VZ (Full-Ball)
						Ca	C_0a	Ca	C_0a	K	K
	d	Ph	dp	dc	Rows × turns	kN	kN	kN	kN	N/μm	N/μm
SDA 3810V-5	38	10	39	32.4	1×5	63.4	117.7	60.4	123.1	629	654
SDA 3812V-5	38	12	39	32.4	1×5	63.4	117.7	60.3	123.3	628	655
SDA 3815V-5	38	15	39	32.4	1×5	63.2	117.7	60.2	123.6	627	655
SDA 3816V-5	38	16	39	32.4	1×5	63.2	117.7	60.2	123.7	627	656
SDA 3820V-5	38	20	39	32.4	1×5	63.0	111.9	60	116.9	632	657
SDA 3825V-4	38	25	39	32.4	1×4	51.1	87.8	48.6	92.7	500	525
SDA 3830V-3	38	30	39	32.4	1×3	38.7	64.9	36.9	68.2	373	390
SDA 3840V-2	38	40	39	32.4	1×2	25.7	42	24.4	43.9	244	253
○ SDA 4008VZ-5	40	8	41.25	36.4	1×5	—	—	42.2	99.4	—	663
SDA 4010VA-5	40	10	41.75	35.2	1×5	65.6	126.4	62.5	132.3	664	692
SDA 4012VA-5	40	12	41.75	35.2	1×5	65.5	126.4	62.4	132.5	664	692
SDA 4015VA-5	40	15	41.75	35.2	1×5	65.4	126.4	62.3	132.8	663	693
SDA 4016VA-5	40	16	41.75	35.2	1×5	65.4	126.4	62.3	132.9	663	693
SDA 4020VA-5	40	20	41.75	35.2	1×5	65.2	127.7	62.1	133.4	668	695
SDA 4020VA-10	40	20	41.75	35.2	2×5	118.4	254.1	112.8	266.9	1,288	1,345
SDA 4025VA-4	40	25	41.75	35.2	1×4	52.9	94.5	50.4	99.4	531	555
SDA 4030VA-3	40	30	41.75	35.2	1×3	40.1	70.3	38.2	73.1	398	412
SDA 4030VA-6	40	30	41.75	35.2	2×3	72.8	139.2	69.4	146.1	764	798
SDA 4040VA-2	40	40	41.75	35.2	1×2	26.6	44.7	25.4	46.9	256	267
SDA 4040VA-4	40	40	41.75	35.2	2×2	48.4	89.4	46.1	93.8	496	518

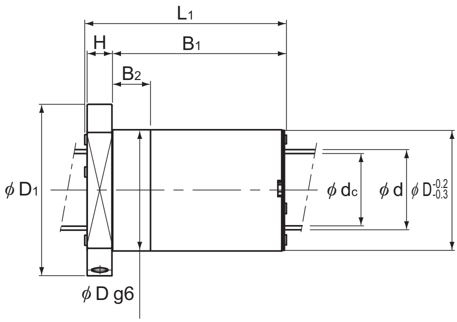
○: Indicates model numbers that are only compatible with Model SDA-VZ (Full-Ball type).

Model number coding

SDA3810V Z -5 TT G0 +830L C5

- SDA3810V: Model No.
- Z: Full-ball type code (No code for caged ball type)
- -5: Number of turns
- TT: Contamination protection accessory symbol[1]
- G0: Axial direction clearance code[2]
- +830L: Overall screw shaft length (in mm)
- C5: Accuracy symbol[3]

[1] See A15-356. [2] See A15-19. [3] See A15-12.



Unit: mm

Nut dimensions: Outer diameter D	Nut dimensions: Flange diameter D_1	Nut dimensions: Overall length L_1	Nut dimensions: H	Nut dimensions: B_1	Nut dimensions: B_2	Nut dimensions: PCD	Nut dimensions: d_1	Nut dimensions: T_w	Nut dimensions: Lubrication hole A	Screw shaft inertial moment/mm kg·m²/mm	Nut mass kg	Shaft mass kg/m	Permissible rotational speed: SDA-V (Caged Ball) min^{-1}	Permissible rotational speed: SDA-VZ (Full-Ball) min^{-1}
63	93	65	14	50	20	78	9	70	M8×1	1.60×10^{-6}	1.1	7.79	4,100	3,330
63	93	74	14	59	20	78	9	70	M8×1	1.60×10^{-6}	1.23	7.97	4,100	3,330
63	93	88	14	73	20	78	9	70	M8×1	1.60×10^{-6}	1.41	8.09	4,100	3,330
63	93	93	14	78	20	78	9	70	M8×1	1.60×10^{-6}	1.5	8.21	4,100	3,330
63	93	112	14	97	20	78	9	70	M8×1	1.60×10^{-6}	1.77	8.35	4,100	3,330
63	93	111	14	96	20	78	9	70	M8×1	1.60×10^{-6}	1.73	8.45	4,100	3,330
63	93	100	14	85	20	78	9	70	M8×1	1.60×10^{-6}	1.56	8.53	4,100	3,330
63	93	87	14	72	20	78	9	70	M8×1	1.60×10^{-6}	1.38	8.62	4,100	3,330
61	91	55	14	41	20	76	9	68	M8×1	1.97×10^{-6}	0.81	9.08	—	3,150
70	100	65	14	50	20	85	9	75	M8×1	1.97×10^{-6}	1.38	8.9	3,830	3,110
70	100	74	14	59	20	85	9	75	M8×1	1.97×10^{-6}	1.55	9.06	3,830	3,110
70	100	88	14	74	20	85	9	75	M8×1	1.97×10^{-6}	1.79	9.14	3,830	3,110
70	100	93	14	78	20	85	9	75	M8×1	1.97×10^{-6}	1.9	9.27	3,830	3,110
70	100	112	14	97	20	85	9	75	M8×1	1.97×10^{-6}	2.25	9.39	3,830	3,110
70	100	112	14	97	20	85	9	75	M8×1	1.97×10^{-6}	2.22	8.81	3,830	3,110
70	100	112	14	97	20	85	9	75	M8×1	1.97×10^{-6}	2.22	9.49	3,830	3,110
70	100	101	14	86	20	85	9	75	M8×1	1.97×10^{-6}	2.01	9.55	3,830	3,110
70	100	101	14	86	20	85	9	75	M8×1	1.97×10^{-6}	1.97	9.13	3,830	3,110
70	100	88	14	73	20	85	9	75	M8×1	1.97×10^{-6}	1.77	9.63	3,830	3,110
70	100	88	14	73	20	85	9	75	M8×1	1.97×10^{-6}	1.75	9.29	3,830	3,110

Notes: L_1 and B_1 dimensions in the dimensional table are those when a thin film seal has been installed.
At least one end of the shaft must accommodate the insertion of the nut onto the ball screw threads for assembly. Please contact THK if this impacts your desired system design.

The rigidity values (K) in the table represent spring constants, each obtained from the load and the elastic deformation under an axial load equal to 30% of the basic axial 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 rigidity value (K) in the table as the actual value.
If the axial load (Fa) is not 30% of Ca, the rigidity value (K_N) is obtained from the following equation.

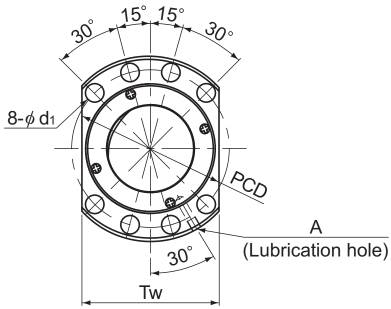
$$K_N = K\left(\frac{Fa}{0.3Ca}\right)^{\frac{1}{3}}$$

K: Rigidity value in the dimensional table

Ball Screw

SDA-V/SDA-VZ
With Preload/No Preload

DN value	SDA-V (Caged Ball)	160,000
	SDA-VZ (Full-Ball)	130,000



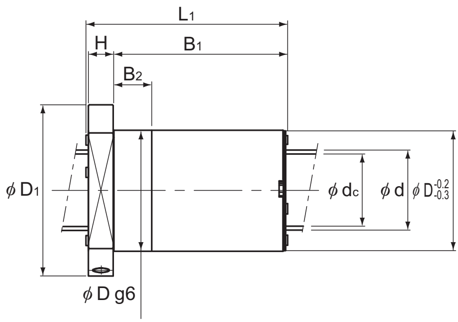
Model No.	Screw shaft outer diameter	Lead	Ball center-to-center diameter	Thread minor diameter	No. of loaded circuits	Basic load rating				Rigidity	
						SDA-V (Caged Ball)		SDA-VZ (Full-Ball)		SDA-V (Caged Ball)	SDA-VZ (Full-Ball)
						Ca	C_0a	Ca	C_0a	K	K
	d	Ph	dp	dc	Rows × turns	kN	kN	kN	kN	N/µm	N/µm
SDA 4510V-5	45	10	46	39.4	1×5	68.7	139.4	65.4	146.5	717	749
SDA 4510VA-5	45	10	46.75	40.2	1×5	69.2	142.2	65.9	149	729	759
SDA 4512V-5	45	12	46	39.4	1×5	68.6	139.4	65.4	146.7	717	750
SDA 4512VA-5	45	12	46.75	40.2	1×5	69.2	142.2	65.9	149.2	728	760
SDA 4516V-5	45	16	46	39.4	1×5	68.5	140.7	65.3	147	722	751
SDA 4516VA-5	45	16	46.75	40.2	1×5	69	142.2	65.8	149.5	727	761
SDA 4520V-5	45	20	46	39.4	1×5	68.4	140.7	65.1	147.5	721	752
SDA 4520VA-5	45	20	46.75	40.2	1×5	68.9	143.6	65.6	150	733	762
SDA 4520VA-10	45	20	46.75	40.2	2×5	125.1	285.8	119.1	300.1	1,413	1,475
SDA 4525V-4	45	25	46	39.4	1×4	55.5	104	52.8	109.8	572	600
SDA 4525VA-4	45	25	46.75	40.2	1×4	55.9	106.7	53.2	111.6	584	608
SDA 4530V-4	45	30	46	39.4	1×4	55.2	105.3	52.6	110.5	577	602
SDA 4530VA-4	45	30	46.75	40.2	1×4	55.7	106.7	53	112.3	583	610
SDA 4540V-3	45	40	46	39.4	1×3	41.7	78.3	39.7	81.9	431	449
SDA 4540VA-3	45	40	46.75	40.2	1×3	42.1	79.7	40.1	83.2	438	455

Model number coding

SDA4510V Z -5 TT G0 +830L C5

- SDA4510V: Model No.
- Z: Full-ball type code (No code for caged ball type)
- -5: Number of turns
- TT: Contamination protection accessory symbol[1]
- G0: Axial direction clearance code[2]
- +830L: Overall screw shaft length (in mm)
- C5: Accuracy symbol[3]

[1] See A15-356. [2] See A15-19. [3] See A15-12.



Unit: mm

Nut dimensions										Screw shaft inertial moment/mm	Nut mass	Shaft mass	Permissible rotational speed	
Outer diameter	Flange diameter	Overall length							Lubrication hole				SDA-V (Caged Ball)	SDA-VZ (Full-Ball)
D	D_1	L_1	H	B_1	B_2	PCD	d_1	T_w	A	$kg \cdot m^2/mm$	kg	kg/m	min^{-1}	min^{-1}
70	105	65	16	48	20	88	11	80	M8×1	3.16×10^{-6}	1.35	11.16	3,470	2,820
75	110	65	16	48	20	93	11	85	M8×1	3.16×10^{-6}	1.62	11.4	3,420	2,780
70	105	74	16	57	20	88	11	80	M8×1	3.16×10^{-6}	1.5	11.38	3,470	2,820
75	110	74	16	57	20	93	11	85	M8×1	3.16×10^{-6}	1.81	11.58	3,420	2,780
70	105	93	16	76	20	88	11	80	M8×1	3.16×10^{-6}	1.81	11.67	3,470	2,820
75	110	93	16	76	20	93	11	85	M8×1	3.16×10^{-6}	2.19	11.82	3,420	2,780
70	105	112	16	95	20	88	11	80	M8×1	3.16×10^{-6}	2.11	11.84	3,470	2,820
75	110	112	16	95	20	93	11	85	M8×1	3.16×10^{-6}	2.57	11.96	3,420	2,780
75	110	112	16	95	20	93	11	85	M8×1	3.16×10^{-6}	2.56	11.28	3,420	2,780
70	105	110	16	93	20	88	11	80	M8×1	3.16×10^{-6}	2.04	11.95	3,470	2,820
75	110	110	16	93	20	93	11	85	M8×1	3.16×10^{-6}	2.51	12.06	3,420	2,780
70	105	130	16	113	20	88	11	80	M8×1	3.16×10^{-6}	2.36	12.04	3,470	2,820
75	110	131	16	114	20	93	11	85	M8×1	3.16×10^{-6}	2.91	12.14	3,420	2,780
70	105	129	16	112	20	88	11	80	M8×1	3.16×10^{-6}	2.33	12.16	3,470	2,820
75	110	129	16	112	20	93	11	85	M8×1	3.16×10^{-6}	2.86	12.23	3,420	2,780

Notes: L_1 and B_1 dimensions in the dimensional table are those when a thin film seal has been installed.
At least one end of the shaft must accommodate the insertion of the nut onto the ball screw threads for assembly. Please contact THK if this impacts your desired system design.

The rigidity values (K) in the table represent spring constants, each obtained from the load and the elastic deformation under an axial load equal to 30% of the basic axial 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 rigidity value (K) in the table as the actual value.
If the axial load (Fa) is not 30% of Ca, the rigidity value (K_N) is obtained from the following equation.

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

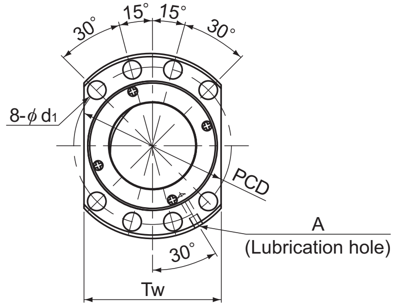
K: Rigidity value in the dimensional table

Ball Screw

Options⇒A15-355

SDA-V/SDA-VZ With Preload/No Preload

DN value		
DN value	SDA-V (Caged Ball)	160,000
	SDA-VZ (Full-Ball)	130,000



Model No.	Screw shaft outer diameter	Lead	Ball center-to-center diameter	Thread minor diameter	No. of loaded circuits	Basic load rating				Rigidity	
						SDA-V (Caged Ball)		SDA-VZ (Full-Ball)		SDA-V (Caged Ball)	SDA-VZ (Full-Ball)
						Ca	C0a	Ca	C0a	K	K
	d	Ph	dp	dc	Rows × turns	kN	kN	kN	kN	N/μm	N/μm
SDA 5010V-5	50	10	51	44.4	1×5	72	155.2	68.6	163.2	780	815
SDA 5010VA-5	50	10	51.75	45.2	1×5	72.5	158.1	69	165.7	791	825
SDA 5012V-5	50	12	51	44.4	1×5	72	155.2	68.5	163.3	779	816
SDA 5012VA-5	50	12	51.75	45.2	1×5	72.4	158.1	69	165.9	791	825
SDA 5016V-5	50	16	51	44.4	1×5	71.9	156.6	68.4	163.7	785	816
SDA 5016VA-5	50	16	51.75	45.2	1×5	72.3	158.1	68.9	166.2	790	826
SDA 5020V-5	50	20	51	44.4	1×5	71.7	156.6	68.3	164.2	784	817
SDA 5020V-10	50	20	51	44.4	2×5	130.2	313.2	124	328.3	1,518	1,583
SDA 5020VA-5	50	20	51.75	45.2	1×5	72.2	159.4	68.8	166.7	795	827
SDA 5020VA-10	50	20	51.75	45.2	2×5	131.1	317.5	124.8	333.3	1,534	1,602
SDA 5025V-4	50	25	51	44.4	1×4	58.2	123.6	55.5	129.8	624	652
SDA 5025VA-4	50	25	51.75	45.2	1×4	58.6	125.1	55.8	131.7	630	660
SDA 5025VA-8	50	25	51.75	45.2	2×4	106.4	251.5	101.3	263.5	1,226	1,277
SDA 5030V-4	50	30	51	44.4	1×4	58	117.5	55.3	122.6	629	654
SDA 5030VA-4	50	30	51.75	45.2	1×4	58.4	118.9	55.7	124.5	635	661
SDA 5030VA-8	50	30	51.75	45.2	2×4	106.1	237.7	101	248.9	1,229	1,280
SDA 5040V-3	50	40	51	44.4	1×3	43.9	86.5	41.8	90.7	467	487
SDA 5040VA-3	50	40	51.75	45.2	1×3	44.2	87.9	42.1	92	473	492
SDA 5040VA-6	50	40	51.75	45.2	2×3	80.3	175.7	76.4	184	916	954
SDA 5050V-2	50	50	51	44.4	1×2	29.2	55.5	27.8	58	303	316
SDA 5050VA-2	50	50	51.75	45.2	1×2	29.4	55.6	28	58.8	303	319

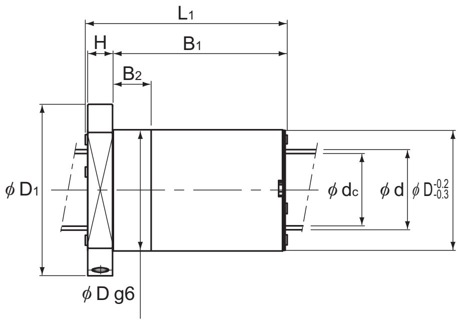
Model number coding

SDA5010V Z -5 TT G0 +830L C5

Model No.
Full-ball type code (No code for caged ball type)
Number of turns
Contamination protection accessory symbol [1]
Axial direction clearance code[2]
Overall screw shaft length (in mm)
Accuracy symbol[3]

[1] See A15-356. [2] See A15-19. [3] See A15-12.

Positioning, ISO 3408 compliant



Unit: mm

Nut dimensions										Screw shaft inertial moment/mm	Nut mass	Shaft mass	Permissible rotational speed	
Outer diameter	Flange diameter	Overall length							Lubrication hole				SDA-V (Caged Ball)	SDA-VZ (Full-Ball)
D	D_1	L_1	H	B_1	B_2	PCD	d_1	T_w	A	kg·m²/mm	kg	kg/m	min^{-1}	min^{-1}
75	110	65	16	48	20	93	11	85	M8×1	4.82×10^{-6}	1.46	13.93	3,130	2,540
82	118	65	16	48	20	100	11	92	M8×1	4.82×10^{-6}	1.89	14.2	3,090	2,510
75	110	74	16	57	20	93	11	85	M8×1	4.82×10^{-6}	1.63	14.19	3,130	2,540
82	118	74	16	57	20	100	11	92	M8×1	4.82×10^{-6}	2.12	14.41	3,090	2,510
75	110	93	16	76	20	93	11	85	M8×1	4.82×10^{-6}	1.96	14.5	3,130	2,540
82	118	93	16	76	20	100	11	92	M8×1	4.82×10^{-6}	2.57	14.67	3,090	2,510
75	110	112	16	95	20	93	11	85	M8×1	4.82×10^{-6}	2.29	14.69	3,130	2,540
75	110	112	16	95	20	93	11	85	M8×1	4.82×10^{-6}	2.25	13.79	3,130	2,540
82	118	112	16	95	20	100	11	92	M8×1	4.82×10^{-6}	3.02	14.83	3,090	2,510
82	118	112	16	95	20	100	11	92	M8×1	4.82×10^{-6}	2.98	14.06	3,090	2,510
75	110	110	16	93	20	93	11	85	M8×1	4.82×10^{-6}	2.22	14.82	3,130	2,540
82	118	110	16	93	20	100	11	92	M8×1	4.82×10^{-6}	2.95	14.95	3,090	2,510
82	118	110	16	93	20	100	11	92	M8×1	4.82×10^{-6}	2.92	14.31	3,090	2,510
75	110	130	16	113	20	93	11	85	M8×1	4.82×10^{-6}	2.57	14.92	3,130	2,540
82	118	130	16	113	20	100	11	92	M8×1	4.82×10^{-6}	3.42	15.03	3,090	2,510
82	118	130	16	113	20	100	11	92	M8×1	4.82×10^{-6}	3.39	14.47	3,090	2,510
75	110	128	16	111	20	93	11	85	M8×1	4.82×10^{-6}	2.52	15.06	3,130	2,540
82	118	129	16	112	20	100	11	92	M8×1	4.82×10^{-6}	3.37	15.13	3,090	2,510
82	118	129	16	112	20	100	11	92	M8×1	4.82×10^{-6}	3.32	14.68	3,090	2,510
75	110	107	16	90	20	93	11	85	M8×1	4.82×10^{-6}	2.13	15.13	3,130	2,540
82	118	107	16	90	20	100	11	92	M8×1	4.82×10^{-6}	2.84	15.2	3,090	2,510

Notes: L_1 and B_1 dimensions in the dimensional table are those when a thin film seal has been installed.
At least one end of the shaft must accommodate the insertion of the nut onto the ball screw threads for assembly. Please contact THK if this impacts your desired system design.

The rigidity values (K) in the table represent spring constants, each obtained from the load and the elastic deformation under an axial load equal to 30% of the basic axial 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 rigidity value (K) in the table as the actual value.
If the axial load (Fa) is not 30% of Ca, the rigidity value (K_N) is obtained from the following equation.

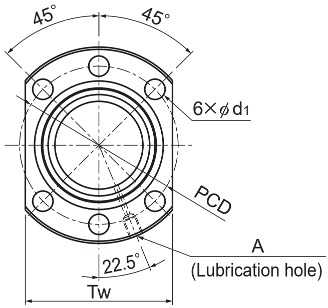
$$K_N = K\left(\frac{Fa}{0.3Ca}\right)^{\frac{1}{3}}$$

K: Rigidity value in the dimensional table

Options⇒A15-355

EPB-V With Preload

DN value	130,000



Model No.	Screw shaft outer diameter	Lead	Ball center-to-center diameter	Thread minor diameter	Loaded circuits	Basic load rating		Rigidity
						Ca	C0a	K
	d	Ph	dp	dc	Rows x turns	kN	kN	N/μm
EPB 1605V-6	16	5	16.75	13.49	3×1	9.3	13.1	315
EPB 2004V-8	20	4	20.5	18.06	4×1	8.2	15.5	503
EPB 2005V-6	20	5	20.75	17.49	3×1	10.6	17.3	396
EPB 2006V-6	20	6	21	16.93	3×1	13.8	20.4	388
EPB 2008V-6	20	8	21	16.93	3×1	13.7	20.4	388
EPB 2010V-6	20	10	21.25	16.36	3×1	17.3	24.5	398
EPB 2504V-8	25	4	25.5	23.06	4×1	9.1	19.5	602
EPB 2505V-6	25	5	25.75	22.49	3×1	12.1	22.6	491
EPB 2506V-6	25	6	26	21.93	3×1	16.0	27.1	488
EPB 2508V-6	25	8	26	21.93	3×1	15.9	27.1	487
EPB 2510V-4	25	10	26	21.93	2×1	11.3	18.0	331
EPB 2512V-4	25	12	26.25	21.36	2×1	14.0	21.2	332
EPB 2806V-6	28	6	29	24.93	3×1	17.5	32.0	560
EPB 3204V-10	32	4	32.5	30.06	5×1	12.3	31.9	921
EPB 3205V-6	32	5	32.75	29.49	3×1	13.9	30.2	616
EPB 3205V-8	32	5	32.75	29.49	4×1	17.8	40.3	811
EPB 3206V-8	32	6	33	28.93	4×1	23.9	49.5	826
EPB 3208V-8	32	8	33.25	28.36	4×1	29.2	55.2	797
EPB 3210V-6	32	10	33.75	27.24	3×1	32.1	52.2	602
EPB 3212V-6	32	12	33.75	27.24	3×1	32	52.2	602
EPB 3604V-6	36	4	36.5	34.04	3×1	8.4	22.2	636
EPB 3606V-8	36	6	37	32.93	4×1	25.2	56.2	914
EPB 3608V-8	36	8	37.25	32.36	4×1	31.6	64.8	908

Note: When the QZ Lubricator and W wiper ring are attached, the overall length of the nut dimensions will increase. Contact THK for details.

Model number coding

EPB3205V-6 RR G0 +650L C3

Model No.

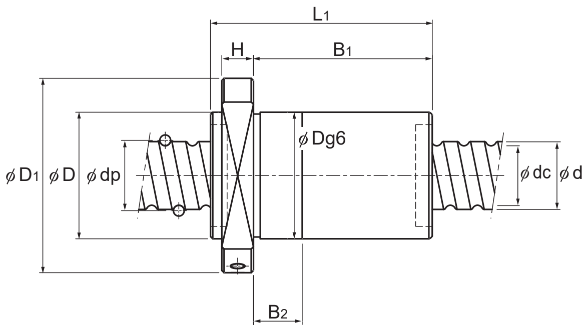
Clearance symbol

Accuracy symbol

Ball screw shaft length (mm)

Seal symbol (RR : Labyrinth seal, WW : Wiper ring.)

Positioning, ISO 3408 compliant



Unit: mm

Nut dimensions										Nut mass	Shaft mass	Permissible rotational speed
Outer diameter D	Flange diameter D_1	Overall length L_1	H	B_1	B_2	PCD	d_1	T_w	Lubrication hole A	kg	kg/m	min^{-1}
28	48	65	10	50	12	38	5.5	40	M6	0.23	1.35	5,000
36	58	69	10	54	12	47	6.6	44	M6	0.31	2.26	5,000
36	58	65	10	50	12	47	6.6	44	M6	0.37	2.17	5,000
36	58	73	10	58	12	47	6.6	44	M6	0.40	2.11	5,000
36	58	87	10	72	15	47	6.6	44	M6	0.47	2.20	5,000
36	58	102	10	87	15	47	6.6	44	M6	0.52	2.14	5,000
40	62	70	10	55	12	51	6.6	48	M6	0.34	3.58	5,000
40	62	66	10	51	12	51	6.6	48	M6	0.40	3.48	5,000
40	62	74	10	59	12	51	6.6	48	M6	0.42	3.40	5,000
40	62	88	10	73	15	51	6.6	48	M6	0.50	3.51	5,000
40	62	81	10	66	18	51	6.6	48	M6	0.48	3.57	5,000
40	62	91	10	76	18	51	6.6	48	M6	0.49	3.50	4,950
42	71	72	12	60	15	57	6.6	55	M6	0.51	4.32	4,480
50	80	81	12	64	15	65	9	62	M6	0.81	5.95	4,000
50	80	67	12	50	12	65	9	62	M6	0.67	5.82	3,960
50	80	78	12	61	12	65	9	62	M6	0.75	5.82	3,960
50	80	95	12	78	15	65	9	62	M6	0.88	5.71	3,930
50	80	117	12	100	18	65	9	62	M6	1.00	5.63	3,900
50	80	108	12	91	18	65	9	62	M6	0.86	5.45	3,850
56	118	104	14	104	20	71	9	65	M6	1.52	5.68	3,850
56	86	58	14	44	15	70	9	65	M6	0.96	7.58	3,560
56	86	92	14	78	15	70	9	65	M6	1.09	7.31	3,510
56	86	112	14	98	20	70	9	65	M6	1.22	7.21	3,480

The rigidity values in the table represent spring constants each obtained from the load and the elastic deformation when providing a preload 8% 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 nut. Therefore, it is normally appropriate to regard roughly 80% of the value in the table as the actual value.
If the applied preload (Fa0) is not 10% of Ca, the rigidity value (K_N) is obtained from the following equation.

$$K_N = K\left(\frac{Fa0}{0.1Ca}\right)^{\frac{1}{3}}$$

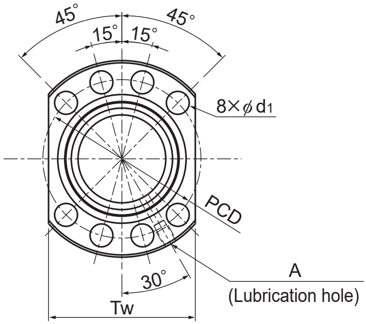
K: Rigidity value in the dimensional table

Ball Screw

Options⇒A15-355

EPB-V
With Preload

DN value	130,000



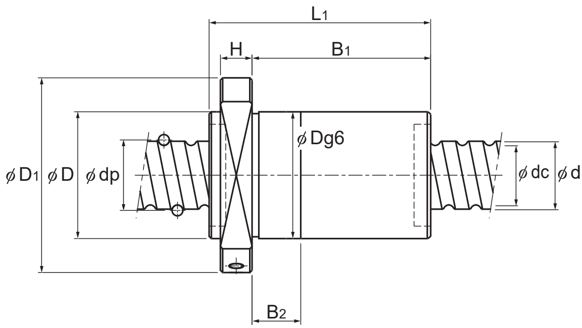
Model No.	Screw shaft outer diameter d	Lead Ph	Ball center-to-center diameter dp	Thread minor diameter d_c	Loaded circuits Rows x turns	Basic load rating Ca kN	Basic load rating C_0a kN	Rigidity K N/μm
EPB 4004V-6	40	4	40.5	38.06	3×1	8.8	24.7	692
EPB 4005V-6	40	5	40.75	37.49	3×1	15.4	38.8	751
EPB 4006V-12	40	6	41	36.93	6×1	37.5	94.4	1,470
EPB 4008V-8	40	8	41.25	36.36	4×1	33.8	74.5	1,014
EPB 4010V-6	40	10	41.75	35.24	3×1	37.3	69.3	756
EPB 4010V-8	40	10	41.75	35.24	4×1	47.6	92.4	995
EPB 4012V-8	40	12	41.75	35.2	4×1	47.6	92.4	995
EPB 5005V-12	50	5	50.75	47.49	6×1	30.9	99.1	1,764
EPB 5008V-8	50	8	51.25	46.36	4×1	37.2	93.9	1,216
EPB 5010V-8	50	10	51.75	45.24	4×1	54.3	120.5	1,234
EPB 6310V-4	63	10	64.75	58.2	2×1	34.5	80.1	800

Note: When the QZ Lubricator and W wiper ring are attached, the overall length of the nut dimensions will increase. Contact THK for details.

Model number coding

EPB4005V-6 RR G0 +650L C3

Model No.
Seal symbol (RR : Labyrinth seal, WW : Wiper ring.)
Clearance symbol
Ball screw shaft length (mm)
Accuracy symbol



Unit: mm

	Nut dimensions										Nut mass	Shaft mass	Permissible rotational speed
	Outer diameter D	Flange diameter D_1	Overall length L_1	H	B_1	B_2	PCD	d_1	T_W	Lubrication hole A	kg	kg/m	min^{-1}
	63	93	59	14	45	12	78	9	70	M8	0.96	9.40	3,200
	63	93	65	14	51	12	78	9	70	M8	1.01	9.23	3,190
	63	93	117	14	103	18	78	9	70	M8	1.61	9.09	3,170
	63	93	113	14	99	18	78	9	70	M8	1.54	8.98	3,150
	63	93	105	14	91	20	78	9	70	M8	1.37	8.76	3,110
	63	93	129	14	115	20	78	9	70	M8	1.64	8.76	3,110
	63	93	152	14	138	20	78	9	70	M8	1.79	8.97	3,110
	75	110	104	16	88	18	93	11	85	M8	2.08	14.59	2,560
	75	110	115	16	99	18	93	11	85	M8	2.16	14.28	2,530
	75	110	131	16	115	18	93	11	85	M8	2.30	14.00	2,510
	90	125	89	18	71	18	108	11	95	M8	2.10	22.64	2,000

The rigidity values in the table represent spring constants each obtained from the load and the elastic deformation when providing a preload 8% 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 nut. Therefore, it is normally appropriate to regard roughly 80% of the value in the table as the actual value.
If the applied preload (Fa0) is not 10% of Ca, the rigidity value (K_N) is obtained from the following equation.

$$K_N = K\left(\frac{Fa0}{0.1Ca}\right)^{\frac{1}{3}}$$

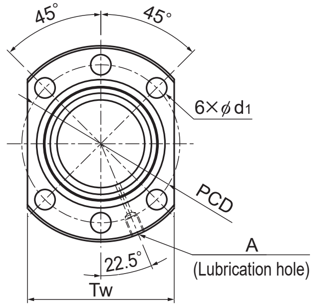
K: Rigidity value in the dimensional table

Ball Screw

Options⇒A15-355

EBB-V
Oversized-Ball Preload / No Preload

DN value	130,000



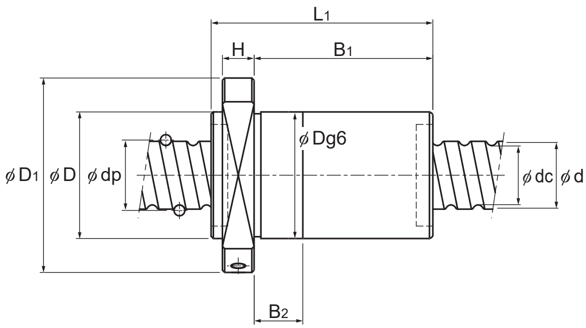
Model No.	Screw shaft outer diameter d	Lead Ph	Ball center-to-center diameter dp	Thread minor diameter d_c	Loaded circuits Rows x turns	Basic load rating Ca kN	Basic load rating C_0a kN	Rigidity K N/μm
EBB 1605V-4	16	5	16.75	13.49	4×1	11.9	17.4	207
EBB 2004V-8	20	4	20.5	18.06	8×1	14.9	30.9	487
EBB 2005V-3	20	5	20.75	17.49	3×1	10.6	17.3	198
EBB 2006V-6	20	6	21	16.93	6×1	25.0	40.8	376
EBB 2008V-6	20	8	21	16.93	6×1	24.9	40.8	375
EBB 2010V-6	20	10	21.25	16.36	6×1	31.4	49.0	385
EBB 2504V-8	25	4	25.5	23.06	8×1	16.4	39.0	583
EBB 2505V-3	25	5	25.75	22.49	3×1	12.1	22.6	245
EBB 2506V-6	25	6	26	21.93	6×1	29.0	54.1	472
EBB 2508V-6	25	8	26	21.93	6×1	28.9	54.1	472
EBB 2510V-3	25	10	26	21.93	3×1	15.9	27.0	243
EBB 2510V-4	25	10	26	21.93	4×1	20.9	37.6	320
EBB 2512V-4	25	12	26.25	21.36	4×1	25.4	42.3	322
EBB 2806V-6	28	6	29	24.93	6×1	31.7	64.1	542
EBB 3204V-10	32	4	32.5	30.06	10×1	22.3	63.9	892
EBB 3205V-3	32	5	32.75	29.49	3×1	13.9	30.2	308
EBB 3205V-4	32	5	32.75	29.49	4×1	17.8	40.3	405
EBB 3205V-6	32	5	32.75	29.49	6×1	25.1	60.4	597
EBB 3206V-8	32	6	33	28.93	8×1	43.3	98.9	800
EBB 3208V-8	32	8	33.25	28.36	8×1	52.9	110.5	772
EBB 3210V-3	32	10	33.75	27.24	3×1	32.1	52.2	301
EBB 3210V-4	32	10	33.75	27.24	4×1	41.3	69.7	396
EBB 3212V-3	32	12	33.75	27.24	3×1	32	52.2	301
EBB 3604V-6	36	4	36.5	34.04	6×1	15.3	44.3	616
EBB 3606V-8	36	6	37	32.93	8×1	45.8	112.4	885
EBB 3608V-8	36	8	37.25	32.36	8×1	57.4	129.7	879

Note: When the QZ Lubricator and W wiper ring are attached, the overall length of the nut dimensions will increase. Contact THK for details.

Model number coding

EBB3205V-6 RR G0 +650L C3

- EBB3205V-6: Model No.
- RR: Seal symbol (RR : Labyrinth seal, WW : Wiper ring.)
- G0: Clearance symbol
- +650L: Ball screw shaft length (mm)
- C3: Accuracy symbol



Unit: mm

Nut dimensions										Nut mass	Shaft mass	Permissible rotational speed
Outer diameter D	Flange diameter D_1	Overall length L_1	H	B_1	B_2	PCD	d_1	T_w	Lubrication hole A	kg	kg/m	min^{-1}
28	48	55	10	40	12	38	5.5	40	M6	0.20	1.35	5,000
36	58	69	10	54	12	47	6.6	44	M6	0.31	2.26	5,000
36	58	50	10	35	12	47	6.6	44	M6	0.30	2.17	5,000
36	58	73	10	58	12	47	6.6	44	M6	0.40	2.11	5,000
36	58	87	10	72	15	47	6.6	44	M6	0.47	2.20	5,000
36	58	102	10	87	15	47	6.6	44	M6	0.52	2.14	5,000
40	62	70	10	55	12	51	6.6	48	M6	0.34	3.58	5,000
40	62	50	10	35	12	51	6.6	48	M6	0.32	3.48	5,000
40	62	74	10	59	12	51	6.6	48	M6	0.42	3.40	5,000
40	62	88	10	73	15	51	6.6	48	M6	0.50	3.51	5,000
40	62	69	10	54	18	51	6.6	48	M6	0.42	3.57	5,000
40	62	81	10	66	18	51	6.6	48	M6	0.48	3.57	5,000
40	62	91	10	76	18	51	6.6	48	M6	0.49	3.50	4,950
42	71	72	12	60	15	57	6.6	55	M6	0.51	4.32	4,480
50	80	81	12	64	15	65	9	62	M6	0.81	5.95	4,000
50	80	52	12	35	12	65	9	62	M6	0.56	5.82	3,960
50	80	57	12	40	12	65	9	62	M6	0.60	5.82	3,960
50	80	67	12	50	12	65	9	62	M6	0.67	5.82	3,960
50	80	95	12	78	15	65	9	62	M6	0.88	5.71	3,930
50	80	117	12	100	18	65	9	62	M6	1.00	5.63	3,900
50	80	78	12	61	18	65	9	62	M6	0.67	5.45	3,850
50	80	90	12	73	18	65	9	62	M6	0.75	5.45	3,850
56	86	80	14	66	20	71	9	65	M6	1.09	5.68	3,850
56	86	58	14	44	15	70	9	65	M6	0.96	7.58	3,560
56	86	92	14	78	15	70	9	65	M6	1.09	7.31	3,510
56	86	112	14	98	20	70	9	65	M6	1.22	7.21	3,480

The rigidity values in the table represent spring constants each obtained from the load and the elastic deformation when providing an axial load 24% of the basic dynamic load rating (Ca).
These values do not include the rigidity of the components related to mounting the 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 30% of Ca, the rigidity value (K_N) is obtained from the following equation.

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

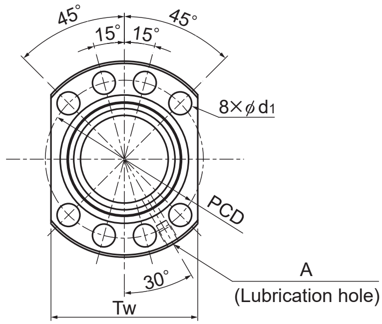
K: Rigidity value in the dimensional table

Ball Screw

Options⇒A15-355

EBB-V
Oversized-Ball Preload / No Preload

DN value	130,000



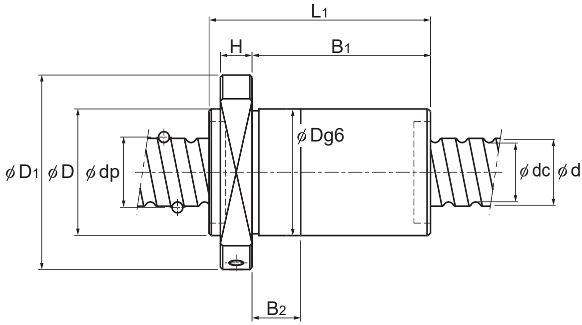
Model No.	Screw shaft outer diameter d	Lead Ph	Ball center-to-center diameter dp	Thread minor diameter dc	Loaded circuits Rows x turns	Basic load rating Ca kN	Basic load rating C0a kN	Rigidity K N/μm
EBB 4004V-6	40	4	40.5	38.06	6×1	15.9	49.4	670
EBB 4005V-6	40	5	40.75	37.49	6×1	26.6	77.5	727
EBB 4006V-12	40	6	41	36.93	12×1	68.1	188.7	1,423
EBB 4008V-8	40	8	41.25	36.36	8×1	61.3	148.9	982
EBB 4010V-3	40	10	41.75	35.24	3×1	37.3	69.3	378
EBB 4010V-4	40	10	41.75	35.24	4×1	47.6	92.4	497
EBB 4012V-8	40	12	41.75	35.2	8×1	86.4	184.8	963
EBB 4020V-3	40	20	41.75	35.24	3×1	36.8	69.3	376
EBB 5005V-12	50	5	50.75	47.49	12×1	56.0	198.3	1,708
EBB 5008V-8	50	8	51.25	46.36	8×1	67.5	187.7	1,177
EBB 5010V-4	50	10	51.75	45.24	4×1	54.3	120.5	617
EBB 5020V-3	50	20	52.25	44.11	3×1	55.3	108.8	465
EBB 6310V-4	63	10	64.75	58.2	4×1	61.9	161.0	775
EBB 6312V-4	63	12	65.25	57.1	4×1	80.9	189.1	759
EBB 6316V-4	63	16	65.7	56.0	4×1	134.0	306.4	970
EBB 6320V-3	63	20	65.7	56.0	3×1	104.4	229.3	736
EBB 8010V-4	80	10	81.75	75.2	4×1	68.6	206.9	943
EBB 8012V-4	80	12	82.25	74.1	4×1	92.1	251.7	953
EBB 8016V-4	80	16	82.7	73.0	4×1	154.7	413.2	1,233
EBB 8020V-4	80	20	82.7	73.0	4×1	154.5	413.2	1,232

Note: When the QZ Lubricator and W wiper ring are attached, the overall length of the nut dimensions will increase. Contact THK for details.

Model number coding

EBB4005V-6 RR G0 +650L C3

Model No. (EBB4005V-6)
Seal symbol (RR : Labyrinth seal, WW : Wiper ring.)
Clearance symbol (G0)
Ball screw shaft length (mm) (+650L)
Accuracy symbol (C3)



Unit: mm

Nut dimensions										Nut mass	Shaft mass	Permissible rotational speed
Outer diameter D	Flange diameter D_1	Overall length L_1	H	B_1	B_2	PCD	d_1	T_W	Lubrication hole A	kg	kg/m	min^{-1}
63	93	59	14	45	12	78	9	70	M8	0.96	9.40	3,200
63	93	65	14	51	12	78	9	70	M8	1.01	9.23	3,190
63	93	117	14	103	18	78	9	70	M8	1.61	9.09	3,170
63	93	113	14	99	18	78	9	70	M8	1.54	8.98	3,150
63	93	75	14	61	20	78	9	70	M8	1.03	8.76	3,110
63	93	85	14	71	20	78	9	70	M8	1.15	8.76	3,110
63	93	152	14	138	20	78	9	70	M8	1.79	8.97	3,110
63	93	122	14	98	27	78	9	70	M8	1.62	9.28	3,110
75	110	104	16	88	18	93	11	85	M8	2.08	14.59	2,560
75	110	115	16	99	18	93	11	85	M8	2.16	14.28	2,530
75	110	87	16	71	18	93	11	85	M8	1.65	14.00	2,510
75	110	117	16	101	27	93	11	85	M8	2.07	14.32	2,480
90	125	89	18	71	18	108	11	95	M8	2.10	22.64	2,000
95	135	104	20	84	25	115	13.5	100	M8	2.93	22.21	1,990
95	135	125	20	105	25	115	13.5	100	M8	3.27	22.07	1,970
95	135	122	20	102	27	115	13.5	100	M8	3.48	22.52	1,970
105	145	93	20	73	18	125	13.5	110	M8	2.60	37.07	1,590
125	165	110	25	85	25	145	13.5	130	M8	6.06	36.51	1,580
125	165	131	25	106	25	145	13.5	130	M8	7.15	36.33	1,570
125	165	149	25	124	25	145	13.5	130	M8	8.13	36.90	1,570

The rigidity values in the table represent spring constants each obtained from the load and the elastic deformation when providing an axial load 24% of the basic dynamic load rating (Ca).
These values do not include the rigidity of the components related to mounting the 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 30% of Ca, the rigidity value (K_N) is obtained from the following equation.

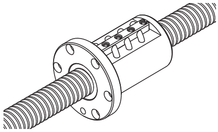
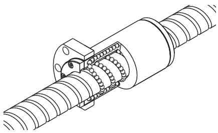
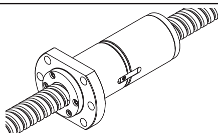
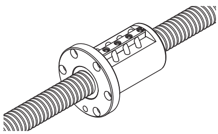
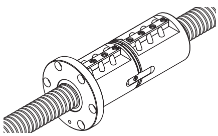
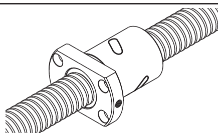
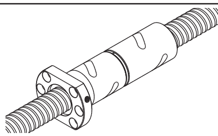
$$K_N = K\left(\frac{Fa}{0.3Ca}\right)^{\frac{1}{3}}$$

K: Rigidity value in the dimensional table

Ball Screw

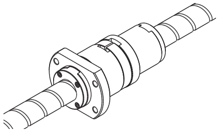
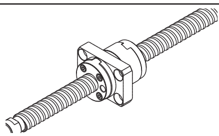
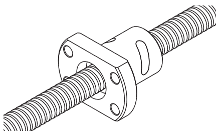
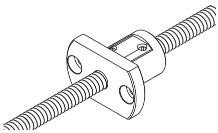
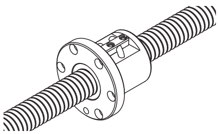
Options⇒A15-355

Positioning Ball Screw

Series	Model		Features
Positioning	SBN-V		High DN value
	SBK		High DN value, large lead
	SBKN		Double nut, high speed
	BIF-V		High DN value
	BIF Unfinished shaft ends		Simple nut
	BNFN-V		Double nut, high DN value
	BNFN		Double nut
	DIK		Compact nut
	DKN		Double nut, compact nut

	Caged Ball	Compact nut	Miniature	High load capacity	Offset preload	Double-nut preload	DN value	Shaft diameter (mm)	Lead (mm)	Page No.
	✓				✓		130,000	16 to 32	4 to 10	A15-112
							160,000	25 to 50	8 to 20	A15-114
	✓				✓		130,000	15 to 32	10 to 32	A15-116
							160,000	36 to 55	20 to 36	A15-118
							210,000	36 to 50	36 to 50	
	✓					✓	160,000	36 to 55	20 to 36	A15-120
					✓		100,000	16 to 32	4 to 6	A15-122
							130,000	25 to 50	8 to 20	A15-124
					✓		70,000	16 to 50	5 to 12	A15-128
				✓		✓	100,000	16 to 32	5 to 6	A15-136
							130,000	28 to 50	10 to 16	A15-136
						✓	70,000	55 to 100	10 to 20	A15-138
		✓			✓		70,000	14 to 63	4 to 16	A15-142
		✓		✓		✓	70,000	40 to 63	20	A15-148

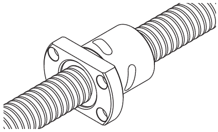
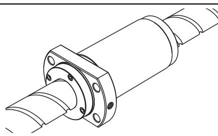
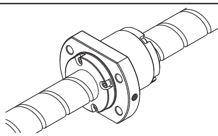
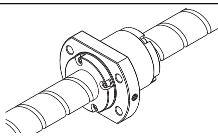
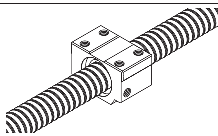
Positioning Ball Screw

Series	Model		Features
Positioning	BLW		Double nut, large lead
	BNK Standardized finished shaft end		Standard to super lead
	MDK Unfinished shaft ends		Compact nut, miniature
	MDK		
	MBF Unfinished shaft ends		Miniature
	MBF		
	BNF-V		High DN value
	BNF Unfinished shaft ends		Standard nut
	BNF		

	Caged Ball	Compact nut	Miniature	High load capacity	Offset preload	Double-nut preload	DN value	Shaft diameter (mm)	Lead (mm)	Page No.
						✓	70,000	15 to 50	10 to 50	A15-150
					✓		70,000	4 to 25	1 to 20	A15-152
		✓	✓				70,000	4 to 14	1 to 5	A15-196
										A15-200
			✓				70,000	4 to 14	1 to 4	A15-202
									1 to 5	A15-204
							100,000	16 to 32	4 to 6	A15-206
							130,000	25 to 50	8 to 20	A15-208
							70,000	16 to 50	5 to 12	A15-212
								55 to 100	10 to 20	A15-220

Ball Screw

Positioning Ball Screw

Series	Model		Features	
Positioning	DK		Compact nut	
	WHF		Super large lead	
	BLK		Large lead	
	WGF		Super large lead	
	BNT		Flat nut	

	Caged Ball	Compact nut	Miniature	High load capacity	Offset preload	DN value	Shaft diameter (mm)	Lead (mm)	Page No.
		✓				70,000	14 to 63	4 to 20	A15-224
						120,000	15 to 25	20 to 50	A15-232
						70,000	8 to 50	8 to 50	A15-234
						70,000	8 to 50	12 to 100	A15-236
						70,000	14 to 45	4 to 12	A15-238

Standard Combinations of Outer Diameters and Leads of the Screw Shafts

Shaft diameter	Lead										
	1	2	3	4	5	6	8	10	12	15	16
4	BNK MBF MDK										
5	BNK										
6	BNK MBF MDK	MBF									
8	BNK MDK	BNK MBF MDK	MBF	MBF			BLK	BNK	WGF		
10	MBF	BNK MBF MDK	MBF	BNK	MBF			BNK		WGF	
12		BNK MBF MDK	MBF	MBF	BNK		BNK				
13											
14		BNK MBF MDK		BNK DIK MBF MDK DK BNT	MDK BNT		BNK				
15								BNK BLW BLK			
16				SBN-V BIF-V BNF-V	SBN-V BIF-V BIF BNFN-V DIK BNF-V BNF DK BNT						SBK BNK BLW BLK
18							BNT	BIF BNF			
20				SBN-V BIF-V DIK BNF-V DK	SBN-V BIF-V BIF DIK BNF-V BNF DK BNT	DIK DK	DIK DK	SBN-V SBK BIF-V BNK BNF-V BNT			
25				SBN-V BIF-V DIK BNF-V DK	SBN-V BIF-V BIF DIK BNF-V BNF DK BNT	SBN-V BIF-V DIK BNF-V DK	SBN-V BIF-V DIK BNF-V DK	SBN-V BIF-V BIF DIK BNF-V BNF DK BNT			
28					SBN-V BIF-V BNFN-V DIK BNF-V DK	BIF-V BIF BNFN-V DIK BNF-V BNF DK BNT		SBN-V BIF-V BNFN-V DIK BNF-V DK			

Unit: mm

	Lead											
	20	24	25	30	32	36	40	50	60	80	90	100
	WGF											
	SBK BNK WGF			WGF WHF			WGF WHF					
	SBK BNK BLW BLK WHF		WHF	SBK WHF			WGF WHF		WGF			
	SBK BNK		SBK BLW BLK WHF					WGF WHF				

Standard Combinations of Outer Diameters and Leads of the Screw Shafts

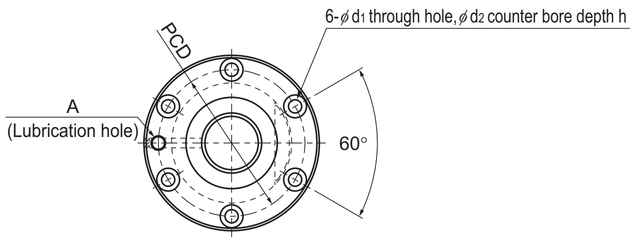
Shaft diameter	Lead										
	1	2	4	5	6	8	10	12	15	16	
30											
32			DIK DK	SBN-V BIF-V BIF BNFN-V DIK BNF-V BNF DK	SBN-V BIF-V BIF DIK BNF-V BNF DK		SBN-V BIF-V BIF DIK BNF-V BNF DK BNT	SBN-V BIF-V DIK BNF-V DK		SBN-V BIF-V BNF-V	
36							SBN-V BIF-V BIF BNFN-V DIK BNF-V BNF BNT	SBN-V BIF-V BNF-V DK		SBN-V BIF-V BNFN-V BNF-V	
40							SBN-V BIF-V BIF DIK BNF-V BNF DK	SBN-V BIF-V BIF DIK BNF-V BNF DK		SBN-V BIF-V BNFN-V DIK BNF-V DK	
45							SBN-V BIF-V BNFN-V BNF-V	SBN-V BIF-V BNF-V BNT		SBN-V BIF-V	
50							SBN-V BIF-V BIF BNFN-V DIK BNF-V BNF DK	SBN-V BIF-V DIK BNF-V DK		SBN-V BIF-V DIK BNF-V DK	
55							BNFN BNF	BNFN BNF		BNFN BNF	
63							BNFN DIK BNF DK	BNFN DIK BNF DK		BNFN BNF	
70							BNFN BNF	BNFN BNF			
80							BNFN BNF	BNFN			
100											

Unit: mm

	Lead											
	20	24	25	30	32	36	40	50	60	80	90	100
									WGF		WGF	
	SBK				SBK BLW BLK							
	SBN-V SBK SBKN BIF-V BNF-V BLK	BLK				SBK BLW BLK						
	SBN-V SBK SBKN BIF-V DKN BNF-V DK			SBK SBKN			SBK BLW BLK			WGF		
	SBN-V BIF-V BNF-V											
	SBN-V SBK SBKN BIF-V DKN BNF-V DK			SBK SBKN		SBK SBKN		SBK BLW BLK				WGF
	SBK SBKN BNFN BNF			SBK SBKN		SBK SBKN						
	BNFN DKN BNF DK											
	BNFN BNF											
	BNFN BNF											
	BNFN BNF											

SBN-V Small With Preload

DN value	130,000



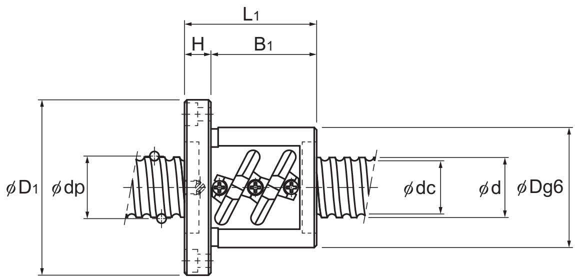
Model No.	Screw shaft outer diameter d	Lead Ph	Ball center-to-center diameter dp	Thread minor diameter dc	No. of loaded circuits Rows × turns	Basic load rating Ca kN	Basic load rating C_0a kN	Rigidity K N/μm
SBN 1604V-5	16	4	16.5	13.8	1×2.5	5.3	8	281
SBN 1605V-5	16	5	16.75	13.2	1×2.5	9.2	12.9	309
SBN 2004V-5	20	4	20.5	17.8	1×2.5	5.9	10.1	335
SBN 2005V-5	20	5	20.75	17.2	1×2.5	10.3	16.2	370
SBN 2010V-5	20	10	20.75	17.2	1×2.5	10.2	16.4	362
SBN 2504V-5	25	4	25.5	22.8	1×2.5	6.4	12.7	400
SBN 2505V-5	25	5	25.75	22.2	1×2.5	11.3	20.3	442
SBN 2506V-5	25	6	26	21.4	1×2.5	15.4	25.4	457
SBN 2805V-5	28	5	28.75	25.2	1×2.5	11.8	22.8	483
SBN 3205V-5	32	5	32.75	29.2	1×2.5	12.6	26.1	536
SBN 3206V-5	32	6	33	28.4	1×2.5	17.2	32.7	555

Model number coding

SBN1604V-5 QZ RR G0 +1200L C5

- SBN1604V-5: Model No.
- QZ: With QZ lubricator (No code without QZ lubricator)
- RR: Contamination protection accessory symbol[1]
- G0: Symbol for Clearance in the axial direction (G0 for all SBN-V variations)
- +1200L: Overall screw shaft length (in mm)
- C5: Accuracy symbol[2]

[1] See A15-356. [2] See A15-12.



Unit: mm

	Nut dimensions								Screw shaft inertial moment/mm	Nut mass	Shaft mass	Permissible rotational speed
	Outer diameter Dg6	Flange diameter D_1	Overall length L_1	H	B_1	PCD	$d_1\times d_2\times h$	Lubrication hole A	$kg\cdot m^2/mm$	kg	kg/m	min^{-1}
	36	59	53	11	42	47	5.5×9.5×5.5	M6	5.05×10^{-8}	0.42	1.42	5,000
	40	60	56	10	46	50	4.5×8×4.5	M6	5.05×10^{-8}	0.5	1.37	5,000
	40	63	49	11	38	51	5.5×9.5×5.5	M6	1.23×10^{-7}	0.43	2.22	5,000
	44	67	56	11	45	55	5.5×9.5×5.5	M6	1.23×10^{-7}	0.61	2.6	5,000
	46	74	90	15	75	59	5.5×9.5×5.5	M6	1.23×10^{-7}	1.06	2.33	5,000
	46	69	48	11	37	57	5.5×9.5×5.5	M6	3.01×10^{-7}	0.55	3.6	5,000
	50	73	55	11	44	61	5.5×9.5×5.5	M6	3.01×10^{-7}	0.72	3.52	5,000
	53	76	62	11	51	64	5.5×9.5×5.5	M6	3.01×10^{-7}	0.9	3.43	5,000
	55	85	59	12	47	69	6.6×11×6.5	M6	4.74×10^{-7}	0.98	4.45	4,520
	58	85	56	12	44	71	6.6×11×6.5	M6	8.08×10^{-7}	0.96	5.88	3,960
	62	89	63	12	51	75	6.6×11×6.5	M6	8.08×10^{-7}	1.22	5.89	3,930

Axial Clearance

Unit: mm

Clearance symbol	G0
Axial Clearance	0 or less

Notes: The overall length of the nut will increase when equipping the QZ lubricating device. See A**15-366** for further details.
At least one end of the shaft must accommodate the insertion of the nut onto the ball screw threads for assembly. Please contact THK if this impacts your desired system design.

The rigidity values in the table represent spring constants, each obtained from the load and the elastic deformation when providing a preload equal to 10% of the basic axial dynamic load rating (Ca) and applying an axial load three times greater than the pre-load. 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 10% of Ca, the rigidity value (K_N) is obtained from the following equation.

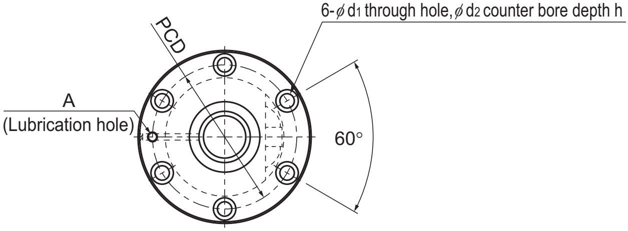
$$K_N = K\left(\frac{Fa_0}{0.1Ca}\right)^{\frac{1}{3}}$$

K: Rigidity value in the dimensional table

Options⇒A15-355

SBN-V Medium With Preload

DN value	160,000



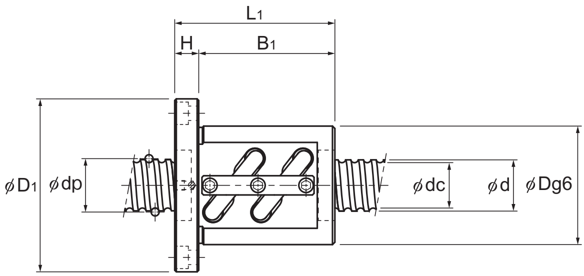
Model No.	Screw shaft outer diameter d	Lead Ph	Ball center-to-center diameter dp	Thread minor diameter dc	No. of loaded circuits Rows × turns	Basic load rating Ca kN	Basic load rating C_0a kN	Rigidity K N/μm
SBN 2508V-7	25	8	26.25	20.5	1×3.5	26.2	43	650
SBN 2510V-5	25	10	26.25	21.5	1×2.5	19.6	30.9	474
SBN 2810V-3	28	10	29.75	22.4	1×1.5	19.5	27.8	332
SBN 3210V-7	32	10	33.75	26.4	1×3.5	43	73.1	836.7
SBN 3212V-5	32	12	34	26.1	1×2.5	37.4	58.7	612.2
SBN 3216V-5	32	16	33.75	26.4	1×2.5	31.9	52.2	592
SBN 3610V-7	36	10	37.75	30.4	1×3.5	45.6	82.3	900
SBN 3612V-7	36	12	38	30.1	1×3.5	53.2	92.6	920
SBN 3616V-5	36	16	38	30.1	1×2.5	39.7	66.4	662
SBN 3620V-3	36	20	37.75	30.5	1×1.5	21.6	32.9	398
SBN 4010V-5	40	10	41.75	34.4	1×2.5	35.8	65.2	708
SBN 4012V-5	40	12	42	34.1	1×2.5	42	73.6	735.4
SBN 4016V-5	40	16	42	34.1	1×2.5	41.9	73.8	736.6
SBN 4020V-5	40	20	41.75	34.4	1×2.5	35.4	65.2	706
SBN 4510V-5	45	10	46.75	39.5	1×2.5	37.9	73.8	780
SBN 4512V-5	45	12	47	39.2	1×2.5	44.4	82.9	809.1
SBN 4516V-5	45	16	47	39.2	1×2.5	44.3	83.1	810.1
SBN 4520V-5	45	20	47	39.2	1×2.5	43.9	82.5	788
SBN 5010V-5	50	10	51.75	44.4	1×2.5	39.4	81	838
SBN 5012V-5	50	12	52.25	43.3	1×2.5	53.6	101.9	936
SBN 5016V-5	50	16	52.7	42.9	1×2.5	89	167.7	1,228
SBN 5020V-5	50	20	52.7	42.9	1×2.5	88.7	167.7	1,228

Model number coding

SBN4012V-5 QZ RR G0 +1200L C5

- SBN4012V-5: Model No.
- QZ: With QZ lubricator (No code without QZ lubricator)
- RR: Contamination protection accessory symbol[1]
- G0: Symbol for Clearance in the axial direction (G0 for all SBN-V variations)
- +1200L: Overall screw shaft length (in mm)
- C5: Accuracy symbol[2]

[1] See A15-356. [2] See A15-12.



Unit: mm

	Nut dimensions								Screw shaft inertial moment/mm	Nut mass	Shaft mass	Permissible rotational speed
	Outer diameter Dg6	Flange diameter D_1	Overall length L_1	H	B_1	PCD	$d_1 \times d_2 \times h$	Lubrication hole A	$kg \cdot m^2/mm$	kg	kg/m	min^{-1}
	58	85	98	15	83	71	6.6×11×6.5	M6	3.01×10^{-7}	1.5	3.51	5,000
	58	85	100	18	82	71	6.6×11×6.5	M6	3.01×10^{-7}	1.31	3.5	5,000
	65	106	88	18	70	85	11×17.5×11	M6	4.74×10^{-7}	2.41	4.15	5,000
	74	108	120	15	105	90	9×14×8.5	M6	8.08×10^{-7}	3.1	5.53	4,740
	76	121	117	18	99	98	11×17.5×11	M6	8.08×10^{-7}	3.7	5.7	4,700
	74	108	139	18	121	90	9×14×8.5	M6	8.08×10^{-7}	3.81	5.82	4,740
	75	120	123	18	105	98	11×17.5×11	M6	1.29×10^{-6}	3.82	7.1	4,230
	78	123	140	18	122	100	11×17.5×11	M6	1.29×10^{-6}	4.34	7.99	4,210
	78	123	140	18	122	100	11×17.5×11	M6	1.29×10^{-6}	4.31	7.99	4,210
	75	114	122	18	104	93	11×17.5×11	M6	1.29×10^{-6}	3.4	7.54	4,230
	82	124	103	18	85	102	11×17.5×11	M6	1.97×10^{-6}	3.61	8.87	3,830
	84	126	119	18	101	104	11×17.5×11	M6	1.97×10^{-6}	4.2	8.83	3,800
	84	126	144	18	126	104	11×17.5×11	M6	1.97×10^{-6}	4.9	9.09	3,800
	82	126	162	18	144	104	11×17.5×11	M6	1.97×10^{-6}	5.17	9.37	3,830
	88	132	111	18	93	110	11×17.5×11	Rc1/8 (PT1/8)	3.16×10^{-6}	4.29	11.36	3,420
	90	130	119	18	101	110	11×17.5×11		3.16×10^{-6}	4.6	11.32	3,400
	90	130	140	18	122	110	11×17.5×11		3.16×10^{-6}	5.3	11.61	3,400
	90	130	162	18	144	110	11×17.5×11		3.16×10^{-6}	5.96	11.1	3,400
	93	135	103	18	85	113	11×17.5×11		4.82×10^{-6}	4.28	14.16	3,090
	100	146	123	22	101	122	14×20×13		4.82×10^{-6}	6.12	13.82	3,060
	105	152	164	25	139	128	14×20×13		4.82×10^{-6}	8.82	13.71	3,030
	105	152	201	28	173	128	14×20×13		4.82×10^{-6}	10.63	14.05	3,030

Axial Clearance

Unit: mm

Clearance symbol	G0
Axial Clearance	0 or less

Notes: The overall length of the nut will increase when equipping the QZ lubricating device. See A**15-366** for further details.
At least one end of the shaft must accommodate the insertion of the nut onto the ball screw threads for assembly. Please contact THK if this impacts your desired system design.

The rigidity values in the table represent spring constants, each obtained from the load and the elastic deformation when providing a preload equal to 10% of the basic axial dynamic load rating (Ca) and applying an axial load three times greater than the pre-load.
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 10% of Ca, the rigidity value (K_N) is obtained from the following equation.

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

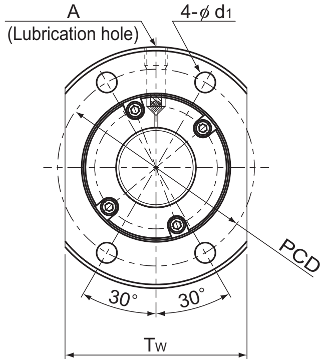
K: Rigidity value in the dimensional table

Options⇒A15-355

Ball Screw

SBK Small
With Preload

DN value	130,000



Model No.	Screw shaft outer diameter d	Lead Ph	Ball center-to-center diameter dp	Thread minor diameter dc	No. of loaded circuits Rows × turns	Basic load rating Ca kN	Basic load rating C0a kN	Rigidity K N/μm
SBK 1520-3.6	15	20	15.75	12.2	1×1.8	5.8	7.8	178
SBK 1616-3.6	16	16	16.65	13.5	1×1.8	4.6	6.4	182
SBK 2010-5.6	20	10	20.75	17.2	1×2.8	10.7	17.3	353
SBK 2020-3.6	20	20	20.75	17.2	1×1.8	7	10.5	229
SBK 2030-3.6	20	30	20.75	17.2	1×1.8	6.9	11.2	236
SBK 2520-3.6	25	20	26	21.5	1×1.8	11	16.9	292
SBK 2525-3.6	25	25	26	21.5	1×1.8	10.8	16.9	290
SBK 3220-5.6	32	20	33.25	27.9	1×2.8	23.6	41.1	565
SBK 3232-5.6	32	32	33.25	27.9	1×2.8	23.1	41.8	567

Note: With model SBK, the raising of both ends of the thread groove is not available. When designing your system this way, contact THK.

Axial Clearance

Unit: mm

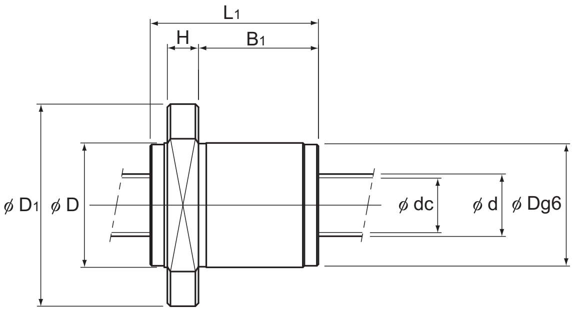
Clearance symbol	G0
Axial Clearance	0 or less

Model number coding

SBK2525-3.6 QZ G0 +1200L C5

- SBK2525-3.6: Model Number
- QZ: With QZ Lubricator (no symbol if the model is without a QZ Lubricator)
- G0: Symbol for clearance in the axial direction (G0 for all SBK variations)
- +1200L: Overall screw shaft length (in mm)
- C5: Accuracy symbol[1]

[1] See A15-12.



Unit: mm

Nut dimensions									Screw shaft inertial moment/mm	Nut mass	Shaft mass	Permissible rotational speed
Outer diameter D	Flange diameter D_1	Overall length L_1	H	B_1	PCD	d_1	T_W	Lubrication hole A	$kg \cdot m^2/mm$	kg	kg/m	min^{-1}
38	62	54	10	38.5	49	5.5	39	M6	3.90×10^{-8}	0.41	1.27	5,000
33	54	45	10	29.5	43	4.5	38	M6	5.05×10^{-8}	0.25	1.46	5,000
40	65	45	10	29.5	53	5.5	49	M6	1.23×10^{-7}	0.37	2.18	5,000
40	65	54	10	38.5	53	5.5	49	M6	1.23×10^{-7}	0.43	2.32	5,000
40	65	71	10	55.5	53	5.5	49	M6	1.23×10^{-7}	0.55	2.36	5,000
47	74	57	12	38	60	6.6	56	M6	3.01×10^{-7}	0.59	3.58	5,000
47	74	68	12	49	60	6.6	56	M6	3.01×10^{-7}	0.69	3.63	5,000
58	92	82	15	58	74	9	68	M6	8.08×10^{-7}	1.23	5.82	3,900
58	92	118	15	94	74	9	68	M6	8.08×10^{-7}	1.70	5.99	3,900

The rigidity values in the table represent spring constants, each obtained from the load and the elastic deformation when providing a preload equal to 10% of the basic axial 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 10% of Ca, the rigidity value (K_N) is obtained from the following equation.

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

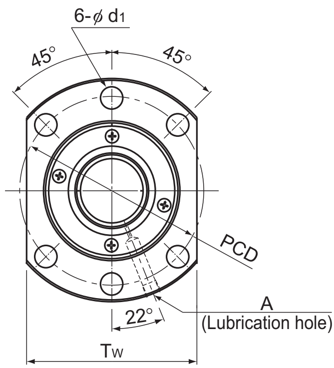
K: Rigidity value in the dimensional table

Ball Screw

Options⇒A15-355

SBK Medium With Preload

DN value	SBK3636, 4040, 5050	210,000
	All other Model SBK units	160,000



Model No.	Screw shaft outer diameter d	Lead Ph	Ball center-to-center diameter dp	Thread minor diameter dc	No. of loaded circuits Rows × turns	Basic load rating Ca kN	Basic load rating C_0a kN	Rigidity K N/μm
SBK 3620-7.6	36	20	37.75	30.4	1×3.8	48.5	85	870
SBK 3636-5.6	36	36	37.75	31.4	1×2.8	36.6	64.7	460
SBK 4020-7.6	40	20	42	34.1	1×3.8	59.7	112.7	970
SBK 4030-7.6	40	30	42	34.1	1×3.8	59.2	107.5	970
SBK 4040-5.6	40	40	42	34.9	1×2.8	44.8	80.3	520
SBK 5020-7.6	50	20	52	44.1	1×3.8	66.8	141.9	1,170
SBK 5030-7.6	50	30	52	44.1	1×3.8	66.5	135	1,170
SBK 5036-7.6	50	36	52	44.1	1×3.8	65.9	135	1,170
SBK 5050-5.6	50	50	52	44.9	1×2.8	50.3	102.4	630
SBK 5520-7.6	55	20	57	49.1	1×3.8	69.8	156.4	1,250
SBK 5530-7.6	55	30	57	49.1	1×3.8	69.2	147	1,250
SBK 5536-7.6	55	36	57	49.1	1×3.8	69.1	148.7	1,260

Note: With model SBK, the raising of both ends of the thread groove is not available. When designing your system this way, contact THK.

Axial Clearance

Unit: mm

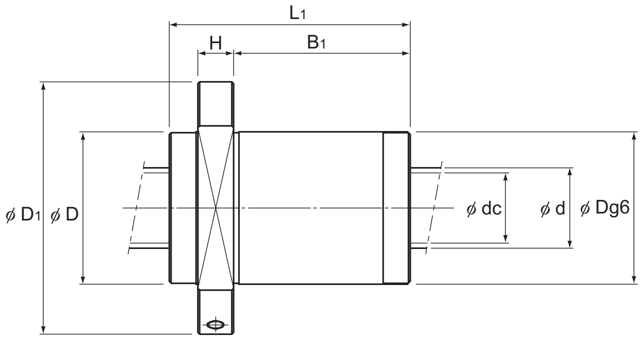
Clearance symbol	G0
Axial Clearance	0 or less

Model number coding

SBK3620-7.6 RR G0 +1500L C5

- SBK3620-7.6: Model number
- RR: Seal symbol[1]
- G0: Symbol for clearance in the axial direction (G0 for all SBK variations)
- +1500L: Overall screw shaft length (in mm)
- C5: Accuracy symbol[2]

[1] See A15-356. [2] See A15-12.



Unit: mm

Nut dimensions									Screw shaft inertial moment/mm	Nut mass	Shaft mass	Permissible rotational speed
Outer diameter D	Flange diameter D_1	Overall length L_1	H	B_1	PCD	d_1	T_W	Lubrication hole A	kg·m²/mm	kg	kg/m	min^{-1}
73	114	110	18	81	93	11	86		1.29×10^{-6}	3.4	5	4,230
73	114	134	18	105	93	11	86		1.29×10^{-6}	3.37	7.43	5,000
80	136	110	20	79	112	14	103		1.97×10^{-6}	4.5	5.7	3,800
80	136	148	20	117	112	14	103		1.97×10^{-6}	5.6	7	3,800
80	136	146	20	115	112	14	103		1.97×10^{-6}	4.74	9.16	5,000
90	146	110	22	77	122	14	110	Rc1/8 (PT1/8)	4.82×10^{-6}	5.3	10.2	3,070
90	146	149	22	116	122	14	110		4.82×10^{-6}	6.6	11.9	3,070
90	146	172	22	139	122	14	110		4.82×10^{-6}	7.4	12.5	3,070
90	146	175	22	142	122	14	110		4.82×10^{-6}	6.46	14.72	4,030
96	152	110	22	77	128	14	114		7.05×10^{-6}	5.7	13	2,800
96	152	149	22	116	128	14	114		7.05×10^{-6}	7.2	14.8	2,800
96	152	172	22	139	128	14	114		7.05×10^{-6}	8.1	15.5	2,800

The rigidity values in the table represent spring constants, each obtained from the load and the elastic deformation when providing a preload equal to 10% of the basic axial dynamic load rating (Ca) and applying an axial load three times greater than the pre-load.
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 10% of Ca, the rigidity value (K_N) is obtained from the following equation.

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

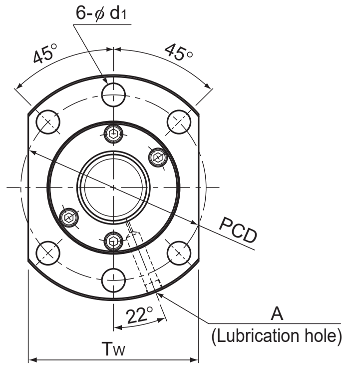
K: Rigidity value in the dimensional table

Ball Screw

Options⇒A15-355

SBKN

DN value	160,000



Model No.	Screw shaft outer diameter d	Lead Ph	Ball center-to-center diameter dp	Thread minor diameter dc	No. of loaded circuits Rows × turns	Basic load rating Ca kN	Basic load rating C_0a kN	Rigidity K N/μm
SBKN 3620-7.6	36	20	37.75	30.4	2×3.8	88.1	170.1	1,660
SBKN 4020-7.6	40	20	42	34.1	2×3.8	108.9	227.1	1,856
SBKN 4030-7.6	40	30	42	34.1	2×3.8	108.1	216.7	1,845
SBKN 5020-7.6	50	20	52	44.1	2×3.8	121.2	283.7	2,209
SBKN 5030-7.6	50	30	52	44.1	2×3.8	120.8	269.9	2,223
SBKN 5036-7.6	50	36	52	44.1	2×3.8	120.1	271.6	2,218
SBKN 5520-7.6	55	20	57	49.1	2×3.8	127.2	314.6	2,123
SBKN 5530-7.6	55	30	57	49.1	2×3.8	126.4	297.3	2,381
SBKN 5536-7.6	55	36	57	49.1	2×3.8	125.9	299	2,399

Note: With model SBKN, the raising of both ends of the thread groove is not available. When designing your system this way,contact THK.

Axial Clearance

Unit: mm

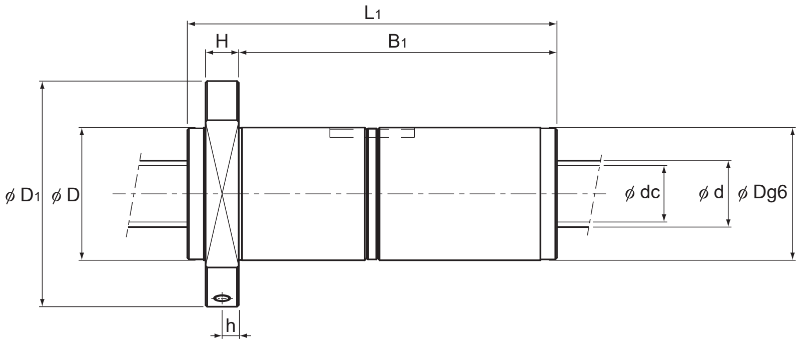
Clearance symbol	G0
Axial Clearance	0 or less

Model number coding

SBKN3620-7.6 RR G0 +1500L C5

- SBKN3620-7.6: Model Number
- RR: Seal symbol[1]
- G0: Symbol for clearance in the axial direction (G0 for all SBKN variations)
- +1500L: Overall screw shaft length (in mm)
- C5: Accuracy symbol[2]

[1] See A15-356. [2] See A15-12.



