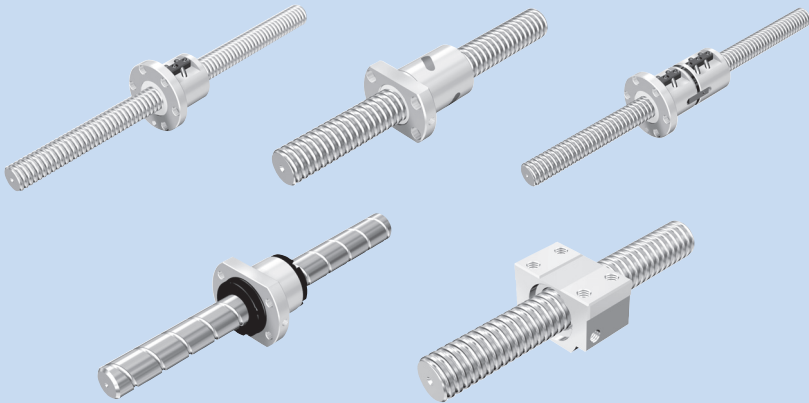


Precision Ball Screw

Models BIF, DIK, BFN, DKN, BLW, BNF, DK, MDK,
BLK/WGF and BNT



Structure and Features	▶▶▶ A-765
Types and Features	▶▶▶ A-769
Service Life	▶▶▶ A-704
Axial Clearance	▶▶▶ A-685
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Dimensional Drawing, Dimensional Table (Preload Type)	▶▶▶ B-652
Dimensional Drawing, Dimensional Table (No Preload Type)	▶▶▶ B-686
Model number coding	▶▶▶ B-718

For THK Precision Ball Screws, a wide array of precision-ground screw shafts and ball screw nuts are available as standard to meet diversified applications.

Structure and Features

[Combinations of Various shaft Diameters and Leads]

You can select the combination of a shaft diameter and a lead that meet the intended use from the various nut types and the screw shaft leads. Those nut types include the return-pipe nuts, which represent the most extensive variations among the series, the compact simple nuts and the large-lead end-cap nuts.

[Standard-stock Types (with Unfinished Shaft Ends/Finished Shaft Ends) are Available]

The unfinished shaft end types, which are mass manufactured by cutting the standardized screw shafts to the standard lengths, and those with finished shaft ends, for which the screw shaft ends are machined to match the corresponding the support units, are available as the standard.

[Accuracy Standards Compliant with JIS (ISO)]

The accuracy of the Ball Screw is controlled in accordance with the JIS standards (JIS B1192-1997).

	Precision Ball Screw						Rolled Ball Screw	
Accuracy grades	C0	C1	C2	C3	C5	C7	C8	C10

Type	Series symbol	Grade	Remarks
For positioning	C	0, 1, 3, 5	JIS series
	Cp	1, 3, 5	ISO compliant
For conveyance	Ct	1, 3, 5, 7, 10	

[Options that Meet the Environment are Available]

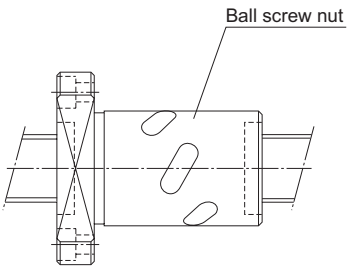
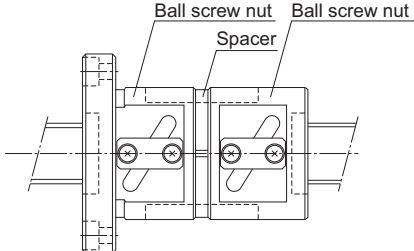
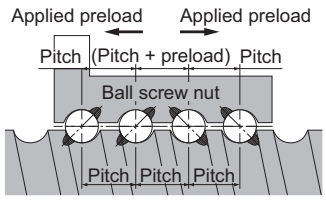
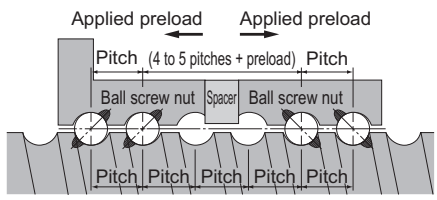
Options are available consisting of a lubricator (QZ), which enables the maintenance interval to be significantly extended, and a wiper ring (W), which improves the ability to remove foreign materials in adverse environments.

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

The Simple-Nut Ball Screw model DIK is an offset preload type in which a phase is provided in the middle of a single ball screw nut, and an axial clearance is set at a below-zero value (under a preload).

Model DIK has a more compact structure and allows smoother motion than the conventional double-nut type (spacer inserted between two nuts).

