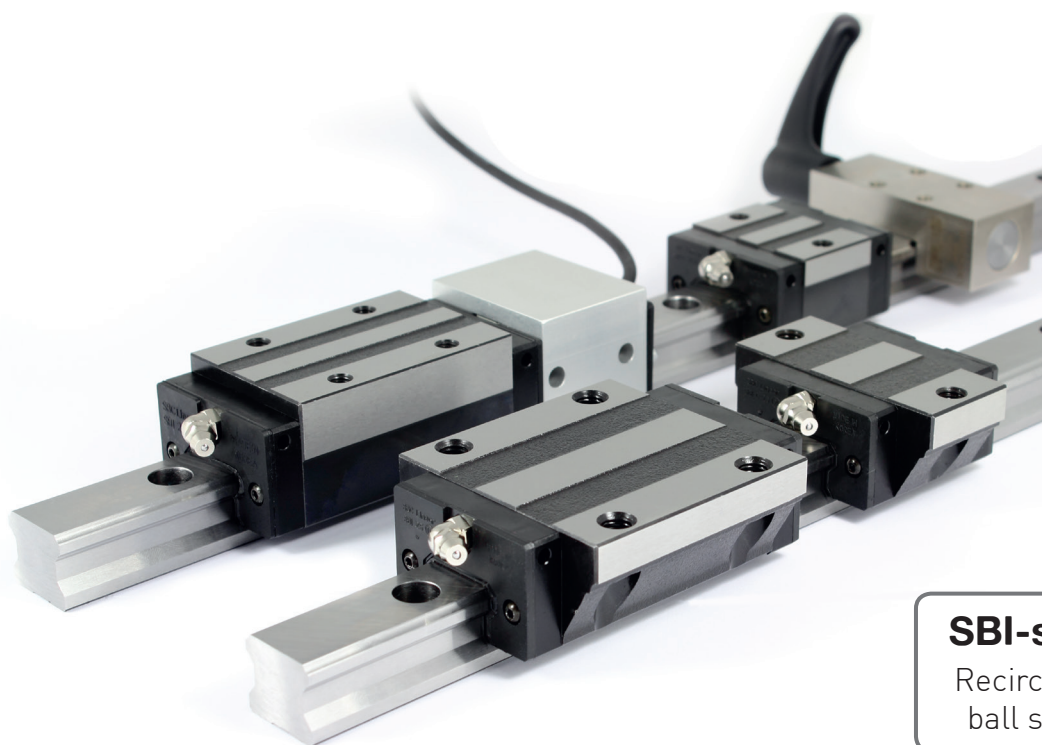


For North America Sales & Support Contact:

## Linear Rail System



**SBI-series**  
Recirculating  
ball system



© SBI catalog - 2013  
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  
subject to change.

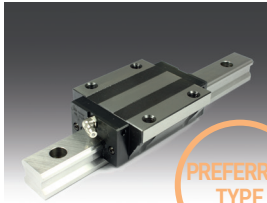
# Overall index

Features SBI

page 3

## Products:

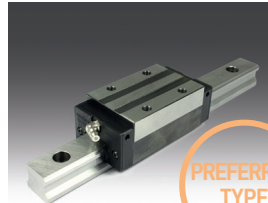
FL / FLL Type



PREFERRED  
TYPE

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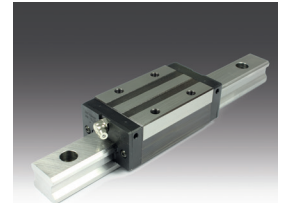
SL / SLL Type



PREFERRED  
TYPE

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HL / HLS / HLL Type



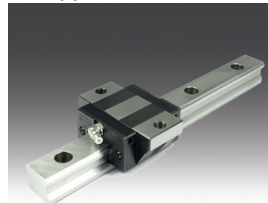
page 13

CL / CLS / CLL Type



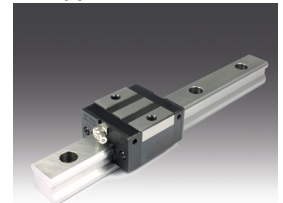
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FV Type



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SV Type



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Options

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Clamping

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Integrated measuring system

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Lubrication

page 34

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:

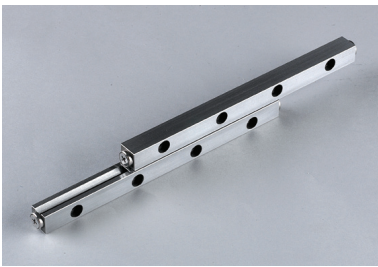
- high precise motion;
- low friction resistance;
- zero play;
- very little mounting space.

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.

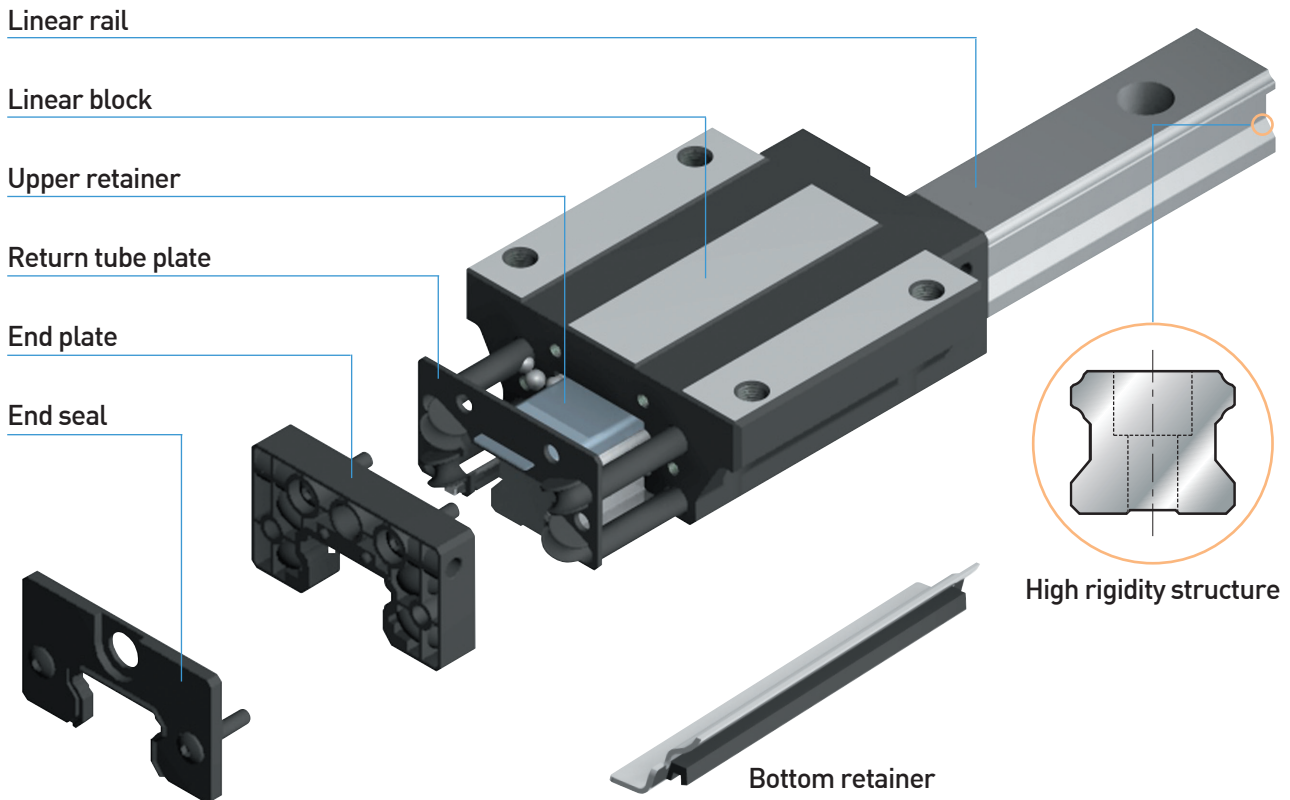
To select the right linear bearing please consult Stamhuis Lineairtechniek B.V.

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.

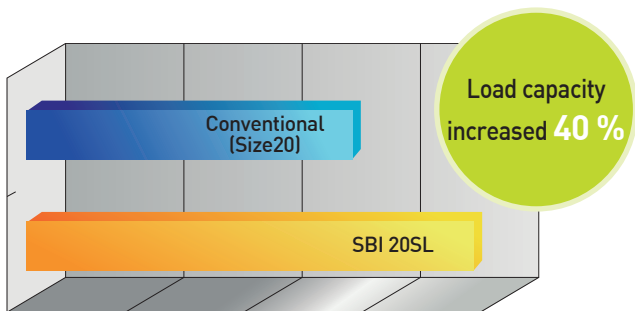
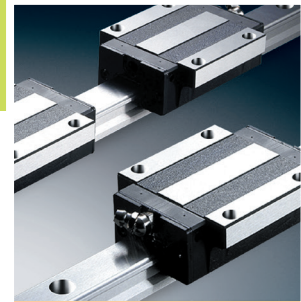
# The structure of SBI



