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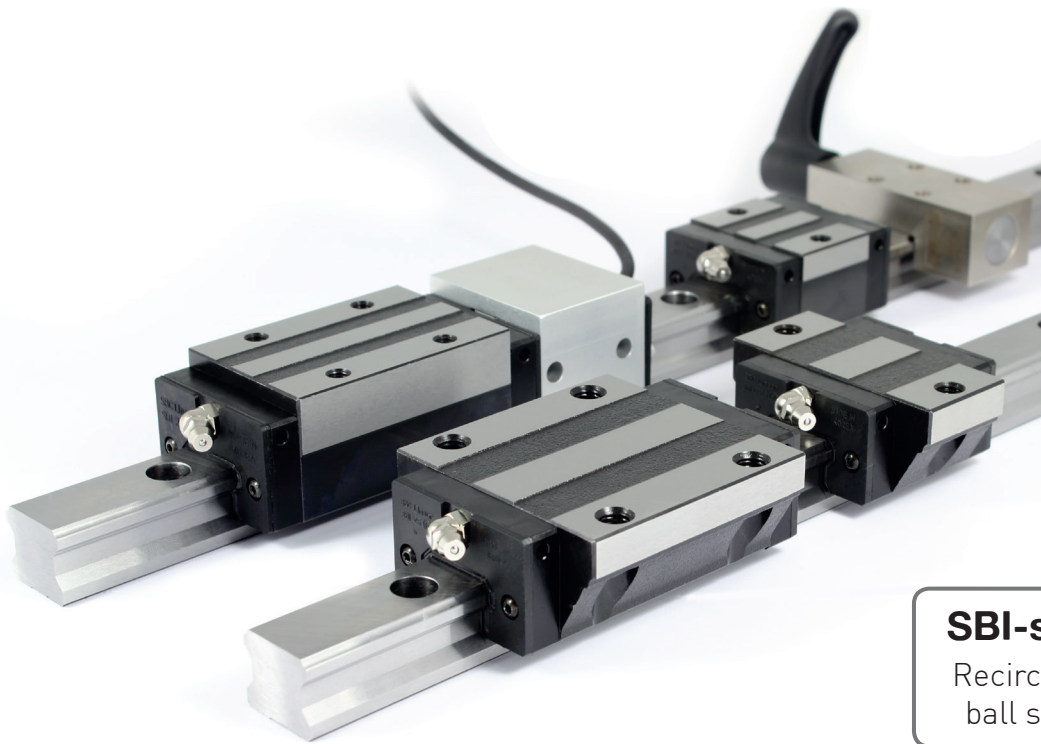
The Precision Alliance

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Linear Rail System



SBI-series

Recirculating
ball system



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V. 11-2013

The catalog composition was made careful after current volume of data.
Nevertheless no adhesion can be taken over for errors. Misprint, mistakes with technical data and technical
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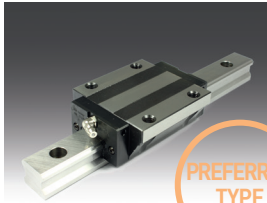
Overall index

Features SBI

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Products:

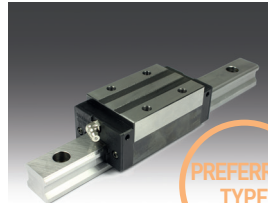
FL / FLL Type



PREFERRED
TYPE

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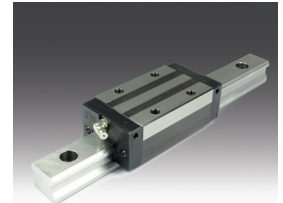
SL / SLL Type



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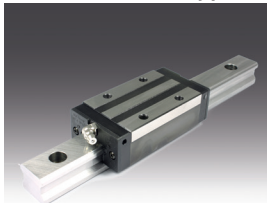
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HL / HLS / HLL Type



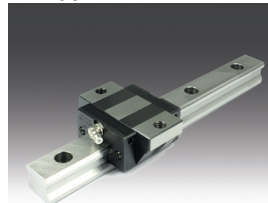
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CL / CLS / CLL Type



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FV Type



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SV Type



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Options

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Integrated measuring system

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Lubrication

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Technical data

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Systems of Linear Motion

There are two basic systems for linear motion depending on their design.

1. Linear motion for limited travel

The first group are precision rail guides and are only suitable for limited travel.

They offer:

- high precise motion;
- low friction resistance;
- zero play;
- very little mounting space.

These items can be ordered as set components (picture 1) to be assembled by the customer in their system but can also be supplied as ready-to-install units (picture 2) including mounting and fixing holes.

These systems are special designed for short travels.

Applications of use:

- Scanning and measuring devices;
- Micro assembly automation;
- Handling equipment.



picture 1



picture 2

2. Linear motion for unendless travel

The second group enable unendless motion using profiled rails on which linear block with recirculating elements balls/rollers can be moved. The stroke is in fact limited by the rail length. In this group there are many styles available to suit every application. For good lubrication the minimum travel should be at least 3x the block length.

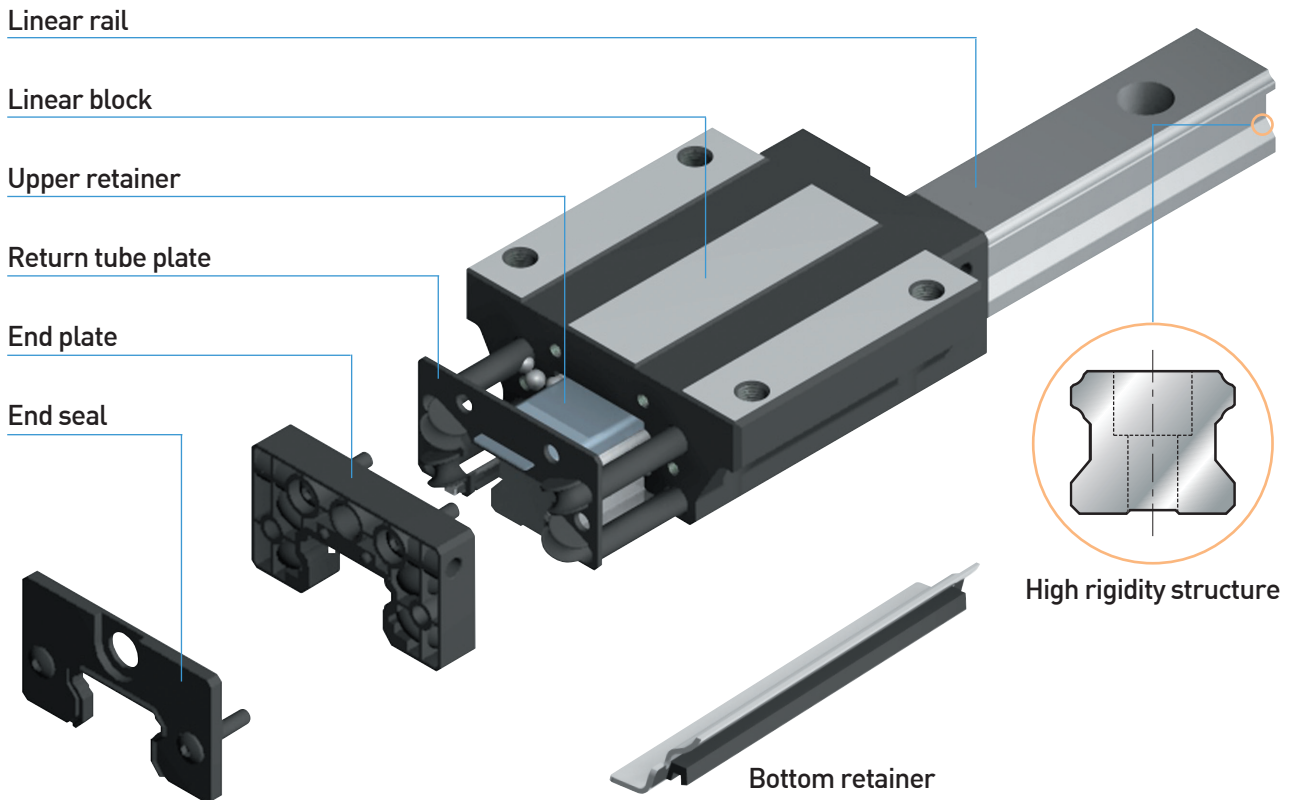
To select the right linear bearing please consult Stamhuis Lineairtechniek B.V.

Applications of use is depending on bearing type:

- Machine tool (light & heavy);
- Pick & Place, Handling devices;
- Robottracks;
- Packaging machines;
- Printers.

This catalog include the profile guide and linear blocks including recirculating balls.

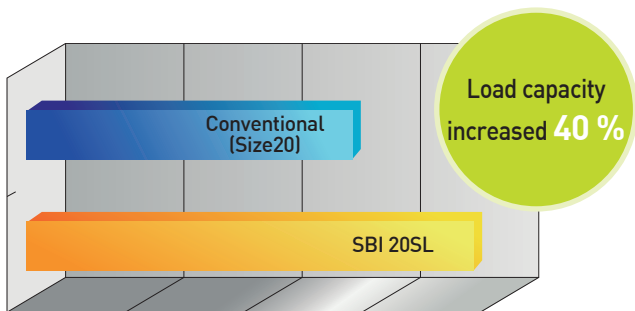
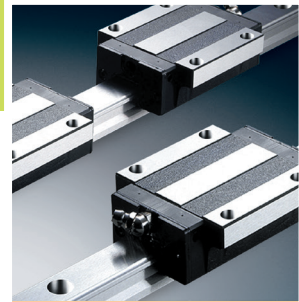
The structure of SBI



<p>End seal</p> <p>New double lip structure which improves resistance to dust and particle contamination.</p>	<p>End plate</p> <p>Manufactured with a new high rigidity engineered plastic. Designed to withstand the highest of unplanned impact loads without breaking.</p>	<p>Retainer</p> <p>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.</p>
<p>Return tube plate</p> <p>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.</p>	<p>Linear block</p> <p>Highly rigid structure with a larger recirculation radius for the smooth movement and longer block length for higher load capacity.</p>	<p>Linear rail</p> <p>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.</p>

High load performance

Improved load capacity from the longer block length and changed radius of curvature



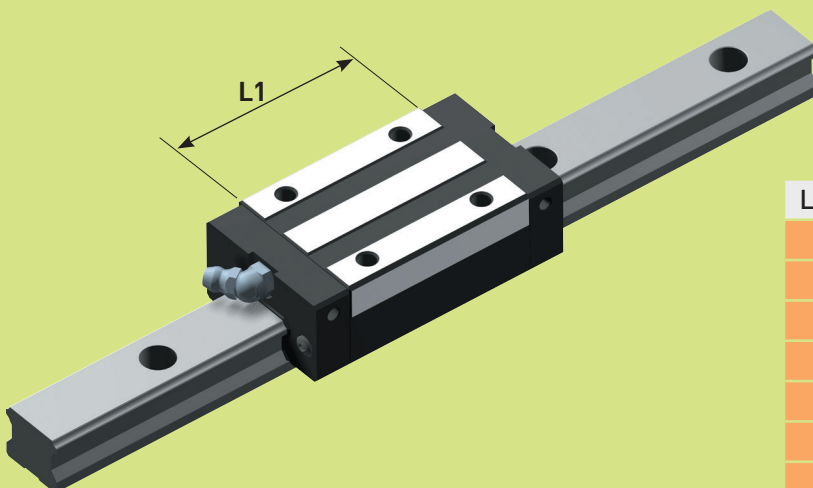
Load capacity increased
40%

(Unit: kN)

	Conventional (size 15)	SBI 15	Conventional (size 20)	SBI 20	Conventional (size 25)	SBI 25
C	8.3	14.1	14.2	22.2	20.9	31.5
Co	13.4	24.1	25	38.2	39.2	52.1

• C: Basic dynamic load rating • Co: Basic static load rating

L1 is 20% greater than with the CONVENTIONAL block.
Greater length = more balls in contact = greater load capacity.



(Unit: mm)

L1 length	Conventional	SBI
15SL	38,8	45,2
20SL	50,8	56,8
25SL	59,5	70
30SL	70,4	79,6
35SL	80,4	94,6
45SL	98	108
55SL	118	131
65SL	147	170,4

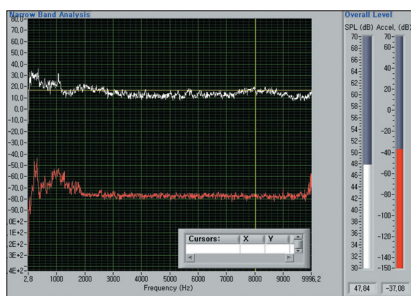
Low noise & high speed

How to test noise level

- [1] Linear rail system is tested at the various speeds, in a semi-anechoic chamber
- [2] Evaluate average value after repeat-operation

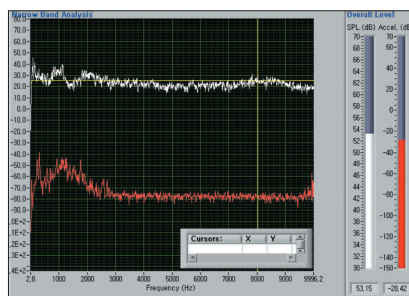
- [3] Test condition :
 - Low speed : 420 mm/sec
 - Medium speed : 840 mm/sec
 - High speed : 1250 mm/sec
 - Tested items : **SBI25 FLL**
 - Grease applied

Noise level test



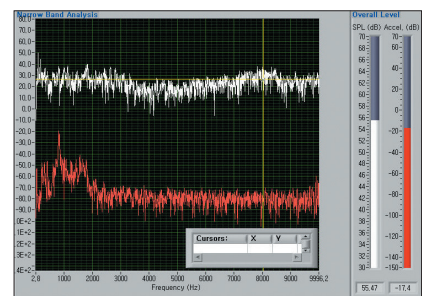
Low speed [420mm/sec]

- Average 47.8 dB



Medium speed [840mm/sec]

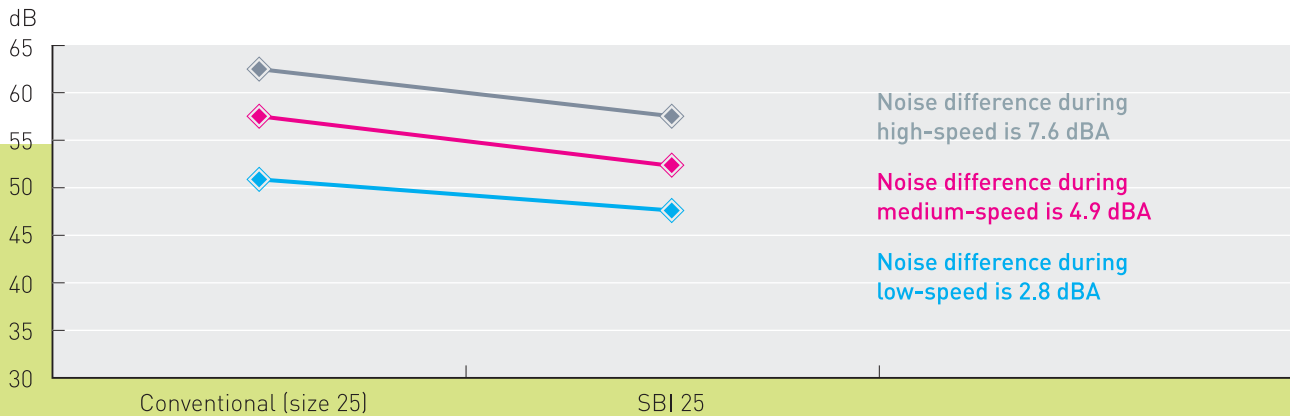
- Average 52.9 dB



High speed [1250mm/sec]

- Average 55.2 dB

Comparison data



Test speed	Conventional (size 25) [SBC Standard]	SBI 25 [SBC New standard]
Average at low speed	50.6	47.8
Average at medium speed	57.8	52.9
Average at high speed	62.8	55.2

High speed

The maximum operation velocity is **5 meter per second**.

