

Ballscrews

Rolled ballscrews

4. Rolled ballscrews

4.1 Properties

One of the benefits of rolled ballscrews is that feed systems equipped with them have less friction and are quieter than standard threads.

HIWIN manufactures them using state-of-the-art rolling technologies where the processes of material selection, rolling, heat treatment, machining and assembly are very closely coordinated.

Rolled ballscrews from HIWIN can be flexibly used in virtually all areas of industry. Rolled ballscrew shafts with diameters of 8 mm to 63 mm are always kept in stock and can be supplied at short notice. They can be supplied with or without end machining. Complete bearing units combined with standardised shaft ends enable us to supply complete ballscrews.

4.2 Tolerance classes

Table 4.1 shows the tolerance classes of rolled ballscrews. The lead accuracy is defined using the deviation from nominal path over any 300 mm section of the entire length. The path deviation over the entire useful path is determined by formula F 3.1 on Page 17.

Table 4.1 Tolerance classes of rolled ballscrews			
Path deviation	Tolerance class		
	T5	T7	T10
V_{300p}	0.023	0.052	0.21

Unit: mm

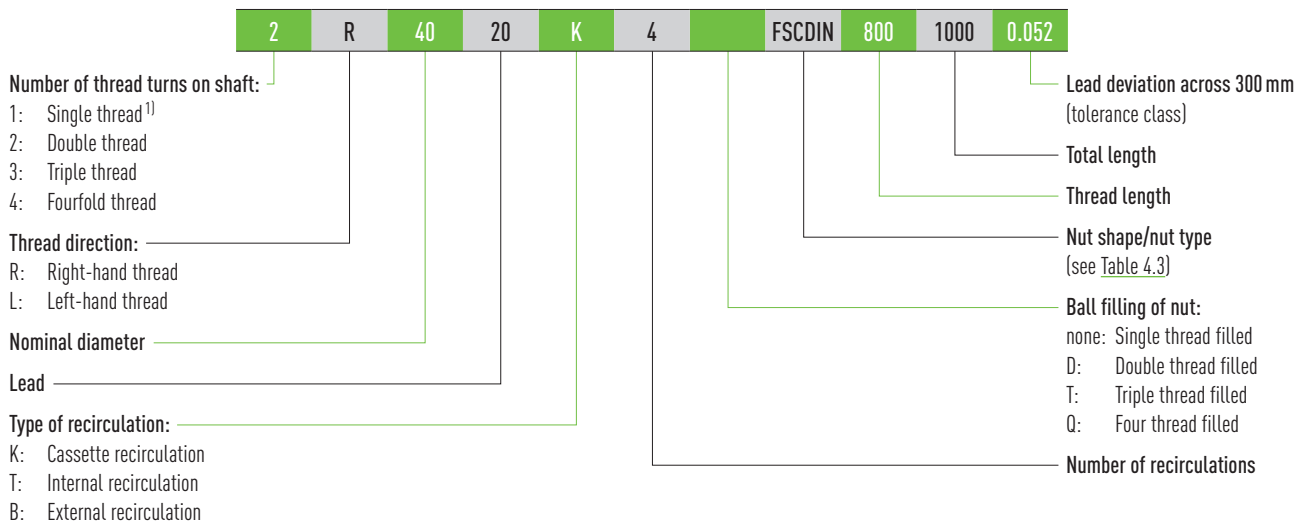
Table 4.2 Overview of available rolled ballscrews																				
Nominal diameter	Lead																			Max. shaft length
	1	1.25	2	2.5	3	4	5	5.08	6	8	10	12	16	20	25	32	40	50	T5	T7, T10
8	○		○	○×	○		○												—	800
10			○	○×	○	○×	○		○		○								600	1,500
12			○	○	○	○×	○×	○		○	○×	○							600	1,500
15							○×				○			○					1,500	3,000
16	○		○	○		○	○×	○	○	○	○×	○	○×	○×		○			1,500	3,000
20				○		○	○×	○	○	○	○×			○×			○		1,500	3,000
25				○		○	○×	○	○	○	○×				○×				2,500	4,500
32					○		○×	○	○	○	○×			○×		○×	○		2,500	4,500
40							○×		○	○	○×	○	○	○×	○		○×		3,000	5,600
50							○×		○		○×	○	○	○×			○×	○	4,000	5,600
63											○×	○	○	○			○		4,000	5,600