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



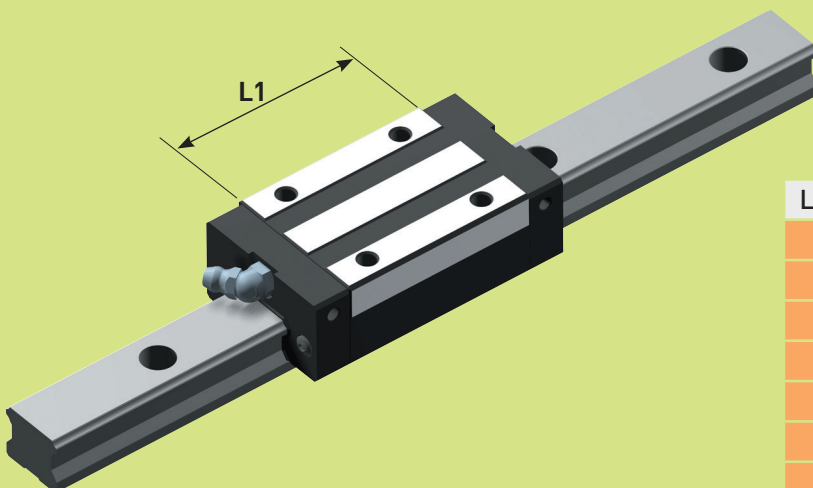
Load capacity increased  
**40%**

(Unit: kN)

|           | Conventional (size 15) | SBI 15 | Conventional (size 20) | SBI 20 | Conventional (size 25) | SBI 25 |
|-----------|------------------------|--------|------------------------|--------|------------------------|--------|
| <b>C</b>  | 8.3                    | 14.1   | 14.2                   | 22.2   | 20.9                   | 31.5   |
| <b>Co</b> | 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 |

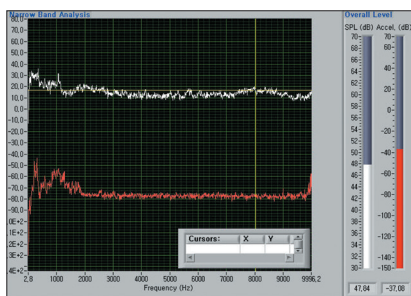
# Low noise & high speed

## 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

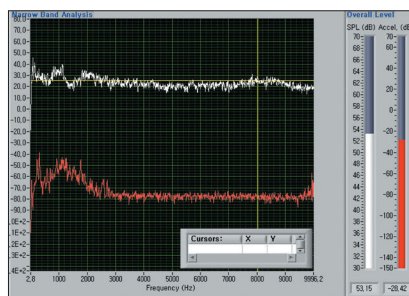
- [3] Test condition :
  - Low speed : 420 mm/sec
  - Medium speed : 840 mm/sec
  - High speed : 1250 mm/sec
  - Tested items : **SBI25 FLL**
  - Grease applied

## Noise level test



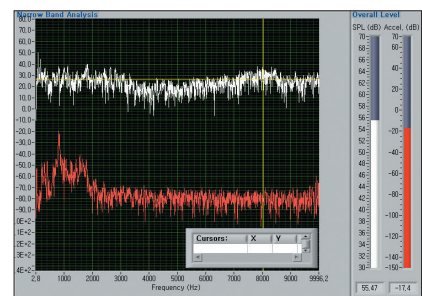
Low speed [420mm/sec]

- Average 47.8 dB



Medium speed [840mm/sec]

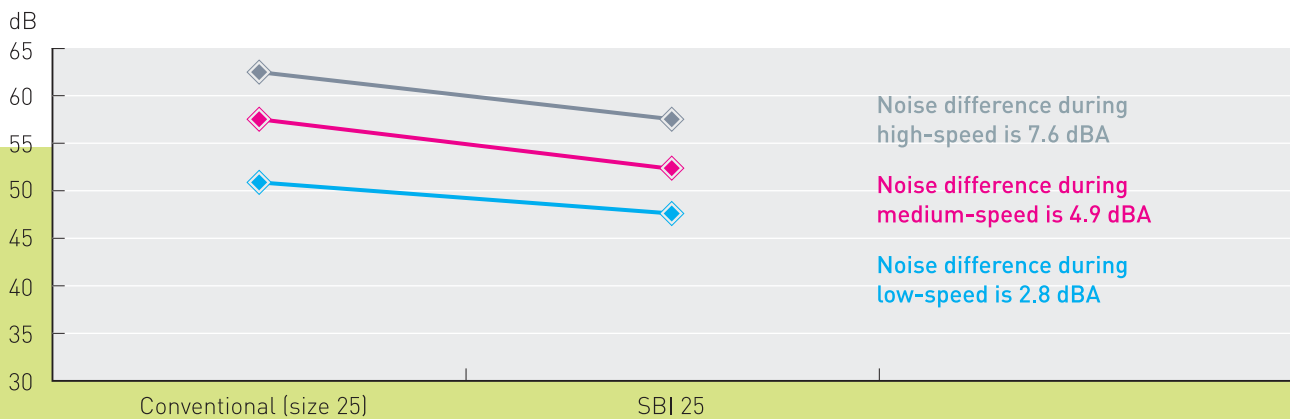
- Average 52.9 dB



High speed [1250mm/sec]

- Average 55.2 dB

## Comparison data



| Test speed              | Conventional (size 25)<br>[SBC Standard] | SBI 25<br>[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

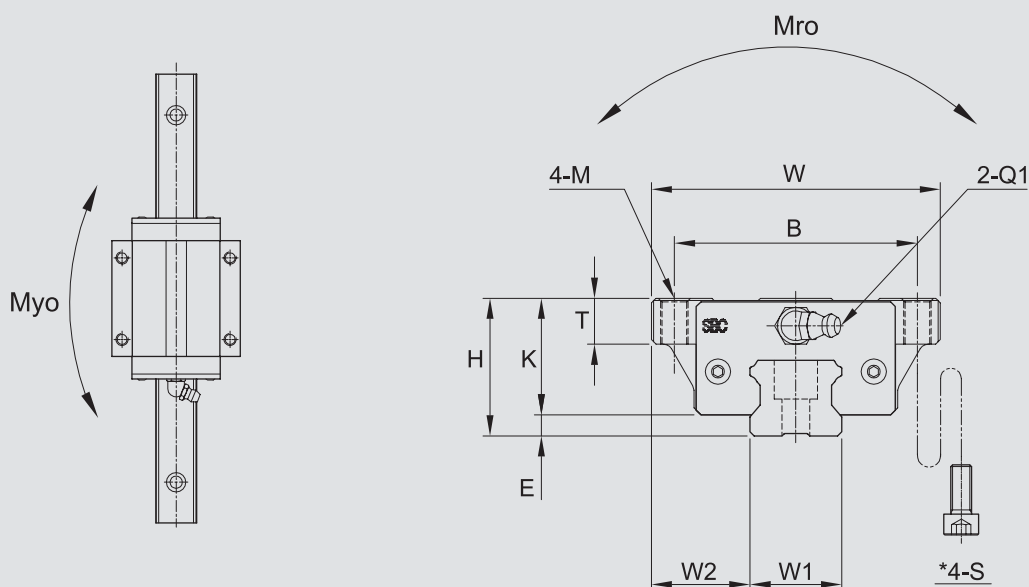
## Coding for assembled rail and block

### **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 |

\*<sub>1</sub> : S: Bolt for bottom mounting type of block.

\*<sub>2</sub> : 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.

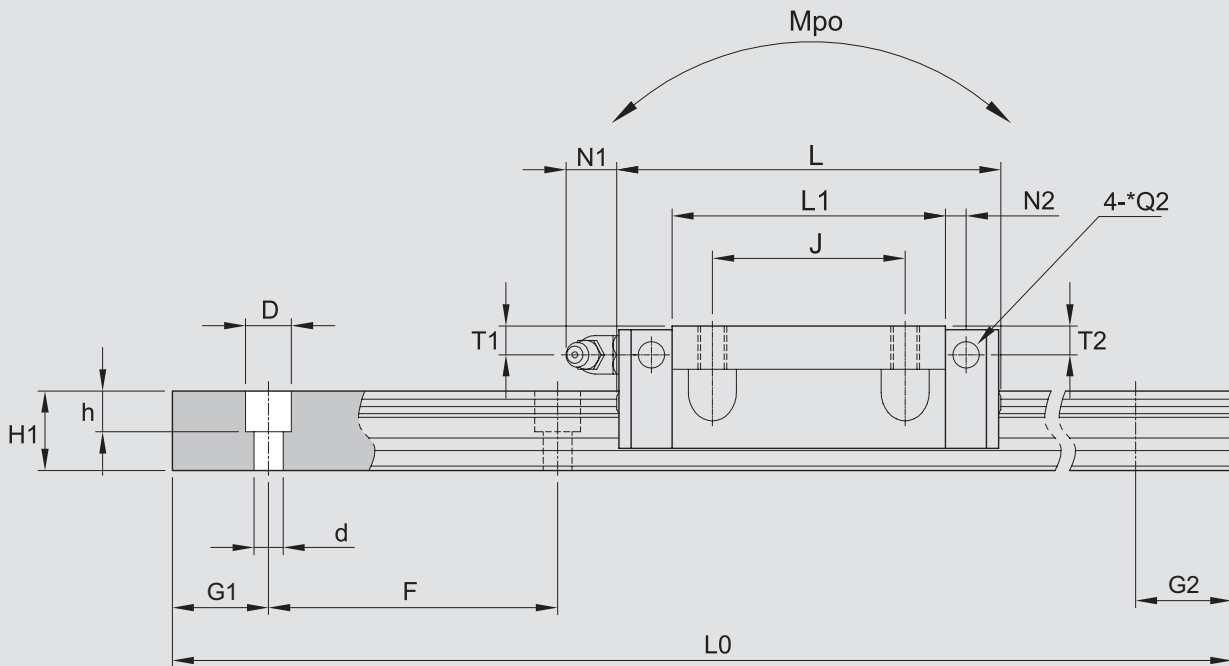
\*<sub>3</sub> : C (basic dynamic load rating), Co (Basic static load rating).