Ordering example

Coding for interchangeable block

SBI20 FL - N - MF - ZZ - K1 - R - HT

[1] [2] [3] [4] [5] [6] [7] [8]

- [1] Model: **SBI15, SBI20, SBI25, SBI30, SBI35, SBI45, SBI55, SBI65**
- [2] Block type: **FL, FLL, SL, SLL, HL, HLS, HLL, CL, CLS, CLL, FV, SV**
- [3] Grease fitting position:
None symbol (Front grease fitting)
N (Side grease fitting)
- [4] Container : **No symbol** (Standard), **MF** (Self lubricant)
- [5] Seal : **No symbol** (Standard), **DD, ZZ, KK**
- [6] Preload : **K0** (None)
K1 (Normal preload, **preferred type**)
K2 (Medium preload)
K3 (Heavy preload)
- [7] Surface treatment: **No symbol** (Standard), **R** (Raydent), **FR** (Fluorocarbon Raydent), **C** (Chrome plating)
- [8] High temperature end plate: **No symbol** (Standard), **HT** (High temperature end plate)

- **K3 preload is not available for SBI 15 model**

Coding for interchangeable rail

SBI20 - 1000L - B - R - G1/G2

[1] [2] [3] [4] [5]

- [1] Model: **SBI15, SBI20, SBI25, SBI30, SBI35, SBI45, SBI55, SBI65**
- [2] Rail length: **SBI15** Max. length **3000** (mm), other models Max. length **4000** (mm)
- [3] Bottom mounting rail: **No symbol** (Standard),
B (Bottom mounting rail)
- [4] Surface treatment: **No symbol** (Standard), **R** (Raydent), **FR** (Fluorocarbon Raydent), **C** (Chrome plating)
- [5] Pitch firts/last hole: Length (mm), expl. **20/20** (For minimum size see page 9-20)

Ordering example

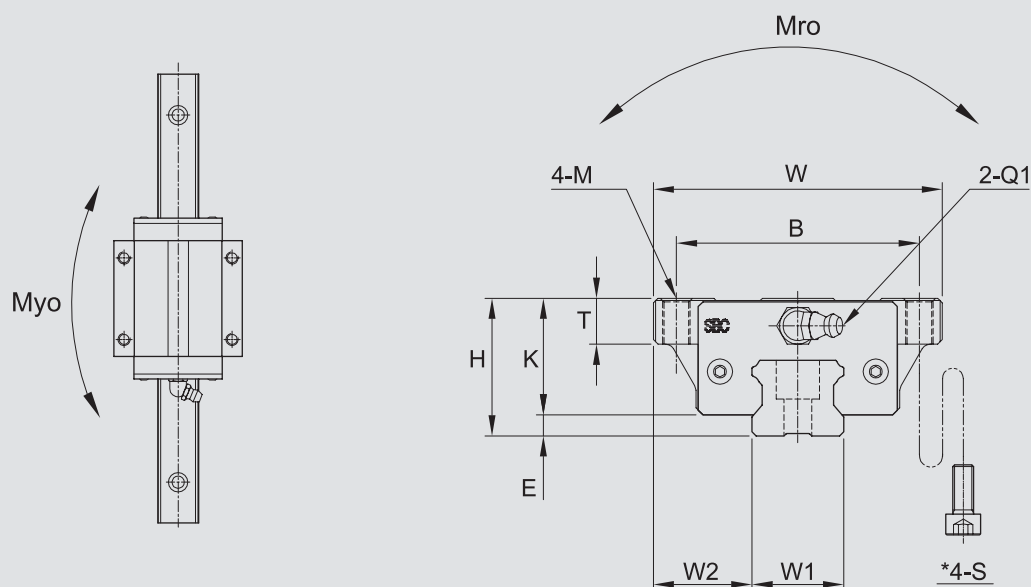
Coding for assembled rail and block

SBI20 FL - N - MF - ZZ - 2 - K1 - HT - 800 - H - R - B - G1/G2 - II

[1] [2] [3] [4] [5] [6] [7] [8] [9] [10] [11] [12] [13] [14]

- [1] Model: **SBI15, SBI20, SBI25, SBI30, SBI35, SBI45, SBI55, SBI65**
- [2] Block type: **FL, FLL, SL, SLL, HL, HLS, HLL, CL, CLS, CLL, FV, SV**
- [3] Grease fitting position: **None** (Front)
N (Side)
- [4] Container: **No symbol** (No container, standard)
MF (Self lubricant container)
- [5] Seal: **No symbol** (End seal)
DD
ZZ
KK
- [6] Block quantity on rail
- [7] Preload: **K0** (None)
K1(Normal preload, **preferred type**)
K2 (Medium preload)
K3 (Heavy preload)
- [8] High temperature end plate: **No symbol** (Standard), **HT** (High temperature end plate)
- [9] Rail length: expl. **800** (mm)
- [10] Accuracy: **N** (Normal), **H** (High, **preferred type**), **P** (Precision)
- [11] Surface treatment: **No symbol** (Standard), **R** (Raydent), **FR** (Fluorcarbon Raydent), **C** (Chrome plating)
- [12] Bottom mounting rail: **No symbol** (Standard), **B** (Bottom mounting rail)
- [13] Pitch firts/last hole: Lenght (mm), exmp: **20/20** (For minimum size see page 9-20)
- [14] Rail: number of rails per axis, **No symbol** (1Row)
II (2Rows)
III (3Rows)
IV (4Rows), etc.

SBI - FL / FLL Type



[unit: mm]

Model	Mounting dimensions				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 FL	24	47	63.8	3	38	30	M5	M4	45.2	9	21	4.5	5.5	3.8	3.4	M4x0.7	Ø3.5
SBI15 FLL	24	47	79.4	3	38	30	M5	M4	60.8	9	21	4.5	5.5	3.8	3.4	M4x0.7	Ø3.5
SBI20 FL	30	63	78.8	4.6	53	40	M6	M5	56.8	12	25.4	6	12	5.8	5	M6x0.75	Ø3.5
SBI20 FLL	30	63	96.4	4.6	53	40	M6	M5	74.4	12	25.4	6	12	5.8	5	M6x0.75	Ø3.5
SBI25 FL	36	70	92	5.5	57	45	M8	M6	70	14	30.5	6	12	5	5	M6x0.75	Ø3.5
SBI25 FLL	36	70	108	5.5	57	45	M8	M6	86	14	30.5	6	12	5	5	M6x0.75	Ø3.5
SBI30 FL	42	90	107.6	7	72	52	M10	M8	79.6	15.5	35	8.5	12	7.8	5	M6x0.75	Ø5.7
SBI30 FLL	42	90	131.6	7	72	52	M10	M8	103.6	15.5	35	8.5	12	7.8	5	M6x0.75	Ø5.7
SBI35 FL	48	100	124.6	7.5	82	62	M10	M8	94.6	15	40.5	8	12	8	6	M6x0.75	Ø5.7
SBI35 FLL	48	100	152.6	7.5	82	62	M10	M8	122.6	15	40.5	8	12	8	6	M6x0.75	Ø5.7
SBI45 FL	60	120	142	9	100	80	M12	M10	108	18	51	10.5	13.5	9.3	6.5	PT1/8	Ø5.7
SBI45 FLL	60	120	174	9	100	80	M12	M10	140	18	51	10.5	13.5	9.3	6.5	PT1/8	Ø5.7
SBI55 FL	70	140	172.4	12	116	95	M14	M12	131	22	58	12	13	12	8	PT1/8	Ø8.7
SBI55 FLL	70	140	211.8	12	116	95	M14	M12	170.4	22	58	12	13	12	8	PT1/8	Ø8.7
SBI65 FL	90	170	219.8	19	142	110	M16	M14	170.4	26	71	14	13	14	10	PT1/8	Ø8.7
SBI65 FLL	90	170	272.2	19	142	110	M16	M14	222.8	26	71	14	13	14	10	PT1/8	Ø8.7

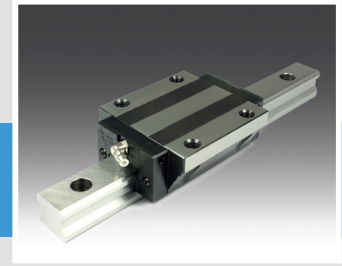
*1 : S: Bolt for bottom mounting type of block.

*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 built it by ourselves.

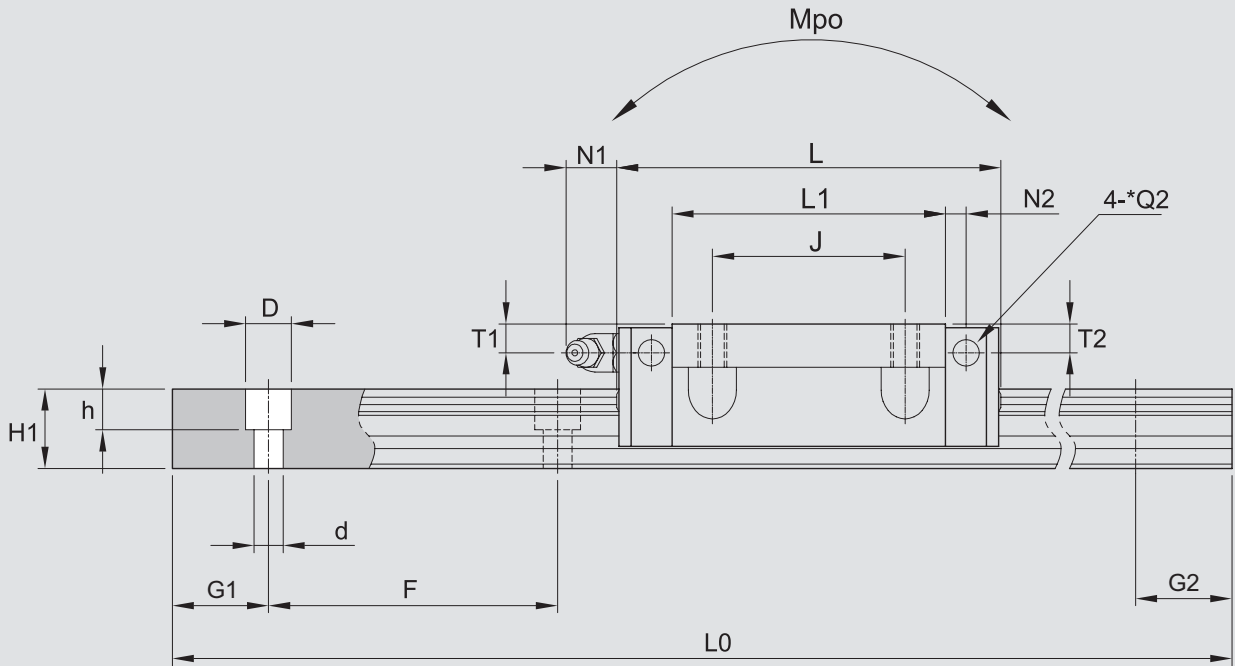
*3 : C (basic dynamic load rating), Co (Basic static load rating).

CAD 2D/3D
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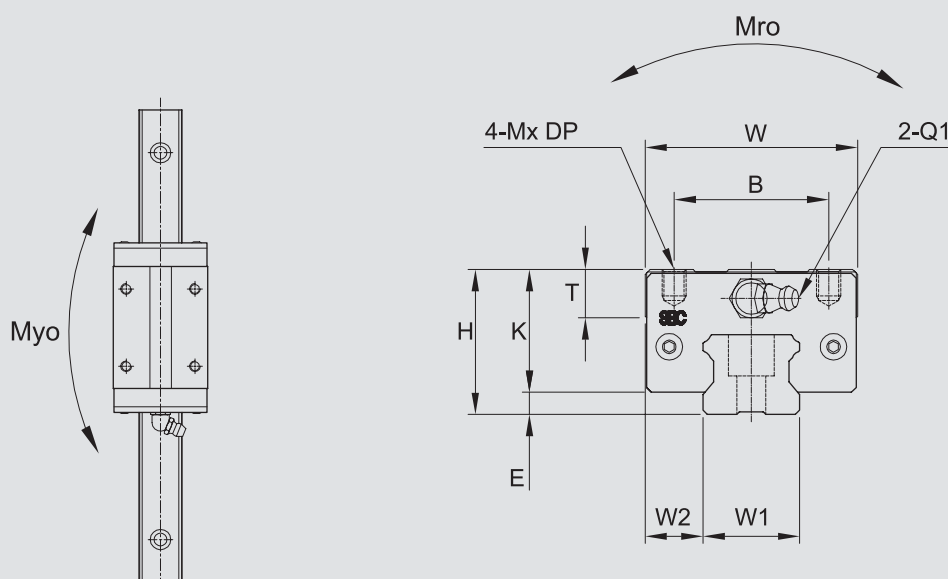
Dimensions



[unit: mm]

Rail dimensions									Basic load rating [kN]		Permissible static moment [kN•m]			Mass	
W1	W2	H1	F	Bolt hole			G1/G2 min.	L0	*C	*Co	Mro	Mpo	Myo	Block [kg]	Rail [kg/m]
				d	D	h									
15	16	13	60	4.5	7.5	5.5	6	3000	14.1	24.1	0.16	0.17	0.17	0.19	1.3
15	16	13	60	4.5	7.5	5.5	6	3000	17.1	31.7	0.21	0.29	0.29	0.26	1.3
20	21.5	16.5	60	6	9.5	8.5	7	4000	22.2	38.2	0.36	0.33	0.33	0.41	2.2
20	21.5	16.5	60	6	9.5	8.5	7	4000	27.9	50	0.47	0.56	0.56	0.54	2.2
23	23.5	20	60	7	11	9	8	4000	31.5	52.1	0.56	0.56	0.56	0.69	3
23	23.5	20	60	7	11	9	8	4000	36.7	64.4	0.69	0.84	0.84	0.85	3
28	31	23	80	9	14	12	9	4000	42.8	65.4	0.85	0.77	0.77	1.04	4.25
28	31	23	80	9	14	12	9	4000	51.3	84.7	1.10	1.30	1.30	1.37	4.25
34	33	26	80	9	14	12	9	4000	59.5	89.1	1.42	1.28	1.28	1.56	6.02
34	33	26	80	9	14	12	9	4000	71.3	115.3	1.83	2.12	2.12	2.04	6.02
45	37.5	32	105	14	20	17	12	4000	79.2	116.3	2.48	1.90	1.90	2.80	9.77
45	37.5	32	105	14	20	17	12	4000	94.8	150.5	3.21	3.14	3.14	3.69	9.77
53	43.5	38	120	16	23	20	14	4000	127.3	181.8	4.81	2.97	2.97	4.42	13.72
53	43.5	38	120	16	23	20	14	4000	147.9	224.5	5.95	4.78	4.78	5.82	13.72
63	53.5	53	150	18	26	22	15	4000	188.3	261.7	8.24	5.57	5.57	9.1	23.17
63	53.5	53	150	18	26	22	15	4000	232.5	354.1	11.15	9.86	9.86	11.98	23.17

