SUBSCRIBE TO NSK NEWSLETTER

MOTION & CONTROL™

NSK

NSK Ball Screws for High-Load Drive

NSKTAC Series of Ball Screw Support Bearings for High-Load Applications

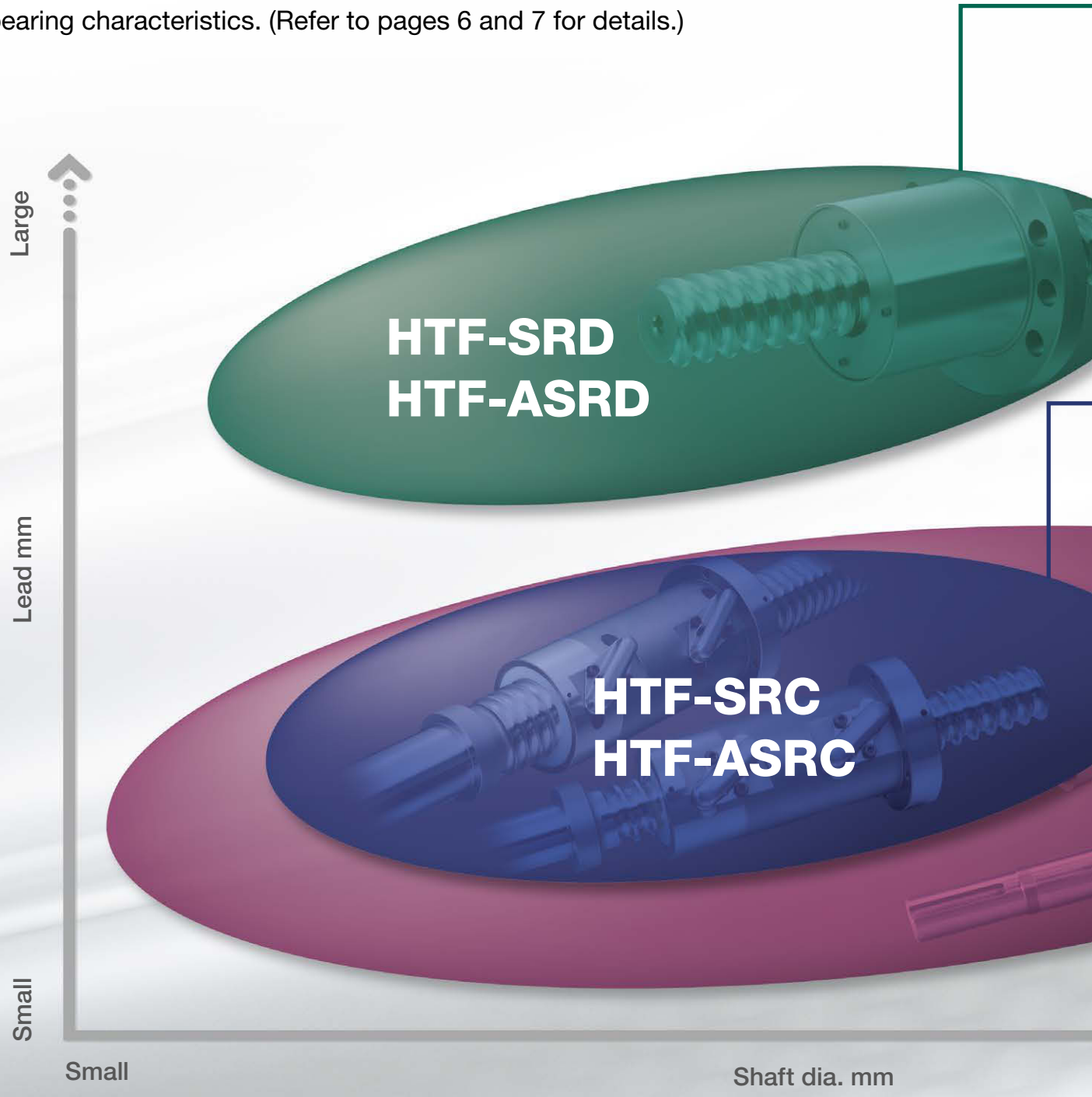
NSK Linear Guides™ RA Model Roller Guide

We have developed easy-to-use ball screws for high-load applications and now offer a wide variety of products suited for high-load drives.
These ball screws enable the electric servo drive to operate under the most severe conditions.

Lineup of NSK Ball Screws for High-Load Drive

Best suited design for high-load applications

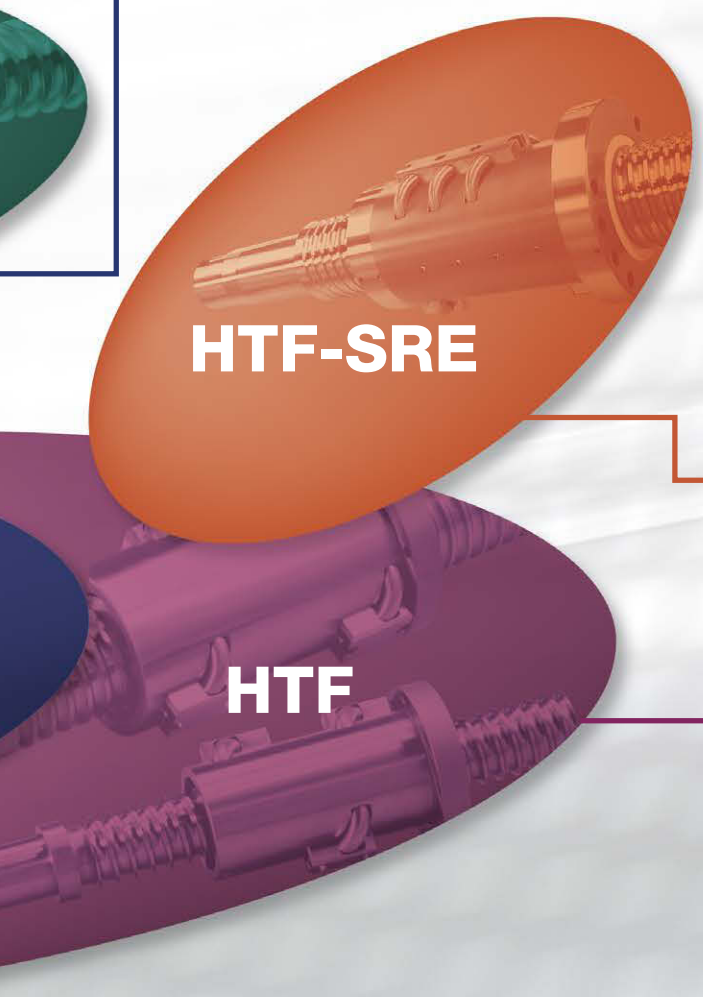
The best arrangement of the ball recirculation circuits and use of the largest possible ball have significantly contributed to the enhancement of high-load bearing characteristics. (Refer to pages 6 and 7 for details.)



As well as long shafts, a variety of shaft end configurations are available

Examples: ■ Involute spline (JIS B 1603) ■ Straight-sided spline (JIS B 1601) ■ Keyways

※There are high load capacity options available for the above ball screws for applicatio



Large

for high torque transmission.

ns where a large load is applied with relatively short strokes.

HTF-SRC Model

Enables a maximum speed of 930 mm/s with fine screw leads.

P13 ⋮ P16

HTF-SRD Model

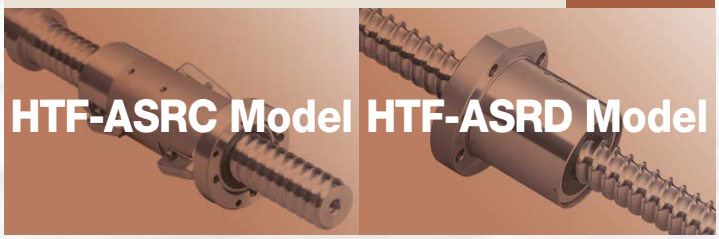
Enables a maximum speed of 1 600 mm/s with coarse screw leads.

P17 ⋮ P20

Equipped with Grease Retaining A1 Seals

Optimized design of A1 seal enables superior grease retaining performance.

P21 ⋮ P26



HTF-SRE Model

To speed up large machinery.

P27 ⋮ P28

HTF Model

Screw diameters of 32 to 200 mm
Leads of 10 to 32 mm
Provides a wide range of screw diameter and lead combinations.

P29 ⋮ P38

Peripheral products for high-load drive ball screws

NSKTAC series of ball screw support bearings

P39 ⋮ P42

NSK Linear Guides™ High rigidity series RA model roller guide

P43 ⋮ P44

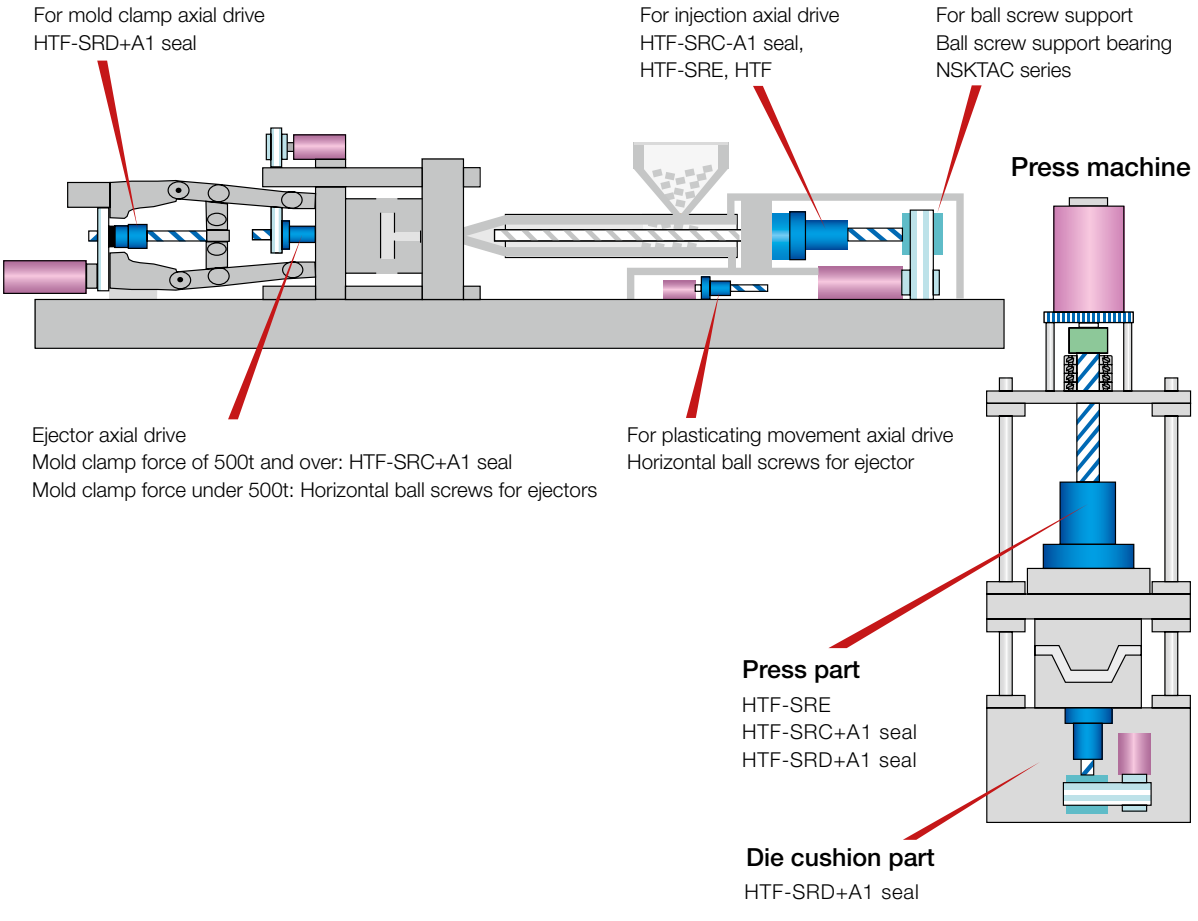
Technical Description

1 Examples of Application

Application	Injection molding machine	Die cast machine	Servo press	Press brake	Punch press	Powder press	Bending machine	Press fitting machine	Elevating machine
HTF Model	○	○	○	○	○	○	○	○	○
SRC Model	◎	○	◎	◎	○	◎	◎	◎	○
SRD Model	◎	◎			○				○
SRE Model	○	◎	◎	○	○	○	○		○

※There are high load capacity options available for applications with large loads with relatively short strokes, such as press fitting machine. Please consult NSK.

Injection molding machine



2 Features

NSK high-load drive ball screws have maximized the ball diameter and increased the number of valid load balls for a design that can withstand a high load. They have achieved a high reliability through many different technologies including even load distribution. Technology for high-speed feeding and preserving the work environment have also been added to accommodate the needs of various devices requiring a large load and high reliability, such as hydraulic cylinder replacement.

High reliability

In addition to high load design, all series are equipped with ball retaining piece S1 for preventing ball competition and helping even nut load distribution, and other original NSK technology to meet a high load bearing requirements.

High-speed feeding

Feeding speed has been increased to improve efficiency of the machine and injection. Maximum speeds are 930 mm/s with a fine lead and 1,600 mm/s with a coarse lead.

High environmental properties

With sophisticated seal technology, grease splattering has been reduced and less topping up is needed in response to ever increasing concerns for environment.

The chart below shows technologies used for each series to achieve high reliability, high-speed feeding and environmental consideration.

Ball screws for high load drive / Technology used		Line up	HTF-SRC	HTF-SRD	HTF-ASRC	HTF-ASRD	HTF-SRE	HTF
High reliability P5～	Design for high load		○	○	○	○	○	○
	Ball retaining piece S1		○	○	○	○	○	○
	Even load distribution [1] (radial load balance)		○	○	○	○	○	○
	Even load distribution [2] (in consideration of axial nut material expansion and contraction)		○	○	○	○	○	○
	High load capacity option (optional)		○	○	○	○	○	○
High-speed feeding P8～	High d/n circulation route design		○	○	○	○	○	
	Ball groove shape for high speed		○	○	○	○	○	○
	Coarse lead setting			○		○		
High environmental properties P9～	Grease retaining A1 seals				○	○		
	Low noise		○	○	○	○	○	

Technical Description

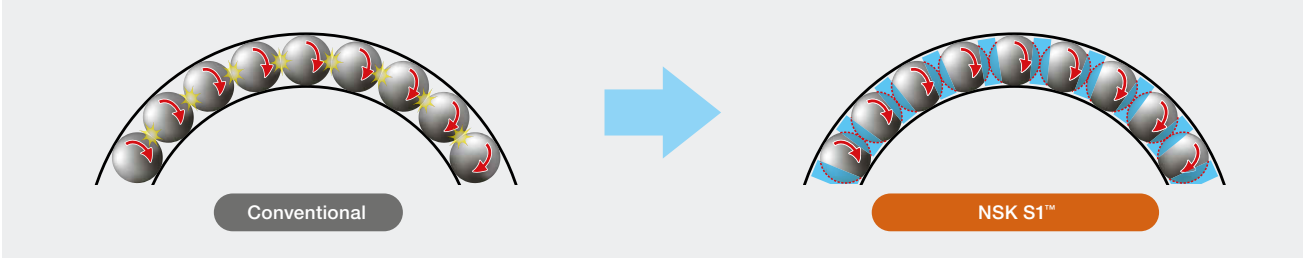
2-1 High reliability

1 Design for high load

NSK ball screws for high load drive have increased load capacity by maximizing the diameter of balls in relation to the lead, increasing the number of valid load balls and optimizing the shape of ball groove for a design that can withstand high load.

2 Resin Retaining Piece NSK S1™

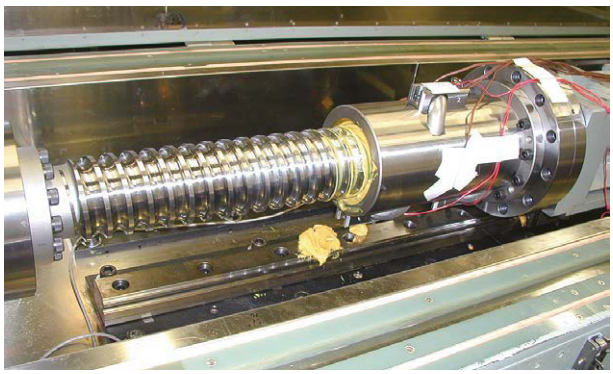
A moment load caused by misalignment of a ball screw can hinder smooth motion of the balls, thus causing ball jamming in the ball recirculation circuits and adversely affecting the durability of the ball screw.
By incorporating the resin retaining piece NSK S1™ between balls, NSK has greatly improved the durability of ball screws under a moment load.



Durability test with continuous high load

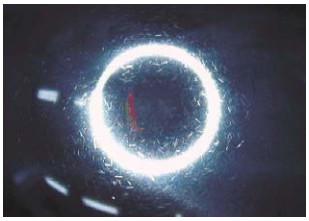
Test model: HTF10025-7.5
All load balls (without S1), and with S1

Test conditions:
Load condition: Forward 200 kN, Back 20 kN
Stroke: 70 mm, Cycle time: 9 sec
Lubrication: Grease
Temperature: Normal

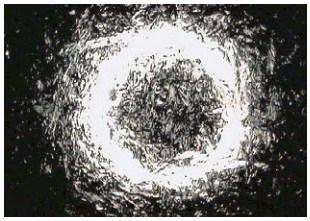


Mounting error: Max. 0.03 mm | 0.3 mm | 0.3 mm

Outer surface of balls



All load balls: very good
(after 100 000 cycles)



All load balls: damaged
(after 10 000 cycles)

With S1: very good
(after 100 000 cycles)

3 Technology to evenly distribute nut load

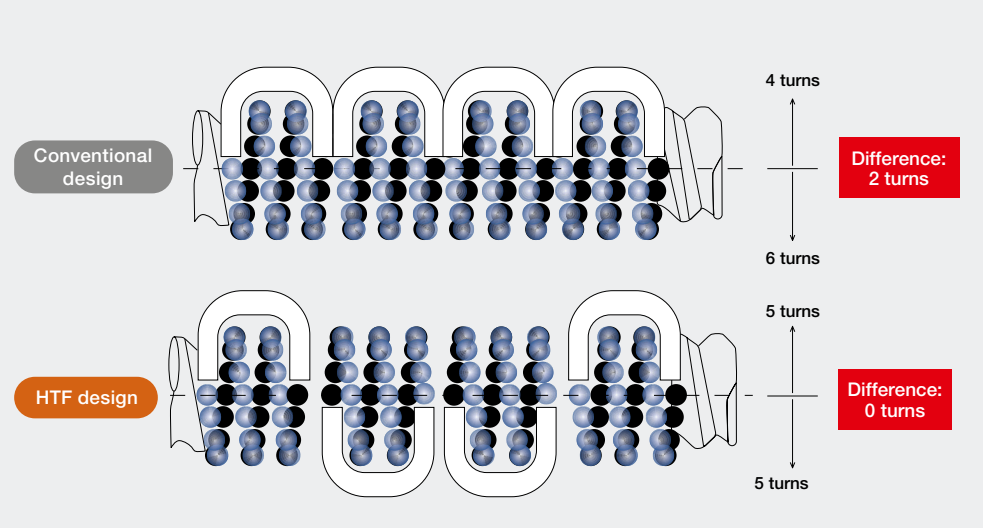
[Patent pending]

With ball screws that carry large loads, it is important to distribute the load evenly to each ball. NSK high-load drive ball screws have improved reliability with the load distribution technology described below.

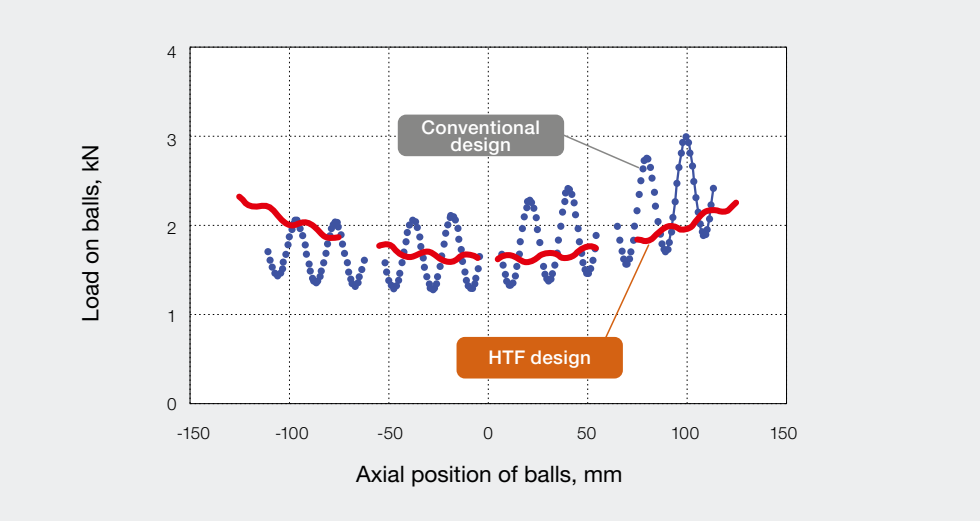
Theory of even load distribution 1 (applies to SRC and return tube models)

Ball return tubes are located 180 degrees apart for equal load distribution to the balls.

