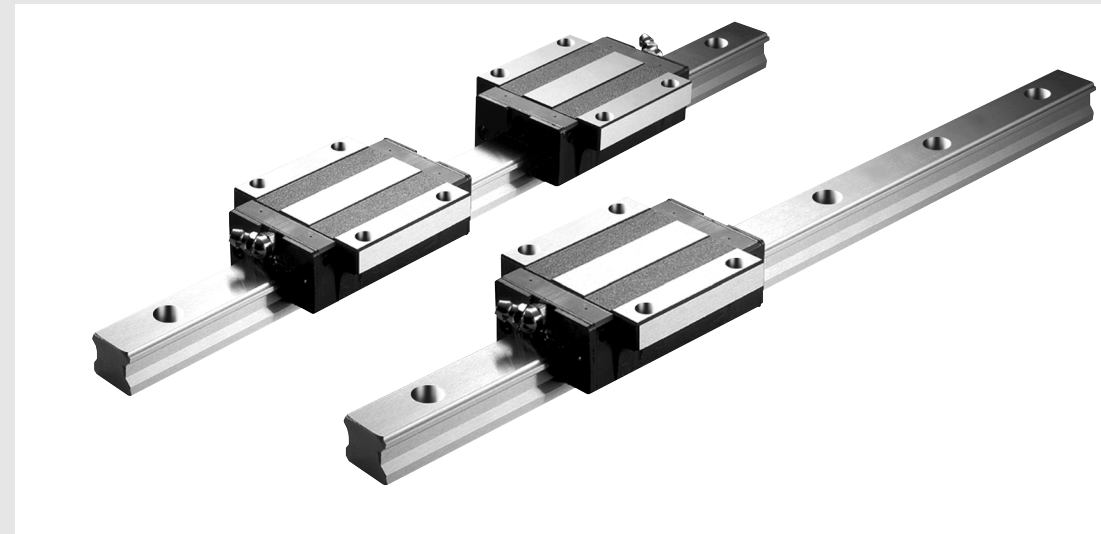


Linear Rail System

SBI High-load Linear Rail System



Circular arc groove

Two point contact structure of circular arc groove. It keeps the function of self-aligning and smooth rolling performance.

45° angle of contact

Four rows of circular arc groove contact balls at an angle of 45 degrees provides the same capacity in all directions.

DF structure

Low noise and High rigidity

Optimized ball recirculation structure and design provides low noise and high-rigidity.

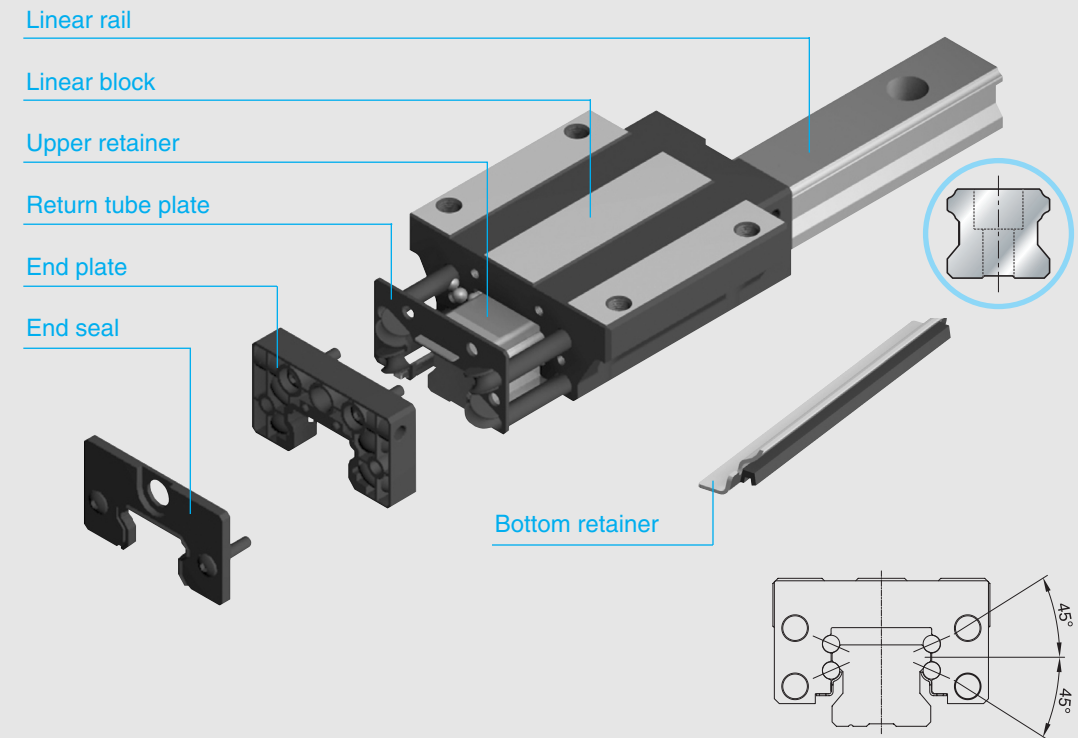
The same dimension

The dimension of height, width and mounting holes are the same as SBG series, with only a slight variation in block length.

Linear Rail System

SBI High-load Linear Rail System

The feature of structure



End seal New double lip structure which improves resistance to dust and particle contamination.

End-plate Manufactured with a new high rigidity engineered plastic. Designed to withstand the highest of unplanned impact loads without breaking.

Retainer Ball retainer plates now snap assembled to the blocks and this unique assembly method allows an amount of internal self-alignment and load sharing while maintaining rigid ball control.

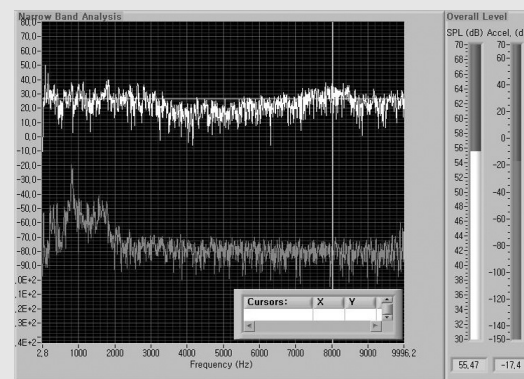
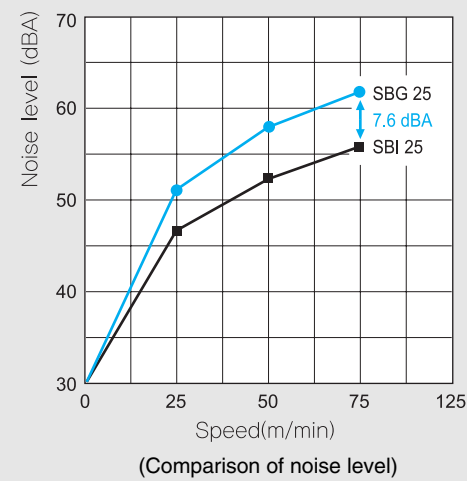
Return tube plate The end plate and reversing ramps of new ball return tubes are now molded as one complete body. This allows for smoother ball rotation through the critical transition points, significantly improving rolling performance, lower operating better lubricant retention inside the bearing.

Linear block Highly rigid structure with a larger recirculation radius for the smooth movement and longer block length for higher load capacity.

Linear rail SBI rail is designed with a low profile and wide base. This characteristic allows greater stability in operation and during manufacture. Results in greater linear precision.

[Low noise]

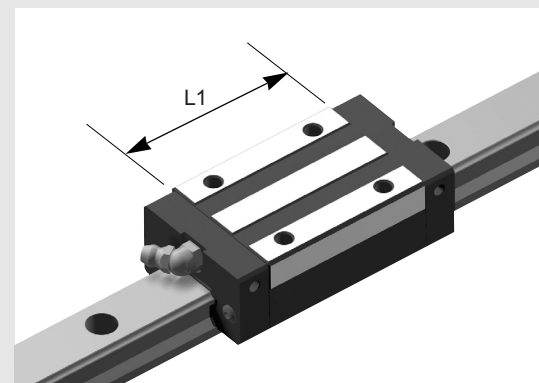
- SBI25 / SBG25 noise level test data



[High load performance]

SBI type is improved load capacity from the longer block length and changed radius of curvature

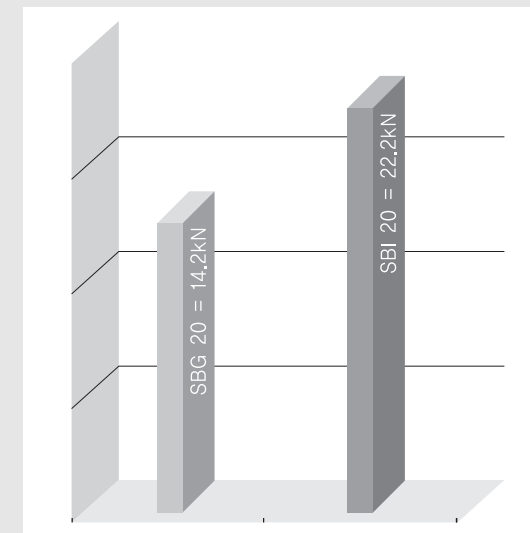
- The comparison of SBI / SBG block length



(Unit : mm)

L1 length	SBG	SBI
15SL	38.8	45.2
20SL	50.8	56.8
25SL	59.5	70

- The comparison of basic dynamic load rating



(Comparison of basic dynamic load rating)

Improved geometry and tolerances increases basic dynamic load rating

- Comparison of lifetime calculation

- L (km) : Nominal life
- C (kN) : Basic dynamic load rating
- P (kN) : Calculated load

$$L = \left(\frac{C}{P}\right)^3 \times 50\text{km}$$

In case of P = 5 kN

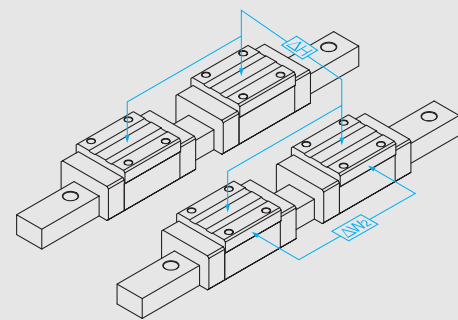
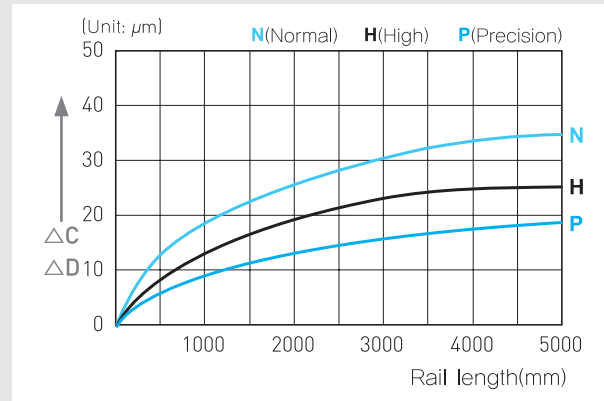
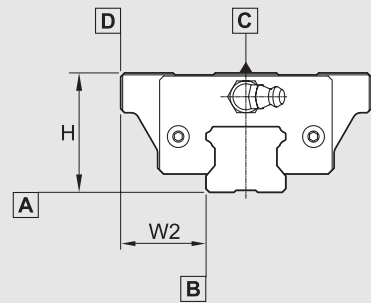
Basic dynamic load rating (C) of SBI20 SL : 22.2 kN

Basic dynamic load rating (C) of SBG20 SL : 14.2 kN

$$\text{SBI 20SL} : L = \left(\frac{C}{P}\right)^3 \times 50 = \left(\frac{22.2}{5}\right)^3 \times 50 = 4376 \text{ km}$$

$$\text{SBG 20SL} : L = \left(\frac{C}{P}\right)^3 \times 50 = \left(\frac{14.2}{5}\right)^3 \times 50 = 1145 \text{ km}$$

Accuracy



- Measuring dimension difference H and W2 between the carriages of the same guide
- $\Delta W2$ (Dimension difference W2 between the carriages of the same guide): measuring the center of block side surface (reference surface)
- ΔH (Dimension difference H between the carriages of the same guide): measuring the center of block top

Item	N	H	P
Tolerance for the height H	± 0.1	± 0.04	± 0.02
Tolerance for the rail-to-block lateral distance W2	± 0.1	± 0.04	± 0.02
Tolerance for the height H difference among blocks	0.03	0.015	0.007
Tolerance for rail-to-block lateral distance W2 distance among blocks	0.03	0.015	0.007
Running parallelism of surface C with surface A		ΔC	
Running parallelism of surface D with surface B		ΔD	

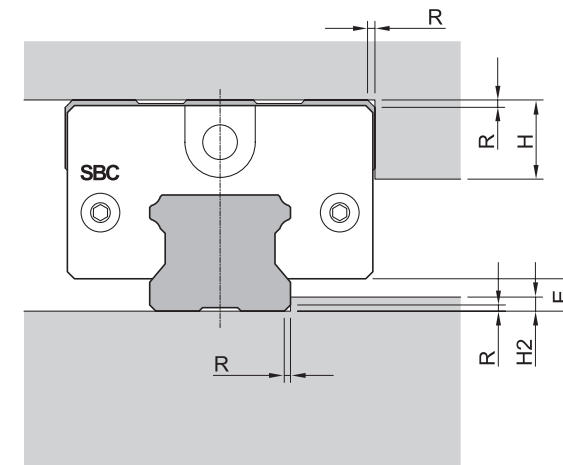
● N : Normal ● H : High ● P : Precision

Preload

Reference	Volume of preload
K0 (None)	Clearance within 0.01mm
K1 (Normal)	Max. 0.02C
K2 (Light)	0.04 ~ 0.06C
K3 (Heavy)	0.08 ~ 0.10C

- C(kN) : Basic dynamic load rating
- * "K3" Preload is not available for SBI15 type

Shoulder height and fillet radius R

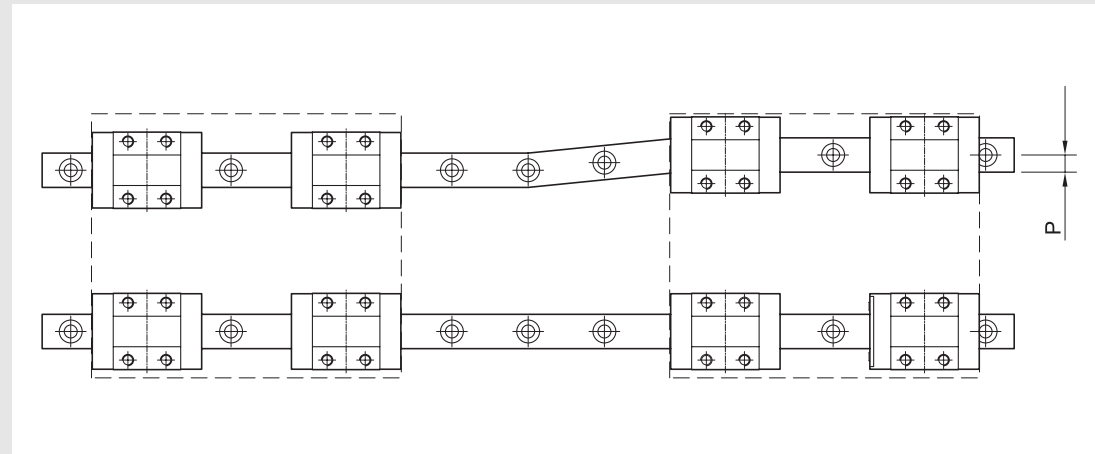


Model number	Fillet radius R	Shoulders height H1	Shoulders height H2	E
15	0.6	7	2.5	3
20	0.6	8	3.5	4.6
25	1	10	4.5	5.5
30	1	11	5	7
35	1	13	6	7.5
45	1.6	16	8	9
55	1.6	20	10	12
65	1.6	25	15	19

Linear Rail System

SBI High-load Linear Rail System

Permissible tolerance (P) of parallelism



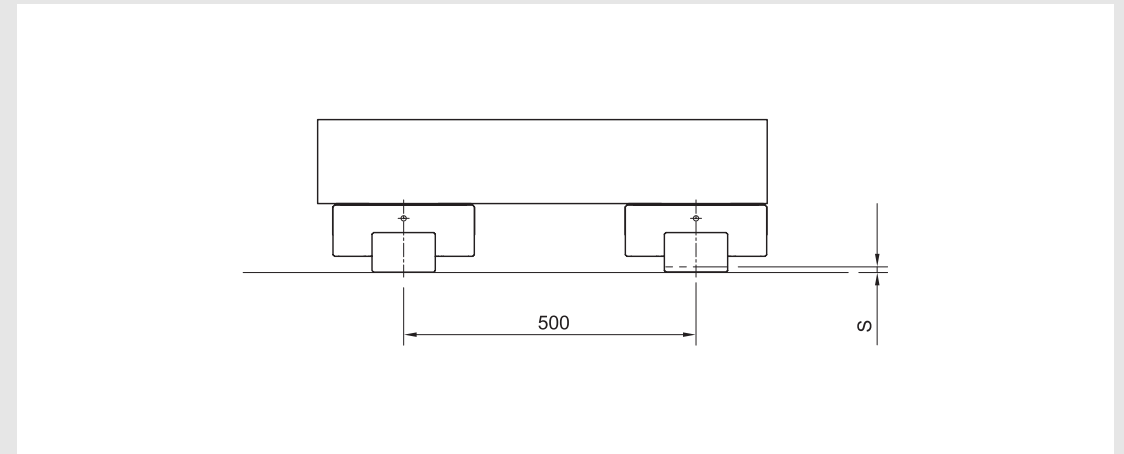
(Unit : mm)

Model size	K1	K2	K3
15	0.025	0.018	-
20	0.025	0.020	0.018
25	0.030	0.022	0.020
30	0.040	0.030	0.027
35	0.050	0.035	0.030
45	0.060	0.040	0.035
55	0.070	0.050	0.045
65	0.080	0.060	0.055

Linear Rail System

SBI High-load Linear Rail System

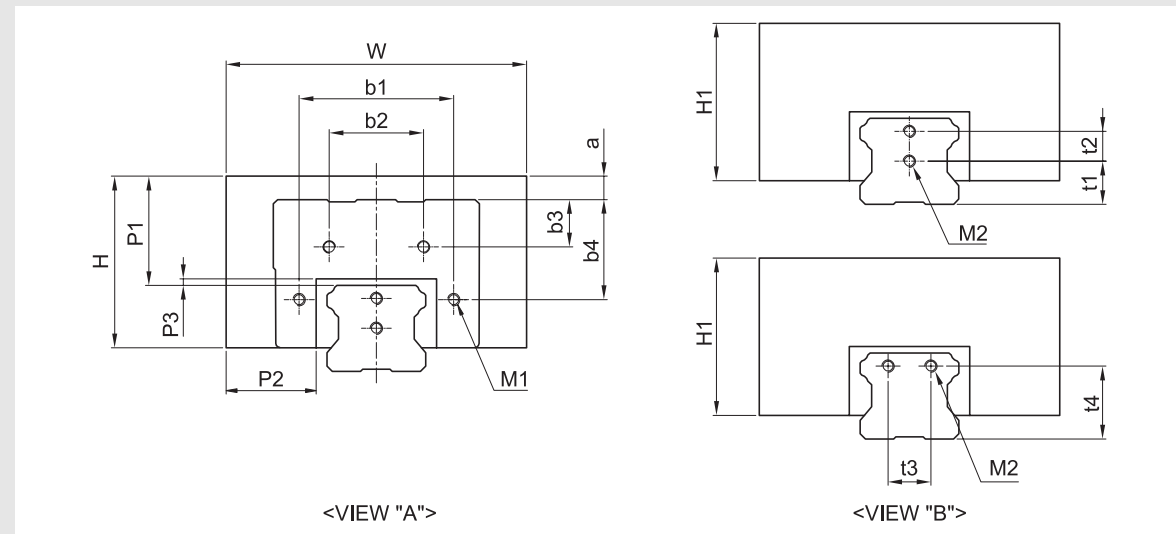
Permissible tolerance (S) of two level offset



(Unit : mm)