[Comparison between the Simple Nut and the Double-Nuts]

Simple-Nut Ball Screw Model DIK	Conventional Double-Nut Type Ball Screw Model BFN
	
Preloading Structure	
 <p style="text-align: center;">Screw shaft</p>	 <p style="text-align: center;">Screw shaft</p>

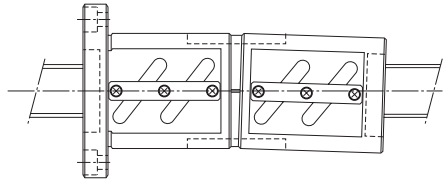
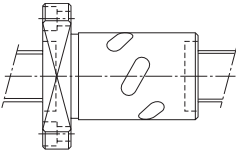
Simple-Nut Ball Screw Model DIK

Conventional Double-Nut Type Ball Screw Model BNFN

Rotational Performance

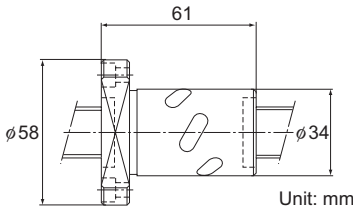
The preload adjustment with Simple Nut Ball Screw model DIK is performed according to the ball diameter. This eliminates the inconsistency in the contact angle, which is the most important factor of the Ball Screw performance. It also ensures the high rigidity, the smooth motion and the high wobbling accuracy.

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

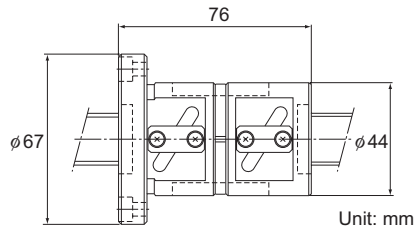


Dimensions

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

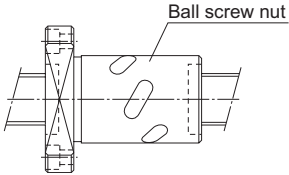
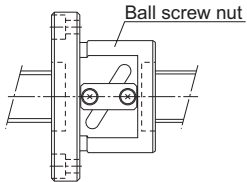
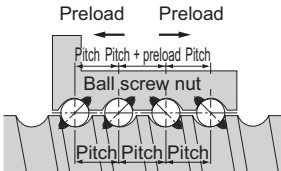
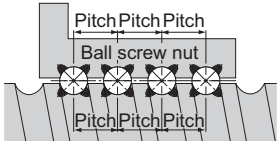
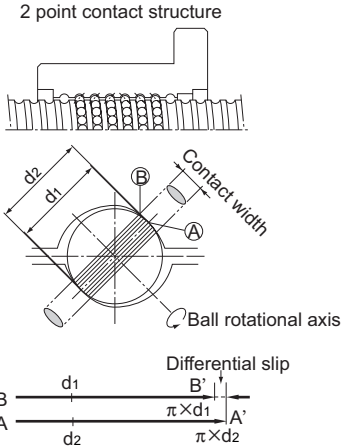
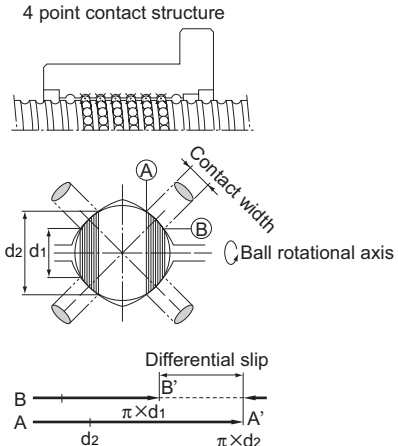


Model DIK 2005-6



Model BNFN 2005-2.5

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

Simple-Nut Ball Screw Model DIK	Conventional Oversize Preload Nut Ball Screw Model BNF
	
Preloading Structure	
	
Accuracy Life	
<p>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 shaft. As a result, no differential slip or spin occurs, thus to minimize the increase in the rotational torque and the generation of heat. Accordingly, a high level of accuracy can be maintained over a long period.</p> <p style="text-align: center;">2 point contact structure</p> 	<p>With the oversize preload nut Ball Screw, a preload is provided through the balls each in contact with the raceway at four points. This causes differential slip and spin to increase the rotational torque, resulting in an accelerated wear and a heat generation. Therefore, the accuracy deteriorates in a short period.</p> <p style="text-align: center;">4 point contact structure</p> 

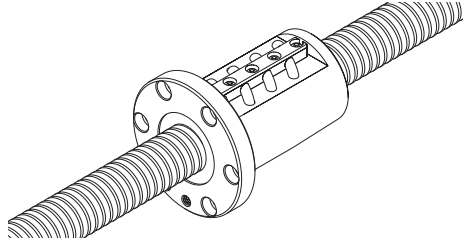
Types and Features

[Preload Type]

