

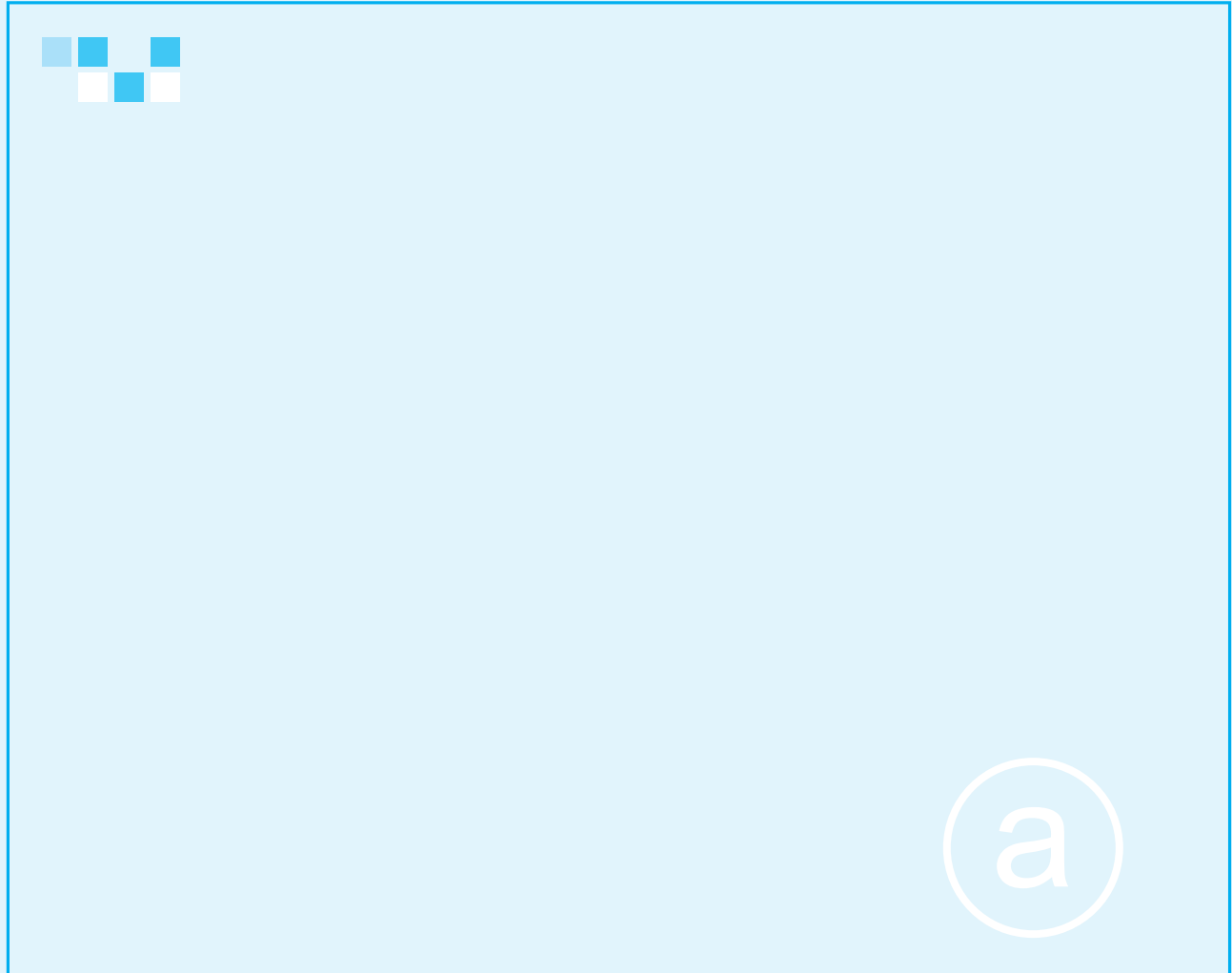
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④ Robot Carrier Guide

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④ Memo



 Linear Rail System

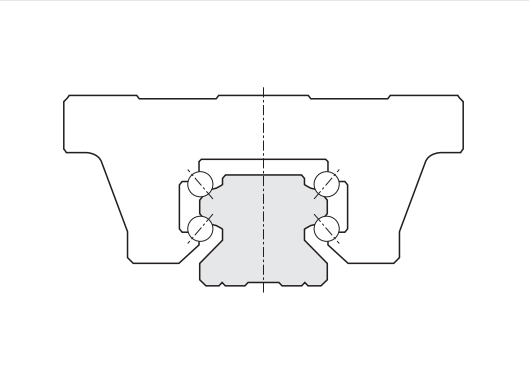
Technical Data / The Types of Linear Rail System / SBI High-load Linear Rail System /  
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Miniature Linear Rail System / SBC-ROSA Roller Linear Rail System

SBC LINEAR RAIL SYSTEM FEATURES

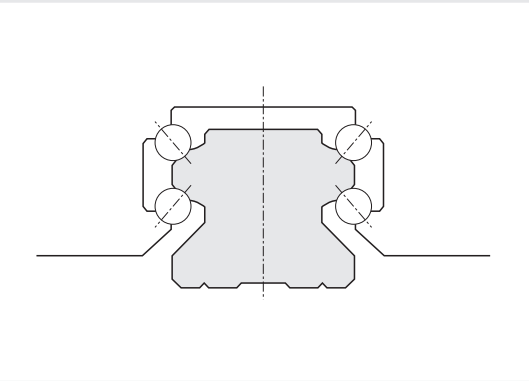
- Circular-Arc raceway structure achieves the high rigidity and large permissible load.
- Four row circular arc groove with 2 points contact creates the same load in all directions.
- DF structure maintains low instrumental errors.
- Low frictional coefficient achieves the high energy efficiency.
- Easy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

Comparison the Linear Rail System with others

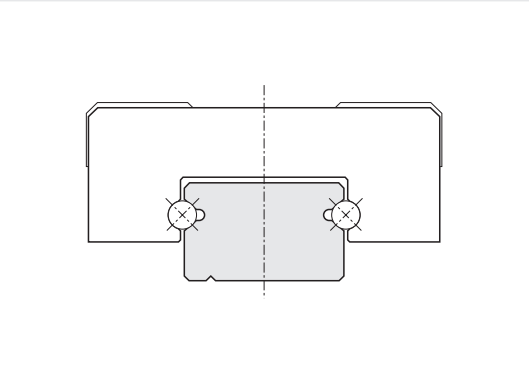
| Item        | Linear Rail System     | Plane Ball System | Sliding Friction Guide       |
|-------------|------------------------|-------------------|------------------------------|
| Assembly    | Self-adjusting         | △                 | Additional working need      |
| Precision   | Absorbing 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

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.

[In case of ball]

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

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

[In case of roller]

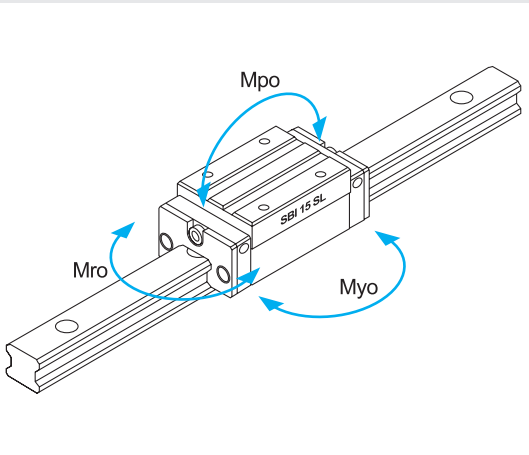
$$L = \left(\frac{C}{P}\right)^{\frac{10}{3}} \times 100\text{km}$$

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

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

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

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

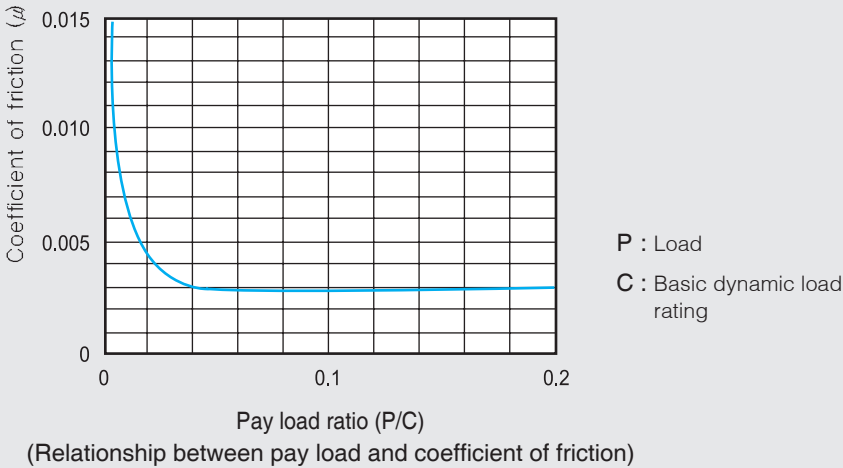
(Table, Static Safety Factor)

| 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 |

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( $\mu$ ) : 0.002~0.004



Calculate comparison by different guide system

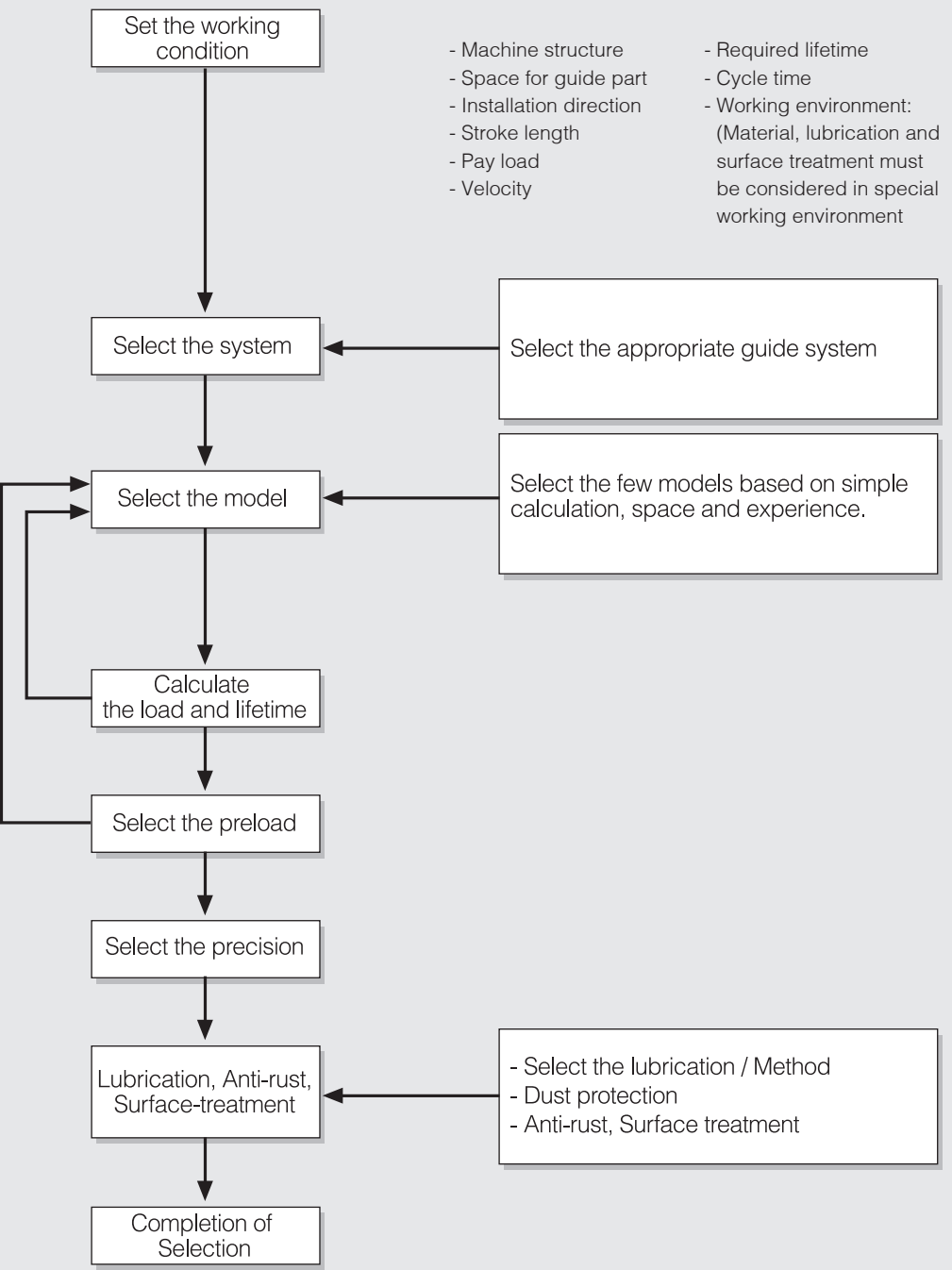
$$F = \mu \cdot P$$

- F : Frictional force
- $\mu$  : Coefficient of friction
- P : Load

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

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

The procedure of selecting linear rail system



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.