CAD 2D/3D  
AVAILABLE

PREFERRED  
TYPE



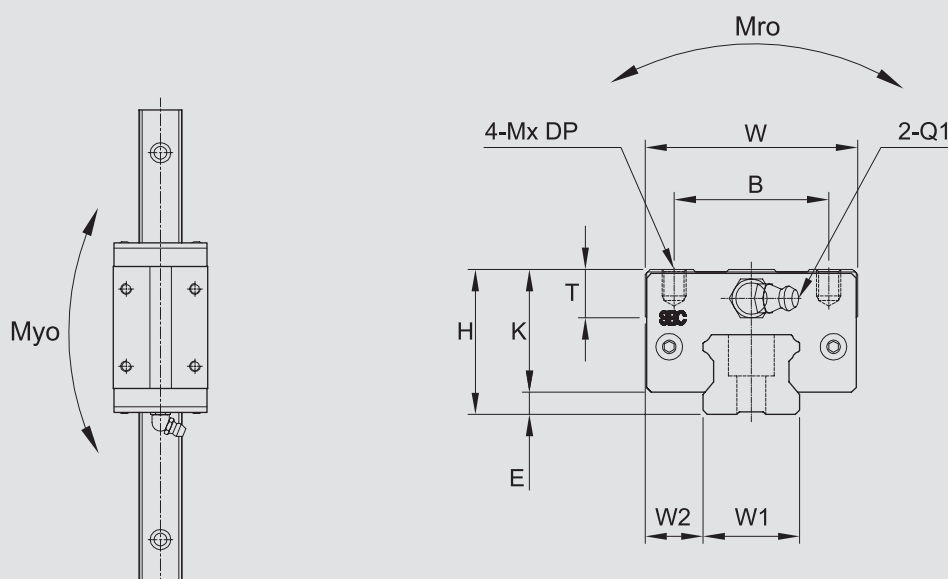
# Dimensions



[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              | 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 |  |

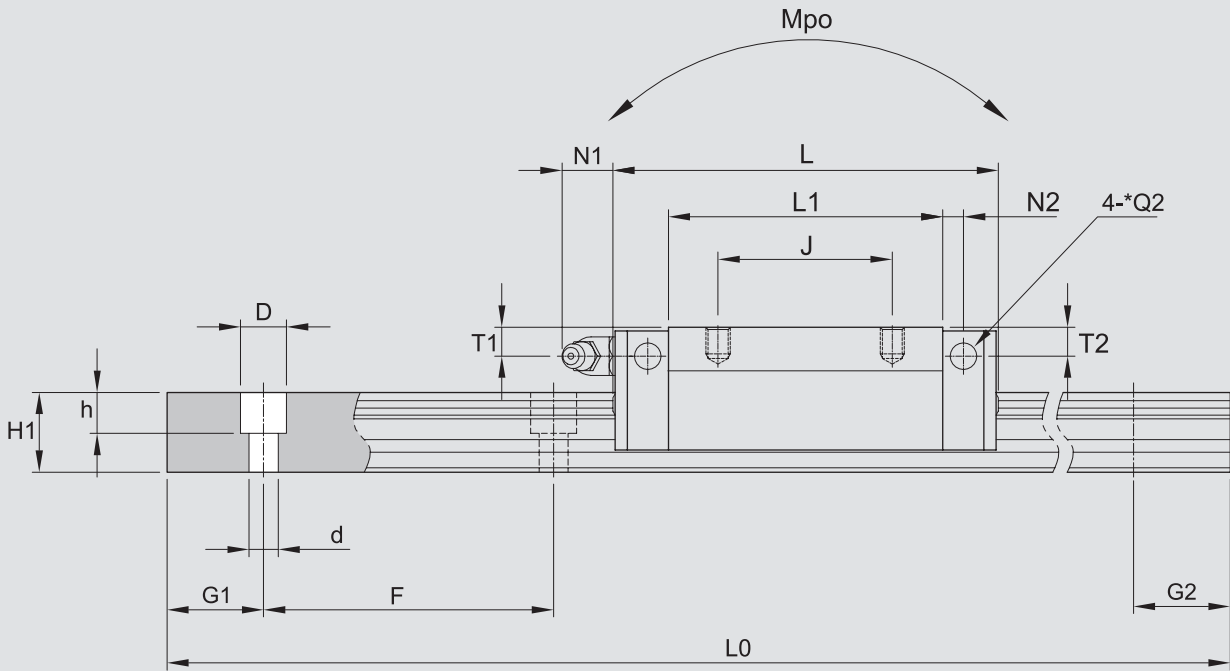
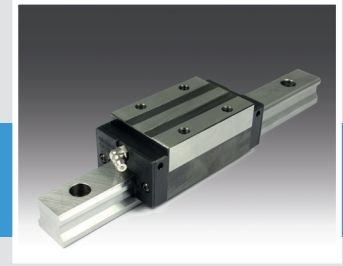
\*<sub>1</sub> : Q2: The hole of side grease nipple is not made to prevent a foreign substance from going into inside.  
When you order the side grease nipple, we built it by ourselves.

\*<sub>2</sub> : C [basic dynamic load rating], Co [Basic static load rating].

CAD 2D/3D  
AVAILABLE

PREFERRED  
TYPE

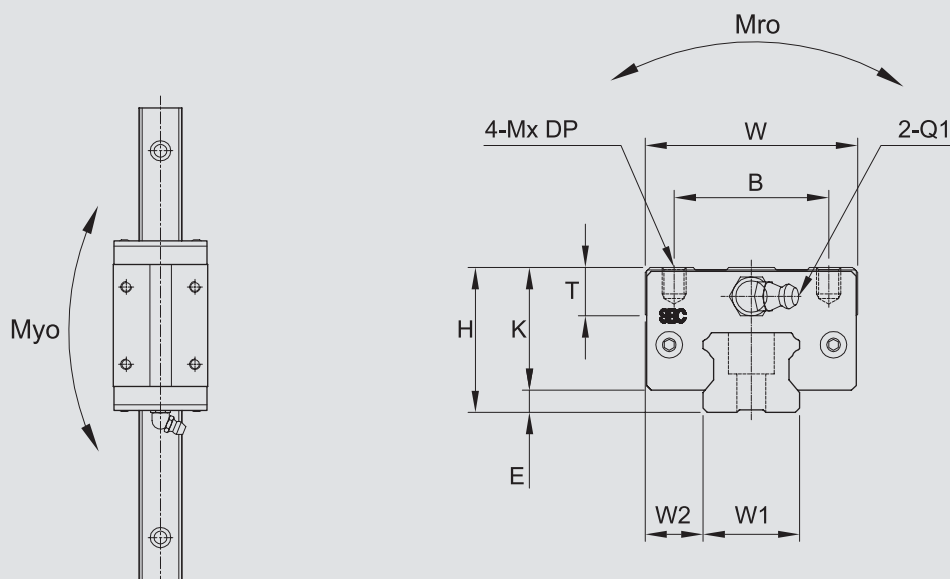
# Dimensions



[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]

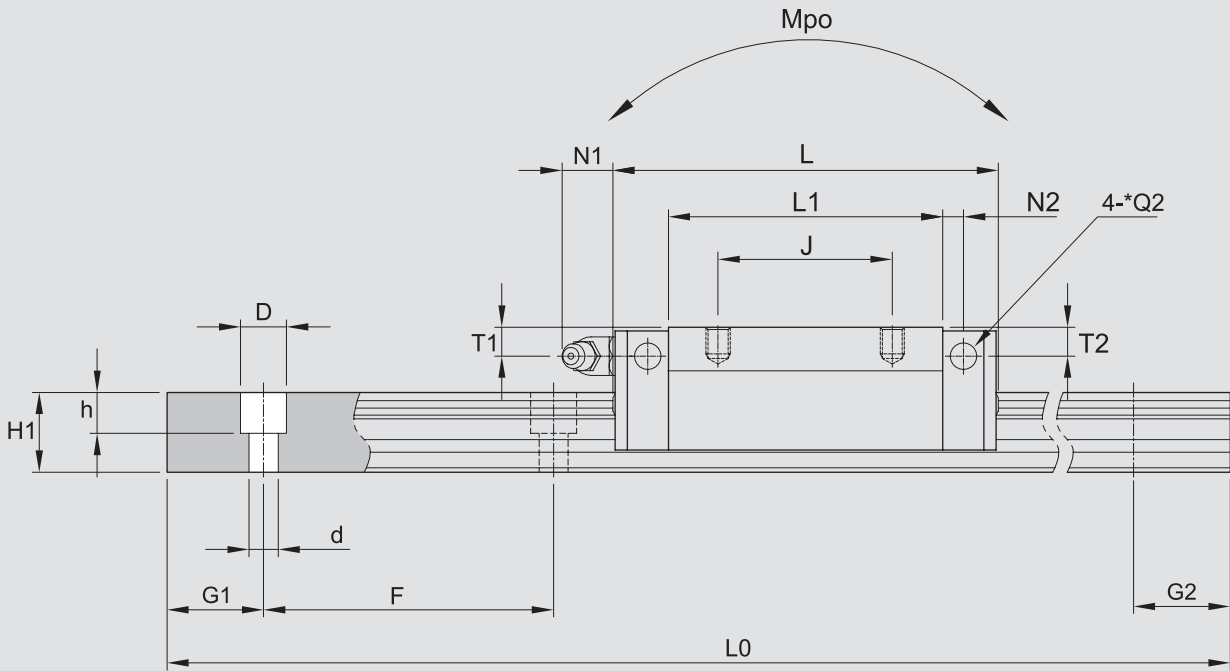
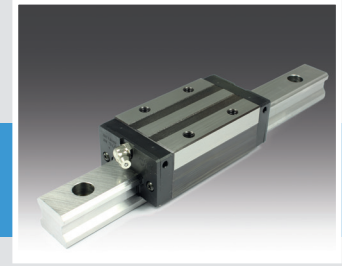
| Model     | Mounting dimensions |     |       |     | Block dimensions  |    |     |    |       |     |      |                |      |     |     |         |      |
|-----------|---------------------|-----|-------|-----|-------------------|----|-----|----|-------|-----|------|----------------|------|-----|-----|---------|------|
|           | 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 |

\*<sub>1</sub> : 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.