Unit: mm

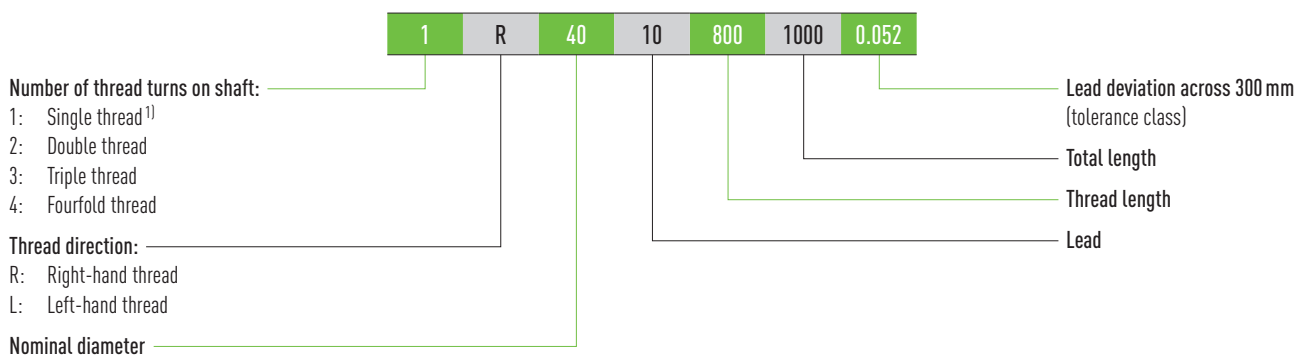
- Right-hand and left-hand thread
- Only right-hand thread
- × Preferred type for right-hand thread with fast delivery in T7
- × Preferred type for right-hand thread with fast delivery in T5 and T7

4.3 HIWIN order code for rolled ballscrews

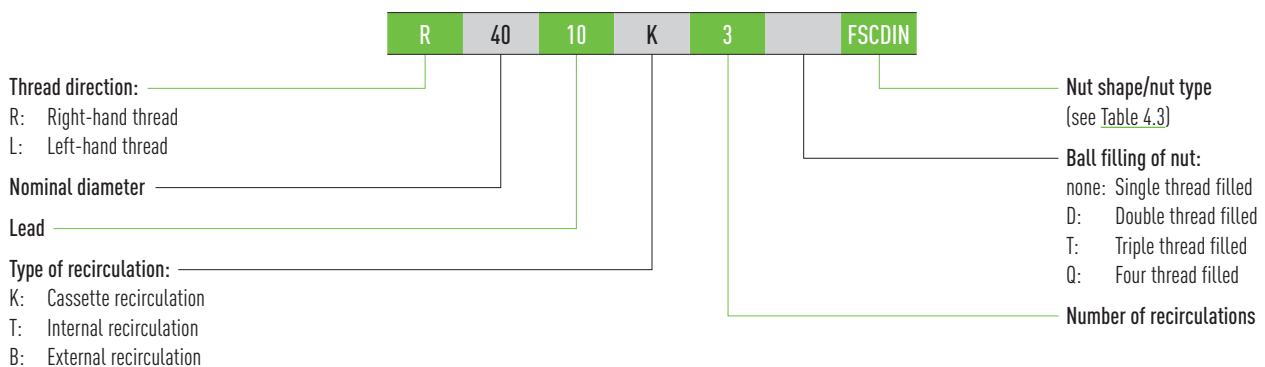
In order to clearly identify the ballscrew, information about the ballscrew shaft and nut is needed.