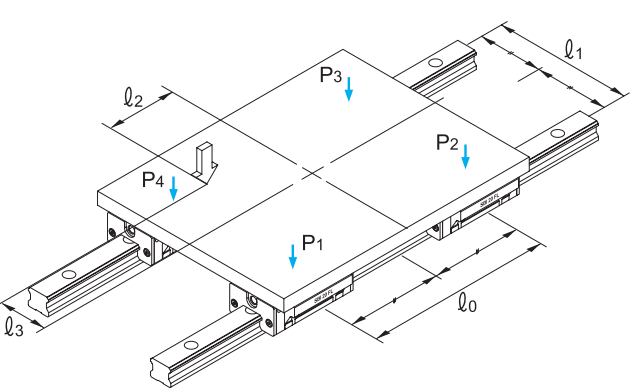
[Condition of calculating the applied load]

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/s<sup>2</sup>) : Gravitational acceleration (= 9.8 m/s<sup>2</sup>)
- V (m/s) : Velocity
- $a_n$  (m/s<sup>2</sup>) : Acceleration

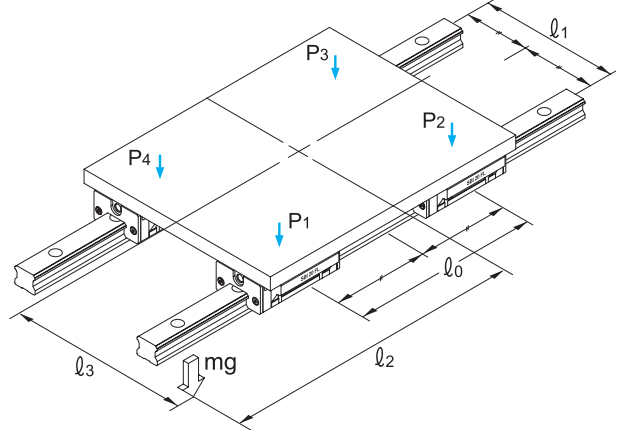
Calculating the applied loads and life time

Condition 1 Horizontal axis



$$\begin{aligned} P_1 &= \frac{mg}{4} + \frac{mg \cdot \ell_2}{2 \cdot \ell_0} - \frac{mg \cdot \ell_3}{2 \cdot \ell_1} \\ P_2 &= \frac{mg}{4} - \frac{mg \cdot \ell_2}{2 \cdot \ell_0} - \frac{mg \cdot \ell_3}{2 \cdot \ell_1} \\ P_3 &= \frac{mg}{4} - \frac{mg \cdot \ell_2}{2 \cdot \ell_0} + \frac{mg \cdot \ell_3}{2 \cdot \ell_1} \\ P_4 &= \frac{mg}{4} + \frac{mg \cdot \ell_2}{2 \cdot \ell_0} + \frac{mg \cdot \ell_3}{2 \cdot \ell_1} \end{aligned}$$

Condition 2 Horizontal axis with overhung

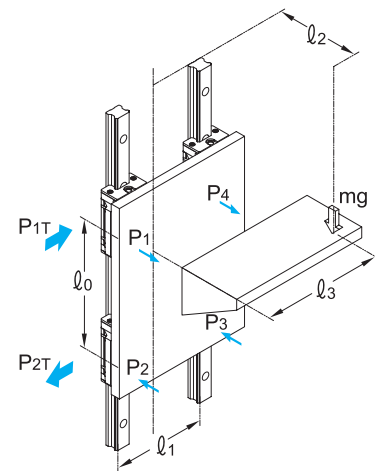


$$\begin{aligned} P_1 &= \frac{mg}{4} + \frac{mg \cdot \ell_2}{2 \cdot \ell_0} + \frac{mg \cdot \ell_3}{2 \cdot \ell_1} \\ P_2 &= \frac{mg}{4} - \frac{mg \cdot \ell_2}{2 \cdot \ell_0} + \frac{mg \cdot \ell_3}{2 \cdot \ell_1} \\ P_3 &= \frac{mg}{4} - \frac{mg \cdot \ell_2}{2 \cdot \ell_0} - \frac{mg \cdot \ell_3}{2 \cdot \ell_1} \\ P_4 &= \frac{mg}{4} + \frac{mg \cdot \ell_2}{2 \cdot \ell_0} - \frac{mg \cdot \ell_3}{2 \cdot \ell_1} \end{aligned}$$

# Linear Rail System

## Technical Data

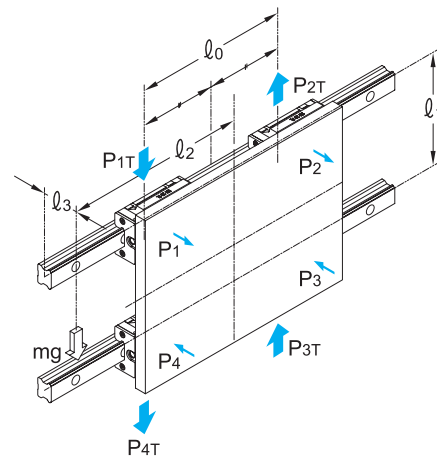
**Condition 3** Vertical axis



$$P_1 \sim P_4 = \frac{mg \cdot l_2}{2 \cdot l_0}$$

$$P_{1T} \sim P_{4T} = \frac{mg \cdot l_3}{2 \cdot l_0}$$

**Condition 4** Vertical axis with wall mounted

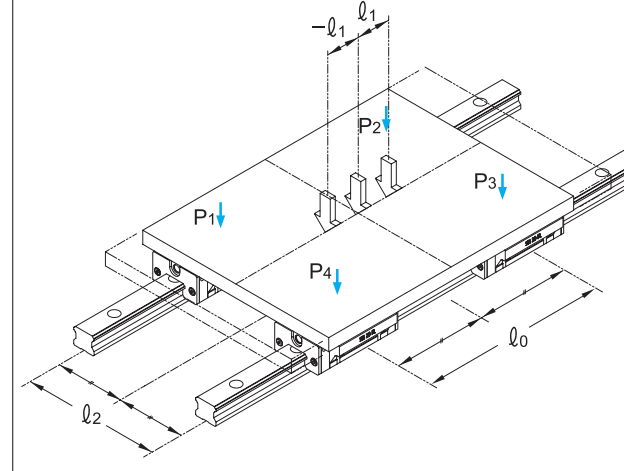


$$P_1 \sim P_4 = \frac{mg \cdot l_3}{2 \cdot l_1}$$

$$P_{1T} = P_{4T} = \frac{mg}{4} + \frac{mg \cdot l_2}{2 \cdot l_0}$$

$$P_{2T} = P_{3T} = \frac{mg}{4} - \frac{mg \cdot l_2}{2 \cdot l_0}$$

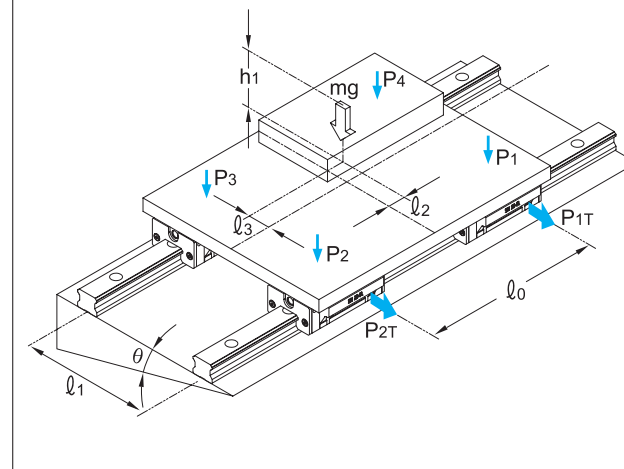
**Condition 5** Horizontal axis with rail movable



$$P_1 \sim P_{4(max)} = \frac{mg}{4} + \frac{mg \cdot l_1}{2 \cdot l_0}$$

$$P_1 \sim P_{4(min)} = \frac{mg}{4} - \frac{mg \cdot l_1}{2 \cdot l_0}$$

**Condition 6** Lateral axis



$$P_1 = \frac{mg \cdot \cos \theta}{4} + \frac{mg \cdot \cos \theta \cdot l_2}{2 \cdot l_0} - \frac{mg \cdot \cos \theta \cdot l_3}{2 \cdot l_1} + \frac{mg \cdot \sin \theta \cdot h_1}{2 \cdot l_1}$$

$$P_{1T} = \frac{mg \cdot \sin \theta}{4} + \frac{mg \cdot \sin \theta \cdot l_2}{2 \cdot l_0}$$

$$P_2 = \frac{mg \cdot \cos \theta}{4} - \frac{mg \cdot \cos \theta \cdot l_2}{2 \cdot l_0} - \frac{mg \cdot \cos \theta \cdot l_3}{2 \cdot l_1} + \frac{mg \cdot \sin \theta \cdot h_1}{2 \cdot l_1}$$

$$P_{2T} = \frac{mg \cdot \sin \theta}{4} - \frac{mg \cdot \sin \theta \cdot l_2}{2 \cdot l_0}$$

$$P_3 = \frac{mg \cdot \cos \theta}{4} - \frac{mg \cdot \cos \theta \cdot l_2}{2 \cdot l_0} + \frac{mg \cdot \cos \theta \cdot l_3}{2 \cdot l_1} - \frac{mg \cdot \cos \theta \cdot h_1}{2 \cdot l_1}$$

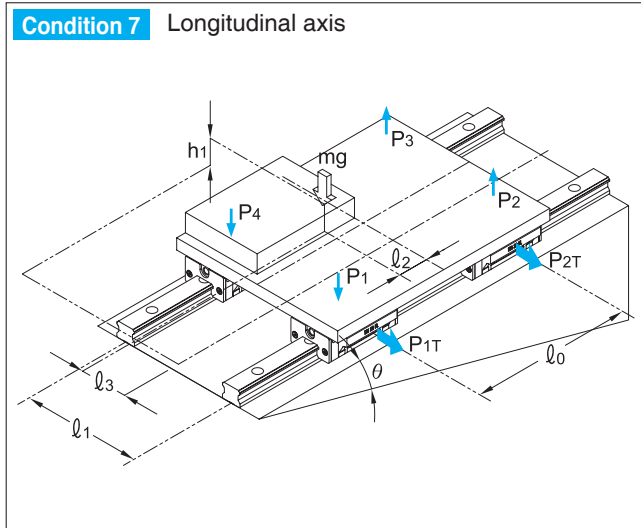
$$P_{3T} = \frac{mg \cdot \sin \theta}{4} + \frac{mg \cdot \sin \theta \cdot l_2}{2 \cdot l_0}$$

$$P_4 = \frac{mg \cdot \cos \theta}{4} + \frac{mg \cdot \cos \theta \cdot l_2}{2 \cdot l_0} + \frac{mg \cdot \cos \theta \cdot l_3}{2 \cdot l_1} - \frac{mg \cdot \sin \theta \cdot h_1}{2 \cdot l_1}$$

$$P_{4T} = \frac{mg \cdot \sin \theta}{4} + \frac{mg \cdot \sin \theta \cdot l_2}{2 \cdot l_0}$$

# Linear Rail System

## Technical Data



$$P_1 = \frac{mg \cdot \cos \theta}{4} + \frac{mg \cdot \cos \theta \cdot l_2}{2 \cdot l_0} - \frac{mg \cdot \cos \theta \cdot l_3}{2 \cdot l_1} + \frac{mg \cdot \sin \theta \cdot h_1}{2 \cdot l_0}$$

$$P_{1T} = \frac{mg \cdot \cos \theta \cdot l_3}{2 \cdot l_0}$$

$$P_2 = \frac{mg \cdot \cos \theta}{4} - \frac{mg \cdot \cos \theta \cdot l_2}{2 \cdot l_0} - \frac{mg \cdot \cos \theta \cdot l_3}{2 \cdot l_1} - \frac{mg \cdot \sin \theta \cdot h_1}{2 \cdot l_0}$$

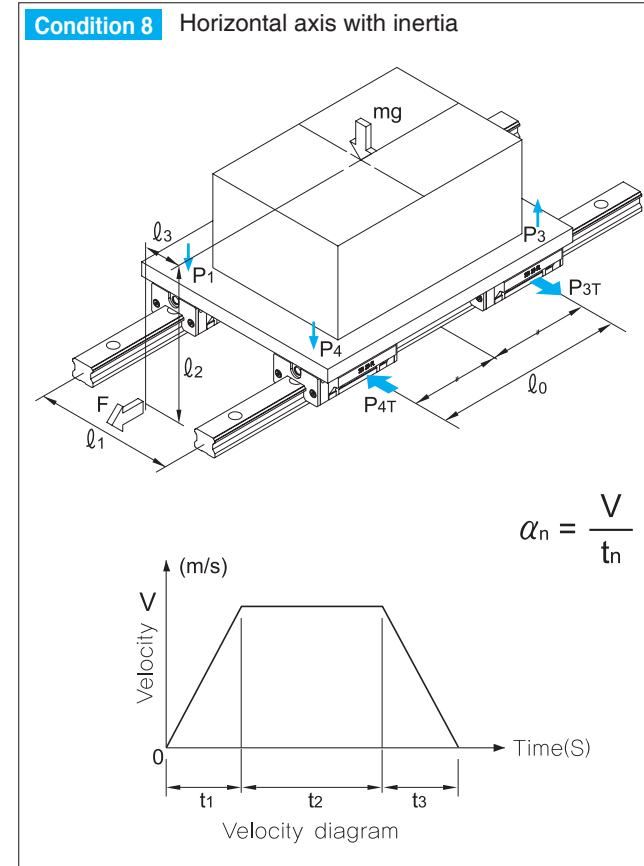
$$P_{2T} = \frac{mg \cdot \sin \theta \cdot l_3}{2 \cdot l_0}$$

$$P_3 = \frac{mg \cdot \cos \theta}{4} - \frac{mg \cdot \cos \theta \cdot l_2}{2 \cdot l_0} + \frac{mg \cdot \cos \theta \cdot l_3}{2 \cdot l_1} - \frac{mg \cdot \sin \theta \cdot h_1}{2 \cdot l_0}$$

$$P_{3T} = \frac{mg \cdot \sin \theta \cdot l_3}{2 \cdot l_0}$$

$$P_4 = \frac{mg \cdot \cos \theta}{4} + \frac{mg \cdot \cos \theta \cdot l_2}{2 \cdot l_0} + \frac{mg \cdot \cos \theta \cdot l_3}{2 \cdot l_1} + \frac{mg \cdot \sin \theta \cdot h_1}{2 \cdot l_0}$$