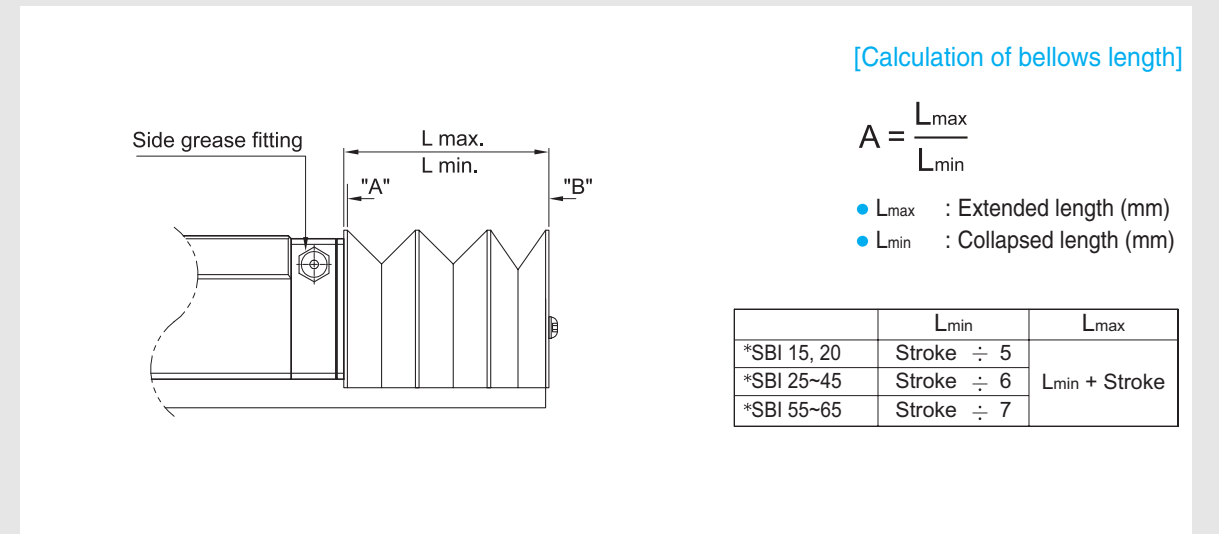
Model size	K1	K2	K3
15	0.13	0.085	-
20	0.13	0.085	0.05
25	0.13	0.085	0.07
30	0.17	0.11	0.09
35	0.21	0.15	0.12
45	0.25	0.17	0.14
55	0.30	0.21	0.17
65	0.35	0.25	0.20

SH Bellows



Model number	Applicable type	W	H	H1	P1	P2	P3	a (*Dimensions according to block types)						b1	b2
								FV	SV	CL	FL	SL	HL		
SH15 A	SBI15	50	25	25	15	15.5	1	4	4	-	4	0	4	26	-
SH15 DA			20	20	10			-1	-1	-	-1	-5	-1		
SH20 A	SBI20	60	29	31	17	18	1	5.5	5.5	5.5	3.5	3.5	-	34	-
SH20 DA			24	26	12			-	-	-	-1.5	-1.5	-		
SH25 A	SBI25	70	35	35	20	21	1	7	7	7	4	0	4	36	-
SH25 DA			30	30	15			-	-	-	-1	-5	-1		
SH30 A	SBI30	80	36	36	20	23	1	-	-	-	1	-2	1	49	-
SH30 DA			33	33	17			-	-	-	-2	-5	-2		
SH35 DA	SBI35	85	39	39	20	22.5	1	-	-	-	-2	-9	-2	56	-
SH45 DA	SBI45	100	48	48	25	25	1	-	-	-	-3	-13	-3	72	-
SH55 DA	SBI55	110	56	56	30	25	1	-	-	-	-2	-12	-2	74	53.4
SH65 DA	SBI65	130	69	69	35	30	1	-	-	-	-2	-2	-	90	64

- * The column of b1 dimension is only applying for SBI20CLS type.
- * The dimension in column "a, b3 and b4" are common for FL=FLL, SL=SLL and HL=HLL, HLS.
- * If SH bellows are applying, rail end mounting holes are necessary.
- * When you select SH bellows, please select the side grease fitting for lubrication.
- * Please contact SBC for more information.



(Unit : mm)

b3			b4						t1	t2	t3	t4	M x Bolt length		A Extended ratio
FL	SL	HL	FV	SV	CL	FL	SL	HL					M1(Block)	M2(Rail)	
-	-	-	13.3	13.3	-	13.3	17.3	13.3	10	-	-	-	M3X16	M4X8	6
-	-	-	14	14	14	16	16	-	6	8	-	-	M3X18	M3X6	6
-	-	-	16.3	16.3	16.3	19.3	23.3	19.3	10	7	-	-	M3X18	M3X6	7
-	-	-	-	-	-	22.8	25.8	22.8	11	8	-	-	M4X22	M4X8	7
-	-	-	-	-	-	26.5	33.5	26.5	-	-	14	21	M4X22	M4X8	7
-	-	-	-	-	-	33.5	43.5	33.5	-	-	20	25	M4X25	M5X10	7
7	17	7	-	-	-	38.5	48.5	38.5	-	-	26	29	M5X30	M5X10	8
7	7	-	-	-	-	45	45	-	-	-	34	42	M5X35	M5X10	8

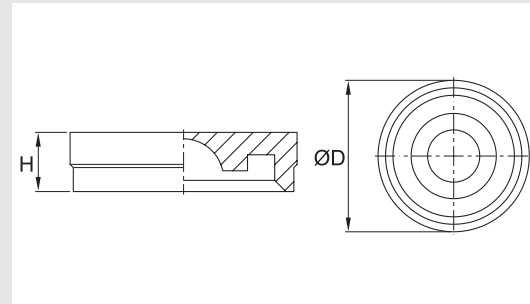
Ordering example : **SH25A - 70 / 420**

① ② ③

- ① Model number
- ② Collapsed length (mm)
- ③ Extended length (mm)

※ 'H' dimension of SH-DA type is lower than SH-A type

RC Cap

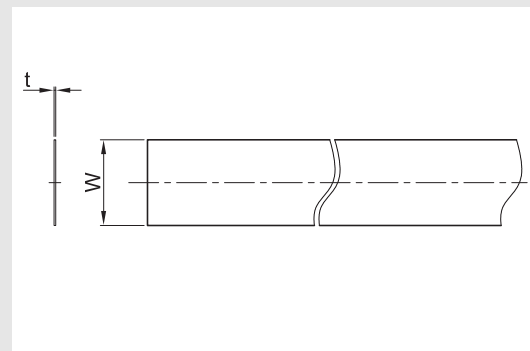


(Unit : mm)

Model	D±0.1	H±0.1
RC 15	7.6	1.3
RC 20	9.6	3.5
RC 25	11.1	2.8
*RC 30	14.2	3.7
RC 45	20.2	4.7
RC 55	23.2	6
RC 65	26.2	6

- RC 30 is used for SBI 30, 35 rail.
- SBI, SBG type use same RC cap.

ST Tape



(Unit : mm)

Model	W	t
ST 15A	11	0.1
ST 20A	15	0.1
ST 25A	17	0.1
ST 30A	21	0.1
ST 35A	27	0.1
ST 45A	37	0.1
ST 55A	43	0.1
ST 65A	51	0.1

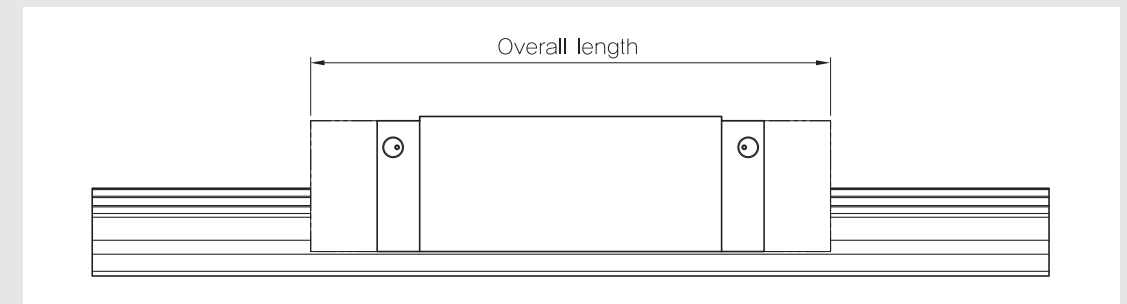
Ordering example : **ST15A - 1000L**

① ②

- ① Model number
- ② Length

Seal and MF container

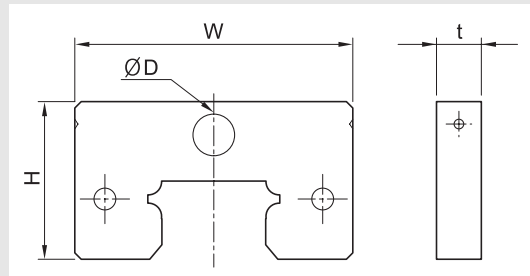
[Method and overall length with each seal]



• E : End seal S : Scraper F : DF (High dust protection seal). MF (Self lubricant) (Unit : mm)

Additional seal	Standard	DD	ZZ	KK	MF (Self lubricant)				
					D(M)F	D(M)FDD	D(M)FZZ	D(M)FKK	
Indication of seal	E	E+E	E+S	E+E+S	F+E	F+E+E	F+E+S	F+E+E+S	
Overall length with seal	15V	39.9	44.5	45.3	49.9	53.9	58.5	59.3	63.9
	15S	56.8	61.4	62.2	68.8	70.8	75.4	76.2	80.8
	15	63.8	68.4	69.2	73.8	77.8	82.4	83.2	87.8
	15L	79.4	84	84.8	89.4	93.4	98	98.8	103.4
	20V	49.1	54.1	54.5	59.5	63.1	68.1	68.5	73.5
	20S	65.2	70.2	70.6	75.6	-	-	-	-
	20	78.8	83.8	84.2	89.2	92.8	97.8	98.2	103.2
	20L	96.4	101.4	101.8	106.8	110.4	115.4	115.8	120.8
	25V	52.6	57.6	58	63	66.6	71.6	72	77
	25	92	97	97.4	102.4	106	111	111.4	116.4
	25L	108	113	113.4	118.4	122	127	127.4	132.4
	30	107.6	113.6	114	120	123.6	129.6	130	136
	30L	131.6	137.6	138	144	147.6	153.6	154	160
	35	124.6	130.6	131	137	140.6	146.6	147	153
	35L	152.6	158.6	159	165	168.6	174.6	175	181
	45	142	148	148.4	154.4	158	164	164.4	170.4
	45L	174	180	180.4	186.4	190	196	196.4	202.4
	55	172.4	179.4	179.2	186.2	190.4	197.4	197.2	204.2
	55L	211.8	218.8	218.6	225.6	229.8	236.8	236.6	243.6
	65	219.8	226.8	226.6	233.6	237.8	244.8	244.6	251.6
65L	272.2	279.2	279	286	290.2	297.2	297	304	

- Bottom seal of SBI type is integrated with bottom retainer. (Except SBI15)
- If block is assembled with MF container, the grease fitting is not supplied. If you would like to feed the grease to the block, please order side grease fitting type.



[Dimension of MF container]

(Unit : mm)

Reference	Model	Applied model	Block type	W	t	H	D
DF / MF	15A	SBI15	FL/FLL/HL/HLL/HLS SL/SLL/FV/SV	33.4	7	20.2	4
	20A	SBI20	FL/FLL SL/SLL	43.4	7	24.6	6.5
	20B		CL/CLL/FV/SV			22.6	
	25A	SBI25	FL/FLL/HL/HLL SL/SLL	47	7	29.7	6.5
	25B		CL/CLL/FV/SV			26.7	
	30A	SBI30	FL/FLL/HL/HLL SL/SLL	59	8	34.2	6.5
	35A	SBI35	FL/FLL/HL/HLL SL/SLL	69	8	39.7	6.5
	45A	SBI45	FL/FLL/HL/HLL SL/SLL	85	8	49.7	10.5
	55A	SBI55	FL/FLL/HL/HLL SL/SLL	98	9	56	10.5
	65A	SBI65	FL/FLL SL/SLL	123	9	69	10.5

[Seal resistance]

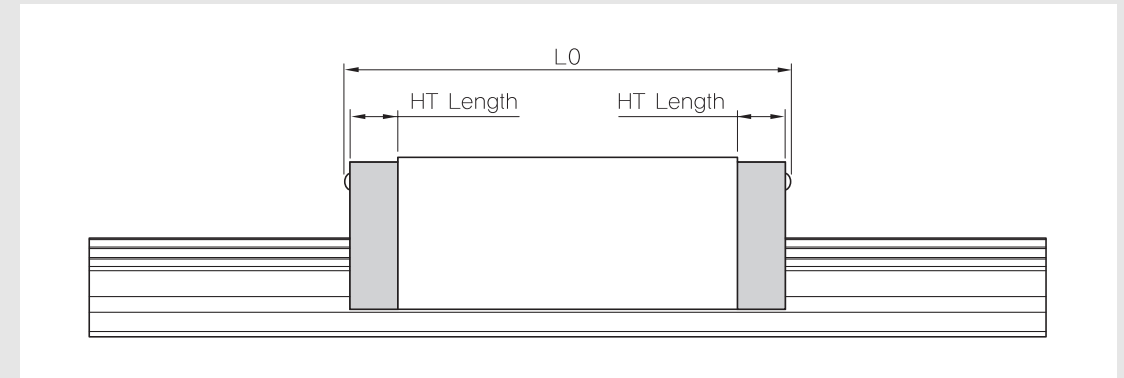
For the maximum value of seal resistance of SBI standard type per block, in which grease is not applied.

※ Scraper has no resistance because it is not contacting rail.

(Unit : N)

Model	End seal	DF	MF
SBI 15	2.0	4.7	3.5
SBI 20	2.5	4.9	3.0
SBI 25	3.0	5.5	3.5
SBI 30	3.9	5.6	3.5
SBI 35	2.5	5.7	3.7
SBI 45	3.4	5.9	4.1
SBI 55	3.5	6.2	4.2
SBI 65	3.6	6.4	4.4

HT high temperature end plate



(Unit : mm)

Reference	HT Length	Overall length							
		Applied model	LO	Applied model	LO	Applied model	LO	Applied model	LO
HT 15A	6.5	SBI 15V	38.3	SBI 15S	53.2	SBI 15	62.2	SBI 15L	77.8
HT 20A	8	SBI 20V	47.1	SBI 20S	63.2	SBI 20	76.8	SBI 20L	94.4
HT 25A	8	SBI 25V	50.6	-	-	SBI 25	90	SBI 25L	106
HT 30A	10	-	-	-	-	SBI 30	105.6	SBI 30L	129.6
HT 35A	11	-	-	-	-	SBI 35	122.6	SBI 35L	150.6
HT 45A	13	-	-	-	-	SBI 45	140	SBI 45L	172
HT 55A	16	-	-	-	-	SBI 55	168.5	SBI 55L	207.9
HT 65A	20	-	-	-	-	SBI 65	215.9	SBI 65L	268.3

Ordering example : **SBI25FL - HT - 2 - K1 - 800 - N**

- | | |
|------------------------------|---------------|
| ① Model | ④ Preload |
| ② High temperature end plate | ⑤ Rail length |
| ③ Block quantity | ⑥ Accuracy |

※ All plastic components are replace with steel or aluminum in the High Temperature Blocks.

※ Side grease fitting is not available for high temperature end plates

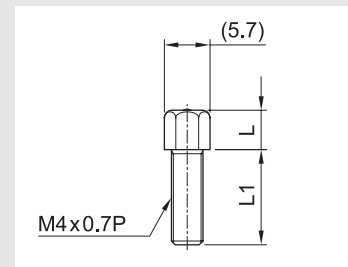
Grease and nipple specification

[Grease]

SBI uses two types of grease according to working conditions. For details, please see the technical data for grease.

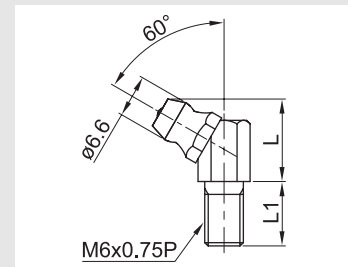
(1) Standard grease fitting (Front grease fitting)

(Unit : mm)



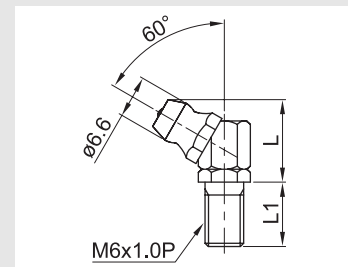
Specification		M4x0.7P		
Applied model	Grease fitting model	Symbol	L	L1
SBI 15	1N	None	7	5.5
	1D	DD, ZZ	5	9
	1Z	KK	5	11
	1F	DF,DFDD,DFZZ,DFKK	5	13

(Unit : mm)



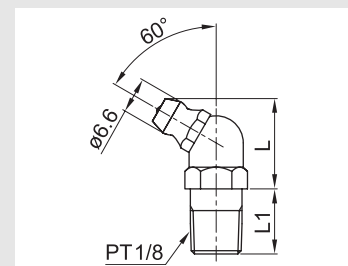
Specification		M6x0.75P, Asia type		
Applied model	Grease fitting model	Symbol	L	L1
SBI 20~35	A2N	None	13.5	7
	A2D	DD, ZZ	13.5	10
	A2Z	KK, DF	13.5	13
	A2K	DFDD,DFZZ	13.5	16
	A2F	DFKK	13.5	19

(Unit : mm)



Specification		M6x1.0P, Europe type		
Applied model	Grease fitting model	Symbol	L	L1
SBI 20~35	E2N	None	13.5	7
	E2D	DD, ZZ	13.5	10
	E2Z	KK, DF	13.5	13
	E2K	DFDD,DFZZ	13.5	16
	E2F	DFKK	13.5	19

(Unit : mm)



Specification		PT 1/8		
Applied model	Grease fitting model	Symbol	L	L1
SBI 45~65	4N	None, DD, ZZ	17	12
	4D	KK	17	16
	4F	DF, DFDD, DFZZ, DFKK	17	23

(2) Side grease fitting

Specification	M4x0.7P	Specification	M4x0.7P	Specification	M6x0.75P	Specification	PT1/8
Applied model	SBI 15	Applied model	SBI 20, 25	Applied model	SBI 30, 35, 45	Applied model	SBI 55, 65
Grease fitting model	S1N	Grease fitting model	S2N	Grease fitting model	S3N	Grease fitting model	S4N

(3) FS nipple connector for side grease fitting (FL, FLL flange type only) ※Please see the page @/36 for assembling the nipple connector.

Specification	M4x0.7P	Specification	M4x0.7P	Specification	M6x0.75P
Applied model	SBI 15	Applied model	SBI 20, 25	Applied model	SBI 30, 35, 45
Grease fitting model	S1C	Grease fitting model	S2C	Grease fitting model	S4C

* For size 30~45, two pieces of FS nipple connector are applied.

(4) Copper pipe

Input size	PT1/8	Input size	PT1/8
Output size	M6x0.75P	Output size	PT1/8
Applied model	SBI 20, 25, 30, 35	Applied model	SBI 45, 55, 65
Grease fitting model	SB01	Grease fitting model	SB21

Ordering example

SBI20 FL - N - MF - ZZ - K1
 [1] [2] [3] [4] [5] [6]

- [1] Model
- [2] Block type : FL, FLL, FV, SL, SLL, SV, HL, HLS, HLL, CL, CLS, CLL
- [3] Position of grease fitting : None (front), N (side)
- [4] Container : No symbol (standard), DF (high dust protection), MF (self lubricant)
- [5] Seal : No symbol (standard), DD, ZZ, KK
- [6] Preload : K0, K1, K2, K3

※ "K3" Preload is not available for SBI 15 type

[Ordering example for rail]

SBI20 - 1000L - B
 [1] [2] [3]

- [1] Model
- [2] Rail length
- [3] Bottom mounting : No symbol (standard), B (bottom mounting rail)

※ If only rail is ordered, N grade is available.

[Ordering for assembled rail and block]

SBI20 FL - N - MF - ZZ - 2 - K1 - 800 - N - R - B - II
 [1] [2] [3] [4] [5] [6] [7] [8] [9] [10] [11] [12]

- [1] Model
- [2] Block type : FL, FLL, FV, SL, SLL, SV, HL, HLS, HLL, CL, CLS, CLL
- [3] Position of grease fitting : None (front), N (side)
- [4] Container : No symbol (standard), DF (high dust protection), MF (self lubricant)
- [5] Seal : No symbol (standard), DD, ZZ, KK
- [6] Block quantity on rail
- [7] Preload : K0, K1, K2, K3
- [8] Rail length
- [9] Accuracy : N, H, P
- [10] Surface treatment
- [11] (B) Bottom mounting rail : No symbol (standard)
- [12] Rail : number of rails per axis, 1=I, 2=II... 4=IV etc.

※ We recommend block and rail assembled to be ordered where high-precision and high-rigidity are required.