SBI – SL / SLL Type



[unit: mm]

Model	Mounting dimensions				Block dimensions													
					Mounting tap hole								Grease fitting					
	H	W	L	E	B	J	M	DP	L1	T±1	K	T1	N1	T2	N2	Q1	*1Q2	
SBI15 SL	28	34	63.8	3	26	26	M4	5	45.2	10	25	8.5	5.5	7.8	3.4	M4x0.7	Ø3.5	
SBI15 SLL	28	34	79.4	3	26	34	M4	5	60.8	10	25	8.5	5.5	7.8	3.4	M4x0.7	Ø3.5	
SBI20 SL	30	44	78.8	4.6	32	36	M5	8	56.8	9.8	25.4	6	11.7	5.8	5	M6x0.75	Ø3.5	
SBI20 SLL	30	44	96.4	4.6	32	50	M5	8	74.4	9.8	25.4	6	11.7	5.8	5	M6x0.75	Ø3.5	
SBI25 SL	40	48	92	5.5	35	35	M6	8	70	16	34.5	10	11.7	9.6	5	M6x0.75	Ø3.5	
SBI25 SLL	40	48	108	5.5	35	50	M6	8	86	16	34.5	10	11.7	9.6	5	M6x0.75	Ø3.5	
SBI30 SL	45	60	107.6	7	40	40	M8	10	79.6	12	38	11.5	11.7	10.8	5	M6x0.75	Ø5.7	
SBI30 SLL	45	60	131.6	7	40	60	M8	10	103.6	12	38	11.5	11.7	10.8	5	M6x0.75	Ø5.7	
SBI35 SL	55	70	124.6	7.5	50	50	M8	10	94.6	15	47.5	15	11.7	15	6	M6x0.75	Ø5.7	
SBI35 SLL	55	70	152.6	7.5	50	72	M8	10	122.6	15	47.5	15	11.7	15	6	M6x0.75	Ø5.7	
SBI45 SL	70	86	142	9	60	60	M10	13	108	17	61	20.5	13.5	19.3	6.5	PT1/8	Ø5.7	
SBI45 SLL	70	86	174	9	60	80	M10	13	140	17	61	20.5	13.5	19.3	6.5	PT1/8	Ø5.7	
SBI55 SL	80	100	172.4	12	75	75	M12	18	131	21	68	22	13	22	8	PT1/8	Ø8.7	
SBI55 SLL	80	100	211.8	12	75	95	M12	18	170.4	21	68	22	13	22	8	PT1/8	Ø8.7	
SBI65 SL	90	126	219.8	19	76	70	M16	16	170.4	26	71	14	13	14	10	PT1/8	Ø8.7	
SBI65 SLL	90	126	272.2	19	76	120	M16	16	222.8	26	71	14	13	14	10	PT1/8	Ø8.7	

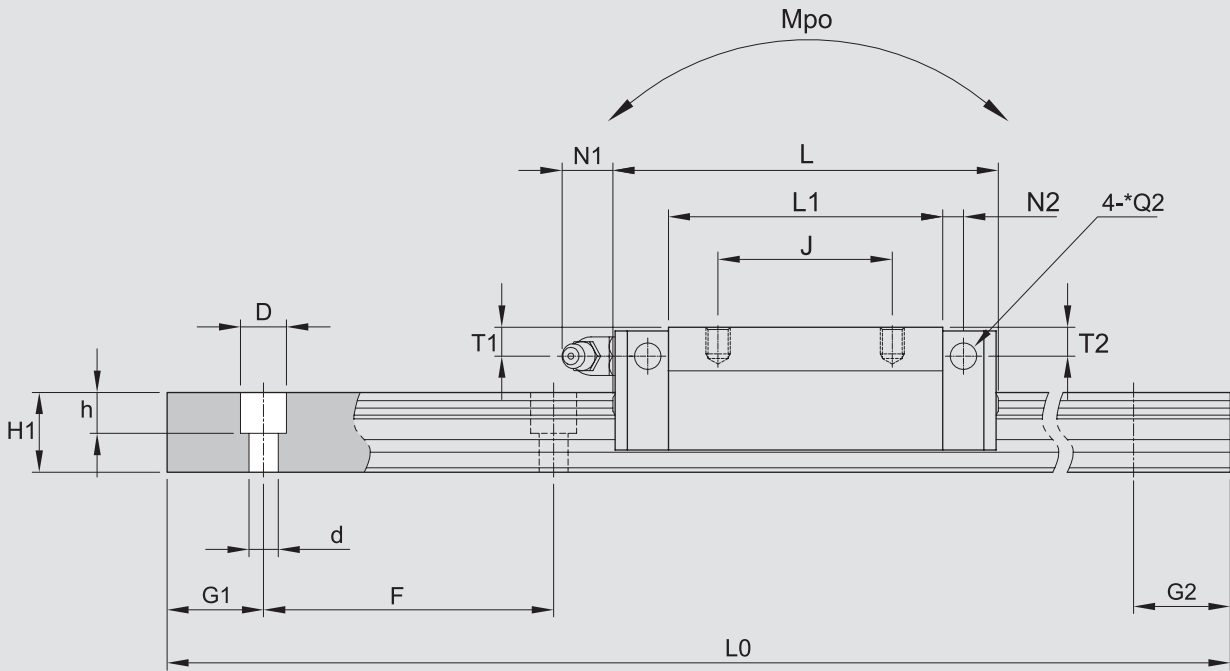
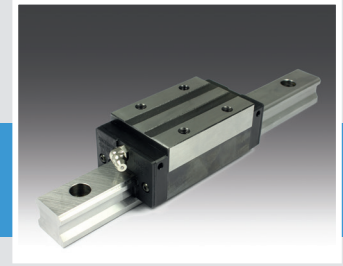
*₁ : Q2: The hole of side grease nipple is not made to prevent a foreign substance from going into inside.
When you order the side grease nipple, we built it by ourselves.

*₂ : C [basic dynamic load rating], Co [Basic static load rating].

CAD 2D/3D
AVAILABLE

PREFERRED
TYPE

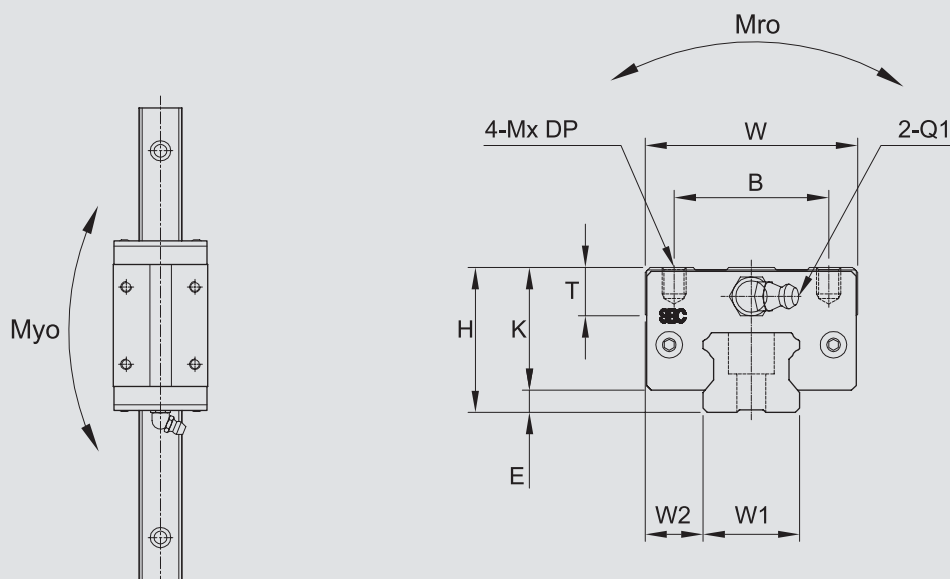
Dimensions



[unit: mm]

Rail dimensions									Basic load rating [kN]		Permissible static moment [kN•m]			Mass	
W1	W2	H1	F	Bolt hole			G1/G2 min.	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	6	3000	14.1	24.1	0.16	0.17	0.17	0.19	1.3
15	9.5	13	60	4.5	7.5	5.5	6	3000	17.1	31.7	0.21	0.29	0.29	0.26	1.3
20	12	16.5	60	6	9.5	8.5	7	4000	22.2	38.2	0.36	0.33	0.33	0.41	2.2
20	12	16.5	60	6	9.5	8.5	7	4000	27.9	50	0.47	0.56	0.56	0.54	2.2
23	12.5	20	60	7	11	9	8	4000	31.5	52.1	0.56	0.56	0.56	0.69	3
23	12.5	20	60	7	11	9	8	4000	36.7	64.4	0.69	0.84	0.84	0.85	3
28	16	23	80	9	14	12	9	4000	42.8	65.4	0.85	0.77	0.77	1.04	4.25
28	16	23	80	9	14	12	9	4000	51.3	84.7	1.10	1.30	1.30	1.37	4.25
34	18	26	80	9	14	12	9	4000	59.5	89.1	1.42	1.28	1.28	1.56	6.02
34	18	26	80	9	14	12	9	4000	71.3	115.3	1.83	2.12	2.12	2.04	6.02
45	20.5	32	105	14	20	17	12	4000	79.2	116.3	2.48	1.90	1.90	2.80	9.77
45	20.5	32	105	14	20	17	12	4000	94.8	150.5	3.21	3.14	3.14	3.69	9.77
53	23.5	38	120	16	23	20	14	4000	127.3	181.8	4.81	2.97	2.97	4.42	13.72
53	23.5	38	120	16	23	20	14	4000	147.9	224.5	5.95	4.78	4.78	5.82	13.72
63	31.5	53	150	18	26	22	15	4000	188.3	261.7	8.24	5.57	5.57	9.1	23.17
63	31.5	53	150	18	26	22	15	4000	232.5	354.1	11.15	9.86	9.86	11.98	23.17

SBI – HL / HLS / HLL Type



[unit: mm]

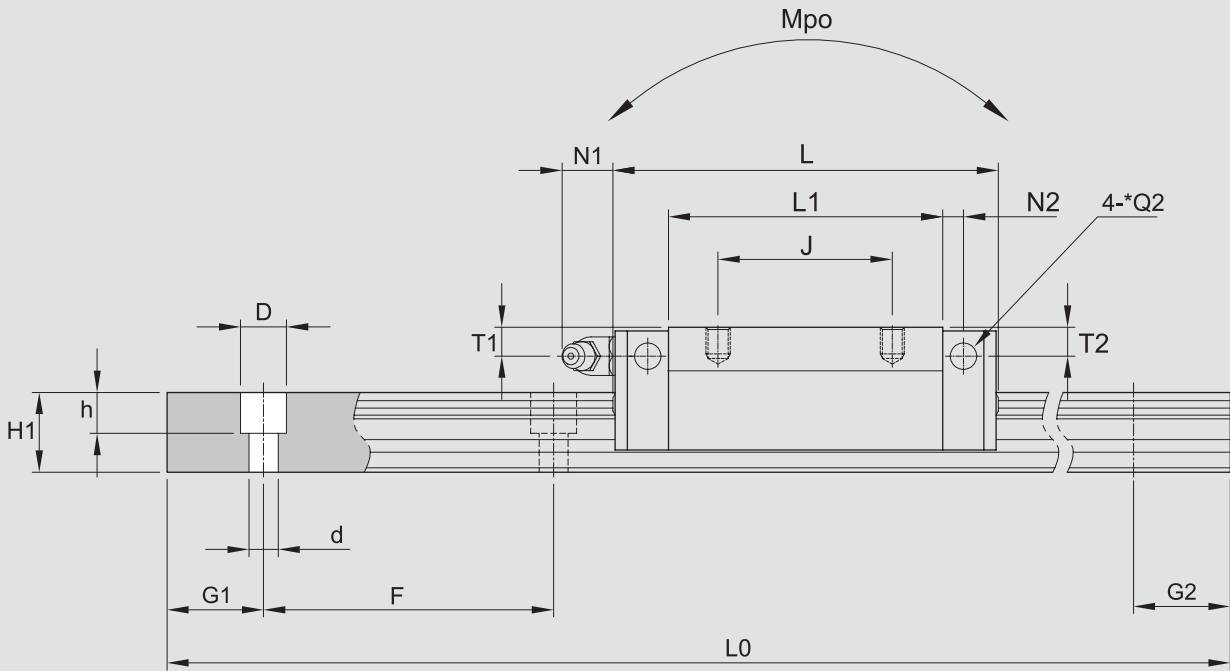
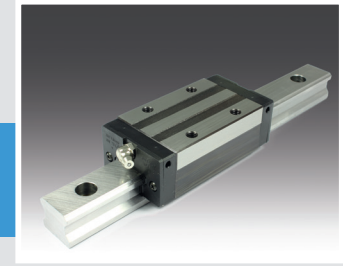
Model	Mounting dimensions				Block dimensions												
	H	W	L	E	Mounting tap hole				L1	T±1	K	Grease fitting					
					B	J	M	DP				T1	N1	T2	N2	Q1	*1Q2
SBI15 HL	24	34	63.8	3	26	26	M4	4	45.2	6	21	4.5	5.5	3.8	3.8	M4x0.7	Ø3.5
SBI15 HLS	24	34	56.8	3	26	26	M4	4	38.2	6	21	4.5	5.5	3.8	3.8	M4x0.7	Ø3.5
SBI15 HLL	24	34	79.4	3	26	34	M4	4	60.8	6	21	4.5	5.5	3.8	3.8	M4x0.7	Ø3.5
SBI25 HL	36	48	92	5.5	35	35	M6	6	70	12	30.5	6	11.7	5.6	5.5	M6x0.75	Ø3.5
SBI25 HLL	36	48	108	5.5	35	50	M6	6	86	12	30.5	6	11.7	5.6	5.5	M6x0.75	Ø3.5
SBI30 HL	42	60	107.6	7	40	40	M8	8	79.6	12	35	8.5	11.7	7.8	5	M6x0.75	Ø5.7
SBI30 HLL	42	60	131.6	7	40	60	M8	8	103.6	12	35	8.5	11.7	7.8	5	M6x0.75	Ø5.7
SBI35 HL	48	70	124.6	7.5	50	50	M8	8	94.6	15	40.5	8	11.7	8	6	M6x0.75	Ø5.7
SBI35 HLL	48	70	152.6	7.5	50	72	M8	8	122.6	15	40.5	8	11.7	8	6	M6x0.75	Ø5.7
SBI45 HL	60	86	142	9	60	60	M10	10	108	17	51	10.5	13.5	9.3	6.5	PT1/8	Ø5.7
SBI45 HLL	60	86	174	9	60	80	M10	10	140	17	51	10.5	13.5	9.3	6.5	PT1/8	Ø5.7
SBI55 HL	70	100	172.4	12	75	75	M12	12	131	21	58	12	13	12	8	PT1/8	Ø8.7
SBI55 HLL	70	100	211.8	12	75	95	M12	12	170.4	21	58	12	13	12	8	PT1/8	Ø8.7

*₁ : 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 built it by ourselves.