$$P_{4T} = \frac{mg \cdot \sin \theta \cdot l_3}{2 \cdot l_0}$$



Acceleration

$$P_1 = P_4 = \frac{mg}{4} - \frac{m \cdot \alpha_1 \cdot l_2}{2 \cdot l_0}$$

$$P_2 = P_3 = \frac{mg}{4} + \frac{m \cdot \alpha_1 \cdot l_2}{2 \cdot l_0}$$

$$P_{1T} \sim P_{4T} = \frac{m \cdot \alpha_1 \cdot l_3}{2 \cdot l_0}$$

In uniform motion

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

Deceleration

$$P_1 = P_4 = \frac{mg}{4} + \frac{m \cdot \alpha_3 \cdot l_2}{2 \cdot l_0}$$

$$P_2 = P_3 = \frac{mg}{4} - \frac{m \cdot \alpha_3 \cdot l_2}{2 \cdot l_0}$$

$$P_{1T} \sim P_{4T} = \frac{m \cdot \alpha_3 \cdot l_3}{2 \cdot l_0}$$

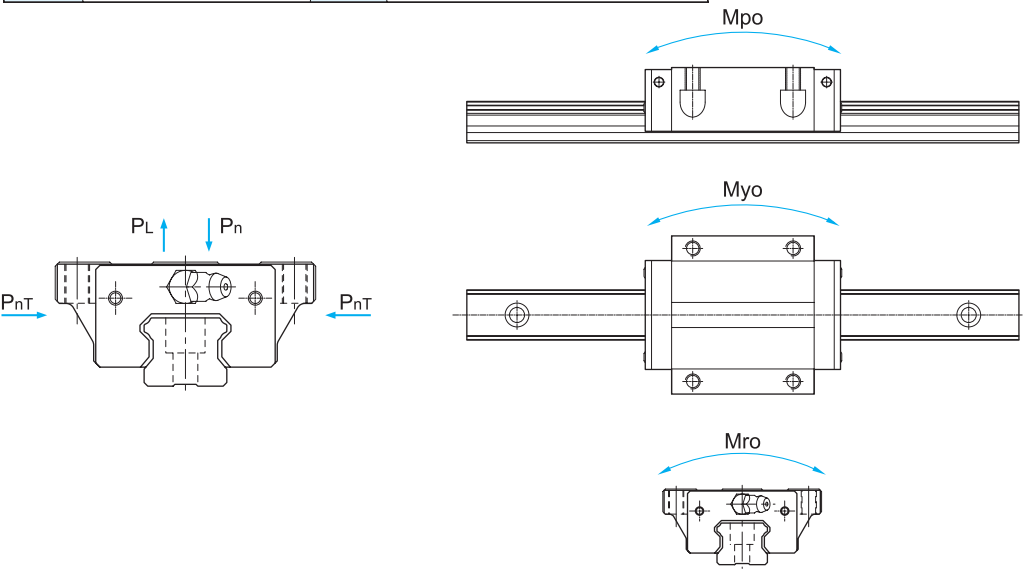
3-2. Calculating the Equivalent Load

Linear Rail Systems can accept normal and moment (M<sub>ro</sub>, M<sub>po</sub>, M<sub>yo</sub>) loads in all directions including radial, reverse-radial and lateral loads at the same time. Therefore, calculate the equivalent load accordingly.

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

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

|          |                     |                 |                              |
|----------|---------------------|-----------------|------------------------------|
| $P_n$    | Radial load         | M <sub>ro</sub> | Moment in rolling direction  |
| $P_L$    | Reverse-radial load | M <sub>po</sub> | Moment in pitching direction |
| $P_{nT}$ | Lateral load        | M <sub>yo</sub> | 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         | $\frac{f_H \cdot f_T \cdot f_C \cdot C_o}{P_n} \geq f_s$       |
| Reverse-radial load is large | $\frac{f_H \cdot f_T \cdot f_C \cdot C_{oL}}{P_L} \geq f_s$    |
| lateral load is large        | $\frac{f_H \cdot f_T \cdot f_C \cdot C_{oT}}{P_{nT}} \geq f_s$ |

- $f_s$  : 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         |

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]

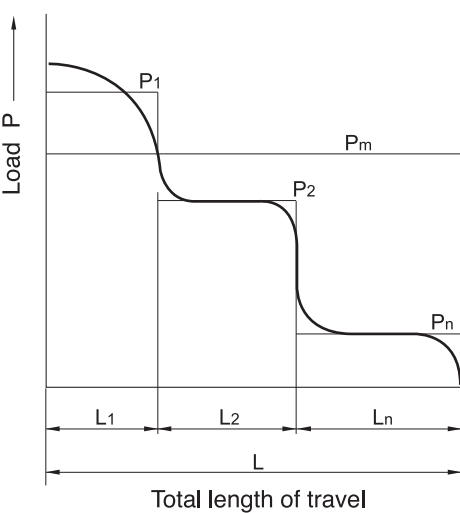
$P_m$  : Mean load (N)  
 $P_n$  : Varying load (N)  
 $L$  : Total length of travel (mm)  
 $L_n$  : Length of travel carrying  $P_n$  (mm)

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

1) Step loads

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

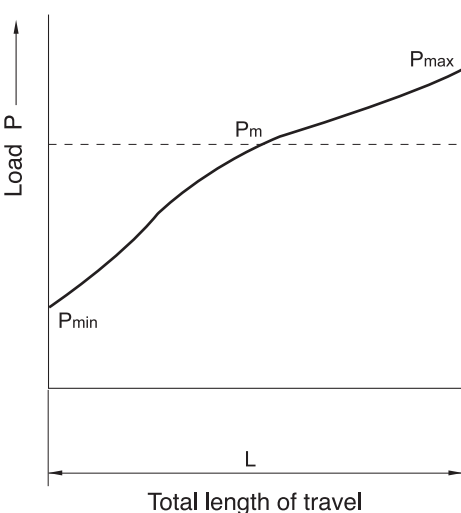
$P_m$  : Mean load (N)  
 $P_n$  : Varying load (N)  
 $L$  : Total length of travel (mm)  
 $L_n$  : Length of travel carrying  $P_n$  (mm)



2) Loads that vary linearly

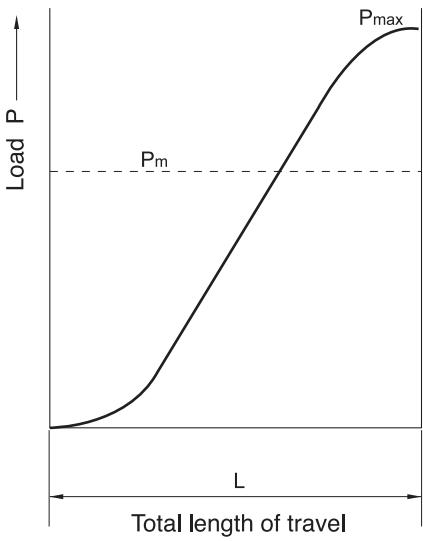
$$P_m \doteq \frac{1}{3} (P_{min} + 2 \cdot P_{max}) \dots (2)$$

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

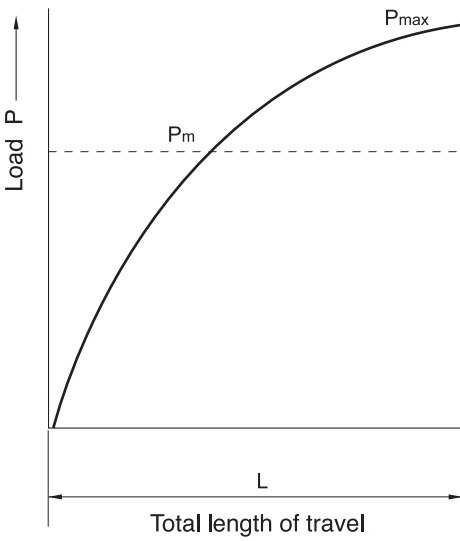


3) Loads varying sinusoidally

a)  $P_m \doteq 0.65_{max} \dots (3)$



b)  $P_m \doteq 0.75_{max} \dots (4)$



3-5. Life Calculation

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

[Calculation of nominal life]

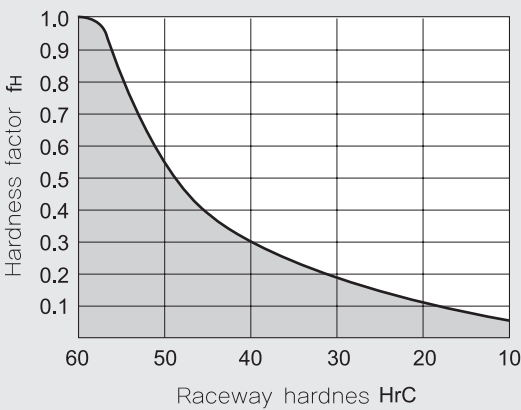
$$L = \left( \frac{f_H \cdot f_T \cdot f_C}{f_W} \cdot \frac{C}{P_C} \right)^3 \times 50$$

- L (km) : Nominal life
- P<sub>C</sub>(N) : Calculated load
- C (N) : Basic dynamic load rating
- f<sub>H</sub> : Hardness factor
- f<sub>T</sub> : Temperature factor
- f<sub>C</sub> : Contact factor
- f<sub>W</sub> : Load factor

Hardness factor (f<sub>H</sub>)

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.

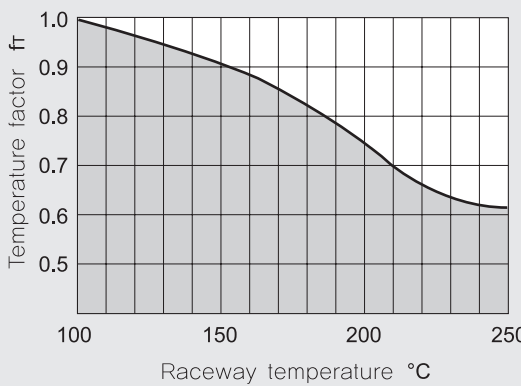


Temperature factor (f<sub>T</sub>)

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

※ The value for linear rail system is normally 1.0 when operation temperature is under 80°C.

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



Contact factor (f<sub>C</sub>)

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

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

Load factor (f<sub>W</sub>)

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 <sub>W</sub> |
|----------------------|----------------------------|----------------------------|
| Very slight          | Very low<br>V ≤ 0.25m/s    | 1 ~ 1.2                    |
| Slight               | Low<br>0.25 < V ≤ 1.0m/s   | 1.2 ~ 1.5                  |
| Moderate             | Medium<br>1.0 < V ≤ 2.0m/s | 1.5 ~ 2.0                  |
| Strong               | High<br>V > 2.0m/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<sub>h</sub> (h) : Hours of nominal life
- L (km) : Nominal life
- ℓ<sub>s</sub> (mm) : Stroke
- n<sub>1</sub> (min<sup>-1</sup>) : Reciprocation cycles per minute

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

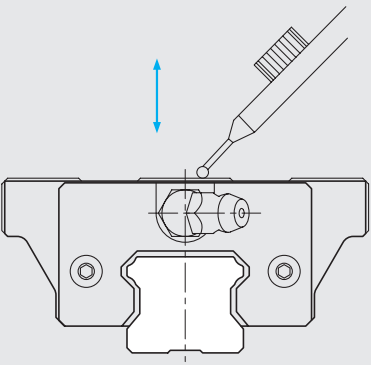
4. Rigidity

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

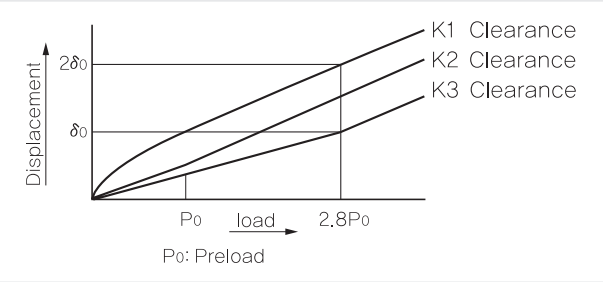
Preload affects the rigidity, internal-load and clearance. Also, it is very important to select appropriate preload according to applied load, impact and vibration expected in the application.

| Preload                | Conditions                                                                                                                                                                       | Example                                                                                                                                                                                                                                                                |
|------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| K3<br>[Heavy preload]  | <input type="checkbox"/> Where rigidity is required, vibration and impact are present.<br><input type="checkbox"/> Engineered machinery for heavy equipment                      | <ul style="list-style-type: none"><li>● Machining center</li><li>● NC lathe</li><li>● Grinding machine</li><li>● Milling machine</li><li>● Vertical axis of machine tool</li></ul>                                                                                     |
| K2<br>[Light preload]  | <input type="checkbox"/> Where overhung loads or moment occur<br><input type="checkbox"/> Single axis operation.<br><input type="checkbox"/> Light load that requires precision. | <ul style="list-style-type: none"><li>● Measuring equipment</li><li>● Electric discharge machine</li><li>● High speed material handling equipment</li><li>● NC drilling machine</li><li>● Industrial robot</li><li>● Z axis for general industrial equipment</li></ul> |
| K1<br>[Normal preload] | <input type="checkbox"/> Where the load direction is constant, impact and vibration are light.<br><input type="checkbox"/> Precision is not required                             | <ul style="list-style-type: none"><li>● Welding machine</li><li>● Binding machine</li><li>● Automatic wrapping machine</li><li>● Material handling equipment</li></ul>                                                                                                 |

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.



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

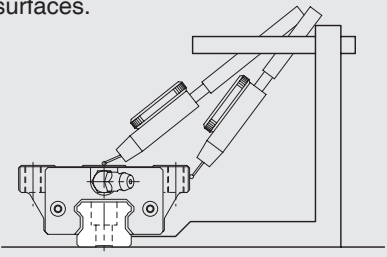
$K \text{ (N/}\mu\text{m)}$  : Rigidity  
 $\delta \text{ (}\mu\text{m)}$  : Displacement  
 $P \text{ (N)}$  : Calculated load

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.