Unit: mm

	Nut dimensions										Screw shaft inertial moment/mm	Nut mass	Shaft mass	Permissible rotational speed
	Outer diameter D	Flange diameter D_1	Overall length L_1	H	B_1	PCD	d_1	T_W	h	Lubrication hole A	$kg\cdot m^2/mm$	kg	kg/m	min^{-1}
	73	114	210	18	181	93	11	86	9	Rc1/8 (PT1/8)	1.29×10^{-6}	4.59	5	4,230
	80	136	210	20	179	112	14	103	10		1.97×10^{-6}	5.45	5.7	3,810
	80	136	283	20	252	112	14	103	10		1.97×10^{-6}	7.72	7	3,810
	90	146	210	22	177	122	14	110	11		4.82×10^{-6}	6.56	10.2	3,070
	90	146	284	22	251	122	14	110	11		4.82×10^{-6}	8.96	11.9	3,070
	90	146	334	22	301	122	14	110	11		4.82×10^{-6}	10.5	12.5	3,070
	96	152	210	22	177	128	14	114	11		7.05×10^{-6}	7.15	13	2,800
	96	152	284	22	251	128	14	114	11		7.05×10^{-6}	9.76	14.8	2,800
	96	152	334	22	301	128	14	114	11		7.05×10^{-6}	11	15.5	2,800

The rigidity values in the table represent spring constants, each obtained from the load and the elastic deformation when providing a preload equal to 10% of the basic axial dynamic load rating (Ca) and applying an axial load three times greater than the pre-load.
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 10% of Ca, the rigidity value (K_N) is obtained from the following equation.

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

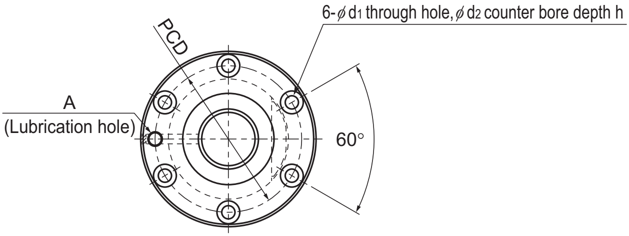
K: Rigidity value in the dimensional table

Ball Screw

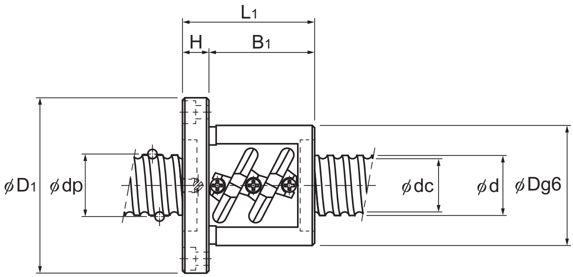
Options⇒A15-355

BIF-V Small With Preload

DN value	100,000



Model No.	Screw shaft outer diameter d	Lead Ph	Ball center-to-center diameter dp	Thread minor diameter dc	No. of loaded circuits Rows × turns	Basic load rating Ca kN	Basic load rating C_0a kN	Rigidity K N/µm
BIF 1604V-5	16	4	16.5	13.8	1×2.5	4.3	8.7	298
BIF 1605V-5	16	5	16.75	13.2	1×2.5	7.4	13.9	330
BIF 2004V-5	20	4	20.5	17.8	1×2.5	4.8	10.9	360
BIF 2004V-10	20	4	20.5	17.8	2×2.5	8.6	21.8	692
BIF 2005V-5	20	5	20.75	17.2	1×2.5	8.3	17.5	390
BIF 2005V-10	20	5	20.75	17.2	2×2.5	15.1	35	762
BIF 2010V-5	20	10	20.75	17.2	1×2.5	8.3	17.6	394
BIF 2504V-5	25	4	25.5	22.8	1×2.5	5.2	13.7	426
BIF 2504V-10	25	4	25.5	22.8	2×2.5	9.5	27.4	824
BIF 2505V-5	25	5	25.75	22.2	1×2.5	9.2	21.9	470
BIF 2505V-10	25	5	25.75	22.2	2×2.5	16.7	43.9	910
BIF 2506V-5	25	6	26	21.4	1×2.5	12.4	27.4	482
BIF 2506V-10	25	6	26	21.4	2×2.5	22.6	54.8	934
BIF 2805V-5	28	5	28.75	25.2	1×2.5	9.7	24.6	520
BIF 2805V-10	28	5	28.75	25.2	2×2.5	17.5	49.2	1,000
BIF 2806V-5	28	6	28.75	25.2	1×2.5	9.6	24.6	520
BIF 2806V-10	28	6	28.75	25.2	2×2.5	17.5	49.2	1,000
BIF 3205V-5	32	5	32.75	29.2	1×2.5	10.2	28.1	570
BIF 3205V-10	32	5	32.75	29.2	2×2.5	18.5	56.3	1,110
BIF 3206V-5	32	6	33	28.4	1×2.5	13.9	35.2	600
BIF 3206V-10	32	6	33	28.4	2×2.5	25.2	70.3	1,150



Unit: mm

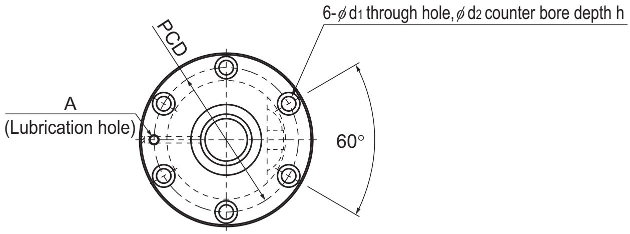
	Nut dimensions								Screw shaft inertial moment/mm	Nut mass	Shaft mass	Permissible rotational speed
	Outer diameter D	Flange diameter D_1	Overall length L_1	H	B_1	PCD	$d_1 \times d_2 \times h$	Lubrication hole A	$kg \cdot m^2/mm$	kg	kg/m	min^{-1}
	36	59	53	11	42	47	5.5×9.5×5.5	M6	5.05×10^{-8}	0.42	1.42	5,000
	40	60	56	10	46	50	4.5×8×4.5	M6	5.05×10^{-8}	0.56	1.37	5,000
	40	63	49	11	38	51	5.5×9.5×5.5	M6	1.23×10^{-7}	0.43	2.22	4,870
	40	63	73	11	62	51	5.5×9.5×5.5	M6	1.23×10^{-7}	0.55	2.22	4,870
	44	67	56	11	45	55	5.5×9.5×5.5	M6	1.23×10^{-7}	0.57	2.19	4,810
	44	67	86	11	75	55	5.5×9.5×5.5	M6	1.23×10^{-7}	0.79	2.19	4,810
	46	74	90	15	75	59	5.5×9.5×5.5	M6	1.23×10^{-7}	1.06	2.46	4,810
	46	69	48	11	37	57	5.5×9.5×5.5	M6	3.01×10^{-7}	0.55	3.6	3,920
	46	69	72	11	61	57	5.5×9.5×5.5	M6	3.01×10^{-7}	0.66	3.6	3,920
	50	73	55	11	44	61	5.5×9.5×5.5	M6	3.01×10^{-7}	0.75	3.52	3,880
	50	73	85	11	74	61	5.5×9.5×5.5	M6	3.01×10^{-7}	0.96	3.52	3,880
	53	76	62	11	51	64	5.5×9.5×5.5	M6	3.01×10^{-7}	0.9	3.43	3,840
	53	76	98	11	87	64	5.5×9.5×5.5	M6	3.01×10^{-7}	1.22	3.43	3,840
	55	85	59	12	47	69	6.6×11×6.5	M6	4.74×10^{-7}	0.98	4.35	3,470
	55	85	89	12	77	69	6.6×11×6.5	M6	4.74×10^{-7}	1.34	4.35	3,470
	55	85	68	12	56	69	6.6×11×6.5	M6	4.74×10^{-7}	1.09	4.52	3,470
	55	85	104	12	92	69	6.6×11×6.5	M6	4.74×10^{-7}	1.52	4.52	3,470
	58	85	56	12	44	71	6.6×11×6.5	M6	8.08×10^{-7}	0.94	5.89	3,050
	58	85	86	12	74	71	6.6×11×6.5	M6	8.08×10^{-7}	1.31	5.89	3,050
	62	89	63	12	51	75	6.6×11×6.5	M6	8.08×10^{-7}	1.21	5.88	3,030
	62	89	99	12	87	75	6.6×11×6.5	M6	8.08×10^{-7}	1.75	5.88	3,030

Note: The overall length of the nut will increase when equipping the QZ Lubricator. See **A15-366** for further details.

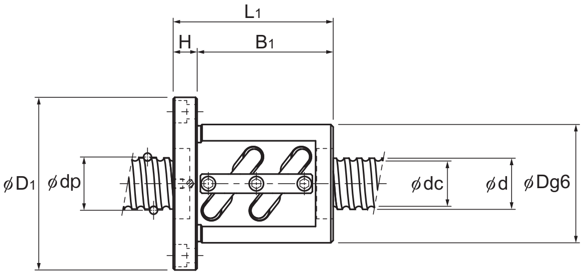
Options⇒A15-355

BIF-V Medium With Preload

DN value	130,000



Model No.	Screw shaft outer diameter d	Lead Ph	Ball center-to-center diameter dp	Thread minor diameter dc	No. of loaded circuits Rows × turns	Basic load rating Ca kN	Basic load rating C_0a kN	Rigidity K N/µm
BIF 2508V-5	25	8	26.25	20.5	1×2.5	15.8	32.9	500
BIF 2508V-7	25	8	26.25	20.5	1×3.5	21.1	46	688
BIF 2508V-10	25	8	26.25	20.5	2×2.5	28.7	65.7	968
BIF 2510V-5	25	10	26.25	21.5	1×2.5	15.8	32.9	500
BIF 2810V-3	28	10	29.75	22.4	1×1.5	15.6	29.4	350
BIF 3210V-5	32	10	33.75	26.4	1×2.5	26	56.2	640
BIF 3210V-7	32	10	33.75	26.4	1×3.5	34.8	78.6	874
BIF 3210V-10	32	10	33.75	26.4	2×2.5	47.3	112.3	1,128
BIF 3212V-5	32	12	34	26.1	1×2.5	30.2	63.2	644
BIF 3212V-7	32	12	34	26.1	1×3.5	40.4	88.5	888
BIF 3216V-5	32	16	33.75	26.4	1×2.5	25.9	56.5	636
BIF 3610V-5	36	10	37.75	30.5	1×2.5	27.6	63.3	696
BIF 3610V-7	36	10	37.75	30.5	1×3.5	36.9	88.6	700
BIF 3610V-10	36	10	37.75	30.5	2×2.5	50.1	126.5	1,350
BIF 3612V-5	36	12	38	30.1	1×2.5	32.2	71.2	708
BIF 3612V-7	36	12	38	30.1	1×3.5	43	99.6	976
BIF 3612V-10	36	12	38	30.1	2×2.5	58.4	142.3	1,372
BIF 3616V-5	36	16	38	30.1	1×2.5	32.1	71.5	710
BIF 3620V-3	36	20	37.75	30.5	1×1.5	17.7	38.4	430
BIF 4010V-5	40	10	41.75	34.4	1×2.5	29	70.4	750
BIF 4010V-7	40	10	41.75	34.4	1×3.5	38.8	98.5	1,044
BIF 4010V-10	40	10	41.75	34.4	2×2.5	52.7	140.7	1,470
BIF 4012V-5	40	12	42	34.1	1×2.5	33.9	79.2	770
BIF 4012V-7	40	12	42	34.1	1×3.5	45.3	110.8	1,062
BIF 4012V-10	40	12	42	34.1	2×2.5	61.6	158.3	1,490
BIF 4016V-5	40	16	42	34.1	1×2.5	33.9	79.4	772
BIF 4020V-5	40	20	41.75	34.4	1×2.5	28.9	71	760



Unit: mm

	Nut dimensions								Screw shaft inertial moment/mm	Nut mass	Shaft mass	Permissible rotational speed
	Outer diameter D	Flange diameter D_1	Overall length L_1	H	B_1	PCD	$d_1\times d_2\times h$	Lubrication hole A	kg·m²/mm	kg	kg/m	min^{-1}
	58	85	82	15	67	71	6.6×11×6.5	M6	3.01×10^{-7}	1.52	3.51	4,950
	58	85	98	15	83	71	6.6×11×6.5	M6	3.01×10^{-7}	1.5	3.51	4,950
	58	85	130	15	115	71	6.6×11×6.5	M6	3.01×10^{-7}	1.93	3.51	4,950
	58	85	100	18	82	71	6.6×11×6.5	M6	3.01×10^{-7}	1.31	3.5	4,950
	65	106	88	18	70	85	11×17.5×11	M6	4.74×10^{-7}	2.33	4.15	4,360
	74	108	100	15	85	90	9×14×8.5	M6	8.08×10^{-7}	2.92	5.53	3,850
	74	108	120	15	105	90	9×14×8.5	M6	8.08×10^{-7}	3.1	5.53	3,850
	74	108	160	15	145	90	9×14×8.5	M6	8.08×10^{-7}	4.27	5.53	3,850
	76	121	117	18	99	98	11×17.5×11	M6	8.08×10^{-7}	3.7	5.7	3,820
	76	121	146	18	128	98	11×17.5×11	M6	8.08×10^{-7}	3.7	5.7	3,820
	74	108	139	18	121	90	9×14×8.5	M6	8.08×10^{-7}	3.81	5.82	3,850
	75	120	111	18	93	98	11×17.5×11	M6	1.29×10^{-6}	3.45	7.1	3,440
	75	120	123	18	105	98	11×17.5×11	M6	1.29×10^{-6}	3.82	7.1	3,440
	75	120	171	18	153	98	11×17.5×11	M6	1.29×10^{-6}	4.84	7.1	3,440
	78	123	123	18	105	100	11×17.5×11	M6	1.29×10^{-6}	4.69	7.99	3,420
	78	123	140	18	122	100	11×17.5×11	M6	1.29×10^{-6}	4.34	7.99	3,420
	78	123	195	18	177	100	11×17.5×11	M6	1.29×10^{-6}	5.67	7.99	3,420
	78	123	140	18	122	100	11×17.5×11	M6	1.29×10^{-6}	4.31	7.99	3,420
	75	114	122	18	104	93	11×17.5×11	M6	1.29×10^{-6}	3.4	7.54	3,440
	82	124	103	18	85	102	11×17.5×11	M6	1.97×10^{-6}	3.61	8.87	3,110
	82	124	123	18	105	102	11×17.5×11	M6	1.97×10^{-6}	3.97	8.87	3,110
	82	124	163	18	145	102	11×17.5×11	M6	1.97×10^{-6}	5.33	8.87	3,110
	84	126	119	18	101	104	11×17.5×11	M6	1.97×10^{-6}	4.36	8.83	3,090
	84	126	143	18	125	104	11×17.5×11	M6	1.97×10^{-6}	4.92	8.83	3,090
	84	126	191	18	173	104	11×17.5×11	M6	1.97×10^{-6}	6.47	8.83	3,090
	84	126	144	18	126	104	11×17.5×11	M6	1.97×10^{-6}	4.9	9.09	3,090
	82	126	162	18	144	104	11×17.5×11	M6	1.97×10^{-6}	5.17	9.37	3,110

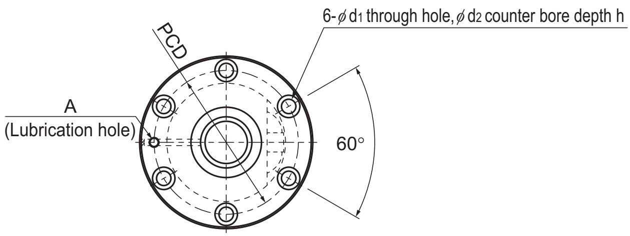
Note: The overall length of the nut will increase when equipping the QZ Lubricator. See A**15-366** for further details.

Ball Screw

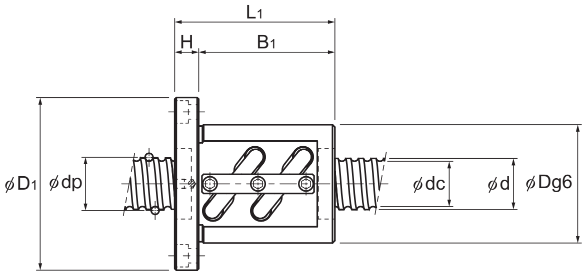
Options⇒A15-355

BIF-V Medium With Preload

DN value	130,000



Model No.	Screw shaft outer diameter d	Lead Ph	Ball center-to-center diameter dp	Thread minor diameter dc	No. of loaded circuits Rows × turns	Basic load rating Ca kN	Basic load rating C_0a kN	Rigidity K N/µm
BIF 4510V-5	45	10	46.75	39.5	1×2.5	30.6	79.3	830
BIF 4510V-10	45	10	46.75	39.5	2×2.5	55.6	158.5	1,610
BIF 4512V-5	45	12	47	39.2	1×2.5	35.9	89.2	846
BIF 4512V-10	45	12	47	39.2	2×2.5	65.2	178.3	1,638
BIF 4516V-5	45	16	47	39.2	1×2.5	35.8	89.4	846
BIF 4520V-5	45	20	47	39.2	1×2.5	35.8	89.7	848
BIF 5010V-5	50	10	51.75	44.4	1×2.5	32.1	88.1	900
BIF 5010V-7	50	10	51.75	44.4	1×3.5	42.9	123.4	1,244
BIF 5010V-10	50	10	51.75	44.4	2×2.5	58.2	176.3	1,750
BIF 5012V-5	50	12	52.25	43.3	1×2.5	43.4	110.1	934
BIF 5012V-7	50	12	52.25	43.3	1×3.5	58	154.1	1,286
BIF 5012V-10	50	12	52.25	43.3	2×2.5	78.8	220.2	1,808
BIF 5016V-5	50	16	52.7	42.9	1×2.5	72.6	183.1	1,220
BIF 5016V-10	50	16	52.7	42.9	2×2.5	131.8	366.2	2,364
BIF 5020V-5	50	20	52.7	42.9	1×2.5	72.5	183.6	1,222



Unit: mm

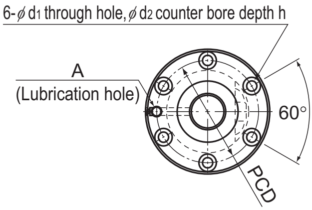
	Nut dimensions								Screw shaft inertial moment/mm	Nut mass	Shaft mass	Permissible rotational speed
	Outer diameter D	Flange diameter D_1	Overall length L_1	H	B_1	PCD	$d_1 \times d_2 \times h$	Lubrication hole A	kg·m²/mm	kg	kg/m	min^{-1}
	88	132	111	18	93	110	11×17.5×11		3.16×10^{-6}	4.29	12.48	2,780
	88	132	171	18	153	110	11×17.5×11		3.16×10^{-6}	5.97	12.48	2,780
	90	130	119	18	101	110	11×17.5×11		3.16×10^{-6}	4.6	11.32	2,760
	90	130	191	18	173	110	11×17.5×11		3.16×10^{-6}	6.67	11.32	2,760
	90	130	140	18	122	110	11×17.5×11		3.16×10^{-6}	5.3	11.61	2,760
	90	130	162	18	144	110	11×17.5×11		3.16×10^{-6}	5.96	11.1	2,760
	93	135	103	18	85	113	11×17.5×11		4.82×10^{-6}	4.28	14.16	2,510
	93	135	123	18	105	113	11×17.5×11	Rc1/8 (PT1/8)	4.82×10^{-6}	4.94	14.16	2,510
	93	135	163	18	145	113	11×17.5×11		4.82×10^{-6}	6.26	14.16	2,510
	100	146	123	22	101	122	14×20×13		4.82×10^{-6}	6.12	13.82	2,480
	100	146	147	22	125	122	14×20×13		4.82×10^{-6}	7.06	13.82	2,480
	100	146	195	22	173	122	14×20×13		4.82×10^{-6}	8.91	13.82	2,480
	105	152	164	25	139	128	14×20×13		4.82×10^{-6}	8.82	13.71	2,460
	105	152	260	25	235	128	14×20×13		4.82×10^{-6}	12.3	13.71	2,460
	105	152	201	28	173	128	14×20×13		4.82×10^{-6}	10.63	14.05	2,460

Note: The overall length of the nut will increase when equipping the QZ Lubricator. See A**15-366** for further details.

Options⇒A15-355

BIF (Unfinished Shaft Ends) With Preload

DN value	70,000



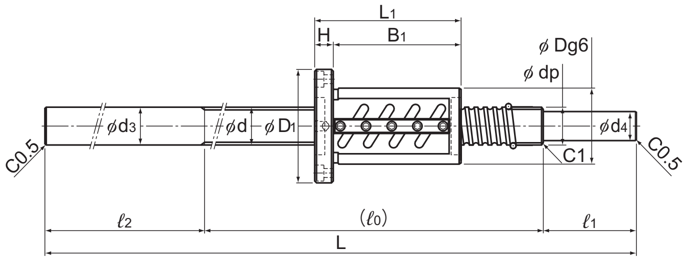
Model No.	Ball screw specifications							Nut			
	Screw shaft outer diameter	Lead	Ball center-to-center diameter	Thread minor diameter	No. of loaded circuits	Basic load rating		Outer diameter	Flange diameter	Overall length	
						Ca	C_0a				
	d	Ph	dp	dc	Rows X turns	kN	kN	D	D_1	L_1	H
BIF 1605-5	16	5	16.75	13.2	1×2.5	7.4	13.9	40	60	56	10
BIF 1810-3	18	10	18.8	15.5	1×1.5	5.1	9.6	42	65	75	12
BIF 2005-5	20	5	20.75	17.2	1×2.5	8.3	17.4	44	67	56	11
BIF 2505-5	25	5	25.75	22.2	1×2.5	9.2	22	50	73	55	11

Model number coding

BIF2005-5 RR G0 +610L C5 A

- BIF2005-5: Model No.
- RR: Seal symbol[1]
- G0: Symbol for clearance in the axial direction[2]
- +610L: Overall screw shaft length (in mm)
- C5: Accuracy symbol[3]
- A: Unfinished shaft ends code (A or B)

[1] See A15-356. [2] See A15-19. [3] See A15-12.



Unit: mm

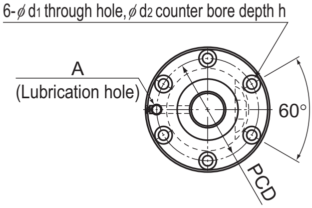
Dimensions							Screw shaft dimensions								Nut mass	Shaft mass	Permissible rotational speed
	B_1	PCD	d_1	d_2	h	Lubrication hole A	Stan-dardstock symbol	Overall length L	ℓ_0	ℓ_1	ℓ_2	d_3	d_4	kg	kg/m	min^{-1}
	46	50	4.5	8	4.5	M6	A	410	200	50	160	16	12.8	0.56	0.92	4,170
								510	300							
								610	400							
								710	500						1.25	
	63	53	5.5	9.5	5.5	M6	A	410	200	50	160	18	15.3	0.75	1.62	3,720
								510	300							
								610	400							
								710	500							
								810	600							
	45	55	5.5	9.5	5.5	M6	A	410	200	50	160	20	15.3	0.57	1.65	3,370
								510	300							
								610	400							
								710	500							
								810	600				16.8			
								1,010	800							
							B	610	300	50	260	20	16.8			
								710	400							
	44	61	5.5	9.5	5.5	M6	A	520	300	60	160	25	20.3	0.75	2.84	2,710
								620	400							
								720	500							
								820	600							
								1,020	800				21.8			
								1,220	1,000							
								1,420	1,200							
							B	720	400	60	260	25	21.8			
								820	500							

Ball Screw

Options⇒A15-355

BIF (Unfinished Shaft Ends) With Preload

DN value	70,000



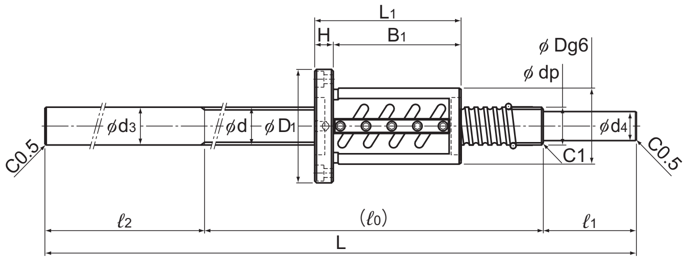
Model No.	Ball screw specifications							Nut			
	Screw shaft outer diameter d	Lead Ph	Ball center-to-center diameter dp	Thread minor diameter dc	No. of loaded circuits Rows X turns	Basic load rating Ca kN	Basic load rating C_0a kN	Outer diameter D	Flange diameter D_1	Overall length L_1	H
BIF 2510A-5	25	10	26.3	21.4	1×2.5	15.8	33	58	85	100	18
BIF 2806-5 BIF 2806-10	28	6	28.75	25.2	1×2.5 2×2.5	9.6 17.5	24.6 49.4	55	85	68 104	12
BIF 3205-5 BIF 3205-10	32	5	32.75	29.2	1×2.5 2×2.5	10.2 18.5	28.1 56.4	58	85	56 86	12

Model number coding

BIF2806-10 RR G0 +1020L C5 A

- BIF2806-10: Model No.
- RR: Seal symbol[1]
- G0: Symbol for clearance in the axial direction[2]
- +1020L: Overall screw shaft length (in mm)
- C5: Accuracy symbol[3]
- A: Unfinished shaft ends code (A or B)

[1] See **A15-356**. [2] See **A15-19**. [3] See **A15-12**.



Unit: mm

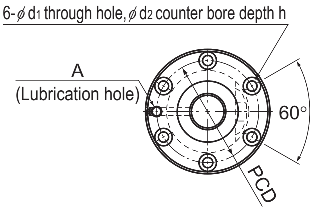
Dimensions							Screw shaft dimensions							Nut mass	Shaft mass	Permissible rotational speed
	B_1	PCD	d_1	d_2	h	Lubrication hole A	Stan-dardstock symbol	Overall length L	ℓ_0	ℓ_1	ℓ_2	d_3	d_4	kg	kg/m	min^{-1}
	82	71	6.6	11	6.5	M6	A	620	400	60	160	25	20.3	1.87	2.68	2,660
								820	600							
								1,020	800							
								1,220	1,000							
								1,420	1,200							
	56 92	69	6.6	11	6.5	M6	A	520	300	60	160	28	20.3	1 1.57	3.89	2,430
								620	400							
								720	500							
								920	700							
								1,020	800				24.8			
								1,220	1,000							
								1,420	1,200							
							B	720	400	70	250	28	24.8			
								920	500		350					
								1,100	700		330					
	44 74	71	6.6	11	6.5	M6	A	730	500	70	160	32	25.3	0.87 1.32	5.03	2,130
								930	700							
								1,230	1,000							
								1,430	1,200							
								1,630	1,400				27.8			
								1,830	1,600							

Ball Screw

Options⇒A15-355

BIF (Unfinished Shaft Ends) With Preload

DN value	70,000



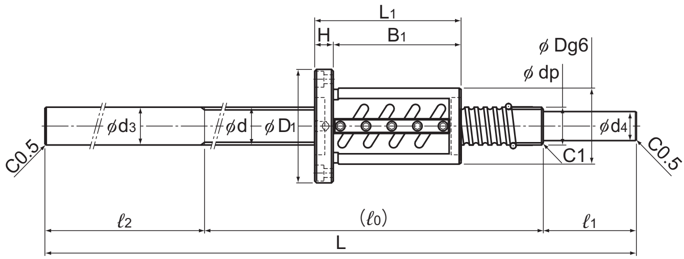
Model No.	Ball screw specifications							Nut			
	Screw shaft outer diameter	Lead	Ball center-to-center diameter	Thread minor diameter	No. of loaded circuits	Basic load rating Ca	Basic load rating C_0a	Outer diameter	Flange diameter	Overall length	
	d	Ph	dp	dc	Rows × turns	kN	kN	D	D_1	L_1	H
BIF 3206-5 BIF 3206-10	32	6	33	28.4	1×2.5 2×2.5	13.9 25.2	35.2 70.4	62	89	63 99	12
BIF 3210A-5	32	10	33.75	26.4	1×2.5	26.1	56.2	74	108	100	15
BIF 3610-5 BIF 3610-10	36	10	37.75	30.5	1×2.5 2×2.5	27.6 50.1	63.3 126.4	75	120	111 171	18

Model number coding

BIF3206-10 RR G0 +1100L C5 B

- BIF3206-10: Model No.
- RR: Seal symbol[1]
- G0: Symbol for clearance in the axial direction[2]
- +1100L: Overall screw shaft length (in mm)
- C5: Accuracy symbol[3]
- B: Unfinished shaft ends code (A or B)

[1] See A15-356. [2] See A15-19. [3] See A15-12.



Unit: mm

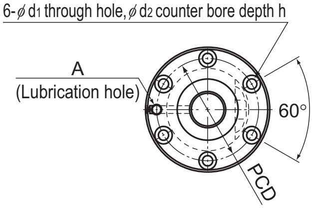
Dimensions							Screw shaft dimensions							Nut mass	Shaft mass	Permissible rotational speed
	B_1	PCD	d_1	d_2	h	Lubrication hole A	Stan-dardstock symbol	Overall length L	ℓ_0	ℓ_1	ℓ_2	d_3	d_4	kg	kg/m	min^{-1}
	51 87	75	6.6	11	6.5	M6	A	730	500	70	160	32	25.3	1.2 1.76	4.63	2,120
								930	700							
								1,230	1,000							
								1,430	1,200							
								1,630	1,400				27.8			
								1,830	1,600							
							B	930	500	70	360	32	27.8			
								1,100	700		330					
								1,430	1,000		360					
	85	90	9	14	8.5	M6	A	730	500	70	160	32	25.3	2.8	3.66	2,070
								930	700							
								1,430	1,200							
								1,830	1,600							
	93 153	98	11	17.5	11	M6	A	730	500	70	160	36	30.3	3.4 4.8	5.03	1,850
								930	700							
								1,430	1,200							
								1,830	1,600							
							B	930	500	100	330					
								1,100	700		300					
								1,830	1,200		530					

Ball Screw

Options⇒A15-355

BIF (Unfinished Shaft Ends) With Preload

DN value	70,000



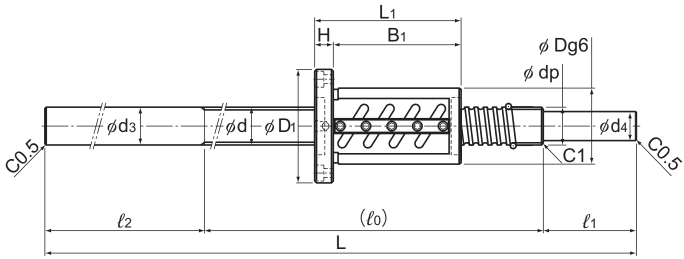
Model No.	Ball screw specifications							Nut			
	Screw shaft outer diameter	Lead	Ball center-to-center diameter	Thread minor diameter	No. of loaded circuits	Basic load rating		Outer diameter	Flange diameter	Overall length	
						Ca	C_0a				
	d	Ph	dp	dc	Rows × turns	kN	kN	D	D_1	L_1	H
BIF 4010-5 BIF 4010-10	40	10	41.75	34.4	1×2.5 2×2.5	29 52.7	70.4 141.1	82	124	103 163	18
BIF 4012-5 BIF 4012-10	40	12	42	34.1	1×2.5 2×2.5	33.9 61.6	79.2 158.8	84	126	119 191	18
BIF 5010-5 BIF 5010-10	50	10	51.75	44.4	1×2.5 2×2.5	32 58.2	88.2 176.4	93	135	103 163	18

Model number coding

BIF4012-10 RR G0 +1230L C5 A

- BIF4012-10: Model No.
- RR: Seal symbol[1]
- G0: Symbol for clearance in the axial direction[2]
- +1230L: Overall screw shaft length (in mm)
- C5: Accuracy symbol[3]
- A: Unfinished shaft ends code (A or B)

[1] See A15-356. [2] See A15-19. [3] See A15-12.



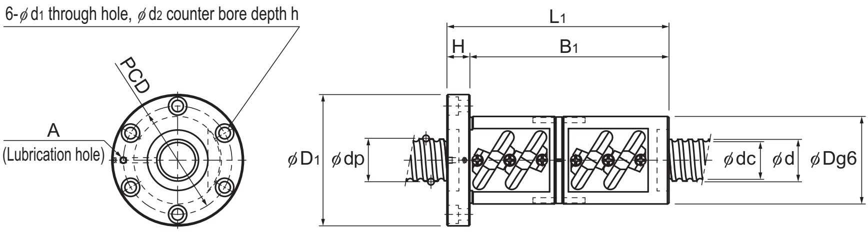
Unit: mm

Dimensions							Screw shaft dimensions							Nut mass	Shaft mass	Permissible rotational speed
	B_1	PCD	d_1	d_2	h	Lubrication hole A	Standard stock symbol	Overall length L	ℓ_0	ℓ_1	ℓ_2	d_3	d_4	kg	kg/m	min^{-1}
	85 145	102	11	17.5	11	M6	A	1,230	1,000	70	160	40	30.3	3.58 5.18	6.59	1,670
								1,730	1,500							
								2,030	1,800							
								2,230	2,000							
	101 173	104	11	17.5	11	M6	A	1,230	1,000	70	160	40	30.3	4.2 6.24	6.39	1,660
								1,730	1,500							
								2,030	1,800							
								2,230	2,000							
							B	1,730	1,200	100	430	40	33.8			
								2,030	1,200		730					
	85 145	113	11	17.5	11	Rc1/8 (PT1/8)	A	1,300	1,000	100	200	50	40.3	4.4 6.35	11.36	1,350
								1,800	1,500							
								2,300	2,000							
								2,800	2,500							

Options⇒A15-355

BNFN-V Small/Medium With Preload

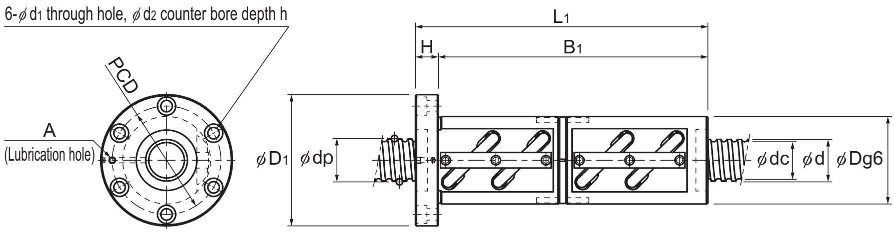
DN value		
	Small	100,000
	Medium	130,000



Small BNFN1605V/2805V/2806V/3205V

Model No.	Screw shaft outer diameter d	Lead Ph	Ball center-to-center diameter dp	Thread minor diameter dc	No. of loaded circuits Rows × turns	Basic load rating Ca kN	Basic load rating C_0a kN	Rigidity K N/µm
BNFN 1605V-5	16	5	16.75	13.2	2×2.5	13.5	27.9	640
BNFN 2805V-7.5	28	5	28.75	25.2	3×2.5	24.8	73.8	1,470
BNFN 2806V-7.5	28	6	28.75	25.2	3×2.5	24.8	73.8	1,470
BNFN 3205V-7.5	32	5	32.75	29.2	3×2.5	26.2	84.4	1,640

Model No.	Screw shaft outer diameter d	Lead Ph	Ball center-to-center diameter dp	Thread minor diameter dc	No. of loaded circuits Rows × turns	Basic load rating Ca kN	Basic load rating C_0a kN	Rigidity K N/µm
BNFN 2810V-2.5	28	10	29.75	22.4	1×2.5	24.3	49	560
BNFN 3610V-7.5	36	10	37.75	30.5	3×2.5	71	189.8	1,990
BNFN 3616V-5	36	16	38	30.1	2×2.5	58.3	142.9	1,380
BNFN 4016V-5	40	16	42	34.1	2×2.5	61.5	158.8	1,500
BNFN 4510V-7.5	45	10	46.75	39.5	3×2.5	78.8	237.8	2,370
BNFN 5010V-7.5	50	10	51.75	44.4	3×2.5	82.5	264.4	2,580



Medium BNFN2810V/3610V/3616V/4016V/4510V/5010V

Unit: mm

	Nut dimensions								Screw shaft inertial moment/mm	Nut mass	Shaft mass	Permissible rotational speed
	Outer diameter D	Flange diameter D_1	Overall length L_1	H	B_1	PCD	$d_1 \times d_2 \times h$	Lubrication hole A	kg·m²/mm	kg	kg/m	min⁻¹
	40	60	106	10	96	50	4.5×8×4.5	M6	5.05×10^{-8}	0.88	1.37	5,000
	55	85	134	12	122	69	6.6×11×6.5	M6	4.74×10^{-7}	1.88	4.45	3,470
	55	85	158	12	149	69	6.6×11×6.5	M6	4.74×10^{-7}	2.16	4.52	3,470
	58	85	136	12	124	71	6.6×11×6.5	M6	8.08×10^{-7}	1.93	5.89	3,050

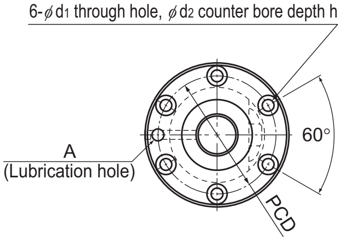
	Nut dimensions								Screw shaft inertial moment/mm	Nut mass	Shaft mass	Permissible rotational speed
	Outer diameter D	Flange diameter D_1	Overall length L_1	H	B_1	PCD	$d_1 \times d_2 \times h$	Lubrication hole A	kg·m²/mm	kg	kg/m	min⁻¹
	65	106	146	18	128	85	11×17.5×11	M6	4.74×10^{-7}	3.41	4.15	4,360
	75	120	261	18	243	98	11×17.5×11	M6	1.29×10^{-7}	6.93	7.1	3,440
	78	123	268	18	250	100	11×17.5×11	M6	1.29×10^{-7}	7.8	7.99	3,420
	84	126	280	22	258	104	11×17.5×11	M6	1.97×10^{-6}	9.27	9.09	3,090
	88	132	261	18	243	110	11×17.5×11	Rc1/8 (PT1/8)	3.16×10^{-6}	8.92	11.36	2,780
	93	135	253	18	235	113	11×17.5×11		4.82×10^{-6}	9.19	14.16	2,510

Note: The overall length of the nut will increase when equipping the QZ Lubricator. See A 15-366 for further details.

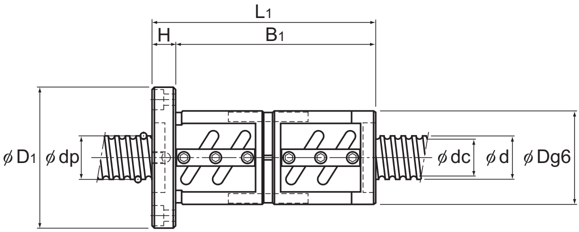
Options⇒A 15-355

BNFN
With Preload

DN value	70,000



Model No.	Screw shaft outer diameter d	Lead Ph	Ball center-to-center diameter dp	Thread minor diameter dc	No. of loaded circuits Rows × turns	Basic load rating Ca kN	Basic load rating C_0a kN	Rigidity K N/µm
BNFN 5510-2.5	55	10	56.75	49.5	1×2.5	33.4	97	970
BNFN 5510-5	55	10	56.75	49.5	2×2.5	60.7	194	1,890
BNFN 5510-7.5	55	10	56.75	49.5	3×2.5	85.9	291.1	2,770
BNFN 5512-2.5	55	12	57	49.2	1×2.5	39.3	108.8	990
BNFN 5512-3	55	12	57	49.2	2×1.5	46	131.3	1,180
BNFN 5512-3.5	55	12	57	49.2	1×3.5	52.4	152.9	1,360
BNFN 5512-5	55	12	57	49.2	2×2.5	71.3	218.5	1,920
BNFN 5512-7.5	55	12	57	49.2	3×2.5	100.9	327.3	2,830
BNFN 5516-2.5	55	16	57.7	47.9	1×2.5	76.1	201.9	1,310
BNFN 5516-5	55	16	57.7	47.9	2×2.5	138.2	402.8	2,550
BNFN 5520-2.5	55	20	57.7	47.9	1×2.5	76	201.9	1,320
BNFN 5520-5	55	20	57.7	47.9	2×2.5	138.2	403.8	2,550
BNFN 6310-2.5	63	10	64.75	57.7	1×2.5	35.4	111.7	1,090
BNFN 6310-5	63	10	64.75	57.7	2×2.5	64.2	222.5	2,100
BNFN 6310-7.5	63	10	64.75	57.7	3×2.5	90.9	334.2	3,090
BNFN 6312A-2.5	63	12	65.25	56.3	1×2.5	48.1	139.2	1,120
BNFN 6312A-5	63	12	65.25	56.3	2×2.5	87.4	278.3	2,160
BNFN 6316-2.5	63	16	65.7	55.9	1×2.5	81.1	231.3	1,470
BNFN 6316-5	63	16	65.7	55.9	2×2.5	147	462.6	2,840
BNFN 6320-2.5	63	20	65.7	55.9	1×2.5	81	231.3	1,470
BNFN 6320-5	63	20	65.7	55.9	2×2.5	147	463.5	2,640



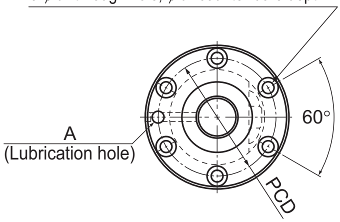
Unit: mm

	Nut dimensions								Screw shaft inertial moment/mm	Nut mass	Shaft mass	Permissible rotational speed
	Outer diameter D	Flange diameter D_1	Overall length L_1	H	B_1	PCD	$d_1 \times d_2 \times h$	Lubrication hole A	$kg \cdot m^2/mm$	kg	kg/m	min^{-1}
	102	144	141	18	123	122	11×17.5×11		7.05×10^{-6}	6.54	16.43	1,230
	102	144	201	18	183	122	11×17.5×11		7.05×10^{-6}	8.88	16.43	1,230
	102	144	261	18	243	122	11×17.5×11		7.05×10^{-6}	11.23	16.43	1,230
	105	147	165	18	147	125	11×17.5×11		7.05×10^{-6}	8.07	16.29	1,220
	105	147	191	18	173	125	11×17.5×11		7.05×10^{-6}	9.17	16.29	1,220
	105	147	189	18	171	125	11×17.5×11		7.05×10^{-6}	9.09	16.29	1,220
	105	147	237	18	219	125	11×17.5×11		7.05×10^{-6}	11.13	16.29	1,220
	105	147	309	18	291	125	11×17.5×11		7.05×10^{-6}	14.19	16.29	1,220
	110	158	196	25	171	133	14×20×13		7.05×10^{-6}	11.28	15.46	1,210
	110	158	292	25	267	133	14×20×13		7.05×10^{-6}	15.94	15.46	1,210
	112	158	227	28	199	134	14×20×13	Rc1/8 (PT1/8)	7.05×10^{-6}	13.49	16.1	1,210
	112	158	347	28	319	134	14×20×13		7.05×10^{-6}	19.61	16.1	1,210
	108	154	137	22	115	130	14×20×13		1.21×10^{-5}	6.98	21.93	1,080
	108	154	197	22	175	130	14×20×13		1.21×10^{-5}	9.4	21.93	1,080
	108	154	257	22	235	130	14×20×13		1.21×10^{-5}	11.81	21.93	1,080
	115	161	159	22	137	137	14×20×13		1.21×10^{-5}	9.32	21.14	1,070
	115	161	231	22	209	137	14×20×13		1.21×10^{-5}	12.84	21.14	1,070
	122	184	208	24	184	152	18×26×17.5		1.21×10^{-5}	14.61	20.85	1,060
	122	184	304	24	280	152	18×26×17.5		1.21×10^{-5}	20.19	20.85	1,060
	122	180	227	28	199	150	18×26×17.5		1.21×10^{-5}	15.91	20.85	1,060
	122	180	347	28	319	150	18×26×17.5		1.21×10^{-5}	22.88	20.85	1,060

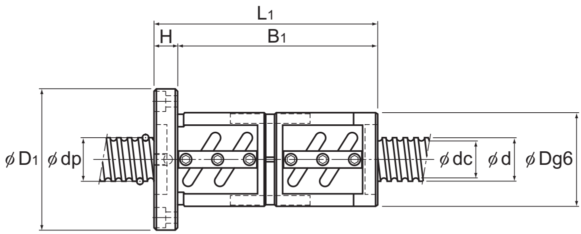
Note: The overall length of the nut will increase when equipping the QZ Lubricator. See A**15-366** for further details.

BNFN
With Preload

DN value	70,000



Model No.	Screw shaft outer diameter d	Lead Ph	Ball center-to-center diameter dp	Thread minor diameter dc	No. of loaded circuits Rows × turns	Basic load rating Ca kN	Basic load rating C_0a kN	Rigidity K N/μm
BNFN 7010-2.5	70	10	71.75	64.5	1×2.5	36.8	123.5	1,180
BNFN 7010-5	70	10	71.75	64.5	2×2.5	66.9	247	2,280
BNFN 7010-7.5	70	10	71.75	64.5	3×2.5	94.9	371.4	3,350
BNFN 7012-2.5	70	12	72	64.2	1×2.5	43.5	139.2	1,200
BNFN 7012-5	70	12	72	64.2	2×2.5	78.9	278.3	2,320
BNFN 7012-7.5	70	12	72	64.2	3×2.5	111.7	417.5	3,420
BNFN 7020-5	70	20	72.7	62.9	2×2.5	153.9	514.5	3,090
BNFN 8010-2.5	80	10	81.75	75.2	1×2.5	38.9	141.1	1,300
BNFN 8010-5	80	10	81.75	75.2	2×2.5	70.6	283.2	2,530
BNFN 8010-7.5	80	10	81.75	75.2	3×2.5	100	424.3	3,720
BNFN 8012-5	80	12	82.3	74.1	2×2.5	96.5	353.8	2,620
BNFN 8020A-2.5	80	20	82.7	72.9	1×2.5	90.1	294	1,770
BNFN 8020A-5	80	20	82.7	72.9	2×2.5	163.7	589	3,430
BNFN 10020A-2.5	100	20	102.7	92.9	1×2.5	99	368.5	2,110
BNFN 10020A-5	100	20	102.7	92.9	2×2.5	179.3	737	4,080
BNFN 10020A-7.5	100	20	102.7	92.9	3×2.5	253.8	1105.4	6,010



Unit: mm

	Nut dimensions								Screw shaft inertial moment/mm	Nut mass	Shaft mass	Permissible rotational speed
	Outer diameter D	Flange diameter D_1	Overall length L_1	H	B_1	PCD	$d_1\times d_2\times h$	Lubrication hole A	kg·m²/mm	kg	kg/m	min^{-1}
	125	167	141	18	123	145	11×17.5×11	Rc1/8 (PT1/8)	1.85×10^{-5}	9.19	27.4	970
	125	167	201	18	183	145	11×17.5×11		1.85×10^{-5}	12.57	27.4	970
	125	167	261	18	243	145	11×17.5×11		1.85×10^{-5}	15.96	27.4	970
	128	170	165	18	147	148	11×17.5×11		1.85×10^{-5}	11.26	27.24	970
	128	170	237	18	219	148	11×17.5×11		1.85×10^{-5}	15.63	27.24	970
	128	170	309	18	291	148	11×17.5×11		1.85×10^{-5}	20	27.24	970
	130	186	325	28	297	158	18×26×17.5		1.85×10^{-5}	23.4	27	960
	130	176	137	22	115	152	14×20×13		3.16×10^{-5}	9.15	36.26	850
	130	176	197	22	175	152	14×20×13		3.16×10^{-5}	12.41	36.26	850
	130	176	257	22	235	152	14×20×13		3.16×10^{-5}	15.67	36.26	850
	135	181	231	22	209	157	14×20×13		3.16×10^{-5}	16.02	35.26	850
	143	204	227	28	199	172	18×26×17.5		3.16×10^{-5}	20.08	35.81	840
	143	204	347	28	319	172	18×26×17.5		3.16×10^{-5}	28.97	35.81	840
	170	243	231	32	199	205	22×32×21.5		7.71×10^{-5}	28.15	57.13	680
	170	243	351	32	319	205	22×32×21.5		7.71×10^{-5}	39.99	57.13	680
	170	243	471	32	439	205	22×32×21.5		7.71×10^{-5}	51.84	57.13	680

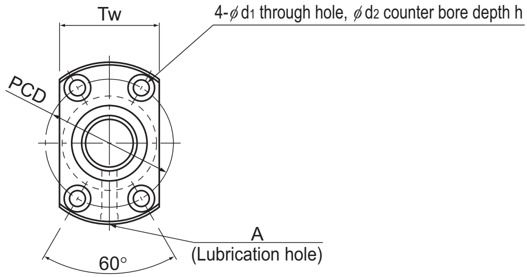
Note: The overall length of the nut will increase when equipping the QZ Lubricator. See A **15-366** for further details.

Ball Screw

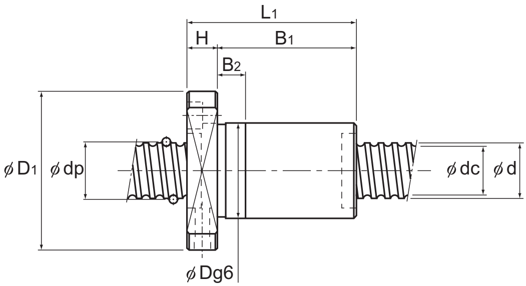
Options⇒A15-355

DIK
With Preload

DN value	70,000



Model No.	Screw shaft outer diameter d	Lead Ph	Ball center-to-center diameter dp	Thread minor diameter dc	No. of loaded circuits Rows × turns	Basic load rating Ca kN	Basic load rating C_0a kN	Rigidity K N/μm
DIK 1404-4	14	4	14.5	11.8	2×1	3	5.1	190
DIK 1404-6	14	4	14.5	11.8	3×1	4.2	7.7	280
DIK 1605-6	16	5	16.75	13.2	3×1	7.4	13	310
DIK 2004-6	20	4	20.5	17.8	3×1	5.2	11.6	380
DIK 2004-8	20	4	20.5	17.8	4×1	6.6	15.5	510
DIK 2005-6	20	5	20.75	17.2	3×1	8.5	17.3	310
DIK 2006-6	20	6	21	16.4	3×1	11.4	21.5	410
DIK 2008-4	20	8	21	16.4	2×1	8.1	14.4	280
DIK 2504-6	25	4	25.5	22.8	3×1	5.7	15	470
DIK 2504-8	25	4	25.5	22.8	4×1	7.4	19.9	620
DIK 2505-6	25	5	25.75	22.2	3×1	9.7	22.6	490
DIK 2506-4	25	6	26	21.4	2×1	9.1	18	330
DIK 2506-6	25	6	26	21.4	3×1	12.8	27	490
DIK 2508-4	25	8	26	21.4	2×1	9.2	18.8	340
DIK 2508-6	25	8	26	21.4	3×1	13.1	28.1	500
DIK 2510-4	25	10	26	21.6	2×1	9	18	330



Unit: mm

Nut dimensions										Screw shaft inertial moment/mm	Nut mass	Shaft mass	Permissible rotational speed
Outer diameter D	Flange diameter D_1	Overall length L_1	H	B_1	B_2	PCD	$d_1 \times d_2 \times h$	Tw	Lubrication hole A	$kg \cdot m^2/mm$	kg	kg/m	min^{-1}
26	45	48	10	38	10	35	4.5×8×4.5	29	M6	2.96×10^{-8}	0.2	1	4,820
26	45	60	10	50	10	35	4.5×8×4.5	29	M6	2.96×10^{-8}	0.23	1	4,820
30	49	60	10	50	10	39	4.5×8×4.5	31	M6	5.05×10^{-8}	0.3	1.25	4,170
32	56	62	11	51	15	44	5.5×9.5×5.5	35	M6	1.23×10^{-7}	0.34	2.18	3,410
32	56	70	11	59	15	44	5.5×9.5×5.5	35	M6	1.23×10^{-7}	0.37	2.18	3,410
34	58	61	11	50	10	46	5.5×9.5×5.5	36	M6	1.23×10^{-7}	0.38	2.06	3,370
35	58	76	11	65	15	46	5.5×9.5×5.5	36	M6	1.23×10^{-7}	0.48	1.93	3,330
35	58	69	11	58	15	46	5.5×9.5×5.5	36	M6	1.23×10^{-7}	0.45	2.06	3,330
38	63	63	11	52	15	51	5.5×9.5×5.5	39	M6	3.01×10^{-7}	0.43	3.5	2,740
38	63	71	11	60	15	51	5.5×9.5×5.5	39	M6	3.01×10^{-7}	0.47	3.5	2,740
40	63	61	11	50	10	51	5.5×9.5×5.5	41	M6	3.01×10^{-7}	0.47	3.35	2,710
40	63	60	11	49	10	51	5.5×9.5×5.5	41	M6	3.01×10^{-7}	0.46	3.19	2,690
40	63	72	11	61	15	51	5.5×9.5×5.5	41	M6	3.01×10^{-7}	0.54	3.19	2,690
40	63	71	12	59	15	51	5.5×9.5×5.5	41	M6	3.01×10^{-7}	0.54	3.35	2,690
40	63	94	12	82	25	51	5.5×9.5×5.5	41	M6	3.01×10^{-7}	0.68	3.35	2,690
40	63	85	15	70	20	51	5.5×9.5×5.5	41	M6	3.01×10^{-7}	0.65	3.45	2,690

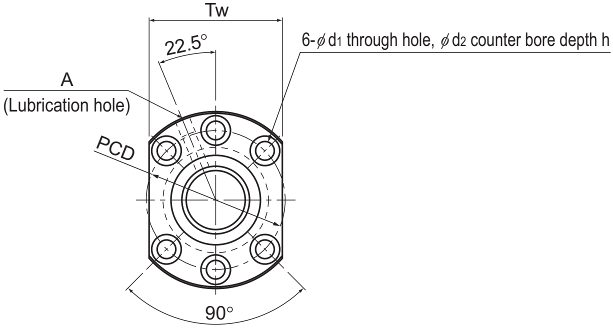
Note: The overall length of the nut will increase when equipping the QZ Lubricator. See **A15-366** for further details.

Options⇒A15-355

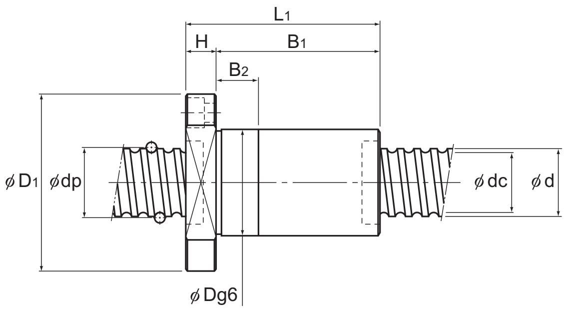
Ball Screw

DIK
With Preload

DN value	70,000



Model No.	Screw shaft outer diameter d	Lead Ph	Ball center-to-center diameter dp	Thread minor diameter dc	No. of loaded circuits Rows × turns	Basic load rating Ca kN	Basic load rating C_0a kN	Rigidity K N/µm
DIK 2805-6	28	5	28.75	25.2	3×1	10.5	26.4	560
DIK 2805-8	28	5	28.75	25.2	4×1	13.4	35.2	730
DIK 2806-6	28	6	29	24.4	3×1	14	32	530
DIK 2810-4	28	10	29.25	23.6	2×1	12.3	25	380
DIK 3204-6	32	4	32.5	30.1	3×1	6.4	19.6	580
DIK 3204-8	32	4	32.5	30.1	4×1	8.2	26.1	760
DIK 3204-10	32	4	32.5	30.1	5×1	10	32.7	940
DIK 3205-6	32	5	32.75	29.2	3×1	11.1	30.2	620
DIK 3205-8	32	5	32.75	29.2	4×1	14.2	40.3	810
DIK 3206-6	32	6	33	28.4	3×1	14.9	37.1	630
DIK 3206-8	32	6	33	28.4	4×1	19.1	49.5	820
DIK 3210-6	32	10	33.75	26.4	3×1	25.7	52.2	600
DIK 3212-4	32	12	33.75	26.4	2×1	18.8	37	430
DIK 3610-6	36	10	37.75	30.5	3×1	28.8	63.8	710
DIK 3610-8	36	10	37.75	30.5	4×1	36.8	85	940
DIK 3610-10	36	10	37.75	30.5	5×1	44.6	106.3	1,160



Unit: mm

	Nut dimensions										Screw shaft inertial moment/mm	Nut mass	Shaft mass	Permissible rotational speed
	Outer diameter D	Flange diameter D_1	Overall length L_1	H	B_1	B_2	PCD	$d_1 \times d_2 \times h$	Tw	Lubrication hole A	kg·m²/mm	kg	kg/m	min^{-1}
	43	71	69	12	57	15	57	6.6×11×6.5	55	M6	4.74×10^{-7}	0.61	4.27	2,430
	43	71	79	12	67	20	57	6.6×11×6.5	55	M6	4.74×10^{-7}	0.68	4.27	2,430
	43	71	73	12	61	15	57	6.6×11×6.5	55	M6	4.74×10^{-7}	0.64	4.36	2,410
	45	71	84	15	69	20	57	6.6×11×6.5	55	M6	4.74×10^{-7}	0.82	4.18	2,390
	45	76	64	11	53	15	63	6.6×11×6.5	59	M6	8.08×10^{-7}	0.57	5.86	2,150
	45	76	72	11	61	15	63	6.6×11×6.5	59	M6	8.08×10^{-7}	0.62	5.86	2,150
	45	76	80	11	69	20	63	6.6×11×6.5	59	M6	8.08×10^{-7}	0.66	5.86	2,150
	46	76	62	12	50	10	63	6.6×11×6.5	59	M6	8.08×10^{-7}	0.6	5.67	2,130
	46	76	73	12	61	15	63	6.6×11×6.5	59	M6	8.08×10^{-7}	0.67	5.67	2,130
	48	76	73	12	61	15	63	6.6×11×6.5	59	M6	8.08×10^{-7}	0.74	6.31	2,120
	48	76	87	12	75	20	63	6.6×11×6.5	59	M6	8.08×10^{-7}	0.85	6.31	2,120
	54	87	110	15	95	25	69	9×14×8.5	66	M6	8.08×10^{-7}	1.57	4.98	2,070
	54	87	98	15	83	25	69	9×14×8.5	66	M6	8.08×10^{-7}	1.43	5.2	2,070
	58	98	122	18	104	30	77	11×17.5×11	75	M6	1.29×10^{-6}	2.03	6.51	1,850
	58	98	143	18	125	35	77	11×17.5×11	75	M6	1.29×10^{-6}	2.3	6.51	1,850
	58	98	164	18	146	45	77	11×17.5×11	75	M6	1.29×10^{-6}	2.57	6.51	1,850

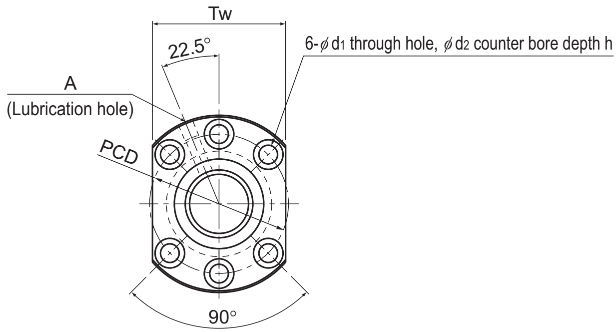
Note: The overall length of the nut will increase when equipping the QZ Lubricator. See A**15-366** for further details.

Options⇒A15-355

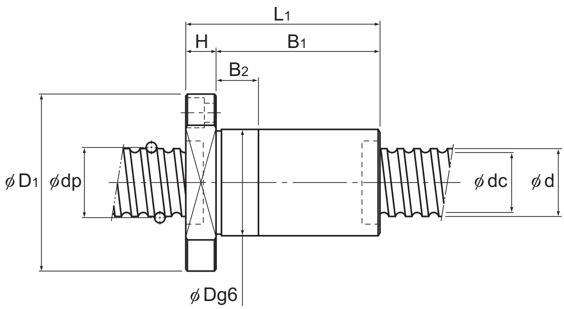
Ball Screw

DIK
With Preload

DN value	70,000



Model No.	Screw shaft outer diameter d	Lead Ph	Ball center-to-center diameter dp	Thread minor diameter dc	No. of loaded circuits Rows × turns	Basic load rating Ca kN	Basic load rating C₀a kN	Rigidity K N/μm
DIK 4010-6	40	10	41.75	34.7	3×1	29.8	69.3	750
DIK 4010-8	40	10	41.75	34.7	4×1	38.1	92.4	1,000
DIK 4012-6	40	12	41.75	34.4	3×1	30.6	72.3	790
DIK 4012-8	40	12	41.75	34.4	4×1	39.2	96.4	1,030
DIK 4016-4	40	16	41.75	34.4	2×1	21.5	68.4	540
DIK 5010-6	50	10	51.75	44.4	3×1	33.9	90.7	940
DIK 5010-8	50	10	51.75	44.4	4×1	43.4	120.5	1,230
DIK 5010-10	50	10	51.75	44.4	5×1	52.5	150.9	1,530
DIK 5012-6	50	12	52.25	43.3	3×1	45.8	113	970
DIK 5012-8	50	12	52.25	43.3	4×1	58.6	150.6	1,270
DIK 5016-4	50	16	52.25	43.3	2×1	32.3	75.5	660
DIK 5016-6	50	16	52.25	43.3	3×1	45.7	113.3	970
DIK 6310-8	63	10	64.75	57.7	4×1	49.5	160.7	1,550
DIK 6312-6	63	12	65.25	56.3	3×1	51.9	147.4	1,200
DIK 6312-8	63	12	65.25	56.3	4×1	66.4	196.6	1,570



Unit: mm

	Nut dimensions										Screw shaft inertial moment/mm	Nut mass	Shaft mass	Permissible rotational speed
	Outer diameter D	Flange diameter D_1	Overall length L_1	H	B_1	B_2	PCD	$d_1 \times d_2 \times h$	Tw	Lubrication hole A	kg·m²/mm	kg	kg/m	min^{-1}
	62	104	113	18	95	25	82	11×17.5×11	79		1.97×10^{-6}	2.09	8.22	1,670
	62	104	137	18	119	35	82	11×17.5×11	79		1.97×10^{-6}	2.42	8.22	1,670
	62	104	138	18	120	35	82	11×17.5×11	79		1.97×10^{-6}	2.44	8.5	1,670
	62	104	163	18	145	45	82	11×17.5×11	79		1.97×10^{-6}	2.78	8.5	1,670
	62	104	120	18	102	30	82	11×17.5×11	79		1.97×10^{-6}	2.19	8.83	1,670
	72	123	114	18	96	30	101	11×17.5×11	92		4.82×10^{-6}	2.65	13.38	1,350
	72	123	137	18	119	35	101	11×17.5×11	92		4.82×10^{-6}	3.03	13.38	1,350
	72	123	160	18	142	45	101	11×17.5×11	92	Rc1/8 (PT1/8)	4.82×10^{-6}	3.41	13.38	1,350
	75	129	145	22	123	35	105	14×20×13	98		4.82×10^{-6}	3.83	12.74	1,330
	75	129	170	22	148	45	105	14×20×13	98		4.82×10^{-6}	4.31	12.74	1,330
	75	129	129	22	107	30	105	14×20×13	98		4.82×10^{-6}	3.52	13.41	1,330
	75	129	175	22	153	45	105	14×20×13	98		4.82×10^{-6}	4.41	13.41	1,330
	85	146	141	22	119	35	122	14×20×13	110		1.21×10^{-5}	4.16	21.93	1,080
	90	146	146	22	124	35	122	14×20×13	110		1.21×10^{-5}	4.93	21.14	1,070
	90	146	171	22	149	45	122	14×20×13	110		1.21×10^{-5}	5.56	21.14	1,070

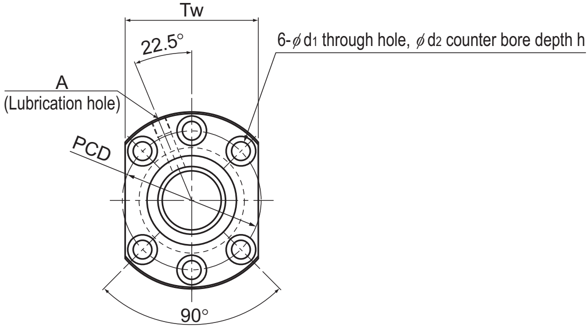
Note: The overall length of the nut will increase when equipping the QZ Lubricator. See A **15-366** for further details.

Ball Screw

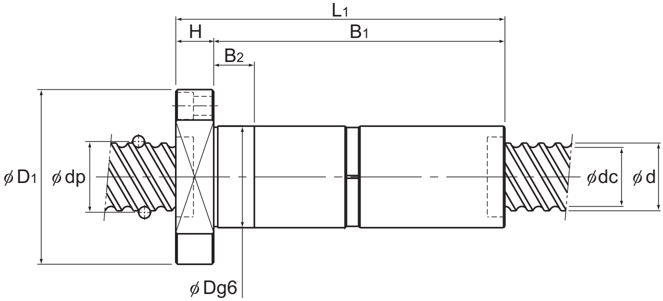
Options⇒A 15-355

DKN
With Preload

DN value	70,000



Model No.	Screw shaft outer diameter	Lead	Ball center-to-center diameter	Thread minor diameter	No. of loaded circuits	Basic load rating		Rigidity			
						Ca	C_0a	K	Outer diameter	Flange diameter	Overall length
	d	Ph	dp	dc	Rows × turns	kN	kN	N/μm	D	D_1	L_1
DKN 4020-3	40	20	41.75	34.7	3×1	29.4	69.3	750	62	104	223
DKN 5020-3	50	20	52.25	43.6	3×1	44.2	108.8	930	75	129	243
DKN 6320-3	63	20	65.7	55.9	3×1	83.5	229.3	1470	95	159	243



Unit: mm

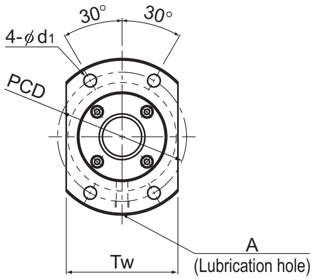
Nut dimensions							Screw shaft inertial moment/mm	Nut mass	Shaft mass	Permissible rotational speed
H	B_1	B_2	PCD	$d_1 \times d_2 \times h$	Tw	Lubrication hole A	kg·m²/mm	kg	kg/m	min^{-1}
18	205	25	82	11×17.5×11	79	Rc1/8 (PT1/8)	1.97×10^{-6}	3.61	9.03	1,670
28	215	30	105	14×20×13	98		4.82×10^{-6}	6.0	13.8	1,330
28	215	30	129	18×26×17.5	121		1.21×10^{-6}	9.5	20.85	1,060

Note: The overall length of the nut will increase when equipping the QZ Lubricator. See A15-366 for further details.

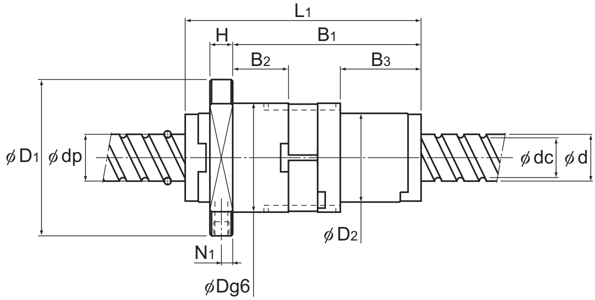
Options⇒A15-355

BLW
With Preload

DN value	70,000



Model No.	Screw shaft outer diameter d	Lead Ph	Ball center-to-center diameter dp	Thread minor diameter dc	No. of loaded circuits Rows X turns	Basic load rating Ca kN	Basic load rating C_0a kN	Rigidity K N/μm	Outer diameter D	Flange diameter D_1	D_2	Overall length L_1	H
BLW 1510-5.6	15	10	15.75	12.5	2×2.8	14.3	27.8	680	43	64	34	89	10
BLW 1616-3.6	16	16	16.65	13.7	2×1.8	7.1	14.3	440	41	60	32	84.5	10
BLW 2020-3.6	20	20	20.75	17.5	2×1.8	11.1	24.7	570	48	69	39	105	10
BLW 2525-3.6	25	25	26	21.9	2×1.8	16.6	38.7	700	57	82	47	124.5	12
BLW 3232-3.6	32	32	33.25	28.3	2×1.8	23.7	59.5	880	68	99	58	155	15
BLW 3636-3.6	36	36	37.4	31.7	2×1.8	30.8	78	980	79	116	66	181	17
BLW 4040-3.6	40	40	41.75	35.2	2×1.8	38.7	99.2	1,090	84	121	73	191	17
BLW 5050-3.6	50	50	52.2	44.1	2×1.8	57.8	155	1,340	106	149	90	245	20



Unit: mm

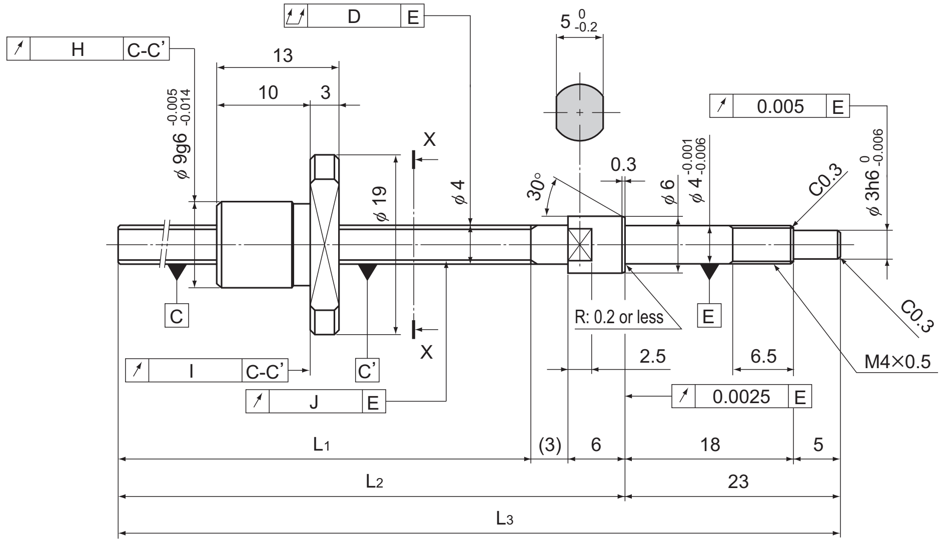
Nut dimensions								Screw shaft inertial moment/mm	Nut mass	Shaft mass	Permissible rotational speed
B_1	B_2	B_3	PCD	d_1	Tw	N_1	Lubrication hole A	kg·m²/mm	kg	kg/m	min^{-1}
69	18.7	28.6	52	5.5	46	5	M6	3.90×10^{-8}	0.81	1.07	4,440
65.5	18.1	27.1	49	4.5	44	6	M6	5.05×10^{-8}	0.67	1.42	4,200
84	25	36	57	5.5	50	5	M6	1.23×10^{-7}	0.54	2.25	3,370
101.5	33	44	68	6.6	60	5	M6	3.01×10^{-7}	0.94	3.52	2,690
127	42.4	55.4	81	9	70	6	M6	8.08×10^{-7}	3.19	5.83	2,100
147.9	49.4	65.4	95	11	82	7	M6	1.29×10^{-6}	5.99	7.34	1,870
158	54.5	70.5	100	11	87	7	M6	1.97×10^{-6}	6.16	9.01	1,670
203.8	70.7	91.7	126	14	108	8	M6	4.82×10^{-6}	9.06	14.08	1,340

Notes: The overall length of the nut will increase when equipping the QZ Lubricator. See A**15-366** for further details.
The Model BLW can be equipped with a brush seal depending on the model number. Contact THK if you would like to use one.

Ball Screw

BNK0401-3 Shaft Diameter: 4; Lead: 1

DN value	70,000



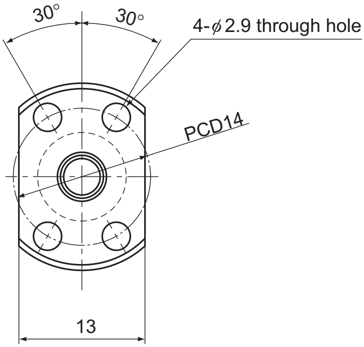
Model No.	Stroke	Screw shaft length		
		L_1	L_2	L_3
BNK 0401-3G0+77LC3Y	20	45	54	77
BNK 0401-3G0+77LC5Y				
BNK 0401-3G2+77LC7Y				
BNK 0401-3G0+97LC3Y	40	65	74	97
BNK 0401-3G0+97LC5Y				
BNK 0401-3G2+97LC7Y				
BNK 0401-3G0+127LC3Y	70	95	104	127
BNK 0401-3G0+127LC5Y				
BNK 0401-3G2+127LC7Y				

Notes: 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, GT clearance is also available as standard.



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 × 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 C_0a (kN)	0.42	0.42	0.42
Preload torque (N·m)	to 9.8×10^{-3}	—	—
Spacer ball	None	None	None
Rigidity value (N/μm)	35		
Circulation method	Deflector		

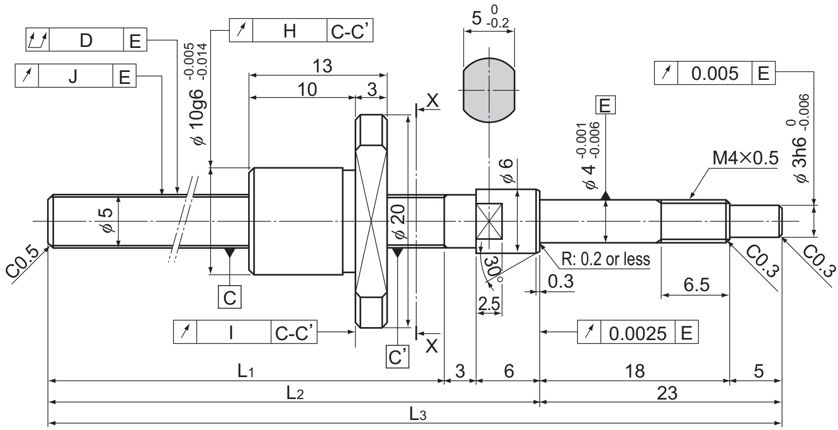
Unit: mm

	Runout of the screw shaft axis D	Runout of the nut circumference H	Flange mounting surface runout I	Runout of the thread groove surface J	Lead angle accuracy		Nut mass kg	Shaft mass kg/m	Permissible rotational speed min^{-1}
					Representative travel distance error	Fluctuation			
	0.015	0.009	0.008	0.008	±0.008	0.008	0.01	0.07	3,500
	0.025	0.012	0.01	0.01	±0.018	0.018	0.01	0.07	3,500
	0.035	0.02	0.014	0.014	Travel distance: ±0.05/300		0.01	0.07	3,500
	0.02	0.009	0.008	0.008	±0.008	0.008	0.01	0.07	3,500
	0.025	0.012	0.01	0.01	±0.018	0.018	0.01	0.07	3,500
	0.035	0.02	0.014	0.014	Travel distance: ±0.05/300		0.01	0.07	3,500
	0.025	0.009	0.008	0.008	±0.008	0.008	0.01	0.07	3,500
	0.035	0.012	0.01	0.01	±0.018	0.018	0.01	0.07	3,500
	0.05	0.02	0.014	0.014	Travel distance: ±0.05/300		0.01	0.07	3,500

Options⇒A15-355

BNK0501-3 Shaft Diameter: 5; Lead: 1

DN value	70,000



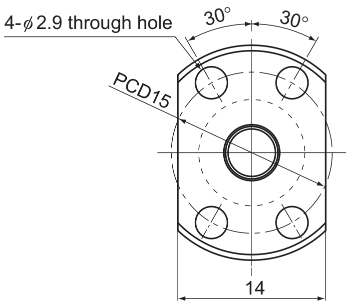
Model No.	Stroke	Screw shaft length		
		L_1	L_2	L_3
BNK 0501-3G0+77LC3Y	20	45	54	77
BNK 0501-3G0+77LC5Y				
BNK 0501-3G2+77LC7Y				
BNK 0501-3G0+97LC3Y	40	65	74	97
BNK 0501-3G0+97LC5Y				
BNK 0501-3G2+97LC7Y				
BNK 0501-3G0+127LC3Y	70	95	104	127
BNK 0501-3G0+127LC5Y				
BNK 0501-3G2+127LC7Y				

Notes: 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, GT clearance is also available as standard.



X-X arrow view

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 × 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 C_0a (kN)	0.55	0.55	0.55
Preload torque (N·m)	to 9.8×10^{-3}	—	—
Spacer ball	None	None	None
Rigidity value (N/μm)	47		
Circulation method	Deflector		

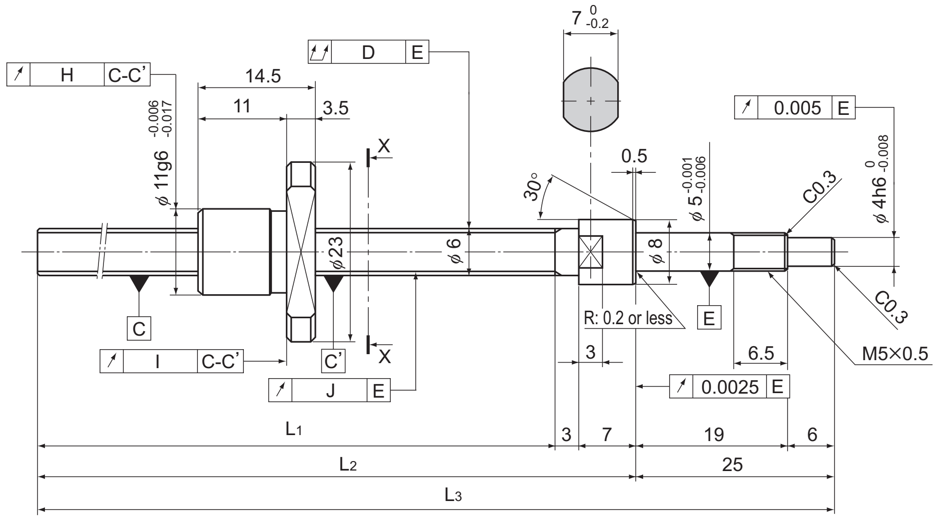
Unit: mm

	Runout of the screw shaft axis	Runout of the nut circumference	Flange mounting surface runout	Runout of the thread groove surface	Lead angle accuracy		Nut mass	Shaft mass	Permissible rotational speed
	D	H	I	J	Representative travel distance error	Fluctuation	kg	kg/m	min^{-1}
	0.015	0.009	0.008	0.008	±0.008	0.008	0.012	0.11	3,500
	0.025	0.012	0.01	0.01	±0.018	0.018	0.012	0.11	3,500
	0.035	0.02	0.014	0.014	Travel distance: ±0.05/300		0.012	0.11	3,500
	0.02	0.009	0.008	0.008	±0.008	0.008	0.012	0.11	3,500
	0.025	0.012	0.01	0.01	±0.018	0.018	0.012	0.11	3,500
	0.035	0.02	0.014	0.014	Travel distance: ±0.05/300		0.012	0.11	3,500
	0.025	0.009	0.008	0.008	±0.008	0.008	0.012	0.11	3,500
	0.035	0.012	0.01	0.01	±0.018	0.018	0.012	0.11	3,500
	0.05	0.02	0.014	0.014	Travel distance: ±0.05/300		0.012	0.11	3,500

Options⇒A15-355

BNK0601-3 Shaft Diameter: 6; Lead: 1

DN value	70,000



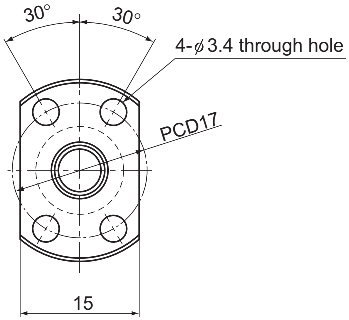
Model No.	Stroke	Screw shaft length		
		L_1	L_2	L_3
BNK 0601-3G0+100LC3Y	40	65	75	100
BNK 0601-3G0+100LC5Y				
BNK 0601-3G2+100LC7Y				
BNK 0601-3G0+130LC3Y	70	95	105	130
BNK 0601-3G0+130LC5Y				
BNK 0601-3G2+130LC7Y				
BNK 0601-3G0+160LC3Y	100	125	135	160
BNK 0601-3G0+160LC5Y				
BNK 0601-3G2+160LC7Y				

Notes: 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, GT clearance is also available as standard.



