Precision Linear Slide Unit

Limited linear motion type

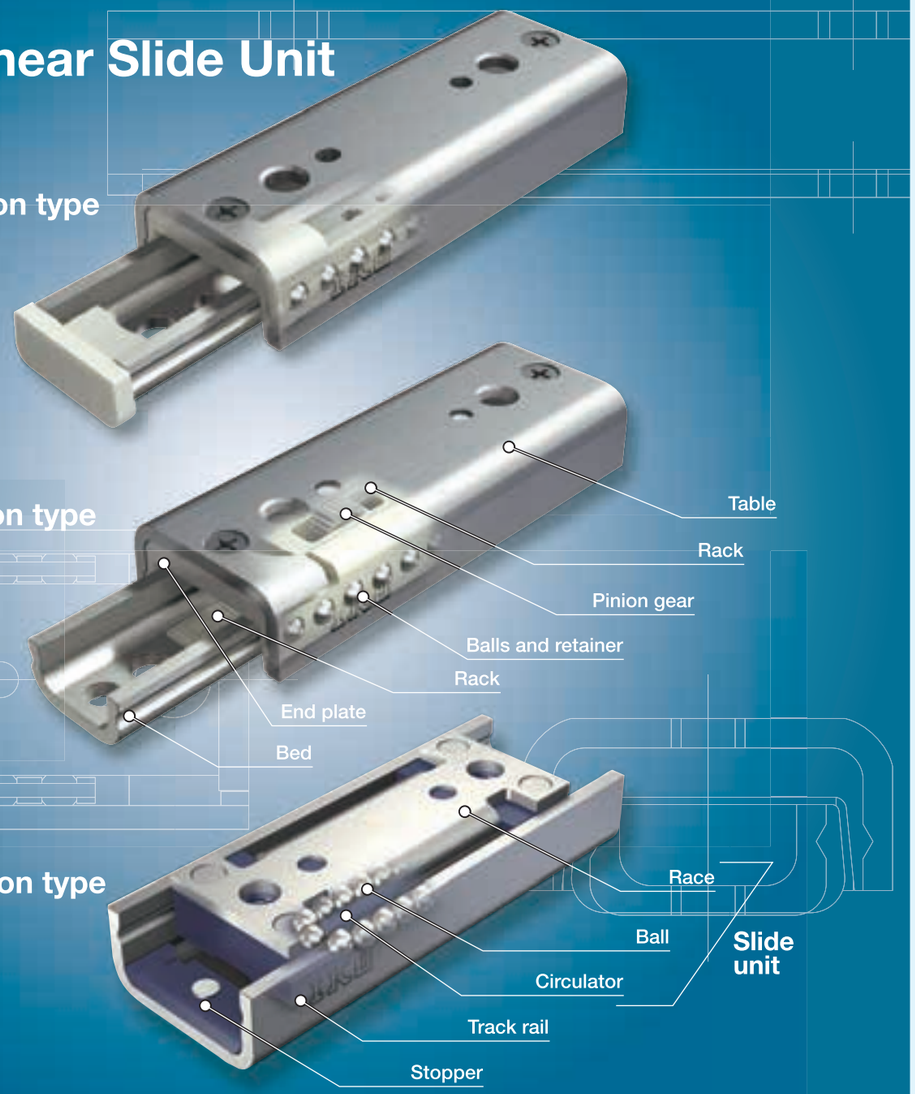
BSP

Built-in rack & pinion type

BSPG

Endless linear motion type

BSR



Points

● Light weight and compact

1 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.

● Stable performance

2 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.

● Quiet and smooth operations

3 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.

● High safety

4 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.

● Stainless steel selections for excellent corrosion resistance

5 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.

1	2	3	4	5
BSP	15	50	SL	T1
BSPG	12	35	SL	T1
BSR	20	60	SL	T1

- 1 **Model** — Model code Page Ⅱ－85
- 2 **Width** — Dimensions Page Ⅱ－85
- 3 **Length** — Dimensions Page Ⅱ－85
- 4 **Material type** — Material code Page Ⅱ－85
- 5 **Clearance amount** — Clearance code Page Ⅱ－85

1N=0.102kgf=0.2248lbs.
1mm=0.03937inch

Identification Number and Specification

1 Model

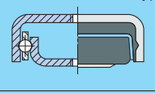
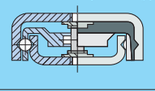
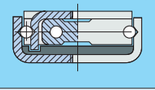
Precision Linear Slide Unit	Limited linear motion type	: BSP
	Built-in rack & pinion type	: BSPG
	Endless linear motion type	: BSR

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

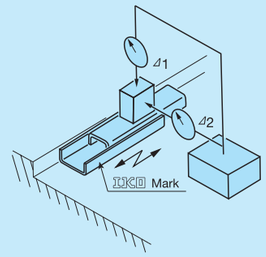
Standard	: No symbol	For details of clearance amount, see Table 2.
T_1Clearance	: T_1	Typically, apply the standard clearance for use in small frictional resistance and the clearance adjusted to the clearance code T_1 for applications requiring high linear motion accuracy.

