# CONTENTS

## ⓐ Linear Rail System



## ⓑ Ball Screw



## ⓒ Support Unit



## ⓓ Linear Bushings

## ⓔ Cross Roller Guide



## ⓕ Robot Carrier Guide



## ⓖ Linear Actuator



ⓐ

# Linear Rail System

Technical Data / The Types of Linear Rail System / SBI High-load Linear Rail System /
SBG Standard Linear Rail System / SPG, SPS Low Noise Linear Rail System /
Miniature Linear Rail System

Linear Rail System

Technical Data

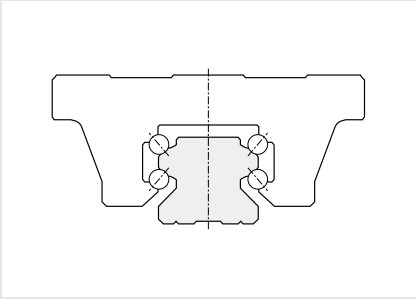


## SBC LINEAR RAIL SYSTEM FEATURES

- Circular-Arc raceway structure achieves the high rigidity and large permissible load.
- Four row circular arc groove with 2 points contact creates the same load in all directions.
- DF structure maintains low instrumental errors.
- Low frictional coefficient achieves the high energy efficiency.
- Easy maintenance.
- Improve the productivity of the machine.
- Various options, Easy machine design and Longer life span.

### Comparison the Linear Rail System with others

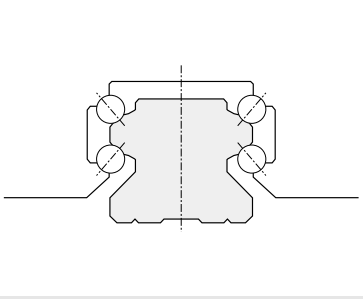
| Item | Linear Rail System | Plane Ball System | Sliding Friction Guide |
|---|---|---|---|
| Assembly | Self-adjusting | △ | Additional working need |
| Precision | Absorbing errors | X | Machining necessary |
| Maintenance | Various grease feeding | ○ | Hard to grease feeding |
| Sway | ○ | ○ | X |
| Impact | ○ | Low rating load | ○ |
| Moment | High rating load | Low rating load | Vulnerable to eccentric load |



### DF Structure

DF structure maintains low instrumental errors.

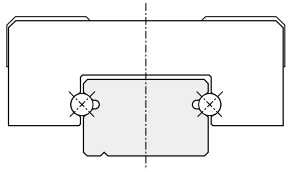
Applied model : SBI, SBG, SBS, SPG, SPS



### The Structure of Raceway Groove and Ball Contact

Circular-Arc Groove, Four Raceway, Two-Point Contact Structure absorb the instrumental errors and create smooth movement even under high load operation.

Applied Model : SBI, SBG, SBS, SPG, SPS



Gothic-Arch Groove, Two Row, Four Point Contact Structure is not effective for absorbing errors but it is optimized for miniaturized machine which is necessary for smooth movement under high load condition.

Applied Model: SBM, SBML, SBMW

Linear Rail System

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.

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

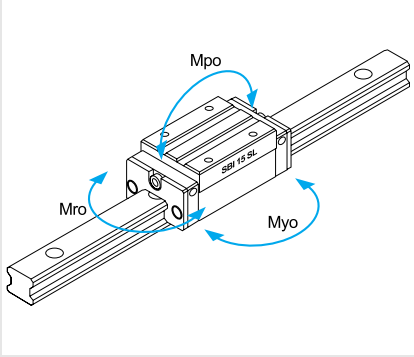
- L : Nominal life
- P : Pay load
- C : Basic dynamic load rating

### 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 50Km 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




### 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.

- Mro : Moment in rolling direction
- Mpo : Moment in pitching direction
- Myo : Moment in yawing direction

$$fs = \frac{Co}{P} \quad \text{(Radial Load)}$$

$$fs = \frac{Mo}{M} \quad \text{(Moment Load)}$$

### Static Safety Factor : fs

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

- Co : Basic Static Load Rating
- P : Pay Load
- Mo : Static Permissible Moment (Mpo, Mro, Myo)
- M : Pay Load Moment

(Table, Static Safety Factor)

| Operating | Load conditions | fs |
|---|---|---|
| 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 |

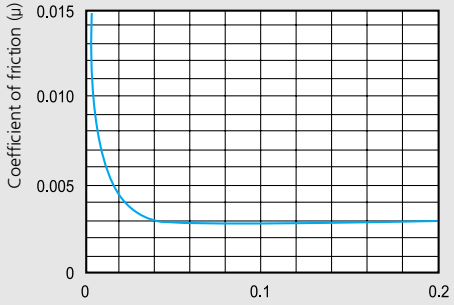
Linear Rail System

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, the light 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.

*Coefficient of friction for linear rail system(μ) : 0.002~0.004




(Relationship between pay load and coefficient of friction)

P : Load

C : Basic dynamic load rating

Calculate comparison by different guide system

$F = \mu \cdot P$

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

(1) Linear rail system

P : 5000N

μ : 0.003

F = 0.003 x 5000N = **15N**

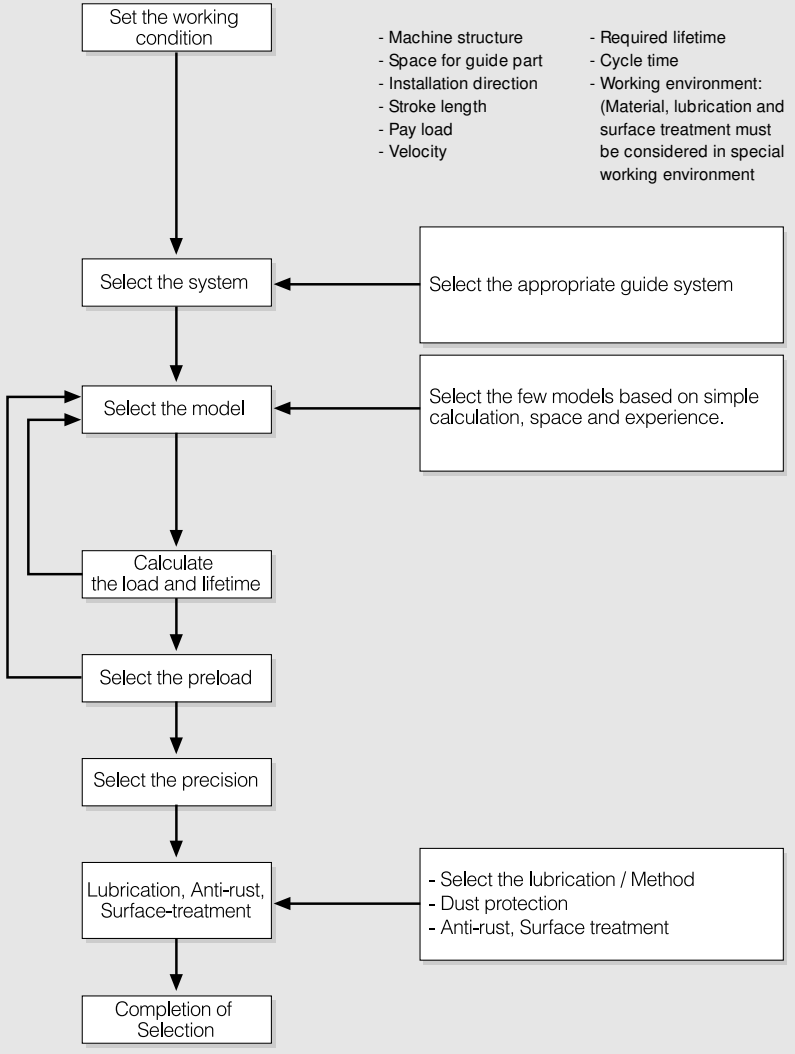
(2) Sliding linear rail system

P : 5000N

μ : 0.2

F = 0.2 x 5000N = **1000N**

## The procedure of selecting linear rail system



Linear Rail System

Technical Data

## Select the system / Model

### 1. Select System

Select the appropriate guide system after considering rigidity, cost of machine and manufacturing time.

### 2. Select Model

Select the few models based on simple calculation, space and experience.

### 3. Calculate the load and life time

Judge the expected life time after calculating the load and life time and apply the model to machine design.

### 3-1. Calculating the applied loads

Loads exerted on a linear rail system vary according to direction. It is important to consider this condition before selecting the type of linear rail systems and model. Refer to the below example when calculating the loads.

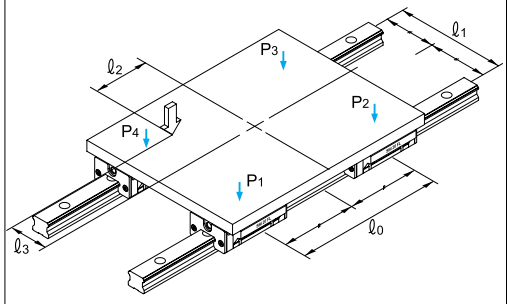
[Condition of calculating the applied load]

Select the few models after considering space and experience and simple calculation for working conditions.

- m (kg) : Load
- $\ell_n$ (mm) : Distance(mm)
- $P_n$ : Radial load
- $P_{nT}$ : Lateral load
- g (m/s²) : Gravitational acceleration (= 9.8 m/s²)
- V (m/s) : Velocity
- an (m/s²) : Acceleration

## Calculating the applied loads and life time

**Condition 1** Horizontal axis



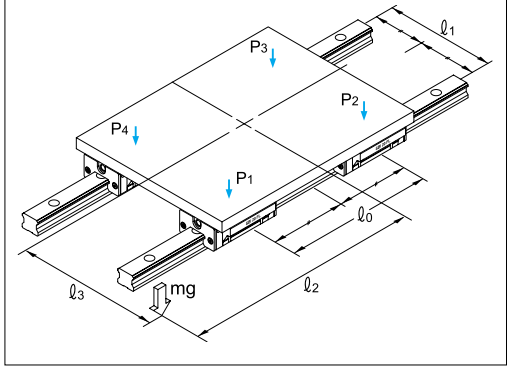

$$P_1 = \frac{mg}{4} + \frac{mg \cdot \ell_2}{2 \cdot \ell_0} - \frac{mg \cdot \ell_3}{2 \cdot \ell_1}$$

$$P_2 = \frac{mg}{4} - \frac{mg \cdot \ell_2}{2 \cdot \ell_0} - \frac{mg \cdot \ell_3}{2 \cdot \ell}$$

$$P_3 = \frac{mg}{4} - \frac{mg \cdot \ell_2}{2 \cdot \ell_0} + \frac{mg \cdot \ell_3}{2 \cdot \ell_1}$$

$$P_4 = \frac{mg}{4} + \frac{mg \cdot \ell_2}{2 \cdot \ell_0} + \frac{mg \cdot \ell_3}{2 \cdot \ell_1}$$

**Condition 2** Horizontal axis with overhung




$$P_1 = \frac{mg}{4} + \frac{mg \cdot \ell_2}{2 \cdot \ell_0} + \frac{mg \cdot \ell_3}{2 \cdot \ell_1}$$

$$P_2 = \frac{mg}{4} - \frac{mg \cdot \ell_2}{2 \cdot \ell_0} + \frac{mg \cdot \ell_3}{2 \cdot \ell}$$

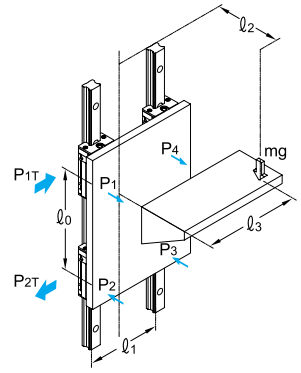
$$P_3 = \frac{mg}{4} - \frac{mg \cdot \ell_2}{2 \cdot \ell_0} - \frac{mg \cdot \ell_3}{2 \cdot \ell_1}$$

$$P_4 = \frac{mg}{4} + \frac{mg \cdot \ell_2}{2 \cdot \ell_0} - \frac{mg \cdot \ell_3}{2 \cdot \ell_1}$$

Linear Rail System

Technical Data

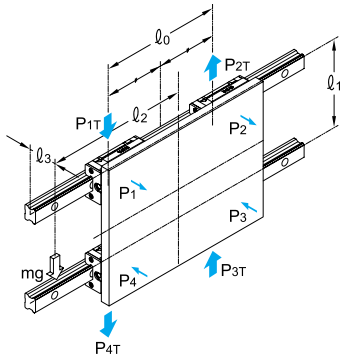
**Condition 3** Vertical axis




$$P_{1} \sim P_{4} = \frac{mg \cdot \ell_2}{2 \cdot \ell_0}$$

$$P_{1T} \sim P_{4T} = \frac{mg \cdot \ell_3}{2 \cdot \ell_0}$$

**Condition 4** Vertical axis with wall mounted

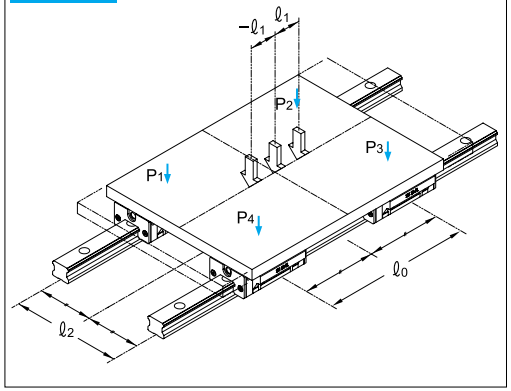



$$P_{1} \sim P_{4} = \frac{mg \cdot \ell_3}{2 \cdot \ell_1}$$

$$P_{1T} \sim P_{4T} = \frac{mg}{4} + \frac{mg \cdot \ell_2}{2 \cdot \ell_0}$$

$$P_{2T} \sim P_{3T} = \frac{mg}{4} - \frac{mg \cdot \ell_2}{2 \cdot \ell_0}$$

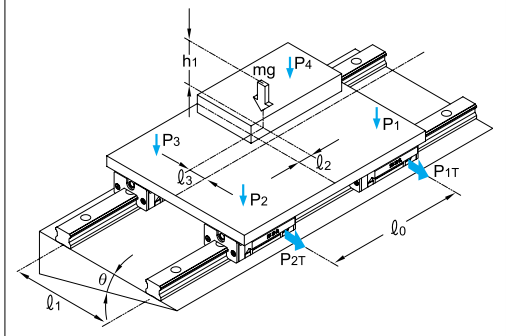
**Condition 5** Horizontal axis with rail movable




$$P_{1} \sim P_{4\,(max)} = \frac{mg}{4} + \frac{mg \cdot \ell_1}{2 \cdot \ell_0}$$

$$P_{1} \sim P_{4\,(min)} = \frac{mg}{4} - \frac{mg \cdot \ell_1}{2 \cdot \ell_0}$$

**Condition 6** Lateral axis




$$P_{1} = \frac{mg \cdot \cos\theta}{4} + \frac{mg \cdot \cos\theta \cdot \ell_2}{2 \cdot \ell_0} - \frac{mg \cdot \cos\theta \cdot \ell_3}{2 \cdot \ell_1} + \frac{mg \cdot \sin\theta \cdot h_1}{2 \cdot \ell_1}$$

$$P_{1T} = \frac{mg \cdot \sin\theta}{4} + \frac{mg \cdot \sin\theta \cdot \ell_2}{2 \cdot \ell_0}$$

$$P_{2} = \frac{mg \cdot \cos\theta}{4} - \frac{mg \cdot \cos\theta \cdot \ell_2}{2 \cdot \ell_0} - \frac{mg \cdot \cos\theta \cdot \ell_2}{2 \cdot \ell_1} + \frac{mg \cdot \sin\theta \cdot h_1}{2 \cdot \ell_1}$$

$$P_{2T} = \frac{mg \cdot \sin\theta}{4} - \frac{mg \cdot \sin\theta \cdot \ell_2}{2 \cdot \ell_0}$$

$$P_{3} = \frac{mg \cdot \cos\theta}{4} - \frac{mg \cdot \cos\theta \cdot \ell_2}{2 \cdot \ell_0} + \frac{mg \cdot \cos\theta \cdot \ell_3}{2 \cdot \ell_1} - \frac{mg \cdot \cos\theta \cdot h_1}{2 \cdot \ell_1}$$

$$P_{3T} = \frac{mg \cdot \sin\theta}{4} + \frac{mg \cdot \sin\theta \cdot \ell_2}{2 \cdot \ell_0}$$

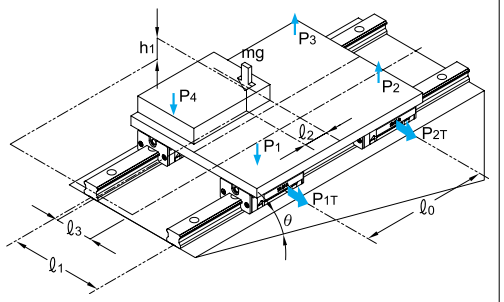
$$P_{4} = \frac{mg \cdot \cos\theta}{4} + \frac{mg \cdot \cos\theta \cdot \ell_2}{2 \cdot \ell_0} + \frac{mg \cdot \cos\theta \cdot \ell_3}{2 \cdot \ell_1} - \frac{mg \cdot \sin\theta \cdot h_1}{2 \cdot \ell_1}$$

$$P_{4T} = \frac{mg \cdot \sin\theta}{4} + \frac{mg \cdot \sin\theta \cdot \ell_2}{2 \cdot \ell_0}$$

Linear Rail System

Technical Data

**Condition 7** Longitudinal axis




$$P_1 = \frac{mg\cdot\cos\theta}{4} + \frac{mg\cdot\cos\theta\cdot\ell_2}{2\cdot\ell_0} - \frac{mg\cdot\cos\theta\cdot\ell_3}{2\cdot\ell_1} + \frac{mg\cdot\sin\theta\cdot h_1}{2\cdot\ell_0}$$

$$P_{1T} = \frac{mg\cdot\cos\theta\cdot\ell_3}{2\cdot\ell_0}$$

$$P_2 = \frac{mg\cdot\cos\theta}{4} - \frac{mg\cdot\cos\theta\cdot\ell_2}{2\cdot\ell_0} - \frac{mg\cdot\cos\theta\cdot\ell_3}{2\cdot\ell_1} - \frac{mg\cdot\sin\theta\cdot h_1}{2\cdot\ell_0}$$

$$P_{2T} = \frac{mg\cdot\sin\theta\cdot\ell_3}{2\cdot\ell_0}$$

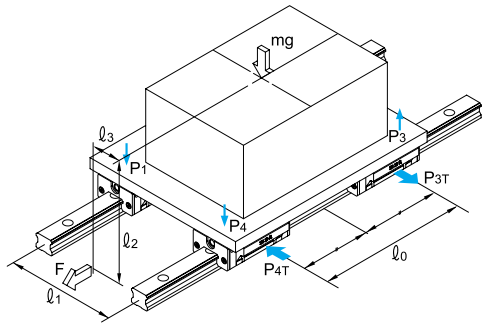
$$P_3 = \frac{mg\cdot\cos\theta}{4} - \frac{mg\cdot\cos\theta\cdot\ell_2}{2\cdot\ell_0} + \frac{mg\cdot\cos\theta\cdot\ell_3}{2\cdot\ell_1} - \frac{mg\cdot\sin\theta\cdot h_1}{2\cdot\ell_0}$$

$$P_{3T} = \frac{mg\cdot\sin\theta\cdot\ell_3}{2\cdot\ell_0}$$

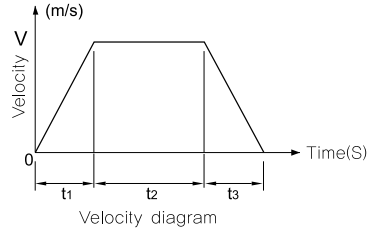
$$P_4 = \frac{mg\cdot\cos\theta}{4} + \frac{mg\cdot\cos\theta\cdot\ell_2}{2\cdot\ell_0} + \frac{mg\cdot\cos\theta\cdot\ell_3}{2\cdot\ell_1} + \frac{mg\cdot\sin\theta\cdot h_1}{2\cdot\ell_0}$$

$$P_{4T} = \frac{mg\cdot\sin\theta\cdot\ell_3}{2\cdot\ell_0}$$

**Condition 8** Horizontal axis with inertia




$$\alpha_n = \frac{V}{t_n}$$




Velocity diagram

Acceleration

$$P_1 = P_4 = \frac{mg}{4} - \frac{m\cdot\alpha_1\cdot\ell_2}{2\cdot\ell_0}$$

$$P_2 = P_3 = \frac{mg}{4} + \frac{m\cdot\alpha_1\cdot\ell_2}{2\cdot\ell_0}$$

$$P_{1T} = P_{4T} = \frac{m\cdot\alpha_1\cdot\ell_3}{2\cdot\ell_0}$$

In uniform motion

$$P_{1T} = P_{4T} = \frac{mg}{4}$$

Deceleration

$$P_1 = P_4 = \frac{mg}{4} + \frac{m\cdot\alpha_3\cdot\ell_2}{2\cdot\ell_0}$$

$$P_2 = P_3 = \frac{mg}{4} - \frac{m\cdot\alpha_3\cdot\ell_2}{2\cdot\ell_0}$$

$$P_{1T} = P_{4T} = \frac{m\cdot\alpha_3\cdot\ell_3}{2\cdot\ell_0}$$

Linear Rail System

Technical Data



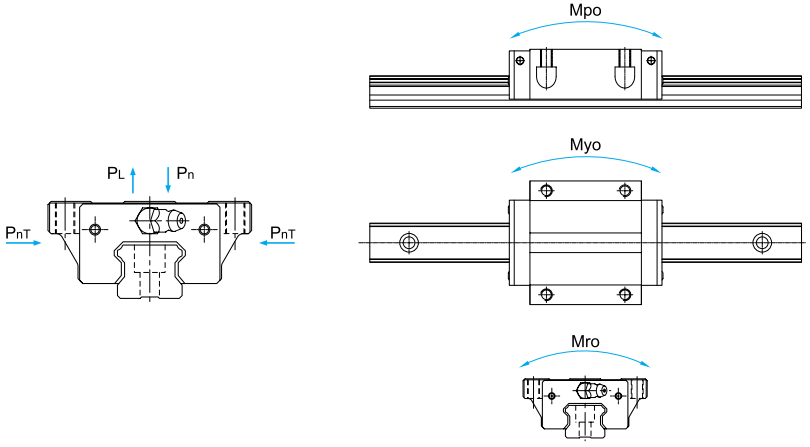
## 3-2. Calculating the Equivalent Load

Linear Rail Systems can accept normal and moment (Mro, Mpo, Myo) loads in all directions including radial, reverse-radial and lateral loads at the same time. Therefore, calculate the equivalent load accordingly.

$P_E$ (Equivalent load) = $P_n + P_{nT}$

$P_n$ : Vertical load
$P_{nT}$ : Horizontal load

| | | | |
|---|---|---|---|
| $P_n$ | Radial load | Mro | Moment in rolling direction |
| $P_L$ | Reverse-radial load | Mpo | Moment in pitching direction |
| $P_{nT}$ | Laterall load | Myo | Moment in yawing direction |




## 3-3. Static Safety Factors (fs)

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

| | |
|---|---|
| Radial load is large | $\frac{f_H \cdot f_T \cdot f_C \cdot C_O}{P_n} \geqq f_S$ |
| Reverse-radial load is large | $\frac{f_H \cdot f_T \cdot f_C \cdot C_{OL}}{P_L} \geqq f_S$ |
| laterall load is large | $\frac{f_H \cdot f_T \cdot f_C \cdot C_{OT}}{P_{nT}} \geqq f_S$ |

- $f_S$ : Static safety factor
- $C_O(N)$ : Basic static load rating (radial)
- $C_{OL}(N)$ : Basic static load rating (reverse-radial)
- $C_{OT}(N)$ : Basic static load rating (lateral)
- $P_n(N)$ : Calculated load (radial)
- $P_L(N)$ : Calculated load (reverse-radial)
- $P_{nT}(N)$ : Calculated load (lateral)
- $f_H$ : Hardness factor
- $f_T$ : Temperature factor
- $f_C$ : Contact factor

[Value of static safety factor (fs)]

| Operating | Load conditions | Lower limit of fs |
|---|---|---|
| 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 |

Linear Rail System

Technical Data



## 3-4. Calculating the Mean Load

Loads acting on a linear rail system can vary according to various conditions. All load conditions must be taken into consideration in order to calculate the required linear rail system capacity

[Equation for calculating the mean load]

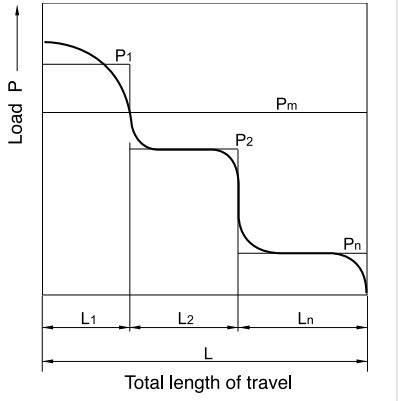
| | | |
|---|---|---|
| $P_m$ : | Mean load | (N) |
| $P_n$ : | Varying load | (N) |
| L : | Total length of travel | (mm) |
| $L_n$ : | Length of travel carrying $P_n$ | (mm) |

$$P_m = \sqrt[3]{\frac{1}{L} \cdot \sum_{m=1}^{n} (P_n^3 \cdot L_n)}$$

### 1) Step loads

$$P_m = \sqrt[3]{\frac{1}{L}(P_1^3 \cdot L_1 + P_2^3 \cdot L_2 \cdots + P_n^3 \cdot L_n)} \cdots\cdots (1)$$

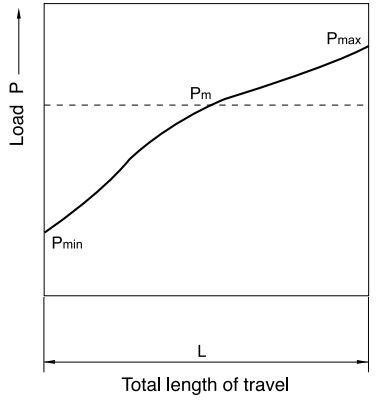
| | | |
|---|---|---|
| $P_m$ : | Mean load | (N) |
| $P_n$ : | Varying load | (N) |
| L : | Total length of travel | (mm) |
| $L_n$ : | Length of travel carrying $P_n$ | (mm) |




### 2) Loads that vary linearly

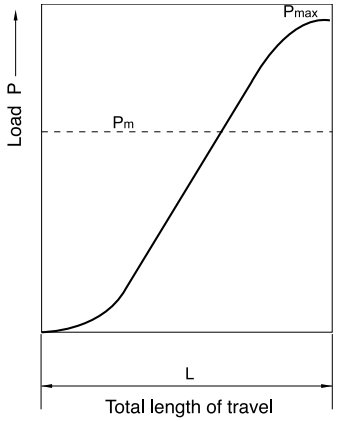
$$P_m \fallingdotseq \frac{1}{3}(P_{min} + 2 \cdot P_{max}) \cdots\cdots (2)$$

| | | |
|---|---|---|
| $P_{min}$ : | Minimum load | (N) |
| $P_{max}$ : | Maximum load | (N) |

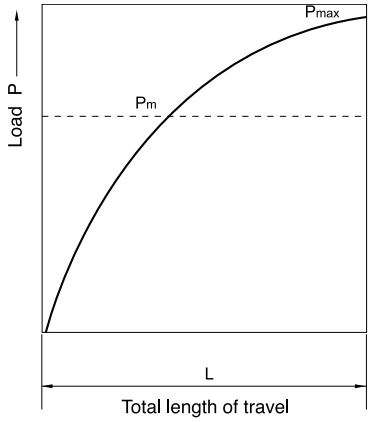



### 3) Loads varying sinusoidally

a) $P_m \fallingdotseq 0.65_{max}$ ····· (3)




b) $P_m \fallingdotseq 0.75_{max}$ ····· (4)



Linear Rail System

Technical Data



## 3-5. Life Calculation

The equation of nominal life for linear rail system is shown as below.

[Calculation of nominal life]

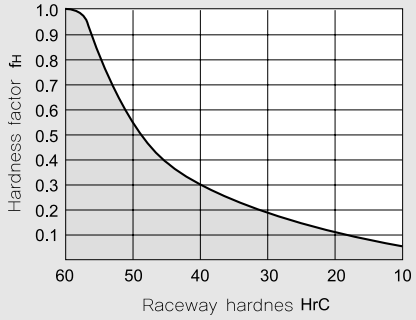
$$L = \left( \frac{f_H \cdot f_T \cdot f_C}{f_W} \cdot \frac{C}{P_C} \right)^3 X\ 50$$

- 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

### Hardness factor ($f_H$)

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.

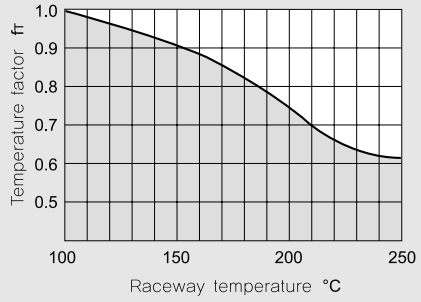



### Temperature factor ($f_T$)

If the temperature of the linear rail system is over 100℃, 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℃.

※ Please contact us if you need linear rail system with over 80℃ working condition.




### Contact factor ($f_C$)

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

| Number of blocks in close contact | Contact factor $f_C$ |
|---|---|
| 2 | 0.81 |
| 3 | 0.72 |
| 4 | 0.66 |
| 5 | 0.61 |
| 6 or more | 0.6 |
| Normal condtion | 1.0 |

### Load factor ($f_W$)

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

| Vibration and Impact | Velocity (V) | Load factor $f_W$ |
|---|---|---|
| Very slight | Very low $V \leqq 0.25$m/s | 1 ~ 1.2 |
| Slight | Low $0.25 < V \leqq 1.0$m/s | 1.2 ~ 1.5 |
| Moderate | Medium $1.0 < V \leqq 2.0$m/s | 1.5 ~ 2.0 |
| Strong | High $V < 2.0$m/s | 2.0 ~ 3.5 |

[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.

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

$$L_h = \frac{L\ X\ 10^6}{2\ X\ \ell_s\ X\ n_1\ X\ 60}$$

Linear Rail System

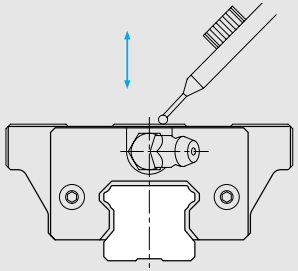
Technical Data



## 4. Rigidity

### 4-1. 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.

### 4-2. Preload

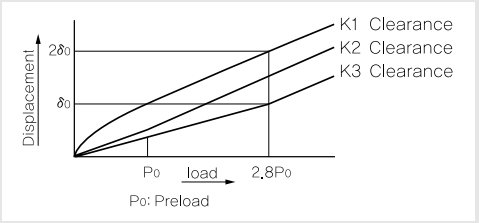
Preload affects the rigidity, internal-load and clearance. Also, it is very important to select appropriate preload according to applied load, impact and vibration expected in the application.

| Preload | Conditions | Example |
|---|---|---|
| K3 [Heavy preload] | ☐ Where rigidity is required, vibration and impact are present.<br>☐ Engineered machinery for heavy equipment | ● Machining center<br>● NC lathe<br>● Grinding machine<br>● Milling machine<br>● Vertical axis of machine tool |
| K2 [Light preload] | ☐ Where overhung loads or moment occur<br>☐ Single axis operation.<br>☐ Light load that requires precision. | ● Measuring equipment<br>● Electric discharge machine<br>● High speed material handling equipment<br>● NC drilling machine<br>● Industrial robot<br>● Z axis for general industrial equipment |
| K1 [Normal preload] | ☐ Where the load direction is constant, impact and vibration are light.<br>☐ Precision is not required | ● Welding machine<br>● Binding machine<br>● Automatic wrapping machine<br>● Material handling equipment |

### 4-3. Rigidity

When the load is applied to Linear Rail Systems, the balls, blocks and rails experience the elastic deformation within permissible range. The ratio of displacement is known as the rigidity.
The rigidity increases as the preload increases.