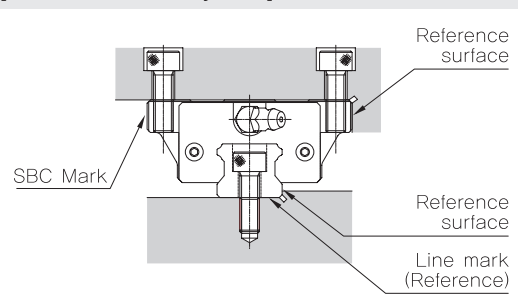
6. Design of system

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

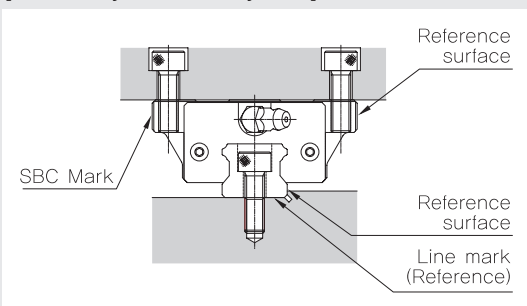
6-1. Identifying reference surface

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.

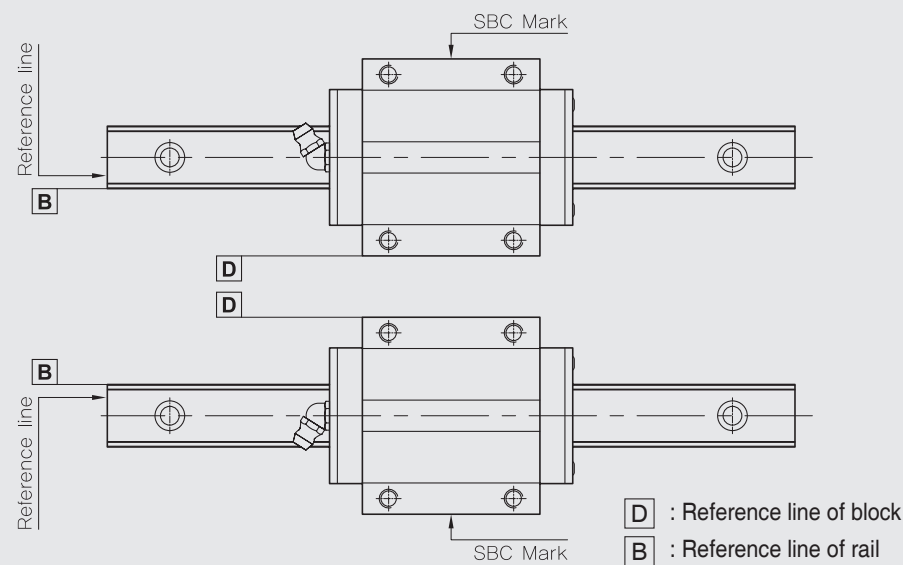
[Master linear rail system]



[Subsidiary linear rail system]



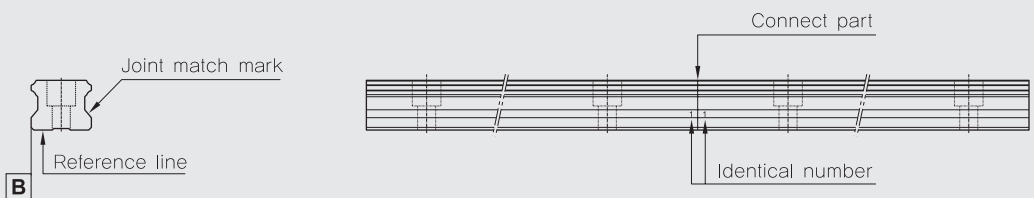
[Example of identifying reference line for pair usage]



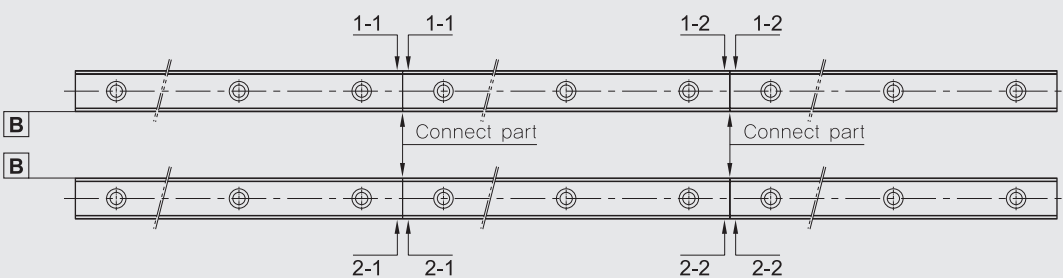
[Rail joint marking]

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



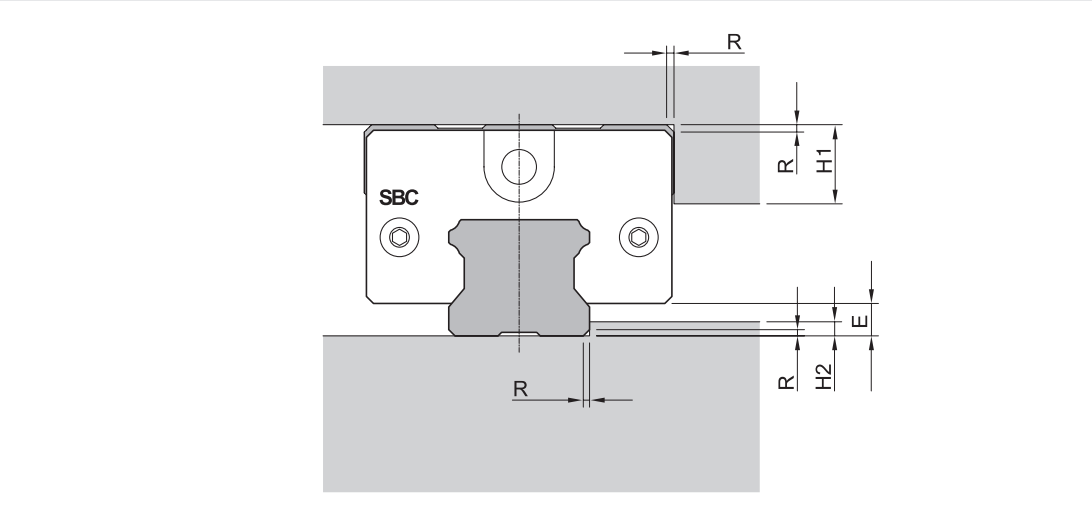
2 axis application and multiple rail joining method



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.

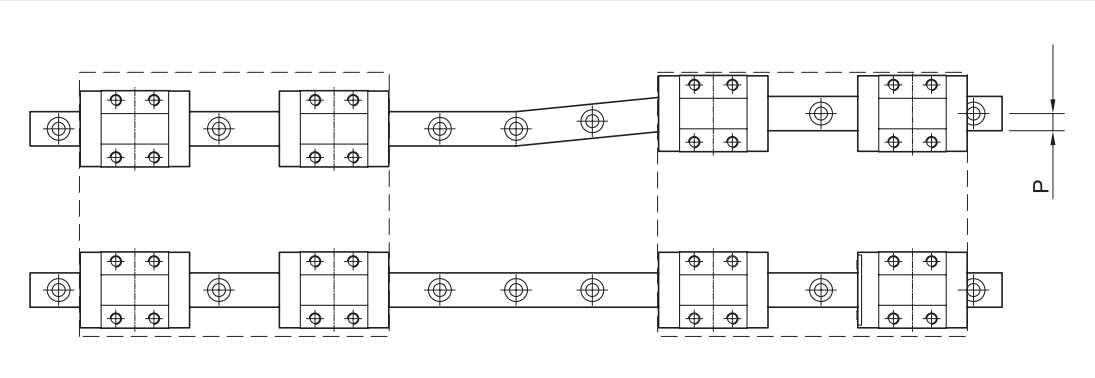


6-3. Permissible tolerance of mounting surface

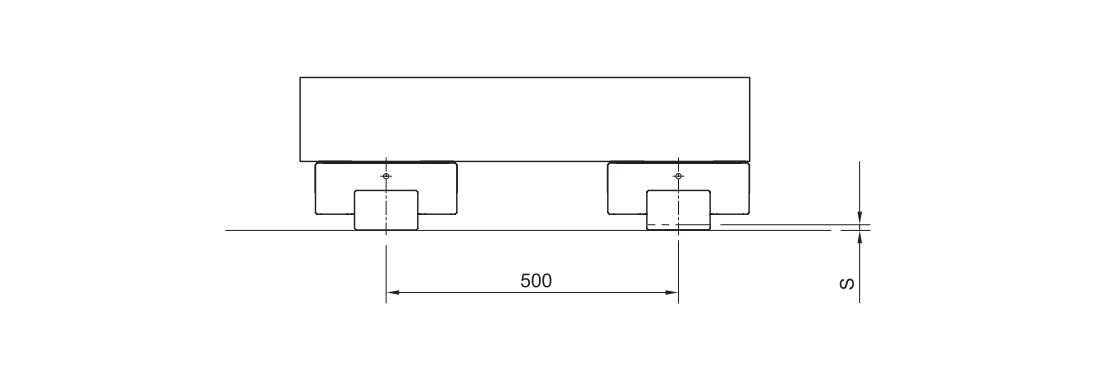
Mounting errors can cause rolling resistance to motion. Due to the self adjusting feature of the SBC linear rail system, rolling resistance or bearing will not be affected as long as the permissible tolerance is observed as per the table shown in the catalogue.

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

[Permissible tolerance (P) of parallelism]



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



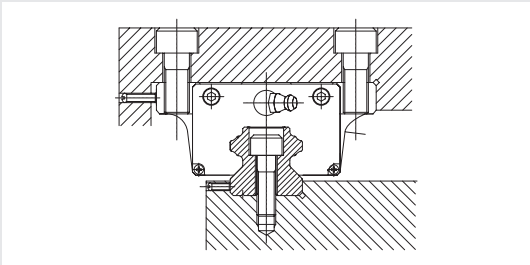
6-4. Mounting linear rail system

[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.

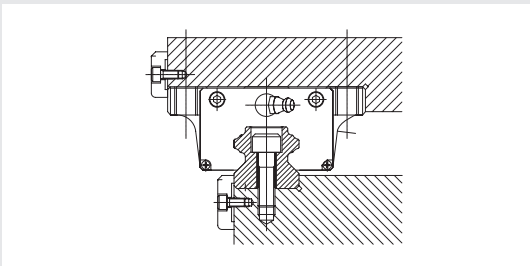
(1) Cap screw mounting

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



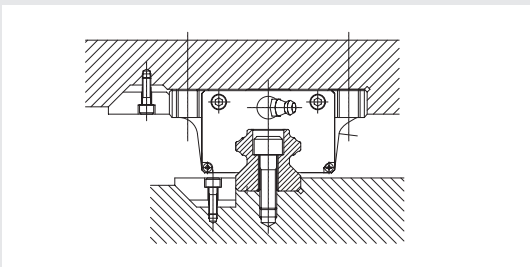
(2) Horizontal clamp mounting

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



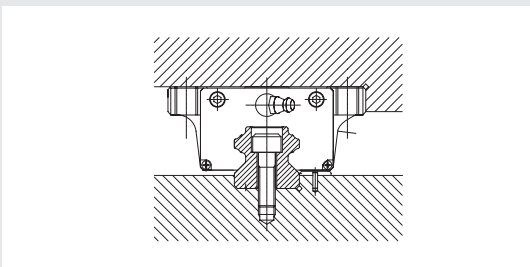
(3) Tapered Gib

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



(4) Dowel Pin

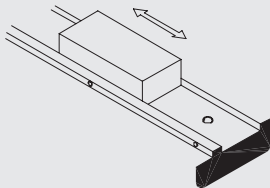
Where the forces are lower and the costs more critical, dowel pins can be used to fix the rail.



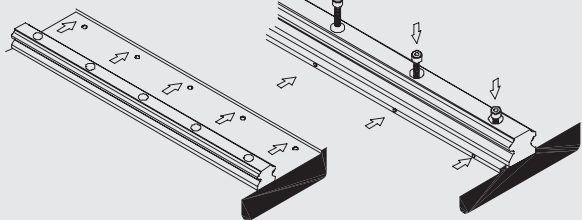
[Rail Mounting procedure]

- 1 Clean and dry the mounting surface.
- 2 Coat each surface with low viscosity spindle oil, then place the rail on the surface and then lightly tighten the mounting bolts temporarily.
- 3 Place the carriage plate on the blocks carefully and tighten the mounting bolts temporarily.
- 4 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.