*₂ : C [basic dynamic load rating], Co [Basic static load rating].



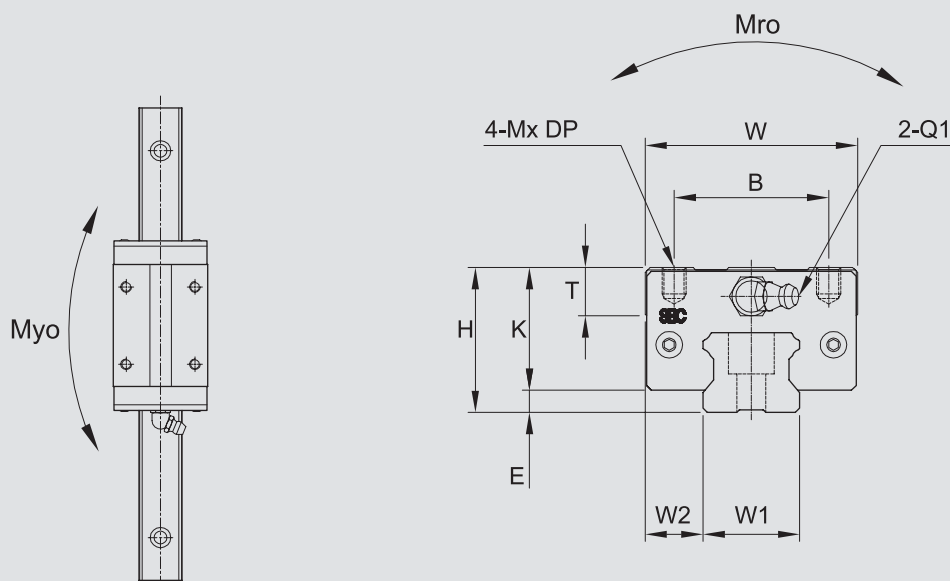
Dimensions



[unit: mm]

W1	W2	H1	F	Rail dimensions			G1/G2 min.	L0	Basic load rating [kN]		Permissible static moment [kN•m]			Mass	
				Bolt hole					* ₂ C	* ₂ C ₀	M _{ro}	M _{po}	M _{yo}	Block [kg]	Rail [kg/m]
				d	D	h									
15	9.5	13	60	4.5	7.5	5.5	6	3000	14.1	24.1	0.16	0.17	0.17	0.19	1.3
15	9.5	13	60	4.5	7.5	5.5	6	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	6	3000	17.1	31.7	0.21	0.29	0.29	0.26	1.3
23	12.5	20	60	7	11	9	8	4000	31.5	52.1	0.56	0.56	0.56	0.69	3
23	12.5	20	60	7	11	9	8	4000	36.7	64.4	0.69	0.84	0.84	0.85	3
28	16	23	80	9	14	12	9	4000	42.8	65.4	0.85	0.77	0.77	1.04	4.25
28	16	23	80	9	14	12	9	4000	51.3	84.7	1.10	1.30	1.30	1.37	4.25
34	18	26	80	9	14	12	9	4000	59.5	89.1	1.42	1.28	1.28	1.56	6.02
34	18	26	80	9	14	12	9	4000	71.3	115.3	1.83	2.12	2.12	2.04	6.02
45	20	32	105	14	20	17	12	4000	79.2	116.3	2.48	1.90	1.90	2.80	9.77
45	20	32	105	14	20	17	12	4000	94.8	150.5	3.21	3.14	3.14	3.69	9.77
53	23.5	38	120	16	23	20	14	4000	127.3	181.8	4.81	2.97	2.97	4.42	13.72
53	23.5	38	120	16	23	20	14	4000	147.9	224.5	5.95	4.78	4.78	5.82	13.72

SBI – CL / CLS / CLL Type



[unit: mm]

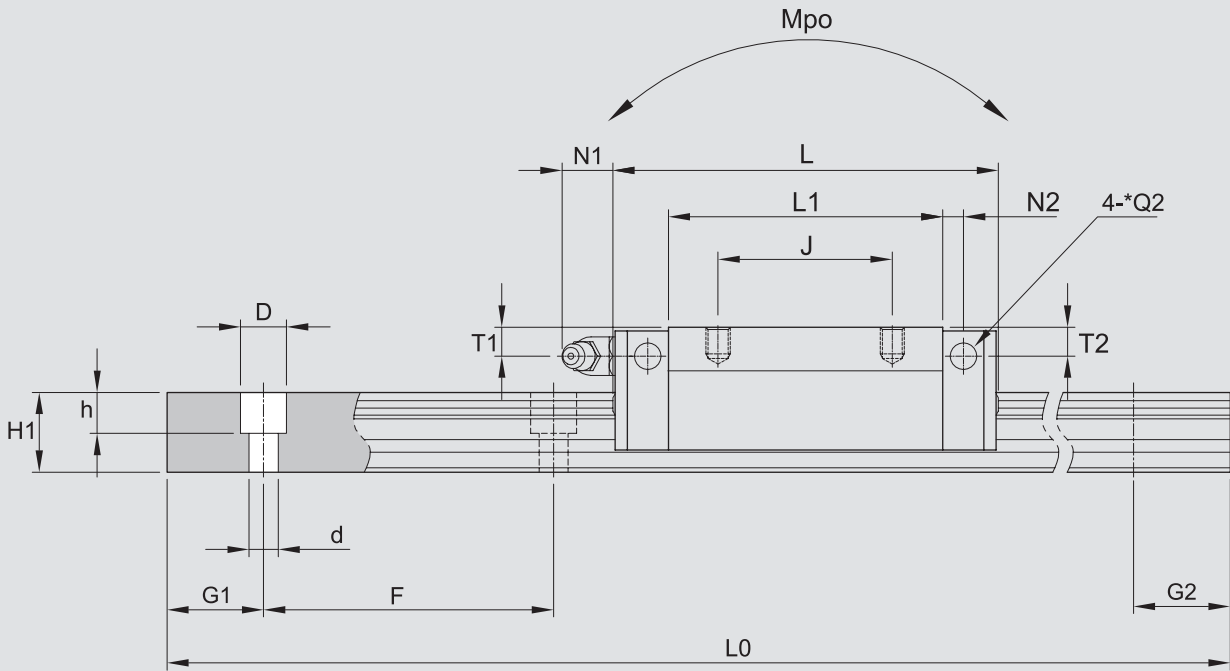
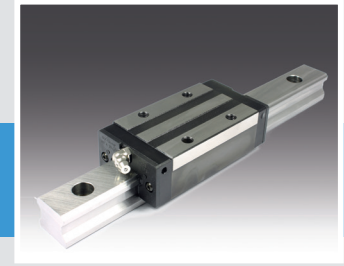
Model	Mounting dimensions				Block dimensions												
	H	W	L	E	Mounting tap hole				L1	T±1	K	Grease fitting					
					B	J	M	DP				T1	N1	T2	N2	Q1	*1Q2
SBI20 CL	28	44	78.8	4.6	32	32	M5	5	56.8	7.8	23.4	4.8	12	4	5	M6x0.75	Ø3.5
SBI20 CLS	28	42	65.5	4.6	32	32	M5	5	43.2	7.8	23.4	4.8	12	4.3	5	M6x0.75	Ø3.5
SBI20 CLL	28	44	96.4	4.6	32	50	M5	5	74.4	7.8	23.4	4.8	12	4	5	M6x0.75	Ø3.5
SBI25 CL	33	48	92	5.5	35	35	M6	6	70	9	27.5	5.4	12	5.4	5	M6x0.75	Ø3.5
SBI25 CLL	33	48	108	5.5	35	50	M6	6	86	9	27.5	5.4	12	5.4	5	M6x0.75	Ø3.5

*₁ : 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 built it by ourselves.

*₂ : C [basic dynamic load rating], Co [Basic static load rating].



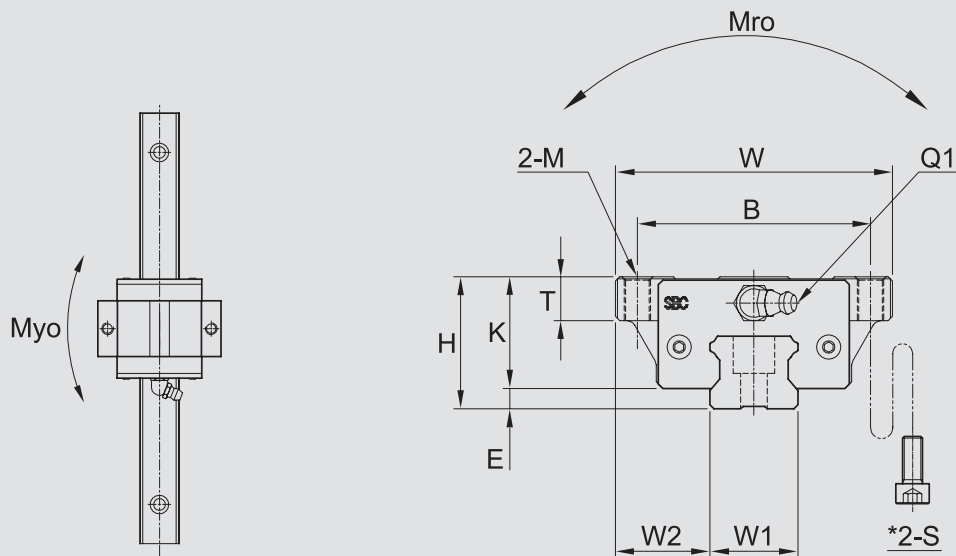
Dimensions



[unit: mm]

Rail dimensions									Basic load rating [kN]		Permissible static moment [kN•m]			Mass	
W1	W2	H1	F	Bolt hole			G1/G2 min.	L0	* ₂ C	* ₂ Co	M _{ro}	M _{po}	M _{yo}	Block [kg]	Rail [kg/m]
				d	D	h									
20	12	16.5	60	6	9.5	8.5	7	4000	22.2	38.2	0.36	0.33	0.33	0.39	2.2
20	11	16.5	60	6	9.5	8.5	7	4000	19.1	27	0.27	0.15	0.15	0.23	2.2
20	12	16.5	60	6	9.5	8.5	7	4000	27.9	50	0.47	0.56	0.56	0.52	2.2
23	12.5	20	60	7	11	9	8	4000	31.5	52.1	0.56	0.56	0.56	0.66	3
23	12.5	20	60	7	11	9	8	4000	36.7	64.4	0.69	0.84	0.84	0.82	3

SBI – FV Type



[unit: mm]

Model	Mounting dimensions				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	8.8	21	4.5	5.5	3.8	3.4	M4x0.7	Ø3.5
SBI20 FV	28	63	49.1	4.5	53	M6	M5	27.1	8	23.4	4.8	12	4	5	M6x0.75	Ø3.5
SBI25 FV	33	70	52.6	5.5	57	M8	M6	30.6	9	27.5	5.4	12	5.4	5	M6x0.75	Ø3.5

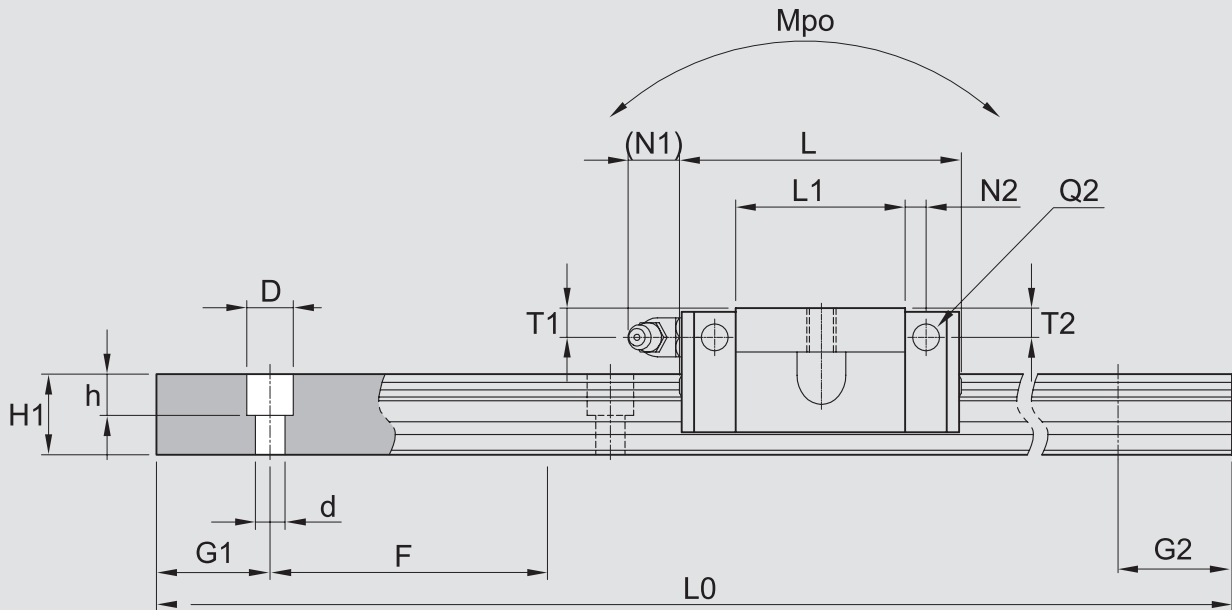
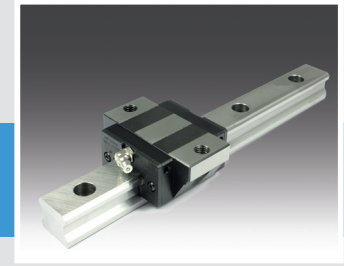
*₁ : S: Bolt for bottom mounting type of block.

*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 built it by ourselves.

*₃ : C (basic dynamic load rating), Co (Basic static load rating).



