

## Precision Linear Slide Unit

Limited linear motion type

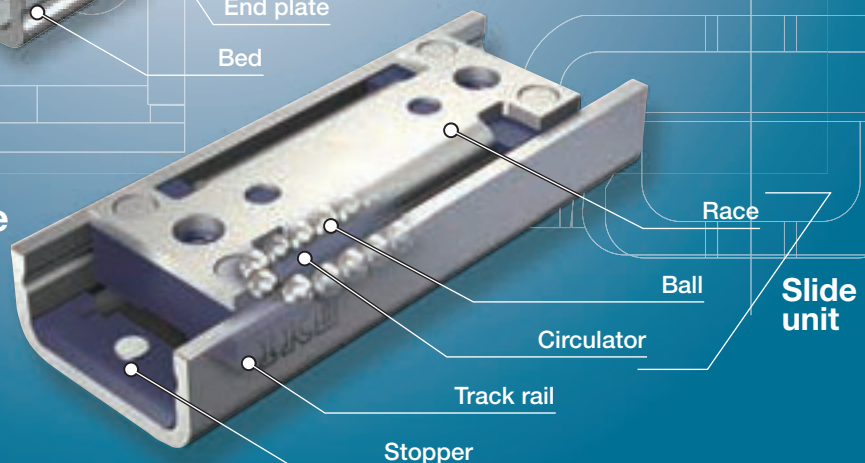
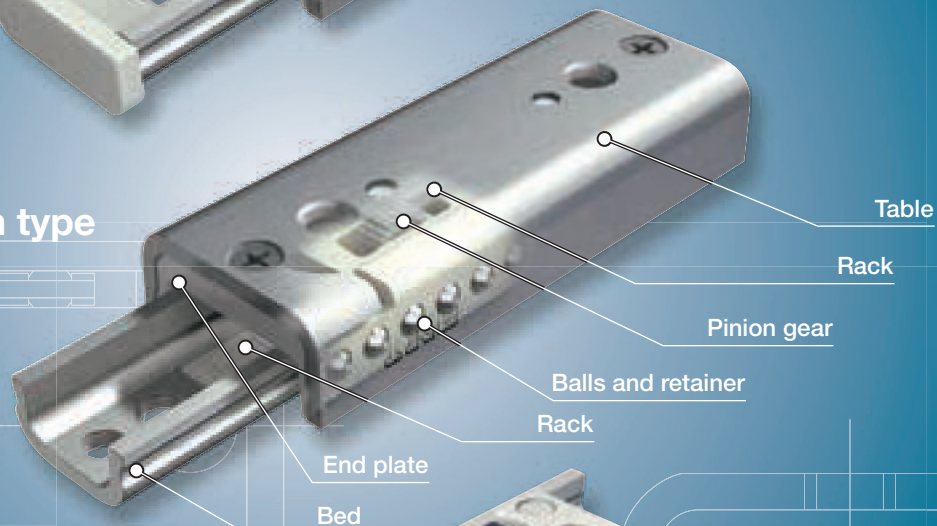
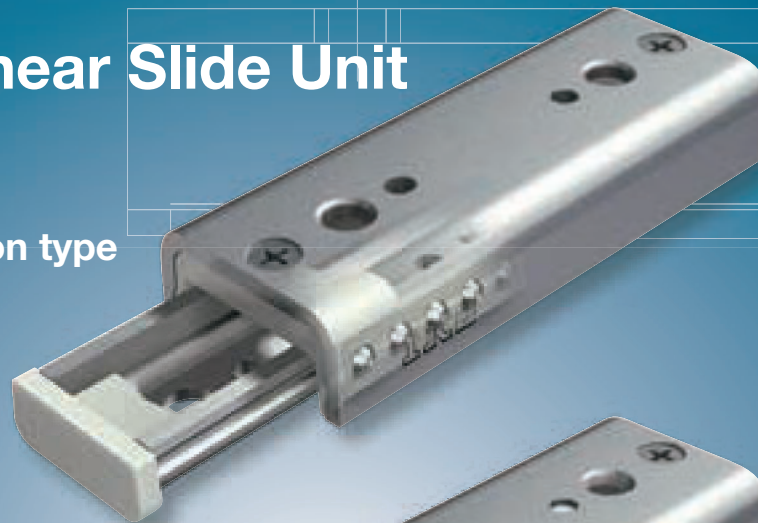
# BSP

Built-in rack & pinion type

# BSPG

Endless linear motion type

# BSR



## Points

### 1 ● Light weight and compact

Weight is saved by precise forming of stainless steel plate to U shape and integration of the way and mounting surface, and downsizing was realized by functional allocation of parts.