X-X arrow view

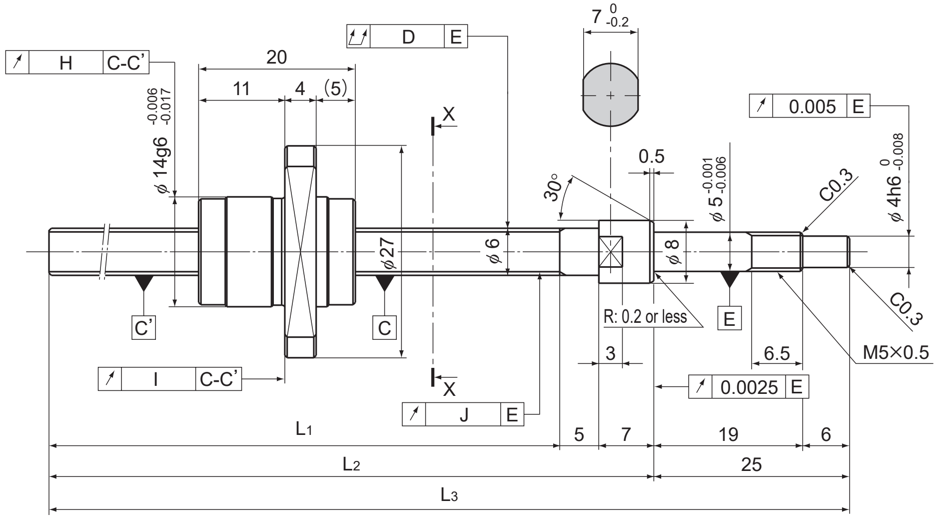
Ball screw specifications			
Lead (mm)	1		
BCD (mm)	6.2		
Thread minor diameter (mm)	5.3		
Threading direction, No. of threaded grooves	Rightward, 1		
No. of circuits	1 turn × 3 rows		
Clearance symbol	G0	GT	G2
Axial clearance (mm)	0	0.005 or less	0.02 or less
Basic dynamic load rating Ca (kN)	0.54	0.54	0.54
Basic static load rating C_0a (kN)	0.94	0.94	0.94
Preload torque (N·m)	to 1.3×10^{-2}	—	—
Spacer ball	None	None	None
Rigidity value (N/μm)	60		
Circulation method	Deflector		

Unit: mm

	Runout of the screw shaft axis	Runout of the nut circumference	Flange mounting surface runout	Runout of the thread groove surface	Lead angle accuracy		Nut mass	Shaft mass	Permissible rotational speed
	D	H	I	J	Representative travel distance error	Fluctuation	kg	kg/m	min^{-1}
	0.015	0.009	0.008	0.008	±0.008	0.008	0.017	0.14	3,500
	0.025	0.012	0.01	0.01	±0.018	0.018	0.017	0.14	3,500
	0.035	0.02	0.014	0.014	Travel distance: ±0.05/300		0.017	0.14	3,500
	0.02	0.009	0.008	0.008	±0.008	0.008	0.017	0.14	3,500
	0.035	0.012	0.01	0.01	±0.018	0.018	0.017	0.14	3,500
	0.05	0.02	0.014	0.014	Travel distance: ±0.05/300		0.017	0.14	3,500
	0.025	0.009	0.008	0.008	±0.01	0.008	0.017	0.14	3,500
	0.035	0.012	0.01	0.01	±0.02	0.018	0.017	0.14	3,500
	0.05	0.02	0.014	0.014	Travel distance: ±0.05/300		0.017	0.14	3,500

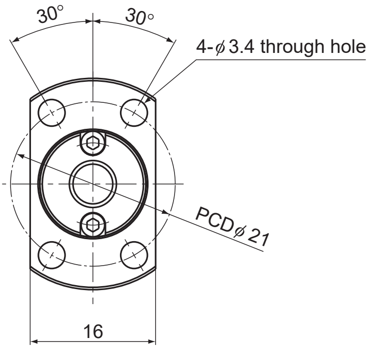
Options⇒A15-355

BNK0608-3 Shaft Diameter: 6; Lead: 8



Model No.	Stroke	Screw shaft length		
		L_1	L_2	L_3
BNK 0608-3GT+130LC5Y	70	93	105	130
BNK 0608-3G2+130LC7Y				
BNK 0608-3GT+160LC5Y	100	123	135	160
BNK 0608-3G2+160LC7Y				

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



X-X arrow view

Ball screw specifications		
Lead (mm)	8	
BCD (mm)	6.3	
Thread minor diameter (mm)	5	
Threading direction, No. of threaded grooves	Rightward, 2	
No. of circuits	1.5 turn × 2 rows	
Clearance symbol	GT	G2
Axial clearance (mm)	0.005 or less	0.02 or less
Basic dynamic load rating Ca (kN)	1.32	1.32
Basic static load rating C_0a (kN)	2.18	2.18
Preload torque (N·m)	—	—
Spacer ball	None	None
Rigidity value (N/μm)	84	
Circulation method	End cap	

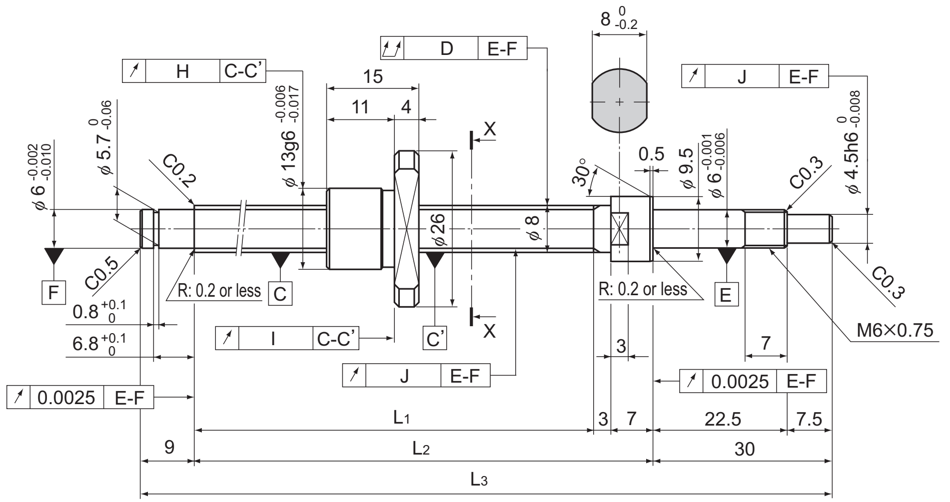
Unit: mm

	Runout of the screw shaft axis	Runout of the nut circumference	Flange mounting surface runout	Runout of the thread groove surface	Lead angle accuracy		Nut mass	Shaft mass	Permissible rotational speed
					Representative travel distance error	Fluctuation			
	D	H	I	J			kg	kg/m	min^{-1}
	0.035	0.012	0.01	0.01	±0.018	0.018	0.025	0.14	5,000
	0.05	0.02	0.014	0.014	Travel distance: ±0.05/300		0.025	0.14	5,000
	0.035	0.012	0.01	0.01	±0.02	0.018	0.025	0.14	5,000
	0.05	0.02	0.014	0.014	Travel distance: ±0.05/300		0.025	0.14	5,000

Options⇒A15-355

BNK0801-3 Shaft Diameter: 8; Lead: 1

DN value	70,000



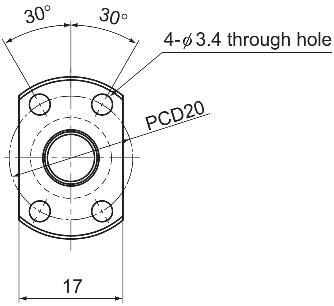
Model No.	Stroke	Screw shaft length		
		L_1	L_2	L_3
BNK 0801-3G0+115LC3Y	40	66	76	115
BNK 0801-3G0+115LC5Y				
BNK 0801-3G2+115LC7Y				
BNK 0801-3G0+145LC3Y	70	96	106	145
BNK 0801-3G0+145LC5Y				
BNK 0801-3G2+145LC7Y				
BNK 0801-3G0+175LC3Y	100	126	136	175
BNK 0801-3G0+175LC5Y				
BNK 0801-3G2+175LC7Y				
BNK 0801-3G0+225LC3Y	150	176	186	225
BNK 0801-3G0+225LC5Y				
BNK 0801-3G2+225LC7Y				

Notes: 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, GT clearance is also available as standard.



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 × 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 C_0a (kN)	1.4	1.4	1.4
Preload torque (N·m)	to 1.8×10^{-2}	—	—
Spacer ball	None	None	None
Rigidity value (N/μm)	80		
Circulation method	Deflector		

Unit: mm

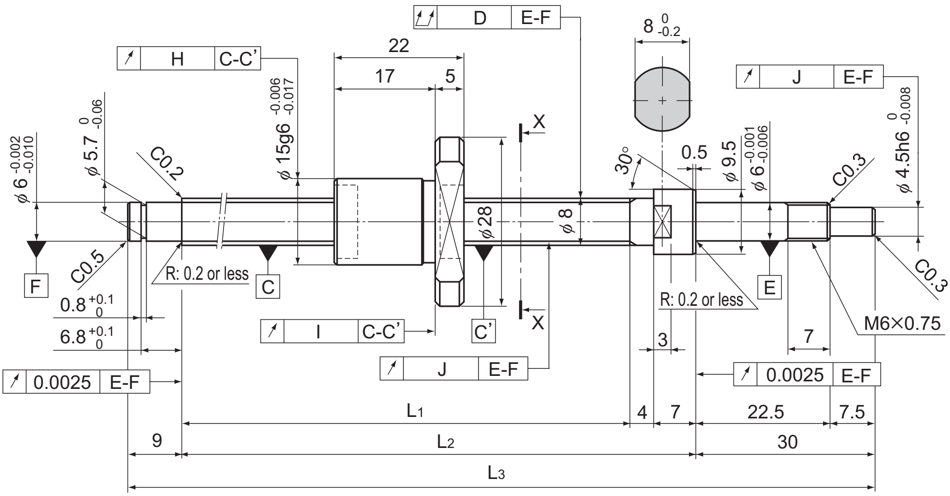
	Runout of the screw shaft axis D	Runout of the nut circumference H	Flange mounting surface runout I	Runout of the thread groove surface J	Lead angle accuracy		Nut mass kg	Shaft mass kg/m	Permissible rotational speed min^{-1}
					Representative travel distance error	Fluctuation			
	0.025	0.009	0.008	0.008	±0.008	0.008	0.024	0.29	3,500
	0.025	0.012	0.01	0.01	±0.018	0.018	0.024	0.29	3,500
	0.035	0.02	0.014	0.014	Travel distance: ±0.05/300		0.024	0.29	3,500
	0.03	0.009	0.008	0.008	±0.008	0.008	0.024	0.29	3,500
	0.035	0.012	0.01	0.01	±0.018	0.018	0.024	0.29	3,500
	0.05	0.02	0.014	0.014	Travel distance: ±0.05/300		0.024	0.29	3,500
	0.03	0.009	0.008	0.008	±0.01	0.008	0.024	0.29	3,500
	0.035	0.012	0.01	0.01	±0.02	0.018	0.024	0.29	3,500
	0.05	0.02	0.014	0.014	Travel distance: ±0.05/300		0.024	0.29	3,500
	0.035	0.009	0.008	0.008	±0.01	0.008	0.024	0.29	3,500
	0.05	0.012	0.01	0.01	±0.02	0.018	0.024	0.29	3,500
	0.065	0.02	0.014	0.014	Travel distance: ±0.05/300		0.024	0.29	3,500

Ball Screw

Options⇒A15-355

BNK0802-3 Shaft Diameter: 8; Lead: 2

DN value	70,000



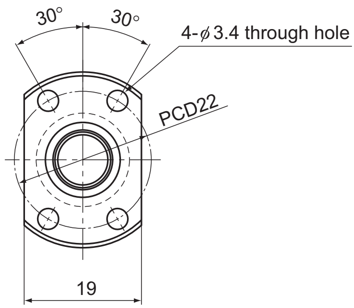
Model No.	Stroke	Screw shaft length		
		L_1	L_2	L_3
BNK 0802-3RRG0+125LC3Y	40	75	86	125
BNK 0802-3RRG0+125LC5Y				
BNK 0802-3RRG2+125LC7Y				
BNK 0802-3RRG0+155LC3Y	70	105	116	155
BNK 0802-3RRG0+155LC5Y				
BNK 0802-3RRG2+155LC7Y				
BNK 0802-3RRG0+185LC3Y	100	135	146	185
BNK 0802-3RRG0+185LC5Y				
BNK 0802-3RRG2+185LC7Y				
BNK 0802-3RRG0+235LC3Y	150	185	196	235
BNK 0802-3RRG0+235LC5Y				
BNK 0802-3RRG2+235LC7Y				

Notes: 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, GT clearance is also available as standard.



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 × 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 C_0a (kN)	2.3	2.3	2.3
Preload torque (N·m)	to 2×10^{-2}	—	—
Spacer ball	None	None	None
Rigidity value (N/μm)	100		
Circulation method	Deflector		

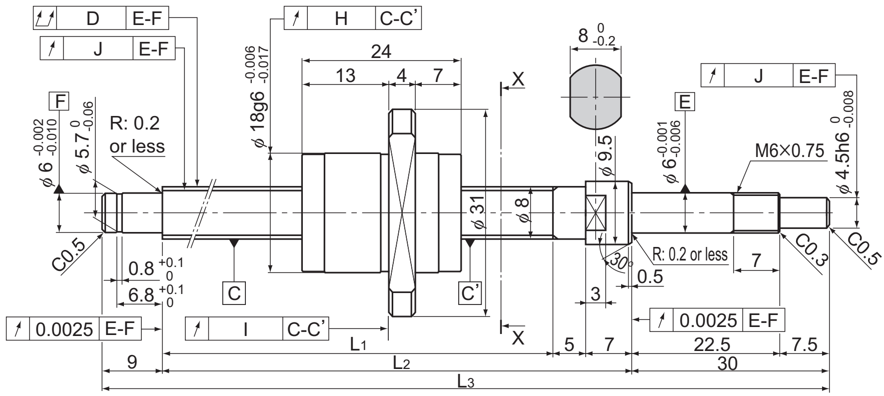
Unit: mm

	Runout of the screw shaft axis D	Runout of the nut circumference H	Flange mounting surface runout I	Runout of the thread groove surface J	Lead angle accuracy		Nut mass kg	Shaft mass kg/m	Permissible rotational speed min^{-1}
					Representative travel distance error	Fluctuation			
	0.025	0.009	0.008	0.008	±0.008	0.008	0.034	0.27	3,500
	0.025	0.012	0.01	0.01	±0.018	0.018	0.034	0.27	3,500
	0.035	0.02	0.014	0.014	Travel distance: ±0.05/300		0.034	0.27	3,500
	0.03	0.009	0.008	0.008	±0.01	0.008	0.034	0.27	3,500
	0.035	0.012	0.01	0.01	±0.02	0.018	0.034	0.27	3,500
	0.05	0.02	0.014	0.014	Travel distance: ±0.05/300		0.034	0.27	3,500
	0.03	0.009	0.008	0.008	±0.01	0.008	0.034	0.27	3,500
	0.035	0.012	0.01	0.01	±0.02	0.018	0.034	0.27	3,500
	0.05	0.02	0.014	0.014	Travel distance: ±0.05/300		0.034	0.27	3,500
	0.035	0.009	0.008	0.008	±0.01	0.008	0.034	0.27	3,500
	0.05	0.012	0.01	0.01	±0.02	0.018	0.034	0.27	3,500
	0.065	0.02	0.014	0.014	Travel distance: ±0.05/300		0.034	0.27	3,500

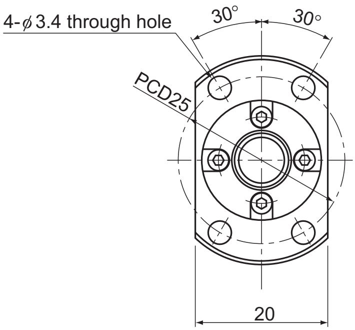
Options⇒A15-355

BNK0810-3 Shaft Diameter: 8; Lead: 10

DN value	70,000



Model No.	Stroke	Screw shaft length		
		L_1	L_2	L_3
BNK 0810-3GT+205LC5Y	100	154	166	205
BNK 0810-3G2+205LC7Y				
BNK 0810-3GT+255LC5Y	150	204	216	255
BNK 0810-3G2+255LC7Y				
BNK 0810-3GT+305LC5Y	200	254	266	305
BNK 0810-3G2+305LC7Y				
BNK 0810-3GT+355LC5Y	250	304	316	355
BNK 0810-3G2+355LC7Y				
BNK 0810-3GT+405LC5Y	300	354	366	405
BNK 0810-3G2+405LC7Y				



X-X arrow view

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 turns × 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 C_0a (kN)	3.82	3.82
Preload torque (N·m)	—	—
Spacer ball	None	None
Rigidity value (N/μm)	100	
Circulation method	End cap	

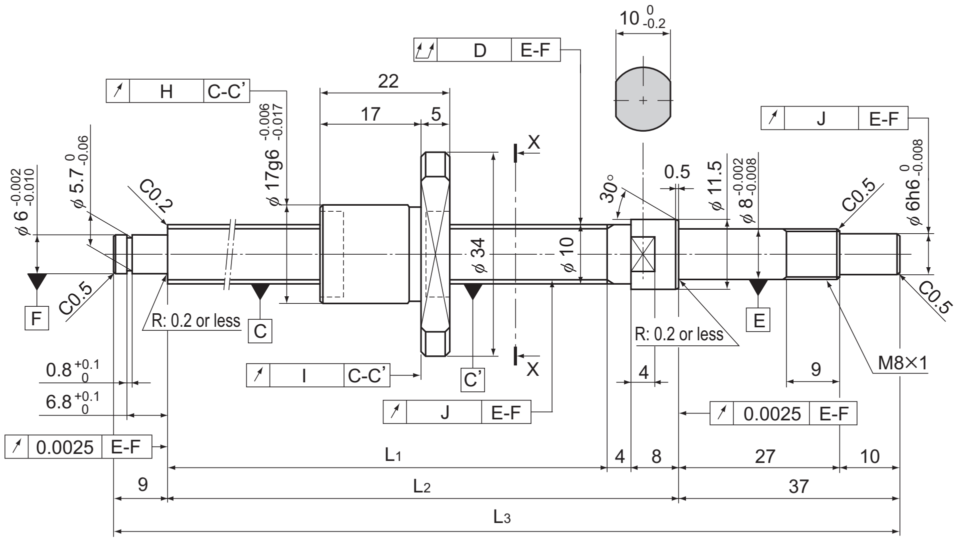
Unit: mm

	Runout of the screw shaft axis D	Runout of the nut circumference H	Flange mounting surface runout I	Runout of the thread groove surface J	Lead angle accuracy		Nut mass kg	Shaft mass kg/m	Permissible rotational speed min^{-1}
					Representative travel distance error	Fluctuation			
	0.05	0.012	0.01	0.01	±0.02	0.018	0.049	0.3	3,500
	0.065	0.02	0.014	0.014	Travel distance: ±0.05/300		0.049	0.3	3,500
	0.05	0.012	0.01	0.01	±0.023	0.018	0.049	0.3	3,500
	0.065	0.02	0.014	0.014	Travel distance: ±0.05/300		0.049	0.3	3,500
	0.05	0.012	0.01	0.01	±0.023	0.018	0.049	0.3	3,500
	0.065	0.02	0.014	0.014	Travel distance: ±0.05/300		0.049	0.3	3,500
	0.06	0.012	0.01	0.01	±0.023	0.018	0.049	0.3	3,500
	0.075	0.02	0.014	0.014	Travel distance: ±0.05/300		0.049	0.3	3,500
	0.07	0.012	0.01	0.01	±0.025	0.018	0.049	0.3	3,500
	0.09	0.02	0.014	0.014	Travel distance: ±0.05/300		0.049	0.3	3,500

Options⇒A15-355

BNK1002-3 Shaft Diameter: 10; Lead: 2

DN value	70,000



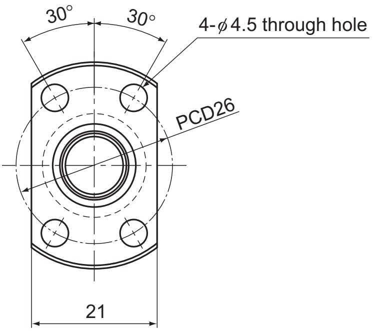
Model No.	Stroke	Screw shaft length		
		L_1	L_2	L_3
BNK 1002-3RRG0+143LC3Y	50	85	97	143
BNK 1002-3RRG0+143LC5Y				
BNK 1002-3RRG2+143LC7Y				
BNK 1002-3RRG0+193LC3Y	100	135	147	193
BNK 1002-3RRG0+193LC5Y				
BNK 1002-3RRG2+193LC7Y				
BNK 1002-3RRG0+243LC3Y	150	185	197	243
BNK 1002-3RRG0+243LC5Y				
BNK 1002-3RRG2+243LC7Y				
BNK 1002-3RRG0+293LC3Y	200	235	247	293
BNK 1002-3RRG0+293LC5Y				
BNK 1002-3RRG2+293LC7Y				

Notes: 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, GT clearance is also available as standard.



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 × 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 C_0a (kN)	2.9	2.9	2.9
Preload torque (N·m)	to 2.5×10^{-2}	—	—
Spacer ball	None	None	None
Rigidity value (N/μm)	100		
Circulation method	Deflector		

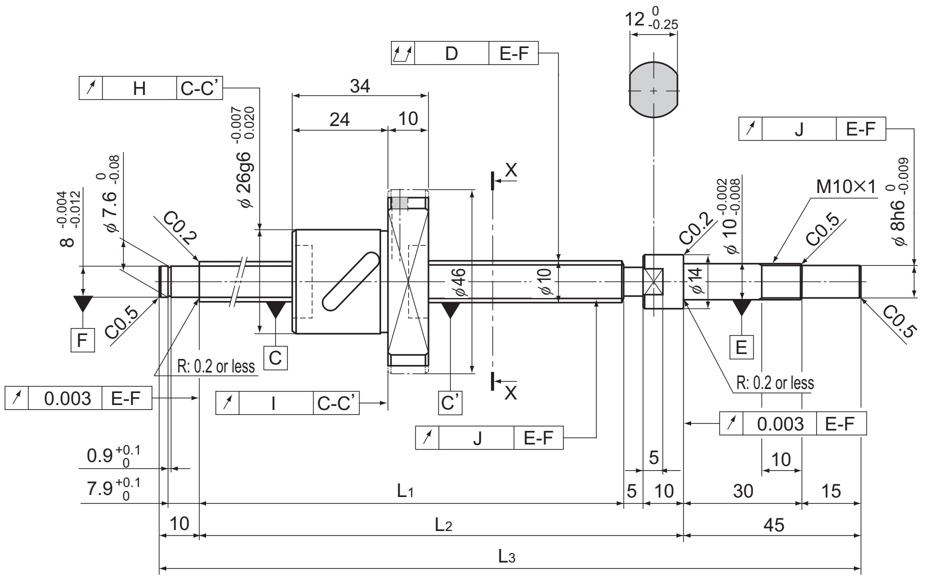
Unit: mm

	Runout of the screw shaft axis D	Runout of the nut circumference H	Flange mounting surface runout I	Runout of the thread groove surface J	Lead angle accuracy		Nut mass kg	Shaft mass kg/m	Permissible rotational speed min^{-1}
					Representative travel distance error	Fluctuation			
	0.02	0.009	0.008	0.007	±0.008	0.008	0.045	0.47	3,500
	0.035	0.012	0.01	0.011	±0.018	0.018	0.045	0.47	3,500
	0.04	0.02	0.014	0.014	Travel distance: ±0.05/300		0.045	0.47	3,500
	0.03	0.009	0.008	0.007	±0.01	0.008	0.045	0.47	3,500
	0.035	0.012	0.01	0.011	±0.02	0.018	0.045	0.47	3,500
	0.04	0.02	0.014	0.014	Travel distance: ±0.05/300		0.045	0.47	3,500
	0.03	0.009	0.008	0.007	±0.01	0.008	0.045	0.47	3,500
	0.04	0.012	0.01	0.011	±0.02	0.018	0.045	0.47	3,500
	0.055	0.02	0.014	0.014	Travel distance: ±0.05/300		0.045	0.47	3,500
	0.03	0.009	0.008	0.007	±0.012	0.008	0.045	0.47	3,500
	0.04	0.012	0.01	0.011	±0.023	0.018	0.045	0.47	3,500
	0.055	0.02	0.014	0.014	Travel distance: ±0.05/300		0.045	0.47	3,500

Options⇒A15-355

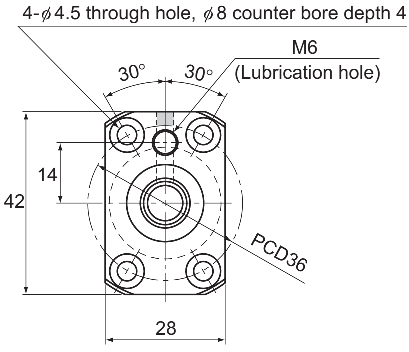
BNK1004-2.5 Shaft Diameter: 10; Lead: 4

DN value	70,000



Model No.	Stroke	Screw shaft length		
		L1	L2	L3
BNK 1004-2.5RRG0+180LC3Y	50	110	125	180
BNK 1004-2.5RRG0+180LC5Y				
BNK 1004-2.5RRG2+180LC7Y				
BNK 1004-2.5RRG0+230LC3Y	100	160	175	230
BNK 1004-2.5RRG0+230LC5Y				
BNK 1004-2.5RRG2+230LC7Y				
BNK 1004-2.5RRG0+280LC3Y	150	210	225	280
BNK 1004-2.5RRG0+280LC5Y				
BNK 1004-2.5RRG2+280LC7Y				
BNK 1004-2.5RRG0+330LC3Y	200	260	275	330
BNK 1004-2.5RRG0+330LC5Y				
BNK 1004-2.5RRG2+330LC7Y				
BNK 1004-2.5RRG0+380LC3Y	250	310	325	380
BNK 1004-2.5RRG0+380LC5Y				
BNK 1004-2.5RRG2+380LC7Y				

Note: For accuracy grades C3 and C5, GT clearance is also available as standard.



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 turns × 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 C_0a (kN)	2.7	5.4	5.4
Preload torque (N·m)	9.8×10^{-3} to 4.9×10^{-2}	—	—
Spacer ball	1 : 1	None	None
Rigidity value (N/μm)	50	100	
Circulation method	Return pipe		

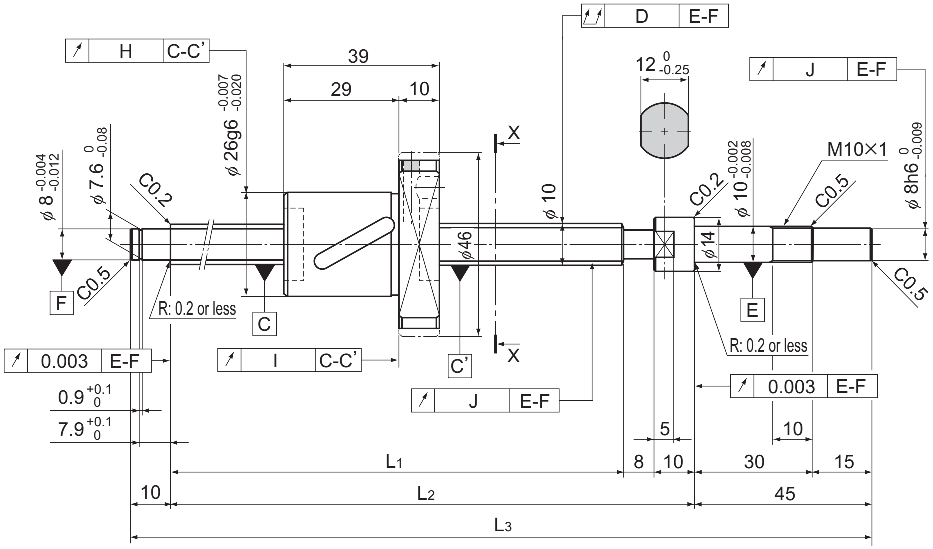
Unit: mm

	Runout of the screw shaft axis D	Runout of the nut circumference H	Flange mounting surface runout I	Runout of the thread groove surface J	Lead angle accuracy: Representative travel distance error	Lead angle accuracy: Fluctuation	Nut mass kg	Shaft mass kg/m	Permissible rotational speed min^{-1}
	0.02	0.009	0.008	0.008	±0.01	0.008	0.15	0.32	5,000
	0.035	0.012	0.01	0.011	±0.02	0.018	0.15	0.32	5,000
	0.04	0.02	0.014	0.014	Travel distance: ±0.05/300		0.15	0.32	5,000
	0.03	0.009	0.008	0.008	±0.01	0.008	0.15	0.32	5,000
	0.04	0.012	0.01	0.011	±0.02	0.018	0.15	0.32	5,000
	0.055	0.02	0.014	0.014	Travel distance: ±0.05/300		0.15	0.32	5,000
	0.03	0.009	0.008	0.008	±0.012	0.008	0.15	0.32	5,000
	0.04	0.012	0.01	0.011	±0.023	0.018	0.15	0.32	5,000
	0.055	0.02	0.014	0.014	Travel distance: ±0.05/300		0.15	0.32	5,000
	0.04	0.009	0.008	0.008	±0.012	0.008	0.15	0.32	5,000
	0.05	0.012	0.01	0.011	±0.023	0.018	0.15	0.32	5,000
	0.065	0.02	0.014	0.014	Travel distance: ±0.05/300		0.15	0.32	5,000
	0.04	0.009	0.008	0.008	±0.012	0.008	0.15	0.32	5,000
	0.05	0.012	0.01	0.011	±0.023	0.018	0.15	0.32	5,000
	0.065	0.02	0.014	0.014	Travel distance: ±0.05/300		0.15	0.32	5,000

Options⇒A15-355

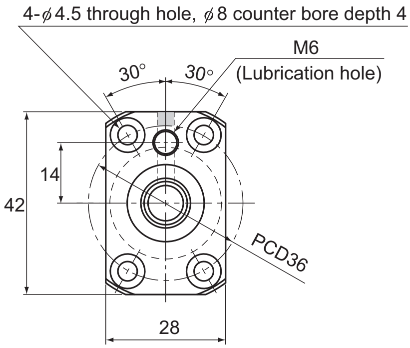
BNK1010-1.5 Shaft Diameter: 10; Lead: 10

DN value	70,000



Model No.	Stroke	Screw shaft length		
		L_1	L_2	L_3
BNK 1010-1.5RRG0+240LC5Y	100	167	185	240
BNK 1010-1.5RRG2+240LC7Y				
BNK 1010-1.5RRG0+290LC5Y	150	217	235	290
BNK 1010-1.5RRG2+290LC7Y				
BNK 1010-1.5RRG0+340LC5Y	200	267	285	340
BNK 1010-1.5RRG2+340LC7Y				
BNK 1010-1.5RRG0+390LC5Y	250	317	335	390
BNK 1010-1.5RRG2+390LC7Y				
BNK 1010-1.5RRG0+440LC5Y	300	367	385	440
BNK 1010-1.5RRG2+440LC7Y				

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



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 turns × 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 C_0a (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
Rigidity value (N/μm)	70	140	
Circulation method	Return pipe		

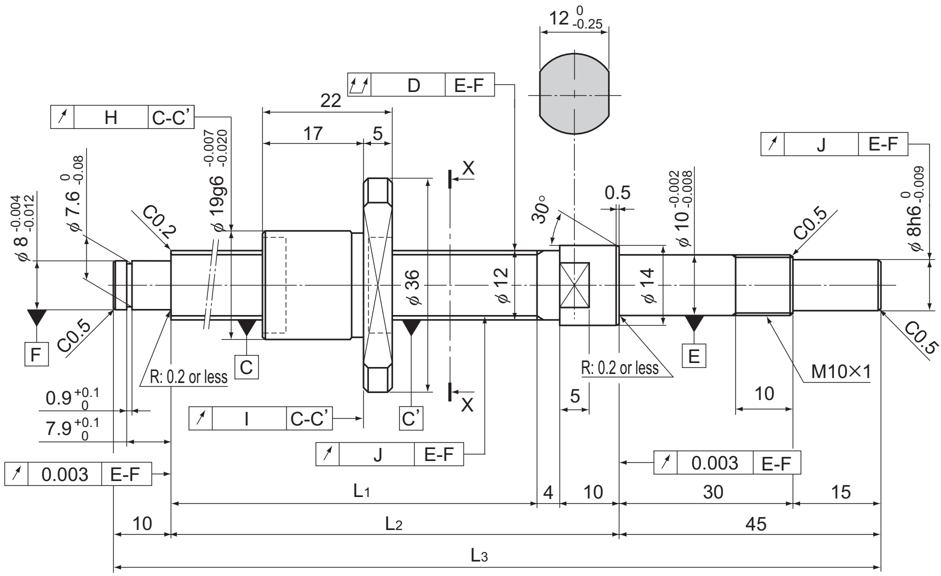
Unit: mm

	Runout of the screw shaft axis D	Runout of the nut circumference H	Flange mounting surface runout I	Runout of the thread groove surface J	Lead angle accuracy: Representative travel distance error	Lead angle accuracy: Fluctuation	Nut mass kg	Shaft mass kg/m	Permissible rotational speed min^{-1}
	0.04	0.012	0.01	0.011	±0.02	0.018	0.17	0.5	5,000
	0.055	0.02	0.014	0.014	Travel distance: ±0.05/300		0.17	0.5	5,000
	0.04	0.012	0.01	0.011	±0.023	0.018	0.17	0.5	5,000
	0.055	0.02	0.014	0.014	Travel distance: ±0.05/300		0.17	0.5	5,000
	0.05	0.012	0.01	0.011	±0.023	0.018	0.17	0.5	5,000
	0.065	0.02	0.014	0.014	Travel distance: ±0.05/300		0.17	0.5	5,000
	0.05	0.012	0.01	0.011	±0.025	0.02	0.17	0.5	5,000
	0.065	0.02	0.014	0.014	Travel distance: ±0.05/300		0.17	0.5	5,000
	0.065	0.012	0.01	0.011	±0.025	0.02	0.17	0.5	5,000
	0.08	0.02	0.014	0.014	Travel distance: ±0.05/300		0.17	0.5	5,000

Options⇒A15-355

BNK1202-3 Shaft Diameter: 12; Lead: 2

DN value	70,000



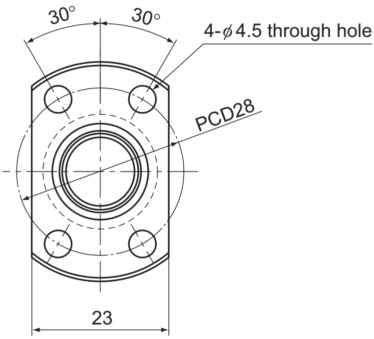
Model No.	Stroke	Screw shaft length		
		L1	L2	L3
BNK 1202-3RRG0+154LC3Y	50	85	99	154
BNK 1202-3RRG0+154LC5Y				
BNK 1202-3RRG2+154LC7Y				
BNK 1202-3RRG0+204LC3Y	100	135	149	204
BNK 1202-3RRG0+204LC5Y				
BNK 1202-3RRG2+204LC7Y				
BNK 1202-3RRG0+254LC3Y	150	185	199	254
BNK 1202-3RRG0+254LC5Y				
BNK 1202-3RRG2+254LC7Y				
BNK 1202-3RRG0+304LC3Y	200	235	249	304
BNK 1202-3RRG0+304LC5Y				
BNK 1202-3RRG2+304LC7Y				
BNK 1202-3RRG0+354LC3Y	250	285	299	354
BNK 1202-3RRG0+354LC5Y				
BNK 1202-3RRG2+354LC7Y				

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, GT clearance is also available as standard.



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 × 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 C_0a (kN)	3.6	3.6	3.6
Preload torque (N·m)	4.0×10^{-3} to 3.4×10^{-2}	—	—
Spacer ball	None	None	None
Rigidity value (N/μm)	120		
Circulation method	Deflector		

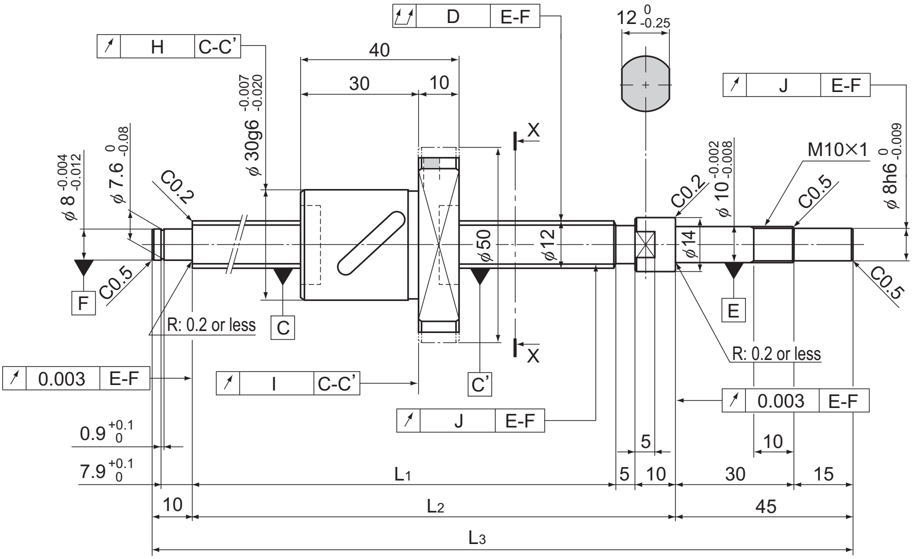
Unit: mm

	Runout of the screw shaft axis	Runout of the nut circumference	Flange mounting surface runout	Runout of the thread groove surface	Lead angle accuracy		Nut mass	Shaft mass	Permissible rotational speed
					Representative travel distance error	Fluctuation			
	D	H	I	J			kg	kg/m	min^{-1}
	0.02	0.01	0.008	0.007	±0.008	0.008	0.05	0.71	3,500
	0.035	0.012	0.01	0.011	±0.018	0.018	0.05	0.71	3,500
	0.04	0.02	0.014	0.014	Travel distance: ±0.05/300		0.05	0.71	3,500
	0.03	0.01	0.008	0.007	±0.01	0.008	0.05	0.71	3,500
	0.04	0.012	0.01	0.011	±0.02	0.018	0.05	0.71	3,500
	0.055	0.02	0.014	0.014	Travel distance: ±0.05/300		0.05	0.71	3,500
	0.03	0.01	0.008	0.007	±0.01	0.008	0.05	0.71	3,500
	0.04	0.012	0.01	0.011	±0.02	0.018	0.05	0.71	3,500
	0.055	0.02	0.014	0.014	Travel distance: ±0.05/300		0.05	0.71	3,500
	0.04	0.01	0.008	0.007	±0.012	0.008	0.05	0.71	3,500
	0.05	0.012	0.01	0.011	±0.023	0.018	0.05	0.71	3,500
	0.055	0.02	0.014	0.014	Travel distance: ±0.05/300		0.05	0.71	3,500
	0.04	0.01	0.008	0.007	±0.012	0.008	0.05	0.71	3,500
	0.05	0.012	0.01	0.011	±0.023	0.018	0.05	0.71	3,500
	0.065	0.02	0.014	0.014	Travel distance: ±0.05/300		0.05	0.71	3,500

Options⇒A15-355

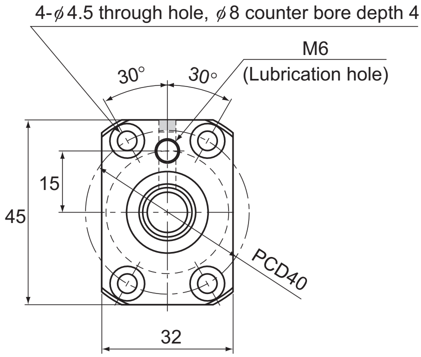
BNK1205-2.5 Shaft Diameter: 12; Lead: 5

DN value	70,000



Model No.	Stroke	Screw shaft length		
		L_1	L_2	L_3
BNK 1205-2.5RRG0+180LC3Y	50	110	125	180
BNK 1205-2.5RRG0+180LC5Y				
BNK 1205-2.5RRG2+180LC7Y				
BNK 1205-2.5RRG0+230LC3Y	100	160	175	230
BNK 1205-2.5RRG0+230LC5Y				
BNK 1205-2.5RRG2+230LC7Y				
BNK 1205-2.5RRG0+280LC3Y	150	210	225	280
BNK 1205-2.5RRG0+280LC5Y				
BNK 1205-2.5RRG2+280LC7Y				
BNK 1205-2.5RRG0+330LC3Y	200	260	275	330
BNK 1205-2.5RRG0+330LC5Y				
BNK 1205-2.5RRG2+330LC7Y				
BNK 1205-2.5RRG0+380LC3Y	250	310	325	380
BNK 1205-2.5RRG0+380LC5Y				
BNK 1205-2.5RRG2+380LC7Y				

Note: For accuracy grades C3 and C5, GT clearance is also available as standard.



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 × 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)	2.3	3.7	3.7
Basic static load rating C_0a (kN)	3.2	6.4	6.4
Preload torque (N·m)	9.8×10^{-3} to 4.9×10^{-2}	—	—
Spacer ball	1 : 1	None	None
Rigidity value (N/μm)	60	120	
Circulation method	Return pipe		

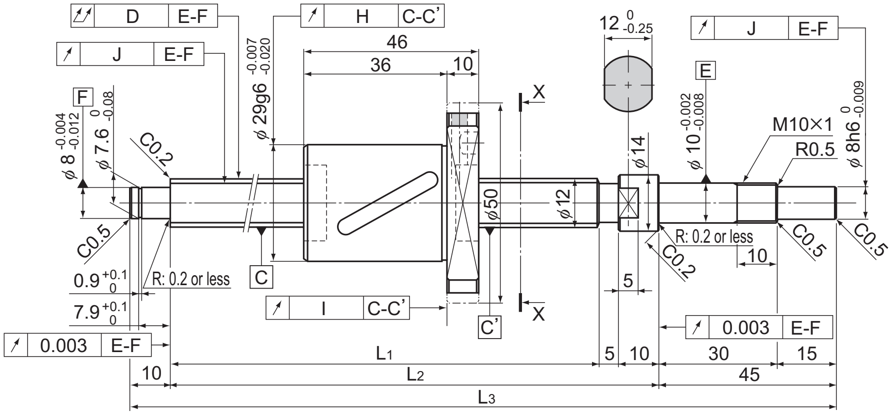
Unit: mm

	Runout of the screw shaft axis D	Runout of the nut circumference H	Flange mounting surface runout I	Runout of the thread groove surface J	Lead angle accuracy: Representative travel distance error	Lead angle accuracy: Fluctuation	Nut mass kg	Shaft mass kg/m	Permissible rotational speed min^{-1}
	0.02	0.009	0.008	0.008	±0.01	0.008	0.22	0.61	5,000
	0.035	0.012	0.01	0.011	±0.02	0.018	0.22	0.61	5,000
	0.04	0.02	0.014	0.014	Travel distance: ±0.05/300		0.22	0.61	5,000
	0.03	0.009	0.008	0.008	±0.01	0.008	0.22	0.61	5,000
	0.04	0.012	0.01	0.011	±0.02	0.018	0.22	0.61	5,000
	0.055	0.02	0.014	0.014	Travel distance: ±0.05/300		0.22	0.61	5,000
	0.03	0.009	0.008	0.008	±0.012	0.008	0.22	0.61	5,000
	0.04	0.012	0.01	0.011	±0.023	0.018	0.22	0.61	5,000
	0.055	0.02	0.014	0.014	Travel distance: ±0.05/300		0.22	0.61	5,000
	0.04	0.009	0.008	0.008	±0.012	0.008	0.22	0.61	5,000
	0.05	0.012	0.01	0.011	±0.023	0.018	0.22	0.61	5,000
	0.065	0.02	0.014	0.014	Travel distance: ±0.05/300		0.22	0.61	5,000
	0.04	0.009	0.008	0.008	±0.012	0.008	0.22	0.61	5,000
	0.05	0.012	0.01	0.011	±0.023	0.018	0.22	0.61	5,000
	0.065	0.02	0.014	0.014	Travel distance: ±0.05/300		0.22	0.61	5,000

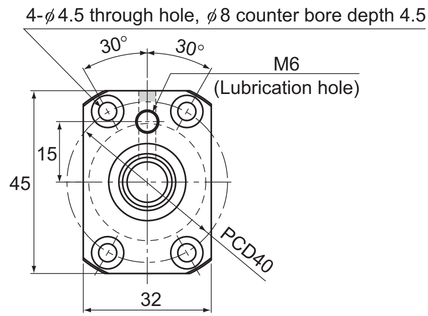
Options⇒A15-355

BNK1208-2.6 Shaft Diameter: 12; Lead: 8

DN value	70,000



Model No.	Stroke	Screw shaft length		
		L_1	L_2	L_3
BNK 1208-2.6RRG2+180LC7Y	50	110	125	180
BNK 1208-2.6RRG2+230LC7Y	100	160	175	230
BNK 1208-2.6RRG2+280LC7Y	150	210	225	280
BNK 1208-2.6RRG2+330LC7Y	200	260	275	330
BNK 1208-2.6RRG2+380LC7Y	250	310	325	380



X-X arrow view

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 × 1 row
Clearance symbol	G2
Axial clearance (mm)	0.02 or less
Basic dynamic load rating Ca (kN)	4.7
Basic static load rating C_0a (kN)	7.5
Preload torque (N·m)	—
Spacer ball	None
Rigidity value (N/µm)	127
Circulation method	Return pipe

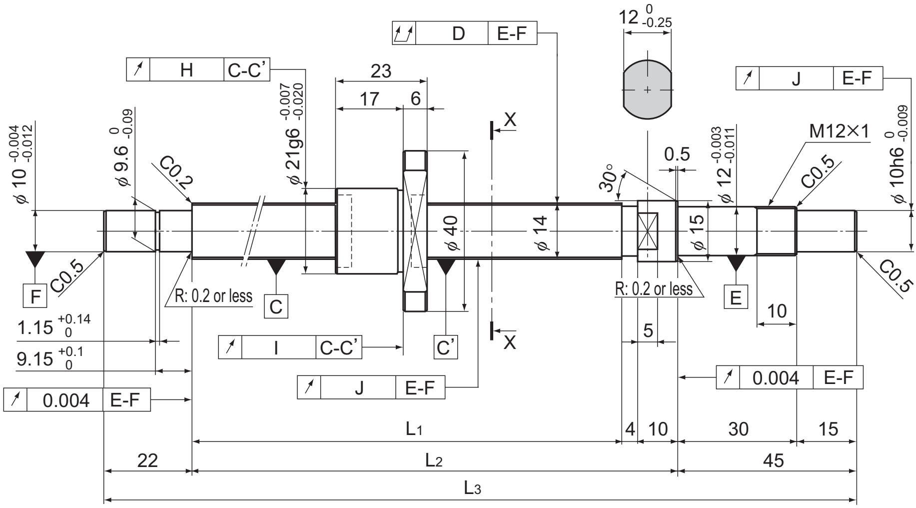
Unit: mm

	Runout of the screw shaft axis D	Runout of the nut circumference H	Flange mounting surface runout I	Runout of the thread groove surface J	Lead angle accuracy	Nut mass kg	Shaft mass kg/m	Permissible rotational speed min^{-1}
	0.04	0.02	0.014	0.014	Travel distance: ±0.05/300	0.27	0.64	3,500
	0.055	0.02	0.014	0.014	Travel distance: ±0.05/300	0.27	0.64	3,500
	0.055	0.02	0.014	0.014	Travel distance: ±0.05/300	0.27	0.64	3,500
	0.065	0.02	0.014	0.014	Travel distance: ±0.05/300	0.27	0.64	3,500
	0.065	0.02	0.014	0.014	Travel distance: ±0.05/300	0.27	0.64	3,500

Options⇒A15-355

BNK1402-3 Shaft Diameter: 14; Lead: 2

DN value	70,000



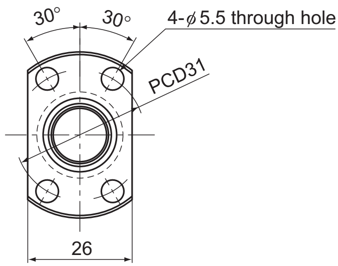
Model No.	Stroke	Screw shaft length		
		L1	L2	L3
BNK 1402-3RRG0+166LC3Y	50	85	99	166
BNK 1402-3RRG0+166LC5Y				
BNK 1402-3RRG2+166LC7Y				
BNK 1402-3RRG0+216LC3Y	100	135	149	216
BNK 1402-3RRG0+216LC5Y				
BNK 1402-3RRG2+216LC7Y				
BNK 1402-3RRG0+266LC3Y	150	185	199	266
BNK 1402-3RRG0+266LC5Y				
BNK 1402-3RRG2+266LC7Y				
BNK 1402-3RRG0+316LC3Y	200	235	249	316
BNK 1402-3RRG0+316LC5Y				
BNK 1402-3RRG2+316LC7Y				
BNK 1402-3RRG0+416LC3Y	300	335	349	416
BNK 1402-3RRG0+416LC5Y				
BNK 1402-3RRG2+416LC7Y				

Notes: 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, GT clearance is also available as standard.



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 × 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 C_0a (kN)	4.3	4.3	4.3
Preload torque (N·m)	4.9×10^{-3} to 4.9×10^{-2}	—	—
Spacer ball	None	None	None
Rigidity value (N/μm)	140		
Circulation method	Deflector		

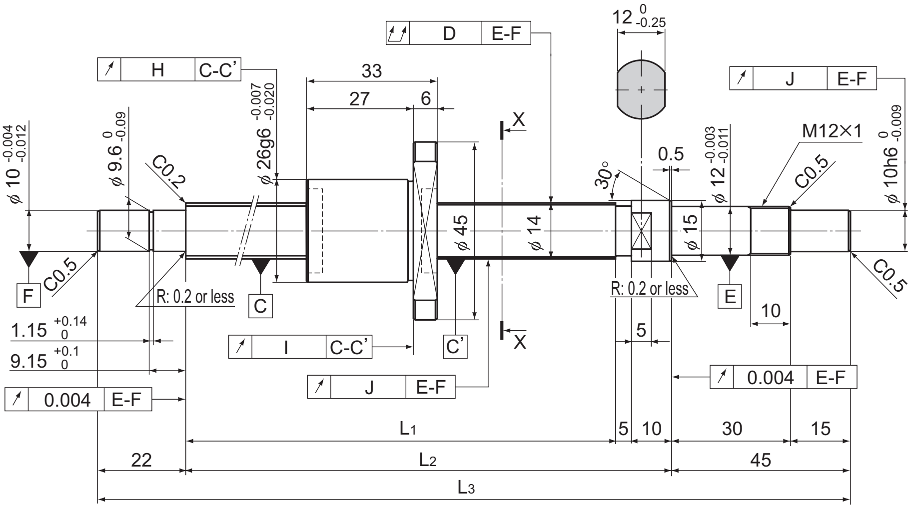
Unit: mm

	Runout of the screw shaft axis	Runout of the nut circumference	Flange mounting surface runout	Runout of the thread groove surface	Lead angle accuracy		Nut mass	Shaft mass	Permissible rotational speed
					Representative travel distance error	Fluctuation			
	D	H	I	J			kg	kg/m	min^{-1}
	0.02	0.01	0.008	0.009	±0.008	0.008	0.15	1	3,500
	0.025	0.012	0.01	0.012	±0.018	0.018	0.15	1	3,500
	0.04	0.02	0.014	0.014	Travel distance: ±0.05/300		0.15	1	3,500
	0.025	0.01	0.008	0.009	±0.01	0.008	0.15	1	3,500
	0.03	0.012	0.01	0.012	±0.02	0.018	0.15	1	3,500
	0.045	0.02	0.014	0.014	Travel distance: ±0.05/300		0.15	1	3,500
	0.025	0.01	0.008	0.009	±0.01	0.008	0.15	1	3,500
	0.03	0.012	0.01	0.012	±0.02	0.018	0.15	1	3,500
	0.045	0.02	0.014	0.014	Travel distance: ±0.05/300		0.15	1	3,500
	0.03	0.01	0.008	0.009	±0.012	0.008	0.15	1	3,500
	0.04	0.012	0.01	0.012	±0.023	0.018	0.15	1	3,500
	0.055	0.02	0.014	0.014	Travel distance: ±0.05/300		0.15	1	3,500
	0.04	0.01	0.008	0.009	±0.013	0.01	0.15	1	3,500
	0.05	0.012	0.01	0.012	±0.025	0.02	0.15	1	3,500
	0.06	0.02	0.014	0.014	Travel distance: ±0.05/300		0.15	1	3,500

Options⇒A15-355

BNK1404-3 Shaft Diameter: 14; Lead: 4

DN value	70,000

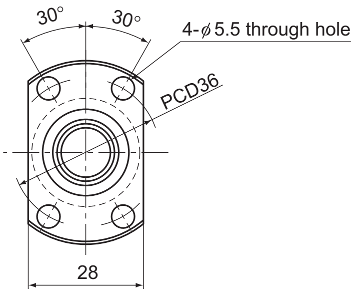


Model No.	Stroke	Screw shaft length		
		L_1	L_2	L_3
BNK 1404-3RRG0+230LC3Y	100	148	163	230
BNK 1404-3RRG0+230LC5Y				
BNK 1404-3RRG2+230LC7Y				
BNK 1404-3RRG0+280LC3Y	150	198	213	280
BNK 1404-3RRG0+280LC5Y				
BNK 1404-3RRG2+280LC7Y				
BNK 1404-3RRG0+330LC3Y	200	248	263	330
BNK 1404-3RRG0+330LC5Y				
BNK 1404-3RRG2+330LC7Y				
BNK 1404-3RRG0+430LC3Y	300	348	363	430
BNK 1404-3RRG0+430LC5Y				
BNK 1404-3RRG2+430LC7Y				
BNK 1404-3RRG0+530LC3Y	400	448	463	530
BNK 1404-3RRG0+530LC5Y				
BNK 1404-3RRG2+530LC7Y				

Notes: 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, GT clearance is also available as standard.



X-X arrow view

Ball screw specifications			
Lead (mm)	4		
BCD (mm)	14.65		
Thread minor diameter (mm)	12.2		
Threading direction, No. of threaded grooves	Rightward, 1		
No. of circuits	1 turn × 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 C_0a (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
Rigidity value (N/μm)	190		
Circulation method	Deflector		

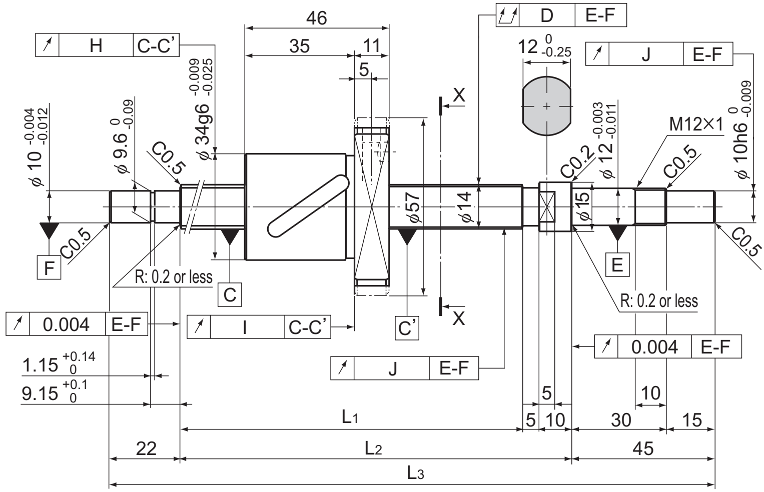
Unit: mm

	Runout of the screw shaft axis D	Runout of the nut circumference H	Flange mounting surface runout I	Runout of the thread groove surface J	Lead angle accuracy: Representative travel distance error	Lead angle accuracy: Fluctuation	Nut mass kg	Shaft mass kg/m	Permissible rotational speed min^{-1}
	0.025	0.01	0.008	0.009	±0.01	0.008	0.13	0.8	3,500
	0.03	0.012	0.01	0.012	±0.02	0.018	0.13	0.8	3,500
	0.045	0.02	0.014	0.014	Travel distance: ±0.05/300		0.13	0.8	3,500
	0.025	0.01	0.008	0.009	±0.01	0.008	0.13	0.8	3,500
	0.03	0.012	0.01	0.012	±0.02	0.018	0.13	0.8	3,500
	0.045	0.02	0.014	0.014	Travel distance: ±0.05/300		0.13	0.8	3,500
	0.03	0.01	0.008	0.009	±0.012	0.008	0.13	0.8	3,500
	0.04	0.012	0.01	0.012	±0.023	0.018	0.13	0.8	3,500
	0.055	0.02	0.014	0.014	Travel distance: ±0.05/300		0.13	0.8	3,500
	0.04	0.01	0.008	0.009	±0.013	0.01	0.13	0.8	3,500
	0.05	0.012	0.01	0.012	±0.025	0.02	0.13	0.8	3,500
	0.06	0.02	0.014	0.014	Travel distance: ±0.05/300		0.13	0.8	3,500
	0.045	0.01	0.008	0.009	±0.015	0.01	0.13	0.8	3,500
	0.055	0.012	0.01	0.012	±0.027	0.02	0.13	0.8	3,500
	0.075	0.02	0.014	0.014	Travel distance: ±0.05/300		0.13	0.8	3,500

Options⇒A15-355

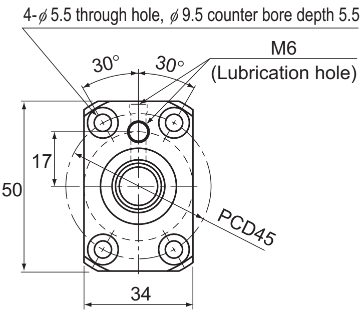
BNK1408-2.5 Shaft Diameter: 14; Lead: 8

DN value	70,000



Model No.	Stroke	Screw shaft length		
		L_1	L_2	L_3
BNK 1408-2.5RRG0+321LC5Y BNK 1408-2.5RRG2+321LC7Y	150	239	254	321
BNK 1408-2.5RRG0+371LC5Y BNK 1408-2.5RRG2+371LC7Y	200	289	304	371
BNK 1408-2.5RRG0+421LC5Y BNK 1408-2.5RRG2+421LC7Y	250	339	354	421
BNK 1408-2.5RRG0+471LC5Y BNK 1408-2.5RRG2+471LC7Y	300	389	404	471
BNK 1408-2.5RRG0+521LC5Y BNK 1408-2.5RRG2+521LC7Y	350	439	454	521
BNK 1408-2.5RRG0+571LC5Y BNK 1408-2.5RRG2+571LC7Y	400	489	504	571
BNK 1408-2.5RRG0+621LC5Y BNK 1408-2.5RRG2+621LC7Y	450	539	554	621
BNK 1408-2.5RRG0+671LC5Y BNK 1408-2.5RRG2+671LC7Y	500	589	604	671
BNK 1408-2.5RRG0+721LC5Y BNK 1408-2.5RRG2+721LC7Y	550	639	654	721
BNK 1408-2.5RRG0+771LC5Y BNK 1408-2.5RRG2+771LC7Y	600	689	704	771
BNK 1408-2.5RRG0+871LC5Y BNK 1408-2.5RRG2+871LC7Y	700	789	804	871

Notes: For accuracy grade C5, GT clearance is also standardized.
Plug the unused lubrication hole before using the product.



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 × 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 C_0a (kN)	5.8	11.5	11.5
Preload torque (N·m)	2×10^{-2} to 7.8×10^{-2}	—	—
Spacer ball	1 : 1	None	None
Rigidity value (N/μm)	80	150	
Circulation method	Return pipe		

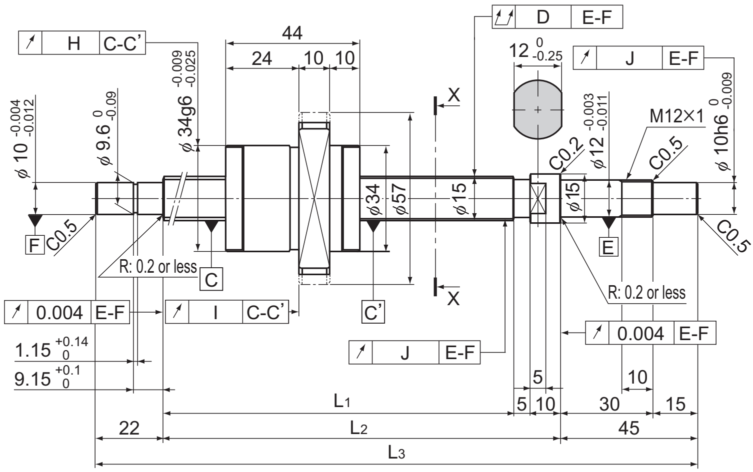
Unit: mm

	Runout of the screw shaft axis D	Runout of the nut circumference H	Flange mounting surface runout I	Runout of the thread groove surface J	Lead angle accuracy: Representative travel distance error	Lead angle accuracy: Fluctuation	Nut mass kg	Shaft mass kg/m	Permissible rotational speed min^{-1}
	0.035	0.015	0.011	0.012	±0.023	0.018	0.29	0.84	4,740
	0.055	0.03	0.018	0.014	Travel distance: ±0.05/300		0.29	0.84	4,740
	0.035	0.015	0.011	0.012	±0.023	0.018	0.29	0.84	4,740
	0.055	0.03	0.018	0.014	Travel distance: ±0.05/300		0.29	0.84	4,740
	0.04	0.015	0.011	0.012	±0.025	0.02	0.29	0.84	4,740
	0.06	0.03	0.018	0.014	Travel distance: ±0.05/300		0.29	0.84	4,740
	0.04	0.015	0.011	0.012	±0.025	0.02	0.29	0.84	4,740
	0.06	0.03	0.018	0.014	Travel distance: ±0.05/300		0.29	0.84	4,740
	0.05	0.015	0.011	0.012	±0.027	0.02	0.29	0.84	4,740
	0.075	0.03	0.018	0.014	Travel distance: ±0.05/300		0.29	0.84	4,740
	0.05	0.015	0.011	0.012	±0.027	0.02	0.29	0.84	4,740
	0.075	0.03	0.018	0.014	Travel distance: ±0.05/300		0.29	0.84	4,740
	0.05	0.015	0.011	0.012	±0.03	0.023	0.29	0.84	4,740
	0.075	0.03	0.018	0.014	Travel distance: ±0.05/300		0.29	0.84	4,740
	0.065	0.015	0.011	0.012	±0.03	0.023	0.29	0.84	4,740
	0.09	0.03	0.018	0.014	Travel distance: ±0.05/300		0.29	0.84	4,740
	0.065	0.015	0.011	0.012	±0.035	0.025	0.29	0.84	4,740
	0.09	0.03	0.018	0.014	Travel distance: ±0.05/300		0.29	0.84	4,740
	0.065	0.015	0.011	0.012	±0.035	0.025	0.29	0.84	4,740
	0.09	0.03	0.018	0.014	Travel distance: ±0.05/300		0.29	0.84	4,740
	0.085	0.015	0.011	0.012	±0.035	0.025	0.29	0.84	4,740
	0.12	0.03	0.018	0.014	Travel distance: ±0.05/300		0.29	0.84	4,740

Options⇒A15-355

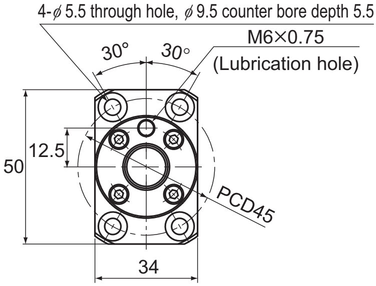
BNK1510-5.6 Shaft Diameter: 15; Lead: 10

DN value	70,000



Model No.	Stroke	Screw shaft length		
		L_1	L_2	L_3
BNK 1510-5.6G0+321LC5Y BNK 1510-5.6G2+321LC7Y	150	239	254	321
BNK 1510-5.6G0+371LC5Y BNK 1510-5.6G2+371LC7Y	200	289	304	371
BNK 1510-5.6G0+421LC5Y BNK 1510-5.6G2+421LC7Y	250	339	354	421
BNK 1510-5.6G0+471LC5Y BNK 1510-5.6G2+471LC7Y	300	389	404	471
BNK 1510-5.6G0+521LC5Y BNK 1510-5.6G2+521LC7Y	350	439	454	521
BNK 1510-5.6G0+571LC5Y BNK 1510-5.6G2+571LC7Y	400	489	504	571
BNK 1510-5.6G0+621LC5Y BNK 1510-5.6G2+621LC7Y	450	539	554	621
BNK 1510-5.6G0+671LC5Y BNK 1510-5.6G2+671LC7Y	500	589	604	671
BNK 1510-5.6G0+721LC5Y BNK 1510-5.6G2+721LC7Y	550	639	654	721
BNK 1510-5.6G0+771LC5Y BNK 1510-5.6G2+771LC7Y	600	689	704	771
BNK 1510-5.6G0+871LC5Y BNK 1510-5.6G2+871LC7Y	700	789	804	871
BNK 1510-5.6G0+971LC5Y BNK 1510-5.6G2+971LC7Y	800	889	904	971

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



X-X arrow view

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 × 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 C_0a (kN)	13.9	27.9	27.9
Preload torque (N·m)	2×10^{-2} to 9.8×10^{-2}	—	—
Spacer ball	1 : 1	None	None
Rigidity value (N/μm)	190	350	
Circulation method	End cap		

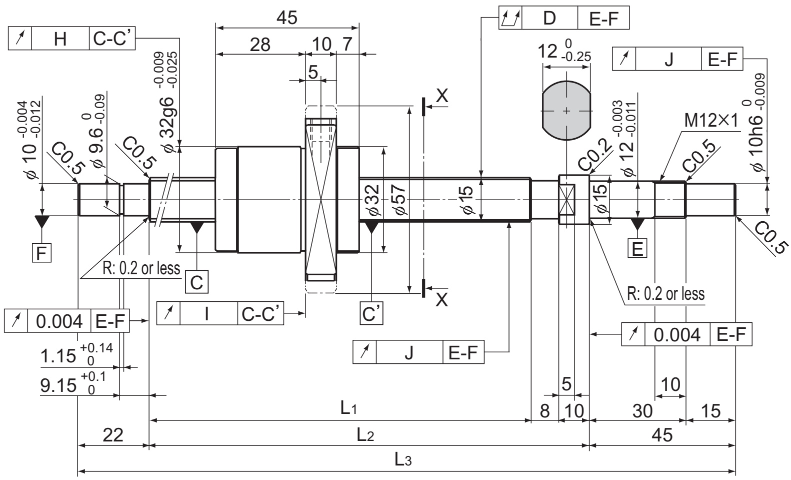
Unit: mm

	Runout of the screw shaft axis D	Runout of the nut circumference H	Flange mounting surface runout I	Runout of the thread groove surface J	Lead angle accuracy: Representative travel distance error	Lead angle accuracy: Fluctuation	Nut mass kg	Shaft mass kg/m	Permissible rotational speed min^{-1}
	0.035	0.015	0.011	0.012	±0.023	0.018	0.22	0.76	4,440
	0.055	0.03	0.018	0.014	Travel distance: ±0.05/300		0.22	0.76	4,440
	0.035	0.015	0.011	0.012	±0.023	0.018	0.22	0.76	4,440
	0.055	0.03	0.018	0.014	Travel distance: ±0.05/300		0.22	0.76	4,440
	0.04	0.015	0.011	0.012	±0.025	0.02	0.22	0.76	4,440
	0.06	0.03	0.018	0.014	Travel distance: ±0.05/300		0.22	0.76	4,440
	0.04	0.015	0.011	0.012	±0.025	0.02	0.22	0.76	4,440
	0.06	0.03	0.018	0.014	Travel distance: ±0.05/300		0.22	0.76	4,440
	0.05	0.015	0.011	0.012	±0.027	0.02	0.22	0.76	4,440
	0.075	0.03	0.018	0.014	Travel distance: ±0.05/300		0.22	0.76	4,440
	0.05	0.015	0.011	0.012	±0.027	0.02	0.22	0.76	4,440
	0.075	0.03	0.018	0.014	Travel distance: ±0.05/300		0.22	0.76	4,440
	0.05	0.015	0.011	0.012	±0.03	0.023	0.22	0.76	4,440
	0.075	0.03	0.018	0.014	Travel distance: ±0.05/300		0.22	0.76	4,440
	0.065	0.015	0.011	0.012	±0.03	0.023	0.22	0.76	4,440
	0.09	0.03	0.018	0.014	Travel distance: ±0.05/300		0.22	0.76	4,440
	0.065	0.015	0.011	0.012	±0.035	0.025	0.22	0.76	4,440
	0.09	0.03	0.018	0.014	Travel distance: ±0.05/300		0.22	0.76	4,440
	0.065	0.015	0.011	0.012	±0.035	0.025	0.22	0.76	4,440
	0.09	0.03	0.018	0.014	Travel distance: ±0.05/300		0.22	0.76	4,440
	0.085	0.015	0.011	0.012	±0.035	0.025	0.22	0.76	4,440
	0.12	0.03	0.018	0.014	Travel distance: ±0.05/300		0.22	0.76	4,440
	0.085	0.015	0.011	0.012	±0.04	0.027	0.22	0.76	4,440
	0.12	0.03	0.018	0.014	Travel distance: ±0.05/300		0.22	0.76	4,440

Options⇒A15-355

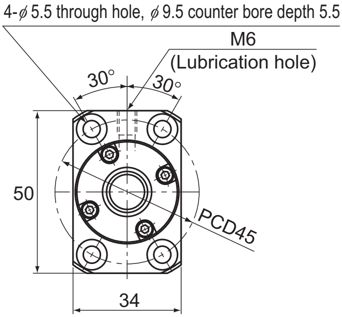
BNK1520-3 Shaft Diameter: 15; Lead: 20

DN value	70,000



Model No.	Stroke	Screw shaft length		
		L_1	L_2	L_3
BNK 1520-3G0+321LC5Y BNK 1520-3G2+321LC7Y	150	236	254	321
BNK 1520-3G0+371LC5Y BNK 1520-3G2+371LC7Y	200	286	304	371
BNK 1520-3G0+421LC5Y BNK 1520-3G2+421LC7Y	250	336	354	421
BNK 1520-3G0+471LC5Y BNK 1520-3G2+471LC7Y	300	386	404	471
BNK 1520-3G0+521LC5Y BNK 1520-3G2+521LC7Y	350	436	454	521
BNK 1520-3G0+571LC5Y BNK 1520-3G2+571LC7Y	400	486	504	571
BNK 1520-3G0+621LC5Y BNK 1520-3G2+621LC7Y	450	536	554	621
BNK 1520-3G0+671LC5Y BNK 1520-3G2+671LC7Y	500	586	604	671
BNK 1520-3G0+721LC5Y BNK 1520-3G2+721LC7Y	550	636	654	721
BNK 1520-3G0+771LC5Y BNK 1520-3G2+771LC7Y	600	686	704	771
BNK 1520-3G0+871LC5Y BNK 1520-3G2+871LC7Y	700	786	804	871
BNK 1520-3G0+971LC5Y BNK 1520-3G2+971LC7Y	800	886	904	971

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



X-X arrow view

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 × 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 C_0a (kN)	7.9	15.8	15.8
Preload torque (N·m)	2×10^{-2} to 8.8×10^{-2}	—	—
Spacer ball	1 : 1	None	None
Rigidity value (N/μm)	110	200	
Circulation method	End cap		

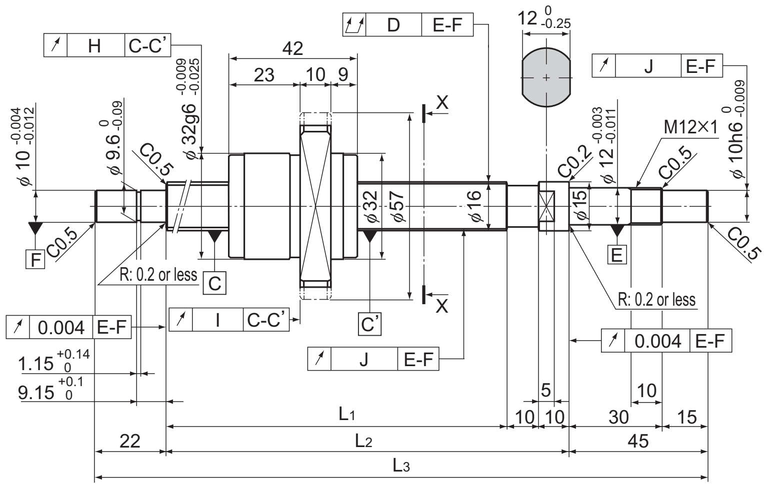
Unit: mm

	Runout of the screw shaft axis D	Runout of the nut circumference H	Flange mounting surface runout I	Runout of the thread groove surface J	Lead angle accuracy: Representative travel distance error	Lead angle accuracy: Fluctuation	Nut mass kg	Shaft mass kg/m	Permissible rotational speed min^{-1}
	0.035	0.015	0.011	0.012	±0.023	0.018	0.32	1.05	4,440
	0.055	0.03	0.018	0.014	Travel distance: ±0.05/300		0.32	1.05	4,440
	0.035	0.015	0.011	0.012	±0.023	0.018	0.32	1.05	4,440
	0.055	0.03	0.018	0.014	Travel distance: ±0.05/300		0.32	1.05	4,440
	0.04	0.015	0.011	0.012	±0.025	0.02	0.32	1.05	4,440
	0.06	0.03	0.018	0.014	Travel distance: ±0.05/300		0.32	1.05	4,440
	0.04	0.015	0.011	0.012	±0.025	0.02	0.32	1.05	4,440
	0.06	0.03	0.018	0.014	Travel distance: ±0.05/300		0.32	1.05	4,440
	0.05	0.015	0.011	0.012	±0.027	0.02	0.32	1.05	4,440
	0.075	0.03	0.018	0.014	Travel distance: ±0.05/300		0.32	1.05	4,440
	0.05	0.015	0.011	0.012	±0.027	0.02	0.32	1.05	4,440
	0.075	0.03	0.018	0.014	Travel distance: ±0.05/300		0.32	1.05	4,440
	0.05	0.015	0.011	0.012	±0.03	0.023	0.32	1.05	4,440
	0.075	0.03	0.018	0.014	Travel distance: ±0.05/300		0.32	1.05	4,440
	0.065	0.015	0.011	0.012	±0.03	0.023	0.32	1.05	4,440
	0.09	0.03	0.018	0.014	Travel distance: ±0.05/300		0.32	1.05	4,440
	0.065	0.015	0.011	0.012	±0.035	0.025	0.32	1.05	4,440
	0.09	0.03	0.018	0.014	Travel distance: ±0.05/300		0.32	1.05	4,440
	0.065	0.015	0.011	0.012	±0.035	0.025	0.32	1.05	4,440
	0.09	0.03	0.018	0.014	Travel distance: ±0.05/300		0.32	1.05	4,440
	0.085	0.015	0.011	0.012	±0.035	0.025	0.32	1.05	4,440
	0.12	0.03	0.018	0.014	Travel distance: ±0.05/300		0.32	1.05	4,440
	0.085	0.015	0.011	0.012	±0.04	0.027	0.32	1.05	4,440
	0.12	0.03	0.018	0.014	Travel distance: ±0.05/300		0.32	1.05	4,440

Options⇒A15-355

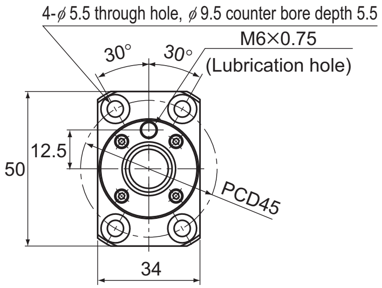
BNK1616-3.6 Shaft Diameter: 16; Lead: 16

DN value	70,000



Model No.	Stroke	Screw shaft length		
		L_1	L_2	L_3
BNK 1616-3.6G0+321LC5Y BNK 1616-3.6G2+321LC7Y	150	234	254	321
BNK 1616-3.6G0+371LC5Y BNK 1616-3.6G2+371LC7Y	200	284	304	371
BNK 1616-3.6G0+421LC5Y BNK 1616-3.6G2+421LC7Y	250	334	354	421
BNK 1616-3.6G0+471LC5Y BNK 1616-3.6G2+471LC7Y	300	384	404	471
BNK 1616-3.6G0+521LC5Y BNK 1616-3.6G2+521LC7Y	350	434	454	521
BNK 1616-3.6G0+571LC5Y BNK 1616-3.6G2+571LC7Y	400	484	504	571
BNK 1616-3.6G0+621LC5Y BNK 1616-3.6G2+621LC7Y	450	534	554	621
BNK 1616-3.6G0+671LC5Y BNK 1616-3.6G2+671LC7Y	500	584	604	671
BNK 1616-3.6G0+721LC5Y BNK 1616-3.6G2+721LC7Y	550	634	654	721
BNK 1616-3.6G0+771LC5Y BNK 1616-3.6G2+771LC7Y	600	684	704	771
BNK 1616-3.6G0+871LC5Y BNK 1616-3.6G2+871LC7Y	700	784	804	871
BNK 1616-3.6G0+971LC5Y BNK 1616-3.6G2+971LC7Y	800	884	904	971

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



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 × 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 C_0a (kN)	7.2	14.3	14.3
Preload torque (N·m)	2×10^{-2} to 9.8×10^{-2}	—	—
Spacer ball	1 : 1	None	None
Rigidity value (N/μm)	120	230	
Circulation method	End cap		

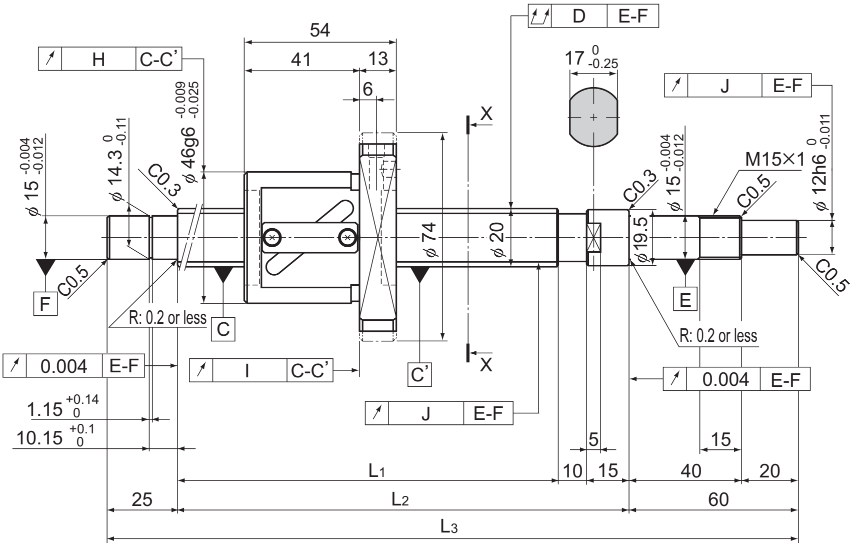
Unit: mm

	Runout of the screw shaft axis	Runout of the nut circumference	Flange mounting surface runout	Runout of the thread groove surface	Lead angle accuracy		Nut mass	Shaft mass	Permissible rotational speed
					Representative travel distance error	Fluctuation			
	D	H	I	J			kg	kg/m	min^{-1}
	0.035	0.015	0.011	0.012	±0.023	0.018	0.2	1.25	4,200
	0.055	0.03	0.018	0.014	Travel distance: ±0.05/300		0.2	1.25	4,200
	0.035	0.015	0.011	0.012	±0.023	0.018	0.2	1.25	4,200
	0.055	0.03	0.018	0.014	Travel distance: ±0.05/300		0.2	1.25	4,200
	0.04	0.015	0.011	0.012	±0.025	0.02	0.2	1.25	4,200
	0.06	0.03	0.018	0.014	Travel distance: ±0.05/300		0.2	1.25	4,200
	0.04	0.015	0.011	0.012	±0.025	0.02	0.2	1.25	4,200
	0.06	0.03	0.018	0.014	Travel distance: ±0.05/300		0.2	1.25	4,200
	0.05	0.015	0.011	0.012	±0.027	0.02	0.2	1.25	4,200
	0.075	0.03	0.018	0.014	Travel distance: ±0.05/300		0.2	1.25	4,200
	0.05	0.015	0.011	0.012	±0.027	0.02	0.2	1.25	4,200
	0.075	0.03	0.018	0.014	Travel distance: ±0.05/300		0.2	1.25	4,200
	0.05	0.015	0.011	0.012	±0.03	0.023	0.2	1.25	4,200
	0.075	0.03	0.018	0.014	Travel distance: ±0.05/300		0.2	1.25	4,200
	0.065	0.015	0.011	0.012	±0.03	0.023	0.2	1.25	4,200
	0.09	0.03	0.018	0.014	Travel distance: ±0.05/300		0.2	1.25	4,200
	0.065	0.015	0.011	0.012	±0.035	0.025	0.2	1.25	4,200
	0.09	0.03	0.018	0.014	Travel distance: ±0.05/300		0.2	1.25	4,200
	0.065	0.015	0.011	0.012	±0.035	0.025	0.2	1.25	4,200
	0.09	0.03	0.018	0.014	Travel distance: ±0.05/300		0.2	1.25	4,200
	0.085	0.015	0.011	0.012	±0.035	0.025	0.2	1.25	4,200
	0.12	0.03	0.018	0.014	Travel distance: ±0.05/300		0.2	1.25	4,200
	0.085	0.015	0.011	0.012	±0.04	0.027	0.2	1.25	4,200
	0.12	0.03	0.018	0.014	Travel distance: ±0.05/300		0.2	1.25	4,200

Options⇒A15-355

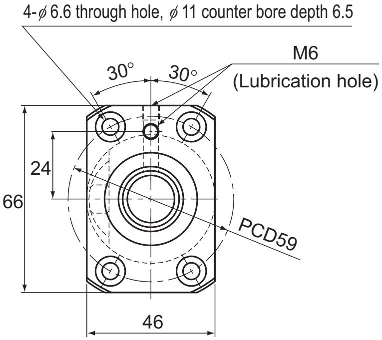
BNK2010-2.5 Shaft Diameter: 20; Lead: 10

DN value	70,000



Model No.	Stroke	Screw shaft length		
		L₁	L₂	L₃
BNK 2010-2.5RRG0+499LC5Y	300	389	414	499
BNK 2010-2.5RRG2+499LC7Y				
BNK 2010-2.5RRG0+599LC5Y	400	489	514	599
BNK 2010-2.5RRG2+599LC7Y				
BNK 2010-2.5RRG0+699LC5Y	500	589	614	699
BNK 2010-2.5RRG2+699LC7Y				
BNK 2010-2.5RRG0+799LC5Y	600	689	714	799
BNK 2010-2.5RRG2+799LC7Y				
BNK 2010-2.5RRG0+899LC5Y	700	789	814	899
BNK 2010-2.5RRG2+899LC7Y				
BNK 2010-2.5RRG0+999LC5Y	800	889	914	999
BNK 2010-2.5RRG2+999LC7Y				
BNK 2010-2.5RRG0+1099LC5Y	900	989	1,014	1,099
BNK 2010-2.5RRG2+1099LC7Y				
BNK 2010-2.5RRG0+1199LC5Y	1,000	1,089	1,114	1,199
BNK 2010-2.5RRG2+1199LC7Y				
BNK 2010-2.5RRG0+1299LC5Y	1,100	1,189	1,214	1,299
BNK 2010-2.5RRG2+1299LC7Y				

Notes: For accuracy grade C5, GT clearance is also standardized.
Plug the unused lubrication hole before using the product.