Minimum difference between upper and lower balls



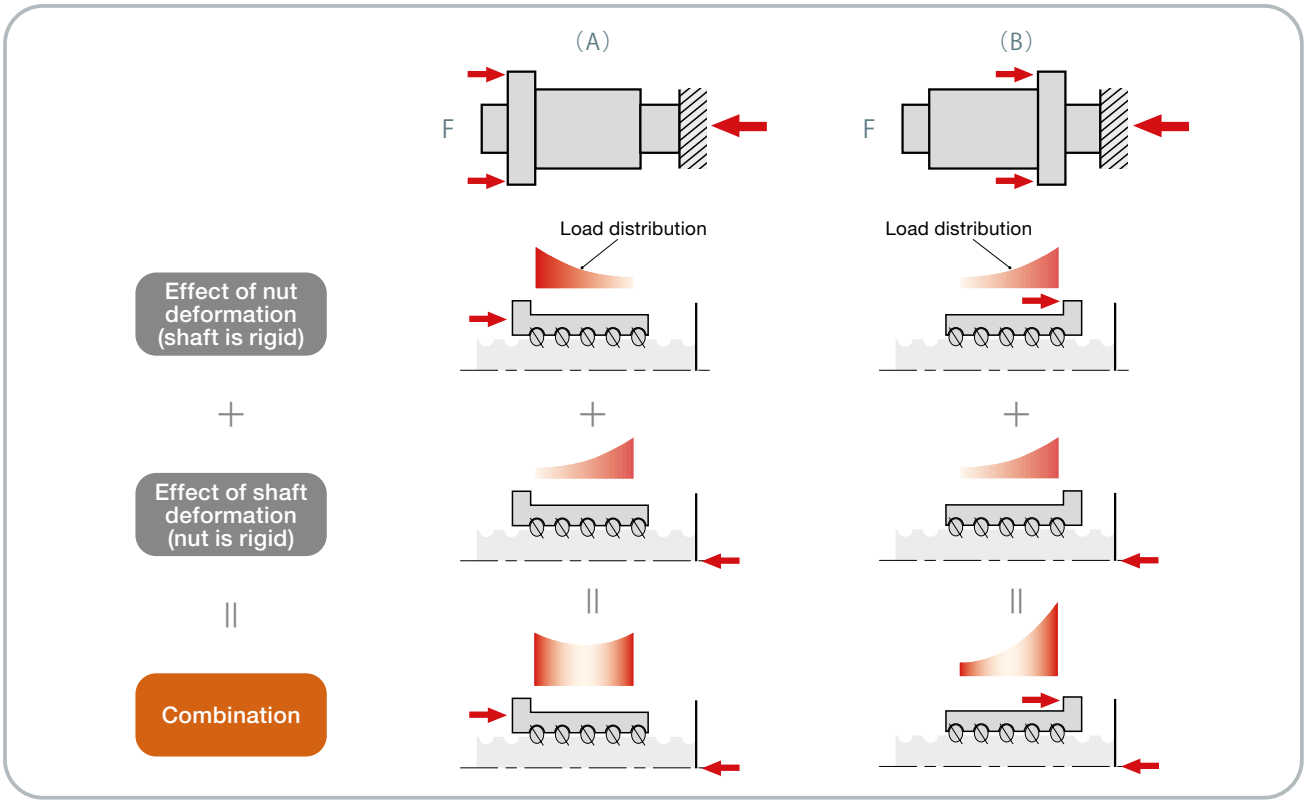
Load distribution to balls



Technical Description

Even load distribution [2]

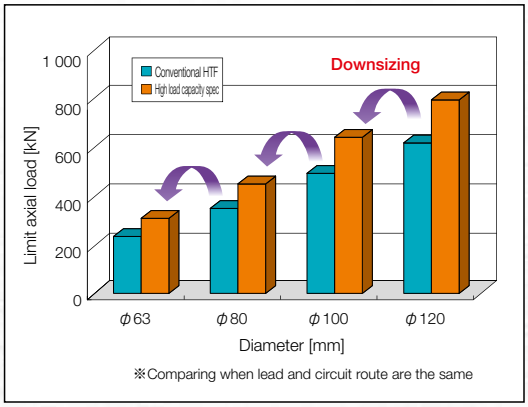
With ball screws that carry a large load, the deformation of components (axis, nut) cannot be disregarded. Based on the load points adapted for screws and nuts in the illustration below (A) (recommended installation), the influence of contraction and expansion in the screw shaft and nut axial direction is offset and inner nut load is evenly distributed. To make these measures even more effective, axis and the cross section of nut are placed as close to each other as possible in HTF-SRC and HTF models.



4 Options for high load capacity

Improving load bearing performance considerably

Load limits for high-load drive ball screws are
(1) Allowable axial load (load limit beyond which stress on ball contact surface has extremely adverse effect on fatigue life)
(2) Limit axial load (limit load of ball and axial groove contact surface reaching groove shoulder).
Through inner spec optimization, limit axial load can be up to 1.3 times greater than conventional high-load drive ball screws. These are suitable for applications where a large load is applied at relatively short strokes, such as sheet metal presses, press brakes, servo presses, mold presses, etc. Choices are made in consideration of balance between enhanced load bearing and service life. Please consult NSK.



A wide range of variations

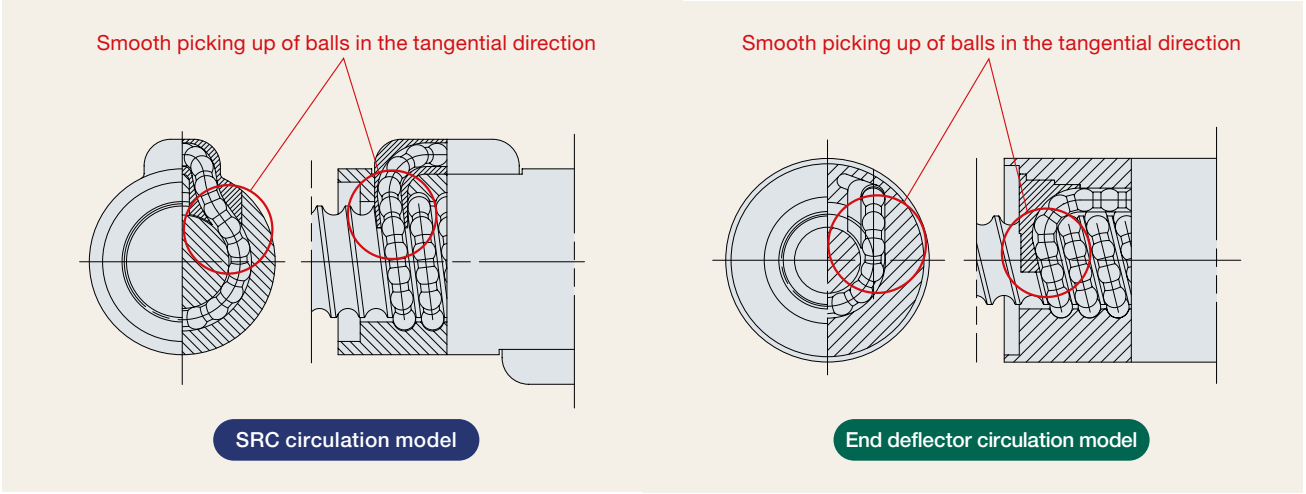
Ball screws with this option are compatible with all models of high-load drive ball screws, such as HTF-SRC, HTF-SRD and grease-retaining A1 series in terms of size.

2-2 High-speed feeding

1 High d/n circulation route design

[Patent pending]

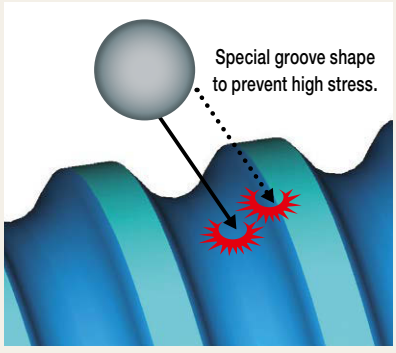
By smoothly picking up balls in the direction tangent to the screw groove, the impact of the balls colliding on other components will be reduced. d/n values (shaft diameter x number of rotations) for speed of circulation components is more than twice as fast as the conventional tube recirculation system.



2 Ball groove shape for high speed

[Patent pending]

While rotating at a high speed, the ball collides with the axis at a high speed. With optimal-design ball grooves, pressure on the ball groove surface is minimized during ball collision, preventing shaft damage.



3 Coarse lead setting

To achieve higher feeding, coarse lead setting is available.(for example, shaft diameter 50 mm for a lead of 40 mm). This, along with high d/n values, enables a high speed feeding.

Technical Description

2-3 High environmental properties

1 Grease retaining A1 seal

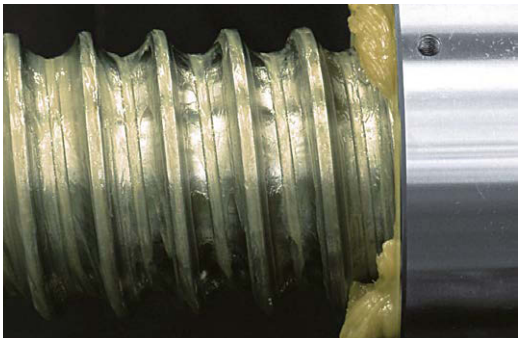
[Patent pending]

Greatly improved grease retaining performance

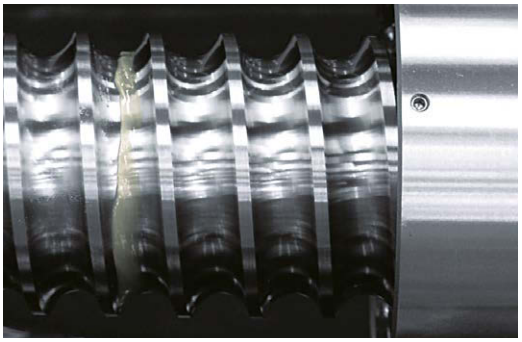
Thanks to the special ball groove profile of the screw shaft together with the grease retaining A1 seal, the grease retaining characteristics have greatly improved compared with those of existing plastic seals.

Grease leakage at initial cycle operation

(Test piece: HTF-ASRC6316-10.5 with high-load grease with an extreme pressure additive [worked penetration: 300])



With conventional labyrinth seals



With grease retaining A1 seals

Suppresses grease scattering and preserves a clean environment

Use of the A1 seal greatly suppresses grease scattering, showing a significant improvement over the use of existing plastic seals. The A1 seal simplifies the design of your cover, helping to preserve a clean and healthy environment.

Grease splash after 100-cycle operation

Test conditions	Test piece	Speed	Stroke	Lubrication
	HTF-ASRC6316-10.5	1 600 min^{-1}	500 mm	High-load grease with an extreme pressure additive

After initial run of 100 cycles at 200 min^{-1}, grease was wiped off from shaft OD, then photos were taken at the speed of 1600 min^{-1}.

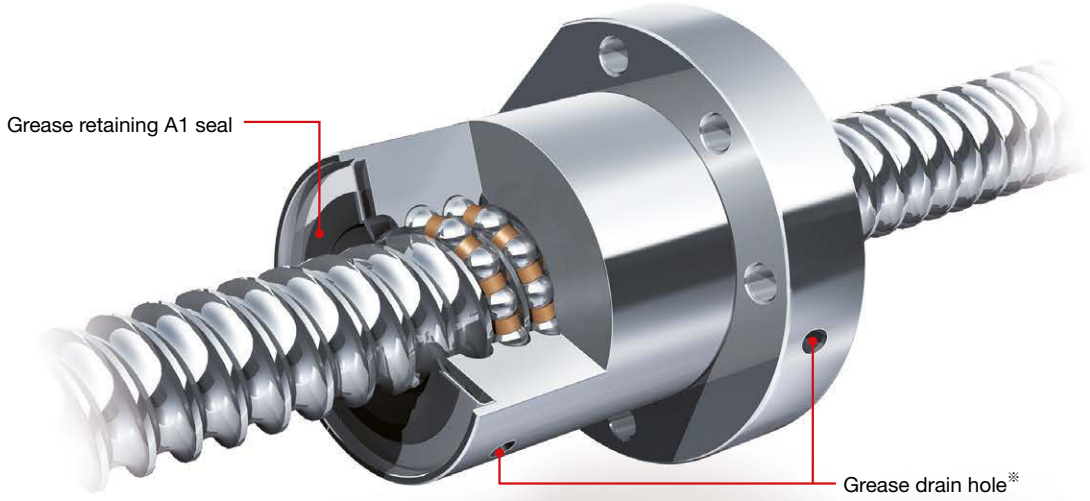
With existing plastic seals
(stroke center area)

With grease retaining A1 seals
(stroke center area)

Low friction torque and low-heat generation

The increase of dynamic torque caused by the A1 seal is very small (30 to 50 Ncm in case of ball screw with 80-mm diameter). This level of increase has practically no impact on the driving torque.
The practical temperature rise caused by the A1 seal is merely 2 to 3 deg C higher than that of existing plastic seals.

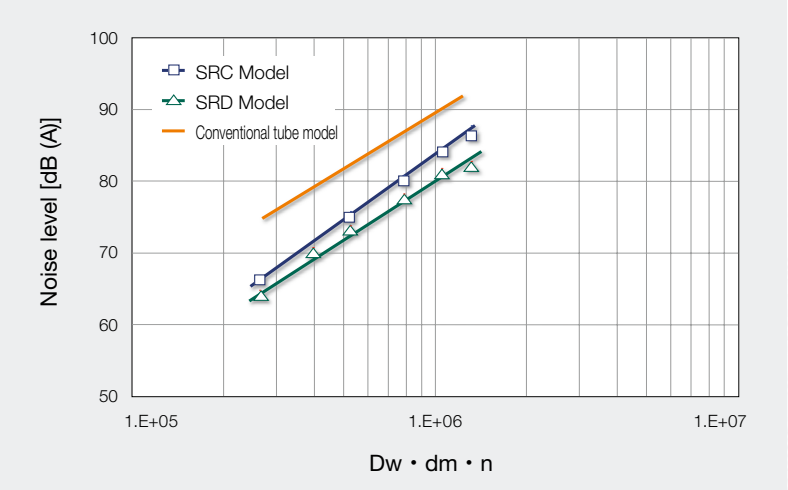
Construction of ball screw equipped with grease retaining A1 seal



※By opening the discharge holes for running-in after grease supplementation, etc., excess grease is discharged. By removing excess grease, grease splatter in high speed operation is reduced.

2 Low noise

By smoothly picking up balls in the screw shaft tangent direction, impact of ball collision on other components can be reduced. Compared to conventional tube model, the noise is reduced by over 6dB (A).



Technical Description

3 In use

1 Life of Ball Screw

Computational life, which is estimated by calculation, is the flaking life caused by rolling contact fatigue. The fatigue life of a ball screw can be estimated by basic dynamic load rating (*Ca*).

Basic dynamic load rating (*Ca*)

Basic dynamic load rating (*Ca*) is the axial load that allows 90% of a group of the same ball screws to rotate one million times (10^6 rev) under the same conditions without flaking occurring due to rolling contact fatigue. Basic dynamic load ratings (*Ca*) are shown in the dimension tables.

How to calculate fatigue life

The fatigue life of a ball screw is obtained by the following formula.

$$L = \left[\frac{Ca}{Fa \cdot fw}\right]^3 \cdot 10^6$$

$$Lt = \frac{L}{60n}$$

$$Ls = \frac{L \cdot l}{10^6}$$

L: Rated fatigue life (rev)

Lt: Life in hours (h)

Ls: Life by running distance (km)

Ca: Basic dynamic load rating (N)

Fa: Axial load (N)

n: Rotational speed (min^{-1})

l: Lead (mm)

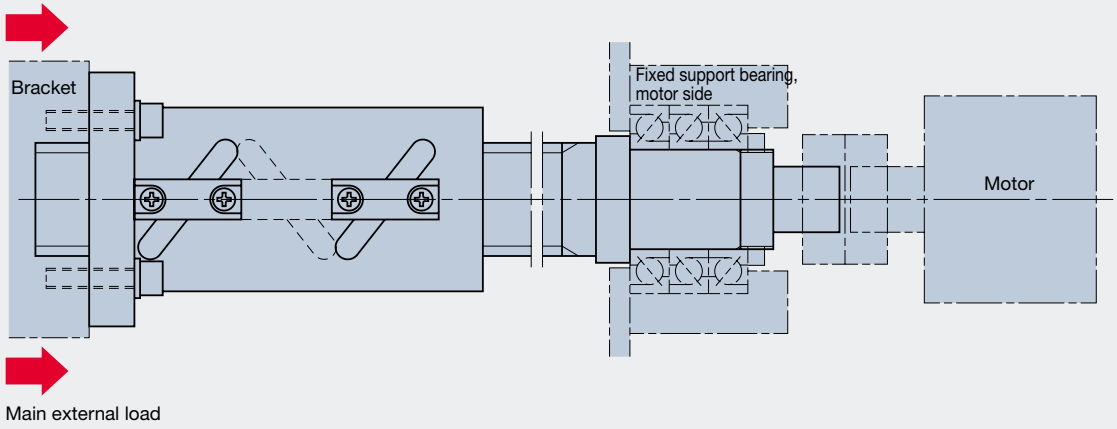
fw: Load factor*

*The load factor is decided by operating conditions.
Consult NSK when impact and/or vibrations occur during the operation.

2 Conditions for attaching ball screws

With design aimed at high loads and even inner nut load distribution, NSK high-load drive ball screws have achieved high-load performance. (See page 7)
To make the most of these features, installation according to the illustration below is recommended.
The bolt holes of the installation surface in this catalog have been set on an assumption that load is received on the surface of the nut flange.
If there is drag load on the bolt for mounting ball screw, the strength of bolts should be carefully considered.
Also make sure to center the ball screw with guides.

Recommended mounting direction for NSK high-load drive ball screws



3 Cautions regarding lubrication

When using ball screws, lubricant needs to be replenished.
As time passes, lubricant and its functions deteriorate.
Lubricant inside of nuts is gradually discharged by stroke motions. Also, operating environments results in impurities in lubricant. Therefore, lubricant needs to be supplemented regularly.

[If high load is applied, use of load withstanding grease containing extreme pressure additives is recommended.]

4 Operating temperature

As the temperature of ball screws rises during use, the strength of the oil film of the lubricant decreases and there is a risk of inadequate lubrication. Be sure to use them at temperatures below 70 deg C (temperature at nut diameter). Contact NSK to ask about environments and use conditions that can easily become too hot.

Other

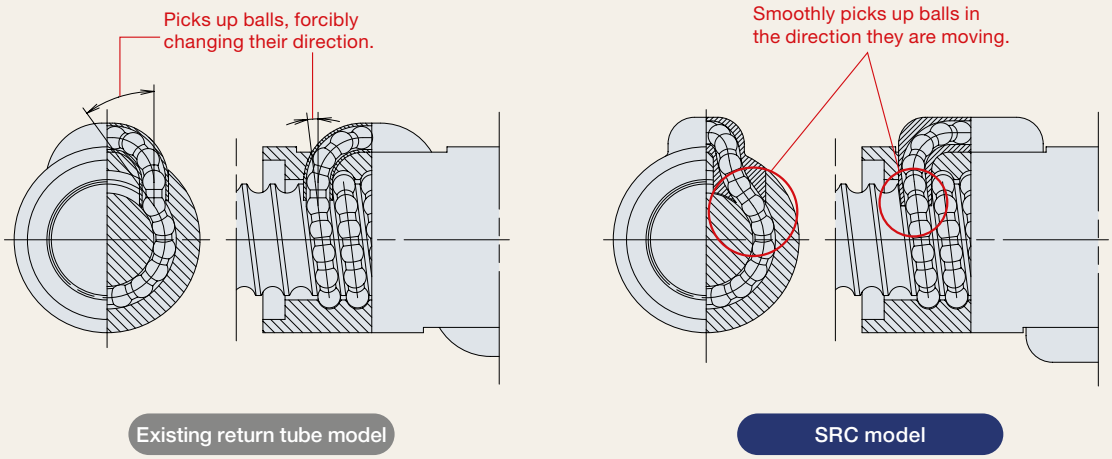
For other information on general technology of ball screws, see the section of ball screw technical explanations in the precision product catalog (CAT. No. 3162).

HTF-SRC Model

1 Specifications

Recirculation system: Equipped with SRC (Smooth Return Coupling)

By smoothly picking up balls in the direction tangent to the screw groove, feeding speed is twice as fast as the conventional tube recirculation system while the noise is half or less.