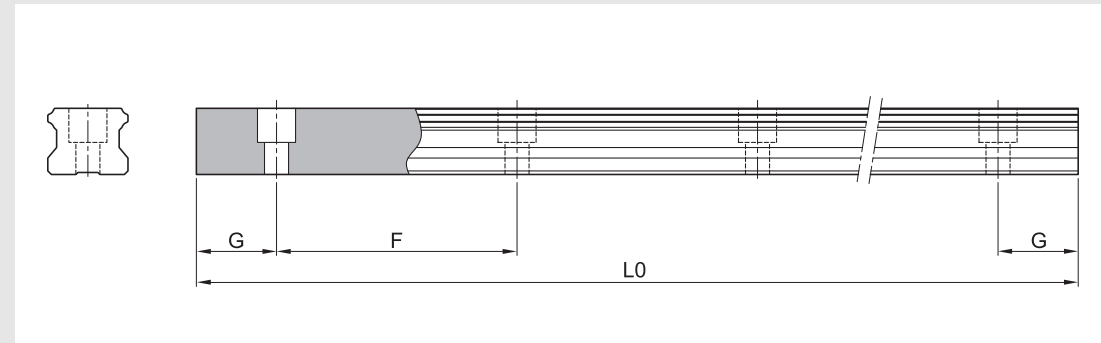
※ For surface treatment, please mark according to each surface treatment symbol.

※ If special G dimension is required, please mark when you place an order.

※ Please contact SBC for high temperature order.

※ "K3" Preload is not available for SBI 15 type

Standard and Max. Length of SBI rail



(Unit : mm)

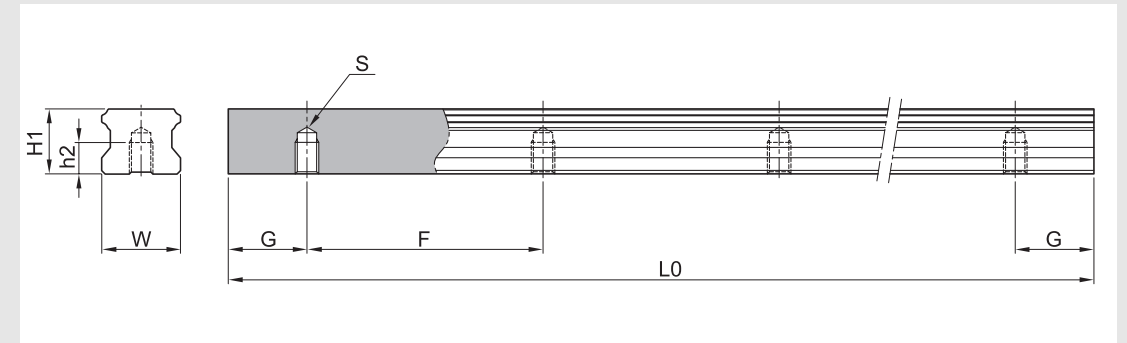
Model number	SBI15	SBI20	SBI25	SBI30	SBI35	SBI45	SBI55	SBI65
Standard length	160	220	220	280	280	570	780	1270
	220	280	280	440	440	885	900	1570
	280	240	340	600	600	1095	1020	2020
	340	460	460	760	760	1200	1140	2470
	460	640	640	1000	1000	1410	1260	2620
	640	820	820	1240	1240	1620	1380	2920
	820	1000	1000	1480	1480	1830	1500	3070
	1000	1240	1240	1640	1640	2040	1620	-
	1240	1480	1480	1800	1800	2250	1740	-
	1480	1600	1600	2040	2040	2460	1860	-
	1600	1840	1840	2200	2200	2985	1980	-
	1960	2080	2080	2520	2520	3510	2220	-
	2200	2200	2200	2840	2840	-	2580	-
	2500	2500	2500	3000	3000	-	2940	-
	2860	2960	2980	3480	3480	-	3540	-
-	3520	3520	-	-	-	-	-	
-	4000	4000	-	-	-	-	-	
F	60	60	60	80	80	105	120	150
G	20	20	20	20	20	22.5	30	35
L0(Max length)	3,000	4,000	4,000	4,000	4,000	4,000	4,000	4,000

* If the maximum length exceeds this size, butt joints can be supplied.

* For more information about butt jointing, please refer to the page of safety design.

* If the G is not standard, please indicate it in the order sheet.

Bottom mounting rail (SBI-B type)

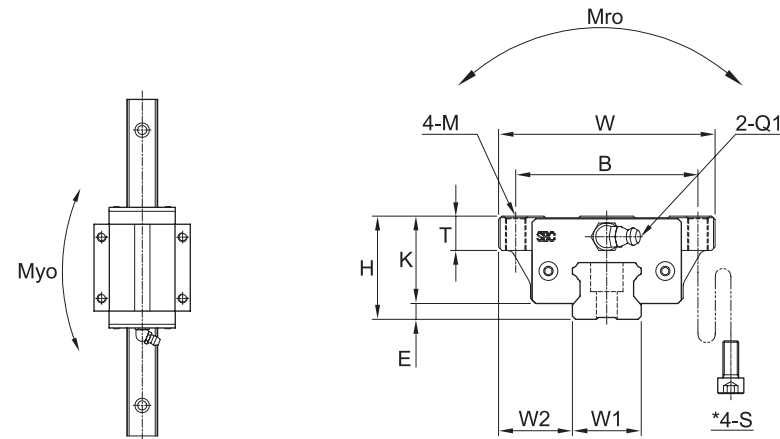


(Unit : mm)

Model number	W1	H1	S	h2	G	F	L0 (Max length)	Weight (kg/m)
SBI 15-B	15	13	M5X0.8	8	20	60	3,000	1.39
SBI 20-B	20	16.5	M6	9	20	60	4,000	2.37
SBI 25-B	23	20	M6	9	20	60	4,000	3.26
SBI 30-B	28	23	M8	12	20	80	4,000	4.63
SBI 35-B	34	26	M8	12	20	80	4,000	6.45
SBI 45-B	45	32	M12	18	22.5	105	4,000	10.49

* If the maximum length exceeds this size, please contact SBC.

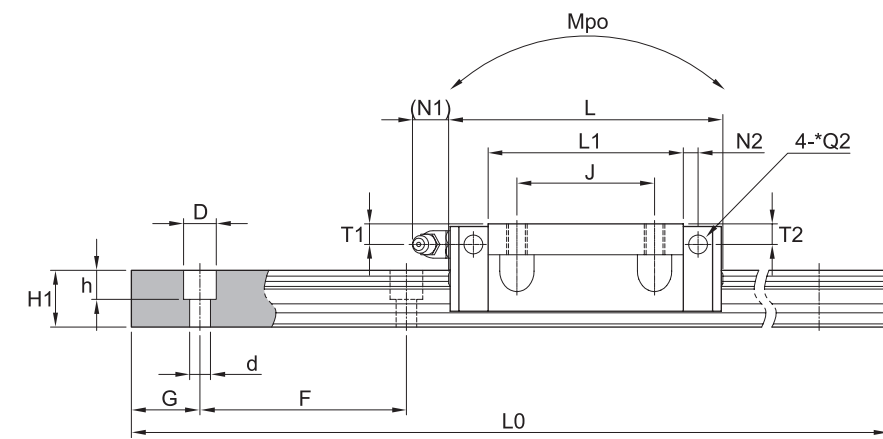
SBI-FL/FLS/FLL



Model	Mounting dimension				Block dimensions												
	H	W	L	E	Mounting tap hole				L1	T±1	K	Grease fitting					
					B	J	M	*S				T1	N1	T2	N2	Q1	*Q2
SBI15 FLS	24	47	56.8	3	38	30	M5	M4	38.2	11	21	4.5	5.5	3.8	3.8	M4x0.7	∅3.5
SBI15 FL	24	47	63.8	3	38	30	M5	M4	45.2	9	21	4.5	5.5	3.8	3.8	M4x0.7	∅3.5
SBI15 FLL	24	47	79.4	3	38	30	M5	M4	60.8	9	21	4.5	5.5	3.8	3.8	M4x0.7	∅3.5
SBI20 FL	30	63	78.8	4.6	53	40	M6	M5	56.8	12	25.4	6	12	5.8	5	M6x0.75	∅3.5
SBI20 FLL	30	63	96.4	4.6	53	40	M6	M5	74.4	12	25.4	6	12	5.8	5	M6x0.75	∅3.5
SBI25 FL	36	70	92	5.5	57	45	M8	M6	70	13	30.5	6	12	5	5	M6x0.75	∅3.5
SBI25 FLL	36	70	108	5.5	57	45	M8	M6	86	13	30.5	6	12	5	5	M6x0.75	∅3.5
SBI30 FL	42	90	107.6	7	72	52	M10	M8	79.6	15.5	35	8.5	12	7.8	5	M6x0.75	∅5.7
SBI30 FLL	42	90	131.6	7	72	52	M10	M8	103.6	15.5	35	8.5	12	7.8	5	M6x0.75	∅5.7
SBI35 FL	48	100	124.6	7.5	82	62	M10	M8	94.6	15	40.5	8	12	8	6	M6x0.75	∅5.7
SBI35 FLL	48	100	152.6	7.5	82	62	M10	M8	122.6	15	40.5	8	12	8	6	M6x0.75	∅5.7
SBI45 FL	60	120	142	9	100	80	M12	M10	108	18	51	10.5	13.5	9.3	6.5	PT1/8	∅5.7
SBI45 FLL	60	120	174	9	100	80	M12	M10	140	18	51	10.5	13.5	9.3	6.5	PT1/8	∅5.7
SBI55 FL	70	140	172.4	12	116	95	M14	M12	131	22	58	12	13	12	8	PT1/8	∅8.7
SBI55 FLL	70	140	211.8	12	116	95	M14	M12	170.4	22	58	12	13	12	8	PT1/8	∅8.7
SBI65 FL	90	170	219.8	19	142	110	M16	M14	170.4	26	71	14	13	14	10	PT1/8	∅8.7
SBI65 FLL	90	170	272.2	19	142	110	M16	M14	222.8	26	71	14	13	14	10	PT1/8	∅8.7

① C (Basic dynamic load rating), Co (Basic static load rating)

② *S: Bolt size for bottom mounting type of block.



(Unit : mm)

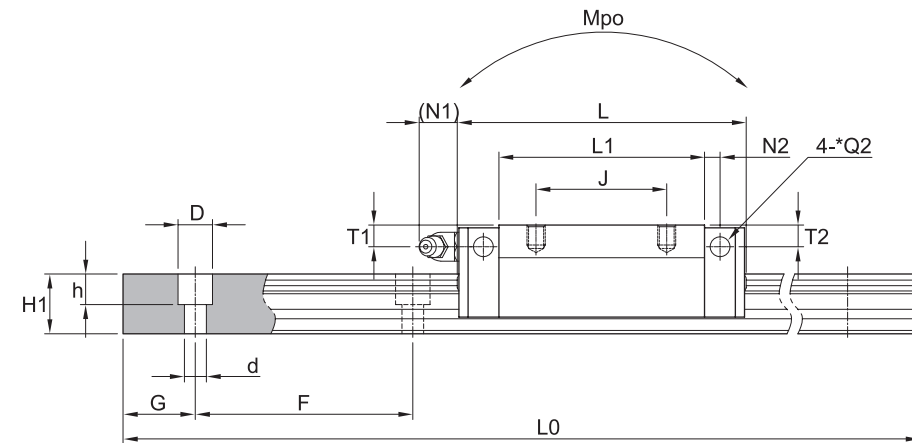
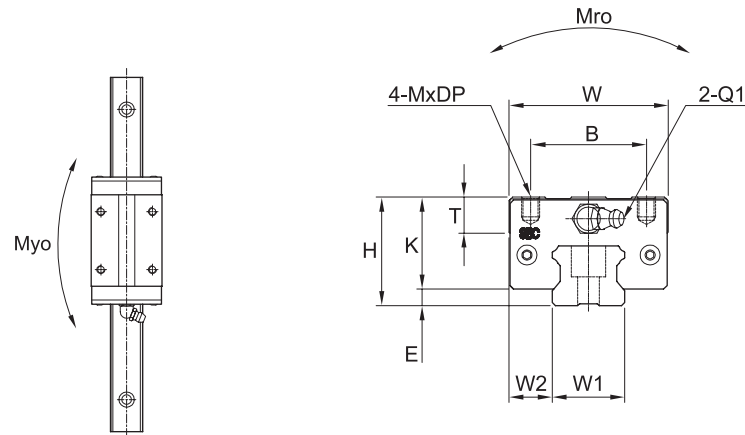
Rail dimension										Basic load rating		Permissible static moment			Mass	
W1	W2	H1	F	Bolt hole			G	Max length of rail L0	C	Co	Mro	Mpo	Myo	Block [kg]	Rail [kg/m]	
				d	D	h										
15	16	13	60	4.5	7.5	5.5	20	3000	12.3	18.3	0.13	0.08	0.08	0.20	1.3	
15	16	13	60	4.5	7.5	5.5	20	3000	14.1	24.1	0.16	0.17	0.17	0.24	1.3	
15	16	13	60	4.5	7.5	5.5	20	3000	17.1	31.7	0.21	0.29	0.29	0.30	1.3	
20	21.5	16.5	60	6	9.5	8.5	20	4000	22.2	38.2	0.36	0.33	0.33	0.46	2.2	
20	21.5	16.5	60	6	9.5	8.5	20	4000	27.9	50	0.47	0.56	0.56	0.60	2.2	
23	23.5	20	60	7	11	9	20	4000	31.5	52.1	0.56	0.56	0.56	0.75	3	
23	23.5	20	60	7	11	9	20	4000	36.7	64.4	0.69	0.84	0.84	0.80	3	
28	31	23	80	9	14	12	20	4000	42.8	65.4	0.85	0.77	0.77	1.25	4.25	
28	31	23	80	9	14	12	20	4000	51.3	84.7	1.10	1.30	1.30	1.65	4.25	
34	33	26	80	9	14	12	20	4000	59.5	89.1	1.42	1.28	1.28	1.92	6.02	
34	33	26	80	9	14	12	20	4000	71.3	115.3	1.83	2.12	2.12	2.43	6.02	
45	37.5	32	105	14	20	17	22.5	4000	79.2	116.3	2.48	1.90	1.90	3.25	9.77	
45	37.5	32	105	14	20	17	22.5	4000	94.8	150.5	3.21	3.14	3.14	4.40	9.77	
53	43.5	38	120	16	23	20	30	4000	127.3	181.8	4.81	2.97	2.97	5.08	13.72	
53	43.5	38	120	16	23	20	30	4000	147.9	224.5	5.95	4.78	4.78	6.58	13.72	
63	53.5	53	150	18	26	22	35	4000	188.3	261.7	8.24	5.57	5.57	10.17	23.17	
63	53.5	53	150	18	26	22	35	4000	232.5	354.1	11.15	9.86	9.86	13.29	23.17	

③ *Q2: The hole of side grease nipple is not made to prevent a foreign substance from going into inside. When you order the side grease nipple, we build it by ourselves.

Linear Rail System

SBI High-load Linear Rail System

SBI-SL/SLL



Model	Mounting dimension				Block dimensions												
	H	W	L	E	Mounting tap hole				L1	T±1	K	Grease fitting					
					B	J	M	DP				T1	N1	T2	N2	Q1	*Q2
SBI15 SL	28	34	63.8	3	26	26	M4	5	45.2	10	25	8.5	5.5	7.8	3.8	M4x0.7	∅3.5
SBI15 SLL	28	34	79.4	3	26	34	M4	5	60.8	10	25	8.5	5.5	7.8	3.8	M4x0.7	∅3.5
SBI20 SL	30	44	78.8	4.6	32	36	M5	5	56.8	10	25.4	6	12	5.8	5	M6x0.75	∅3.5
SBI20 SLL	30	44	96.4	4.6	32	50	M5	5	74.4	10	25.4	6	12	5.8	5	M6x0.75	∅3.5
SBI25 SL	40	48	92	5.5	35	35	M6	8	70	16	34.5	10	12	9	5	M6x0.75	∅3.5
SBI25 SLL	40	48	108	5.5	35	50	M6	8	86	16	34.5	10	12	9	5	M6x0.75	∅3.5
SBI30 SL	45	60	107.6	7	40	40	M8	10	79.6	12	38	11.5	12	10.8	5	M6x0.75	∅5.7
SBI30 SLL	45	60	131.6	7	40	60	M8	10	103.6	12	38	11.5	12	10.8	5	M6x0.75	∅5.7
SBI35 SL	55	70	124.6	7.5	50	50	M8	10	94.6	15	47.5	15	12	15	6	M6x0.75	∅5.7
SBI35 SLL	55	70	152.6	7.5	50	72	M8	10	122.6	15	47.5	15	12	15	6	M6x0.75	∅5.7
SBI45 SL	70	86	142	9	60	60	M10	13	108	17	61	20.5	13.5	19.3	6.5	PT1/8	∅5.7
SBI45 SLL	70	86	174	9	60	80	M10	13	140	17	61	20.5	13.5	19.3	6.5	PT1/8	∅5.7
SBI55 SL	80	100	172.4	12	75	75	M12	18	131	21	68	22	13	22	8	PT1/8	∅8.7
SBI55 SLL	80	100	211.8	12	75	95	M12	18	170.4	21	68	22	13	22	8	PT1/8	∅8.7
SBI65 SL	90	126	219.8	19	76	70	M16	16	170.4	26	71	14	13	14	10	PT1/8	∅8.7
SBI65 SLL	90	126	272.2	19	76	120	M16	16	222.8	26	71	14	13	14	10	PT1/8	∅8.7

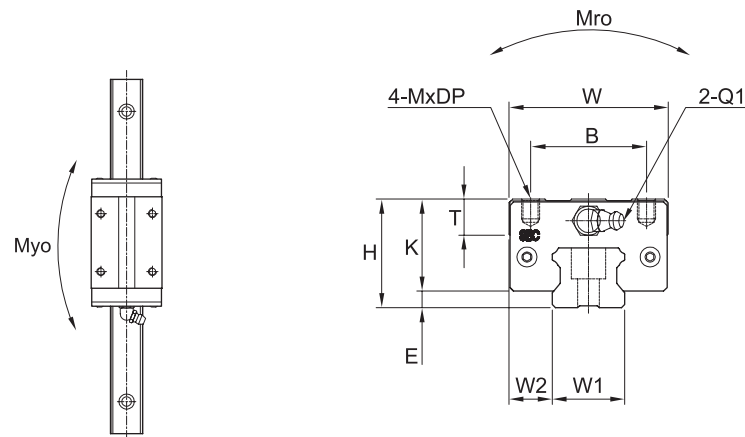
(Unit : mm)

Rail dimension										Basic load rating		Permissible static moment			Mass	
W1	W2	H1	F	Bolt hole			G	Max length of rail L0	C	Co	Mro	Mpo	Myo	Block [kg]	Rail [kg/m]	
				d	D	h										
15	9.5	13	60	4.5	7.5	5.5	20	3000	14.1	24.1	0.16	0.17	0.17	0.23	1.3	
15	9.5	13	60	4.5	7.5	5.5	20	3000	17.1	31.7	0.21	0.29	0.29	0.31	1.3	
20	12	16.5	60	6	9.5	8.5	20	4000	22.2	38.2	0.36	0.33	0.33	0.36	2.2	
20	12	16.5	60	6	9.5	8.5	20	4000	27.9	50	0.47	0.56	0.56	0.47	2.2	
23	12.5	20	60	7	11	9	20	4000	31.5	52.1	0.56	0.56	0.56	0.68	3	
23	12.5	20	60	7	11	9	20	4000	36.7	64.4	0.69	0.84	0.84	0.82	3	
28	16	23	80	9	14	12	20	4000	42.8	65.4	0.85	0.77	0.77	1.06	4.25	
28	16	23	80	9	14	12	20	4000	51.3	84.7	1.10	1.30	1.30	1.37	4.25	
34	18	26	80	9	14	12	20	4000	59.5	89.1	1.42	1.28	1.28	1.83	6.02	
34	18	26	80	9	14	12	20	4000	71.3	115.3	1.83	2.12	2.12	2.34	6.02	
45	20.5	32	105	14	20	17	22.5	4000	79.2	116.3	2.48	1.90	1.90	3.30	9.77	
45	20.5	32	105	14	20	17	22.5	4000	94.8	150.5	3.21	3.14	3.14	4.23	9.77	
53	23.5	38	120	16	23	20	30	4000	127.3	181.8	4.81	2.97	2.97	4.42	13.72	
53	23.5	38	120	16	23	20	30	4000	147.9	224.5	5.95	4.78	4.78	5.82	13.72	
63	31.5	53	150	18	26	22	35	4000	188.3	261.7	8.24	5.57	5.57	9.10	23.17	
63	31.5	53	150	18	26	22	35	4000	232.5	354.1	11.15	9.86	9.86	11.98	23.17	

① C (Basic dynamic load rating), Co (Basic static load rating)

② *Q2: The hole of side grease nipple is not made to prevent a foreign substance from going into inside.
When you order the side grease nipple, we build it by ourselves.