X-X arrow view

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 × 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 C_0a (kN)	11	22	22
Preload torque (N·m)	2×10^{-2} to 9.8×10^{-2}	—	—
Spacer ball	1 : 1	None	None
Rigidity value (N/μm)	110	210	
Circulation method	Return pipe		

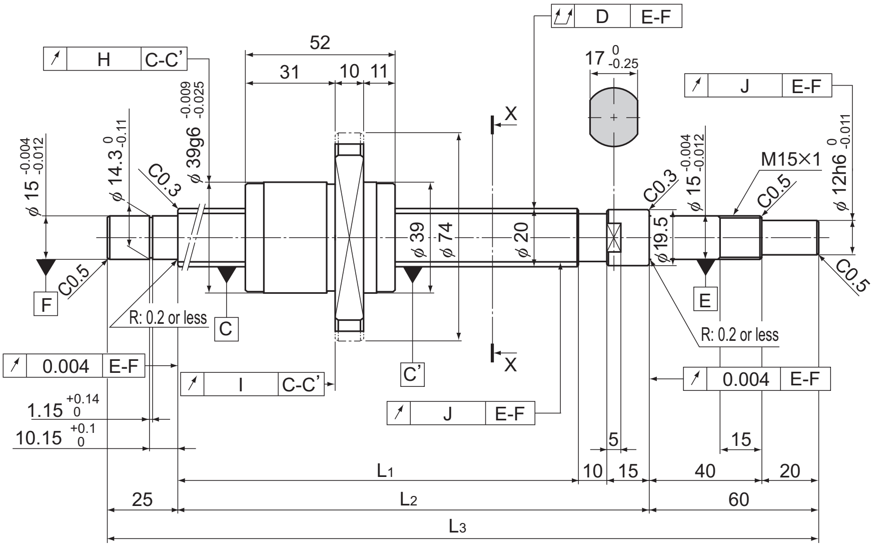
Unit: mm

	Runout of the screw shaft axis	Runout of the nut circumference	Flange mounting surface runout	Runout of the thread groove surface	Lead angle accuracy		Nut mass	Shaft mass	Permissible rotational speed
					Representative travel distance error	Fluctuation			
	D	H	I	J			kg	kg/m	min^{-1}
	0.04	0.015	0.011	0.012	±0.025	0.02	0.58	1.81	3,330
	0.06	0.03	0.018	0.014	Travel distance: ±0.05/300		0.58	1.81	3,330
	0.05	0.015	0.011	0.012	±0.027	0.02	0.58	1.81	3,330
	0.075	0.03	0.018	0.014	Travel distance: ±0.05/300		0.58	1.81	3,330
	0.065	0.015	0.011	0.012	±0.03	0.023	0.58	1.81	3,330
	0.09	0.03	0.018	0.014	Travel distance: ±0.05/300		0.58	1.81	3,330
	0.065	0.015	0.011	0.012	±0.035	0.025	0.58	1.81	3,330
	0.09	0.03	0.018	0.014	Travel distance: ±0.05/300		0.58	1.81	3,330
	0.085	0.015	0.011	0.012	±0.035	0.025	0.58	1.81	3,330
	0.12	0.03	0.018	0.014	Travel distance: ±0.05/300		0.58	1.81	3,330
	0.085	0.015	0.011	0.012	±0.04	0.027	0.58	1.81	3,330
	0.12	0.03	0.018	0.014	Travel distance: ±0.05/300		0.58	1.81	3,330
	0.11	0.015	0.011	0.012	±0.04	0.027	0.58	1.81	3,330
	0.15	0.03	0.018	0.014	Travel distance: ±0.05/300		0.58	1.81	3,330
	0.11	0.015	0.011	0.012	±0.046	0.03	0.58	1.81	3,330
	0.15	0.03	0.018	0.014	Travel distance: ±0.05/300		0.58	1.81	3,330
	0.15	0.015	0.011	0.012	±0.046	0.03	0.58	1.81	3,330
	0.19	0.03	0.018	0.014	Travel distance: ±0.05/300		0.58	1.81	3,330

Options⇒A15-355

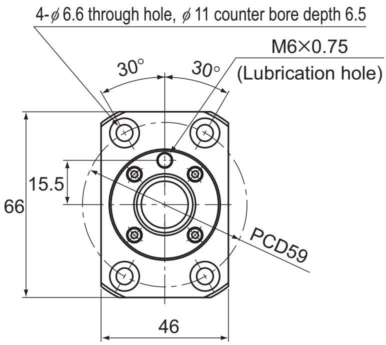
BNK2020-3.6 Shaft Diameter: 20; Lead: 20

DN value	70,000



Model No.	Stroke	Screw shaft length		
		L_1	L_2	L_3
BNK 2020-3.6G0+520LC5Y BNK 2020-3.6G2+520LC7Y	300	410	435	520
BNK 2020-3.6G0+620LC5Y BNK 2020-3.6G2+620LC7Y	400	510	535	620
BNK 2020-3.6G0+720LC5Y BNK 2020-3.6G2+720LC7Y	500	610	635	720
BNK 2020-3.6G0+820LC5Y BNK 2020-3.6G2+820LC7Y	600	710	735	820
BNK 2020-3.6G0+920LC5Y BNK 2020-3.6G2+920LC7Y	700	810	835	920
BNK 2020-3.6G0+1020LC5Y BNK 2020-3.6G2+1020LC7Y	800	910	935	1,020
BNK 2020-3.6G0+1120LC5Y BNK 2020-3.6G2+1120LC7Y	900	1,010	1,035	1,120
BNK 2020-3.6G0+1220LC5Y BNK 2020-3.6G2+1220LC7Y	1,000	1,110	1,135	1,220
BNK 2020-3.6G0+1320LC5Y BNK 2020-3.6G2+1320LC7Y	1,100	1,210	1,235	1,320

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



X-X arrow view

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 × 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 C_0a (kN)	12.3	24.7	24.7
Preload torque (N·m)	2×10^{-2} to 9.8×10^{-2}	—	—
Spacer ball	1 : 1	None	None
Rigidity value (N/μm)	160	290	
Circulation method	End cap		

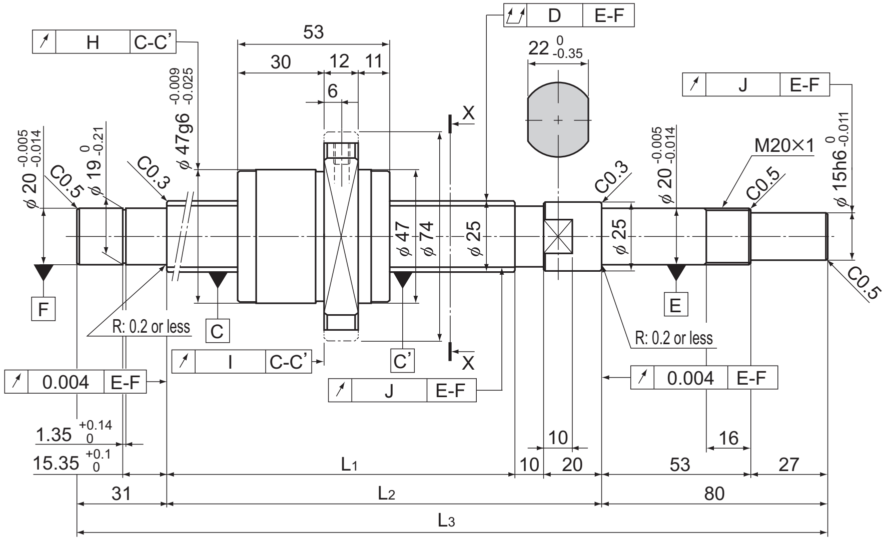
Unit: mm

	Runout of the screw shaft axis	Runout of the nut circumference	Flange mounting surface runout	Runout of the thread groove surface	Lead angle accuracy		Nut mass	Shaft mass	Permissible rotational speed
					Representative travel distance error	Fluctuation			
	D	H	I	J			kg	kg/m	min^{-1}
	0.05	0.015	0.011	0.012	±0.027	0.02	0.39	2.04	3,370
	0.075	0.03	0.018	0.014	Travel distance: ±0.05/300		0.39	2.04	3,370
	0.05	0.015	0.011	0.012	±0.03	0.023	0.39	2.04	3,370
	0.075	0.03	0.018	0.014	Travel distance: ±0.05/300		0.39	2.04	3,370
	0.065	0.015	0.011	0.012	±0.03	0.023	0.39	2.04	3,370
	0.09	0.03	0.018	0.014	Travel distance: ±0.05/300		0.39	2.04	3,370
	0.085	0.015	0.011	0.012	±0.035	0.025	0.39	2.04	3,370
	0.12	0.03	0.018	0.014	Travel distance: ±0.05/300		0.39	2.04	3,370
	0.085	0.015	0.011	0.012	±0.04	0.027	0.39	2.04	3,370
	0.12	0.03	0.018	0.014	Travel distance: ±0.05/300		0.39	2.04	3,370
	0.11	0.015	0.011	0.012	±0.04	0.027	0.39	2.04	3,370
	0.15	0.03	0.018	0.014	Travel distance: ±0.05/300		0.39	2.04	3,370
	0.11	0.015	0.011	0.012	±0.046	0.03	0.39	2.04	3,370
	0.15	0.03	0.018	0.014	Travel distance: ±0.05/300		0.39	2.04	3,370
	0.11	0.015	0.011	0.012	±0.046	0.03	0.39	2.04	3,370
	0.15	0.03	0.018	0.014	Travel distance: ±0.05/300		0.39	2.04	3,370
	0.15	0.015	0.011	0.012	±0.046	0.03	0.39	2.04	3,370
	0.19	0.03	0.018	0.014	Travel distance: ±0.05/300		0.39	2.04	3,370

Options⇒A15-355

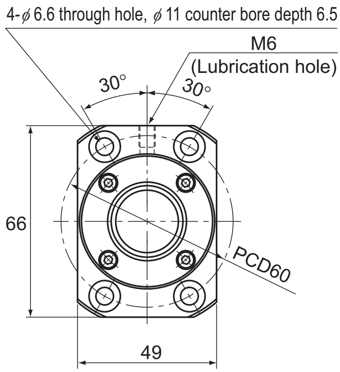
BNK2520-3.6 Shaft Diameter: 25; Lead: 20

DN value	70,000



Model No.	Stroke	Screw shaft length		
		L_1	L_2	L_3
BNK 2520-3.6G0+751LC5Y	500	610	640	751
BNK 2520-3.6G2+751LC7Y				
BNK 2520-3.6G0+851LC5Y	600	710	740	851
BNK 2520-3.6G2+851LC7Y				
BNK 2520-3.6G0+1051LC5Y	800	910	940	1,051
BNK 2520-3.6G2+1051LC7Y				
BNK 2520-3.6G0+1251LC5Y	1,000	1,110	1,140	1,251
BNK 2520-3.6G2+1251LC7Y				
BNK 2520-3.6G0+1451LC5Y	1,200	1,310	1,340	1,451
BNK 2520-3.6G2+1451LC7Y				
BNK 2520-3.6G0+1651LC5Y	1,400	1,510	1,540	1,651
BNK 2520-3.6G2+1651LC7Y				
BNK 2520-3.6G0+1851LC5Y	1,600	1,710	1,740	1,851
BNK 2520-3.6G2+1851LC7Y				

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



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 × 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 C_0a (kN)	19	38	38
Preload torque (N·m)	4.9×10^{-2} to 2.2×10^{-1}	—	—
Spacer ball	1 : 1	None	None
Rigidity value (N/μm)	190	360	
Circulation method	End cap		

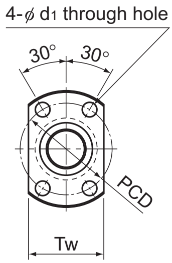
Unit: mm

Runout of the screw shaft axis D	Runout of the nut circumference H	Flange mounting surface runout I	Runout of the thread groove surface J	Lead angle accuracy: Representative travel distance error	Lead angle accuracy: Fluctuation	Nut mass kg	Shaft mass kg/m	Permissible rotational speed min^{-1}
0.055	0.015	0.011	0.013	±0.03	0.023	0.53	3.03	2,690
0.07	0.03	0.018	0.02	Travel distance: ±0.05/300		0.53	3.03	2,690
0.065	0.015	0.011	0.013	±0.035	0.025	0.53	3.03	2,690
0.085	0.03	0.018	0.02	Travel distance: ±0.05/300		0.53	3.03	2,690
0.085	0.015	0.011	0.013	±0.04	0.027	0.53	3.03	2,690
0.1	0.03	0.018	0.02	Travel distance: ±0.05/300		0.53	3.03	2,690
0.11	0.015	0.011	0.013	±0.046	0.03	0.53	3.03	2,690
0.13	0.03	0.018	0.02	Travel distance: ±0.05/300		0.53	3.03	2,690
0.11	0.015	0.011	0.013	±0.054	0.035	0.53	3.03	2,690
0.13	0.03	0.018	0.02	Travel distance: ±0.05/300		0.53	3.03	2,690
0.14	0.015	0.011	0.013	±0.054	0.035	0.53	3.03	2,690
0.17	0.03	0.018	0.02	Travel distance: ±0.05/300		0.53	3.03	2,690
0.14	0.015	0.011	0.013	±0.065	0.04	0.53	3.03	2,690
0.17	0.03	0.018	0.02	Travel distance: ±0.05/300		0.53	3.03	2,690

Options⇒A15-355

MDK (Unfinished Shaft Ends) No Preload

DN value	70,000



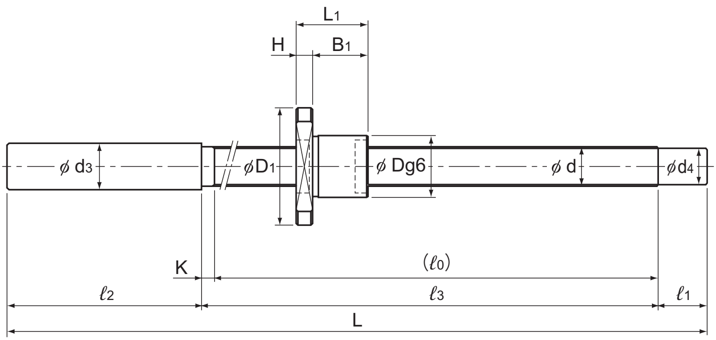
Model No.	Ball screw specifications							Nut			
	Screw shaft outer diameter	Lead	Ball center-to-center diameter	Thread minor diameter	No. of loaded circuits	Basic load rating		Outer diameter	Flange diameter	Overall length	
						Ca	C_0a				
	d	Ph	dp	dc	Rows × turns	kN	kN	D	D_1	L_1	H
MDK 0401-3	4	1	4.15	3.4	3×1	0.29	0.42	9	19	13	3
MDK 0601-3	6	1	6.2	5.3	3×1	0.54	0.94	11	23	14.5	3.5
MDK 0801-3	8	1	8.2	7.3	3×1	0.64	1.4	13	26	15	4
MDK 0802-3	8	2	8.3	7	3×1	1.4	2.3	15	28	22	5
MDK 1002-3	10	2	10.3	9	3×1	1.5	2.9	17	34	22	5

Model number coding

MDK0401-3 GT +95L C5 A

- MDK0401-3: Model No.
- GT: Symbol for clearance in the axial direction[1]
- +95L: Overall screw shaft length (in mm)
- C5: Accuracy symbol[2]
- A: Unfinished shaft ends code

[1] See A15-19. [2] See A15-12.



Unit: mm

dimensions					Screw shaft dimensions									Nut mass	Shaft mass	Permissible rotational speed
	B_1	PCD	d_1	Tw	Unfinished shaft end symbol	Overall length L	ℓ_0	ℓ_1	ℓ_2	ℓ_3	d_3	d_4	K	kg	kg/m	min^{-1}
	10	14	2.9	13	A	95	47	10	35	50	6.2	3.2	3	0.01	0.07	3,500
						115	67			70						
						145	97			100						
	11	17	3.4	15	A	120	67	10	40	70	8.2	5.3	3	0.02	0.14	3,500
						150	97			100						
						180	127			130						
	11	20	3.4	17	A	130	67	15	45	70	10.2	7.3	3	0.02	0.29	3,500
						160	97			100						
						190	127			130						
						240	177			180						
	17	22	3.4	19	A	140	76	15	45	80	10.2	7	4	0.04	0.27	3,500
						170	106			110						
						200	136			140						
						250	186			190						
	17	26	4.5	21	A	160	86	15	55	90	12.2	9	4	0.05	0.47	3,500
						210	136			140						
						260	186			190						
						310	236			240						

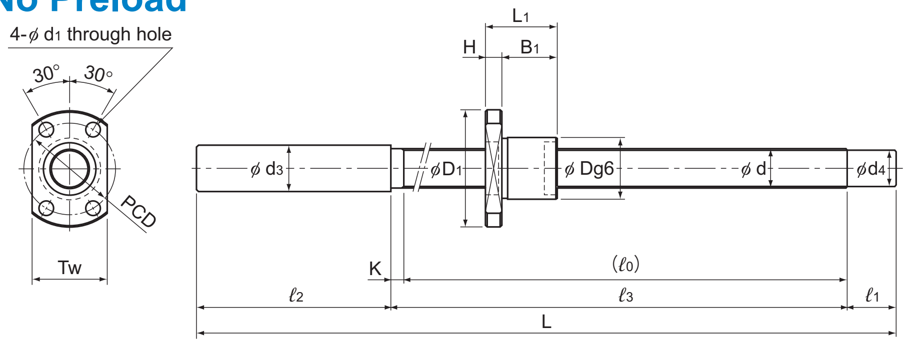
Note: Models MDK 0401, 0601, and 0801 are not provided with a labyrinth seal.

Ball Screw

Options⇒A15-355

MDK (Unfinished Shaft Ends) No Preload

DN value	70,000



MDK1202/1402/1404

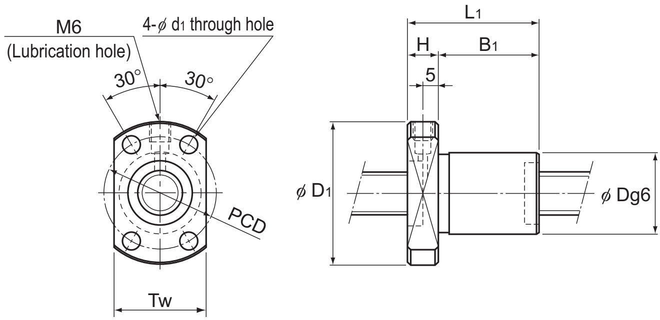
Model No.	Ball screw specifications							Nut				
	Screw shaft outer diameter d	Lead Ph	Ball center-to-center diameter dp	Thread minor diameter dc	No. of loaded circuits Rows X turns	Basic load rating Ca kN	Basic load rating C_0a kN	Outer diameter D	Flange diameter D_1	Overall length L_1	H
MDK 1202-3	12	2	12.3	11	3×1	1.7	3.6	19	36	22	5
MDK 1402-3	14	2	14.3	13	3×1	1.8	4.3	21	40	23	6
MDK 1404-3	14	4	14.65	12.2	3×1	4.2	7.6	26	45	33	6
MDK 1405-3	14	5	14.75	11.2	3×1	7	11.6	26	45	42	10

Model number coding

MDK1202-3 RR GT +165L C5 A

- MDK1202-3: Model No.
- RR: Seal symbol[1]
- GT: Symbol for clearance in the axial direction[2]
- +165L: Overall screw shaft length (in mm)
- C5: Accuracy symbol[3]
- A: Unfinished shaft ends code

[1] See A15-356. [2] See A15-19. [3] See A15-12.



MDK1405

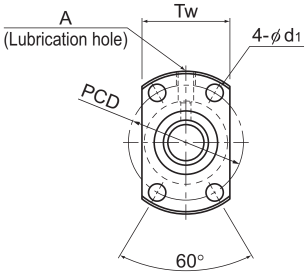
Unit: mm

dimensions					Screw shaft dimensions									Nut mass	Shaft mass	Permissible rotational speed
	B_1	PCD	d_1	Tw	Unfinished shaft end symbol	Overall length L	ℓ_0	ℓ_1	ℓ_2	ℓ_3	d_3	d_4	K	kg	kg/m	min^{-1}
	17	28	4.5	23	A	165	86	15	60	90	14.2	11	4	0.05	0.71	3,500
						215	136			140						
						265	186			190						
						315	236			240						
						365	286			290						
	17	31	5.5	26	A	175	86	25	60	90	15.2	13	4	0.07	1	3,500
						225	136			140						
						275	186			190						
						325	236			240						
						425	336			340						
	27	36	5.5	28	A	240	150	25	60	155	15.2	11.9	5	0.14	0.8	3,500
						290	200			205						
						340	250			255						
						440	350			355						
						540	450			455						
	32	36	5.5	28	A	250	160	25	60	165	14	11.2	5	0.19	1.2	4,740
						300	210			215						
						350	260			265						
						450	360			365						
						550	460			465						

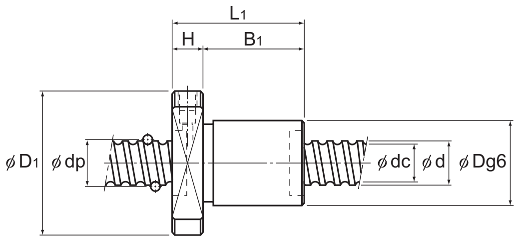
Options⇒A15-355

MDK
No Preload

DN value	70,000



Model No.	Screw shaft outer diameter d	Lead Ph	Ball center-to-center diameter dp	Thread minor diameter dc	No. of loaded circuits Rows X turns	Basic load rating Ca kN	Basic load rating C_0a kN	Rigidity K N/μm	Outer diameter D	Flange diameter D_1	Overall length L_1
MDK 0401-3	4	1	4.15	3.4	3×1	0.29	0.42	35	9	19	13
MDK 0601-3	6	1	6.2	5.3	3×1	0.54	0.94	60	11	23	14.5
MDK 0801-3	8	1	8.2	7.3	3×1	0.64	1.4	80	13	26	15
MDK 0802-3	8	2	8.3	7	3×1	1.4	2.3	80	15	28	22
MDK 1002-3	10	2	10.3	9	3×1	1.5	2.9	100	17	34	22
MDK 1202-3	12	2	12.3	11	3×1	1.7	3.6	120	19	36	22
MDK 1402-3	14	2	14.3	13	3×1	1.8	4.3	190	21	40	23
MDK 1404-3	14	4	14.65	12.2	3×1	4.2	7.6	190	26	45	33
MDK 1405-3	14	5	14.75	11.2	3×1	7	11.6	140	26	45	42



Unit: mm

Nut dimensions							Screw shaft inertial moment/mm	Nut mass	Shaft mass	Permissible rotational speed
	H	B_1	PCD	d_1	Tw	Lubrication hole A	kg·m²/mm	kg	kg/m	min^{-1}
	3	10	14	2.9	13	—	1.97×10^{-10}	0.01	0.07	3,500
	3.5	11	17	3.4	15	—	9.99×10^{-10}	0.017	0.14	3,500
	4	11	20	3.4	17	—	3.16×10^{-9}	0.024	0.29	3,500
	5	17	22	3.4	19	—	3.16×10^{-9}	0.034	0.27	3,500
	5	17	26	4.5	21	—	7.71×10^{-9}	0.045	0.47	3,500
	5	17	28	4.5	23	—	1.60×10^{-8}	0.05	0.71	3,500
	6	17	31	5.5	26	—	2.96×10^{-8}	0.15	1	3,500
	6	27	36	5.5	28	—	2.96×10^{-8}	0.13	0.8	3,500
	10	32	36	5.5	28	M6	2.96×10^{-8}	0.18	0.91	4,740

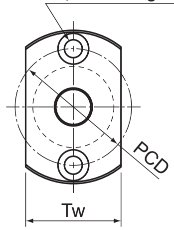
Note: Models MDK0401, 0601, and 0801 are not provided with a seal.

Ball Screw

Options⇒A15-355

MBF (Unfinished Shaft Ends)
No Preload

DN value	70,000



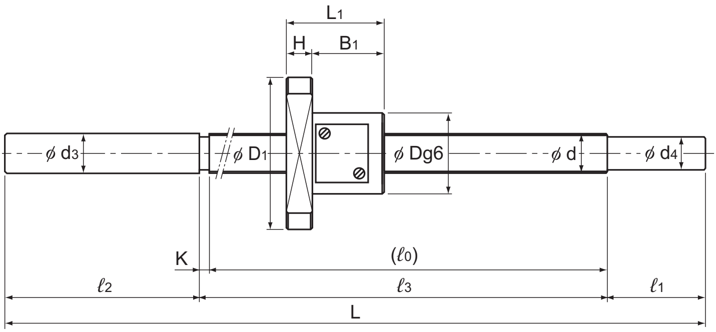
Model No.	Ball screw specifications							Nut			
	Screw shaft outer diameter	Lead	Ball center-to-center diameter	Thread minor diameter	No. of loaded circuits	Basic load rating		Outer diameter	Flange diameter	Overall length	
						Ca	C_0a				
	d	Ph	dp	dc	Rows X turns	kN	kN	D	D_1	L_1	H
MBF 0401-3.7	4	1	4.15	3.3	1×3.7	0.59	0.93	11	24	18	4
MBF 0601-3.7	6	1	6.15	5.3	1×3.7	0.74	1.5	13	30	21	5
MBF 0802-3.7	8	2	8.3	6.6	1×3.7	2.5	4.2	20	40	28	6
MBF 1002-3.7	10	2	10.3	8.6	1×3.7	2.8	5.3	23	43	28	6
MBF 1202-3.7	12	2	12.3	10.6	1×3.7	3	6.5	25	47	30	8
MBF 1402-3.7	14	2	14.3	12.6	1×3.7	3.3	7.5	26	48	30	8
MBF 1404-3.7	14	4	14.3	11.8	1×3.7	5.7	11.1	30	54	38	8

Model number coding

MBF0802-3.7 RR GT +218L C5 A

Model No.
Seal symbol[1]
Symbol for clearance in the axial direction[2]
Overall screw shaft length (in mm)
Accuracy symbol[3]
Unfinished shaft ends code

[1] See A15-356. [2] See A15-19. [3] See A15-12.



Unit: mm

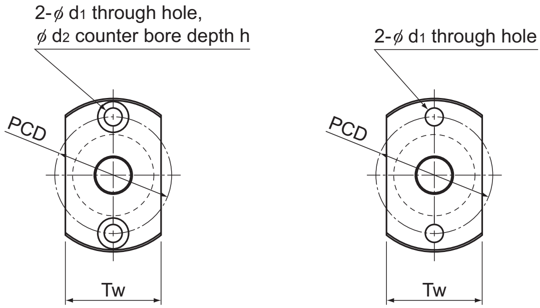
dimensions						Screw shaft dimensions										Nut mass	Shaft mass	Permissible rotational speed
B_1	PCD	d_1	d_2	h	Tw	Unfinished shaft end symbol	Overall length L	ℓ_0	ℓ_1	ℓ_2	ℓ_3	d_3	d_4	K	kg	kg/m	min^{-1}
14	17	3.4	6.5	2.5	13	A	90	48	10	30	50	4.3	3.2	2	0.02	0.07	3,500
							110	68			70						
							130	88			90						
16	21.5	3.4	6.5	3	17	A	131	58	20	50	61	6.3	5.2	3	0.04	0.14	3,500
							161	88			91						
							201	128			131						
22	30	4.5	8	4	24	A	168	85	25	55	88	8.3	6.2	3	0.1	0.19	3,500
							193	110			113						
							218	135			138						
22	33	4.5	8	4	27	A	183	95	25	60	98	10.3	8.2	3	0.11	0.36	3,500
							223	135			138						
							273	185			188						
22	36	5.5	9.5	5.5	29	A	210	117	30	60	120	12.3	10.2	3	0.15	0.58	3,500
							235	142			145						
							285	192			195						
22	37	5.5	9.5	5.5	32	A	205	102	40	60	105	14.3	12.2	3	0.16	0.85	3,500
							245	142			145						
							295	192			195						
							345	242			245						
30	42	5.5	9.5	5.5	34	A	233	129	40	60	133	14.3	11.2	4	0.25	1.2	3,500
							293	189			193						
							353	249			253						
							413	309			313						

Note: The standard specification for the Model MBF is with no seal. Please contact THK if you are interested in attaching a seal.

Options⇒A15-355

MBF
No Preload

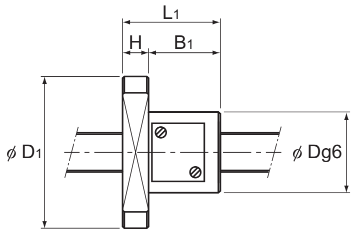
DN value	70,000



Nut type Ⅰ　　Nut type Ⅱ

Model No.	Screw shaft outer diameter d	Lead Ph	Ball center-to-center diameter dp	Thread minor diameter dc	No. of loaded circuits Rows × turns	Basic load rating Ca kN	Basic load rating C_0a kN	Rigidity K N/µm
MBF0401-3.7	4	1	4.15	3.3	1×3.7	0.59	0.93	54
MBF0601-3.7	6	1	6.15	5.3	1×3.7	0.74	1.5	75
MBF0602-2.7	6	2	6.2	5.1	1×2.7	0.75	1.2	58
MBF0602.5-2.7	6	2.5	6.2	5.1	1×2.7	0.75	1.2	59
MBF0801.5-3.7	8	1.5	8.2	7.1	1×3.7	1.1	2.2	99
MBF0802-3.7	8	2	8.3	6.6	1×3.7	2.5	4.2	111
MBF0802.5-3.7	8	2.5	8.3	6.6	1×3.7	2.4	4.1	111
MBF0803-2.7	8	3	8.3	6.2	1×2.7	2.6	4.2	85
MBF0804-2.7	8	4	8.3	6.2	1×2.7	2.6	4.2	84
MBF1001-3.7	10	1	10.15	9.3	1×3.7	0.84	2	113
MBF1001.5-3.7	10	1.5	10.2	9.1	1×3.7	1.25	2.8	120
MBF1002-3.7	10	2	10.3	8.6	1×3.7	2.8	5.3	134
MBF1002.5-3.7	10	2.5	10.3	8.6	1×3.7	2.7	5.3	133
MBF1003-3.7	10	3	10.3	8.2	1×3.7	3.9	7.2	140
MBF1005-2.7	10	5	10.3	8.2	1×2.7	3	5.2	103
MBF1202-3.7	12	2	12.3	10.6	1×3.7	3	6.5	156
MBF1202.5-3.7	12	2.5	12.3	10.6	1×3.7	3	6.4	156
MBF1203-3.7	12	3	12.3	10.2	1×3.7	4.3	8.7	162
MBF1204-3.7	12	4	12.3	9.8	1×3.7	5.4	10.2	165
MBF1402-3.7	14	2	14.3	12.6	1×3.7	3.3	7.5	176
MBF1404-3.7	14	4	14.3	11.8	1×3.7	5.7	11.1	187

Notes: The standard specification for the Model MBF is with no seal. Please contact THK if you are interested in attaching a seal.
The Model MBF can support an axial clearance of 0 or less. Please contact THK if you would like to use it in this manner.



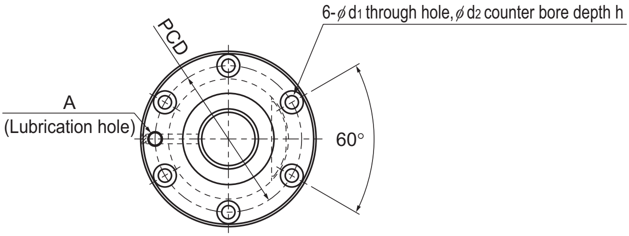
Unit: mm

	Nut dimensions											Screw shaft inertial moment/mm	Nut mass	Shaft mass	Permissible rotational speed
	Outer diameter D	Flange diameter D_1	Overall length L_1	H	B_1	PCD	d_1	d_2	h	Nut type	Tw	$kg \cdot m^2/mm$	kg	kg/m	min^{-1}
	11	24	18	4	14	17	3.4	6.5	2.5	I	13	1.97×10^{-10}	0.02	0.07	3,500
	13	30	21	5	16	21.5	3.4	6.5	3	I	17	9.99×10^{-10}	0.04	0.14	3,500
	15	29	17	4	13	23	3.4	—	—	II	17	9.99×10^{-10}	0.03	0.21	3,500
	15	29	18	4	14	23	3.4	—	—	II	17	9.99×10^{-10}	0.03	0.21	3,500
	16	30	19	4	15	24	3.4	—	—	II	18	3.16×10^{-9}	0.03	0.36	3,500
	20	40	28	6	22	30	4.5	8	4	I	24	3.16×10^{-9}	0.1	0.19	3,500
	20	38	26	5	21	30	4.5	—	—	II	22	3.16×10^{-9}	0.07	0.34	3,500
	20	38	25	5	20	30	4.5	—	—	II	22	3.16×10^{-9}	0.06	0.32	3,500
	21	39	28	5	23	31	4.5	—	—	II	23	3.16×10^{-9}	0.08	0.34	3,500
	19	37	18	5	13	29	4.5	—	—	II	21	7.71×10^{-9}	0.04	0.57	3,500
	19	37	20	5	15	29	4.5	—	—	II	21	7.71×10^{-9}	0.04	0.57	3,500
	23	43	28	6	22	33	4.5	8	4	I	27	7.71×10^{-9}	0.11	0.36	3,500
	24	44	27	6	21	35	5.5	—	—	II	26	7.71×10^{-9}	0.09	0.55	3,500
	24	44	30	6	24	35	5.5	—	—	II	26	7.71×10^{-9}	0.1	0.52	3,500
	24	44	34	6	28	35	5.5	—	—	II	26	7.71×10^{-9}	0.12	0.56	3,500
	25	47	30	8	22	36	5.5	9.5	5.5	I	29	1.60×10^{-8}	0.15	0.58	3,500
	26	46	27	6	21	37	5.5	—	—	II	28	1.60×10^{-8}	0.11	0.8	3,500
	28	48	30	6	24	39	5.5	—	—	II	30	1.60×10^{-8}	0.14	0.77	3,500
	28	48	33	6	27	39	5.5	—	—	II	30	1.60×10^{-8}	0.15	0.76	3,500
	26	48	30	8	22	37	5.5	9.5	5.5	I	32	2.96×10^{-8}	0.16	0.85	3,500
	30	54	38	8	30	42	5.5	9.5	5.5	I	34	2.96×10^{-8}	0.25	1.2	3,500

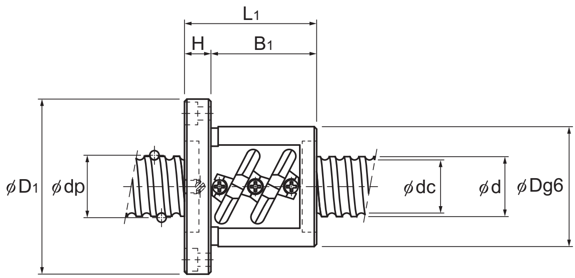
Options⇒A15-355

BNF-V Small
No Preload

DN value	100,000



Model No.	Screw shaft outer diameter d	Lead Ph	Ball center-to-center diameter dp	Thread minor diameter dc	No. of loaded circuits Rows × turns	Basic load rating Ca kN	Basic load rating C_0a kN	Rigidity K N/μm
BNF 1604V-5	16	4	16.5	13.8	2×2.5	7.8	17.4	290
BNF 1605V-2.5	16	5	16.75	13.2	1×2.5	7.4	13.9	170
BNF 1605V-5	16	5	16.75	13.2	2×2.5	13.5	27.9	320
BNF 2004V-2.5	20	4	20.5	17.8	1×2.5	4.8	10.9	180
BNF 2004V-5	20	4	20.5	17.8	2×2.5	8.6	21.8	350
BNF 2005V-2.5	20	5	20.75	17.2	1×2.5	8.3	17.5	200
BNF 2005V-5	20	5	20.75	17.2	2×2.5	15.1	35	380
BNF 2010V-2.5	20	10	20.75	17.2	1×2.5	8.3	17.6	197
BNF 2504V-2.5	25	4	25.5	22.8	1×2.5	5.2	13.7	210
BNF 2504V-5	25	4	25.5	22.8	2×2.5	9.5	27.4	410
BNF 2505V-2.5	25	5	25.75	22.2	1×2.5	9.2	21.9	240
BNF 2505V-5	25	5	25.75	22.2	2×2.5	16.7	43.9	460
BNF 2506V-2.5	25	6	26	21.4	1×2.5	12.4	27.4	250
BNF 2506V-5	25	6	26	21.4	2×2.5	22.6	54.8	470
BNF 2805V-2.5	28	5	28.75	25.2	1×2.5	9.7	24.6	250
BNF 2805V-5	28	5	28.75	25.2	2×2.5	17.5	49.2	500
BNF 2805V-7.5	28	5	28.75	25.2	3×2.5	24.8	73.8	740
BNF 2806V-2.5	28	6	28.75	25.2	1×2.5	9.6	24.6	250
BNF 2806V-5	28	6	28.75	25.2	2×2.5	17.5	49.2	500
BNF 2806V-7.5	28	6	28.75	25.2	3×2.5	24.8	73.8	740
BNF 3205V-2.5	32	5	32.75	29.2	1×2.5	10.2	28.1	280
BNF 3205V-5	32	5	32.75	29.2	2×2.5	18.5	56.3	560
BNF 3205V-7.5	32	5	32.75	29.2	3×2.5	26.2	84.4	810
BNF 3206V-2.5	32	6	33	28.4	1×2.5	13.9	35.2	290
BNF 3206V-5	32	6	33	28.4	2×2.5	25.2	70.3	580



Unit: mm

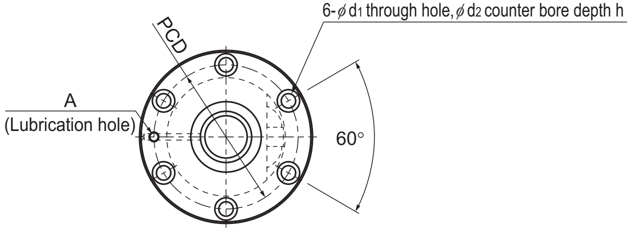
	Nut dimensions								Screw shaft inertial moment/mm	Nut mass	Shaft mass	Permissible rotational speed
	Outer diameter D	Flange diameter D_1	Overall length L_1	H	B_1	PCD	$d_1 \times d_2 \times h$	Lubrication hole A	kg·m²/mm	kg	kg/m	min^{-1}
	36	59	53	11	42	47	5.5×9.5×5.5	M6	5.05×10^{-8}	0.42	1.42	5,000
	40	60	41	10	31	50	4.5×8×4.5	M6	5.05×10^{-8}	0.37	1.37	5,000
	40	60	56	10	46	50	4.5×8×4.5	M6	5.05×10^{-8}	0.49	1.37	5,000
	40	63	37	11	26	51	5.5×9.5×5.5	M6	1.23×10^{-7}	0.3	2.22	4,870
	40	63	49	11	38	51	5.5×9.5×5.5	M6	1.23×10^{-7}	0.49	2.22	4,870
	44	67	41	11	30	55	5.5×9.5×5.5	M6	1.23×10^{-7}	0.46	2.19	4,810
	44	67	56	11	45	55	5.5×9.5×5.5	M6	1.23×10^{-7}	0.6	2.19	4,810
	46	74	58	15	43	59	5.5×9.5×5.5	M6	1.23×10^{-7}	0.68	2.46	4,810
	46	69	36	11	25	57	5.5×9.5×5.5	M6	3.01×10^{-7}	0.21	3.6	3,920
	46	69	48	11	37	57	5.5×9.5×5.5	M6	3.01×10^{-7}	0.55	3.6	3,920
	50	73	40	11	29	61	5.5×9.5×5.5	M6	3.01×10^{-7}	0.52	3.52	3,880
	50	73	55	11	44	61	5.5×9.5×5.5	M6	3.01×10^{-7}	0.68	3.52	3,880
	53	76	44	11	33	64	5.5×9.5×5.5	M6	3.01×10^{-7}	0.61	3.43	3,840
	53	76	62	11	51	64	5.5×9.5×5.5	M6	3.01×10^{-7}	0.91	3.43	3,840
	55	85	44	12	32	69	6.6×11×6.5	M6	4.74×10^{-7}	1.02	4.45	3,470
	55	85	59	12	47	69	6.6×11×6.5	M6	4.74×10^{-7}	1.06	4.45	3,470
	55	85	74	12	62	69	6.6×11×6.5	M6	4.74×10^{-7}	1.16	4.45	3,470
	55	85	50	12	38	69	6.6×11×6.5	M6	4.74×10^{-7}	0.87	4.52	3,470
	55	85	68	12	56	69	6.6×11×6.5	M6	4.74×10^{-7}	1.09	4.52	3,470
	55	85	86	12	74	69	6.6×11×6.5	M6	4.74×10^{-7}	1.3	4.52	3,470
	58	85	41	12	29	71	6.6×11×6.5	M6	8.08×10^{-7}	0.76	5.89	3,050
	58	85	56	12	44	71	6.6×11×6.5	M6	8.08×10^{-7}	0.94	5.89	3,050
	58	85	71	12	59	71	6.6×11×6.5	M6	8.08×10^{-7}	1.13	5.89	3,050
	62	89	45	12	33	75	6.6×11×6.5	M6	8.08×10^{-7}	0.94	5.88	3,030
	62	89	63	12	51	75	6.6×11×6.5	M6	8.08×10^{-7}	1.21	5.88	3,030

Note: The overall length of the nut will increase when equipping the QZ Lubricator. See A**15-366** for further details.

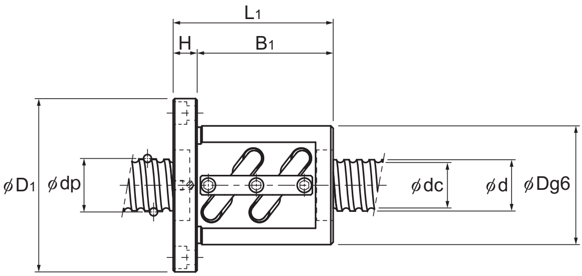
Ball Screw

BNF-V Medium
No Preload

DN value	130,000



Model No.	Screw shaft outer diameter d	Lead Ph	Ball center-to-center diameter dp	Thread minor diameter dc	No. of loaded circuits Rows × turns	Basic load rating Ca kN	Basic load rating C_0a kN	Rigidity K N/µm
BNF 2508V-2.5	25	8	26.25	20.5	1×2.5	15.8	32.9	250
BNF 2508V-3.5	25	8	26.25	20.5	1×3.5	21.1	46	340
BNF 2508V-5	25	8	26.25	20.5	2×2.5	28.7	65.7	480
BNF 2510V-2.5	25	10	26.25	21.5	1×2.5	15.8	32.9	250
BNF 2810V-2.5	28	10	29.75	22.4	1×2.5	24.3	49	280
BNF 3210V-2.5	32	10	33.75	26.4	1×2.5	26	56.2	310
BNF 3210V-3.5	32	10	33.75	26.4	1×3.5	34.8	78.6	440
BNF 3210V-5	32	10	33.75	26.4	2×2.5	47.3	112.3	620
BNF 3212V-3.5	32	12	34	26.1	1×3.5	40.4	88.5	440
BNF 3216V-5	32	16	33.75	26.4	2×2.5	47.1	113.1	616
BNF 3610V-2.5	36	10	37.75	30.5	1×2.5	27.6	63.3	350
BNF 3610V-5	36	10	37.75	30.5	2×2.5	50.1	126.5	680
BNF 3610V-7.5	36	10	37.75	30.5	3×2.5	71	189.8	990
BNF 3612V-2.5	36	12	38	30.1	1×2.5	32.2	71.2	350
BNF 3612V-5	36	12	38	30.1	2×2.5	58.4	142.3	690
BNF 3616V-2.5	36	16	38	30.1	1×2.5	32.1	71.5	350
BNF 3620V-1.5	36	20	37.75	30.5	1×1.5	17.7	38.4	215
BNF 4010V-2.5	40	10	41.75	34.4	1×2.5	29	70.4	380
BNF 4010V-3.5	40	10	41.75	34.4	1×3.5	38.8	98.5	520
BNF 4010V-5	40	10	41.75	34.4	2×2.5	52.7	140.7	740
BNF 4012V-2.5	40	12	42	34.1	1×2.5	33.9	79.2	390
BNF 4012V-3.5	40	12	42	34.1	1×3.5	45.3	110.8	530
BNF 4012V-5	40	12	42	34.1	2×2.5	61.6	158.3	750
BNF 4016V-5	40	16	42	34.1	2×2.5	61.5	158.8	740
BNF 4020V-5	40	20	41.75	34.4	2×2.5	52.4	142	736



Unit: mm

	Nut dimensions								Screw shaft inertial moment/mm	Nut mass	Shaft mass	Permissible rotational speed
	Outer diameter D	Flange diameter D_1	Overall length L_1	H	B_1	PCD	$d_1 \times d_2 \times h$	Lubrication hole A	kg·m²/mm	kg	kg/m	min⁻¹
	58	85	58	15	43	71	6.6×11×6.5	M6	3.01×10^{-7}	1.07	3.51	4,950
	58	85	66	15	51	71	6.6×11×6.5	M6	3.01×10^{-7}	1.29	3.51	4,950
	58	85	82	15	67	71	6.6×11×6.5	M6	3.01×10^{-7}	1.44	3.51	4,950
	58	85	70	18	52	71	6.6×11×6.5	M6	3.01×10^{-7}	1.43	3.5	4,950
	65	106	86	18	68	85	11×17.5×11	M6	4.74×10^{-8}	2.3	4.15	4,360
	74	108	70	15	55	90	9×14×8.5	M6	8.08×10^{-7}	2.2	5.53	3,850
	74	108	80	15	65	90	9×14×8.5	M6	8.08×10^{-7}	2.44	5.53	3,850
	74	108	100	15	85	90	9×14×8.5	M6	8.08×10^{-7}	2.92	5.53	3,850
	76	121	98	18	80	98	11×17.5×11	M6	8.08×10^{-7}	3.4	5.7	3,820
	74	108	139	18	121	90	9×14×8.5	M6	8.08×10^{-7}	3.81	5.82	3,850
	75	120	81	18	63	98	11×17.5×11	M6	1.29×10^{-6}	2.75	7.1	3,440
	75	120	111	18	93	98	11×17.5×11	M6	1.29×10^{-6}	3.45	7.1	3,440
	75	120	141	18	123	98	11×17.5×11	M6	1.29×10^{-6}	4.15	7.1	3,440
	78	123	87	18	69	100	11×17.5×11	M6	1.29×10^{-6}	3.14	7.99	3,420
	78	123	123	18	105	100	11×17.5×11	M6	1.29×10^{-6}	4.07	7.99	3,420
	78	123	92	18	74	100	11×17.5×11	M6	1.29×10^{-6}	3.27	7.99	3,420
	75	114	82	18	64	93	11×17.5×11	M6	1.29×10^{-6}	2.38	7.54	3,440
	82	124	73	18	55	102	11×17.5×11	M6	1.97×10^{-6}	2.86	8.87	3,110
	82	124	83	18	65	102	11×17.5×11	M6	1.97×10^{-6}	3.14	8.87	3,110
	82	124	103	18	85	102	11×17.5×11	M6	1.97×10^{-6}	3.69	8.87	3,110
	84	126	83	18	65	104	11×17.5×11	M6	1.97×10^{-6}	3.31	8.83	3,090
	84	126	95	18	77	104	11×17.5×11	M6	1.97×10^{-6}	3.66	8.83	3,090
	84	126	119	18	101	104	11×17.5×11	M6	1.97×10^{-6}	4.36	8.83	3,090
	84	126	144	18	126	104	11×17.5×11	M6	1.97×10^{-6}	5.52	9.09	3,090
	82	126	162	18	144	104	11×17.5×11	M6	1.97×10^{-6}	5.17	9.37	3,110

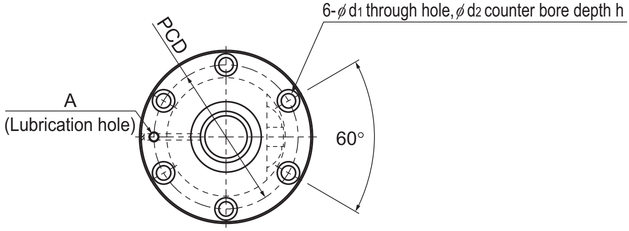
Note: The overall length of the nut will increase when equipping the QZ Lubricator. See A **15-366** for further details.

Ball Screw

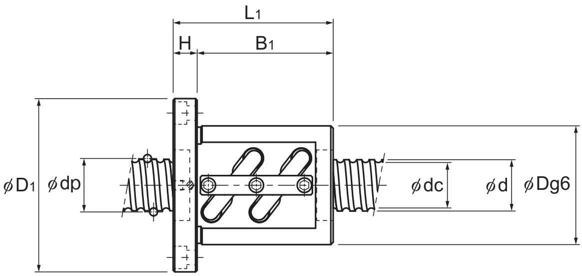
Options⇒A **15-355**

BNF-V Medium No Preload

DN value	130,000



Model No.	Screw shaft outer diameter d	Lead Ph	Ball center-to-center diameter dp	Thread minor diameter dc	No. of loaded circuits Rows × turns	Basic load rating Ca kN	Basic load rating C_0a kN	Rigidity K N/μm
BNF 4510V-2.5	45	10	46.75	39.5	1×2.5	30.6	79.3	420
BNF 4510V-3	45	10	46.75	39.5	2×1.5	35.8	95.1	500
BNF 4510V-5	45	10	46.75	39.5	2×2.5	55.6	158.5	800
BNF 4510V-7.5	45	10	46.75	39.5	3×2.5	78.8	237.8	1,190
BNF 4512V-5	45	12	47	39.2	2×2.5	65.2	178.3	820
BNF 4520V-2.5	45	20	47	39.2	1×2.5	35.8	89.7	424
BNF 5010V-2.5	50	10	51.75	44.4	1×2.5	32.1	88.1	450
BNF 5010V-3.5	50	10	51.75	44.4	1×3.5	42.9	123.4	620
BNF 5010V-5	50	10	51.75	44.4	2×2.5	58.2	176.3	880
BNF 5010V-7.5	50	10	51.75	44.4	3×2.5	82.5	264.4	1,290
BNF 5012V-2.5	50	12	52.25	43.3	1×2.5	43.4	110.1	470
BNF 5012V-3.5	50	12	52.25	43.3	1×3.5	58	154.1	640
BNF 5012V-5	50	12	52.25	43.3	2×2.5	78.8	220.2	910
BNF 5016V-2.5	50	16	52.7	42.9	1×2.5	72.6	183.1	620
BNF 5016V-5	50	16	52.7	42.9	2×2.5	131.8	366.2	1,180
BNF 5020V-2.5	50	20	52.7	42.9	1×2.5	72.5	183.6	620



Unit: mm

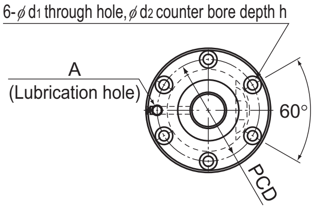
Nut dimensions								Screw shaft inertial moment/mm	Nut mass	Shaft mass	Permissible rotational speed
Outer diameter D	Flange diameter D_1	Overall length L_1	H	B_1	PCD	$d_1\times d_2\times h$	Lubrication hole A	kg·m²/mm	kg	kg/m	min^{-1}
88	132	81	18	63	110	11×17.5×11		3.16×10^{-6}	3.43	11.36	2,780
88	132	94	18	76	110	11×17.5×11		3.16×10^{-6}	3.83	11.36	2,780
88	132	111	18	93	110	11×17.5×11		3.16×10^{-6}	4.35	11.36	2,780
88	132	141	18	123	110	11×17.5×11		3.16×10^{-6}	5.26	11.36	2,780
90	130	119	18	101	110	11×17.5×11		3.16×10^{-6}	4.74	11.32	2,760
90	130	102	18	84	110	11×17.5×11		3.16×10^{-6}	4.28	11.1	2,760
93	135	73	18	55	113	11×17.5×11		4.82×10^{-6}	3.33	14.16	2,510
93	135	83	18	65	113	11×17.5×11	Rc1/8 (PT1/8)	4.82×10^{-6}	3.66	14.16	2,510
93	135	103	18	85	113	11×17.5×11		4.82×10^{-6}	4.31	14.16	2,510
93	135	133	18	115	113	11×17.5×11		4.82×10^{-6}	5.28	14.16	2,510
100	146	87	22	65	122	14×20×13		4.82×10^{-6}	4.57	13.82	2,480
100	146	99	22	77	122	14×20×13		4.82×10^{-6}	5.05	13.82	2,480
100	146	123	22	101	122	14×20×13		4.82×10^{-6}	6.02	13.82	2,480
105	152	116	25	91	128	14×20×13		4.82×10^{-6}	6.98	13.71	2,460
105	152	164	25	139	128	14×20×13		4.82×10^{-6}	9.18	13.71	2,460
105	152	141	28	113	128	14×20×13		4.82×10^{-6}	8.32	14.05	2,460

Note: The overall length of the nut will increase when equipping the QZ Lubricator. See A**15-366** for further details.

Ball Screw

BNF (Unfinished Shaft Ends) No Preload

DN value	70,000



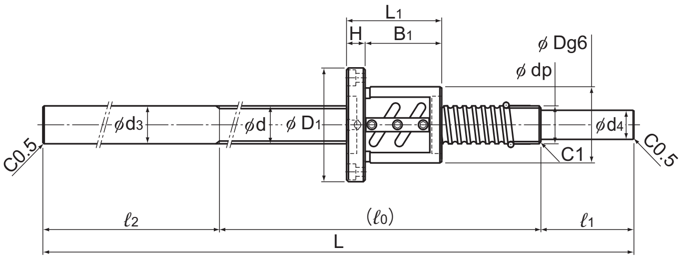
Model No.	Ball screw specifications							Nut				
	Screw shaft outer diameter	Lead	Ball center-to-center diameter	Thread minor diameter	No. of loaded circuits	Basic load rating		Outer diameter	Flange diameter	Overall length	
						Ca	C_0a				
	d	Ph	dp	dc	Rows × turns	kN	kN	D	D_1	L_1	H
BNF 1605-2.5	16	5	16.75	13.2	1×2.5	7.4	13.9	40	60	41	10
BNF 1810-2.5	18	10	18.8	15.5	1×2.5	7.8	15.9	42	65	69	12
BNF 2005-5	20	5	20.75	17.2	2×2.5	15.1	35	44	67	56	11
BNF 2505-5	25	5	25.75	22.2	2×2.5	16.7	44	50	73	55	11

Model number coding

BNF2005-5 RR G1 +610L C5 A

- BNF2005-5: Model No.
- RR: Seal symbol[1]
- G1: Symbol for clearance in the axial direction[2]
- +610L: Overall screw shaft length (in mm)
- C5: Accuracy symbol[3]
- A: Unfinished shaft ends code (A or B)

[1] See A15-356. [2] See A15-19. [3] See A15-12.



Unit: mm

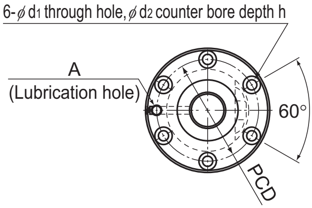
Dimensions							Screw shaft dimensions							Nut mass	Shaft mass	Permissible rotational speed
	B_1	PCD	d_1	d_2	h	Lubrication hole A	Stan-dardstock symbol	Overall length L	ℓ_0	ℓ_1	ℓ_2	d_3	d_4	kg	kg/m	min^{-1}
	31	50	4.5	8	4.5	M6	A	410	200	50	160	16	12.8	0.37	0.92	4,170
								510	300							
								610	400							
								710	500						1.25	
	57	53	5.5	9.5	5.5	M6	A	410	200	50	160	18	15.3	0.67	1.62	3,720
								510	300							
								610	400							
								710	500							
								810	600							
	45	55	5.5	9.5	5.5	M6	A	410	200	50	160	20	15.3	0.57	1.65	3,370
								510	300							
								610	400							
								710	500							
								810	600				16.8			
								1,010	800							
							B	610	300	50	260	20	16.8			
								710	400							
	44	61	5.5	9.5	5.5	M6	A	520	300	60	160	25	20.3	0.75	2.84	2,710
								620	400							
								720	500							
								820	600							
								1,020	800				21.8			
								1,220	1,000							
								1,420	1,200							
							B	720	400	60	260	25	21.8			
								820	500							

Ball Screw

Options⇒A15-355

BNF (Unfinished Shaft Ends)
No Preload

DN value	70,000



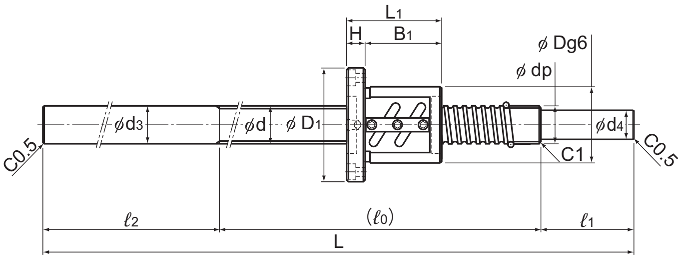
Model No.	Ball screw specifications							Nut			
	Screw shaft outer diameter d	Lead Ph	Ball center-to-center diameter dp	Thread minor diameter dc	No. of loaded circuits Rows X turns	Basic load rating Ca kN	Basic load rating C_0a kN	Outer diameter D	Flange diameter D_1	Overall length L_1	H
BNF 2510A-2.5	25	10	26.3	21.4	1×2.5	15.8	33	58	85	70	18
BNF 2806-5	28	6	28.75	25.2	2×2.5	17.5	49.4	55	85	68	12
BNF 3205-5	32	5	32.75	29.2	2×2.5	18.5	56.4	58	85	56	12

Model number coding

BNF2806-10 RR G1 +1020L C5 A

- BNF2806-10: Model No.
- RR: Seal symbol[1]
- G1: Symbol for clearance in the axial direction[2]
- +1020L: Overall screw shaft length (in mm)
- C5: Accuracy symbol[3]
- A: Unfinished shaft ends code (A or B)

[1] See A15-356. [2] See A15-19. [3] See A15-12.



Unit: mm

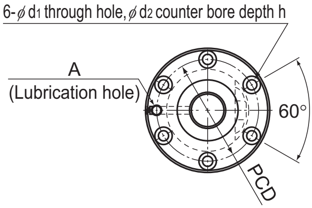
Dimensions							Screw shaft dimensions							Nut mass	Shaft mass	Permissible rotational speed
	B_1	PCD	d_1	d_2	h	Lubrication hole A	Standard stock symbol	Overall length L	ℓ_0	ℓ_1	ℓ_2	d_3	d_4	kg	kg/m	min^{-1}
	52	71	6.6	11	6.5	M6	A	620	400	60	160	25	20.3	1.43	2.68	2,660
								820	600							
								1,020	800							
								1,220	1,000							
								1,420	1,200							
	56	69	6.6	11	6.5	M6	A	520	300	60	160	28	20.3	1.13	3.89	2,430
								620	400							
								720	500							
								920	700							
								1,020	800				24.8			
								1,220	1,000							
								1,420	1,200							
							B	720	400	70	250	28	24.8			
								920	500		350					
								1,100	700		330					
	44	71	6.6	11	6.5	M6	A	730	500	70	160	32	25.3	0.93	5.03	2,130
								930	700							
								1,230	1,000							
								1,430	1,200							
								1,630	1,400				27.8			
								1,830	1,600							

Ball Screw

Options⇒A15-355

BNF (Unfinished Shaft Ends)
No Preload

DN value	70,000



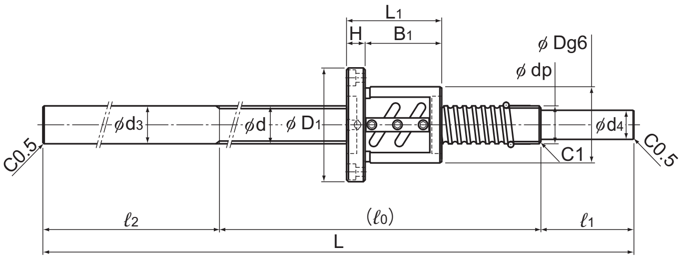
Model No.	Ball screw specifications							Nut			
	Screw shaft outer diameter	Lead	Ball center-to-center diameter	Thread minor diameter	No. of loaded circuits	Basic load rating		Outer diameter	Flange diameter	Overall length	
						Ca	C_0a				
	d	Ph	dp	dc	Rows × turns	kN	kN	D	D_1	L_1	H
BNF 3206-5	32	6	33	28.4	2×2.5	25.2	70.4	62	89	63	12
BNF 3210A-5	32	10	33.75	26.4	2×2.5	47.2	112.7	74	108	100	15
BNF 3610-5	36	10	37.75	30.5	2×2.5	50.1	126.4	75	120	111	18

Model number coding

BNF3206-10 RR G1 +1100L C5 B

- BNF3206-10: Model No.
- RR: Seal symbol[1]
- G1: Symbol for clearance in the axial direction [2]
- +1100L: Overall screw shaft length (in mm)
- C5: Accuracy symbol [3]
- B: Unfinished shaft ends code (A or B)

[1] See A**15-356**. [2] See A**15-19**. [3] See A**15-12**.



Unit: mm

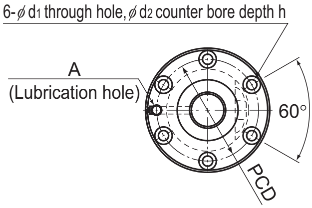
	Dimensions						Screw shaft dimensions								Nut mass	Shaft mass	Permissible rotational speed
	B_1	PCD	d_1	d_2	h	Lubrication hole A	Standardstock symbol	Overall length L	ℓ_0	ℓ_1	ℓ_2	d_3	d_4	kg	kg/m	min^{-1}
	51	75	6.6	11	6.5	M6	A	730	500	70	160	32	25.3	1.2	4.63	2,120
								930	700							
								1,230	1,000							
								1,430	1,200							
								1,630	1,400				27.8			
								1,830	1,600							
							B	930	500	70	360	32	27.8			
								1,100	700		330					
								1,430	1,000		360					
	85	90	9	14	8.5	M6	A	730	500	70	160	32	25.3	2.8	3.66	2,070
								930	700							
								1,430	1,200							
								1,830	1,600							
	93	98	11	17.5	11	M6	A	730	500	70	160	36	30.3	3.4	5.03	1,850
								930	700							
								1,430	1,200							
								1,830	1,600							
							B	930	500	100	330	36	30.3			
								1,100	700		300					
								1,830	1,200		530					

Ball Screw

Options⇒A15-355

BNF (Unfinished Shaft Ends)
No Preload

DN value	70,000



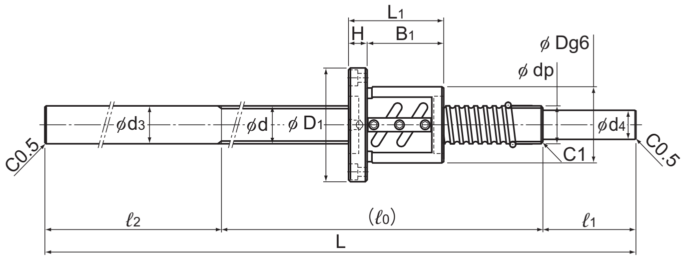
Model No.	Ball screw specifications							Nut			
	Screw shaft outer diameter	Lead	Ball center-to-center diameter	Thread minor diameter	No. of loaded circuits	Basic load rating		Outer diameter	Flange diameter	Overall length	
						Ca	C_0a				
	d	Ph	dp	dc	Rows × turns	kN	kN	D	D_1	L_1	H
BNF 4010-5	40	10	41.75	34.4	2×2.5	52.7	141.1	82	124	103	18
BNF 4012-5	40	12	42	34.1	2×2.5	61.6	158.8	84	126	119	18
BNF 5010-5	50	10	51.75	44.4	2×2.5	58.2	176.4	93	135	103	18

Model number coding

BNF4012-10 RR G1 +1230L C5 A

- BNF4012-10: Model No.
- RR: Seal symbol[1]
- G1: Symbol for clearance in the axial direction[2]
- +1230L: Overall screw shaft length (in mm)
- C5: Accuracy symbol[3]
- A: Unfinished shaft ends code (A or B)

[1] See A15-356. [2] See A15-19. [3] See A15-12.



Unit: mm

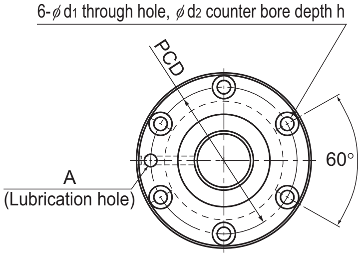
	Dimensions						Screw shaft dimensions								Nut mass	Shaft mass	Permissible rotational speed
	B_1	PCD	d_1	d_2	h	Lubrication hole A	Standard stock symbol	Overall length L	ℓ_0	ℓ_1	ℓ_2	d_3	d_4	kg	kg/m	min^{-1}
	85	102	11	17.5	11	M6	A	1,230	1,000	70	160	40	30.3	3.58	6.59	1,670
								1,730	1,500							
								2,030	1,800							
								2,230	2,000							
	101	104	11	17.5	11	M6	A	1,230	1,000	70	160	40	30.3	4.2	6.39	1,660
								1,730	1,500							
								2,030	1,800							
								2,230	2,000							
							B	1,730	1,200	100	430	40	33.8			
								2,030	1,200		730					
	85	113	11	17.5	11	Rc1/8 (PT1/8)	A	1,300	1,000	100	200	50	40.3	4.4	11.36	1,350
								1,800	1,500							
								2,300	2,000							
								2,800	2,500							

Ball Screw

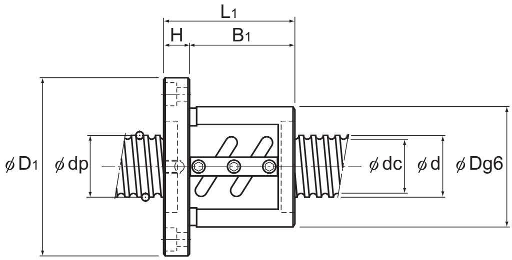
Options⇒A15-355

BNF
No Preload

DN value	70,000



Model No.	Screw shaft outer diameter d	Lead Ph	Ball center-to-center diameter dp	Thread minor diameter dc	No. of loaded circuits Rows × turns	Basic load rating Ca kN	Basic load rating $C_{0}a$ kN	Rigidity K N/μm
BNF 5510-2.5	55	10	56.75	49.5	1×2.5	33.4	97	490
BNF 5510-5	55	10	56.75	49.5	2×2.5	60.7	194	950
BNF 5510-7.5	55	10	56.75	49.5	3×2.5	85.9	291.1	1,390
BNF 5512-2.5	55	12	57	49.2	1×2.5	39.3	108.8	500
BNF 5512-3	55	12	57	49.2	2×1.5	46	131.3	590
BNF 5512-3.5	55	12	57	49.2	1×3.5	52.4	152.9	680
BNF 5512-5	55	12	57	49.2	2×2.5	71.3	218.5	960
BNF 5512-7.5	55	12	57	49.2	3×2.5	100.9	327.3	1,420
BNF 5516-2.5	55	16	57.7	47.9	1×2.5	76.1	201.9	650
BNF 5516-5	55	16	57.7	47.9	2×2.5	138.2	402.8	1,280
BNF 5520-2.5	55	20	57.7	47.9	1×2.5	76	201.9	660
BNF 5520-5	55	20	57.7	47.9	2×2.5	138.2	403.8	1,280
BNF 6310-2.5	63	10	64.75	57.7	1×2.5	35.4	111.7	550
BNF 6310-5	63	10	64.75	57.7	2×2.5	64.2	222.5	1,050
BNF 6310-7.5	63	10	64.75	57.7	3×2.5	90.9	334.2	1,550
BNF 6312A-2.5	63	12	65.25	56.3	1×2.5	48.1	139.2	560
BNF 6312A-5	63	12	65.25	56.3	2×2.5	87.4	278.3	1,090
BNF 6316-5	63	16	65.7	55.9	2×2.5	147	462.6	1,420
BNF 6320-2.5	63	20	65.7	55.9	1×2.5	81	231.3	740
BNF 6320-5	63	20	65.7	55.9	2×2.5	147	463.5	1,420



Unit: mm

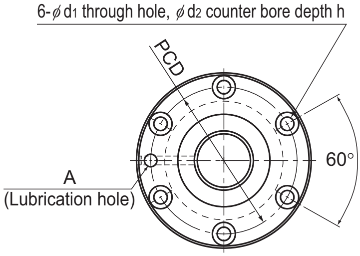
Nut dimensions								Screw shaft inertial moment/mm	Nut mass	Shaft mass	Permissible rotational speed
Outer diameter D	Flange diameter D_1	Overall length L_1	H	B_1	PCD	$d_1 \times d_2 \times h$	Lubrication hole A	kg·m²/mm	kg	kg/m	min^{-1}
102	144	81	18	63	122	11×17.5×11	Rc1/8 (PT1/8)	7.05×10^{-6}	4.19	16.43	1,230
102	144	111	18	93	122	11×17.5×11		7.05×10^{-6}	5.36	16.43	1,230
102	144	141	18	123	122	11×17.5×11		7.05×10^{-6}	6.54	16.43	1,230
105	147	93	18	75	125	11×17.5×11		7.05×10^{-6}	5.01	16.29	1,220
105	147	107	18	89	125	11×17.5×11		7.05×10^{-6}	5.6	16.29	1,220
105	147	105	18	87	125	11×17.5×11		7.05×10^{-6}	5.52	16.29	1,220
105	147	129	18	111	125	11×17.5×11		7.05×10^{-6}	6.54	16.29	1,220
105	147	165	18	147	125	11×17.5×11		7.05×10^{-6}	8.07	16.29	1,220
110	158	116	25	91	133	14×20×13		7.05×10^{-6}	7.4	15.46	1,210
110	158	164	25	139	133	14×20×13		7.05×10^{-6}	9.73	15.46	1,210
112	158	127	28	99	134	14×20×13		7.05×10^{-6}	8.4	16.1	1,210
112	158	187	28	159	134	14×20×13		7.05×10^{-6}	11.45	16.1	1,210
108	154	77	22	55	130	14×20×13		1.21×10^{-5}	4.57	21.93	1,080
108	154	107	22	85	130	14×20×13		1.21×10^{-5}	5.77	21.93	1,080
108	154	137	22	115	130	14×20×13		1.21×10^{-5}	6.98	21.93	1,080
115	161	87	22	65	137	14×20×13		1.21×10^{-5}	5.8	21.14	1,070
115	161	123	22	101	137	14×20×13		1.21×10^{-5}	7.56	21.14	1,070
122	184	160	24	136	152	18×26×17.5		1.21×10^{-5}	11.82	20.85	1,060
122	180	127	28	99	150	18×26×17.5		1.21×10^{-5}	10.1	21.57	1,060
122	180	187	28	159	150	18×26×17.5		1.21×10^{-5}	13.58	21.57	1,060

Note: The overall length of the nut will increase when equipping the QZ Lubricator. See **A15-366** for further details.