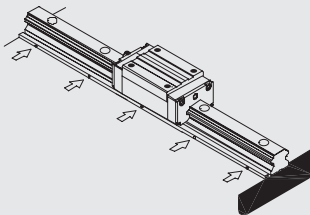
① Checking the mounting



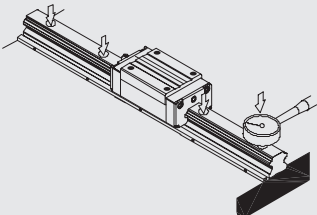
② Setting the rail against the datum plane



③ Tightening set screws

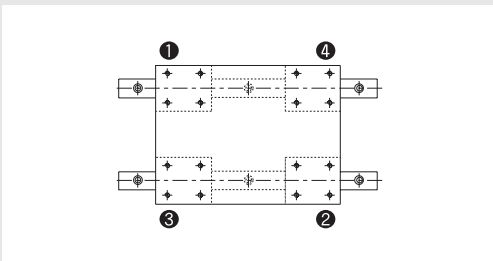


④ Final tightening of mounting bolts



[Block Mounting procedure]

- 1 Clamp the reference rail in place and tighten the mounting bolts with a torque wrench, making several passes to reach the desired torque
- 2 Carefully position the table with bearings onto the rails and tighten the non-reference blocks with a torque wrench.
- 3 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 |

(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  | 100km              | Normal working condition<br>(Load ≤ 0.15C) |
| Oil    | 1 week        | 40km               | Volume and<br>(Load ≤ 0.3C, V ≤ 1m/s)      |
|        | 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 Gadus S2 V100 3<br>[Korea Shell] |
| Special working condition | Clean room                          | SNG 5050<br>[NTG Korea]                |
|                           | Vibration                           |                                        |
|                           | Wide temperature                    |                                        |

- \* Please contact SBC for the requests below
- when you need MSDS(Material Safety Data Sheet) according to Grease Type
  - when you use our product in environments beyond the scope of use

[Normal working condition: Multipurpose industrial application]

| [1] General                                                                                                                                                                                                     | [2] Special feature                                                                                                                                          | [3] Representative feature                                                                                                                                                                   |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"><li>● <b>Name</b> : Shell Gadus S2 V100 3</li><li>● <b>Company</b> : Korea Shell</li><li>● <b>Appearance</b> : Bright brown color, semi-solid in normal temperature</li></ul> | <ul style="list-style-type: none"><li>● High load resistance</li><li>● Anti-corrosive</li><li>● High liquidity</li><li>● High mechanical stability</li></ul> | <ul style="list-style-type: none"><li>● <b>Consistency enhancer</b> : Lithium/Calcium</li><li>● <b>Base oil</b> : Mineral oil</li><li>● <b>Working temperature</b> : -10°C ~ 120°C</li></ul> |

| Test item                                                  | Representative value         | Test method                 |
|------------------------------------------------------------|------------------------------|-----------------------------|
| Base oil<br>Kinematic Viscosity<br>@ 40°C cSt<br>100°C cSt | Mineral oil<br><br>100<br>11 | IP 71/ASTM-D445             |
| Cone Penetration<br>Confusion @ 25°C 0.1mm                 | 220~250<br>(3)               | IP 50/ASTM-D217<br>(NLGI *) |
| Dropping Point °C                                          | 195                          | IP 396                      |

\* NLGI :National Lubricating Grease Institute

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

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

| [1] General                                                                                                                                                             | [2] Special feature                                                                                                                                                                                              | [3] Representative feature                                                                                                                                                 |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"><li>● <b>Name</b> : SNG5050</li><li>● <b>Company</b> : NTG Korea</li><li>● <b>Appearance</b> : Butter in normal temperature</li></ul> | <ul style="list-style-type: none"><li>● Excellent stability of oxidation</li><li>● Long life grease</li><li>● Low dust accumulating and excellent chemical-resistance</li><li>● Wide temperature range</li></ul> | <ul style="list-style-type: none"><li>● <b>Consistency</b> : Urea</li><li>● <b>Base oil</b> : Synthetic oil</li><li>● <b>Working temperature</b> : -40°C ~ 200°C</li></ul> |

| Test item                                             |       | Representative value | Test method    |
|-------------------------------------------------------|-------|----------------------|----------------|
| Consistency [25°C, 60 times]                          |       | 3                    | NLGI *         |
| Dropping point                                        |       | 280°C                | JIS K 2220 5.4 |
| Evaporation (22h) mass %                              | 99°C  | 0.11%                | JIS K 2220 5.6 |
|                                                       | 150°C | 0.57%                | JIS K 2220 5.6 |
| Oil separation rate (24h) mass %                      | 150°C | 0.5%                 | JIS K 2220 5.7 |
| Film evaporation (24h) mass %                         | 150°C | 5.54%                | -              |
|                                                       | 180°C | 16.44%               | -              |
| Stability of oxidation [99°C, 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

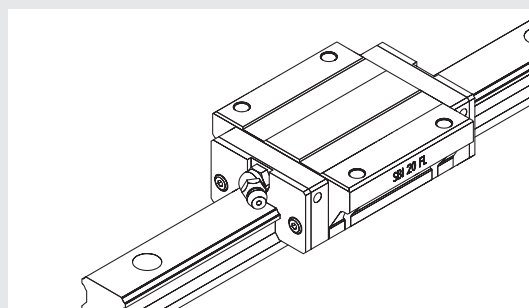
| Consistency test method | KS        | NLGI |
|-------------------------|-----------|------|
|                         | 220 ~ 250 | 3    |

### 7-6. Grease fitting

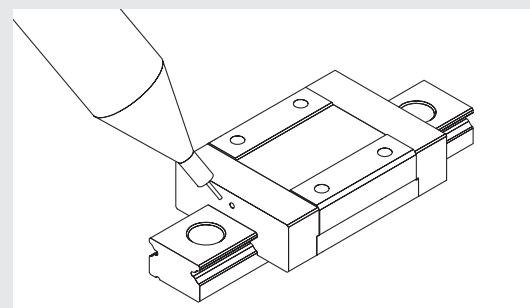
Select the appropriate grease fitting from below options in accordance with design.

#### [Standard grease fitting]

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



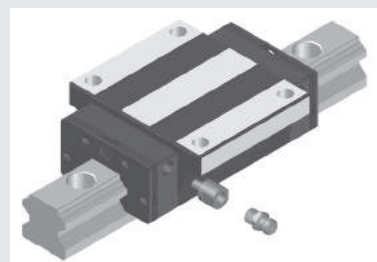
(SBG, SBI front grease fitting)



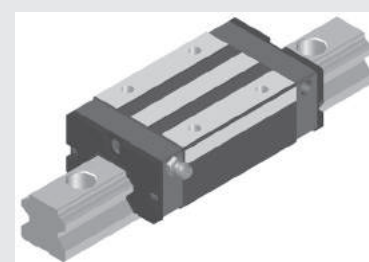
(SBM, SBMW front grease fitting)

#### [Side grease fitting]

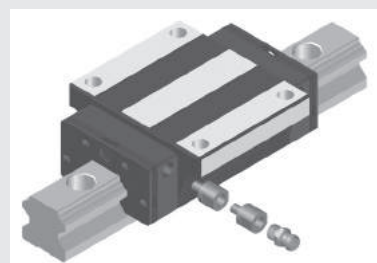
When greasing is difficult because of limited space in front of the grease nipple, the side grease fitting can be supplied. (\*Side grease fitting is not available for SBM, SBMW.)



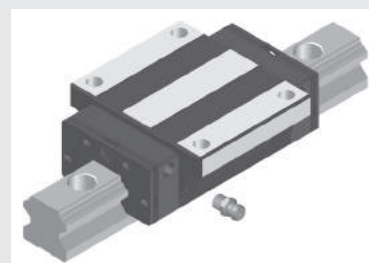
(SBG, SBI 15~25 FL side grease fitting)



(SBG, SBI SL side grease fitting)



(SBG 30~35 FL side grease fitting)  
(SBI 30~45 FL side grease fitting)



(SBG 45~65 FL side grease fitting)  
(SBI 55~65 FL 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 (Anti-rust Treatment)

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

##### [AR-H : Black chrome coating]

Since black chrome coating is penetrating to rail and block, so it achieves higher corrosion resistance.

##### [AR-2F : Fluorocarbon chrome coating]

Fluorocarbon chrome coating on black chrome coating is suitable when high corrosion resistance is required (water or salty water working condition).



(AR-H : Black chrome coating)

#### [Caution for surface treatment]

- ① Be aware that the rail hole may not surface treated.
- ② Set the higher safety factor in case surface treated linear rail system is selected.
- ③ Except above surface treatments, the other plating may cause performance problems.
- ④ Contact SBC for other information on surface treatments.

8-2. Dust protection

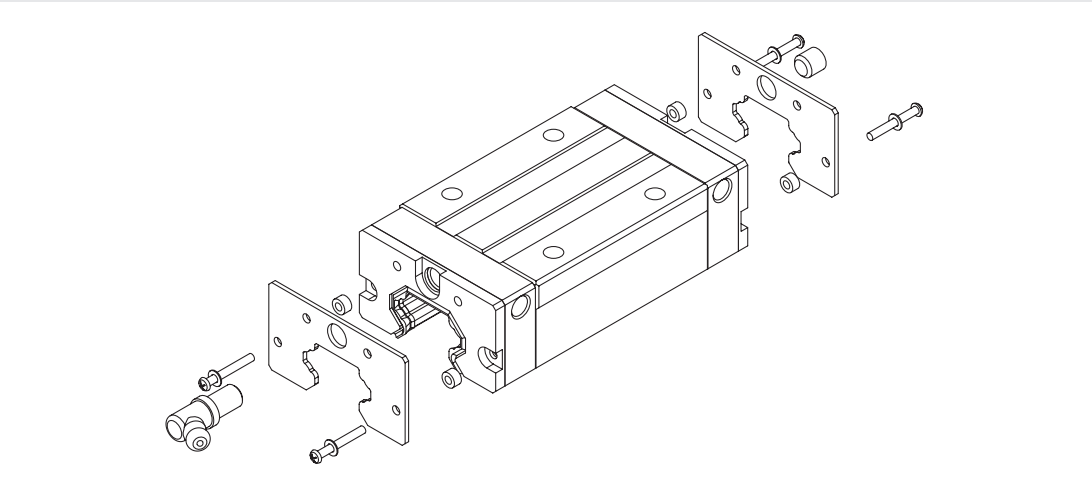
The dimensions for each seal is shown on dimension page.

[Seal options]

Select the appropriate seal options according to working conditions.

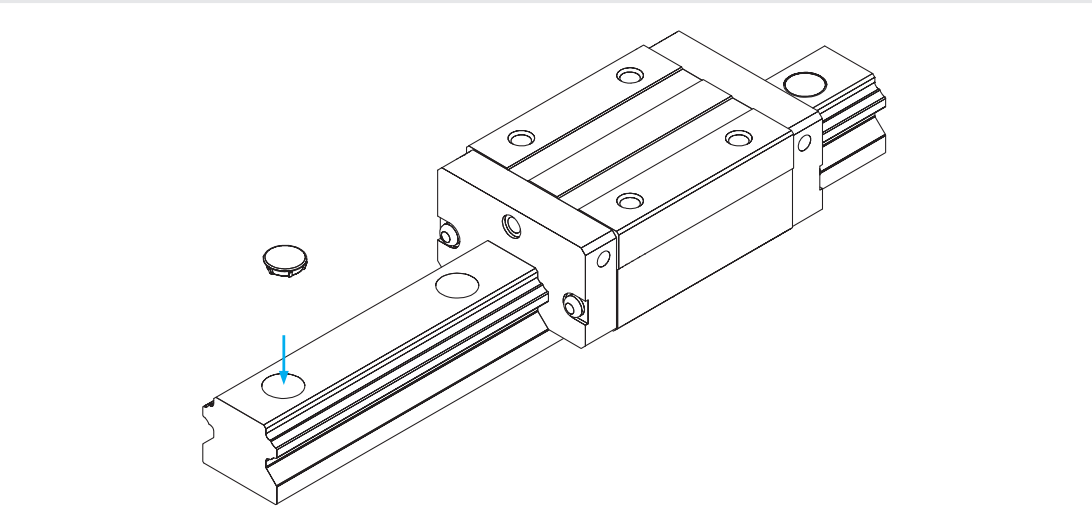
| Item                                        | Symbol               | Application      |
|---------------------------------------------|----------------------|------------------|
| End seal + Bottom seal                      | No symbol (Standard) | Normal condition |
| End seal + End seal + Bottom seal           | DD                   | Dust condition   |
| End seal + Scraper + Bottom seal            | ZZ                   | Welding spatter  |
| End seal + End seal + Scraper + Bottom seal | 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.



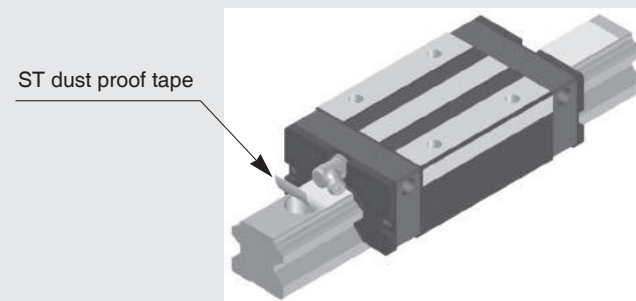
◁ RC cap mounting method ▷

- ① Bolt the rail on the plate.
- ② Put the RC cap on the rail mounting hole and place the bigger steel plate on the cap then tap it with hammer.
- ③ Check the RC cap to make sure it is properly seated.

### [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.

※ If you use ST tape and RC cap together, it would be more effective.



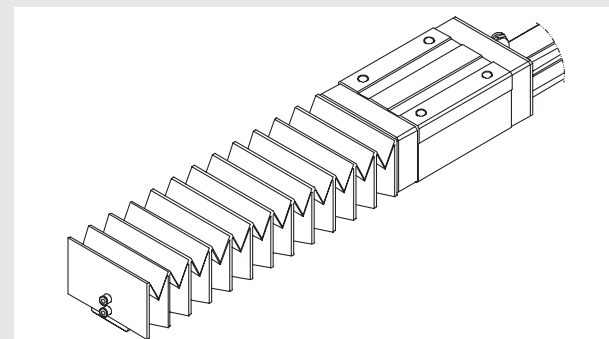
### ◁ Installation of ST tape ▷

- ① After assembling a rail to the bed, clean the surface of the rail and remove any oil.
  - ② Attach the ST tape slowly over the rail length to within 2 or 3 mm from each end of the rail.
  - ③ 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.

※ We recommended to use additional Telescopic tool, if you use it in dust environment.