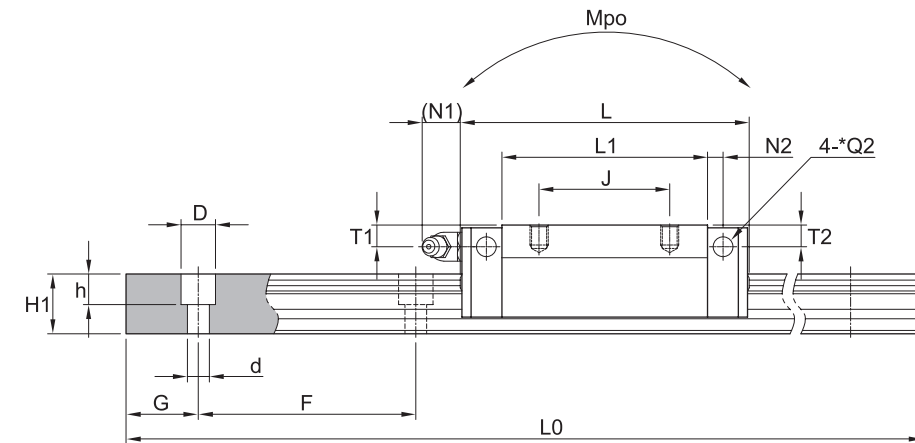
SBI-HL/HLS/HLL



Model	Mounting dimension				Block dimensions												
	H	W	L	E	Mounting tap hole				L1	T±1	K	Grease fitting					
					B	J	M	DP				T1	N1	T2	N2	Q1	*Q2
SBI15 HLS	24	34	56.8	3	26	26	M4	4	38.2	6	21	4.5	5.5	3.8	3.8	M4x0.7	∅3.5
SBI15 HL	24	34	63.8	3	26	26	M4	4	45.2	6	21	4.5	5.5	3.8	3.8	M4x0.7	∅3.5
SBI15 HLL	24	34	79.4	3	26	34	M4	4	60.8	6	21	4.5	5.5	3.8	3.8	M4x0.7	∅3.5
SBI25 HL	36	48	92	5.5	35	35	M6	6	70	12	30.5	6	12	5	5.5	M6x0.75	∅3.5
SBI25 HLL	36	48	108	5.5	35	50	M6	6	86	12	30.5	6	12	5	5.5	M6x0.75	∅3.5
SBI30 HL	42	60	107.6	7	40	40	M8	8	79.6	12	35	8.5	12	7.8	5	M6x0.75	∅5.7
SBI30 HLL	42	60	131.6	7	40	60	M8	8	103.6	12	35	8.5	12	7.8	5	M6x0.75	∅5.7
SBI35 HL	48	70	124.6	7.5	50	50	M8	8	94.6	15	40.5	8	12	8	6	M6x0.75	∅5.7
SBI35 HLL	48	70	152.6	7.5	50	72	M8	8	122.6	15	40.5	8	12	8	6	M6x0.75	∅5.7
SBI45 HL	60	86	142	9	60	60	M10	10	108	17	51	10.5	13.5	9.3	6.5	PT1/8	∅5.7
SBI45 HLL	60	86	174	9	60	80	M10	10	140	17	51	10.5	13.5	9.3	6.5	PT1/8	∅5.7
SBI55 HL	70	100	172.4	12	75	75	M12	12	131	21	58	12	13	12	8	PT1/8	∅8.7
SBI55 HLL	70	100	211.8	12	75	95	M12	12	170.4	21	58	12	13	12	8	PT1/8	∅8.7

① C (Basic dynamic load rating), Co (Basic static load rating)

② *Q2: The hole of side grease nipple is not made to prevent a foreign substance from going into inside. When you order the side grease nipple, we build it by ourselves.



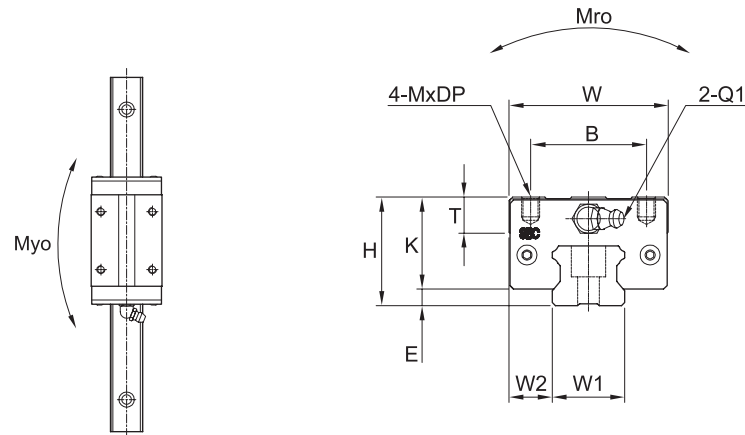
(Unit : mm)

Rail dimension										Basic load rating		Permissible static moment			Mass	
W1	W2	H1	F	Bolt hole			G	Max length of rail L0	C	Co	Mro	Mpo	Myo	Block [kg]	Rail [kg/m]	
				d	D	h										
15	9.5	13	60	4.5	7.5	5.5	20	3000	12.3	18.3	0.13	0.08	0.08	0.15	1.3	
15	9.5	13	60	4.5	7.5	5.5	20	3000	14.1	24.1	0.16	0.17	0.17	0.18	1.3	
15	9.5	13	60	4.5	7.5	5.5	20	3000	17.1	31.7	0.21	0.29	0.29	0.24	1.3	
23	12.5	20	60	7	11	9	20	4000	31.5	52.1	0.56	0.56	0.56	0.57	3	
23	12.5	20	60	7	11	9	20	4000	36.7	64.4	0.69	0.84	0.84	0.70	3	
28	16	23	80	9	14	12	20	4000	42.8	65.4	0.85	0.77	0.77	1.48	4.25	
28	16	23	80	9	14	12	20	4000	51.3	84.7	1.10	1.30	1.30	1.58	4.25	
34	18	26	80	9	14	12	20	4000	59.5	89.1	1.42	1.28	1.28	1.47	6.02	
34	18	26	80	9	14	12	20	4000	71.3	115.3	1.83	2.12	2.12	2.04	6.02	
45	20.5	32	105	14	20	17	22.5	4000	79.2	116.3	2.48	1.90	1.90	2.80	9.77	
45	20.5	32	105	14	20	17	22.5	4000	94.8	150.5	3.21	3.14	3.14	3.29	9.77	
53	23.5	38	120	16	23	20	30	4000	127.3	181.8	4.81	2.97	2.97	4.42	13.72	
53	23.5	38	120	16	23	20	30	4000	147.9	224.5	5.95	4.78	4.78	5.82	13.72	

Linear Rail System

SBI High-load Linear Rail System

SBI-CL/CLS/CLL



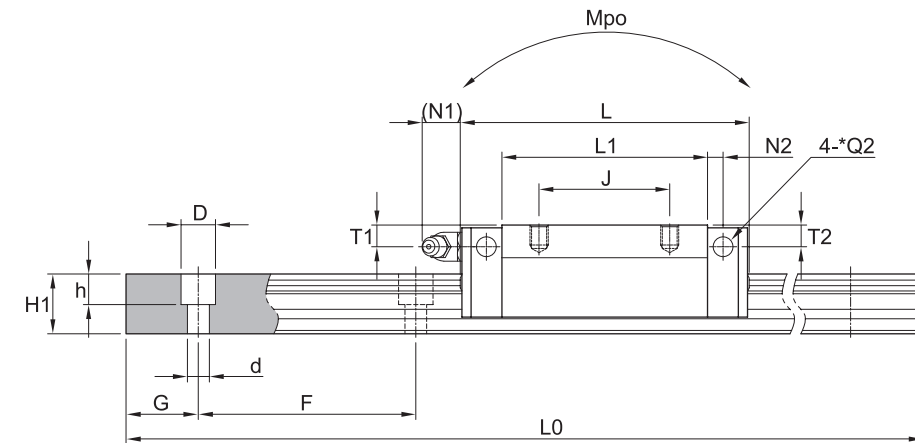
Model	Mounting dimension				Block dimensions												
	H	W	L	E	Mounting tap hole				L1	T±1	K	Grease fitting					
					B	J	M	DP				T1	N1	T2	N2	Q1	*Q2
SBI20 CLS	28	42	65.2	4.6	32	32	M5	5	43.2	7.8	23.4	4.8	12	4.3	5	M6x0.75	∅3.5
SBI20 CL	28	44	78.8	4.6	32	32	M5	5	56.8	7.8	23.4	4.8	12	3.8	5	M6x0.75	∅3.5
SBI20 CLL	28	44	96.4	4.6	32	50	M5	5	74.4	7.8	23.4	4.8	12	3.8	5	M6x0.75	∅3.5
SBI25 CL	33	48	92	5.5	35	35	M6	6	70	9	27.5	5.4	12	5.4	5	M6x0.75	∅3.5
SBI25 CLL	33	48	108	5.5	35	50	M6	6	86	9	27.5	5.4	12	5.4	5	M6x0.75	∅3.5

① C (Basic dynamic load rating), Co (Basic static load rating)

② *Q2: The hole of side grease nipple is not made to prevent a foreign substance from going into inside. When you order the side grease nipple, we build it by ourselves.

Linear Rail System

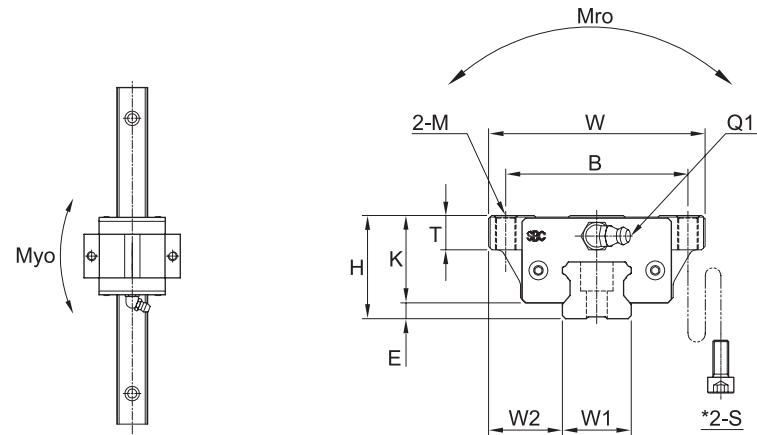
SBI High-load Linear Rail System



(Unit : mm)

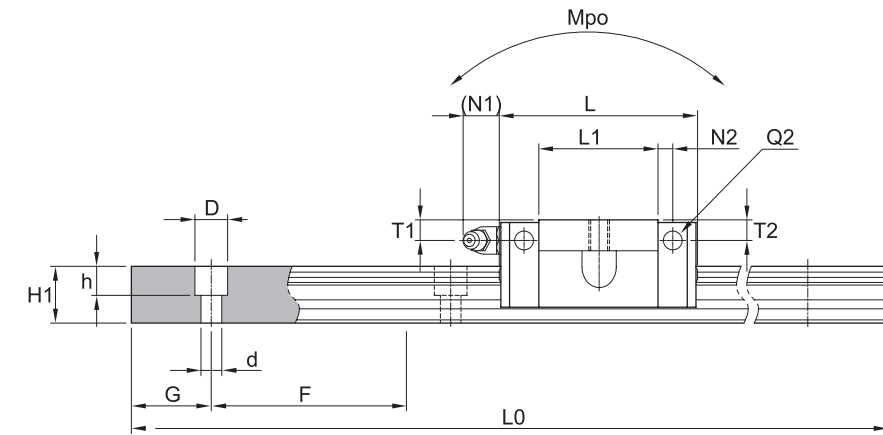
Rail dimension										Basic load rating		Permissible static moment			Mass	
W1	W2	H1	F	Bolt hole			G	Max length of rail L0	C	Co	Mro	Mpo	Myo	Block [kg]	Rail [kg/m]	
				d	D	h										
20	11	16.5	60	6	9.5	8.5	20	4000	19.1	27.0	0.27	0.15	0.15	0.23	2.2	
20	12	16.5	60	6	9.5	8.5	20	4000	22.2	38.2	0.36	0.33	0.33	0.32	2.2	
20	12	16.5	60	6	9.5	8.5	20	4000	27.9	50	0.47	0.56	0.56	0.41	2.2	
23	12.5	20	60	7	11	9	20	4000	31.5	52.1	0.56	0.56	0.56	0.49	3	
23	12.5	20	60	7	11	9	20	4000	36.7	64.4	0.69	0.84	0.84	0.57	3	

SBI-FV



Model	Mounting dimension				Block dimensions												
	H	W	L	E	Mounting tap hole			L1	T±1	K	Grease fitting						
					B	M	*S				T1	N1	T2	N2	Q1	*Q2	
SBI15 FV	24	47	39.9	3	38	M5	M4	21.3	9	21	4.5	5.5	3.8	3.8	M4x0.7	∅3.5	
SBI20 FV	28	63	49.1	4.6	53	M6	M5	27.1	12	23.4	4.8	12	3.8	5	M6x0.75	∅3.5	
SBI25 FV	33	70	52.6	5.5	57	M8	-	30.6	13	27.5	5.4	12	5.4	5	M6x0.75	∅3.5	

- ① C (Basic dynamic load rating), Co (Basic static load rating)
- ② *S: Bolt size for bottom mounting type of block.
- ③ *Q2: The hole of side grease nipple is not made to prevent a foreign substance from going into inside. When you order the side grease nipple, we build it by ourselves.



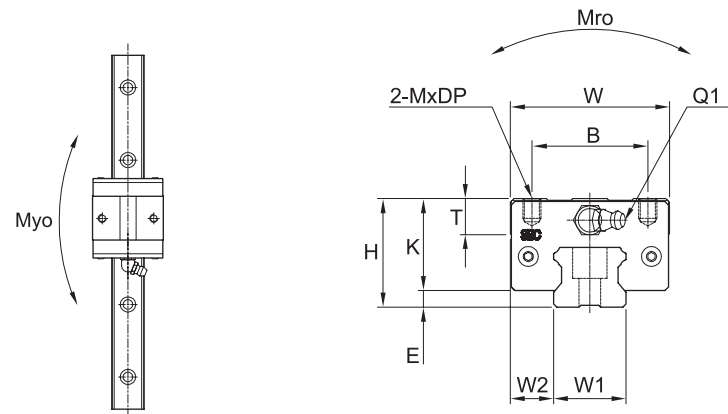
(Unit : mm)

Rail dimension										Basic load rating		Permissible static moment			Mass	
W1	W2	H1	F	Bolt hole			G	Max length of rail L0	C	Co	Mro	Mpo	Myo	Block [kg]	Rail [kg/m]	
				d	D	h										
15	16	13	60	4.5	7.5	5.5	20	3000	5.8	12.8	0.04	0.03	0.03	0.11	1.3	
20	21.5	16.5	60	6	9.5	8.5	20	4000	9.4	20.2	0.12	0.10	0.10	0.23	2.2	
23	23.5	20	60	7	11	9	20	4000	12.4	26.1	0.19	0.17	0.17	0.32	3	

Linear Rail System

SBI High-load Linear Rail System

SBI-SV



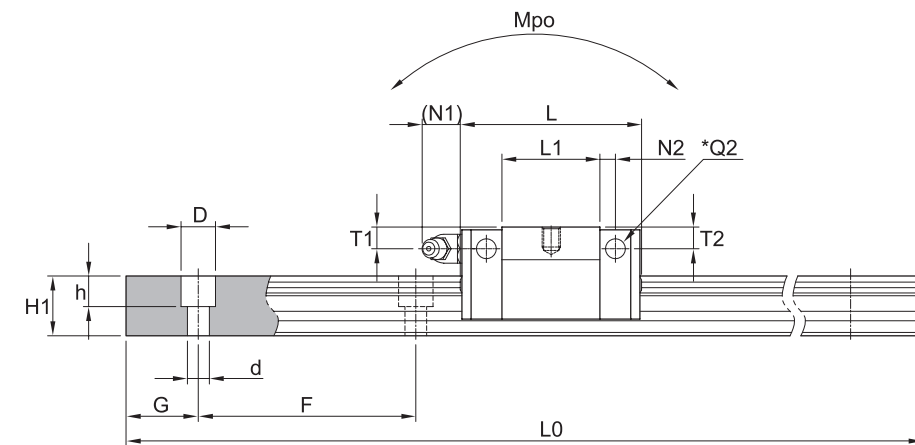
Model	Mounting dimension				Block dimensions												
	H	W	L	E	Mounting tap hole			L1	T±	K	Grease fitting						
					B	M	DP				T1	N1	T2	N2	Q1	*Q2	
SBI15 SV	24	34	39.9	3	26	M4	4	21.3	6	21	4.5	5.5	3.8	3.8	M4x0.7	∅3.5	
SBI20 SV	28	44	49.1	4.6	32	M5	5	27.1	7.8	23.4	4.8	12	3.8	5	M6x0.75	∅3.5	
SBI25 SV	33	48	52.6	5.5	35	M6	6	30.6	9	27.5	5.4	12	5.4	5	M6x0.75	∅3.5	

① C (Basic dynamic load rating), Co (Basic static load rating)

② *Q2: The hole of side grease nipple is not made to prevent a foreign substance from going into inside.
When you order the side grease nipple, we build it by ourselves.

Linear Rail System

SBI High-load Linear Rail System

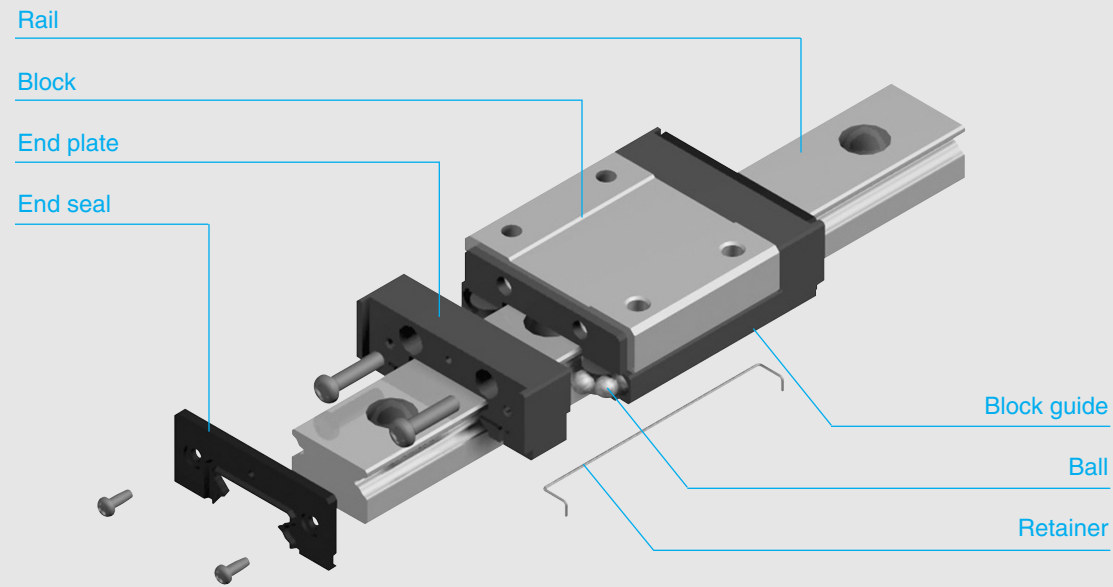


(Unit : mm)

Rail dimension									Basic load rating [kN]		Permissible static moment [kN · m]			Mass	
W1	W2	H1	F	Bolt hole			G	Max length of rail L0	C	Co	Mro	Mpo	Myo	Block [kg]	Rail [kg/m]
				d	D	h									
15	9.5	13	60	4.5	7.5	5.5	20	3000	5.8	12.8	0.04	0.03	0.03	0.10	1.3
20	12	16.5	60	6	9.5	8.5	20	4000	9.4	20.2	0.12	0.10	0.10	0.17	2.2
23	12.5	20	60	7	11	9	20	4000	12.4	26.1	0.19	0.17	0.17	0.24	3

Linear Rail System

Miniature Linear Rail System



[Feature of structure]

SBC Miniature linear rail system utilizes two rows of ball bearings which make four point contact between the rail and block. This design achieves both a slim profile and high rigidity. The special engineered plastic is used for the end-plate allows for long life ball recirculation.

[Ball retention]

To retain the ball bearings inside the block, a wire retainer is used between the block and rail. With this retainer, the block can be carefully removed from the rail without losing ball bearings.

[Low noise]

With a ball return path made from engineered plastic, contact noise between the balls and block wall is removed, therefore achieving low noise.

[Smooth movement]

The steel block, ball returns, and end caps are carefully engineered to act as a single path enabling smooth operation in both horizontal and vertical applications.

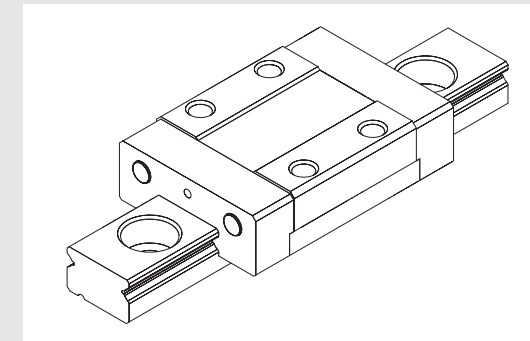
[Excellent corrosion resistance]

Both the rail and block are made from stainless steel for excellent corrosion resistance. This is ideal for semiconductor, life science, LCD, or other clean room production environments.

