

# Rolled Rotary Ball Screw

## Model BLR

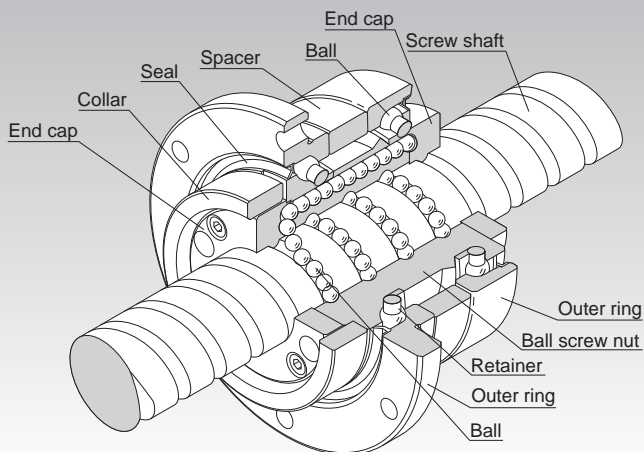


Fig.1 Structure of Large Lead Rotary Nut Ball Screw Model BLR

**Point of Selection** **A15-8**

**Options** **A15-352**

**Model No.** **A15-369**

**Precautions on Use** **A15-374**

**Accessories for Lubrication** **A24-1**

**Mounting Procedure and Maintenance** **B15-104**

Accuracy Standards **A15-306**

Example of Assembly **A15-307**

Axial Clearance **A15-19**

Maximum Length of the Screw Shaft **A15-24**

DN Value **A15-33**

## Structure and Features

The Rotary Ball Screw is a rotary-nut ball screw unit that has an integrated structure consisting of a ball screw nut and a support bearing. The support bearing is an angular bearing that has a contact angle of 60°, contains an increased number of balls and achieves a large axial rigidity.

Model BLR is divided into two types: the Precision Ball Screw and the Rolled Screw Ball.

### [Smooth Motion]

It achieves smoother motion than rack-and-pinion based straight motion.

### [Low Noise even in High-speed Rotation]

Model BLR produces very low noise when the balls are picked up along the end cap. In addition, the balls circulate by passing through the ball screw nut, allowing this model to be used at high speed.

### [High Rigidity]

The support bearing of this model is larger than that of the screw shaft rotational type. Thus, its axial rigidity is significantly increased.

### [Compact]

Since the nut and the support bearing are integrated, a highly accurate, and a compact design is achieved.

### [Easy Installation]

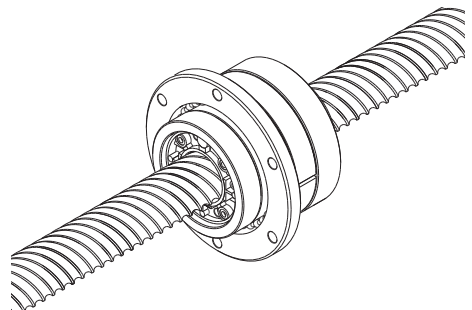
By simply mounting this model to the housing using bolts, a ball screw nut rotating mechanism can be obtained. (For the housing's inner-diameter tolerance, H7 is recommended.)