In case of four way equal load type, the preload is available until the load increases to some 2.8 times the preload applied.




$$K = \frac{P}{\delta}$$

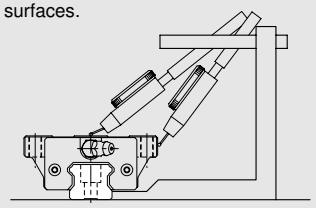
K (N/μm) : Rigidity
δ (μm) : Displacement
P (N) : Calculated load

## 5. Accuracy

Accuracy of linear rail system is generally defined by the running parallelism or the vertical and horizontal variations between the block and the rail mounting surfaces.

### 5-1. Running parallelism

It is tolerance of parallelism between reference of block and rail when the rail is mounted and block is moving in the whole length of rail.



### 5-2. Difference in Height

Difference in height between blocks on the same rail.

### 5-3. Difference in width

Difference in width between rail and blocks on the same rail

### 5-4. Accuracy level

Accuracy levels are divided into three type – **N, H** and **P**.

※See the dimension pages for each accuracy.

Linear Rail System

Technical Data



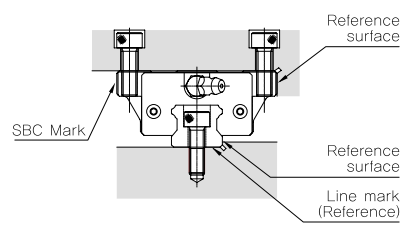
## 6. Design of system

Mounting method, tolerance of the mounting sufraces, and order in which the rails are mounted all affect the accuracy of machine,. Therefore we recommend considering below conditions.

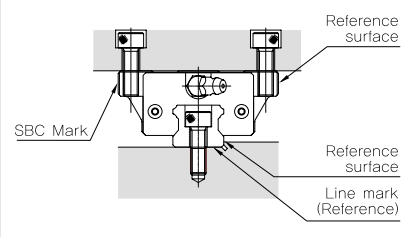
### 6-1. Identifying reference surface

The unmarked edge of the block and the lined edge of the rail define the reference surfaces. Please note the methods below for locating these surfaces in your design.

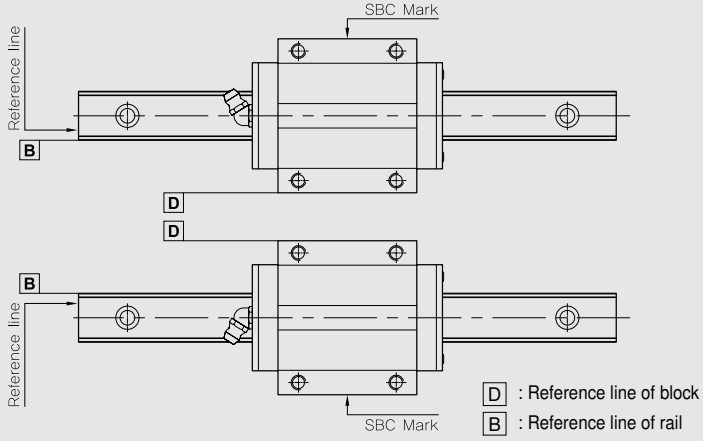
[Master linear rail system]




[Subsidiary linear rail system]



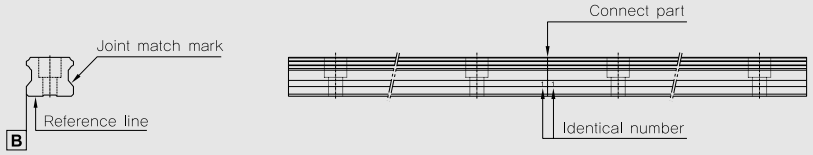

[Example of identifying reference line for pair usage]



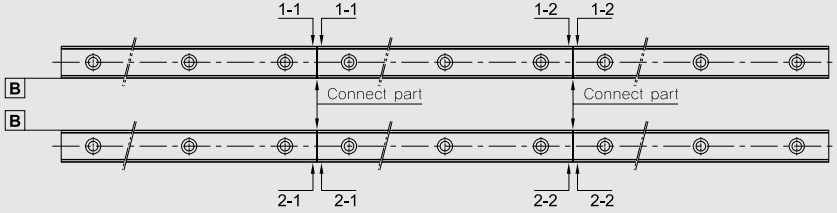

[Rail joint marking]

For extremely long travel applications it may be necessary to join the rails via a butt joint. These joint are matched for continuous smooth motion at the factory and numbered. When installing the segments insure that the numbers at the joints match. In the case of a double rail system the first of the two numbers identifies the rail.

Two rail joining method




2 axis application and multiple rail joining method



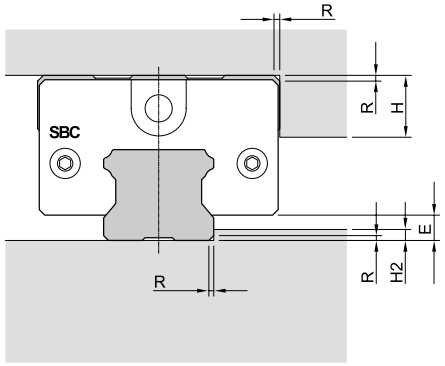
Linear Rail System

Technical Data

## 6-2. 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.

※ See the each pages for shoulder height and fillet radius R.

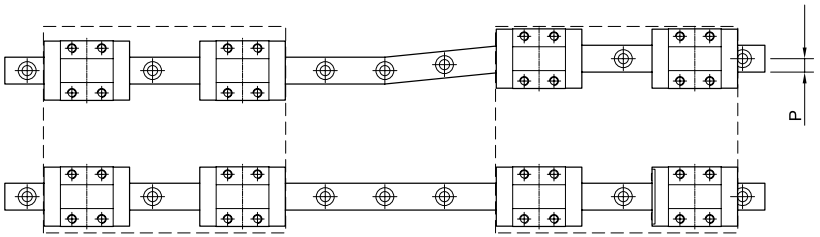



## 6-3. Permissible tolerance of mounting surface

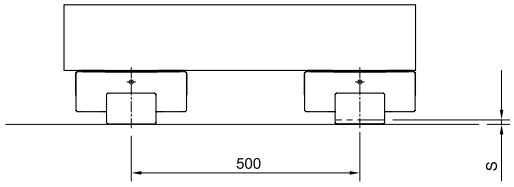
Mounting errors can cause rolling resistance to motion. Due to the self adjusting feature of the SBC linear rail system, rolling resistance or bearing will not be affected as long as the permissible tolerance is observed as per the table shown in the catalogue.

※ See the each page for permissible tolerance of mounting surface.

[Permissible tolerance (P) of parallelism]




[Permissible tolerance (S) of rail mounting surface height variation]



Linear Rail System

Technical Data



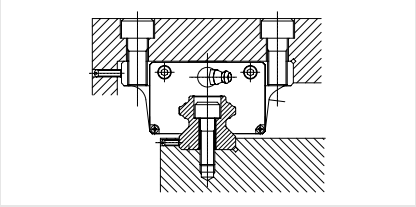
## 6-4. Mounting linear rail system

### [Securing Method for Blocks and Rails]

Normally, both the bearing block and rail are mounted to the structure with bolts. When a horizontal load is applied, shock, or vibration, it is recommended that the rail be clamped horizontally against the reference surface.

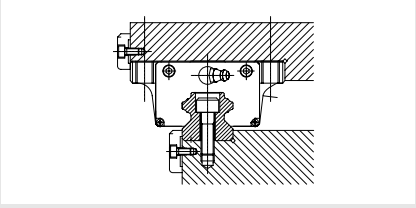
### (1) Cap screw mounting

Small bolts are used when space is limited. The number of bolts can be adjusted as necessary.



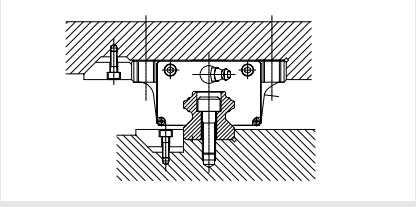
### (2) Horizontal clamp mounting

This method provides an easy solution to shock and vibration applications.



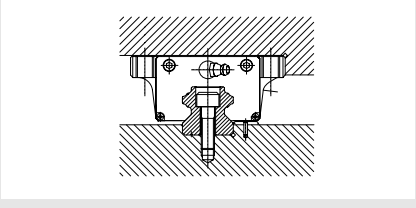
### (3) Tapered Gibb

This method offers the most secure means for locating the rail and block against the reference surface.



### (4) Dowel Pin

Where the forces are lower and the costs more critical, dowel pins can be used to fix the rail.



### [Rail Mounting procedure]

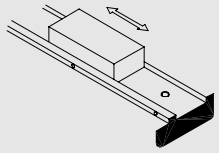
❶ Clean and dry the mounting surface.

❷ Coat each surface with low viscosity spindle oil, then place the rail on the surface and then lightly tighten the mounting bolts temporarily.

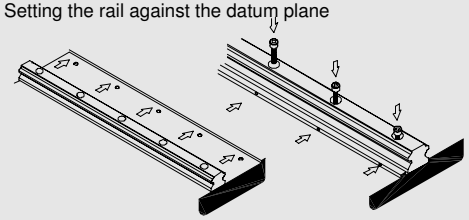
❸ Place the carriage plate on the blocks carefully and tighten the mounting bolts temporarily.

❹ Position the carriage plate by tightening the master block against the reference surface using the selected securing method and tighten the mounting bolts with a torque wrench.
※ Follow the above order to mount subsidiary blocks.

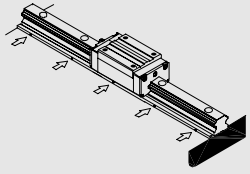
① Checking the mounting



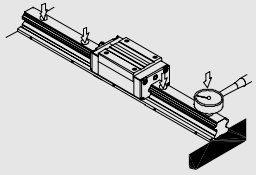
② Setting the rail against the datum plane



③ Tightening set screws



④ Final tightening of mounting bolts

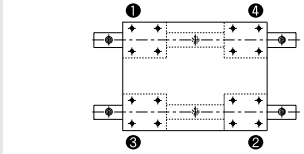


### [Block Mounting procedure]

❶ Clamp the reference rail in place and tighten the mounting bolts with a torque wrench, making several passes to reach the desired torque

❷ Carefully position the table with bearings onto the rails and tighten the non-reference blocks with a torque wrench.

❸ Starting at one end ,move the table along the rail and tighten the non-reference rail slowly during several passes with a final pass using the torque wrench. Do not over tighten



[Bolt mounting torque]

Below bolt mounting torque is recommended for mounting the rail.

Unit : N.cm

| Bolt | Mounting torque | | |
|---|---|---|---|
| | Steel | Cast iron | Aluminum |
| M2 | 58.8 | 39.2 | 29.4 |
| M2.3 | 78.4 | 53.9 | 39.2 |
| M2.6 | 118 | 78.4 | 58.8 |
| M3 | 196 | 127 | 98 |
| M4 | 412 | 274 | 206 |
| M5 | 882 | 588 | 441 |
| M6 | 1370 | 921 | 686 |
| M8 | 3040 | 2010 | 1470 |
| M10 | 6760 | 4510 | 3330 |
| M12 | 11800 | 7840 | 5880 |
| M14 | 15700 | 10500 | 7840 |
| M16 | 19600 | 13100 | 9800 |
| M20 | 38200 | 25500 | 19100 |
| M22 | 51900 | 34800 | 26000 |
| M24 | 65700 | 44100 | 32800 |
| M30 | 130000 | 87200 | 65200 |





## 7. Lubrication

Lubrication for linear rail system is a key part of its performance.

- Reduce friction and wearing for each moving part.
- Eliminate the heat on linear rail system.
- Prevent corrosion on inside and outside of linear rail system.
- Dust-prevention.

### 7-1. Lubrication requirements for linear rail system

- Form a strong oil film
- Have high thermal stability
- Low-friction
- High water resistance
- Oil must have high-viscosity and grease must have consistency again repeated agitation of grease
- Non-corrosive

### 7-2. Comparison of lubrication

A comparison of the application features for oil and grease used in linear rail system is shown in the table below.

| Item | Grease | Oil |
|---|---|---|
| Rotation | Low, intermediate | High |
| Seal | Simple | Cautious |
| Lubrication change | Complicated | Simple |
| Life | Short | Long |
| Thermal radiation | Bad | Good |
| Friction torque | Large | Less |
| Performance | Good | Excellent |

Linear Rail System
Technical Data

### (1) How to grease

- **With grease gun :** The grease is fed through the grease fitting on linear rail system.
- **With pump :** The grease is fed periodically by automation pump.

### (2) How to feed oil

- Oil-brushed on, sprayed or pumped.

### 7-3. Lubricants interval

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

| Item | Checking time | Lubricant interval | Working condition and outcome |
|---|---|---|---|
| Grease | 3 ~ 6 months | 6 months ~ 1 year | Normal working condition |
| | | 3000km | 3000km/6 months |
| Oil | 1 week | According to checking | Volume and contamination of oil |
| | Everyday | Any time | Volume of oil |

### 7-4. Class of oil

| Lubricant | Class |
|---|---|
| Oil | Coolant oil, turbine oil ISOVG32 ~ 68 |

### 7-5. Classification and selection of lubrication

Lubricant for linear rail system must be selected after considering vibration, clean room, vacuum and working condition.

SBC supplies two kinds of grease as standards.

| Item | Application | Brand |
|---|---|---|
| Normal working condition | Multipurpose industrial application | Shell Alvania EP(LF)0 [Korea Shell] |
| Special working condition | Clean room | SNG 5050 [NTG Korea] |
| | Vibration | |
| | Wide temperature | |

* Contact SBC for special lubes or MSDS sheets

## Technical Data

### [Normal working condition: Multipurpose industrial application]

**[1] General**

- **Name :** Shell Alvania EP(LF)0
- **Company :** Korea Shell
- **Appearance :** Bright brown color, semi-solid in normal temperature

**[2] Special feature**

- High load resistance
- Anti-corrosive
- High liquidity
- High mechanical stability

**[3] Representative feature**

- **Consistency enhancer :** Lithium
- **Base oil :** Mineral oil
- **Working temperature :** -30℃ ~ 100℃

| Test item | Representative value | Test method |
|---|---|---|
| Consistency [25℃, 60 times] | 0 | NLGI * |
| Dropping point | 180℃ | ASTM D 566 |
| Copper plate corrosion [Method B,100℃, 24h] | 1 B | ASTM D 4048 |
| Evaporation [99℃, 22h] | 0.40 % | ASTM D 972 |
| Stability of oxidation [99℃, 100h] | 0.40 kgf/cm² | ASTM D 942 |
| Mixing stability [100,000cycles] | 393 | ASTM D 217 |

* NLGI :National Lubricating Grease Institute

| Consistency test method | KS | NLGI |
|---|---|---|
| | 355 ~ 385 | 0 |





## Technical Data

### [Special working condition : Wide-temperature and low dust accumulating]

**[1] General**

- **Name :** SNG5050
- **Company :** NTG Korea
- **Appearance :** Butter in normal temperature

**[2] Special feature**

- Excellent stability of oxidation
- Long life grease
- Low dust accumulating and excellent chemical-resistance
- Wide temperature range

**[3] Representative feature**

- **Consistency :** Urea
- **Base oil :** Synthetic oil
- **Working temperature :** -40℃ ~ 200℃

| Test item | | Representative value | Test method |
|---|---|---|---|
| Consistency [25℃, 60 times] | | 3 | NLGI * |
| Dropping point | | 280℃ | JIS K 2220 5.4 |
| Evaporation (22h) mass % | 99℃ | 0.11% | JIS K 2220 5.6 |
| | 150℃ | 0.57% | JIS K 2220 5.6 |
| Oil separation rate (24h) mass % | 150℃ | 0.5% | JIS K 2220 5.7 |
| Film evaporation (24h) mass % | 150℃ | 5.54% | - |
| | 180℃ | 16.44% | - |
| Stability of oxidation [99℃, 100h] mass % | | 0.015% | JIS K 2220 5.8 |
| Mixing stability [100,000cycles] | | Pass | ASTM D 1743 |
| Wear resistance ( 1200rpm, 392N, room temperature 1h) | | 0.57 | ASTM D 2266 |

* NLGI : National Lubricating Grease Institute

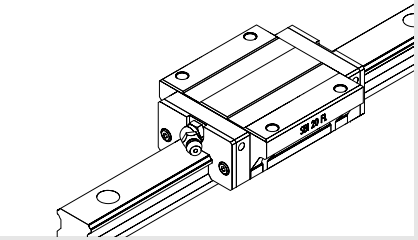
| Consistency test method | KS | NLGI |
|---|---|---|
| | 220 ~ 250 | 3 |

## 7-6. Grease fitting

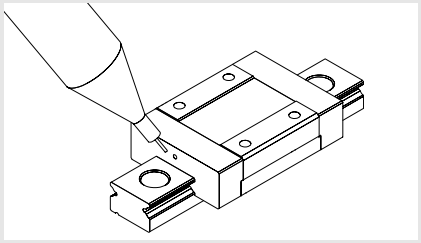
Select the appropriate grease fitting from below options in accordance with design.

### [Standard grease fitting]

Front grease fitting (except SBM, SBMW) for linear rail system is standard grease fitting.



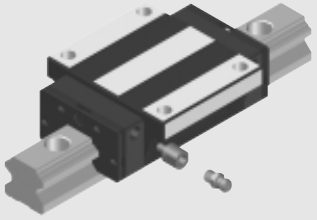
(SBG, SBI front grease fitting)



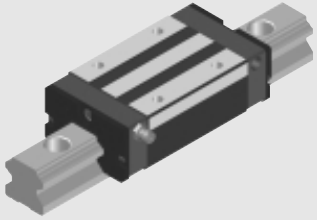
(SBM, SBMW front grease fitting)

### [Side grease fitting]

When greasing is difficult because of limited space in front of the grease nipple, the side grease fitting can be supplied. (*Side grease fitting is not available for SBM, SBMW.)



(SBG, SBI FL side grease fitting)



(SBG, SBI SL side grease fitting)

## 8. Safety design

Dust prevention, rust prevention and re-lubrication according to working conditions of the linear rail system are necessary for required life time.

### 8-1. Anti-rust

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

### [Chrome plating]

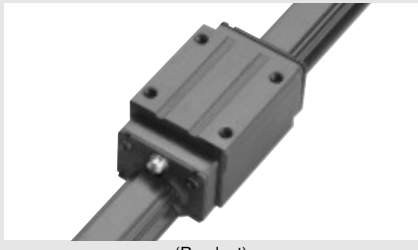
It achieves high rust resistance and wear resistance with the coating film of over 750HV.

### [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).



(Raydent)

### [Caution for surface treatment]

❶ Be aware that the rail hole may not surface treated.
❷ Set the higher safety factor in case surface treated linear rail system is selected.
❸ Except above surface treatments, the other plating may cause performance problems.
❹ Contact SBC for other information on surface treatments.

Linear Rail System
Technical Data

## 8-2. Dust protection

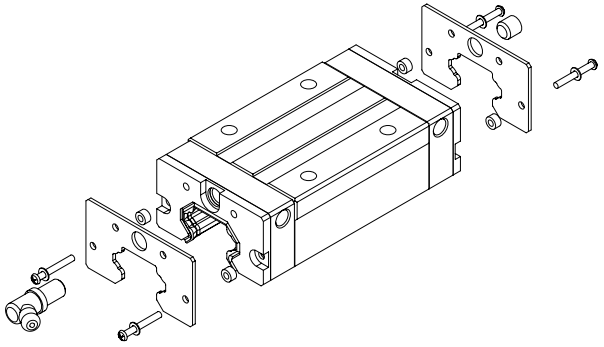
The dimensions for each seal is shown on dimension page.

### [Seal options]

Select the appropriate seal options according to working conditions.

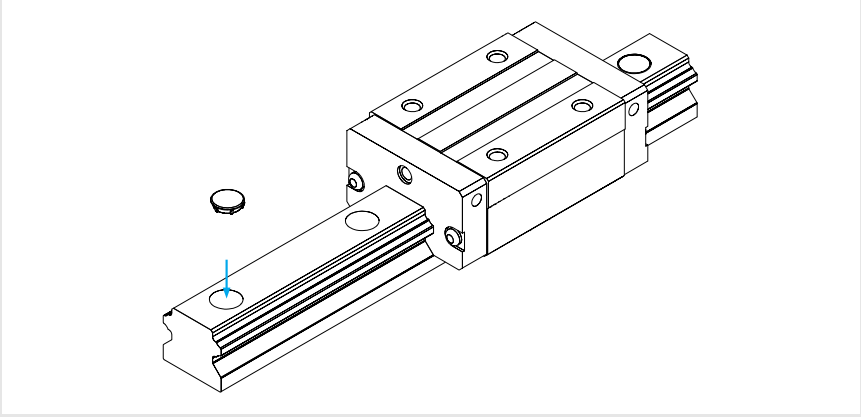
| Item | Symbol | Application |
|---|---|---|
| End seal | No symbol (Standard) | Normal condition |
| End seal + end seal | DD | Dust condition |
| End seal + scraper | ZZ | Welding spatter |
| End seal + end seal + scraper | KK | Dust and chips |

* Bottom seal is not available for SBI, SBG, SBS15



### [RC cap: rail hole cap]

Contaminants invade into the bolt holes of the rail and pollute the inside of the bearing. You can use hole caps made from hardened rubber to fill the holes. RC caps are provided with the rails.



**◁ RC cap mounting method ▷**

❶ Bolt the rail on the plate.

❷ Put the RC cap on the rail mounting hole and place the bigger steel plate on the cap then tap it with hammer.

❸ Check the RC cap to make sure it is properly seated.

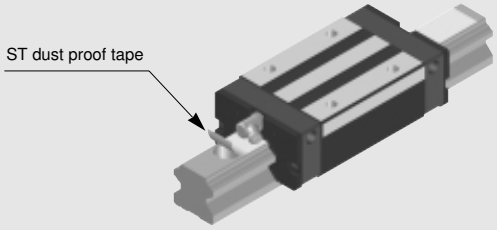
Linear Rail System

Technical Data



[ST dustproof tape]

Stainless steel ST dustproof tape greatly improves rail face sealing and works in conjunction with guide block seals. Conventional plastic plugs do not offer the same improved sealing performance.




◁ **Installation of ST tape** ▷

❶ After assembling a rail to the bed, clean the surface of the rail and remove any oil.

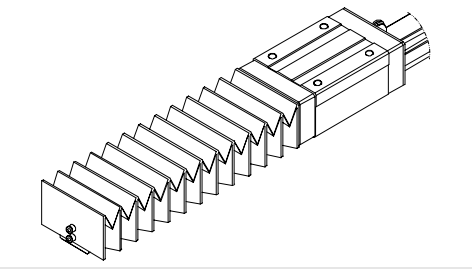
❷ Attach the ST tape slowly over the rail length to within 2 or 3 mm from each end of the rail.

❸ After attachment to the rail, apply pressure with dry cloth 3 or 4 times along the length of the rail to release encapsulated epoxy. Tape should be applied 4 to 6 hours prior to use to allow initial bonding.

※ It is strongly recommended to wear safety gloves, the edge of this tape is sharp and can cut as you attach it to the rail.

[Bellows]

For the best protection of the linear rail system, bellows should be used.



● Reference : SBI type : SH-A
SBG type : SH

## 8-3. High temperature design

[HT end-plate]

If working temperature is more than 80℃, SBC supply the high temperature end-plate which is made of aluminum.

● Recommended working temperature : -20 ~ 180℃

※ For high temperature applications we can replace all plastic components with steel or aluminum.

Linear Rail System

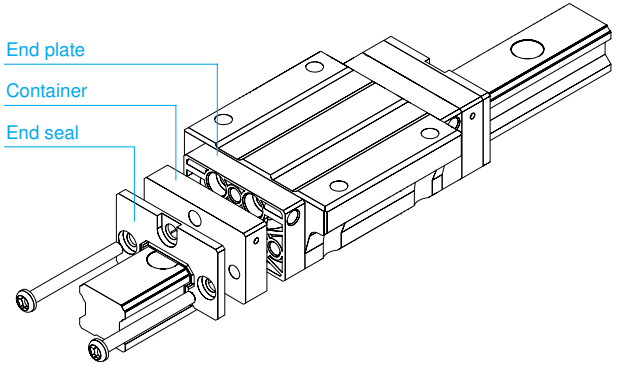
Technical Data

## 8-4. High dust-proof and self-lubricant container

For protecting the linear rail system from fine foreign matter and where the grease feeding is not easy, SBC created the high dust-proof, (DF) seal and self-lubricant container (MF).

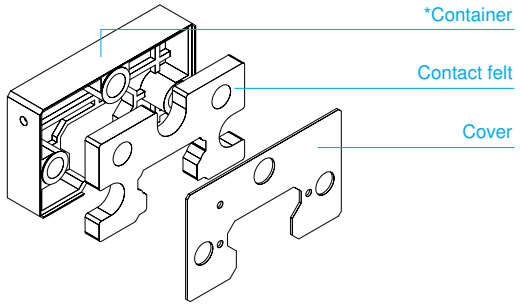
● Function and classification in accordance with seal type

DF : Dust protection for fine foreign matter
MF : Self lubricating for long maintenance intervals

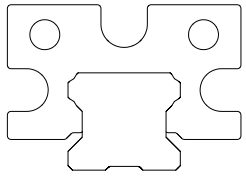



[High dust-proof seal : DF seal]

High-density felt built in DF container wipes the raceway tracking profile with a thin film of oil.
An additional seal or scraper may be added for highly contaminated applications.




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



(fully contat the rail and wipe the dust)

※ Caution

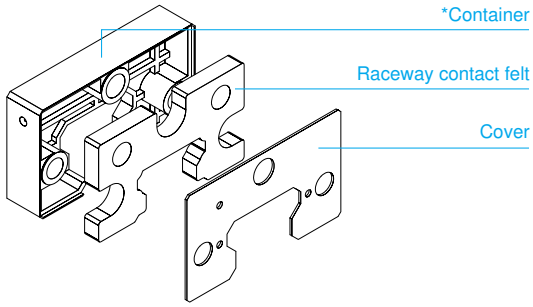
If you would like to use DF seal in watery or clean-room working condition, please contact SBC.

Linear Rail System

Technical Data

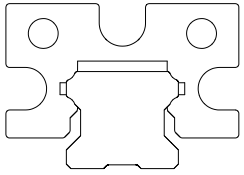
### [Self lubricant : MF container]

MF (Self lubricanting) contains grease impregnated felt which feeds the grease on the raceway continuously. Each compact seal kit will guarantee total surface lubrication and long maintenance free bearing life.




* Container

- Its contact surfaces are tolerance match to the guiderail to ensure perfect sealing.



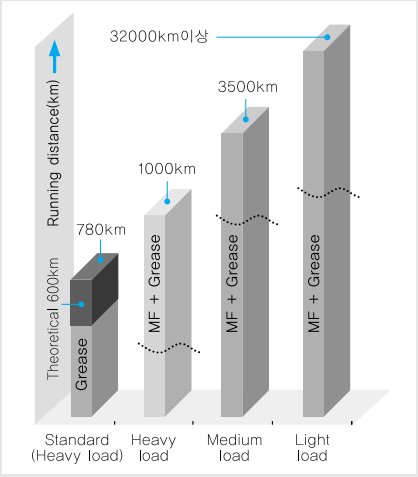
(Wipe the raceway and grease is coating on the raceway)

## 8-5. MF container Lifetime test

### [Performance test]

● SBG20SL-1-K1-1500-N

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




### [Grease feeding]

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

※ Caution

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

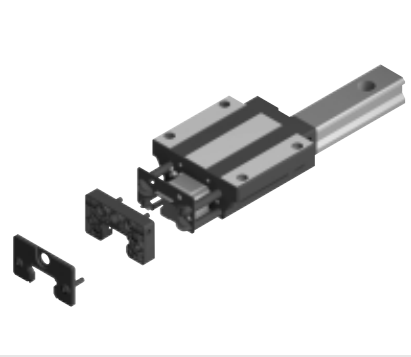
Linear Rail System

## The Types of Linear Rail System

The Types of Linear Rail System

### SBI high-load type

With all advantages of our SBG type, SBI improves load capacity, and increases speed capabilities for the rail system.

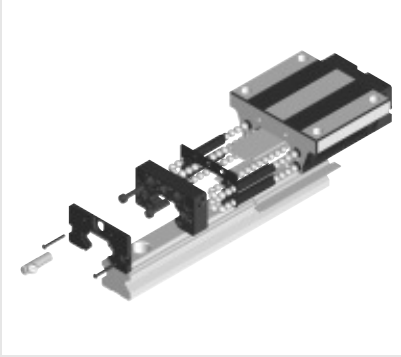


**SBI type**

-Type: SBI15~45

### SBG standard

Standard SBC linear rail system.



**SBG type**

Type: SBG 15~65

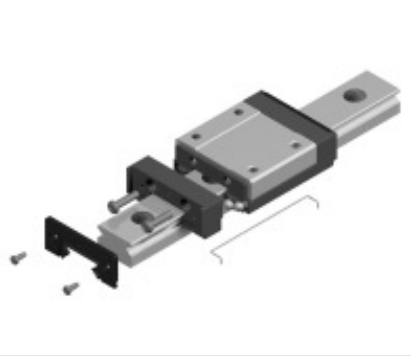
**SBS type**

-Assembly height is lower than SBG type

-Type : SBS 15~45

### SBM miniature

Miniature linear rail system with compact size also achieve high-load.



**SBM (Standard miniature)**

-Type: SBM09~15

**SBML (High-load miniature)**

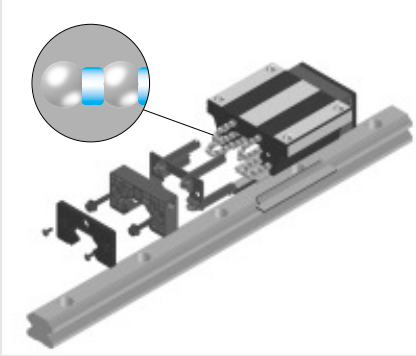
-Type : SBML09~15

**SBMW (Wide type miniature)**

-Type: SBMW09~15

### SPG spacer

Low noise type in which the plastic spacer are inserted in between balls.