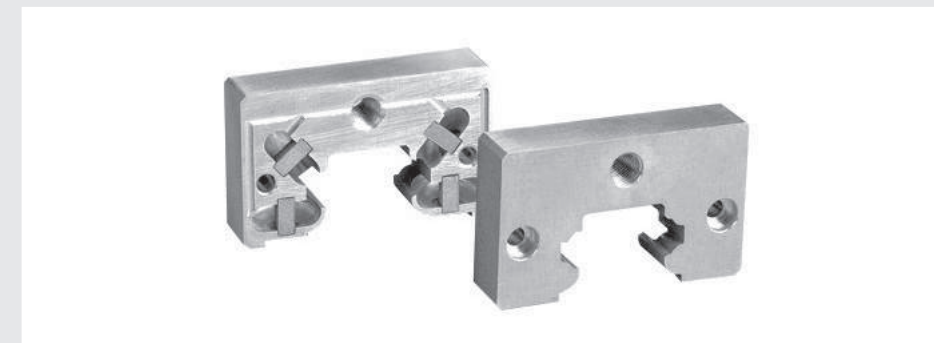
- Reference : SBI type : SH-A  
SBG type : SH

### 8-3. High temperature design

#### [HT end-plate]

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

- Recommended working temperature : -30 ~ 150°C



- ※ When High Temperature end-plate is applied to a block,
  - The product will be released without all plastic components (end-plate, end-seal, bottom seal, return tube plate)
  - Please set up additional measures to prevent dust

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

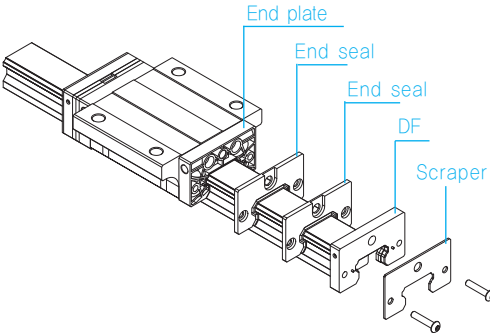
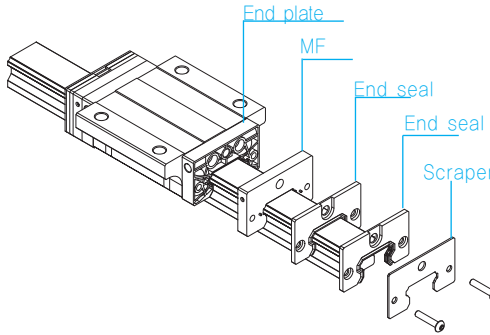
For protecting the linear rail system from fine foreign matter and where the grease feeding is not easy, SBC created the high dust-proof, (DF) seal and self-lubricant container (MF).

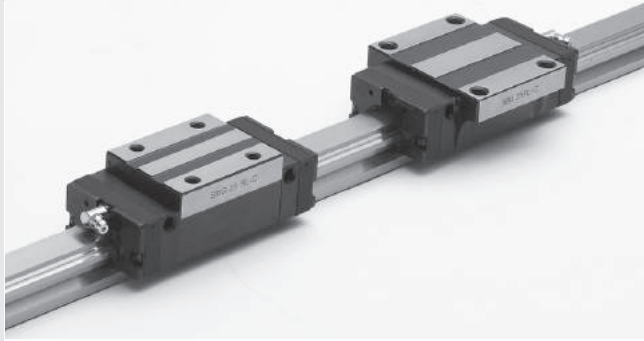
• Function and classification in accordance with seal type

DF : Dust protection for microscopic dust

MF : Self lubricating for long maintenance intervals

• Components and Order of assembly based on the type of seal

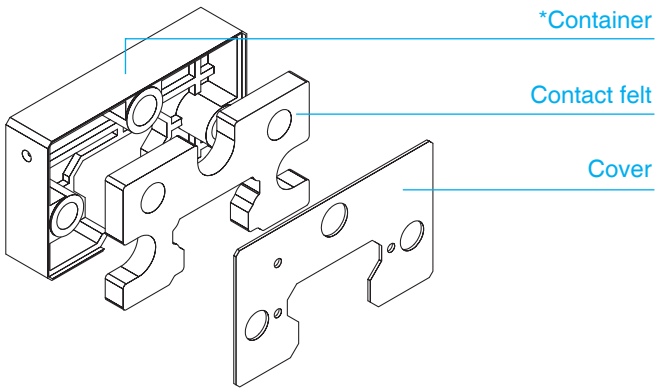
| DF : Dust protection for microscopic dust                                          |                                        | MF : Self lubricating for long maintenance intervals                                |                                        |
|------------------------------------------------------------------------------------|----------------------------------------|-------------------------------------------------------------------------------------|----------------------------------------|
|  |                                        |  |                                        |
| Symbol                                                                             | Components and Order of assembly       | Symbol                                                                              | Components and Order of assembly       |
| DF                                                                                 | End plate+End seal+DF                  | MF                                                                                  | End plate+MF+End seal                  |
| DFDD                                                                               | End plate+End seal+End seal+DF         | MFDD                                                                                | End plate+MF+End seal+End seal         |
| DFZZ                                                                               | End plate+End seal+DF+Scraper          | MFZZ                                                                                | End plate+MF+End seal+Scraper          |
| DFKK                                                                               | End plate+End seal+End seal+DF+Scraper | MFKK                                                                                | End plate+MF+End seal+End seal+Scraper |



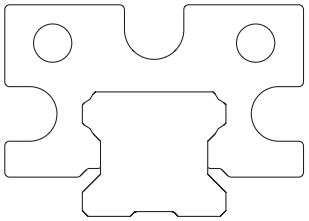
[High dust-proof seal : DF seal]

High-density felt built in DF container wipes the raceway tracking profile so it achieves higher dust protection.

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.



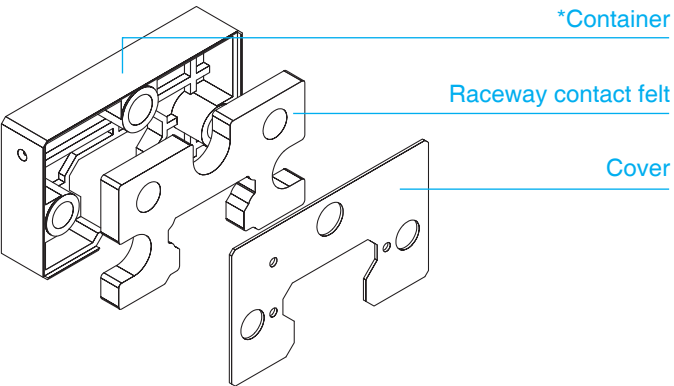
(fully contact the rail and wipe the dust)

※ Caution

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

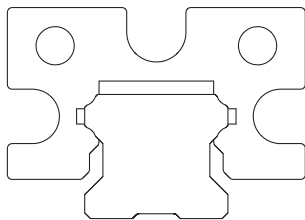
[Self lubricant : MF container]

MF (Self lubricating) 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.



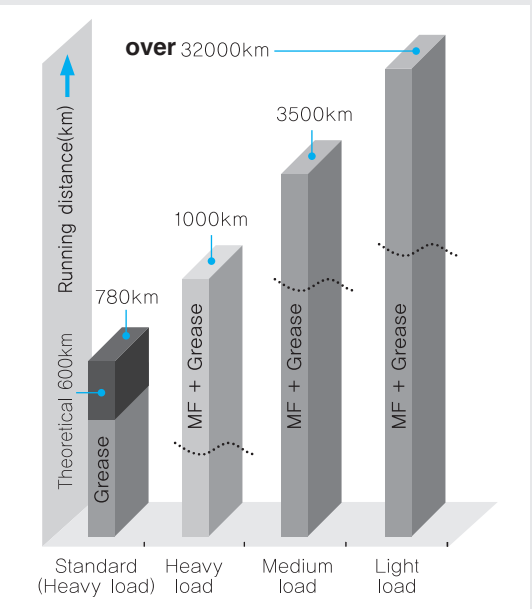
(Wipe the raceway and grease is coating on the raceway)

8-5. MF container Lifetime test

[Performance test]

● SBG20SL-1-K1-1500-N

| Condition            | Heavy   | Medium |       |
|----------------------|---------|--------|-------|
| 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

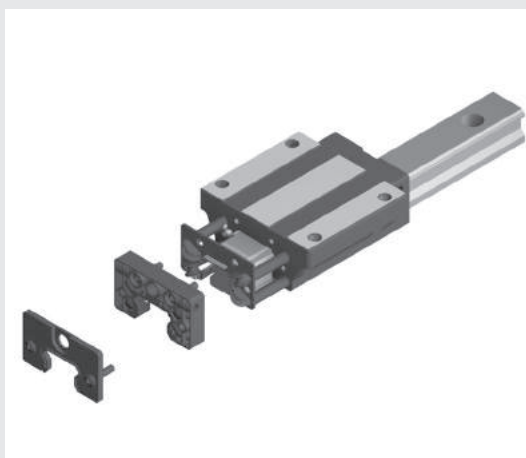
If MF container is required to use in special working condition like clean room, please contact SBC.

# Linear Rail System

## The Types of Linear Rail System

### SBI high-load type

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

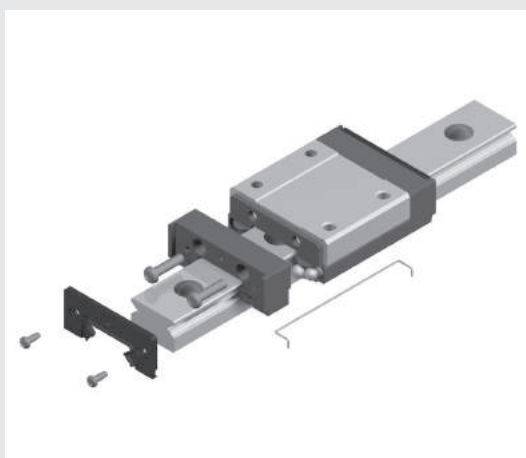


#### SBI type

-Type: SBI15~65

### SBM miniature type

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



#### SBM (Standard miniature)

-Type: SBM07~15

#### SBML (High-load miniature)

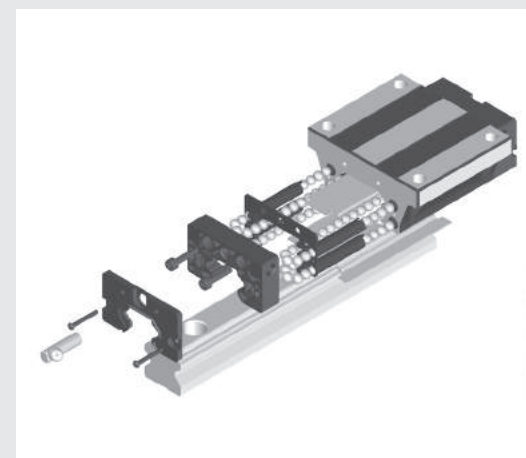
-Type : SBML09~15

#### SBMW (Wide type miniature)

-Type: SBMW09~15

### SBG standard type

Standard SBC linear rail system.