Model BIF

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

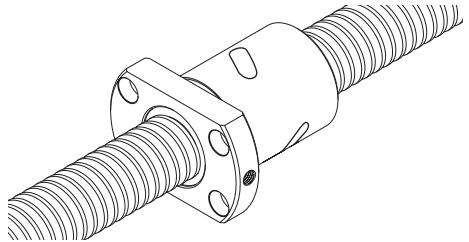
Specification Table⇒B-652



Model DIK

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

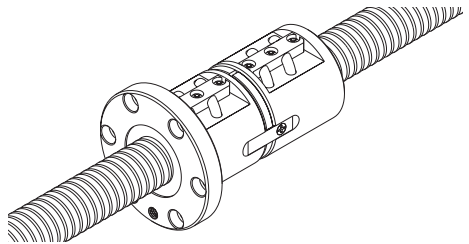
Specification Table⇒B-652



Model BNFN

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

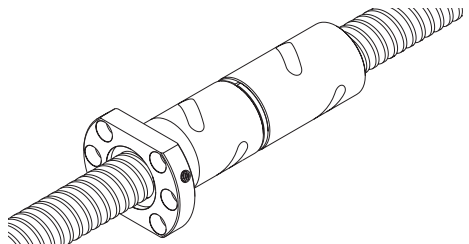
Specification Table⇒B-652



Model DKN

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

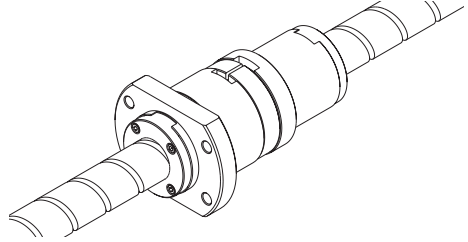
Specification Table⇒B-672



Model BLW

Specification Table⇒B-652

Since a preload is provided through a spacer between two large lead nuts, high-speed feed without backlash is ensured.

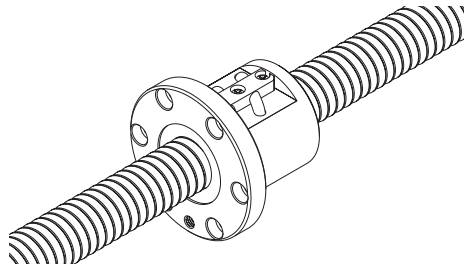


[No Preload Type]

Model BNF

Specification Table⇒B-686

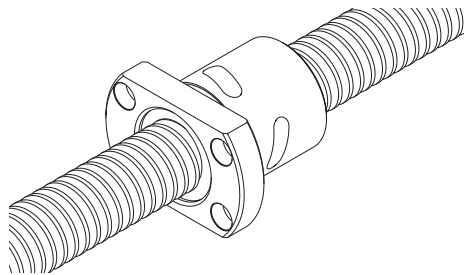
The simplest type with a single ball screw nut. It is designed to be mounted using the bolt holes drilled on the flange.



Model DK

Specification Table⇒B-686

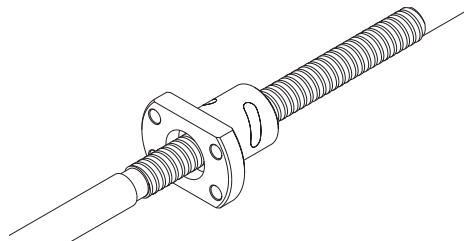
The most compact type, with a ball screw nut diameter 70 to 80% of that of the return-pipe nut.



Model MDK

Specification Table⇒B-686

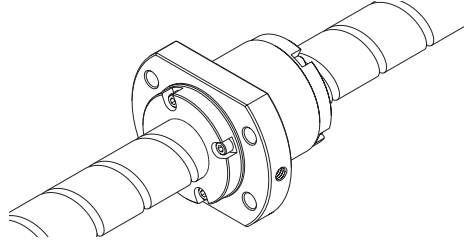
This model is a miniature nut with a screw shaft diameter of $\phi 4$ to 14 mm and a lead of 1 to 5 mm.



Models BLK/WGF

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

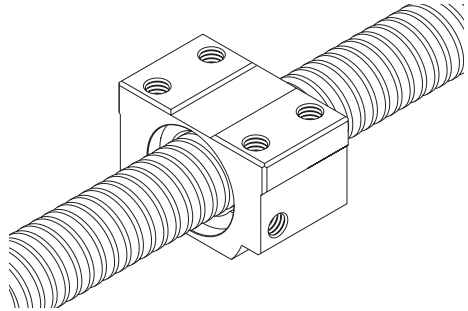
Specification Table⇒B-686



Square Ball Screw Nut Model BNT

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

Specification Table⇒B-716



Service Life

For details, see A-704.

Axial Clearance

For details, see A-685.

Accuracy Standards

For details, see A-678.