\*<sub>2</sub> : C [basic dynamic load rating], Co [Basic static load rating].



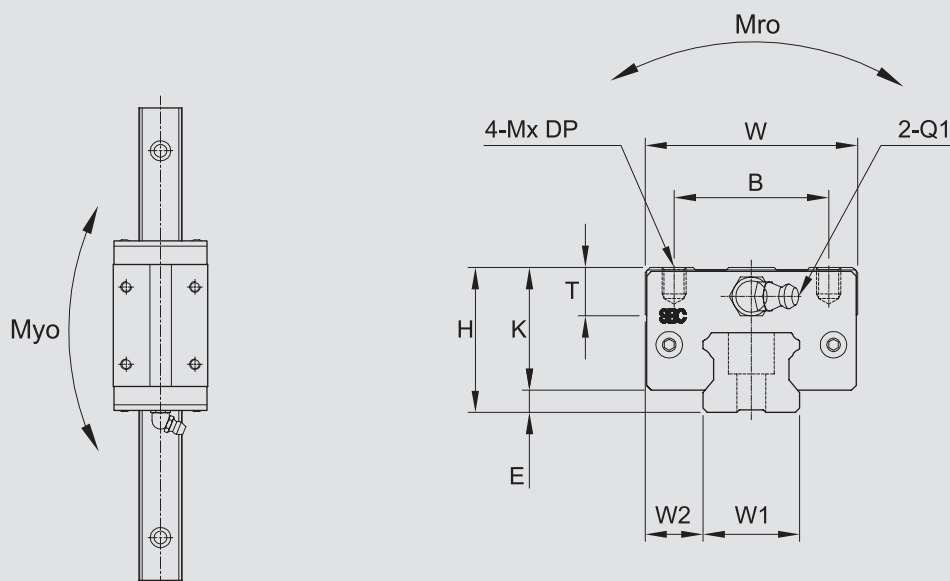
# Dimensions



[unit: mm]

| W1 | W2   | H1 | Rail dimensions |           |     | G1/G2 min. | L0 | Basic load rating [kN] |                               | Permissible static moment [kN•m] |                 |                 | Mass       |             |       |
|----|------|----|-----------------|-----------|-----|------------|----|------------------------|-------------------------------|----------------------------------|-----------------|-----------------|------------|-------------|-------|
|    |      |    | F               | Bolt hole |     |            |    | * <sub>2</sub> C       | * <sub>2</sub> C <sub>0</sub> | M <sub>ro</sub>                  | M <sub>po</sub> | M <sub>yo</sub> | 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 |

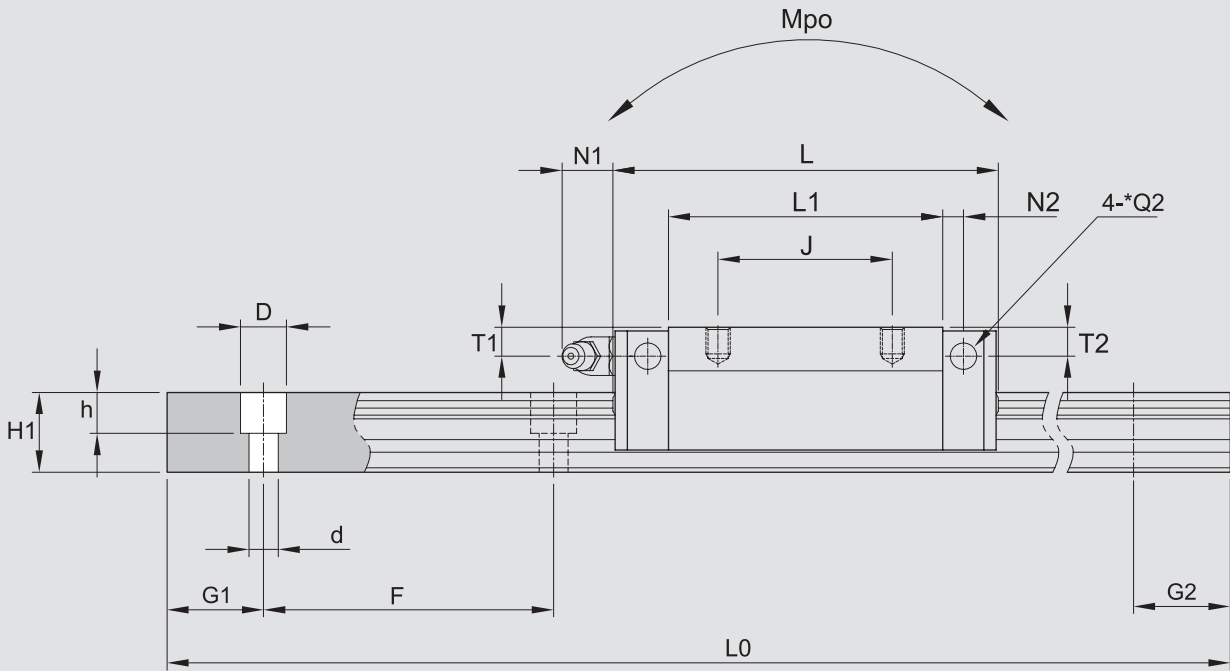
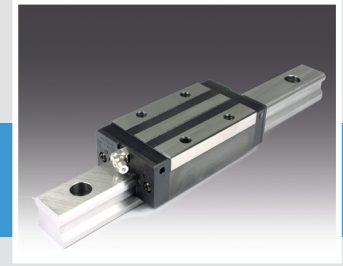
\*<sub>1</sub> : Q2: The hole of side grease nipple is not made to prevent a foreign substance from going into inside.  
When you order the side grease nipple, we built it by ourselves.

\*<sub>2</sub> : C [basic dynamic load rating], Co [Basic static load rating].





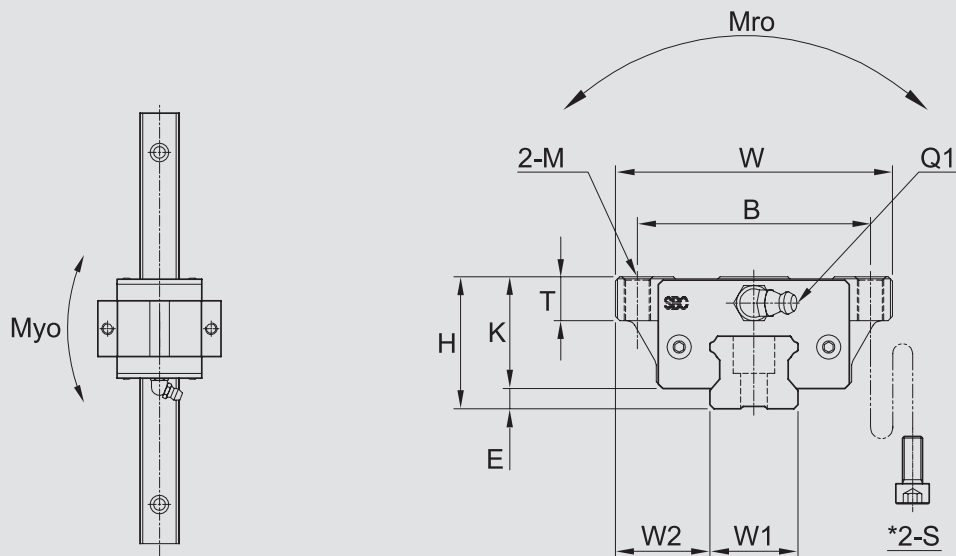
# Dimensions



[unit: mm]

| Rail dimensions |      |      |    |           |     |     |            |      | Basic load rating [kN] |                   | Permissible static moment [kN•m] |                 |                 | Mass       |             |
|-----------------|------|------|----|-----------|-----|-----|------------|------|------------------------|-------------------|----------------------------------|-----------------|-----------------|------------|-------------|
| W1              | W2   | H1   | F  | Bolt hole |     |     | G1/G2 min. | L0   | * <sub>2</sub> C       | * <sub>2</sub> Co | M <sub>ro</sub>                  | M <sub>po</sub> | M <sub>yo</sub> | 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      | *2Q2 |
| 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 |

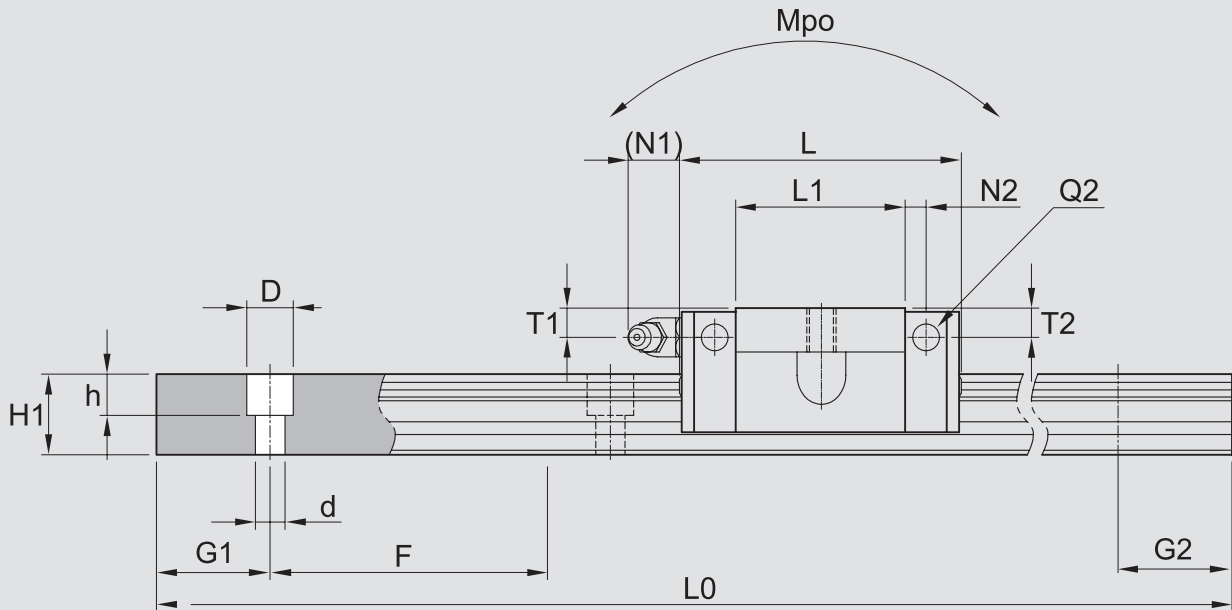
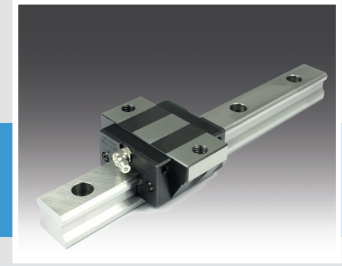
\*<sub>1</sub> : S: Bolt for bottom mounting type of block.