Allowable d·n value and feed speed

Lead 14 and 16 mm: 160 000 or less
Lead 20 and 25 mm: 140 000 or less
d·n: Shaft diameter d (mm) × Rotational speed n (min^{-1})
☆Allowable d·n value for HTF-SRC5020: 160 000

Allowable feed speed of combinations of shaft diameter and lead

Unit [mm/s]

Shaft dia. (mm) \ Lead (mm)	14	16	20	25
50	750	860	1 060☆	—
63	—	680	740	930
80	—	540	590	730
100	—	—	470	590
120	—	—	390	490

High-speed performance two times greater than existing products

Noise reduced by 6 dB (A) or more compared with return tube model

Accuracy grade

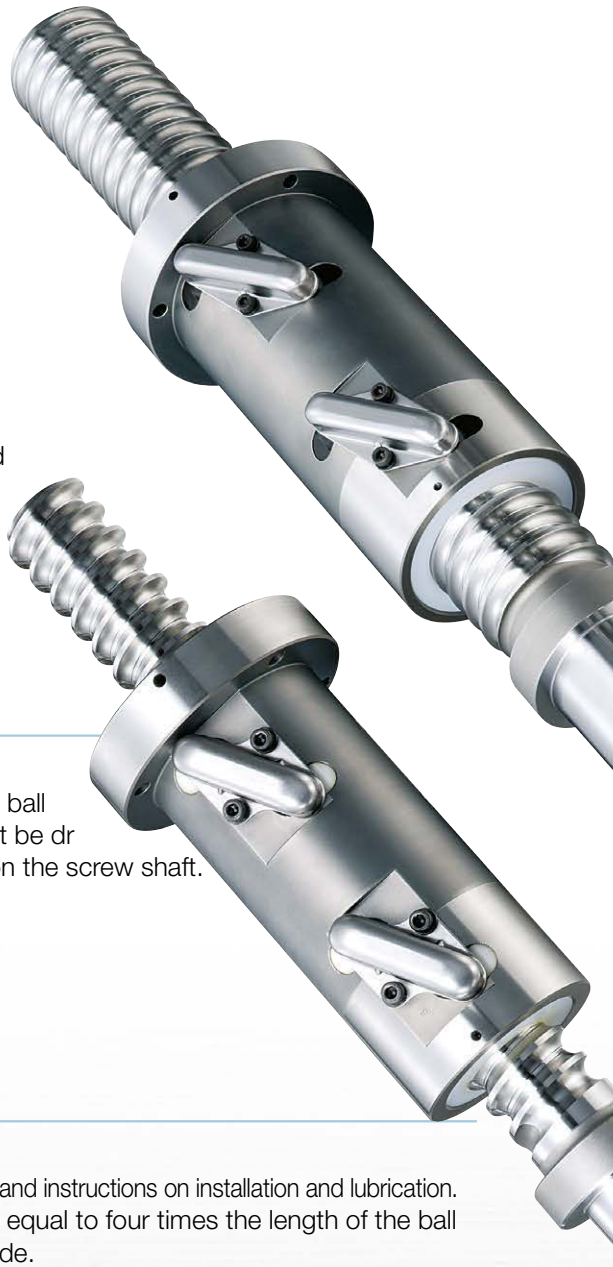
Ct7 of JIS B 1192 is applicable as the standard accuracy grade.

Axial play

Standard axial play: 0.020 mm or less, or 0.050 mm or less

Optional specs

- High load capacity option to increase limit axial load.
  See page 7 for details.
- Consult NSK if the number of circuits is to be changed for a higher load capacity or circulation routes are to be placed on a single side.



2 Design Precautions

1) When designing the shaft ends, one end of the screw shaft must have ball groove cut through to the shaft end or the ball groove root diameter must be dr or less (see dimension chart), otherwise the ball nut cannot be installed on the screw shaft.
2) Please consult NSK with your special design requirements.

3 Selection of Ball Screw

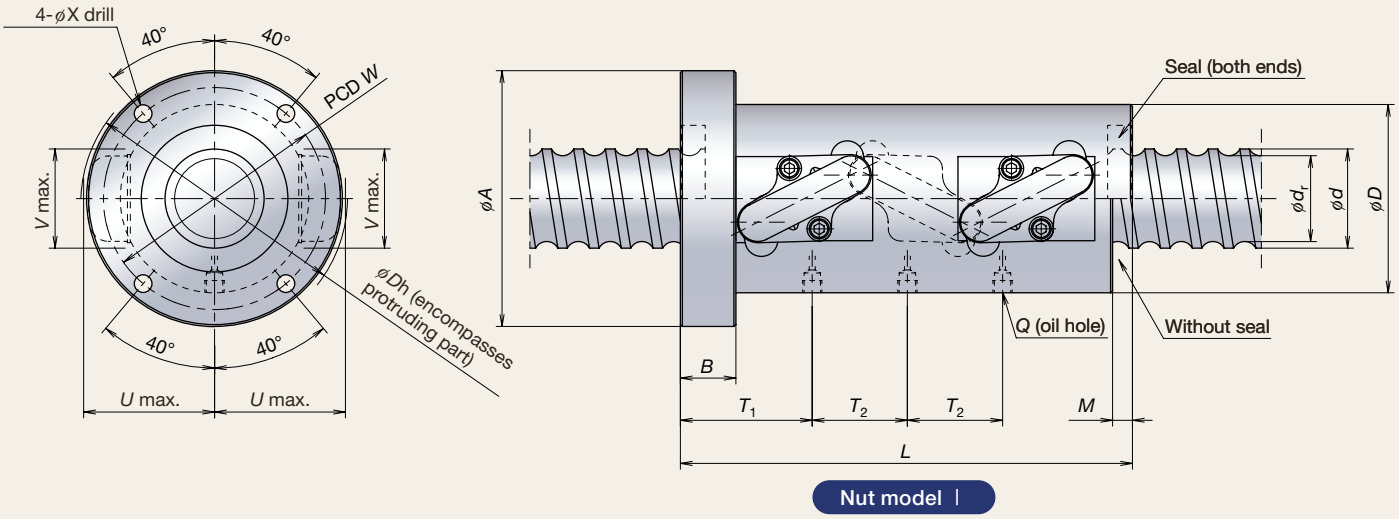
- Please refer to pages 11 and 12 for details on the operating life of the ball screw and instructions on installation and lubrication.
- Please consult NSK in the case of a short stroke operation less than or equal to four times the length of the ball screw lead.capacity or circulation routes are to be placed on a single side.

4 Operating Temperature

- Use temperature: 70 deg C maximum (temperature at nut diameter).
  Use at or below 60 deg C is recommended.

HTF-SRC Model

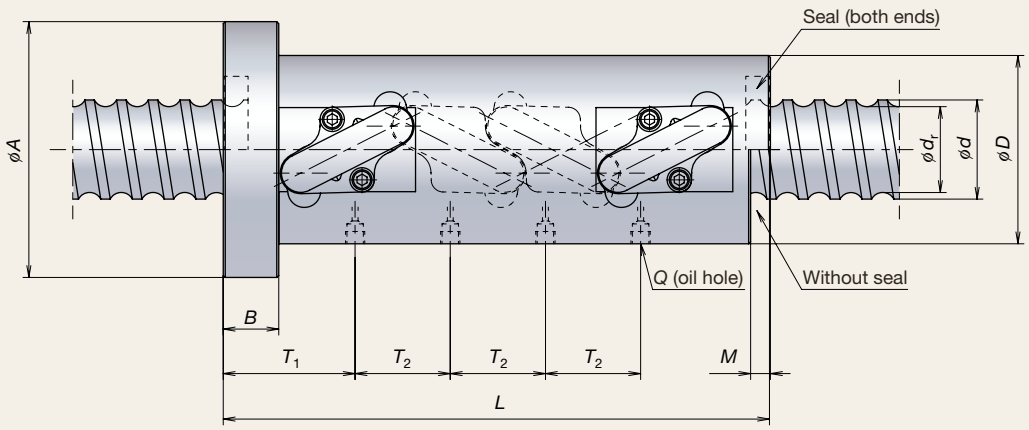
Outline drawing



HTF-SRC Model Specifications

Model No.	Lead ℓ	Shaft dia. d	Root dia. d_r	Effective ball turns Turns × Circuits	Nut model	Basic load rating (kN)		D	A	B
						Dynamic C_a	Static C_{0a}			
HTF-SRC5014-7.5	14	50	41.6	2.5×3	I	264	623	80	114	28
HTF-SRC5016-7.5	16	50	39	2.5×3	I	383	818	95	129	28
HTF-SRC6316-7.5	16	63	52	2.5×3	I	429	1 050	105	139	28
HTF-SRC6316-10	16	63	52	2.5×4	II	549	1 410	105	139	28
HTF-SRC6316-10.5	16	63	52	3.5×3	I	562	1 450	105	139	28
HTF-SRC6316-14	16	63	52	3.5×4	II	720	1 930	105	139	28
HTF-SRC8016-10.5	16	80	69	3.5×3	I	627	1 870	120	154	32
HTF-SRC8016-14	16	80	69	3.5×4	II	802	2 490	120	154	32
HTF-SRC5020-7.5	20	50	39	2.5x3	I	383	818	95	129	28
HTF-SRC6320-7.5	20	63	49	2.5×3	I	572	1 280	117	157	32
HTF-SRC6320-10	20	63	49	2.5×4	II	732	1 710	117	157	32
HTF-SRC8020-10.5	20	80	66	3.5×3	I	838	2 300	130	170	32
HTF-SRC10020-10.5	20	100	86	3.5×3	I	936	2 910	145	185	32
HTF-SRC10020-14	20	100	86	3.5×4	II	1 200	3 890	145	185	32
HTF-SRC12020-7.5	20	120	106	2.5×3	I	776	2 550	173	213	40
HTF-SRC12020-10	20	120	106	2.5×4	II	994	3 400	173	213	40
HTF-SRC6325-10.5	25	63	49	3.5×3	I	750	1 770	117	157	32
HTF-SRC8025-7.5	25	80	63	2.5×3	I	790	1 960	145	185	40
HTF-SRC10025-10.5	25	100	83	3.5×3	I	1 200	3 430	159	199	40
HTF-SRC10025-14	25	100	83	3.5×4	II	1 540	4 580	159	199	40
HTF-SRC12025-10.5	25	120	103	3.5×3	I	1 300	4 200	173	213	40
HTF-SRC12025-14	25	120	103	3.5×4	II	1 660	5 600	173	213	40

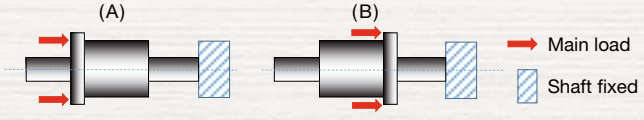
Remarks: 1. The ball nut length with no seals is shorter by M than that of a ball nut with seals.
2. Please consult NSK if load exceeds the allowable axial load (Fa max.).
3. The right hand screw is the standard. For specifications on left hand screws, contact NSK.
4. The allowable axial load is a value in the case of S clearance. If the clearance amount and mounting conditions differ, please note that the allowable axial load is also different.



Nut model II

Unit [mm]

Ball nut dimensions										Allowable axial load (kN) Mounting ☆ See below	
L	M	W	X	U	V	Dh	Q	T_1	T_2	[A] Recommended	[B]
202	10	97	9	54.5	46	111	M6×1	69	42	104	76.8
228	10	112	9	66	50	134	Rc1/8	74.5	48	129	107
228	10	122	9	72.5	50	148	Rc1/8	74.5	48	184	142
276	10	122	9	72.5	50	148	Rc1/8	74.5	48	209	152
276	10	122	9	72.5	50	148	Rc1/8	74.5	64	217	157
340	10	122	9	72.5	50	148	Rc1/8	74.5	64	236	162
278	10	137	9	80	60	165	Rc1/8	78.5	64	321	209
342	10	137	9	80	60	165	Rc1/8	78.5	64	360	217
268	10	112	9	66	50	135	Rc1/8	83.5	60	121	99.4
279	12	137	11	80	62	163	Rc1/8	90	60	211	172
339	12	137	11	80	62	163	Rc1/8	90	60	232	182
339	12	150	11	88	64	180	Rc1/8	90	80	362	254
339	12	165	11	97	78	199	Rc1/8	90	80	524	325
419	12	165	11	97	78	199	Rc1/8	90	80	588	335
287	12	193	11	109.5	88	229	Rc1/8	98	60	525	376
347	12	193	11	109.5	88	229	Rc1/8	98	60	628	407
405	12	137	11	81.5	61	167	Rc1/8	101.75	100	222	172
347	17	165	11	99.5	73	202	Rc1/8	111.75	75	334	269
422	17	179	11	108	79	220	Rc1/8	111.75	100	560	383
522	17	179	11	108	79	220	Rc1/8	111.75	100	612	395
421	17	193	11	116	92	238	Rc1/8	111.25	100	750	465
521	17	193	11	116	92	238	Rc1/8	111.25	100	836	479

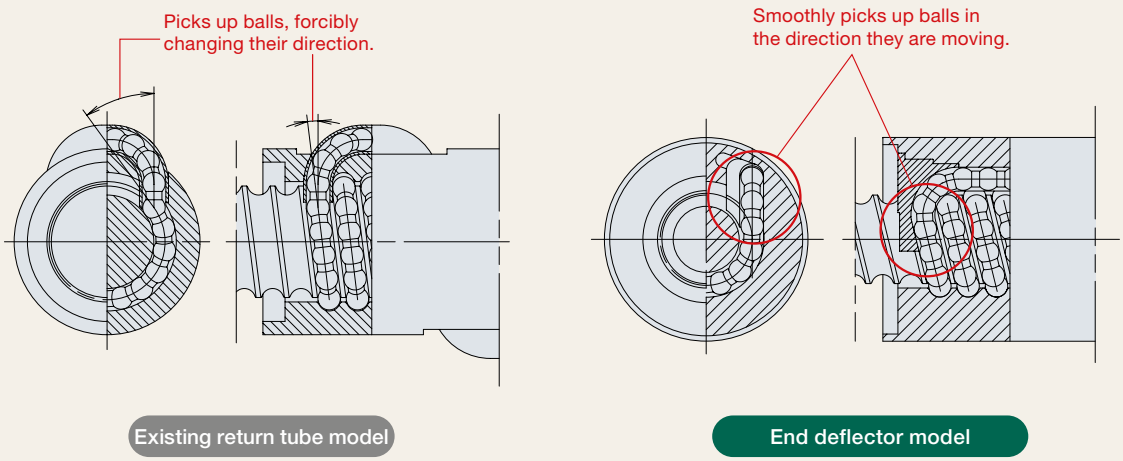


HTF-SRD Model

1 Specifications

Recirculation system: Equipped with end deflector

By adopting a highly-regarded end deflector recirculation system, feeding speed of 3 000 mm/s has been achieved. There is no runout of recirculation components and a good rotation balance is ensured.



Allowable d·n value and feed speed

d·n: 120 000 or less
d·n: Shaft diameter d (mm) × Rotational speed (min^{-1})

Allowable feed speed of combinations of shaft diameter and lead

Unit [mm/s]

Shaft dia. (mm) \ Lead (mm)	32	40	50	60	70	80	100	120
50	—	1 600	2 000	—	—	—	—	—
63	1 000	1 250	—	1 900	—	—	—	—
80	—	—	1 250	—	—	2 000	—	3 000
100	—	—	—	1 200	—	—	2 000	—
120	—	—	—	—	1 160	—	—	2 000

High-lead specification optimal for high speed

Noise reduced by 6 dB (A) or more compared with return tube model

Accuracy grade

Ct7 of JIS B 1192 is applicable as the standard accuracy grade.

Axial play

Standard axial play: 0.020 mm or less, or 0.050 mm or less

Seal

The ball nut length is shortened by the use of thin seals.

Option

High load capacity option to increase limit axial load. See page 7 for details.
Please consult NSK if you are considering nut rotation.

2 Design Precautions

1) When designing the shaft ends, one end of the screw shaft must have ball groove cut through to the shaft end or the ball groove root diameter must be dr or less (see dimension chart), otherwise the ball nut cannot be installed on the screw shaft.
2) Please consult NSK with your special design requirements.

3 Selection of Ball Screw

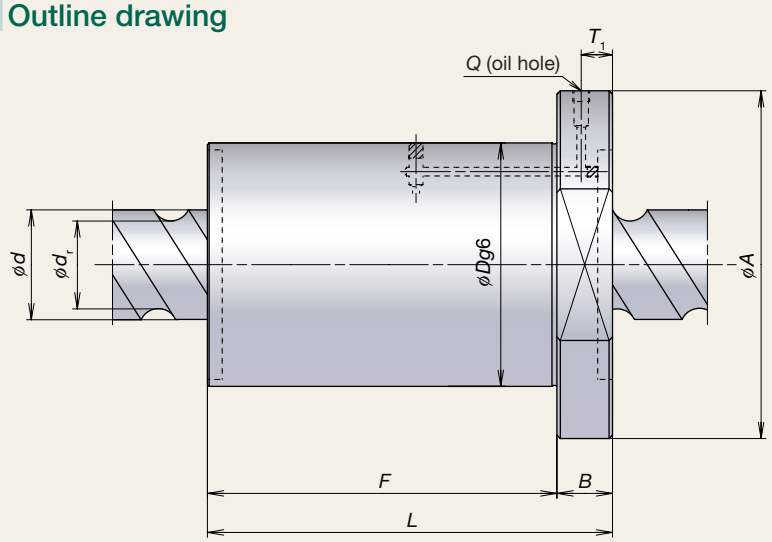
- Please refer to pages 11 and 12 for details on the operating life of the ball screw and instructions on installation and lubrication.
- Please consult NSK in the case of a short stroke operation less than or equal to four times the length of the ball screw lead.capacity or circulation routes are to be placed on a single side.

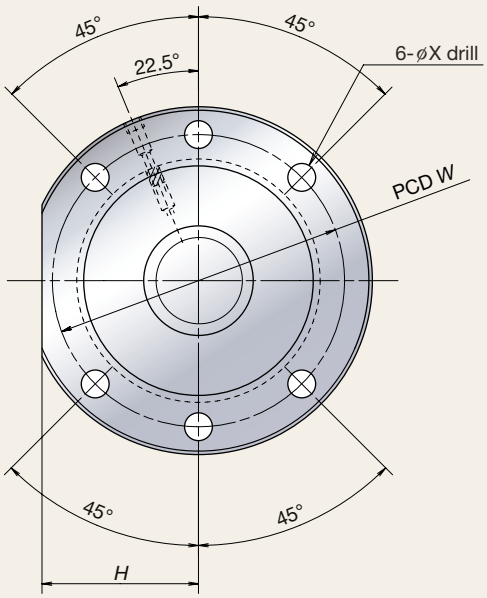
4 Operating Temperature

- Use temperature: 70 deg C maximum (temperature at nut diameter).
  Use at or below 60 deg C is recommended.

HTF-SRD Model

Outline drawing



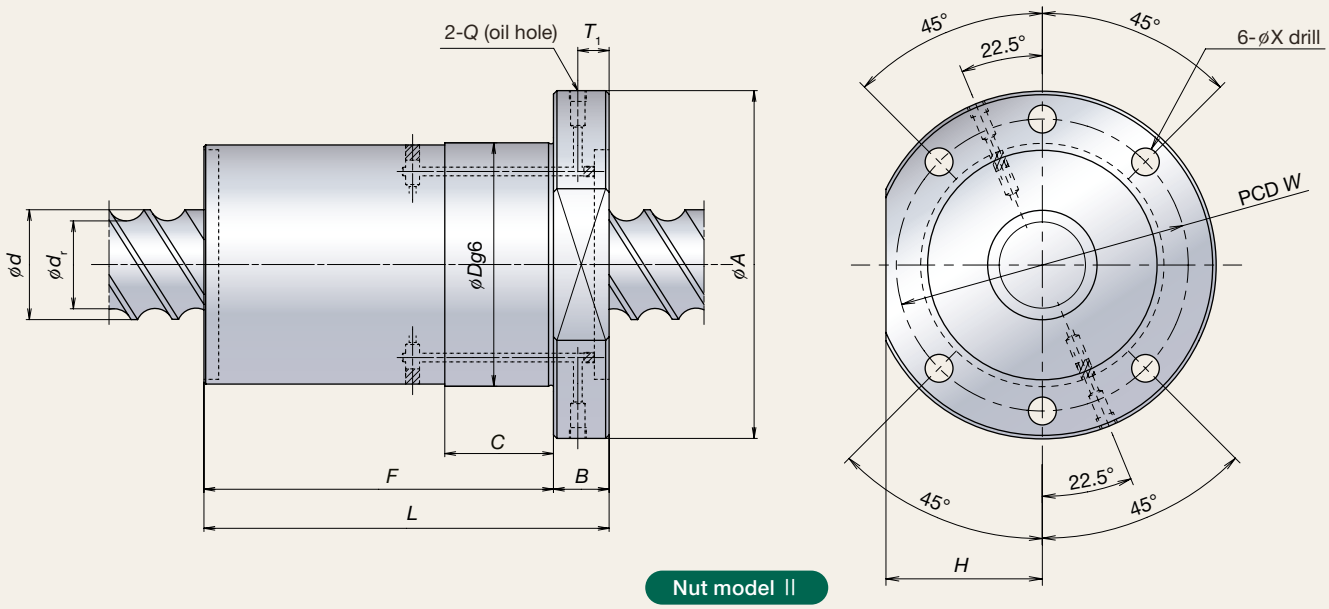


Nut model I

HTF-SRD Model Specifications

Model No.	Lead ℓ	Shaft dia. d	Root dia. d_r	Nut model	Basic load rating (kN)			
					Dynamic C_a	Static C_{0a}	D	A
HTF-SRD6332-4E	32	63	49	I	292	590	140	190
HTF-SRD5040-6E	40	50	39	II	243	491	115	165
HTF-SRD5040-8E	40	50	39	II	319	679	115	165
HTF-SRD6340-6E	40	63	49	II	363	768	140	200
HTF-SRD6340-8E	40	63	49	II	476	1 060	140	200
HTF-SRD5050-6E	50	50	39	II	243	491	115	165
HTF-SRD5050-8E	50	50	39	II	319	679	115	165
HTF-SRD8050-6E	50	80	63	II	502	1 180	175	250
HTF-SRD8050-8E	50	80	63	II	658	1 630	175	250
HTF-SRD6360-6E	60	63	49	II	363	768	140	200
HTF-SRD6360-8E	60	63	49	II	476	1 060	140	200
HTF-SRD10060-6E	60	100	83	II	583	1 490	195	270
HTF-SRD10060-8E	60	100	83	II	765	2 060	195	270
HTF-SRD12070-6E	70	120	103	II	630	1 810	210	285
HTF-SRD12070-8E	70	120	103	II	826	2 520	210	285
HTF-SRD8080-6E	80	80	63	II	502	1 180	175	250
HTF-SRD8080-8E	80	80	63	II	658	1 630	175	250
HTF-SRD100100-6E	100	100	83	II	583	1 490	195	270
HTF-SRD100100-8E	100	100	83	II	765	2 060	195	270
HTF-SRD80120-4E	120	80	63	II	337	751	175	250
HTF-SRD120120-6E	120	120	103	II	630	1 810	210	285
HTF-SRD120120-8E	120	120	103	II	826	2 520	210	285

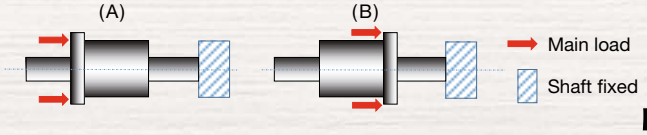
Remarks: 1. Please consult NSK if load exceeds the allowable axial load (Fa max.).
2. The right hand screw is the standard. For specifications on left hand screws, contact NSK.
3. The allowable axial load is a value in the case of S clearance. If the clearance amount and mounting conditions differ, please note that the allowable axial load is also different.
4. When F and C dimensions are the same, the diameter of whole area of F dimension is ϕDg6.