### 2 ● Stable performance

With simple two-row four-point contact structure, motion accuracy with stable load carrying capacity and high motion accuracy can be achieved for load in every direction.

### 3 ● Quiet and smooth operations

The excellent retaining and guiding mechanism of the ball and precisely-finished raceway realizes very quiet and smooth operations. High response characteristics and positioning accuracy are obtained for micro-feeding operation as well.

### 4 ● High safety

Since non-combustible or self-extinguishing materials are used for all synthetic resin components, they may be used for wide range of applications including household office automation equipment that requires incombustibility.

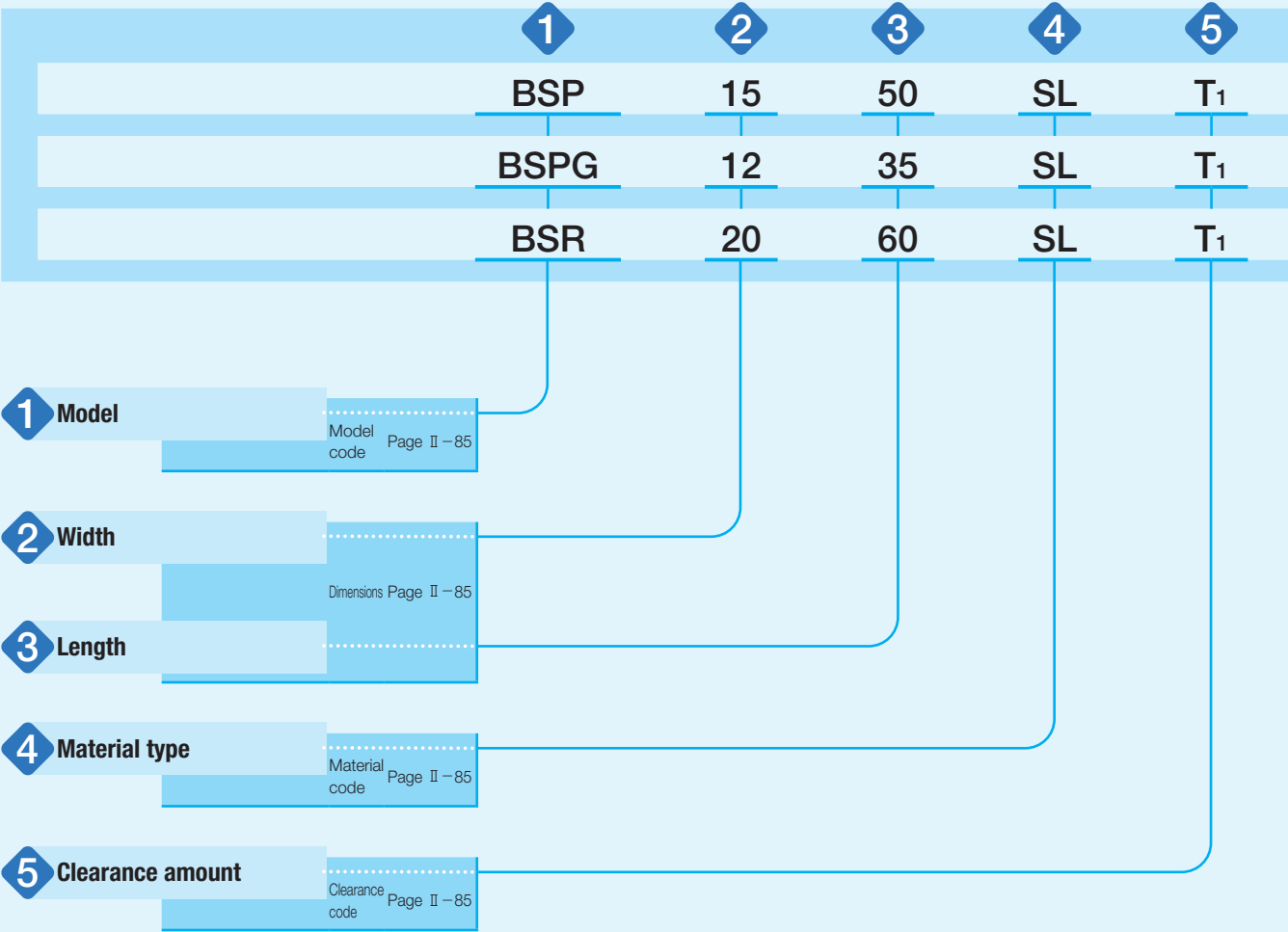
### 5 ● Stainless steel selections for excellent corrosion resistance

