

B-3-2.2 SRC Recirculation Ball Screws

1. Features

SRC Recirculation is a new generation standard method for ball recirculation in ball screws. Quiet operation is possible in all speed ranges.

2. Specifications

(1) Ball recirculation system

The structure of a SRC Recirculation system is shown below.

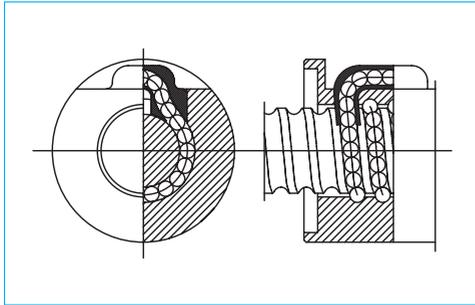


Fig.1 Structure of SRC recirculation system

Table 1 Accuracy grade and axial play

Accuracy grade	C0, C1, C2, C3, C5, Ct7
Axial play	Z, 0 mm (preloaded); T, 0.005 mm or less; S, 0.020 mm or less

(2) Accuracy grade and axial play

The available standard accuracy grade and axial play are shown in **Table 1**. Please consult NSK for other grades.

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

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

Allowable *d·n* value: 160 000 or less

Criterion of maximum rotational speed

: 5 000 min⁻¹

Note: Please also review the critical speed.

See "Technical Description: Permissible Rotational Speed" (page B47) for details.

(4) Options

A type equipped with the NSK K1 lubrication unit is also available.

3. Lineup

There are three different preloads available (Table2).

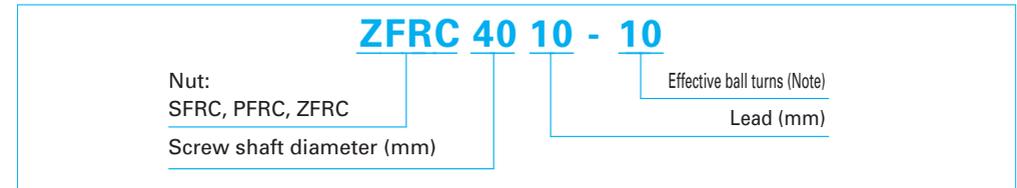
Table 2 SRC recirculation ball screws lineup

Nut	Shape	Flange shape	Nut shape	Preload
SFRC		Flanged Circular III	Circular	No preload Slight axial play
PFRC		Flanged Circular III	Circular	P-preload (light preload) Spacer ball 1:1
ZFRC		Flanged Circular III	Circular	Z-preload (medium preload)

4. Structure of model number and reference number

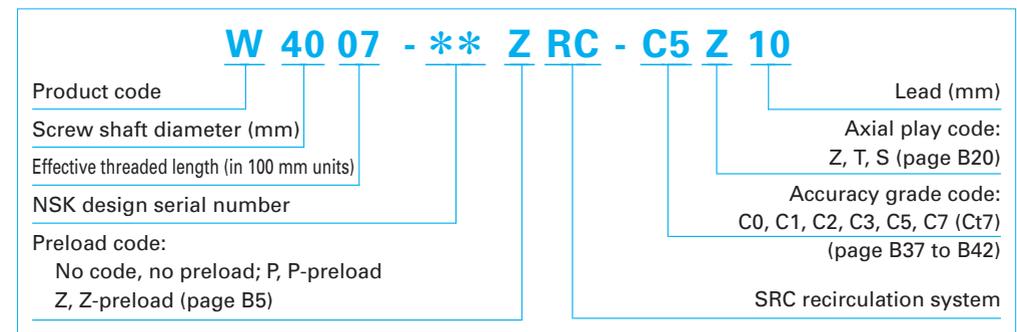
The following explains the codes used in model numbers and ball screw reference numbers.

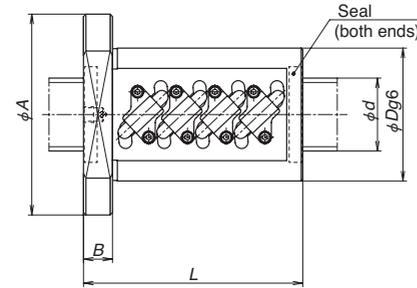
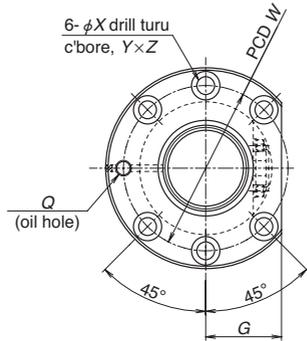
◇ Model number



Note: In Z-preload, the number here is twice the effective ball turns.