Nut model II

Unit [mm]

Ball nut dimensions									Allowable axial load (kN) Mounting ☆ See below	
B	F	C	L	H	W	X	Q	T_1	[A] Recommended	[B]
32	144	—	176	85	165	14	Rc1/8	22	119	114
28	131	131	159	72.5	140	14	Rc1/8	18	106	99.1
28	171	171	199	72.5	140	14	Rc1/8	18	123	111
32	131	131	163	90	170	18	Rc1/8	22	181	169
32	171	171	203	90	170	18	Rc1/8	22	213	192
28	159	159	187	72.5	140	14	Rc1/8	18	102	94.6
28	209	209	237	72.5	140	14	Rc1/8	18	116	103
40	154	154	194	110	210	22	Rc1/8	30	284	263
40	204	204	244	110	210	22	Rc1/8	30	336	302
32	188	188	220	90	170	18	Rc1/8	22	168	153
32	248	248	280	90	170	18	Rc1/8	22	190	169
40	185	185	225	122	235	22	Rc1/8	30	366	330
40	245	245	285	122	235	22	Rc1/8	30	436	378
50	210	210	260	130	250	22	Rc1/8	40	451	393
50	280	280	330	130	250	22	Rc1/8	40	549	450
40	244	244	284	110	210	22	Rc1/8	30	258	234
40	324	100	364	110	210	22	Rc1/8	30	293	258
40	301	100	341	122	235	22	Rc1/8	30	336	294
40	401	100	441	122	235	22	Rc1/8	30	383	320
40	243	243	283	110	210	22	Rc1/8	30	185	172
50	356	100	406	130	250	22	Rc1/8	40	413	343
50	476	100	526	130	250	22	Rc1/8	40	480	375



HTF-ASRC Model and HTF-ASRD Model Equipped with Grease Retaining A1 Seal

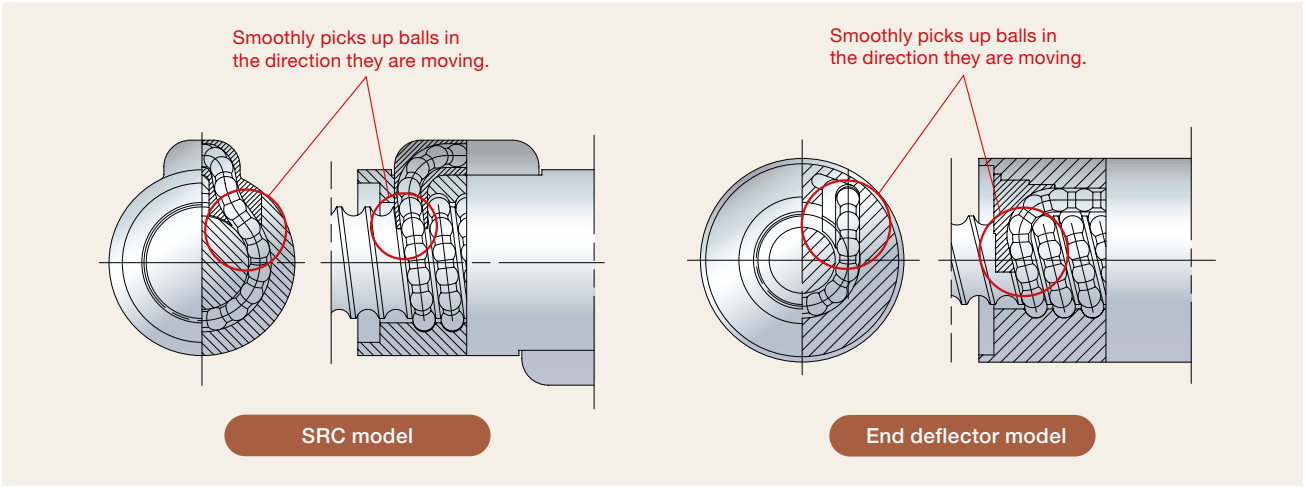
1 Specifications

Equipped with grease retaining A1 seal

The optimum design of the A1 seal (patent applied for and pending) allows superior grease retaining performance.

Recirculation system: Equipped with SRC or end deflector

These ball screws are used with the SRC or the end deflector recirculation system, which pick up balls smoothly in the direction they are moving.



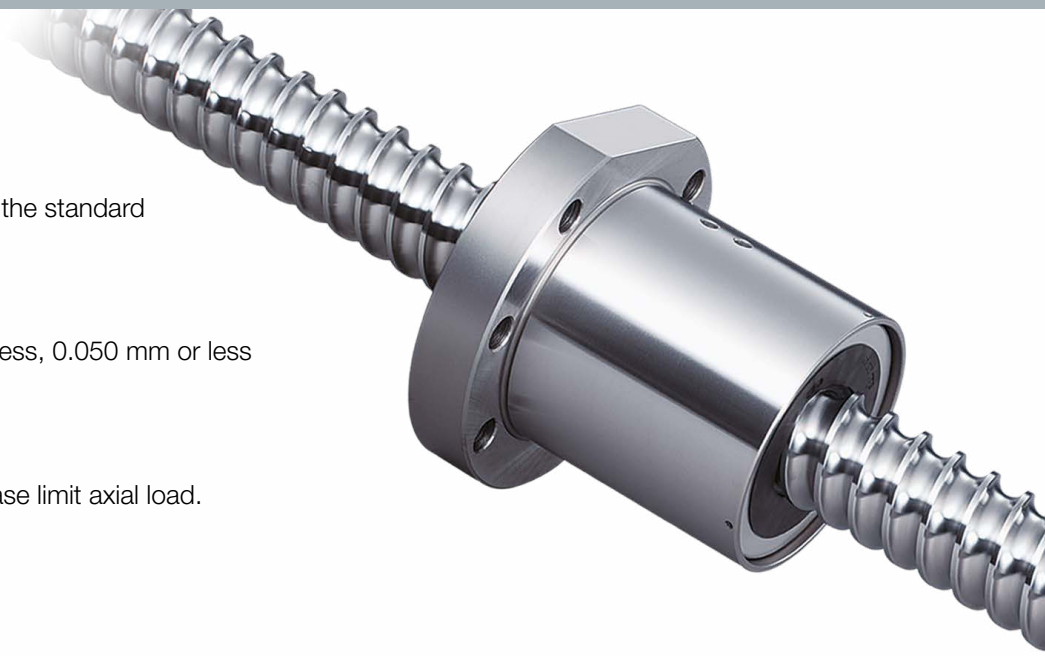
Allowable d·n value and feed speed

Lead 16 mm: 160 000 or less
Lead 20 and 25 mm: 140 000 or less
Lead 32, 40 and 50 mm: 120 000 or less
d·n: Shaft diameter d (mm) × Rotational speed (min^{-1})

Allowable feed speed of combinations of shaft diameter and lead

Unit [mm/s]

Lead (mm) / Shaft dia. (mm)	HTF-ASRC Model			HTF-ASRD Model			
	16	20	25	32	40	50	60
50	860	—	—	—	1 600	—	—
63	680	740	930	1 000	1 250	—	—
80	540	590	730	—	—	1 250	—
100	—	470	590	—	—	—	1 200
120	—	390	490	—	—	—	—



Accuracy grade

Ct7 of JIS B 1192 is applicable as the standard accuracy grade.

Axial play

Standard axial play: 0.020 mm or less, 0.050 mm or less

Option

High load capacity option to increase limit axial load.
See page 7 for details.

2 Design Precautions

1) When designing the shaft ends, one end of the screw shaft must have ball groove cut through to the shaft end or the ball groove root diameter must be dr or less (see dimension chart), otherwise the ball nut cannot be installed on the screw shaft.
2) The table below shows the maximum length of screw shaft for the equipment of the A1 seal.
3) Please contact NSK with your special design requirements.

Unit [mm]

Shaft dia.	Max. shaft length
50	1 500
63	1 500
80	1 700
100, 120	1 900

3 Selection of Ball Screw

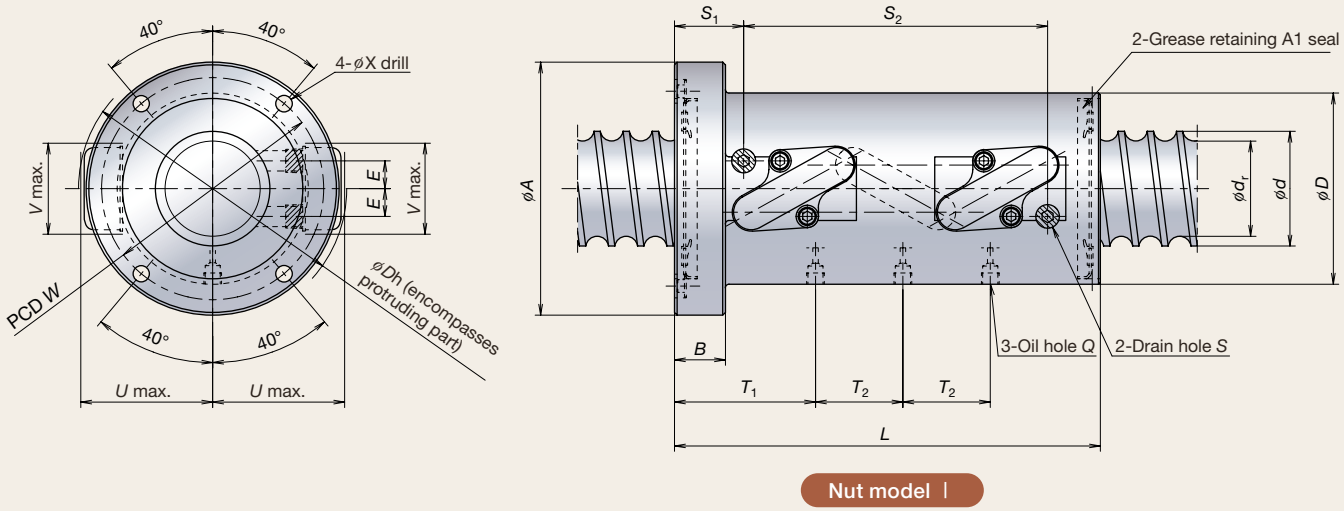
- Please refer to pages 11 and 12 for details on the operating life of the ball screw and instructions on installation and lubrication.
- Please consult NSK in the case of a short stroke operation less than or equal to four times the length of the ball screw lead.

4 Environmental Conditions

- Use temperature: 70 deg C maximum (temperature at nut diameter). Use at or below 60 deg C is recommended.
- Never use in an environment where degreasing solvents are present.
  Examples: grease-removing organic solvent such as hexane or thinner, white kerosine, rust preventive oil (containing white kerosine)

HTF-ASRC Model

Outline drawing

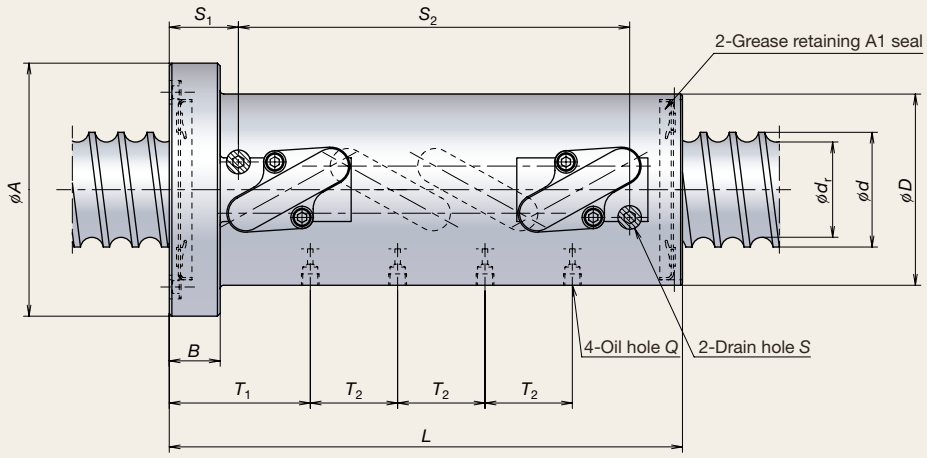


Nut model I

HTF-ASRC Model Specifications

Model No.	Lead ℓ	Shaft dia. d	Root dia. d_r	Effective ball turns Turns × Circuits	Nut model	Basic load rating (kN)				
						Dynamic C_a	Static C_{0a}	D	A	B
HTF-ASRC5016-7.5	16	50	39	2.5×3	I	383	818	95	129	28
HTF-ASRC6316-7.5	16	63	52	2.5×3	I	429	1 050	105	139	28
HTF-ASRC6316-10	16	63	52	2.5×4	II	549	1 410	105	139	28
HTF-ASRC6316-10.5	16	63	52	3.5×3	I	562	1 450	105	139	28
HTF-ASRC6316-14	16	63	52	3.5×4	II	720	1 930	105	139	28
HTF-ASRC8016-10.5	16	80	69	3.5×3	I	627	1 870	120	154	32
HTF-ASRC8016-14	16	80	69	3.5×4	II	802	2 490	120	154	32
HTF-ASRC6320-7.5	20	63	49	2.5×3	I	572	1 280	117	157	32
HTF-ASRC6320-10	20	63	49	2.5×4	II	732	1 710	117	157	32
HTF-ASRC8020-10.5	20	80	66	3.5×3	I	838	2 300	130	170	32
HTF-ASRC10020-10.5	20	100	86	3.5×3	I	936	2 910	145	185	32
HTF-ASRC10020-14	20	100	86	3.5×4	II	1 200	3 890	145	185	32
HTF-ASRC12020-7.5	20	120	106	2.5×3	I	776	2 550	173	213	40
HTF-ASRC12020-10	20	120	106	2.5×4	II	994	3 400	173	213	40
HTF-ASRC6325-10.5	25	63	49	3.5×3	I	750	1 770	117	157	32
HTF-ASRC8025-7.5	25	80	63	2.5×3	I	790	1 960	145	185	40
HTF-ASRC10025-10.5	25	100	83	3.5×3	I	1 200	3 430	159	199	40
HTF-ASRC10025-14	25	100	83	3.5×4	II	1 540	4 580	159	199	40
HTF-ASRC12025-10.5	25	120	103	3.5×3	I	1 300	4 200	173	213	40
HTF-ASRC12025-14	25	120	103	3.5×4	II	1 660	5 600	173	213	40

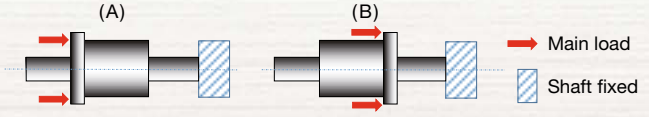
Remarks: 1. Drain holes shall be plugged for shipping.
2. The right hand screw is the standard. For specifications on left hand screws, contact NSK.
3. The allowable axial load is a value in the case of S clearance. If the clearance amount and mounting conditions differ, please note that the allowable axial load is also different.



Nut model II

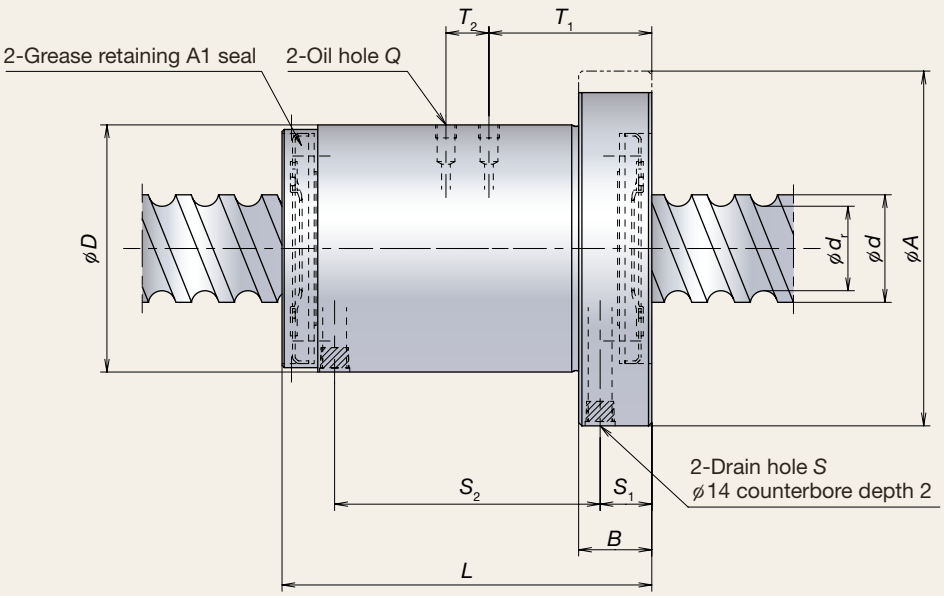
Unit [mm]

Ball nut dimensions													Allowable axial load (kN) Mounting ☆ See below	
L	*W*	*X*	*U*	*V*	*D*h	*Q*	T_1	T_2	*S*	*E*	S_1	S_2	[A] Recommended	[B]
234	112	9	66	50	134	Rc1/8	77.5	48	Rc1/4	15.3	38	167	129	107
234	122	9	72.5	50	148	Rc1/8	77.5	48	Rc1/4	15.3	38	167	184	142
282	122	9	72.5	50	148	Rc1/8	77.5	48	Rc1/4	15.3	38	215	209	152
282	122	9	72.5	50	148	Rc1/8	77.5	64	Rc1/4	11.8	38	215	217	157
346	122	9	72.5	50	148	Rc1/8	77.5	64	Rc1/4	11.8	38	279	236	162
284	137	9	80	60	165	Rc1/8	81.5	64	Rc1/4	11.3	42	215	321	209
348	137	9	80	60	165	Rc1/8	81.5	64	Rc1/4	11.3	42	279	360	217
279	137	11	80	62	163	Rc1/8	90	60	Rc1/4	18.5	43	204	211	172
339	137	11	80	62	163	Rc1/8	90	60	Rc1/4	18.5	43	264	232	182
339	150	11	88	64	180	Rc1/8	90	80	Rc1/4	15	43	264	362	254
339	165	11	97	78	199	Rc1/8	90	80	Rc1/4	13	43	264	524	325
419	165	11	97	78	199	Rc1/8	90	80	Rc1/4	13	43	344	588	335
287	193	11	109.5	88	229	Rc1/8	98	60	Rc1/4	20	51	204	525	376
347	193	11	109.5	88	229	Rc1/8	98	60	Rc1/4	20	51	264	628	407
405	137	11	81.5	61	167	Rc1/8	101.75	100	Rc1/4	13.5	47	323	222	172
347	165	11	99.5	73	202	Rc1/8	111.75	75	Rc1/4	19	55	251	334	269
422	179	11	108	79	220	Rc1/8	111.75	100	Rc1/4	14	55	326	560	383
522	179	11	108	79	220	Rc1/8	111.75	100	Rc1/4	14	55	426	612	395
421	193	11	116	92	238	Rc1/8	111.25	100	Rc1/4	11	55	325	750	465
521	193	11	116	92	238	Rc1/8	111.25	100	Rc1/4	11	55	425	836	479



HTF-ASRD Model

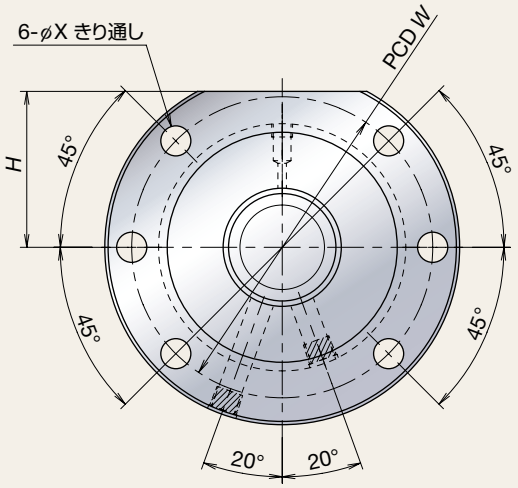
Outline drawing



HTF-ASRD Model Specifications

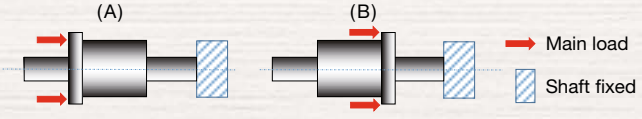
Model No.	Lead ℓ	Shaft dia. d	Root dia. d_r	Basic load rating (kN)					
				Dynamic C_a	Static C_{0a}	D	A	B	L
HTF-ASRD6332-4E	32	63	49	292	590	140	190	36	186
HTF-ASRD5040-6E	40	50	39	243	491	115	165	34	172
HTF-ASRD5040-8E	40	50	39	319	679	115	165	34	212
HTF-ASRD6340-6E	40	63	49	363	768	140	200	36	176
HTF-ASRD6340-8E	40	63	49	476	1 060	140	200	36	216
HTF-ASRD8050-6E	50	80	63	502	1 180	175	250	40	208
HTF-ASRD8050-8E	50	80	63	658	1 630	175	250	40	258
HTF-ASRD10060-6E	60	100	83	583	1 490	195	270	40	239
HTF-ASRD10060-8E	60	100	83	765	2 060	195	270	40	299

Remarks: 1. Drain holes shall be plugged for shipping.
2. The right hand screw is the standard. For specifications on left hand screws, contact NSK.
3. The allowable axial load is a value in the case of S clearance. If the clearance amount and mounting conditions differ, please note that the allowable axial load is also different.