Order code for ballscrew shaft without the nut



Order code for ballscrew nut without the shaft



¹⁾ Standard; can be omitted with single-thread shafts

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Table 4.3 Overview of nut shapes

Nut designation	Description
FSIDIN	Flange single nut with internal single recirculation
FSCDIN	Flange single nut with cassette recirculation
RSI	Cylindrical single nut with internal single return
RSIT	Cylindrical single nut with screw-in thread and internal single return

4.4 Nuts for rolled ballscrews

4.4.1 Flange single nut FSCDIN/FSIDIN

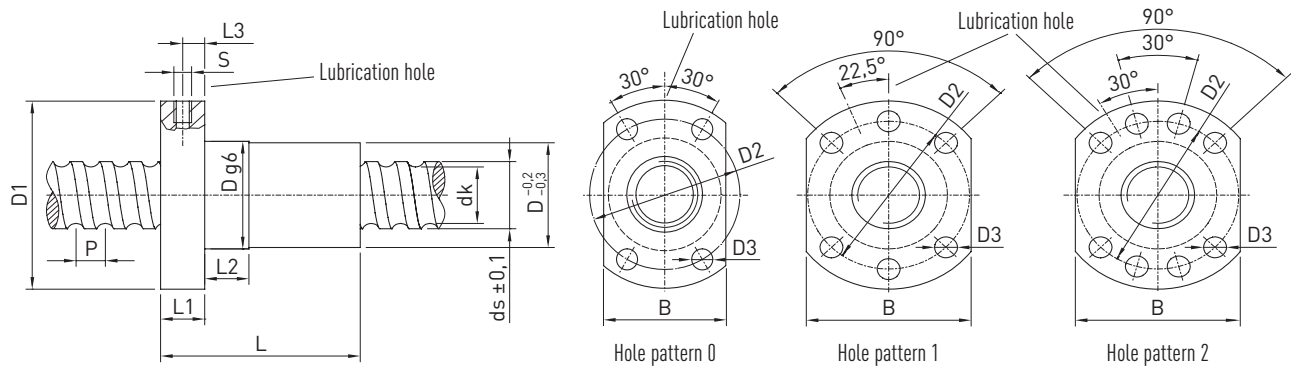


Table 4.4 Nut dimensions

Type	ds	P	D	D1	D2	D3	Hole pattern	L	L1	L2	L3	S	B	dk	C _{dyn} [N]	C ₀ [N]	Max. axial play [mm]	Mass [kg/piece]
R12-05K4-FSCDIN	11.7	5	24	40	32	4.5	0	33	8	8	4	M3	26	9.9	5,500	12,000	0.02	0.11
R12-10K3-FSCDIN	11.8	10	24	40	32	4.5	0	43	8	8	4	M3	26	9.6	5,100	10,100	0.02	0.13
R15-05K4-FSCDIN	13.9	5	28	48	38	5.5	1	38	10	10	5	M6	40	11.8	12,600	21,000	0.04	0.18
R16-05T3-FSIDIN	15.5	5	28	48	38	5.5	1	40	10	10	5	M6	40	12.9	6,500	11,700	0.04	0.18
R16-10K3-FSCDIN	14.7	10	28	48	38	5.5	1	45	10	10	5	M6	40	12.5	9,100	19,300	0.04	0.20
R16-16K3-FSCDIN	15.0	16	28	48	38	5.5	1	61	12	20	6	M6	40	13.0	7,900	17,000	0.04	0.26
R16-20K2-FSCDIN	14.0	20	28	48	38	5.5	1	56	10	10	5	M6	40	11.8	5,200	10,400	0.04	0.25
R20-05K4-FSCDIN	19.6	5	36	58	47	6.6	1	40	10	10	5	M6	44	16.9	13,400	32,740	0.04	0.28
R20-10K3-FSCDIN	19.3	10	36	58	47	6.6	1	48	10	10	5	M6	44	16.6	10,000	23,500	0.04	0.32
R20-20K2-FSCDIN	19.7	20	36	58	47	6.6	1	57	10	10	5	M6	44	17.1	6,800	15,300	0.04	0.37
R20-20K4-DFSCDIN	19.7	20	36	58	47	6.6	1	57	10	10	5	M6	44	17.1	12,300	30,500	0.04	0.36
R25-05K4-FSCDIN	24.9	5	40	62	51	6.6	1	43	10	12	5	M6	48	22.3	14,900	41,500	0.04	0.22
R25-10K4-FSCDIN	24.5	10	40	62	51	6.6	1	61	10	16	5	M6	48	21.8	16,100	44,900	0.04	0.43
R25-25K2-FSCDIN	24.7	25	40	62	51	6.6	1	70	10	16	5	M6	48	22.1	7,400	19,100	0.04	0.48
R25-25K4-DFSCDIN	24.7	25	40	62	51	6.6	1	70	10	16	5	M6	48	22.1	13,500	38,200	0.04	0.46
R32-05K6-FSCDIN	31.7	5	50	80	65	9	1	48	12	10	6	M6	62	29.1	23,900	81,900	0.04	0.59
R32-10K5-FSCDIN	31.8	10	50	80	65	9	1	77	12	16	6	M6	62	28.6	31,500	80,100	0.04	0.82
R32-20K3-FSCDIN	31.8	20	50	80	65	9	1	88	12	16	6	M6	62	28.6	17,000	48,500	0.04	0.91
R32-32K2-FSCDIN	31.9	32	50	80	65	9	1	88	12	20	6	M6	62	28.7	11,600	31,800	0.04	0.90
R32-32K4-DFSCDIN	31.9	32	50	80	65	9	1	88	12	20	6	M6	62	28.7	20,600	62,200	0.04	0.87