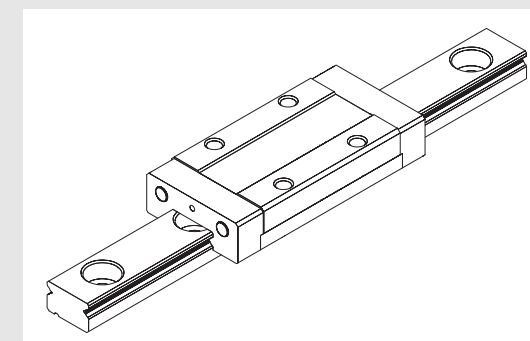
Linear Rail System

Miniature Linear Rail System

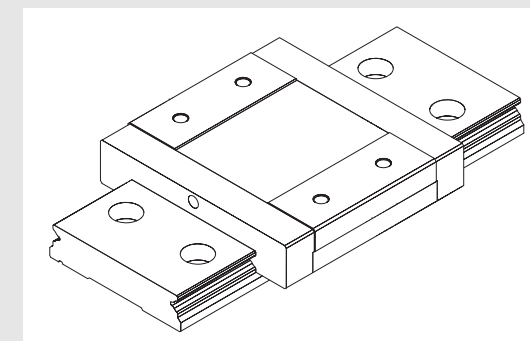
Types and features



[SBM type]
Standard type of miniature.

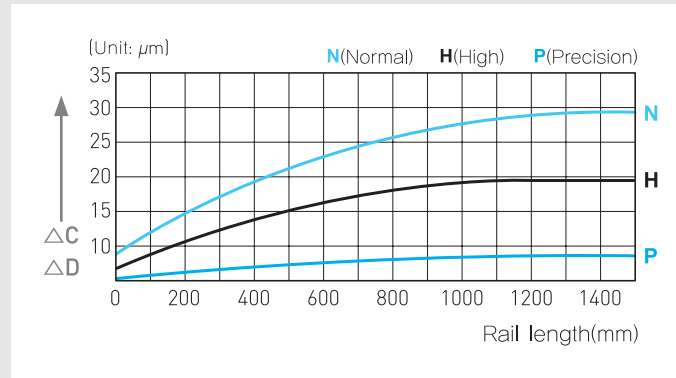
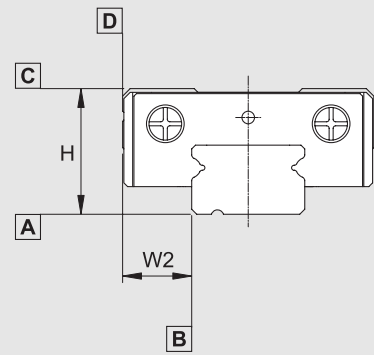


[SBML type]
Block length is modified type to increase load capacity.



[SBMW type]
The width and length of linear block and rail are modified to increase load ratings and permissible moments.

Accuracy



(Unit : mm)

Item	N	H	P
Tolerance for the height H	± 0.04	± 0.02	± 0.01
Tolerance for the rail-to-block lateral distance W2	± 0.04	± 0.025	± 0.015
Tolerance for the height H difference among blocks	0.03	0.015	0.007
Tolerance for rail-to-block lateral distance W2 distance among blocks	0.03	0.015	0.007
Running parallelism of surface C with surface A		ΔC	
Running parallelism of surface D with surface B		ΔD	

● N : Normal ● H : High ● P : Precision

[Preload]

Reference	Volume of preload
K1	Max. 0.02C
K2	0.04 ~ 0.06C

● C(kN) : Basic dynamic load rating

[Seal resistance]

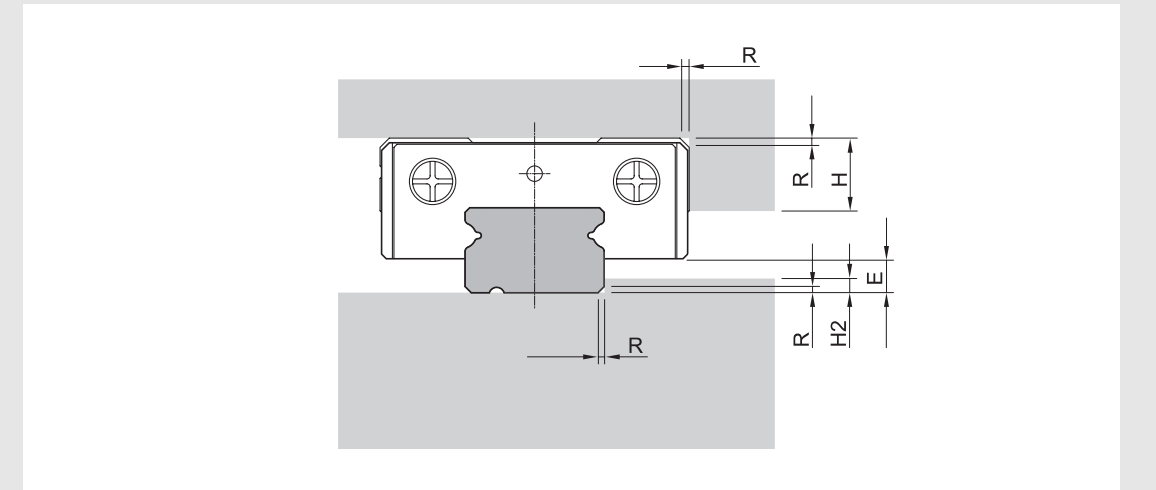
(Unit : N)

Reference	SBM/SBML	SBMW
07	0.08	-
09	0.2	0.8
12	0.59	1.1
15	1.18	1.3

[Grease]

SBM(L), SBMW Uses two types of grease according to working conditions. For details, please see the technical data for grease.

Shoulder height and fillet radius R



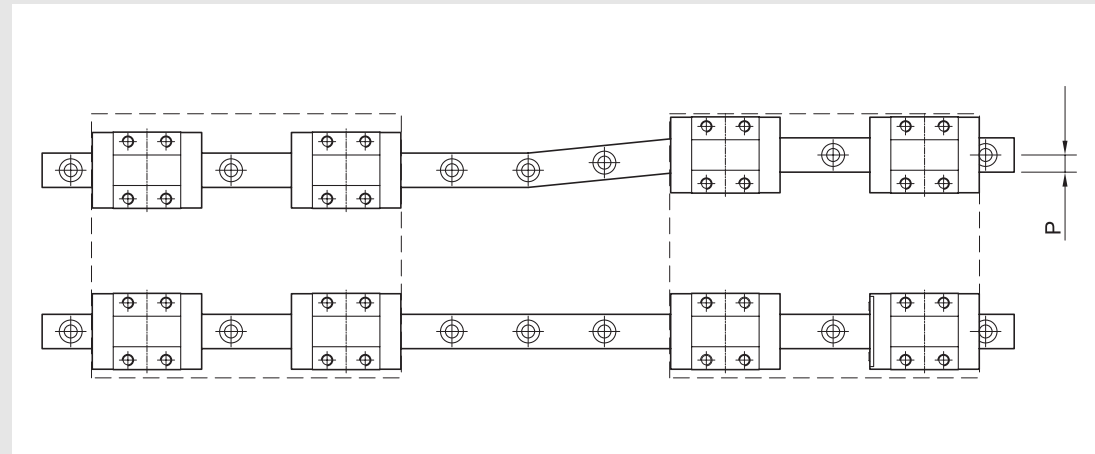
(Unit : mm)

Model number	Fillet radius R	Shoulders height H1	Shoulders height H2	E
SBM07	0.2	3	1.2	1.5
SBM(L)09	0.3	3	1.9	2.2
SBM(L)12	0.3	4	2	3
SBM(L)15	0.3	5	2.5	4
SBMW09	0.3	3	3.4	3.7
SBMW12	0.3	4	3.7	4
SBMW15	0.3	5	3.4	3.7

Linear Rail System

Miniature Linear Rail System

Permissible tolerance (P) of parallelism



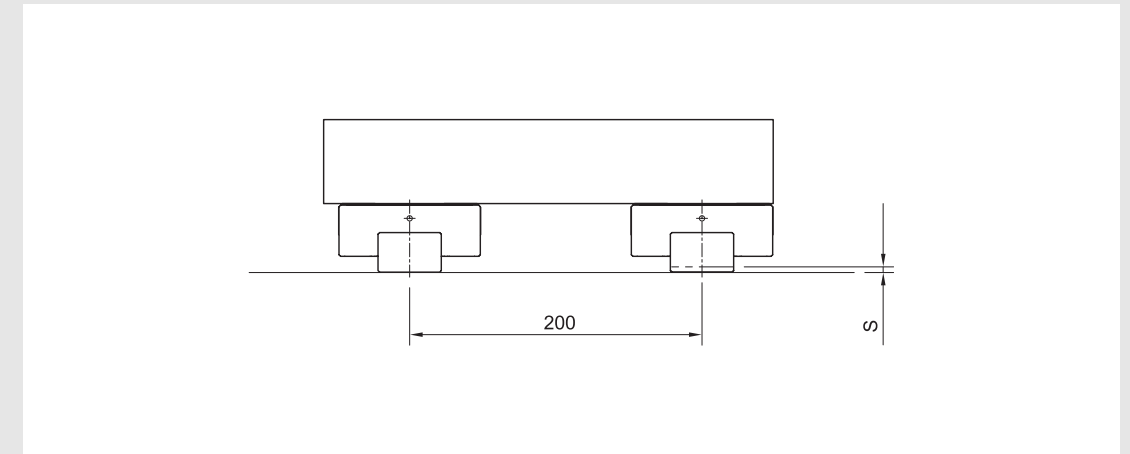
(Unit : mm)

Model size	K1	K2
07	0.003	-
09	0.004	0.003
12	0.009	0.005
15	0.01	0.006

Linear Rail System

Miniature Linear Rail System

Permissible tolerance (S) of two level offset



(Unit : mm)

Model size	K1	K2
07	0.025	-
09	0.035	0.006
12	0.05	0.012
15	0.06	0.02

Linear Rail System

Miniature Linear Rail System

Ordering example

[Seal resistance]

SBM09 - K1
[1] [2]

- [1] Model : SBM, SBML, SBMW
- [2] Preload : K1, K2

[Ordering example for rail]

SBM09 - 600L - B
[1] [2] [3]

- [1] Model : SBM, SBMW
- [2] Rail length
- [3] Through tap hole rail : Standard (No symbol)
※ If only rail is ordered, N grade is available.

[Ordering for assembled rail and block]

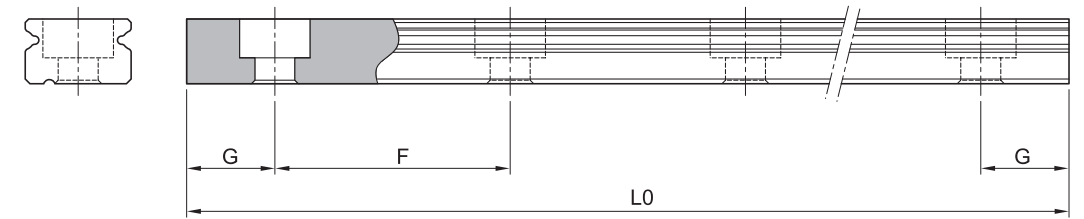
SBM09 - 2 - K1 - 600 - N - R - B - II
[1] [2] [3] [4] [5] [6] [7] [8]

- [1] Model : SBM, SBML, SBMW
- [2] Block quantity on rail
- [3] Preload : K1, K2
- [4] Rail length
- [5] Accuracy : N, H, P
- [6] Surface treatment
- [7] Through tap hole rail : Standard (No symbol)
- [8] Rail : Number of rails per axis 1=I, 2=II... 4+IV etc.
- ※ We recommend block and rail assembled to be ordered where high-precision and high-rigidity are required.
- ※ For surface treatment, please mark according to each surface treatment symbol.
- ※ If special G dimension is required, please mark when you place an order.

Linear Rail System

Miniature Linear Rail System

Standard and Max length



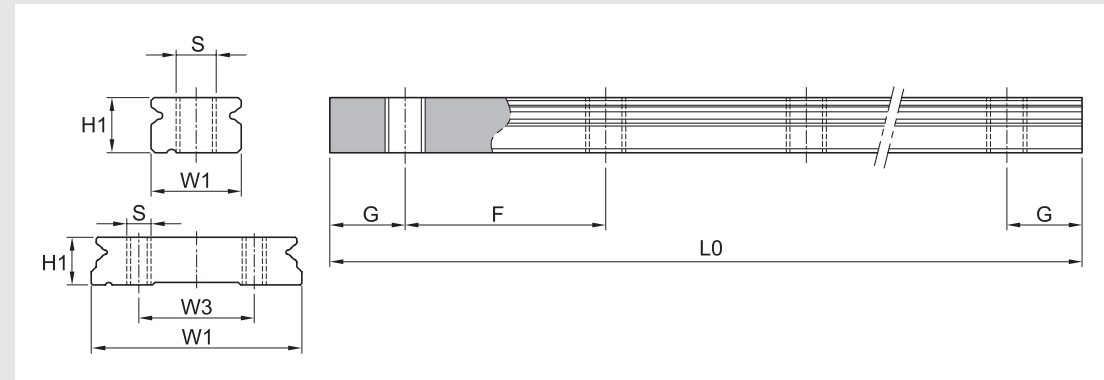
(Unit : mm)

Model number	SBM07	SBM09	SBM12	SBM15	SBMW09	SBMW12	SBMW15
Standard length	40	55	70	70	50	70	110
	55	75	95	110	80	110	150
	70	95	120	150	110	150	190
	85	115	145	190	140	190	230
	100	135	170	230	170	230	270
	115	155	195	270	200	270	350
	130	175	220	310	260	350	430
	160	215	245	350	320	430	510
	190	255	270	390	380	510	590
	220	295	320	430	440	590	670
	250	355	395	470	500	670	750
	280	415	470	590	560	750	830
		495	545	670	620	830	910
		535	620	830	680	910	990
		615	695	910	740	990	1070
		675	770	990	800	1070	1190
		715	870	1070	860	1190	
		735	970	1190	920		
		795	1020		980		
		875	1195		1040		
	955			1100			
	995			1190			
	1035						
	1115						
	1195						
F	15	20	25	40	30	40	40
G	5	7.5	10	15	10	15	15
L0(Max length)	490	1195	1195	1190	1190	1190	1190

* SBM, SBML use same rail.

* If special G dimension is required, please mark when you place an order.

Miniature through tap hole rail

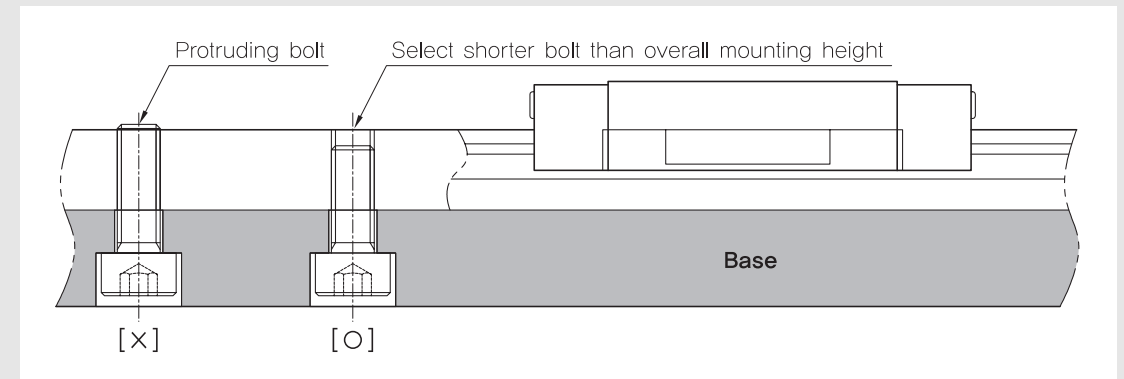


(Unit : mm)

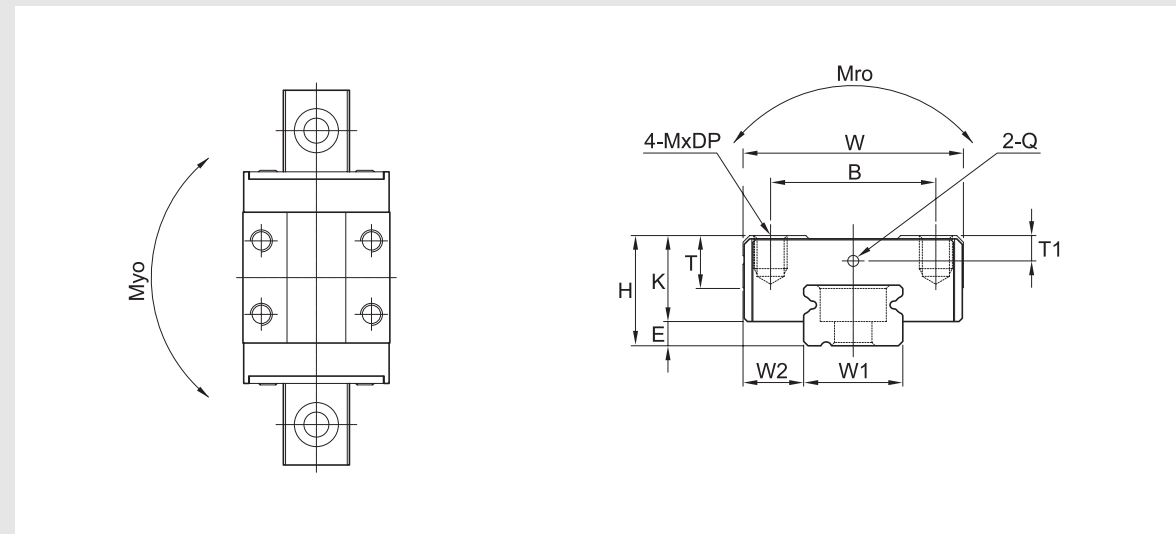
Model	W1	W3	H1	S	G	F	L0 (Max length)	Mass (kg/m)
SBM 07-B	7	-	4.7	M3x0.5P	5	15	490	0.22
SBM 09-B	9	-	5.5	M4x0.7P	7.5	20	1195	0.32
SBM 12-B	12	-	7.5	M4x0.7P	10	25	1195	0.32
SBM 15-B	15	-	9.5	M4x0.7P	15	40	1190	0.59
SBMW 09-B	18	-	7.5	M4x0.7P	10	30	1190	0.99
SBMW 12-B	24	-	8.5	M5x0.8P	15	40	1190	1.42
SBMW 15-B	42	23	9.5	M5x0.8P	15	40	1190	2.93

Caution for mounting miniature through tap hole rail

If the mounting bolt is longer than overall mounting height, the bolt can protrude which can cause interference with the seal or bearing itself. Therefore, make sure the appropriate bolt selection.