## Type

### [No Preload Type]

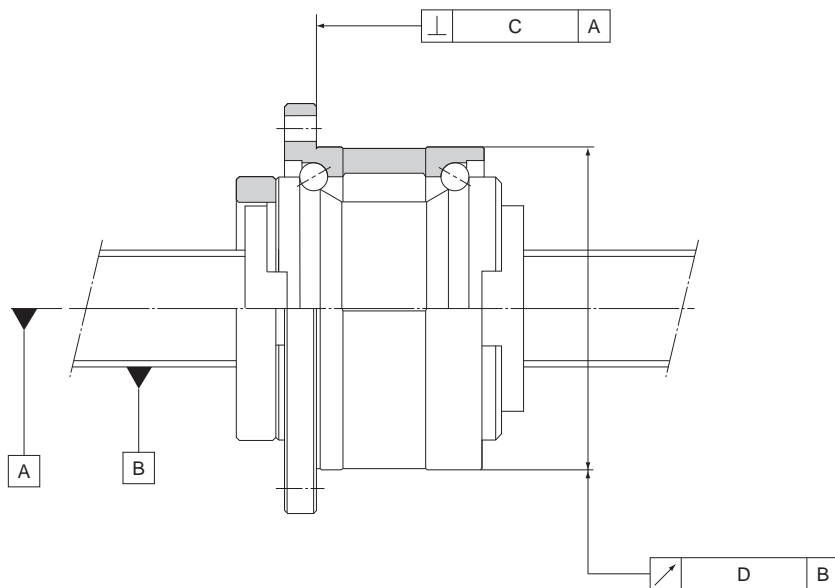
## Model BLR

Specification Table → **A15-310**



## Accuracy Standards

The accuracy of model BLR is compliant with the JIS standard (JIS B 1192-1997) except for the radial runout of the circumference of the ball screw nut from the screw axis (D) and the perpendicularity of the flange-mounting surface against the screw axis (C).

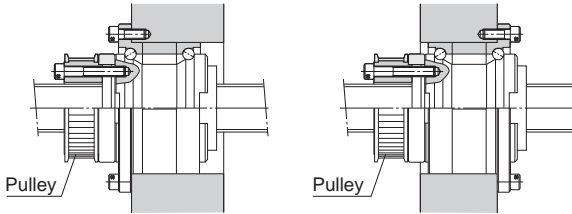


Unit: mm

Lead angle accuracy	C7, C8, C10	
Accuracy grades	C10	
Model No.	C	D
BLR 1616	0.035	0.065
BLR 2020	0.035	0.065
BLR 2525	0.035	0.065
BLR 3232	0.035	0.065
BLR 3636	0.036	0.066
BLR 4040	0.046	0.086
BLR 5050	0.046	0.086

## Example of Assembly

### [Example of Mounting Ball Screw Nut Model BLR]



Standard installation method

Inverted flange

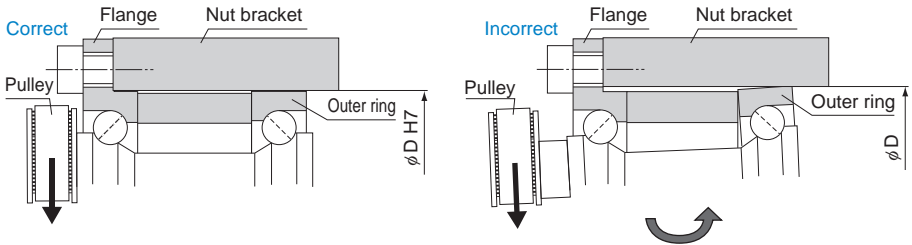
Note) If the flange is to be inverted, indicate "K" in the model number. (applicable only to model BLR)

Example: BLR 2020-3.6 **K** UU

Symbol for inverted flange

(No symbol for standard flange orientation)

### [Important note concerning model BLR]



Note) Since the outer rings are separable, it is necessary to include an internal diameter tolerance in the nut bracket so that the outer ring on the side opposite from the flange does not shift. (H7 is recommended.)

### [Example of Mounting Model BLR on the Table]

(1) Screw shaft free, ball screw nut fixed

(Suitable for a long table)

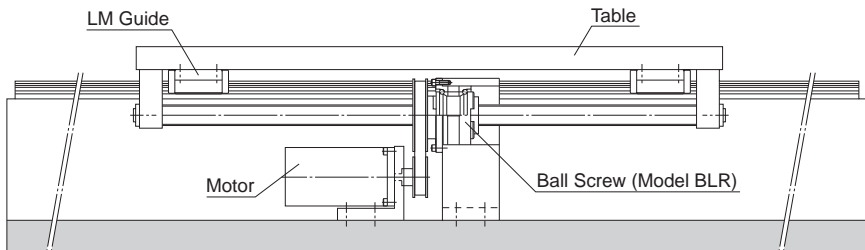


Fig.2 Example of Installation on the Table (Ball Screw Nut Fixed)

- (2) Ball screw nut free, screw shaft fixed  
(Suitable for a short table and a long stroke)