All dimensions stated without a unit are in mm

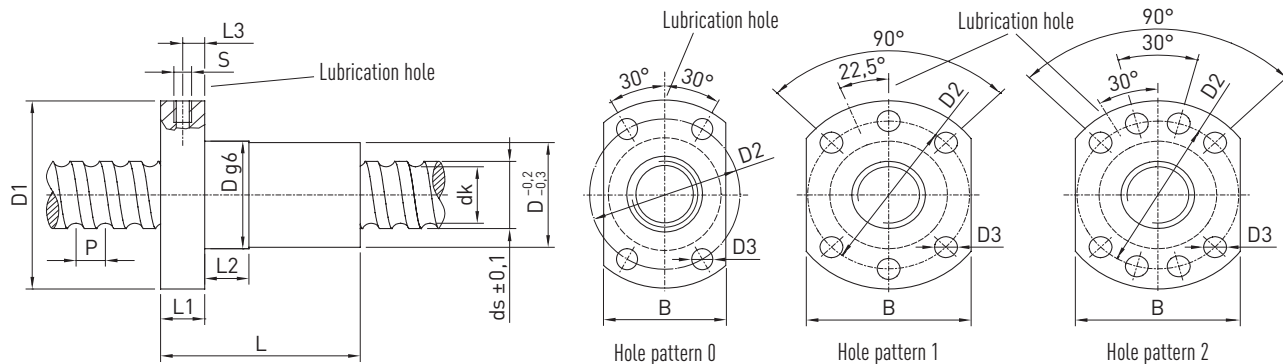


Table 4.4 Nut dimensions

Type	ds	P	D	D1	D2	D3	Hole pattern	L	L1	L2	L3	S	B	dk	C _{dyn} [N]	C ₀ [N]	Max. axial play [mm]	Mass [kg/piece]
R40-05K6-FSCDIN	39.4	5	63	93	78	9	2	50	14	10	7	M8 × 1	70	36.8	25,900	100,600	0.04	0.93
R40-10K4-FSCDIN	37.8	10	63	93	78	9	2	70	14	16	7	M8 × 1	70	32.8	45,000	123,000	0.04	1.19
R40-20K3-FSCDIN	37.8	20	63	93	78	9	2	88	14	16	7	M8 × 1	70	32.8	34,850	90,000	0.07	1.43
R40-40K2-FSCDIN	37.9	40	63	93	78	9	2	102	14	16	7	M8 × 1	70	32.9	23,000	58,400	0.07	1.61
R40-40K4-DFSCDIN	37.9	40	63	93	78	9	2	102	14	16	7	M8 × 1	70	32.9	41,500	115,800	0.07	1.59
R50-05K6-FSCDIN	49.4	5	75	110	93	11	2	50	16	10	8	M8 × 1	85	46.8	28,300	127,200	0.07	1.32
R50-10K6-FSCDIN	48.0	10	75	110	93	11	2	90	16	20	8	M8 × 1	85	42.9	74,500	250,000	0.07	2.05
R50-20K5-FSCDIN	47.9	20	75	110	93	11	2	132	18	25	9	M8 × 1	85	42.9	67,200	217,500	0.07	2.89
R50-40K3-FSCDIN	50.0	40	75	110	93	11	2	149	18	45	9	M8 × 1	85	45.0	39,000	123,000	0.07	2.96
R50-40K4-DFSCDIN	50.0	40	75	110	93	11	2	149	18	45	9	M8 × 1	85	45.0	70,300	242,600	0.07	2.93
R63-10T6-FSIDIN	63.1	10	90	125	108	11	2	120	18	16	9	M8 × 1	95	58.0	61,920	214,090	0.07	3.30