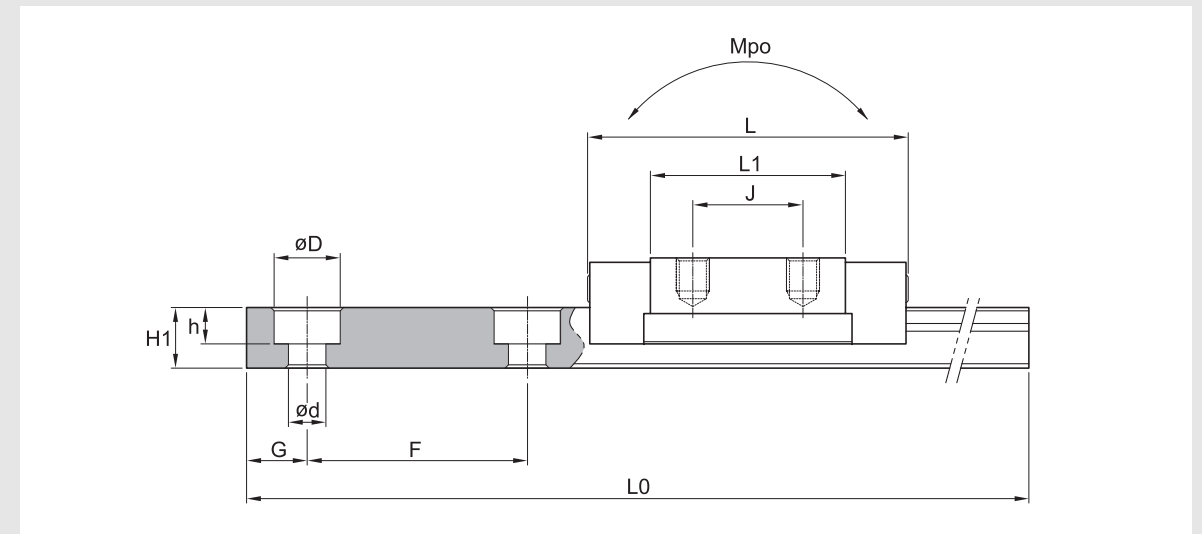


SBM/SBML



Model	Mounting dimension				Block dimensions								
	H	W	L	E	Mounting tap hole				L1	T	K	Greasing hole	
					B	J	M	DP				T1	Q
SBM 07	8	17	22.8	1.5	12	8	M2	2.5	13.4	3.6	6.5	1.6	∅1
SBM 09	10	20	30.4	2.2	15	10	M3	3	17.8	5	7.8	2.3	∅1
SBML 09	10	20	40.8	2.2	15	16	M3	3	28.2	5	7.8	2.3	∅1
SBM 12	13	27	35	3	20	15	M3	3.5	19.8	6	10	2.8	∅1
SBML 12	13	27	47.6	3	20	20	M3	3.5	32.4	6	10	2.8	∅1
SBM 15	16	32	43	4	25	20	M3	4	25.4	7	12	3.1	∅1
SBML 15	16	32	58.8	4	25	25	M3	4	41.2	7	12	3.1	∅1

① C (Basic dynamic load rating), Co (Basic static load rating)



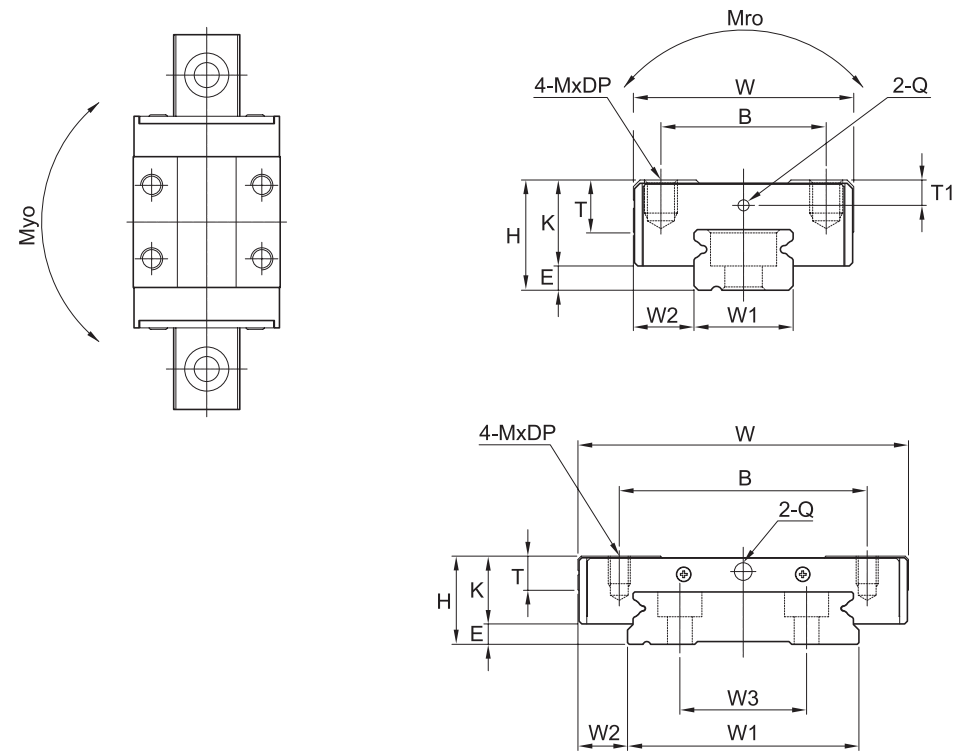
(Unit : mm)

Rail dimension										Basic load rating [kN]		Permissible static moment [N·m]			Mass	
W1	W2	H1	F	Bolt hole			G	Max length of rail L0	C	Co	Mro	Mpo	Myo	Block [kg]	Rail [kg/m]	
				d	D	h										
7	5	4.7	15	2.4	4.2	2.3	5	490	0.9	1.47	5.15	2.46	2.46	0.006	0.22	
9	5.5	5.5	20	4	6	3.3	7.5	1195	1.4	2.7	12.15	6.01	6.01	0.013	0.32	
9	5.5	5.5	20	4	6	3.3	7.5	1195	2.1	4.6	20.7	16.22	16.22	0.023	0.32	
12	7.5	7.5	25	4	6	4.5	10	1195	3.3	4.9	29.4	12.13	12.13	0.029	0.59	
12	7.5	7.5	25	4	6	4.5	10	1195	5	9.1	54.6	36.86	36.86	0.043	0.59	
15	8.5	9.5	40	4	6	4.5	15	1190	4.9	7.5	56.25	23.81	23.81	0.052	0.99	
15	8.5	9.5	40	4	6	4.5	15	1190	7.1	12.9	96.75	66.44	66.44	0.079	0.99	

Linear Rail System

Miniature Linear Rail System

SBMW

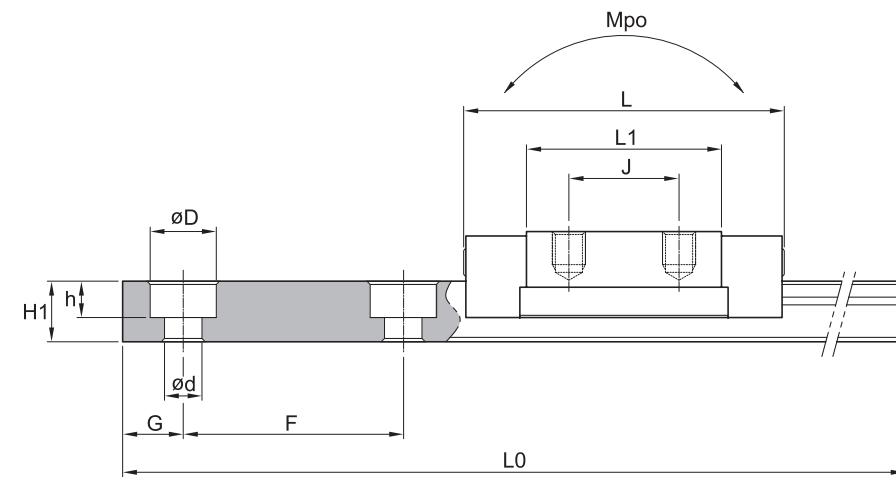


Model	Mounting dimension				Block dimensions								
	H	W	L	E	Mounting tap hole				L1	T	K	Greasing hole	
					B	J	M	DP				T1	Q
SBMW 09	12	30	42.3	3.7	21	12	M3	3	27	4.5	8.3	2	∅1.4
SBMW 12	14	40	48.4	4	28	15	M3	3.5	30.9	5	10	2.4	∅1.6
SBMW 15	16	60	57.5	3.7	45	20	M4	4.5	38.9	6.2	12.3	2.8	∅3.2

① C (Basic dynamic load rating), Co (Basic static load rating)

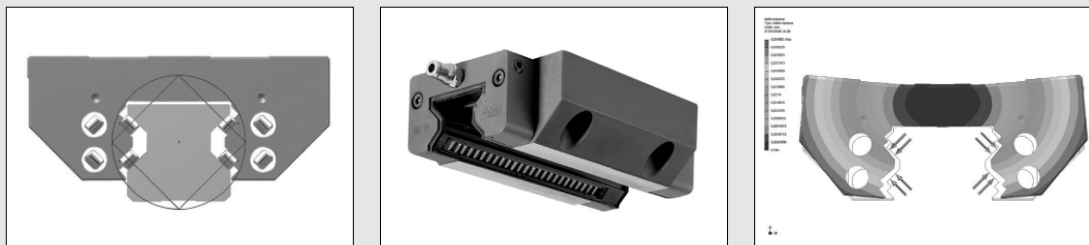
Linear Rail System

Miniature Linear Rail System



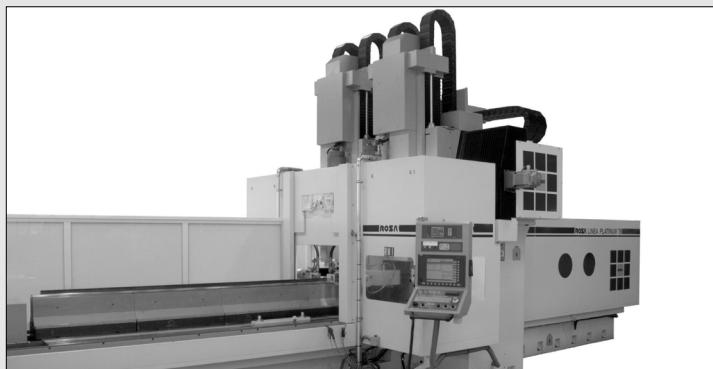
(Unit : mm)

Rail dimension										Basic load rating [kN]		Permissible static moment [N·m]			Mass	
W1	W2	H1	W3	F	Bolt hole			G	Max length of rail L0	C	Co	Mro	Mpo	Myo	Block [kg]	Rail [kg/m]
					d	D	h									
18	6	7.5	-	30	3.5	6	4.5	10	1190	2.45	3.92	35.96	16.26	16.26	0.03	0.99
24	8	8.5	-	40	4.5	8	4.5	15	1190	4.02	6.08	47.62	17.15	18.62	0.03	1.42
42	9	9.5	23	40	4.5	8	4.5	15	1190	6.66	9.80	136.9	35.28	38.22	0.12	2.93



Advanced technical solutions for high-tech industries

SBC-ROSA roller linear rail system is manufactured by technical cooperation with SBC-ROSA. This roller linear rail system is suitable for high loads, great stiffness and high reliability, especially for machine tools.



The features of SBC-ROSA roller linear rail system

MG roller linear rail system of SBC-ROSA is an advanced technical solution for high-tech industries and is achieved the high loads, high stiffness and high reliability.

(1) Extended life time

2 times longer life time than steel ball

In case of steel ball : 50km

In case of roller : 100km

(2) Designed with FEM analysis

[Streamlined roller slide ways]

- The geometries and the directions of the roller slide ways were calculated by means of FEM according to each individual preload, thus assuring the best performances of load capacities and obtainable accuracies all the time.

[Roller]

- The rollers are manufactured according to the most recent knowledge about rolling element-related theory, thus assuring high stiffness, maximum load capacity and long life.

(3) Innovative Lubrication System

- The introduction of the lubricant into the front head is controlled by means of check valves. These valves are installed on both sides of the carriage slide ways and prevent the lubricant from flowing back while sliding. With minimum quantities of lubricant, independently from the assembly position, the perfect distribution over the slide ways will be assured.
- Each front head of the carriage has 4 lubrication inputs: two side inputs, one front input and one on the other side

(4) Sliding Uniformity

- Thanks to streamlined radiuses for internal recirculation systems, pulsation phenomena are reduced to the minimum, thus offering a low resistance to the forward movement.

(5) Innovative Design

- The accurate study of all plastic elements in the carriage enabled reduced the interferences in the internal recirculation system, thus increasing relevant reliability and life.
- The slide ways are well protected by means of cross-wise and longitudinal gaskets that assure good sealing (also in contaminated environments).

1. Calculating the applied loads

To calculate the applied loads, please see the page @/10 in the linear rail system.

2. Life Calculation

[Calculation of nominal life]

The equation of nominal life is shown as below.

$$L = \left(\frac{f_H \cdot f_T \cdot f_C}{f_W} \cdot \frac{C}{P_C} \right)^{\frac{10}{3}} \times 100$$

※ Please see the page @/20 for f_H (hardness factor), f_T (temperature factor), f_C (contact factor) and f_W (load factor).

- L (km) : Nominal life
- P_C (N) : Calculated load
- C (N) : Basic dynamic load rating
- f_H : Hardness factor
- f_T : Temperature factor
- f_C : Contact factor
- f_W : Load factor

[Life calculation]

$$L_h = \frac{L \times 10^6}{2 \times n_1 \times l_s \times 60}$$

- L_h (h) : Hours of nominal life
- L (km) : Nominal life
- l_s (N) : Stroke
- n_1 (min⁻¹) : Reciprocation cycles per minute

3. Calculation of the static safety coefficient

Conditions of use	Lower limit of F_s
Maximum stiffness, great impact stresses and vibrations	≥ 6
High stiffness, variable and average impact stresses, vibrations	≥ 4
Uniform stresses, light vibrations	≥ 3

$$f_s = \frac{C_o}{P_{max}}$$

- f_s : Static safety factor
- C_o : Basic static load rating (N)
- P_{max} : Maximum load (N)

4. Durability test

[Test conditions]

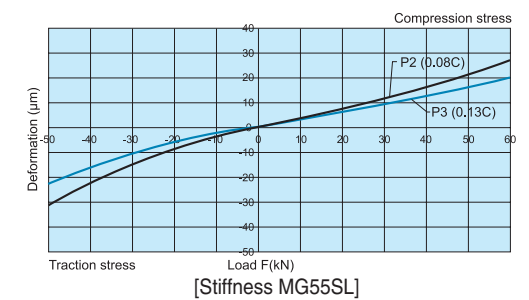
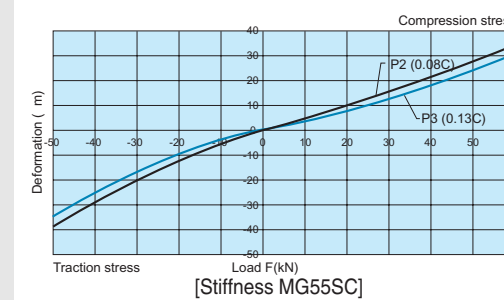
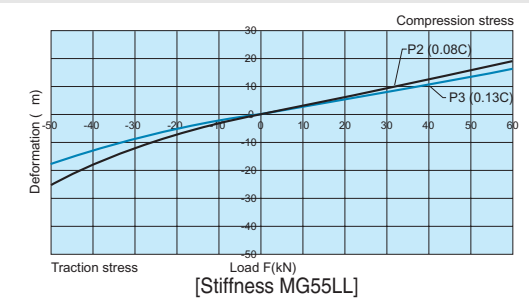
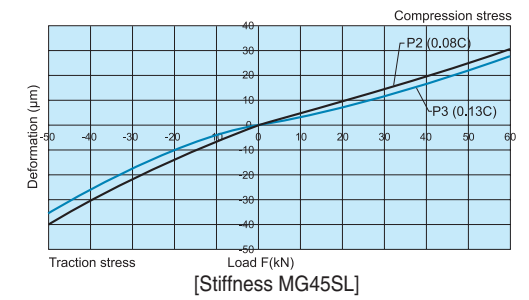
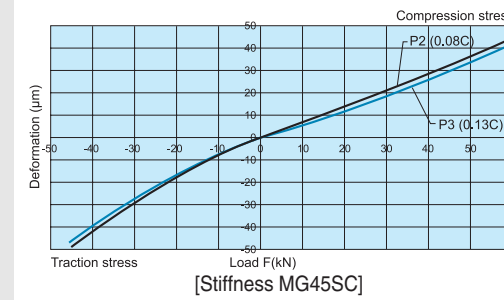
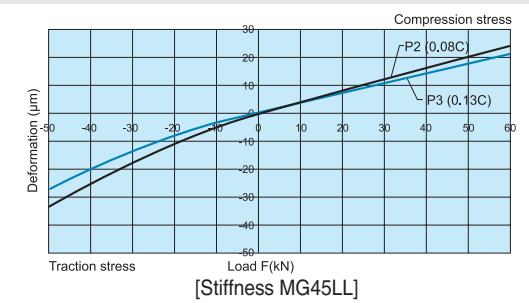
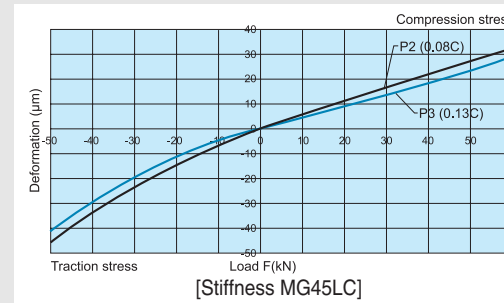
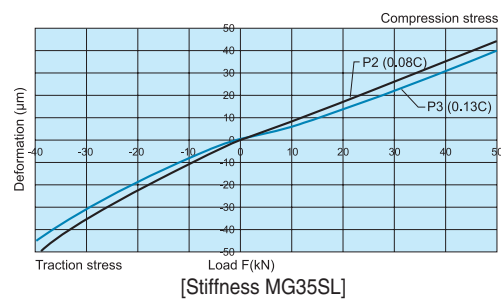
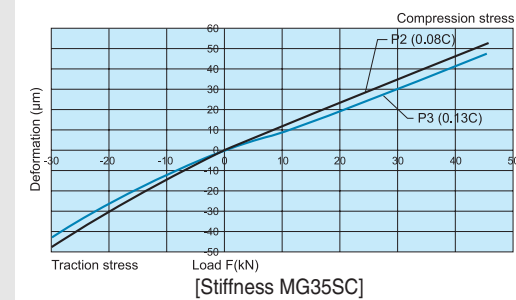
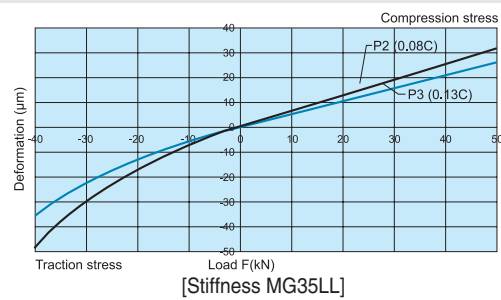
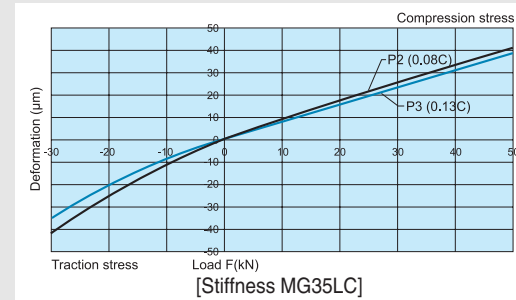
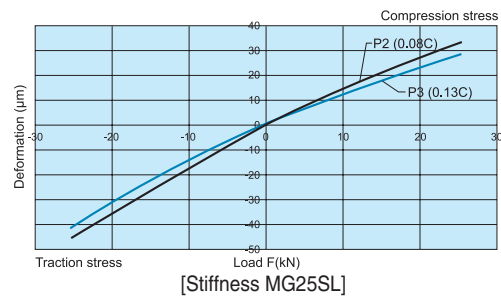
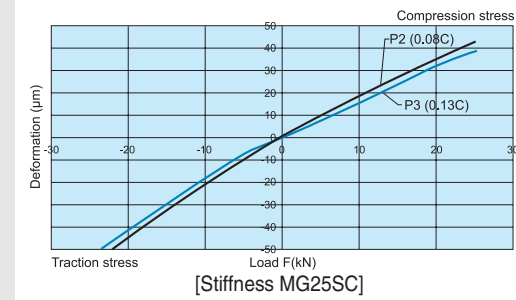
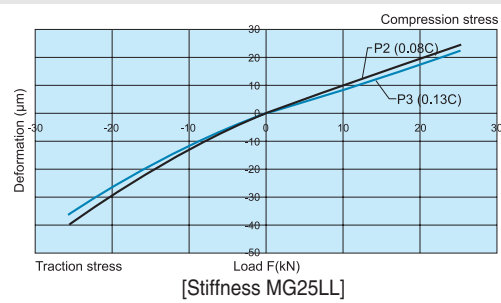
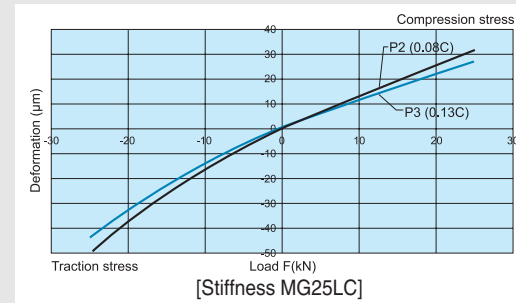


Test conditions for the linear roller bearing according to the standards	DIN 631
Load coefficient MG35	C/P=3
Load coefficient MG25/45/55	C/P=2
Endurance with C/P = 3	3893 km
Endurance with C/P = 2	1050 km
Test speed	120 m/min.
Maximum stroke	2 m
Acceleration	10 m/s ²
Lubricant	Oil ISO VG 220

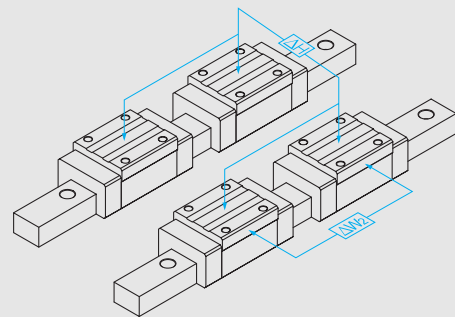
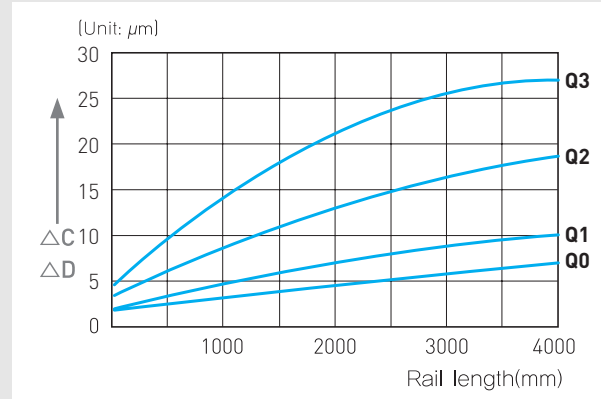
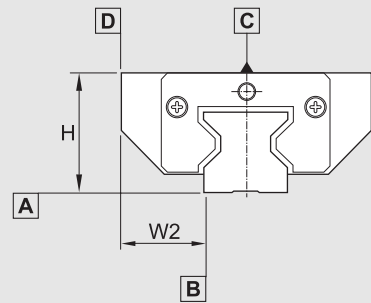
According to the DIN 631 standards, endurance is considered as to be achieved if the surfaces of the slide ways have no Pitting > 0.3 x roller diameter.