\*<sub>2</sub> : 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.

\*<sub>3</sub> : C (basic dynamic load rating), Co (Basic static load rating).



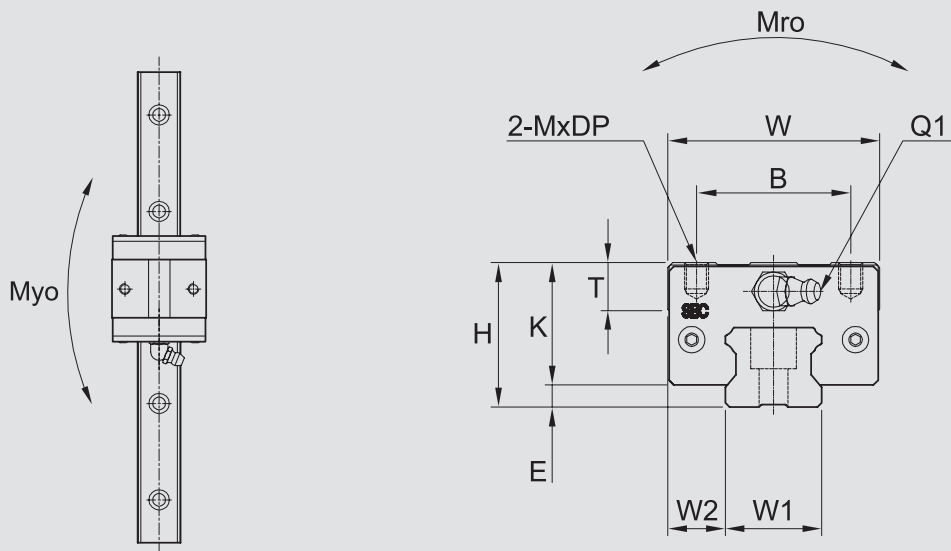
# Dimensions



[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

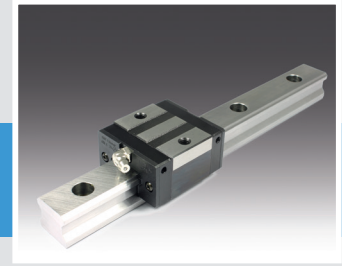


[unit: mm]

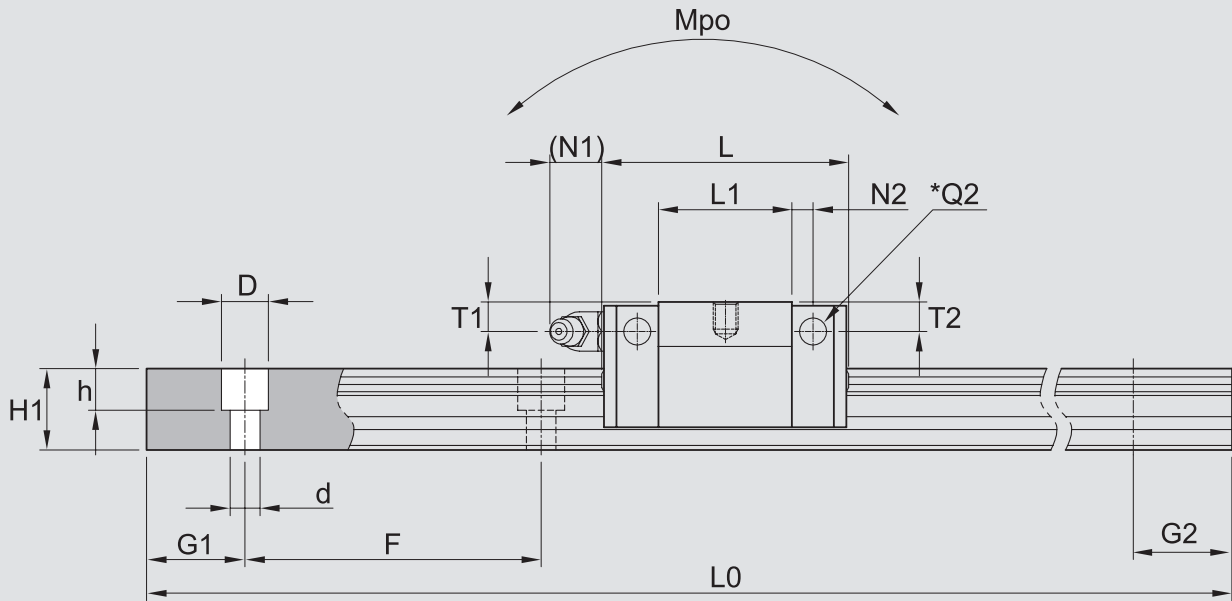
| Model    | Mounting dimensions |    |      |     | Block dimensions  |    |    |      |     |      |                |     |     |     |         |      |
|----------|---------------------|----|------|-----|-------------------|----|----|------|-----|------|----------------|-----|-----|-----|---------|------|
|          | 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 |

\*<sub>1</sub> : 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.

\*<sub>2</sub> : C [basic dynamic load rating], Co [Basic static load rating].



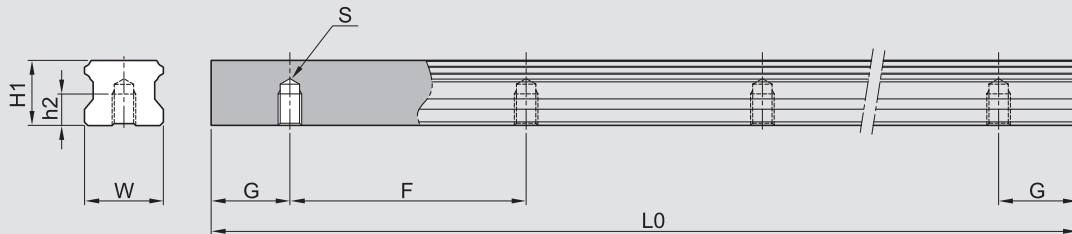
# Dimensions



[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.

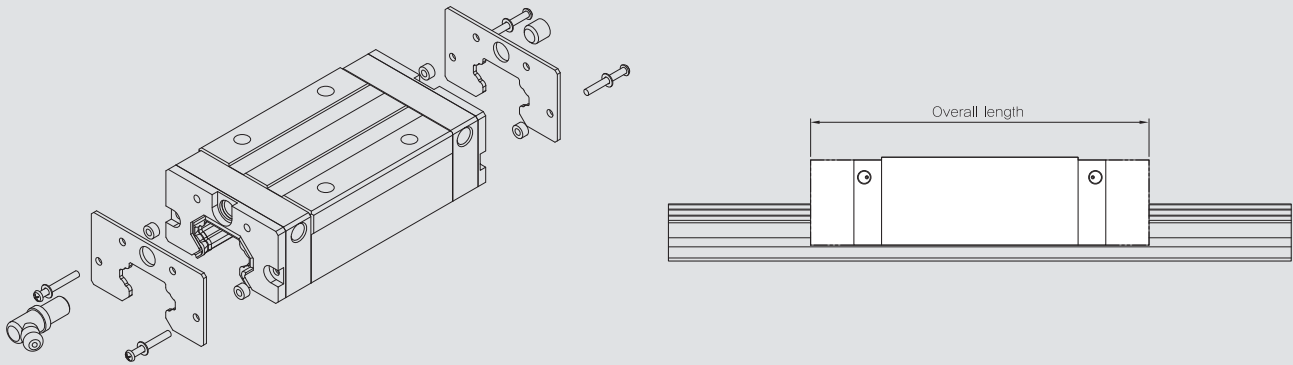
### Fluorocarbon raydent treatment

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



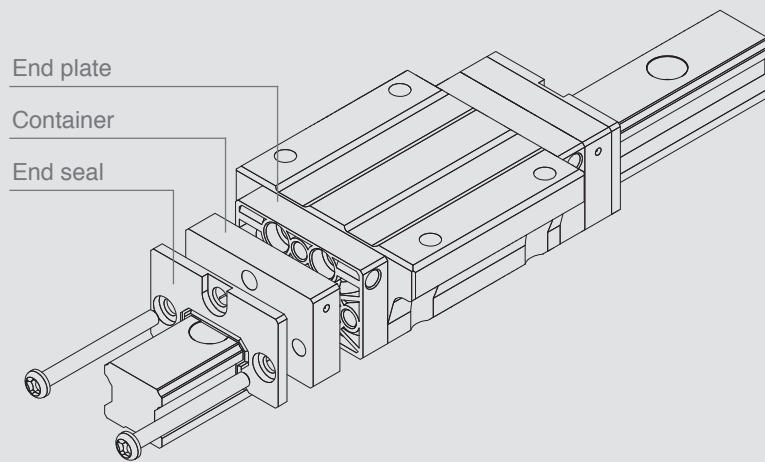
| Item                          | Symbol               | Application      |
|-------------------------------|----------------------|------------------|
| End seal                      | No symbol (Standard) | Normal condition |
| End seal + end seal           | DD                   | Dust condition   |
| 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).