All dimensions stated without a unit are in mm

- Nuts with NBR wiper
- For nut housing, see Section 8.4
- No axial play on request (T5)
- FSCDIN/FSIDIN: Nut filled on one turn
- DFSCDIN: Nut filled on two turns
- R12 to R40 also available in T5

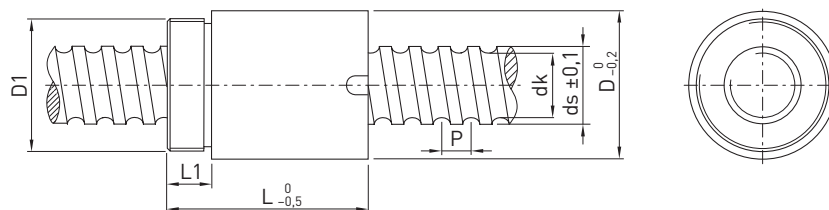
Order example:

R	25	10	K3	FSCDIN	650	730	0.052
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4.4.2 Cylindrical single nut with screw-in thread RSIT



Sufficient lubricant supply to the shaft must be guaranteed via a lubricant channel in the adjacent construction.



Table 4.5 Nut dimensions

Type	ds	P	D	D1	L	L1	dk	Dynamic load rating C_{dyn} [N]	Static load rating C_0 [N]	Max. axial play [mm]	Mass [kg/piece]
R08-02.5T2-RSIT ¹⁾	7.7	2.5	17.5	M15 × 1	27.5	7.5	6.1	1,300	1,750	0.04	0.03
R10-02.5T2-RSIT ²⁾	9.9	2.5	19.5	M17 × 1	25.0	7.5	8.1	1,780	2,630	0.04	0.04
R10-04T2-RSIT ²⁾	9.9	4.0	24.0	M22 × 1	32.0	10.0	7.7	1,980	2,820	0.04	0.08
R12-04B1-RSIT ¹⁾	12.0	4.0	25.5	M20 × 1	34.0	10.0	9.5	3,000	5,700	0.04	0.08

All dimensions stated without a unit are in mm

¹⁾ Polyamide wiper on one side

²⁾ Without dirt wiper

- Reduced axial play on request
- Nuts with dirt wipers

Order example:

R	12	4	B1	RSIT	350	405	0.052
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4.4.3 Cylindrical single nut RSI

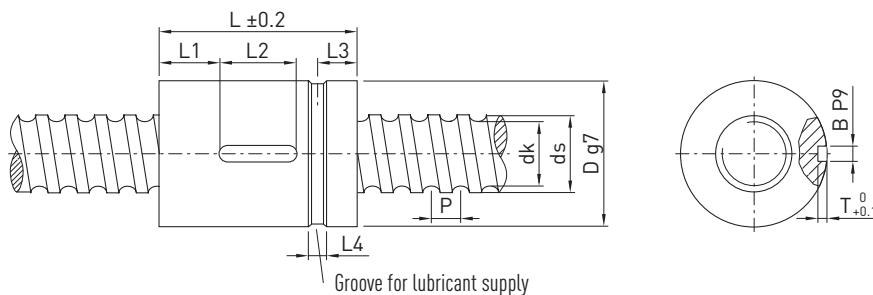


Table 4.6 Nut dimensions

Type	ds	P	D	L	L1	L2	L3	L4	T	B	dk	Dynamic load rating C_{dyn} [N]	Static load rating C_0 [N]	Max. axial play [mm]	Mass [kg/piece]
R16-10T3-RSI	15.4	10	28	60	8	20	9.5	5	2.5	4	12.9	6,100	10,800	0.04	0.17
R20-10T3-RSI	19.9	10	34	60	20	20	12.0	4	2.0	5	17.5	8,100	12,600	0.04	0.35

All dimensions stated without a unit are in mm

- Reduced axial play on request
- Nuts with dirt wipers

Order example:

R	16	10	T3	RSI	350	405	0.052
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