**Low noise (Spacer type)**

Spacer are inserted in between balls

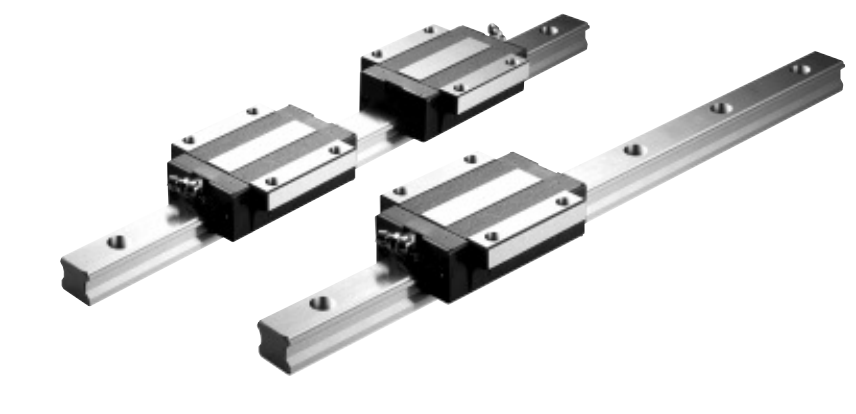
**SPG (=SBG dimensionally interchangeable)**

Type : SPG 20~35

**SPS (=SBS dimensionally interchangeable)**

-Type: SPS 20~35

## SBI high-load linear rail system



### Circular arc groove

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

### 45° angle of contact

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

### DF structure

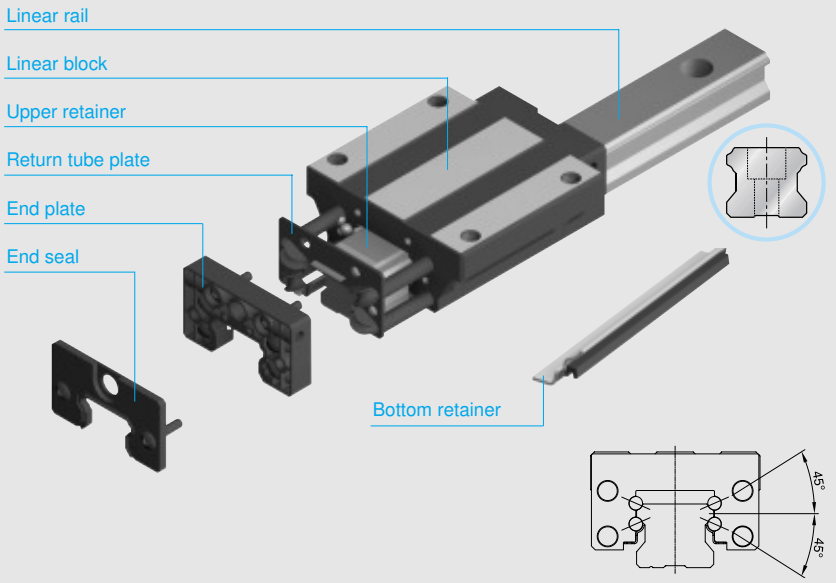
### Low noise and High rigidity

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

### The same dimension

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

### The feature of structure




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

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

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

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

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

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



Linear Rail System

SBI high-load linear rail system

Linear Rail System

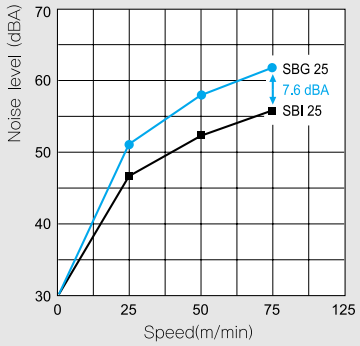
## SBI high-load linear rail system

SBI high-load linear rail system

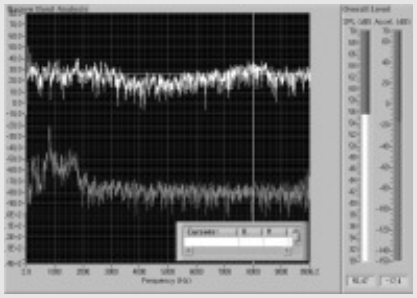


### [Low noise]

- SBI25 / SBG25 noise level test data




(Comparison of noise level)

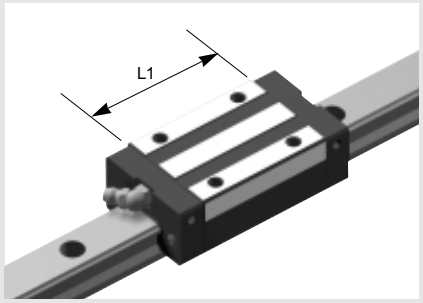


(SBI 1.3m/sec)

### [High load performance]

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

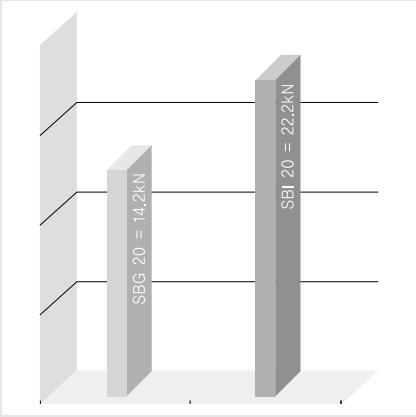
- The comparison of SBI / SBG block length




(Unit : mm)

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

- The comparison of basic dynamic load rating




(Comparison of basic dynamic load rating)

Improved geometry and tolerances increases basic dynamic load rating

- Comparison of lifetime calculation

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

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

In case of P = 5 kN
Basic dynamic load rating (C) of SBI20 SL : 22.2 kN
Basic dynamic load rating (C) of SBG20 SL : 14.2 kN

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

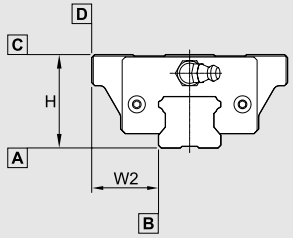
**SBG 20SL** : $L = \left(\frac{C}{P}\right)^3 X\ 50 = \left(\frac{14.2}{P}\right)^3 X\ 50 = 1145$ km

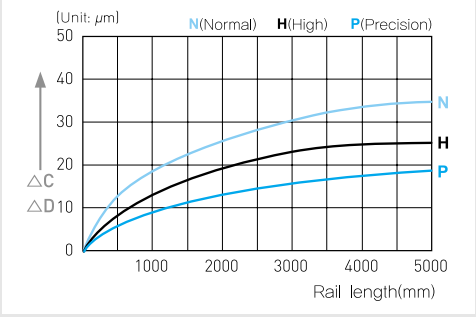
Linear Rail System

## SBI high-load linear rail system

SBI high-load linear rail system

### Accuracy




(Unit : mm)

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

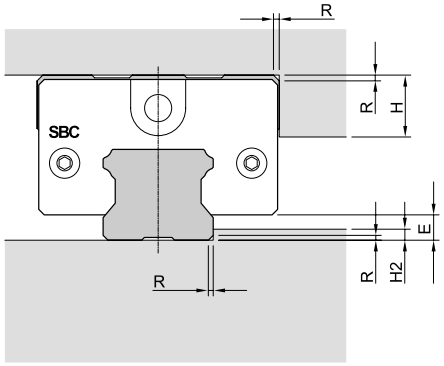
- **N** : Normal
- **H** : High
- **P** : Precision

### Preload

| Reference | Volume of preload |
|---|---|
| K0 (None) | Clearance within 0.01mm |
| K1 (Normal) | 0.00 ~ 0.02C |
| K2 (Light) | 0.04 ~ 0.06C |
| K3 (Heavy) | 0.08 ~ 0.10C |

- C(kN) : Basic dynamic load rating

### Shoulder height and fillet radius R




(Unit : mm)

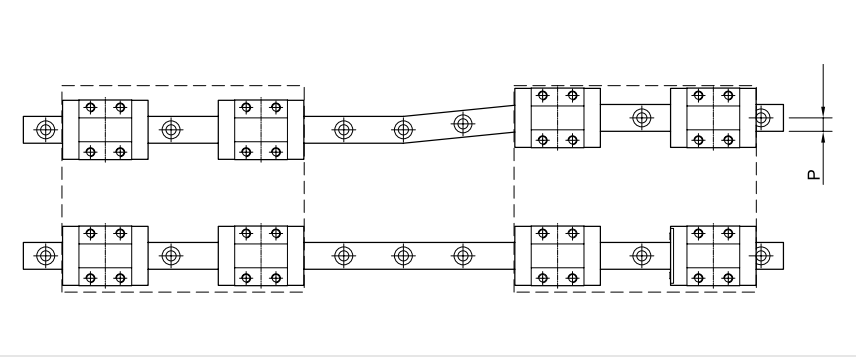
| Model number | Fillet radius R | Shoulders height H1 | Shoulders height H2 | E |
|---|---|---|---|---|
| 15 | 0.6 | 7 | 2.5 | 3 |
| 20 | 1 | 8 | 3.5 | 4.6 |
| 25 | 1 | 10 | 4.5 | 5.5 |
| 30 | 1 | 11 | 5 | 7 |
| 35 | 1 | 13 | 6 | 7.5 |
| 45 | 1.6 | 16 | 8 | 9 |

Linear Rail System

## SBI high-load linear rail system

SBI high-load linear rail system

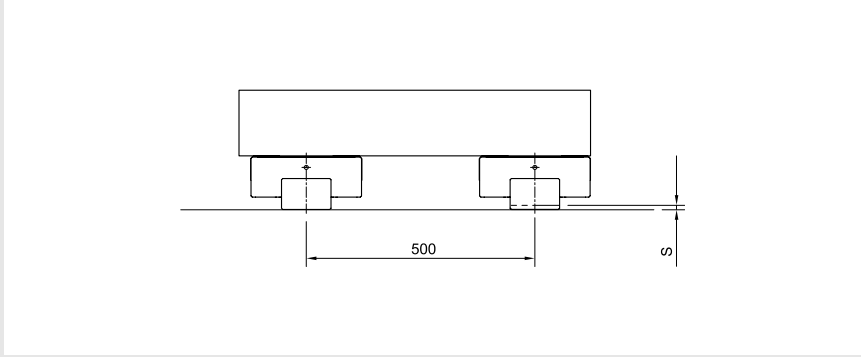
### Permissible tolerance (P) of parallelism




(Unit : mm)

| Model size | K1 | K2 | K3 |
|---|---|---|---|
| 15 | 0.025 | 0.018 | - |
| 20 | 0.025 | 0.020 | 0.018 |
| 25 | 0.030 | 0.022 | 0.020 |
| 30 | 0.040 | 0.030 | 0.027 |
| 35 | 0.050 | 0.035 | 0.030 |
| 45 | 0.060 | 0.040 | 0.035 |

### Permissible tolerance (S) of two level offset




(Unit : mm)

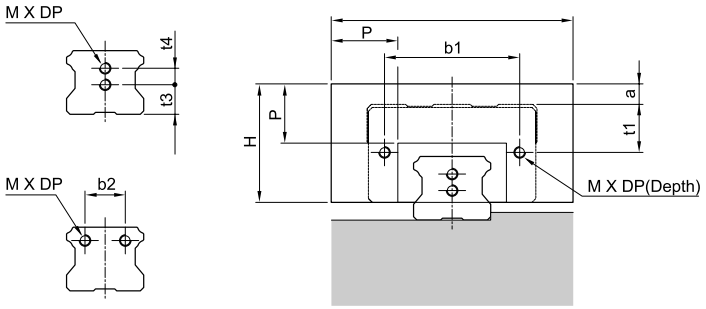
| Model size | K1 | K2 | K3 |
|---|---|---|---|
| 15 | 0.13 | 0.085 | - |
| 20 | 0.13 | 0.085 | 0.05 |
| 25 | 0.13 | 0.085 | 0.07 |
| 30 | 0.17 | 0.11 | 0.09 |
| 35 | 0.21 | 0.15 | 0.12 |
| 45 | 0.25 | 0.17 | 0.14 |

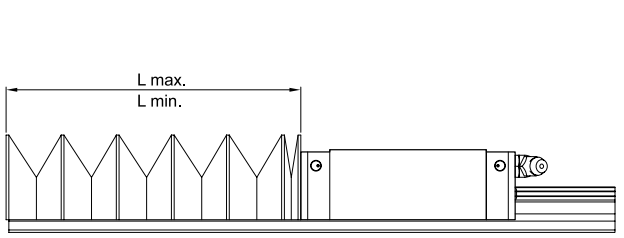
Linear Rail System

SBI high-load linear rail system



## SH Bellows




[Calculation of bellows length]

$$L_{min} = \frac{L_{max}}{A}$$

- $L_{max}$ : Extended length (mm)
- $L_{min}$ : Collapsed length (mm)
- A : Extended ratio

(Unit : mm)

| Model number | Applicable type | W | H | P | a | | | | | | b1 | b2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | FV | SV | C | F | S | H | | |
| SH15A | SBI15 | 55 | 27 | 15.5 | 6 | 6 | - | 6 | 2 | 6 | 26 | - |
| SH20A | SBI20 | 66 | 32 | 17.5 | 7.5 | 7.5 | 7.5 | 5.5 | 5.5 | 5.5 | 34 | - |
| SH25A | SBI25 | 78 | 38 | 22.7 | 11.5 | 11.5 | 11.5 | 8.5 | 4.5 | 8.5 | 36 | - |
| SH30A | SBI30 | 84 | 42 | 22 | - | | - | 7 | 4 | 7 | 49 | - |
| SH35A | SBI35 | 88 | 43 | 19.5 | - | | - | 2.5 | 4.5 | 2.5 | 56 | 24 |
| SH45A | SBI45 | 100 | 55 | 27 | - | | - | 4 | 6 | 4 | 72 | 20 |

| t1 | | | | | | t3 | t4 | M x DP | | A Extended ratio | Model number |
|---|---|---|---|---|---|---|---|---|---|---|---|
| FV | SV | C | F | S | H | | | Rail | Block | | |
| 13.3 | 13.3 | - | 13.3 | 17.3 | 13.3 | 10 | - | M4X8 | M3X15 | 6 | SH15A |
| 8 | 8 | 8 | 6 | 6 | 6 | 6 | 8 | M3X6 | M3X18 | 6 | SH20A |
| 21.3 | 21.3 | 21.3 | 19.3 | 23.3 | 19.3 | 10 | 7 | M3X6 | M3X18 | 7 | SH25A |
| - | | - | 22.8 | 25.8 | 22.8 | 11 | 8 | M4X8 | M4X22 | 7 | SH30A |
| - | | - | 26.5 | 33.5 | 26.5 | 21 | - | M4X8 | M4X22 | 7 | SH35A |
| - | | - | 33.5 | 43.5 | 33.5 | 25 | - | M5X8 | M2X25 | 7 | SH45A |

* Dimension of “a”, “t1” stand for as below
- F : FL, FLL
- C : CL, CLL
- S : SL, SLL
- H : HL, HLL

* If you use SH bellows, rain end mounting holes must be provided

* Please contact SBC for lubricant with SH bellows.

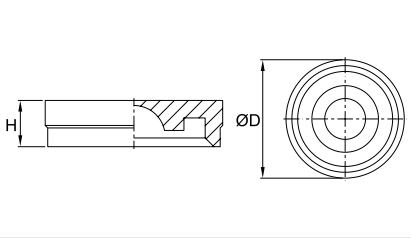
Ordering example : **SH25A** – **70** / **420**
❶ ❷ ❸

❶ Model number
❷ Collapsed length (mm)
❸ Extended length (mm)

Linear Rail System

SBI high-load linear rail system

## RC Cap

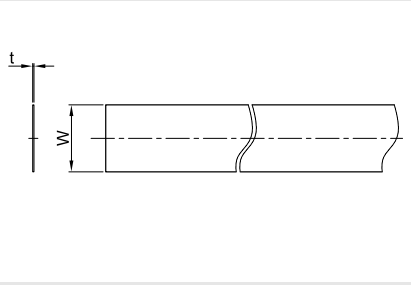



(Unit : mm)

| Model | D | H |
|---|---|---|
| RC 15 | 7.7 | 1.5 |
| RC 20 | 9.7 | 3.5 |
| RC 25 | 11.2 | 2.8 |
| *RC 30 | 14.2 | 3.7 |
| RC 45 | 20.2 | 4.7 |

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

## ST Tape




(Unit : mm)

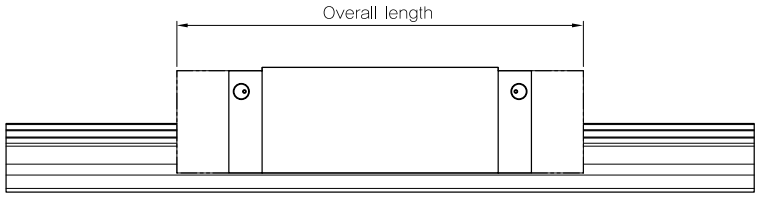
| Model | W | t |
|---|---|---|
| ST 15A | 11 | 0.1 |
| ST 20A | 15 | 0.1 |
| ST 25A | 17 | 0.1 |
| ST 30A | 21 | 0.1 |
| ST 35A | 27 | 0.1 |
| ST 45A | 37 | 0.1 |

Ordering example : **ST15A** - **1000L**
❶ ❷

❶ Model number
❷ Length

## Seal and MF container

[Method and overall length with each seal]




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

(Unit : mm)

| Additional seal | | Standard | DD | ZZ | KK | D(M)F | D(M)FDD | D(M)FZZ | D(M)FKK |
|---|---|---|---|---|---|---|---|---|---|
| Indication of seal | | E | E+E | E+S | E+E+S | F+E | F+E+E | F+E+S | F+E+E+S |
| Overall length with seal | 15V | 39.9 | 44.7 | 45.5 | 50.3 | 53.9 | 58.7 | 73.5 | 64.3 |
| | 15 | 63.8 | 68.6 | 69.4 | 74.2 | 77.8 | 82.6 | 83.4 | 88.2 |
| | 15L | 79.4 | 84.2 | 85 | 89.8 | 93.4 | 98.2 | 99 | 103.8 |
| | 20V | 46.9 | 47.3 | 52.3 | 55.9 | 60.9 | 75.3 | 66.3 | 46.9 |
| | 20 | 78.8 | 83.8 | 84.2 | 89.2 | 92.8 | 97.8 | 98.2 | 103.2 |
| | 20L | 96.4 | 101.4 | 101.8 | 106.8 | 110.4 | 115.4 | 115.8 | 120.8 |
| | 25V | 57.6 | 58 | 63 | 66.6 | 71.6 | 86 | 77 | 57.6 |
| | 25 | 92 | 97 | 97.4 | 102.4 | 106 | 111 | 111.4 | 116.4 |
| | 25L | 108 | 113 | 113.4 | 118.4 | 122 | 127 | 127.4 | 132.4 |
| | 30 | 107.6 | 113.6 | 114 | 120 | 123.6 | 129.6 | 130 | 136 |
| | 30L | 131.6 | 137.6 | 138 | 144 | 147.6 | 153.6 | 154 | 160 |
| | 35 | 124.6 | 130.6 | 131 | 137 | 140.6 | 146.6 | 147 | 153 |
| | 35L | 152.6 | 158.6 | 159 | 165 | 168.6 | 174.6 | 175 | 181 |
| | 45 | 142 | 148 | 148.4 | 154.4 | 158 | 164 | 164.4 | 170.4 |
| | 45L | 174 | 180 | 180.4 | 186.4 | 190 | 196 | 196.4 | 202.4 |

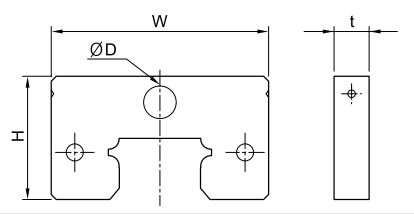
- Bottom seal of SBI type is integrated with bottom retainer. (Except SBI15)
- If block is assembled with MF container, the grease fitting is not supplied. If you would like to feed the grease to the block, please order side grease fitting type.

Linear Rail System

SBI high-load linear rail system



## [Dimension of MF container]




(Unit : mm)

| Reference | Model | W | t | H | D |
|---|---|---|---|---|---|
| DF MF | 15A | 33.4 | 7 | 20.2 | 4 |
| | 20A | 43.4 | 7 | 24.6 | 6.5 |
| | 25A | 47 | 7 | 29.7 | 6.5 |
| | 30A | 59 | 8 | 34.2 | 6.5 |
| | 35A | 69 | 8 | 39.7 | 6.5 |
| | 45A | 85 | 8 | 49.7 | 8.5 |

## [Seal resistance]

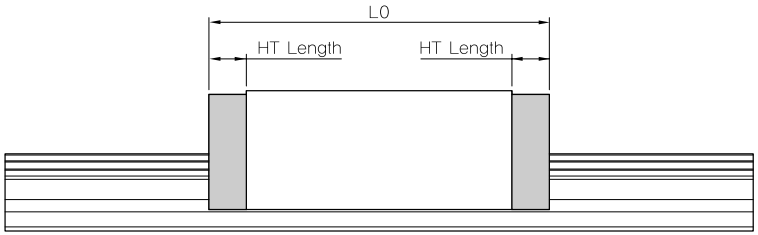
For the maximum value of seal resistance of SBI standard type per block, in which grease is not applied.

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

(Unit : mm)

| Model | End seal | DF | MF |
|---|---|---|---|
| SBI 15 | 2.0 | 4.7 | 3.5 |
| SBI 20 | 2.5 | 4.9 | 3.0 |
| SBI 25 | 3.0 | 5.5 | 3.5 |
| SBI 30 | 3.9 | 5.8 | 3.5 |
| SBI 35 | 2.5 | 5.2 | 3.7 |
| SBI 45 | 3.4 | 5.9 | 4.1 |

## HT high temperature end plate




(Unit : mm)

| Reference | HT Length | Overall length | | | | | |
|---|---|---|---|---|---|---|---|
| | | Applied model | L0 | Applied model | L0 | Applied model | L0 |
| HT 15A | 6.5 | SBI 15 V | 38.9 | SBI 15 | 58.2 | SBI 15L | 73.8 |
| HT 20A | 8 | SBI 20 V | 43.1 | SBI 20 | 72.8 | SBI 20L | 90.4 |
| HT 25A | 8 | SBI 25 V | 46.6 | SBI 25 | 86 | SBI 25L | 102 |
| HT 30A | 10 | - | - | SBI 30 | 99.6 | SBI 30L | 123.6 |
| HT 35A | 11 | - | - | SBI 35 | 116.6 | SBI 35L | 144.6 |
| HT 45A | 13 | - | - | SBI 45 | 134 | SBI 45L | 166 |

Ordering example : **SBI25FL** - **HT** - **2** - **K1** - **800** - **N**
❶ ❷ ❸ ❹ ❺ ❻

❶ Model
❷ High temperature end plate
❸ Block quantity
❹ Preload
❺ Rail length
❻ Accuracy

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

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

## Grease and nipple specification

### [Grease]

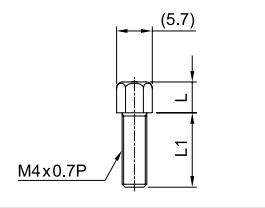
SBI uses two types of grease according to working conditions.
For details, please see the technical data for grease.

Linear Rail System

## SBI high-load linear rail system

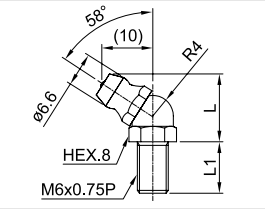
SBI high-load linear rail system

### (1) Standard grease fitting (Front grease fitting)



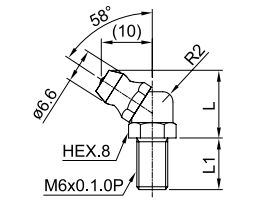

(Unit : mm)

| Specification | | M4x0.7P | | |
|---|---|---|---|---|
| Applied model | Grease fitting model | Symbol | L | L1 |
| SBI 15 | 1N | None | 7 | 6 |
| | 1D | DD, ZZ | 5 | 9 |
| | 1Z | KK | 5 | 12 |
| | 1F | ZZDF | 5 | 16 |



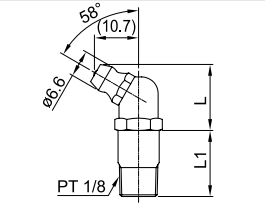

(Unit : mm)

| Specification | | M6x0.75P, Standard | | |
|---|---|---|---|---|
| Applied model | Grease fitting model | Symbol | L | L1 |
| SBI20~35 | IA2N | None | 14 | 8 |
| | IA2D | DD, ZZ | 14 | 10 |
| | IA2Z | KK | 14 | 13 |
| | IA2NF | DF | 14 | 15 |
| | IA2DF | DFDD, DFZZ | 14 | 17 |
| | IA2ZF | DFKK | 14 | 20 |




(Unit : mm)

| Specification | | M6x1.0P, Order made | | |
|---|---|---|---|---|
| Applied model | Grease fitting model | Symbol | L | L1 |
| SBI20~35 | IE2N | None | 14 | 8 |
| | IE2D | DD, ZZ | 14 | 10 |
| | IE2Z | KK | 14 | 13 |
| | IE2NF | DF | 14 | 15 |
| | IE2DF | DFDD, DFZZ | 14 | 17 |
| | IE2ZF | DFKK | 14 | 20 |

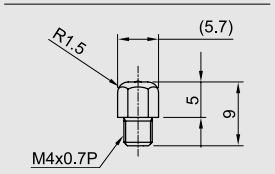



(Unit : mm)

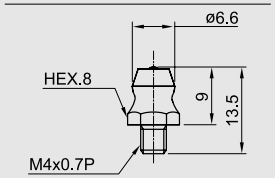
| Specification | | PT 1/8 | | |
|---|---|---|---|---|
| Applied model | Grease fitting model | Symbol | L | L1 |
| SBI45 | 4N | None | 17 | 13 |
| | 4D | DD, KK, ZZ | 17 | 16 |
| | 4NF | DF | 17 | 21 |
| | 4DF | DFDD, DFKK, DFZZ | 17 | 24 |

* M6x0.75P is standard grease fitting for SBI20~35 type. If you need M6x1.0P, please contact SBC.

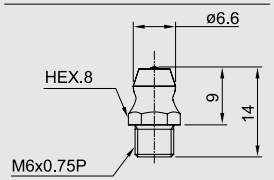
### (2) Side grease fitting




| Specification | M4x0.7P |
|---|---|
| Applied model | SBI 15 |
| Grease fitting model | S1N |

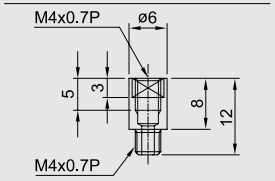



| Specification | M4x0.7P |
|---|---|
| Applied model | SBI 20, 25 |
| Grease fitting model | S2N |

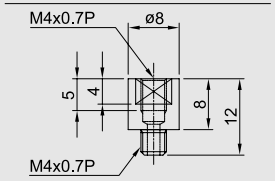



| Specification | M6x0.75P |
|---|---|
| Applied model | SBI 30, 35, 45 |
| Grease fitting model | S3N |

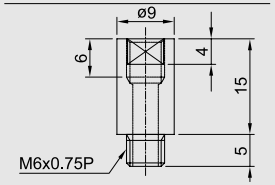
### (3) FS nipple connector for side grease fitting (FL. FLL flange type only)




| Specification | M4x0.7P |
|---|---|
| Applied model | SBI 15 |
| Grease fitting model | S1C |

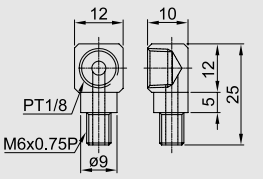



| Specification | M4x0.7P |
|---|---|
| Applied model | SBI 20, 25 |
| Grease fitting model | S2C |

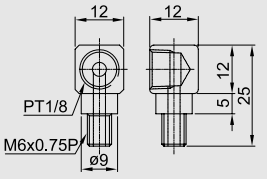



| Specification | M6x0.75P |
|---|---|
| Applied model | SBI 30, 35, 45 |
| Grease fitting model | S3C |

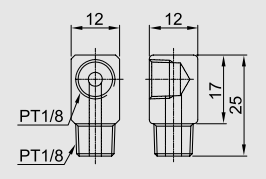
### (4) Copper pipe




| Input size | PT1/8 |
|---|---|
| Output size | M6x0.75P |
| Applied model | SBI 20 |
| Grease fitting model | S2P |




| Input size | PT1/8 |
|---|---|
| Output size | M6x0.75P |
| Applied model | SBI 25, 30, 35 |
| Grease fitting model | S3P |




| Input size | PT1/8 |
|---|---|
| Output size | PT1/8 |
| Applied model | SBI 45 |
| Grease fitting model | S4P |

Linear Rail System

SBI high-load linear rail system

## Ordering example

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

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

[Ordering example for rail]

**SBI20 – 1000L – B**
[1] [2] [3]

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

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

[Ordering for assembled rail and block]

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

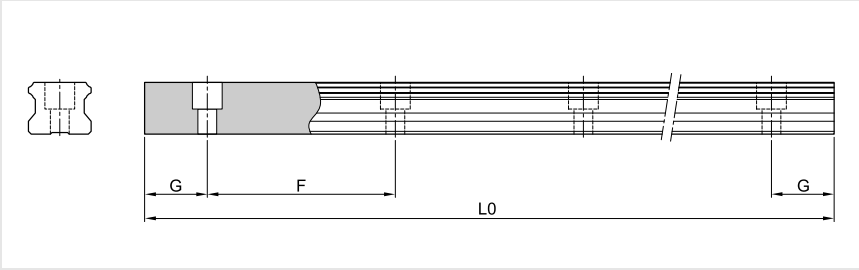
[1] Model
[2] Block type : FL, FLL, FV, SL. SLL, SV, HL, HLL, CL, CLL
[3] Position of grease fitting : None (front), N (side)
[4] Container : No symbol (standard), DF (high dust protection), MF (self lubricant)
[5] Seal : No symbol (standard), DD, ZZ, KK
[6] Block quantity on rail
[7] Preload : K0, K1,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

※ We recommend block and rail assembled to be ordered where high-precision and high-rigidity are required.
※ For surface treatment, please mark according to each surface treatment symbol.
※ If special G dimension is required, please mark when you place an order.
※ Please contact SBC for high temperature order.

Linear Rail System

SBI high-load linear rail system

## Standard and Max. Length of SBI rail

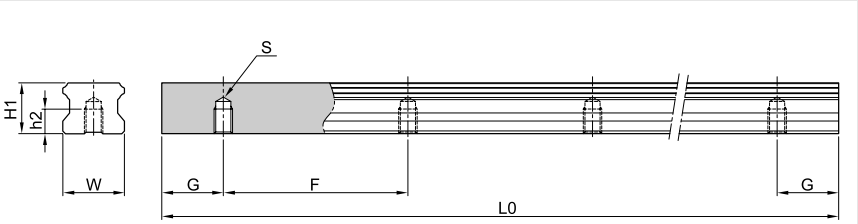



(Unit : mm)

| Model number | SBI15 | SBI20 | SBI25 | SBI30 | SBI35 | SBI45 |
|---|---|---|---|---|---|---|
| Standard length | 160 | 220 | 220 | 280 | 280 | 570 |
| | 220 | 280 | 280 | 440 | 440 | 885 |
| | 280 | 240 | 340 | 600 | 600 | 1095 |
| | 340 | 460 | 460 | 760 | 760 | 1200 |
| | 460 | 640 | 640 | 1000 | 1000 | 1410 |
| | 640 | 820 | 820 | 1240 | 1240 | 1620 |
| | 820 | 1000 | 1000 | 1480 | 1480 | 1830 |
| | 1000 | 1240 | 1240 | 1640 | 1640 | 2040 |
| | 1240 | 1480 | 1480 | 1800 | 1800 | 2250 |
| | 1480 | 1600 | 1600 | 2040 | 2040 | 2460 |
| | 1600 | 1840 | 1840 | 2200 | 2200 | 2985 |
| | 1960 | 2080 | 2080 | 2520 | 2520 | 3510 |
| | 2200 | 2200 | 2200 | 2840 | 2840 | 4000 |
| | 2500 | 2500 | 2500 | 3000 | 3000 | - |
| | 2860 | 2960 | 2980 | 3480 | 3480 | - |
| | 3000 | 3520 | 3520 | 4000 | 4000 | - |
| | | 4000 | 4000 | - | - | - |
| F | 60 | 60 | 60 | 80 | 80 | 105 |
| G | 20 | 20 | 20 | 20 | 20 | 22.5 |
| L0(Max length) | 3,000 | 4,000 | 4,000 | 4,000 | 4,000 | 4,000 |

* If the maximum length exceeds this size, butt joints can be supplied.
* For more information about butt jointing, please refer to the page of safety design.
* If the G is not standard, please indicate it in the order sheet.