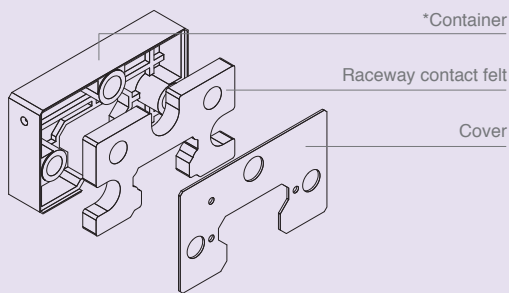


## Grease feeding

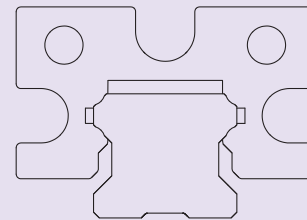
The MF container may be re-charged by adding oil grease to hole inside of block with a gun.

## Caution

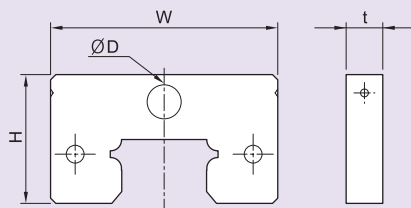
If MF container is required to use in special working condition like clean room, please contact us.



\* 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]

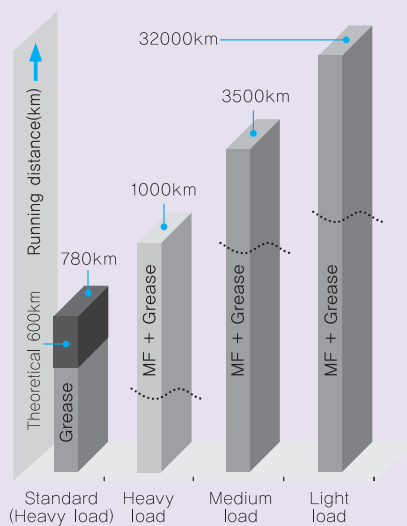
| Model  | End seal | MF  |
|--------|----------|-----|
| SBI 15 | 2.0      | 3.5 |
| SBI 20 | 2.5      | 3.0 |
| SBI 25 | 3.0      | 3.5 |
| SBI 30 | 3.9      | 3.5 |
| SBI 35 | 2.5      | 3.7 |
| SBI 45 | 3.4      | 4.1 |
| SBI 55 | 3.5      | 4.2 |
| SBI 65 | 3.6      | 4.4 |

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

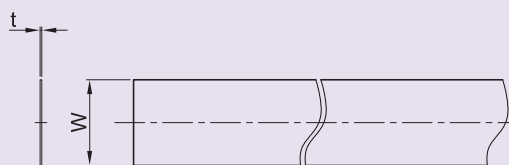
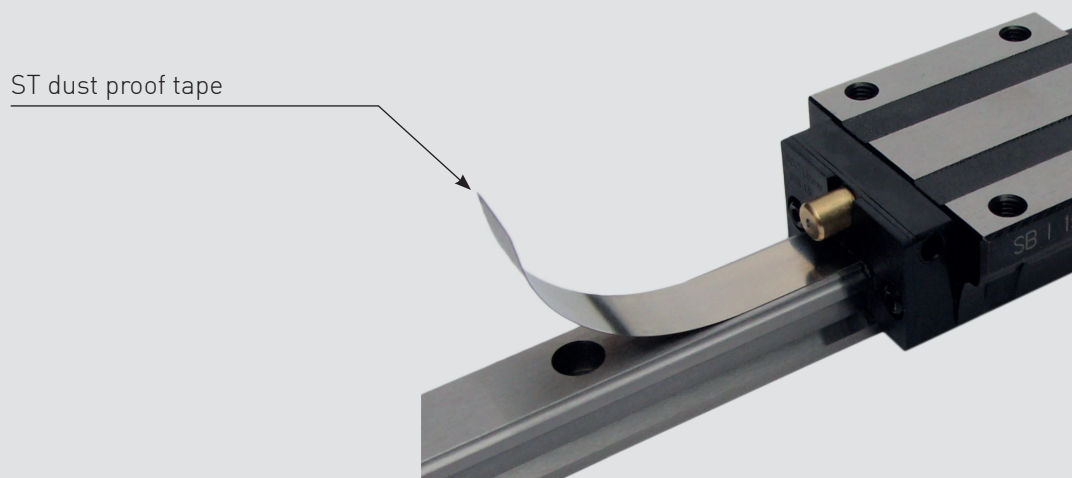
Performance test  
SBI20SL-1-K1-1500-N



| 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)

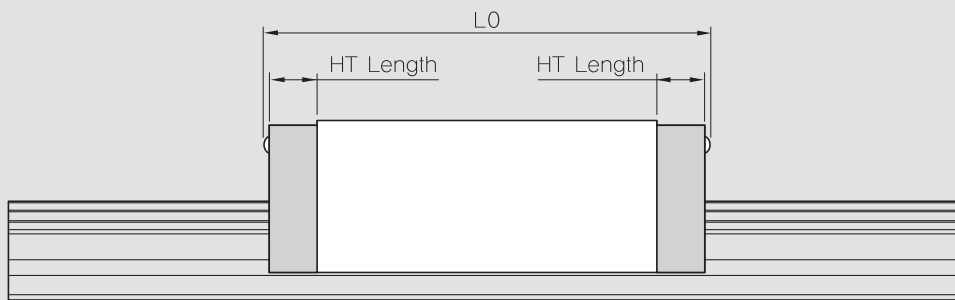
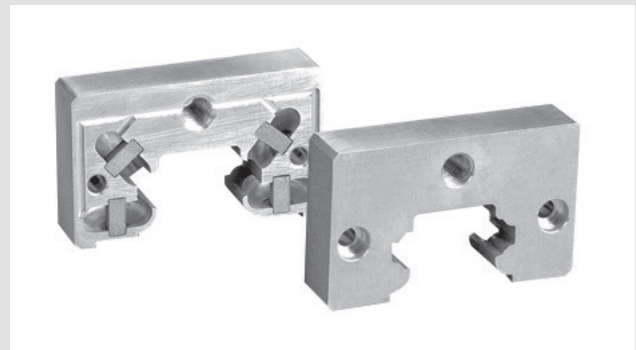
| Model  | W  | t   |
|--------|----|-----|
| ST 15A | 11 | 0.1 |
| ST 20A | 15 | 0.1 |
| ST 25A | 17 | 0.1 |
| ST 30A | 21 | 0.1 |
| ST 35A | 27 | 0.1 |
| ST 45A | 37 | 0.1 |
| ST 55A | 43 | 0.1 |
| ST 65A | 51 | 0.1 |

[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



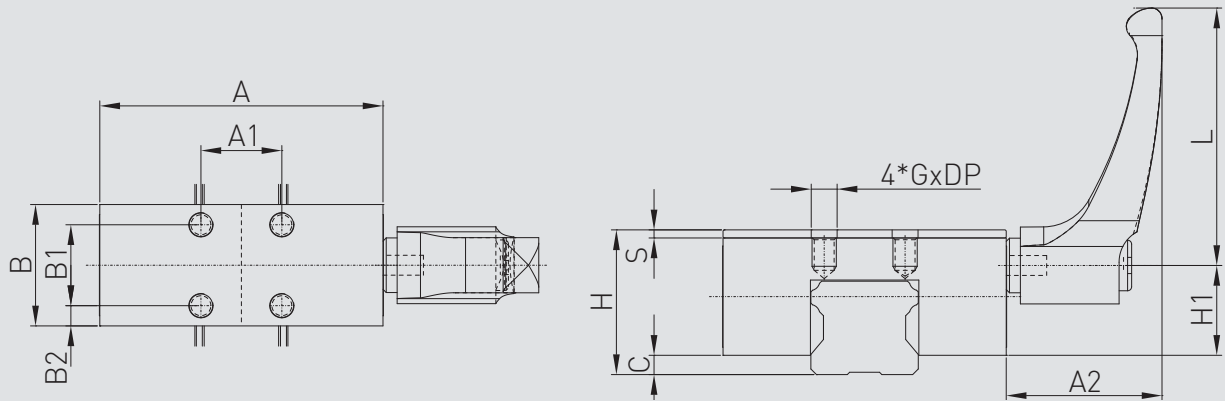
[unit: mm]

| 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

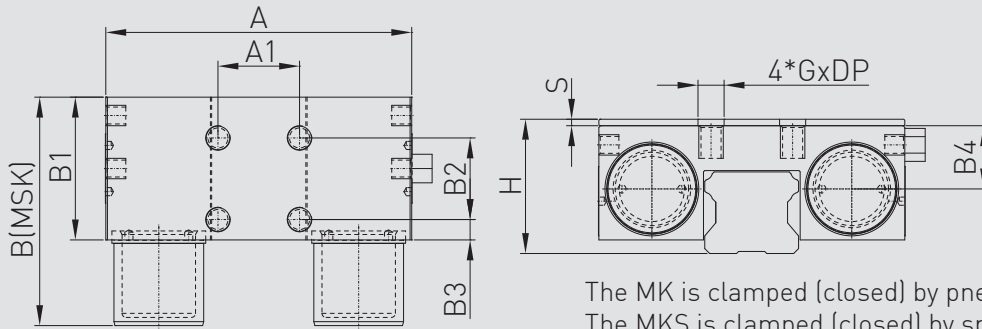
# SBI - Manual clamping HK



| 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]