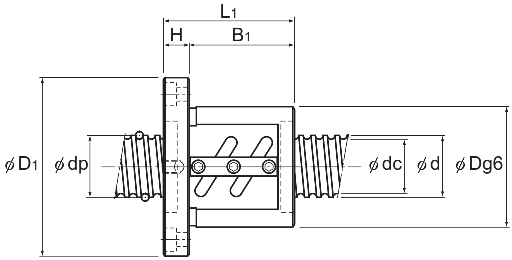
Options⇒A15-355

BNF
No Preload

DN value	70,000



Model No.	Screw shaft outer diameter d	Lead Ph	Ball center-to-center diameter dp	Thread minor diameter dc	No. of loaded circuits Rows × turns	Basic load rating Ca kN	Basic load rating C_0a kN	Rigidity K N/μm
BNF 7010-2.5	70	10	71.75	64.5	1×2.5	36.8	123.5	590
BNF 7010-5	70	10	71.75	64.5	2×2.5	66.9	247	1,140
BNF 7010-7.5	70	10	71.75	64.5	3×2.5	94.9	371.4	1,680
BNF 7012-2.5	70	12	72	64.2	1×2.5	43.5	139.2	600
BNF 7012-5	70	12	72	64.2	2×2.5	78.9	278.3	1,160
BNF 7012-7.5	70	12	72	64.2	3×2.5	111.7	417.5	1,710
BNF 7020-5	70	20	72.7	62.9	2×2.5	153.9	514.5	1,550
BNF 8010-2.5	80	10	81.75	75.2	1×2.5	38.9	141.1	650
BNF 8010-5	80	10	81.75	75.2	2×2.5	70.6	283.2	1,270
BNF 8010-7.5	80	10	81.75	75.2	3×2.5	100	424.3	1,860
BNF 8020A-2.5	80	20	82.7	72.9	1×2.5	90.1	294	890
BNF 8020A-5	80	20	82.7	72.9	2×2.5	163.7	589	1,720
BNF 8020A-7.5	80	20	82.7	72.9	3×2.5	231.6	883.2	2,520
BNF 10020A-2.5	100	20	102.7	92.9	1×2.5	99	368.5	2,110
BNF 10020A-5	100	20	102.7	92.9	2×2.5	179.3	737	4,080
BNF 10020A-7.5	100	20	102.7	92.9	3×2.5	253.8	1105.4	6,010



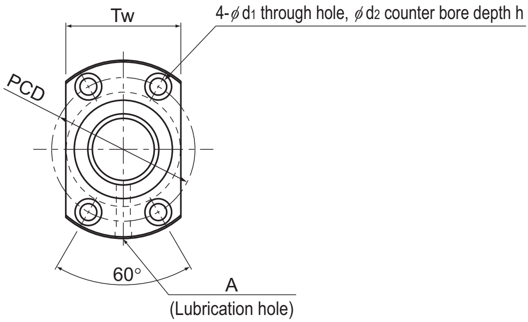
Unit: mm

Nut dimensions								Screw shaft inertial moment/mm	Nut mass	Shaft mass	Permissible rotational speed
Outer diameter D	Flange diameter D_1	Overall length L_1	H	B_1	PCD	$d_1 \times d_2 \times h$	Lubrication hole A	kg·m²/mm	kg	kg/m	min⁻¹
125	167	81	18	63	145	11×17.5×11		1.85×10^{-5}	5.8	27.4	970
125	167	111	18	93	145	11×17.5×11		1.85×10^{-5}	7.49	27.4	970
125	167	141	18	123	145	11×17.5×11		1.85×10^{-5}	9.19	27.4	970
128	170	93	18	75	148	11×17.5×11		1.85×10^{-5}	6.89	27.24	970
128	170	129	18	111	148	11×17.5×11		1.85×10^{-5}	9.08	27.24	970
128	170	165	18	147	148	11×17.5×11		1.85×10^{-5}	11.26	27.24	970
130	186	185	28	157	158	18×26×17.5		1.85×10^{-5}	14.5	27	960
130	176	77	22	55	152	14×20×13	Rc1/8 (PT1/8)	3.16×10^{-5}	5.9	36.26	850
130	176	107	22	85	152	14×20×13		3.16×10^{-5}	7.53	36.26	850
130	176	137	22	115	152	14×20×13		3.16×10^{-5}	9.15	36.26	850
143	204	127	28	99	172	18×26×17.5		3.16×10^{-5}	12.68	35.81	840
143	204	187	28	159	172	18×26×17.5		3.16×10^{-5}	17.12	35.81	840
143	204	247	28	219	172	18×26×17.5		3.16×10^{-5}	21.56	35.81	840
170	243	131	32	99	205	22×32×21.5		7.71×10^{-5}	18.28	57.13	680
170	243	191	32	159	205	22×32×21.5		7.71×10^{-5}	24.2	57.13	680
170	243	251	32	219	205	22×32×21.5		7.71×10^{-5}	30.12	57.13	680

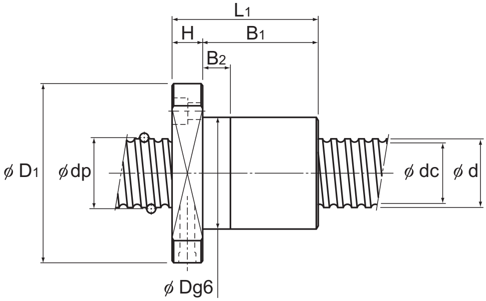
Note: The overall length of the nut will increase when equipping the QZ Lubricator. See A**15-366** for further details.

DK
No Preload

DN value	70,000



Model No.	Screw shaft outer diameter d	Lead Ph	Ball center-to-center diameter dp	Thread minor diameter dc	No. of loaded circuits Rows × turns	Basic load rating Ca kN	Basic load rating C_0a kN	Rigidity K N/μm
DK 1404-4	14	4	14.5	11.8	4×1	5.4	10.2	180
DK 1404-6	14	4	14.5	11.8	6×1	7.7	15.4	270
DK 1605-3	16	5	16.75	13.1	3×1	7.4	13	160
DK 1605-4	16	5	16.75	13.1	4×1	9.5	17.4	210
DK 2004-3	20	4	20.5	17.8	3×1	5.2	11.6	190
DK 2004-4	20	4	20.5	17.8	4×1	6.6	15.5	250
DK 2005-3	20	5	20.75	17.1	3×1	8.5	17.3	200
DK 2005-4	20	5	20.75	17.1	4×1	11	23.1	260
DK 2006-3	20	6	21	16.4	3×1	11.4	21.5	410
DK 2006-4	20	6	21	16.4	4×1	14.6	28.6	540
DK 2008-4	20	8	21	16.4	4×1	14.6	28.8	270



Unit: mm

	Nut dimensions										Screw shaft inertial moment/mm	Nut mass	Shaft mass	Permissible rotational speed
	Outer diameter D	Flange diameter D_1	Overall length L_1	H	B_1	B_2	PCD	$d_1 \times d_2 \times h$	Tw	Lubrication hole A	$kg \cdot m^2/mm$	kg	kg/m	min^{-1}
	26	45	48	10	38	10	35	4.5×8×4.5	29	M6	2.96×10^{-8}	0.2	1	4,820
	26	45	60	10	50	10	35	4.5×8×4.5	29	M6	2.96×10^{-8}	0.23	1	4,820
	30	49	45	10	35	10	39	4.5×8×4.5	31	M6	5.05×10^{-8}	0.24	1.25	4,170
	30	49	50	10	40	10	39	4.5×8×4.5	31	M6	5.05×10^{-8}	0.26	1.25	4,170
	32	56	42	11	31	10	44	5.5×9.5×5.5	35	M6	1.23×10^{-7}	0.26	2.18	3,410
	32	56	46	11	35	10	44	5.5×9.5×5.5	35	M6	1.23×10^{-7}	0.27	2.18	3,410
	34	58	46	11	35	10	46	5.5×9.5×5.5	36	M6	1.23×10^{-7}	0.31	2.06	3,370
	34	58	51	11	40	10	46	5.5×9.5×5.5	36	M6	1.23×10^{-7}	0.34	2.06	3,370
	35	58	52	11	41	10	46	5.5×9.5×5.5	36	M6	1.23×10^{-7}	0.36	1.93	3,330
	35	58	59	11	48	10	46	5.5×9.5×5.5	36	M6	1.23×10^{-7}	0.39	1.93	3,330
	35	58	69	11	58	15	46	5.5×9.5×5.5	36	M6	1.23×10^{-7}	0.45	2.06	3,330

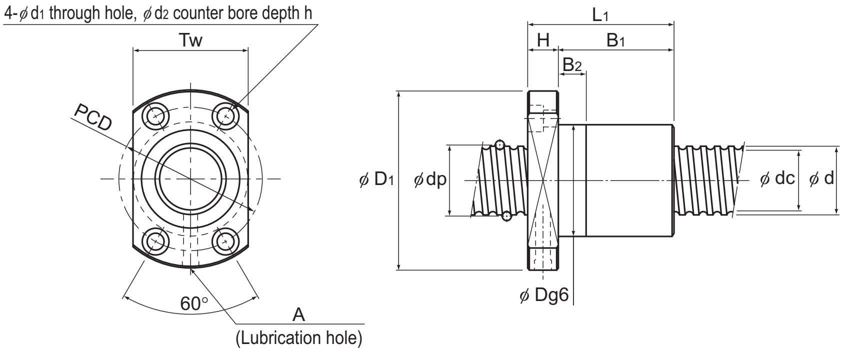
Note: The overall length of the nut will increase when equipping the QZ Lubricator. See A **15-366** for further details.

Ball Screw

Options⇒A 15-355

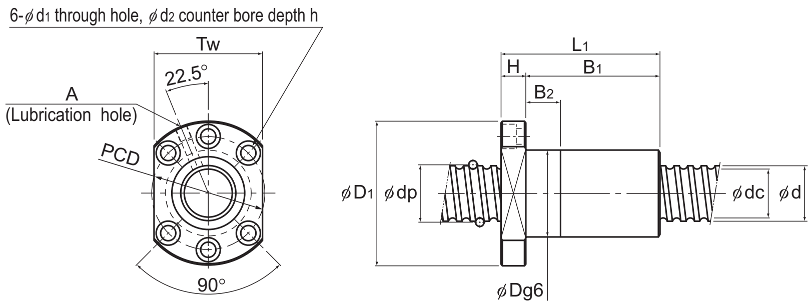
DK
No Preload

DN value	70,000



DK2504 to 2510

Model No.	Screw shaft outer diameter d	Lead Ph	Ball center-to-center diameter dp	Thread minor diameter dc	No. of loaded circuits Rows × turns	Basic load rating Ca kN	Basic load rating C0a kN	Rigidity K N/μm
DK 2504-3	25	4	25.5	22.8	3×1	5.7	15	230
DK 2504-4	25	4	25.5	22.8	4×1	7.4	19.9	310
DK 2505-3	25	5	25.75	22.1	3×1	9.7	22.6	250
DK 2505-4	25	5	25.75	22.1	4×1	12.4	30.3	320
DK 2506-3	25	6	26	21.4	3×1	12.8	27	250
DK 2506-4	25	6	26	21.4	4×1	16.8	37.4	330
DK 2508-3	25	8	26	21.4	3×1	13.1	28.1	250
DK 2508-4	25	8	26	21.4	4×1	16.8	37.5	330
DK 2510-3	25	10	26	21.6	3×1	12.7	27	250
DK 2510-4	25	10	26	21.6	4×1	16.7	37.6	330
DK 2805-3	28	5	28.75	25.2	3×1	10.5	26.4	270
DK 2805-4	28	5	28.75	25.2	4×1	13.4	35.2	360
DK 2806-3	28	6	29	24.4	3×1	14	32	280
DK 2806-4	28	6	29	24.4	4×1	18	42.5	370
DK 2810-4	28	10	29.25	23.6	4×1	22.4	50	370



DK2805 to 2810

Unit: mm

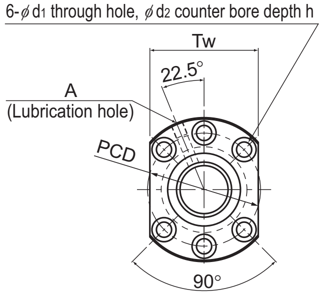
Nut dimensions										Screw shaft inertial moment/mm	Nut mass	Shaft mass	Permissible rotational speed
Outer diameter D	Flange diameter D_1	Overall length L_1	H	B_1	B_2	PCD	$d_1 \times d_2 \times h$	Tw	Lubrication hole A	kg·m²/mm	kg	kg/m	min⁻¹
38	63	43	11	32	10	51	5.5×9.5×5.5	39	M6	3.01×10^{-7}	0.33	3.5	2,740
38	63	47	11	36	10	51	5.5×9.5×5.5	39	M6	3.01×10^{-7}	0.35	3.5	2,740
40	63	46	11	35	10	51	5.5×9.5×5.5	41	M6	3.01×10^{-7}	0.38	3.35	2,710
40	63	51	11	40	10	51	5.5×9.5×5.5	41	M6	3.01×10^{-7}	0.41	3.35	2,710
40	63	52	11	41	10	51	5.5×9.5×5.5	41	M6	3.01×10^{-7}	0.41	3.19	2,690
40	63	60	11	49	10	51	5.5×9.5×5.5	41	M6	3.01×10^{-7}	0.46	3.19	2,690
40	63	62	12	50	10	51	5.5×9.5×5.5	41	M6	3.01×10^{-7}	0.48	3.35	2,690
40	63	71	12	59	15	51	5.5×9.5×5.5	41	M6	3.01×10^{-7}	0.54	3.35	2,690
40	63	80	15	65	15	51	5.5×9.5×5.5	41	M6	3.01×10^{-7}	0.62	3.45	2,690
40	63	85	15	70	20	51	5.5×9.5×5.5	41	M6	3.01×10^{-7}	0.65	3.45	2,690
43	71	49	12	37	10	57	6.6×11×6.5	55	M6	4.74×10^{-7}	0.48	4.27	2,430
43	71	54	12	42	10	57	6.6×11×6.5	55	M6	4.74×10^{-7}	0.51	4.27	2,430
43	71	53	12	41	10	57	6.6×11×6.5	55	M6	4.74×10^{-7}	0.5	4.36	2,410
43	71	61	12	49	10	57	6.6×11×6.5	55	M6	4.74×10^{-7}	0.56	4.36	2,410
45	71	84	15	69	20	57	6.6×11×6.5	55	M6	4.74×10^{-7}	0.82	4.18	2,390

Note: The overall length of the nut will increase when equipping the QZ Lubricator. See **A15-366** for further details.

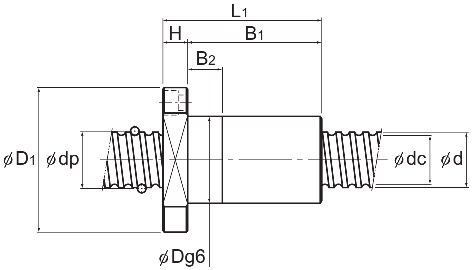
Options⇒**A15-355**

DK
No Preload

DN value	70,000



Model No.	Screw shaft outer diameter	Lead	Ball center-to-center diameter	Thread minor diameter	No. of loaded circuits	Basic load rating		Rigidity
						Ca	C_0a	K
	d	Ph	dp	dc	Rows × turns	kN	kN	N/µm
DK 3204-3	32	4	32.5	30.1	3×1	6.4	19.6	290
DK 3204-4	32	4	32.5	30.1	4×1	8.2	26.1	380
DK 3205-3	32	5	32.75	29.2	3×1	11.1	30.2	300
DK 3205-4	32	5	32.75	29.2	4×1	14.2	40.3	400
DK 3205-6	32	5	32.75	29.2	6×1	20.1	60.4	600
DK 3206-3	32	6	33	28.4	3×1	14.9	37.1	310
DK 3206-4	32	6	33	28.4	4×1	19.1	49.5	410
DK 3210-3	32	10	33.75	26.4	3×1	25.7	52.2	300
DK 3210-4	32	10	33.75	26.4	4×1	33	69.7	390
DK 3212-4	32	12	33.75	26.4	4×1	34.2	73.9	420
DK 3610-3	36	10	37.75	30.5	3×1	28.8	63.8	350
DK 3610-4	36	10	37.75	30.5	4×1	36.8	85	470
DK 4010-3	40	10	41.75	34.4	3×1	29.8	69.3	380
DK 4010-4	40	10	41.75	34.4	4×1	38.1	92.4	500
DK 4012-3	40	12	41.75	34.4	3×1	30.6	72.3	390
DK 4012-4	40	12	41.75	34.4	4×1	39.2	96.4	520
DK 4016-4	40	16	41.75	34.4	4×1	39.1	96.8	520
DK 4020-3	40	20	41.75	34.7	3×1	29.4	69.3	750



Unit: mm

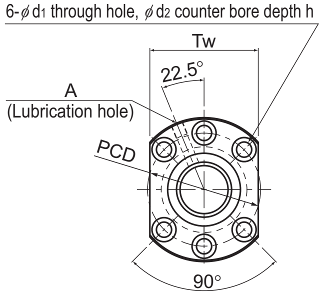
	Nut dimensions										Screw shaft inertial moment/mm	Nut mass	Shaft mass	Permissible rotational speed
	Outer diameter D	Flange diameter D_1	Overall length L_1	H	B_1	B_2	PCD	$d_1 \times d_2 \times h$	Tw	Lubrication hole A	kg·m²/mm	kg	kg/m	min^{-1}
	45	76	44	11	33	10	63	6.6×11×6.5	59	M6	8.08×10^{-7}	0.44	5.86	2,150
	45	76	48	11	37	10	63	6.6×11×6.5	59	M6	8.08×10^{-7}	0.47	5.86	2,150
	46	76	47	12	35	10	63	6.6×11×6.5	59	M6	8.08×10^{-7}	0.5	5.67	2,130
	46	76	52	12	40	10	63	6.6×11×6.5	59	M6	8.08×10^{-7}	0.53	5.67	2,130
	46	76	62	12	50	10	63	6.6×11×6.5	59	M6	8.08×10^{-7}	0.6	5.67	2,130
	48	76	53	12	41	10	63	6.6×11×6.5	59	M6	8.08×10^{-7}	0.58	6.31	2,120
	48	76	61	12	49	10	63	6.6×11×6.5	59	M6	8.08×10^{-7}	0.65	6.31	2,120
	54	87	80	15	65	15	69	9×14×8.5	66	M6	8.08×10^{-7}	1.22	4.98	2,070
	54	87	90	15	75	20	69	9×14×8.5	66	M6	8.08×10^{-7}	1.34	4.98	2,070
	54	87	98	15	83	25	69	9×14×8.5	66	M6	8.08×10^{-7}	1.43	5.2	2,070
	58	98	82	18	64	15	77	11×17.5×11	75	M6	1.29×10^{-6}	1.52	6.51	1,850
	58	98	93	18	75	20	77	11×17.5×11	75	M6	1.29×10^{-6}	1.66	6.51	1,850
	62	104	83	18	65	15	82	11×17.5×11	79	Rc1/8 (PT1/8)	1.97×10^{-6}	3.14	8.22	1,670
	62	104	93	18	75	20	82	11×17.5×11	79		1.97×10^{-6}	3.41	8.22	1,670
	62	104	90	18	72	20	82	11×17.5×11	79		1.97×10^{-6}	1.77	8.5	1,670
	62	104	103	18	85	25	82	11×17.5×11	79		1.97×10^{-6}	1.95	8.5	1,670
	62	104	120	18	102	30	82	11×17.5×11	79		1.97×10^{-6}	2.19	8.83	1,670
	62	104	123	18	105	30	82	11×17.5×11	79		1.97×10^{-6}	2.23	9.03	1,670

Note: The overall length of the nut will increase when equipping the QZ Lubricator. See A**15-366** for further details.

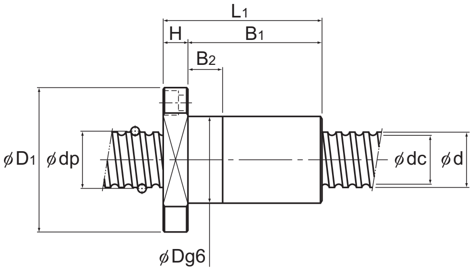
Options⇒A**15-355**

DK
No Preload

DN value	70,000



Model No.	Screw shaft outer diameter d	Lead Ph	Ball center-to-center diameter dp	Thread minor diameter dc	No. of loaded circuits Rows × turns	Basic load rating Ca kN	Basic load rating C_0a kN	Rigidity K N/μm
DK 5010-3	50	10	51.75	44.4	3×1	33.9	90.7	470
DK 5010-4	50	10	51.75	44.4	4×1	43.4	120.5	610
DK 5010-6	50	10	51.75	44.4	6×1	62.7	186.8	930
DK 5012-3	50	12	52.25	43.3	3×1	45.8	113	490
DK 5012-4	50	12	52.25	43.3	4×1	58.6	150.6	640
DK 5016-3	50	16	52.25	43.3	3×1	45.7	113.3	490
DK 5016-4	50	16	52.25	43.3	4×1	58.5	151	640
DK 5020-3	50	20	52.25	43.6	3×1	44.2	108.8	470
DK 6310-4	63	10	64.75	57.7	4×1	49.5	160.7	780
DK 6310-6	63	10	64.75	57.7	6×1	70.3	242.1	1,140
DK 6312-3	63	12	65.25	56.3	3×1	51.9	147.4	600
DK 6312-4	63	12	65.25	56.3	4×1	66.4	196.6	785
DK 6320-3	63	20	65.7	55.9	3×1	83.5	229.3	1,470



Unit: mm

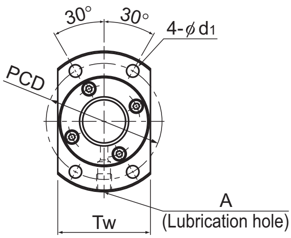
	Nut dimensions										Screw shaft inertial moment/mm	Nut mass	Shaft mass	Permissible rotational speed
	Outer diameter D	Flange diameter D_1	Overall length L_1	H	B_1	B_2	PCD	$d_1 \times d_2 \times h$	Tw	Lubrication hole A	$kg \cdot m^2/mm$	kg	kg/m	min^{-1}
	72	123	83	18	65	15	101	11×17.5×11	92		4.82×10^{-6}	2.14	13.38	1,350
	72	123	93	18	75	20	101	11×17.5×11	92		4.82×10^{-6}	2.3	13.38	1,350
	72	123	114	18	96	30	101	11×17.5×11	92		4.82×10^{-6}	2.65	13.38	1,350
	75	129	97	22	75	20	105	14×20×13	98		4.82×10^{-6}	2.91	12.74	1,330
	75	129	110	22	88	25	105	14×20×13	98		4.82×10^{-6}	3.16	12.74	1,330
	75	129	111	22	89	25	105	14×20×13	98		4.82×10^{-6}	3.18	13.41	1,330
	75	129	129	22	107	30	105	14×20×13	98	Rc1/8 (PT1/8)	4.82×10^{-6}	3.52	13.41	1,330
	75	129	136	28	108	30	105	14×20×13	98		4.82×10^{-6}	3.94	13.8	1,330
	85	146	97	22	75	20	122	14×20×13	110		1.21×10^{-5}	3.28	21.93	1,080
	85	146	118	22	96	30	122	14×20×13	110		1.21×10^{-5}	3.7	21.93	1,080
	90	146	98	22	76	20	122	14×20×13	110		1.21×10^{-5}	3.71	21.14	1,070
	90	146	111	22	89	25	122	14×20×13	110		1.21×10^{-5}	4.04	21.14	1,070
	95	159	136	28	108	30	129	18×26×17.5	121		1.21×10^{-5}	6.17	21.57	1,060

Note: The overall length of the nut will increase when equipping the QZ Lubricator. See A**15-366** for further details.

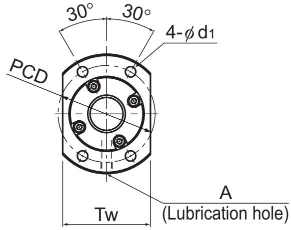
Options⇒A15-355

WHF
No Preload

DN value	120,000

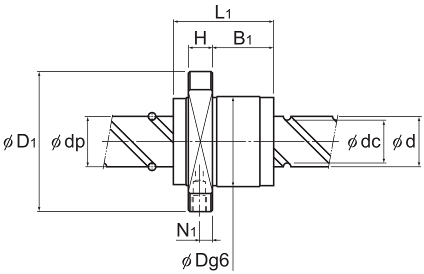


WHF1530/1540/2020/2025/
2030/2040/2550



WHF2525

Model No.	Screw shaft outer diameter	Lead	Ball center-to-center diameter	Thread minor diameter	No. of loaded circuits	Basic load rating		Rigidity	Nut dimensions		
						Ca	C_0a	K	Outer diameter	Flange diameter	Overall length
	d	Ph	dp	dc	Rows × turns	kN	kN	N/μm	D	D_1	L_1
WHF 1530-3.4	15	30	15.75	12.5	2×1.7	8	14.4	195	32	53	64.5
WHF 1540-3.4	15	40	15.75	12.5	2×1.7	7.7	16.3	209	34	57	81.6
WHF 2020-3.4	20	20	20.75	17.5	2×1.7	9.6	21	225	42	64	47.1
WHF 2025-3.4	20	25	20.75	17.6	2×1.7	9.8	22.3	236	39	62	56.2
WHF 2030-3.4	20	30	20.75	17.6	2×1.7	9.9	23.5	243	39	62	65.3
WHF 2040-3.4	20	40	20.75	17.5	2×1.7	9.6	20.3	256	37	57	82.7
WHF 2525-3.4	25	25	26	21.9	2×1.7	14.5	33.1	285	50	77	58.8
WHF 2550-3.4	25	50	26	21.9	2×1.7	14.4	31.9	323	45	69	103.3



Unit: mm

	Nut dimensions							Screw shaft inertial moment/mm	Nut mass	Shaft mass	Permissible rotational speed
	H	B_1	PCD	d_1	Tw	N_1	Lubrication hole A	kg·m²/mm	kg	kg/m	min^{-1}
	10	47.5	43	5.5	33	5	M6	3.9×10^{-8}	0.38	1.26	5,000
	10	64.6	45	5.5	40	5	M6	3.9×10^{-8}	0.48	1.28	5,000
	10	24.1	53	5.5	46	5	M6	1.23×10^{-7}	0.49	2.25	5,000
	10	33.2	50	5.5	46	5	M6	1.23×10^{-7}	0.51	2.26	5,000
	10	43.3	50	5.5	46	5	M6	1.23×10^{-7}	0.55	2.28	5,000
	10	65.7	47	5.5	38	5	M6	1.23×10^{-7}	0.58	2.34	5,000
	12	31.3	63	6.6	56	6	M6	3.01×10^{-7}	0.65	3.52	4,610
	12	79.3	57	6.6	46	6	M6	3.01×10^{-7}	0.72	3.66	4,610

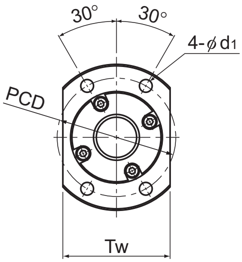
Notes: The Model WHF can be equipped with a brush seal depending on the model number. Contact THK if you would like to use one.
The overall length of the nut will increase when equipping the QZ Lubricator. See **A15-366** for further details.

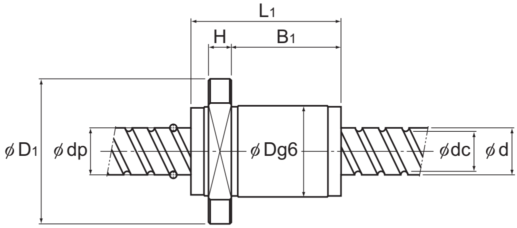
Ball Screw

Options⇒A15-355

BLK (Precision Ball Screw) No Preload

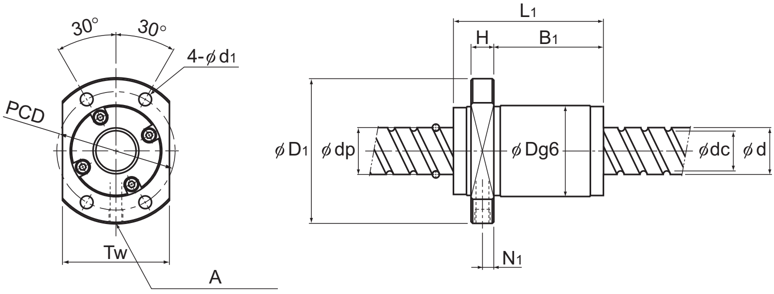
DN value	70,000





BLK0808

Model No.	Screw shaft outer diameter d	Lead Ph	Ball center-to-center diameter dp	Thread minor diameter dc	No. of loaded circuits Rows × turns	Basic load rating Ca kN	 C_{0a} kN	Rigidity K N/μm
BLK 0808-3.2	8	8	8.4	6.7	2×1.6	2.2	3.8	95
BLK 1510-5.6	15	10	15.75	12.5	2×2.8	14.3	27.8	340
BLK 1616-2.8	16	16	16.65	13.7	1×2.8	5.2	9.9	180
BLK 1616-3.6	16	16	16.65	13.7	2×1.8	7.1	14.3	220
BLK 2020-2.8	20	20	20.75	17.5	1×2.8	8.1	17.2	230
BLK 2020-3.6	20	20	20.75	17.5	2×1.8	11.1	24.7	290
BLK 2525-2.8	25	25	26	21.9	1×2.8	12.2	26.9	270
BLK 2525-3.6	25	25	26	21.9	2×1.8	16.6	38.7	350
BLK 3232-2.8	32	32	33.25	28.3	1×2.8	17.3	41.4	340
BLK 3232-3.6	32	32	33.25	28.3	2×1.8	23.7	59.5	440
BLK 3620-5.6	36	20	37.75	31.2	2×2.8	54.9	134.3	760
BLK 3624-5.6	36	24	38	30.7	2×2.8	63.8	151.9	770
BLK 3636-2.8	36	36	37.4	31.7	1×2.8	22.4	54.1	390
BLK 3636-3.6	36	36	37.4	31.7	2×1.8	30.8	78	490
BLK 4040-2.8	40	40	41.75	35.2	1×2.8	28.2	68.9	430
BLK 4040-3.6	40	40	41.75	35.2	2×1.8	38.7	99.2	550
BLK 5050-2.8	50	50	52.2	44.1	1×2.8	42.2	107.8	530
BLK 5050-3.6	50	50	52.2	44.1	2×1.8	57.8	155	670



BLK1510 to 5050

Unit: mm

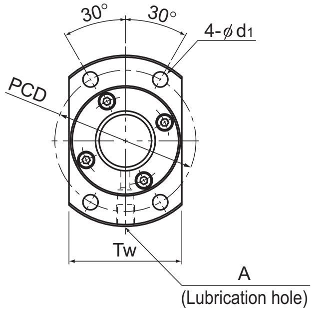
Nut dimensions										Screw shaft inertial moment/mm	Nut mass	Shaft mass	Permissible rotational speed
Outer diameter D	Flange diameter D_1	Overall length L_1	H	B_1	PCD	d_1	Tw	N_1	Lubrication hole A	kg·m²/mm	kg	kg/m	min^{-1}
18	31	20	4	10	25	3.4	20	—	—	3.16×10^{-9}	0.03	0.36	3,500
34	57	44	10	24	45	5.5	40	5	M6	3.9×10^{-8}	0.34	0.31	4,440
32	53	54	10	37.5	42	4.5	38	5	M6	5.05×10^{-8}	0.32	1.41	4,200
32	53	38	10	21.5	42	4.5	38	5	M6	5.05×10^{-8}	0.21	1.41	4,200
39	62	65	10	47.5	50	5.5	46	5	M6	1.23×10^{-7}	0.49	2.25	3,370
39	62	45	10	27.5	50	5.5	46	5	M6	1.23×10^{-7}	0.35	2.25	3,370
47	74	80	12	60	60	6.6	56	6	M6	3.01×10^{-7}	0.89	3.52	2,690
47	74	55	12	35	60	6.6	56	6	M6	3.01×10^{-7}	0.64	3.52	2,690
58	92	102	15	77	74	9	68	7.5	M6	8.08×10^{-7}	1.78	5.83	2,100
58	92	70	15	45	74	9	68	7.5	M6	8.08×10^{-7}	1.32	5.83	2,100
70	110	78	17	45	90	11	80	8.5	M6	1.29×10^{-6}	2.23	6.49	1,850
75	115	94	18	59	94	11	86	9	M6	1.29×10^{-6}	3.05	6.39	1,840
66	106	113	17	86	85	11	76	8.5	M6	1.29×10^{-6}	2.61	7.34	1,870
66	106	77	17	50	85	11	76	8.5	M6	1.29×10^{-6}	1.93	7.34	1,870
73	114	125	17	96.5	93	11	84	8.5	M6	1.97×10^{-6}	3.4	9.01	1,670
73	114	85	17	56.5	93	11	84	8.5	M6	1.97×10^{-6}	2.48	9.01	1,670
90	135	156	20	122	112	14	104	10	M6	4.82×10^{-6}	6.18	14.08	1,340
90	135	106	20	72	112	14	104	10	M6	4.82×10^{-6}	4.45	14.08	1,340

Notes: The Model BLK can be equipped with a brush seal depending on the model number. Contact THK if you would like to use one.
The overall length of the nut will increase when equipping the QZ Lubricator. See A15-366 for further details.

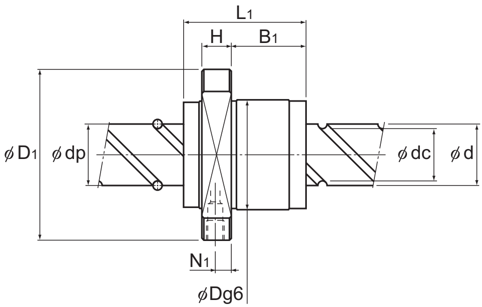
Options⇒A15-355

WGF
No Preload

DN value	70,000



Model No.	Screw shaft outer diameter d	Lead Ph	Ball center-to-center diameter dp	Thread minor diameter dc	No. of loaded circuits Rows × turns	Basic load rating Ca kN	Basic load rating C_0a kN	Rigidity K N/μm
WGF 0812-3	8	12	8.4	6.6	2×1.65	2.2	3.9	110
WGF 1015-3	10	15	10.5	8.3	2×1.65	3.3	6.2	140
WGF 1320-3	13	20	13.5	10.8	2×1.65	4.7	9.6	180
WGF 1520-1.5	15	20	15.75	12.5	1×1.5	4.4	7.9	100
WGF 1520-3	15	20	15.75	12.5	2×1.5	8.1	15.8	190
WGF 1530-1	15	30	15.75	12.5	2×0.6	3.5	5.4	90
WGF 1530-3	15	30	15.75	12.5	2×1.6	8.1	14.6	220
WGF 1540-1.5	15	40	15.75	12.5	2×0.75	3.9	7.4	110
WGF 2040-1	20	40	20.75	17.5	2×0.65	4.3	8	110
WGF 2040-3	20	40	20.75	17.5	2×1.65	9.5	20.2	280
WGF 2060-1.5	20	60	20.75	17.5	2×0.75	4.5	11	140
WGF 2550-1	25	50	26	21.9	2×0.65	6.4	12.5	140
WGF 2550-3	25	50	26	21.9	2×1.65	14.3	31.7	340
WGF 3060-1	30	60	31.25	26.4	2×0.65	8.9	18	170
WGF 3060-3	30	60	31.25	26.4	2×1.65	19.9	45.7	410
WGF 3090-1.5	30	90	31.25	26.4	2×0.75	9.8	25.8	200
WGF 4080-1	40	80	41.75	35.2	2×0.65	15	32.1	220
WGF 4080-3	40	80	41.75	35.2	2×1.65	33.4	81.4	530
WGF 50100-1	50	100	52.2	44.1	2×0.65	22.4	50.1	270
WGF 50100-3	50	100	52.2	44.1	2×1.65	49.9	127.2	650



Unit: mm

Nut dimensions										Screw shaft inertial moment/mm	Nut mass	Shaft mass	Permissible rotational speed
Outer diameter D	Flange diameter D_1	Overall length L_1	H	B_1	PCD	d_1	Tw	N_1	Lubrication hole A	kg·m²/mm	kg	kg/m	min^{-1}
18	31	27	4	17	25	3.4	20	—	—	3.16×10^{-9}	0.054	0.35	3,500
23	40	33	5	22	32	4.5	25	—	—	7.71×10^{-9}	0.11	0.55	3,500
28	45	43	5	29	37	4.5	30	—	—	2.2×10^{-8}	0.18	0.96	3,500
32	53	45	10	28	43	5.5	33	5	M6	3.9×10^{-8}	0.29	1.22	4,440
32	53	45	10	28	43	5.5	33	5	M6	3.9×10^{-8}	0.29	1.22	4,440
32	53	33	10	17	43	5.5	33	5	M6	3.9×10^{-8}	0.23	1.26	4,440
32	53	63	10	47	43	5.5	33	5	M6	3.9×10^{-8}	0.38	1.26	4,440
32	53	42	10	26.3	43	5.5	33	5	M6	3.9×10^{-8}	0.28	1.28	4,440
37	57	41	10	25	47	5.5	38	5.5	M6	1.23×10^{-7}	0.24	2.34	3,370
37	57	81	10	65	47	5.5	38	5.5	M6	1.23×10^{-7}	0.48	2.34	3,370
37	57	60	10	40.1	47	5.5	38	5.5	M6	1.23×10^{-7}	0.4	2.37	3,370
45	69	52	12	31.5	57	6.6	46	7	M6	3.01×10^{-7}	0.43	3.66	2,690
45	69	102	12	81.5	57	6.6	46	7	M6	3.01×10^{-7}	0.85	3.66	2,690
55	89	62	15	37	71	9	56	9	M6	6.24×10^{-7}	1.11	5.28	2,240
55	89	122	15	97	71	9	56	9	M6	6.24×10^{-7}	1.9	5.28	2,240
55	89	92	15	61.3	71	9	56	9	M6	6.24×10^{-7}	1.51	5.34	2,240
73	114	79	17	50.5	93	11	74	9	M6	1.97×10^{-6}	2.34	9.38	1,670
73	114	159	17	130.5	93	11	74	9	M6	1.97×10^{-6}	4.18	9.38	1,670
90	135	98	20	64	112	14	92	10	M6	4.82×10^{-6}	4.18	14.66	1,340
90	135	198	20	164	112	14	92	10	M6	4.82×10^{-6}	7.63	14.66	1,340

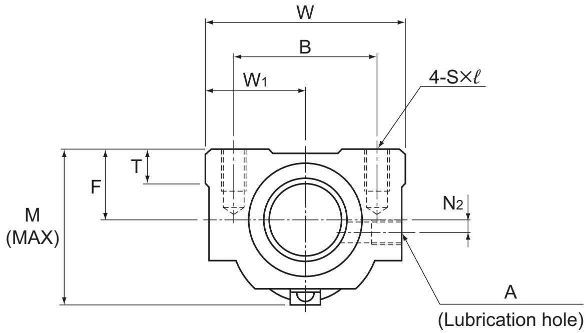
Notes: The Model WGF can be equipped with a brush seal depending on the model number. Contact THK if you would like to use one.
The overall length of the nut will increase when equipping the QZ Lubricator. See A**15-366** for further details.

Ball Screw

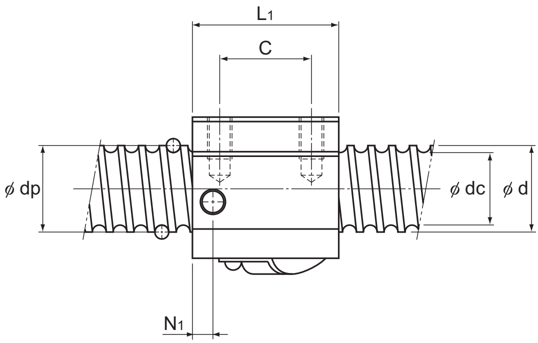
Options⇒A15-355

BNT
No Preload

DN value	70,000



Model No.	Screw shaft outer diameter d	Lead Ph	Ball center-to-center diameter dp	Thread minor diameter dc	No. of loaded circuits Rows × turns	Basic load rating Ca kN	Basic load rating C_0a kN	Rigidity K N/µm
BNT 1404-3.6	14	4	14.4	11.5	1×3.65	6.8	12.6	190
BNT 1405-2.6	14	5	14.5	11.2	1×2.65	7.2	12.6	150
BNT 1605-2.6	16	5	16.75	13.5	1×2.65	7.8	14.7	170
BNT 1808-3.6	18	8	19.3	14.4	1×3.65	18.2	34.4	270
BNT 2005-2.6	20	5	20.5	17.2	1×2.65	8.7	18.3	200
BNT 2010-2.6	20	10	21.25	16.4	1×2.65	14.7	27.8	220
BNT 2505-2.6	25	5	25.5	22.2	1×2.65	9.6	23	240
BNT 2510-5.3	25	10	26.8	20.2	2×2.65	43.4	92.8	520
BNT 2806-2.6	28	6	28.5	25.2	1×2.65	10.1	25.8	270
BNT 2806-5.3	28	6	28.5	25.2	2×2.65	18.3	51.6	510
BNT 3210-2.6	32	10	33.75	27.2	1×2.65	27.3	59.5	330
BNT 3210-5.3	32	10	33.75	27.2	2×2.65	49.6	118.9	640
BNT 3610-2.6	36	10	37	30.5	1×2.65	28.7	65.6	360
BNT 3610-5.3	36	10	37	30.5	2×2.65	52.1	131.2	700
BNT 4512-5.3	45	12	46.5	39.2	2×2.65	68.1	186.7	860



Unit: mm

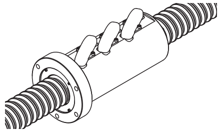
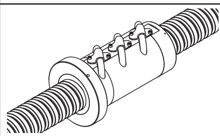
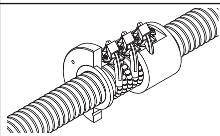
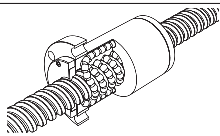
Nut dimensions												Screw shaft inertial moment/mm	Nut mass	Shaft mass	Permissible rotational speed
Width	Center height	Overall length	Mounting hole								Lubrication hole				
W	F	L_1	B	C	S×ℓ	W_1	T	M	N_1	N_2	A	kg·m²/mm	kg	kg/m	min^{-1}
34	13	35	26	22	M4×7	17	6	30	6	2	M6	2.96×10^{-8}	0.15	0.93	4,860
34	13	35	26	22	M4×7	17	6	31	6	2	M6	2.96×10^{-8}	0.15	0.92	4,820
42	16	36	32	22	M5×8	21	21.5	32.5	6	2	M6	5.05×10^{-8}	0.3	1.24	4,170
48	17	56	35	35	M6×10	24	10	44	8	3	M6	8.09×10^{-8}	0.47	1.46	3,620
48	17	35	35	22	M6×10	24	9	39	5	3	M6	1.23×10^{-7}	0.28	2.06	3,410
48	18	58	35	35	M6×10	24	9	46	10	2	M6	1.23×10^{-7}	0.5	1.99	3,290
60	20	35	40	22	M8×12	30	9.5	45	7	5	M6	3.01×10^{-7}	0.41	3.35	2,740
60	23	94	40	60	M8×12	30	10	55	10	—	M6	3.01×10^{-7}	1.18	2.79	2,610
60	22	42	40	18	M8×12	30	10	50	8	—	M6	4.74×10^{-7}	0.81	4.42	2,450
60	22	67	40	40	M8×12	30	10	50	8	—	M6	4.74×10^{-7}	0.78	4.42	2,450
70	26	64	50	45	M8×12	35	12	62	10	—	M6	8.08×10^{-7}	1.3	4.98	2,070
70	26	94	50	60	M8×12	35	12	62	10	—	M6	8.08×10^{-7}	2	4.98	2,070
86	29	64	60	45	M10×16	43	17	67	11	—	M6	1.29×10^{-6}	1.8	6.54	1,890
86	29	96	60	60	M10×16	43	17	67	11	—	M6	1.29×10^{-6}	2.4	6.54	1,890
100	36	115	75	75	M12×20	50	20.5	80	13	—	M6	3.16×10^{-6}	4.1	10.56	1,500

Notes: The Model BNT can be equipped with a brush seal depending on the model number. Contact THK if you would like to use one.
The overall length of the nut will increase when equipping the QZ Lubricator. See **A15-366** for further details.

Ball Screw

Options⇒A15-355

High-Thrust Ball Screw

Series	Model		Features	
High-thrust	HBN-V		High load, high DN value	
	HBN-K HBN-KA		High load, high DN value	
	HBN		High load, high DN value	
	SBKH		High load, high DN value, large lead	

	Caged Ball	Compact nut	Miniature	High load capacity	Offset preload	DN value	Shaft diameter (mm)	Lead (mm)	Page No.
	✓			✓		160,000	50 to 80	10 to 25	A15-246
	✓			✓		120,000	63 to 140	16 to 50	A15-248
	✓			✓		130,000	32 to 63	10 to 20	A15-254
	✓			✓		130,000	63 to 120	32 to 60	A15-256

Standard Combinations of Outer Diameters and Leads of the Screw Shafts

Shaft diameter	Lead							
	4	5	6	10	12	16	20	
32				HBN				
36				HBN	HBN			
40				HBN	HBN			
50				HBN-V HBN	HBN-V HBN	HBN-V HBN		
63						HBN-V HBN	HBN-V HBN	
80						HBN-V	HBN-V	
100						HBN-K HBN-KA	HBN-K HBN-KA	
120							HBN-K HBN-KA	
140								

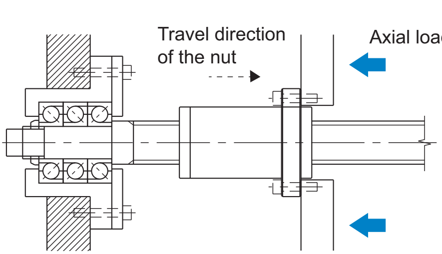
Unit: mm

	Lead								
	25	30	32	35	36	40	42	50	60
	HBN-V		SBKH	HBN-K		SBKH	HBN-K	HBN-K	
	HBN-V					HBN-K HBN-KA		HBN-K HBN-KA SBKH	SBKH
	HBN-K HBN-KA							SBKH	SBKH
	HBN-K HBN-KA								SBKH
	HBN-K HBN-KA		HBN-K HBN-KA			HBN-K HBN-KA			

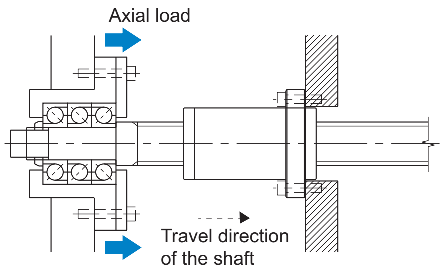
Examples of Assembling Models HBN-V, HBN-K, HBN-KA, HBN, and SBKH

If using models HBN-V, HBN-K, HBN-KA, HBN, or SBKH under a large load, arrange the nut flange and the fixed-side support unit in relation to the loading direction as indicated in the figures below while taking into account the load balance of the balls. In addition, be sure not to apply a tensile load to the bolts while the unit is operating. If you intend to use this product in configurations other than those below, contact THK.

Example Assembly of Models HBN-V, HBN-K, HBN-KA, HBN, and SBKH (Recommended)

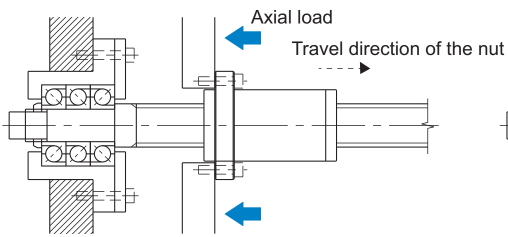


When the nut is moving

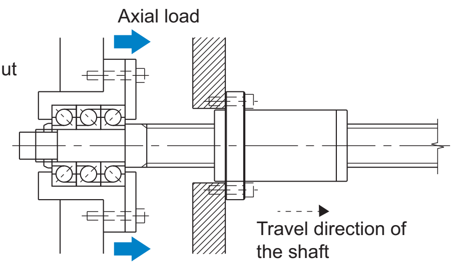


When the shaft is moving

Example Assembly of Models HBN-V, HBN-K, HBN-KA, HBN, and SBKH (Not Recommended)



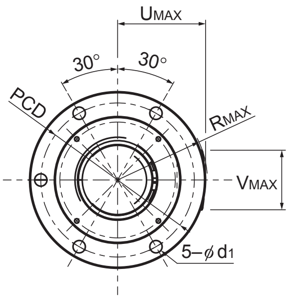
When the nut is moving



When the shaft is moving

HBN-V
No Preload

DN value	160,000



Model No.	Screw shaft outer diameter	Lead	Ball center-to-center diameter	Thread minor diameter	No. of loaded circuits	Basic load rating		Permissible load[1]	Rigidity
						C_a	C_{0a}	F_P	K
	d	Ph	dp	dc	Rows × turns	kN	kN	kN	N/μm
HBN5010V-7.5	50	10	52	44	3×2.5	189	506	71	1,977
HBN5012V-7.5	50	12	52.4	43.2	3×2.5	250	624	87	2,056
HBN5016V-7.5	50	16	53	39.6	3×2.5	410	902	126	2,516
HBN6316V-7.5	63	16	66	52.6	3×2.5	459	1,134	159	3,010
HBN6316V-10.5	63	16	66	52.6	3×3.5	598	1,544	216	4,040
HBN6320V-7.5	63	20	66.5	49.8	3×2.5	613	1,410	197	3,098
HBN6325V-10.5	63	25	66.5	49.8	3×3.5	797	1,920	269	4,154
HBN8016V-7.5	80	16	83	70.2	3×2.5	510	1,440	202	3,626
HBN8016V-10.5	80	16	83	70.2	3×3.5	668	1,970	276	4,888
HBN8020V-7.5	80	20	83.5	66.8	3×2.5	688	1,787	250	3,730
HBN8020V-10.5	80	20	83.5	66.8	3×3.5	899	2,442	342	5,022
HBN8025V-7.5	80	25	84	63.6	3×2.5	872	2,135	299	3,819
HBN8025V-10.5	80	25	84	63.6	3×3.5	1,139	2,912	408	5,133

[1] The permissible load F_P indicates the maximum axial load that the ball screw can receive.

Notes: This model is capable of achieving a longer service life than the conventional ball screw under a high load.
Certain precautions are necessary regarding the assembly method. (See **A15-244**.)
For high-load ball screws, the standard maximum length of the screw shaft is 3,000 mm. For lengths greater than this, please contact THK.

Axial Clearance

Unit: mm

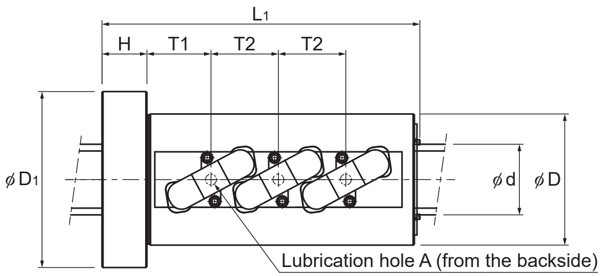
Clearance symbol	G2
Axial clearance	0 to 0.02

Model number coding

HBN6320V-7.5 RR G2 +1400L C7

- HBN6320V-7.5: Model number
- RR: Seal symbol[1]
- G2: Symbol for clearance in the axial direction
(For the axial clearance, this model has clearance G2 as standard.
Other clearance is also available at your request. Contact THK for details.)
- +1400L: Overall screw shaft length (in mm)
- C7: Accuracy symbol[2]

[1] See **A15-356**. [2] See **A15-12**.



Unit: mm

	Nut dimensions												Screw shaft inertial moment/mm	Nut mass	Shaft mass	Permissible rotational speed
	Outer diameter D	Flange diameter D_1	Overall length L_1	H	PCD	d_1	T1	T2	U_{MAX}	V_{MAX}	R_{MAX}	Lubrication hole A	$kg\cdot m^2/mm$	kg	kg/m	min^{-1}
	75	109	143	18	92	9	31	30	50	48	52	M6	4.82×10^{-6}	3.0	13.7	3,070
	80	114	163	18	96	9	35	36	54	48	55	M6	4.82×10^{-6}	4.0	13.4	3,050
	95	129	213	28	112	9	43	48	64	48	65	Rc1/8 (PT1/8)	4.82×10^{-6}	8.7	12.1	3,010
	105	139	213	28	122	9	43	48	71	57	71.5		1.21×10^{-5}	9.4	20.2	2,420
	105	139	261	28	122	9	59	64	71	57	71.5		1.21×10^{-5}	11.4	20.2	2,420
	117	157	257	32	137	11	51	60	78	57	79		1.21×10^{-5}	15.5	19.1	2,400
	117	157	377	32	137	11	83.5	100	78	57	79		1.21×10^{-5}	22.4	25.2	2,400
	120	154	219	32	137	9	43	48	79	70	80		3.16×10^{-5}	10.9	33.9	1,920
	120	154	267	32	137	9	59	64	79	70	80		3.16×10^{-5}	13.2	33.9	1,920
	130	170	257	32	150	11	50	60	86	69	87		3.16×10^{-5}	16.7	32.5	1,910
	130	170	317	32	150	11	70	80	86	69	87		3.16×10^{-5}	20.5	32.5	1,910
	145	185	315	40	165	11	60	75	95	68	95		3.16×10^{-5}	27.9	31.4	1,900
	145	185	391	40	165	11	85.5	100	95	69	96		3.16×10^{-5}	34.4	31.4	1,900

The rigidity values in the table represent spring constants, each obtained from the load and the elastic deformation under an axial load equal to 30% of the basic axial 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 30% of Ca, the rigidity value (K_N) is obtained from the following equation.

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

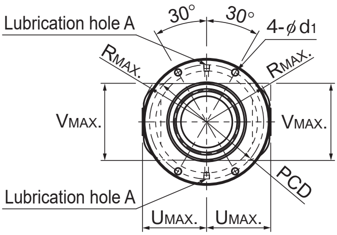
K: Rigidity value in the dimensional table

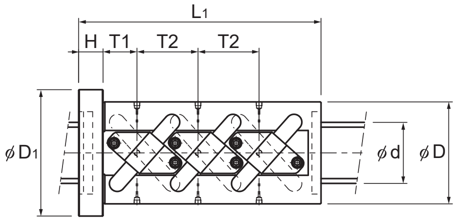
Ball Screw

Options⇒A15-355

HBN-K and HBN-KA No Preload

DN value	120,000





Models HBN6335K to HBN8050K (two rows)

Model No.	Screw shaft outer diameter d	Lead Ph	Ball center-to-center diameter dp	Thread minor diameter dc	No. of loaded circuits Rows X turns	Threads	Basic load rating Ca kN	Basic load rating $C_{0}a$ kN	Permissible load[1] F_P kN	Rigidity K N/µm
HBN6335K-10	63	35	66	52.6	4×2.5	2	548	1,376	169	3,935
HBN6335K-15	63	35	66	52.6	6×2.5	2	776	2,064	240	5,791
HBN6342K-3	63	42	66.5	49.6	2×1.5	2	259	526	80	1,289
HBN6350K-10	63	50	66.5	49.6	4×2.5	2	719	1,723	222	4,011
HBN8040K-5	80	40	83.5	66.6	2×2.5	2	451	1,105	154	2,503
HBN8040KA-5	80	40	83.5	66.6	2×2.5	2	451	1,105	154	2,503
HBN8050K-15	80	50	83.5	66.6	6×2.5	2	1,171	3,376	472	7,270
HBN8050KA-15	80	50	83.5	66.6	6×2.5	2	1,171	3,376	472	7,270

[1] The permissible load F_P indicates the maximum axial load that the ball screw can receive.
Notes: This model is capable of achieving a longer service life than the conventional ball screw under a high load.
Certain precautions are necessary regarding the assembly method. (See A **15-244**.)
For high-load ball screws, the standard maximum length of the screw shaft is 3,000 mm. For lengths greater than this, please contact THK.

Axial Clearance

Unit: mm

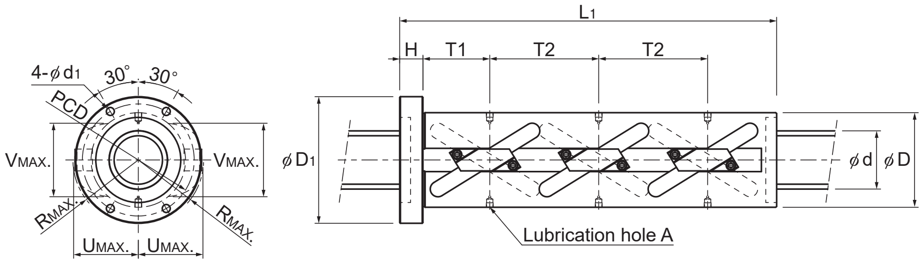
Clearance symbol	G2
Axial clearance	0 to 0.02

Model number coding

HBN6335K-10 RR G2 +1200L C7

- HBN6335K-10: Model number
- RR: Seal symbol[1]
- G2: Symbol for clearance in the axial direction (For the axial clearance, this model has clearance G2 as standard. Other clearance is also available at your request. Contact THK for details.)
- +1200L: Overall screw shaft length (in mm)
- C7: Accuracy symbol[2]

[1] See A **15-356**. [2] See A **15-12**.



Models HBN8040KA and HBN8050KA (two rows)

Unit: mm

	Nut dimensions												Screw shaft inertial moment/mm	Nut mass	Shaft mass	Permissible rotational speed
	Outer diameter D	Flange diameter D_1	Overall length L_1	H	PCD	d_1	T1	T2	U_{MAX}	V_{MAX}	R_{MAX}	Lubrication hole A	$kg\cdot m^2/mm$	kg	kg/m	min^{-1}
	105	139	271	28	122	9	72.5	105	70.5	82	73	Rc1/8 (PT1/8)	1.21×10^{-5}	10.5	24	1,810
	105	139	376	28	122	9	72.5	105	70.5	82	73		1.21×10^{-5}	14.5	24	1,810
	117	157	156	32	137	11	39.5	—	79	84	80		1.21×10^{-5}	8.3	24	1,800
	117	157	358	32	137	11	94	150	78.5	84	80		1.21×10^{-5}	19.2	24	1,800
	134	174	185	32	154	11	81	—	88	102	93		3.16×10^{-5}	11	39	1,430
	130	174	185	32	154	11	81	—	88	102	93		3.16×10^{-5}	10.2	39	1,430
	134	174	519	32	154	11	92	150	89	101	90		3.16×10^{-5}	31.9	39	1,430
	130	174	519	32	154	11	92	150	89	102	90		3.16×10^{-5}	29.2	39	1,430

The rigidity values in the table represent spring constants, each obtained from the load and the elastic deformation under an axial load equal to 30% of the basic axial 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 30% of Ca, the rigidity value (K_N) is obtained from the following equation.

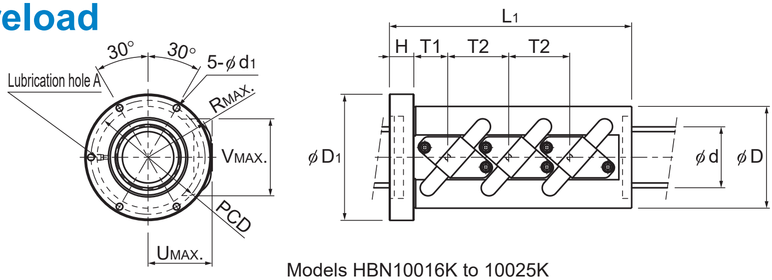
$$K_N = K\left(\frac{Fa}{0.3Ca}\right)^{\frac{1}{3}}$$

K: Rigidity value in the dimensional table

Options⇒A15-355

HBN-K and HBN-KA No Preload

DN value	120,000



Models HBN10016K to 10025K

Model No.	Screw shaft outer diameter d	Lead Ph	Ball center-to-center diameter dp	Thread minor diameter dc	No. of loaded circuits Rows × turns	Threads	Basic load rating Ca kN	Basic load rating C0a kN	Permissible load[1] FP kN	Rigidity K N/μm
HBN10016K-10	100	16	103	89.6	4×2.5	1	673	2,244	314	5,619
HBN10016KA-10	100	16	103	89.6	4×2.5	1	673	2,244	314	5,619
HBN10020K-7.5	100	20	103.5	86.6	3×2.5	1	717	2,107	295	4,432
HBN10020KA-7.5	100	20	103.5	86.6	3×2.5	1	717	2,107	295	4,432
HBN10020K-10	100	20	103.5	86.6	4×2.5	1	919	2,810	393	5,830
HBN10020KA-10	100	20	103.5	86.6	4×2.5	1	919	2,810	393	5,830
HBN10020K-12.5	100	20	103.5	86.6	5×2.5	1	1,114	3,512	491	7,212
HBN10020KA-12.5	100	20	103.5	86.6	5×2.5	1	1,114	3,512	491	7,212
HBN10020K-7	100	20	103.5	86.6	2×3.5	1	674	1,956	273	4,129
HBN10020KA-7	100	20	103.5	86.6	2×3.5	1	674	1,956	273	4,129
HBN10020K-10.5	100	20	103.5	86.6	3×3.5	1	955	2,934	410	6,077
HBN10020KA-10.5	100	20	103.5	86.6	3×3.5	1	955	2,934	410	6,077
HBN10025K-7.5	100	25	104	83.6	3×2.5	1	921	2,532	354	4,565
HBN10025KA-7.5	100	25	104	83.6	3×2.5	1	921	2,532	354	4,565
HBN10025K-10	100	25	104	83.6	4×2.5	1	1,180	3,376	472	6,005
HBN10025KA-10	100	25	104	83.6	4×2.5	1	1,180	3,376	472	6,005
HBN10025K-12.5	100	25	104	83.6	5×2.5	1	1,429	4,220	590	7,429
HBN10025KA-12.5	100	25	104	83.6	5×2.5	1	1,429	4,220	590	7,429
HBN10025K-7	100	25	104	83.6	2×3.5	1	866	2,355	329	4,261
HBN10025KA-7	100	25	104	83.6	2×3.5	1	866	2,355	329	4,261
HBN10025K-10.5	100	25	104	83.6	3×3.5	1	1,227	3,533	494	6,273
HBN10025KA-10.5	100	25	104	83.6	3×3.5	1	1,227	3,533	494	6,273
HBN10025K-14	100	25	104	83.6	4×3.5	1	1,572	4,711	659	8,252
HBN10025KA-14	100	25	104	83.6	4×3.5	1	1,572	4,711	659	8,252

[1] The permissible load F_P indicates the maximum axial load that the ball screw can receive.

Notes: This model is capable of achieving a longer service life than the conventional ball screw under a high load.
Certain precautions are necessary regarding the assembly method. (See **A15-244**.)
For high-load ball screws, the standard maximum length of the screw shaft is 3,000 mm. For lengths greater than this, please contact THK.

Axial Clearance

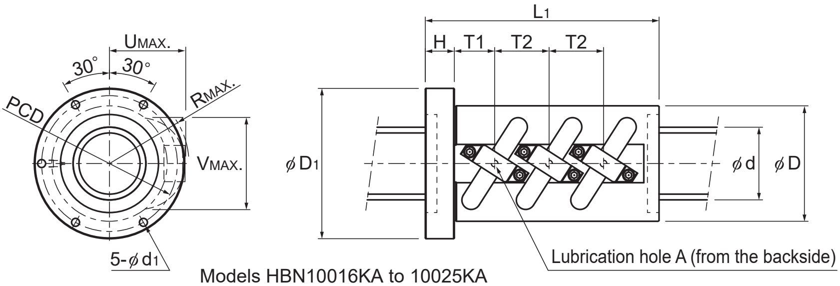
Unit: mm

Clearance symbol	G2
Axial clearance	0 to 0.02

Model number coding **HBN10016K-10 RR G2 +1200L C7**

- HBN10016K-10: Model number
- RR: Seal symbol[1]
- G2: Symbol for clearance in the axial direction (For the axial clearance, this model has clearance G2 as standard. Other clearance is also available at your request. Contact THK for details.)
- +1200L: Overall screw shaft length (in mm)
- C7: Accuracy symbol[2]

[1] See **A15-356**. [2] See **A15-12**.



Models HBN10016KA to 10025KA

Unit: mm

	Nut dimensions												Screw shaft inertial moment/mm	Nut mass	Shaft mass	Permissible rotational speed
	Outer diameter D	Flange diameter D_1	Overall length L_1	H	PCD	d_1	T1	T2	U_{MAX}	V_{MAX}	R_{MAX}	Lubrication hole A	$kg \cdot m^2/mm$	kg	kg/m	min^{-1}
	150	190	263	32	170	11	37.5	48	92	119	98.5		7.71×10^{-5}	18.1	61	1,160
	145	190	263	32	170	11	37.5	48	92	119	98.5		7.71×10^{-5}	16.3	61	1,160
	154	194	252	32	174	11	44	60	96	123	101		7.71×10^{-5}	18.9	61	1,150
	145	194	252	32	174	11	44	60	96	123	101		7.71×10^{-5}	15.6	61	1,150
	154	194	312	32	174	11	44	60	96	123	101		7.71×10^{-5}	23.4	61	1,150
	145	194	312	32	174	11	44	60	96	123	101		7.71×10^{-5}	19.2	61	1,150
	154	194	372	32	174	11	44	60	96	123	101		7.71×10^{-5}	27.9	61	1,150
	145	194	372	32	174	11	44	60	96	123	101		7.71×10^{-5}	22.8	61	1,150
	154	194	232	32	174	11	44	80	97	128	105		7.71×10^{-5}	23.4	61	1,150
	145	194	232	32	174	11	44	80	97	128	105		7.71×10^{-5}	20.5	61	1,150
	154	194	312	32	174	11	44	80	97	128	105		7.71×10^{-5}	29.4	61	1,150
	145	194	312	32	174	11	44	80	97	128	105	Rc1/8 (PT1/8)	7.71×10^{-5}	25.3	61	1,150
	167	207	322	40	187	11	55.5	75	105	127	109.5		7.71×10^{-5}	32	61	1,150
	159	207	322	40	187	11	55.5	75	105	127	109.5		7.71×10^{-5}	28.2	61	1,150
	167	207	397	40	187	11	55.5	75	105	127	109.5		7.71×10^{-5}	39.4	61	1,150
	159	207	397	40	187	11	55.5	75	105	127	109.5		7.71×10^{-5}	34.5	61	1,150
	167	207	472	40	187	11	55.5	75	105	127	109.5		7.71×10^{-5}	46.9	61	1,150
	159	207	472	40	187	11	55.5	75	105	127	109.5		7.71×10^{-5}	41	61	1,150
	167	207	297	40	187	11	55.5	100	105	127	109.5		7.71×10^{-5}	29.5	61	1,150
	159	207	297	40	187	11	55.5	100	105	127	109.5		7.71×10^{-5}	26.3	61	1,150
	167	207	397	40	187	11	55.5	100	105	127	109.5		7.71×10^{-5}	39.4	61	1,150
	159	207	397	40	187	11	55.5	100	105	127	109.5		7.71×10^{-5}	34.8	61	1,150
	167	207	497	40	187	11	55.5	100	105	127	109.5		7.71×10^{-5}	49.3	61	1,150
	159	207	497	40	187	11	55.5	100	105	127	109.5		7.71×10^{-5}	43.3	61	1,150

The rigidity values in the table represent spring constants, each obtained from the load and the elastic deformation under an axial load equal to 30% of the basic axial 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 30% of Ca, the rigidity value (K_N) is obtained from the following equation.

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

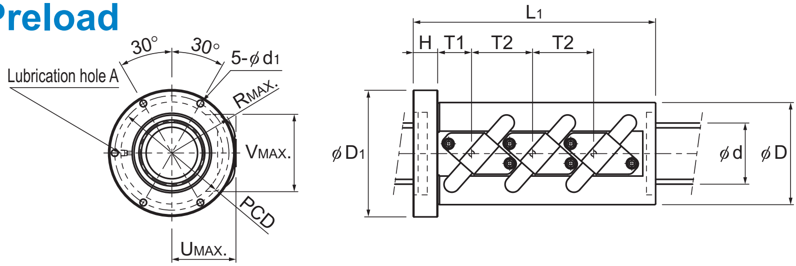
K: Rigidity value in the dimensional table

Ball Screw

Options⇒A15-355

HBN-K and HBN-KA No Preload

DN value	120,000



Models HBN12020K to 14040K

Model No.	Screw shaft outer diameter	Lead	Ball center-to-center diameter	Thread minor diameter	No. of loaded circuits	Threads	Basic load rating		Permissible load[1]	Rigidity
							Ca	C0a	FP	K
	d	Ph	dp	dc	Rows X turns		kN	kN	kN	N/µm
HBN12020K-10	120	20	123.5	106.6	4×2.5	1	995	3,389	474	6,746
HBN12020KA-10	120	20	123.5	106.6	4×2.5	1	995	3,389	474	6,746
HBN12025K-7.5	120	25	124	103.6	3×2.5	1	996	3,034	424	5,254
HBN12025KA-7.5	120	25	124	103.6	3×2.5	1	996	3,034	424	5,254
HBN12025K-10	120	25	124	103.6	4×2.5	1	1,276	4,045	566	6,912
HBN12025KA-10	120	25	124	103.6	4×2.5	1	1,276	4,045	566	6,912
HBN12025K-12.5	120	25	124	103.6	5×2.5	1	1,546	5,057	708	8,550
HBN12025KA-12.5	120	25	124	103.6	5×2.5	1	1,546	5,057	708	8,550
HBN12025K-14	120	25	124	103.6	4×3.5	1	1,698	5,632	788	9,479
HBN12025KA-14	120	25	124	103.6	4×3.5	1	1,698	5,632	788	9,479
HBN14025K-10	140	25	144	123.6	4×2.5	1	1,360	4,714	660	7,781
HBN14025KA-10	140	25	144	123.6	4×2.5	1	1,360	4,714	660	7,781
HBN14032K-10.5	140	32	145	119.6	3×3.5	1	2,089	6,510	911	7,997
HBN14032KA-10.5	140	32	145	119.6	3×3.5	1	2,089	6,510	911	7,997
HBN14040K-7.5	140	40	144	123.6	3×2.5	1	1,058	3,527	493	5,909
HBN14040KA-7.5	140	40	144	123.6	3×2.5	1	1,058	3,527	493	5,909

[1] The permissible load F_P indicates the maximum axial load that the ball screw can receive.

Notes: This model is capable of achieving a longer service life than the conventional ball screw under a high load. Certain precautions are necessary regarding the assembly method. (See **A15-244**.)
For high-load ball screws, the standard maximum length of the screw shaft is 3,000 mm. For lengths greater than this, please contact THK.

Axial Clearance

Unit: mm

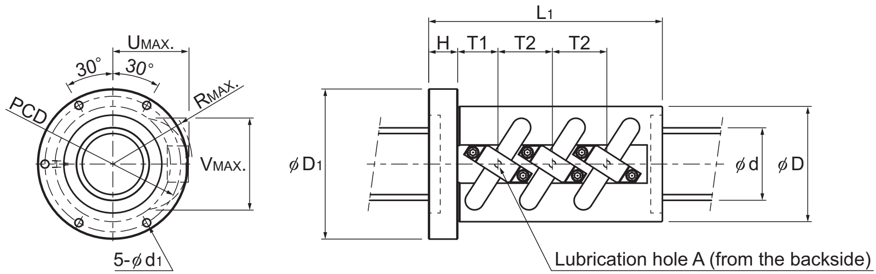
Clearance symbol	G2
Axial clearance	0 to 0.02

Model number coding

HBN12025K-10 RR G2 +1200L C7

- HBN12025K-10: Model number
- RR: Seal symbol[1]
- G2: Symbol for clearance in the axial direction (For the axial clearance, this model has clearance G2 as standard. Other clearance is also available at your request. Contact THK for details.)
- +1200L: Overall screw shaft length (in mm)
- C7: Accuracy symbol[2]

[1] See **A15-356**. [2] See **A15-12**.



Models HBN12020KA to 14040KA

Unit: mm

Nut dimensions												Screw shaft inertial moment/mm	Nut mass	Shaft mass	Permissible rotational speed
Outer diameter D	Flange diameter D_1	Overall length L_1	H	PCD	d_1	T1	T2	U_{MAX}	V_{MAX}	R_{MAX}	Lubrication hole A	kg·m²/mm	kg	kg/m	min⁻¹
190	230	322	40	210	11	46	60	110	142	117	Rc1/8 (PT1/8)	1.59×10^{-4}	38.1	88	970
173	230	322	40	210	11	46	60	110	143	117		1.59×10^{-4}	28.7	88	970
195	235	322	40	215	11	54.5	75	115	147	122		1.59×10^{-4}	42.6	88	960
173	235	322	40	215	11	54.5	75	115	147	122		1.59×10^{-4}	30.2	88	960
195	235	397	40	215	11	54.5	75	115	147	122		1.59×10^{-4}	52.6	88	960
173	235	397	40	215	11	54.5	75	115	147	122		1.59×10^{-4}	36.9	88	960
195	235	472	40	215	11	54.5	75	115	147	122		1.59×10^{-4}	62.5	88	960
173	235	472	40	215	11	54.5	75	115	147	122		1.59×10^{-4}	43.5	88	960
195	235	497	40	215	11	54.5	100	115	147	122		1.59×10^{-4}	65.8	88	960
173	235	497	40	215	11	54.5	100	115	147	122		1.59×10^{-4}	45.8	88	960
230	290	397	40	260	18	54.5	75	140	175	148		2.96×10^{-4}	77.6	120	830
204	290	397	40	260	18	54.5	75	140	175	148		2.96×10^{-4}	54.1	120	830
230	290	480	40	260	18	67	128	147	175	154		2.96×10^{-4}	96.8	120	820
222	290	480	40	260	18	67	128	147	175	154		2.96×10^{-4}	89.2	120	820
230	290	470	40	260	18	95	120	140	170	140		2.96×10^{-4}	88.2	120	830
204	290	470	40	260	18	95	120	140	170	140		2.96×10^{-4}	59.9	120	830

The rigidity values in the table represent spring constants, each obtained from the load and the elastic deformation under an axial load equal to 30% of the basic axial 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 30% of Ca, the rigidity value (K_N) is obtained from the following equation.

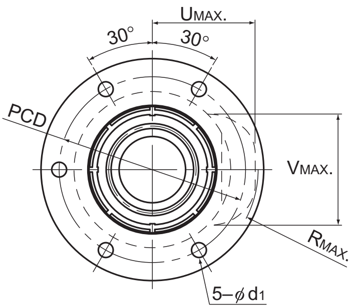
$$K_N = K\left(\frac{Fa}{0.3Ca}\right)^{\frac{1}{3}}$$

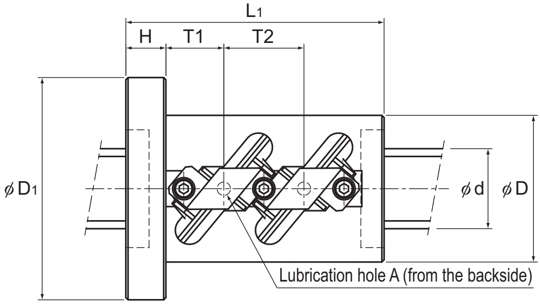
K: Rigidity value in the dimensional table

Options⇒A15-355

HBN
No Preload

DN value	130,000





Models HBN3210 to 3612

Model No.	Screw shaft outer diameter d	Lead Ph	Ball center-to-center diameter dp	Thread minor diameter dc	No. of loaded circuits Rows × turns	Basic load rating Ca kN	Basic load rating C_{0a} kN	Permissible load[1] F_P kN	Rigidity K N/µm
HBN 3210-5	32	10	34	26	2×2.5	102.9	191.3	31.9	1,077
HBN 3610-5	36	10	38	30	2×2.5	108.2	220.4	33.5	1,176
HBN 3612-5	36	12	38.4	29	2×2.5	141.1	267.7	43.7	1,207
HBN 4010-7.5	40	10	42	34	3×2.5	162.6	366	50.4	1,910
HBN 4012-7.5	40	12	42.4	33	3×2.5	212.4	441.6	65.8	1,922
HBN 5010-7.5	50	10	52	44	3×2.5	179.1	462.7	55.5	2,279
HBN 5012-7.5	50	12	52.4	43	3×2.5	235.7	572.2	73.1	2,345
HBN 5016-7.5	50	16	53	39.6	3×2.5	379.6	820.9	117.7	2,392
HBN 6316-7.5	63	16	66	52.6	3×2.5	427.1	1,043.8	132.4	2,898
HBN 6316-10.5	63	16	66	52.6	3×3.5	577.1	1,461.3	178.9	4,029
HBN 6320-7.5	63	20	66.5	49.6	3×2.5	578.8	1,283.1	179.4	3,030

[1] The permissible load F_P indicates the maximum axial load that the ball screw can receive.

Notes: This model is capable of achieving a longer service life than the conventional ball screw under a high load.
Certain precautions are necessary regarding the assembly method. (See A**15-244**.)
For high-load ball screws, the standard maximum length of the screw shaft is 3,000 mm. For lengths greater than this, please contact THK.

Axial Clearance

Unit: mm

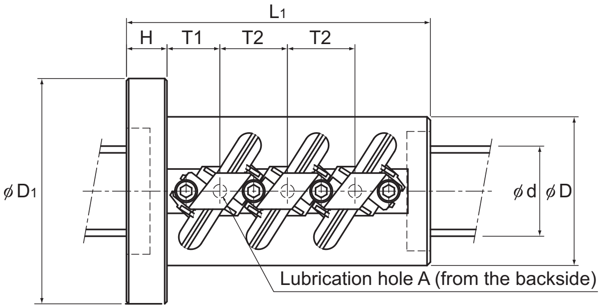
Clearance symbol	G2
Axial clearance	0 to 0.02

Model number coding

HBN3210-5 RR G2 +1200L C7

- HBN3210-5: Model number
- RR: Seal symbol[1]
- G2: Symbol for clearance in the axial direction (For the axial clearance, this model has clearance G2 as standard. Other clearance is also available at your request. Contact THK for details.)
- +1200L: Overall screw shaft length (in mm)
- C7: Accuracy symbol[2]

[1] See A**15-356**. [2] See A**15-12**.