Unit [mm]

Ball nut dimensions									Allowable axial load (kN) Mounting ☆ See below	
H	*W*	*X*	*Q*	T_1	T_2	*S*	S_1	S_2	[A] Recommended	[B]
85	165	14	Rc1/8	85.1	—	Rc1/4	23.5	138	119	114
72.5	140	14	Rc1/8	75.7	20	Rc1/4	24	123.5	106	99.1
72.5	140	14	Rc1/8	95.7	20	Rc1/4	24	163.5	123	111
90	170	18	Rc1/8	77.6	20	Rc1/4	24	127.5	181	169
90	170	18	Rc1/8	97.6	20	Rc1/4	24	167.5	213	192
110	210	22	Rc1/8	91.1	25	Rc1/4	26	156	284	263
110	210	22	Rc1/8	116.1	25	Rc1/4	26	206	336	302
122	235	22	Rc1/8	104.5	30	Rc1/4	26	187	366	330
122	235	22	Rc1/8	134.5	30	Rc1/4	26	247	436	378

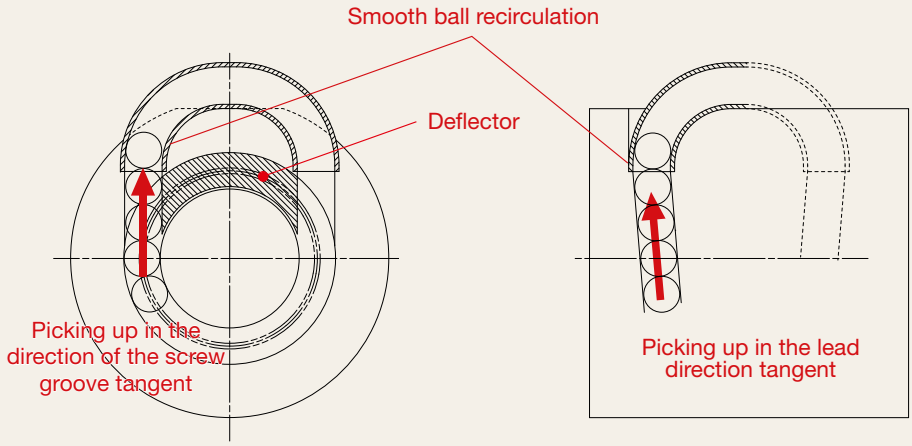


HTF-SRE Model

1 Specifications

Recirculation system: picking up balls in the direction tangent to deflector

By smoothly picking up balls in the direction of the screw groove tangent, feeding speed is 1.4 to 2 times as fast as the conventional tube recirculation system.



Allowable d-n value

Allowable d-n value 100,000

d-n value: shaft diameter d [mm] × rotations n [min^{-1}]

Allowable feed speed of combinations of shaft diameter and lead

Unit [mm]

Shaft dia. \ Lead	25	30	70	80	Allowable rotating speed [min^{-1}]
140	■	■			714
160	■	■	■	■	625
200		■	■	■	500

- Please consult NSK about ball nut shape and dimensions.
- A double-spread screw can be used for leads of 50mm and more.

High-speed performance two times greater than existing products

Abundant variation

Accuracy grade

Ct7 of JIS B 1192 is applicable as the standard accuracy grade.

Axial play

Standard axial play: 0.050 mm or less

Option

- High load capacity option to increase limit axial load. See page 7 for details.
- Consult NSK if the number of circuits is to be changed for a higher load capacity or circulation routes are to be placed on a single side.

2 Design Precautions

1) When designing the shaft ends, one end of the screw shaft must have ball groove cut through to the shaft end or the ball groove root diameter must be dr or less (see dimension chart), otherwise the ball nut cannot be installed on the screw shaft.
2) Please consult NSK with your special design requirements

3 Selection of Ball Screw

- Please refer to pages 11 and 12 for details on the operating life of the ball screw and instructions on installation and lubrication.
- Please consult NSK in the case of a short stroke operation less than or equal to four times the length of the ball screw lead.capacity or circulation routes are to be placed on a single side.

4 Operating Temperature

- Use temperature: 70 deg C maximum (temperature at nut diameter).

HTF Model

1 Specifications

Allowable d·n value and feed speed

Lead	20 mm or less	25 mm	30 to 32 mm
Standard	≦70 000	≦70 000	≦50 000
High-speed	≦100 000	—	—

d·n: Shaft diameter d (mm) × Rotational speed (min^{-1})

For even faster specs, HTF-SRC is recommended (See pages 13–16 for details).

Allowable feed speed of combinations of shaft diameter and lead

Unit [mm/s]

Shaft dia. [mm]	Lead [mm]							
	10	12	14	16	20	25	30	32
32	520							
36	460	550						
40	410	500						
45	370	440						
50	330	400	460	530				
55	300	360	420	480				
63		310	370	440	520	460		
80			290	330	410	360		
100				260	330	290		
120				220	270	240		
140					230	200	170	190
160						180	150	160
200							120	130

Leads with a diameter of 20 mm or less have high-speed feeding specs.

Accuracy grade

Ct7 of JIS B 1192 is applicable as the standard accuracy grade.

Axial play

Standard axial play: 0.020 mm or less, or 0.050 mm or less

Optional specs

- High load capacity option to increase limit axial load.
  See page 7 for details.
- Consult NSK if the number of circuits is to be changed for a higher load capacity or circulation routes are to be placed on a single side.

2 Design Precautions

1) When designing the shaft ends, one end of the screw shaft must have a ball groove cut through to the shaft end or the ball groove root diameter must be dr or less (see dimension chart), otherwise the ball nut cannot be installed on the screw shaft.
2) Please consult NSK with your special design requirements.

3 Selection of Ball Screw

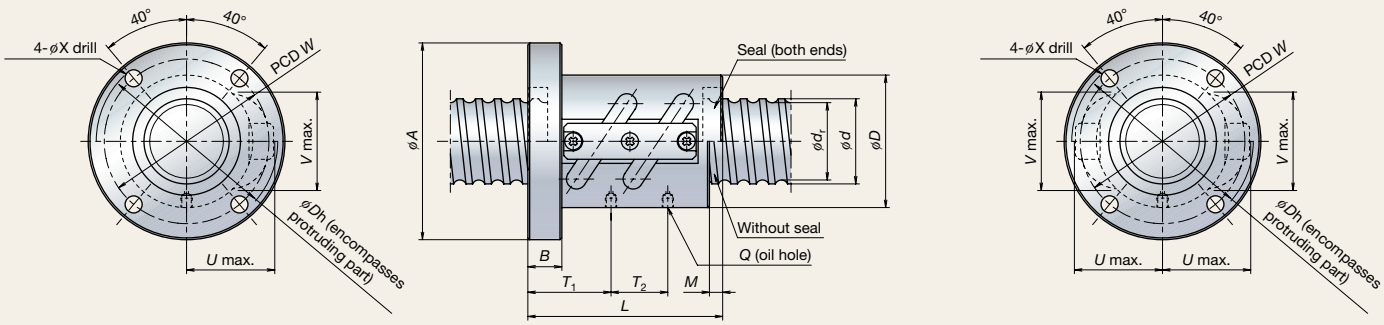
- Please refer to pages 11 and 12 for details on the operating life of the ball screw and instructions on installation and lubrication.
- Please consult NSK in the case of a short stroke operation less than or equal to four times the length of the ball screw lead.

4 Operating Temperature

- Use temperature: 70 deg C maximum (temperature at nut diameter)

HTF Model

Outline drawing

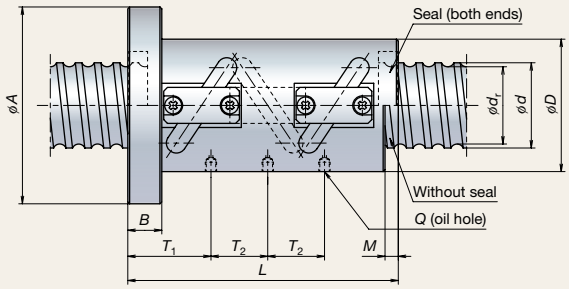


Nut model I

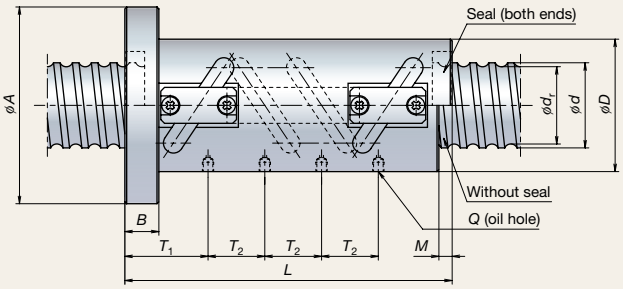
HTF Model Specifications

Model No.	Lead ℓ	Shaft dia. d	Root dia. d_r	Effective ball turns Turns × Circuits	Nut model	Basic load rating (kN)				
						Dynamic C_a	Static C_{0a}	D	A	B
HTF3210-5	10	32	25.6	2.5×2	I	88.7	169	58	92	18
HTF3610-5	10	36	29.6	2.5×2	I	96.1	191	62	96	18
HTF4010-7.5	10	40	33.6	2.5×3	II	149	344	66	100	18
HTF4510-7.5	10	45	38.6	2.5×3	II	158	386	70	104	18
HTF4510-10	10	45	38.6	2.5×4	III	203	514	70	104	18
HTF5010-7.5	10	50	43.6	2.5×3	II	166	435	75	109	18
HTF5010-10	10	50	43.6	2.5×4	III	213	580	75	109	18
HTF5510-7.5	10	55	48.6	2.5×3	II	173	477	80	114	18
HTF5510-10	10	55	48.6	2.5×4	III	222	636	80	114	18
HTF3612-5	12	36	29	2.5×2	I	112	228	66	100	22
HTF4012-7.5	12	40	33	2.5×3	II	184	422	70	104	22
HTF4512-7.5	12	45	38	2.5×3	II	195	473	72	106	22
HTF5012-7.5	12	50	43	2.5×3	II	205	525	77	111	22
HTF5012-10	12	50	43	2.5×4	III	263	700	77	111	22
HTF5512-7.5	12	55	48	2.5×3	II	214	586	82	116	22
HTF5512-10	12	55	48	2.5×4	III	274	781	82	116	22
HTF6312-7.5	12	63	56	2.5×3	II	227	668	92	126	22
HTF6312-10	12	63	56	2.5×4	III	290	891	92	126	22

Remarks: 1. The ball nut length with no seals is shorter by M than that of a ball nut with seals.
2. Please consult NSK if load exceeds the allowable axial load (Fa max.).
3. The right hand screw is the standard. For specifications on left hand screws, contact NSK.
4. The allowable axial load is a value in the case of S clearance. If the clearance amount and mounting conditions differ, please note that the allowable axial load is also different.



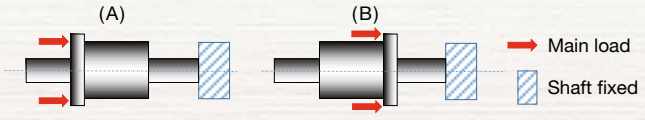
Nut model II



Nut model III

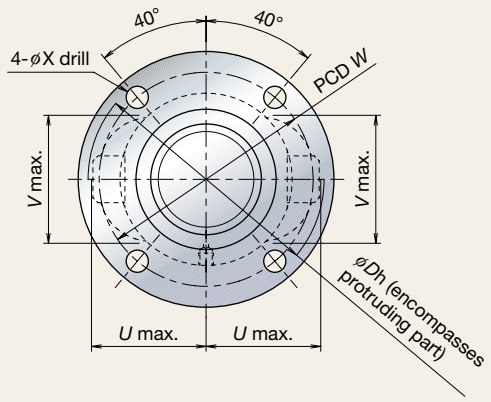
Unit [mm]

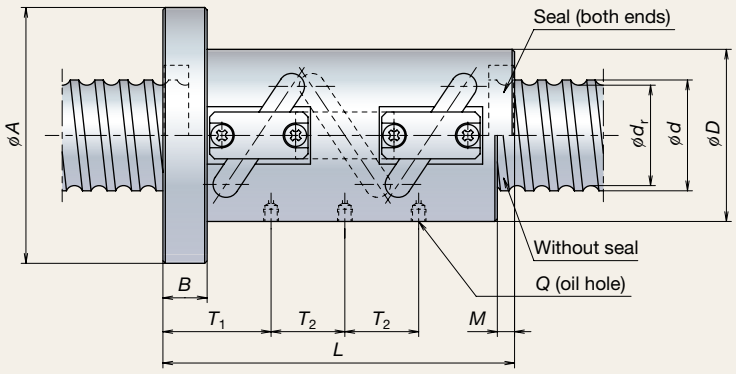
Ball nut dimensions										Allowable axial load (kN) Mounting ☆ See below	
L	M	W	X	U	V	Dh	Q	T_1	T_2	[A] Recommended	[B]
103	7	75	9	40.5	42	82	M6×1	36.5	30	33.0	29.5
103	7	79	9	43	45	87	M6×1	36.5	30	37.5	33.3
143	7	83	9	45	48	91	M6×1	46.5	30	59.5	46.1
143	7	87	9	47	52	95	M6×1	46.5	30	70.2	52.3
173	7	87	9	47	52	95	M6×1	46.5	30	81.4	56.1
143	7	92	9	49	57	99	M6×1	46.5	30	82.0	59.6
173	7	92	9	49	57	99	M6×1	46.5	30	92.4	67.1
143	7	97	9	51.5	62	104	M6×1	46.5	30	92.8	66.2
173	7	97	9	51.5	62	104	M6×1	46.5	30	110	71.5
123	8	83	9	46.5	46	94	M6×1	44	36	42.8	38.2
171	8	87	9	47.5	50	96	M6×1	56	36	62.7	49.8
171	8	89	9	49.5	54	100	M6×1	56	36	75.9	56.5
171	8	94	9	52	59	105	M6×1	56	36	88.5	64.2
207	8	94	9	52	59	105	M6×1	56	36	102	68.5
171	8	99	9	54.5	63	110	M6×1	56	36	101	71.9
207	8	99	9	54.5	63	110	M6×1	56	36	118	77.0
171	8	109	9	58.5	70	118	M6×1	56	36	120	85.8
207	8	109	9	58.5	70	118	M6×1	56	36	143	92.5



HTF Model

Outline drawing



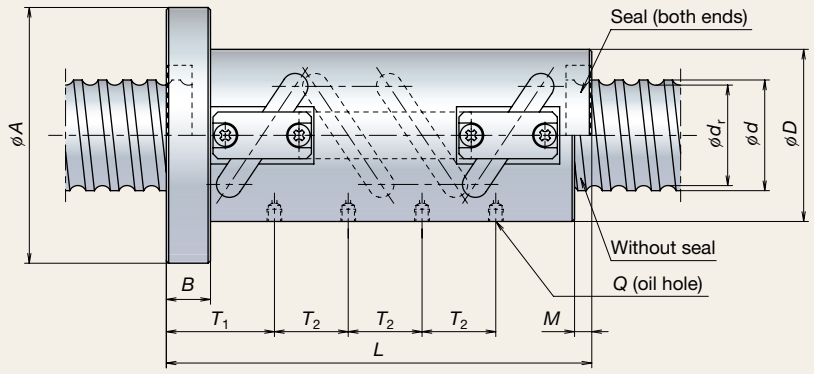


Nut model II

HTF Model Specifications

Model No.	Lead ℓ	Shaft dia. d	Root dia. d_r	Effective ball turns Turns × Circuits	Nut model	Basic load rating (kN)		D	A	B
						Dynamic C_a	Static C_{0a}			
HTF5014-7.5	14	50	41.7	2.5×3	II	264	623	80	114	28
HTF5514-7.5	14	55	46.7	2.5×3	II	270	696	85	119	28
HTF6314-7.5	14	63	54.7	2.5×3	II	291	800	94	128	28
HTF6314-10	14	63	54.7	2.5×4	III	373	1 070	94	128	28
HTF8014-7.5	14	80	71.7	2.5×3	II	327	1 020	116	150	28
HTF8014-10	14	80	71.7	2.5×4	III	418	1 360	116	150	28
HTF5016-7.5	16	50	39	2.5×3	II	383	818	95	129	28
HTF5516-7.5	16	55	44	2.5×3	II	399	922	99	133	28
HTF6316-7.5	16	63	52	2.5×3	II	429	1 050	105	139	28
HTF6316-10	16	63	52	2.5×4	III	549	1 410	105	139	28
HTF6316-10.5	16	63	52	3.5×3	II	562	1 450	105	139	28
HTF6316-14	16	63	52	3.5×4	III	720	1 930	105	139	28
HTF8016-7.5	16	80	69	2.5×3	II	478	1 340	120	154	32
HTF8016-10	16	80	69	2.5×4	III	612	1 790	120	154	32
HTF8016-10.5	16	80	69	3.5×3	II	627	1 870	120	154	32
HTF8016-14	16	80	69	3.5×4	III	802	2 490	120	154	32
HTF10016-7.5	16	100	89	2.5×3	II	529	1 710	145	185	32
HTF10016-10	16	100	89	2.5×4	III	677	2 280	145	185	32
HTF12016-7.5	16	120	109	2.5×3	II	572	2 050	173	213	32
HTF12016-10	16	120	109	2.5×4	III	732	2 730	173	213	32

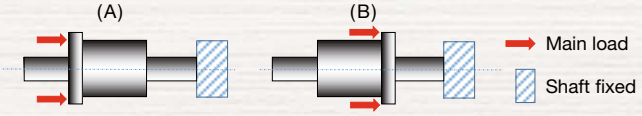
Remarks: 1. The ball nut length with no seals is shorter by M than that of a ball nut with seals.
2. Please consult NSK if load exceeds the allowable axial load (Fa max.).
3. The right hand screw is the standard. For specifications on left hand screws, contact NSK.
4. The allowable axial load is a value in the case of S clearance. If the clearance amount and mounting conditions differ, please note that the allowable axial load is also different.