Table 2 Clearance of raceways unit: μm

Type and code	Clearance of raceways
Standard (no symbol)	0 ~ +4
T_1	−4 ~ 0

Accuracy

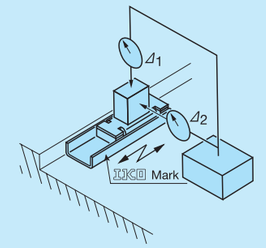
Table 3 Running accuracy for BSP and BSPG



unit: μm

Stroke length mm Over	Stroke length mm Incl.	Parallelism at the bed center against the table mounting surface Δ_1	Parallelism at the bed center against the table reference mounting surface Δ_2
–	18	3	6
18	30	4	8
30	50	5	10
50	80	6	12

Table 4 Running accuracy for BSR



unit: μm

Stroke length mm Over	Stroke length mm Incl.	Parallelism at the slide unit center against the track rail mounting surface Δ_1	Parallelism at the slide unit center against the track rail reference mounting surface Δ_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.

1N=0.102kgf=0.2248lbs.
1mm=0.03937inch

Precaution for Use

❶ 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.

❷ 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.

❸ 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.

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

Precaution for Mounting

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

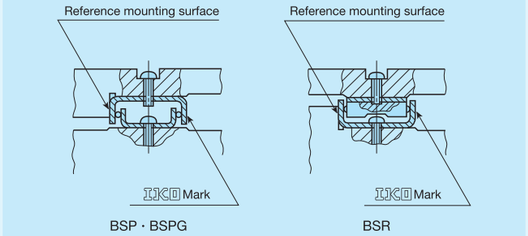
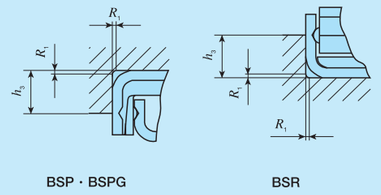


Fig. 1 Reference mounting surface

❷ 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.

❸ 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



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	–		
BSP 15	BSPG 15	BSR 15	5	
BSP 20	BSPG 20	BSR 20	6	
BSP 25	BSPG 25	BSR 25		

❹ 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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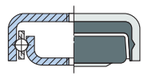
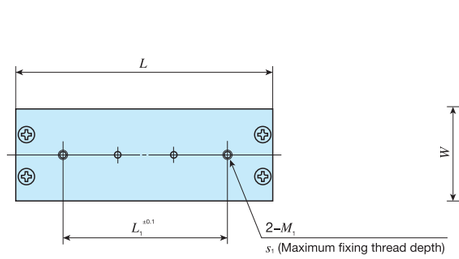
1mm=0.03937inch

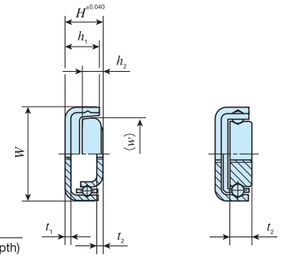
Limited linear motion type

Shape: **BSP**

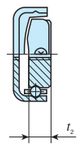


Size: 7 | 10 | 15 | 20 | 25

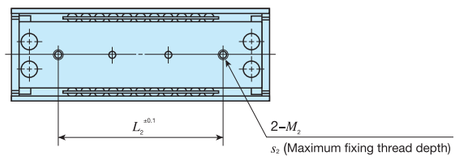




BSP 7



BSP 10



Identification number	Mass (Ref.) g	Nominal dimensions mm W	H	L	Maximum stroke length	Table mounting dimensions mm L_1	M_1	Maximum fixing thread depth s_1	h_1	t_1	Bed mounting dimensions mm w	L_2	M_2	Maximum fixing thread depth s_2	h_2	t_2	Basic dynamic load rating C N	Basic static load rating C_0 N
BSP 7 15 SL(1)	2.1	7	4	15	9	5	M2	1	3.4	0.9	3.6	5	M2	2	–	2	93.3	42.0
BSP 7 20 SL(1)	2.8			20		10						10					134	70.0
BSP 7 30 SL(1)	4.2			30	18	20						20					170	98.0
BSP 7 40 SL(1)	5.6			40	23	30						30					203	126
BSP 10 25 SL	6.2	10	6	25	15	15	M2.6	1.5	5.8	1.1	6.2	15	M2.6	2.7	3.7	2.7	340	156
BSP 10 35 SL	8.8			35	26	25						25					398	194
BSP 10 45 SL	11.3			45	38	35						35					453	233
BSP 15 30 SL	11	15	8	30	22	14	M3	2.5	7	1.2	11.2	14	M3	3	4.5	1.2	395	194
BSP 15 40 SL	14.7			40	24	24						24					550	311
BSP 15 50 SL	18.4			50	32	34						34					644	389
BSP 15 60 SL	22.1			60	40	40						40					732	467
BSP 20 40 SL	23.7	20	10	40	22	24	M3	3.2	9	1.4	16	24	M3	3.5	6.2	1.4	726	386
BSP 20 50 SL	29.7			50	28	34						34					866	496
BSP 20 60 SL	35.7			60	34	40						40					998	606
BSP 20 70 SL	41.7			70	40	45						45					1 120	717
BSP 20 80 SL	47.6			80	53	50						50					1 180	772
BSP 25 50 SL	37.6	25	10	50	26	34	M3	3.5	9	1.6	20.5	34	M3	3	5.7	1.6	866	496
BSP 25 60 SL	45.3			60	32	40						40					998	606
BSP 25 70 SL	52.9			70	40	45						45					1 120	717
BSP 25 80 SL	60.5			80	51	50						50					1 180	772
BSP 25 100 SL	75.8			100	63	60						60					1 410	992

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

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1mm=0.03937inch