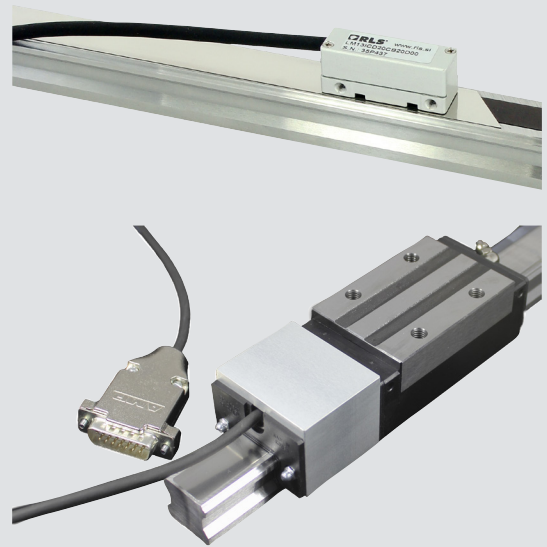
| Model         | Holding power [N] | A   | A1 | A2 | B  | B1 | B2 | B3   | B4   | C    | G   | DP  | Ø  |
|---------------|-------------------|-----|----|----|----|----|----|------|------|------|-----|-----|----|
| MK/MKS 1501 A | 650/400           | 55  | 15 | 6  | 58 | 39 | 15 | 15.5 | 12   | 2.5  | 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

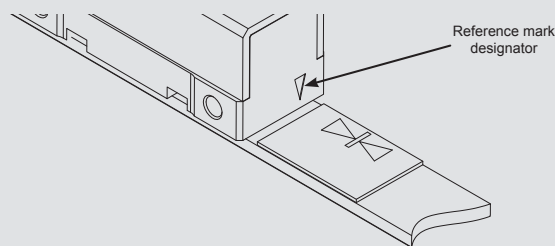
## Advantages

- SBI Guideway with unique ball circulation technology
- Compact design
- Resolution from 250 to 1  $\mu\text{m}$
- 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

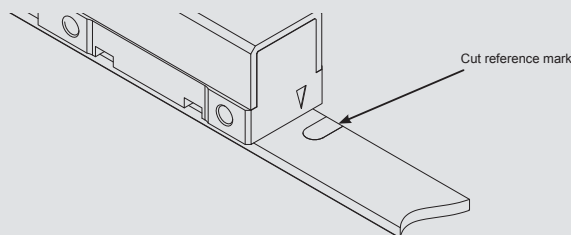
## Reference mark

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<br>With stick-on reference: 0.5 to 1.5 mm  |
| Error band                                | ±40 µm at 20 °C   |
| Linear expansion coefficient              | ~ 17 × 10 <sup>-6</sup> /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)<br>±7.5 µm for 1 mm ride height<br>±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 <sup>2</sup> ; 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)<br>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 <sup>2</sup> (IEC 60068-2-6)   |
| Shocks                               | (11 ms) 300 m/s <sup>2</sup> (IEC 60068-2-27)   |

| Digital output signal                             |   |
|---|---|
| Square wave differential line driver to EIA RS422 |   |
| Power supply voltage                              | 4.6 C to 7 V ***<br>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:<br>$U_H \geq 2.5 \text{ V}$ at $-I_H = 20 \text{ mA}$<br>$U_L \leq 0.5 \text{ V}$ at $I_L = 20 \text{ mA}$  |
| Permissible load                                  | $Z_0 \geq 100 \Omega$ between associated outputs<br>$I_L \leq 20 \text{ mA}$ max. load per output<br>Capacitive load $\leq 1000 \text{ pF}$<br>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).



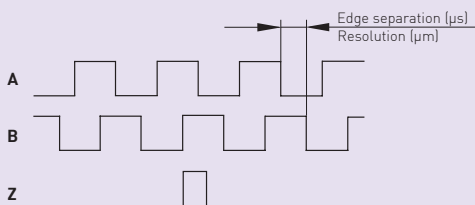
**Table maximum speed for digital output**

| 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   |

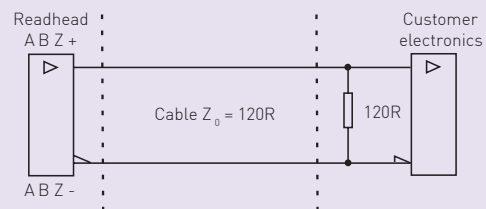
- This speed applies only for the measuring system, not for the guideway.

### Timing diagram

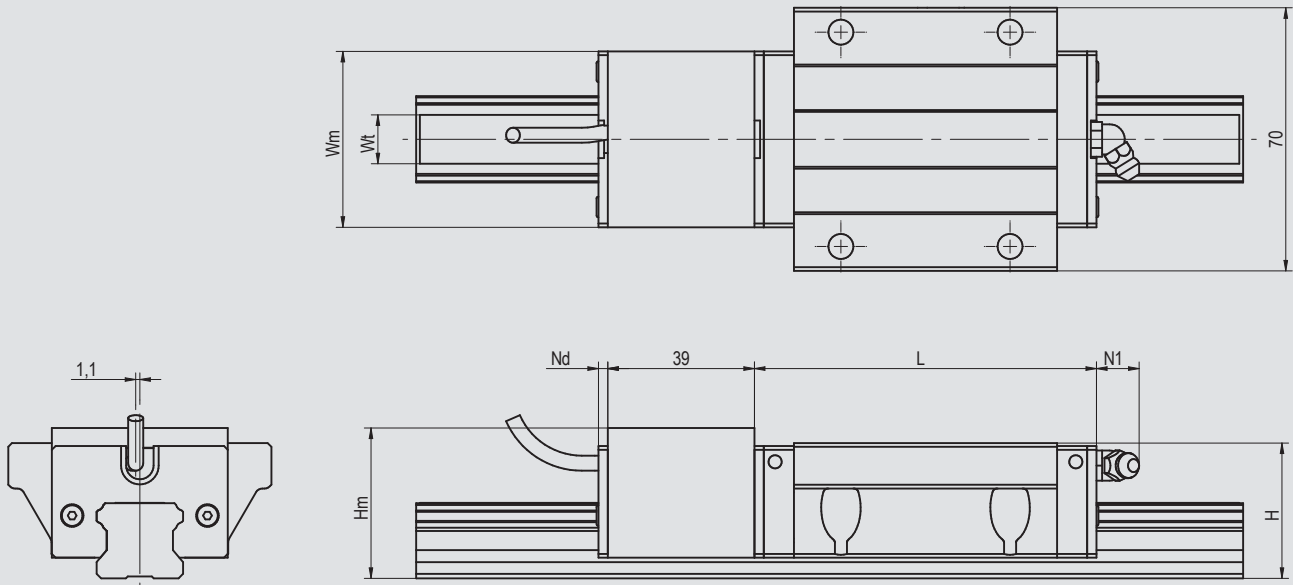
Complementary signals not shown



### Recommended signal termination



# Dimensions



| Model | Hm | Wm | Wt | Nd  |
|-------|----|----|----|-----|
| 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.

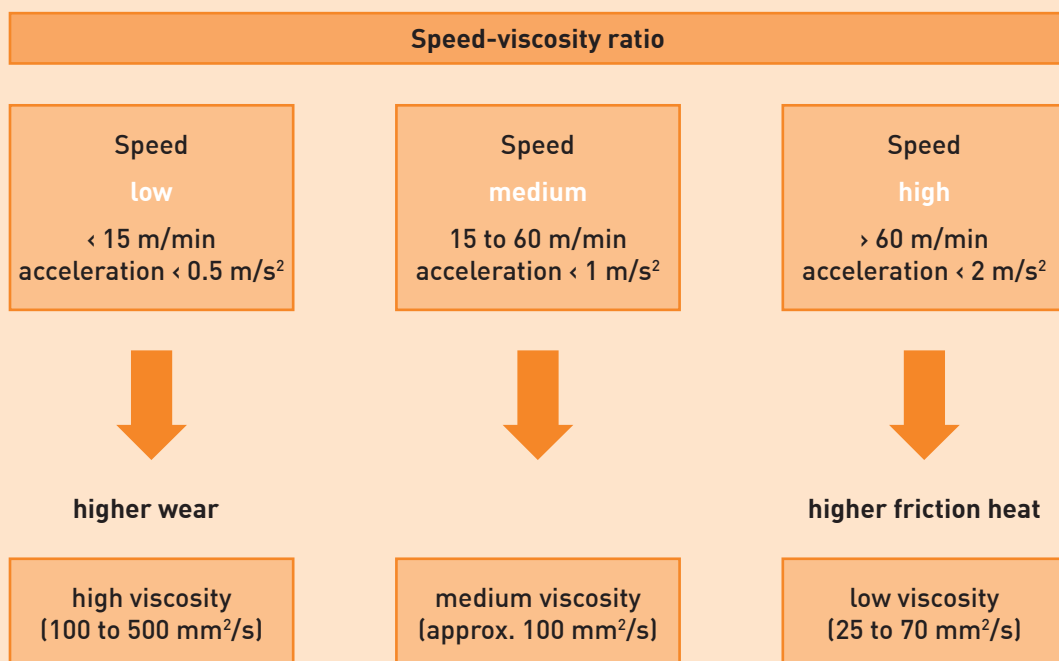
These are taxing requirements. As the field of automation is continuously developing, producing ever more linear drives and guideways, these requirements will continue to become yet more demanding – for the components as well as for the lubricants used.

## 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.

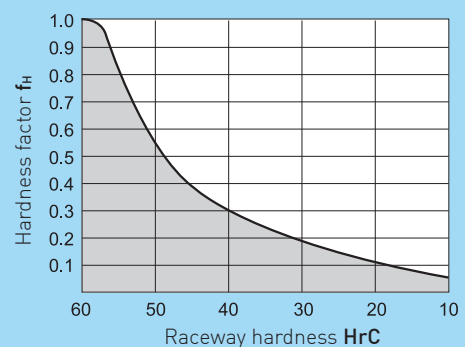
### Basic Static Load Rating : Co ( kN)

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.