Nut model III

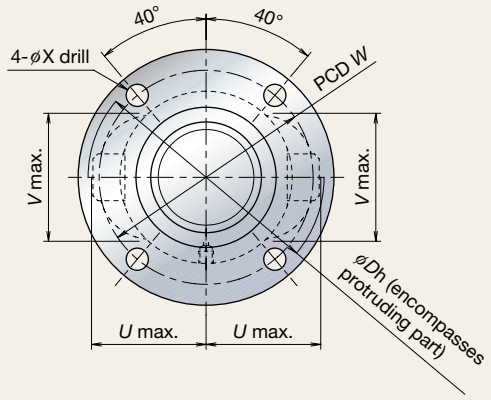
Unit [mm]

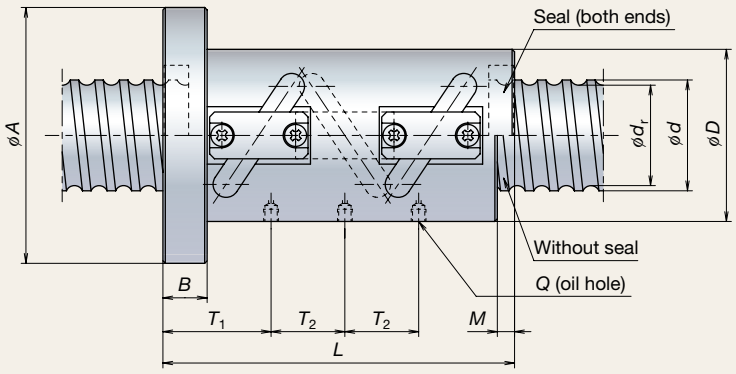
Ball nut dimensions										Allowable axial load (kN) Mounting ☆ See below	
L	M	W	X	U	V	Dh	Q	T_1	T_2	[A] Recommended	[B]
200	10	97	9	55.5	61	112	M6×1	66.5	42	104	76.8
200	10	102	9	57.5	65	116	M6×1	66.5	42	119	86.0
200	10	111	9	61.5	72	124	M6×1	66.5	42	145	102
242	10	111	9	61.5	72	124	M6×1	66.5	42	170	109
200	10	133	9	72	87	146	M6×1	66.5	42	195	139
242	10	133	9	72	87	146	M6×1	66.5	42	234	151
223	10	112	9	68	66	137	Rc1/8	73	48	128	109
223	10	116	9	70	70	141	Rc1/8	73	48	150	121
223	10	122	9	72.5	76	146	Rc1/8	73	48	184	142
271	10	122	9	72.5	76	146	Rc1/8	73	48	209	152
271	10	122	9	72.5	76	146	Rc1/8	73	64	217	157
335	10	122	9	72.5	76	146	Rc1/8	73	64	236	162
227	10	137	9	80	92	161	Rc1/8	77	48	259	186
275	10	137	9	80	92	161	Rc1/8	77	48	305	200
275	10	137	9	80	92	161	Rc1/8	77	64	321	209
339	10	137	9	80	92	161	Rc1/8	77	64	360	217
227	10	165	11	91	109	184	Rc1/8	77	48	347	250
275	10	165	11	91	109	184	Rc1/8	77	48	418	272
227	10	193	11	104	126	210	Rc1/8	77	48	425	318
275	10	193	11	104	126	210	Rc1/8	77	48	519	351



HTF Model

Outline drawing



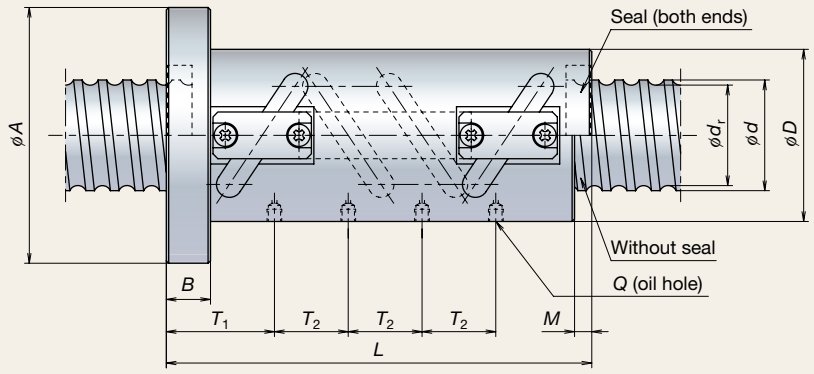


Nut model II

HTF Model Specifications

Model No.	Lead ℓ	Shaft dia. d	Root dia. d_r	Effective ball turns Turns × Circuits	Nut model	Basic load rating (kN)		D	A	B
						Dynamic C_a	Static C_{0a}			
HTF6320-7.5	20	63	49	2.5×3	II	572	1 320	117	157	32
HTF6320-10	20	63	49	2.5×4	III	732	1 760	117	157	32
HTF6320-10.5	20	63	49	3.5×3	II	749	1 810	117	157	32
HTF8020-7.5	20	80	66	2.5×3	II	639	1 690	130	170	32
HTF8020-10	20	80	66	2.5×4	III	818	2 250	130	170	32
HTF8020-10.5	20	80	66	3.5×3	II	838	2 300	130	170	32
HTF10020-7.5	20	100	86	2.5×3	II	713	2 140	145	185	32
HTF10020-10	20	100	86	2.5×4	III	914	2 850	145	185	32
HTF10020-10.5	20	100	86	3.5×3	II	935	2 920	145	185	32
HTF10020-14	20	100	86	3.5×4	III	1 200	3 890	145	185	32
HTF12020-7.5	20	120	106	2.5×3	II	775	2 550	173	213	40
HTF12020-10	20	120	106	2.5×4	III	993	3 400	173	213	40
HTF12020-10.5	20	120	106	3.5×3	II	1 020	3 530	173	213	40
HTF12020-14	20	120	106	3.5×4	III	1 300	4 710	173	213	40
HTF14020-7.5	20	140	126	2.5×3	II	829	3 000	204	250	40
HTF14020-10	20	140	126	2.5×4	III	1 060	4 000	204	250	40
HTF6325-10.5	25	63	49	3.5×3	II	749	1 810	117	157	32
HTF8025-7.5	25	80	64	2.5×3	II	829	2 020	145	185	40
HTF10025-7.5	25	100	84	2.5×3	II	917	2 550	159	199	40
HTF10025-10	25	100	84	2.5×4	III	1 170	3 400	159	199	40
HTF10025-10.5	25	100	84	3.5×3	II	1 200	3 490	159	199	40
HTF10025-14	25	100	84	3.5×4	III	1 540	4 650	159	199	40
HTF12025-7.5	25	120	104	2.5×3	II	990	3 080	173	213	40
HTF12025-10	25	120	104	2.5×4	III	1 270	4 110	173	213	40
HTF12025-10.5	25	120	104	3.5×3	II	1 300	4 200	173	213	40
HTF12025-14	25	120	104	3.5×4	III	1 660	5 600	173	213	40
HTF14025-7.5	25	140	124	2.5×3	II	1 050	3 610	204	250	40
HTF14025-10	25	140	124	2.5×4	III	1 350	4 810	204	250	40
HTF14025-10.5	25	140	124	3.5×3	II	1 380	4 910	204	250	40
HTF14025-14	25	140	124	3.5×4	III	1 770	6 540	204	250	40
HTF16025-7.5	25	160	144	2.5×3	II	1 140	4 140	234	280	40
HTF16025-10	25	160	144	2.5×4	III	1 450	5 520	234	280	40

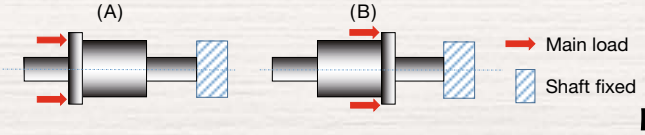
Remarks: 1. The ball nut length with no seals is shorter by M than that of a ball nut with seals.
2. Please consult NSK if load exceeds the allowable axial load (Fa max.).
3. The right hand screw is the standard. For specifications on left hand screws, contact NSK.
4. The allowable axial load is a value in the case of S clearance. If the clearance amount and mounting conditions differ, please note that the allowable axial load is also different.



Nut model III

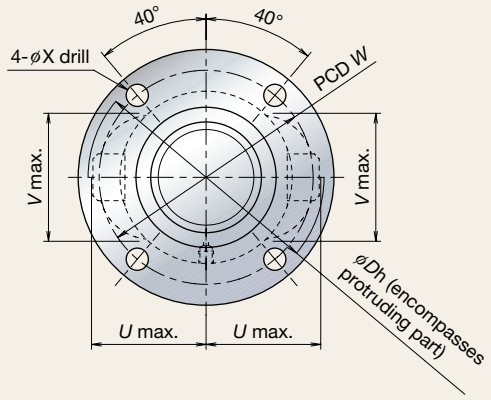
Unit [mm]

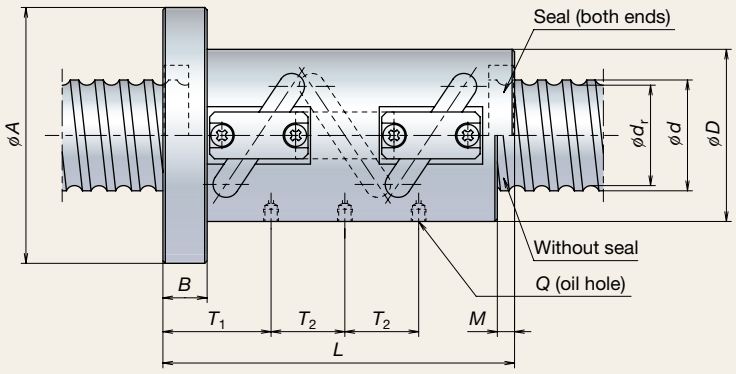
Ball nut dimensions										Allowable axial load (kN) Mounting ☆ See below	
L	M	W	X	U	V	Dh	Q	T_1	T_2	[A] Recommended	[B]
273	12	137	11	83.5	81	168	Rc1/8	88	60	212	173
333	12	137	11	83.5	81	168	Rc1/8	88	60	234	183
333	12	137	11	83.5	81	168	Rc1/8	88	80	243	190
273	12	150	11	89.5	96	181	Rc1/8	88	60	310	233
333	12	150	11	89.5	96	181	Rc1/8	88	60	353	247
333	12	150	11	89.5	96	181	Rc1/8	88	80	365	255
273	12	165	11	97.5	114	196	Rc1/8	88	60	427	295
333	12	165	11	97.5	114	196	Rc1/8	88	60	501	314
333	12	165	11	97.5	114	196	Rc1/8	90	80	320	324
413	12	165	11	97.5	114	196	Rc1/8	90	80	582	335
281	12	193	11	111	130	223	Rc1/8	96	60	522	376
341	12	193	11	111	130	223	Rc1/8	96	60	624	407
341	12	193	11	111	131	223	Rc1/8	96	80	657	424
421	12	193	11	111	131	223	Rc1/8	96	80	748	442
281	12	226	14	122.5	148	248	Rc1/8	96	60	630	468
341	12	226	14	122.5	148	248	Rc1/8	96	60	765	514
398	12	137	11	83.5	83	169	Rc1/8	98.75	100	228	175
338	17	165	11	102	100	206	Rc1/8	109.25	75	338	271
338	17	179	11	108.5	118	219	Rc1/8	109.25	75	484	354
413	17	179	11	108.5	118	219	Rc1/8	109.25	75	554	375
413	17	179	11	108.5	118	219	Rc1/8	109.25	100	575	388
513	17	179	11	108.5	118	219	Rc1/8	109.25	100	629	399
338	17	193	11	116	135	223	Rc1/8	109.25	75	612	424
413	17	193	11	116	135	223	Rc1/8	109.25	75	712	450
413	17	193	11	116	134	233	Rc1/8	109.25	100	739	464
513	17	193	11	116	134	233	Rc1/8	109.25	100	821	479
338	17	226	14	127.5	153	258	Rc1/8	109.25	75	752	531
413	17	226	14	127.5	153	258	Rc1/8	109.25	75	897	572
413	17	226	14	127.5	153	258	Rc1/8	109.25	100	939	594
513	17	226	14	127.5	153	258	Rc1/8	109.25	100	1 060	618
338	17	256	14	138	173	279	Rc1/8	109.25	75	874	638
413	17	256	14	138	173	279	Rc1/8	109.25	75	1 050	696



HTF Model

Outline drawing



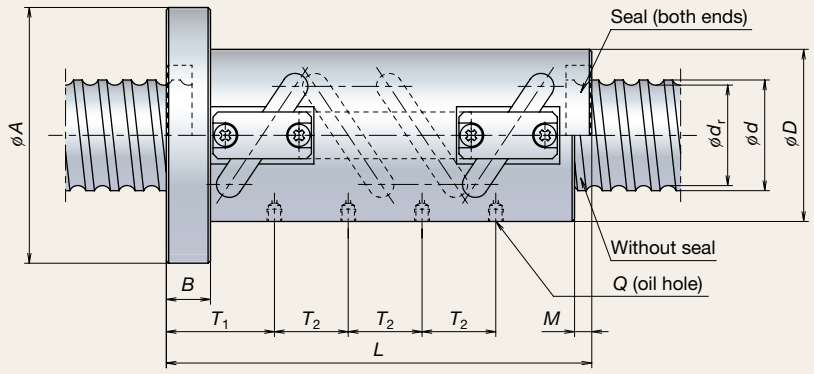


Nut model II

HTF Model Specifications

Model No.	Lead ℓ	Shaft dia. d	Root dia. d_r	Effective ball turns Turns × Circuits	Nut model	Basic load rating (kN)		D	A	B
						Dynamic C_a	Static C_{0a}			
HTF14030-7.5	30	140	121	2.5×3	II	1 310	4 110	222	282	50
HTF14030-10	30	140	121	2.5×4	III	1 670	5 490	222	282	50
HTF14030-10.5	30	140	121	3.5×3	II	1 710	5 710	222	282	50
HTF16030-7.5	30	160	141	2.5×3	II	1 400	4 760	234	294	50
HTF16030-10	30	160	141	2.5×4	III	1 790	6 340	234	294	50
HTF16030-10.5	30	160	141	3.5×3	II	1 830	6 520	234	294	50
HTF20030-7.5	30	200	181	2.5×3	II	1 550	5 960	290	350	50
HTF20030-10	30	200	181	2.5×4	III	1 980	7 950	290	350	50
HTF14032-7.5	32	140	118	2.5×3	II	1 590	4 740	222	296	70
HTF14032-10	32	140	118	2.5×4	III	2 040	6 320	222	296	70
HTF14032-10.5	32	140	118	3.5×3	II	2 080	6 420	222	296	70
HTF16032-7.5	32	160	138	2.5×3	II	1 660	5 370	234	308	70
HTF16032-10	32	160	138	2.5×4	III	2 130	7 160	234	308	70
HTF16032-10.5	32	160	138	3.5×3	II	2 180	7 460	234	308	70
HTF20032-7.5	32	200	178	2.5×3	II	1 840	6 840	290	364	70
HTF20032-10	32	200	178	2.5×4	III	2 360	9 120	290	364	70

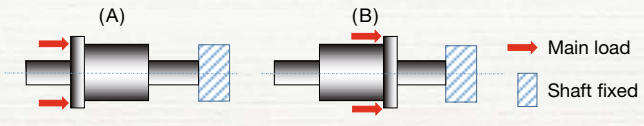
Remarks: 1. The ball nut length with no seals is shorter by M than that of a ball nut with seals.
2. Please consult NSK if load exceeds the allowable axial load (Fa max.).
3. The right hand screw is the standard. For specifications on left hand screws, contact NSK.
4. The allowable axial load is a value in the case of S clearance. If the clearance amount and mounting conditions differ, please note that the allowable axial load is also different.



Nut model III

Unit [mm]

Ball nut dimensions										Allowable axial load (kN) Mounting ☆ See below	
L	*M*	*W*	*X*	*U*	*V*	*Dh*	*Q*	T_1	T_2	[A] Recommended	[B]
411	22	252	18	139	160	281	Rc1/8	134.5	90	809	613
501	22	252	18	139	160	281	Rc1/8	134.5	90	938	659
501	22	252	18	139	160	281	Rc1/8	134.5	120	987	688
411	22	264	18	148	177	299	Rc1/8	134.5	90	1 010	708
501	22	264	18	148	177	299	Rc1/8	134.5	90	1 190	761
501	22	264	18	148	177	299	Rc1/8	134.5	120	1 240	786
411	22	320	18	178	212	359	Rc1/8	134.5	90	1 300	955
501	22	320	18	178	212	359	Rc1/8	134.5	90	1 570	1 040
465	22	259	22	148	163	299	Rc1/8	166.5	96	828	621
561	22	259	22	148	163	299	Rc1/8	166.5	96	954	664
561	22	259	22	148	163	299	Rc1/8	166.5	128	998	690
465	22	271	22	152	181	307	Rc1/8	166.5	96	1 020	708
561	22	271	22	152	181	307	Rc1/8	166.5	96	1 200	757
561	22	271	22	152	181	307	Rc1/8	166.5	128	1 270	791
465	22	327	22	182	215	367	Rc1/8	166.5	96	1 340	968
561	22	327	22	182	215	367	Rc1/8	166.5	96	1 610	1 050



NSKTAC Series of Ball Screw Support Bearings for High-Load Applications

Standard Series and Special Bore Diameter Series of Ball Screw Support Bearings for High-Load Applications

NSKHPS™
Angular Contact Thrust Ball Bearings of Ball Screw Support Bearings for High-Load Drive Applications

High-capacity bearings used for supporting ball screws operating under high loads typically adopt large-diameter steel balls in order to ensure sufficient high capacity and to reduce the number of rows of combinations. With the development and commercialization of the special bore diameter series, which has the same load rating as that of the standard series but with a smaller bore diameter, users can maintain equivalent high-capacity performance with a smaller diameter of screw shaft end without changing the number of rows. Please refer to pages 41 and 42 for applicable bearing tables.

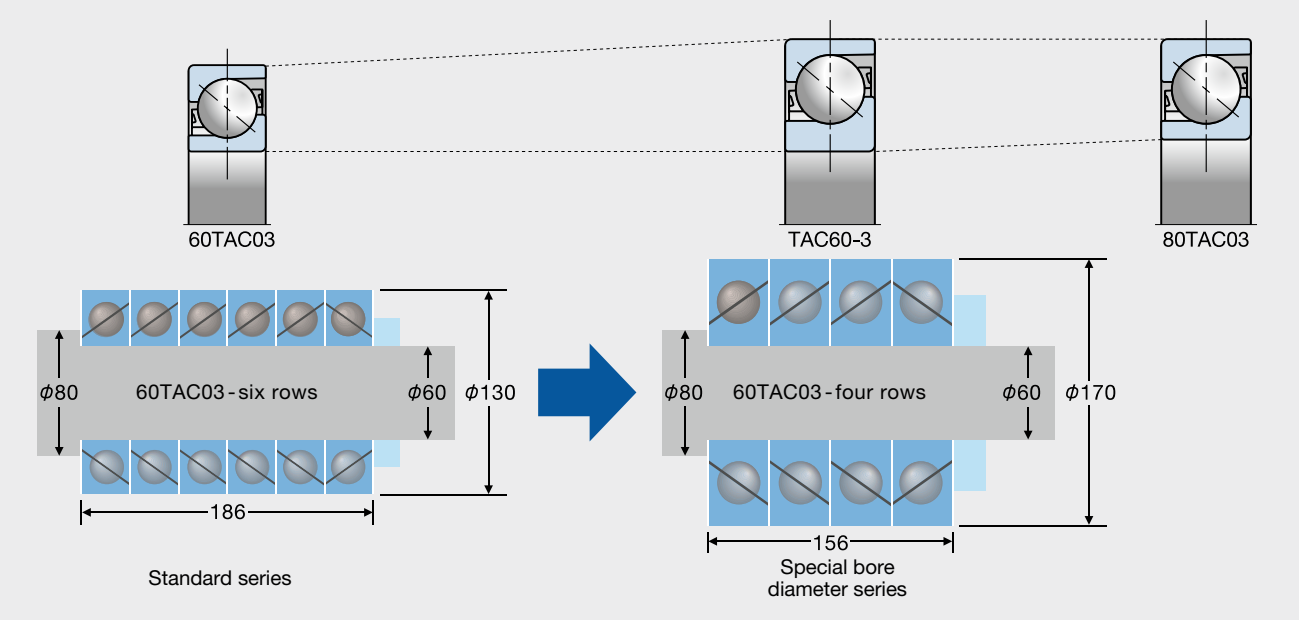
Extended bearing life and higher axial-load capacity

Special bore diameter series facilitates increasing load capacity of coaxial diameter and downscaling screw shaft end.

Easy handling by means of universal matching

Special Bore Series for Higher Load Capacity with Unchanged Shaft Diameter

The Special Bore Series are Standard Series bearings of the next larger size with only their bore reduced in size, permitting higher load capacity with the same shaft diameter as well as more compact screw shaft ends.