#### SBG type

Type: SBG 15~65

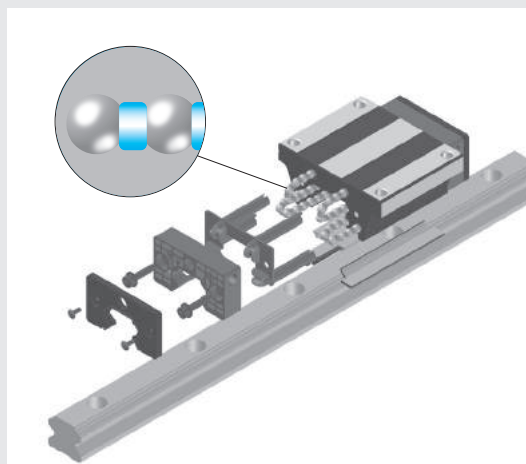
#### SBS type

-Assembly height is lower than SBG type

-Type : SBS 15~45

### SPG spacer type

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



#### Low noise (Spacer type)

Spacer are inserted in between balls

#### SPG Type (=SBG dimensionally interchangeable)

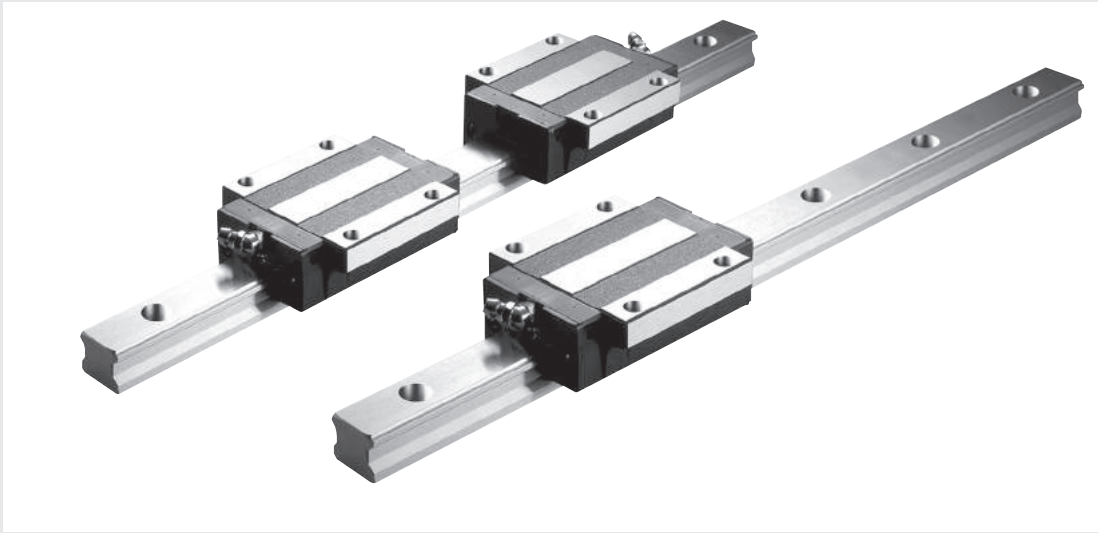
Type : SPG 20~35

#### SPS Type (=SBS dimensionally interchangeable)

-Type: SPS 20~35

# Linear Rail System

## SBI High-load Linear Rail System



### Circular arc groove

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

### 45° angle of contact

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

### DF structure

### Low noise and High rigidity

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

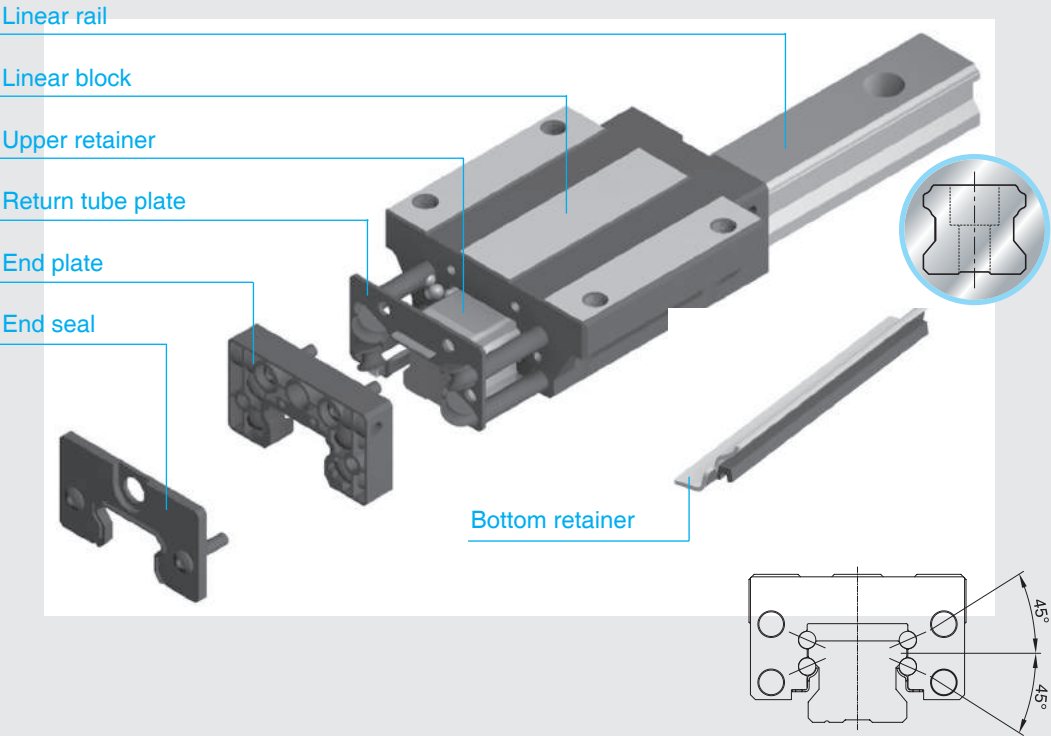
### The same dimension

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

# Linear Rail System

## SBI High-load Linear Rail System

### The feature of structure



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

**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.

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

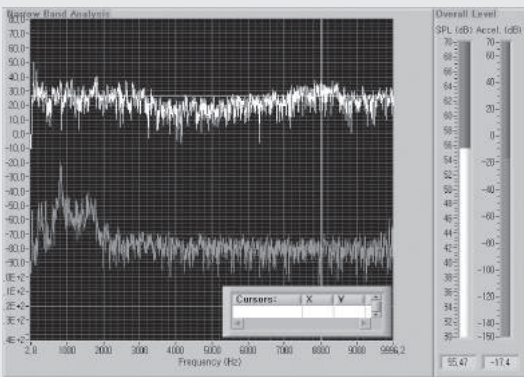
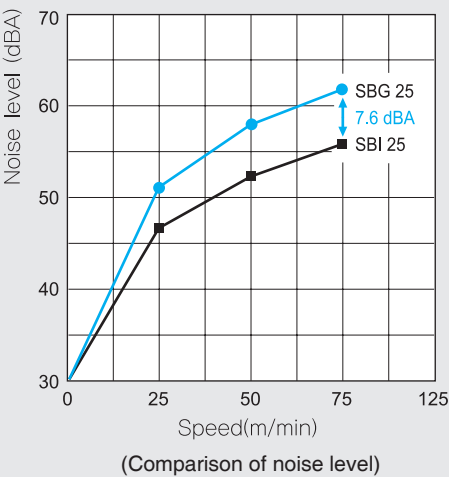
**End-plate** Manufactured with a new high rigidity engineered plastic. Designed to withstand the highest of unplanned impact loads without breaking.

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

[Low noise]

- SBI25 / SBG25 noise level test data

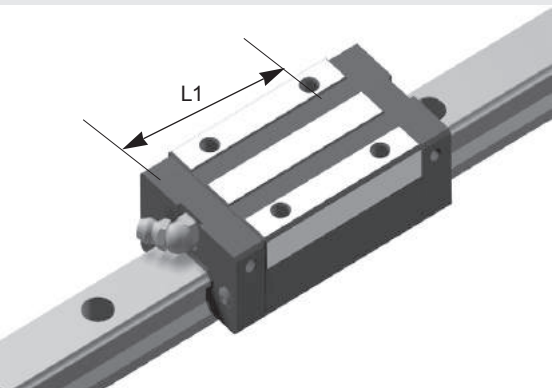


(SBI 1.3m/sec)

[High load performance]

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

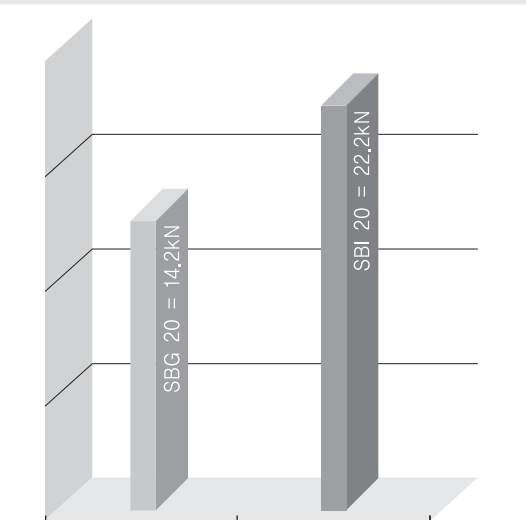
- The comparison of SBI / SBG block length



(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



Improved geometry and tolerances increases basic dynamic load rating

- Comparison of lifetime calculation

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

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

In case of P = 5 kN

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

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

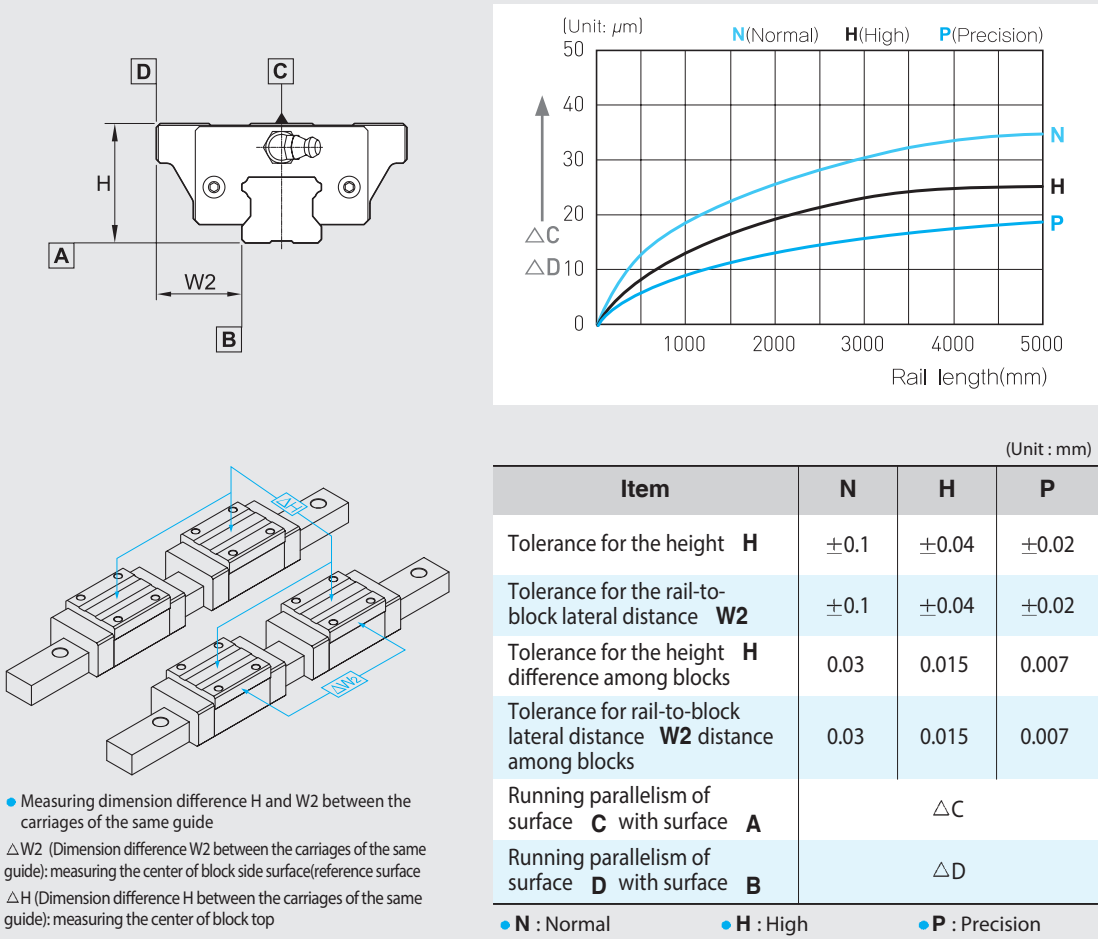
**SBI 20SL :**  $L = \left( \frac{C}{P} \right)^3 \times 50 = \left( \frac{22.2}{5} \right)^3 \times 50 = 4376 \text{ km}$

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

Linear Rail System

SBI High-load Linear Rail System

Accuracy



Preload

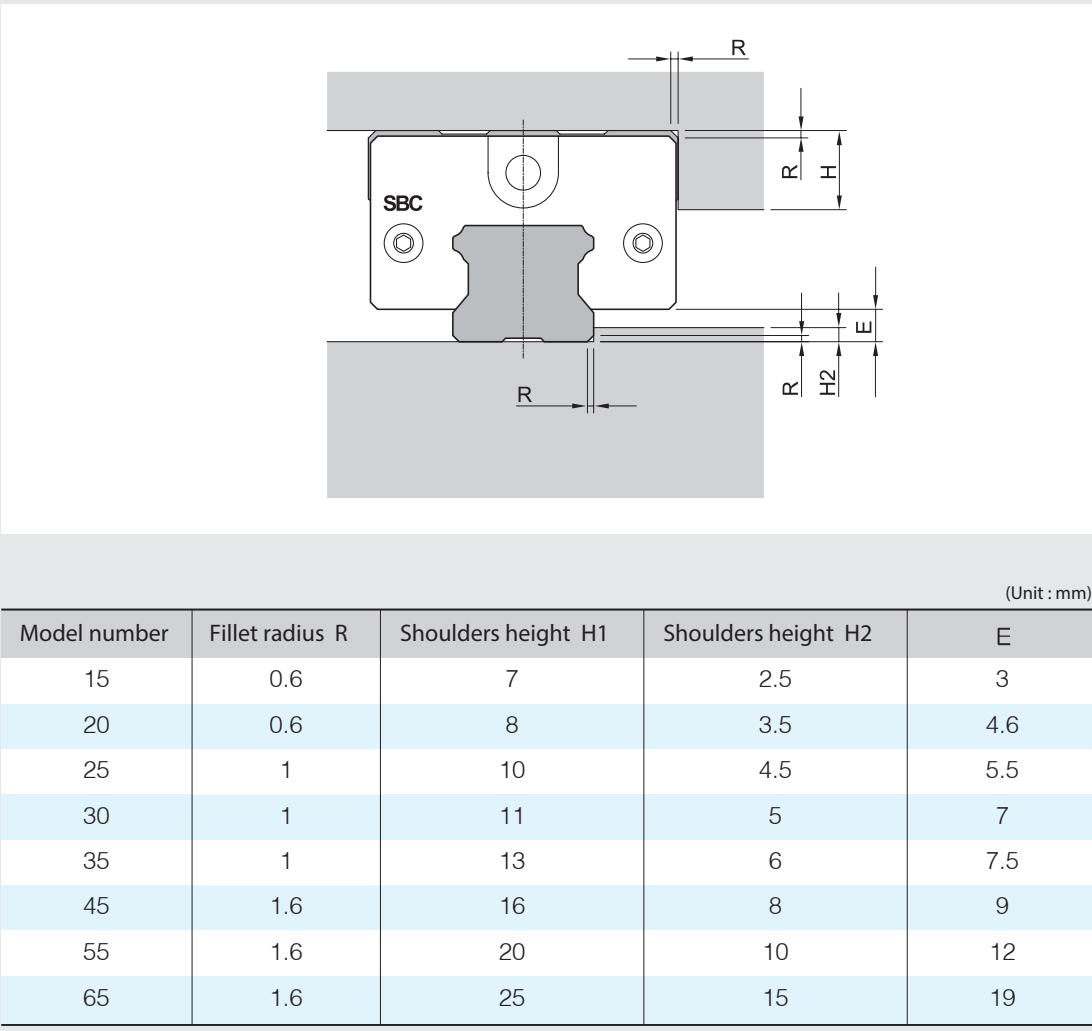
| Reference   | Volume of preload       |
|-------------|-------------------------|
| K0 (None)   | Clearance within 0.01mm |
| K1 (Normal) | Max. 0.02C              |
| K2 (Light)  | 0.04 ~ 0.06C            |
| K3 (Heavy)  | 0.08 ~ 0.10C            |