All tests concerning the MG35 model were interrupted after a stroke equaling 4260 and 4870 km. Despite the long distance in kilometers that was covered, we detected the absence of damage to the slide ways.

5. Stiffness diagram



6. Accuracy classes



- Measuring dimension difference H and W2 between the carriages of the same guide
- $\Delta W2$ (Dimension difference W2 between the carriages of the same guide): measuring the center of block side surface (reference surface)
- ΔH (Dimension difference H between the carriages of the same guide): measuring the center of block top

(Unit : mm)

Accuracy class	Q3	Q2	Q1	Q0
Tolerance on H assembly dimension	± 0.03	± 0.02	± 0.01	± 0.005
Tolerance on W2 assembly dimension	± 0.02	± 0.02	± 0.007	± 0.005
Dimension difference H between the carriages of the same guide	0.015	0.007	0.005	0.003
Dimension difference W2 between the carriages of the same guide	0.015	0.007	0.005	0.003
Running parallelism of surface C against surface A	ΔC			
Running parallelism of surface D against surface B	ΔD			

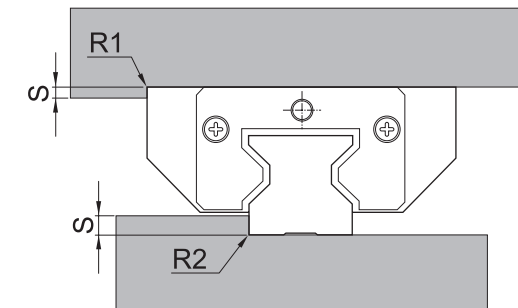
- Q3 : High-accuracy grade
- Q2 : Precision grade
- Q1 : Super precision grade
- Q0 : Ultra precision grade

7. Preload classes

Preload class	Preload
P2 (Light)	0.08C
P3 (Heavy)	0.13C

- C(N) : Basic dynamic load rating

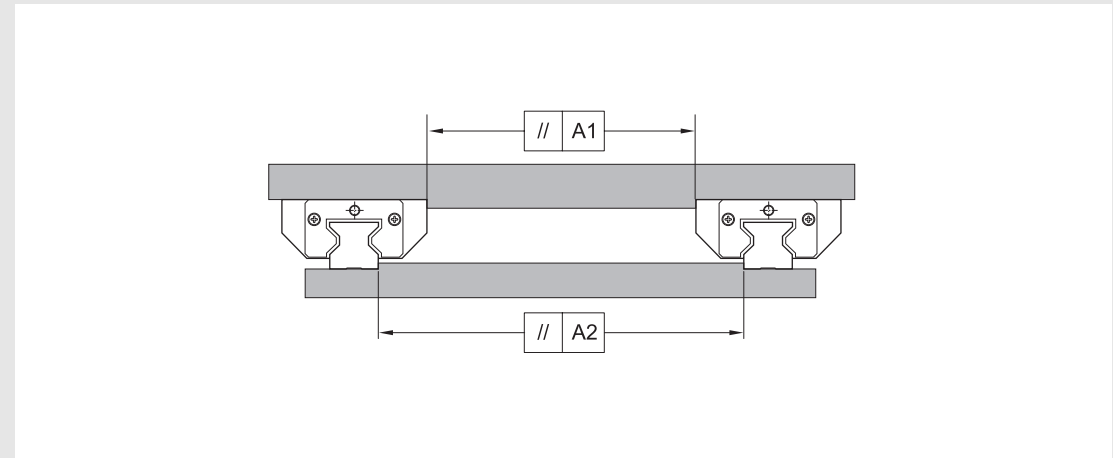
8. Shoulder height and fillet radius R



(Unit : mm)

Model	S	Fillet radius R1	Fillet radius R2
25	5	0.8	0.8
35	6	0.8	0.8
45	8	0.8	0.8
55	10	1.2	1.0
65	10	1.5	1.5

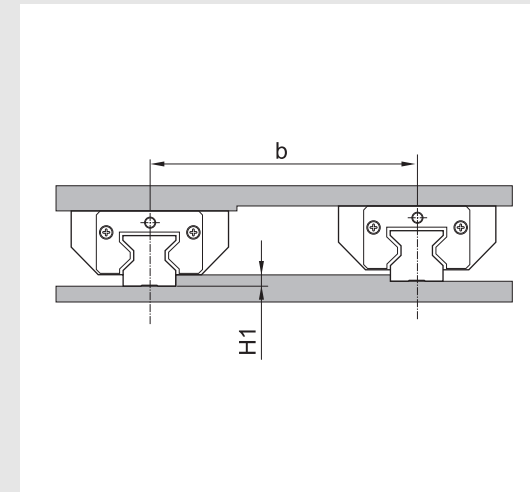
9. Parallelism tolerance for shoulder surface



(Unit : mm)

Size	P2 preload	P3 preload
25	0.008	0.005
35	0.012	0.008
45	0.014	0.009
55	0.017	0.011
65	0.018	0.011

10. Maximum allowable deviation in height



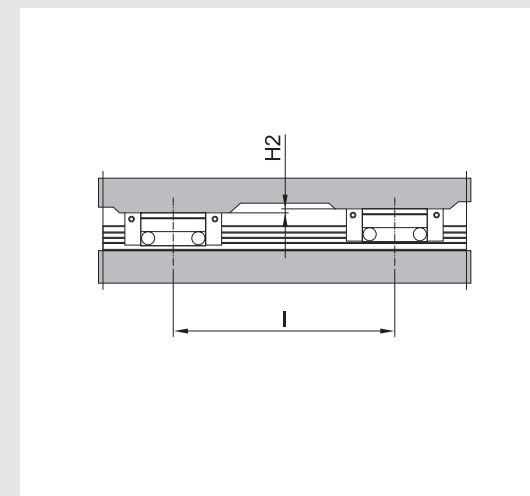
To obtain the maximum allowable deviation value in height, subtract the tolerance value of the dimension H (see the table about the accuracy classes on page ①/142) from the value H1 obtained by means of the following formula:

$$\Delta H1 = X \cdot b \cdot 10^{-4}$$

- $\Delta H1$: Maximum allowable deviation in height (Unit: mm)
- X : Calculation factor
- b : Distance between rails

Preload class	P2 (Light)	P3 (Heavy)
X (Calculation factor)	1.7×10^{-4}	1.2×10^{-4}

11. Maximum allowable deviation in longitudinal direction



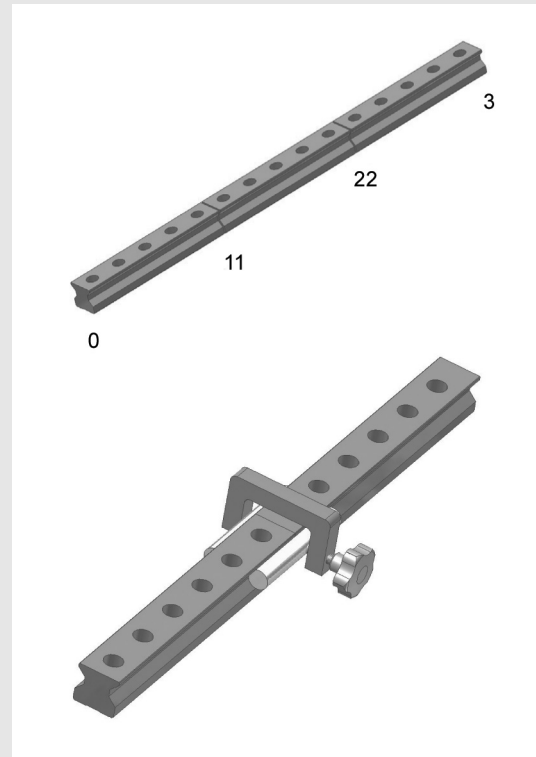
To obtain maximum allowable deviation value in longitudinal direction, subtract the tolerance value of the dimension H (see the table about the accuracy classes on page ①/142) from the value H2 obtained by means of the following formula

$$\Delta H2 = Y \cdot l$$

- $\Delta H2$: Maximum allowable deviation in longitudinal direction (Unit: mm)
- Y : Calculation factor
- l : Distance between carriages

Carriage type	LC/SC	LL/SL
Y (Calculation factor)	4.5×10^{-5}	3.5×10^{-5}

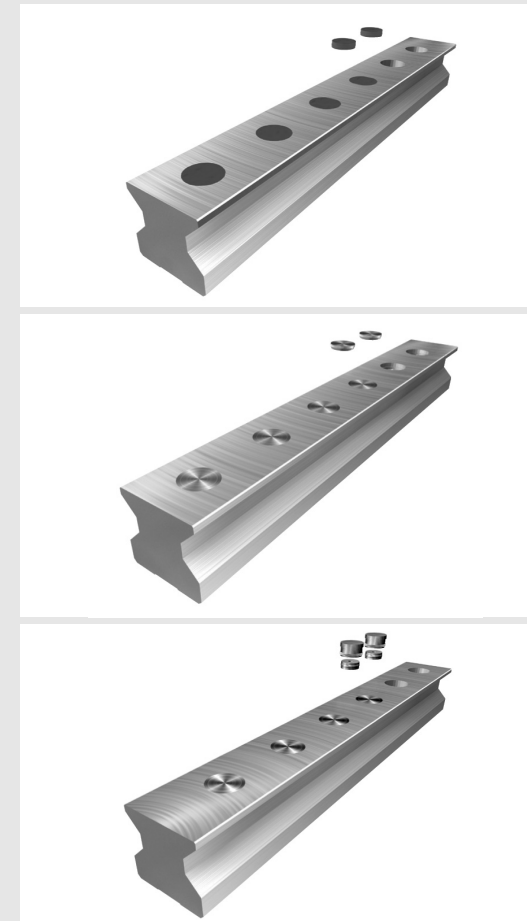
General instructions for the assembly of the guides



[Comply with the following instructions]

- Always put the mono-guide against the supporting end stop (if available)
- Always tighten the screws in an alternating way by starting from the center of the guide and preferably by using a dynamometric wrench
- The guides formed by several parts are marked with numbers in the joints. During the assembly, you must match the aforesaid numbers. Always check that the guides are aligned one close to the other without leaving empty spaces, even tiny ones.
- As for the assembly of the guides in several parts (no side end stop), align the joints of the guides by using ground shafts and clamp, as shown in the picture.

Mono-guide accessories



[Rail hole caps]

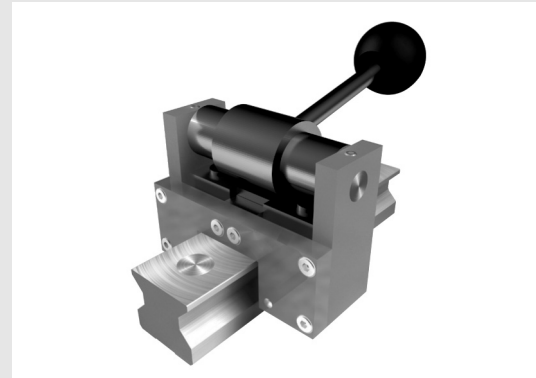
- Plastic caps - TPMG
They are used to cover the fastening holes of the guide and are included in the standard supply. The caps should not be used in case of metal chips, especially if they are not ; indeed, it is advisable to use the caps with protected axes or in environments that are not very dirty.
- Brass caps - TOMG
They are used in case of thermal and mechanical stresses, metal chips or rather if an absolutely smooth guide surface is required.
They are supplied on demand in the order.
- Steel caps - TAMG
They are used in case of high thermal or mechanical stresses or in working environments characterized by chip removal. The covering cap includes a cap and a pressure collar supplied apart. Before installing the caps into the guide holes, both parts must be embedded. In order to correctly fix them, it is advisable to use the specific assembly tool DMT.
They are supplied on demand in the order



Linear Rail System

SBC-ROSA Roller Linear Rail System

[DMT- Assembly tool for steel caps(TAMG)]



The assembly tool DMT is used to correctly assemble the steel caps that are introduced into the relevant holes by manually pressing the lever.

It is supplied on demand in the order

[Strip to protect and cover the fastening holes of the guide]



The use of the covering strip considerably simplifies the performance of the operations during the fastening of the mono-guide. After having assembled and aligned it on the bedplate of machine, the protect strip will be introduced into the groove of the guide, and then fastened with two heads at the ends.

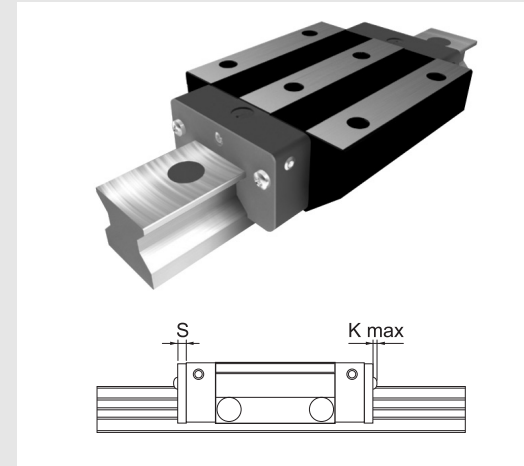
- Advantages -

- Corrosion-resistant material (stainless steel).
- Particularly tough configuration thanks to the increased thickness..
- Anchoring to a special precision groove and fastening to the ends with two closing heads.
- Prevent closing caps from being used, thus considerably reducing the general assembly times and makes the wiping action more effective.

Linear Rail System

SBC-ROSA Roller Linear Rail System

[End seal TPA]

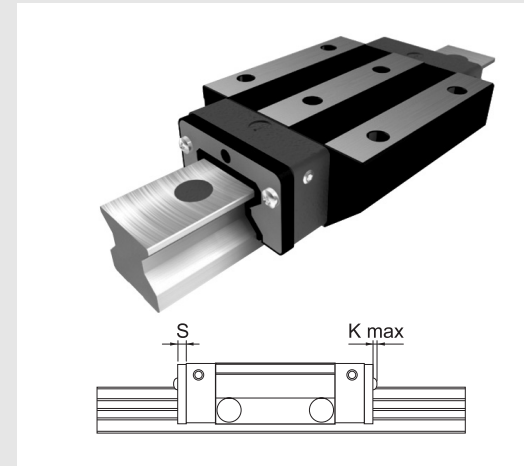


The stainless steel wiper protects the scraper rings that are built-in in the front heads of the carriage and for possible additional end seals TPNBR/TPVIT.

In particular, it is effective in the presence of hot chips and coarse dirt particles thanks to the minimum clearance between the wiper and the guide

Size	S	K
25	1	2.6
35	1	3.3
45	1.5	4
55	2	4.8
65	2	4.8

[Additional end seal TPNBR/TPVIT]



The end seals TPNBR and TPVIT offer an effective additional protection to the mono-guides that work in very dirty environments. They can be directly assembled on the carriages without the need to disassemble the latter.

- Features of the NBR version -

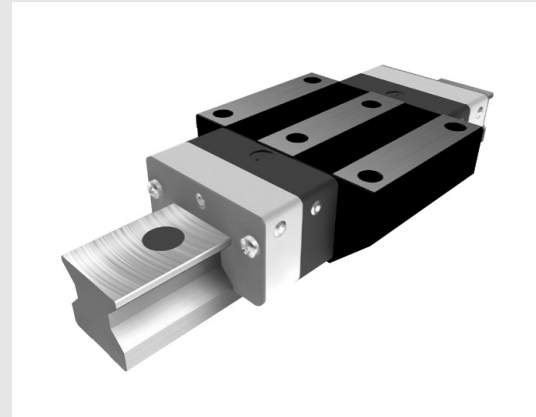
- Excellent stability in the presence of oil
- Excellent mechanical features
- Working temperature from -30°C to +110°C

- Features of the VITON version -

- Excellent stability in the presence of aggressive coolants and oils
- Excellent mechanical features
- Working temperature from -30°C to +200°C

Size	S	K
25	6	2.6
35	6	3.3
45	6	4
55	7	4.8
65	7	4.8

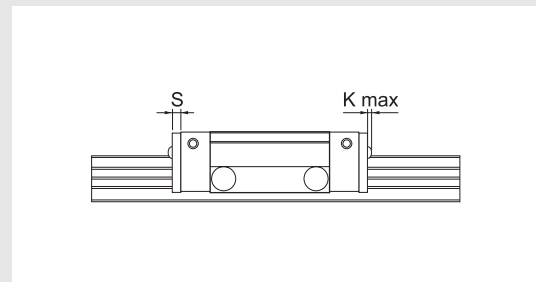
Long-life lubrication cartridge TLL



The cartridge TLL allows a capillary lubrication of the slide ways by using minimum quantities of lubricant. Indeed, by using a special synthetic material, just the necessary quantity of lubricant flows : this way, the re-lubrication time will be extended as much as possible. It is advisable to use it in dry and clean environments, always in combination with the steel wipers TPA.

- The distribution of the lubricant is assured in all assembly positions.
- The cartridges TLL can be recharged
- Use only high-quality mineral oil (DIN 51517CLP or DIN 51524HLP with ISO VG 220 viscosity)
- Lubrication interval up to 5000km or maximum every 12 months (variable according to the use)
- Reduction of the costs relating to the lubrication system
- Low environmental impact thanks to a minimum consumption of lubricant

※ The TLL lubrication units should not be used in the presence of lubricating oil-coolants in direct contact with the guides.



Size	S	K
25	16	2.6
35	20	3.3
45	23	4
55	27	4.8
65	32	4.8

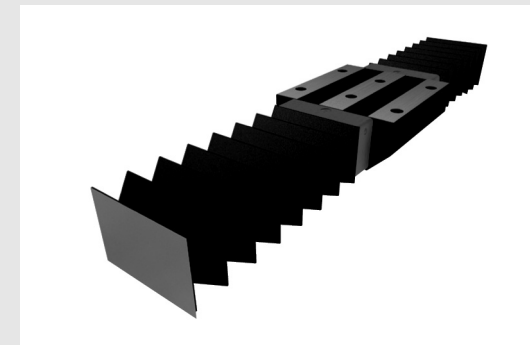
Lin Clamp clamping system



Lin Clamp clamping systems were designed for static and dynamic locks(emergency).

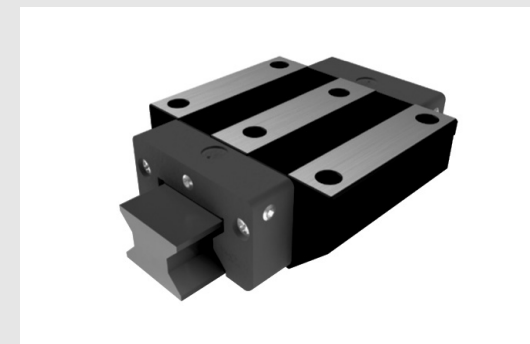
- Pneumatic compact system
- Active (locking with air) or passive (locking with no air) system
- Excellent locking ability
- Available for all sizes
- Lower costs compared with hydraulic and electric solutions

Bellows



The bellows are used as an additional protection against dust and water splashes.

Assembly guide



The plastic-material assembly guide is used to transport the carriage and if it is necessary to remove the carriage from the mono-guide

Greasing

[Recommend grease and oil]

It is advisable to use the following grease and oil types

- Grease according to the DIN 51825 standard, type KP2K-20 (high-performance grease based on lithium soap)
- Liquid grease according to the DIN 51826 standard, types : NLGI 00 and NLGI 000
- Mineral oil according to the DIN 51517 standard, type CLP, or according to the DIN 51524 standard, type HLP
- Viscosity range : from ISO VG 68 to ISO VG 220

[Initial lubrication before the start-up]

Immediately after the assembly, the carriages must be lubricated with the quantities that are specified in the table ; move the carriage for a stroke that at least corresponds to three times its own length.

