

B-3-3.5.2 HTF-SRD Type for High-Load Drives

This product is being applied for a patent.

1. Features

- High-speed operation and low noise
Used with end deflectors, HTF-SRD type ball screws achieve the maximum feed speed of 1 600 mm/s. The ball nut body surface is completely round, thus enabling well balanced ball nut rotation. Double start thread structure which has more recirculation circuits, and large diameter balls contribute to have high load carrying capacity.
- Low noise and compact design
End deflector system using a ball scooping mechanism in the direction of screw spiral offers smoother ball recirculation system, thus contributing to less than half the noise level compared with existing ball screws equipped with a return tube. Compact, high-performance seal is available. Nut outside diameter is compact compare with the return tube recirculation system. Also, compact, thin plastic seal is available. Nut outside diameter is compact compare with the return tube recirculation system.

2. Specifications

(1) Ball recirculation system

End-deflector recirculation system has features of high-speed, low-noise operation, and compact ball nut. The structure of recirculation parts are as follows.

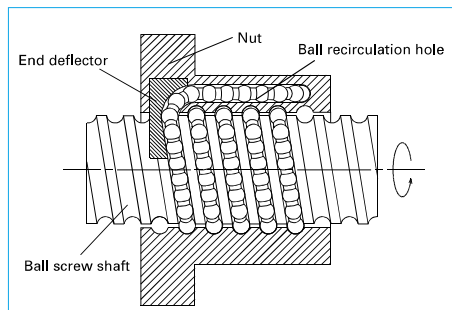


Fig. 1 Structure of End-deflector recirculation system

(2) Accuracy grade and axial play

The available standard accuracy grade and axial play are as follows. Please consult NSK for other grades.

Table 1 Accuracy grade and axial play

Accuracy grade	Ct7
Axial play	S, 0.020 mm or less; N, 0.050 mm or less

(3) Allowable d·n value and the criterion of maximum rotational speed

Allowable d·n value and the criterion of maximum rotational speed are shown below. Please consult NSK if the rotational speed exceeds the permissible range below.

Table 2 Allowable d·n value and the criterion of maximum rotational speed

Allowable d·n value	120 000 or less
Criterion of maximum rotational speed	2 400 min ⁻¹

d·n value: shaft dia. d [mm] × rotational speed n [min⁻¹]

Note: Please also review the critical speed. See "Technical Description: Permissible Rotational Speed" (page B47) for details.

(4) Ball retaining piece NSK S1™

The NSK S1, resin retainers between the balls, significantly extend ball screw durability to the moment load.

3. Design Precautions

The HTF-SRD type is designed to distribute the load uniformly to the load balls for high-load drive mechanism. We recommend installing the ball screws in the way shown below for the full use of this characteristic.

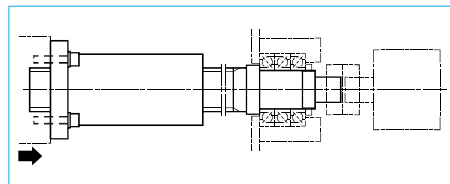


Fig. 2 Recommended installing direction of high-load drives ball screw

In addition, we will make full analysis when you use the HTF-SRD type under extreme conditions such as application of extremely high load or operating in short stroke. Contact NSK about operating conditions (see page B531). When designing the screw shaft end, one end

of the screw shaft must meet either one of the following conditions. If not, we cannot install the ball nut on the screw shaft.

- Cut the ball groove through to the shaft end.
- The diameters of bearing journals and the gear or pulley seat must be less than the root diameter of ball groove "dr" specified on the dimension table.


For general precautions regarding ball screws, refer to "Design Precautions" (page B83) and

"Handling Precautions" (page B103).

4. Product categories

The HTF-SRD type has a model as follows.