Models HBN4010 to 6320

Unit: mm

Nut dimensions												Screw shaft inertial moment/mm	Nut mass	Shaft mass	Permissible rotational speed
Outer diameter D	Flange diameter D_1	Overall length L_1	H	PCD	d_1	T1	T2	U_{MAX}	V_{MAX}	R_{MAX}	Lubrication hole A	kg·m²/mm	kg	kg/m	min^{-1}
58	85	98	15	71	6.6	22	30	43	46	43.5	M6	8.08×10^{-7}	1.8	5.26	3,820
62	89	98	15	75	6.6	22	30	45	50	46	M6	1.29×10^{-6}	1.9	6.79	3,420
66	100	116	18	82	9	26	36	49	52.5	50	M6	1.29×10^{-6}	2.8	6.55	3,380
66	100	135	18	82	9	23.5	30	46.5	54	48	M6	1.97×10^{-6}	2.9	8.52	3,090
70	104	152	18	86	9	26	36	51	56	52	M6	1.97×10^{-6}	3.7	5.24	3,060
78	112	135	18	94	9	23.5	30	52	63.5	54.5	M6	4.82×10^{-6}	3.7	13.7	2,500
80	114	152	18	96	9	26	36	56	66	58.5	M6	4.82×10^{-6}	4.4	13.34	2,480
95	135	211	28	113	9	37.5	48	64.5	69.6	65.2	Rc1/8 (PT1/8)	4.82×10^{-6}	10.0	12.1	2,450
105	139	211	28	122	9	37.5	48	70.5	82	72.5		1.21×10^{-5}	10.6	20.2	1,960
105	139	259	28	122	9	53.5	64	70.5	82	73		1.21×10^{-5}	17.4	20.2	1,960
117	157	252	32	137	11	44	60	79	86.5	80		1.21×10^{-5}	17.2	19.13	1,950

The rigidity values in the table represent spring constants, each obtained from the load and the elastic deformation under an axial load equal to 30% of the basic axial 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 30% of Ca, the rigidity value (K_N) is obtained from the following equation.

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

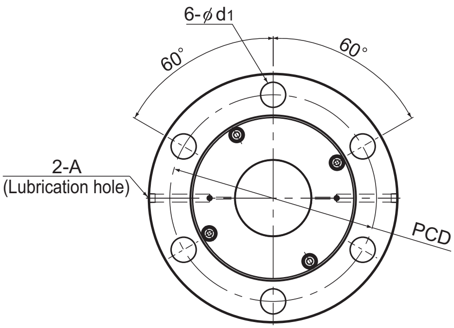
K: Rigidity value in the dimensional table

Ball Screw

Options⇒A15-355

SBKH
No Preload

DN value	130,000



Model No.	Screw shaft outer diameter d	Lead Ph	Ball center-to-center diameter dp	Screw shaft Thread minor diameter dc	No. of loaded circuits Rows × turns	Basic load rating Ca kN	Basic load rating C_0a kN	Permissible load[1] F_P kN	Rigidity K N/μm
SBKH 6332-3.8	63	32	66.5	49.8	1×3.8	304	631	88	1,435
SBKH 6340-7.6	63	40	66.0	52.6	2×3.8	413	967	135	2,723
SBKH 8050-7.6	80	50	84.0	63.6	2×3.8	777	1,788	250	3,402
SBKH 8060-7.6	80	60	84.0	63.6	2×3.8	780	1,824	255	3,452
SBKH 10050-7.6	100	50	104.0	83.6	2×3.8	876	2,401	336	4,098
SBKH 10060-7.6	100	60	104.0	83.6	2×3.8	880	2,294	321	4,149
SBKH 12060-7.6	120	60	124.0	103.6	2×3.8	962	2,941	411	4,809

[1] The permissible load F_P indicates the maximum axial load that the ball screw can receive.

Notes: If desiring both ends of the screw shaft to be larger than the screw shaft diameter, contact THK.
Certain precautions are necessary regarding the assembly method. (See **A15-244**.)
For high-load ball screws, the standard maximum length of the screw shaft is 3,000 mm. For lengths greater than this, please contact THK.

Axial Clearance

Unit: mm

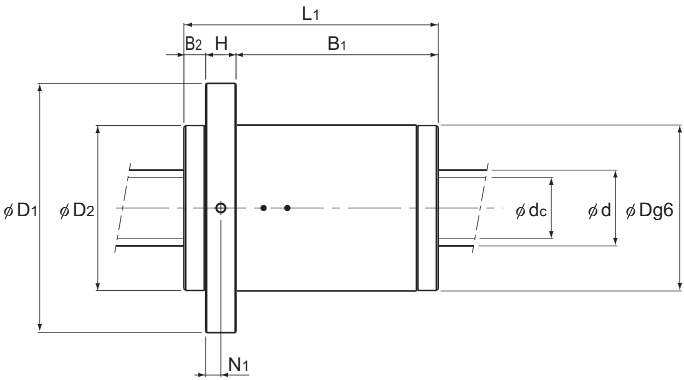
Clearance symbol	G1	G2	G3
Axial clearance	0 to 0.01	0 to 0.02	0 to 0.05

Model number coding

SBKH8050-7.6 RR G2 +1200L C7

- SBKH8050-7.6: Model Number
- RR: Seal symbol[1] (RR: labyrinth seal on both sides)
- G2: Axial clearance symbol (clearance in the axial direction must be: G1, G2 or G3. Clearance G0 and GT are not supported.)
- +1200L: Overall screw shaft length (in mm)
- C7: Accuracy symbol[2]

[1] See **A15-356**. [2] See **A15-12**.



Unit: mm

	Nut dimensions											Screw shaft inertial moment/mm	Nut mass	Shaft mass	Permissible rotational speed
	Outer diameter D	Flange diameter D_1	Cap diameter D_2	Overall length L_1	H	B_1	B_2	PCD	d_1	N_1	Lubrication hole A	$kg \cdot m^2/mm$	kg	kg/m	min^{-1}
	140	205	(140)	190	28	143	(19)	173	22	14		1.21×10^{-5}	17.2	21	1,950
	127	191	(127)	209	30	163	(16)	159	22	15		1.21×10^{-5}	15.5	21	1,960
	175	253	(175)	268	32	213	(23)	214	26	16		3.16×10^{-5}	36.9	31.3	1,540
	175	253	(175)	306	40	243	(23)	214	26	20	Rc1/8 (PT1/8)	3.16×10^{-5}	43.5	32.5	1,540
	195	273	(195)	269	40	206	(23)	234	26	20		7.71×10^{-5}	44.5	51.3	1,250
	195	273	(195)	307	40	244	(23)	234	26	20		7.71×10^{-5}	50.5	52.9	1,250
	210	288	(210)	308	45	240	(23)	249	26	22.5		1.60×10^{-4}	53.7	78.1	1,040

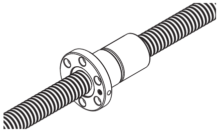
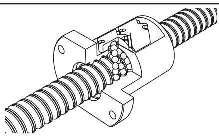
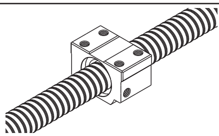
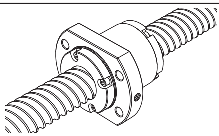
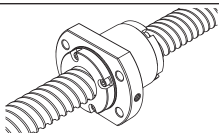
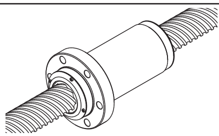
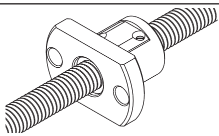
The rigidity values (K) in the table represent spring constants, each obtained from the load and the elastic deformation under an axial load equal to 30% of the basic axial dynamic load rating (Ca).
These values do not include the rigidity of the components related to mounting the ball screw nut. Therefore,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

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

K: Rigidity value in the dimensional table

Options⇒A15-355

Transport Ball Screw

Series	Model		Features
Transport	JPF		Constant-pressure preloading, compact nut
	BTK-V		High DN value
	BNT		Flat nut
	BLK		Large lead
	WTF		Super large lead
	CNF		Super large lead
	MTF Unfinished Shaft Ends		Miniature
	MTF		

	Caged Ball	Compact nut	Miniature	High load capacity	Preload	DN value	Shaft diameter (mm)	Lead (mm)	Page No.
					✓	50,000	14 to 40	4 to 10	A15-262
						100,000	10 to 50	6 to 16	A15-264
						50,000	14 to 45	4 to 12	A15-266
						70,000	15 to 50	10 to 50	A15-268
						70,000	15 to 50	20 to 100	A15-270
						70,000	15 to 30	30 to 60	A15-272
			✓			50,000	6 to 12	1 to 2	A15-274
						70,000	6 to 14	1 to 5	A15-276

Standard Combinations of Outer Diameters and Leads of the Screw Shafts

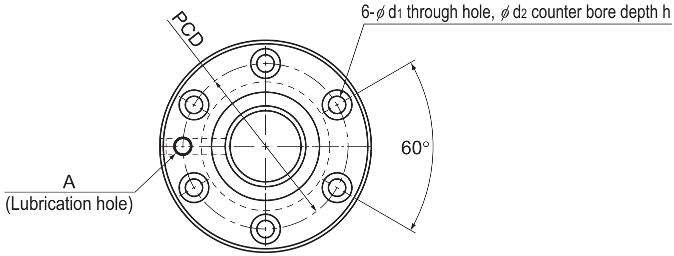
Shaft diameter	Lead									
	1	2	4	5	6	8	10	12	16	20
6	MTF									
8	MTF	MTF		MTF		BLK				
10		MTF	MTF		BTK-V		BLK			
12		MTF				BTK-V				
14		MTF	JPF BTK-V BNT	JPF BTK-V BNT						
15							BLK			WTF
16				JPF BTK-V BNT					BLK	
18						BTK-V BNT				
20				JPF BTK-V BNT			BTK-V BNT			BLK
25				JPF BTK-V BNT			JPF BTK-V BNT			
28				JPF	JPF BTK-V BNT					
30										
32							JPF BTK-V BNT			
36							JPF BTK-V BNT			BLK
40							JPF BTK-V			
45								BTK-V BNT		
50									BTK-V	

Unit: mm

	Lead									
	24	25	30	32	36	40	50	60	80	100
			WTF CNF							
						WTF CNF				
		BLK					WTF CNF			
								WTF CNF		
				BLK						
	BLK				BLK					
						BLK			WTF	
							BLK			WTF

JPF
With Preload

DN value	50,000



Model No.	Screw shaft outer diameter	Lead	Ball center-to-center diameter	Thread minor diameter	No. of loaded circuits	Basic load rating				
						Ca	C_0a	Outer diameter	Flange diameter	Outer diameter
	d	Ph	dp	dc	Rows × turns	kN	kN	D	D_1	D_2
JPF 1404-4	14	4	14.4	11.5	2×1	2.8	5.1	26	46	25.5
JPF 1405-4	14	5	14.5	11.2	2×1	3.9	8.6	26	46	25.5
JPF 1605-4	16	5	16.75	13.5	2×1	3.7	8.2	30	49	29.5
JPF 2005-6	20	5	20.5	17.2	3×1	6	16	34	57	33.5
JPF 2505-6	25	5	25.5	22.2	3×1	6.9	20.8	40	66	39.5
JPF 2510-4	25	10	26.8	20.2	2×1	11.4	24.5	47	72	46.5
JPF 2805-6	28	5	28.75	25.2	3×1	7.3	23.9	43	69	42.5
JPF 2806-6	28	6	28.5	25.2	3×1	7.3	23.9	43	69	42.5
JPF 3210-6	32	10	33.75	27.2	3×1	19.3	49.9	54	88	53.5
JPF 3610-6	36	10	37	30.5	3×1	20.6	56.2	58	98	57.5
JPF 4010-6	40	10	41.75	35.2	3×1	22.2	65.3	62	104	61.5

Model number coding

JPF1404-4 RR G0 +500L C7 T

Model No.

Seal symbol[1]

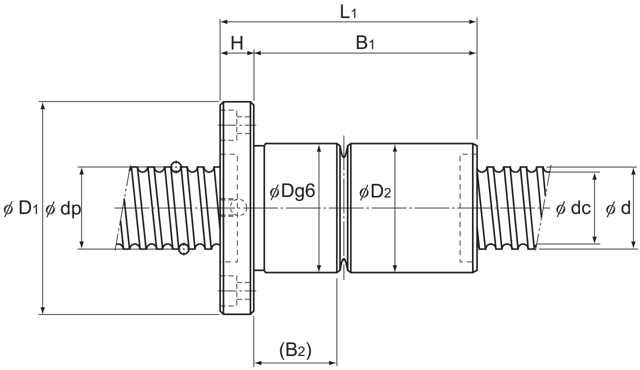
Overall screw shaft length (in mm)

Symbol for rolled shaft

Symbol for clearance in the axial direction

Accuracy symbol[2]

[1] See A15-356. [2] See A15-12.



Unit: mm

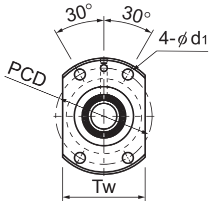
Nut dimensions							Screw shaft inertial moment/mm	Nut mass	Shaft mass	Permissible rotational speed
Overall length L_1	H	B_1	B_2	PCD	$d_1 \times d_2 \times h$	Lubrication hole A	$kg \cdot m^2/mm$	kg	kg/m	min^{-1}
52	10	42	16.5	36	4.5×8×4.5	M6	2.96×10^{-8}	0.22	1	3,470
60	10	50	20	36	4.5×8×4.5	M6	2.96×10^{-8}	0.24	0.99	3,440
60	10	50	19.5	39	4.5×8×4.5	M6	5.05×10^{-8}	0.3	1.34	2,980
80	11	69	26.5	45	5.5×9.5×5.5	M6	1.23×10^{-7}	0.46	2.15	2,430
80	11	69	26	51	5.5×9.5×5.5	M6	3.01×10^{-7}	0.6	3.45	1,960
112	12	100	42	58	6.6×11×6.5	M6	3.01×10^{-7}	1.2	3.26	1,860
80	12	68	25	55	6.6×11×6.5	M6	4.74×10^{-7}	0.66	4.27	1,730
90	12	78	35	55	6.6×11×6.5	M6	4.74×10^{-7}	0.72	4.44	1,750
135	15	120	53.5	70	9×14×8.5	M6	8.08×10^{-7}	1.84	5.49	1,480
138	18	120	53.5	77	11×17.5×11	M6	1.29×10^{-6}	2.22	6.91	1,350
138	18	120	53.5	82	11×17.5×11	Rc1/8 (PT1/8)	1.97×10^{-6}	2.42	8.81	1,190

Notes: The ball screw nut and the screw shaft of Model JPF are not sold separately.
The basic load rating corresponds to the recommended loading direction.
If a load is applied in the opposite direction, the value must be 0.1×Ca or less during use.

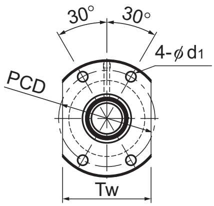
Options⇒A15-355

BTK-V
No Preload

DN value	100,000



BTK1006V/1208V



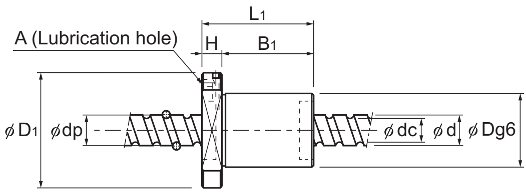
BTK1404V to 5016V

Model No.	Screw shaft outer diameter	Lead	Ball center-to-center diameter	Thread minor diameter	No. of loaded circuits	Basic load rating		Rigidity				
						Ca	C_0a	K	Outer diameter	Flange diameter	Overall length	
	d	Ph	dp	dc	Rows X turns	kN	kN	N/µm	D	D_1	L_1	H
BTK 1006V-2.6	10	6	10.5	7.8	1×2.65	2.8	4.9	88	26	42	36	8
BTK 1208V-2.6	12	8	12.65	9.7	1×2.65	3.8	6.8	108	29	45	44	8
BTK 1404V-3.6	14	4	14.4	11.5	1×3.65	5.5	11.5	150	31	50	40	10
BTK 1405V-2.6	14	5	14.5	11.2	1×2.65	5	11.4	116	32	50	40	10
BTK 1605V-2.6	16	5	16.75	13.5	1×2.65	5.4	13.3	130	34	54	40	10
BTK 1808V-3.6	18	8	19.3	14.4	1×3.65	13.1	31	210	50	80	61	12
BTK 2005V-2.6	20	5	20.5	17.2	1×2.65	6	16.5	150	40	60	40	10
BTK 2010V-2.6	20	10	21.25	16.4	1×2.65	10.6	25.1	160	52	82	61	12
BTK 2505V-2.6	25	5	25.5	22.2	1×2.65	6.7	20.8	180	43	67	40	10
BTK 2510V-5.3	25	10	26.8	20.2	2×2.65	31.2	83.7	400	60	96	98	15
BTK 2806V-2.6	28	6	28.5	25.2	1×2.65	7	23.4	200	50	80	47	12
BTK 2806V-5.3	28	6	28.5	25.2	2×2.65	12.8	46.8	390	50	80	65	12
BTK 3210V-2.6	32	10	33.75	27.2	1×2.65	19.8	53.8	250	67	103	68	15
BTK 3210V-5.3	32	10	33.75	27.2	2×2.65	36	107.5	490	67	103	98	15
BTK 3610V-2.6	36	10	37	30.5	1×2.65	20.8	59.8	270	70	110	70	17
BTK 3610V-5.3	36	10	37	30.5	2×2.65	37.8	118.7	530	70	110	100	17
BTK 4010V-5.3	40	10	41.75	35.2	2×2.65	40.3	134.9	590	76	116	100	17
BTK 4512V-5.3	45	12	46.5	39.2	2×2.65	49.5	169	650	82	128	118	20
BTK 5016V-5.3	50	16	52.7	42.9	2×2.65	93.8	315.2	930	102	162	145	25

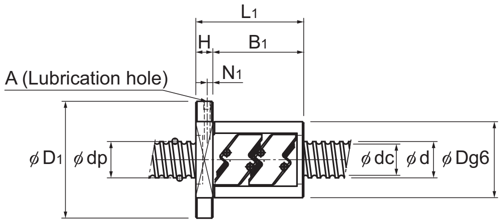
Model number coding **BTK1405V-2.6 ZZ +500L C7 T H1K**

- BTK1405V-2.6: Model No.
- ZZ: Contamination protection accessory symbol[1]
- +500L: Overall screw shaft length (in mm)
- C7: Accuracy symbol[2]
- T: Symbol for rolled shaft
- H1K: Recommended shaft ends shape code

[1] See A15-356. [2] See A15-12.



BTK1006V/1208V



BTK1404V to 5016V

Unit: mm

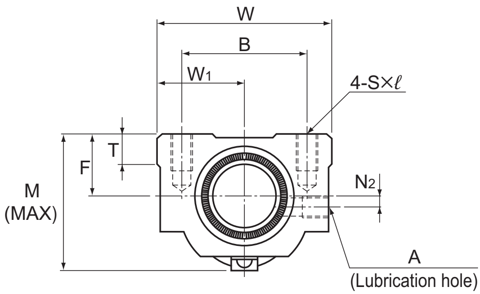
Nut dimensions						Axial clearance	Standard shaft length	Screw shaft inertial moment/mm	Nut mass	Shaft mass	Permissible rotational speed
				Lubrication hole							
B_1	PCD	d_1	Tw	N_1	A			kg·m²/mm	kg	kg/m	min⁻¹
28	34	4.5	29	—	3	0.05	200, 300, 500, 1,000	7.71×10^{-9}	0.12	0.48	5,000
36	37	4.5	32	—	3	0.05	200, 300, 500, 1,000	1.60×10^{-8}	0.18	0.72	5,000
30	40	4.5	37	5	M6	0.1	500, 1,000	2.96×10^{-8}	0.23	1	5,000
30	40	4.5	38	5	M6	0.1	500, 1,000	2.96×10^{-8}	0.22	0.99	5,000
30	44	4.5	40	5	M6	0.1	500, 1,000, 1,500	5.05×10^{-8}	0.24	1.34	5,000
49	65	6.6	60	5	M6	0.1	500, 1,000, 1,500	8.09×10^{-8}	0.84	1.71	5,000
30	50	4.5	46	5	M6	0.1	500, 1,000, 1,500, 2,000	1.23×10^{-7}	0.32	2.15	4,870
49	67	6.6	64	5	M6	0.1	500, 1,000, 1,500, 2,000	1.23×10^{-7}	0.93	2.16	4,700
30	55	5.5	50	5	M6	0.1	500, 1,000, 1,500, 2,000	3.01×10^{-7}	0.34	3.45	3,920
83	78	9	72	5	M6	0.1	500, 1,000, 1,500, 2,000	3.01×10^{-7}	1.83	3.26	3,730
35	65	6.6	60	6	M6	0.1	500, 1,000, 2,000, 2,500	4.74×10^{-7}	0.59	4.44	3,500
53	65	6.6	60	6	M6	0.1	500, 1,000, 2,000, 2,500	4.74×10^{-7}	0.75	4.44	3,500
53	85	9	78	5	M6	0.14	500, 1,000, 1,500, 2,000, 2,500, 3,000	8.08×10^{-7}	1.56	5.49	2,960
83	85	9	78	5	M6	0.14	500, 1,000, 1,500, 2,000, 2,500, 3,000	8.08×10^{-7}	2.1	5.49	2,960
53	90	11	82	7	M6	0.17	500, 1,000, 2,000, 2,500, 3,000	1.29×10^{-6}	1.78	6.91	2,700
83	90	11	82	7	M6	0.17	500, 1,000, 2,000, 2,500, 3,000	1.29×10^{-6}	2.35	6.91	2,700
83	96	11	88	7	M6	0.17	1,000, 1,500, 2,000, 2,500, 3,000, 3,500	1.97×10^{-6}	2.6	8.81	2,390
98	104	14	94	8	M6	0.17	1,000, 1,500, 2,000, 3,000, 3,500, 4,000	3.16×10^{-6}	3.48	11.08	2,150
120	132	18	104	12.5	Rc1/8 (PT1/8)	0.2	1,000, 1,500, 2,000, 3,000, 3,500, 4,000	4.82×10^{-6}	6.52	13.66	1,890

Note: The overall length of the nut will increase when equipping the QZ Lubricator. See **A15-366** for further details.

Ball Screw

BNT (Rolled Ball Screw) No Preload

DN value	50,000



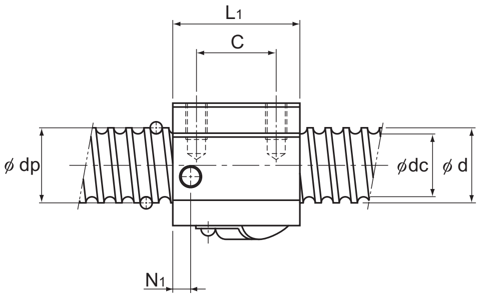
Model No.	Screw shaft outer diameter d	Lead Ph	Ball center-to-center diameter dp	Thread minor diameter dc	No. of loaded circuits Rows × turns	Basic load rating Ca kN	C0a kN	Rigidity K N/μm	Width W	Center height F	Overall length L1
BNT 1404-3.6	14	4	14.4	11.5	1×3.65	5.5	11.5	150	34	13	35
BNT 1405-2.6	14	5	14.5	11.2	1×2.65	5	11.4	110	34	13	35
BNT 1605-2.6	16	5	16.75	13.5	1×2.65	5.4	13.3	130	42	16	36
BNT 1808-3.6	18	8	19.3	14.4	1×3.65	13.1	31	210	48	17	56
BNT 2005-2.6	20	5	20.5	17.2	1×2.65	6	16.5	150	48	17	35
BNT 2010-2.6	20	10	21.25	16.4	1×2.65	10.6	25.1	160	48	18	58
BNT 2505-2.6	25	5	25.5	22.2	1×2.65	6.7	20.8	180	60	20	35
BNT 2510-5.3	25	10	26.8	20.2	2×2.65	31.2	83.7	400	60	23	94
BNT 2806-2.6	28	6	28.5	25.2	1×2.65	7	23.4	200	60	22	42
BNT 2806-5.3	28	6	28.5	25.2	2×2.65	12.8	46.8	390	60	22	67
BNT 3210-2.6	32	10	33.75	27.2	1×2.65	19.8	53.8	250	70	26	64
BNT 3210-5.3	32	10	33.75	27.2	2×2.65	36	107.5	490	70	26	94
BNT 3610-2.6	36	10	37	30.5	1×2.65	20.8	59.3	270	86	29	64
BNT 3610-5.3	36	10	37	30.5	2×2.65	37.8	118.7	530	86	29	96
BNT 4512-5.3	45	12	46.5	39.2	2×2.65	49.5	169	650	100	36	115

Model number coding

BNT2010-2.6 ZZ +1000L C7 T H1K

- BNT2010-2.6: Model No.
- ZZ: Contamination protection accessory symbol[1]
- +1000L: Overall screw shaft length (in mm)
- C7: Accuracy symbol[2]
- T: Symbol for rolled shaft
- H1K: Recommended shaft ends shape code

[1] See A15-356. [2] See A15-12.



Unit: mm

	Nut dimensions									Axial clearance	Screw shaft inertial moment/mm	Nut mass	Shaft mass	Permissible rotational speed
	Mounting hole													
	B	C	S×ℓ	W_1	T	M	N_1	N_2	A		kg·m²/mm	kg	kg/m	min^{-1}
	26	22	M4×7	17	6	30	6	2	M6	0.1	2.96×10^{-8}	0.15	1	3,470
	26	22	M4×7	17	6	31	6	2	M6	0.1	2.96×10^{-8}	0.15	0.99	3,440
	32	22	M5×8	21	21.5	32.5	6	2	M6	0.1	5.05×10^{-8}	0.3	1.34	2,980
	35	35	M6×10	24	10	44	8	3	M6	0.1	8.09×10^{-8}	0.47	1.71	2,590
	35	22	M6×10	24	9	39	5	3	M6	0.1	1.23×10^{-7}	0.28	2.15	2,430
	35	35	M6×10	24	9	46	10	2	M6	0.1	1.23×10^{-7}	0.5	2.16	2,350
	40	22	M8×12	30	9.5	45	7	5	M6	0.1	3.01×10^{-7}	0.41	3.45	1,960
	40	60	M8×12	30	10	55	10	—	M6	0.1	3.01×10^{-7}	1.18	3.26	1,860
	40	18	M8×12	30	10	50	8	—	M6	0.1	4.74×10^{-7}	0.81	4.44	1,750
	40	40	M8×12	30	10	50	8	—	M6	0.1	4.74×10^{-7}	0.78	4.44	1,750
	50	45	M8×12	35	12	62	10	—	M6	0.14	8.08×10^{-7}	1.3	5.49	1,480
	50	60	M8×12	35	12	62	10	—	M6	0.14	8.08×10^{-7}	2	5.49	1,480
	60	45	M10×16	43	17	67	11	—	M6	0.17	1.29×10^{-6}	1.8	6.91	1,350
	60	60	M10×16	43	17	67	11	—	M6	0.17	1.29×10^{-6}	2.4	6.91	1,350
	75	75	M12×20	50	20.5	80	13	—	M6	0.2	3.16×10^{-6}	4.1	11.08	1,070

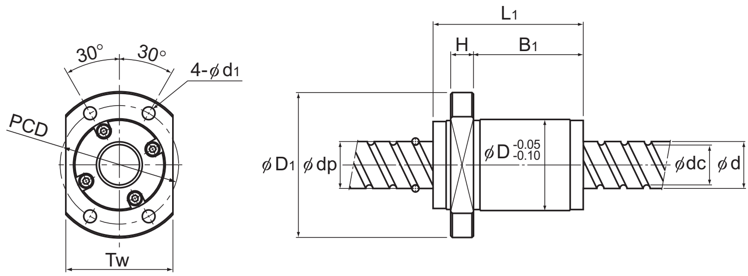
Note: The overall length of the nut will increase when equipping the QZ Lubricator. See A **15-366** for further details.

Ball Screw

Options⇒A **15-355**

BLK (Rolled Ball Screw) No Preload

DN value	70,000



BLK0808/1010

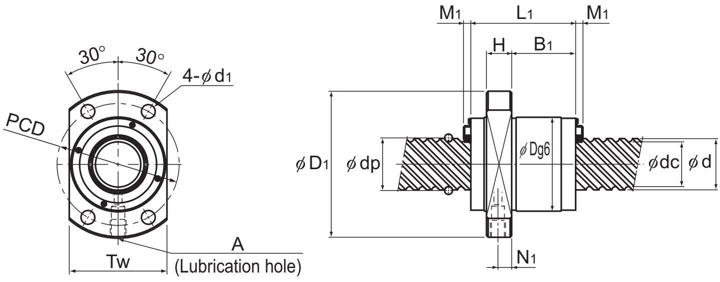
Model No.	Screw shaft outer diameter d	Lead Ph	Ball center-to-center diameter dp	Thread minor diameter dc	No. of loaded circuits Rows × turns	Basic load rating Ca kN	C_0a kN	Rigidity K N/μm	Outer diameter D	Flange diameter D_1	Overall length L_1	H
BLK 0808-3.2	8	8	8.4	6.7	2×1.6	2.2	3.8	95	18	31	20	4
BLK 1010-3.2	10	10	10.5	8.4	2×1.6	3.3	5.9	117	23	40	24	5
BLK 1510-5.6	15	10	15.75	12.5	2×2.8	9.8	25.2	260	34	57	44	10
BLK 1616-3.6	16	16	16.65	13.7	2×1.8	5.8	12.9	170	32	53	38	10
BLK 1616-7.2	16	16	16.65	13.7	4×1.8	10.5	25.9	340	32	53	38	10
BLK 2020-3.6	20	20	20.75	17.5	2×1.8	7.7	22.3	210	39	62	45	10
BLK 2020-7.2	20	20	20.75	17.5	4×1.8	13.9	44.6	410	39	62	45	10
BLK 2525-3.6	25	25	26	21.9	2×1.8	12.1	35	270	47	74	55	12
BLK 2525-7.2	25	25	26	21.9	4×1.8	21.9	69.9	520	47	74	55	12
BLK 3232-3.6	32	32	33.25	28.3	2×1.8	17.3	53.9	330	58	92	70	15
BLK 3232-7.2	32	32	33.25	28.3	4×1.8	31.3	107.8	650	58	92	70	15
BLK 3620-5.6	36	20	37.75	31.2	2×2.8	39.8	121.7	570	70	110	78	17
BLK 3624-5.6	36	24	38	30.7	2×2.8	46.2	137.4	590	75	115	94	18
BLK 3636-3.6	36	36	37.4	31.7	2×1.8	22.4	70.5	370	66	106	77	17
BLK 3636-7.2	36	36	37.4	31.7	4×1.8	40.6	141.1	730	66	106	77	17
BLK 4040-3.6	40	40	41.75	35.2	2×1.8	28.1	89.8	420	73	114	85	17
BLK 4040-7.2	40	40	41.75	35.2	4×1.8	51.1	179.6	810	73	114	85	17
BLK 5050-3.6	50	50	52.2	44.1	2×1.8	42.1	140.4	510	90	135	106	20
BLK 5050-7.2	50	50	52.2	44.1	4×1.8	76.3	280.7	1,000	90	135	106	20

Model number coding

BLK3232-3.6 ZZ +1500L C7 T H1K

- BLK3232-3.6: Model No.
- ZZ: Contamination protection accessory symbol[1]
- +1500L: Overall screw shaft length (in mm)
- C7: Accuracy symbol[2]
- T: Symbol for rolled shaft
- H1K: Recommended shaft ends shape code

[1] See A15-356. [2] See A15-12.



BLK1510～5050

Unit: mm

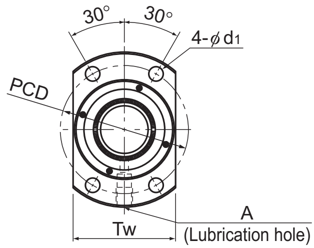
Nut dimensions							Axial clear-ance	Standard shaft length	Screw shaft inertial moment/mm	Nut mass	Shaft mass	Permissible rotational speed
				Lubrication hole		Seal						
B_1	PCD	d_1	Tw	N_1	A	M_1			kg·m²/mm	kg	kg/m	min⁻¹
10	25	3.4	20	—	—	—	0.1	—	3.16×10^{-9}	0.03	0.36	3,500
13	32	4.5	25	—	—	—	0.1	—	7.71×10^{-9}	0.06	0.55	3,500
24	45	5.5	40	5	M6	3.5	0.1	500, 1,000	3.90×10^{-8}	0.26	1.16	4,440
21.5	42	4.5	38	5	M6	3.5	0.1	500, 1,000, 1,500	5.05×10^{-8}	0.21	1.35	4,200
21.5	42	4.5	38	5	M6	3.5	0.1	500, 1,000, 1,500	5.05×10^{-8}	0.25	1.35	4,200
27.5	50	5.5	46	5	M6	3.5	0.1	500, 1,000, 1,500	1.23×10^{-7}	0.35	2.18	3,370
27.5	50	5.5	46	5	M6	3.5	0.1	500, 1,000, 1,500	1.23×10^{-7}	0.35	2.18	3,370
35	60	6.6	56	6	M6	3.5	0.1	500, 1,000, 1,500, 2,000, 2,500	3.01×10^{-7}	0.64	3.41	2,690
35	60	6.6	56	6	M6	3.5	0.1	500, 1,000, 1,500, 2,000, 2,500	3.01×10^{-7}	0.64	3.41	2,690
45	74	9	68	7.5	M6	3.8	0.14	1,000, 1,500, 2,000, 2,500, 3,000	8.08×10^{-7}	1.14	5.69	2,100
45	74	9	68	7.5	M6	3.8	0.14	1,000, 1,500, 2,000, 2,500, 3,000	8.08×10^{-7}	1.14	5.69	2,100
45	90	11	80	8.5	M6	5	0.17	1,000, 1,500, 2,000, 2,500, 3,000	1.29×10^{-6}	1.74	7.09	1,850
59	94	11	86	9	M6	5	0.17	1,000, 1,500, 2,000, 2,500, 3,000	1.29×10^{-6}	2.42	7.02	1,840
50	85	11	76	8.5	M6	5	0.17	1,000, 1,500, 2,000, 2,500, 3,000	1.29×10^{-6}	1.74	7.12	1,870
50	85	11	76	8.5	M6	5	0.17	1,000, 1,500, 2,000, 2,500, 3,000	1.29×10^{-6}	1.74	7.12	1,870
56.5	93	11	84	8.5	M6	5.4	0.17	1,000, 1,500, 2,000, 2,500, 3,000, 4,000	1.97×10^{-6}	2.16	8.76	1,670
56.5	93	11	84	8.5	M6	5.4	0.17	1,000, 1,500, 2,000, 2,500, 3,000, 4,000	1.97×10^{-6}	2.16	8.76	1,670
72	112	14	104	10	M6	5.4	0.2	1,000, 1,500, 2,000, 3,000, 4,000	4.82×10^{-6}	3.89	13.79	1,340
72	112	14	104	10	M6	5.4	0.2	1,000, 1,500, 2,000, 3,000, 4,000	4.82×10^{-6}	3.86	13.79	1,340

Note: The overall length of the nut will increase when equipping the QZ Lubricator. See A**15-366** for further details.

Ball Screw

WTF
No Preload

DN value	70,000



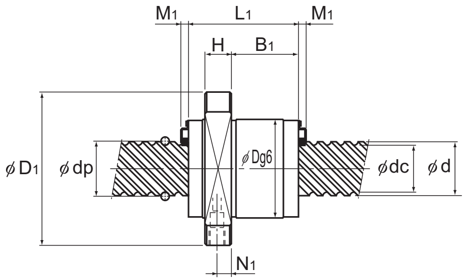
Model No.	Screw shaft outer diameter	Lead	Ball center-to-center diameter	Thread minor diameter	No. of loaded circuits	Basic load rating		Rigidity				
						Ca	C_0a	K	Outer diameter	Flange diameter	Overall length	
	d	Ph	dp	dc	Rows × turns	kN	kN	N/μm	D	D_1	L_1	H
WTF 1520-3	15	20	15.75	12.5	2×1.5	5.5	14.2	140	32	53	45	10
WTF 1520-6	15	20	15.75	12.5	4×1.5	10.1	28.5	280	32	53	45	10
WTF 1530-2	15	30	15.75	12.5	4×0.6	4.3	9.3	120	32	53	33	10
WTF 1530-3	15	30	15.75	12.5	2×1.6	5.6	12.4	160	32	53	63	10
WTF 2040-2	20	40	20.75	17.5	4×0.65	5.4	13.6	160	37	57	41.5	10
WTF 2040-3	20	40	20.75	17.5	2×1.65	6.6	17.2	200	37	57	81.5	10
WTF 2550-2	25	50	26	21.9	4×0.65	8.5	21.2	200	45	69	52	12
WTF 2550-3	25	50	26	21.9	2×1.65	10.4	26.9	260	45	69	102	12
WTF 3060-2	30	60	31.25	26.4	4×0.65	11.8	30.6	240	55	89	62.5	15
WTF 3060-3	30	60	31.25	26.4	2×1.65	14.5	38.9	310	55	89	122.5	15
WTF 4080-2	40	80	41.75	35.2	4×0.65	19.8	54.5	320	73	114	79	17
WTF 4080-3	40	80	41.75	35.2	2×1.65	24.3	69.2	400	73	114	159	17
WTF 50100-2	50	100	52.2	44.1	4×0.65	29.6	85.2	390	90	135	98	20
WTF 50100-3	50	100	52.2	44.1	2×1.65	36.3	108.1	500	90	135	198	20

Model number coding

WTF3060-3 ZZ +1500L C7 T H1K

- WTF3060-3: Model No.
- ZZ: Contamination protection accessory symbol[1]
- +1500L: Overall screw shaft length (in mm)
- C7: Accuracy symbol[2]
- T: Symbol for rolled shaft
- H1K: Recommended shaft ends shape code

[1] See A**15-356**. [2] See A**15-12**.



Unit: mm

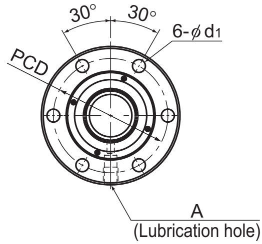
Nut dimensions							Axial clearance	Standard shaft length	Screw shaft inertial moment/mm	Nut mass	Shaft mass	Permissible rotational speed
				Lubrication hole		Seal						
B_1	PCD	d_1	Tw	N_1	A	M_1			kg·m²/mm	kg	kg/m	min^{-1}
28	43	5.5	33	5	M6	3.5	0.1	500, 1,000	3.90×10^{-8}	0.2	1.17	4,440
28	43	5.5	33	5	M6	3.5	0.1	500, 1,000	3.90×10^{-8}	0.2	1.17	4,440
17	43	5.5	33	5	M6	3.5	0.1	500, 1,000, 1,500	3.90×10^{-8}	0.22	1.19	4,440
47	43	5.5	33	5	M6	3.5	0.1	500, 1,000, 1,500	3.90×10^{-8}	0.4	1.19	4,440
25.5	47	5.5	38	5.5	M6	3.5	0.1	500, 1,000, 1,500, 2,000	1.23×10^{-7}	0.25	2.12	3,370
65.5	47	5.5	38	5.5	M6	3.5	0.1	500, 1,000, 1,500, 2,000	1.23×10^{-7}	0.5	2.12	3,370
31.5	57	6.6	46	7	M6	3.5	0.1	1,000, 1,500, 2,000, 3,000	3.01×10^{-7}	0.45	3.34	2,690
81.5	57	6.6	46	7	M6	3.5	0.1	1,000, 1,500, 2,000, 3,000	3.01×10^{-7}	0.85	3.34	2,690
37.5	71	9	56	9	M6	3.8	0.14	1,000, 2,000, 3,000, 4,000	6.24×10^{-7}	0.8	4.84	2,240
97.5	71	9	56	9	M6	3.8	0.14	1,000, 2,000, 3,000, 4,000	6.24×10^{-7}	1.7	4.84	2,240
50.5	93	11	74	9	M6	5.4	0.17	1,000, 1,500, 2,000, 3,000	1.97×10^{-6}	2.1	8.66	1,670
130.5	93	11	74	9	M6	5.4	0.17	1,000, 1,500, 2,000, 3,000	1.97×10^{-6}	3.67	8.66	1,670
64	112	14	92	10	M6	5.4	0.2	1,500, 3,000	4.82×10^{-6}	3.5	13.86	1,340
164	112	14	92	10	M6	5.4	0.2	1,500, 3,000	4.82×10^{-6}	6.4	13.86	1,340

Note: The overall length of the nut will increase when equipping the QZ Lubricator. See A**15-366** for further details.

Options⇒A15-355

CNF
No Preload

DN value	70,000



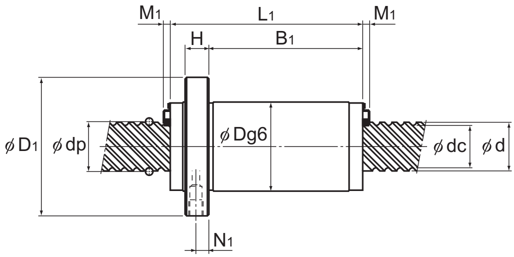
Model No.	Screw shaft outer diameter	Lead	Ball center-to-center diameter	Thread minor diameter	No. of loaded circuits	Basic load rating		Rigidity	Nut dimensions				
						Ca	$C_{0}a$	K	Outer diameter	Flange diameter	Overall length		
	d	Ph	dp	dc	Rows × turns	kN	kN	N/μm	D	D_1	L_1	H	B_1
CNF 1530-6	15	30	15.75	12.5	4×1.6	10.1	24.7	310	32	53	63	10	47
CNF 2040-6	20	40	20.75	17.5	4×1.65	12	34.4	400	37	57	81	10	65
CNF 2550-6	25	50	26	21.9	4×1.65	18.9	53.9	460	45	69	102	12	81.5
CNF 3060-6	30	60	31.25	26.4	4×1.65	26.2	77.7	600	55	89	122	15	97

Model number coding

CNF2040-6 ZZ +1500L C7 T H1K

- CNF2040-6: Model No.
- ZZ: Contamination protection accessory symbol[1]
- +1500L: Overall screw shaft length (in mm)
- C7: Accuracy symbol[2]
- T: Symbol for rolled shaft
- H1K: Recommended shaft ends shape code

[1] See A15-356. [2] See A15-12.



Unit: mm

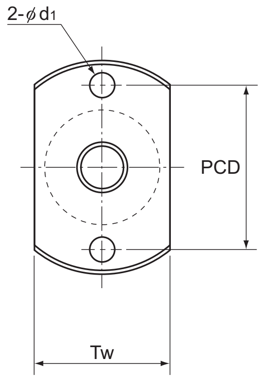
Nut dimensions					Axial clearance	Standard shaft length	Screw shaft inertial moment/mm	Nut mass	Shaft mass	Permissible rotational speed
		Lubrication hole		Seal						
PCD	d_1	N_1	A	M_1			kg·m²/mm	kg	kg/m	min^{-1}
43	5.5	5	M6	3.5	0.1	500, 1,000, 1,500	3.90×10^{-8}	0.42	1.19	4,440
47	5.5	5.5	M6	3.5	0.1	500, 1,000, 1,500, 2,000	1.23×10^{-7}	0.5	2.12	3,370
57	6.6	7	M6	3.5	0.1	1,000, 1,500, 2,000, 3,000	3.01×10^{-7}	0.85	3.34	2,690
71	9	9	M6	3.8	0.14	1,000, 2,000, 3,000, 4,000	6.24×10^{-7}	1.7	4.84	2,240

Note: The overall length of the nut will increase when equipping the QZ Lubricator. See **A15-366** for further details.

Options⇒A15-355

MTF (Unfinished Shaft Ends)
No Preload

DN value	50,000



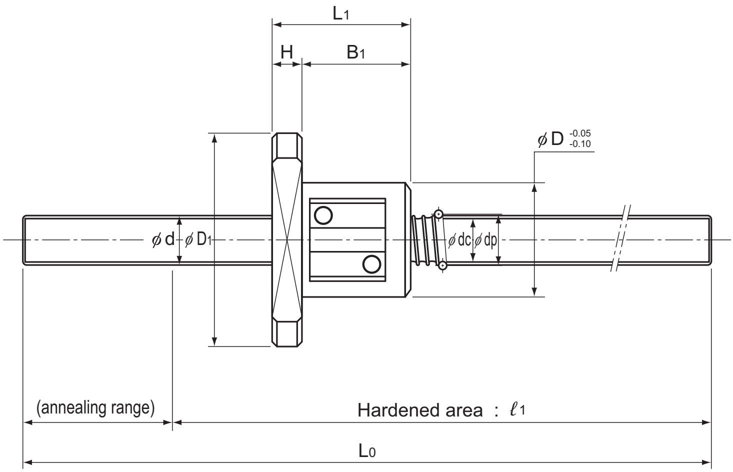
Model No.	Screw shaft outer diameter d	Lead Ph	Ball center-to-center diameter dp	Thread minor diameter dc	No. of loaded circuits Rows×turns	Basic load rating Ca kN	Basic load rating C_0a kN	Rigidity K N/μm	Outer diameter D	Flange diameter D_1
MTF 0601-3.7	6	1	6.15	5.3	1×3.7	0.7	1.2	70	13	30
MTF 0802-3.7	8	2	8.3	6.6	1×3.7	2.1	3.8	90	20	40
MTF 1002-3.7	10	2	10.3	8.6	1×3.7	2.3	4.8	110	23	43
MTF 1202-3.7	12	2	12.3	10.6	1×3.7	2.5	5.8	130	25	47

Model number coding

MTF 08 02 -3.7 +250L C7 T

- MTF: Model No.
- 08: Screw shaft outer diameter (in mm)
- 02: Lead (in mm)
- +250L: Overall shaft length (in mm)
- C7: Accuracy symbol (No symbol for Normal Grade)
- T: Symbol for ball screw shaft

Notes: Model MTF is only sold as a set (ball screw nut and screw shaft).
Model MTF has only anti-rust oil applied.



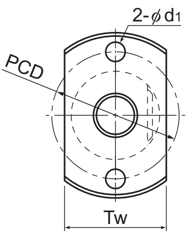
Unit: mm

Nut dimensions							Axial clearance	Standard shaft length		Screw shaft inertial moment/mm	Nut mass	Shaft mass	Permissible rotational speed
	Overall length L_1	H	B_1	PCD	d_1	T_W			ℓ_1	$kg \cdot m^2/mm$	kg	kg/m	min^{-1}
	21	5	16	21.5	3.4	17	0.05	150	100	9.99×10^{-10}	0.03	0.19	3,500
								250	200				
	28	6	22	30	4.5	24	0.05	150	95	3.16×10^{-9}	0.08	0.31	3,500
								250	195				
	28	6	22	33	4.5	27	0.05	200	140	7.71×10^{-9}	0.1	0.52	3,500
								300	240				
	30	8	22	36	5.5	29	0.05	200	140	1.6×10^{-8}	0.13	0.77	3,500
								300	240				

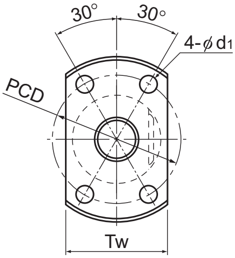
Options⇒A15-355

MTF
No Preload

DN value	50,000



Nut type Ⅰ



Nut type Ⅱ

Model No.	Screw shaft outer diameter	Lead	Ball center-to-center diameter	Thread minor diameter	No. of loaded circuits	Basic load rating		Rigidity			
						Ca	C_0a	K	Outer diameter	Flange diameter	Overall length
	d	Ph	dp	dc	Rows × turns	kN	kN	N/μm	D	D_1	L_1
○ MTF 0601-3.7	6	1	6.15	5.3	1×3.7	0.7	1.2	70	13	30	21
MTF 0801-3.7	8	1	8.15	7.3	1×3.7	0.78	1.65	95	16	29	17
○ MTF 0802-3.7	8	2	8.3	6.6	1×3.7	2.1	3.8	90	20	40	28
MTF 0805-2.7	8	5	8.3	6.6	1×2.7	1.85	3	82	18	31	28
○ MTF 1002-3.7	10	2	10.3	8.6	1×3.7	2.3	4.8	110	23	43	28
MTF 1004-2.7	10	4	10.3	8.2	1×2.7	3	5.2	104	24	41	28
○ MTF 1202-3.7	12	2	12.3	10.6	1×3.7	2.5	5.8	130	25	47	30
MTF 1402-3.7	14	2	14.3	12.6	1×3.7	3.2	7.5	176	26	45	25

Model number coding

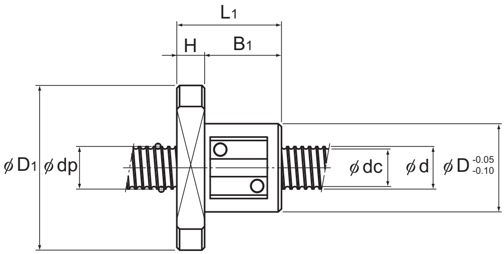
MTF 0802-3.7 +250L C7 T

Model No.

Overall screw shaft length (in mm)

Symbol for rolled shaft

Accuracy code: (No code for Normal Grade)



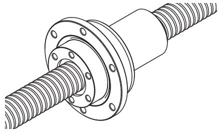
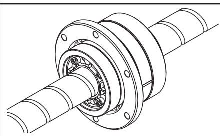
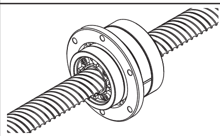
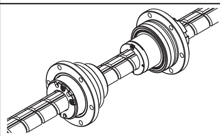
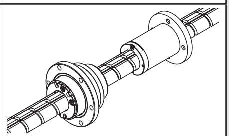
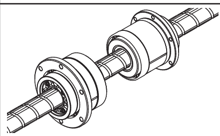
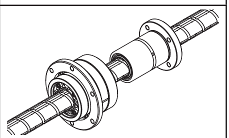
Unit: mm

Nut dimensions							Axial clearance	Standard shaft length	Screw shaft inertial moment/mm	Nut mass	Shaft mass	Permissible rotational speed
	H	B_1	PCD	d_1	Tw	Nut type			$kg \cdot m^2/mm$	kg	kg/m	min^{-1}
	5	16	21.5	3.4	17	I	0.05	150, 250	9.99×10^{-10}	0.03	0.19	3,500
	4	13	23	3.4	18	II	0.05	—	3.16×10^{-9}	0.02	0.36	3,500
	6	22	30	4.5	24	I	0.05	150, 250	3.16×10^{-9}	0.08	0.31	3,500
	4	24	25	3.4	20	II	0.05	—	3.16×10^{-9}	0.05	0.33	3,500
	6	22	33	4.5	27	I	0.05	200, 300	7.71×10^{-9}	0.1	0.52	3,500
	5	23	33	4.5	26	II	0.05	—	7.71×10^{-9}	0.09	0.52	3,500
	8	22	36	5.5	29	I	0.05	200, 300	1.60×10^{-8}	0.13	0.77	3,500
	6	19	36	5.5	28	II	0.05	—	2.96×10^{-8}	0.08	1.07	3,500

○: indicates MTF model numbers for which nuts are processed with AP-C treatment as standard. For details, see B0-20.

Notes: Seals are not installed on the Model MTF.
Model MTF is only sold as a set (ball screw nut and screw shaft).
Model MTF has only anti-rust oil applied.

Rotary Nut Ball Screw

Series	Model		Features
Rotary nut	DIR		Nut rotation, compact, preload
	BLR		Large lead, nut rotation, no preload
	BLR (rolled)		Large lead, nut rotation, no preload
	BNS-V		Ball screw / spline, low inertia
	NS-V		
	BNS		Ball screw / spline
	NS		

	Caged Ball	Compact nut	Miniature	High load capacity	Offset preload	DN value	Shaft diameter (mm)	Lead (mm)	Page No.
		✓			✓	70,000	16 to 40	5 to 12	A15-296
						70,000	16 to 50	16 to 50	A15-298
						70,000	16 to 50	16 to 50	A15-300
		✓				100,000	16 to 25	16 to 25	A15-302
		✓							A15-308
						70,000	8 to 50	12 to 50	A15-304
									A15-310

Standard Combinations of Outer Diameters and Leads of the Screw Shafts

Shaft diameter	Lead							
	4	5	6	10	12	15	16	
8					BNS NS			
10						BNS NS		
14								
16		DIR					BLR BLR (rolled) BNS NS	
20		DIR						
25		DIR		DIR				
28								
32		DIR	DIR	DIR				
36				DIR				
40				DIR	DIR			
50								

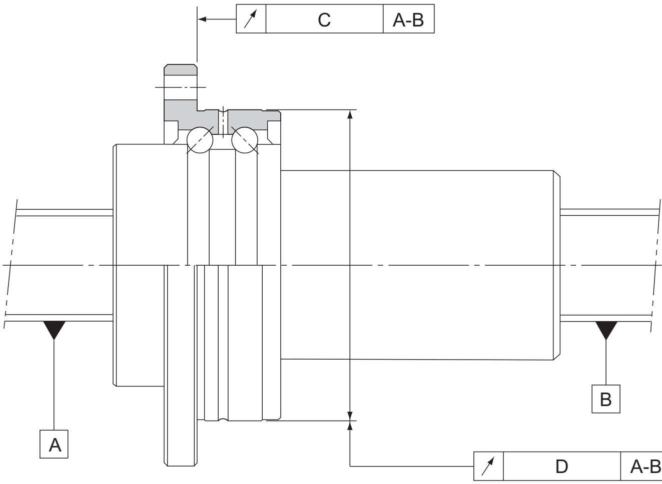
Unit: mm

	Lead						
	20	25	30	32	36	40	50
	BLR BLR (rolled) BNS NS						
		BLR BLR (rolled) BNS NS					
				BLR BLR (rolled) BNS NS			
					BLR BLR (rolled)		
						BLR BLR (rolled) BNS NS	
							BLR BLR (rolled) BNS NS

Accuracy Standards

Model DIR

The accuracy of Model DIR is compliant with the JIS standard JIS B 1192 (ISO 3408) except for the radial runout 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).

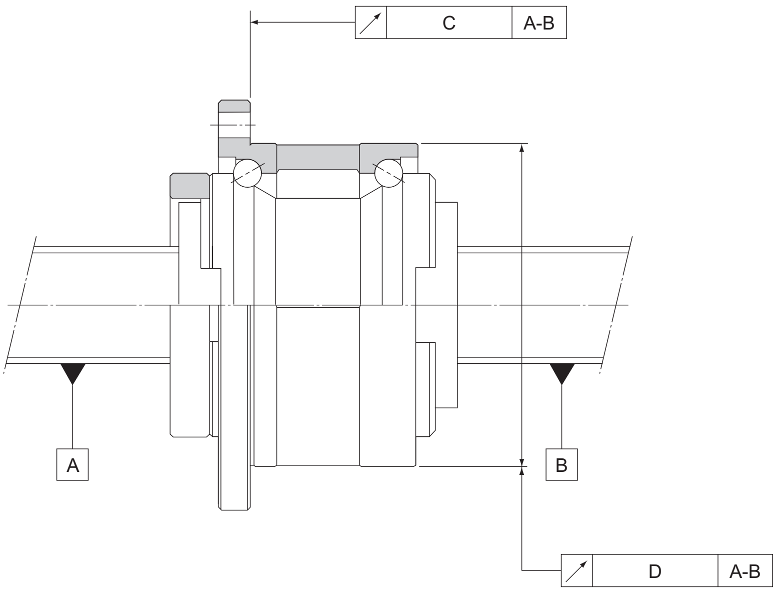


Unit: mm

Accuracy grades	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

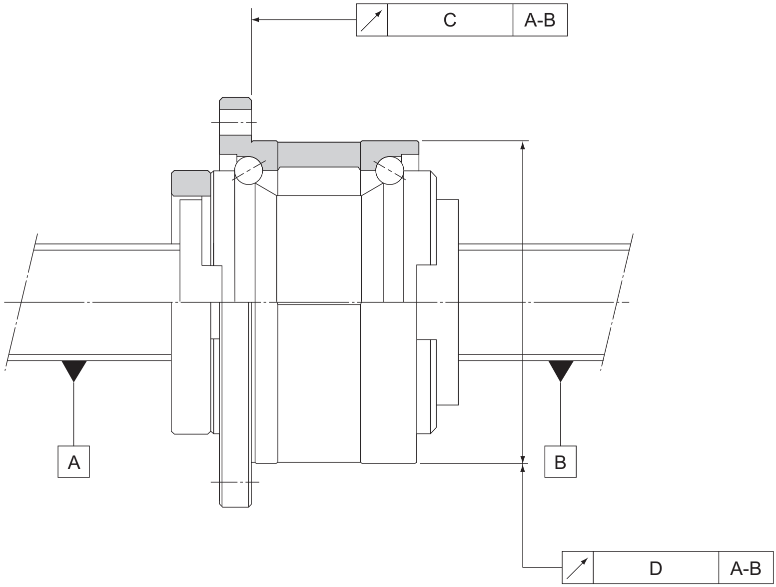
Model BLR

The accuracy of Model BLR is compliant with the JIS standard JIS B 1192 (ISO 3408) except for the radial runout 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

Lead angle accuracy	C3		C5		C7	
Accuracy grades	C3		C5		C7	
Model No.	C	D	C	D	C	D
BLR 1616	0.013	0.017	0.016	0.020	0.023	0.035
BLR 2020	0.013	0.017	0.016	0.020	0.023	0.035
BLR 2525	0.015	0.020	0.018	0.024	0.023	0.035
BLR 3232	0.015	0.020	0.018	0.024	0.023	0.035
BLR 3636	0.016	0.021	0.019	0.025	0.024	0.036
BLR 4040	0.018	0.026	0.021	0.033	0.026	0.046
BLR 5050	0.018	0.026	0.021	0.033	0.026	0.046



Unit: mm

Lead angle accuracy	C7, C8, C10	
Accuracy grades	C10	
Model No.	C	D
BLR 1616	0.035	0.065
BLR 2020	0.035	0.065
BLR 2525	0.035	0.065
BLR 3232	0.035	0.065
BLR 3636	0.036	0.066
BLR 4040	0.046	0.086
BLR 5050	0.046	0.086

● **Model BNS-V/NS-V**

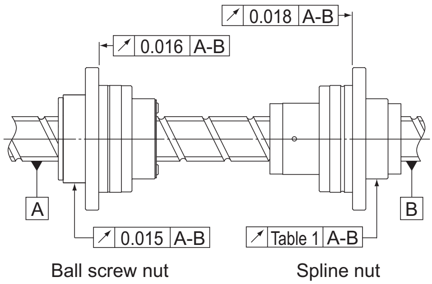
Ball screws and ball splines are manufactured with the following specifications.

Ball Screw

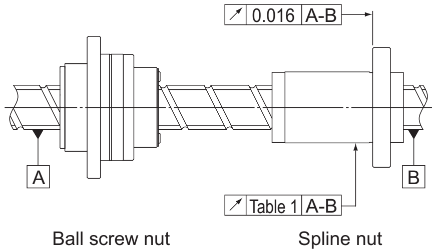
Axial clearance : 0 mm to 0.01 mm (G1)
Lead angle accuracy : C5
(For detailed specifications, see A**15-12**, A**15-19**.)

Ball Spline

Clearance in the rotational direction : 0 or less (CL: light preload)
(For detailed specifications, see A**3-32**.)
Accuracy grade : class H
(For detailed specifications, see A**3-36**.)



Model BNS-V



Model NS-V

Table 1: Radial Runout of the Spline Nut Outer Diameter in Relation to the Shaft Journals

Unit: mm

Overall shaft length		Shaft diameter	
Above	Up to	ø16/ø20	ø25
—	200	0.034	0.032
200	315	0.045	0.039
315	400	0.053	0.044
400	500	0.062	0.050
500	630	0.075	0.057
630	800	0.092	0.068

● Model BNS/NS

Ball Screw

Axial clearance : 0 or less

Lead angle accuracy : C5

(For detailed specifications, see **A15-12**, **A15-19**.)

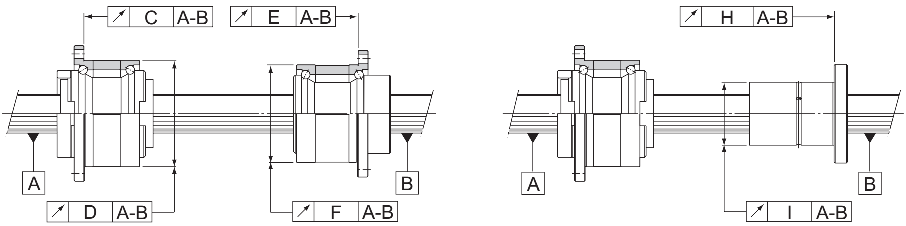
Ball Spline

Clearance in the rotational direction : 0 or less (CL: light preload)

(For detailed specifications, see **A3-32**.)

Accuracy grade : class H

(For detailed specifications, see **A3-36**.)



Ball screw nut　Spline nut　Ball screw nut　Spline nut

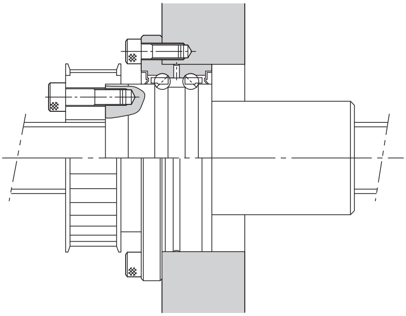
Model BNS　Model NS

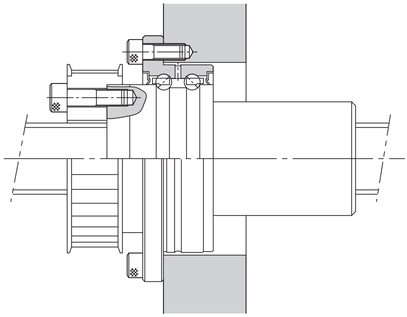
Unit: mm

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

Assembly Examples

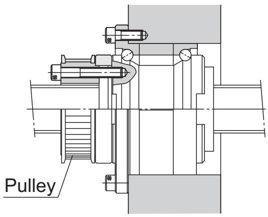
Example of Mounting Ball Screw Nut Model DIR



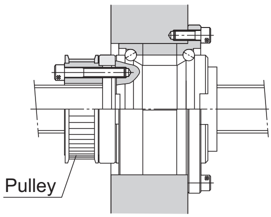


Installation to the housing can be performed on the end face of the outer ring flange.

Example of Mounting Ball Screw Nut Model BLR



Standard installation method



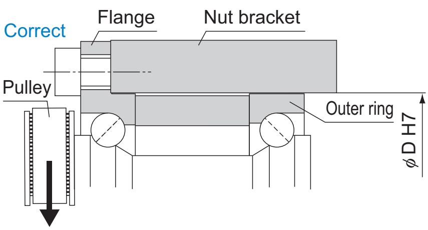
Inverted flange

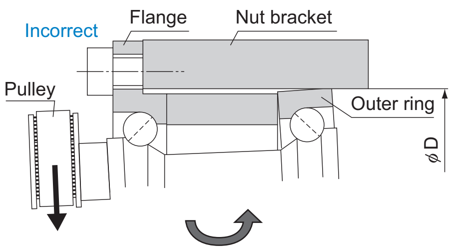
Note: If the flange is to be inverted, indicate “K” in the model number (applicable only to model BLR).

Example: BLR 2020-3.6 K UU

K: Inverted flange symbol (no symbol for standard flange)

Important Note Concerning Model BLR





Note: Since the outer rings are separable, it is necessary to include an internal diameter tolerance in the nut bracket so that the outer ring on the side opposite from the flange does not shift. (H7 is recommended.)

Example of Mounting Model BLR on a Table

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

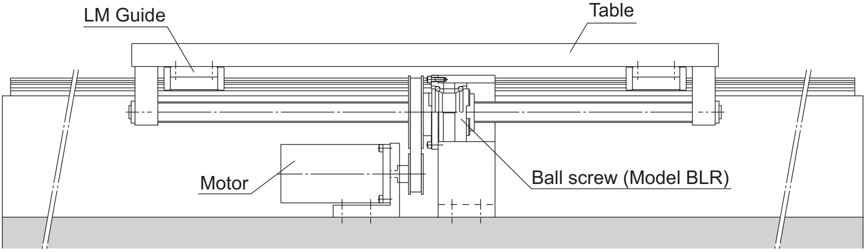


Fig. 1: Example of Installation on a Table (Ball Screw Nut Fixed)

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

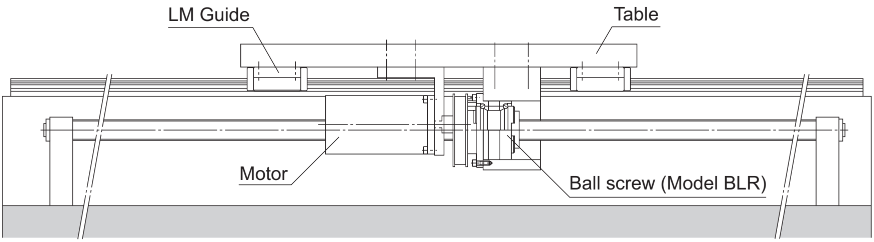
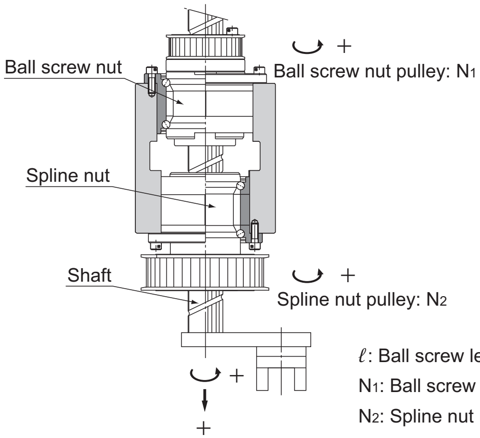


Fig. 2: Example of Installation on a Table (Screw Shaft Fixed)

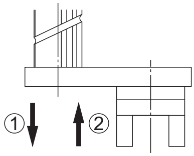
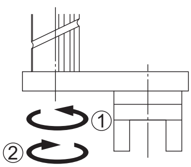
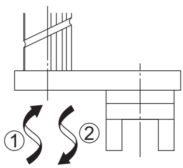
Note: A design incorporating a tension mechanism is needed when using a timing belt. For belt tensions, see the belt manufacturer's catalog. When used with a long stroke, apply tension to the screw shaft to reduce oscillations.

Action Patterns

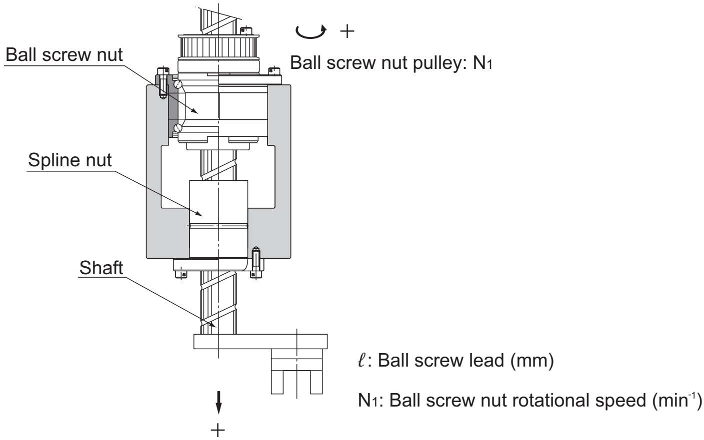
Model BNS Basic Actions

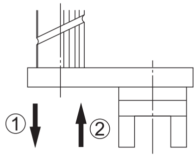


ℓ: Ball screw lead (mm)
N_1: Ball screw nut rotational speed (min^{-1})
N_2: Spline nut rotational speed (min^{-1})

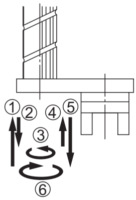
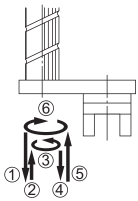
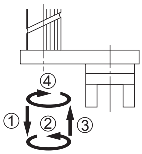
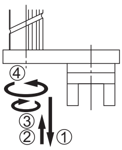
Motion		Action direction	Input: Ball screw pulley	Input: Ball spline pulley	Shaft motion: Vertical direction (speed)	Shaft motion: Rotational direction (rotational speed)
1. Vertical 	(1)	Vertical direction→down Rotational direction→0	N_1 (Forward)	0	$V=N_1 \cdot \ell$ ($N_1 \neq 0$)	0
	(2)	Vertical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

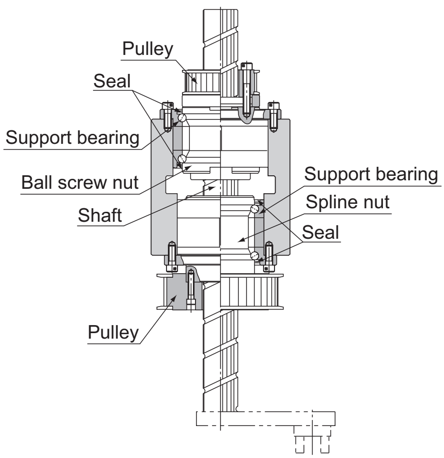


Motion		Action direction	Input	Shaft motion
			Ball screw pulley	Vertical direction (speed)
1. Vertical 	(1)	Vertical direction →down	N_1 (Forward)	$V=N_1 \cdot \ell$ ($N_1 \neq 0$)
	(2)	Vertical direction →up	$-N_1$ (Reverse)	$V=-N_1 \cdot \ell$ ($N_1 \neq 0$)

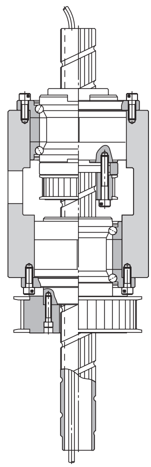
Model BNS Extended Actions

Motion		Action direction	Input		Shaft motion	
			Ball screw pulley	Ball spline pulley	Vertical direction (speed)	Rotational direction (rotational speed)
1. Up→down→forward →up→down→reverse 	(1)	Vertical direction→up	$-N_1$ (Reverse)	0	$V=-N_1\cdot\ell$ $(N_1\neq0)$	0
	(2)	Vertical direction→down	N_1 (Forward)	0	$V=N_1\cdot\ell$ $(N_1\neq0)$	0
	(3)	Rotational direction→forward	N_1	N_2 (Forward)	0	N_2 (Forward) $(N_1=N_2\neq0)$
	(4)	Vertical direction→up	$-N_1$	0	$V=-N_1\cdot\ell$ $(N_1\neq0)$	0
	(5)	Vertical direction→down	N_1	0	$V=N_1\cdot\ell$ $(N_1\neq0)$	0
	(6)	Rotational direction→reverse	$-N_1$	$-N_2$ (Reverse)	0	$-N_2$ (Reverse) $(-N_1=N_2\neq0)$
2. Down→up→forward →down→up→reverse 	(1)	Vertical direction→down	N_1	0	$V=N_1\cdot\ell$ $(N_1\neq0)$	0
	(2)	Vertical direction→up	$-N_1$	0	$V=-N_1\cdot\ell$ $(N_1\neq0)$	0
	(3)	Rotational direction→forward	N_1	N_2	0	N_2 $(N_1=N_2\neq0)$
	(4)	Vertical direction→down	N_1	0	$V=N_1\cdot\ell$ $(N_1\neq0)$	0
	(5)	Vertical direction→up	$-N_1$	0	$V=-N_1\cdot\ell$ $(N_1\neq0)$	0
	(6)	Rotational direction→reverse	$-N_1$	$-N_2$	0	$-N_2$ $(-N_1=N_2\neq0)$
3. Down→forward →up→reverse 	(1)	Vertical direction→down	N_1	0	$V=N_1\cdot\ell$ $(N_1\neq0)$	0
	(2)	Rotational direction→forward	N_1	N_2	0	N_2 $(N_1=N_2\neq0)$
	(3)	Vertical direction→up	$-N_1$	0	$V=-N_1\cdot\ell$ $(N_1\neq0)$	0
	(4)	Rotational direction→reverse	$-N_1$	$-N_2$	0	$-N_2$ $(-N_1=N_2\neq0)$
4. Down→up →reverse→forward 	(1)	Vertical direction→down	N_1	0	$V=N_1\cdot\ell$ $(N_1\neq0)$	0
	(2)	Vertical direction→up	$-N_1$	0	$V=-N_1\cdot\ell$ $(N_1\neq0)$	0
	(3)	Rotational direction→reverse	$-N_1$	$-N_2$	0	$-N_2$ $(-N_1=N_2\neq0)$
	(4)	Rotational direction→forward	N_1	N_2	0	N_2 $(N_1=N_2\neq0)$

Assembly Examples

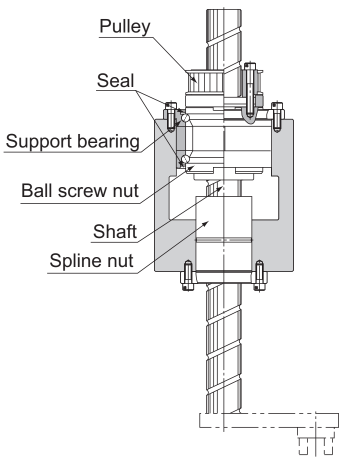


●Example of installing the ball screw nut input pulley and the spline nut input pulley, both outside the housing.
The housing length is minimized.

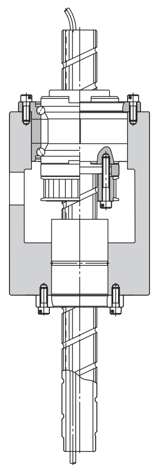


●Example of installing the ball screw nut pulley inside the housing.

Fig. 3: 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. 4: Example of Assembling Model NS

Example Application

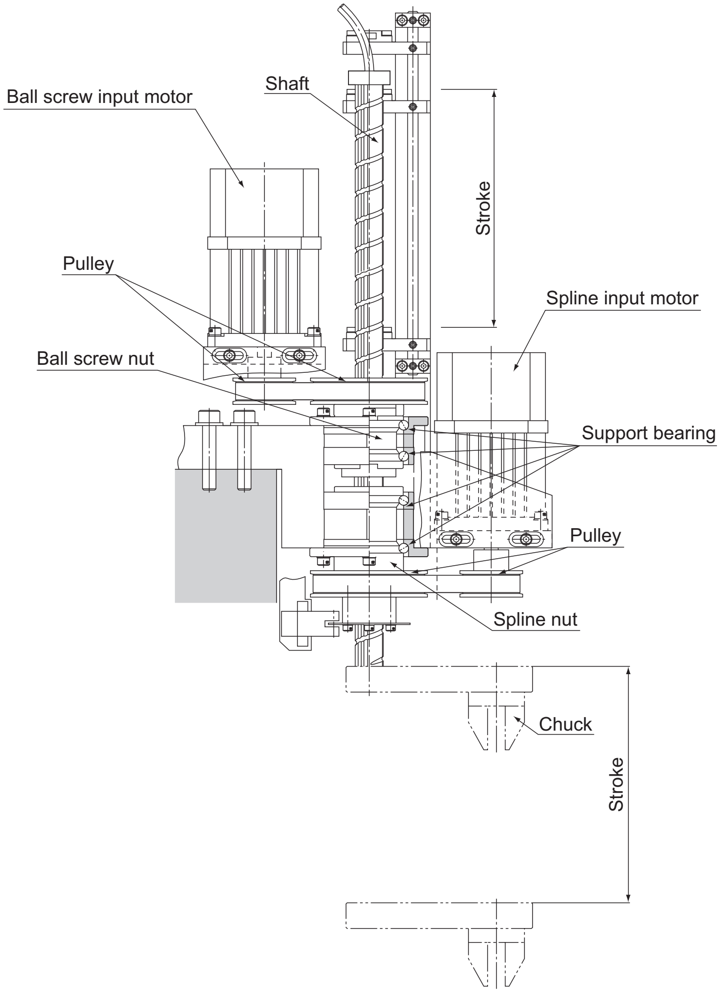
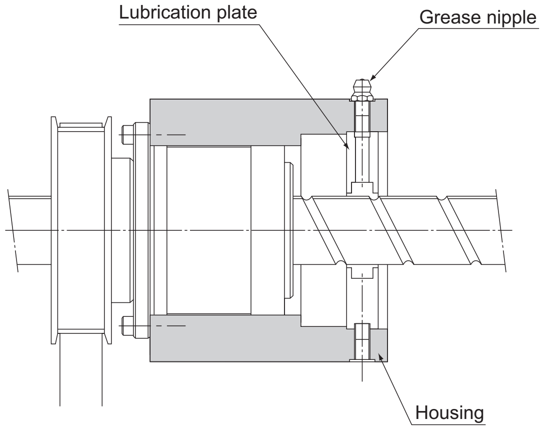


Fig. 5: Example of Using Model BNS

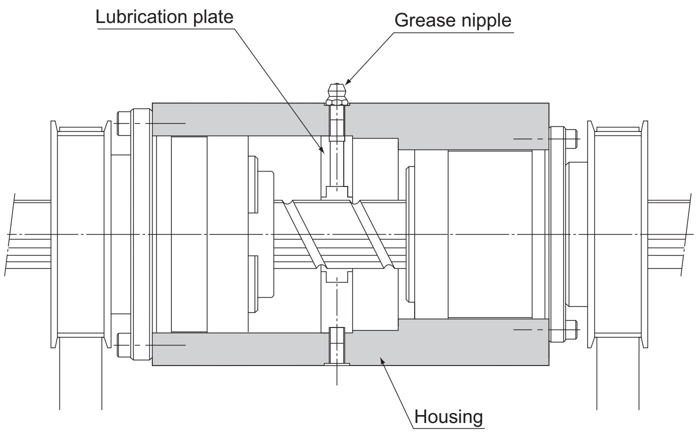
Lubrication

When lubricating the rotary ball screw, attach the lubrication plate to the housing in advance.



Lubrication Methods

When lubricating a ball screw or a ball spline, attach the lubrication plate to the housing in advance.



Lubrication Methods

Permissible Rotational Speeds for Rotary Ball Screws

The permissible rotational speed for models DIR and BLR are whichever is lowest of the critical speed of the rotary ball screw, a DN value of (70,000), or the permissible rotational speed of the support bearing. When using the product, do not exceed the permissible rotational speed.