Quantity (cm ³ /carriage)	MG25		MG35		MG45		MG55		MG65	
	Grease	Oil	Grease	Oil	Grease	Oil	Grease	Oil	Grease	Oil
LC/SC	1.9	0.8	2.9	1.0	5.3	1.4	8.4	1.8	15	3.6
LL/SL	2.2		3.7		6.6		10.6		18.9	

[Recommended lubrication interval and lubrication values]

The table specifies the correct values and lubrication interval. In case of short stroke (shorter than twice the length L of the carriage), apply a double quantity of lubricant by means of 2 lubrication points (one per each head).

Load	MG25		MG35		MG45		MG55		MG65	
	Grease	Oil	Grease	Oil	Grease	Oil	Grease	Oil	Grease	Oil
C/P > 8	800 km	400 km / 1.2cm ³	500km	250 km / 1.2cm ³	300 km	125 km / 1.2cm ³	200 km	100 km / 1.5cm ³	100 km	50 km / 1.5cm ³
5 ≤ C/P < 8	500 km	250 km / 0.7cm ³	300 km	180 km / 1.0cm ³	150 km	90 km / 0.9cm ³	100 km	60 km / 1.2cm ³	50 km	40 km / 1.5cm ³
3 ≤ C/P < 5	200 km	100 km / 0.4cm ³	150 km	80 km / 0.6cm ³	80 km	40 km / 0.45cm ³	50 km	30 km / 0.5cm ³	25 km	20 km / 0.6cm ³
2 ≤ C/P < 3	120 km	40 km / 0.2cm ³	80 km	30 km / 0.25cm ³	40 km	20 km / 0.25cm ³	25 km	15 km / 0.25cm ³	15 km	10 km / 0.3cm ³

(Recommended lubrication interval and lubrication values)

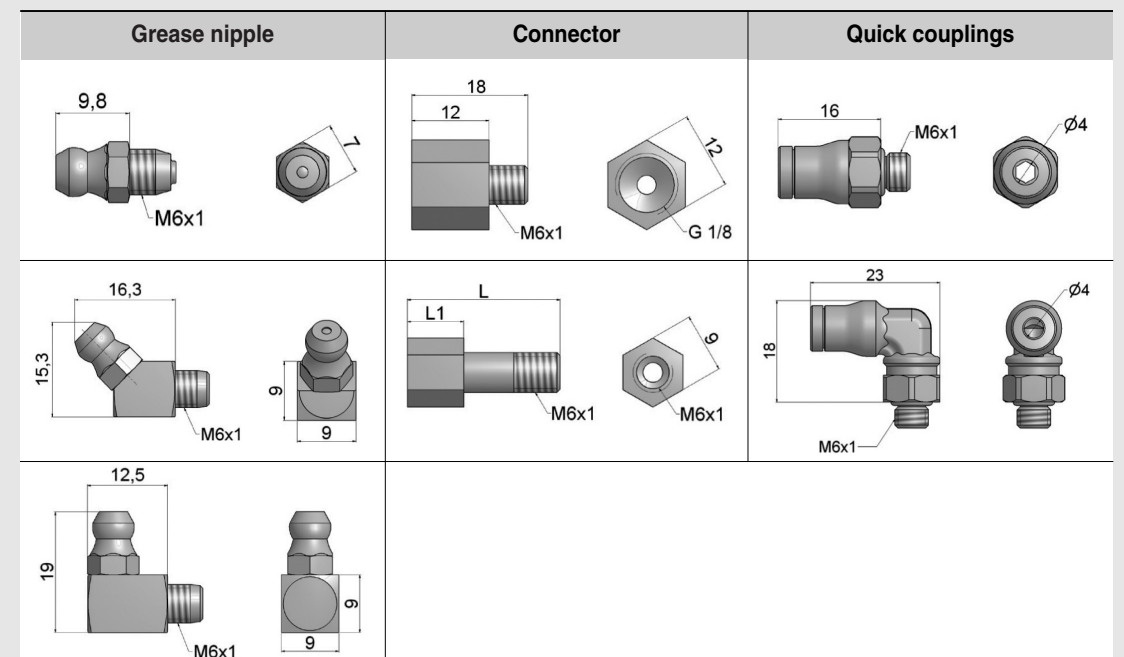
Quantity (cm ³ /carriage)	MG25	MG35	MG45	MG55	MG65
LC/SC	0.5	1.2	2.2	3.2	5.9
LL/SL	0.6	1.4	2.6	4	7.4

(Minimum quantity of oil allowed by impulse)

cm ³ /impuls	MG25	MG35	MG45	MG55	MG65
Horizontal	0.06	0.1	0.1	0.16	0.2
Vertical	0.06	0.1	0.1	0.16	0.2
Horizontal-Vertical, Crosswise	0.08	0.15	0.15	0.25	0.3

※ Please set the lubrication interval and lubrication values according to working condition and working environments.

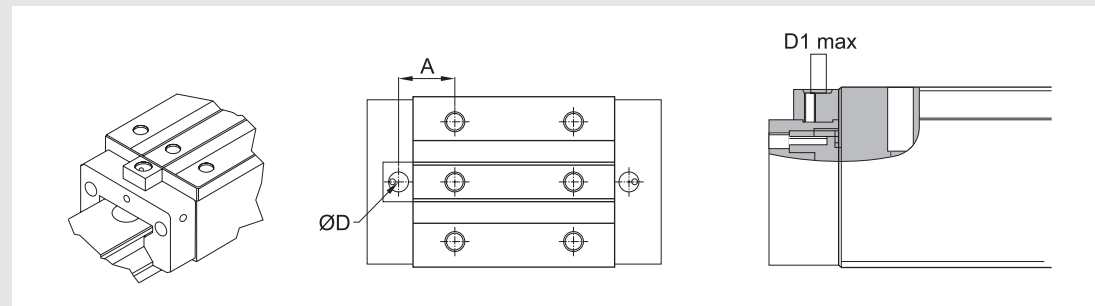
Nipple



[Top lubrication]

All carriage types are prepared for top lubrication. SC and SL models are provided with a spacer equipped with O-ring to compensate for the difference in height. Top lubrication must be specified in the order.

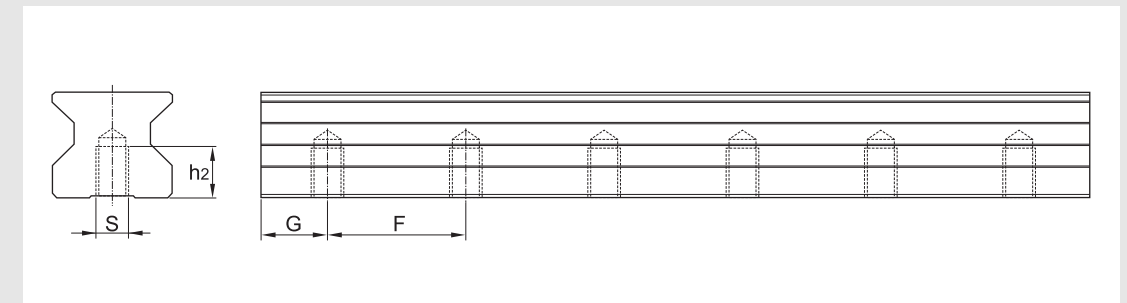
It is not possible to drill the heads after the assembly, as the chips created during this operation may clog the lubrication channels.



(Unit : mm)

Item	Carriage type	MG25	MG35	MG45	MG55	MG65
A	LC	14	15.5	17.6	21.5	29
	LL	23.7	27	33.9	42.5	54.3
	SC	19	21.5	27.6	31.5	49
	SL	21.2	22	33.9	42.5	49.2
D	-	10	10	10	10	13
D1	-	3	4.5	4.5	4.5	3.5

Bottom mounting rail



Size	S	h2	G	F
MG25	M6	12	14	30
MG35	M8	15	19	40
MG45	M12	19	25	52.5
MG55	M14	22	29	60
MG65	M16	25	36.5	75

Ordering example

MG35 SC - TB - 2 - P2 - 598 - Q1 -R - II
 [1] [2] [3] [4] [5] [6] [7] [8] [9]

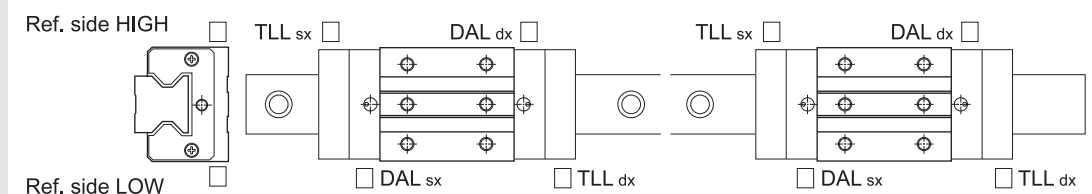
- [1] Model
- [2] Block type : LC, LL, SC, SL
- [3] Additional seal : None (standard)
 - TP - TPA
 - TB - TPNBR
 - TV - TPVIT
 - TAB - TPA+TPNBR
 - TAV - TPA+TPVIT
 - TLL - TPA+TLL
- [4] Number of carriages on the rail
- [5] Preload : P2, P3
- [6] Rail length
- [7] Accuracy class : Q0, Q1, Q2, Q3
- [8] Surface treatment : None (standard)
- [9] Number of rails per axis : None (I), II, III, IV.....

※ We recommend purchasing the block and rail as assembled set if high accuracy and high stiffness are required.

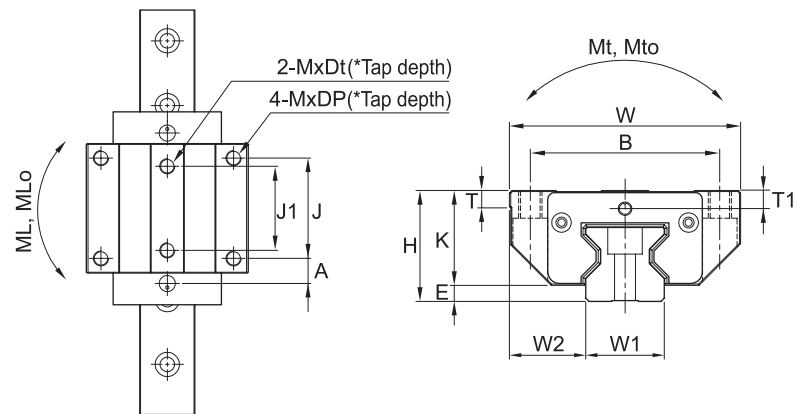
※ Please indicate the G (distance from rail end to first hole) dimension if G is not standard

Ordering sheet

Company	
TEL./FAX.	(TEL.) / (FAX.)
Person in charge	
Date	
Ordering items	
G dimension (distance from rail end to first hole)	mm
Stainless steel cover	<input type="checkbox"/> Yes <input type="checkbox"/> None
Rail hole cap specification	<input type="checkbox"/> TPMG(Plastic) <input type="checkbox"/> TOMG(Brass) <input type="checkbox"/> TAMG(Steel)
Rail hole cap quantity	PCS / 1Rail
Assembly tool for steel caps	<input type="checkbox"/> DMT
Additional seal specification	<input type="checkbox"/> TPA <input type="checkbox"/> TPNBR <input type="checkbox"/> TPVIT
Long-life lubrication cartridge	<input type="checkbox"/> TLL
Bellows	Minimum: mm / Max: mm
Surface treatment	
Lubricant type	<input type="checkbox"/> Grease (type:) <input type="checkbox"/> Oil
Nipple position and type	

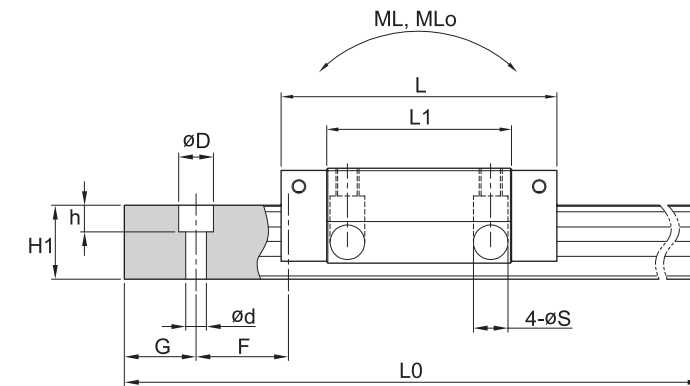


MG-LC/LL



Model	Mounting dimension				Block dimension												
	H	W	L	E	Mounting tap hole								L1	T	K	T1	A
					B	J	J1	M	DP	S	Dt						
MG25 LC	36	70	90.2	5.5	57	45	40	M8	9	11	6.5	62	7.5	29.5	5.5	14	
MG25 LL	36	70	109.7	5.5	57	45	40	M8	9	11	6.5	81.5	7.5	29.5	5.5	23.7	
MG35 LC	48	100	119.3	7	82	62	52	M10	12	15	10	80	8	41	7.9	15.5	
MG35 LL	48	100	142.3	7	82	62	52	M10	12	15	10	103	8	41	7.9	27	
MG45 LC	60	120	147.3	10	100	80	60	M12	15	18	12	101.3	10	50	8	17.6	
MG45 LL	60	120	179.8	10	100	80	60	M12	15	18	12	133.8	10	50	8	33.9	
MG55 LC	70	140	173	13	116	95	70	M14	18	20	13.5	120	12	57	9	21.5	
MG55 LL	70	140	215	13	116	95	70	M14	18	20	13.5	162	12	57	9	42	
MG65 LC	90	170	221.8	12	142	110	82	M16	15	23	19.5	159.8	15.5	78	22	29	
MG65 LL	90	170	272.3	12	142	110	82	M16	15	23	19.5	210.3	15.5	78	22	54.3	

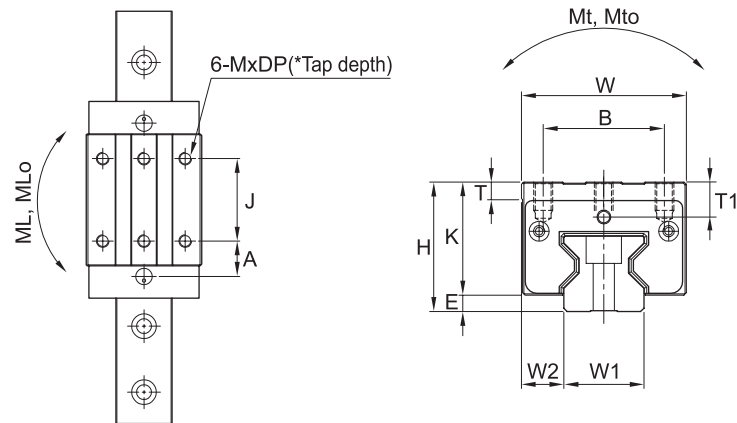
- ① C (Basic dynamic load rating), Co (Basic static load rating)
- ② Mt (Torsional moment of dynamic load), Mto (Torsional moment of static load)
- ③ ML(Longitudinal moment of dynamic load), MLo (Longitudinal moment of static load)



(Unit : mm)

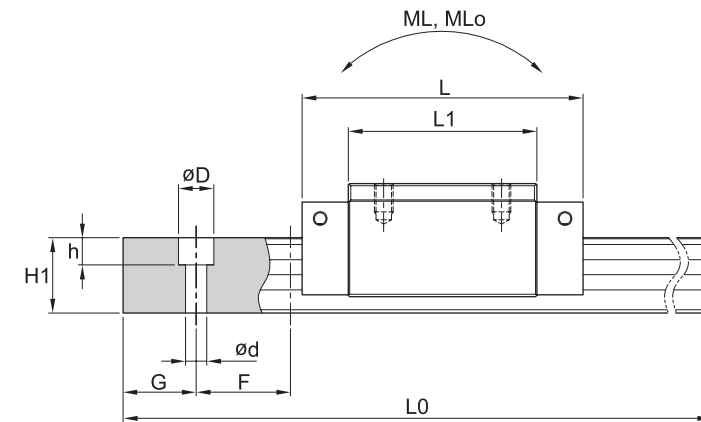
Rail dimension										Basic load rating [kN]		Moment [kN · m]				Mass	
W1	W2	H1	F	Bolt hole			G	Max length of rail L0	C	Co	Mt	Mto	ML	MLo	Block [kg]	Rail [kg/m]	
				d	D	h											
23	23.5	24.5	30	7	11	11.5	14	4000	28.7	57.6	0.43	0.86	0.28	0.57	0.7	3.4	
23	23.5	24.5	30	7	11	11.5	14	4000	38.9	76.8	0.58	1.15	0.49	0.97	0.9	3.4	
34	33	32	40	9	15	17	19	4000	53.3	99	1.17	2.19	0.67	1.25	1.7	6.5	
34	33	32	40	9	15	17	19	4000	72.6	136	1.59	3.01	1.18	2.24	2.2	6.5	
45	37.5	40	52.5	14	20	19	25	4000	95	184	2.61	5.07	1.53	2.97	3.3	10.7	
45	37.5	40	52.5	14	20	19	25	4000	119.5	242.2	3.29	6.67	2.44	4.95	4.3	10.7	
53	43.5	48	60	16	24	22	29	4000	132.6	256	4.50	8.70	2.57	4.98	5.1	15.2	
53	43.5	48	60	16	24	22	29	4000	176	351	5.97	11.91	4.47	8.91	7	15.2	
63	53.5	55	75	18	26	26	36.5	4000	212	414	8.10	15.78	5.21	10.14	9.3	22.5	
63	53.5	55	75	18	26	26	36.5	4000	276	579	10.53	22.10	8.98	11.84	13.5	22.5	

MG-SC/SL



Model	Mounting dimension				Block dimension								
	H	W	L	E	Mounting tap hole				L1	T	K	T1	A
					B	J	M	DP					
MG25 SC	40	48	90.2	6.5	35	35	M6	9	62	7.5	33.5	9.5	19
MG25 SL	40	48	109.7	6.5	35	50	M6	9	81.5	7.5	33.5	9.5	21.2
MG35 SC	55	70	119.3	7	50	50	M8	12	80	8	48	14.9	21.5
MG35 SL	55	70	142.3	7	50	72	M8	12	103	8	48	14.9	22
MG45 SC	70	86	147.3	10	60	60	M10	18	101.3	10	60	18	27.6
MG45 SL	70	86	179.8	10	60	80	M10	18	133.8	10	60	18	33.9
MG55 SC	80	100	173	13	75	75	M12	19	120	12	67	19	31.5
MG55 SL	80	100	215	13	75	95	M12	19	162	12	67	19	42
MG65 SC	90	126	221.8	12	76	70	M16	15	159.8	15.5	78	22	49
MG65 SL	90	126	272.3	12	76	120	M16	15	210.3	15.5	78	22	49.2

- ① C (Basic dynamic load rating), Co (Basic static load rating)
- ② Mt (Torsional moment of dynamic load), Mto (Torsional moment of static load)
- ③ ML(Longitudinal moment of dynamic load), MLo (Longitudinal moment of static load)



(Unit : mm)

Rail dimension										Basic load rating [kN]		Moment [kN · m]				Mass	
W1	W2	H1	F	Bolt hole			G	Max length of rail L0	C	Co	Mt	Mto	ML	MLo	Block [kg]	Rail [kg/m]	
				d	D	h											
23	12.5	24.5	30	7	11	11.5	14	4000	28.7	57.6	0.43	0.86	0.28	0.57	0.6	3.4	
23	12.5	24.5	30	7	11	11.5	14	4000	38.9	76.8	0.58	1.15	0.49	0.97	0.8	3.4	
34	18	32	40	9	15	17	19	4000	53.3	99	1.17	2.19	0.67	1.25	1.6	6.5	
34	18	32	40	9	15	17	19	4000	72.6	136	1.59	3.01	1.18	2.24	2	6.5	
45	20.5	40	52.5	14	20	19	25	4000	95	184	2.61	5.07	1.53	2.97	3.1	10.7	
45	20.5	40	52.5	14	20	19	25	4000	119.5	242.2	3.29	6.67	2.44	4.95	4.1	10.7	
53	23.5	48	60	16	24	22	29	4000	132.6	256	4.50	8.70	2.57	4.98	4.7	15.2	
53	23.5	48	60	16	24	22	29	4000	176	351	5.97	11.91	4.47	8.91	6.2	15.2	
63	31.5	55	75	18	26	26	36.5	4000	212	414	8.10	15.78	5.21	10.14	8.5	22.5	
63	31.5	55	75	18	26	26	36.5	4000	276	579	10.53	22.10	8.98	11.84	12.7	22.5	