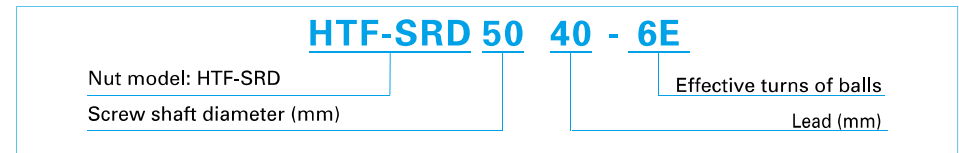
Table 3 HTF-SRD type product categories

Nut model	Shape	Flange shape	Preload system
HTF-SRD		Circular III	Non-preload Slight axial play

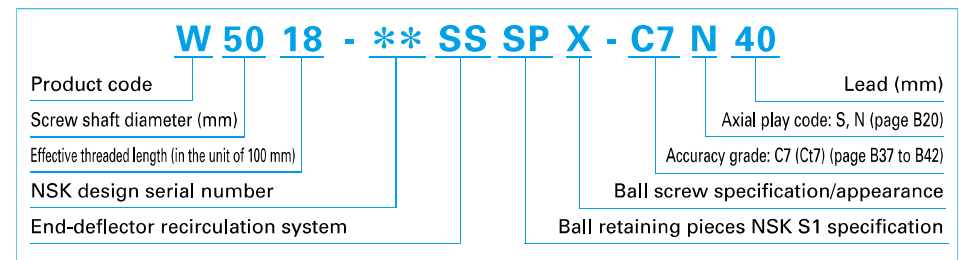
5. Structure of model number and reference number

The followings describe the structure of "Model number" and "Reference number for ball screw".

◇Model number



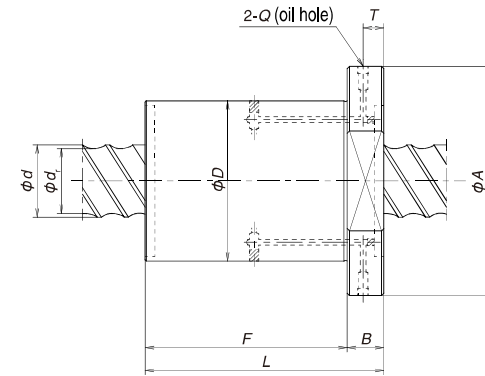
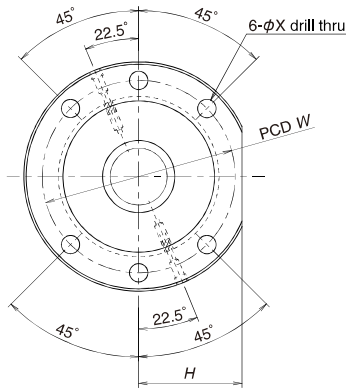
◇Reference number for ball screw



6. Handling Precautions

Maximum operating temperature: 70°C (at outside diameter of ball nut)
The lubricant deteriorates, operating temperature

is recommended 60°C and under. 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.



Model No.	Shaft dia. <i>d</i>	Lead <i>l</i>	Root dia. <i>d_r</i>	Effective turns of balls	Basic load rating (kN)		Allowable axial load (kN)
					Dynamic <i>C_d</i>	Static <i>C_{0a}</i>	
HTF-SRD5040-6E	50	40	39	6	243	491	67.6
HTF-SRD5040-8E				8	319	679	92
HTF-SRD6332-4E	63	32	49	4	292	590	72.6
HTF-SRD6340-6E		40		6	363	768	106
HTF-SRD6340-8E	8		476	1 060	144		
HTF-SRD8050-6E	80	50	63	6	502	1 180	163
HTF-SRD8050-8E				8	658	1 630	224
HTF-SRD10060-6E	100	60	83	6	583	1 490	211
HTF-SRD10060-8E				8	765	2 060	288
HTF-SRD12070-6E	120	70	103	6	630	1 810	259
HTF-SRD12070-8E				8	826	2 520	352

Unit: mm

Nut entire length <i>L</i>	Nut dia. <i>D</i>	Ball nut dimensions							Max. feeding speed (mm/sec)
		Flange dia. <i>A</i>	Notch size <i>H</i>	Flange width <i>B</i>	Nut length <i>F</i>	Bolt hole PCD <i>W</i>	Bolt hole size <i>X</i>	Oil hole position <i>T</i>	
159	115	165	72.5	28	131	140	14	16	1 600
199					171				
176	140	190	85	32	144	165	14	18	1 000
163					131				
203					171				
194	175	250	110	40	154	210	22	18	1 250
244					204				
225	195	270	122	40	185	235	22	20	1 200
285					245				
260					210				
330	280								

- Notes: 1. The right hand screw is the standard. For specifications on left hand screws, contact NSK.
 2. Please consult NSK if load exceeds the allowable axial load.
 3. The allowable axial load is determined in accordance with the mounting conditions of ball screws recommended by NSK (See page B517). If your mounting conditions differ from those provided, please consult NSK.