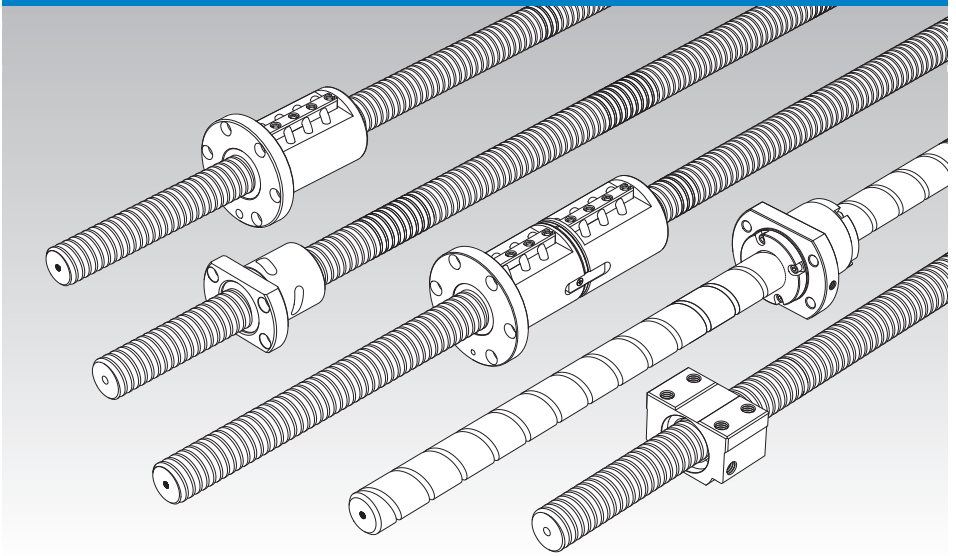
Precision Ball Screw

Models BIF-V, DIK, BNFN-V/BNFN, DKN, BLW, BNF-V/BNF, DK, MDK, WHF, BLK/WGF and BNT



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.

[Screw Shaft Standard Products (Unfinished Shaft Ends/Finished Shaft Ends) 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 support units, are available as the standard.

[Accuracy Standards Compliant with JIS (ISO)]
The precision of the ball screw is controlled in accordance with JIS standards (JIS B1192-1997) and ISO 3408.

	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 transport	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.

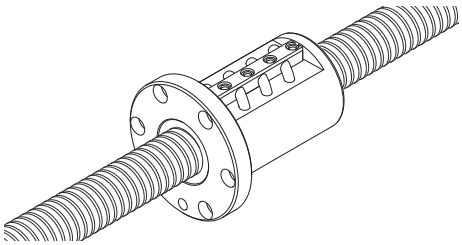
Types and Features

[Preload Type]

Model BIF-V

Specification Table⇒A15-192

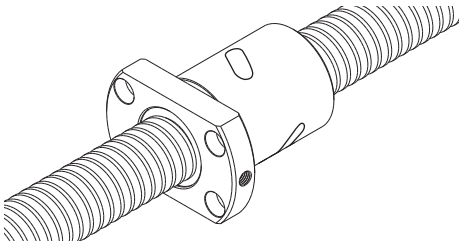
The right and the left screws are provided with a phase in the middle of the ball screw nut, and an axial clearance is set at a below-zero value (under a preload). This compact model is capable of a smooth motion.The Model BIF-V has improved DN values in comparison with the conventional Model BIF. (DN values: Small: 100,000, Medium: 130,000)



Model DIK

Specification Table⇒A15-198

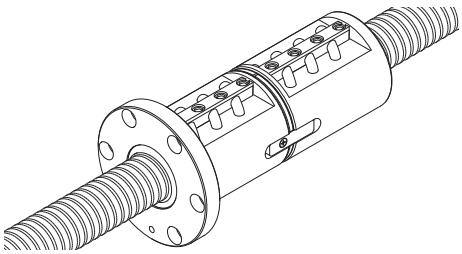
The right and the left screws are provided with a phase in the middle of the ball screw nut, and an axial clearance is set at a below-zero value (under a preload). This compact model is capable of a smooth motion.



Models BNFN-V/BNFN

Specification Table⇒A15-204

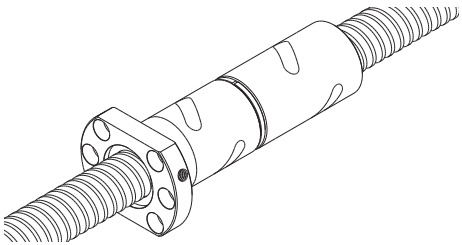
The most common type with a preload provided via a spacer between the two combined ball screw nuts to eliminate the backlash. It can be mounted using the bolt holes drilled on the flange.The Model BNFN-V has improved DN values in comparison with the conventional Model BNFN. (DN values: Small: 100,000, Medium: 130,000)



Model DKN

Specification Table⇒A15-210

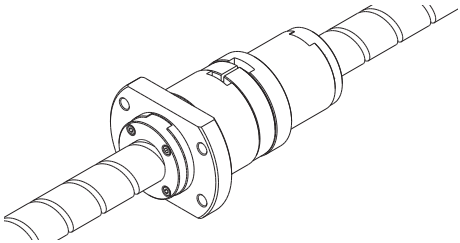
A preload is provided via a spacer between the two combined ball screw nuts to achieve a below-zero axial clearance (under a preload).