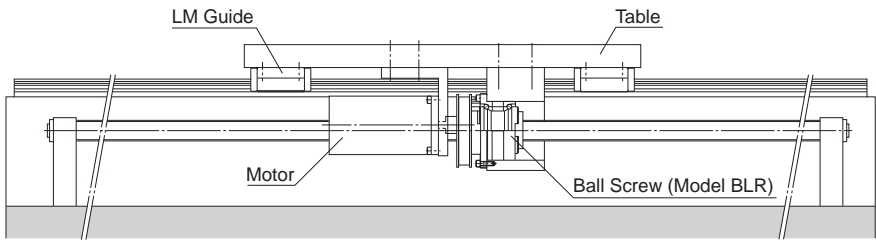
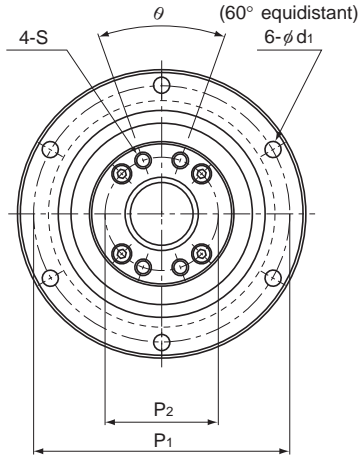


Fig.3 Example of Installation on the Table (Screw Shaft Fixed)



# Model BLR Large Lead Rotary Nut Rolled Ball Screw



Model No.	Screw shaft outer diameter d	Thread minor diameter dc	Lead Ph	Ball center-to-center diameter dp	Basic load rating		Outer diameter D	Flange diameter D <sub>1</sub>	Overall length L <sub>1</sub>	D <sub>3</sub>
					Ca	C <sub>0a</sub>				
					kN	kN				
BLR 1616-3.6	16	13.7	16	16.65	5.8	12.9	52 <sup>0</sup> <sub>-0.007</sub>	68	43.5	40 <sup>0</sup> <sub>-0.025</sub>
BLR 2020-3.6	20	17.5	20	20.75	7.7	22.3	62 <sup>0</sup> <sub>-0.007</sub>	78	54	50 <sup>0</sup> <sub>-0.025</sub>
BLR 2525-3.6	25	21.9	25	26	12.1	35	72 <sup>0</sup> <sub>-0.007</sub>	92	65	58 <sup>0</sup> <sub>-0.03</sub>
BLR 3232-3.6	32	28.3	32	33.25	17.3	53.9	80 <sup>0</sup> <sub>-0.007</sub>	105	80	66 <sup>0</sup> <sub>-0.03</sub>
BLR 3636-3.6	36	31.7	36	37.4	22.4	70.5	100 <sup>0</sup> <sub>-0.008</sub>	130	93	80 <sup>0</sup> <sub>-0.03</sub>
BLR 4040-3.6	40	35.2	40	41.75	28.1	89.8	110 <sup>0</sup> <sub>-0.008</sub>	140	98	90 <sup>0</sup> <sub>-0.035</sub>
BLR 5050-3.6	50	44.1	50	52.2	42.1	140.4	120 <sup>0</sup> <sub>-0.008</sub>	156	126	100 <sup>0</sup> <sub>-0.035</sub>

## Model number coding

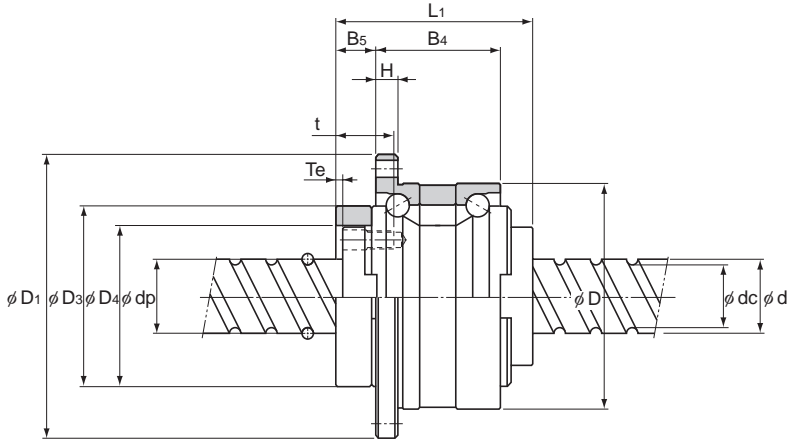
**BLR2020-3.6 K UU +1000L C7 T**

Model number | Flange orientation symbol (\*1) | Overall screw shaft length (in mm) | Symbol for rolled Ball Screw  
 Symbol for support bearing seal (\*2) | Accuracy symbol (\*3)

(\*1) See **A15-307**. (\*2) UU: seal attached on both ends; No symbol: without seal. (\*3) See **A15-12**.

Note) For clearance in the axial direction, see **A15-19**.