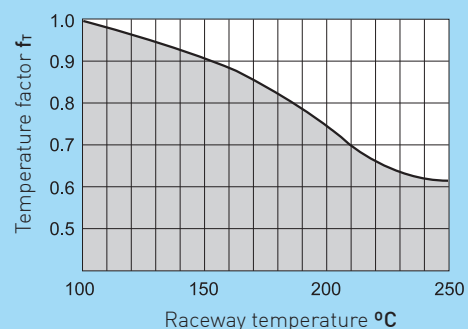
- The value for linear rail system is normally 1.0 since the linear rail system has sufficient hardness.



## 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<sub>c</sub>)

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<sub>c</sub> shown here.

| Number of blocks in close contact | Contact factor f <sub>c</sub> |
|-----------------------------------|-------------------------------|
| 2                                 | 0.81                          |
| 3                                 | 0.72                          |
| 4                                 | 0.66                          |
| 5                                 | 0.61                          |
| 6 or more                         | 0.6                           |
| Normal condition                  | 1.0                           |

### Load factor (f<sub>w</sub>)

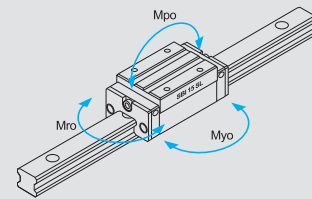
Operating machines create vibrations. The effects of vibrations are difficult to calculate precisely. Refer to the following table to compensate for these vibrations.

| Vibration and Impact | Velocity (V)                | Load factor f <sub>w</sub> |
|----------------------|-----------------------------|----------------------------|
| Very slight          | Very slow<br>V ≤ 0.25 m/s   | 1 ~ 1.2                    |
| Slight               | Low<br>0.25 < V ≤ 1.0 m/s   | 1.2 ~ 1.5                  |
| Moderate             | Medium<br>1.0 < V ≤ 2.0 m/s | 1.5 ~ 2.0                  |
| Strong               | High<br>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<sub>ro</sub> : Moment in rolling direction
- M<sub>po</sub> : Moment in pitching direction
- M<sub>yo</sub> : Moment in yawing direction



### Static Safety Factor : f<sub>s</sub>

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

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

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.

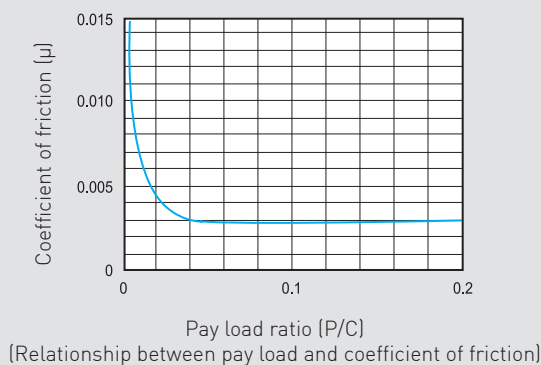
- C<sub>o</sub> : Basic Static Load Rating
- P : Pay Load
- M<sub>o</sub> : Static Permissible Moment (M<sub>po</sub>, M<sub>ro</sub>, M<sub>yo</sub>)
- M : Pay Load Moment

| Operating           | Load conditions                                       | f <sub>s</sub> |
|---------------------|---|----------------|
| 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
- $\mu$  : Coefficient of friction
- P : Load

**P** : Load  
**C** : Basic dynamic load rating

**(1) SBI Linear rail system**  
P : 5000N  
 $\mu$  : 0.003  
F = 0.003 x 5000N = 15N

**(2) Sliding linear rail system**  
P : 5000N  
 $\mu$  : 0.2  
F = 0.2 x 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.

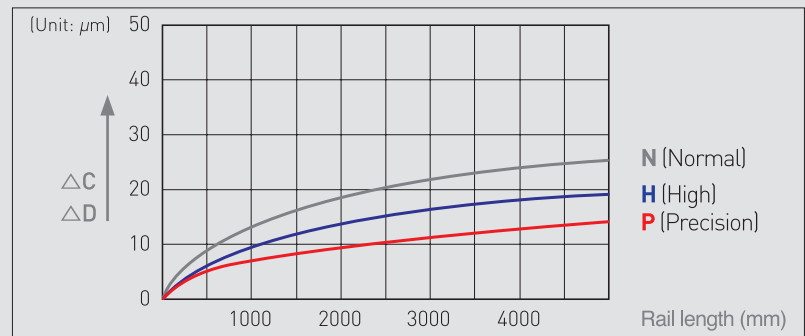
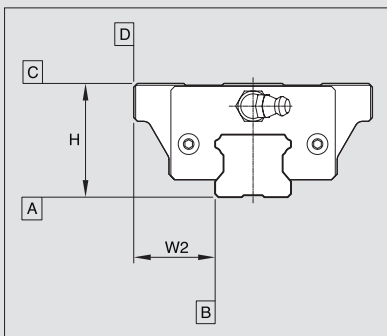
$$L_h = \frac{L \times 10^6}{2 \times l_s \times n_1 \times 60}$$

- $L_h$  (h) : Hours of nominal life
- L (km) : Nominal life
- $l_s$  (mm) : Stroke
- $n_1$  ( $\text{min}^{-1}$ ) : 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

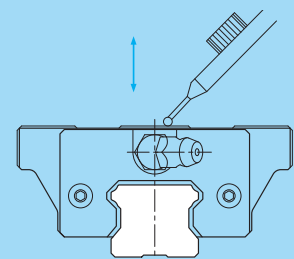
The block side to side movement by vibration is called clearance.

### 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.



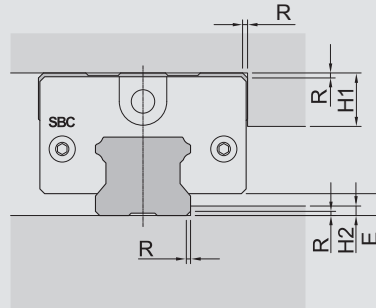
| Preload      | Conditions  | Volume of preload        |
|--------------|---|--------------------------|
| K0 (None)    |   | Clearance within 0.01 mm |
| K1* (Normal) | <ul style="list-style-type: none"> <li>Where the load direction is constant, impact and vibration are light.</li> <li>Precision is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



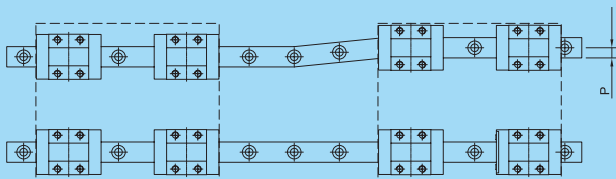
[unit: mm]

| 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.

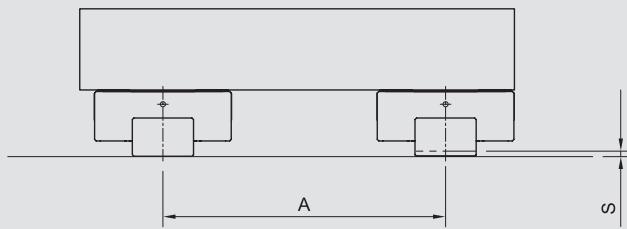
## Permissible tolerance (P) of parallelism



[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

$$S = A * y$$

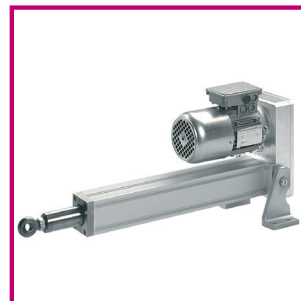
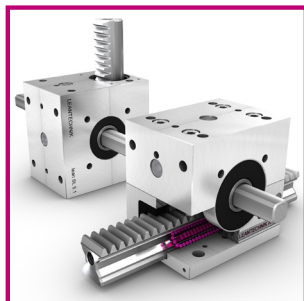
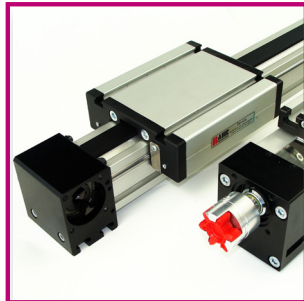
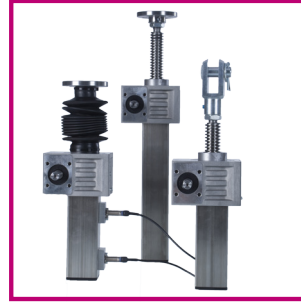
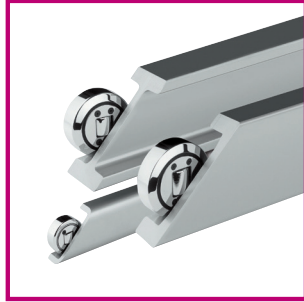
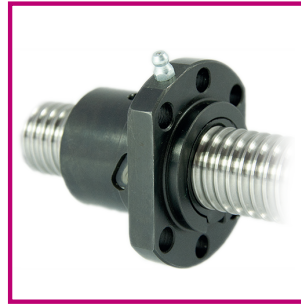
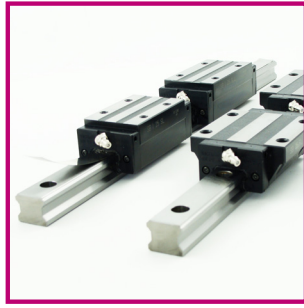
$$S = 1500 * 0.06 * 10^{-3}$$

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

Factor y

[unit: mm]

| Model | Preload classes         |                         |                          |
|-------|-------------------------|-------------------------|--------------------------|
|       | K1<br>*10 <sup>-3</sup> | K2<br>*10 <sup>-3</sup> | K3<br>* 10 <sup>-3</sup> |
| 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.