Table 1: Model DIR Permissible Rotational Speed

Unit: min^{-1}

Model No.	Permissible rotational speed			
	Ball screw unit		Support bearing	
	Calculated using shaft length	Calculated using DN value	Grease lubrication	Oil lubrication
DIR1605	see A15-32.	4,170	4,000	5,400
DIR2005		3,370	3,500	4,700
DIR2505		2,710	2,900	3,900
DIR2510		2,690	2,900	3,900
DIR3205		2,130	2,400	3,300
DIR3206		2,120	2,400	3,300
DIR3210		2,070	2,400	3,300
DIR3610		1,850	2,100	2,800
DIR4010		1,670	1,900	2,600
DIR4012		1,670	1,900	2,600

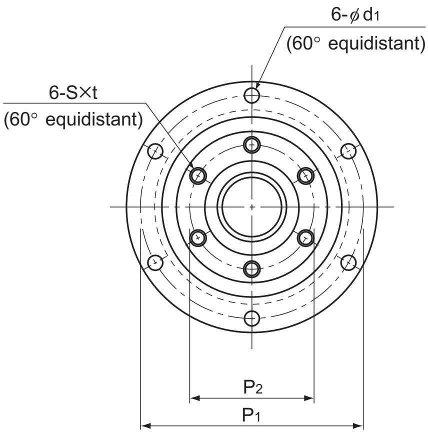
Table 2: Model BLR Permissible Rotational Speed

Unit: min^{-1}

Model No.	Permissible rotational speed			
	Ball screw unit		Support bearing	
	Calculated using shaft length	Calculated using DN value	Grease lubrication	Oil lubrication
BLR1616	see A15-32.	4,200	4,000	5,400
BLR2020		3,370	3,200	4,300
BLR2525		2,690	2,800	3,700
BLR3232		2,100	2,400	3,300
BLR3636		1,870	2,000	2,700
BLR4040		1,670	1,600	2,200
BLR5050		1,340	1,400	2,000

DIR
With Preload

DN value	70,000



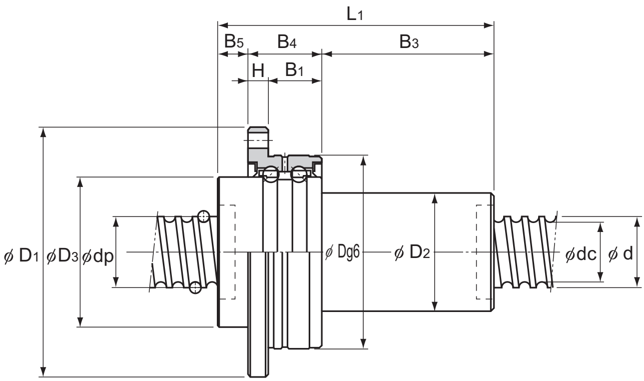
Model No.	Screw shaft outer diameter d	Thread minor diameter dc	Lead Ph	Ball center-to-center diameter dp	Basic load rating Ca kN	Basic load rating C_0a kN	Rigidity K N/μm	Outer diameter D	Flange diameter D_1	Overall length L_1	D_3 h7
DIR 1605-6	16	13.2	5	16.75	7.4	13	310	48	64	79	36
DIR 2005-6	20	17.2	5	20.75	8.5	17.3	310	56	72	80	43.5
DIR 2505-6	25	22.2	5	25.75	9.7	22.6	490	66	86	88	52
DIR 2510-4	25	21.6	10	26	9	18	330	66	86	106	52
DIR 3205-6	32	29.2	5	32.75	11.1	30.2	620	78	103	86	63
DIR 3206-6	32	28.4	6	33	14.9	37.1	630	78	103	97	63
DIR 3210-6	32	26.4	10	33.75	25.7	52.2	600	78	103	131	63
DIR 3610-6	36	30.5	10	37.75	28.8	63.8	710	92	122	151	72
DIR 4010-6	40	34.7	10	41.75	29.8	69.3	750	100	130	142	79.5
DIR 4012-6	40	34.4	12	41.75	30.6	72.3	790	100	130	167	79.5

Model number coding

DIR2005-6 RR G0 +520L C1

- DIR2005-6: Model number
- RR: Seal symbol[1]
- G0: Symbol for clearance in the axial direction[2]
- +520L: Overall screw shaft length (in mm)
- C1: Accuracy symbol[3]

[1] See A15-356. [2] See A15-19. [3] See A15-12.



Unit: mm

	Ball screw dimensions											Support bearing basic load rating		Nut inertial moment	Nut mass	Shaft mass	Permissible rotational speed
	D_2	B_5	B_4	B_3	P_1	P_2	H	B_1	S	t	d_1	Ca kN	C_0a kN	kg·m²	kg	kg/m	min⁻¹
	30	8	21	50	56	30	6	15	M4	6	4.5	8.7	10.5	6.10×10^{-5}	0.49	1.24	4,170
	34	9	21	50	64	36	6	15	M5	8	4.5	9.7	13.4	1.18×10^{-4}	0.68	2.05	3,370
	40	13	25	50	75	43	7	18	M6	10	5.5	12.7	18.2	2.65×10^{-4}	1.07	3.34	2,710
	40	11	25	70	75	43	7	18	M6	10	5.5	12.7	18.2	2.84×10^{-4}	1.16	3.52	2,690
	46	11	25	50	89	53	8	17	M6	10	6.6	13.6	22.3	5.10×10^{-4}	1.39	5.67	2,130
	48	11	25	61	89	53	8	17	M6	10	6.6	13.6	22.3	5.68×10^{-4}	1.54	5.47	2,120
	54	11	25	95	89	53	8	17	M6	10	6.6	13.6	22.3	8.13×10^{-4}	2.16	4.98	2,070
	58	14	33	104	105	61	10	23	M8	12	9	20.4	32.3	1.47×10^{-3}	3.25	6.51	1,850
	62	14	33	95	113	67	10	23	M8	12	9	21.5	36.8	2.06×10^{-3}	3.55	8.22	1,670
	62	14	33	120	113	67	10	23	M8	12	9	21.5	36.8	2.25×10^{-3}	3.9	8.5	1,670

The rigidity values in the table represent spring constants, each obtained from the load and the elastic deformation when providing a preload equal to 10% of the basic axial 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 10% of Ca, the rigidity value (K_N) is obtained from the following equation.

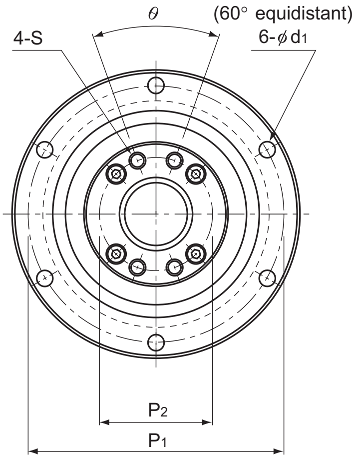
$$K_N = K\left(\frac{Fa_0}{0.1Ca}\right)^{\frac{1}{3}}$$

K: Rigidity value in the dimensional table

Options⇒A15-355

BLR (Precision Ball Screw) No Preload

DN value	70,000



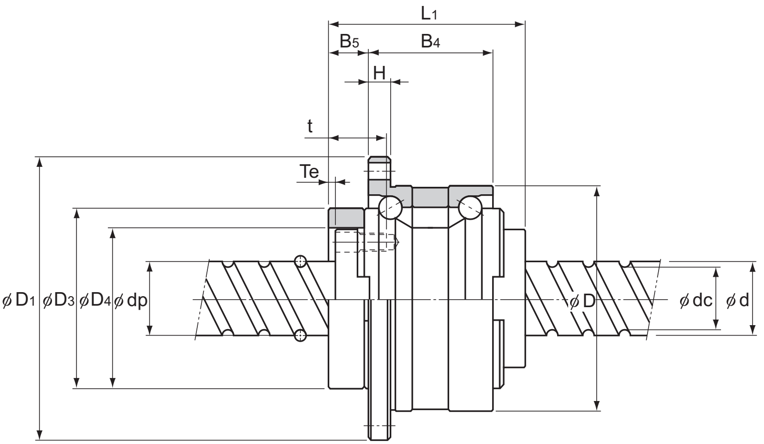
Model No.	Screw shaft outer diameter d	Thread minor diameter dc	Lead Ph	Ball center-to-center diameter dp	Basic load rating Ca kN	Basic load rating C_0a kN	Outer diameter D	Flange diameter D_1	Overall length L_1	D_3
BLR 1616-3.6	16	13.7	16	16.65	7.1	14.3	52 $^{0}_{-0.007}$	68	43.5	40 $^{0}_{-0.025}$
BLR 2020-3.6	20	17.5	20	20.75	11.1	24.7	62 $^{0}_{-0.007}$	78	54	50 $^{0}_{-0.025}$
BLR 2525-3.6	25	21.9	25	26	16.6	38.7	72 $^{0}_{-0.007}$	92	65	58 $^{0}_{-0.03}$
BLR 3232-3.6	32	28.3	32	33.25	23.7	59.5	80 $^{0}_{-0.007}$	105	80	66 $^{0}_{-0.03}$
BLR 3636-3.6	36	31.7	36	37.4	30.8	78	100 $^{0}_{-0.008}$	130	93	80 $^{0}_{-0.03}$
BLR 4040-3.6	40	35.2	40	41.75	38.7	99.2	110 $^{0}_{-0.008}$	140	98	90 $^{0}_{-0.035}$
BLR 5050-3.6	50	44.1	50	52.2	57.8	155	120 $^{0}_{-0.008}$	156	126	100 $^{0}_{-0.035}$

Model number coding

BLR2020-3.6 K UU G1 +1000L C5

- BLR2020-3.6: Model number
- K: Flange orientation symbol
- UU: Symbol for support bearing seal[1]
- G1: Symbol for clearance in the axial direction[2]
- +1000L: Overall screw shaft length (in mm)
- C5: Accuracy symbol[3]

[1] UU: Seal attached on both ends No symbol: Without seal. [2] See A15-19. [3] See A15-12.



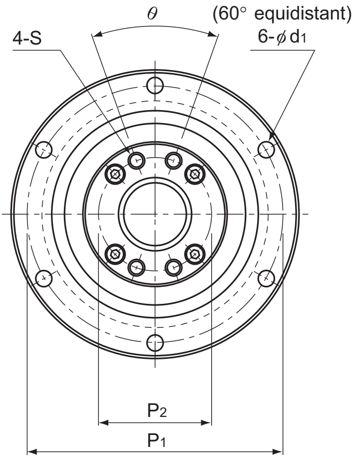
Unit: mm

	Ball screw dimensions											Support bearing basic load rating		Nut inertial moment	Nut mass	Shaft mass	Permissible rotational speed
												Ca	C_0a				
	D_4	H	B_4	B_5	Te	P_1	P_2	S	t	d_1	θ°	kN	kN	kg·m^2	kg	kg/m	min^{-1}
	32 $^{+0.025}_{0}$	5	27.5	9	2	60	25	M4	12	4.5	40	19.4	19.2	4.80×10^{-5}	0.38	1.41	4,200
	39 $^{+0.025}_{0}$	6	34	11	2	70	31	M5	16	4.5	40	26.8	29.3	1.44×10^{-4}	0.68	2.25	3,370
	47 $^{+0.025}_{0}$	8	43	12.5	3	81	38	M6	19	5.5	40	28.2	33.3	3.23×10^{-4}	1.1	3.52	2,690
	58 $^{+0.03}_{0}$	9	55	14	3	91	48	M6	19	6.6	40	30	39	6.74×10^{-4}	1.74	5.83	2,100
	66 $^{+0.03}_{0}$	11	62	17	3	113	54	M8	22	9	40	56.4	65.2	1.68×10^{-3}	3.2	7.34	1,870
	73 $^{+0.03}_{0}$	11	68	16.5	3	123	61	M8	22	9	50	59.3	74.1	2.79×10^{-3}	3.95	9.01	1,670
	90 $^{+0.035}_{0}$	12	80	25	4	136	75	M10	28	11	50	62.2	83	5.82×10^{-3}	6.22	14.08	1,340

Options⇒A15-355

BLR (Rolled Ball Screw)
No Preload

DN value	70,000



Model No.	Screw shaft outer diameter	Thread minor diameter	Lead	Ball center-to-center diameter	Basic load rating					
					Ca	C_0a	Outer diameter	Flange diameter	Overall length	
	d	dc	Ph	dp	kN	kN	D	D_1	L_1	D_3
BLR 1616-3.6	16	13.7	16	16.65	5.8	12.9	52 $^{0}_{-0.007}$	68	43.5	40 $^{0}_{-0.025}$
BLR 2020-3.6	20	17.5	20	20.75	7.7	22.3	62 $^{0}_{-0.007}$	78	54	50 $^{0}_{-0.025}$
BLR 2525-3.6	25	21.9	25	26	12.1	35	72 $^{0}_{-0.007}$	92	65	58 $^{0}_{-0.03}$
BLR 3232-3.6	32	28.3	32	33.25	17.3	53.9	80 $^{0}_{-0.007}$	105	80	66 $^{0}_{-0.03}$
BLR 3636-3.6	36	31.7	36	37.4	22.4	70.5	100 $^{0}_{-0.008}$	130	93	80 $^{0}_{-0.03}$
BLR 4040-3.6	40	35.2	40	41.75	28.1	89.8	110 $^{0}_{-0.008}$	140	98	90 $^{0}_{-0.035}$
BLR 5050-3.6	50	44.1	50	52.2	42.1	140.4	120 $^{0}_{-0.008}$	156	126	100 $^{0}_{-0.035}$

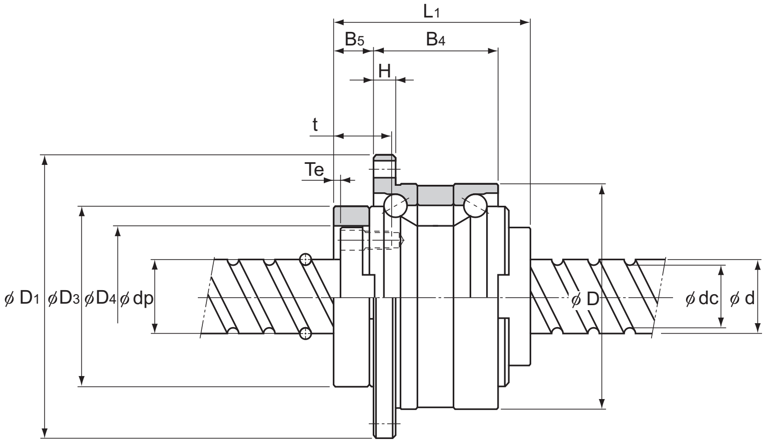
Model number coding

BLR2020-3.6 K UU +1000L C7 T

- BLR2020-3.6: Model number
- K: Flange orientation symbol
- UU: Symbol for support bearing seal[1]
- +1000L: Overall screw shaft length (in mm)
- C7: Accuracy symbol[2]
- T: Symbol for rolled Ball Screw

[1] UU: seal attached on both ends; No symbol: without seal. [2] See A**15-12**.

Note: For clearance in the axial direction, see A**15-19**.



Unit: mm

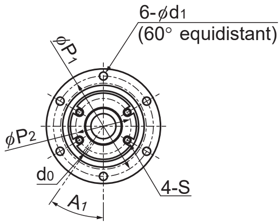
	Ball screw dimensions											Support bearing basic load rating		Nut inertial moment	Nut mass	Shaft mass	Permissible rotational speed
	D_4	H	B_4	B_5	Te	P_1	P_2	S	t	d_1	θ°	Ca kN	C_0a kN	kg·m²	kg	kg/m	min⁻¹
	32 +0.025/0	5	27.5	9	2	60	25	M4	12	4.5	40	19.4	19.2	4.80×10^{-5}	0.38	1.35	4,200
	39 +0.025/0	6	34	11	2	70	31	M5	16	4.5	40	26.8	29.3	1.44×10^{-4}	0.68	2.17	3,370
	47 +0.025/0	8	43	12.5	3	81	38	M6	19	5.5	40	28.2	33.3	3.23×10^{-4}	1.1	3.41	2,690
	58 +0.03/0	9	55	14	3	91	48	M6	19	6.6	40	30	39	6.74×10^{-4}	1.74	5.69	2,100
	66 +0.03/0	11	62	17	3	113	54	M8	22	9	40	56.4	65.2	1.68×10^{-3}	3.2	7.12	1,870
	73 +0.03	11	68	16.5	3	123	61	M8	22	9	50	59.3	74.1	2.79×10^{-3}	3.95	8.76	1,670
	90 +0.035/0	12	80	25	4	136	75	M10	28	11	50	62.2	83	5.82×10^{-3}	6.22	13.79	1,340

Ball Screw

Options⇒A15-355

BNS-V Low-Inertia Type: Linear-Rotary Motion No Preload

DN value	100,000



Ball screw unit

Ball screw unit

Model No.	Screw shaft outer diameter	Screw shaft inner diameter	Lead	Ball screw dimensions										
				Basic load rating		Ball center-to-center diameter	Thread minor diameter	Outer diameter	Flange diameter	Overall length				
				Ca	C_0a			D			D_3			
	d	db	Ph	kN	kN	dp	dc	g6	D_1	L_1	h7	AE	BE	H
BNS 1616V	16	11	16	4.6	6.8	16.65	13.7	42	54	38	32.5	31	31	4
BNS 2020V	20	14	20	7.3	11.7	20.75	17.5	48	64	45	39.5	37	36	6
BNS 2525V	25	18	25	8	14.4	25.35	22.1	56	72	55	43.5	42	41.6	6

Ball spline

Model No.	Ball spline dimensions											
	Basic load rating		Static permissible moment	Basic torque rating		Outer diameter	Flange diameter	Overall length				
	C	C_0	M_A	C_T	C_{0T}	D_7			D_6			
	kN	kN	N·m	N·m	N·m	g6	D_5	L_2	h7	AE_1	BE_1	H_1
BNS 1616V	8.4	13.4	77.4	42.9	68.6	42	54	46.4	32.5	27.5	28	4
BNS 2020V	10.5	18.6	144	66.4	117.2	48	64	59	36	31.5	32	6
BNS 2525V	15.9	26.2	230	125.3	207	56	72	67	43.5	39.5	40	6

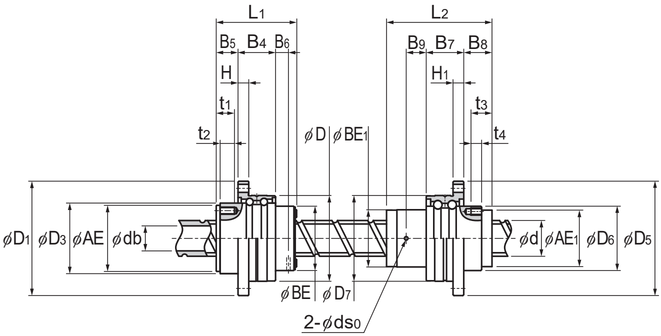
Notes: For K hollow shaft, please refer to the db dimension for the inner bore diameter of the shaft.
A solid shaft is also available upon request. See “Ball Spline” A3-120 for details.

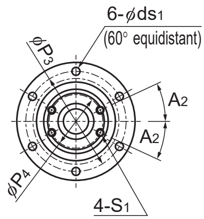
Model number coding

BNS2020V +500L C5

Model number — Overall shaft length (in mm) — Accuracy symbol[1]

[1] See A15-12.





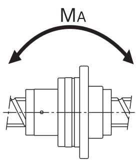
Ball spline

Unit: mm

												Support bearing basic load rating		Nut inertial moment	Screw shaft inertial moment	Nut mass	Shaft mass	Permissible rotational speed
												Ca	C_0a					
	B_4	B_5	P_1	P_2	S	t_1	t_2	d_1	B_6	d_0	A_1	kN	kN	kg·m²	kg·m²/mm	kg	kg/m	min⁻¹
	18	9.7	48	25.5	M3	8.2	6	3.4	5.8	2	35°	6.7	8.6	2.00×10^{-5}	3.21×10^{-8}	0.21	0.8	5,000
	21	12.2	56	31	M4	10.2	8	4.5	7.2	2	35°	7.3	10.6	6.50×10^{-5}	8.04×10^{-8}	0.39	1.21	4,810
	21	13.2	64	36	M5	10.2	8	4.5	15.3	3	35°	9.7	13.4	1.02×10^{-4}	1.91×10^{-7}	0.51	1.79	3,940

Unit: mm

												Support bearing basic load rating		Nut inertial moment	Nut mass
												Ca	C_0		
	B_7	B_8	P_3	P_4	S_1	t_3	t_4	ds_1	A_2	B_9	ds_0	kN	kN	kg·m²	kg
	18	13	48	25	M3	11.5	6	3.4	20°	5	2	5.2	5.1	1.80×10^{-5}	0.19
	21	15.8	56	30	M4	11.8	6	4.5	25°	5.4	2	6.7	6.4	4.20×10^{-5}	0.33
	21	19.2	64	36	M5	15.2	8	4.5	25°	7.6	3	7.4	7.8	9.80×10^{-5}	0.49

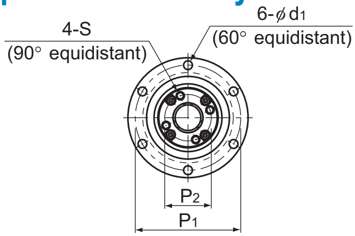


Ball Screw

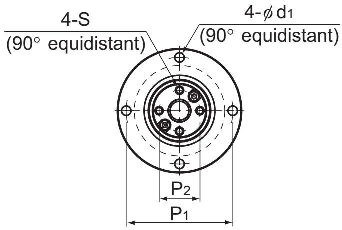
Options⇒A15-355

BNS-A Compact Type: Linear-Rotary Motion No Preload

DN value	70,000



Ball screw unit (Models BNS 1616A to 4040A)



Ball screw unit (Models BNS 0812A and 1015A)

Ball screw unit

Model No.	Screw shaft outer diameter	Screw shaft inner diameter	Lead	Ball screw dimensions								
				Basic load rating		Ball center-to-center diameter	Thread minor diameter	Outer diameter	Flange diameter	Overall length		
				Ca	C_0a			D			D_3	D_4
	d	db	Ph	kN	kN	dp	dc	g6	D_1	L_1	h7	H7
BNS 0812A	8	—	12	1.1	1.8	8.4	6.6	32	44	28.5	22	19
BNS 1015A	10	—	15	1.7	2.7	10.5	8.3	36	48	34.5	26	23
BNS 1616A	16	11	16	3.9	7.2	16.65	13.7	48	64	40	36	32
BNS 2020A	20	14	20	6.1	12.3	20.75	17.5	56	72	48	43.5	39
BNS 2525A	25	18	25	9.1	19.3	26	21.9	66	86	58	52	47
BNS 3232A	32	23	32	13	29.8	33.25	28.3	78	103	72	63	58
BNS 4040A	40	29	40	21.4	49.7	41.75	35.2	100	130	88	79.5	73

Ball spline

Model No.	Ball spline dimensions									
	Basic load rating		Static permissible moment	Basic torque rating		Outer diameter	Flange diameter	Overall length		
	C	C_0	M_A	C_T	C_{0T}	D_7			D_6	
	kN	kN	N·m	N·m	N·m	g6	D_5	L_2	h7	BE_1
BNS 0812A	1.5	2.6	5.9	2	2.9	32	44	25	24	16
BNS 1015A	2.7	4.9	15.7	3.9	7.8	36	48	33	28	21
BNS 1616A	7.1	12.6	67.6	31.4	34.3	48	64	50	36	31
BNS 2020A	10.2	17.8	118	56.8	55.8	56	72	63	43.5	35
BNS 2525A	15.2	25.8	210	105	103	66	86	71	52	42
BNS 3232A	20.5	34	290	180	157	78	103	80	63	52
BNS 4040A	37.8	60.5	687	418	377	100	130	100	79.5	64

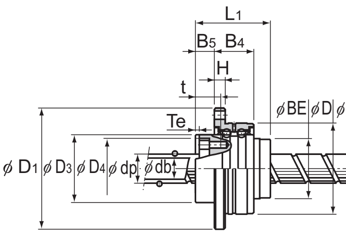
Notes: For K hollow shaft, please refer to the db dimension for the inner bore diameter of the shaft.
A solid shaft is also available upon request. See “Ball Spline” **A3-120** for details.

Model number coding

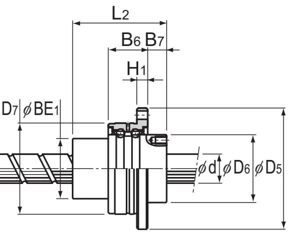
BNS2020A +500L C5

Model number | Overall shaft length (in mm) | Accuracy symbol[1]

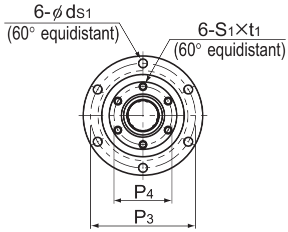
[1] See **A15-12**.



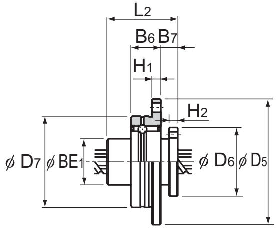
Ball screw unit
(Models BNS 0812A to 4040A)



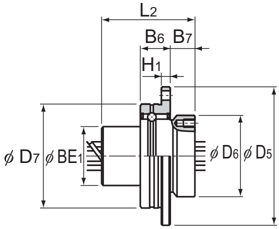
Ball spline
(Models BNS 1616A to 4040A)



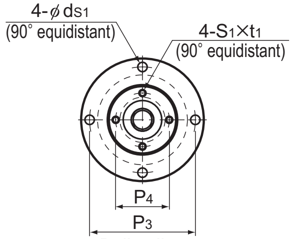
Ball spline
(Models BNS 1616A to 4040A)



Ball spline
(Model BNS 0812A)



Ball spline
(Model BNS 1015A)



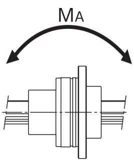
Ball spline
(Models BNS 0812A and 1015A)

Unit: mm

BE	H	B_4	B_5	Te	P_1	P_2	S	t	d_1	Support bearing basic load rating Ca kN	Support bearing basic load rating C_0a kN	Nut inertial moment kg·m²	Screw shaft inertial moment kg·m²/mm	Nut mass kg	Shaft mass kg/m	Permissible rotational speed min^{-1}
19	3	10.5	7	1.5	38	14.5	M2.6	10	3.4	0.8	0.5	3.00×10^{-6}	3.16×10^{-9}	0.08	0.35	3,500
23	3	10.5	8	1.5	42	18	M3	11.5	3.4	0.9	0.7	8.00×10^{-6}	7.71×10^{-9}	0.15	0.52	3,500
32	6	21	10	2	56	25	M4	13.5	4.5	8.7	10.5	3.50×10^{-5}	3.92×10^{-8}	0.31	0.8	4,200
39	6	21	11	2.5	64	31	M5	16.5	4.5	9.7	13.4	8.50×10^{-5}	9.37×10^{-8}	0.54	1.21	3,370
47	7	25	13	3	75	38	M6	20	5.5	12.7	18.2	2.12×10^{-4}	2.20×10^{-7}	0.88	1.79	2,690
58	8	25	14	3	89	48	M6	21	6.6	13.6	22.3	5.42×10^{-4}	5.92×10^{-7}	1.39	2.96	2,100
73	10	33	16.5	3	113	61	M8	24.5	9	21.5	36.8	1.72×10^{-3}	1.43×10^{-6}	3.16	4.51	1,670

Unit: mm

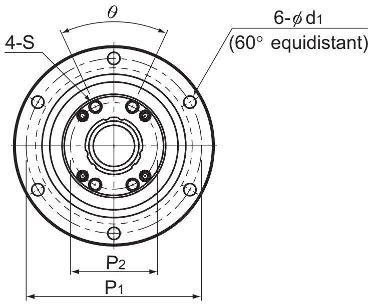
H_1	B_6	B_7	H_2	P_3	P_4	$S_1\times t_1$	ds_1	Support bearing basic load rating C kN	Support bearing basic load rating C_0 kN	Nut inertial moment kg·m²	Nut mass kg
3	10.5	6	3	38	19	M2.6×3	3.4	0.69	0.24	3.00×10^{-6}	0.08
3	10.5	9	—	42	23	M3×4	3.4	0.77	0.3	8.00×10^{-6}	0.13
6	21	10	—	56	30	M4×6	4.5	6.7	6.4	4.40×10^{-5}	0.35
6	21	12	—	64	36	M5×8	4.5	7.4	7.8	9.90×10^{-5}	0.51
7	25	13	—	75	44	M5×8	5.5	9.7	10.6	2.20×10^{-4}	0.79
8	25	17	—	89	54	M6×10	6.6	10.5	12.5	5.17×10^{-4}	1.25
10	33	20	—	113	68	M6×10	9	16.5	20.7	1.61×10^{-3}	2.51



Options⇒A15-355

BNS Heavy Load Type: Linear-Rotary Motion No Preload

DN value	70,000



Ball screw unit

Ball screw unit

Model No.	Screw shaft outer diameter	Screw shaft inner diameter	Lead	Ball screw dimensions							
				Basic load rating		Ball center-to-center diameter	Thread minor diameter	Outer diameter	Flange diameter	Overall length	D_3
	d	db	Ph	Ca kN	C_0a kN	dp	dc	D	D_1	L_1	h7
BNS 1616	16	11	16	3.9	7.2	16.65	13.7	$52^{\;0}_{-0.007}$	68	43.5	40
BNS 2020	20	14	20	6.1	12.3	20.75	17.5	$62^{\;0}_{-0.007}$	78	54	50
BNS 2525	25	18	25	9.1	19.3	26	21.9	$72^{\;0}_{-0.007}$	92	65	58
BNS 3232	32	23	32	13	29.8	33.25	28.3	$80^{\;0}_{-0.007}$	105	80	66
BNS 4040	40	29	40	21.4	49.7	41.75	35.2	$110^{\;0}_{-0.008}$	140	98	90
BNS 5050	50	36	50	31.8	77.6	52.2	44.1	$120^{\;0}_{-0.008}$	156	126	100

Ball spline

Model No.	Ball spline dimensions							
	Basic load rating		Static permissible moment	Basic torque rating		Outer diameter	Flange diameter	Overall length
	C kN	C_0 kN	M_A N·m	C_T N·m	C_{0T} N·m	D_7	D_5	L_2
BNS 1616	7.1	12.6	67.6	31.4	34.3	$52^{\;0}_{-0.007}$	68	50
BNS 2020	10.2	17.8	118	56.8	55.8	$56^{\;0}_{-0.007}$	72	63
BNS 2525	15.2	25.8	210	105	103	$62^{\;0}_{-0.007}$	78	71
BNS 3232	20.5	34	290	180	157	$80^{\;0}_{-0.007}$	105	80
BNS 4040	37.8	60.5	687	418	377	$100^{\;0}_{-0.008}$	130	100
BNS 5050	60.9	94.5	1,340	842	768	$120^{\;0}_{-0.008}$	156	125

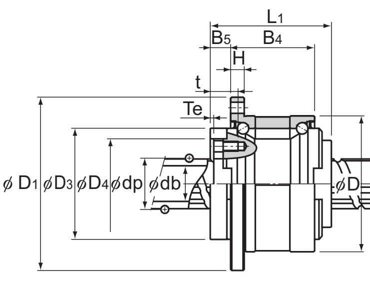
[1] Dimension U indicates the length from the head of the hexagonal-socket-head type bolt to the ball screw nut end.
Notes: For K hollow shaft, please refer to the db dimension for the inner bore diameter of the shaft.
A solid shaft is also available upon request. See “Ball Spline” **A3-120** for details.

Model number coding

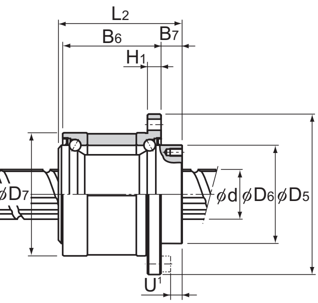
BNS2525 +600L C5

Model number — Overall shaft length (in mm) — Accuracy symbol[1]

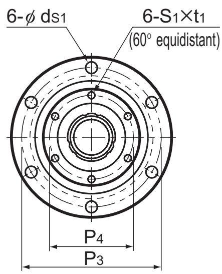
[1] See **A15-12**.



Ball screw unit



Ball spline



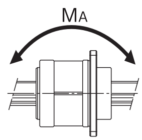
Ball spline

Unit: mm

												Support bearing basic load rating		Nut inertial moment	Screw shaft inertial moment	Nut mass	Shaft mass	Permissible rotational speed
	D_4 H7	H	B_4	B_5	Te	P_1	P_2	S	t	d_1	θ°	Ca kN	C_0a kN	kg·m²	kg·m²/mm	kg	kg/m	min^{-1}
	32	5	27.5	9	2	60	25	M4	12	4.5	40	19.4	19.2	4.80×10^{-5}	3.92×10^{-8}	0.38	0.8	4,200
	39	6	34	11	2	70	31	M5	16	4.5	40	26.8	29.3	1.44×10^{-4}	9.37×10^{-8}	0.68	1.21	3,370
	47	8	43	12.5	3	81	38	M6	19	5.5	40	28.2	33.3	3.23×10^{-4}	2.20×10^{-7}	1.1	1.79	2,690
	58	9	55	14	3	91	48	M6	19	6.6	40	30	39	6.74×10^{-4}	5.92×10^{-7}	1.74	2.96	2,100
	73	11	68	16.5	3	123	61	M8	22	9	50	59.3	74.1	2.79×10^{-3}	1.43×10^{-6}	3.95	4.51	1,670
	90	12	80	25	4	136	75	M10	28	11	50	62.2	83	5.82×10^{-3}	3.52×10^{-6}	6.22	7.16	1,340

Unit: mm

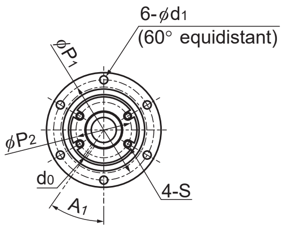
										Support bearing basic load rating		Nut inertial moment	Nut mass
	D_6 h7	H_1	B_6	B_7	P_3	P_4	$S_1\times t_1$	ds_1	U^1	C kN	C_0 kN	kg·m²	kg
	39.5	5	37	10	60	32	M5×8	4.5	5	12.7	11.8	5.20×10^{-5}	0.51
	43.5	6	48	12	64	36	M5×8	4.5	7	16.3	15.5	8.70×10^{-5}	0.7
	53	6	55	13	70	45	M6×8	4.5	8	17.6	18	1.72×10^{-4}	0.93
	65.5	9	60	17	91	55	M6×10	6.6	10	20.1	24	5.61×10^{-4}	1.8
	79.5	11	74	23	113	68	M6×10	9	13	37.2	42.5	1.47×10^{-3}	3.9
	99.5	12	97	25	136	85	M10×15	11	13	41.7	54.1	6.25×10^{-3}	6.7



Options⇒A15-355

NS-V Low-Inertia Type: Linear Motion No Preload

DN value	100,000



Ball screw unit

Ball screw unit

Model No.	Screw shaft outer diameter	Screw shaft inner diameter	Lead	Ball screw dimensions										
				Basic load rating		Ball center-to-center diameter	Thread minor diameter	Outer diameter	Flange diameter	Overall length				
				C_a	C_{0a}			D			D_3			
	d	db	Ph	kN	kN	dp	dc	g6	D_1	L_1	h7	AE	BE	H
NS 1616V	16	11	16	4.6	6.8	16.65	13.7	42	54	38	32.5	31	31	4
NS 2020V	20	14	20	7.3	11.7	20.75	17.5	48	64	45	39.5	37	36	6
NS 2525V	25	18	25	8	14.4	25.35	22.1	56	72	55	43.5	42	41.6	6

Ball spline

Model No.	Ball spline dimensions						
	Basic load rating		Static permissible moment	Basic torque rating		Outer diameter	Flange diameter
	C	C_0	M_A	C_T	C_{0T}	D_7	D_5
	kN	kN	N·m	N·m	N·m		
NS 1616V	8.4	13.4	77.4	42.9	68.6	28 $^{0}_{-0.013}$	48
NS 2020V	10.5	18.6	144	66.4	117.2	32 $^{0}_{-0.016}$	54
NS 2525V	15.9	26.2	230	125.3	207	40 $^{0}_{-0.016}$	62

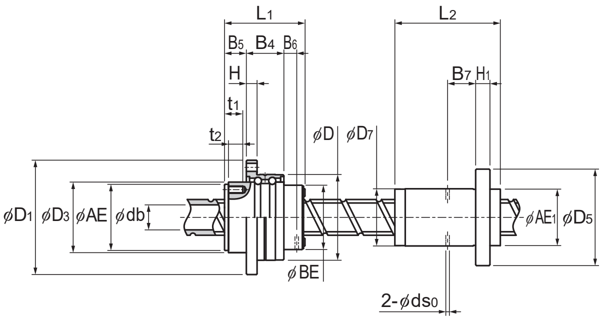
Notes: For K hollow shaft, please refer to the db dimension for the inner bore diameter of the shaft.
A solid shaft is also available upon request. See "Ball Spline" **A3-120** for details.

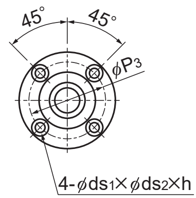
Model number coding

NS2020V +500L C5

Model number — Overall shaft length (in mm) — Accuracy symbol[1]

[1] See **A15-12**.





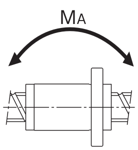
Ball spline

Unit: mm

												Support bearing basic load rating		Nut inertial moment	Screw shaft inertial moment	Nut mass	Shaft mass	Permissible rotational speed
												Ca	C_0a					
	B_4	B_5	P_1	P_2	S	t_1	t_2	d_1	B_6	d_0	A_1	kN	kN	$kg \cdot m^2$	$kg \cdot m^2/mm$	kg	kg/m	min^{-1}
	18	9.7	48	25.5	M3	8.2	6	3.4	5.8	2	35°	6.7	8.6	2.00×10^{-5}	3.21×10^{-8}	0.21	0.8	5,000
	21	12.2	56	31	M4	10.2	8	4.5	7.2	2	35°	7.3	10.6	6.50×10^{-5}	8.04×10^{-8}	0.39	1.21	4,810
	21	13.2	64	36	M5	10.2	8	4.5	15.3	3	35°	9.7	13.4	1.02×10^{-4}	1.91×10^{-7}	0.51	1.79	3,940

Unit: mm

	Overall length					Mounting hole			Nut mass
	L_2	H_1	B_7	ds_0	P_3	ds_1	ds_2	h	kg
	46.4	6	11.7	2	38	4.5	8	4.4	0.13
	59	8	15.7	2	43	5.5	9.5	5.4	0.21
	67	8	18.3	3	51	5.5	9.5	5.4	0.34

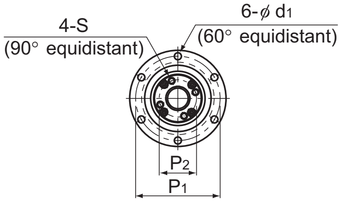


Ball Screw

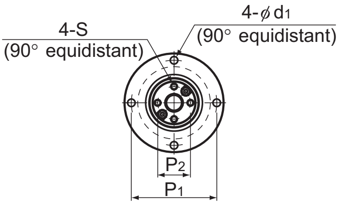
Options⇒A15-355

NS-A Compact Type: Linear Motion No Preload

DN value	70,000



Ball screw unit (Models NS 1616A to 4040A)



Ball screw unit (Models NS 0812A and 1015A)

Ball screw unit

Model No.	Screw shaft outer diameter	Screw shaft inner diameter	Lead	Ball screw dimensions								
				Basic load rating		Ball center-to-center diameter	Thread minor diameter	Outer diameter	Flange diameter	Overall length	D_3	D_4
				Ca	C_0a			D				
	d	db	Ph	kN	kN	dp	dc	g6	D_1	L_1	h7	H7
NS 0812A	8	—	12	1.1	1.8	8.4	6.6	32	44	28.5	22	19
NS 1015A	10	—	15	1.7	2.7	10.5	8.3	36	48	34.5	26	23
NS 1616A	16	11	16	3.9	7.2	16.65	13.7	48	64	40	36	32
NS 2020A	20	14	20	6.1	12.3	20.75	17.5	56	72	48	43.5	39
NS 2525A	25	18	25	9.1	19.3	26	21.9	66	86	58	52	47
NS 3232A	32	23	32	13	29.8	33.25	28.3	78	103	72	63	58
NS 4040A	40	29	40	21.4	49.7	41.75	35.2	100	130	88	79.5	73

Ball spline

Model No.	Ball spline dimensions						
	Basic load rating		Static permissible moment	Basic torque rating		Outer diameter	Flange diameter
	C	C_0	M_A	C_T	C_{0T}		
	kN	kN	N·m	N·m	N·m	D_7	D_5 $^{0}_{-0.2}$
NS 0812A	1.5	2.6	5.9	2	2.9	16 $^{0}_{-0.011}$	32
NS 1015A	2.8	4.9	15.7	3.9	7.8	21 $^{0}_{-0.013}$	42
NS 1616A	7.1	12.6	67.6	31.4	34.3	31 $^{0}_{-0.013}$	51
NS 2020A	10.2	17.8	118	56.8	55.8	35 $^{0}_{-0.016}$	58
NS 2525A	15.2	25.8	210	105	103	42 $^{0}_{-0.016}$	65
NS 3232A	20.5	34	290	180	157	49 $^{0}_{-0.016}$	77
NS 4040A	37.8	60.5	687	418	377	64 $^{0}_{-0.019}$	100

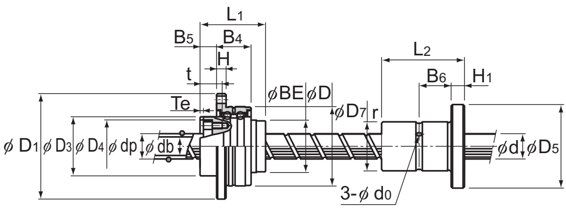
Notes: For K hollow shaft, please refer to the db dimension for the inner bore diameter of the shaft.
A solid shaft is also available upon request. See “Ball Spline” A3-120 for details.

Model number coding

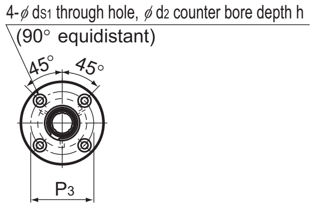
NS2020A +500L C5

Model number / Overall shaft length (in mm) / Accuracy symbol[1]

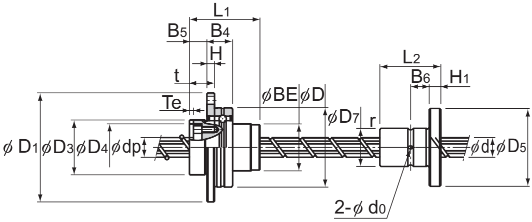
[1] See A15-12.



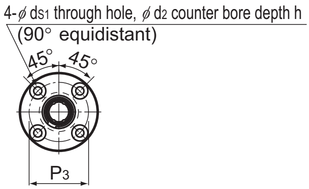
Ball screw unit (Models NS 1616A to 4040A)   Ball spline (Models NS 1616A to 4040A)



Ball spline (Models NS 1616A to 4040A)



Ball screw unit (Models NS 0812A and 1015A)   Ball spline (Models NS 0812A and 1015A)



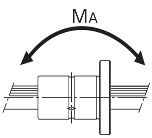
Ball spline (Models NS 0812A and 1015A)

Unit: mm

											Support bearing basic load rating		Nut inertial moment	Screw shaft inertial moment	Nut mass	Shaft mass	Permissible rotational speed
											Ca	C0a					
	BE	H	B4	B5	Te	P1	P2	S	t	d1	kN	kN	kg·m²	kg·m²/mm	kg	kg/m	min⁻¹
	19	3	10.5	7	1.5	38	14.5	M2.6	10	3.4	0.8	0.5	3.00×10^{-6}	3.16×10^{-9}	0.08	0.35	3,500
	23	3	10.5	8	1.5	42	18	M3	11.5	3.4	0.9	0.7	8.00×10^{-6}	7.71×10^{-9}	0.15	0.52	3,500
	32	6	21	10	2	56	25	M4	13.5	4.5	8.7	10.5	3.50×10^{-5}	3.92×10^{-8}	0.31	0.8	4,200
	39	6	21	11	2.5	64	31	M5	16.5	4.5	9.7	13.4	8.50×10^{-5}	9.37×10^{-8}	0.54	1.21	3,370
	47	7	25	13	3	75	38	M6	20	5.5	12.7	18.2	2.12×10^{-4}	2.20×10^{-7}	0.88	1.79	2,690
	58	8	25	14	3	89	48	M6	21	6.6	13.6	22.3	5.42×10^{-4}	5.92×10^{-7}	1.39	2.96	2,100
	73	10	33	16.5	3	113	61	M8	24.5	9	21.5	36.8	1.72×10^{-3}	1.43×10^{-6}	3.16	4.51	1,670

Unit: mm

	Overall length				Lubrication hole		Mounting hole			Nut mass
	L_2	H_1	B_6	r	d_0	P_3	ds_1	d_2	h	kg
	25	5	7.5	0.5	1.5	24	3.4	6.5	3.3	0.04
	33	6	10.5	0.5	1.5	32	4.5	8	4.4	0.09
	$50^{\ 0}_{-0.2}$	7	18	0.5	2	40	4.5	8	4.4	0.23
	$63^{\ 0}_{-0.2}$	9	22.5	0.5	2	45	5.5	9.5	5.4	0.33
	$71^{\ 0}_{-0.3}$	9	26.5	0.5	3	52	5.5	9.5	5.4	0.45
	$80^{\ 0}_{-0.3}$	10	30	0.5	3	62	6.6	11	6.5	0.58
	$100^{\ 0}_{-0.3}$	14	36	0.5	4	82	9	14	8.6	1.46

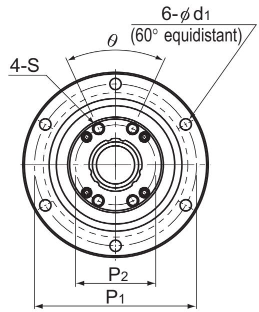


Ball Screw

Options⇒A15-355

NS Heavy Load Type: Linear Motion No Preload

DN value	70,000



Ball screw unit

Ball screw unit

Model No.	Screw shaft outer diameter d	Screw shaft inner diameter db	Lead Ph	Ball screw dimensions							
				Basic load rating		Ball center-to-center diameter	Thread minor diameter	Outer diameter	Flange diameter	Overall length	
				Ca kN	C_0a kN	dp	dc	D	D_1	L_1	D_3 h7
NS 1616	16	11	16	3.9	7.2	16.65	13.7	52 $^{0}_{-0.007}$	68	43.5	40
NS 2020	20	14	20	6.1	12.3	20.75	17.5	62 $^{0}_{-0.007}$	78	54	50
NS 2525	25	18	25	9.1	19.3	26	21.9	72 $^{0}_{-0.007}$	92	65	58
NS 3232	32	23	32	13	29.8	33.25	28.3	80 $^{0}_{-0.007}$	105	80	66
NS 4040	40	29	40	21.4	49.7	41.75	35.2	110 $^{0}_{-0.008}$	140	98	90
NS 5050	50	36	50	31.8	77.6	52.2	44.1	120 $^{0}_{-0.008}$	156	126	100

Ball spline

Model No.	Ball spline dimensions					
	Basic load rating		Static permissible moment	Basic torque rating		Outer diameter
	C kN	C_0 kN	M_A N·m	C_T N·m	C_{0T} N·m	D_7
NS 1616	7.1	12.6	67.6	31.4	34.3	31 $^{0}_{-0.013}$
NS 2020	10.2	17.8	118	56.9	55.9	35 $^{0}_{-0.016}$
NS 2525	15.2	25.8	210	105	103	42 $^{0}_{-0.016}$
NS 3232	20.5	34	290	180	157	49 $^{0}_{-0.016}$
NS 4040	37.8	60.5	687	419	377	64 $^{0}_{-0.019}$
NS 5050	60.9	94.5	1,340	842	769	80 $^{0}_{-0.019}$

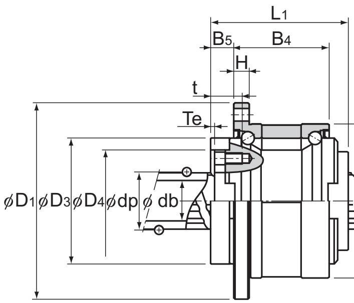
Notes: For K hollow shaft, please refer to the db dimension for the inner bore diameter of the shaft.
A solid shaft is also available upon request. See "Ball Spline" A**3-120** for details.

Model number coding

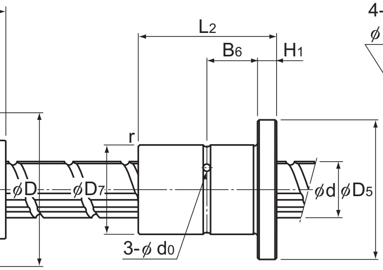
NS2525 +600L C5

Model number — Overall shaft length (in mm) — Accuracy symbol[1]

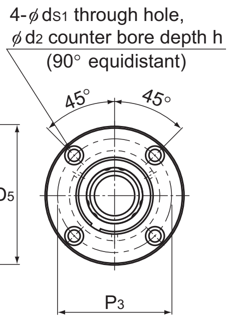
[1] See A**15-12**.



Ball screw unit



Ball spline



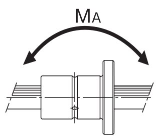
Ball spline

Unit: mm

	D_4 H7	H	B_4	B_5	Te	P_1	P_2	S	t	d_1	θ°	Support bearing basic load rating Ca kN	C_0a kN	Nut inertial moment kg·m²	Screw shaft inertial moment kg·m²/mm	Nut mass kg	Shaft mass kg/m	Permissible rotational speed min^{-1}
	32	5	27.5	9	2	60	25	M4	12	4.5	40	19.4	19.2	4.80×10^{-5}	3.92×10^{-8}	0.38	0.8	4,200
	39	6	34	11	2	70	31	M5	16	4.5	40	26.8	29.3	1.44×10^{-4}	9.37×10^{-8}	0.68	1.21	3,370
	47	8	43	12.5	3	81	38	M6	19	5.5	40	28.2	33.3	3.23×10^{-4}	2.20×10^{-7}	1.1	1.79	2,690
	58	9	55	14	3	91	48	M6	19	6.6	40	30	39	6.74×10^{-4}	5.92×10^{-7}	1.74	2.96	2,100
	73	11	68	16.5	3	123	61	M8	22	9	50	59.3	74.1	2.79×10^{-3}	1.43×10^{-6}	3.95	4.51	1,670
	90	12	80	25	4	136	75	M10	28	11	50	62.2	83	5.82×10^{-3}	3.52×10^{-6}	6.22	7.16	1,340

Unit: mm

	Flange diameter D_5	Overall length L_2	H_1	B_6	r	Lubrication hole d_0	P_3	Mounting hole ds_1	Mounting hole d_2	Mounting hole h	Nut mass kg
	51	$50^{\ 0}_{-0.2}$	7	18	0.5	2	40	4.5	8	4.4	0.23
	58	$63^{\ 0}_{-0.2}$	9	22.5	0.5	2	45	5.5	9.5	5.4	0.33
	65	$71^{\ 0}_{-0.3}$	9	26.5	0.5	3	52	5.5	9.5	5.4	0.45
	77	$80^{\ 0}_{-0.3}$	10	30	0.5	3	62	6.6	11	6.5	0.58
	100	$100^{\ 0}_{-0.3}$	14	36	0.5	4	82	9	14	8.6	1.46
	124	$125^{\ 0}_{-0.3}$	16	46.5	1	4	102	11	17.5	11	2.76



Options⇒A15-355

Ball Screw/Spline Permissible Rotational Speeds

The permissible rotational speed of the ball screw/spline is limited by the lower of the critical speed of the ball screw, the DN value, or the permissible speed of the support bearing. Do not exceed the permissible rotational speed when operating.

Table 1: Permissible Rotational Speed for Model BNS-V

Unit: min^{-1}

Model No.	Ball screw		Support bearing			
			Ball screw		Ball spline	
	Calculated from shaft length	Calculated from DN value	Grease lubrication	Oil lubrication	Grease lubrication	Oil lubrication
BNS1616V	see A**15-32**.	5,000	4,400	6,100	4,400	6,100
BNS2020V		4,810	3,900	5,100	4,000	5,400
BNS2525V		3,940	3,500	4,700	3,500	4,700

Table 2: Permissible Rotational Speed for Model BNS-A

Unit: min^{-1}

Model No.	Ball screw		Support bearing			
			Ball screw		Ball spline	
	Calculated from shaft length	Calculated from DN value	Grease lubrication	Oil lubrication	Grease lubrication	Oil lubrication
BNS0812A	see A**15-32**.	3,500	—	—	6,900	9,300
BNS1015A		3,500	—	—	5,900	7,900
BNS1616A		4,200	4,000	5,400	4,000	5,400
BNS2020A		3,370	3,500	4,700	3,500	4,700
BNS2525A		2,690	2,900	3,900	2,900	3,900
BNS3232A		2,100	2,400	3,300	2,400	3,300
BNS4040A		1,670	1,900	2,600	1,900	2,600

Table 3: Permissible Rotational Speed for Model BNS

Unit: min^{-1}

Model No.	Ball screw		Support bearing			
			Ball screw		Ball spline	
	Calculated from shaft length	Calculated from DN value	Grease lubrication	Oil lubrication	Grease lubrication	Oil lubrication
BNS1616	see A**15-32**.	4,200	4,000	5,600	4,000	5,400
BNS2020		3,370	3,200	4,300	3,600	4,900
BNS2525		2,690	2,800	3,700	3,200	4,300
BNS3232		2,100	2,400	3,300	2,400	3,300
BNS4040		1,670	1,800	2,400	2,000	2,700
BNS5050		1,340	1,600	2,200	1,600	2,200

Table 4: Permissible Rotational Speed for Model NS-V

Unit: min^{-1}

Model No.	Ball screw		Support bearing	
			Ball screw	
	Calculated from shaft length	Calculated from DN value	Grease lubrication	Oil lubrication
NS1616V	see A**15-32**.	5,000	4,400	6,100
NS2020V		4,810	3,900	5,100
NS2525V		3,940	3,500	4,700

Table 5: Permissible Rotational Speed for Model NS-A

Unit: min^{-1}

Model No.	Ball screw		Support bearing	
			Ball screw	
	Calculated from shaft length	Calculated from DN value	Grease lubrication	Oil lubrication
NS0812A	see A**15-32**.	3,500	—	—
NS1015A		3,500	—	—
NS1616A		4,200	4,000	5,400
NS2020A		3,370	3,500	4,700
NS2525A		2,690	2,900	3,900
NS3232A		2,100	2,400	3,300
NS4040A		1,670	1,900	2,600

Table 6: Permissible Rotational Speed for Model NS

Unit: min^{-1}

Model No.	Ball screw		Support bearing	
			Ball screw	
	Calculated from shaft length	Calculated from DN value	Grease lubrication	Oil lubrication
NS1616	see A**15-32**.	4,200	4,000	5,600
NS2020		3,370	3,200	4,300
NS2525		2,690	2,800	3,700
NS3232		2,100	2,400	3,300
NS4040		1,670	1,800	2,400
NS5050		1,340	1,600	2,200

Maximum Manufacturing Lengths of Screw Shafts

Table 1, Table 2, and Table 3 show the maximum manufacturing lengths of precision ball screws by accuracy grade. Table 5, Table 6, Table 7, and Table 8 show the maximum manufacturing lengths of rolled ball screws by accuracy grade.

Table 1: Maximum Manufacturing Lengths of Precision Ball Screws 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	1,100
16	620	730	900	1,050	1,100	1,400
18	720	840	1,050	1,220	1,350	1,600
20	820	950	1,200	1,400	1,600	1,800
25	1,100	1,400	1,600	1,800	2,000	2,400
28	1,300	1,600	1,900	2,100	2,350	2,700
30	1,450	1,700	2,050	2,300	2,570	2,950
32	1,600	1,800	2,200	2,500	2,800	3,200
36	2,000	2,100	2,550	2,950	3,250	3,650
40	2,000	2,400	2,900	3,400	3,700	4,300
45	2,000	2,750	3,350	3,950	4,350	5,050
50	2,000	3,100	3,800	4,500	5,000	5,800
55	2,000	3,450	4,150	5,300	6,050	6,500
63	2,000	4,000	5,200	5,800	6,700	7,700
70	2,000	4,000	6,300	6,450	7,650	9,000
80	2,000	4,000	6,300	7,900	9,000	11,000
100	2,000	4,000	6,300	11,000	11,000	11,000

Notes: For ball screw models HBN-V, HBN-K, HBN-KA, HBN, and SBKH, the standard maximum length of the screw shaft is 3,000 mm.
For lengths greater than this, please contact THK.

Table 2: Maximum Manufacturing Lengths of Precision Ball Screws (Model MBF without Preload) by Model Number

Unit: mm

Screw shaft outer diameter	C0	C1	C2	C3	C5	C7
MBF0401-3.7	90	110	120	120	120	120
MBF0601-3.7	150	170	210	210	210	210
MBF0602-2.7	140	160	—	230	280	290
MBF0602.5-2.7	140	160	—	230	280	290
MBF0801.5-3.7	200	250	—	330	350	350
MBF0802-3.7	230	270	340	340	340	340
MBF0802.5-3.7	200	200	—	320	320	320
MBF0803-2.7	200	200	—	320	320	320
MBF0804-2.7	200	200	—	320	320	320
MBF1001-3.7	260	260	—	460	460	460
MBF1001.5-3.7	260	260	—	460	460	460
MBF1002-3.7	350	400	500	500	500	500
MBF1002.5-3.7	260	260	—	380	420	500
MBF1003-3.7	260	260	—	380	420	500
MBF1005-2.7	260	260	—	380	420	500
MBF1202-3.7	440	500	630	680	680	680
MBF1202.5-3.7	320	350	—	510	510	510
MBF1203-3.7	320	450	—	600	620	680
MBF1204-3.7	320	450	—	600	620	680
MBF1402-3.7	530	620	770	870	890	890
MBF1404-3.7	530	620	770	870	890	890

Table 3: Maximum Manufacturing Lengths of Precision Ball Screws (Model BLK without Preload) by Model Number

Unit: mm

Screw shaft outer diameter	C0	C1	C2	C3	C5	C7
BLK0808-3.2[1]	—	—	—	300	410	410
BLK1510-5.6	570	670	830	950	980	1,100
BLK1616-2.8	620	730	900	1,050	1,100	1,400
BLK1616-3.6	620	730	900	1,050	1,100	1,400
BLK2020-2.8	820	950	1,200	1,400	1,600	1,800
BLK2020-3.6	820	950	1,200	1,400	1,600	1,800
BLK2525-2.8	1,100	1,400	1,600	1,800	2,000	2,400
BLK2525-3.6	1,100	1,400	1,600	1,800	2,000	2,400
BLK3232-2.8	1,600	1,800	2,200	2,500	2,800	3,200
BLK3232-3.6	1,600	1,800	2,200	2,500	2,800	3,200
BLK3620-5.6	2,000	2,100	2,550	2,950	3,250	3,650
BLK3624-5.6	2,000	2,100	2,550	2,950	3,250	3,650
BLK3636-2.8	2,000	2,100	2,550	2,950	3,250	3,650
BLK3636-3.6	2,000	2,100	2,550	2,950	3,250	3,650
BLK4040-2.8	2,000	2,400	2,900	3,400	3,700	4,300
BLK4040-3.6	2,000	2,400	2,900	3,400	3,700	4,300
BLK5050-2.8	2,000	3,100	3,800	4,500	5,000	5,800
BLK5050-3.6	2,000	3,100	3,800	4,500	5,000	5,800

[1] BLK0808-3.2 is only compatible with accuracy grades C3, C5, and C7. Contact THK if you would like to use accuracy grades C0 or C1.

Table 4: Maximum Manufacturing Lengths of Precision Ball Screws (ISO Standard-Compliant Ball Screws)

Unit: mm

Shaft diameter	Ground shaft			CES shaft			
	C3	C5	C7	Cp3	Cp5	Ct5	Ct7
16	1,050	1,100	1,400	1,050	1,100	1,100	1,400
20	1,400	1,600	1,800	1,400	1,600	1,600	1,800
25	1,800	2,000	2,400	1,800	2,000	2,000	2,400
32	2,500	2,800	3,200	2,500	2,800	2,800	3,200
40	3,400	3,700	4,300	3,400	3,700	3,700	4,300
50	4,500	5,000	5,800	—	—	—	—
63	5,800	6,700	7,700	—	—	—	—

Table 5: Maximum Manufacturing Lengths of Rolled Ball Screws 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	1,000	—
14 to 15	1,500	1,500	1,500
16 to 18	1,500	1,800	1,800
20	2,000	2,200	2,200
25	2,000	3,000	3,000
28	3,000	3,000	3,000
30	3,000	3,000	4,000
32 to 36	3,000	4,000	4,000
40	3,000	5,000	5,000
45	3,000	5,500	5,500
50	3,000	6,000	6,000

Table 6: Maximum Manufacturing Lengths of Rolled Ball Screws (Model JPF with Preload) by Model Number

Unit: mm

Model	Overall screw shaft length
JPF1404-4	1,000
JPF1405-4	
JPF1605-4	
JPF2005-6	2,000
JPF2505-6	
JPF2510-4	
JPF2805-6	
JPF2806-6	3,000
JPF3210-6	
JPF3610-6	
JPF4010-6	

Table 7: Maximum Manufacturing Lengths of Rolled Ball Screws (Model MTF with Preload) by Model Number

Unit: mm

Screw shaft outer diameter	C7	C8	C10
MTF0601-3.7	320	320	—
MTF0801-3.7	320	—	450
MTF0802-3.7	320	320	—
MTF0805-2.7	320	—	450
MTF1002-3.7	500	1,000	—
MTF1004-2.7	500	—	650
MTF1202-3.7	500	1,000	—
MTF1402-3.7	700	—	700

Table 8: Maximum Manufacturing Lengths of Rolled Ball Screws (Model BLK with Preload) by Model Number

Unit: mm

Screw shaft outer diameter	C7	C8	C10
BLK0808-3.2	320	—	450
BLK1010-3.2	500	—	650
BLK1510-5.6	1,500	1,500	1,500
BLK1616-3.6	1,500	1,800	1,800
BLK1616-7.2	1,500	1,800	1,800
BLK2020-3.6	2,000	2,200	2,200
BLK2020-7.2	2,000	2,200	2,200
BLK2525-3.6	2,000	3,000	3,000
BLK2525-7.2	2,000	3,000	3,000
BLK3232-3.6	3,000	4,000	4,000
BLK3232-7.2	3,000	4,000	4,000
BLK3620-5.6	3,000	4,000	4,000
BLK3624-5.6	3,000	4,000	4,000
BLK3636-3.6	3,000	4,000	4,000
BLK3636-7.2	3,000	4,000	4,000
BLK4040-3.6	3,000	5,000	5,000
BLK4040-7.2	3,000	5,000	5,000
BLK5050-3.6	3,000	6,000	6,000
BLK5050-7.2	3,000	6,000	6,000

Ball Screw

Options

Contaminaton Protection

If foreign materials enter the ball screw, they may lead to abnormal wear and ball jamming, which could shorten the life of the product. Therefore, it is necessary to prevent foreign material from entering the product. If it is likely that foreign materials will get inside, it is important to select an effective contamination protection device suited to the conditions in which it will be used.

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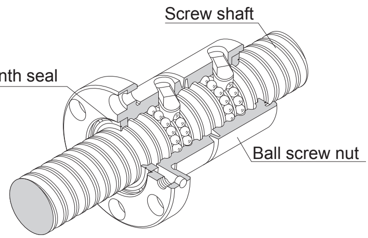
(Precision ball screw)
(Rolled Ball Screw Model JPF)
Symbol: RR</td>
<td>

A15-358</td>
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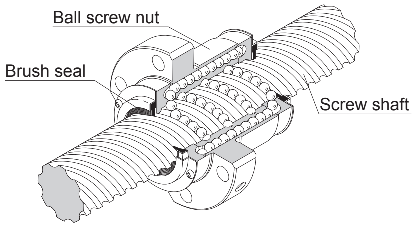
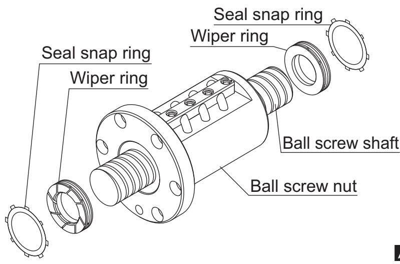
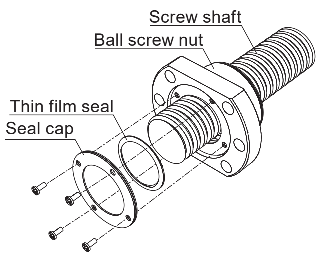
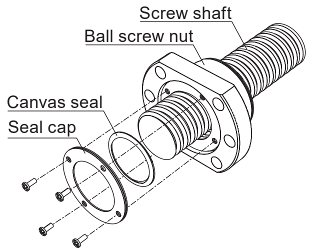
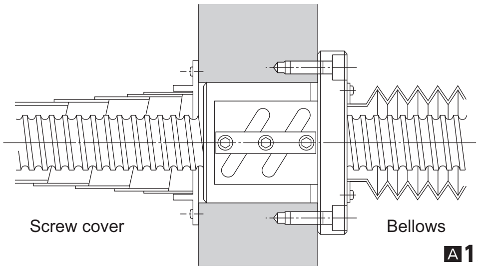
<tr>
<td>Brush seal
(Rolled ball screws)
Symbol: ZZ</td>
<td>

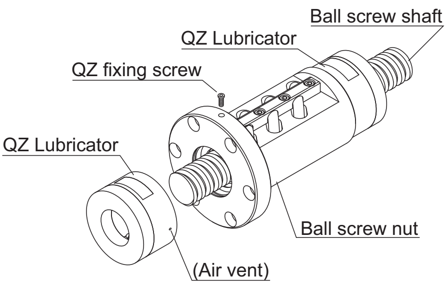
A15-358</td>
</tr>
<tr>
<td>Wiper ring
Symbol: WW</td>
<td>

A15-359～</td>
</tr>
<tr>
<td>Thin film seal
(SDAN-V, SDA-V only)
Symbol: TT</td>
<td>
</td>
</tr>
</table>

Canvas seal (SDAN-V, SDA-V, HBN-V only) Symbol: CC	 A15-361～
Dust cover Bellows Screw cover	 A15-363

Lubrication

To maximize the performance of the ball screw, it is necessary to select a lubricant and a lubrication method suited to the operating conditions.
For types of lubricants, characteristics of lubricants and lubrication methods, see the section on “Lubrication Accessories” on **A24-2**.
Also, the QZ Lubricator is available as an optional accessory that significantly increases the maintenance interval.



QZ Lubricator

A15-364～

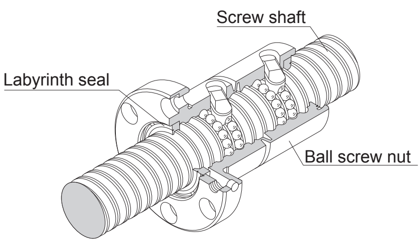
Corrosion Resistance (Surface Treatment, etc.)

Depending on the service environment, a ball screw may require corrosion resistance treatment or a different material. For details about corrosion resistance treatment and material changes, contact THK. (see **B0-18**)

Contamination Protection Seal for Ball Screws

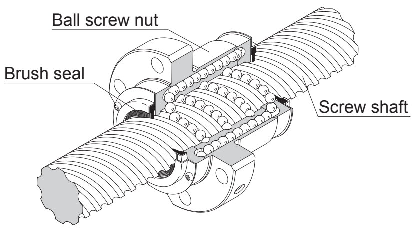
If the ball screw is used in an atmosphere free from foreign material but with suspended dust, a labyrinth seal (with symbol RR) and a brush seal (with symbol ZZ) can be used as contamination protection accessories.
The labyrinth seal is designed to maintain a slight clearance between the seal and the screw shaft raceway so that torque does not develop and no heat is generated, though its effect in contamination protection is limited.
With ball screws other than large lead and super lead types, there is no difference in nut dimensions between those with and without a seal.

Labyrinth seal
Symbol: RR (Precision ball screw)
(Rolled Ball Screw Model JPF)



Labyrinth seal

Brush seal
Symbol: ZZ (Rolled ball screw)

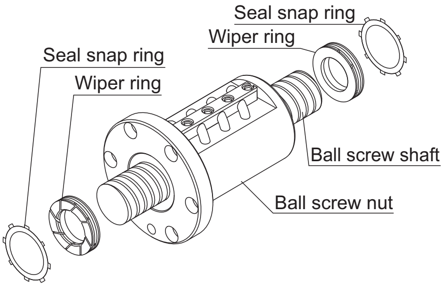


Brush seal

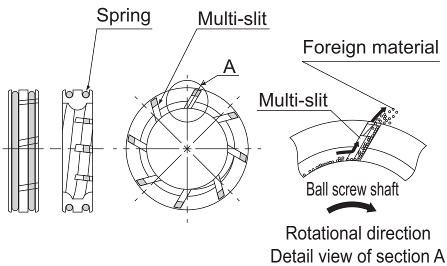
Wiper Ring W

●For the supported models and the ball screw nut dimension with wiper ring W attached, see A15-366 to A15-375.

Wiper ring W is made from special resin with superior wear resistance. It makes elastic contact with the outer diameter of the ball screw shaft and the groove and prevents foreign impurities from entering the ball screw nut by redirecting contaminants through eight slits.



External View

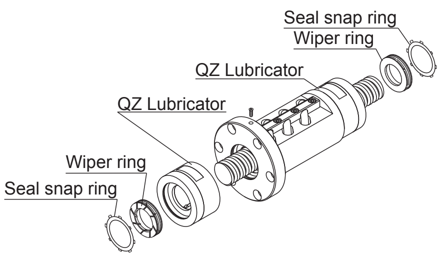


Structural Drawing

Features

- A total of eight slits on the circumference remove foreign materials in succession, and prevent entrance of foreign material.
- The wiper ring is in contact with the ball screw shaft, so it prevents the discharge of grease.
- Heat generation is minimized because a spring is used to keep the wiper ring in contact with the ball screw shaft at a constant pressure level.
- Wiper ring W is made from a material with superior wear and chemical resistance, allowing extended use without a decrease in performance.

It can be attached together with a QZ Lubricator.
For the supported models and the ball screw nut dimensions after wiper ring W is attached, see **A15-366**.



QZ Lubricator + Wiper ring

Model number coding

BIF2505V-5 QZ WW G0 +1000L C5

QZ: With QZ Lubricator
WW: With wiper ring W

Note: See **A15-366**.

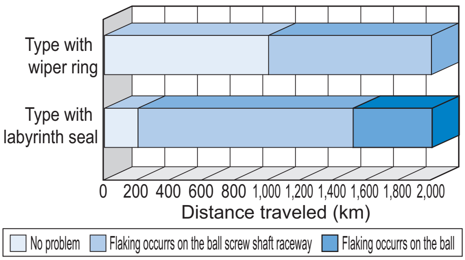
Ball Screw (Options)

● Test in an environment with foreign material

Test conditions

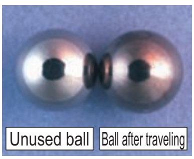
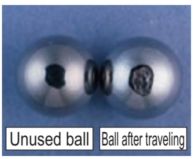
Item	Description
Model No.	BIF3210V–5G0+1500LC5
Maximum rotational speed	1,000 min^{-1}
Maximum speed	10 m/min
Maximum circumferential speed	1.8 m/s
Time constant	60 ms
Dowel	1 s
Stroke	900 mm
Load (through preload only)	1.31 kN
Grease	THK AFG Grease 8 cm^3 (Initial lubrication to the ball screw nut only.)
Foundry dust	FCD400 average particle diameter: 250 μm
Volume of foreign material per shaft	5 g/h

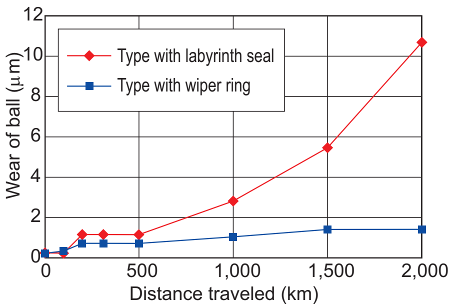
Test result



- Type with wiper ring
  Slight flaking occurred in the ball screw shaft at a travel distance of 1,000 km.
- Type with labyrinth seal
  Flaking occurred throughout the circumference of the screw shaft raceway at a travel distance of 200 km.
  Flaking occurred on the balls after traveling 1,500 km.

Change in the ball after traveling 2,000 km

(1) Type with wiper ring	(2) Type with labyrinth seal
	
●Discolored, but no breakage	●Flaking occurs



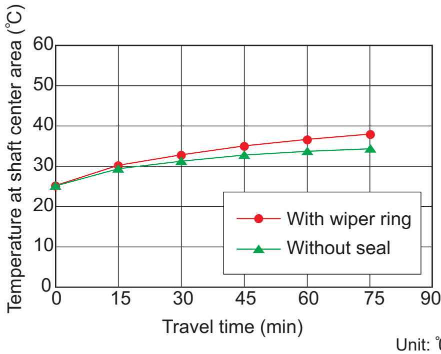
- Type with wiper ring
  Wear of balls at a travel distance of 2,000 km: 1.4 μm.
- Type with labyrinth seal
  Starts to be worn rapidly after 500 km, and the ball wear amount at the travel distance of 2,000 km: 11 μm.

● Heat Generation Test

Test conditions

Item	Description
Model No.	BLK3232-3.6G0+1426LC5
Maximum rotational speed	1,000 min^{-1}
Maximum speed	32 m/min
Maximum circumferential speed	1.7 m/s
Time constant	100 ms
Stroke	1,000 mm
Load (through preload only)	0.98 kN
Grease	THK AFG Grease 5 cm^3 (contained in the ball screw nut)

Test result



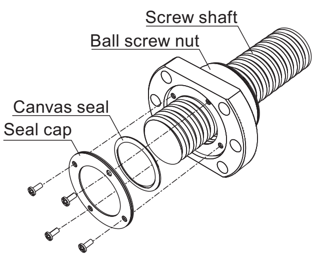
Unit: ℃

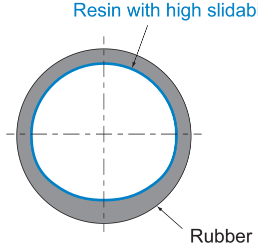
Item	With wiper ring	Without seal
Heat generation temperature	37.1	34.5
Temperature rise	12.2	8.9

Canvas Seal CC

●See A15-376 for compatible models and ball screw nut dimensions after canvas seal installation.

Canvas seals are made from resin with high slidability and superior wear resistance. They prevent foreign material from entering the nut through elastic contact with the outer diameter of the ball screw shaft and the groove.





Features

- The seal is in contact with the ball screw shaft, so it prevents the intrusion of foreign material and reduces the discharge of grease.
- Heat generation is minimized by the rubber base and highly slidable resin in the part that slides along the shaft despite the seal coming in contact with the shaft.

Model number coding

SDA2505V-3 CC G0 +1000L C5

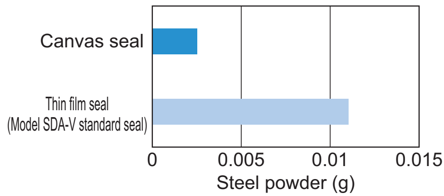
CC: With canvas seal

● Foreign material test

Test conditions

Item	Description
Test pieces	Precision ball screw ϕ40
Maximum rotational speed	100 min^{-1}
Maximum speed	3 m/min
Stroke	800 mm
Load (through preload only)	2.25 kN
Grease	THK AFJ Grease 12 cm^3 (contained in the ball screw nut)
Applied test material	Steel powder and grease mixture Powder-to-grease ratio = 1:2
Test material amount	0.1 g
Run time	1 h

Test result

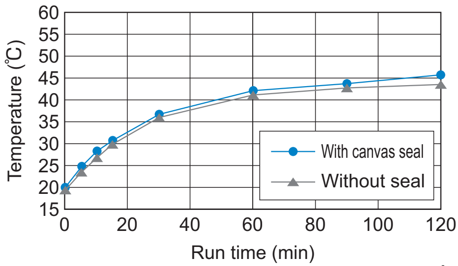


● Heat generation test

Test conditions

Item	Description
Test pieces	Precision ball screw ϕ40
Maximum rotational speed	2,500 min^{-1}
Maximum speed	75 m/min
Stroke	800 mm
Load (through preload only)	2.25 kN
Grease	THK AFJ Grease 12 cm^3 (contained in the ball screw nut)

Test result



Unit: ℃

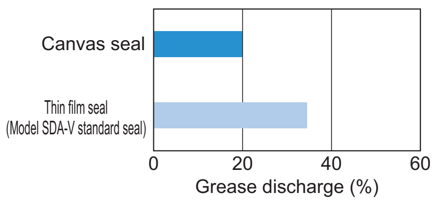
Item	With canvas seal	Without seal
Heat generation temperature	45.8	43.6
Temperature rise	25.7	24.1

● Grease sealing test

Test conditions

Item	Description
Test pieces	Precision ball screw ϕ40
Maximum rotational speed	100 min^{-1}
Maximum speed	3 m/min
Stroke	800 mm
Load (through preload only)	2.25 kN
Grease	THK AFJ Grease 12 cm^3 (contained in the ball screw nut)
Run time	1 h

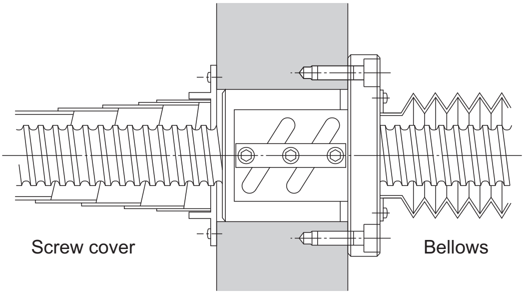
Test result



Dust Cover for Ball Screws

Bellows/Screw Cover

When using the product in an environment with dust and contaminants, be sure to prevent intrusion of foreign material by using bellows, a screw cover, or the like. The contamination protection can be increased by also using a contamination protection seal. For details, contact THK. When conferring with us, please use the bellows specifications (A**15-380**).

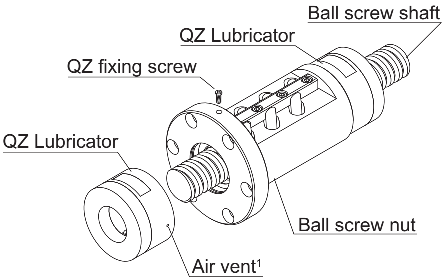


Dust cover

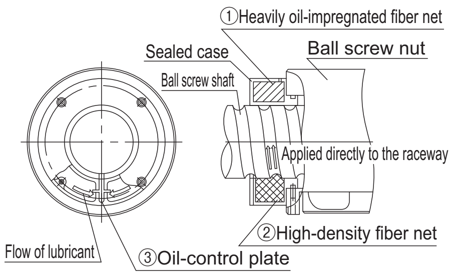
QZ Lubricator

●For the supported models and the ball screw nut dimension with QZ Lubricator attached, see A15-366 to A15-375.

