

B-3-3.5.1 HTF-SRC Type for High-Load Drives

1. Features

● High-speed operation and low noise
 The SRC recirculation system contributes to more than twice the feed speed (d·n value: 140 000 and 160 000) and the noise level of less than 8 to 10 dB (half to 1/3 of noise) compared with the HTF type.

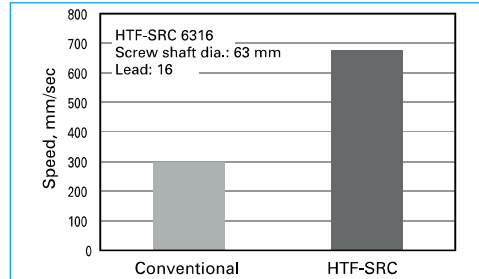


Fig. 1 Feed speed comparison

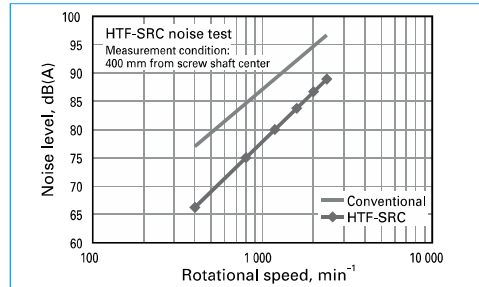


Fig. 2 Noise level comparison

2. Specifications

(1) Ball recirculation system

The SRC recirculation system picks up balls in the direction they are moving, and thus contributed to high-speed, low-noise operation. Structure of the recirculation system is as follows.

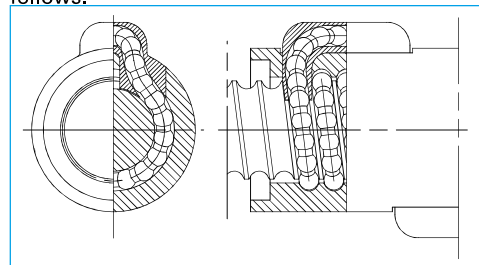


Fig. 3 Structure of SRC recirculation system

(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

Lead	14, 16 mm	20, 25 mm*
Allowable d·n value	160 000 or less	140 000 or less
Criterion of maximum rotational speed	3 225 min ⁻¹	

d·n value: shaft dia. d [mm] × rotational speed n [min⁻¹]
 ☆ Allowable d·n value for HTF-SRC5020: 160 000

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.

(5) Other

Please consult NSK for special requests, such as the addition of a recirculation circuit to increase the load capacity, or the arrangement of all recirculation circuits on the same phase of ball nut circumference.

3. Design Precautions

The HTF-SRC 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.

In addition, we will make full analysis when you use the HTF-SRC 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-SRC type has a model as follows.

Table 3 HTF-SRC type product categories

Nut model	Shape	Flange shape	Preload system
HTF-SRC		Flanged Circular I	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

HTF-SRC 63 20 - 7.5

Nut model: HTF-SRC	Effective turns of balls
Screw shaft diameter (mm)	Lead (mm)

◇ Reference number for ball screw

W 63 04 - ** RC SP - C7 S 20

Product code	Lead (mm)
Screw shaft diameter (mm)	Axial play code: S, N (page B20)
Effective threaded length (in the unit of 100 mm)	Accuracy grade: C7 (Ct7) (page B37 to B42)
NSK design serial number	Ball retaining pieces NSK S1 specification
SRC recirculation system	

6. Handling Precautions

Maximum operating temperature: 70°C (at outside diameter of ball nut)

The lubricant deteriorates, operating temperature

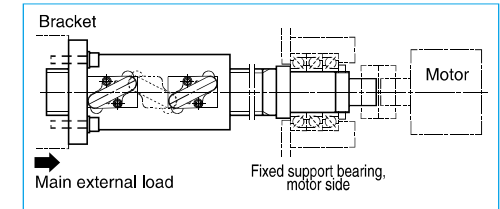
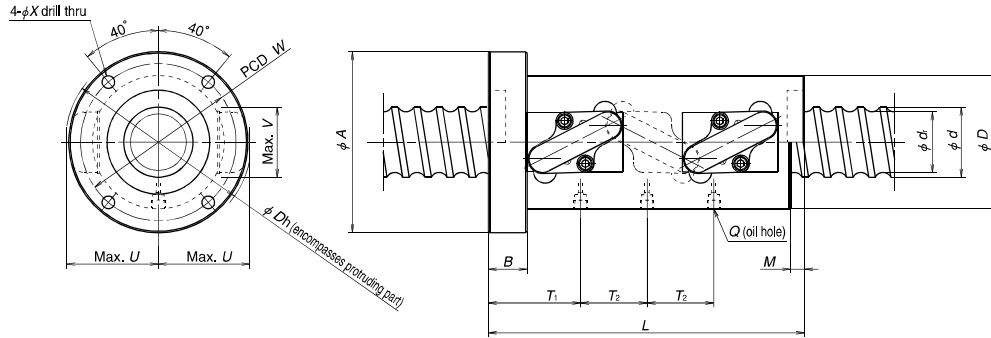