## Bottom mounting rail (SBI-B type)

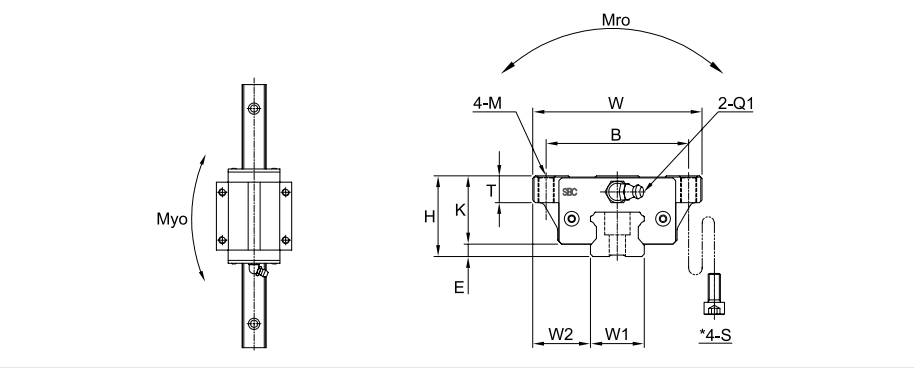


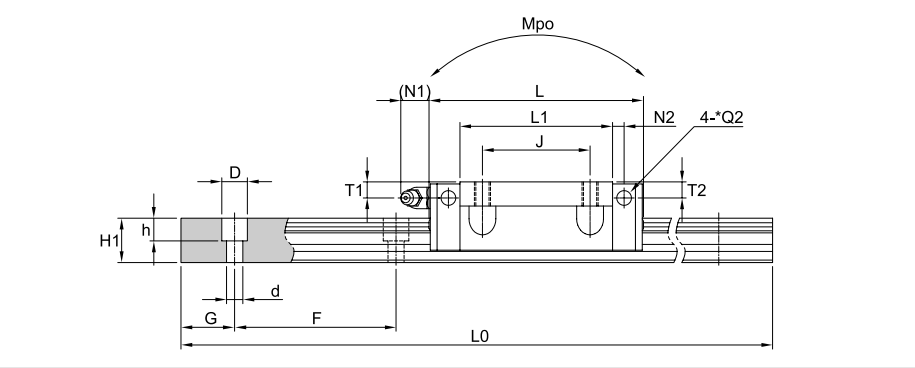

(Unit : mm)

| Model number | W1 | H1 | S | h2 | G | F | L0 (Max length) | Weight (kg/m) |
|---|---|---|---|---|---|---|---|---|
| SBI 15-B | 15 | 15 | M5X0.8 | 8 | 20 | 60 | 3,000 | 1.39 |
| SBI 20-B | 20 | 17.5 | M6 | 10 | 20 | 60 | 4,000 | 2.37 |
| SBI 25-B | 23 | 21.8 | M6 | 12 | 20 | 60 | 4,000 | 3.26 |
| SBI 30-B | 28 | 25 | M8 | 15 | 20 | 80 | 4,000 | 4.63 |
| SBI 35-B | 34 | 29 | M8 | 17 | 20 | 80 | 4,000 | 6.45 |
| SBI 45-B | 45 | 38 | M12 | 24 | 22.5 | 105 | 4,000 | 10.49 |

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

## SBI-FL/FLL




(Unit : mm)

| Model | Mounting dimension | | | | Block dimensions | | | | | | | | | | | | Rail dimension | | | | | | | | | Basic load rating [kN] | | Permissible static moment [kN • m] | | | Mass | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | H | W | L | E | Mounting tap hole | | | | L1 | T | K | Grease fitting | | | | | W1 | W2 | H1 | F | Bolt hole | | | G | Max length of rail L0 | | | | | | Block [kg] | Rail [kg/m] |
| | | | | | B | J | M | *S | | | | T1 | N1 | T2 | N2 | Q1 *Q2 | | | | | d | D | h | | | C | Co | Mro | Mpo | Myo | | |
| SBI15 FL | 24 | 47 | 63.8 | 3 | 38 | 30 | M5 | M4 | 45.2 | 8 | 21 | 4.5 | 3.6 | 3.8 | 3.4 | M4x0.7 Ø4 | 15 | 16 | 13 | 60 | 4.5 | 7.5 | 5.5 | 20 | 3000 | 14.1 | 24.1 | 0.16 | 0.17 | 0.17 | 0.19 | 1.3 |
| SBI15 FLL | 24 | 47 | 79.4 | 3 | 38 | 30 | M5 | M4 | 60.8 | 8 | 21 | 4.5 | 3.6 | 3.8 | 3.4 | M4x0.7 Ø4 | 15 | 16 | 13 | 60 | 4.5 | 7.5 | 5.5 | 20 | 4000 | 17.1 | 31.7 | 0.21 | 0.29 | 0.29 | 0.26 | 1.3 |
| SBI20 FL | 30 | 63 | 78.8 | 4.6 | 53 | 40 | M6 | M5 | 56.8 | 10 | 25.4 | 6 | 11 | 5.8 | 5 | M6x0.75 Ø4 | 20 | 21.5 | 16.5 | 60 | 6 | 9.5 | 8.5 | 20 | 4000 | 22.2 | 38.2 | 0.36 | 0.33 | 0.33 | 0.41 | 2.2 |
| SBI20 FLL | 30 | 63 | 96.4 | 4.6 | 53 | 40 | M6 | M5 | 74.4 | 10 | 25.4 | 6 | 11 | 5.8 | 5 | M6x0.75 Ø4 | 20 | 21.5 | 16.5 | 60 | 6 | 9.5 | 8.5 | 20 | 4000 | 27.9 | 50 | 0.47 | 0.56 | 0.56 | 0.54 | 2.2 |
| SBI25 FL | 36 | 70 | 92 | 5.5 | 57 | 45 | M8 | M6 | 70 | 12 | 30.5 | 6 | 11 | 5.8 | 5 | M6x0.75 Ø4 | 23 | 23.5 | 20 | 60 | 7 | 11 | 9 | 20 | 4000 | 31.5 | 52.1 | 0.56 | 0.56 | 0.56 | 0.69 | 3 |
| SBI25 FLL | 36 | 70 | 108 | 5.5 | 57 | 45 | M8 | M6 | 85 | 12 | 30.5 | 6 | 11 | 5.8 | 5 | M6x0.75 Ø4 | 23 | 23.5 | 20 | 60 | 7 | 11 | 9 | 20 | 4000 | 36.7 | 64.4 | 0.69 | 0.84 | 0.84 | 0.85 | 3 |
| SBI30 FL | 42 | 90 | 107.6 | 7 | 72 | 52 | M10 | M8 | 79.6 | 12.5 | 35 | 8.5 | 11 | 7.8 | 5 | M6x0.75 Ø6 | 28 | 31 | 23 | 80 | 9 | 14 | 12 | 20 | 4000 | 42.8 | 65.4 | 0.85 | 0.77 | 0.77 | 1.04 | 4.25 |
| SBI30 FLL | 42 | 90 | 131.6 | 7 | 72 | 52 | M10 | M8 | 103.6 | 12.5 | 35 | 8.5 | 11 | 7.8 | 5 | M6x0.75 Ø6 | 28 | 31 | 23 | 80 | 9 | 14 | 12 | 20 | 4000 | 51.3 | 84.7 | 1.10 | 1.30 | 1.30 | 1.37 | 4.25 |
| SBI35 FL | 48 | 100 | 124.6 | 7.5 | 82 | 62 | M10 | M8 | 94.6 | 15 | 40.5 | 8 | 11 | 8 | 6 | M6x0.75 Ø6 | 34 | 33 | 26 | 80 | 9 | 14 | 12 | 20 | 4000 | 59.5 | 89.1 | 1.42 | 1.28 | 1.28 | 1.56 | 6.02 |
| SBI35 FLL | 48 | 100 | 152.6 | 7.5 | 82 | 62 | M10 | M8 | 122.6 | 15 | 40.5 | 8 | 11 | 8 | 6 | M6x0.75 Ø6 | 34 | 33 | 26 | 80 | 9 | 14 | 12 | 20 | 4000 | 71.3 | 115.3 | 1.83 | 2.12 | 2.12 | 2.04 | 6.02 |
| SBI45 FL | 60 | 120 | 148 | 9 | 100 | 80 | M12 | M10 | 108 | 18 | 51 | 10.5 | 13.5 | 9.3 | 6.5 | PT1/8 Ø6 | 45 | 37.5 | 32 | 105 | 14 | 20 | 17 | 22.5 | 4000 | 79.2 | 116.3 | 2.48 | 1.90 | 1.90 | 2.80 | 9.77 |
| SBI45 FLL | 60 | 120 | 180 | 9 | 100 | 80 | M12 | M10 | 140 | 18 | 51 | 10.5 | 13.5 | 9.3 | 6.5 | PT1/8 Ø6 | 45 | 37.5 | 32 | 105 | 14 | 20 | 17 | 22.5 | 4000 | 94.8 | 150.5 | 3.21 | 3.14 | 3.14 | 3.69 | 9.77 |

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

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

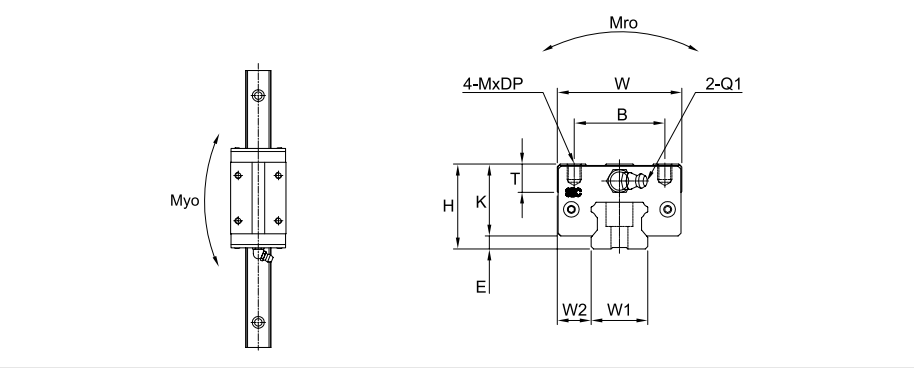
❸ *Q2: The hole of side grease nipple is not made to prevent a foreign substance from going into inside.
When you order the side grease nipple, we build it by ourselves.

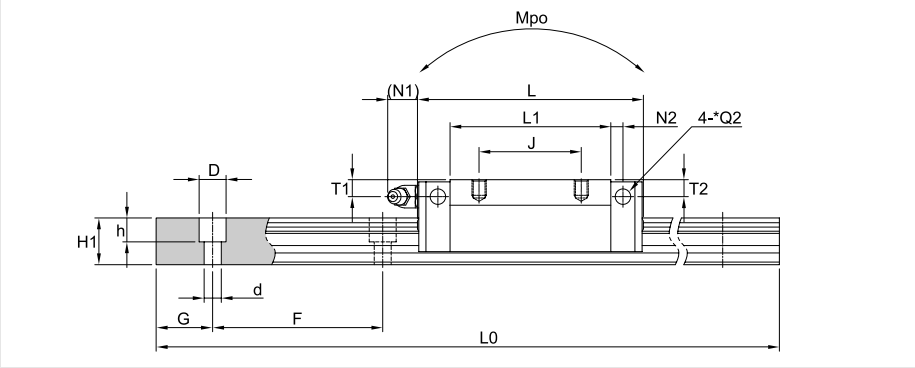
Linear Rail System

## SBI high-load linear rail system

SBI high-load linear rail system

### SBI-SL/SLL




(Unit : mm)

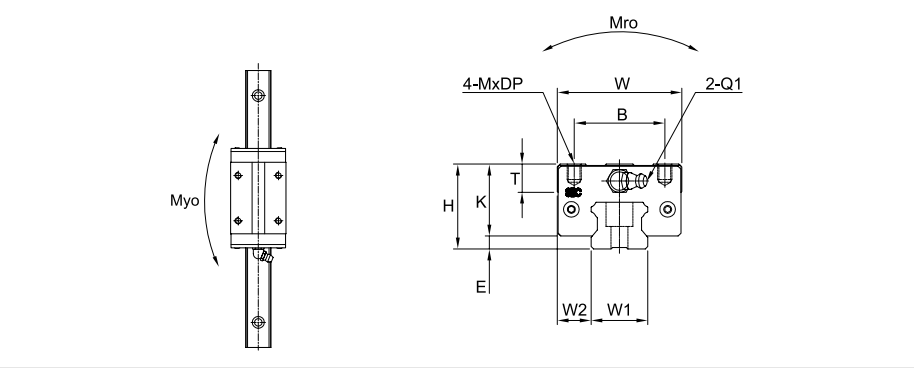
| Model | Mounting dimension | | | | Block dimensions | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | H | W | L | E | Mounting tap hole | | | | L1 | T | K | Grease fitting | | | | | |
| | | | | | B | J | M | DP | | | | T1 | N1 | T2 | N2 | Q1 | *Q2 |
| SBI15 SL | 28 | 34 | 63.8 | 3 | 26 | 26 | M4 | 5 | 45.2 | 10 | 25 | 8.5 | 3.6 | 7.8 | 3.4 | M4x0.7 | Ø4 |
| SBI15 SLL | 28 | 34 | 79.4 | 3 | 26 | 34 | M4 | 5 | 60.8 | 10 | 25 | 8.5 | 3.6 | 7.8 | 3.4 | M4x0.7 | Ø4 |
| SBI20 SL | 30 | 44 | 78.8 | 4.6 | 32 | 36 | M5 | 8 | 56.8 | 10 | 25.4 | 6 | 11 | 5.8 | 5 | M6x0.75 | Ø4 |
| SBI20 SLL | 30 | 44 | 96.4 | 4.6 | 32 | 50 | M5 | 8 | 74.4 | 10 | 25.4 | 6 | 11 | 5.8 | 5 | M6x0.75 | Ø4 |
| SBI25 SL | 40 | 48 | 92 | 5.5 | 35 | 35 | M6 | 8 | 70 | 12 | 34.5 | 10 | 11 | 9.6 | 5 | M6x0.75 | Ø4 |
| SBI25 SLL | 40 | 48 | 108 | 5.5 | 35 | 50 | M6 | 8 | 86 | 12 | 34.5 | 10 | 11 | 9.6 | 5 | M6x0.75 | Ø4 |
| SBI30 SL | 45 | 60 | 107.6 | 7 | 40 | 40 | M8 | 10 | 79.6 | 15 | 38 | 11.5 | 11 | 10.8 | 5 | M6x0.75 | Ø6 |
| SBI30 SLL | 45 | 60 | 131.6 | 7 | 40 | 60 | M8 | 10 | 103.6 | 15 | 38 | 11.5 | 11 | 10.8 | 5 | M6x0.75 | Ø6 |
| SBI35 SL | 55 | 70 | 124.6 | 7.5 | 50 | 50 | M8 | 10 | 94.6 | 15 | 47.5 | 15 | 11 | 15 | 6 | M6x0.75 | Ø6 |
| SBI35 SLL | 55 | 70 | 152.6 | 7.5 | 50 | 72 | M8 | 10 | 122.6 | 15 | 47.5 | 15 | 11 | 15 | 6 | M6x0.75 | Ø6 |
| SBI45 SL | 70 | 86 | 148 | 9 | 60 | 60 | M10 | 13 | 108 | 20 | 61 | 20.5 | 13.5 | 19.3 | 6.5 | PT1/8 | Ø6 |
| SBI45 SLL | 70 | 86 | 180 | 9 | 60 | 80 | M10 | 13 | 140 | 20 | 61 | 20.5 | 13.5 | 19.3 | 6.5 | PT1/8 | Ø6 |

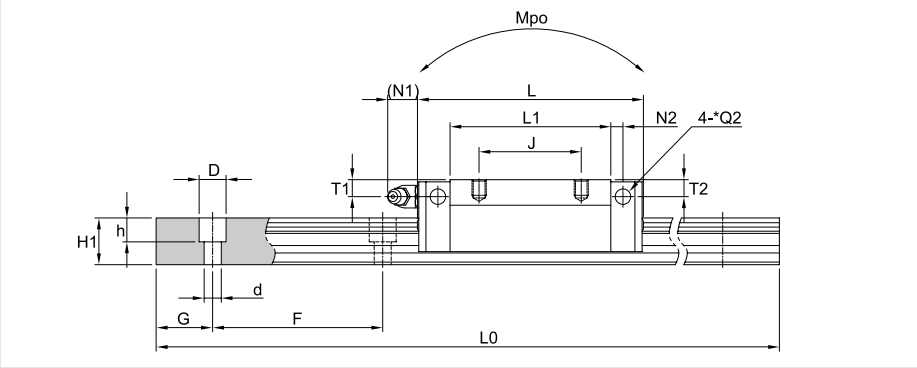
| Rail dimension | | | | | | | | | Basic load rating [kN] | | Permissible static moment [kN • m] | | | Mass | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| W1 | W2 | H1 | F | Bolt hole | | | G | Max langth of rail L0 | C | Co | Mro | Mpo | Myo | Block [kg] | Rail [kg/m] |
| | | | | d | D | h | | | | | | | | | |
| 15 | 9.5 | 13 | 60 | 4.5 | 7.5 | 5.5 | 20 | 3000 | 14.1 | 24.1 | 0.16 | 0.17 | 0.17 | 0.19 | 1.3 |
| 15 | 9.5 | 13 | 60 | 4.5 | 7.5 | 5.5 | 20 | 4000 | 17.1 | 31.7 | 0.21 | 0.29 | 0.29 | 0.26 | 1.3 |
| 20 | 12 | 16.5 | 60 | 6 | 9.5 | 8.5 | 20 | 4000 | 22.2 | 38.2 | 0.36 | 0.33 | 0.33 | 0.41 | 2.2 |
| 20 | 12 | 16.5 | 60 | 6 | 9.5 | 8.5 | 20 | 4000 | 27.9 | 50 | 0.47 | 0.56 | 0.56 | 0.54 | 2.2 |
| 23 | 12.5 | 20 | 60 | 7 | 11 | 9 | 20 | 4000 | 31.5 | 52.1 | 0.56 | 0.56 | 0.56 | 0.69 | 3 |
| 23 | 12.5 | 20 | 60 | 7 | 11 | 9 | 20 | 4000 | 36.7 | 64.4 | 0.69 | 0.84 | 0.84 | 0.85 | 3 |
| 28 | 16 | 23 | 80 | 9 | 14 | 12 | 20 | 4000 | 42.8 | 65.4 | 0.85 | 0.77 | 0.77 | 1.04 | 4.25 |
| 28 | 16 | 23 | 80 | 9 | 14 | 12 | 20 | 4000 | 51.3 | 84.7 | 1.10 | 1.30 | 1.30 | 1.37 | 4.25 |
| 34 | 18 | 26 | 80 | 9 | 14 | 12 | 20 | 4000 | 59.5 | 89.1 | 1.42 | 1.28 | 1.28 | 1.56 | 6.02 |
| 34 | 18 | 26 | 80 | 9 | 14 | 12 | 20 | 4000 | 71.3 | 115.3 | 1.83 | 2.12 | 2.12 | 2.04 | 6.02 |
| 45 | 20 | 32 | 105 | 14 | 20 | 17 | 22.5 | 4000 | 79.2 | 116.3 | 2.48 | 1.90 | 1.90 | 2.80 | 9.77 |
| 45 | 20 | 32 | 105 | 14 | 20 | 17 | 22.5 | 4000 | 94.8 | 150.5 | 3.21 | 3.14 | 3.14 | 3.69 | 9.77 |

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

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

## SBI-HL/HLL



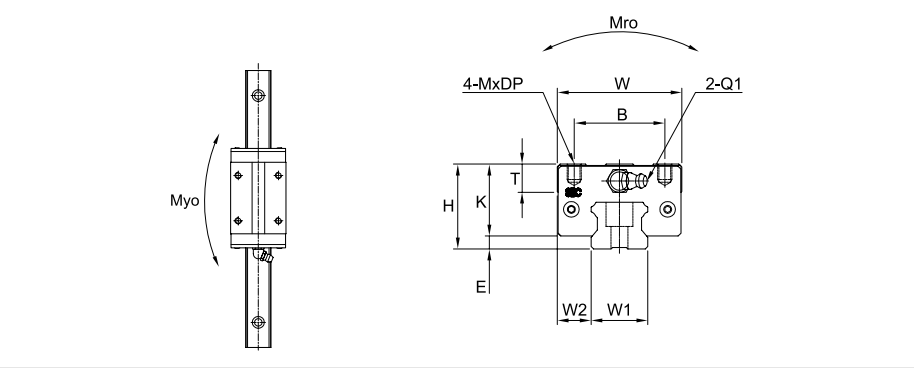

(Unit : mm)

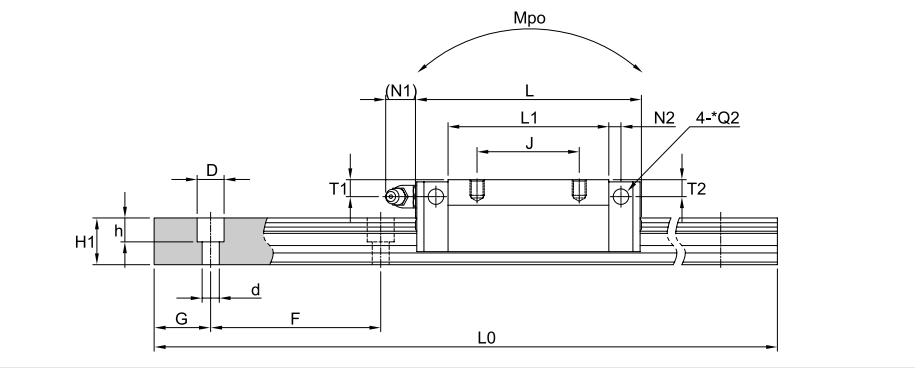
| Model | Mounting dimension | | | | Block dimensions | | | | | | | | | | | | Rail dimension | | | | | | | | | Basic load rating [kN] | | Permissible static moment [kN • m] | | | Mass | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | H | W | L | E | Mounting tap hole | | | | L1 | T | K | Grease fitting | | | | | W1 | W2 | H1 | F | Bolt hole | | | G | Max langth of rail L0 | | | | | | Block [kg] | Rail [kg/m] |
| | | | | | B | J | M | DP | | | | T1 | N1 | T2 | N2 | Q1 *Q2 | | | | | d | D | h | | | C | Co | Mro | Mpo | Myo | | |
| SBI15 HL | 24 | 34 | 63.8 | 3 | 26 | 26 | M4 | 5 | 45.2 | 6 | 21 | 4.5 | 3.6 | 3.8 | 3.4 | M4x0.7 Ø4 | 15 | 9.5 | 13 | 60 | 4.5 | 7.5 | 5.5 | 20 | 3000 | 14.1 | 24.1 | 0.16 | 0.17 | 0.17 | 0.19 | 1.3 |
| SBI15 HLL | 24 | 34 | 79.4 | 3 | 26 | 34 | M4 | 5 | 60.8 | 6 | 21 | 4.5 | 3.6 | 3.8 | 3.4 | M4x0.7 Ø4 | 15 | 9.5 | 13 | 60 | 4.5 | 7.5 | 5.5 | 20 | 4000 | 17.1 | 31.7 | 0.21 | 0.29 | 0.29 | 0.26 | 1.3 |
| SBI25 HL | 36 | 48 | 92 | 5.5 | 35 | 35 | M6 | 8 | 70 | 12 | 30.5 | 6 | 11 | 5.6 | 5.5 | M6x0.75 Ø4 | 23 | 12.5 | 20 | 60 | 7 | 11 | 9 | 20 | 4000 | 31.5 | 52.1 | 0.56 | 0.56 | 0.56 | 0.69 | 3 |
| SBI25 HLL | 36 | 48 | 108 | 5.5 | 35 | 50 | M6 | 8 | 86 | 12 | 30.5 | 6 | 11 | 5.6 | 5.5 | M6x0.75 Ø4 | 23 | 12.5 | 20 | 60 | 7 | 11 | 9 | 20 | 4000 | 36.7 | 64.4 | 0.69 | 0.84 | 0.84 | 0.85 | 3 |
| SBI30 HL | 42 | 60 | 107.6 | 7 | 40 | 40 | M8 | 10 | 79.6 | 15 | 35 | 8.5 | 11 | 7.8 | 5 | M6x0.75 Ø6 | 28 | 16 | 23 | 80 | 9 | 14 | 12 | 20 | 4000 | 42.8 | 65.4 | 0.85 | 0.77 | 0.77 | 1.04 | 4.25 |
| SBI30 HLL | 42 | 60 | 131.6 | 7 | 40 | 60 | M8 | 10 | 103.6 | 15 | 35 | 8.5 | 11 | 7.8 | 5 | M6x0.75 Ø6 | 28 | 16 | 23 | 80 | 9 | 14 | 12 | 20 | 4000 | 51.3 | 84.7 | 1.10 | 1.30 | 1.30 | 1.37 | 4.25 |
| SBI35 HL | 48 | 70 | 124.6 | 7.5 | 50 | 50 | M8 | 10 | 94.6 | 15 | 40.5 | 8 | 11 | 8 | 6 | M6x0.75 Ø6 | 34 | 18 | 26 | 80 | 9 | 14 | 12 | 20 | 4000 | 59.5 | 89.1 | 1.42 | 1.28 | 1.28 | 1.56 | 6.02 |
| SBI35 HLL | 48 | 70 | 152.6 | 7.5 | 50 | 72 | M8 | 10 | 122.6 | 15 | 40.5 | 8 | 11 | 8 | 6 | M6x0.75 Ø6 | 34 | 18 | 26 | 80 | 9 | 14 | 12 | 20 | 4000 | 71.3 | 115.3 | 1.83 | 2.12 | 2.12 | 2.04 | 6.02 |
| SBI45 HL | 60 | 86 | 148 | 9 | 60 | 60 | M10 | 13 | 108 | 20 | 51 | 10.5 | 13.5 | 9.3 | 6.5 | PT1/8 Ø6 | 45 | 20 | 32 | 105 | 14 | 20 | 17 | 22.5 | 4000 | 79.2 | 116.3 | 2.48 | 1.90 | 1.90 | 2.80 | 9.77 |
| SBI45 HLL | 60 | 86 | 180 | 9 | 60 | 80 | M10 | 13 | 140 | 20 | 51 | 10.5 | 13.5 | 9.3 | 6.5 | PT1/8 Ø6 | 45 | 20 | 32 | 105 | 14 | 20 | 17 | 22.5 | 4000 | 94.8 | 150.5 | 3.21 | 3.14 | 3.14 | 3.69 | 9.77 |

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

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

## SBI-CL/CLL



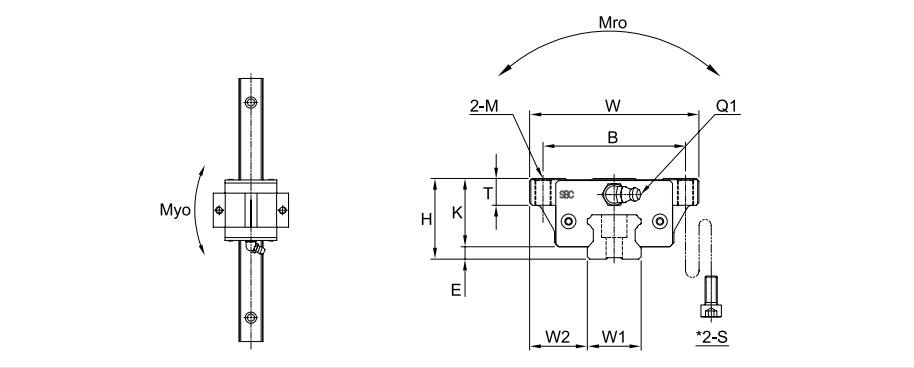

(Unit : mm)

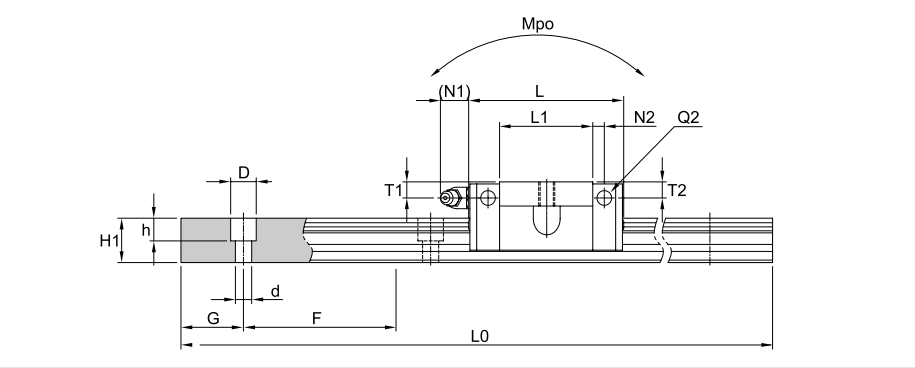
| Model | Mounting dimension | | | | Block dimensions | | | | | | | | | | | | Rail dimension | | | | | | | | | Basic load rating [kN] | | Permissible static moment [kN • m] | | | Mass | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | H | W | L | E | Mounting tap hole | | | | L1 | T | K | Grease fitting | | | | | W1 | W2 | H1 | F | Bolt hole | | | G | Max langth of rail L0 | | | | | | Block [kg] | Rail [kg/m] |
| | | | | | B | J | M | DP | | | | T1 | N1 | T2 | N2 | Q1 *Q2 | | | | | d | D | h | | | C | Co | Mro | Mpo | Myo | | |
| SBI20 CL | 28 | 44 | 78.8 | 4.6 | 32 | 32 | M5 | 5 | 56.8 | 8 | 23.4 | 4.8 | 11 | 4 | 5 | M6x0.75 M4 | 20 | 12 | 16.5 | 60 | 6 | 9.5 | 8.5 | 20 | 4000 | 22.2 | 38.2 | 0.36 | 0.33 | 0.33 | 0.39 | 2.2 |
| SBI20 CLL | 28 | 44 | 96.4 | 4.6 | 32 | 50 | M5 | 5 | 74.4 | 8 | 23.4 | 4.8 | 11 | 4 | 5 | M6x0.75 M4 | 20 | 12 | 16.5 | 60 | 6 | 9.5 | 8.5 | 20 | 4000 | 27.9 | 50 | 0.47 | 0.56 | 0.56 | 0.52 | 2.2 |
| SBI25 CL | 33 | 48 | 92 | 5.5 | 35 | 35 | M6 | 6 | 70 | 9 | 27.5 | 5.4 | 11 | 5.4 | 5 | M6x0.75 M4 | 23 | 12.5 | 20 | 60 | 7 | 11 | 9 | 20 | 4000 | 31.5 | 52.1 | 0.56 | 0.56 | 0.56 | 0.66 | 3 |
| SBI25 CLL | 33 | 48 | 108 | 5.5 | 35 | 50 | M6 | 6 | 86 | 9 | 27.5 | 5.4 | 11 | 5.4 | 5 | M6x0.75 M4 | 23 | 12.5 | 20 | 60 | 7 | 11 | 9 | 20 | 4000 | 36.7 | 64.4 | 0.69 | 0.84 | 0.84 | 0.82 | 3 |

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

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

SBI-FV




(Unit : mm)

| Model | Mounting dimension | | | | Block dimensions | | | | | | | | | | | | Rail dimension | | | | | | | | | Basic load rating [kN] | | Permissible static moment [kN • m] | | | Mass | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | H | W | L | E | Mounting tap hole | | | L1 | T | K | Grease fitting | | | | | | W1 | W2 | H1 | F | Bolt hole | | | G | Max langth of rail L0 | | | | | | Block [kg] | Rail [kg/m] |
| | | | | | B | M | *S | | | | T1 | N1 | T2 | N2 | Q1 | *Q2 | | | | | d | D | h | | | C | Co | Mro | Mpo | Myo | | |
| SBI15 FV | 24 | 47 | 39.9 | 3 | 38 | M5 | M4 | 21.3 | 8 | 21 | 4.5 | 3.6 | 3.8 | 3.4 | M4x0.7 | Ø4 | 15 | 16 | 13 | 60 | 4.5 | 7.5 | 5.5 | 20 | 3000 | 5.8 | 12.8 | 0.04 | 0.03 | 0.03 | 0.10 | 1.3 |
| SBI20 FV | 28 | 63 | 49.1 | 4.5 | 53 | M6 | M5 | 27.1 | 8 | 23.4 | 4.8 | 11 | 4 | 5 | M6x0.75 | M4 | 20 | 21.5 | 16.5 | 60 | 6 | 9.5 | 8.5 | 20 | 4000 | 9.4 | 20.2 | 0.12 | 0.10 | 0.10 | 0.24 | 2.2 |
| SBI25 FV | 33 | 70 | 52.6 | 5.5 | 57 | M8 | M6 | 30.6 | 9 | 27.5 | 5.4 | 11 | 5.4 | 5 | M6x0.75 | M4 | 23 | 23.5 | 20 | 60 | 7 | 11 | 9 | 20 | 4000 | 12.4 | 26.1 | 0.19 | 0.17 | 0.17 | 0.37 | 3 |

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

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

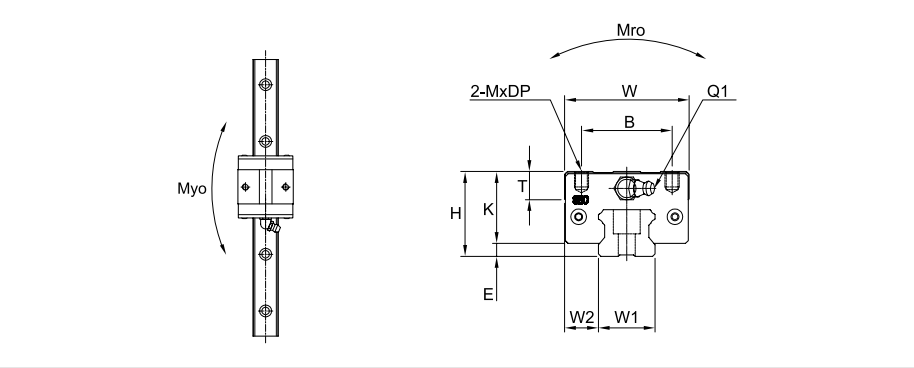
❸ *Q2: The hole of side grease nipple is not made to prevent a foreign substance from going into inside.
When you order the side grease nipple, we build it by ourselves.