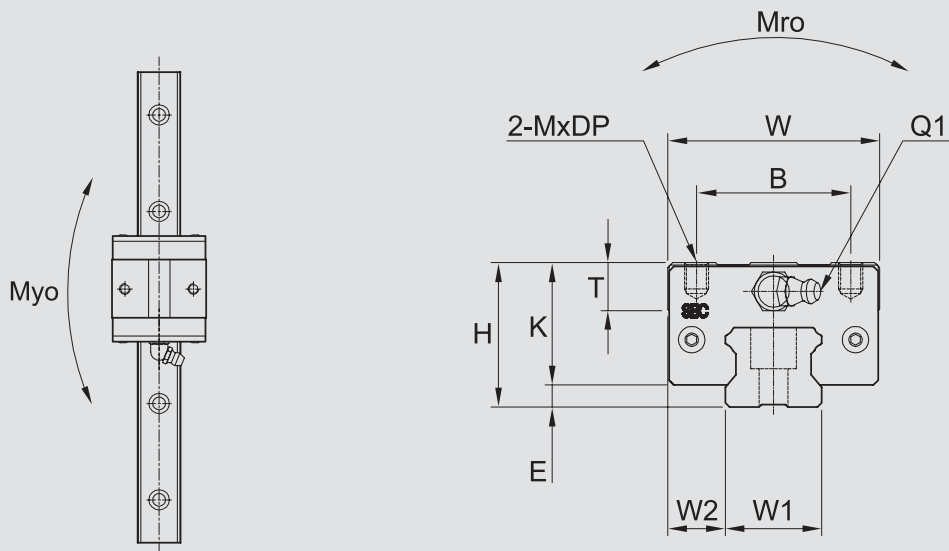
Dimensions



[unit: mm]

Rail dimensions									Basic load rating [kN]		Permissible static moment [kN•m]			Mass	
W1	W2	H1	F	Bolt hole			G1/G2 min.	L0	*C	*Co	Mro	Mpo	Myo	Block [kg]	Rail [kg/m]
				d	D	h									
15	16	13	60	4.5	7.5	5.5	6	3000	5.8	12.8	0.04	0.03	0.03	0.10	1.3
20	21.5	16.5	60	6	9.5	8.5	7	4000	9.4	20.2	0.12	0.10	0.10	0.24	2.2
23	23.5	20	60	7	11	9	8	4000	12.4	26.1	0.19	0.17	0.17	0.37	3

SBI – SV Type



[unit: mm]

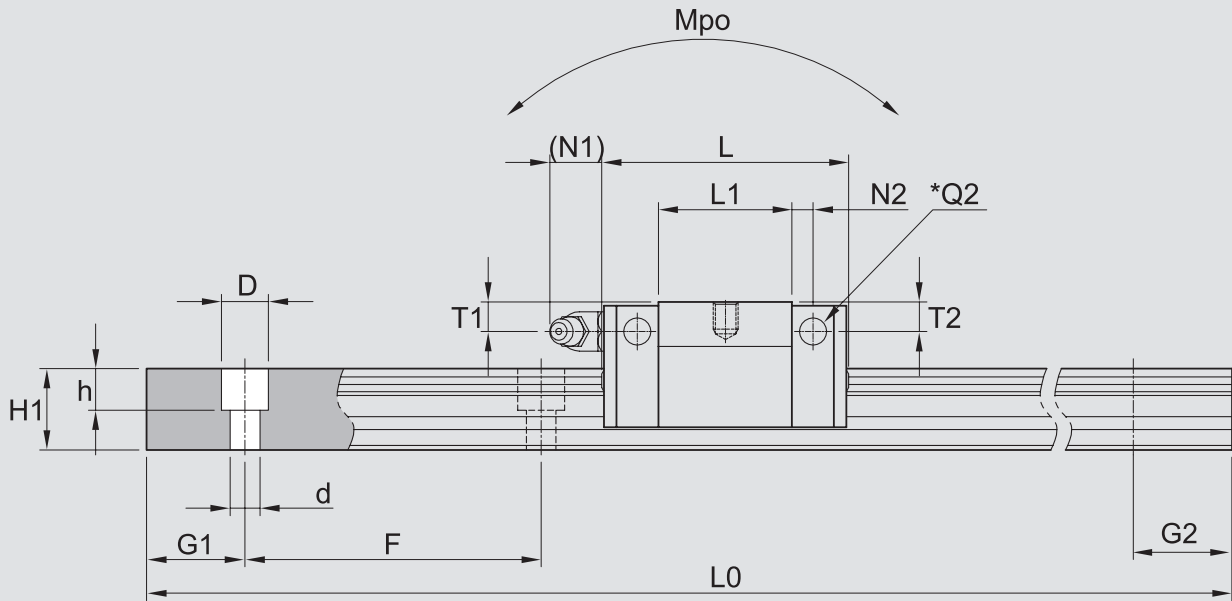
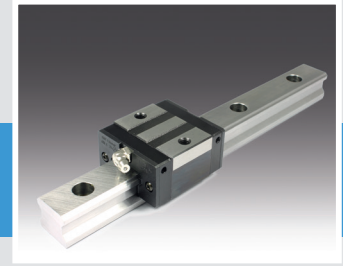
Model	Mounting dimensions				Block dimensions												
	H	W	L	E	Mounting tap hole				L1	T±1	K	Grease fitting					
					B	M	DP	T1				N1	T2	N2	Q1	*1Q2	
SBI15 SV	24	34	39.9	3	26	M4	4	21.3	6	21	4.5	5.5	3.8	3.4	M4x0.7	Ø3.5	
SBI20 SV	28	44	49.1	4.6	32	M5	5	27.1	7.8	23.4	4.8	12	4	5	M6x0.75	Ø3.5	
SBI25 SV	33	48	52.6	5.5	35	M6	6	30.6	9	27.5	5.4	12	5.4	5	M6x0.75	Ø3.5	

*₁ : 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 built it by ourselves.

*₂ : C [basic dynamic load rating], Co [Basic static load rating].



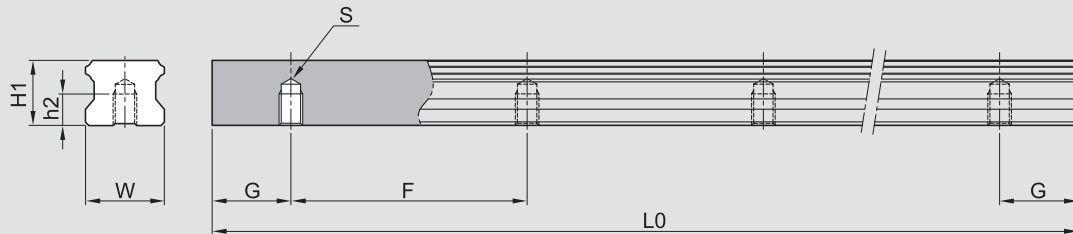
Dimensions



[unit: mm]

Rail dimensions									Basic load rating [kN]		Permissible static moment [kN•m]			Mass	
W1	W2	H1	F	Bolt hole			G1/G2	L0	*2C	*2Co	Mro	Mpo	Myo	Block [kg]	Rail [kg]
				d	D	h	min.								
15	9.5	13	60	4.5	7.5	5.5	6	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	7	4000	9.4	20.2	0.12	0.10	0.10	0.24	2.2
23	12.5	20	60	7	11	9	8	4000	12.4	26.1	0.19	0.17	0.17	0.37	3

SBI - Bottom mounting rail



[unit: mm]

Model number	W1	H1	S	h2	G *2 min.	F	L0 *1 (Max length)	Weight (kg/m)
SBI 15-B	15	13	M5	8	20	60	3000	1.39
SBI 20-B	20	16.5	M6	9	20	60	4000	2.37
SBI 25-B	23	20	M6	9	20	60	4000	3.26
SBI 30-B	28	23	M8	12	20	80	4000	4.63
SBI 35-B	34	26	M8	12	20	80	4000	6.45
SBI 45-B	45	32	M12	18	22.5	105	4000	10.49

For ordering see page 7/8

*1 if the maximum length exceeds this size, please contact us, for joined rails.

*2 info min. G value

RAYDENT coating for rail and carriage

Three types of surface treatment are available for anti-rust and appearance.

Chrome plating

It achieves high rust resistance and wear resistance with the coating film of over 750HV.

Raydent-treatment

For corrosion resistance, raydent surface treatment is available. This treatment is suitable for corrosion resistance.

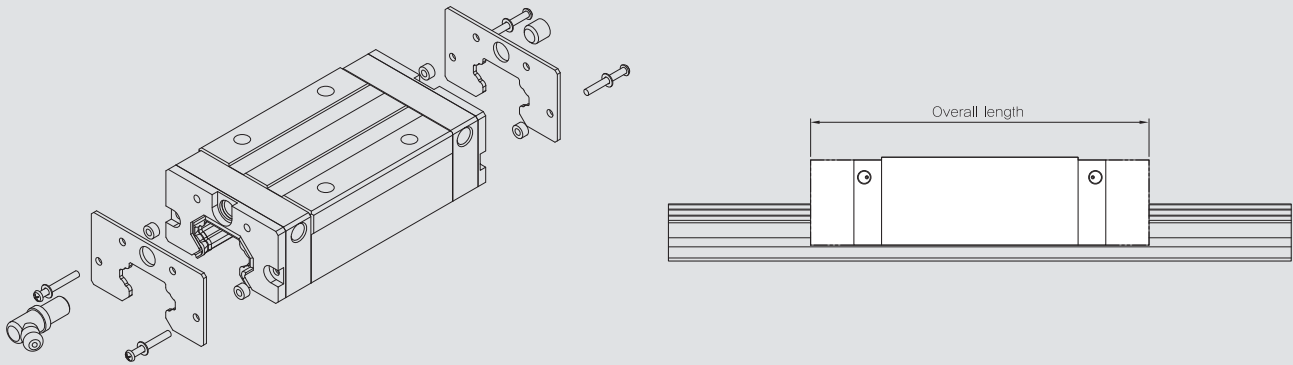
Fluorocarbon raydent treatment

Fluorocarbon coating on raydent-treatment is suitable where high corrosion resistance is required (water or salty water working condition).



For ordering see page 7/8

SBI - Extra seals



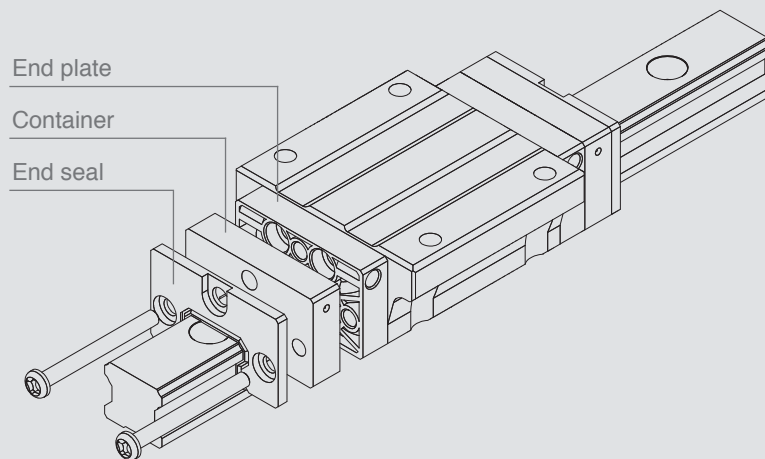
Item	Symbol	Application
End seal	No symbol (Standard)	Normal condition
End seal + end seal	DD	Dust condition
End seal + scraper	ZZ	Welding spatter
End seal + end seal + scraper	KK	Dust and chips

- Bottom seal of SBI type is integrated with bottom retainer. **(Except SBI15)**, see page 4
- If block is assembled with MF container, the grease fitting is not supplied.

Overall length with seal	MF:Self lubricant							
	Standard	DD	ZZ	KK	MF	MFDD	MFZZ	MFKK
15 FV/SV	39.9	44.5	45.3	49.9	53.9	58.5	59.3	63.9
15 HLS	56.8	61.4	62.2	68.8	70.8	75.4	76.2	80.8
15 FL/SL/HL	63.8	68.4	69.2	73.8	77.8	82.4	83.2	87.8
15 FLL/SLL/HLL	79.4	84	84.8	89.4	93.4	98	98.8	103.4
20 FV/SV	49.1	54.1	54.5	59.5	63.1	68.1	68.5	73.5
20 CLS	65.5	70.2	70.6	75.6	-	-	-	-
20 FL/SL/HL/CL	78.8	83.8	84.2	89.2	92.8	97.8	98.2	103.2
20 FLL/SLL/HLL/CLL	96.4	101.4	101.8	106.8	110.4	115.4	115.8	120.8
25 FV/SV	52.6	57.6	58	63	66.6	71.6	72	77
25 FL/SL/HL/CL	92	97	97.4	102.4	106	111	111.4	116.4
25 FLL/SLL/HLL/CLL	108	113	113.4	118.4	122	127	127.4	132.4
30 FL/SL/HL	107.6	113.6	114	120	123.6	129.6	130	136
30 FLL/SLL/HLL	131.6	137.6	138	144	147.6	153.6	154	160
35 FL/SL/HL	124.6	130.6	131	137	140.6	146.6	147	153
35 FLL/SLL/HLL	152.6	158.6	159	165	168.6	174.6	175	181
45 FL/SL/HL	142	148	148.4	154.4	158	164	164.4	170.4
45 FLL/SLL/HLL	174	180	180.4	186.4	190	196	196.4	202.4
55 FL/SL/HL	172.4	179.4	179.2	186.2	190.4	197.4	197.2	204.2
55 FLL/SLL/HLL	211.8	218.8	218.6	225.6	229.8	236.8	236.6	243.6
65 FL/SL	219.8	226.8	226.6	233.6	237.8	244.8	244.6	251.6
65 FLL/SLL	272.2	279.2	279	286	290.2	297.2	297	304

SBI - Self lubricant MF container

In the situations where greasing is difficult, the SBC created the self-lubricant container (MF).

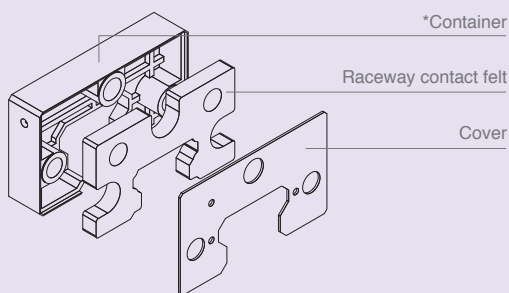


Grease feeding

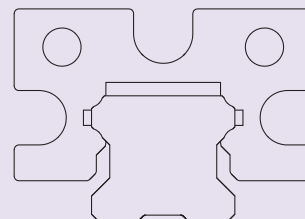
The MF container may be re-charged by adding oil grease to hole inside of block with a gun.

Caution

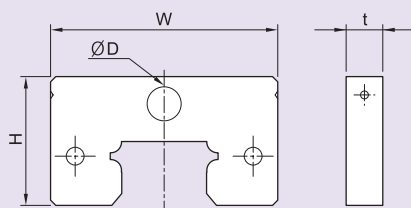
If MF container is required to use in special working condition like clean room, please contact us.



* Container - Its contact surfaces are matched to the guiderail to ensure perfect sealing.