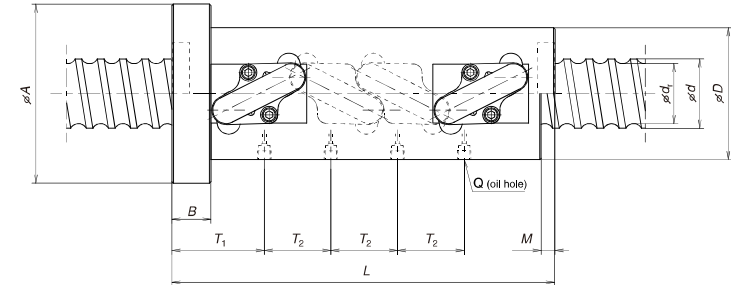
Fig. 4 Recommended installing direction of high-load drive ball screw

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.



Nut model I



Nut model II

Unit: mm

Model No.	Shaft dia. <i>d</i>	Lead <i>l</i>	Root dia. <i>d_r</i>	Effective turns of balls Turns × Circuits	Nut model	Basic load rating (kN)		Allowable axial load (kN)
						Dynamic <i>C_a</i>	Static <i>C_{0a}</i>	
HTF-SRC5014-7.5	50	14	41.6	2.5×3	I	264	623	73.1
HTF-SRC5016-7.5		16	39	2.5×3		383	818	91.1
HTF-SRC5020-7.5		20	39	2.5×3		383	818	91.0
HTF-SRC6316-7.5	63	16	52	2.5×3	I	429	1 050	119
HTF-SRC6316-10				2.5×4	II	549	1 410	159
HTF-SRC6316-10.5				3.5×3	I	562	1 450	167
HTF-SRC6316-14		3.5×4	II	720	1 930	215		
HTF-SRC6320-7.5		20	49	2.5×3	I	572	1 280	147
HTF-SRC6320-10					2.5×4	II	732	1 710
HTF-SRC6325-10.5	25	49	3.5×3	I	750	1 770	170	
HTF-SRC8016-10.5	80	16	69	3.5×3	I	627	1 870	221
HTF-SRC8016-14				3.5×4	II	802	2 490	295
HTF-SRC8020-10.5		20	66	3.5×3	I	838	2 300	267
HTF-SRC8025-7.5					I	790	1 960	221
HTF-SRC10020-10.5	100	20	86	3.5×3	I	936	2 910	346
HTF-SRC10020-14				3.5×4	II	1 200	3 890	461
HTF-SRC10025-10.5		25	83	3.5×3	I	1 200	3 430	408
HTF-SRC10025-14					3.5×4	II	1 540	4 580
HTF-SRC12020-7.5	120	20	106	2.5×3	I	776	2 550	304
HTF-SRC12020-10				2.5×4	II	994	3 400	406
HTF-SRC12025-10.5		25	103	3.5×3	I	1 300	4 200	498
HTF-SRC12025-14					3.5×4	II	1 660	5 600

- Notes: 1. The right hand screw is the standard. For specifications on left hand screws, contact NSK.
 2. The ball nut length with no seals is shorter by M than that length of a ball nut with seals.
 3. Please consult NSK if load exceeds the allowable axial load.
 4. The allowable axial load is determined in accordance with the mounting conditions of ball screws recommended by NSK (See page B514). If your mounting conditions differ from those provided, please consult NSK.

Ball nut dimensions												Max. feeding speed (mm/sec)							
Nut length <i>L</i>	Nut dia. <i>D</i>	Flange dia. <i>A</i>	Flange width <i>B</i>	Seal width <i>M</i>	Bolt hole PCD <i>W</i>	Bolt hole size <i>X</i>	Protruding tube dimensions			Oil hole <i>Q</i>	Oil hole position								
							<i>U</i>	<i>V</i>	<i>D_h</i>		<i>T₁</i>	<i>T₂</i>							
202	80	114	28	10	97	9	54.5	46	111	M6×1	69	42	750						
228	95	129					66	50	134	Rc1/8	74.5	48	860						
268	95	129					66	50	134	Rc1/8	83.5	60	1 070						
228	105	139					10	122	9	72.5	50	148	Rc1/8	74.5	48	48	680		
276			64																
276			64																
340			64																
279			117	157	32	12												137	11
339	101.75	100					930												
405								101.75	100	930									
278	120	154	32	10	137	9	80	60	165	Rc1/8	78.5	64	540						
342														90	80	590			
339																	111.75	75	730
347																	111.75	75	730
339	145	185	32	12	165	11	97	78	199	Rc1/8	90	80	470						
419														111.75	100	590			
422																	111.75	100	590
522	159	199	40	17	179	11	108	79	220	Rc1/8	111.75	100	590						
287														98	60	390			
347																	111.25	100	490
421																			
521	173	213	40	12	193	11	109.5	88	229	Rc1/8	111.25	100	490						
421														111.25	100	490			
521	173	213	40	17	193	11	116	92	238	Rc1/8	111.25	100	490						
421														111.25	100	490			

HTF-SRC