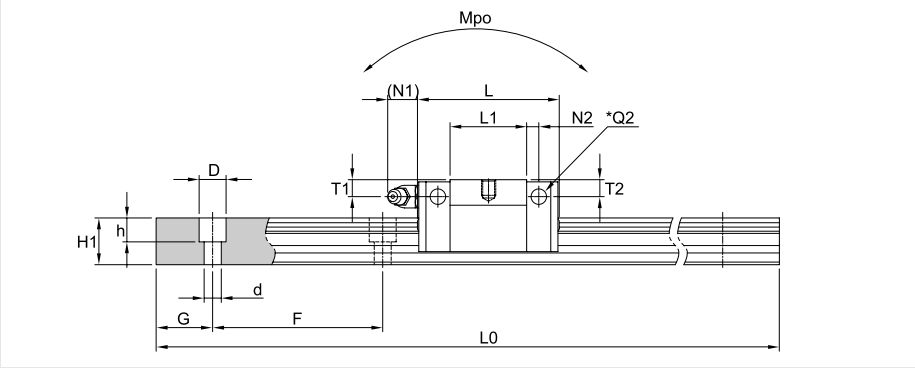
Linear Rail System

SBI high-load linear rail system



## SBI-SV




(Unit : mm)

| Model | Mounting dimension | | | | Block dimensions | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | H | W | L | E | Mounting tap hole | | | L1 | T | K | Grease fitting | | | | | |
| | | | | | B | M | DP | | | | T1 | N1 | T2 | N2 | Q1 | *Q2 |
| SBI15 SV | 24 | 34 | 39.9 | 3 | 26 | M4 | 5 | 21.3 | 6 | 21 | 4.5 | 3.6 | 3.8 | 3.4 | M4x0.7 | Ø4 |
| SBI20 SV | 28 | 44 | 49.1 | 4.6 | 32 | M5 | 5 | 27.1 | 8 | 23.4 | 4.8 | 11 | 4 | 5 | M6x0.75 | M4 |
| SBI25 SV | 33 | 48 | 52.6 | 5.5 | 35 | M6 | 6 | 30.6 | 9 | 27.5 | 5.4 | 11 | 5.4 | 5 | M6x0.75 | M4 |

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

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

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

## SBG Standard linear rail system

### Circular arc groove

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

### 45° angle of contact

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

### DF structure

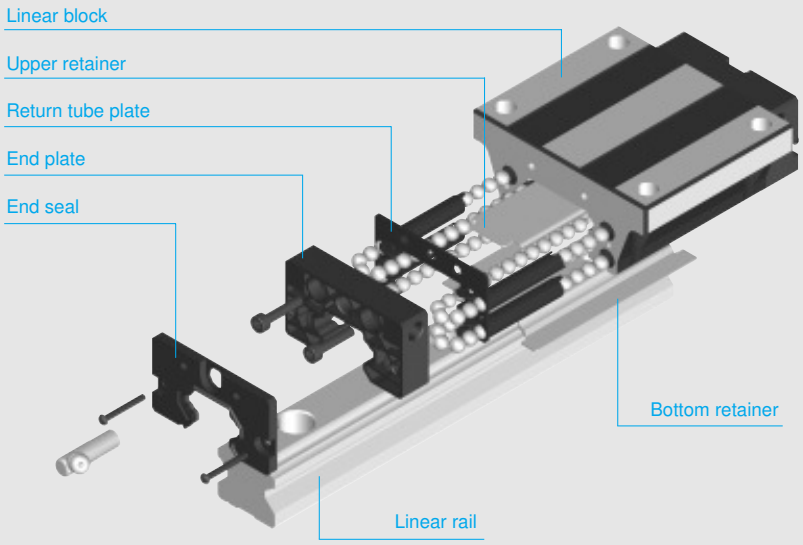
### The same dimension



Linear Rail System

SBG Standard linear rail system

### The Block Structure

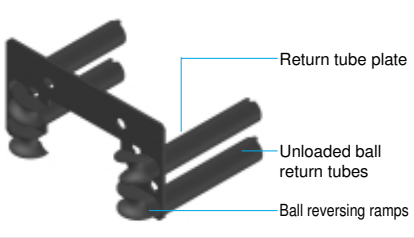



**Linear rail** The same rail profile may be used for every type of block (SBG, SBS, SPG and SPS). SBC uses only high strength and heat-treated special steels in all rails.

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

**Linear block** SBG, SBS, SPG and SPS types are available. All blocks are dimensionally interchangeable.

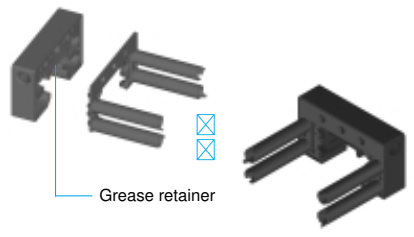
## SBG Standard linear rail system



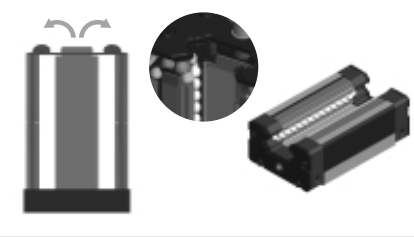

(Structure of return tube plate)

Single component Return tube & reversing plate structure Inserting a molded tube into the ball return paths keeps lubricant cleaner by providing better loose ball control and free lubricant flow while preventing metal to metal skidding contact with what is normally an imprecise return path wall.

※ Return tube plate is available for SBG(S), SPG(S) 20~35.




(Close fitting end-plate reduces grease loss)



(Snap assembled)

Retainer Ball retainers are snap assembled to the internal body and end-plate without fixed position screws. The retainers can self align according to load orientation and direct the balls smoothly into the load zone. This function eliminates ball skid and hot zone pre-load creating smoother running and longer life. These new retainers are made of stainless steel (SUS304) and are corrosion resistant.

Bottom retainer is one body type with rubber seal to prevent contamination from bottom.

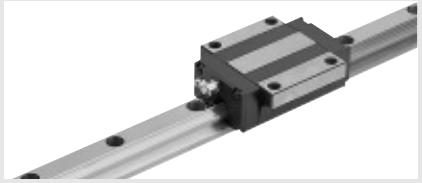
※ Bottom seal is not available for size 15 of SBG(S), SPG(S).

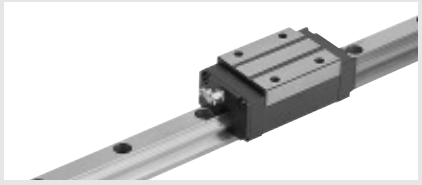




SBG Standard linear rail system

### SBG type





SBG is SBC standard linear block and FL, FLL, SL, SLL are available.

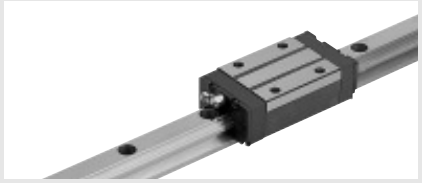
**SBG-FL/FLL**

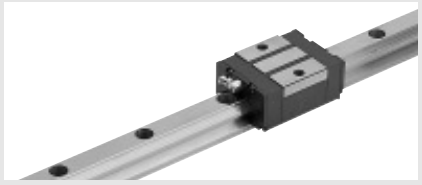
-Flange type
-Size 15~65

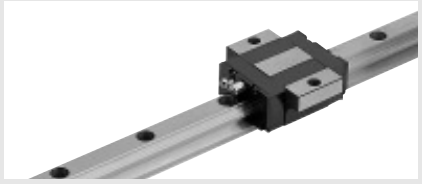
**SBG-SL/SLL**

-Slim type
-Size 15~65

### SBS type







SBS type use same rail as SBG rail and the height is lower than SBG-SL type.

**SBS-SL/SLL**

-Slim type
-Size 15~45

**SBS-HL/HLL**

-SBS-SL (Height is higher than SBS-SL/SLL type)
-Size 25

**SBS-FV**

-Flange type with shorter length
-Size 15~25

**SBS-SV**

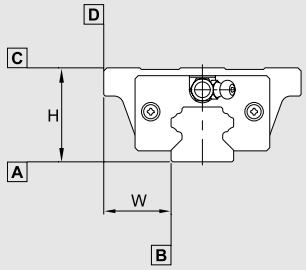
-Slim type with shorter length
-Size 15~25

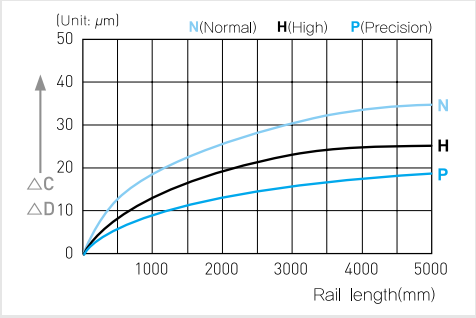
Linear Rail System

## SBG Standard linear rail system

SBG Standard linear rail system

### Accuracy




(Unit : mm)

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

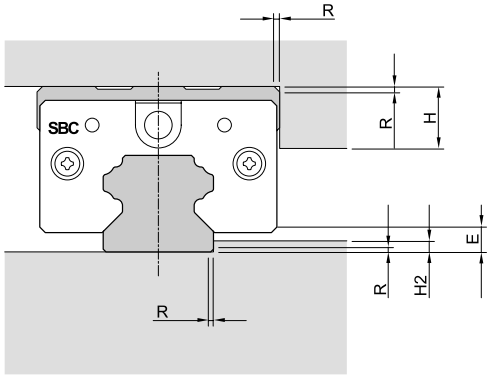
- **N** : Normal
- **H** : High
- **P** : Precision

### Preload

| Reference | Volume of preload |
|---|---|
| K1 (Normal) | 0.00 ~ 0.02C |
| K2 (Light) | 0.04 ~ 0.06C |
| K3 (Heavy) | 0.08 ~ 0.10C |

- C(kN) : Basic dynamic load rating

### Shoulder height and fillet radius R



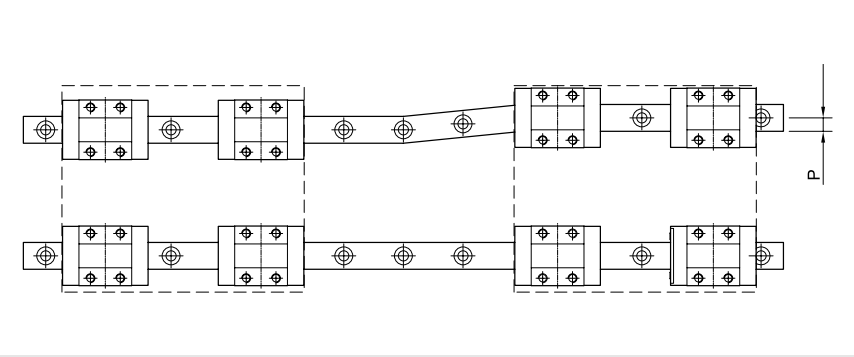

(Unit : mm)

| Model number | Fillet radius R | Shoulders height H1 | Shoulders height H2 | E |
|---|---|---|---|---|
| 15 | 0.5 | 4 | 2 | 3 |
| 20 | 0.5 | 5 | 2.5 | 3.5 |
| 25 | 1.0 | 5 | 3.5 | 6.5 |
| 30 | 1.0 | 5 | 4.5 | 7 |
| 35 | 1.0 | 6 | 6 | 7.5 |
| 45 | 1.0 | 8 | 8 | 10 |
| 55 | 1.5 | 8 | 8 | 13 |
| 65 | 1.5 | 10 | 10 | 17.5 |

Linear Rail System

SBG Standard linear rail system

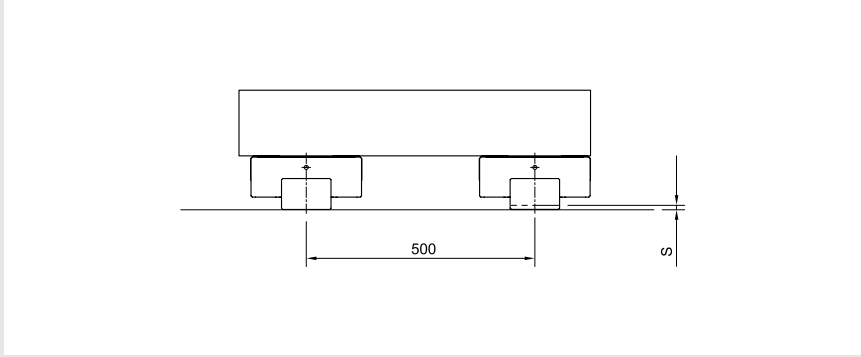
## Permissible tolerance (P) of parallelism




(Unit : mm)

| Model size | K1 | K2 | K3 |
|---|---|---|---|
| 15 | 0.025 | 0.018 | - |
| 20 | 0.025 | 0.02 | 0.018 |
| 25 | 0.03 | 0.022 | 0.02 |
| 30 | 0.04 | 0.03 | 0.027 |
| 35 | 0.05 | 0.035 | 0.03 |
| 45 | 0.06 | 0.04 | 0.035 |
| 55 | 0.07 | 0.05 | 0.045 |
| 65 | 0.08 | 0.06 | 0.055 |

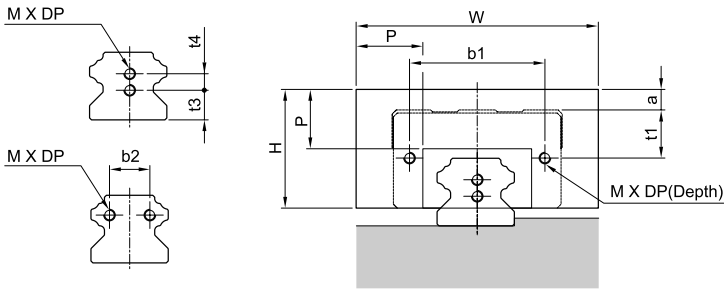
## Permissible tolerance (S) of two level offset

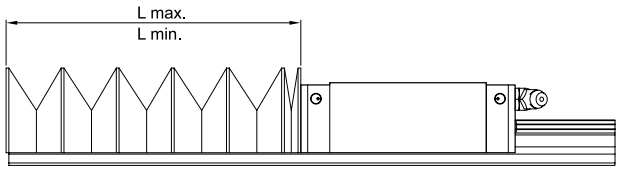



(Unit : mm)

| Model size | K1 | K2 | K3 |
|---|---|---|---|
| 15 | 0.13 | 0.085 | - |
| 20 | 0.13 | 0.085 | 0.05 |
| 25 | 0.13 | 0.085 | 0.07 |
| 30 | 0.17 | 0.11 | 0.09 |
| 35 | 0.21 | 0.15 | 0.12 |
| 45 | 0.25 | 0.17 | 0.14 |
| 55 | 0.3 | 0.21 | 0.17 |
| 65 | 0.35 | 0.25 | 0.2 |

## SH Bellows




[Calculation of bellows length]

$$L_{min} = \frac{L_{max}}{A}$$

- $L_{max}$ : Extended length (mm)
- $L_{min}$ : Collapsed length (mm)
- A : Extended ratio

(Unit : mm)

| Model number | Applicable type | W | H | P | a | | | | | b1 | b2 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | SBG | | SBS | | | | |
| | | | | | FL | SL | SL | FV | HL | | |
| SH 15 | SBG(S)15 | 55 | 27 | 15 | 6 | 2 | 6 | 6 | | 13 | |
| SH 20 | SBG(S)20 | 66 | 32 | 17 | 5.5 | 5.5 | 7.5 | 7.5 | - | 20 | - |
| SH 25 | SBG25 | 78 | 38 | 20 | 8.5 | 4.5 | 10 | 10 | 7 | 35/21 | - |
| SH 25B | SBS25 | 78 | 38 | 20 | 8.5 | 4.5 | 10 | 10 | 7 | 35/21 | - |
| SH 30 | SBG(S)30 | 84 | 42 | 20 | 7 | 4 | 7 | - | - | 34 | - |
| SH 35 | SBG(S)35 | 88 | 43 | 20 | 2.5 | - | 2.5 | - | - | 39 | 14 |
| SH 45 | SBG(S)45 | 100 | 51 | 20 | - | - | - | - | - | 68 | 20 |
| SH 55 | SBG55 | 108 | 54 | 20 | - | - | - | - | - | 80 | 26 |
| SH 65 | SBG65 | 132 | 68 | 20 | - | - | - | - | - | 100 | 32 |

| t1 | | | | | t2 | t3 | t4 | M x DP | | A Extended ratio | Model number |
|---|---|---|---|---|---|---|---|---|---|---|---|
| SBG | | SBS | | | | | | Rail | Block | | |
| FL | SL | SL | FV | HL | | | | | | | |
| 4.5 | 8.5 | 4.5 | 4.5 | | | 10 | | M4x8 | M2x7 | 5 | SH 15 |
| 6 | 6 | 4 | 4 | - | - | 6 | 8 | M3x6 | M2x7 | 5 | SH 20 |
| 4.5 | 8.5 | 4 | 4 | 7 | - | 10 | 8 | M3x6 | M3x20 /M2x8 | 7 | SH 25 |
| 4.5 | 8.5 | 4 | 4 | 7 | - | 10 | 8 | M3x6 | M3x20 /M2x8 | 7 | SH25B |
| 8.5 | 11.5 | 8.5 | - | - | - | 11 | 10 | M4x8 | M3x8 | 7 | SH 30 |
| 9.5 | 16.5 | 9.5 | - | - | 23 | - | - | M4x8 | M3x8 | 7 | SH35 |
| 5.5 | 15.6 | - | - | - | 29 | - | - | M5x10 | M4x12 | 7 | SH 45 |
| 6.25 | 16.25 | - | - | - | 35 | - | - | M5x10 | M5x15 | 6 | SH 55 |
| 8.5 | 8.5 | - | - | - | 42 | - | - | M6x12 | M6x18 | 6 | SH 65 |

* Same dimensions for SBG, SBS, SPG, SPS

* The Bellows for SBG25 and SBS25 is not same

* The dimension of “a, t1” is same for FLL, SLL, SV, HLL

* If you use SH bellows, rain end mounting holes must be provided

* Please contact SBC for lubricant with SH bellows.

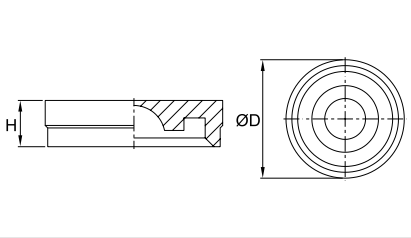
Ordering example : **SH25** – **70** / **420**
❶ ❷ ❸

❶ Model number
❷ Collapsed length (mm)
❸ Extended length (mm)

Linear Rail System

SBG Standard linear rail system

## RC Cap

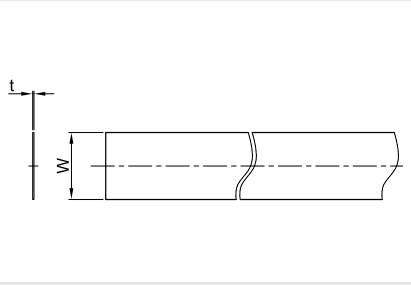



(Unit : mm)

| Model | D | H |
|---|---|---|
| RC 15 | 7.7 | 1.5 |
| RC 20 | 9.7 | 3.5 |
| RC 25 | 11.2 | 2.8 |
| *RC 30 | 14.2 | 3.7 |
| RC 45 | 20.2 | 4.7 |
| RC 55 | 23.2 | 6 |
| RC 65 | 26.2 | 6 |

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

## ST Tape




(Unit : mm)

| Model | W | t |
|---|---|---|
| ST 15 | 8.3 | 0.1 |
| ST 20 | 11 | 0.1 |
| ST 25 | 12 | 0.1 |
| ST 30 | 17 | 0.1 |
| ST 35 | 21 | 0.1 |
| ST 45 | 30 | 0.1 |
| ST 55 | 34 | 0.1 |
| ST 65 | 40 | 0.1 |

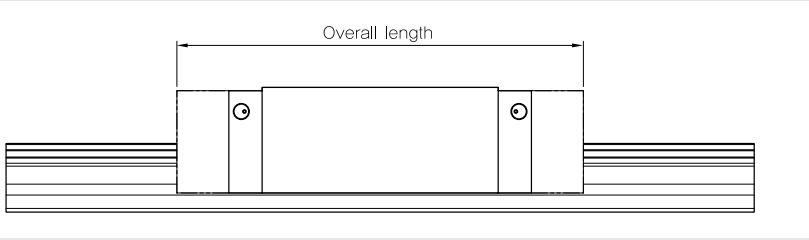
Ordering example : **ST15 - 1000L**
❶ ❷

❶ Model number
❷ Length

- Equivalent rail is used for SBG, SBS, SPG, SPS

## Seal and MF container

[Method and overall length with each seal]




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

(Unit : mm)

| Additional seal | | Standard | DD | ZZ | KK | D(M)F | D(M)FDD | D(M)FZZ | D(M)FKK |
|---|---|---|---|---|---|---|---|---|---|
| Indication of seal | | E | E+E | E+S | E+E+S | F+E | F+E+E | F+E+S | F+E+E+S |
| Overall length with seal | 15 | 60.8 | 66.8 | 62.8 | 68.8 | - | - | - | - |
| | 15V | 44.9 | 50.9 | 46.9 | 52.9 | - | - | - | - |
| | 20 | 77.2 | 83.6 | 79.6 | 86 | 93.2 | 99.6 | 95.6 | 102 |
| | 20L | 93.2 | 99.6 | 95.6 | 102 | 109.2 | 115.6 | 111.6 | 118 |
| | 20V | 54.2 | 60.6 | 56.6 | 63 | 70.2 | 76.6 | 72.6 | 79 |
| | 25 | 86.9 | 93.3 | 89.3 | 95.7 | 102.9 | 109.3 | 105.3 | 111.7 |
| | 25L | 106.4 | 112.8 | 108.8 | 115.2 | 122.4 | 128.8 | 124.8 | 131.2 |
| | 25V | 62.6 | 69 | 65 | 71.4 | 78.6 | 85 | 81 | 87.4 |
| | 30 | 99 | 103.6 | 101.4 | 106 | 115 | 119.6 | 117.4 | 122 |
| | 30L | 121.5 | 126.1 | 123.9 | 128.5 | 137.5 | 142.1 | 139.9 | 144.5 |
| | 35 | 112.6 | 117.2 | 115 | 119.6 | 128.6 | 133.2 | 131 | 135.6 |
| | 35L | 138.1 | 142.7 | 140.5 | 145.1 | 154.1 | 158.7 | 156.5 | 161.1 |
| | 45 | 140.4 | 145.2 | 142.8 | 147.6 | 156.4 | 161.2 | 158.8 | 163.6 |
| | 45L | 172.4 | 177.2 | 174.8 | 179.6 | 188.4 | 193.2 | 190.8 | 195.6 |
| | 55 | 164.8 | 170.8 | 167.2 | 173.2 | - | - | - | - |
| | 55L | 202.8 | 208.8 | 205.2 | 211.2 | - | - | - | - |
| | 65 | 195.2 | 201.2 | 197.6 | 203.6 | - | - | - | - |
| | 65L | 255.2 | 261.2 | 257.6 | 263.6 | - | - | - | - |

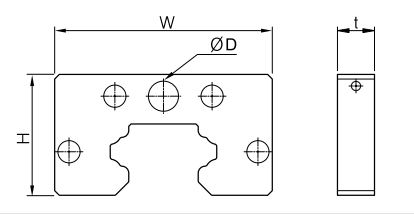
- Bottom seal of SBG(S) type is integrated with bottom retainer. (Except SBG, SBS15)
- If block is assembled with MF container, the grease fitting is not supplied. If you would like to feed the grease to the block, please order side grease fitting type.

Linear Rail System

SBG Standard linear rail system



## [Dimension of MF container]




(Unit : mm)

| Reference | Model | W | t | H | D |
|---|---|---|---|---|---|
| DF MF | 20 | 43 | 8 | 24 | 6.5 |
| | 25 | 47 | 8 | 26.1 | 6.5 |
| | 30 | 59 | 8 | 34.5 | 6.5 |
| | 35 | 68 | 8 | 40 | 6.5 |
| | 45 | 84 | 8 | 49 | 8.5 |

※ Container is available for SBG(S), SPG(S) 20~45

## [Seal resistance]

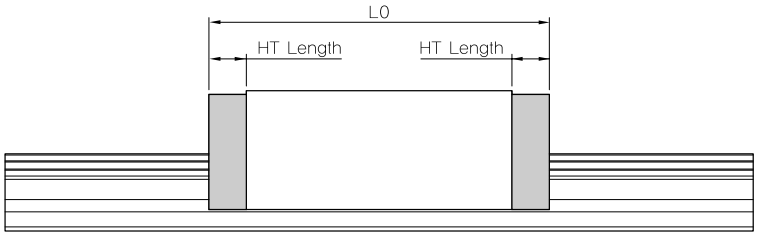
For the maximum value of seal resistance of SBG standard type per block, in which grease is not applied.

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

(Unit : mm)

| Model | End seal | DF | MF |
|---|---|---|---|
| SBG 15 | 1.96 | - | - |
| SBG 20 | 2.58 | 2.89 | 1.61 |
| SBG 25 | 3.92 | 3.95 | 4.21 |
| SBG 30 | 7.84 | 7.83 | 6.37 |
| SBG 35 | 11.76 | 9.67 | 7.06 |
| SBG 45 | 19.6 | 9.87 | 7.35 |
| SBG 55 | 19.6 | - | - |
| SBG 65 | 34.3 | - | - |

## HT high temperature end plate




(Unit : mm)

| Reference | HT Length | Overall length | | | | | |
|---|---|---|---|---|---|---|---|
| | | Applied model | L0 | Applied model | L0 | Applied model | L0 |
| HT 15 | 8 | SBG(S) 15 | 46.8 | - | - | SBS 15V | 38.9 |
| HT 20 | 10 | SBG(S) 20 | 60.8 | SBG(S) 20L | 76.8 | SBS 20V | 47.8 |
| HT 25 | 10.5 | SBG(S) 25 | 70 | SBG(S) 25L | 89.5 | SBS 25V | 56.2 |
| HT 30 | 11.5 | SBG(S) 30 | 81.9 | SBG(S) 30L | 104.4 | - | - |
| HT 35 | 12 | SBG(S) 35 | 92.4 | SBG(S) 35L | 117.9 | - | - |
| HT 45 | 16 | SBG(S) 45 | 114 | SBG(S) 45L | 146 | - | - |
| HT 55 | 18 | SBG(S) 55 | 136 | SBG(S) 55L | 174 | - | - |
| HT 65 | 18 | SBG(S) 65 | 165 | SBG(S) 65L | 225 | - | - |

Ordering example : **SBG25FL - HT - 2 - K1 - 800 - N**
❶ ❷ ❸ ❹ ❺ ❻

❶ Model
❷ High temperature end plate
❸ Block quantity
❹ Preload
❺ Rail length
❻ Accuracy

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

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

## Grease and nipple specification

### [Grease]

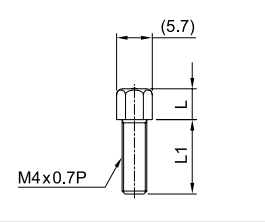
SBG uses two types of grease according to working conditions.
For details, please see the technical data for grease.

Linear Rail System

SBG Standard linear rail system

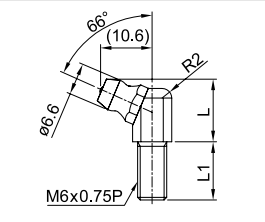


## (1) Standard grease fitting (Front grease fitting)



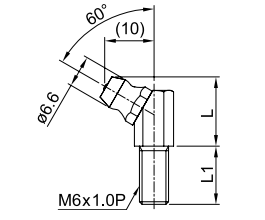

(Unit : mm)

| Specification | | M4x0.7P | | |
|---|---|---|---|---|
| Applied model | Grease fitting model | Symbol | L | L1 |
| SBG(S) 15 | 1N | None | 7 | 6 |
| | 1D | DD, ZZ | 5 | 9 |
| | 1Z | KK | 5 | 12 |



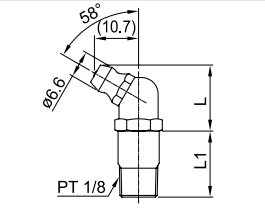

(Unit : mm)

| Specification | | M6x0.75P, Standard | | |
|---|---|---|---|---|
| Applied model | Grease fitting model | Symbol | L | L1 |
| SBG(S) 20~35 | GA2N | None | 15 | 9.5 |
| | GA2D | DD, ZZ | 15 | 12.5 |
| | GA2Z | KK | 15 | 15.5 |
| SPG(S) 20~35 | GA2NF | DF | 15 | 17.5 |
| | GA2DF | DFDD, DFKK | 15 | 19.5 |
| | GA2ZF | DFZZ | 15 | 20.5 |




(Unit : mm)

| Specification | | M6x1.0P, Order made | | |
|---|---|---|---|---|
| Applied model | Grease fitting model | Symbol | L | L1 |
| SBG(S) 20~35 | GE2N | None | 15 | 9.5 |
| | GE2D | DD, ZZ | 15 | 12.5 |
| | GE2Z | KK | 15 | 15.5 |
| SPG(S) 20~35 | GE2NF | DF | 15 | 17.5 |
| | GE2DF | DFDD, DFKK | 15 | 19.5 |
| | GE2ZF | DFZZ | 15 | 20.5 |

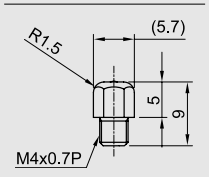



(Unit : mm)

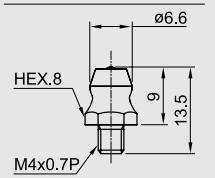
| Specification | | PT 1/8 | | |
|---|---|---|---|---|
| Applied model | Grease fitting model | Symbol | L | L1 |
| SBG(S) 45~65 | 4N | None | 17 | 13 |
| | 4D | DD, KK, ZZ | 17 | 16 |
| | 4NF | DF | 17 | 21 |
| | 4DF | DFDD, DFKK, DFZZ | 17 | 24 |

* M6x0.75P is standard grease fitting for SBG(S)20~35 type. If you need M6x1.0P, please contact SBC.