Stainless steel highly resistant to corrosion is used for all steel components, so that they are suitable for applications where rust prevention oil is not preferred, such as in a cleanroom environment.

# Identification Number and Specification

## Example of an identification number

The specifications of BSP, BSPG and BSR are indicated by the identification number. Indicate the identification number, consisting of a model code, dimensions, a material code, and a clearance code for each specification to apply.



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# Identification Number and Specification

1

Model

Precision Linear Slide Unit

Limited linear motion type : BSP  
Built-in rack & pinion type : BSPG  
Endless linear motion type : BSR

For applicable models and width, see Table 1.

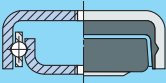
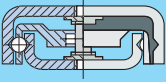
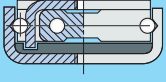
2

Width

7, 10, 12, 15, 20, 25

Indicate the width in mm.  
For applicable models and width, see Table 1.

Table 1 Models and width

Shape	Model	Characteristics	Width					
			7	10	12	15	20	25
Limited linear motion type 	BSP	Retainer made of special synthetic resin is used to prevent interference noise from contact of balls. This type performs very smooth and light limited linear motion without stick-slip.	○	○	—	○	○	○
Built-in rack & pinion type 	BSPG	A pinion gear assembled in the retainer integrated with two-row ball raceway is engaged with the racks fixed to the table and bed to prevent creeping of retainer position. Like BSP, this type also performs smooth linear motion.	—	—	○	○	○	○
Endless linear motion type 	BSR	The ball circulation structure made of special synthetic resin realizes quiet and smooth endless linear motion according to the length of a track rail.	—	—	○	○	○	○

3

Length

Indicate the length in mm.

4

Material type

Stainless steel made : SL

Stainless steel (SL) can be specified only for the material type.

5

Clearance amount

Standard : No symbol  
T<sub>1</sub>Clearance : T<sub>1</sub>

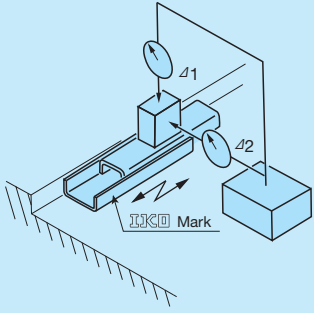
For details of clearance amount, see Table 2.  
Typically, apply the standard clearance for use in small frictional resistance and the clearance adjusted to the clearance code T<sub>1</sub> for applications requiring high linear motion accuracy.

Table 2 Clearance of raceways unit: μm

Type and code	Clearance of raceways
Standard (no symbol)	0 ~ +4
T <sub>1</sub>	−4 ~ 0

## Accuracy

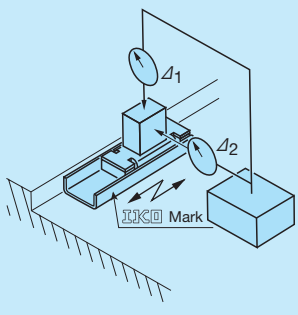
Table 3 Running accuracy for BSP and BSPG



unit:  $\mu\text{m}$

Stroke length mm		Parallelism at the bed center against the table mounting surface	Parallelism at the bed center against the table reference mounting surface
Over	Incl.	$\Delta_1$	$\Delta_2$
—	18	3	6
18	30	4	8
30	50	5	10
50	80	6	12

Table 4 Running accuracy for BSR



unit:  $\mu\text{m}$

Stroke length mm		Parallelism at the slide unit center against the track rail mounting surface	Parallelism at the slide unit center against the track rail reference mounting surface
Over	Incl.	$\Delta_1$	$\Delta_2$
—	18	3	6
18	30	4	8
30	50	5	10
50	80	6	12

## Lubrication

Grease is not pre-packed in the BSP and BSR, so please perform adequate lubrication as needed.