Wipe the raceway and grease is coating on the raceway



Model	W	t	H	D
MF 15A	33.4	7	20.2	4
MF 20A	43.4	7	24.6	6.5
MF 25A	47	7	29.7	6.5
MF 30A	59	8	34.2	6.5
MF 35A	69	8	39.7	6.5
MF 45A	85	8	49.7	10.5
MF 55A	98	9	56	10.5
MF 65A	123	9	69	10.5

[unit: mm]

Seal resistance

[unit: N]

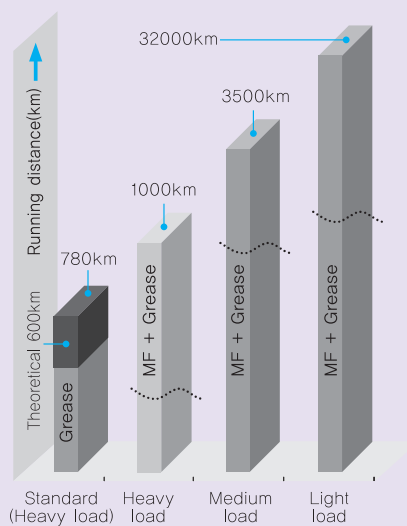
Model	End seal	MF
SBI 15	2.0	3.5
SBI 20	2.5	3.0
SBI 25	3.0	3.5
SBI 30	3.9	3.5
SBI 35	2.5	3.7
SBI 45	3.4	4.1
SBI 55	3.5	4.2
SBI 65	3.6	4.4

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.

MF container Lifetime test

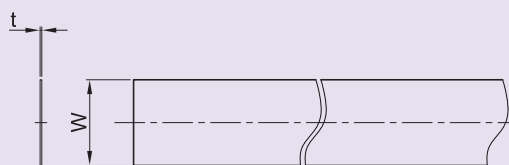
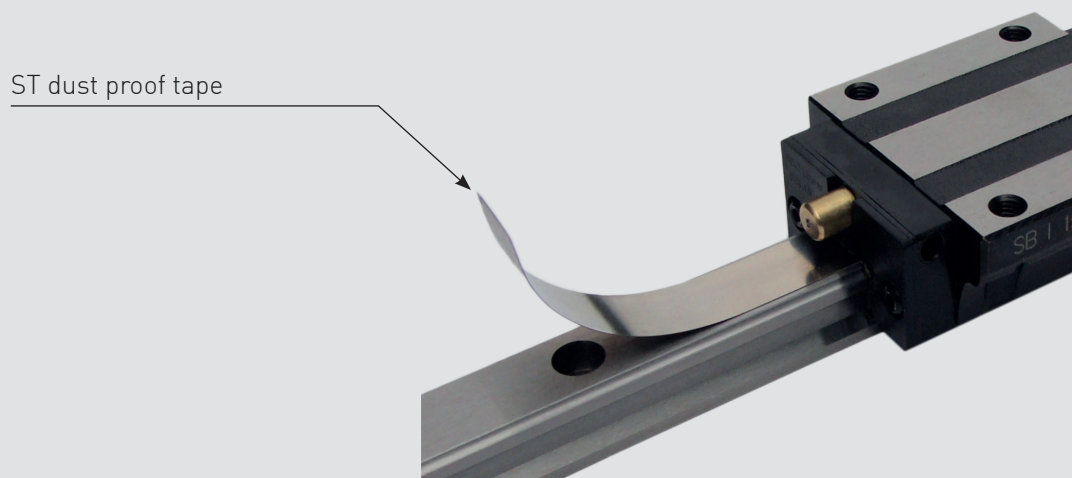
Performance test
SBI20SL-1-K1-1500-N



Condition	Heavy	Medium	Light
Load	4.9kN	2.5kN	1.0kN
Velocity	20 m/min		
Theoretical Lifetime	600 km	1500 km	-

SBI - ST dustproof tape

Compared to other sealings, dustproof tape offers maximum performance under the worst conditions, like coolant, hot metal chips, etc.



Ordering example: **ST15A - 1000L**

① ②

- ① Model number
- ② Length expl. **1000** (mm)

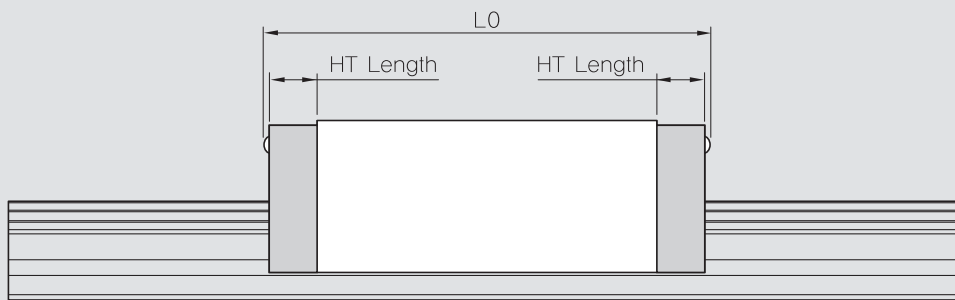
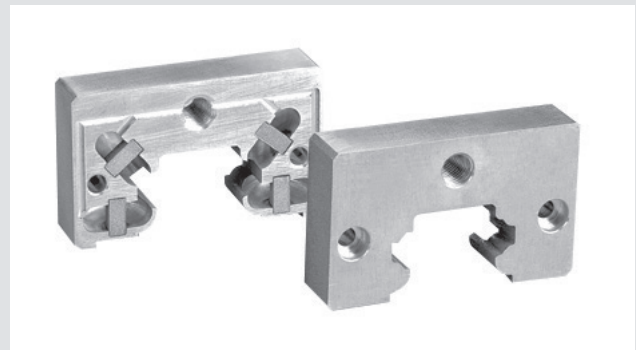
Model	W	t
ST 15A	11	0.1
ST 20A	15	0.1
ST 25A	17	0.1
ST 30A	21	0.1
ST 35A	27	0.1
ST 45A	37	0.1
ST 55A	43	0.1
ST 65A	51	0.1

[unit: mm]

SBI - HT end plate

When operating temperature is higher than 80°C, SBC supply the high temperature end plate. The end plate is made of aluminium.

Recommended operating temperature : -20 ~ 180°C



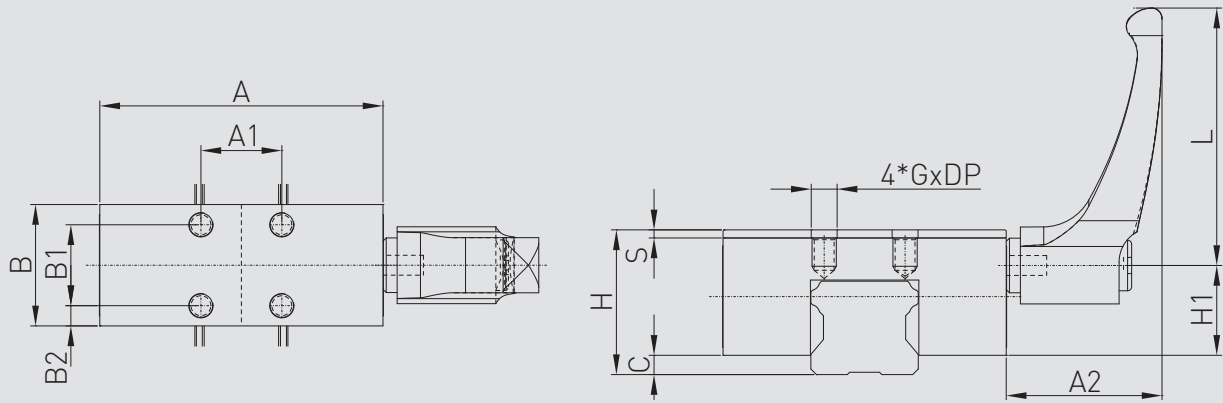
[unit: mm]

Reference	HT Length	Overall length							
		Applied model	L0	Applied model	L0	Applied model	L0	Applied model	L0
HT15A	6.5	SBI15V	38.3	SBI15S	53.2	SBI15	62.2	SBI15L	77.8
HT20A	8	SBI20V	47.1	SBI20S	63.2	SBI20	76.8	SBI20L	94.4
HT25A	8	SBI25V	50.6	-	-	SBI25	90	SBI25L	106
HT30A	10	-	-	-	-	SBI30	105.6	SBI30L	129.6
HT35A	11	-	-	-	-	SBI35	122.6	SBI35L	150.6
HT45A	13	-	-	-	-	SBI45	140	SBI45L	172
HT55A	16	-	-	-	-	SBI55	168.5	SBI55L	207.9
HT65A	20	-	-	-	-	SBI65	215.9	SBI65L	268.3

Ordering example: see page 7/8

- * 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

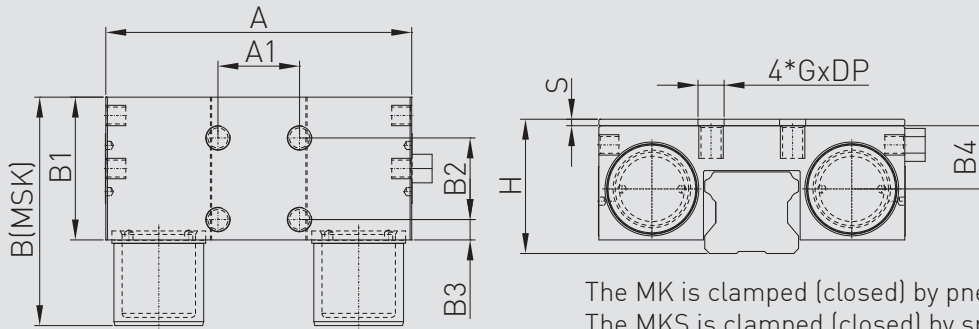
SBI - Manual clamping HK



Model	Type guideway	FL/FLL			SL/SLL			HL/HLS/HLL		
		H	S	Adapter plate	H	S	Adapter plate	H	S	Adapter plate
HK 1501A	SBI15	24	2	PHK 15-2	28	6	PHK 15-6	24	2	PHK 15-2
HK 2001A	SBI20	30	2	PHK 20-2	30	2	PHK 20-2	-	-	-
HK 2501A	SBI25	36	2	PHK 25-2	40	6	PHK 25-6	36	2	PHK 25-2
HK 3001A	SBI30	42	3	PHK 30-3	45	6	PHK 30-6	42	3	PHK 30-3
HK 3501A	SBI35	48	3	PHK 35-3	55	10	PHK 35-10	48	3	PHK 35-3
HK 4501A	SBI45	60	6	PHK 45-6	70	16	PHK 45-16	60	6	PHK 45-6
HK 5501A	SBI55	70	6	PHK 55-6	80	16	PHK 55-16	70	6	PHK 55-6
HK 6501A	SBI65	90	-	-	90	-	-	-	-	-

Model	Holding power [N]	A	A1	A2	B	B1	B2	C	G	L	DP	H1
HK 1501 A	1200	47	17	33.5	25	17	4	6.5	M4	44	5	12.5
HK 2001 A	1200	60	15	33.5	24	15	4.5	9	M5	44	6	12.5
HK 2501 A	1200	70	20	41.5	30	20	5	12	M6	63	7	15
HK 3001 A	2000	90	22	50.5	38	22	8.5	12	M6	78	8	21.5
HK 3501 A	2000	100	24	50.5	38	24	7.5	13	M8	78	10	21.5
HK 4501 A	2000	120	26	50.5	44	26	9	18	M10	78	14	26.5
HK 5501 A	2000	140	30	61.5	49	30	9.5	21	M14	95	16	31
HK 6501 A	2000	170	35	61.5	64	35	14.5	26	M16	95	24	36

SBI - Pneumatic clamping MK/MKS



The MK is clamped (closed) by pneumatic pressure.
The MKS is clamped (closed) by spring-loaded energy storage and is opened by pneumatic pressure.

[unit: mm]

Model	Type guideway	FL/FLL			SL/SLL			HL/HLS/HLL		
		H	S	Adapter plate	H	S	Adapter plate	H	S	Adapter plate
MK/MKS 1501A	SBI15	24	1	PMK 15-1	28	5	PMK 15-5	24	1	PMK 15-1
MK/MKS 2001A	SBI20	30	1	PMK 20-1	30	1	PMK 20-1	-	-	-
MK/MKS 2501A	SBI25	36	2	PMK 25-2	40	6	PMK 25-6	36	2	PMK 25-2
MK/MKS 3001A	SBI30	42	3	PMK 30-3	45	6	PMK 30-6	42	3	PMK 30-3
MK/MKS 3501A	SBI35	48	3	PMK 35-3	55	10	PMK 35-10	48	3	PMK 35-3
MK/MKS 4501A	SBI45	60	8	PMK 45-8	70	18	PMK 45-18	60	8	PMK 45-8
MK/MKS 5501A	SBI55	70	6	PMK 55-6	80	16	PMK 55-16	70	6	PMK 55-6
MK/MKS 6501A	SBI65	90	-	-	90	-	-	-	-	-

[unit: mm]

Model	Holding power [N]	A	A1	A2	B	B1	B2	B3	B4	C	G	DP	Ø
MK/MKS 1501 A	650/400	55	15	6	58	39	15	15.5	12	2.5	M4	4.5	16
MK/MKS 2001 A	1000/600	66	20	6	61	39	20	5	14.4	4.5	M5	5.5	20
MK/MKS 2501 A	1200/750	75	20	5	56	35	20	5	15.5	8	M6	8	22
MK/MKS 3001 A	1750/1050	90	22	5	68	39	22	8.5	20.5	7	M8	10	25
MK/MKS 3501 A	2000/1250	100	24	5	67	39	24	7.5	20.5	11.5	M8	10	28
MK/MKS 4501 A	2250/1450	120	26	5	82	49	26	11.5	26.8	14.5	M10	15	30
MK/MKS 5501 A	2250/1450	128	30	5	82	49	30	9.5	30.5	21.5	M10	18	30
MK/MKS 6501 A	2250/1450	138	30	5	82	49	30	9.5	46	27	M10	15	30

SBI - Integrated measuring system

Solid construction for measuring

The high-pitched SBI Linear rail system is performed with a contactless high-speed linear magnetic system designed for use in wide range environments.

The basic linear block is provided with solid house with internal a readhead. The housing make's a stable connection between the readhead and the linear block and give also protection. The rail is provided with a separate self-adhesive magnetic scale. The magnetic scale is flush with the rail and protected by a stainless steel dustproof tape.



The measuring system is suitable for extreme service, the readhead have a sealing to IP68, and is highly resistant to shock, vibrations and pressure. The non-contact, frictionless design eliminates wear while reducing hysteresis giving precision at high speeds and accelerations.