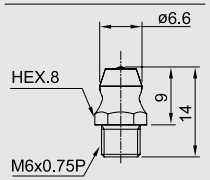
## (2) Side grease fitting



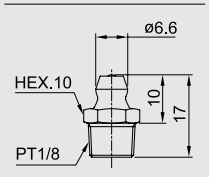

| Specification | M4x0.7P |
|---|---|
| Applied model | SBG(S) 15 |
| Grease fitting model | S1N |




| Specification | M4x0.7P |
|---|---|
| Applied model | SBG(S) 20~25 |
| Grease fitting model | S2N |

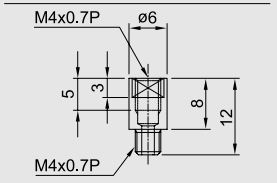



| Specification | M6x0.75P |
|---|---|
| Applied model | SBG(S) 30~45 |
| Grease fitting model | S3N |

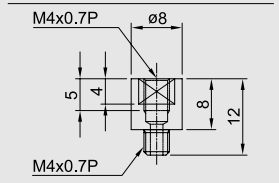



| Specification | PT1/8 |
|---|---|
| Applied model | SBG 55~65 |
| Grease fitting model | S4N |

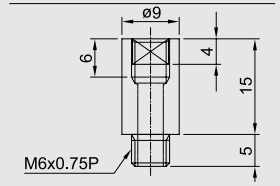
## (3) FS nipple connector for side grease fitting (FL. FLL flange type only)




| Specification | M4x0.7P |
|---|---|
| Applied model | SBG(S) 15 |
| Grease fitting model | S1C |

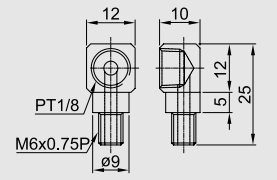



| Specification | M4x0.7P |
|---|---|
| Applied model | SBG(S) 20, 25 |
| Grease fitting model | S2C |

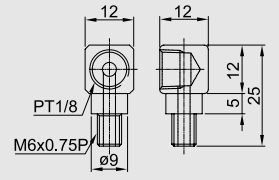



| Specification | M6x0.75P |
|---|---|
| Applied model | SBG(S) 30~45 |
| Grease fitting model | S3C |

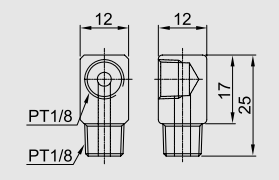
## (4) Copper pipe




| Input size | PT1/8 |
|---|---|
| Output size | M6x0.75P |
| Applied model | SBG(S),SPG(S)20 |
| Grease fitting model | S2P |




| Input size | PT1/8 |
|---|---|
| Output size | M6x0.75P |
| Applied model | SBG(S),SPG(S)25~35 |
| Grease fitting model | S3P |




| Input size | PT1/8 |
|---|---|
| Output size | PT1/8 |
| Applied model | SBG(S) 45~65 |
| Grease fitting model | S4P |

Linear Rail System

SBG Standard linear rail system

## Ordering example

**SBG20 FL – N – MF – ZZ – K1**
[1] [2] [3] [4] [5] [6]

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

[Ordering example for rail]

**SBG20 – 1000L – B**
[1] [2] [3]

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

※ If only rail is ordered, N grade is available.
※ An order for rail only, please mark it as SBG since same rail is used for SBG, SBS, SPG, SPS

[Ordering for assembled rail and block]

**SBG20 FL – N – MF – ZZ – 2 – K1 – 800 – N – R – B – II**
[1] [2] [3] [4] [5] [6] [7] [8] [9] [10] [11] [12]

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

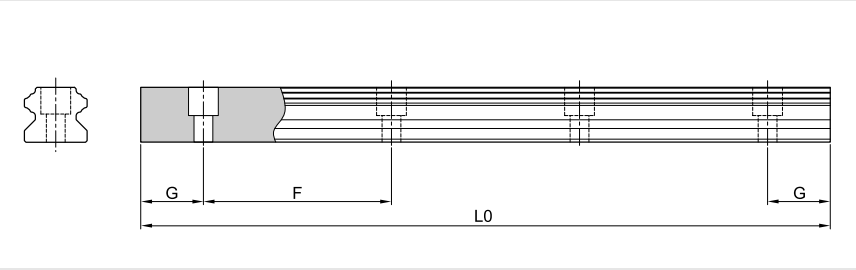
※ We recommend block and rail assembled to be ordered where high-precision and high-rigidity are required.
※ For surface treatment, please mark according to each surface treatment symbol.
※ If special G dimension is required, please mark when you place an order.
※ Please contact SBC for high temperature order.

Linear Rail System

## SBG Standard linear rail system

SBG Standard linear rail system

### Standard and Max. Length of SBG rail

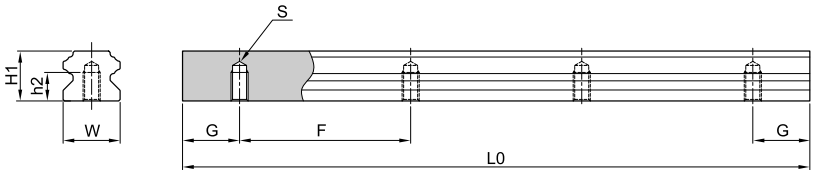



(Unit : mm)

| Model number | SBG15 | SBG20 | SBG25 | SBG30 | SBG35 | SBG45 | SBG55 | SBG65 |
|---|---|---|---|---|---|---|---|---|
| Standard length | 160 | 220 | 220 | 280 | 280 | 570 | 780 | 1270 |
| | 220 | 280 | 280 | 440 | 440 | 885 | 900 | 1570 |
| | 280 | 240 | 340 | 600 | 600 | 1095 | 1020 | 2020 |
| | 340 | 460 | 460 | 760 | 760 | 1200 | 1140 | 2470 |
| | 460 | 640 | 640 | 1000 | 1000 | 1410 | 1260 | 2620 |
| | 640 | 820 | 820 | 1240 | 1240 | 1620 | 1380 | 2920 |
| | 820 | 1000 | 1000 | 1480 | 1480 | 1830 | 1500 | 3070 |
| | 1000 | 1240 | 1240 | 1640 | 1640 | 2040 | 1620 | 4000 |
| | 1240 | 1480 | 1480 | 1800 | 1800 | 2250 | 1740 | |
| | 1480 | 1600 | 1600 | 2040 | 2040 | 2460 | 1860 | |
| | 1600 | 1840 | 1840 | 2200 | 2200 | 2985 | 1980 | |
| | 1960 | 2080 | 2080 | 2520 | 2520 | 3510 | 2220 | |
| | 2200 | 2200 | 2200 | 2840 | 2840 | 4000 | 2580 | |
| | 2500 | 2500 | 2500 | 3000 | 3000 | | 2940 | |
| | 2860 | 2960 | 2980 | 3480 | 3480 | | 3540 | |
| | 3000 | 3520 | 3520 | 4000 | 4000 | | 4000 | |
| | | 4000 | 4000 | | | | | |
| F | 60 | 60 | 60 | 80 | 80 | 105 | 120 | 150 |
| G | 20 | 20 | 20 | 20 | 20 | 22.5 | 30 | 35 |
| L0(Max length) | 3,000 | 4,000 | 4,000 | 4,000 | 4,000 | 4,000 | 4,000 | 4,000 |

* The rail for SBG(S), SPG(S) is identical.
* If the maximum length exceeds this size, butt joints can be supplied.
* For more information about butt jointing, please refer to the page of safety design.
* If the G is not standard, please indicate it in the order sheet.

### Bottom mounting rail (SBG-B type)

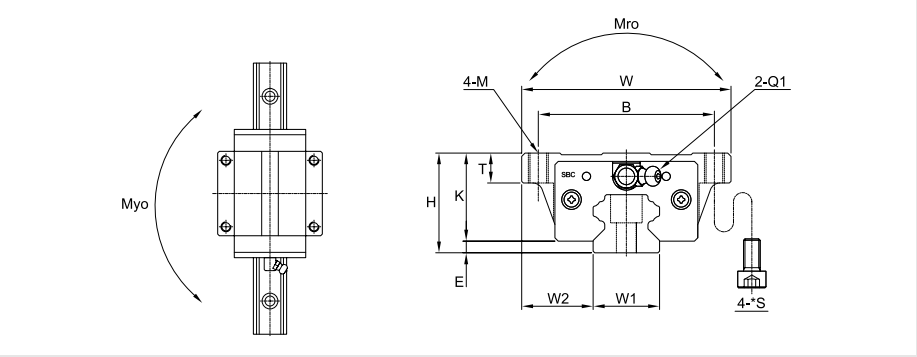


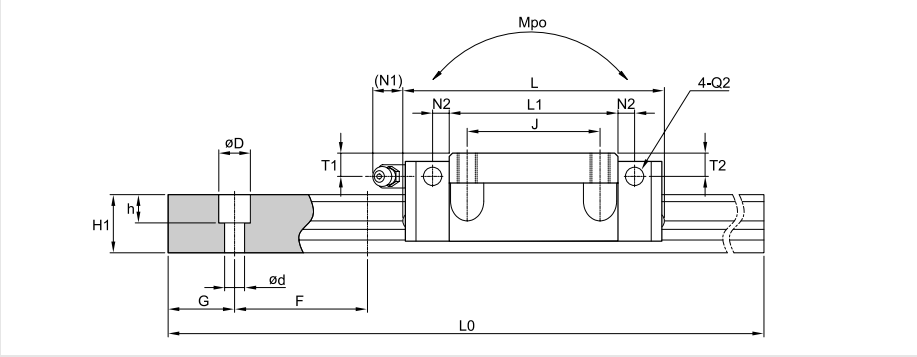

(Unit : mm)

| Model number | W1 | H1 | S | h2 | G | F | L0 (Max length) | Weight (kg/m) |
|---|---|---|---|---|---|---|---|---|
| SBG 15-B | 15 | 15 | M5x0.8 | 8 | 20 | 60 | 3,000 | 1.53 |
| SBG 20-B | 20 | 17.5 | M6 | 10 | 20 | 60 | 4,000 | 2.28 |
| SBG 25-B | 23 | 21.8 | M6 | 12 | 20 | 60 | 4,000 | 3.21 |
| SBG 30-B | 28 | 25 | M8 | 15 | 20 | 80 | 4,000 | 4.58 |
| SBG 35-B | 34 | 29 | M8 | 17 | 20 | 80 | 4,000 | 6.62 |
| SBG 45-B | 45 | 38 | M12 | 24 | 22.5 | 105 | 4,000 | 11.43 |

* The rail for SBG(S), SPG(S) is identical
* If the maximum length exceeds this size, please contact SBC.

## SBG-FL/FLL




(Unit : mm)

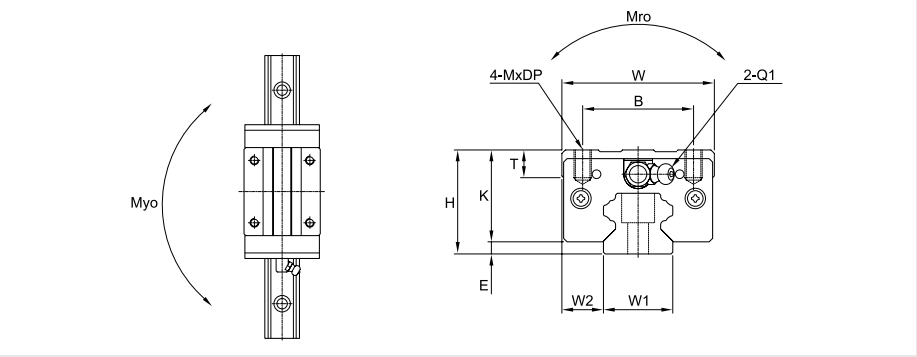
| Model | Mounting dimension | | | | Block dimensions | | | | | | | | | | | | Rail dimension | | | | | | | | | Basic load rating [kN] | | Permissible static moment [kN • m] | | | Mass | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | H | W | L | E | Mounting tap hole | | | | L1 | T | K | Grease fitting | | | | | W1 | W2 | H1 | F | Bolt hole | | | G | Max langth of rail L0 | | | | | | Block [kg] | Rail [kg/m] |
| | | | | | B | J | M | *S | | | | T1 | N1 | T2 | N2 | Q1 | | | | | d | D | h | | | C | Co | Mro | Mpo | Myo | | |
| SBG15 FL | 24 | 47 | 60.8 | 3 | 38 | 30 | M5 | M4 | 38.8 | 7.2 | 21 | 4 | 5 | 4.5 | 4.5 | M4x0.7 | 15 | 16 | 15 | 60 | 4.5 | 7.5 | 5.3 | 20 | 3000 | 8.33 | 13.4 | 0.07 | 0.05 | 0.05 | 0.18 | 1.45 |
| SBG20 FL | 30 | 63 | 77.2 | 3.5 | 53 | 40 | M6 | M5 | 50.8 | 9 | 26.5 | 7 | 9.8 | 7 | 5 | M6x0.75 | 20 | 21.5 | 17.5 | 60 | 6 | 9.5 | 8.5 | 20 | 4000 | 14.2 | 25 | 0.22 | 0.18 | 0.18 | 0.42 | 2.2 |
| SBG20 FLL | 30 | 63 | 93.2 | 3.5 | 53 | 40 | M6 | M5 | 66.8 | 9 | 26.5 | 7 | 9.8 | 7 | 5 | M6x0.75 | 20 | 21.5 | 17.5 | 60 | 6 | 9.5 | 8.5 | 20 | 4000 | 16.9 | 36.5 | 0.28 | 0.31 | 0.31 | 0.54 | 2.2 |
| SBG25 FL | 36 | 70 | 86.9 | 6.5 | 57 | 45 | M8 | M6 | 59.5 | 10 | 29.5 | 8.2 | 9.8 | 8.1 | 5.5 | M6x0.75 | 23 | 23.5 | 21.8 | 60 | 7 | 11 | 9 | 20 | 4000 | 20.9 | 39.2 | 0.35 | 0.31 | 0.3 | 0.62 | 3.1 |
| SBG25 FLL | 36 | 70 | 106.4 | 6.5 | 57 | 45 | M8 | M6 | 79 | 10 | 29.5 | 8.2 | 9.8 | 8.1 | 5.5 | M6x0.75 | 23 | 23.5 | 21.8 | 60 | 7 | 11 | 9 | 20 | 4000 | 24.6 | 48 | 0.43 | 0.49 | 0.48 | 0.78 | 3.1 |
| SBG30 FL | 42 | 90 | 99 | 7 | 72 | 52 | M10 | M8 | 70.4 | 12 | 35 | 8.5 | 10.7 | 8.5 | 5.5 | M6x0.75 | 28 | 31 | 25 | 80 | 9 | 14 | 12 | 20 | 4000 | 29.2 | 53.8 | 0.59 | 0.49 | 0.48 | 1.1 | 4.45 |
| SBG30 FLL | 42 | 90 | 121.5 | 7 | 72 | 52 | M10 | M8 | 92.9 | 12 | 35 | 8.5 | 10.7 | 8.5 | 5.5 | M6x0.75 | 28 | 31 | 25 | 80 | 9 | 14 | 12 | 20 | 4000 | 35.3 | 67.9 | 0.74 | 0.79 | 0.78 | 1.44 | 4.45 |
| SBG35 FL | 48 | 100 | 112.6 | 7.5 | 82 | 62 | M10 | M8 | 80.4 | 13 | 40.5 | 8 | 10.7 | 8 | 6 | M6x0.75 | 34 | 33 | 29 | 80 | 9 | 14 | 12 | 20 | 4000 | 38.8 | 68.6 | 0.94 | 0.74 | 0.72 | 1.57 | 6.4 |
| SBG35 FLL | 48 | 100 | 138.1 | 7.5 | 82 | 62 | M10 | M8 | 105.9 | 13 | 40.5 | 8 | 10.7 | 8 | 6 | M6x0.75 | 34 | 33 | 29 | 80 | 9 | 14 | 12 | 20 | 4000 | 46 | 90.4 | 1.24 | 1.3 | 1.28 | 2.14 | 6.4 |
| SBG45 FL | 60 | 120 | 140.4 | 10 | 100 | 80 | M12 | M10 | 98 | 15 | 50 | 10 | 11 | 10 | 8 | PT1/8 | 45 | 37.5 | 38 | 105 | 14 | 20 | 17 | 22.5 | 4000 | 61.6 | 110.6 | 1.98 | 1.56 | 1.54 | 2.96 | 11.25 |
| SBG45 FLL | 60 | 120 | 172.4 | 10 | 100 | 80 | M12 | M10 | 130 | 15 | 50 | 10 | 11 | 10 | 8 | PT1/8 | 45 | 37.5 | 38 | 105 | 14 | 20 | 17 | 22.5 | 4000 | 75.5 | 138.5 | 2.45 | 2.33 | 2.3 | 3.75 | 11.25 |
| SBG55 FL | 70 | 140 | 164.8 | 13 | 116 | 95 | M14 | M12 | 118 | 17 | 57 | 12 | 11 | 10.5 | 10 | PT1/8 | 53 | 43.5 | 45 | 120 | 16 | 23 | 20 | 30 | 4000 | 91.2 | 156.9 | 3.37 | 2.69 | 2.65 | 4.49 | 15.25 |
| SBG55 FLL | 70 | 140 | 202.8 | 13 | 116 | 95 | M14 | M12 | 156 | 17 | 57 | 12 | 11 | 10.5 | 10 | PT1/8 | 53 | 43.5 | 45 | 120 | 16 | 23 | 20 | 30 | 4000 | 111.8 | 196.6 | 4.19 | 4.05 | 3.97 | 5.68 | 15.25 |
| SBG65 FL | 90 | 170 | 195.2 | 17.5 | 142 | 110 | M16 | M14 | 147 | 23 | 72.5 | 15 | 11 | 12 | 10 | PT1/8 | 63 | 53.5 | 58.5 | 150 | 18 | 26 | 22 | 35 | 4000 | 147.9 | 240.1 | 6.17 | 4.85 | 4.75 | 8.7 | 23.9 |
| SBG65 FLL | 90 | 170 | 255.2 | 17.5 | 142 | 110 | M16 | M14 | 207 | 23 | 72.5 | 15 | 11 | 12 | 10 | PT1/8 | 63 | 53.5 | 58.5 | 150 | 18 | 26 | 22 | 35 | 4000 | 189.1 | 320.4 | 8.18 | 8.34 | 8.14 | 9.5 | 23.9 |

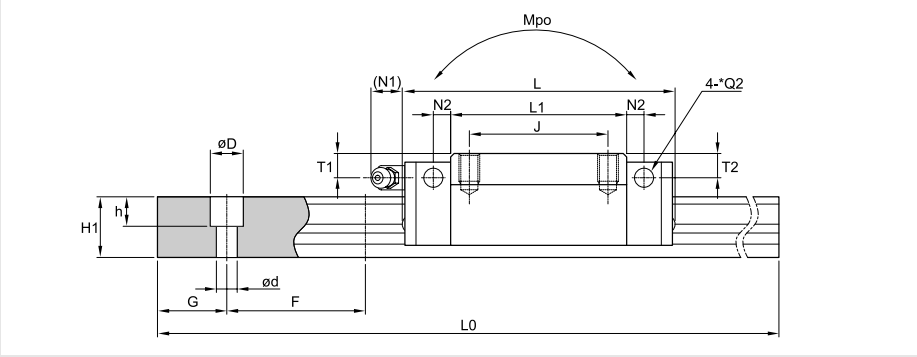
❶ C (Basic dynamic load rating), Co (Basic static load rating)

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

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

## SBG-SL/SLL



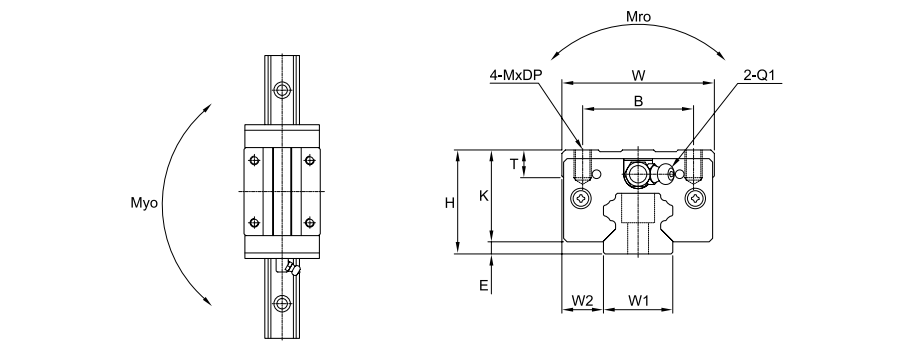

(Unit : mm)

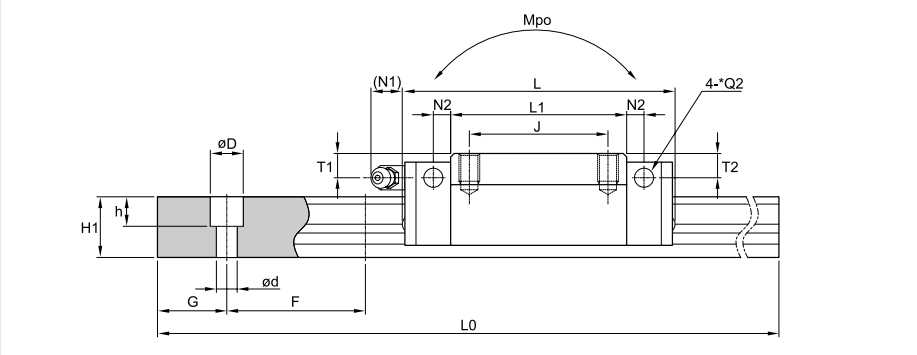
| Model | Mounting dimension | | | | Block dimensions | | | | | | | | | | | | Rail dimension | | | | | | | | | Basic load rating [kN] | | Permissible static moment [kN • m] | | | Mass | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | H | W | L | E | Mounting tap hole | | | | L1 | T | K | Grease fitting | | | | | W1 | W2 | H1 | F | Bolt hole | | | G | Max langth of rail L0 | | | | | | Block [kg] | Rail [kg/m] |
| | | | | | B | J | M | DP | | | | T1 | N1 | T2 | N2 | Q1 | | | | | d | D | h | | | C | Co | Mro | Mpo | Myo | | |
| SBG15 SL | 28 | 34 | 60.8 | 3 | 26 | 26 | M4 | 5 | 38.8 | 8 | 25 | 8 | 5 | 8.5 | 4.5 | M4x0.7 | 15 | 9.5 | 15 | 60 | 4.5 | 7.5 | 5.3 | 20 | 3000 | 8.33 | 13.4 | 0.07 | 0.05 | 0.05 | 0.2 | 1.45 |
| SBG20 SL | 30 | 44 | 77.2 | 3.5 | 32 | 36 | M5 | 8 | 50.8 | 8 | 26.5 | 7 | 9.8 | 7 | 5 | M6x0.75 | 20 | 12 | 17.5 | 60 | 6 | 9.5 | 8.5 | 20 | 4000 | 14.2 | 25 | 0.22 | 0.18 | 0.18 | 0.33 | 2.2 |
| SBG20 SLL | 30 | 44 | 93.2 | 3.5 | 32 | 50 | M5 | 8 | 66.8 | 8 | 26.5 | 7 | 9.8 | 7 | 5 | M6x0.75 | 20 | 12 | 17.5 | 60 | 6 | 9.5 | 8.5 | 20 | 4000 | 16.9 | 36.5 | 0.28 | 0.31 | 0.31 | 0.45 | 2.2 |
| SBG25 SL | 40 | 48 | 86.9 | 6.5 | 35 | 35 | M6 | 8 | 59.5 | 12 | 33.5 | 12.2 | 9.8 | 12.1 | 5.5 | M6x0.75 | 23 | 12.5 | 21.8 | 60 | 7 | 11 | 9 | 20 | 4000 | 20.9 | 39.2 | 0.35 | 0.31 | 0.3 | 0.56 | 3.1 |
| SBG25 SLL | 40 | 48 | 106.4 | 6.5 | 35 | 50 | M6 | 8 | 79 | 12 | 33.5 | 12.2 | 9.8 | 12.1 | 5.5 | M6x0.75 | 23 | 12.5 | 21.8 | 60 | 7 | 11 | 9 | 20 | 4000 | 24.6 | 48 | 0.43 | 0.49 | 0.48 | 0.73 | 3.1 |
| SBG30 SL | 45 | 60 | 99 | 7 | 40 | 40 | M8 | 10 | 70.4 | 12 | 38 | 11.5 | 10.7 | 11.5 | 5.5 | M6x0.75 | 28 | 16 | 25 | 80 | 9 | 14 | 12 | 20 | 4000 | 29.2 | 53.8 | 0.59 | 0.49 | 0.48 | 0.98 | 4.45 |
| SBG30 SLL | 45 | 60 | 121.5 | 7 | 40 | 60 | M8 | 10 | 92.9 | 12 | 38 | 11.5 | 10.7 | 11.5 | 5.5 | M6x0.75 | 28 | 16 | 25 | 80 | 9 | 14 | 12 | 20 | 4000 | 35.3 | 67.9 | 0.74 | 0.79 | 0.78 | 1.28 | 4.45 |
| SBG35 SL | 55 | 70 | 112.6 | 7.5 | 50 | 50 | M8 | 12 | 80.4 | 15 | 47.5 | 15 | 10.7 | 15 | 6 | M6x0.75 | 34 | 18 | 29 | 80 | 9 | 14 | 12 | 20 | 4000 | 38.8 | 68.6 | 0.94 | 0.74 | 0.72 | 1.63 | 6.4 |
| SBG35 SLL | 55 | 70 | 138.1 | 7.5 | 50 | 72 | M8 | 12 | 105.9 | 15 | 47.5 | 15 | 10.7 | 15 | 6 | M6x0.75 | 34 | 18 | 29 | 80 | 9 | 14 | 12 | 20 | 4000 | 46 | 90.4 | 1.24 | 1.3 | 1.28 | 2.12 | 6.4 |
| SBG45 SL | 70 | 86 | 140.4 | 10 | 60 | 60 | M10 | 13 | 98 | 15 | 60 | 15 | 11 | 20 | 8 | PT1/8 | 45 | 20.5 | 38 | 105 | 14 | 20 | 17 | 22.5 | 4000 | 61.6 | 110.6 | 1.98 | 1.56 | 1.54 | 2.96 | 11.25 |
| SBG45 SLL | 70 | 86 | 172.4 | 10 | 60 | 80 | M10 | 13 | 130 | 15 | 60 | 15 | 11 | 20 | 8 | PT1/8 | 45 | 20.5 | 38 | 105 | 14 | 20 | 17 | 22.5 | 4000 | 75.5 | 138.5 | 2.45 | 2.33 | 2.3 | 3.75 | 11.25 |
| SBG55 SL | 80 | 100 | 164.8 | 13 | 75 | 75 | M12 | 18 | 118 | 18 | 67 | 18 | 11 | 20.5 | 10 | PT1/8 | 53 | 23.5 | 45 | 120 | 16 | 23 | 20 | 30 | 4000 | 91.2 | 156.9 | 3.37 | 2.69 | 2.65 | 4.52 | 15.25 |
| SBG55 SLL | 80 | 100 | 202.8 | 13 | 75 | 95 | M12 | 18 | 156 | 18 | 67 | 18 | 11 | 20.5 | 10 | PT1/8 | 53 | 23.5 | 45 | 120 | 16 | 23 | 20 | 30 | 4000 | 111.8 | 196.6 | 4.19 | 4.05 | 3.97 | 5.68 | 15.25 |
| SBG65 SL | 90 | 126 | 195.2 | 17.5 | 76 | 70 | M16 | 20 | 147 | 23 | 72.5 | 23 | 11 | 12 | 10 | PT1/8 | 63 | 31.5 | 58.5 | 150 | 18 | 26 | 22 | 35 | 4000 | 147.9 | 240.1 | 6.17 | 4.85 | 4.75 | 7.43 | 23.9 |
| SBG65 SLL | 90 | 126 | 255.2 | 17.5 | 76 | 120 | M16 | 20 | 207 | 23 | 72.5 | 23 | 11 | 12 | 10 | PT1/8 | 63 | 31.5 | 58.5 | 150 | 18 | 26 | 22 | 35 | 4000 | 189.1 | 320.4 | 8.18 | 8.34 | 8.14 | 12.05 | 23.9 |

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

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

## SBS-SL, HL/SLL, HLL



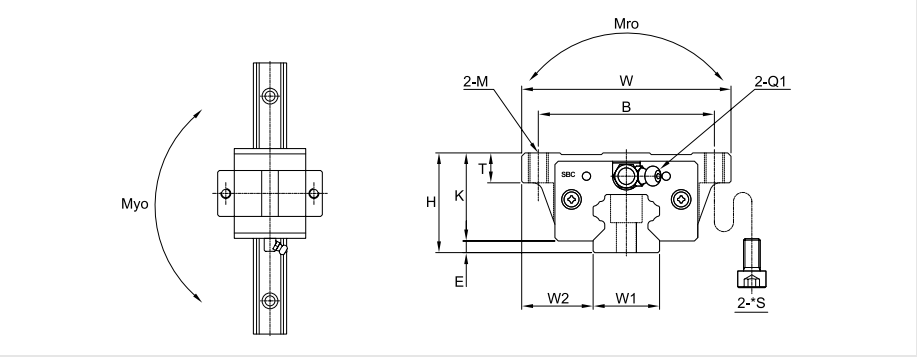

(Unit : mm)