Upon delivery, anti-rust oil is applied. Therefore, perform cleaning with clean solution before mounting, apply high-quality lubrication oil or grease to the raceway, and conduct shakedown before use.

The BSPG is packed with special grease applied to the raceway and rack and pinion. In general applications, keep cleanliness and mount it as it is.

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## Precaution for Use

### ① Applied load

For use with stable and high running accuracy, it is recommended to use applied load around 20% or lower of the basic static load rating.

### ② Handling

When high running accuracy is required for BSP and BSPG, set the load point at the center of the table (or bed) and use with sufficient stroke length.

For the BSP, the retainer may be deviated from the right position due to offset load or irregular and high-velocity motion, etc. Fully stroke it once in certain operating time or certain number of reciprocating motion to correct the retainer position. If it is difficult to correct the retainer position, use BSPG or BSR.

Since BSP, BSPG and BSR have no built-in mechanical stopper to regulate linear motion in the event of collision, install a stopper mechanism in proximity if risk of overstroke exists.

### ③ Operating temperature

The maximum operating temperature is 120°C and temperature up to 100°C is allowed for continuous operation. However, when it exceeds 100°C, contact IKO.

### ④ Maximum velocity

Operating velocity should not exceed 30 m/min during operation.

## Precaution for Mounting

### ① Reference mounting surface

Reference mounting surface is the opposite side of the IKO mark.

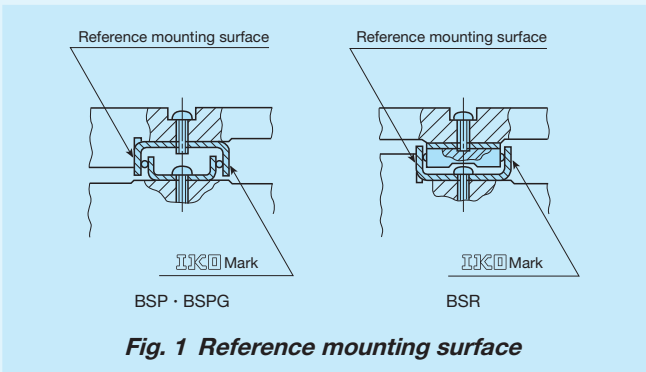


Fig. 1 Reference mounting surface

### ② Typical mounting structure

The mating surface to mount BSP, BSPG and BSR should be finished to high accuracy as much as possible so as not to affect the motion accuracy.

For the opposite corner of the mating reference mounting, it is recommended to have relieved fillet as indicated in Fig. 1, but you may also mount it based on  $R_1$  dimension indicated in Table 5. The value indicated in Table 5 is recommended for the shoulder height on the mating side.

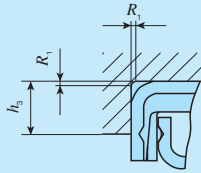
### ③ Mounting

The fixing thread depth of fixing screws must not exceed the maximum fixing thread depth indicated in the dimension table.

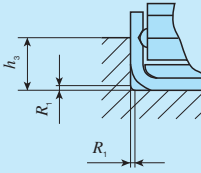
When mounting BSP and BSPG, use female screws of the table and bed, or insert screws smaller by one size to the female screws. However, note that BSP 715 SL through BSP 740 SL cannot be mounted from the inside of the table and bed.

When mounting the track rail of BSR, use female screws of the track rail or insert screws smaller by one size to the female screws. However, note that BSR 1530 SL through BSR 2040 SL cannot be mounted from the inside of the track rail. In addition, when BSR 1230 SL through BSR 1260 SL are to be mounted from the inside of the track rail, contact IKO.

Table 5 Shoulder height and corner radius of the reference mounting surface



BSP · BSPG



BSR

unit: mm

Identification number			Shoulder height $h_3$	Corner radius $R_1$ (maximum)
—	—	BSR 12	2.5	0.5
BSP 7	—	—	3	
BSP 10	—	—	4	
—	BSPG 12	—	5	
BSP 15	BSPG 15	BSR 15	6	
BSP 20	BSPG 20	BSR 20	6	
BSP 25	BSPG 25	BSR 25	6	

4 Tightening torque for fixing screw

If the fixing force of BSP, BSPG and BSR toward the mating surface is too strong, performance and accuracy are adversely affected. Although it depends on material, rigidity and finishing condition of the mating surface, it is generally recommended to use smaller tightening torque for fixing screws and use value comparable to Table 6. In addition, use a stopper measure such as adhesive agent if fixing screw may be loosened by vibration, etc.