Model BLW

Specification Table⇒A15-211

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

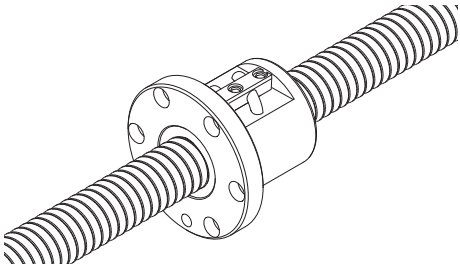


[No Preload Type]

Models BNF-V/BNF

Specification Table⇒A15-212

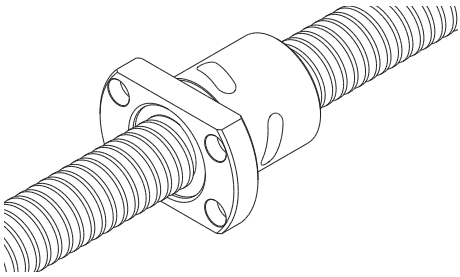
The simplest type with a single ball screw nut. It is designed to be mounted using the bolt holes drilled on the flange.The Model BNF-V has improved DN values in comparison with the Model BNF. (DN values: Small: 100,000, Medium: 130,000)



Model DK

Specification Table⇒A15-222

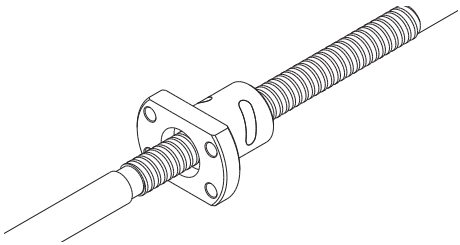
The most compact type, with a ball screw nut diameter 70 to 80% of that of the return-pipe nut.



Model MDK

Specification Table⇒A15-230

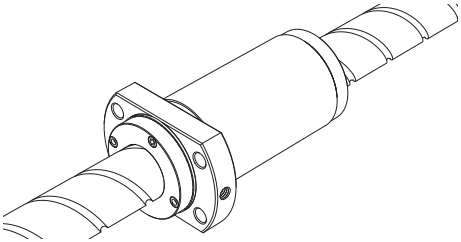
A miniature type with a screw shaft diameter of ϕ4 to ϕ14 mm and a lead of 1 to 5mm.



Model WHF

Specification Table⇒A15-231

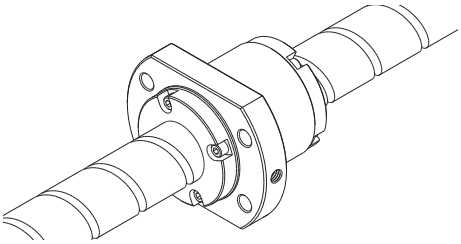
This Ball Screw for high-speed feed achieves a DN value of 120,000 by using a new circulation structure.
Since the nut outer diameter and the mounting holes of this model are dimensionally interchangeable with the previous model WGF, model WGF can be replaced with this model. (WHF1530, WHF2040 and WHF2550)



Models BLK/WGF

Specification Table⇒A15-232

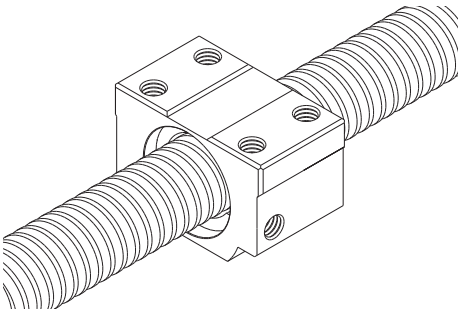
With model BLK, the shaft diameter is equal to the lead dimension. Model WGF has a lead dimension 1.5 to 3 times longer than the shaft diameter.



Square Ball Screw Nut Model BNT

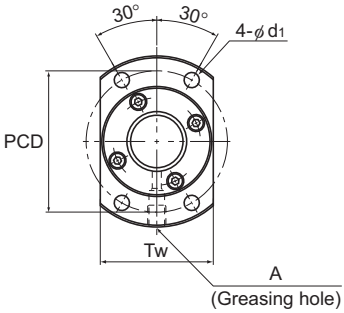
Specification Table⇒A15-236

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

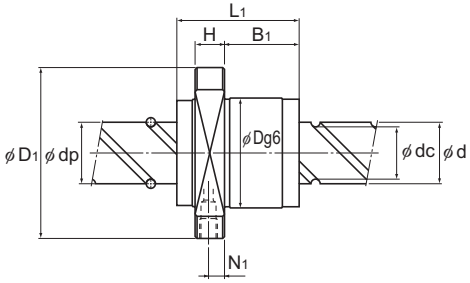


WGF
No Preload

DN value	70000



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

Note) Model WGF cannot be attached with seal.
The overall length of the nut will increase when equipping the QZ lubricating device. See **A15-356** for further details.
For model number coding, see **A15-238**.

Options⇒A15-345