Formulation of Bearing Numbers

Standard series

Example: 60 TAC 03 D T85 SU M PN5D

- 60 — Bearing bore diameter
- TAC — Bearing type symbol
- 03 — Dimension symbol
- D — Internal design symbol
- T85 — Cage symbol
- SU — Arrangement symbol
- M — Preload symbol
- PN5D — Accuracy symbol

60	Bearing bore diameter	Bore diameter (mm)
TAC	Bearing type symbol	Angular contact thrust ball bearing
03	Dimension symbols	02: 02 series; 03: 03 series
D	Internal design symbol	Contact angle 55 °
T85	Cage symbol	T85: Polyamide resin cage M: Brass cage
SU	Arrangement symbol	SU: Universal matching for single row
M	Preload symbol	M: Medium preload EL: Extra light preload
PN5D	Accuracy symbol	PN5D: Standard accuracy (ISO class 5 equivalent)

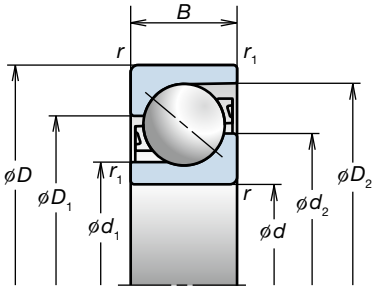
Special bore diameter series

Example: TAC 60 - 3 T85 SU M PN5D

- TAC — Bearing type symbol
- 60 — Bearing bore diameter
- 3 — Internal design symbol
- T85 — Cage symbol
- SU — Arrangement symbol
- M — Preload symbol
- PN5D — Accuracy symbol

TAC	Bearing type symbol	Angular contact thrust ball bearing
60	Bearing bore diameter	Bore diameter (mm)
3	Internal design symbol	Contact angle 55 °
T85	Cage symbol	T85: Polyamide resin cage M: Brass cage
SU	Arrangement symbol	SU: Universal matching for single row
M	Preload symbol	M: Medium preload EL: Extra light preload
PN5D	Accuracy symbol	PN5D: Standard accuracy (ISO class 5 equivalent)

NSKTAC Series of Ball Screw Support Bearings for High-Load Applications



Bearing numbers[1]	Boundary dimensions (mm)					Dimensions (mm)				Recommended Grease Quantities (cc/row)	Contact angle (degree)	Limiting speeds[2] (min^{-1})	
	d	*D*	*B*	*r* (Min.)	r_1 (Min.)	d_1	d_2	D_1	D_2			Grease	Oil
15TAC02D	15	35	11	0.6	0.3	19.1	24.5	26	31.9	1	55	12 000	14 800
20TAC03D	20	52	15	1.1	0.6	27.2	35.3	37.5	46.1	2.7	55	8 300	10 300
25TAC02D	25	52	15	1	0.6	30.8	38.1	39.6	47.3	3	55	7 700	9 700
TAC35-3	35	90	23	1.5	1	50.4	64.2	67.1	81.7	14	55	4 600	6 000
40TAC03D	40	90	23	1.5	1	50.4	64.2	67.1	81.7	14	55	4 600	5 700
TAC40-3	40	110	27	2	1	62	79.1	82.4	100.6	25	55	3 700	5 000
45TAC03D	45	100	25	1.5	1	56.5	71.7	74.7	90.8	18	55	4 100	5 200
TAC45-3	45	110	27	2	1	62	79.1	82.4	100.6	25	55	3 700	4 800
50TAC03D	50	110	27	2	1	62	79.1	82.4	100.6	25	55	3 700	4 700
TAC50-3	50	130	31	2.1	1.1	73.9	93.8	98	119	40	55	3 100	4 200
55TAC03D	55	120	29	2	1	68	86.4	90.2	109.7	32	55	3 400	4 300
60TAC03D	60	130	31	2.1	1.1	73.9	93.8	98	119	40	55	3 100	3 900
TAC60-3	60	170	39	2.1	1.1	98.5	123.6	128.7	157.5	85	55	2 400	3 300
70TAC03D	70	150	35	2.1	1.1	86.3	108.6	113.4	137.8	59	55	2 700	3 400
75TAC03D	75	160	37	2.1	1.1	92.4	116.2	121	146.2	67	55	2 500	3 200
80TAC03D	80	170	39	2.1	1.1	98.5	123.6	128.7	157.5	85	55	2 400	3 000
TAC80-3	80	215	47	3	1.1	124	154.9	160.4	194.5	156	55	1 900	2 600
100TAC03D	100	215	47	3	1.1	124	154.9	160.4	194.5	156	55	1 900	2 400
TAC100-3	100	260	55	3	1.1	150.5	186.9	193.4	231.7	254	55	1 500	2 100
120TAC03D	120	260	55	3	1.1	150.5	186.9	193.4	231.7	254	55	1 500	2 000
* TAC120-3M	120	300	62	4	1.5	170.8	215.3	224.1	265.7	336	55	1 300	1 800
* 140TAC03DM	140	300	62	4	1.5	170.8	215.3	224.1	265.7	336	55	1 300	1 700
* TAC140-3M	140	340	68	4	1.5	197.5	246.2	254.3	298.8	442	55	1 200	1 600
* 160TAC03DM	160	340	68	4	1.5	197.5	246.2	254.3	298.8	442	55	1 200	1 500
* TAC160-3M	160	380	75	4	1.5	221.1	275.6	284.9	334.9	624	55	1 000	1 400
* 180TAC03DM	180	380	75	4	1.5	221.1	275.6	284.9	334.9	624	55	1 000	1 400

Note: 1. An asterisk (*) indicates bearings that are also available equipped with screw holes for mounting bolts.
2. Limiting speeds are based on the standard preload of each bearing. The values shown are valid for all types of bearing arrangement.
3. Preload values for bearings with a bore diameter of 100mm or more as well as for TAC80-3 are based on EL preload.
4. The starting torque values in the table apply to grease lubrication.
5. To calculate permissible axial load, multiply limiting axial load by 0.7.
6. When it is used under the condition that impact load is applied, brass cage is recommended. Please consult NSK.

Multi-row combination calculations

Calculation of preload, axial rigidity and starting torque for bearing arrangements
Multiply by factors in table B.

Table B

Number of load-sustaining rows	2 rows		3 rows			4 rows		5 rows
	DFD	DFF	DFT	DFFD	DFFF	DFTD	DFFT	DFTT
	⊘⊘	⊘⊘⊘	⊘⊘⊘	⊘⊘⊘⊘	⊘⊘⊘⊘⊘	⊘⊘⊘⊘	⊘⊘⊘⊘⊘	⊘⊘⊘⊘⊘
	DBD	DBB	DBT	DBBD	DBBB	DBTD	DBBT	DBTT
	⊘⊘	⊘⊘⊘	⊘⊘⊘	⊘⊘⊘⊘	⊘⊘⊘⊘⊘	⊘⊘⊘⊘	⊘⊘⊘⊘⊘	⊘⊘⊘⊘⊘
Preload factor	1.36	2.00	1.57	2.42	3.00	1.72	2.72	1.83
Axial rigidity	1.49	2.00	1.89	2.51	3.00	2.24	2.97	2.57
Starting torque	1.35	2.00	1.55	2.41	3.00	1.68	2.71	1.77

	Mass (kg) (approx.)	Preload[3] (DB and DF Arrangement) (N)	Axial Rigity[3] (DB and DF Arrangement (N/μm)	Starting Torque[4] (DB and DF Arrangement (N • m)	Basic dynamic load rating C_a by number of rows sustaining F_a					Limiting axial load by number of rows sustaining F_a[5]				
					1 row (kN)	2 rows (kN)	3 rows (kN)	4 rows (kN)	5 rows (kN)	1 row (kN)	2 rows (kN)	3 rows (kN)	4 rows (kN)	5 rows (kN)
	0.047	400	290	0.017	21.0	34.0	45.0	55.5	64.5	18.6	37.5	56.0	74.5	93.0
	0.155	830	430	0.026	42.5	69.5	92.0	113	132	38.5	77.0	116	154	193
	0.137	690	430	0.036	37.0	60.0	79.5	97.5	114	36.0	72.5	109	145	181
	0.712	2 500	780	0.26	113	184	244	299	350	118	235	355	470	590
	0.659	2 500	780	0.26	113	184	244	299	350	118	235	355	470	590
	1.28	3 900	970	0.50	166	270	360	440	515	181	360	540	720	905
	0.877	2 800	830	0.31	133	216	287	350	410	142	283	425	565	710
	1.21	3 900	970	0.50	166	270	360	440	515	181	360	540	720	905
	1.14	3 900	970	0.50	166	270	360	440	515	181	360	540	720	905
	2.00	5 200	1 120	0.78	218	355	470	575	670	242	485	725	965	1 210
	1.44	4 280	1 060	0.68	190	310	410	500	585	210	420	630	840	1 050
	1.80	5 200	1 120	0.78	218	355	470	575	670	242	485	725	965	1 210
	4.47	8 050	1 400	1.5	305	495	660	805	940	390	775	1 170	1 550	1 940
	2.67	6 400	1 250	1.1	262	425	565	690	810	305	615	920	1 230	1 530
	3.20	7 230	1 330	1.3	283	460	610	750	875	345	690	1 040	1 380	1 730
	3.80	8 050	1 400	1.5	305	495	660	805	940	390	775	1 170	1 550	1 940
	8.66	1 240	880	0.15	420	685	910	1 110	1 300	510	1 020	1 530	2 040	2 550
	7.54	1 240	880	0.15	420	685	910	1 110	1 300	510	1 020	1 530	2 040	2 550
	14.8	1 620	1 050	0.21	520	850	1 130	1 380	1 610	680	1 360	2 040	2 720	3 400
	13.3	1 620	1 050	0.21	520	850	1 130	1 380	1 610	680	1 360	2 040	2 720	3 400
	24.5	1 710	1 130	0.24	640	1 040	1 380	1 680	1 970	794	1 590	2 380	3 200	3 950
	22.5	1 710	1 130	0.24	640	1 040	1 380	1 680	1 970	794	1 590	2 380	3 200	3 950
	34.5	1 850	1 240	0.27	725	1 180	1 570	1 920	2 240	1 040	2 080	3 100	4 150	5 200
	32.0	1 850	1 240	0.27	725	1 180	1 570	1 920	2 240	1 040	2 080	3 100	4 150	5 200
	46.8	1 940	1 310	0.30	815	1 330	1 760	2 150	2 520	1 360	2 720	4 100	5 450	6 800
	43.7	1 940	1 310	0.30	815	1 330	1 760	2 150	2 520	1 360	2 720	4 100	5 450	6 800

Dynamic equivalent load

Angular contact thrust ball bearings for equipment such as electric injection molding machines are subjected to extremely large axial loads (F_a) in comparison to radial loads (F_r).
Therefore, the dynamic equivalent load P of the support bearing is obtained by the following formula regardless of the number of rows:

P is 0.81 $F_r + F_a$

NSK Linear Guides™ High Rigidity Series RA Model Roller Guide

The RA model roller guide feature high-load capacity and high rigidity. This model is the culmination of NSK's analysis technology and tribology.

RA roller guides represent the culmination of NSK's extensive experience in roller bearings and linear guide technologies.
Their optimized designs take full advantage of our unique expertise to realize smooth motion and super-high load capacity, rigidity, and motion accuracy. RA models help support higher machine performance to meet your needs.

Super-high load capacity

Thanks to analysis technologies, RA roller guide is among the best in the world–with operating life thanks to their high load capacity.

Super-high rigidity

We pursued a complete, optimal design, down to the detailed shape of roller slides and rails, thereby realizing super-high rigidity.

Interchangeable series

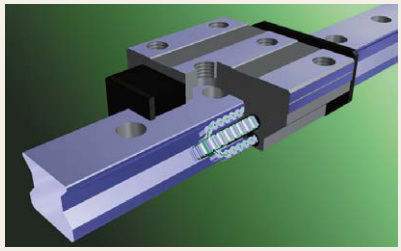
Rails and roller slides are each stocked independently, allowing for quick delivery.

Highly dust-resistant design

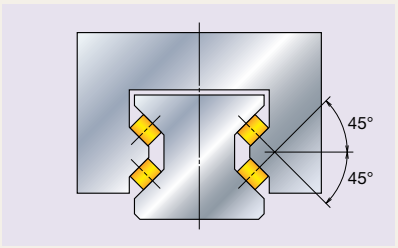
Specifications featuring highly dust-resistant V1 end seals with enhanced abrasion resistance are also available (RA 25–65).

Optimal Design

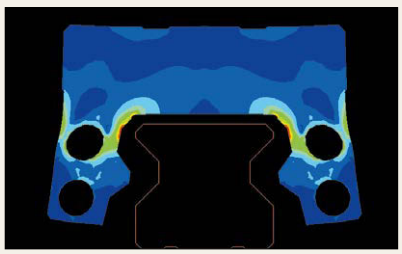
NSK conducts comprehensive and detailed performance simulations of roller guides by combining analysis and tribology technologies cultivated over many years of experience.
These advancements have allowed us to attain thoroughly optimized designs down to the dimensions and shapes of the guide components.



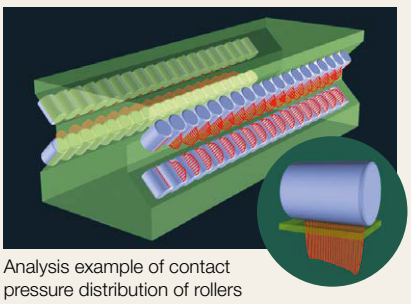
Smooth motion by use of retaining pieces



Balanced four-directional equal load specification



Example of roller slide deformation analysis



Analysis example of contact pressure distribution of rollers

Specifications

Roller Slide Types and Shapes

- Roller slides are available in square, flanged, and low-profile types.
- The mounting holes of the flanged type have a tapped part used to fix the roller slide from the top surface and a tapped minor diameter section for use as bolt holes from the bottom. This allows for mounting from either the top or bottom.
- Two roller slide lengths are available: the standard high load type and the longer super-high load type.

Fig. 1 Square type (RA15, 20, 25, 30, 35, 45, 55, and 65)

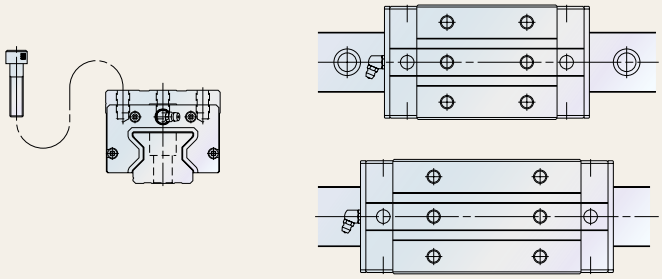


Fig. 2 Low-profile type (RA15, 25, 30, 35, 45, and 55)

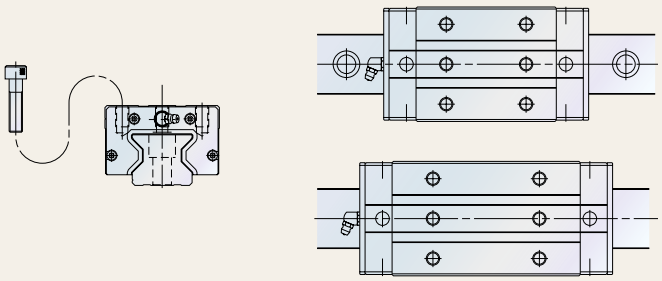
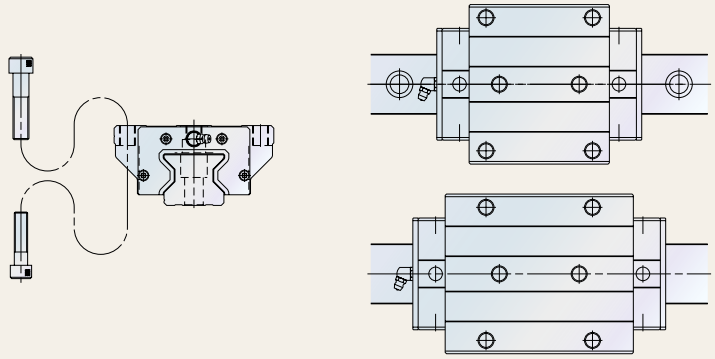


Fig. 3 Flanged type (RA15, 20, 25, 30, 35, 45, 55, and 65)



Please refer to CAT. No. E3328 for more details. It also introduces the RB model with low mounting height, which facilitates compact machine design.

Technical Data sheet

NSK Technical Data Sheet for NSK High-Load Drive Ball Screw

Custom-made ball screw

Company name:	Date:
Section:	Person in charge:
Address:	

NSK sales office

Name of machine*1: *Electric injection molding machine; 200-ton capacity* Application*2: *Injection axis*

Drawing/rough sketch attached?: ☑ Yes ☐ No

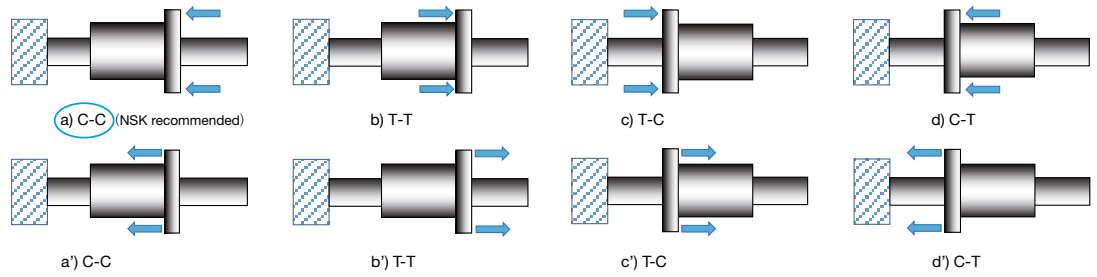
*1 Please specify capacity of the machine in case of injection molding machine or press.

*2 If the application is injection molding machine, please indicate the axis. (Examples: injection axis and clamping axis)

1. Use conditions

Operating conditions	☑ Shaft rotation–Moving nut ☐ Shaft rotation–Moving shaft ☐ Nut rotation–Moving nut ☐ Nut rotation–Moving shaft	☑ Normal operation ☐ Back drive operation ☐ Oscillation	Degree of vibration / impact	☐ Smooth operation without impact ☑ Normal operation ☐ Operation associated with impact or vibration
Direction of load*3	☐ C-C ☑ T-T ☐ T-C ☐ C-T ☐ other (Refer to figures below.) *See attachment*		Mounting orientation	☑ Horizontal ☐ Vertical (Indicate the direction of gravity.)
Lubricant	☑ Grease (Brand name: *High-load grease with an extreme pressure additive*) ☐ Oil (Maker:)		How to replenish lubricant	☐ Grease gun ☑ Automatic (cm³/ cycles)
Request for oil hole	☑ NSK recommended ☐ Your request			
Necessity of seals	☑ Yes ☐ No		NSK S1 necessary?	☑ NSK recommended ☐ Not necessary
Environment	Temperature (*40* deg)	Particles / ☐ Yes (Size of particle: a) to 0.1, b) over 0.1 to 0.3, c) over 0.3, d) Ingredient:) ☑ No particle		
Surface treatment	☑ Not required ☐ Low-temperature chrome plating ☐ Fluoride low-temperature chrome plating ☐ Other			
Quantity in mass-production	/Month	/Year	/Lot	Quantity used per machine: *1* pcs./machine

*3 Please specify loading direction code on the figures below. (Shaft fixed: ▨, Main load: ← Opposite load direction is opposite to the arrow)



*4 Check the strength of the ball screw and nut sections by the above main and Opposite loads.

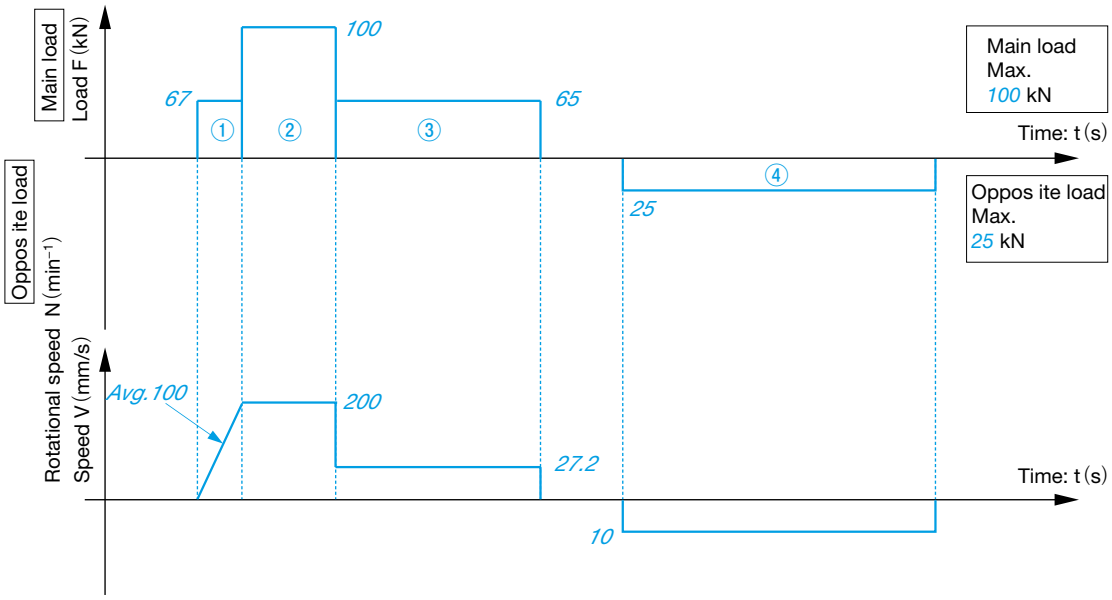
2. Specifications

Shaft diameter	ø *63* mm	Lead	*16* mm	Accuracy grade	*Ct7*	Axial play	*0.050 or less* mm max.
Nut model No.	*HTF-SRC 6316-7.5-S1*	Effective turns of balls	*2.5×3*	Direction of turn	*right*	Thread length / Overall shaft length	*800* / *1200*

Special note / Requests

NSK Technical Data Sheet for NSK High-Load Drive Ball Screw

3. Load chart (If using multiple ball screws in an axis, fill out the axial load per ball screw.)



	Axial load* F (kN)	Rotational speed or Average speed N (min⁻¹)	Rotational speed or Average speed V (mm/s)	Time t (s)	Stroke St (mm)	Remarks
①	67		100	0.1	10	
②	100		200	0.5	100	
③	65		27.2	7	190	
④	25		10	30	300	
⑤	0		0	10.4	0	
⑥				Total: 48	Total: 600	
⑦						
⑧						
⑨						
⑩						

Main load — Dynamic axial load (max.)*: 100 (kN) — Static axial load (max.)* (at 0 mm/s): (kN)

Opposite load — Dynamic axial load (max.)*: 25 (kN) — Static axial load (max.)* (at 0 mm/s): (kN)

Stroke in normal use: 300 (mm) — Maximum stroke: 500 (mm)

Cycle time: 18 (s) — Required life: 40000 (☑ h or ☐ cycles)

*If using multiple ball screws in an axis, fill out the axial load per ball screw.

4. Plan to conduct the endurance test of the ball screw?

Actual data on the machine → ☐ Yes

→ ☑ N/A → Planning to check endurance (Date: From the middle of March 20XX)

→ No (Reason:)

Endurance of the ball screw

(1) Mounting accuracy, load conditions, and lubricating conditions are the main factors affecting the ball screw fatigue life. Therefore, we recommend evaluating the influence of those factors on actual use of your machines.

(2) A temperature rise caused by operational and environmental conditions may reduce the effectiveness of lubricant.

(3) Discrepancies in this information, such as the direction and size of the main and opposite loads, may lead to premature failure.