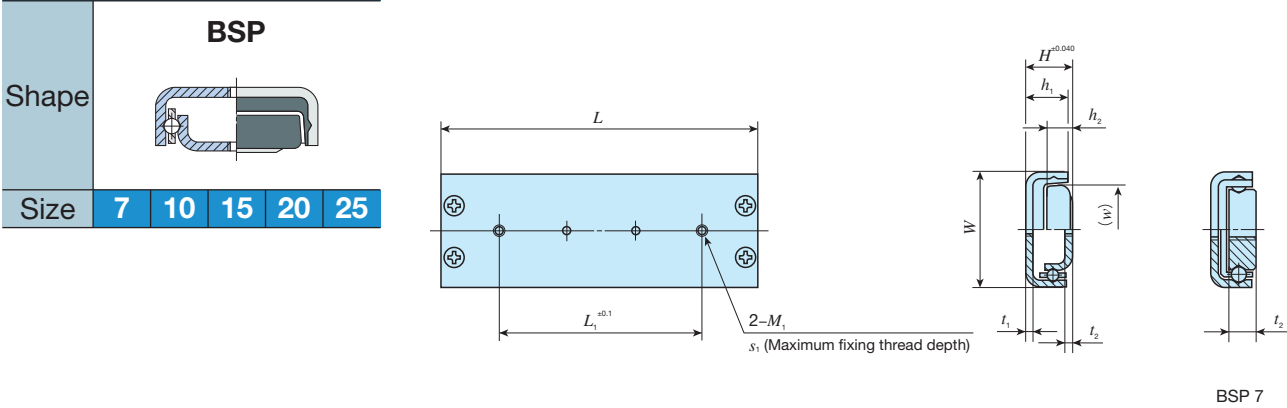
Table 6 Tightening torque for fixing screw

Bolt size	Tightening torque N · m
M2 × 0.4	0.065
M2.3 × 0.4	0.10
M2.6 × 0.45	0.15
M3 × 0.5	0.24

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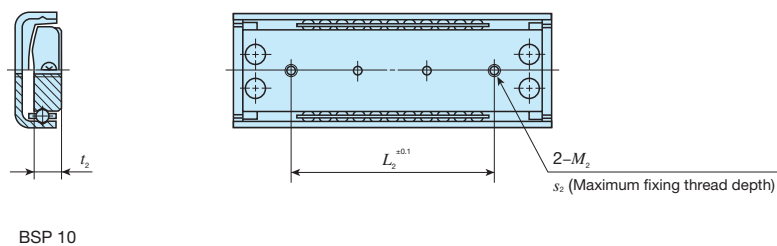
Limited linear motion type



Identification number	Mass (Ref.)  g	Nominal dimensions mm				Table mounting dimensions mm			
		W	H	L	Maximum stroke length	L <sub>1</sub>	M <sub>1</sub>	Maximum fixing thread depth s <sub>1</sub>	
BSP 7 15 SL <sup>(1)</sup>	2.1	7	4	15	9	5	M2	1	
BSP 7 20 SL <sup>(1)</sup>	2.8			20		10			
BSP 7 30 SL <sup>(1)</sup>	4.2			30	18	20			
BSP 7 40 SL <sup>(1)</sup>	5.6			40	23	30			
BSP 10 25 SL	6.2	10	6	25	15	15	M2.6	1.5	
BSP 10 35 SL	8.8			35	26	25			
BSP 10 45 SL	11.3			45	38	35			
BSP 15 30 SL	11	15	8	30	22	14	M3	2.5	
BSP 15 40 SL	14.7			40	24	24			
BSP 15 50 SL	18.4			50	32	34			
BSP 15 60 SL	22.1			60	40	40			
BSP 20 40 SL	23.7	20	10	40	22	24	M3	3.2	
BSP 20 50 SL	29.7			50	28	34			
BSP 20 60 SL	35.7			60	34	40			
BSP 20 70 SL	41.7			70	40	45			
BSP 20 80 SL	47.6			80	53	50			
BSP 25 50 SL	37.6	25	10	50	26	34	M3	3.5	
BSP 25 60 SL	45.3			60	32	40			
BSP 25 70 SL	52.9			70	40	45			
BSP 25 80 SL	60.5			80	51	50			
BSP 25 100 SL	75.8			100	63	60			

Note (¹) BSP 715 SL through BSP 740 SL cannot be mounted from the inside of the table and bed.