# Rolled Rotary Ball Screw



Unit: mm

Ball screw dimensions												Support bearing basic load rating		Nut inertial moment kg·cm <sup>2</sup>	Nut mass kg	Shaft mass kg/m
D <sub>4</sub>	H	B <sub>4</sub>	B <sub>5</sub>	T <sub>e</sub>	P <sub>1</sub>	P <sub>2</sub>	S	t	d <sub>1</sub>	θ°	Ca kN	C <sub>0a</sub> kN				
32	$^{+0.025}_0$	5	27.5	9	2	60	25	M4	12	4.5	40	19.4	19.2	0.48	0.38	1.35
39	$^{+0.025}_0$	6	34	11	2	70	31	M5	16	4.5	40	26.8	29.3	1.44	0.68	2.17
47	$^{+0.025}_0$	8	43	12.5	3	81	38	M6	19	5.5	40	28.2	33.3	3.23	1.1	3.41
58	$^{+0.03}_0$	9	55	14	3	91	48	M6	19	6.6	40	30	39	6.74	1.74	5.69
66	$^{+0.03}_0$	11	62	17	3	113	54	M8	22	9	40	56.4	65.2	16.8	3.2	7.12
73	$^{+0.03}_0$	11	68	16.5	3	123	61	M8	22	9	50	59.3	74.1	27.9	3.95	8.76
90	$^{+0.035}_0$	12	80	25	4	136	75	M10	28	11	50	62.2	83	58.2	6.22	13.79

Ball Screw



## Maximum Length of the Ball Screw Shaft

Table1 shows the manufacturing limit lengths of precision Ball Screws by accuracy grades, Table2 shows the manufacturing limit lengths of precision Ball Screws compliant with DIN standard by accuracy grades, and Table3 shows the manufacturing limit lengths of rolled Ball Screws by accuracy grades.

If the shaft dimensions exceed the manufacturing limit in Table1, Table2 or Table3, contact THK.

Table1 Maximum Length of the Precision Ball Screw by Accuracy Grade

Unit: mm

Screw shaft outer diameter	Overall screw shaft length						
	C0	C1	C2	C3	C5	C7	
4	90	110	120	120	120	120	
6	150	170	210	210	210	210	
8	230	270	340	340	340	340	
10	350	400	500	500	500	500	
12	440	500	630	680	680	680	
13	440	500	630	680	680	680	
14	530	620	770	870	890	890	
15	570	670	830	950	980	1100	
16	620	730	900	1050	1100	1400	
18	720	840	1050	1220	1350	1600	
20	820	950	1200	1400	1600	1800	
25	1100	1400	1600	1800	2000	2400	
28	1300	1600	1900	2100	2350	2700	
30	1450	1700	2050	2300	2570	2950	
32	1600	1800	2200	2500	2800	3200	
36	2000	2100	2550	2950	3250	3650	
40		2400	2900	3400	3700	4300	
45		2750	3350	3950	4350	5050	
50		3100	3800	4500	5000	5800	
55		3450	4150	5300	6050	6500	
63		4000	5200	5800	6700	7700	
70				6300	6450	7650	9000
80					7900	9000	10000
100					10000	10000	

Table2 Manufacturing limit lengths of precision Ball Screws (DIN standard compliant Ball Screws)

Unit: mm

Shaft diameter	Ground shaft			CES shaft			
	C3	C5	C7	Cp3	Cp5	Ct5	Ct7
16	1050	1100	1400	1050	1100	1100	1400
20	1400	1600	1800	1400	1600	1600	1800
25	1800	2000	2400	1800	2000	2000	2400
32	2500	2800	3200	2500	2800	2800	3200
40	3400	3700	4300	3400	3700	3700	4300
50	4500	5000	5800	—	—	—	—
63	5800	6700	7700	—	—	—	—

Table3 Maximum Length of the Rolled Ball Screw by Accuracy Grade

Unit: mm

Screw shaft outer diameter	Overall screw shaft length		
	C7	C8	C10
6 to 8	320	320	—
10 to 12	500	1000	—
14 to 15	1500	1500	1500
16 to 18	1500	1800	1800
20	2000	2200	2200
25	2000	3000	3000
28	3000	3000	3000
30	3000	3000	4000
32 to 36	3000	4000	4000
40	3000	5000	5000
45	3000	5500	5500
50	3000	6000	6000