The SBI Linear rail system brings reliable solutions to tough, hard-working applications including woodworking, stone-cutting, sawing, metalworking, textiles, printing, packaging, plastics processing, automation and assembly systems, laser/flame/water-jet cutting, electronic assembly equipment etc

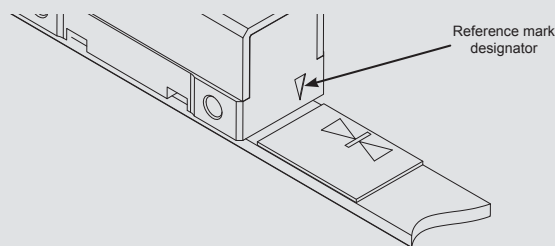
Advantages

- SBI Guideway with unique ball circulation technology
- Compact design
- Resolution from 250 to 1 μm
- High speed operation
- Excellent dirt immunity
- Integral set-up LED
- Axis lengths of up to 100 m
- High reliability from proven noncontact sensing technology
- Industry standard digital outputs
- Optional with reference point

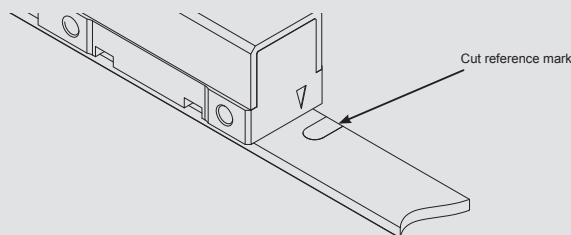
Reference mark

The repeatable bi-directional reference signal can be provided in 3 ways.

1. **Stick-on reference mark.** The LM13 readhead should be ordered with the reference mark option. After installation of the scale a reference mark sticker can be applied to the scale at the required position using the reference mark applicator tool. Ensure that the reference sticker is oriented to the corresponding side of the readhead that has the reference mark designator marked.



2. **Selected at point of order.** The LM13 readhead should be ordered with the reference mark option. If required the cover foil can be installed over the cut reference mark.



Technical specification

System data	
Maximum measuring length	50 m (100 m special order)
Pole length	2 mm
Available resolutions for digital outputs	1 µm, 2 µm, 4 µm, 5 µm, 10 µm, 20 µm, 25 µm, 50 µm, 125 µm and 250 µm
Maximum speed for digital outputs	See table page 32
Sensor/magnetic scale gap	With periodic or machined reference: 0.1 to 1.5 mm With stick-on reference: 0.5 to 1.5 mm
Error band	±40 µm at 20 °C
Linear expansion coefficient	~ 17 × 10 ⁻⁶ /K
Repeatability	Better than unit of resolution
Hysteresis *	< 3 µm up to 0.2 mm ride height
Sub divisional error	±3.5 µm for < 0.7 mm ride height (to ensure SDE remains under ±3.5 µm order option 01 that provides alarm and red LED at 0.7 mm ride height) ±7.5 µm for 1 mm ride height ±15 µm for 1.5 mm ride height

* Repeatability, and can be measured and compensated once installed.

SBI - Integrated measuring system

Electrical data	
Power supply	4.6 V to 7 V – reverse polarity protected ***
Power consumption (without any load)	< 30 mA
Voltage drop over cable	13 mV/m – without load 54 mV/m – with 120 Ω load
Output signals	Digital – Differential RS422, short circuit protected
Cable	PUR high flexible cable, drag-chain compatible, double-shielded 8 × 0.05 mm ² ; durability: 20 million cycles at 20 mm bend radius
Environmental conditions	
Temperature	Operating -10 °C to +80 °C (cable under non-dynamic conditions: -20 °C to +85 °C) Storage -40 °C to +85 °C
Environmental sealing	IP68 (according to IEC 60529)
EMC Immunity	IEC 61000-6-2 (particularly: ESD: IEC 61000-4-2; EM fields: IEC 61000-4-3; Burst: IEC 61000-4-4; Surge: IEC 61000-4-5; Conducted disturbances: IEC 61000-4-6; Power frequency magnet fields: IEC 61000-4-8; Pulse magnetic fields: IEC 61000-4-9)
EMC Interference	IEC 61000-6-4 (for industrial, scientific and medical equipment: IEC 55011)
Vibrations	(55 Hz to 2000 Hz) 300 m/s ² (IEC 60068-2-6)
Shocks	(11 ms) 300 m/s ² (IEC 60068-2-27)

Digital output signal	
Square wave differential line driver to EIA RS422	
Power supply voltage	4.6 C to 7 V *** Reverse polarity protection
Incremental signals	2 square-wave signals A, B and their inverted signals A-, B-
Reference mark signal	1 or more square-wave pulse Z and its inverted pulse Z-
Signal level	Differential line driver to EIA standard RS422: $U_H \geq 2.5 \text{ V}$ at $-I_H = 20 \text{ mA}$ $U_L \leq 0.5 \text{ V}$ at $I_L = 20 \text{ mA}$
Permissible load	$Z_0 \geq 100 \Omega$ between associated outputs $I_L \leq 20 \text{ mA}$ max. load per output Capacitive load $\leq 1000 \text{ pF}$ Outputs are protected against short circuit to 0 V and to +5 V
Alarm	High impedance on output lines A, B, A-, B-
Switching time (10 to 90 %)	t_+ , $t_- < 30 \text{ ns}$ (with 1 m cable and recommended input circuit)

*** On readhead with 1 m cable; for longer cables please consider voltage drop on cable (13 mV/m without load, 54 mV/m with 120 Ω load per channel pair).

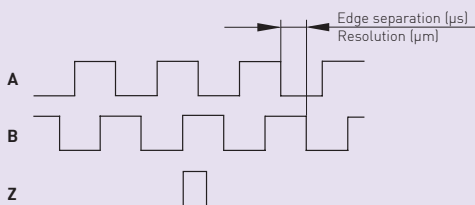
Table maximum speed for digital output

Resolution (μm)	Maximum velocity (m/s)				
	4.16	1.04	0.52	0.26	0.13
1	4.16	1.04	0.52	0.26	0.13
2	8.32	2.08	1.04	0.52	0.25
4	16.64	4.16	2.08	0.99	0.51
5	20.80	5.20	2.59	1.30	0.63
10	25.00	10.40	5.20	2.59	1.27
20	25.00	10.40	5.20	2.59	1.27
25	25.00	6.50	3.25	1.62	0.79
50	25.00	6.50	3.25	1.62	0.79
125	25.00	25.00	25.00	25.00	15.14
250	25.00	25.00	25.00	25.00	25.00
Edge separation (μs)	0.12	0.50	1	2	4
Count frequency (kHz)	8333	2000	1000	500	250

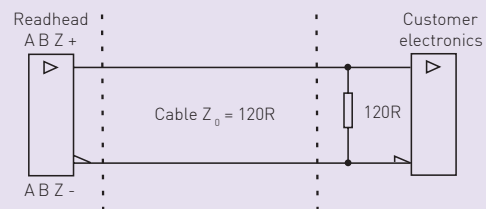
- This speed applies only for the measuring system, not for the guideway.

Timing diagram

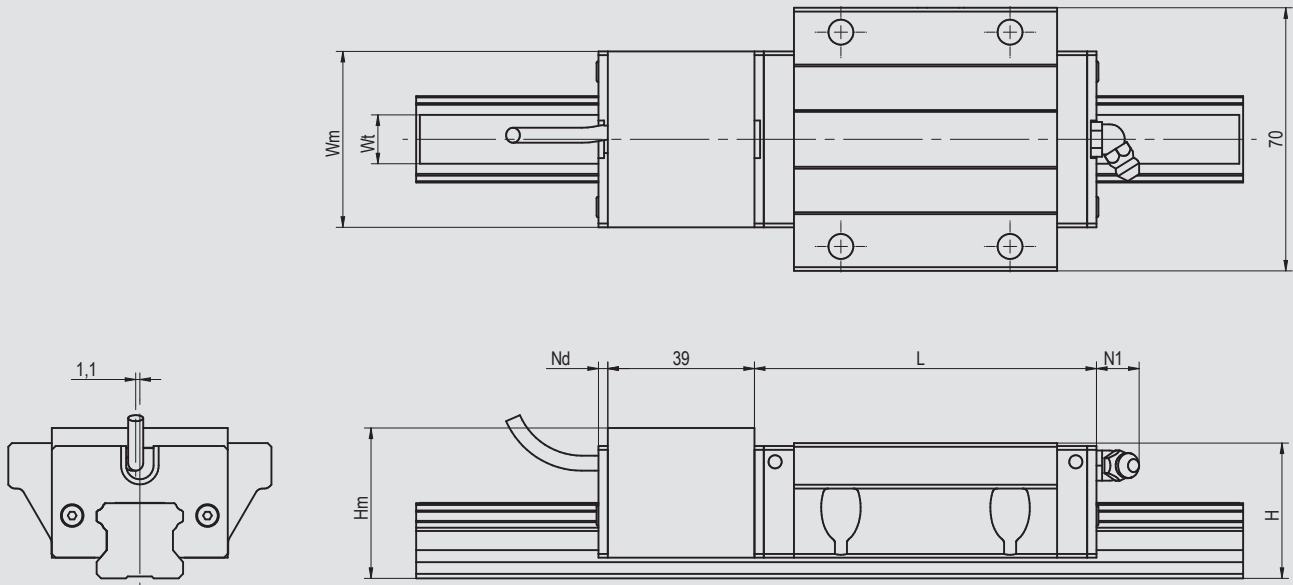
Complementary signals not shown



Recommended signal termination



Dimensions



Model	H_m	W_m	W_t	N_d
SBI25	40	48	17	2,5
SBI30	42	60	21	3,0
SBI35	48	70	27	3,0
SBI45	60	86	37	3,0

- * Not available for Size 15 and 20.
- * For size 55 and 65 on request available.
- * See for H, L and N1 page 9-20

Lubrication

Lubricants lined up for smooth operation

Linear motion guides are found in machine tools, machining centres, manufacturing robots, measurement and control systems as well as in medical diagnostic scanners. Accurate straightness and evenness of all components is a prerequisite of their correct function. Other crucial factors are accurate positioning, repetitive accuracy and wear-free operation under high load, shock loading and short reciprocating movements. Quiet running is expected at high speed and acceleration as well as good resistance to radiation and aggressive media.

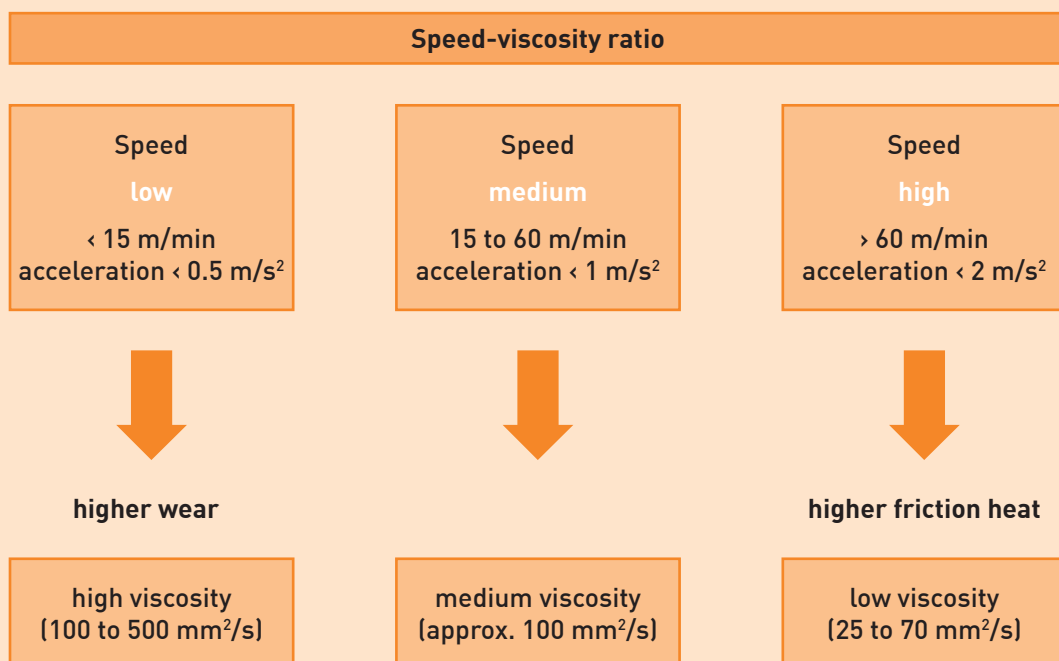
These are taxing requirements. As the field of automation is continuously developing, producing ever more linear drives and guideways, these requirements will continue to become yet more demanding – for the components as well as for the lubricants used.

How lubricants must perform

The choice of lubricant has a strong impact on the service life and performance of linear motion guides.

We will provide you with the right lubricant, which must ensure the following:

- Lowest torque when starting up the system, i.e. under mixed-friction conditions
- Wear protection of the linear motion guide components
- Noise-dampening effect at high speeds
- Good corrosion protection when exposed to aggressive media
- Sealing effect protecting the components against contamination



Lubrication

Grease lubrication

Because of a trend towards minimum quantity lubrication, longer lubrication intervals and simplified design there is increasing demand for special lubricating greases offering high performance and good corrosion protection.

Benefits: grease lubrication offers better emergency running characteristics, better noise dampening and a reliable sealing effect.

Linear type	Application / requirement	Selection criterion	Product	Remarks
SBI-series	Universal	Low speed	Klüberplex BEM 41-141	Lubricating grease, good adhesion and sealing effect
		Medium speed		
	Food-processing and pharmaceuticals industry	High speed	Klüberplex UH1 14-222	Meets USDA H1 and NSF H1 requirements

NLGI grade 1 greases can be applied to the lubricating nipple of a linear motion guide by means of a pressure grease gun. If the component has no lubricating nipples, the grease can be brushed directly onto the sliding surfaces of rail. If an even, thin grease film is desired, a solvent may be added to the grease for dispersion.

Grease relubrication

- We recommend cleaning the guide rail with a lint-free cloth prior to relubrication.
- The relubrication quantity is approx. 50% of the initial lubrication quantity.
- Frequent relubrication is desirable, i.e. application of small quantities at shorter intervals.
- If a different lubricant is used for relubrication purposes, compatibility with the original lubricant should be determined. Greases used for relubrication should match the previous grease's basic composition (base oil type, thickener, base oil viscosity, NLGI class). Please check with the grease manufacturer.

Relubrication or lifetime lubrication?

Shorter relubrication intervals can be expected with extreme operating conditions:

- High load $C/P < 20$;
C = basic dynamic load rating in N;
P = equivalent dynamic load in N
- Short strokes; micro-movements
- High temperatures $> 70\text{ °C}$
- Aggressive media or radiation
- Insufficient sealing

A general formula to calculate the relubrication intervals in linear motion guides does not yet exist. Factors like the type of linear guide used, variations in design, the quality of sealing and operating conditions must be considered, all of which makes the determination of correction factors a difficult task.

Lubrication gun



Grease gun with one hand operation. With 3 different nozzles to suit all sizes, excluding grease. DIN 1283

Ordering example: GR-0002

Lubrication Cartridge



For more information please contact us.