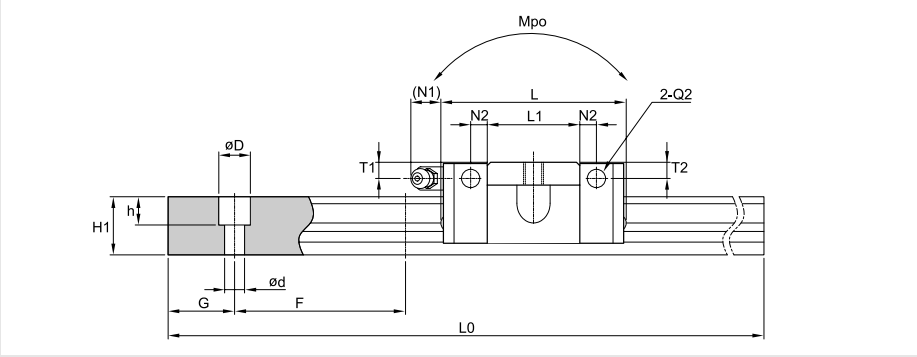
| Model | Mounting dimension | | | | Block dimensions | | | | | | | | | | | | Rail dimension | | | | | | | | | Basic load rating [kN] | | Permissible static moment [kN • m] | | | Mass | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | H | W | L | E | Mounting tap hole | | | | L1 | T | K | Grease fitting | | | | | W1 | W2 | H1 | F | Bolt hole | | | G | Max langth of rail L0 | | | | | | Block [kg] | Rail [kg/m] |
| | | | | | B | J | M | DP | | | | T1 | N1 | T2 | N2 | Q1 | | | | | d | D | h | | | C | Co | Mro | Mpo | Myo | | |
| SBS15 SL | 24 | 34 | 60.8 | 3 | 26 | 26 | M4 | 5 | 38.8 | 6 | 21 | 4 | 5 | 4.5 | 4.5 | M4x0.7 | 15 | 9.5 | 15 | 60 | 4.5 | 7.5 | 5.3 | 20 | 3000 | 8.33 | 13.4 | 0.07 | 0.05 | 0.05 | 0.2 | 1.45 |
| SBS20 SL | 28 | 44 | 77.2 | 3.5 | 32 | 32 | M5 | 7 | 50.8 | 7.5 | 24.5 | 5 | 9.8 | 5 | 5 | M6x0.75 | 20 | 12 | 17.5 | 60 | 6 | 9.5 | 8.5 | 20 | 4000 | 14.2 | 25 | 0.22 | 0.18 | 0.18 | 0.33 | 2.2 |
| SBS20 SLL | 28 | 44 | 93.2 | 3.5 | 32 | 50 | M5 | 7 | 66.8 | 7.5 | 24.5 | 5 | 9.8 | 5 | 5 | M6x0.75 | 20 | 12 | 17.5 | 60 | 6 | 9.5 | 8.5 | 20 | 4000 | 16.9 | 36.5 | 0.28 | 0.31 | 0.31 | 0.45 | 2.2 |
| SBS25 SL | 33 | 48 | 86.9 | 6.5 | 35 | 35 | M6 | 6 | 59.5 | 8 | 26.5 | 5.2 | 9.8 | 5.1 | 5.5 | M6x0.75 | 23 | 12.5 | 21.8 | 60 | 7 | 11 | 9 | 20 | 4000 | 20.9 | 39.2 | 0.35 | 0.31 | 0.3 | 0.56 | 3.1 |
| SBS25 SLL | 33 | 48 | 106.4 | 6.5 | 35 | 50 | M6 | 6 | 79 | 8 | 26.5 | 5.2 | 9.8 | 5.1 | 5.5 | M6x0.75 | 23 | 12.5 | 21.8 | 60 | 7 | 11 | 9 | 20 | 4000 | 24.6 | 48 | 0.43 | 0.49 | 0.48 | 0.73 | 3.1 |
| SBS25 HL | 36 | 48 | 86.9 | 6.5 | 35 | 35 | M6 | 8 | 59.5 | 11 | 29.5 | 8.2 | 9.8 | 8.1 | 5.5 | M6x0.75 | 23 | 12.5 | 21.8 | 60 | 7 | 11 | 9 | 20 | 4000 | 20.9 | 39.2 | 0.35 | 0.31 | 0.3 | 0.98 | 3.1 |
| SBS25 HLL | 36 | 48 | 106.4 | 6.5 | 35 | 50 | M6 | 8 | 79 | 11 | 29.5 | 8.2 | 9.8 | 8.1 | 5.5 | M6x0.75 | 23 | 12.5 | 21.8 | 60 | 7 | 11 | 9 | 20 | 4000 | 24.6 | 48 | 0.43 | 0.49 | 0.48 | 1.28 | 3.1 |
| SBS30 SL | 42 | 60 | 99 | 7 | 40 | 40 | M8 | 10 | 70.4 | 12 | 35 | 8.5 | 10.7 | 8.5 | 5.5 | M6x0.75 | 28 | 16 | 25 | 80 | 9 | 14 | 12 | 20 | 4000 | 29.2 | 53.8 | 0.59 | 0.49 | 0.48 | 0.98 | 4.45 |
| SBS30 SLL | 42 | 60 | 121.5 | 7 | 40 | 60 | M8 | 10 | 92.9 | 12 | 35 | 8.5 | 10.7 | 8.5 | 5.5 | M6x0.75 | 28 | 16 | 25 | 80 | 9 | 14 | 12 | 20 | 4000 | 35.3 | 67.9 | 0.74 | 0.79 | 0.78 | 1.28 | 4.45 |
| SBS35 SL | 48 | 70 | 112.6 | 7.5 | 50 | 50 | M8 | 12 | 80.4 | 15 | 40.5 | 8 | 10.7 | 8 | 6 | M6x0.75 | 34 | 18 | 29 | 80 | 9 | 14 | 12 | 20 | 4000 | 38.8 | 68.6 | 0.94 | 0.74 | 0.72 | 1.63 | 6.4 |
| SBS35 SLL | 48 | 70 | 138.1 | 7.5 | 50 | 72 | M8 | 12 | 105.9 | 15 | 40.5 | 8 | 10.7 | 8 | 6 | M6x0.75 | 34 | 18 | 29 | 80 | 9 | 14 | 12 | 20 | 4000 | 46 | 90.4 | 1.24 | 1.3 | 1.28 | 2.12 | 6.4 |
| SBS45 SL | 60 | 86 | 140.4 | 10 | 60 | 60 | M10 | 10 | 98 | 15 | 50 | 10 | 11 | 10 | 8 | PT1/8 | 45 | 20.5 | 38 | 105 | 14 | 20 | 17 | 22.5 | 4000 | 61.6 | 110.6 | 1.98 | 1.56 | 1.54 | 2.96 | 11.25 |
| SBS45 SLL | 60 | 86 | 172.4 | 10 | 60 | 80 | M10 | 10 | 130 | 15 | 50 | 10 | 11 | 10 | 8 | PT1/8 | 45 | 20.5 | 38 | 105 | 14 | 20 | 17 | 22.5 | 4000 | 75.5 | 138.5 | 2.45 | 2.33 | 2.3 | 3.75 | 11.25 |

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

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

## SBS-FV




(Unit : mm)

| Model | Mounting dimension | | | | Block dimensions | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | H | W | L | E | Mounting tap hole | | | L1 | T | K | Grease fitting | | | | | | |
| | | | | | B | M | *S | | | | T1 | N1 | T2 | N2 | Q1 | *Q2 | |
| SBS15 FV | 24 | 47 | 44.9 | 3 | 38 | M5 | M4 | 22.9 | 7.2 | 21 | 4 | 5 | 4.5 | 4.5 | M4x0.7 | Ø4 | |
| SBS20 FV | 28 | 63 | 54.2 | 3.5 | 53 | M6 | M5 | 27.8 | 7 | 24.5 | 5 | 9.8 | 5 | 5 | M6x0.75 | Ø6 | |
| SBS25 FV | 33 | 70 | 62.6 | 6.5 | 57 | M8 | M6 | 35.2 | 7 | 26.5 | 5.2 | 9.8 | 5.1 | 5.5 | M6x0.75 | Ø6 | |

| Rail dimension | | | | | | | | | Basic load rating [kN] | | Permissible static moment [kN • m] | | | Mass | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| W1 | W2 | H1 | F | Bolt hole | | | G | Max langth of rail L0 | C | Co | Mro | Mpo | Myo | Block [kg] | Rail [kg/m] |
| | | | | d | D | h | | | | | | | | | |
| 15 | 16 | 15 | 60 | 4.5 | 7.5 | 5.3 | 20 | 3000 | 4.48 | 7.23 | 0.04 | 0.03 | 0.03 | 0.1 | 1.45 |
| 20 | 21.5 | 17.5 | 60 | 6 | 9.5 | 8.5 | 20 | 4000 | 7.65 | 13.5 | 0.12 | 0.1 | 0.1 | 0.24 | 2.2 |
| 23 | 23.5 | 21.8 | 60 | 7 | 11 | 9 | 20 | 4000 | 11.29 | 21.1 | 0.19 | 0.17 | 0.17 | 0.37 | 3.1 |

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

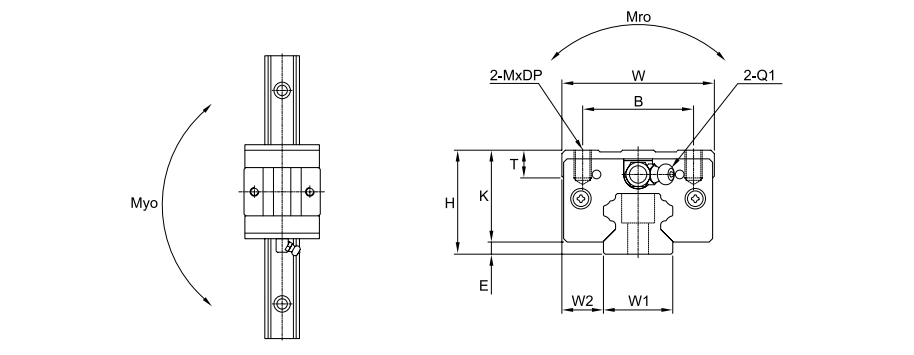
❷ *S: Bolt size for bottom mounting type of block.

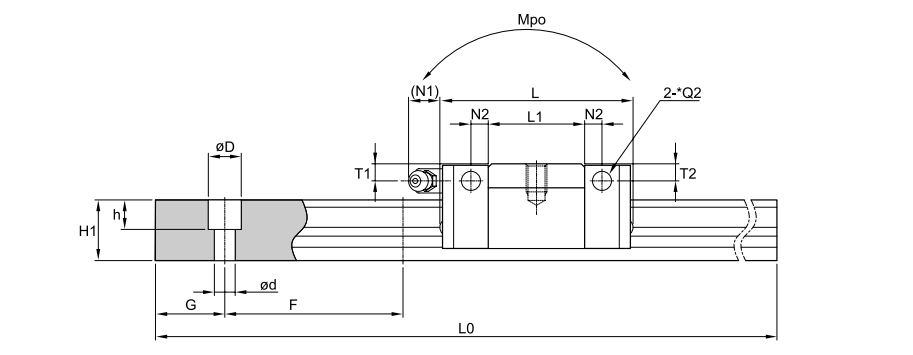
❸ *Q2: The hole of side grease nipple is not made to prevent a foreign substance from going into inside.
When you order the side grease nipple, we build it by ourselves.

Linear Rail System

SBG Standard linear rail system

## SBS-SV



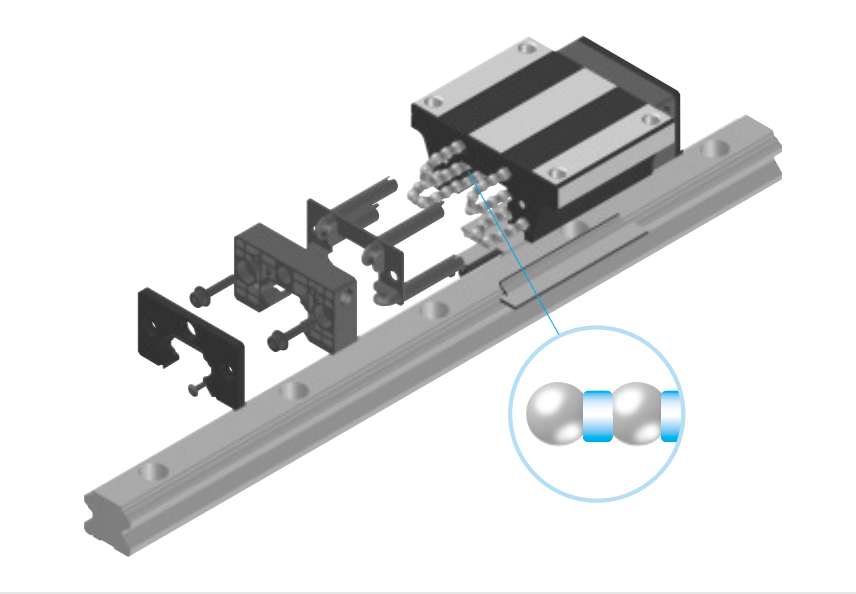

(Unit : mm)

| Model | Mounting dimension | | | | Block dimensions | | | | | | | | | | | | Rail dimension | | | | | | | | | | Basic load rating [kN] | | Permissible static moment [kN • m] | | | Mass | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | H | W | L | E | Mounting tap hole | | | L1 | T | K | Grease fitting | | | | | | W1 | W2 | H1 | F | Bolt hole | | | G | Max langth of rail L0 | | | | | | Block [kg] | Rail [kg/m] |
| | | | | | B | M | DP | | | | T1 | N1 | T2 | N2 | Q1 | *Q2 | | | | | d | D | h | | | C | Co | Mro | Mpo | Myo | | |
| SBS15 SV | 24 | 34 | 44.9 | 3 | 26 | M4 | 5 | 22.9 | 6 | 21 | 4 | 5 | 4.5 | 4.5 | M4x0.7 | Ø4 | 15 | 9.5 | 15 | 60 | 4.5 | 7.5 | 5.3 | 20 | 3000 | 4.48 | 7.23 | 0.04 | 0.03 | 0.03 | 0.1 | 1.45 |
| SBS20 SV | 28 | 44 | 54.2 | 3.5 | 32 | M5 | 7 | 27.8 | 7.5 | 24.5 | 5 | 9.8 | 5 | 5 | M6x0.75 | Ø6 | 20 | 12 | 17.5 | 60 | 6 | 9.5 | 8.5 | 20 | 4000 | 7.65 | 13.5 | 0.12 | 0.1 | 0.1 | 0.19 | 2.2 |
| SBS25 SV | 33 | 48 | 62.6 | 6.5 | 35 | M6 | 6 | 35.2 | 8 | 26.5 | 5.2 | 9.8 | 5.1 | 5.5 | M6x0.75 | Ø6 | 23 | 12.5 | 21.8 | 60 | 7 | 11 | 9 | 20 | 4000 | 11.29 | 21.1 | 0.19 | 0.17 | 0.17 | 0.32 | 3.1 |

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

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

## The feature of SPG, SPS type



### [Design feature]

SPG, SPS type is ball spacer inserted type between balls. This spacer minimizes the noise level by eliminating metal to metal contact and storing grease which provides long term, maintenance free operation.

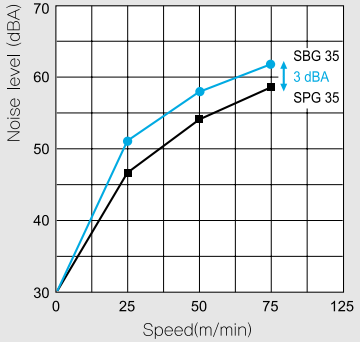
### [Using SBG standard rail]

SPG, SPS type are using SBG standard rail.

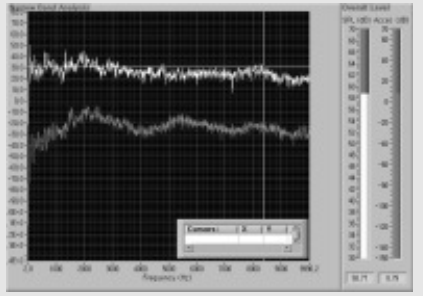
### [Dimensionally interchangeable with SBG type]

SPG/SPS spacer series blocks are dimensionally interchangeable with SBG/SBS blocks.

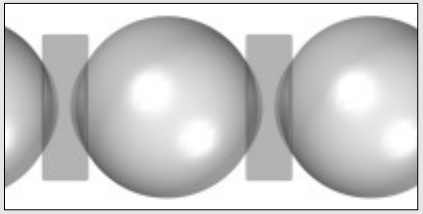
### [Noise level test for SBG35 and SPG35]




(Comparison of noise level)



(SPG35 1.3m/sec)



### [Grease retention]

The spacers provide grease storage areas providing long term, maintenance free operation.

### [Ordering example]

Ordering example for SPG/SPS type are identical with SBG type ordering. Therefore, please see the ordering example for SBG type.



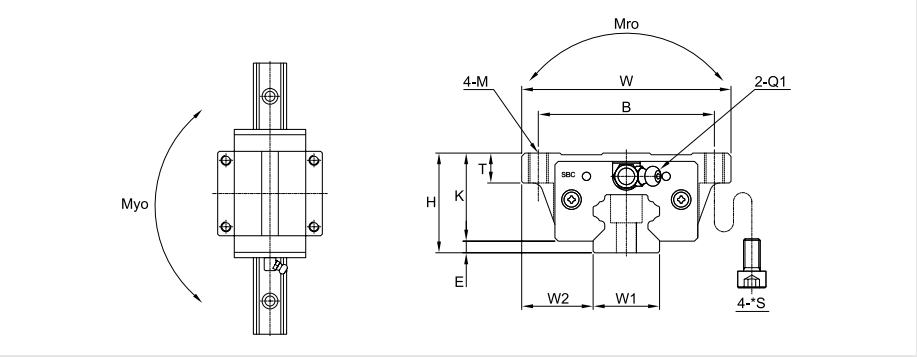
Linear Rail System
The feature of SPG, SPS type

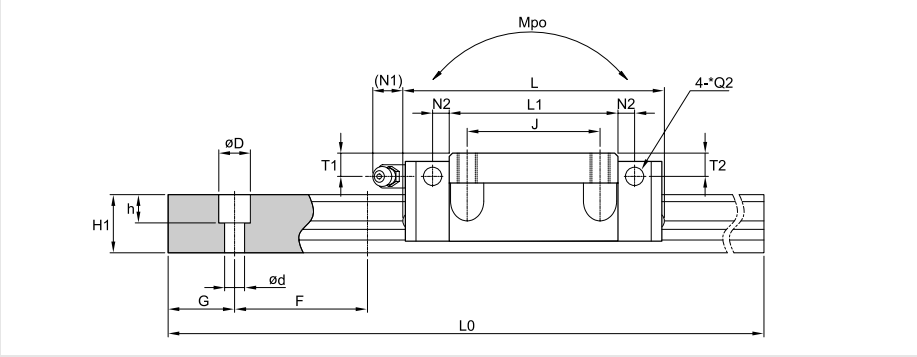
Linear Rail System

## The feature of SPG, SPS type

The feature of SPG, SPS type

### SPG-FL/FLL




(Unit : mm)

| Model | Mounting dimension | | | | Block dimensions | | | | | | | | | | | | Rail dimension | | | | | | | | | Basic load rating [kN] | | Permissible static moment [kN • m] | | | Mass | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | H | W | L | E | Mounting tap hole | | | | L1 | T | K | Grease fitting | | | | | W1 | W2 | H1 | F | Bolt hole | | | G | Max langth of rail L0 | | | | | | Block [kg] | Rail [kg/m] |
| | | | | | B | J | M | *S | | | | T1 | N1 | T2 | N2 | Q1 | | | | | d | D | h | | | C | Co | Mro | Mpo | Myo | | |
| SPG20 FL | 30 | 63 | 77.2 | 3.5 | 53 | 40 | M6 | M5 | 50.8 | 9 | 26.5 | 7 | 9.8 | 7 | 5 | M6x0.75 | 20 | 21.5 | 17.5 | 60 | 6 | 9.5 | 8.5 | 20 | 4000 | 14.2 | 25 | 0.22 | 0.18 | 0.18 | 0.42 | 2.2 |
| SPG20 FLL | 30 | 63 | 93.2 | 3.5 | 53 | 40 | M6 | M5 | 66.8 | 9 | 26.5 | 7 | 9.8 | 7 | 5 | M6x0.75 | 20 | 21.5 | 17.5 | 60 | 6 | 9.5 | 8.5 | 20 | 4000 | 16.9 | 36.5 | 0.28 | 0.31 | 0.31 | 0.54 | 2.2 |
| SPG25 FL | 36 | 70 | 86.9 | 6.5 | 57 | 45 | M8 | M6 | 59.5 | 10 | 29.5 | 8.2 | 9.8 | 8.1 | 5.5 | M6x0.75 | 23 | 23.5 | 21.8 | 60 | 7 | 11 | 9 | 20 | 4000 | 20.9 | 39.2 | 0.35 | 0.31 | 0.3 | 0.62 | 3.1 |
| SPG25 FLL | 36 | 70 | 106.4 | 6.5 | 57 | 45 | M8 | M6 | 79 | 10 | 29.5 | 8.2 | 9.8 | 8.1 | 5.5 | M6x0.75 | 23 | 23.5 | 21.8 | 60 | 7 | 11 | 9 | 20 | 4000 | 24.6 | 48 | 0.43 | 0.49 | 0.48 | 0.78 | 3.1 |
| SPG30 FL | 42 | 90 | 99 | 7 | 72 | 52 | M10 | M8 | 70.4 | 12 | 35 | 8.5 | 10.7 | 8.5 | 5.5 | M6x0.75 | 28 | 31 | 25 | 80 | 9 | 14 | 12 | 20 | 4000 | 29.2 | 53.8 | 0.59 | 0.49 | 0.48 | 1.1 | 4.45 |
| SPG30 FLL | 42 | 90 | 121.5 | 7 | 72 | 52 | M10 | M8 | 92.9 | 12 | 35 | 8.5 | 10.7 | 8.5 | 5.5 | M6x0.75 | 28 | 31 | 25 | 80 | 9 | 14 | 12 | 20 | 4000 | 35.3 | 67.9 | 0.74 | 0.79 | 0.78 | 1.44 | 4.45 |
| SPG35 FL | 48 | 100 | 112.6 | 7.5 | 82 | 62 | M10 | M8 | 80.4 | 13 | 40.5 | 8 | 10.7 | 8 | 6 | M6x0.75 | 34 | 33 | 29 | 80 | 9 | 14 | 12 | 20 | 4000 | 38.8 | 68.6 | 0.94 | 0.74 | 0.72 | 1.57 | 6.4 |
| SPG35 FLL | 48 | 100 | 138.1 | 7.5 | 82 | 62 | M10 | M8 | 105.9 | 13 | 40.5 | 8 | 10.7 | 8 | 6 | M6x0.75 | 34 | 33 | 29 | 80 | 9 | 14 | 12 | 20 | 4000 | 46 | 90.4 | 1.24 | 1.3 | 1.28 | 2.14 | 6.4 |

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

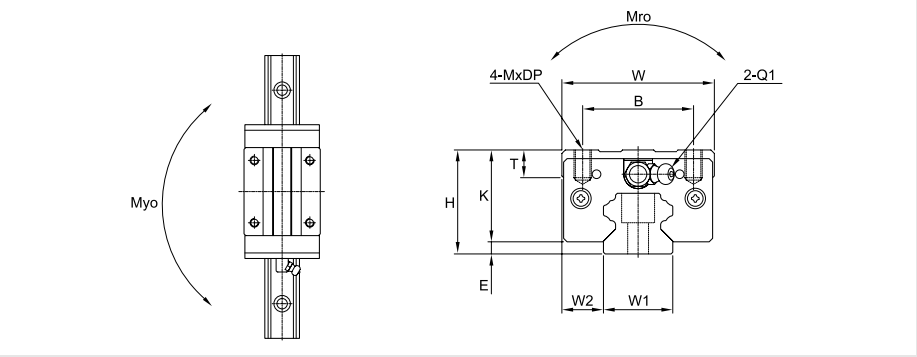
❷ *S: Bolt size for bottom mounting type of block.

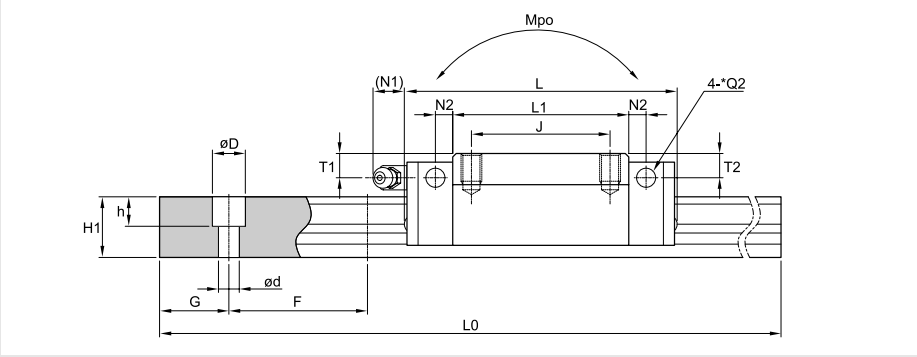
❸ *Q2: The hole of side grease nipple is not made to prevent a foreign substance from going into inside.
When you order the side grease nipple, we build it by ourselves.

Linear Rail System

The feature of SPG, SPS type

## SPG-SL/SL




(Unit : mm)

| Model | Mounting dimension | | | | Block dimensions | | | | | | | | | | | | Rail dimension | | | | | | | | | Basic load rating [kN] | | Permissible static moment [kN • m] | | | Mass | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | H | W | L | E | Mounting tap hole | | | | L1 | T | K | Grease fitting | | | | | W1 | W2 | H1 | F | Bolt hole | | | G | Max langth of rail L0 | | | | | | Block [kg] | Rail [kg/m] |
| | | | | | B | J | M | DP | | | | T1 | N1 | T2 | N2 | Q1 | | | | | d | D | h | | | C | Co | Mro | Mpo | Myo | | |
| SPG20 SL | 30 | 44 | 77.2 | 3.5 | 32 | 36 | M5 | 8 | 50.8 | 8 | 26.5 | 8 | 9.8 | 7 | 5 | M6x0.75 | 20 | 12 | 17.5 | 60 | 6 | 9.5 | 8.5 | 20 | 4000 | 14.2 | 25 | 0.22 | 0.18 | 0.18 | 0.33 | 2.2 |
| SPG20 SLL | 30 | 44 | 93.2 | 3.5 | 32 | 50 | M5 | 8 | 66.8 | 8 | 26.5 | 8 | 9.8 | 7 | 5 | M6x0.75 | 20 | 12 | 17.5 | 60 | 6 | 9.5 | 8.5 | 20 | 4000 | 16.9 | 36.5 | 0.28 | 0.31 | 0.31 | 0.45 | 2.2 |
| SPG25 SL | 40 | 48 | 86.9 | 6.5 | 35 | 35 | M6 | 8 | 59.5 | 12 | 33.5 | 12 | 9.8 | 12.2 | 5.5 | M6x0.75 | 23 | 12.5 | 21.8 | 60 | 7 | 11 | 9 | 20 | 4000 | 20.9 | 39.2 | 0.35 | 0.31 | 0.3 | 0.56 | 3.1 |
| SPG25 SLL | 40 | 48 | 106.4 | 6.5 | 35 | 50 | M6 | 8 | 79 | 12 | 33.5 | 12 | 9.8 | 12.2 | 5.5 | M6x0.75 | 23 | 12.5 | 21.8 | 60 | 7 | 11 | 9 | 20 | 4000 | 24.6 | 48 | 0.43 | 0.49 | 0.48 | 0.73 | 3.1 |
| SPG30 SL | 45 | 60 | 99 | 7 | 40 | 40 | M8 | 10 | 70.4 | 12 | 38 | 12 | 10.7 | 11.5 | 5.5 | M6x0.75 | 28 | 16 | 25 | 80 | 9 | 14 | 12 | 20 | 4000 | 29.2 | 53.8 | 0.59 | 0.49 | 0.48 | 0.98 | 4.45 |
| SPG30 SLL | 45 | 60 | 121.5 | 7 | 40 | 60 | M8 | 10 | 92.9 | 12 | 38 | 12 | 10.7 | 11.5 | 5.5 | M6x0.75 | 28 | 16 | 25 | 80 | 9 | 14 | 12 | 20 | 4000 | 35.3 | 67.9 | 0.74 | 0.79 | 0.78 | 1.28 | 4.45 |
| SPG35 SL | 55 | 70 | 112.6 | 7.5 | 50 | 50 | M8 | 12 | 80.4 | 15 | 47.5 | 15 | 10.7 | 15 | 6 | M6x0.75 | 34 | 18 | 29 | 80 | 9 | 14 | 12 | 20 | 4000 | 38.8 | 68.6 | 0.94 | 0.74 | 0.72 | 1.63 | 6.4 |
| SPG35 SLL | 55 | 70 | 138.1 | 7.5 | 50 | 72 | M8 | 12 | 105.9 | 15 | 47.5 | 15 | 10.7 | 15 | 6 | M6x0.75 | 34 | 18 | 29 | 80 | 9 | 14 | 12 | 20 | 4000 | 46 | 90.4 | 1.24 | 1.3 | 1.28 | 2.12 | 6.4 |

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

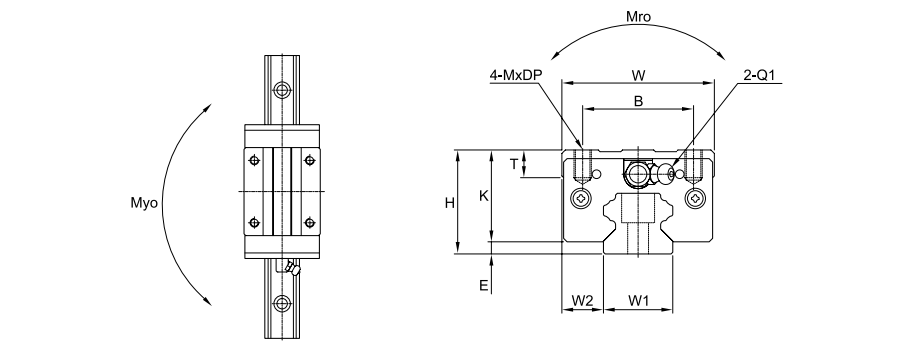
❷ *Q2: The hole of side grease nipple is not made to prevent a foreign substance from going into inside.
When you order the side grease nipple, we build it by ourselves.

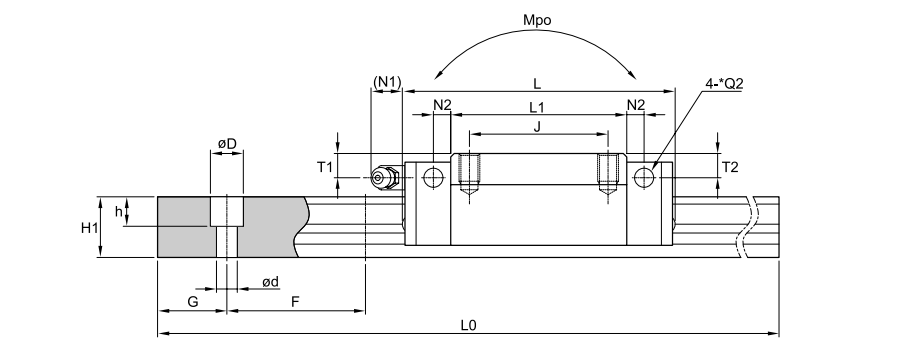
Linear Rail System

## The feature of SPG, SPS type

The feature of SPG, SPS type

### SPS-SL, HL/SLL, HL




(Unit : mm)

| Model | Mounting dimension | | | | Block dimensions | | | | | | | | | | | | Rail dimension | | | | | | | | | Basic load rating [kN] | | Permissible static moment [kN • m] | | | Mass | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | H | W | L | E | Mounting tap hole | | | | L1 | T | K | Grease fitting | | | | | W1 | W2 | H1 | F | Bolt hole | | | G | Max langth of rail L0 | | | | | | Block [kg] | Rail [kg/m] |
| | | | | | B | J | M | DP | | | | T1 | N1 | T2 | N2 | Q1 | | | | | d | D | h | | | C | Co | Mro | Mpo | Myo | | |
| SPS20 SL | 28 | 44 | 77.2 | 3.5 | 32 | 32 | M5 | 7 | 50.8 | 7.5 | 24.5 | 5 | 9.8 | 5 | 5 | M6x0.75 | 20 | 12 | 17.5 | 60 | 6 | 9.5 | 8.5 | 20 | 4000 | 14.2 | 25 | 0.22 | 0.18 | 0.18 | 0.33 | 2.2 |
| SPS20 SLL | 28 | 44 | 93.2 | 3.5 | 32 | 50 | M5 | 7 | 66.8 | 7.5 | 24.5 | 5 | 9.8 | 5 | 5 | M6x0.75 | 20 | 12 | 17.5 | 60 | 6 | 9.5 | 8.5 | 20 | 4000 | 16.9 | 36.5 | 0.28 | 0.31 | 0.31 | 0.45 | 2.2 |
| SPS25 SL | 33 | 48 | 86.9 | 6.5 | 35 | 35 | M6 | 6 | 59.5 | 8 | 26.5 | 5.2 | 9.8 | 5.1 | 5.5 | M6x0.75 | 23 | 12.5 | 21.8 | 60 | 7 | 11 | 9 | 20 | 4000 | 20.9 | 39.2 | 0.35 | 0.31 | 0.3 | 0.56 | 3.1 |
| SPS25 SLL | 33 | 48 | 106.4 | 6.5 | 35 | 50 | M6 | 6 | 79 | 8 | 26.5 | 5.2 | 9.8 | 5.1 | 5.5 | M6x0.75 | 23 | 12.5 | 21.8 | 60 | 7 | 11 | 9 | 20 | 4000 | 24.6 | 48 | 0.43 | 0.49 | 0.48 | 0.73 | 3.1 |
| SPS25 HL | 36 | 48 | 86.9 | 6.5 | 35 | 35 | M6 | 8 | 59.5 | 11 | 29.5 | 8.2 | 9.8 | 8.1 | 5.5 | M6x0.75 | 23 | 12.5 | 21.8 | 60 | 7 | 11 | 9 | 20 | 4000 | 20.9 | 39.2 | 0.35 | 0.31 | 0.3 | 0.98 | 3.1 |
| SPS25 HLL | 36 | 48 | 106.4 | 6.5 | 35 | 50 | M6 | 8 | 79 | 11 | 29.5 | 8.2 | 9.8 | 8.1 | 5.5 | M6x0.75 | 23 | 12.5 | 21.8 | 60 | 7 | 11 | 9 | 20 | 4000 | 24.6 | 48 | 0.43 | 0.49 | 0.48 | 1.28 | 3.1 |
| SPS30 SL | 42 | 60 | 99 | 7 | 40 | 40 | M8 | 10 | 70.4 | 12 | 35 | 8.5 | 10.7 | 8.5 | 5.5 | M6x0.75 | 28 | 16 | 25 | 80 | 9 | 14 | 12 | 20 | 4000 | 29.2 | 53.8 | 0.59 | 0.49 | 0.48 | 0.98 | 4.45 |
| SPS30 SLL | 42 | 60 | 121.5 | 7 | 40 | 60 | M8 | 10 | 92.9 | 12 | 35 | 8.5 | 10.7 | 8.5 | 5.5 | M6x0.75 | 28 | 16 | 25 | 80 | 9 | 14 | 12 | 20 | 4000 | 35.3 | 67.9 | 0.74 | 0.79 | 0.78 | 1.28 | 4.45 |
| SPS35 SL | 48 | 70 | 112.6 | 7.5 | 50 | 50 | M8 | 12 | 80.4 | 15 | 40.5 | 8 | 10.7 | 8 | 6 | M6x0.75 | 34 | 18 | 29 | 80 | 9 | 14 | 12 | 20 | 4000 | 38.8 | 68.6 | 0.94 | 0.74 | 0.72 | 1.63 | 6.4 |
| SPS35 SLL | 48 | 70 | 138.1 | 7.5 | 50 | 72 | M8 | 12 | 105.9 | 15 | 40.5 | 8 | 10.7 | 8 | 6 | M6x0.75 | 34 | 18 | 29 | 80 | 9 | 14 | 12 | 20 | 4000 | 46 | 90.4 | 1.24 | 1.3 | 1.28 | 2.12 | 6.4 |

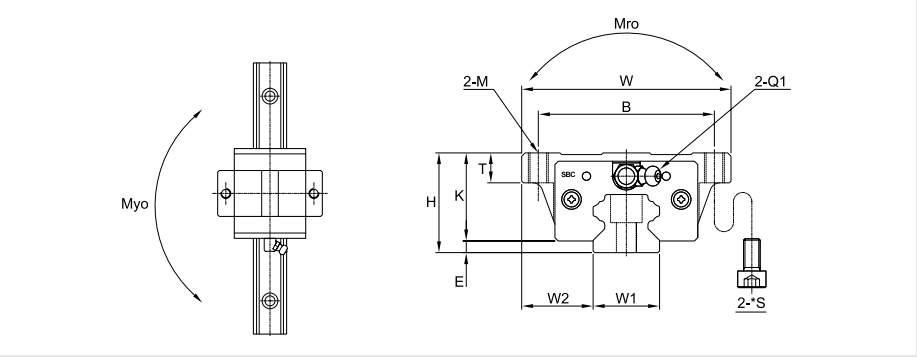
❶ C (Basic dynamic load rating), Co (Basic static load rating)

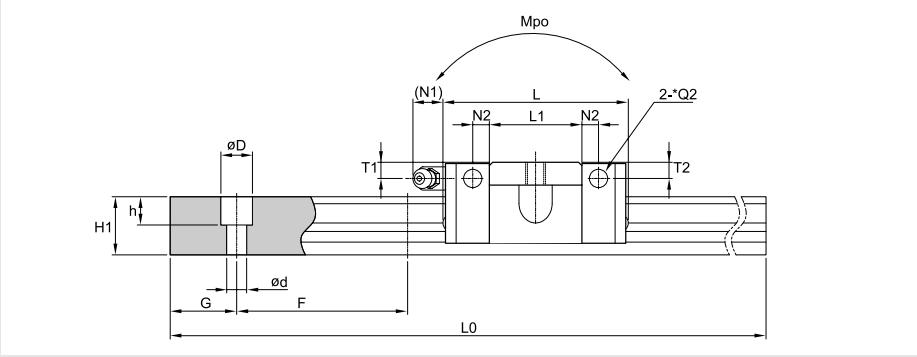
❷ *Q2: The hole of side grease nipple is not made to prevent a foreign substance from going into inside.
When you order the side grease nipple, we build it by ourselves.