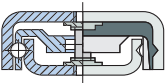
			Bed mounting dimensions mm						Basic dynamic load rating C N	Basic static load rating C <sub>0</sub> N
	<i>h</i> <sub>1</sub>	<i>t</i> <sub>1</sub>	<i>w</i>	<i>L</i> <sub>2</sub>	<i>M</i> <sub>2</sub>	Maximum fixing thread depth <i>s</i> <sub>2</sub>	<i>h</i> <sub>2</sub>	<i>t</i> <sub>2</sub>		
	3.4	0.9	3.6	5	M2	2	—	2	93.3	42.0
				10					134	70.0
				20					170	98.0
				30					203	126
	5.8	1.1	6.2	15	M2.6	2.7	3.7	2.7	340	156
				25					398	194
				35					453	233
	7	1.2	11.2	14	M3	3	4.5	1.2	395	194
				24					550	311
				34					644	389
				40					732	467
	9	1.4	16	24	M3	3.5	6.2	1.4	726	386
				34					866	496
				40					998	606
				45					1 120	717
				50					1 180	772
	9	1.6	20.5	34	M3	3	5.7	1.6	866	496
				40					998	606
				45					1 120	717
				50					1 180	772
				60					1 410	992

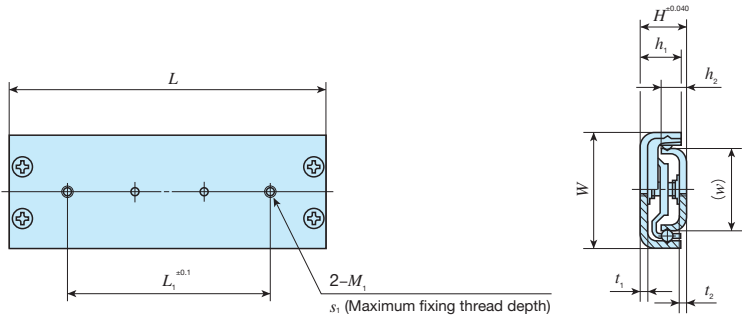
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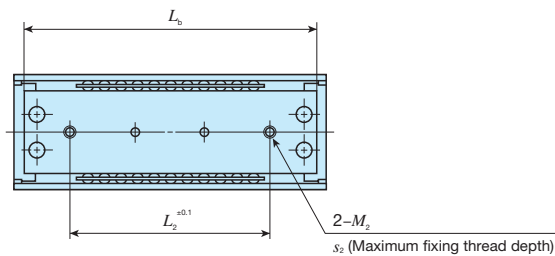
IKO Precision Linear Slide

Built-in rack & pinion type

Shape	BSPG			
				
Size	12	15	20	25



Identification number	Mass (Ref.)  g	Nominal dimensions mm				Table mounting dimensions mm				
		W	H	L	Maximum stroke length	L <sub>1</sub>	M <sub>1</sub>	Maximum fixing thread depth s <sub>1</sub>	h <sub>1</sub>	
BSPG 12 25 SL	6.5	12	6	25	14	15	M2.6	2	5.2	
BSPG 12 35 SL	9.0			35	24	24				
BSPG 12 45 SL	11.6			45	34	34				
BSPG 15 40 SL	15.8	15	8	40	24	24	M3	2.5	7	
BSPG 15 50 SL	19.6			50	32	34				
BSPG 15 60 SL	23.5			60	40	40				
BSPG 20 40 SL	25.5	20	10	40	22	24	M3	3.2	9	
BSPG 20 50 SL	31.8			50	28	34				
BSPG 20 60 SL	38.1			60	34	40				
BSPG 20 70 SL	44.4			70	40	45				
BSPG 20 80 SL	50.5			80	47	50				
BSPG 25 50 SL	40.3	25	10	50	26	34	M3	3.5	9	
BSPG 25 60 SL	48.3			60	32	40				
BSPG 25 70 SL	56.2			70	38	45				
BSPG 25 80 SL	64.1			80	44	50				
BSPG 25 100 SL	80.0			100	56	60				