Technical Data sheet

NSK Technical Data Sheet for NSK High-Load Drive Ball Screw

Custom-made ball screw

Company name:	Date:	NSK sales office
Section:	Person in charge:	
Address:		

Name of machine*1: _____ Application*2: _____

Drawing/rough sketch attached?: ☐ Yes ☐ No

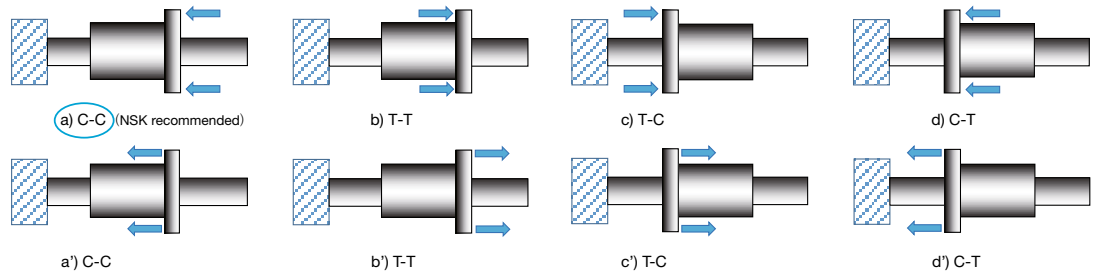
*1 Please specify capacity of the machine in case of injection molding machine or press.

*2 If the application is injection molding machine, please indicate the axis. (Examples: injection axis and clamping axis)

1. Use conditions

Operating conditions	☐ Shaft rotation–Moving nut ☐ Shaft rotation–Moving shaft ☐ Nut rotation–Moving nut ☐ Nut rotation–Moving shaft	☐ Normal operation ☐ Back drive operation ☐ Oscillation	Degree of vibration / impact	☐ Smooth operation without impact ☐ Normal operation ☐ Operation associated with impact or vibration
Direction of load*3	☐ C-C ☐ T-T ☐ T-C ☐ C-T ☐ other (Refer to figures below.)		Mounting orientation	☐ Horizontal ☐ Vertical (Indicate the direction of gravity.)
Lubricant	☐ Grease (Brand name: ☐ Oil Maker:)		How to replenish lubricant	☐ Grease gun ☐ Automatic (cm³/ cycles)
Request for oil hole	☐ NSK recommended ☐ Your request			
Necessity of seals	☐ Yes ☐ No		NSK S1 necessary?	☐ NSK recommended ☐ Not necessary
Environment	Temperature (deg)	Particles / ☐ Yes (Size of particle: a) to 0.1, b) over 0.1 to 0.3, c) over 0.3, d) Ingredient:) ☐ No particle		
Surface treatment	☐ Not required ☐ Low-temperature chrome plating ☐ Fluoride low-temperature chrome plating ☐ Other			
Quantity in mass-production	/Month /Year /Lot		Quantity used per machine	pcs./machine

*3 Please specify loading direction code on the figures below. (Shaft fixed: ▨, Main load: ← Opposite load direction is opposite to the arrow)



*4 Check the strength of the ball screw and nut sections by the above main and Opposite loads.

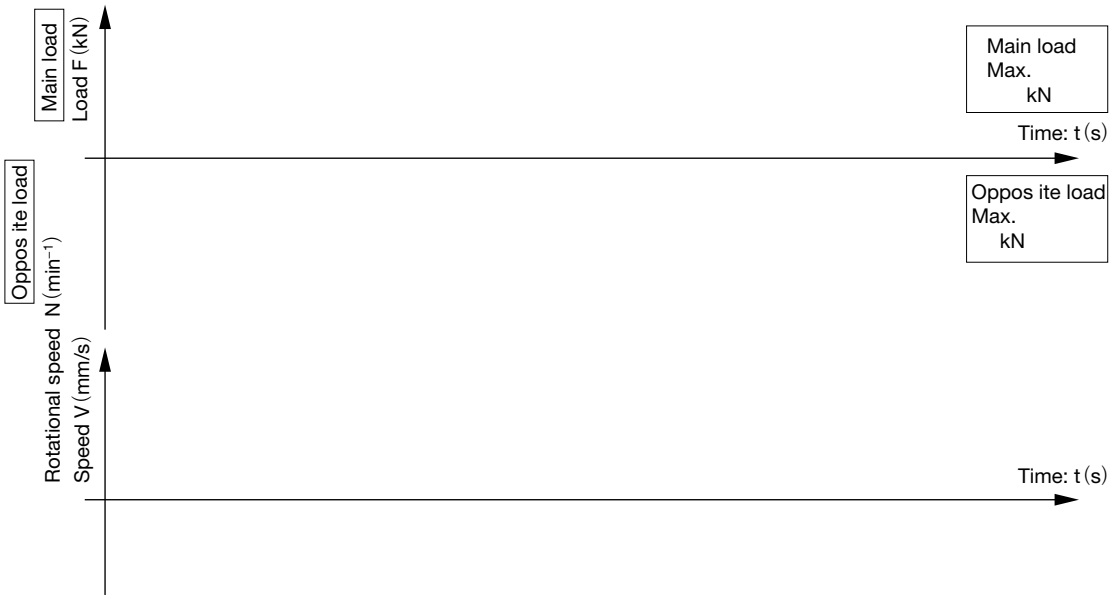
2. Specifications

Shaft diameter	ø mm	Lead	mm	Accuracy grade		Axial play	mm max.
Nut model No.		Effective turns of balls		Direction of turn		Thread length / Overall shaft length	/

Special note / Requests

NSK Technical Data Sheet for NSK High-Load Drive Ball Screw

3. Load chart (If using multiple ball screws in an axis, fill out the axial load per ball screw.)



	Axial load* F (kN)	Rotational speed or Average speed N (min^{-1})	Rotational speed or Average speed V (mm/s)	Time t (s)	Stroke St (mm)	Remarks
①						
②						
③						
④						
⑤						
⑥						
⑦						
⑧						
⑨						
⑩						

Main load Dynamic axial load (max.)*: (kN) Static axial load (max.)* (at 0 mm/s): (kN)

Opposite load Dynamic axial load (max.)*: (kN) Static axial load (max.)* (at 0 mm/s): (kN)

Stroke in normal use: (mm) Maximum stroke: (mm)

Cycle time: (s) Required life: (☐ h or ☐ cycles)

*If using multiple ball screws in an axis, fill out the axial load per ball screw.

4. Plan to conduct the endurance test of the ball screw?

Actual data on the machine → ☐ Yes

→ ☐ N/A → Planning to check endurance (Date:)

→ No (Reason:)

Endurance of the ball screw

(1) Mounting accuracy, load conditions, and lubricating conditions are the main factors affecting the ball screw fatigue life. Therefore, we recommend evaluating the influence of those factors on actual use of your machines.

(2) A temperature rise caused by operational and environmental conditions may reduce the effectiveness of lubricant.

(3) Discrepancies in this information, such as the direction and size of the main and opposite loads, may lead to premature failure.

Worldwide Sales Offices

P: Phone F: Fax ☆: Head Office

NSK LTD.-HEADQUARTERS, TOKYO, JAPAN

Nissei Bldg., 1-6-3 Ohsaki, Shinagawa-ku, Tokyo 141-8560, Japan

INDUSTRIAL MACHINERY BUSINESS DIVISION-HEADQUARTERS
P: +81-3-3779-7227 F: +81-3-3779-7433

AUTOMOTIVE BUSINESS DIVISION-HEADQUARTERS
P: +81-3-3779-7189 F: +81-3-3779-7917

●Africa

South Africa:

NSK SOUTH AFRICA (PTY) LTD.

SANDTON 25 Galaxy Avenue, Linbro Business Park, Sandton 2146, South Africa
P: +27-011-458-3600 F: +27-011-458-3608

●Asia and Oceania

Australia:

NSK AUSTRALIA PTY. LTD.

MELBOURNE 100 Logis Boulevard, Dandenong South, Victoria, 3175, Australia
P: +61-3-9765-4400 F: +61-3-9765-4466

New Zealand:

NSK NEW ZEALAND LTD.

AUCKLAND Unit F, 70 Business Parade South, Highbrook, Business Park Auckland 2013, New Zealand
P: +64-9-276-4992 F: +64-9-276-4082

China:

NSK (SHANGHAI) TRADING CO., LTD.

JIANGSU No.8 NSK Rd., Huaqiao Economic Development Zone, Kunshan, Jiangsu, China (215332)
P: +86-512-5796-3000 F: +86-512-5796-3300

NSK (CHINA) INVESTMENT CO., LTD.

JIANGSU ☆ No.8 NSK Rd., Huaqiao Economic Development Zone, Kunshan, Jiangsu, China (215332)
P: +86-512-5796-3000 F: +86-512-5796-3300

BEIJING Room 1906, Beijing Fortune Bldg., No.5 Dong San Huan Bei Lu, Chao Yang District, Beijing, China (100004)
P: +86-10-6590-8161 F: +86-10-6590-8166

TIAN JIN Unit 4604, 46/F., Metropolitan Tower, 183 Nanjing Road, Heping District, Tianjin, China (300051)
P: +86-22-8319-5030 F: +86-22-8319-5033

CHANGCHUN Room 902-03, Changchun Hongwell International Plaza, No.3299 Renmin Street, Changchun, Jilin, China (130061)
P: +86-431-8898-8682 F: +86-431-8898-8670

SHENYANG No.7, 15 Street, Shenyang Economic & Technological Development Area, Shenyang, Liaoning, China (110141)
P: +86-24-2550-5017 F: +86-24-2334-2058

DALIAN Room 1805 Xiwang Tower, No.136 Zhongshan Road, Zhongshan District, Dalian, Liaoning, China (116001)
P: +86-411-8800-8168 F: +86-411-8800-8160

NANJING Room A1 22F, Golden Eagle International Plaza, No.89 Hanzhong Road, Nanjing, Jiangsu, China (210029)
P: +86-25-8472-6671 F: +86-25-8472-6687

FUZHOU Room 1801-1811, B1#1A Class Office Building, Wanda Plaza, No.8 Aojiang Road, Fuzhou, China (350009)
P: +86-591-8380-1030 F: +86-591-8380-1225

WUHAN Room 1512, No.198Yuncai Road, Office Building, Oceanwide City Square, JiangHan, District, WuHan, China (400039)
P: +86-27-8556-9630 F: +86-27-8556-9615

QINGDAO Room 802, Farglory International Plaza, No.26 Xianggang Zhong Road, Shinan District, Qingdao, Shandong, China (266071)
P: +86-532-5568-3877 F: +86-532-5568-3876

GUANGZHOU Room 1011-16, Yuexiu Financial Tower, No.28 Zhujiang Road East, Zhujiang New Town, Guangzhou, Guangdong, China (510627)
P: +86-20-3817-7800 F: +86-20-3786-4501

CHANGSHA Room 3209, Huayuan International Center, No.36, Section 2, Xiangjiang Middle Road, Tianxin District, Changsha, Hunan, China (410002)
P: +86-731-8571-3100 F: +86-731-8571-3255

LUOYANG Room 955, HUA-YANG PLAZA HOTEL, NO.88 Kaixuan W.Rd., Jian Xi District, Luoyang,Henan Province, China (471003)
P: +86-379-6069-6188 F: +86-379-6069-6180

XI'AN Room 1007, B Changan Metropolls Center, No.88 Nanguanzheng Steet, Xi'an, Shanxi, China (710068)
P: +86-29-8765-1896 F: +86-29-8765-1895

CHONGQING Room 612, Commercial Apartment, Athestel Hotel, No.288, Keyuan Rd.4, Jiulongpo District, Chongqing, China (400039)
P: +86-23-6806-5310 F: +86-23-6806-5292

CHENGDU Room1117, Lippo Tower, No.62 North Kehua Road, Chengdu, Sichuan, China (610041)
P: +86-28-8528-3680 F: +86-28-8528-3690

NSK CHINA SALES CO., LTD.

JIANGSU No.8 NSK Rd., Huaqiao Economic Development Zone, Kunshan, Jiangsu, China (215332)
P: +86-512-5796-3000 F: +86-512-5796-3300

NSK HONG KONG LTD.

HONG KONG ☆ Suite 705, 7th Floor, South Tower, World Finance Centre, Harbour City, T.S.T, Kowloon, Hong Kong, China
P: +852-2739-9933 F: +852-2739-9323

SHENZHEN Room 624-626, 6/F, Kerry Center, Renminnan Road, Shenzhen, Guangdong, China
P: +86-755-25904886 F: +86-755-25904883

Taiwan:

TAIWAN NSK PRECISION CO., LTD.

TAIPEI ☆ 10F-A6, No.168, Sec.3, Nanjing East Rd., Zhongshan Dist., Taipei City 104, Taiwan
P: +886-2-2772-3355 F: +886-2-2772-3300

TAICHUNG 3F. -2, No. 540, Sec. 3, Taiwan Blvd., Xitun Dist., Taichung City 407, Taiwan
P: +886-4-2708-3393 F: +886-4-2708-3395

TAINAN Rm. A1, 9F., No.189, Sec. 1, Yongfu Rd., West Central Dist., Tainan City 700, Taiwan
P: +886-6-215-6058 F: +886-6-215-5518

India:

NSK BEARINGS INDIA PRIVATE LTD.

CHENNAI ☆ TVH Beliciaa Towers, 2nd Floor, Block I, No.71/1, MRC Nagar Main Road, MRC Nagar, Chennai, Tamil Nadu, India - 600028
P: +91-44-28479600

GURGAON Unit No. 202, 2nd Floor, 'A' Block, Iris Tech Park, Sector-48, Sohna Road, Gurgaon, Haryana, India-122018
P: +91-124-4838000

MUMBAI No.321, A Wing, Ahura Centre, 82, Mahakali Caves Road, Andheri East, Mumbai, Maharashutra, India-400093
P: +91-22-28387787

JAMSHEDPUR 36, Maharani Mansion Ground Floor, Circuit House Area P.O.- Bistupur, East Singhbhum, Jamshedpur, Jharkhand, India-831011
P: +91-657–2421144

Indonesia:

PT. NSK INDONESIA

JAKARTA Summitmas II, 4th Floor, Jl. Jend Sudirman Kav. 61-62, Jakarta 12190, Indonesia
P: +62-21-252-3458 F: +62-21-252-3223

Korea:

NSK KOREA CO., LTD.

SEOUL Posco Center (West Wing) 9F, 440, Teheran-ro, Gangnam-gu, Seoul, 06194, Korea
P: +82-2-3287-0300 F: +82-2-3287-0345

Malaysia:

NSK BEARINGS (MALAYSIA) SDN. BHD.

SHAH ALAM ☆ No. 2, Jalan Pemaju, U1/15, Seksyen U1, Hicom Glenmarie Industrial Park, 40150 Shah Alam, Selangor, Malaysia
P: +60-3-7803-8859 F: +60-3-7806-5982

PRAI No.24, Jalan kikik, Taman Inderawasih, 13600 Prai, Penang, Malaysia
P: +60-4-3902275 F: +60-4-3991830

JOHOR BAHRU 88 Jalan Ros Merah 2/17, Taman Johor Jaya, 81100 Johor Bahru, Johor, Malaysia
P: +60-7-3546290 F: +60-7-3546291

Philippines:

NSK INTERNATIONAL (SINGAPORE) PTE LTD.
PHILIPPINES REPRESENTATIVE OFFICE (MANILA)

MANILA 8th Floor The Salcedo Towers 169 H.V. Dela Costa St.,Salcedo Villege Makati City, Philippines 1227
P: +63-2-893-9543 F: +63-2-893-9173

Singapore:

NSK INTERNATIONAL (SINGAPORE) PTE LTD.

SINGAPORE 238A, Thomson Road, #24-01/02, Novena Square Tower A, Singapore 307684
P: +65-6496-8000 F: +65-6250-5845

Thailand:

NSK BEARINGS (THAILAND) CO.,LTD.

BANGKOK 26 Soi Onnuch 55/1 Pravet Subdistrict, Pravet District, Bangkok 10250, Thailand
P: +66-2320-2555 F: +66-2320-2826

Vietnam:

NSK VIETNAM CO., LTD.

HANOI Techno Center, Room 204-205, Thang Long Industrial Park, Dong Anh District, Hanoi, Vietnam
P: +84-24-3955-0159 F: +84-24-3955-0158

HO CHI MINH CITY REPRESENTATIVE OFFICE Unit 609, The Landmark Building, 5B Ton Duc Thang Street,District 1, Ho Chi Minh City, Vietnam
P: +84-28-3822-7907 F: +84-28-3822-7910

Worldwide Sales Offices

P: Phone F: Fax ☆: Head Office

●Europe

United Kingdom:

NSK EUROPE LTD. (EUROPEAN HEADQUARTERS)

MAIDENHEAD The Place, Bridge Avenue, Maidenhead, Berkshire SL6 1AF, U.K.
P: +44-1628-509-800

NSK UK LTD.

NEWARK Northern Road, Newark, Nottinghamshire NG24 2JF, U.K.
P: +44-1636-605-123 F: +44-1636-605-000

France:

NSK FRANCE S.A.S.

PARIS Quartier de l'Europe, 2 Rue Georges Guynemer, 78283 Guyancourt, France
P: +33-1-30-57-39-39 F: +33-1-30-57-00-01

Germany:

NSK DEUTSCHLAND GMBH

DUSSELDORF ☆ Harkortstrasse 15, D-40880 Ratingen, Germany
P: +49-2102-4810 F: +49-2102-4812-290

STUTTGART Liebknechtstrasse 33, D-70565 Stuttgart-Vaihingen, Germany
P: +49-711-79082-0 F: +49-711-79082-289

WOLFSBURG Tischlerstrasse 3, D-38440 Wolfsburg, Germany
P: +49-5361-27647-10 F: +49-5361-27647-70

Italy:

NSK ITALIA S.P.A.

MILANO Via Garibaldi 215, Garbagnate Milanese (Milano) 20024, Italy
P: +39-299-5191 F: +39-299-025778

Netherlands:

NSK EUROPEAN DISTRIBUTION CENTRE B.V.

TILBURG Brakman 54, 5047 SW Tilburg, Netherlands
P: +31-13-4647647 F: +31-13-4641082

Poland:

NSK POLSKA SP.Z O.O.

WARSAW Ul. Migdalowa 4/73, 02-796, Warsaw, Poland
P: +48-22-645-1525 F: +48-22-645-1529

Spain:

NSK SPAIN S.A.

BARCELONA C/Tarragona, 161 Cuerpo Bajo, 2a Planta, 08014, Barcelona, Spain
P: +34-93-289-2763 F: +34-93-433-5776

Turkey:

NSK RULMANLARI ORTA DOGU TIC. LTD. STI.

ISTANBUL Cevizli Mahallesi. D-100 Güney Yanyolu, Kuriş Kule İş Merkezi No:2 Kat:4, P.K.: 34846, Cevizli-Kartal-Istanbul, Turkey
P: +90-216-5000-675 F: +90-216-5000-676

United Arab Emirates:

NSK BEARINGS GULF TRADING CO.

DUBAI JAFZA View 19, Floor 24 Office LB192402/3, PO Box 262163, Downtown Jebel Ali, Dubai, U.A.E
P: +971-(0)4-804-8200 F: +971-(0)4-884-7227

●North and South America

United States of America:

NSK AMERICAS, INC. (AMERICAN HEADQUARTERS)

ANN ARBOR 4200 Goss Road, Ann Arbor, Michigan 48105, U.S.A.
P: +1-734-913-7500 F: +1-734-913-7511

NSK CORPORATION

ANN ARBOR 4200 Goss Road, Ann Arbor, Michigan 48105, U.S.A.
P: +1-734-913-7500 F: +1-734-913-7511

NSK PRECISION AMERICA, INC.

FRANKLIN ☆ 3450 Bearing Drive, Franklin, Indiana 46131, U.S.A.
P: +1-317-738-5000 F: +1-317-738-5050

SAN JOSE 780 Montague Expressway, Suite 505, San Jose, California, 95131, U.S.A.
P: +1-408-944-9400 F: +1-408-944-9405

NSK LATIN AMERICA, INC.

MIAMI 11601 NW 107 Street, Suite 200, Miami Florida, 33178, U.S.A.
P: +1-305-477-0605 F: +1-305-477-0377

Canada:

NSK CANADA INC.

TORONTO ☆ 317 Rutherford Road South, Brampton, Ontario, L6W 3R5, Canada
P: +1-888-603-7667 F: +1-905-890-1938

MONTREAL 2150-32E Avenue Lachine, Quebec, Canada H8T 3H7
P: +1-514-633-1220 F: +1-800-800-2788

Argentina:

NSK ARGENTINA SRL

BUENOS AIRES Garcia del Rio 2477 Piso 7 Oficina "A" (1429) Buenos Aires-Argentina
P: +54-11-4704-5100 F: +54-11-4704-0033

Brazil:

NSK BRASIL LTDA.

SUZANO ☆ Av. Vereador João Batista Fitipaldi, 66, Vila Maluf, Suzano-SP-Brazil-CEP 08685-000
P: +55-11-4744-2500

Peru:

NSK PERU S.A.C.

LIMA Calle Teniente Enrique Palacios 360 Oficina 311 Miraflores, Lima, Peru
P: +51-493-4385

Mexico:

NSK RODAMIENTOS MEXICANA, S.A. DE C.V.

SILAO, GUANAJUATO Circuito Mexiamora Oriente No. 331, Parque Industrial Santa Fe I, Puerto Interior. Silao, Guanajuato, Mexico. C.P. 36275
P: +52-472-500-9500 F: +52-472-103-9403

<As of June 2023>
For the latest information, please refer to the NSK website.
www.nsk.com

MOTION & CONTROL™

NSK

Eco-awareness and reliability in motion

NSK used environmentally friendly printing methods for this publication.

CAT. No. E3238e 2023 Z-11 Printed in Japan First edition published in MAR. 2009