The QZ Lubricator feeds the right amount of lubricant to the ball screw shaft raceway. This allows an oil film to continuously form between the balls and the raceway, and it significantly extends the lubrication maintenance intervals.
The structure of the QZ Lubricator consists of three major components: (1) a heavily oil-impregnated fiber net (functions to store lubricant), (2) a high-density fiber net (functions to apply lubricant to the raceway) and (3) an oil-control plate (functions to adjust oil flow). The lubricant contained in the QZ Lubricator is primarily fed by capillary action, which is also used in devices such as felt-tip pens.



External view



Structural Drawing

Features

- Since the QZ Lubricator compensates for oil loss, the lubrication maintenance interval can be significantly extended.
- Because it feeds the appropriate amount of lubricant directly to the ball raceway, it is an environmentally-friendly lubrication system that does not contaminate the surrounding area.

[1] Some types of QZ Lubricator have a vent hole. Be careful not to block the hole with grease or other obstructions.

Model number coding

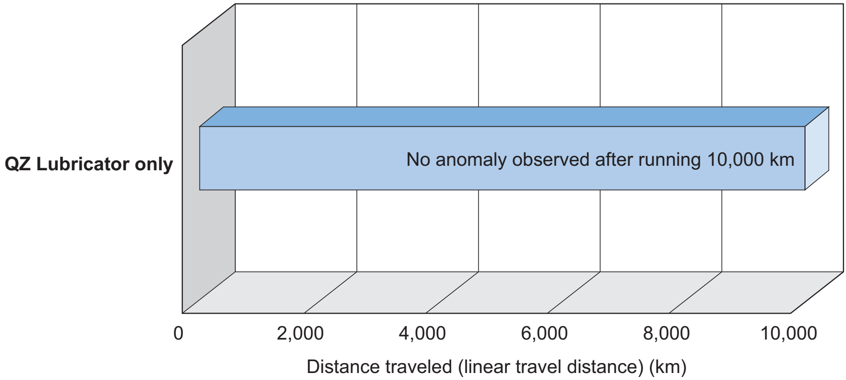
BIF2505V-5 QZ WW G0 +1000L C5

QZ: With QZ Lubricator
WW: With wiper ring W

Note: See A15-366.

● Significantly extended maintenance interval

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

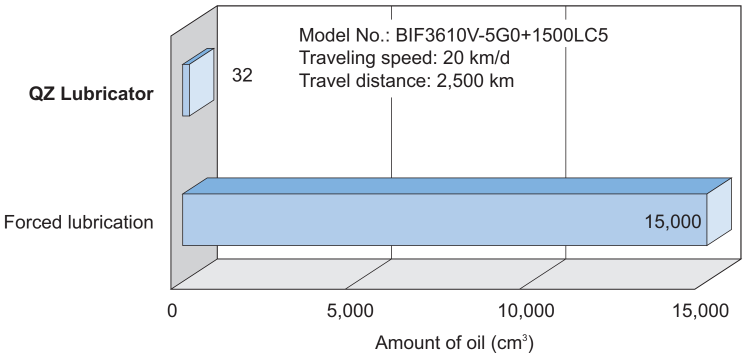


Test conditions

Item	Description
Ball screw	BIF2510V
Maximum rotational speed	2,500 min^{-1}
Maximum speed	25 m/min
Stroke	500 mm
Load	Internal preload only

● Environmentally friendly lubrication system

Since the 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)

Compared

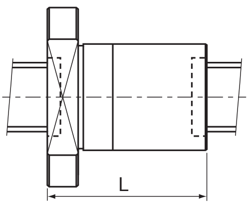
Forced lubrication
0.25 cm^3 / 3 min × 24 h × 125 d
= 15,000 cm^3

Reduced to approx. $\frac{1}{470}$

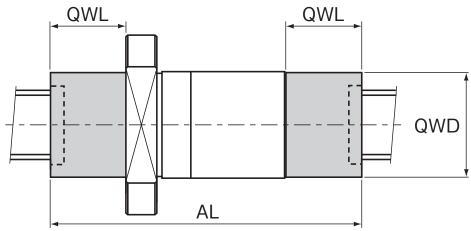
Ball Screw (Options)

Dimensions of Each Model with Options Attached

Dimensions of the Ball Screw Nut with Wiper Ring W and QZ Lubricator Attached



With WW (without QZ)



With QZ and WW

Note) For models BLW, BLK (precision and rolled), WGF, BNK1510 or higher (excluding BNK2010), WTF, and CNF, a wiper ring is attached to the outside of the nut.

Unit: mm

Model No.		WW availability	QZ availability	Dimensions including WW	Length of protrusion with QZ attached	Outer diameter of protrusion with QZ attached	Dimensions including QZ and WW
				L	QWL	QWD	AL
EPB	1605V-6	○	○	65	25	27	121
	2004V-8	○	×	69	—	—	—
	2005V-6	○	○	65	26.5	33	124
	2006V-6	○	○	74	30	34	139
	2008V-6	○	○	88	25	34	143
	2010V-6	×	×	—	—	—	—
	2504V-8	○	○	70	34	37	134
	2505V-6	○	○	66	27.6	39	118.2
	2506V-6	○	○	74	28.3	39	127.6
	2508V-6	○	○	90	29.6	39	143.2
	2510V-4	○	○	85	31.6	39	143.2
	2512V-4	×	×	—	—	—	—
	2806V-6	×	○	—	31	42	135
	3204V-10	○	×	82	—	—	—
	3205V-6	○	○	67	35	45	133
	3205V-8	○	○	78	35	45	144
	3206V-8	○	○	96	35	47	160
	3208V-8	○	×	119	—	—	—
	3210V-6	○	○	112	40	49	185
	3212V-6	○	○	128	36.5	53	195
	3604V-6	×	×	—	—	—	—
	3606V-8	×	×	—	—	—	—
	3608V-8	×	×	—	—	—	—
	4004V-6	×	×	—	—	—	—
	4005V-6	○	○	65	28.5	61	122
	4006V-12	○	×	124	—	—	—
	4008V-8	×	×	—	—	—	—
	4010V-6	○	○	114	44	61	197
	4010V-8	○	○	138	44	61	221
	4012V-8	○	○	163	44	61	251
	5005V-12	○	×	111	—	—	—
	5008V-8	○	×	123	—	—	—
	5010V-8	○	○	140	37	71	207
	6310V-4	○	○	92	39	84	169
EBB	1605V-4	○	○	55	25	27	111
	2004V-8	○	×	69	—	—	—
	2005V-3	○	○	50	26.5	33	109
	2006V-6	○	○	74	30	34	139
	2008V-6	○	○	88	25	34	143
	2010V-6	×	×	—	—	—	—
	2504V-8	○	○	70	34	37	134

Unit: mm

Model No.		WW availability	QZ availability	Dimensions including WW	Length of protrusion with QZ attached	Outer diameter of protrusion with QZ attached	Dimensions including QZ and WW
				L	QWL	QWD	AL
EBB	2505V-3	○	○	50	27.6	39	102.2
	2506V-6	○	○	74	28.3	39	127.6
	2508V-6	○	○	90	29.6	39	143.2
	2510V-3	○	○	73	31.6	39	131.2
	2510V-4	○	○	85	31.6	39	143.2
	2512V-4	×	×	—	—	—	—
	2806V-6	×	○	—	31	42	135
	3204V-10	○	×	82	—	—	—
	3205V-3	○	○	52	35	45	118
	3205V-4	○	○	57	35	45	123
	3205V-6	○	○	67	35	45	133
	3206V-8	○	○	96	35	47	160
	3208V-8	○	×	119	—	—	—
	3210V-3	○	○	82	40	49	154
	3210V-4	○	○	94	40	49	166
	3212V-3	○	○	90	36.5	53	157
	3604V-6	×	×	—	—	—	—
	3606V-8	×	×	—	—	—	—
	3608V-8	×	×	—	—	—	—
	4004V-6	×	×	—	—	—	—
	4005V-6	○	○	65	28.5	61	122
	4006V-12	○	×	124	—	—	—
	4008V-8	×	×	—	—	—	—
	4010V-3	○	○	83	44	61	166
	4010V-4	○	○	94	44	61	177
	4012V-8	○	○	163	44	61	251
	4020V-3	○	○	129	47	61	213
	5005V-12	○	×	111	—	—	—
	5008V-8	○	×	123	—	—	—
	5010V-4	○	○	96	37	71	163
	5020V-3	○	○	129	40	71	197
	6310V-4	○	○	92	39	84	169
	6312V-4	○	○	109	32	89	170
	6316V-4	×	×	—	—	—	—
	6320V-3	○	○	133	30.5	94	184
	8010V-4	×	×	—	—	—	—
	8012V-4	×	×	—	—	—	—
	8016V-4	×	×	—	—	—	—
	8020V-4	×	×	—	—	—	—

○ : Available △ : Available per request × : Not available

Notes: Please contact THK for more information regarding the model numbers that do not support WW and QZ.
Parentheses indicate the dimensions with QZ but without WW.

Options

Dimensions of Each Model with Options Attached

Unit: mm

Model No.		WW availability	QZ availability	Dimensions including WW	Length of protrusion with QZ attached	Outer diameter of protrusion with QZ attached	Dimensions including QZ and WW
				L	QWL	QWD	AL
SBN (Small, cage)	1604V-5	○	○	53	29	31	111
	1605V-5	○	○	56	29	31	114
	2004V-5	○	○	49	27.5	39	104
	2005V-5	○	○	56	27.5	43	111
	2010V-5	△	○	—	31.5	43	(153)
	2504V-5	○	○	48	32.5	45	113
	2505V-5	○	○	55	32.5	45	120
	2506V-5	○	○	62	33	45	128
	2805V-5	○	○	59	22	54	103
	3205V-5	○	○	56	32	57	120
	3206V-5	○	○	63	32	57	127
SBN (Medium, cage)	2508V-7	○	○	98	34	45	166
	2510V-5	○	○	100	37	45	174
	2810V-3	○	○	88	33	54	154
	3210V-7	○	○	120	31	73	182
	3212V-5	○	○	117	33	73	183
	3216V-5	△	○	—	34	73	(207)
	3610V-7	○	○	123	33	64	189
	3612V-7	○	○	140	35	64	210
	3616V-5	○	○	140	32	64	204
	3620V-3	○	○	122	32	64	186
	4010V-5	○	○	103	37	66	177
	4012V-5	○	○	119	38	66	195
	4016V-5	○	○	144	42	66	228
	4020V-5	△	○	—	35	66	(232)
	4510V-5	○	○	111	35.5	79	182
	4512V-5	○	○	119	35.5	79	190
	4516V-5	○	○	140	35.5	79	211
	4520V-5	△	○	—	33.5	79	(229)
	5010V-5	○	○	103	37.5	79	178
	5012V-5	○	○	123	38.5	79	200
	5016V-5	○	○	164	38.5	79	241
	5020V-5	○	○	201	40.5	79	282
SBK (Small, cage)	1520-3.6	△	○	—	22	31	(98)
	1616-3.6	△	×	—	—	—	—
	2010-5.6	△	○	—	27	36	(99)
	2020-3.6	○	○	54	27	36	108
	2030-3.6	△	○	—	27	36	(125)
	2520-3.6	○	○	57	35.5	44	128
	2525-3.6	○	○	68	35.5	44	139
	3220-5.6	○	○	82	34.5	53	151
	3232-5.6	△	○	—	34.5	53	(187)
SBK (Medium, cage)	3620-7.6	○	○	110	28	69	166
	3636-5.6	○	○	134	28	69	190
	4020-7.6	○	○	110	30.5	79	171
	4030-7.6	○	○	148	30.4	79	208.8
	4040-5.6	○	○	146	30.4	79	206.8
	5020-7.6	○	○	110	35	89	180
	5030-7.6	○	○	149	35	89	219
	5036-7.6	○	○	172	35	89	242
	5050-5.6	○	○	175	35	89	245

Unit: mm

Model No.		WW availability	QZ availability	Dimensions including WW	Length of protrusion with QZ attached	Outer diameter of protrusion with QZ attached	Dimensions including QZ and WW
				L	QWL	QWD	AL
SBK (Medium, cage)	5520-7.6	○	○	110	32	95	174
	5530-7.6	○	○	149	32	95	213
	5536-7.6	○	○	172	32	95	236
SBKN (Cage)	3620-7.6	○	○	210	28	69	266
	4020-7.6	○	○	210	30.5	79	271
	4030-7.6	○	○	283	30.4	79	343.8
	5020-7.6	○	○	210	35	89	280
	5030-7.6	○	○	284	35	89	354
	5036-7.6	○	○	334	35	89	404
	5520-7.6	○	○	210	32	95	274
	5530-7.6	○	○	284	32	95	348
	5536-7.6	○	○	334	32	95	398
SDAN (Cage)	3110V-5	×	×	—	—	—	—
	3112V-5	×	×	—	—	—	—
	3116V-5	×	×	—	—	—	—
	3120V-5	×	×	—	—	—	—
	3205V-4	×	×	—	—	—	—
	3206V-5	×	×	—	—	—	—
	3208V-5	×	×	—	—	—	—
	3210V-5	×	×	—	—	—	—
	3210VA-5	×	×	—	—	—	—
	3212VA-5	×	×	—	—	—	—
	3216VA-5	×	×	—	—	—	—
	3220VA-5	×	×	—	—	—	—
	3606V-4	×	×	—	—	—	—
	3610V-5	×	×	—	—	—	—
	3612V-5	×	×	—	—	—	—
	3616V-5	×	×	—	—	—	—
	3620V-5	×	×	—	—	—	—
	3810V-5	×	×	—	—	—	—
	3812V-5	×	×	—	—	—	—
	3816V-5	×	×	—	—	—	—
	3820V-5	×	×	—	—	—	—
	4008VX-5	×	×	—	—	—	—
	4010VA-5	×	×	—	—	—	—
	4012VA-5	×	×	—	—	—	—
	4016VA-5	×	×	—	—	—	—
	4020VA-5	×	×	—	—	—	—
	4510V-5	×	×	—	—	—	—
	4510VA-5	×	×	—	—	—	—
	4512V-5	×	×	—	—	—	—
	4512VA-5	×	×	—	—	—	—
	4516V-5	×	×	—	—	—	—
	4516VA-5	×	×	—	—	—	—
	4520V-5	×	×	—	—	—	—
	4520VA-5	×	×	—	—	—	—
	5010V-5	×	×	—	—	—	—
	5010VA-5	×	×	—	—	—	—

○ : Available △ : Available per request × : Not available

Notes: Please contact THK for more information regarding the model numbers that do not support WW and QZ.
Parentheses indicate the dimensions with QZ but without WW.

Ball Screw (Options)

Unit: mm

Model No.		WW availability	QZ availability	Dimensions including WW	Length of protrusion with QZ attached	Outer diameter of protrusion with QZ attached	Dimensions including QZ and WW
				L	QWL	QWD	AL
SDAN (Cage)	5012V-5	×	×	—	—	—	—
	5012VA-5	×	×	—	—	—	—
	5016V-5	×	×	—	—	—	—
	5016VA-5	×	×	—	—	—	—
	5020V-5	×	×	—	—	—	—
	5020VA-5	×	×	—	—	—	—
	5025V-4	×	×	—	—	—	—
	5025VA-4	×	×	—	—	—	—
	5030V-4	×	×	—	—	—	—
	5030VA-4	×	×	—	—	—	—
	5040V-3	×	×	—	—	—	—
	5040VA-3	×	×	—	—	—	—
	5510VX-4	×	×	—	—	—	—
	5510VAX-4	×	×	—	—	—	—
	5512VX-4	×	×	—	—	—	—
	5512VAX-4	×	×	—	—	—	—
	5516VX-4	×	×	—	—	—	—
	5516VAX-4	×	×	—	—	—	—
	5520VX-4	×	×	—	—	—	—
	5520VAX-4	×	×	—	—	—	—
	6310VX-4	×	×	—	—	—	—
	6312VX-4	×	×	—	—	—	—
	6316VX-4	×	×	—	—	—	—
	6320VX-4	×	×	—	—	—	—
	6325VX-4	×	×	—	—	—	—
	6330VX-4	×	×	—	—	—	—
	6340VX-3	×	×	—	—	—	—
SDA (Cage)	1004VZ-4	×	×	—	—	—	—
	1005VZ-4	×	×	—	—	—	—
	1010VZ-3	×	×	—	—	—	—
	1205VZ-3	×	×	—	—	—	—
	1210VZ-2	×	×	—	—	—	—
	1220VZ-2	×	×	—	—	—	—
	1230VZ-2	×	×	—	—	—	—
	1405V-4	×	×	—	—	—	—
	1505V-3	×	×	—	—	—	—
	1510V-3	×	×	—	—	—	—
	1520V-4	×	×	—	—	—	—
	1530V-4	×	×	—	—	—	—
	1605V-3	×	×	—	—	—	—
	1610V-3	×	×	—	—	—	—
	1616V-3	×	×	—	—	—	—
	2004V-4	×	×	—	—	—	—
	2005V-3	×	×	—	—	—	—
	2006V-4	×	×	—	—	—	—
	2010V-3	×	×	—	—	—	—
	2010V-6	×	×	—	—	—	—
	2020V-3	×	×	—	—	—	—
	2020V-6	×	×	—	—	—	—
	2030V-2	×	×	—	—	—	—
	2040V-2	×	×	—	—	—	—

Unit: mm

Model No.		WW availability	QZ availability	Dimensions including WW	Length of protrusion with QZ attached	Outer diameter of protrusion with QZ attached	Dimensions including QZ and WW
				L	QWL	QWD	AL
SDA (Cage)	2060V-2	×	×	—	—	—	—
	2505V-3	×	×	—	—	—	—
	2510V-3	×	×	—	—	—	—
	2520V-3	×	×	—	—	—	—
	2525V-3	×	×	—	—	—	—
	2530V-2	×	×	—	—	—	—
	2530V-4	×	×	—	—	—	—
	2550V-2	×	×	—	—	—	—
	2806V-5	×	×	—	—	—	—
	3110V-5	×	×	—	—	—	—
	3112V-5	×	×	—	—	—	—
	3116V-5	×	×	—	—	—	—
	3120V-5	×	×	—	—	—	—
	3132V-2	×	×	—	—	—	—
	3205V-4	×	×	—	—	—	—
	3206V-5	×	×	—	—	—	—
	3208V-5	×	×	—	—	—	—
	3210V-5	×	×	—	—	—	—
	3210VA-5	×	×	—	—	—	—
	3212VA-5	×	×	—	—	—	—
	3216VA-5	×	×	—	—	—	—
	3220VA-5	×	×	—	—	—	—
	3232VA-2	×	×	—	—	—	—
	3610V-5	×	×	—	—	—	—
	3612V-5	×	×	—	—	—	—
	3616V-5	×	×	—	—	—	—
	3620V-5	×	×	—	—	—	—
	3636V-2	×	×	—	—	—	—
	3810V-5	×	×	—	—	—	—
	3812V-5	×	×	—	—	—	—
	3815V-5	×	×	—	—	—	—
	3816V-5	×	×	—	—	—	—
	3820V-5	×	×	—	—	—	—
	3825V-4	×	×	—	—	—	—
	3830V-3	×	×	—	—	—	—
	3840V-2	×	×	—	—	—	—
	4008VZ-5	×	×	—	—	—	—
	4010VA-5	×	×	—	—	—	—
	4012VA-5	×	×	—	—	—	—
	4015VA-5	×	×	—	—	—	—
	4016VA-5	×	×	—	—	—	—
	4020VA-5	×	×	—	—	—	—
	4020VA-10	×	×	—	—	—	—
	4025VA-4	×	×	—	—	—	—
	4030VA-3	×	×	—	—	—	—
	4030VA-6	×	×	—	—	—	—
	4040VA-2	×	×	—	—	—	—
	4040VA-4	×	×	—	—	—	—

○ : Available △ : Available per request × : Not available

Notes: Please contact THK for more information regarding the model numbers that do not support WW and QZ.
Parentheses indicate the dimensions with QZ but without WW.

Options

Dimensions of Each Model with Options Attached

Unit: mm

Model No.		WW availability	QZ availability	Dimensions including WW	Length of protrusion with QZ attached	Outer diameter of protrusion with QZ attached	Dimensions including QZ and WW
				L	QWL	QWD	AL
SDA (Cage)	4510V-5	×	×	—	—	—	—
	4510VA-5	×	×	—	—	—	—
	4512V-5	×	×	—	—	—	—
	4512VA-5	×	×	—	—	—	—
	4516V-5	×	×	—	—	—	—
	4516VA-5	×	×	—	—	—	—
	4520V-5	×	×	—	—	—	—
	4520VA-5	×	×	—	—	—	—
	4520VA-10	×	×	—	—	—	—
	4525V-4	×	×	—	—	—	—
	4525VA-4	×	×	—	—	—	—
	4530V-4	×	×	—	—	—	—
	4530VA-4	×	×	—	—	—	—
	4540V-3	×	×	—	—	—	—
	4540VA-3	×	×	—	—	—	—
	5010V-5	×	×	—	—	—	—
	5010VA-5	×	×	—	—	—	—
	5012V-5	×	×	—	—	—	—
	5012VA-5	×	×	—	—	—	—
	5016V-5	×	×	—	—	—	—
	5016VA-5	×	×	—	—	—	—
	5020V-5	×	×	—	—	—	—
	5020V-10	×	×	—	—	—	—
	5020VA-5	×	×	—	—	—	—
	5020VA-10	×	×	—	—	—	—
	5025V-4	×	×	—	—	—	—
	5025VA-4	×	×	—	—	—	—
	5025VA-8	×	×	—	—	—	—
	5030V-4	×	×	—	—	—	—
	5030VA-4	×	×	—	—	—	—
	5030VA-8	×	×	—	—	—	—
	5040V-3	×	×	—	—	—	—
	5040VA-3	×	×	—	—	—	—
	5040VA-6	×	×	—	—	—	—
	5050V-2	×	×	—	—	—	—
	5050VA-2	×	×	—	—	—	—
HBN (Cage)	5010V-7.5	×	×	—	—	—	—
	5012V-7.5	×	×	—	—	—	—
	5016V-7.5	×	×	—	—	—	—
	6316V-7.5	×	×	—	—	—	—
	6316V-10.5	×	×	—	—	—	—
	6320V-7.5	×	×	—	—	—	—
	6325V-10.5	×	×	—	—	—	—
	8016V-7.5	×	×	—	—	—	—
	8016V-10.5	×	×	—	—	—	—
	8020V-7.5	×	×	—	—	—	—
	8020V-10.5	×	×	—	—	—	—
	8025V-7.5	×	×	—	—	—	—
	8025V-10.5	×	×	—	—	—	—
	6335K-10	×	△	—	—	—	—
	6335K-15	×	△	—	—	—	—

Unit: mm

Model No.		WW availability	QZ availability	Dimensions including WW	Length of protrusion with QZ attached	Outer diameter of protrusion with QZ attached	Dimensions including QZ and WW
				L	QWL	QWD	AL
HBN (Cage)	6342K-3	×	△	—	—	—	—
	6350K-10	×	△	—	—	—	—
	8040K-5	×	△	—	—	—	—
	8040KA-5	×	△	—	—	—	—
	8050K-15	×	△	—	—	—	—
	8050KA-15	×	△	—	—	—	—
	10016K-10	×	△	—	—	—	—
	10016KA-10	×	△	—	—	—	—
	10020K-7.5	×	△	—	—	—	—
	10020KA-7.5	×	△	—	—	—	—
	10020K-10	×	△	—	—	—	—
	10020KA-10	×	△	—	—	—	—
	10020K-12.5	×	△	—	—	—	—
	10020KA-12.5	×	△	—	—	—	—
	10020K-7	×	△	—	—	—	—
	10020KA-7	×	△	—	—	—	—
	10020K-10.5	×	△	—	—	—	—
	10020KA-10.5	×	△	—	—	—	—
	10025K-7.5	×	△	—	—	—	—
	10025KA-7.5	×	△	—	—	—	—
	10025K-10	×	△	—	—	—	—
	10025KA-10	×	△	—	—	—	—
	10025K-12.5	×	△	—	—	—	—
	10025KA-12.5	×	△	—	—	—	—
	10025K-7	×	△	—	—	—	—
	10025KA-7	×	△	—	—	—	—
	10025K-10.5	×	△	—	—	—	—
	10025KA-10.5	×	△	—	—	—	—
	10025K-14	×	△	—	—	—	—
	10025KA-14	×	△	—	—	—	—
	12020K-10	×	△	—	—	—	—
	12020KA-10	×	△	—	—	—	—
	12025K-7.5	×	△	—	—	—	—
	12025KA-7.5	×	△	—	—	—	—
	12025K-10	×	△	—	—	—	—
	12025KA-10	×	△	—	—	—	—
	12025K-12.5	×	△	—	—	—	—
	12025KA-12.5	×	△	—	—	—	—
	12025K-14	×	△	—	—	—	—
	12025KA-14	×	△	—	—	—	—
	14025K-10	×	△	—	—	—	—
	14025KA-10	×	△	—	—	—	—
	14032K-10.5	×	△	—	—	—	—
	14032KA-10.5	×	△	—	—	—	—
	14040K-7.5	×	△	—	—	—	—
	14040KA-7.5	×	△	—	—	—	—
	3210-5	×	△	—	—	—	—
	3610-5	×	△	—	—	—	—

○ : Available △ : Available per request × : Not available

Notes: Please contact THK for more information regarding the model numbers that do not support WW and QZ.
Parentheses indicate the dimensions with QZ but without WW.

Ball Screw (Options)

Unit: mm

Model No.		WW availability	QZ availability	Dimensions including WW L	Length of protrusion with QZ attached QWL	Outer diameter of protrusion with QZ attached QWD	Dimensions including QZ and WW AL
HBN (Cage)	3612-5	×	△	—	—	—	—
	4010-7.5	×	△	—	—	—	—
	4012-7.5	×	△	—	—	—	—
	5010-7.5	×	△	—	—	—	—
	5012-7.5	×	△	—	—	—	—
	5016-7.5	×	△	—	—	—	—
	6316-7.5	×	△	—	—	—	—
	6316-10.5	×	△	—	—	—	—
	6320-7.5	×	△	—	—	—	—
SBKH (Cage)	6332-3.8	×	△	—	—	—	—
	6340-7.6	×	△	—	—	—	—
	8050-7.6	×	△	—	—	—	—
	8060-7.6	×	△	—	—	—	—
	10050-7.6	×	△	—	—	—	—
	10060-7.6	×	△	—	—	—	—
	12060-7.6	×	△	—	—	—	—
BIF (Small)	1604V-5	○	○	53	29	31	111
	1605V-5	○	○	56	29	31	114
	2004V-5	○	○	49	27.5	39	104
	2004V-10	○	○	73	27.5	39	128
	2005V-5	○	○	56	27.5	43	111
	2005V-10	○	○	86	27.5	43	141
	2010V-5	△	○	—	31.5	43	(153)
	2504V-5	○	○	48	32.5	45	113
	2504V-10	○	○	72	32.5	45	137
	2505V-5	○	○	55	32.5	45	120
	2505V-10	○	○	85	32.5	45	150
	2506V-5	○	○	62	33	45	128
	2506V-10	○	○	98	33	45	164
	2805V-5	○	○	59	22	54	103
	2805V-10	○	○	89	22	54	133
	2806V-5	○	○	68	23	54	114
	2806V-10	○	○	104	23	54	150
	3205V-5	○	○	56	32	57	120
	3205V-10	○	○	86	32	57	150
	3206V-5	○	○	63	32	57	127
	3206V-10	○	○	99	32	57	163
BIF (Medium)	2508V-5	○	○	82	34	45	150
	2508V-7	○	○	98	34	45	166
	2508V-10	○	○	130	34	45	198
	2510V-5	○	○	100	37	45	174
	2810V-3	○	○	88	33	54	154
	3210V-5	○	○	100	31	73	162
	3210V-7	○	○	120	31	73	182
	3210V-10	○	○	160	31	73	222
	3212V-5	○	○	117	33	73	183
	3212V-7	○	○	146	33	73	212
	3216V-5	△	○	—	34	73	(207)
	3610V-5	○	○	111	33	64	177
	3610V-7	○	○	123	33	64	189
	3610V-10	○	○	171	33	64	237

Unit: mm

Model No.		WW availability	QZ availability	Dimensions including WW L	Length of protrusion with QZ attached QWL	Outer diameter of protrusion with QZ attached QWD	Dimensions including QZ and WW AL
BIF (Medium)	3612V-5	○	○	123	35	64	193
	3612V-7	○	○	140	35	64	210
	3612V-10	○	○	195	35	64	265
	3616V-5	○	○	140	32	64	204
	3620V-3	○	○	122	32	64	186
	4010V-5	○	○	103	37	66	177
	4010V-7	○	○	123	37	66	197
	4010V-10	○	○	163	37	66	237
	4012V-5	○	○	119	38	66	195
	4012V-7	○	○	143	38	66	219
	4012V-10	○	○	191	38	66	267
	4016V-5	○	○	144	42	66	228
	4020V-5	△	○	—	35	66	(232)
	4510V-5	○	○	111	35.5	79	182
	4510V-10	○	○	171	35.5	79	242
	4512V-5	○	○	119	35.5	79	190
	4512V-10	○	○	191	35.5	79	262
	4516V-5	○	○	140	35.5	79	211
	4520V-5	△	○	—	33.5	79	(229)
	5010V-5	○	○	103	37.5	79	178
	5010V-7	○	○	123	37.5	79	198
	5010V-10	○	○	163	37.5	79	238
	5012V-5	○	○	123	38.5	79	200
	5012V-7	○	○	147	38.5	79	224
	5012V-10	○	○	195	38.5	79	272
	5016V-5	○	○	164	38.5	79	241
	5016V-10	○	○	260	38.5	79	337
	5020V-5	○	○	201	40.5	79	282
DIK	1404-4	△	×	—	—	—	—
	1404-6	△	×	—	—	—	—
	1605-6	○	○	60	33	29	126
	2004-6	○	×	62	—	—	—
	2004-8	○	×	70	—	—	—
	2005-6	○	○	61	26.5	33	114
	2006-6	○	○	76	30	34	136
	2008-4	○	○	69	25	34	119
	2504-6	○	○	63	34	37	131
	2504-8	○	○	71	34	37	139
	2505-6	○	○	61	28	39	117
	2506-4	○	○	60	28	39	116
	2506-6	○	○	72	28	39	128
	2508-4	○	○	71	30	39	131
	2508-6	○	○	94	30	39	154
	2510-4	○	○	85	32	39	149
	2805-6	○	○	69	31	42	131
	2805-8	○	○	79	31	42	141
	2806-6	○	○	73	31	42	135
	2810-4	○	○	84	35	44	154

○ : Available △ : Available per request × : Not available

Notes: Please contact THK for more information regarding the model numbers that do not support WW and QZ.
Parentheses indicate the dimensions with QZ but without WW.

Options

Dimensions of Each Model with Options Attached

Unit: mm

Model No.		WW availability	QZ availability	Dimensions including WW	Length of protrusion with QZ attached	Outer diameter of protrusion with QZ attached	Dimensions including QZ and WW
				L	QWL	QWD	AL
DIK	3204-6	○	×	64	—	—	—
	3204-8	○	×	72	—	—	—
	3204-10	○	×	80	—	—	—
	3205-6	○	○	62	35	45	132
	3205-8	○	○	73	35	45	143
	3206-6	○	○	73	35	47	143
	3206-8	○	○	87	35	47	157
	3210-6	○	○	110	35.5	53	181
	3212-4	○	○	98	36.5	53	171
	3610-6	○	○	122	33.5	57	189
	3610-8	○	○	143	33.5	57	210
	3610-10	○	○	164	33.5	57	231
	4010-6	○	○	113	44	61	201
	4010-8	○	○	137	44	61	225
	4012-6	○	○	138	44	61	226
	4012-8	○	○	163	44	61	251
	4016-4	○	○	120	44	61	208
	5010-6	○	○	114	37	71	188
	5010-8	○	○	137	37	71	211
	5010-10	○	○	160	37	71	234
	5012-6	○	○	145	38	71	221
	5012-8	○	○	170	38	71	246
	5016-4	○	○	129	38	71	205
	5016-6	○	○	175	38	71	251
	6310-8	△	○	—	39	84	(219)
	6312-6	○	○	146	32	89	210
	6312-8	○	○	171	32	89	235
BNFN	1605V-5	○	○	106	29	31	164
	2805V-7.5	○	○	134	22	54	178
	2806V-7.5	○	○	158	23	54	204
	2810V-2.5	○	○	146	33	54	212
	3205V-7.5	○	○	136	32	57	200
	3610V-7.5	○	○	261	33	64	327
	3616V-5	○	○	268	32	64	332
	4016V-5	○	○	280	42	66	364
	4510V-7.5	○	○	261	35.5	79	332
	5010V-7.5	○	○	253	37.5	79	328
	5510-2.5	○	○	141	34	95	209
	5510-5	○	○	201	34	95	269
	5510-7.5	○	○	261	34	95	329
	5512-2.5	○	△	165	—	—	—
	5512-3	○	△	191	—	—	—
	5512-3.5	○	△	189	—	—	—
	5512-5	○	△	237	—	—	—
	5512-7.5	○	△	309	—	—	—
	5516-2.5	○	○	196	34	95	264
	5516-5	○	○	292	34	95	360
	5520-2.5	○	○	227	34	95	295
	5520-5	○	○	347	34	95	415
	6310-2.5	○	○	137	33	107	203
	6310-5	○	○	197	33	107	263

Unit: mm

Model No.		WW availability	QZ availability	Dimensions including WW	Length of protrusion with QZ attached	Outer diameter of protrusion with QZ attached	Dimensions including QZ and WW
				L	QWL	QWD	AL
BNFN	6310-7.5	○	○	257	33	107	323
	6312A-2.5	△	○	—	34	113	227
	6312A-5	△	○	—	34	113	299
	6316-2.5	○	○	208	35	113	278
	6316-5	○	○	304	35	113	374
	6320-2.5	○	○	227	42	113	311
	6320-5	○	○	347	42	113	431
	7010-2.5	△	△	—	—	—	—
	7010-5	△	△	—	—	—	—
	7010-7.5	△	△	—	—	—	—
	7012-2.5	△	△	—	—	—	—
	7012-5	△	△	—	—	—	—
	7012-7.5	△	△	—	—	—	—
	7020-5	○	△	325	—	—	—
	8010-2.5	○	○	137	35	129	207
	8010-5	○	○	197	35	129	267
	8010-7.5	○	○	257	35	129	327
	8012-5	△	△	—	—	—	—
	8020A-2.5	○	○	227	40	142	307
	8020A-5	○	○	347	40	142	427
	10020A-2.5	○	△	231	—	—	—
	10020A-5	○	△	351	—	—	—
	10020A-7.5	○	△	471	—	—	—
DKN	4020-3	○	○	223	47	61	317
	5020-3	○	○	243	40	71	323
	6320-3	○	○	243	30.5	94	304
BLW	1510-5.6	○	○	96	25.5	31	140
	1616-3.6	△	○	—	25.5	31	(135.5)
	2020-3.6	○	○	112	31	36	167
	2525-3.6	○	○	131.5	39	44	202.5
	3232-3.6	○	○	162.6	37.5	53	230
	3636-3.6	○	○	191	30	65	241
	4040-3.6	○	○	201.8	30	72	251
	5050-3.6	○	○	255.8	29.5	89	304
BNF (Small)	1604V-5	○	○	53	29	31	111
	1605V-2.5	○	○	41	29	31	99
	1605V-5	○	○	56	29	31	114
	2004V-2.5	○	○	37	27.5	39	92
	2004V-5	○	○	49	27.5	39	104
	2005V-2.5	○	○	41	27.5	43	96
	2005V-5	○	○	56	27.5	43	111
	2010V-2.5	△	○	—	31.5	43	(123)
	2504V-2.5	○	○	36	32.5	45	101
	2504V-5	○	○	48	32.5	45	113
	2505V-2.5	○	○	40	32.5	45	105
	2505V-5	○	○	55	32.5	45	120
	2506V-2.5	○	○	44	33	45	110
	2506V-5	○	○	62	33	45	128

○ : Available △ : Available per request × : Not available

Notes: Please contact THK for more information regarding the model numbers that do not support WW and QZ.
Parentheses indicate the dimensions with QZ but without WW.

Ball Screw (Options)

Unit: mm

Model No.		WW availability	QZ availability	Dimensions including WW L	Length of protrusion with QZ attached QWL	Outer diameter of protrusion with QZ attached QWD	Dimensions including QZ and WW AL
BNF (Small)	2805V-2.5	○	○	44	22	54	88
	2805V-5	○	○	59	22	54	103
	2805V-7.5	○	○	74	22	54	118
	2806V-2.5	○	○	50	23	54	96
	2806V-5	○	○	68	23	54	114
	2806V-7.5	○	○	86	23	54	132
	3205V-2.5	○	○	41	32	57	105
	3205V-5	○	○	56	32	57	120
	3205V-7.5	○	○	71	32	57	135
	3206V-2.5	○	○	45	32	57	109
	3206V-5	○	○	63	32	57	127
BNF (Medium)	2508V-2.5	○	○	58	34	45	126
	2508V-3.5	○	○	66	34	45	134
	2508V-5	○	○	82	34	45	150
	2510V-2.5	○	○	70	37	45	144
	2810V-2.5	○	○	86	33	54	152
	3210V-2.5	○	○	70	31	73	132
	3210V-3.5	○	○	80	31	73	142
	3210V-5	○	○	100	31	73	162
	3212V-3.5	○	○	98	33	73	164
	3216V-5	△	○	—	34	73	(207)
	3610V-2.5	○	○	81	33	64	147
	3610V-5	○	○	111	33	64	177
	3610V-7.5	○	○	141	33	64	207
	3612V-2.5	○	○	87	35	64	157
	3612V-5	○	○	123	35	64	193
	3616V-2.5	○	○	92	32	64	156
	3620V-1.5	○	○	82	32	64	146
	4010V-2.5	○	○	73	37	66	147
	4010V-3.5	○	○	83	37	66	157
	4010V-5	○	○	103	37	66	177
	4012V-2.5	○	○	83	38	66	159
	4012V-3.5	○	○	95	38	66	171
	4012V-5	○	○	119	38	66	195
	4016V-5	○	○	144	42	66	228
	4020V-5	△	○	—	35	66	(232)
	4510V-2.5	○	○	81	35.5	79	152
	4510V-3	○	○	94	35.5	79	165
	4510V-5	○	○	111	35.5	79	182
	4510V-7.5	○	○	141	35.5	79	212
	4512V-5	○	○	119	35.5	79	190
	4520V-2.5	△	○	—	33.5	79	(169)
	5010V-2.5	○	○	73	37.5	79	148
	5010V-3.5	○	○	83	37.5	79	158
	5010V-5	○	○	103	37.5	79	178
	5010V-7.5	○	○	133	37.5	79	208
	5012V-2.5	○	○	87	38.5	79	164
	5012V-3.5	○	○	99	38.5	79	176
	5012V-5	○	○	123	38.5	79	200

Unit: mm

Model No.		WW availability	QZ availability	Dimensions including WW L	Length of protrusion with QZ attached QWL	Outer diameter of protrusion with QZ attached QWD	Dimensions including QZ and WW AL
BNF (Medium)	5016V-2.5	○	○	116	38.5	79	193
	5016V-5	○	○	164	38.5	79	241
	5020V-2.5	○	○	141	40.5	79	222
BNF	5510-2.5	○	○	81	34	95	149
	5510-5	○	○	111	34	95	179
	5510-7.5	○	○	141	34	95	209
	5512-2.5	○	△	93	—	—	—
	5512-3	○	△	107	—	—	—
	5512-3.5	○	△	105	—	—	—
	5512-5	○	△	129	—	—	—
	5512-7.5	○	△	165	—	—	—
	5516-2.5	○	○	116	34	95	184
	5516-5	○	○	164	34	95	232
	5520-2.5	○	○	127	34	95	195
	5520-5	○	○	187	34	95	255
	6310-2.5	○	○	77	33	107	143
	6310-5	○	○	107	33	107	173
	6310-7.5	○	○	137	33	107	203
	6312A-2.5	△	○	—	34	113	(155)
	6312A-5	△	○	—	34	113	(191)
	6316-5	△	○	—	35	113	(230)
	6320-2.5	○	○	127	42	113	211
	6320-5	○	○	187	42	113	271
	7010-2.5	△	△	—	—	—	—
	7010-5	△	△	—	—	—	—
	7010-7.5	△	△	—	—	—	—
	7012-2.5	△	△	—	—	—	—
	7012-5	△	△	—	—	—	—
	7012-7.5	△	△	—	—	—	—
	7020-5	○	△	185	—	—	—
	8010-2.5	△	○	—	35	129	(147)
	8010-5	△	○	—	35	129	(177)
	8010-7.5	△	○	—	35	129	(207)
	8020A-2.5	○	○	127	40	142	207
	8020A-5	○	○	187	40	142	267
	8020A-7.5	○	○	247	40	142	327
	10020A-2.5	○	△	131	—	—	—
	10020A-5	○	△	191	—	—	—
	10020A-7.5	○	△	251	—	—	—
DK	1404-4	△	×	—	—	—	—
	1404-6	△	×	—	—	—	—
	1605-3	○	○	45	33	29	111
	1605-4	○	○	50	33	29	116
	2004-3	○	×	42	—	—	—
	2004-4	○	×	46	—	—	—
	2005-3	○	○	46	26.5	33	99

○ : Available △ : Available per request × : Not available

Notes: Please contact THK for more information regarding the model numbers that do not support WW and QZ.
Parentheses indicate the dimensions with QZ but without WW.

Options

Dimensions of Each Model with Options Attached

Unit: mm

Model No.		WW availability	QZ availability	Dimensions including WW L	Length of protrusion with QZ attached QWL	Outer diameter of protrusion with QZ attached QWD	Dimensions including QZ and WW AL
DK	2005-4	○	○	51	26.5	33	104
	2006-3	○	○	52	30	34	112
	2006-4	○	○	59	30	34	119
	2008-4	○	○	69	25	34	119
	2504-3	○	○	43	34	37	111
	2504-4	○	○	47	34	37	115
	2505-3	○	○	46	28	39	102
	2505-4	○	○	51	28	39	107
	2506-3	○	○	52	28	39	108
	2506-4	○	○	60	28	39	116
	2508-3	○	○	62	30	39	122
	2508-4	○	○	71	30	39	131
	2510-3	○	○	80	32	39	144
	2510-4	○	○	85	32	39	149
	2805-3	○	○	49	31	42	111
	2805-4	○	○	54	31	42	116
	2806-3	○	○	53	31	42	115
	2806-4	○	○	61	31	42	123
	2810-4	○	○	84	35	44	154
	3204-3	○	×	44	—	—	—
	3204-4	○	×	48	—	—	—
	3205-3	○	○	47	35	45	117
	3205-4	○	○	52	35	45	122
	3205-6	○	○	62	35	45	132
	3206-3	○	○	53	35	47	123
	3206-4	○	○	61	35	47	131
	3210-3	○	○	80	35.5	53	151
	3210-4	○	○	90	35.5	53	161
	3212-4	○	○	98	36.5	53	171
	3610-3	○	○	82	33.5	57	149
	3610-4	○	○	93	33.5	57	160
	4010-3	○	○	83	44	61	171
	4010-4	○	○	93	44	61	181
	4012-3	○	○	90	44	61	178
	4012-4	○	○	103	44	61	191
	4016-4	○	○	120	44	61	208
	4020-3	○	○	123	47	61	217
	5010-3	○	○	83	37	71	157
	5010-4	○	○	93	37	71	167
	5010-6	○	○	114	37	71	188
	5012-3	○	○	97	38	71	173
	5012-4	○	○	110	38	71	186
	5016-3	○	○	111	38	71	187
	5016-4	○	○	129	38	71	205
	5020-3	○	○	136	40	71	216
	6310-4	△	○	—	39	84	(175)
	6310-6	△	○	—	39	84	(196)
	6312-3	○	○	98	32	89	162
	6312-4	○	○	111	32	89	175
	6320-3	○	○	136	30.5	94	197

Unit: mm

Model No.		WW availability	QZ availability	Dimensions including WW L	Length of protrusion with QZ attached QWL	Outer diameter of protrusion with QZ attached QWD	Dimensions including QZ and WW AL
MBF	0401-3.7	×	×	—	—	—	—
	0601-3.7	×	×	—	—	—	—
	0602-2.7	×	×	—	—	—	—
	0602.5-2.7	×	×	—	—	—	—
	0801.5-3.7	×	×	—	—	—	—
	0802-3.7	×	×	—	—	—	—
	0802.5-3.7	×	×	—	—	—	—
	0803-2.7	×	×	—	—	—	—
	0804-2.7	×	×	—	—	—	—
	1001-3.7	×	×	—	—	—	—
	1001.5-3.7	×	×	—	—	—	—
	1002-3.7	×	×	—	—	—	—
	1002.5-3.7	×	×	—	—	—	—
	1003-3.7	×	×	—	—	—	—
	1005-2.7	×	×	—	—	—	—
	1202-3.7	×	×	—	—	—	—
	1202.5-3.7	×	×	—	—	—	—
	1203-3.7	×	×	—	—	—	—
	1204-3.7	×	×	—	—	—	—
	1402-3.7	△	×	—	—	—	—
	1404-3.7	△	×	—	—	—	—
WHF	1530-3.4	×	○	—	25.5	31	(115.5)
	1540-3.4	×	○	—	25.5	31	(132.6)
	2020-3.4	×	○	—	31	36	(109.5)
	2025-3.4	×	○	—	31	36	(118.5)
	2030-3.4	×	○	—	31	36	(127.5)
	2040-3.4	×	○	—	31	36	(145)
	2525-3.4	×	○	—	39	44	(137)
	2550-3.4	×	○	—	39	44	(181.5)
BLK (Precision)	0808-3.2	×	×	—	—	—	—
	1510-5.6	○	○	51	25.5	31	95
	1616-2.8	△	○	—	25.5	31	(105)
	1616-3.6	△	○	—	25.5	31	(89)
	2020-2.8	○	○	72	31	36	127
	2020-3.6	○	○	52	31	36	107
	2525-2.8	○	○	87	39	44	158
	2525-3.6	○	○	62	39	44	133
	3232-2.8	○	○	109.6	37.5	53	177
	3232-3.6	○	○	77.6	37.5	53	145
	3620-5.6	○	○	88	34	69	146
	3624-5.6	△	○	—	33	74	(160)
	3636-2.8	○	○	123	30	65	173
	3636-3.6	○	○	87	30	65	137
	4040-2.8	○	○	135.8	30	72	185
	4040-3.6	○	○	95.8	30	72	145
	5050-2.8	○	○	166.8	29.5	89	215
	5050-3.6	○	○	116.8	29.5	89	165

○ : Available △ : Available per request × : Not available

Notes: Please contact THK for more information regarding the model numbers that do not support WW and QZ.
Parentheses indicate the dimensions with QZ but without WW.

Unit: mm

Model No.		WW availability	QZ availability	Dimensions including WW L	Length of protrusion with QZ attached QWL	Outer diameter of protrusion with QZ attached QWD	Dimensions including QZ and WW AL
WGF	0812-3	×	×	—	—	—	—
	1015-3	×	×	—	—	—	—
	1320-3	×	×	—	—	—	—
	1520-1.5	○	○	52	25.5	31	96
	1520-3	○	○	52	25.5	31	96
	1530-1	×	○	—	25.5	31	(84)
	1530-3	×	○	—	25.5	31	(114)
	1540-1.5	×	○	—	25.5	31	(93)
	2040-1	×	○	—	31	36	(103)
	2040-3	×	○	—	31	36	(143.5)
	2060-1.5	×	○	—	31	36	(122)
	2550-1	×	○	—	39	44	(130)
	2550-3	×	○	—	39	44	(180)
	3060-1	×	○	—	37.5	53	(137)
	3060-3	×	○	—	37.5	53	(197)
	3090-1.5	×	○	—	37.5	53	(167)
	4080-1	×	○	—	30	72	(139)
	4080-3	×	○	—	30	72	(219)
	50100-1	×	○	—	29.5	89	(157)
	50100-3	×	○	—	29.5	89	(257)
BNK	0401-3	×	×	—	—	—	—
	0501-3	×	×	—	—	—	—
	0601-3	×	×	—	—	—	—
	0608-3	×	×	—	—	—	—
	0801-3	×	×	—	—	—	—
	0802-3	×	×	—	—	—	—
	0810-3	×	×	—	—	—	—
	1002-3	×	×	—	—	—	—
	1004-2.5	×	×	—	—	—	—
	1010-1.5	×	×	—	—	—	—
	1205-2.5	×	×	—	—	—	—
	1402-3	×	×	—	—	—	—
	1404-3	△	×	—	—	—	—
	1408-2.5	△	○	—	20	33	(86)
	1510-5.6	○	○	51	25.5	31	95
	1520-3	○	○	52	25.5	31	96
	1616-3.6	△	○	—	25.5	31	(93)
	2010-2.5	○	○	54	31.5	43	117
	2020-3.6	○	○	59	31	36	114
	2520-3.6	○	○	60	39	44	131
JPF	1404-4	△	×	—	—	—	—
	1405-4	△	×	—	—	—	—
	1605-4	○	×	60	—	—	—
	2005-6	○	×	80	—	—	—
	2505-6	○	×	80	—	—	—
	2510-4	○	×	112	—	—	—
	2805-6	○	×	80	—	—	—
	2806-6	○	×	90	—	—	—
	3210-6	○	×	135	—	—	—
	3610-6	○	×	138	—	—	—
	4010-6	○	×	138	—	—	—

Unit: mm

Model No.		WW availability	QZ availability	Dimensions including WW L	Length of protrusion with QZ attached QWL	Outer diameter of protrusion with QZ attached QWD	Dimensions including QZ and WW AL
BTK-V	1006-2.6	×	△	—	—	—	—
	1208-2.6	×	△	—	—	—	—
	1404-3.6	△	△	—	—	—	—
	1405-2.6	○	△	40	—	—	—
	1605-2.6	○	△	40	—	—	—
	1808-3.6	△	△	—	—	—	—
	2005-2.6	○	△	40	—	—	—
	2010-2.6	○	△	61	—	—	—
	2505-2.6	○	△	40	—	—	—
	2510-5.3	○	○	98	32.5	45	163
	2806-2.6	○	△	47	—	—	—
	2806-5.3	○	△	65	—	—	—
	3210-2.6	○	○	68	32	57	132
	3210-5.3	○	○	98	32	57	162
	3610-2.6	○	○	70	31	64	132
	3610-5.3	○	○	100	31	64	162
	4010-5.3	○	○	100	34	66	168
	4512-5.3	△	△	—	—	—	—
	5016-5.3	○	○	145	35	79	215
MTF	0601-3.7	×	×	—	—	—	—
	0801-3.7	×	×	—	—	—	—
	0802-3.7	×	×	—	—	—	—
	0805-2.7	×	×	—	—	—	—
	1002-3.7	×	×	—	—	—	—
	1004-2.7	×	×	—	—	—	—
	1202-3.7	×	×	—	—	—	—
	1402-3.7	×	×	—	—	—	—
BLK (Rolled)	0808-3.2	×	×	—	—	—	—
	1010-3.2	×	×	—	—	—	—
	1510-5.6	○	○	51	25.5	31	95
	1616-3.6	△	○	—	25.5	31	(89)
	1616-7.2	△	○	—	25.5	31	(89)
	2020-3.6	○	△	52	—	—	—
	2020-7.2	○	△	52	—	—	—
	2525-3.6	○	△	62	—	—	—
	2525-7.2	○	△	62	—	—	—
	3232-3.6	○	○	77.6	37.5	53	145
	3232-7.2	○	○	77.6	37.5	53	145
	3620-5.6	○	△	88	—	—	—
	3624-5.6	○	△	104	—	—	—
	3636-3.6	△	△	—	—	—	—
	3636-7.2	△	△	—	—	—	—
	4040-3.6	△	△	—	—	—	—
	4040-7.2	△	△	—	—	—	—
	5050-3.6	△	△	—	—	—	—
	5050-7.2	△	△	—	—	—	—

○ : Available △ : Available per request × : Not available

Notes: Please contact THK for more information regarding the model numbers that do not support WW and QZ.
Parentheses indicate the dimensions with QZ but without WW.

Options

Dimensions of Each Model with Options Attached

Unit: mm

Model No.		WW availability	QZ availability	Dimensions including WW L	Length of protrusion with QZ attached QWL	Outer diameter of protrusion with QZ attached QWD	Dimensions including QZ and WW AL
WTF	1520-3	○	○	52	25.5	31	96
	1520-6	○	○	52	25.5	31	96
	1530-2	×	○	—	25.5	31	(84)
	1530-3	×	○	—	25.5	31	(114)
	2040-2	×	△	—	—	—	—
	2040-3	×	△	—	—	—	—
	2550-2	×	△	—	—	—	—
	2550-3	×	△	—	—	—	—
	3060-2	×	○	—	37.5	53	(137.5)
	3060-3	×	○	—	37.5	53	(197.5)
	4080-2	×	△	—	—	—	—
	4080-3	×	△	—	—	—	—
	50100-2	×	△	—	—	—	—
	50100-3	×	△	—	—	—	—
CNF	1530-6	×	○	—	25.5	31	(114)
	2040-6	×	△	—	—	—	—
	2550-6	×	△	—	—	—	—
	3060-6	×	○	—	37.5	53	(197)

Unit: mm

Model No.		WW availability	QZ availability	Dimensions including WW L	Length of protrusion with QZ attached QWL	Outer diameter of protrusion with QZ attached QWD	Dimensions including QZ and WW AL
BNT (Both precision and rolled)	1404-3.6	○	×	35	—	—	—
	1405-2.6	○	×	35	—	—	—
	1605-2.6	○	○	36	29	31	94
	1808-3.6	○	○	56	20	49	96
	2005-2.6	○	○	35	27	38	89
	2010-2.6	○	○	58	27	38	112
	2505-2.6	○	○	35	27	39	89
	2510-5.3	○	○	94	32.5	45	159
	2806-2.6	○	○	42	31	42	104
	2806-5.3	○	○	67	31	42	129
	3210-2.6	○	○	64	40	49	144
	3210-5.3	○	○	94	40	49	174
	3610-2.6	○	○	64	31	64	126
	3610-5.3	○	○	96	31	64	158
	4512-5.3	○	○	115	33	67	181

○ : Available △ : Available per request × : Not available

Notes: Please contact THK for more information regarding the model numbers that do not support WW and QZ.
Parentheses indicate the dimensions with QZ but without WW.

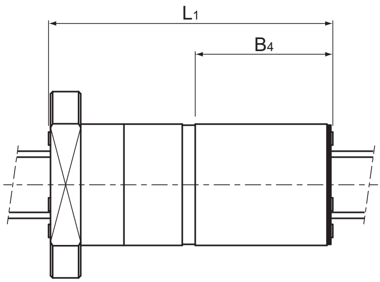
Model number coding

BIF2505V-5 QZ WW G0 +1000L C5

QZ: With QZ Lubricator
WW: With wiper ring W

Note: QZ Lubricator and wiper ring W are not sold alone.

Ball Screw Nut Dimensions with Canvas Seal



Unit: mm

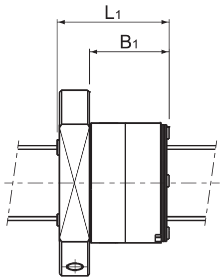
Model No.	SDA-V_TT (with thin film seal)		SDA-V_CC (with canvas seal)	
	L_1	B_4	L_1	B_4
SDAN 3110V-5	135	62	136	63
SDAN 3112V-5	158	72	159	72
SDAN 3116V-5	189	90	190	91
SDAN 3120V-5	232	109	233	110
SDAN 3205V-4	62	29	62	29
SDAN 3206V-5	84	39	85	40
SDAN 3208V-5	108	49	108	49
SDAN 3210V-5	121	58	122	59
SDAN 3210VA-5	135	62	136	63
SDAN 3212VA-5	158	72	160	72
SDAN 3216VA-5	189	90	190	91
SDAN 3220VA-5	232	109	233	110
SDAN 3606V-4	72	33	73	34
SDAN 3610V-5	135	62	136	63
SDAN 3612V-5	158	72	159	72
SDAN 3616V-5	189	90	190	91
SDAN 3620V-5	232	109	233	110
SDAN 3810V-5	135	62	136	63
SDAN 3812V-5	158	71	159	72
SDAN 3816V-5	189	90	190	91
SDAN 3820V-5	232	109	233	110
SDAN 4008VX-5	111	52	111	52
SDAN 4010VA-5	135	62	136	63
SDAN 4012VA-5	158	72	160	72
SDAN 4016VA-5	189	90	190	91
SDAN 4020VA-5	232	109	233	110
SDAN 4510V-5	135	62	136	63
SDAN 4510VA-5	135	62	136	63
SDAN 4512V-5	158	72	159	72
SDAN 4512VA-5	158	72	160	72
SDAN 4516V-5	189	90	190	91
SDAN 4516VA-5	189	90	190	91

Unit: mm

Model No.	SDA-V_TT (with thin film seal)		SDA-V_CC (with canvas seal)	
	L_1	B_4	L_1	B_4
SDAN 4520V-5	232	109	233	110
SDAN 4520VA-5	232	109	233	110
SDAN 5010V-5	135	62	136	63
SDAN 5010VA-5	135	62	136	63
SDAN 5012V-5	158	72	159	72
SDAN 5012VA-5	158	72	160	72
SDAN 5016V-5	189	90	190	91
SDAN 5016VA-5	189	90	190	91
SDAN 5020V-5	232	109	233	110
SDAN 5020VA-5	232	109	233	110
SDAN 5025V-4	235	108	237	108
SDAN 5025VA-4	235	108	237	108
SDAN 5030V-4	265	128	266	128
SDAN 5030VA-4	265	128	267	128
SDAN 5040V-3	268	126	270	126
SDAN 5040VA-3	269	126	270	126
SDAN 5510VX-4	115	52	116	53
SDAN 5510VAX-4	115	52	116	53
SDAN 5512VX-4	134	60	135	60
SDAN 5512VAX-4	134	60	135	60
SDAN 5516VX-4	157	74	158	75
SDAN 5516VAX-4	157	74	158	75
SDAN 5520VX-4	192	89	193	90
SDAN 5520VAX-4	192	89	193	90
SDAN 6310VX-4	115	52	116	53
SDAN 6312VX-4	135	61	143	64
SDAN 6316VX-4	158	75	165	79
SDAN 6320VX-4	193	90	200	94
SDAN 6325VX-4	237	109	244	113
SDAN 6330VX-4	266	128	273	132
SDAN 6340VX-3	269	126	276	130

Options

Dimensions of Each Model with Options Attached



Unit: mm

Model No.	SDA-V_TT (with thin film seal)		SDA-V_CC (with canvas seal)	
	L_1	B_1	L_1	B_1
SDA1004VZ-4	24	16	—	—
SDA1005VZ-4	28	20	—	—
SDA1010VZ-3	37	29	—	—
SDA1205VZ-3	25	17	—	—
SDA1210VZ-2	29	21	—	—
SDA1220VZ-2	47	39	—	—
SDA1230VZ-2	65	57	—	—
SDA1405V-4	30	20	31	21
SDA1505V-3	25	15	26	16
SDA1510V-3	38	28	39	29
SDA1520V-4	46	36	47	37
SDA1530V-4	65	55	65	55
SDA1605V-3	25	15	26	16
SDA1610V-3	39	29	40	30
SDA1616V-3	56	46	56	46
SDA2004V-4	27	17	27	17
SDA2005V-3	27	17	27	17
SDA2006V-4	35	25	36	26
SDA2010V-3	40	30	41	31
SDA2010V-6	40	30	41	31
SDA2020V-3	67	57	68	58
SDA2020V-6	67	57	68	58
SDA2030V-2	66	56	67	57
SDA2040V-2	84	74	85	75
SDA2060V-2	63	53	—	—
SDA2505V-3	27	17	27	17
SDA2510V-3	40	30	41	31
SDA2520V-3	67	57	68	58
SDA2525V-3	82	72	82	72
SDA2530V-2	66	56	66	56
SDA2530V-4	66	56	66	56
SDA2550V-2	102	92	103	93
SDA2806V-5	42	30	43	31
SDA3110V-5	65	50	66	51
SDA3112V-5	74	59	75	60
SDA3116V-5	93	78	94	79

Unit: mm

Model No.	SDA-V_TT (with thin film seal)		SDA-V_CC (with canvas seal)	
	L_1	B_1	L_1	B_1
SDA3120V-5	112	97	113	98
SDA3132V-2	73	58	74	59
SDA3205V-4	32	20	32	20
SDA3206V-5	42	30	43	31
SDA3208V-5	52	40	52	40
SDA3210V-5	61	49	62	50
SDA3210VA-5	65	50	66	51
SDA3212VA-5	74	59	76	61
SDA3216VA-5	93	78	94	79
SDA3220VA-5	112	97	113	98
SDA3232VA-2	73	58	75	60
SDA3610V-5	65	50	66	51
SDA3612V-5	74	59	75	60
SDA3616V-5	93	78	94	79
SDA3620V-5	112	97	113	98
SDA3636V-2	81	66	83	68
SDA3810V-5	65	50	66	51
SDA3812V-5	74	59	75	60
SDA3815V-5	88	73	89	74
SDA3816V-5	93	78	94	79
SDA3820V-5	112	97	113	98
SDA3825V-4	111	96	112	97
SDA3830V-3	100	85	101	86
SDA3840V-2	87	72	89	74
SDA4008VZ-5	55	41	55	41
SDA4010VA-5	65	50	66	51
SDA4012VA-5	74	59	76	61
SDA4015VA-5	88	74	90	74
SDA4016VA-5	93	78	94	79
SDA4020VA-5	112	97	113	98
SDA4020VA-10	112	97	113	98
SDA4025VA-4	112	97	113	98
SDA4030VA-3	101	86	102	87
SDA4030VA-6	101	86	102	87
SDA4040VA-2	88	73	89	74

Unit: mm

Model No.	SDA-V_TT (with thin film seal)		SDA-V_CC (with canvas seal)	
	L_1	B_1	L_1	B_1
SDA4040VA-4	88	73	89	74
SDA4510V-5	65	48	66	49
SDA4510VA-5	65	48	66	49
SDA4512V-5	74	57	75	58
SDA4512VA-5	74	57	76	59
SDA4516V-5	93	76	94	77
SDA4516VA-5	93	76	94	77
SDA4520V-5	112	95	113	96
SDA4520VA-5	112	95	113	96
SDA4520VA-10	112	95	113	96
SDA4525V-4	110	93	112	95
SDA4525VA-4	110	93	112	95
SDA4530V-4	130	113	132	115
SDA4530VA-4	131	114	132	115
SDA4540V-3	129	112	130	113
SDA4540VA-3	129	112	130	113
SDA5010V-5	65	48	66	49
SDA5010VA-5	65	48	66	49
SDA5012V-5	74	57	75	58

Unit: mm

Model No.	SDA-V_TT (with thin film seal)		SDA-V_CC (with canvas seal)	
	L_1	B_1	L_1	B_1
SDA5012VA-5	74	57	76	59
SDA5016V-5	93	76	94	77
SDA5016VA-5	93	76	94	77
SDA5020V-5	112	95	113	96
SDA5020V-10	112	95	113	96
SDA5020VA-5	112	95	113	96
SDA5020VA-10	112	95	113	96
SDA5025V-4	110	93	112	95
SDA5025VA-4	110	93	112	95
SDA5025VA-8	110	93	112	95
SDA5030V-4	130	113	131	114
SDA5030VA-4	130	113	132	115
SDA5030VA-8	130	113	132	115
SDA5040V-3	128	111	130	113
SDA5040VA-3	129	112	130	113
SDA5040VA-6	129	112	130	113
SDA5050V-2	107	90	108	91
SDA5050VA-2	107	90	108	91

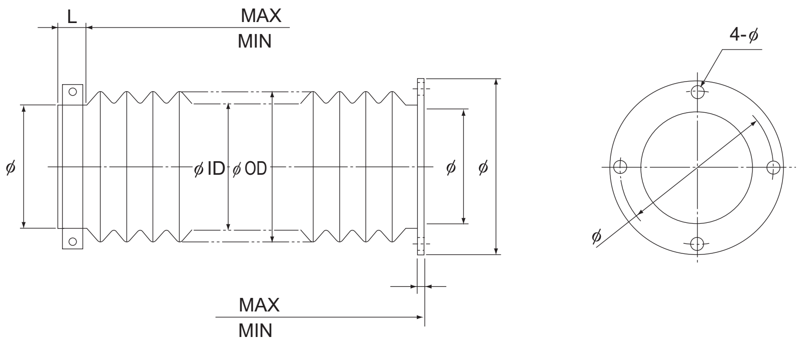
Model number coding

SDA2505V-3 CC G0 +1000L C5

With canvas seal

Specifications of the Bellows

Bellows are available as a contamination protection accessory. Use this specification sheet.



(Band type)　(Flange type)

Specifications of the Bellows

Ball screw model number:

Dimensions of the bellows

Stroke:(　　　　　) mm　　MAX:(　　　　　) mm　　MIN:(　　　　　) mm

Permissible outer diameter:(ϕ OD　　　　　) mm　Desired inner diameter:(ϕ ID　　　　　)mm

---

How it is used

Installation direction:(horizontal, vertical, slanted)　Speed:(　　　)mm/sec.　mm/min.

Motion:(reciprocation, vibration)

Conditions

Resistance to oil and water:(necessary, unnecessary)　　Oil name (　　　　　　)

Chemical resistance: Name (　　　　　　　　　　) × (　　　　) %

Location:(indoor, outdoor)

Remarks:

Number of units to be manufactured:

Model Number Coding

The model number configuration for ball screws differs depending on the type. Refer to the corresponding configuration example shown in Table 1 to Table 3.
THK can also provide shaft end shapes matched to support units. These can also be denoted in the symbols, which should be used for this purpose.

Precision Ball Screw Types and Sample Model Number Configurations

Table 1

	Model No.		Shaft end shape	Model number coding
Precision	SBN-V, SBK, SBKN, SDAN-V, SDA-V, HBN-V/HBN-K/HBN-KA/HBN, SBKH, BIF-V, BNFN-V/BNFN, MDK, MBF, BNF-V/BNF, DIK, DKN, BLW, DK, WHF, BLK, WGF, BNT		Fixed side: H, J Supported side: K	1
	Finished shaft ends	BNK	Y	2
	Unfinished shaft ends A	MBF, MDK, BNF, BIF	Fixed side: H, J Supported side: K	3
	Unfinished shaft ends B	BNF, BIF		
	Rotary ball screw	BLR, DIR		4
	Ball screw/spline	BNS-V, BNS-A, BNS, NS-V, NS-A, NS	—	5

Rolled Ball Screw Types and Sample Model Number Configurations

Table 2

	Model No.		Shaft end shape	Model number coding
Rolled	Ball screw nut and screw shaft combination products	JPF, BTK-V, MTF, BLK, WTF, CNF, BNT	Fixed side: H, J Supported side: K	6
	Rotary ball screw	BLR		7
	Standalone screw shafts	TS		8
	Standalone ball screw nuts	BTK-V, BLK, WTF, CNF, BNT, BLR	—	

Support Unit, Nut Bracket, and Lock Nut Types and Sample Model Number Configurations

Table 3

Model No.		Shaft end shape	Model number coding
Support unit	EK, BK, FK, EF, BF, FF	—	9
Nut brackets for BNK	MC	—	
Lock nut	RN	—	

1. Precision Ball Screw

- **Models SBN-V, SBK, SBKN, SDAN-V, SDA-V, HBN-V/HBN-K/HBN-KA/HBN, SBKH, BIF-V, BNFN-V/BNFN, MDK, MBF, BNF-V/BNF, DIK, DKN, BLW, DK, WHF, BLK, WGF, and BNT**

BIF 25 05 -5 RR G0 + 620L C5 - H1K - G

- BIF: Model No.
- 25: Screw shaft outer diameter (in mm)
- 05: Lead (in mm)
- -5: No. of circuits (rows × turns)
- RR: Seal symbol
  - No symbol: without seal
  - RR: labyrinth seal on both ends[3]
  - TT: with thin film seals on both sides (for SDAN-V, SDA-V only)[3]
  - CC: with canvas seals on both sides (for SDAN-V, SDA-V or HBN-V only)[3]
- G0: Symbol for clearance in the axial direction
- 620L: Overall screw shaft length (in mm)
- C5: Accuracy symbol
- H1K: Recommended Shaft Ends Shapes[2]
  - H, J: fixed side symbol
  - K: supported side symbol
- G: Direction of nut flange orientation
  - No symbol: faces fixed side
  - G: faces supported side[1]

[1] 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.
[2] See A**15-344** to A**15-349**.
[3] See A**15-356**, A**15-357**.

2. Precision Ball Screw Finished Shaft Ends

- **Model BNK**

BNK2010-2.5RRG2+699LC7Y

- Y: Finished shaft ends code

Note: Refer to A**15-152** for the corresponding model number.

3. Precision Ball Screw Unfinished Shaft Ends

● **Models BIF, MDK, MBF, and BNF**

BIF2505-5RRG0+720LC5A

A: Unfinished shaft ends code (A or B)

Note: Refer to A15-196 for the corresponding model number.

4. Rotary Ball Screw

● **Models BLR and DIR**

BLR2020-3.6 K UU G1 +1000L C5

- BLR2020-3.6: Model No.
- K: Flange orientation symbol
- UU: Symbol for support bearing seal
- G1: Symbol for clearance in the axial direction
- +1000L: Overall screw shaft length (in mm)
- C5: Accuracy symbol

5. Ball Screw/Spline

● **Models BNS-V, BNS-A, BNS, NS-V, NS-A, and NS**

BNS2525 +600L C5

- BNS2525: Model No.
- +600L: Overall shaft length (in mm)
- C5: Accuracy symbol

6. Rolled Ball Screw

● Models BTK-V, MTF, BLK, WTF, CNF, and BNT (Rolled)

• Combination of the Ball Screw Nut and the Screw Shaft

BTK1405V-2.6 ZZ +500L C7 T - H1K - G

- BTK1405V-2.6: Model No.
- ZZ: Seal symbol
  - No symbol: without seal
  - ZZ: brush seal attached to both ends of the ball screw nut (see A15-356)
- +500L: Overall screw shaft length (in mm)
- C7: Accuracy symbol (see A15-12) (no symbol for class C10)
- T: Symbol for rolled shaft
- H1K: Recommended shaft End shape (see A15-344 onward)
- G: Direction of nut flange orientation
  - No symbol: faces fixed side
  - G: faces supported side[1]

[1] The ball nut flange faces the fixed side unless otherwise specified.
If desiring the flange to face the supported side, add symbol G at the end of the ball screw model number when placing an order.

6. Rolled Ball Screw

● Model JPF

• Rolled Ball Screw model JPF

JPF1404-4 RR G0 +500L C7 T

- JPF1404-4: Model number
- RR: Seal symbol
  - No symbol: without seal
  - RR: Labyrinth seal attached to both ends of the ball screw nut (see A15-356)
- G0: Axial clearance symbol
- +500L: Overall screw shaft length (in mm)
- C7: Accuracy symbol (see A15-12) (no symbol for class C10)
- T: Symbol for rolled shaft

7. Rolled Rotary Ball Screw

● Model BLR (Rolled)

BLR2020-3.6 K UU +1000L C7 T

- BLR2020-3.6: Model No.
- K: Flange orientation symbol
- UU: Symbol for support bearing seal
- +1000L: Overall screw shaft length (in mm)
- C7: Accuracy symbol
- T: Symbol for rolled Ball Screw

Note: For clearance in the axial direction, see A15-19.

8. Standalone Rolled Shafts Nuts

● **Models BTK-V, BLK/WTF, CNF, BNT(Rolled), BLR(Rolled), and TS**

Rolled shaft only

TS 14 05 +500L C7

- TS: Symbol for rolled ball screw shaft
- 14: Screw shaft outer diameter (in mm)
- 05: Lead (in mm)
- +500L: Overall screw shaft length (in mm)
- C7: Accuracy symbol (see page A**15-12**) (no symbol for class C10)

Nut only

BTK1405V-2.6 ZZ

- BTK1405V-2.6: Model No.
- ZZ: Seal symbol
  no symbol: without seal
  ZZ: brush seal attached to both ends of the ball screw nut (see A**15-356**)

9. Support Units, Nut Brackets and Lock Nuts

● **Models EK, BK, FK, EF, BF, FF, MC, and RN**

EK12

- EK12: Model No.

10. Ball Screw Options, W Wiper Rings and QZ Lubricators

BIF2505V-5 QZ WW G0 +1000L C5

- QZ: With QZ Lubricator
- WW: With wiper ring W

Note: See A**15-366**.

Notes on Ordering

Options

The details of the product options differ according to the model number. Check before ordering. See A**15-355**.

Other Notes on Specifications

Contact THK separately for information on the specifications below.

- Shaft end shape (for recommended shaft end shapes, indicate the symbol).
- Surface treatment (see B**0-20**)
- Grease used
- Nipple mounting

Handling

(1) Please use at least two people to move any product weighing 20 kg or more, or use a cart or another method of conveyance. Otherwise, it may cause injury or damage the unit.
(2) Do not disassemble the parts. This will result in loss of functionality.
(3) Tilting the screw shaft and nut may cause them to fall under their own weight.
(4) Take care not to drop or strike this product. Otherwise, it may cause injury or damage the unit. Even if there is no outward indication of damage, a sudden impact could prevent the unit from functioning properly.
(5) Do not remove the nut from the screw shaft during set up.
(6) Wear appropriate safety gear, such as protective gloves and safety shoes, when handling the product.

Precautions on Use

(1) Prevent foreign material, such as cutting chips or coolant, from entering the product. Failure to do so could damage the product.
(2) If the product is used in an environment where cutting chips, coolant, corrosive solvents, water, etc., may enter the product, use bellows, covers, etc., to prevent them from entering the product.
(3) Do not use the product at temperature of 80℃ or higher. Exposure to such temperatures may deform or damage plastic and rubber parts.
(4) If foreign material such as cutting chips adheres to the product, replenish the lubricant after cleaning the product.
(5) Slight oscillations can inhibit the formation of an oil film between the raceways and the area of contact for the balls, resulting in fretting. Therefore, be sure to use a type of grease with high fretting resistance. We recommend periodically rotating the nut once to help ensure that a film forms between the raceways and balls.
(6) When using the return-pipe or return-piece type ball screw in a horizontal orientation, there is a difference in torque on the outbound and inbound cycle depending on the mounting orientation of the circulation part (return pipe or return piece). To use the product with a consistent torque, we recommend designing the product with the mounting orientation of the circulation part facing downwards.
(7) Do not forcibly drive a pin, key, or other positioning device into the product. This could create indentations on the raceway and impair the product’s function.
(8) If offset or skewing occurs with the ball screw shaft support or the ball screw nut, it may substantially shorten the service life. Pay attention to mounted components and to mounting accuracy.
(9) If any rolling elements fall out, contact THK. Do not use the product in that condition.
(10) When using this product with a vertical orientation, take preventive measures such as adding a safety mechanism to prevent falls. The ball screw nut may fall by its own weight.
(11) Do not use this product beyond its permissible rotational speed. This could damage the product or otherwise cause it to malfunction. Be sure to use the product within the specification range designated by THK.
(12) Do not allow the ball screw nut to overshoot. The product may malfunction if any of the balls fall out, the circulation components become damaged, or any indentations form in the ball raceways. Continuing to use the product in this condition may lead to premature wear or damage to circulating parts.

(13) Use a ball screw in conjunction with a guide element such as an LM Guide or ball spline. Failure to do so could damage the product.
(14) If the mounting material lacks sufficient rigidity or accuracy, the bearing load may be focused in one area, and bearing functionality will dramatically decrease. Therefore, carefully consider the rigidity and accuracy of the housing and base, and the strength of the securing bolts.

Lubrication

(1) Thoroughly remove anti-rust oil and apply lubricant before using the product.
(2) Do not mix different lubricants. Even greases containing the same type of thickening agent may, if mixed, interact negatively due to disparate additives or other ingredients.
(3) When using the product in locations exposed to constant vibrations or in special environments such as clean rooms, vacuums, and extreme heat or cold, use a lubricant suitable for its use/environment.
(4) When lubricating a product having no grease nipple or lubrication hole, apply grease directly on the raceway and stroke the product several times to let the grease spread inside.
(5) The consistency of grease changes according to the temperature. Please keep in mind that the torque of the ball screw may be affected by changes in viscosity.
(6) After lubrication, the rotational torque of the ball screw may increase due to the stirring resistance of the grease. Be sure to perform a warm-up operation and allow the grease to break in sufficiently before operating the machine.
(7) Excess grease may spatter after lubrication. Wipe off spattered grease as necessary.
(8) Grease deteriorates over time, which decreases the lubricity, so perform regular grease inspections and replenish grease based on frequency of use.
(9) Although the lubrication interval may vary according to operating conditions and the service environment, lubrication should be performed approximately every 100 km in travel distance (three to six months). The final lubrication interval/amount should be set at the actual machine.
(10) There is a risk that lubrication may not work sufficiently if the lubricating oil does not circulate due to the mounting orientation or the oiling port of the nut, so be sure to give these factors adequate consideration during design.
(11) It is necessary to provide adequate lubrication when using ball screws. Using the product without lubrication may increase wear on the rolling elements and shorten the service life.
Table 1 (B **15-108**) shows a guideline for the feed amount of oil.

Storage

When storing the ball screw, pack it as designated by THK and store it indoors in a horizontal position away from high or low temperatures and high humidity.
Please note that if the product has been kept in storage for an extended period, the lubricant inside may have deteriorated. Please ensure that you replenish the lubricant before use.
If you request that we do not apply anti-rust oil to a product, please be aware that it may rust due to the storage environment or length of storage.

Disposal

The product should be treated as industrial waste and disposed of appropriately.

Handling Precautions for Optional Accessories for the Ball Screw

QZ Lubricator for the Ball Screw

For details regarding the QZ Lubricator, see A15-364.

Selection Precautions

Make sure the stroke length exceeds the total length of the screw shaft with the QZ Lubricator attached.

Handling

Take care not to drop or strike the product.
Keep air holes clear of grease or other obstructions.
The QZ Lubricator lubricates the raceway only, so it must be used in combination with regular greasing or oil lubrication.
In models equipped with the QZ Lubricator, raceways are provided with the minimum required level of lubrication. Please note: Use of the product in a vertical position, or other operating conditions, may cause lubricant to drip from the ball screw shaft.

Service Environment

Be sure the service temperature of this product is between –10 and 50℃, and do not clean the product by immersing it in an organic solvent or kerosene, or leave it unpacked.