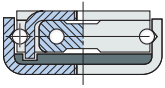


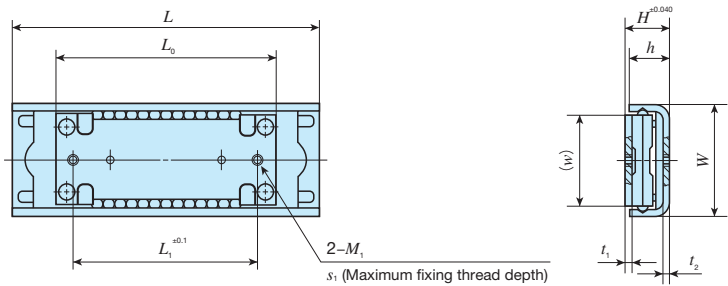
Bed mounting dimensions mm									Basic dynamic load rating $C$ N	Basic static load rating $C_0$ N
$t_1$	$L_b$	$w$	$L_2$	$M_2$	Maximum fixing thread depth $s_2$	$h_2$	$t_2$			
1.2	23.6	7.6	15	M2.6	2	3	1		244	131
	33.6		24						299	175
	43.6		34						350	219
1.2	37	9.6	24	M3	3	4.5	1.2		550	311
	47		34						644	389
	57		40						732	467
1.4	37	13.8	24	M3	3.5	6.2	1.4		726	386
	47		34						866	496
	57		40						998	606
	67		45						1 120	717
	77		50						1 240	827
1.6	46	18.4	34	M3	3	5.7	1.6		866	496
	56		40						998	606
	66		45						1 120	717
	76		50						1 240	827
	96		60						1 460	1 050

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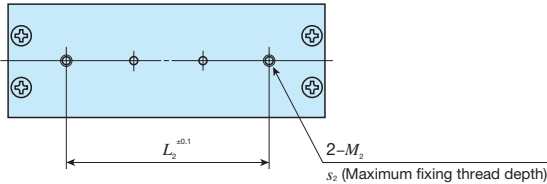
Endless linear motion type

Shape	BSR			
				
Size	12	15	20	25



Identification number	Mass (Ref.)  g	Nominal dimensions mm				Slide Unit mm			
		W	H	L	Maximum stroke length	w	L <sub>0</sub>	L <sub>1</sub>	
BSR 12 30 SL <sup>(1)</sup>	5.8	12	4.5	30	13	9.8	21.5	15	
BSR 12 40 SL <sup>(1)</sup>	7.0			40	23				
BSR 12 50 SL <sup>(1)</sup>	8.2			50	33				
BSR 12 60 SL <sup>(1)</sup>	9.3			60	43				
BSR 15 30 SL <sup>(2)</sup>	12.6	15	8	30	10	12.2	30	24	
BSR 15 40 SL	14.8			40	20				
BSR 15 50 SL	17.1			50	30				
BSR 15 60 SL	19.3			60	40				
BSR 20 40 SL <sup>(2)</sup>	27.6	20	10	40	12	16.8	40	32	
BSR 20 50 SL	31.1			50	22				
BSR 20 60 SL	34.6			60	32				
BSR 20 70 SL	38.1			70	42				
BSR 20 80 SL	41.6			80	52				
BSR 25 70 SL	53.8	25	10	70	33	21.4	50	42	
BSR 25 80 SL	58.4			80	43				
BSR 25 100 SL	67.4			100	63				

Notes <sup>(1)</sup> When BSR 1230 SL through BSR 1260 SL are to be mounted from the inside of the track rail, contact IKO.  
<sup>(2)</sup> BSR 1530 SL and BSR 2040 SL cannot be mounted from the inside of the track rail.



Mounting dimensions				Track rail mounting dimensions mm					Basic dynamic load rating $C$ N	Basic static load rating $C_0$ N
	$M_1$	Maximum fixing thread depth $s_1$	$t_1$	$L_2$	$M_2$	Maximum fixing thread depth $s_2$	$h$	$t_2$		
	M2	1.3	0.9	15	M2	1.6	4	0.9	214	140
				20						
				34						
				40						
	M3	1.8	1	14	M3	3	7	1.2	543	311
				24						
				34						
				40						
	M3	2.2	1.4	24	M3	3.5	9	1.4	921	551
				34						
				40						
				45						
				50						
	M3	2.4	1.6	45	M3	3.5	9	1.6	1 170	772
				50						
				60						

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