Lubrication interval

Size	interval (km)
SBI 15	1000
SBI 20	1000
SBI 25	1000
SBI 30	900
SBI 35	500
SBI 45	250
SBI 55	150
SBI 65	140

Lubrication volumes

[unit: g]

Size	volume at installation	volume at relubrication
SBI 15	0.8 - 1.1	0.5
SBI 20	1.1 - 1.4	0.6
SBI 25	1.6 - 2.1	0.9
SBI 30	2.4 - 3.0	1.3
SBI 35	4.1 - 5.0	2.5
SBI 45	5.6 - 6.5	3
SBI 55	6.1 - 7.1	3.5
SBI 65	8.0 - 9.0	4.1

Lubricants intervals vary according to the environment and working condition of machine. Therefore, above lubricant intervals are recommended. Do not mix oil and grease systems.

Technical data

Load Rating & Life

Under normal conditions, the linear rail system can be damaged by metal fatigue as the result of repeated stress. The repeated stress causes flaking of the raceways and steel balls. The life of linear rail system is defined as the total travel distance that the linear rail system travels until flaking occurs.

Nominal Life : L (km)

We define the nominal life as the total distance of travel (L=km) without flaking by 90% of a group of an identical group of linear rail systems operating under the same condition.

$$L = \left(\frac{f_H \cdot f_T \cdot f_C}{f_W} \cdot \frac{C}{P_C} \right)^3 \times 50 \text{ km}$$

- 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

Basic Dynamic Load Rating : C (kN)

The basic dynamic load rating C is a statistical number and it is based on 90% of the bearings surviving 50 km of travel carrying the full load.

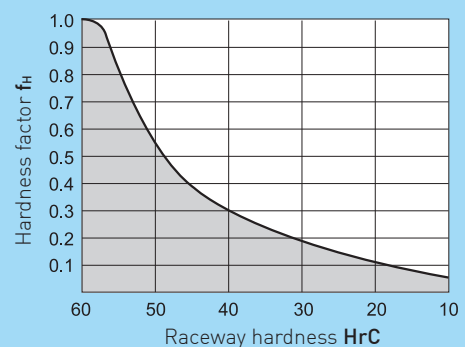
Basic Static Load Rating : Co (kN)

If an excessive load or shock is applied to the linear rail system in the static or dynamic state, permanent but local deformation can occur to the steel balls and raceway. The Basic Static Load Rating is the maximum load the bearing can accept without affecting the dynamic life. This value is usually associated with a permanent deformation of the race way surface of 0.0001 time the ball diameter

Hardness factor (fH)

To optimize the load capacity of a linear rail system, the hardness of the rail should be HRC 58~62.

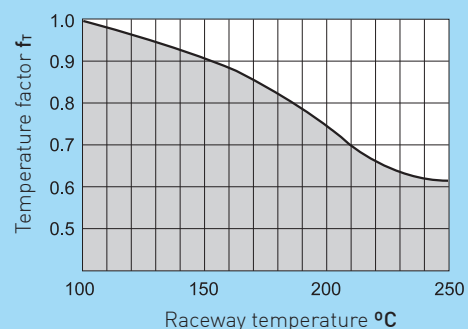
- The value for linear rail system is normally 1.0 since the linear rail system has sufficient hardness.



Temperature factor (fT)

If the temperature of the linear rail system is over 100°C, The hardness of the block and rail will be reduced, and as the result, the temperature factor, ft should be taken into Account.

- The value for linear rail system is normally 1.0 when operation temperature is under 80°C.
- Please contact us if you need linear rail system with over 80°C working condition.



Contact factor (f_c)

When two or more blocks are used in close contact, it is hard to obtain a uniform load distribution because of mounting errors and tolerances. The basic dynamic load C should be multiplied by the contact factor f_c shown here.

Number of blocks in close contact	Contact factor f _c
2	0.81
3	0.72
4	0.66
5	0.61
6 or more	0.6
Normal condition	1.0

Load factor (f_w)

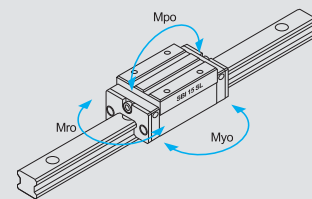
Operating machines create vibrations. The effects of vibrations are difficult to calculate precisely. Refer to the following table to compensate for these vibrations.

Vibration and Impact	Velocity (V)	Load factor f _w
Very slight	Very slow V ≤ 0.25 m/s	1 ~ 1.2
Slight	Low 0.25 < V ≤ 1.0 m/s	1.2 ~ 1.5
Moderate	Medium 1.0 < V ≤ 2.0 m/s	1.5 ~ 2.0
Strong	High V < 2.0 m/s	2.0 ~ 3.5

Static Permissible Moment : Mo (kN.m)

These load are maximum moments or torque loads that can be applied to the bearing without damaging the bearing or affecting subsequent dynamic life.

- M_{ro} : Moment in rolling direction
- M_{po} : Moment in pitching direction
- M_{yo} : Moment in yawing direction



Static Safety Factor : f_s

$$f_s = \frac{C_o}{P} \quad (\text{Radial Load})$$

$$f_s = \frac{M_o}{M} \quad (\text{Moment Load})$$

When calculating a load exerted on the linear rail system, both mean load and maximum load need to be considered. Operating machines create moment of inertia. When selecting the right linear rail system, consider all of the loads.

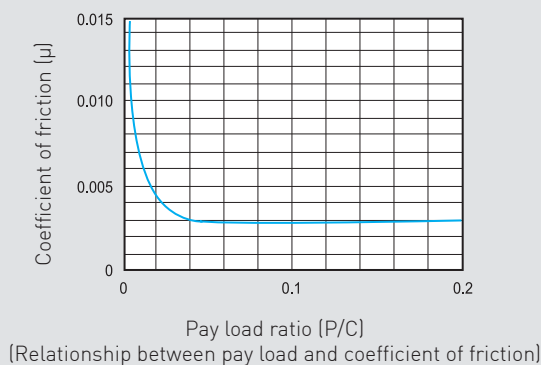
- C_o : Basic Static Load Rating
- P : Pay Load
- M_o : Static Permissible Moment (M_{po}, M_{ro}, M_{yo})
- M : Pay Load Moment

Operating	Load conditions	f _s
Normally stationary	Impact load or machine deflection is small	1,0 ~ 1,3
	Impact or twisting load is applied	2,0 ~ 3,0
Normally moving	Normal load is exerted or machine deflection is small	1,0 ~ 1,5
	Impact or twisting load is applied	2,5 ~ 7,0

Technical data

Frictional resistance

The static and dynamic coefficient of friction of the SBC linear rail systems are so small that they minimize the required driving force and temperature increase. Frictional force depends on load, preload, velocity and lubrication. In general, a load with high speed is more affected by the lubricant, while the medium or heavy load are more affected by the load and are less sensitive to lubrication selection.



Calculate comparison by different guide system

$$F = \mu \cdot P$$

- F : Frictional force
- μ : Coefficient of friction
- P : Load

P : Load
C : Basic dynamic load rating

(1) SBI Linear rail system
 P : 5000N
 μ : 0.003
 $F = 0.003 \times 5000N = 15N$

(2) Sliding linear rail system
 P : 5000N
 μ : 0.2
 $F = 0.2 \times 5000N = 1000N$

Life calculation

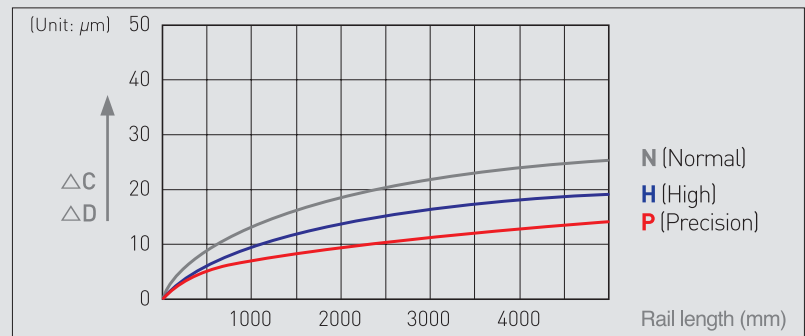
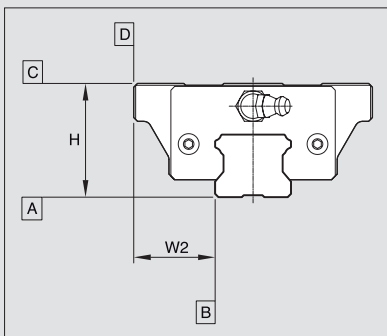
When the nominal life (L) is calculated. The life of linear rail system can be calculated by following equation, if the stroke and reciprocating cycles per minute are constant.

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

- L_h (h) : Hours of nominal life
- L (km) : Nominal life
- l_s (mm) : Stroke
- n_1 (min^{-1}) : Complete cycles per minute

Accuracy Standard

The accuracy of SBI is divided into three grades, **N** (Normal), **H** (High) and **P** (Precision).



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 difference among blocks	0.03	0.015	0.007
Running parallelism of surface C with surface A		Δ C	
Running parallelism of surface D with surface B		Δ D	

[unit: mm]

* :preferred type

Radial clearance

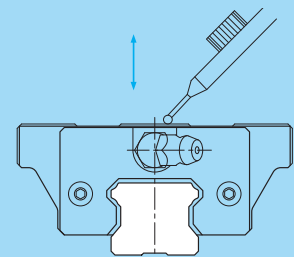
The block side to side movement by vibration is called clearance.

Clearance checking

After mounting the linear rail system, move the block up and down then check the change of value.

Preload

Preload affects the rigidity, internal-load and clearance. Also, it is very important to select appropriate preload according to applied load, impact and vibration expected in the application.



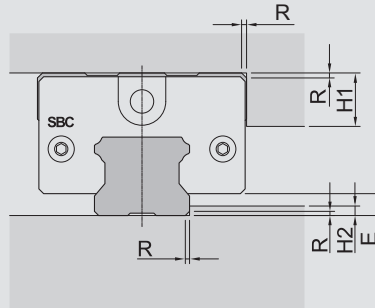
Preload	Conditions	Volume of preload
K0 (None)		Clearance within 0.01 mm
K1* (Normal)	<ul style="list-style-type: none"> Where the load direction is constant, impact and vibration are light. Precision is not required 	0.00 - 0.02 C
K2 (Light)	<ul style="list-style-type: none"> Where overhung loads or moment occur Single axis operation. Light load that requires precision. 	0.04 - 0.06 C
K3 (Heavy)	<ul style="list-style-type: none"> Where rigidity is required, vibration and impact are present. Engineered machinery for heavy equipment 	0.08 - 0.10 C

* :preferred type

Technical data

Shoulder height and fillet radius R

When the bearing and rail are installed on the table and base, the fillet radius, chamfer size and shoulder height must be considered.



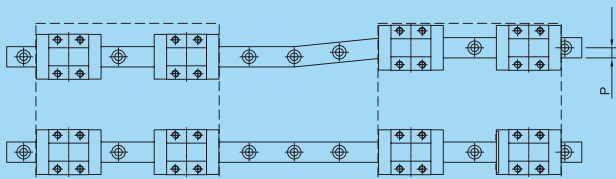
[unit: mm]

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

Permissible tolerance of mounting surface

Mounting errors can cause rolling resistance to motion. Due to the self adjusting feature of the SBC linear rail system, rolling resistance or bearing will not be affected as long as the permissible tolerance is observed as per the table shown.

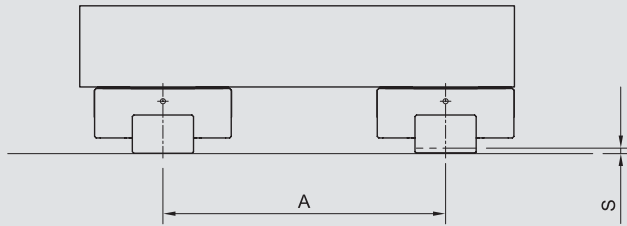
Permissible tolerance (P) of parallelism



[unit: mm]

Model	Preload classes		
	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

Permissible tolerance (S) of two level offset



Formule:

$$S = A * y \text{ (mm)}$$

Example:

A = 1500 mm
Preload = K1
Size = 25

$$S = A * y$$

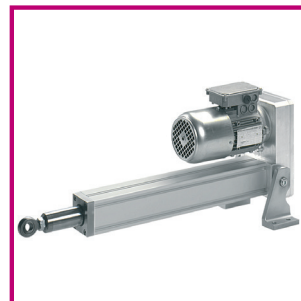
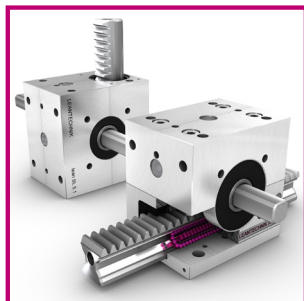
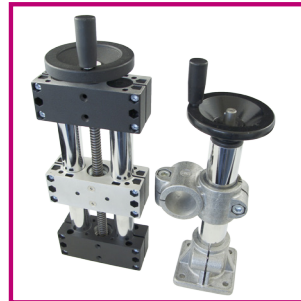
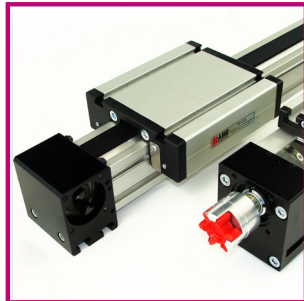
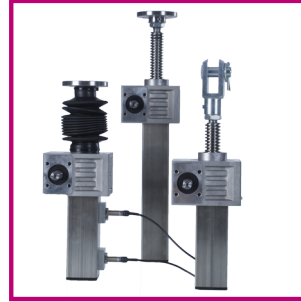
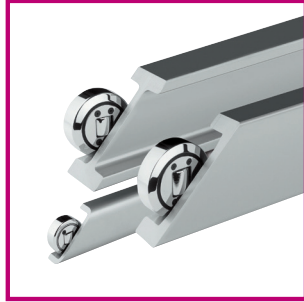
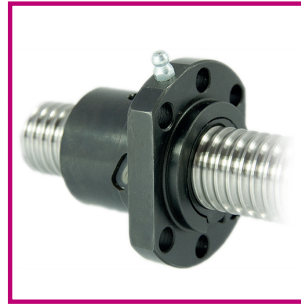
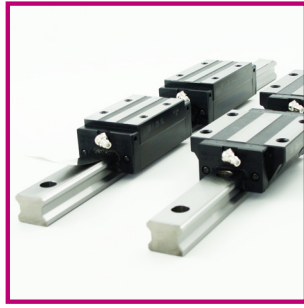
$$S = 1500 * 0.06 * 10^{-3}$$

$$S = 0.09 \text{ mm}$$

Factor y

[unit: mm]

Model	Preload classes		
	K1 *10 ⁻³	K2 *10 ⁻³	K3 * 10 ⁻³
15	0.05	0.036	-
20	0.05	0.040	0.036
25	0.06	0.044	0.040
30	0.08	0.060	0.054
35	0.10	0.070	0.060
45	0.12	0.080	0.070
55	0.14	0.100	0.090
65	0.16	0.120	0.110



Our Quick Center service can deliver a comprehensive range of products, with the possibility of customer specific treatment, within a short period of time. It concerns a wide assortment of products such as balls screws, linear guide ways, linear bearings and shafts, combined bearings, ect. Please visit our website for actual list.