Linear Rail System

The feature of SPG, SPS type

## SPS-FV




(Unit : mm)

| Model | Mounting dimension | | | | Block dimensions | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | H | W | L | E | Mounting tap hole | | | L1 | T | K | Grease fitting | | | | | |
| | | | | | B | M | *S | | | | T1 | N1 | T2 | N2 | Q1 | *Q2 |
| SPS20 FV | 28 | 63 | 54.2 | 3.5 | 53 | M6 | M5 | 27.8 | 7 | 24.5 | 5 | 9.8 | 5 | 5 | M6x0.75 | Ø6 |
| SPS25 FV | 33 | 70 | 62.6 | 6.5 | 57 | M8 | M6 | 35.2 | 7 | 26.5 | 5.2 | 9.8 | 5.1 | 5.5 | M6x0.75 | Ø6 |

| Rail dimension | | | | | | | | | Basic load rating [kN] | | Permissible static moment [kN • m] | | | Mass | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| W1 | W2 | H1 | F | Bolt hole | | | G | Max langth of rail L0 | C | Co | Mro | Mpo | Myo | Block [kg] | Rail [kg/m] |
| | | | | d | D | h | | | | | | | | | |
| 20 | 21.5 | 17.5 | 60 | 6 | 9.5 | 8.5 | 20 | 4000 | 7.65 | 13.5 | 0.12 | 0.1 | 0.1 | 0.24 | 2.2 |
| 23 | 23.5 | 21.8 | 60 | 7 | 11 | 9 | 20 | 4000 | 11.29 | 21.1 | 0.19 | 0.17 | 0.17 | 0.37 | 3.1 |

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

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

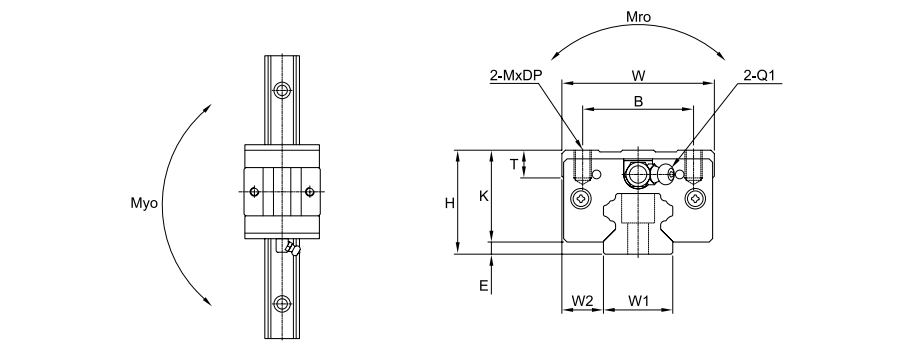
❸ *Q2: The hole of side grease nipple is not made to prevent a foreign substance from going into inside.
When you order the side grease nipple, we build it by ourselves.

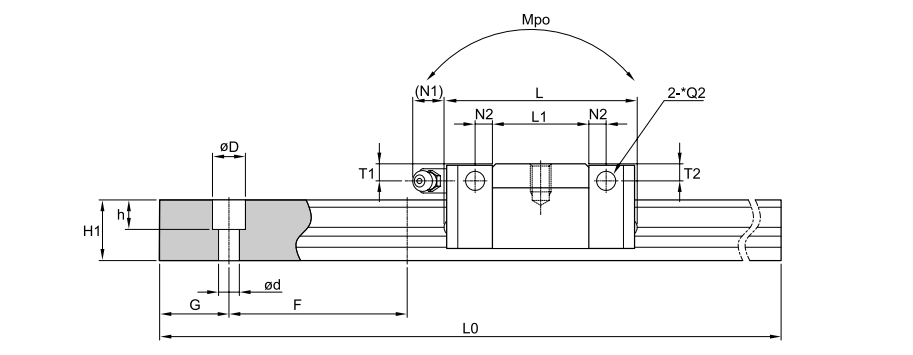
Linear Rail System

## The feature of SPG, SPS type

The feature of SPG, SPS type

### SPS-SV




(Unit : mm)

| Model | Mounting dimension | | | | Block dimensions | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | H | W | L | E | Mounting tap hole | | | L1 | T | K | Grease fitting | | | | | |
| | | | | | B | M | DP | | | | T1 | N1 | T2 | N2 | Q1 | *Q2 |
| SPS20 SV | 28 | 44 | 54.2 | 3.5 | 32 | M5 | 7 | 27.8 | 7.5 | 24.5 | 5 | 9.8 | 5 | 5 | M6x0.75 | Ø6 |
| SPS25 SV | 33 | 48 | 62.6 | 6.5 | 35 | M6 | 6 | 35.2 | 8 | 26.5 | 5.2 | 9.8 | 5.1 | 5.5 | M6x0.75 | Ø6 |

| Rail dimension | | | | | | | | | Basic load rating [kN] | | Permissible static moment [kN • m] | | | Mass | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| W1 | W2 | H1 | F | Bolt hole | | | G | Max langth of rail L0 | C | Co | Mro | Mpo | Myo | Block [kg] | Rail [kg/m] |
| | | | | d | D | h | | | | | | | | | |
| 20 | 12 | 17.5 | 60 | 6 | 9.5 | 8.5 | 20 | 4000 | 7.65 | 13.5 | 0.12 | 0.1 | 0.1 | 0.19 | 2.2 |
| 23 | 12.5 | 21.8 | 60 | 7 | 11 | 9 | 20 | 4000 | 11.29 | 21.1 | 0.19 | 0.17 | 0.17 | 0.32 | 3.1 |

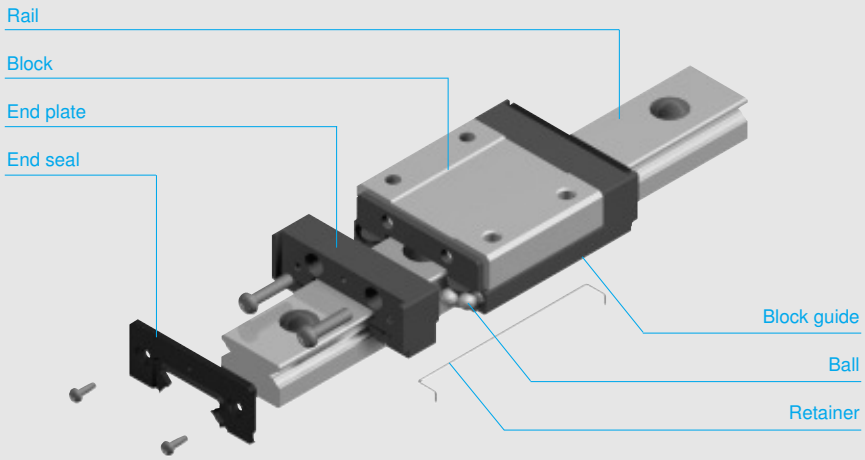
❶ C (Basic dynamic load rating), Co (Basic static load rating)

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

Linear Rail System

Miniature Linear Rail System






### [Feature of structure]

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

### [Ball retention]

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

### [Low noise]

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

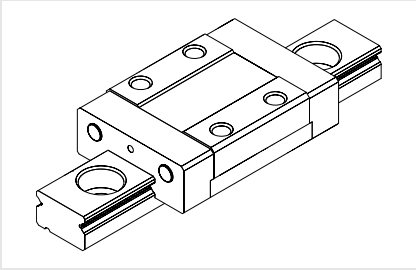
### [Smooth movement]

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

### [Excellent corrosion resistance]

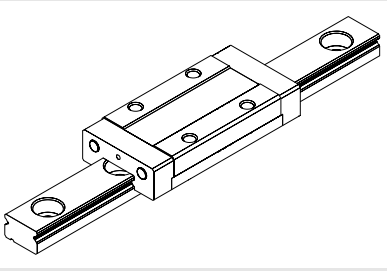
Both the rail and block are made from stainless steel for excellent corrosion resistance. This is ideal for semiconductor, life science, LCD, or other clean room production environments.

## Types and features



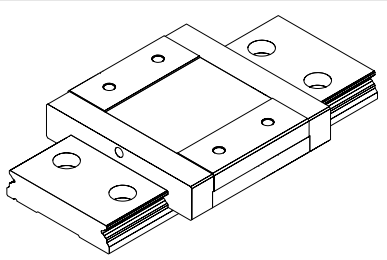
### [SBM type]

Standard type of miniature.



### [SBML type]

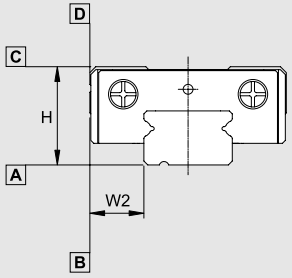
Block length is modified type to increase load capacity.

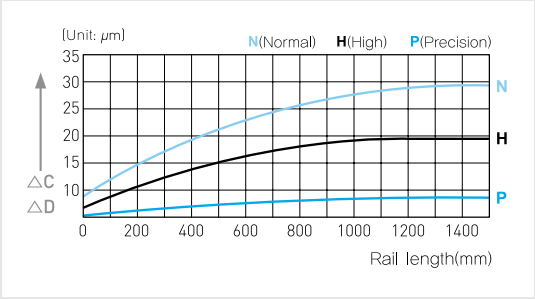


### [SBMW type]

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

## Accuracy




(Unit : mm)

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

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

### [Radial clearance]

(Unit : mm)

| Reference | K1 | K2 |
|---|---|---|
| 09 | -2 ~ 2 | -4 ~ 0 |
| 12 | -2 ~ 2 | -6 ~ 0 |
| 15 | -2 ~ 2 | -10 ~ 0 |

### [Seal resistance]

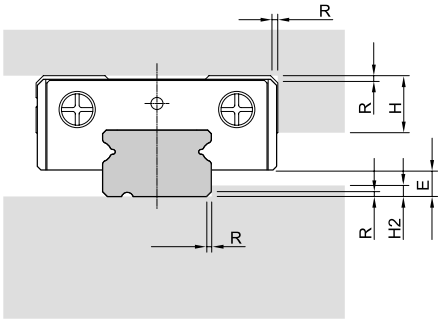
(Unit : mm)

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

### [Grease]

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

## Shoulder height and fillet radius R

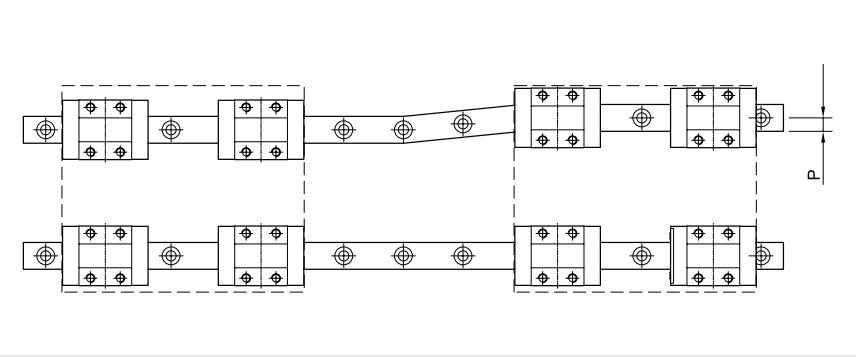



(Unit : mm)

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

Linear Rail System
Miniature Linear Rail System

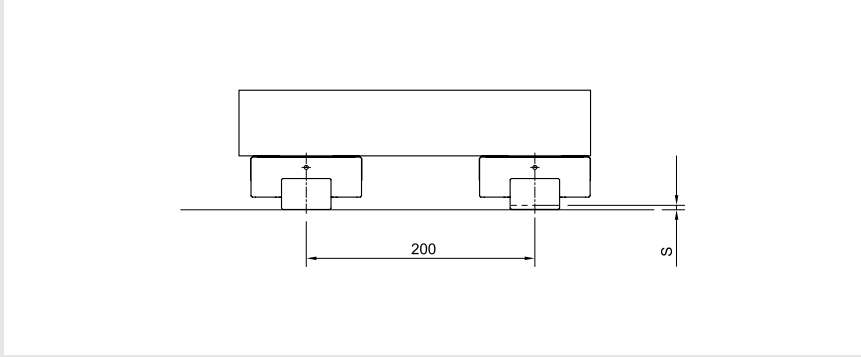
## Permissible tolerance (P) of parallelism




(Unit : mm)

| Model size | K1 | K2 |
|---|---|---|
| 09 | 3 | 4 |
| 12 | 5 | 9 |
| 15 | 6 | 10 |

## Permissible tolerance (S) of two level offset




(Unit : mm)

| Model size | K1 | K2 |
|---|---|---|
| 09 | 6 | 35 |
| 12 | 12 | 50 |
| 15 | 20 | 60 |

Linear Rail System

Miniature Linear Rail System

## Ordering example

[Seal resistance]

**SBM09 – K1**
[1] [2]

[1] Model : SBM, SBML, SBMW

[2] Preload : K1, K2

[Ordering example for rail]

**SBM09 – 600L – B**
[1] [2] [3]

[1] Model : SBM, SBMW

[2] Rail length

[3] Through tap hole rail : Standard (No symbol)

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

[Ordering for assembled rail and block]

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

[1] Model : SBM, SBML, SBMW

[2] Block quantity on rail

[3] Preload : K1, K2

[4] Rail length

[5] Accuracy : N, H, P

[6] Surface treatment

[7] Through tap hole rail : Standard (No symbol)

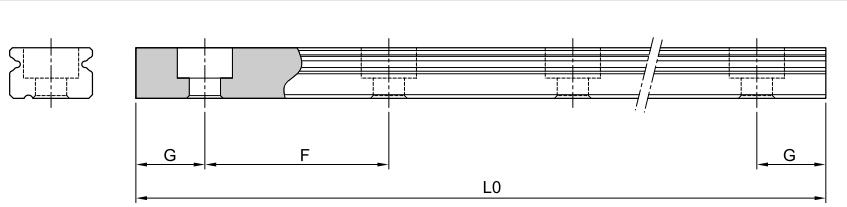
[8] Rail : Number of rails per axis 1=I, 2=II… 4+IV etc.

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

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

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

## Standard and Max length




(Unit : mm)

| Model number | SBM(L)09 | SBM(L)12 | SBM(L)15 | SBMW09 | SBMW12 | SBMW15 |
|---|---|---|---|---|---|---|
| Standard length | 55 | 70 | 70 | 50 | 70 | 110 |
| | 75 | 95 | 110 | 80 | 110 | 150 |
| | 95 | 120 | 150 | 110 | 150 | 190 |
| | 115 | 145 | 190 | 140 | 190 | 230 |
| | 135 | 170 | 230 | 170 | 230 | 270 |
| | 155 | 195 | 270 | 200 | 270 | 350 |
| | 175 | 220 | 310 | 260 | 350 | 430 |
| | 215 | 245 | 350 | 320 | 430 | 510 |
| | 255 | 270 | 390 | 380 | 510 | 590 |
| | 295 | 320 | 430 | 440 | 590 | 670 |
| | 355 | 395 | 470 | 500 | 670 | 750 |
| | 415 | 470 | 590 | 560 | 750 | 830 |
| | 495 | 545 | 670 | 620 | 830 | 910 |
| | 535 | 620 | 830 | 680 | 910 | 990 |
| | 615 | 695 | 910 | 740 | 990 | 1070 |
| | 675 | 770 | 990 | 800 | 1070 | 1190 |
| | 715 | 870 | 1070 | 860 | 1190 | |
| | 735 | 970 | 1190 | 920 | | |
| | 795 | 1020 | | 980 | | |
| | 875 | 1195 | | 1040 | | |
| | 955 | | | 1100 | | |
| | 995 | | | 1190 | | |
| | 1035 | | | | | |
| | 1115 | | | | | |
| | 1195 | | | | | |
| F | 20 | 25 | 40 | 30 | 40 | 40 |
| G | 7.5 | 10 | 15 | 15 | 15 | 15 |
| L0(Max length) | 1195 | 1195 | 1190 | 1190 | 1190 | 1190 |

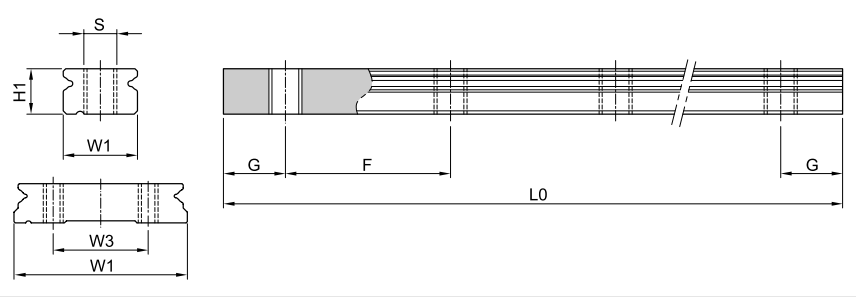
* SBM, SBML use same rail.

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

Linear Rail System

Miniature Linear Rail System

## Miniature through tap hole rail

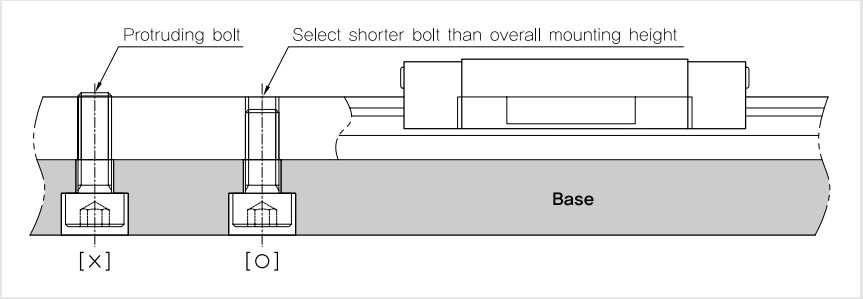



(Unit : mm)

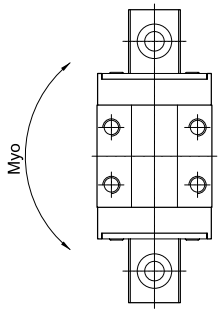
| Model | W1 | W3 | H1 | S | G | F | L0 (Max length) | Mass (kg/m) |
|---|---|---|---|---|---|---|---|---|
| SBM 09-B | 9 | - | 5.5 | M4x0.7 | 7.5 | 20 | 1200 | 0.32 |
| SBM 12-B | 12 | - | 7.5 | M4x0.7 | 10 | 25 | 1200 | 0.32 |
| SBM 15-B | 15 | - | 9.5 | M4x0.7 | 15 | 40 | 1200 | 0.59 |
| SBMW 09-B | 18 | - | 7.5 | M4x0.7 | 10 | 30 | 1200 | 0.99 |
| SBMW 12-B | 24 | - | 8.5 | M5x0.8 | 15 | 40 | 1200 | 1.42 |
| SBMW 15-B | 42 | 23 | 9.5 | M5x0.8 | 15 | 40 | 1200 | 2.93 |

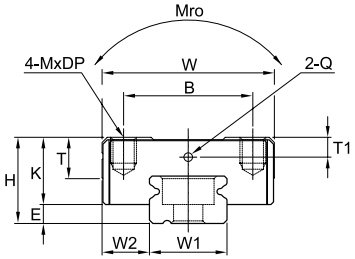
## Caution for mounting miniature through tap hole rail

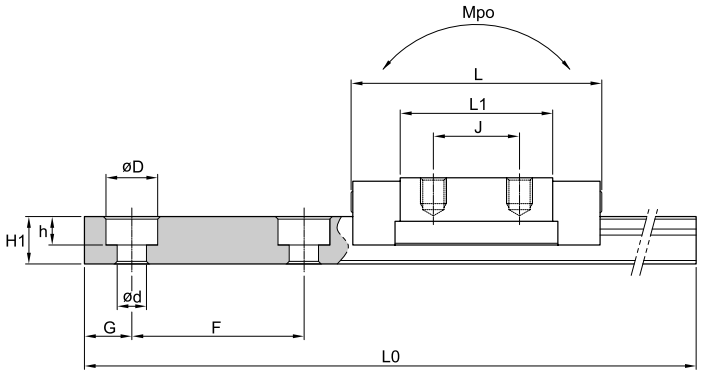
If the mounting bolt is longer than overall mounting height, the bolt can protrude which can cause tinterference with the seal or bearing itself. Therefore, make sure the appropriate bolt selection.



## SBM/SBML



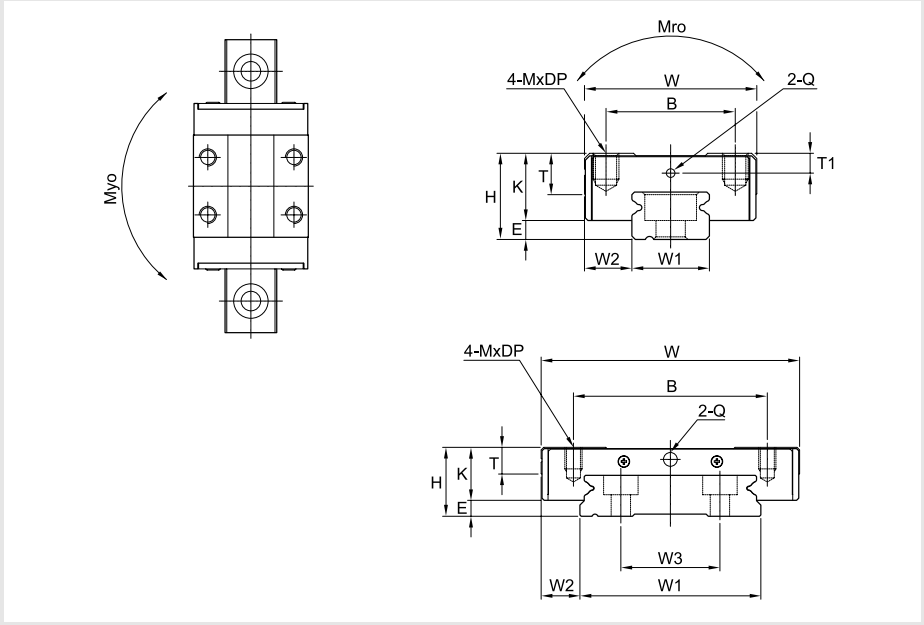

(Unit : mm)

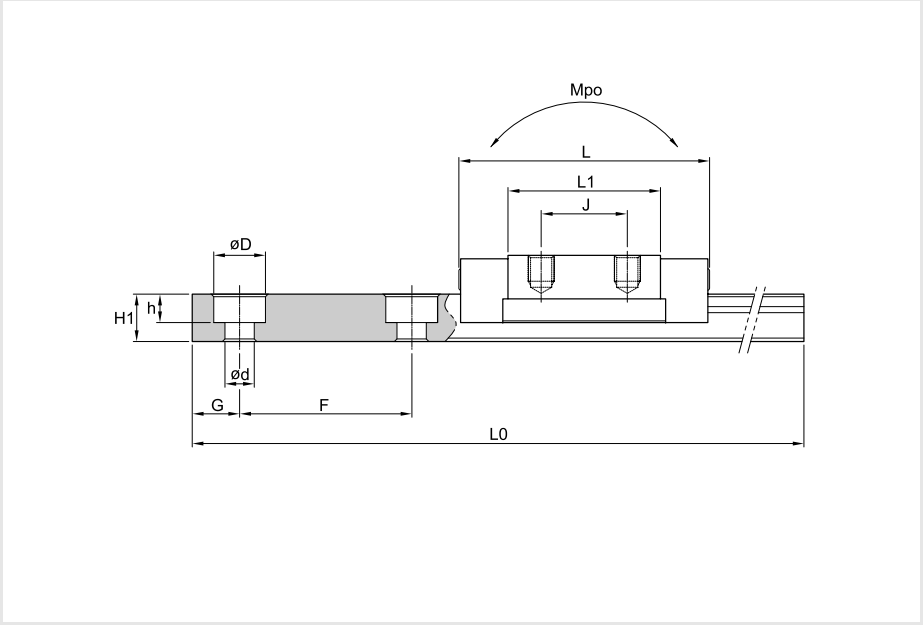
| Model | Mounting dimension | | | | Block dimensions | | | | | | | | | Rail dimension | | | | | | | | | | Basic load rating [kN] | | Permissible static moment [kN • m] | | | Mass | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | H | W | L | E | Mounting tap hole | | | | L1 | T | K | Greasing hole | | W1 | W2 | H1 | F | Bolt hole | | | G | Max langth of rail L0 | | | | | | | Block [kg] | Rail [kg/m] |
| | | | | | B | J | M | DP | | | | T1 | Q | | | | | d | D | h | | | C | Co | Mro | Mpo | Myo | | |
| SBM 09 | 10 | 20 | 30.4 | 2.2 | 15 | 10 | M3 | 3 | 17.8 | 5 | 7.8 | 2.3 | Ø1 | 9 | 5.5 | 5.5 | 20 | 3.5 | 6 | 3.3 | 7.5 | 1195 | 1.4 | 2.7 | 12.15 | 6.01 | 6.01 | 0.013 | 0.32 |
| SBML 09 | 10 | 20 | 40.8 | 2.2 | 15 | 16 | M3 | 3 | 28.2 | 5 | 7.8 | 2.3 | Ø1 | 9 | 5.5 | 5.5 | 20 | 3.5 | 6 | 3.3 | 7.5 | 1195 | 2.1 | 4.6 | 20.7 | 16.22 | 16.22 | 0.023 | 0.32 |
| SBM 12 | 13 | 27 | 35 | 3 | 20 | 15 | M3 | 3.5 | 19.8 | 6 | 10 | 2.8 | Ø1 | 12 | 7.5 | 7.5 | 25 | 3.5 | 6 | 4.5 | 10 | 1195 | 3.3 | 4.9 | 29.4 | 12.13 | 12.13 | 0.029 | 0.59 |
| SBML 12 | 13 | 27 | 47.6 | 3 | 20 | 20 | M3 | 3.5 | 32.6 | 6 | 10 | 2.8 | Ø1 | 12 | 7.5 | 7.5 | 25 | 3.5 | 6 | 4.5 | 10 | 1195 | 5 | 9.1 | 54.6 | 36.86 | 36.86 | 0.043 | 0.59 |
| SBM 15 | 16 | 32 | 43 | 4 | 25 | 20 | M3 | 4 | 25.4 | 7 | 12 | 3.1 | Ø1 | 15 | 9.5 | 9.5 | 40 | 3.5 | 6 | 4.5 | 15 | 1190 | 4.9 | 7.5 | 56.25 | 23.81 | 23.81 | 0.052 | 0.99 |
| SBML 15 | 16 | 32 | 58.8 | 4 | 25 | 25 | M3 | 4 | 41.2 | 7 | 12 | 3.1 | Ø1 | 15 | 9.5 | 9.5 | 40 | 3.5 | 6 | 4.5 | 15 | 1190 | 7.1 | 12.9 | 96.75 | 66.44 | 66.44 | 0.079 | 0.99 |

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

Linear Rail System
Miniature Linear Rail System

## SBMW




(Unit : mm)

| Model | Mounting dimension | | | | Block dimensions | | | | | | | | | Rail dimension | | | | | | | | | | | | Basic load rating [kN] | | Permissible static moment [kN • m] | | | Mass | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | H | W | L | E | Mounting tap hole | | | | L1 | T | K | Greasing hole | | W1 | W2 | H1 | W3 | F | Bolt hole | | | G | Max langth of rail L0 | | | | | | | | Block [kg] | Rail [kg/m] |
| | | | | | B | J | M | DP | | | | T1 | Q | | | | | | d | D | h | | | C | Co | Mro | Mpo | Myo | | | |
| SBMW 09 | 12 | 30 | 41 | 3.7 | 21 | 12 | M3 | 3 | 27 | 4.5 | 8.3 | 2 | Ø1.4 | 18 | 6 | 7.5 | - | 30 | 3.5 | 6 | 3.5 | 10 | 1190 | 2.45 | 3.92 | 3.67 | 1.66 | 1.66 | 0.03 | 0.99 |
| SBMW 12 | 14 | 40 | 47.5 | 4 | 28 | 15 | M3 | 3.5 | 30.9 | 5 | 10 | 2.4 | Ø1.6 | 24 | 8 | 8.5 | - | 40 | 4.5 | 8 | 4.5 | 15 | 1190 | 4.02 | 6.08 | 4.86 | 1.75 | 1.9 | 0.03 | 1.42 |
| SBMW 15 | 16 | 60 | 57.5 | 3.7 | 45 | 20 | M3 | 4.5 | 38.9 | 6.2 | 12.3 | 2.8 | Ø3.2 | 42 | 9 | 9.5 | 23 | 40 | 4.5 | 8 | 4.5 | 15 | 1190 | 6.66 | 9.80 | 13.97 | 3.6 | 3.9 | 0.12 | 2.93 |

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