◇ Reference number for ball screw





The number of circuits (number of circulating parts) may differ from the diagram

Unit: mm

Model No.	Preload	Shaft dia. <i>d</i>	Lead <i>l</i>	Root dia. <i>d_r</i>	Effective ball turns Turns × Circuits	Basic load ratings (N)		Axial rigidity <i>K</i> (N/μm)
						Dynamic <i>C₀</i>	Static <i>C_{0s}</i>	
ZFRC 2812-7	Z	28	12	23.5	3.5x1	26100	50200	592
PFRC 2812-3.5	P				3.5x1	16400	25100	270
SFRC 2812-3.5	Clearance				3.5x1	26100	50200	381
ZFRC 2816-5	Z	28	16	22.4	2.5x1	27400	47400	437
PFRC 2816-2.5	P				2.5x1	17300	23700	199
SFRC 2816-2.5	Clearance				2.5x1	27400	47400	281
ZFRC 3205-10	Z	32	5	29.2	2.5x2	21800	56000	891
PFRC 3205-5	P				2.5x2	13700	28000	406
SFRC 3205-5	Clearance				2.5x2	21800	56000	573
ZFRC 3210-10	Z	32	10	26.4	2.5x2	54500	110000	970
PFRC 3210-5	P				2.5x2	34300	55100	434
SFRC 3210-5	Clearance				2.5x2	54500	110000	623
ZFRC 4005-10	Z	40	5	37.2	2.5x2	23900	70500	1067
PFRC 4005-5	P				2.5x2	15100	35300	486
SFRC 4005-5	Clearance				2.5x2	23900	70500	685
ZFRC 4010-10	Z	40	10	34.4	2.5x2	61200	137000	1154
PFRC 4010-5	P				2.5x2	38600	68300	526
SFRC 4010-5	Clearance				2.5x2	61200	137000	740
ZFRC 4012-10	Z	40	12	34.1	2.5x2	71700	154000	1177
PFRC 4012-5	P				2.5x2	45200	77200	528
SFRC 4012-5	Clearance				2.5x2	71700	154000	756
ZFRC 4508-10	Z	45	8	40.5	2.5x2	44000	118000	1234
PFRC 4508-5	P				2.5x2	27700	58900	557
SFRC 4508-5	Clearance				2.5x2	44000	118000	792
ZFRC 4510-10	Z	45	10	39.4	2.5x2	65800	157000	1291
PFRC 4510-5	P				2.5x2	41500	78500	582
SFRC 4510-5	Clearance				2.5x2	65800	157000	830
ZFRC 4512-10	Z	45	12	39.1	2.5x2	75600	176000	1304
PFRC 4512-5	P				2.5x2	47600	88200	586
SFRC 4512-5	Clearance				2.5x2	75600	176000	838
ZFRC 5010-10	Z	50	10	44.4	2.5x2	68100	174000	1397
PFRC 5010-5	P				2.5x2	42900	87200	630
SFRC 5010-5	Clearance				2.5x2	68100	174000	898
ZFRC 5012-10	Z	50	12	43.2	2.5x2	91500	218000	1441
PFRC 5012-5	P				2.5x2	57600	109000	647
SFRC 5012-5	Clearance				2.5x2	91500	218000	926
ZFRC 5508-10	Z	55	8	50.5	2.5x2	47300	144000	1439
PFRC 5508-5	P				2.5x2	29800	72000	651
SFRC 5508-5	Clearance				2.5x2	47300	144000	923
ZFRC 6312-14	Z	63	12	56.2	3.5x2	136000	385000	2388
PFRC 6312-7	P				3.5x2	85400	193000	1078
SFRC 6312-7	Clearance				3.5x2	136000	385000	1539

Nut total length <i>L</i>	Ball nut dimensions					Bolt hole dimensions			Bolt hole PCD <i>W</i>	Oil hole <i>Q</i>	Max. feed speed (m/min)
	Nut diameter <i>D</i>	Flange diameter <i>A</i>	Flange width <i>B</i>	Flange notch <i>G</i>	Bolt hole dimensions						
					<i>X</i>	<i>Y</i>	<i>Z</i>				
128	60	88	15	33	6.6	11	6.5	73	M6x1	60	
80											
80											
131	73	101	15	38	6.6	11	6.5	86	M6x1	80	
83											
83											
89	58	85	12	32	6.6	11	6.5	71	M6x1	25	
59											
59											
163	74	108	15	41	9	14	8.5	90	M6x1	50	
103											
103											
92	67	101	15	39	9	14	8.5	83	M6x1	25	
62											
62											
166	82	124	18	47	11	17.5	11	102	Rc1/8	40	
106											
106											
192	86	128	18	48	11	17.5	11	106	Rc1/8	48	
120											
120											
136	82	124	18	47	11	17.5	11	102	Rc1/8	28	
88											
88											
166	88	132	18	50	11	17.5	11	110	Rc1/8	35	
106											
106											
192	90	132	18	50	11	17.5	11	110	Rc1/8	42	
120											
120											
166	93	135	18	51	11	17.5	11	113	Rc1/8	32	
106											
106											
198	100	146	22	55	14	20	13	122	Rc1/8	38	
126											
126											
133	94	136	18	52	11	17.5	11	114	Rc1/8	23	
85											
85											
244	115	161	22	61	14	20	13	137	Rc1/8	30	
148											
148											

Notes: 1. Values for axial rigidity *K* above are theoretical values elastic deformation between the screw groove and ball when axial load is applied to a ball nut for which preload is set at 3% for PFRC (P-preload), and 5% for ZFRC (Z-preload) of the basic dynamic load rating (*C₀*).

2. Spacer balls are installed in PFRC.