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

Linear Rail System

SBI High-load Linear Rail System

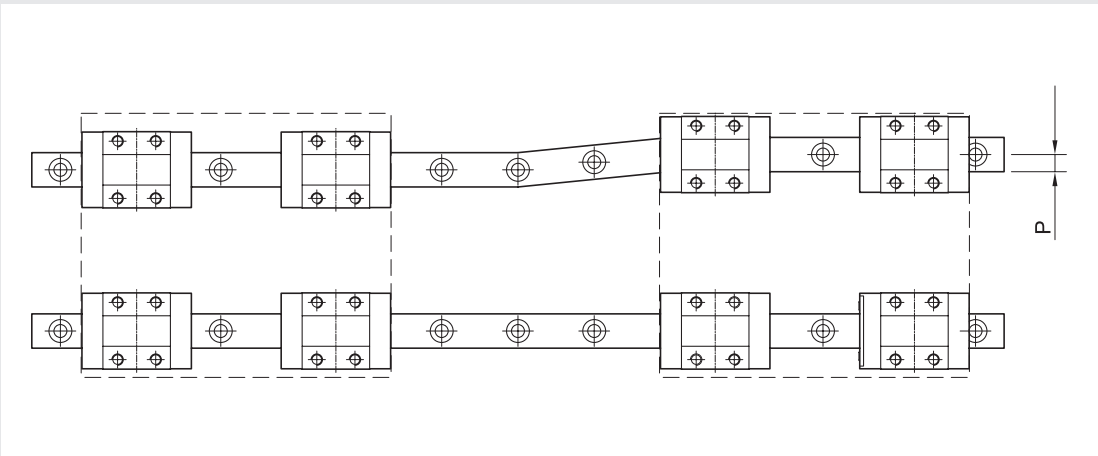
Shoulder height and fillet radius R



Linear Rail System

SBI High-load Linear Rail System

Permissible tolerance (P) of parallelism



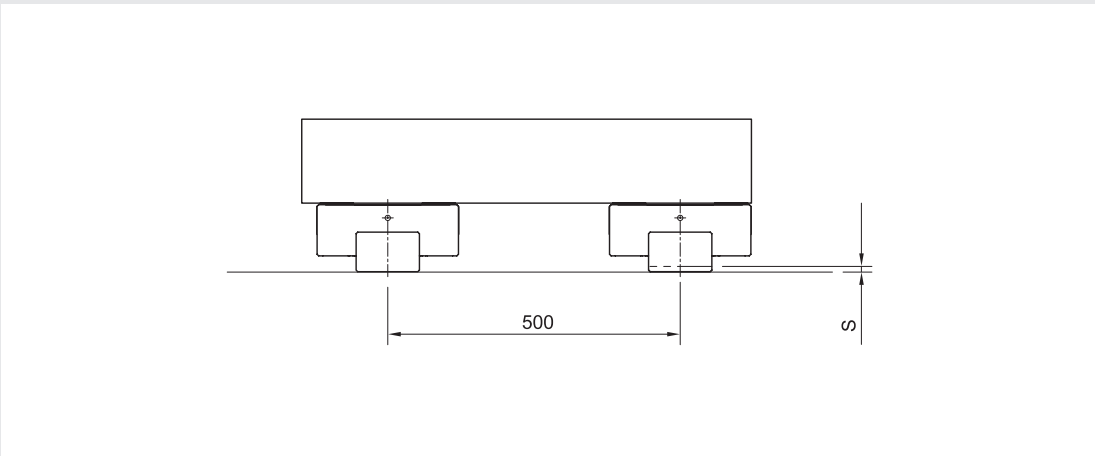
(Unit : mm)

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

Linear Rail System

SBI High-load Linear Rail System

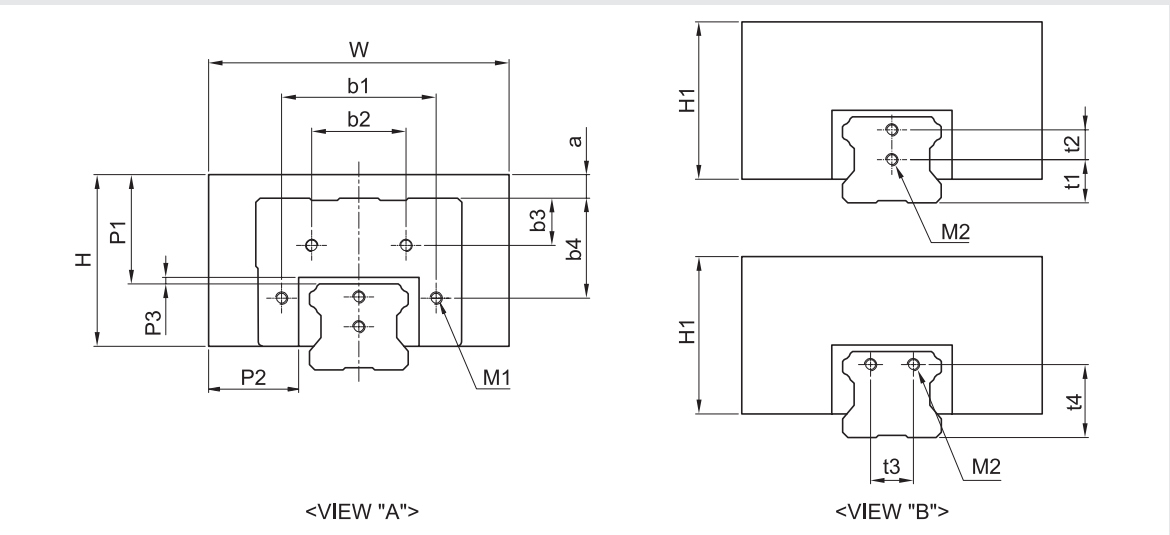
Permissible tolerance (S) of two level offset



(Unit : mm)

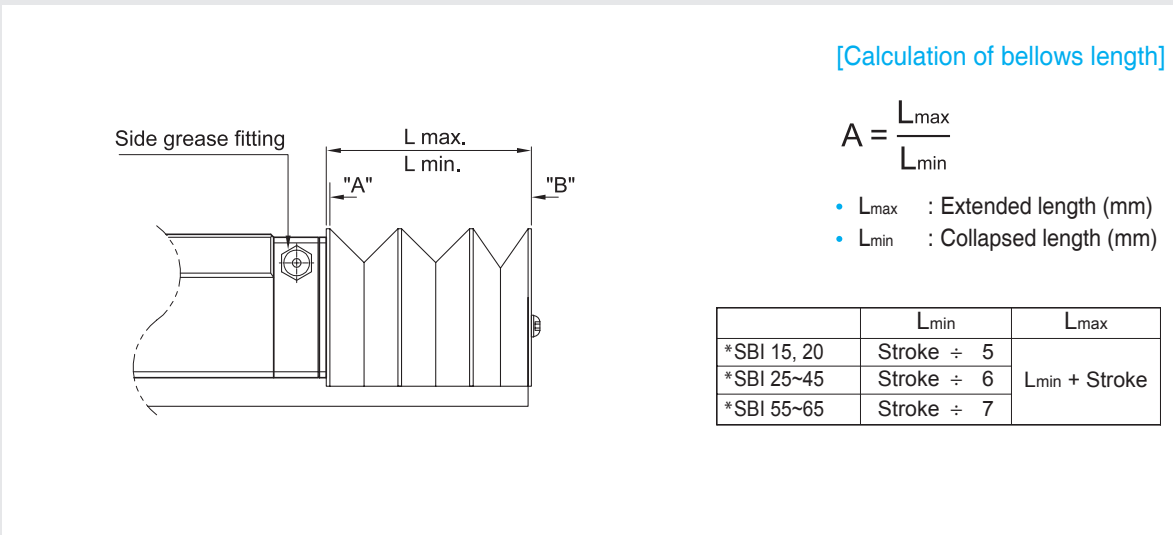
| Model size | K1   | K2    | K3   |
|------------|------|-------|------|
| 15         | 0.13 | 0.085 | -    |
| 20         | 0.13 | 0.085 | 0.05 |
| 25         | 0.13 | 0.085 | 0.07 |
| 30         | 0.17 | 0.11  | 0.09 |
| 35         | 0.21 | 0.15  | 0.12 |
| 45         | 0.25 | 0.17  | 0.14 |
| 55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

SH Bellows



| Model number | Applicable type | W   | H  | H1 | P1 | P2   | P3 | a (*Dimensions according to block types) |     |     |      |      |    | b1         | b2   |
|--------------|-----------------|-----|----|----|----|------|----|------------------------------------------|-----|-----|------|------|----|------------|------|
|              |                 |     |    |    |    |      |    | FV                                       | SV  | CL  | FL   | SL   | HL |            |      |
| SH15 A       | SBI15           | 50  | 25 | 25 | 15 | 15.5 | 1  | 4                                        | 4   | —   | 4    | 0    | 4  | 26         | —    |
| SH15 DA      |                 |     | 20 | 20 | 10 |      |    | —1                                       | —1  | —   | —1   | —5   | —1 |            |      |
| SH20 A       | SBI20           | 60  | 29 | 31 | 17 | 18   | 1  | 5.5                                      | 5.5 | 5.5 | 3.5  | 3.5  | —  | 34<br>(32) | —    |
| SH20 DA      |                 |     | 24 | 26 | 12 |      |    | —                                        | —   | —   | —1.5 | —1.5 | —  |            |      |
| SH25 A       | SBI25           | 70  | 35 | 35 | 20 | 21   | 1  | 7                                        | 7   | 7   | 4    | 0    | 4  | 36         | —    |
| SH25 DA      |                 |     | 30 | 30 | 15 |      |    | —                                        | —   | —   | —1   | —5   | —1 |            |      |
| SH30 A       | SBI30           | 80  | 36 | 36 | 20 | 23   | 1  | —                                        | —   | —   | 1    | —2   | 1  | 49         | —    |
| SH30 DA      |                 |     | 33 | 33 | 17 |      |    | —                                        | —   | —   | —2   | —5   | —2 |            |      |
| SH35 DA      | SBI35           | 85  | 39 | 39 | 20 | 22.5 | 1  | —                                        | —   | —   | —2   | —9   | —2 | 56         | —    |
| SH45 DA      | SBI45           | 100 | 48 | 48 | 25 | 25   | 1  | —                                        | —   | —   | —3   | —13  | —3 | 72         | —    |
| SH55 DA      | SBI55           | 110 | 56 | 56 | 30 | 25   | 1  | —                                        | —   | —   | —2   | —12  | —2 | 74         | 53.4 |
| SH65 DA      | SBI65           | 130 | 69 | 69 | 35 | 30   | 1  | —                                        | —   | —   | —2   | —2   | —  | 90         | 64   |

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



[Calculation of bellows length]

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

- L<sub>max</sub> : Extended length (mm)
- L<sub>min</sub> : Collapsed length (mm)

|             | Lmin       | Lmax          |
|-------------|------------|---------------|
| *SBI 15, 20 | Stroke ÷ 5 | Lmin + Stroke |
| *SBI 25~45  | Stroke ÷ 6 |               |
| *SBI 55~65  | Stroke ÷ 7 |               |

| (Unit : mm) |    |    |      |      |      |      |      |      |    |    |    |    |                 |          |                        |
|-------------|----|----|------|------|------|------|------|------|----|----|----|----|-----------------|----------|------------------------|
| b3          |    |    | b4   |      |      |      |      |      | t1 | t2 | t3 | t4 | M x Bolt length |          | A<br>Extended<br>ratio |
| FL          | SL | HL | FV   | SV   | CL   | FL   | SL   | HL   |    |    |    |    | M1(Block)       | M2(Rail) |                        |
| —           | —  | —  | 13.3 | 13.3 | —    | 13.3 | 17.3 | 13.3 | 10 | —  | —  | —  | M3X16           | M4X8     | 6                      |
|             |    |    |      |      |      |      |      |      |    |    |    |    |                 |          | 4                      |
| —           | —  | —  | 14   | 14   | 14   | 16   | 16   | —    | 6  | 8  | —  | —  | M3X18           | M3X6     | 6                      |
|             |    |    |      |      |      |      |      |      |    |    |    |    |                 |          | 4                      |
| —           | —  | —  | 16.3 | 16.3 | 16.3 | 19.3 | 23.3 | 19.3 | 10 | 7  | —  | —  | M3X18           | M3X6     | 7                      |
|             |    |    |      |      |      |      |      |      |    |    |    |    |                 |          | 5                      |
| —           | —  | —  | —    | —    | —    | 22.8 | 25.8 | 22.8 | 11 | 8  | —  | —  | M4X22           | M4X8     | 7                      |
|             |    |    |      |      |      |      |      |      |    |    |    |    |                 |          | 6                      |
| —           | —  | —  | —    | —    | —    | 26.5 | 33.5 | 26.5 | —  | —  | 14 | 21 | M4X22           | M4X8     | 7                      |
| —           | —  | —  | —    | —    | —    | 33.5 | 43.5 | 33.5 | —  | —  | 20 | 25 | M4X25           | M5X10    | 7                      |
| 7           | 17 | 7  | —    | —    | —    | 38.5 | 48.5 | 38.5 | —  | —  | 26 | 29 | M5X30           | M5X10    | 8                      |
| 7           | 7  | —  | —    | —    | —    | 45   | 45   | —    | —  | —  | 34 | 42 | M5X35           | M5X10    | 8                      |

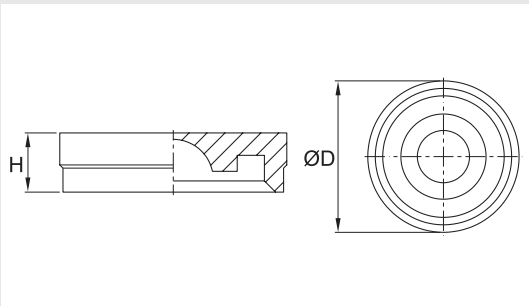
- Ordering example : **SH25A – 70 / 420**
- ① Model number
  - ② Collapsed length (mm)
  - ③ Extended length (mm)

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

Linear Rail System

SBI High-load Linear Rail System

RC Cap

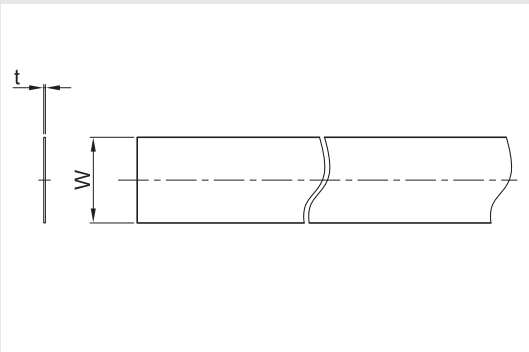


(Unit : mm)

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

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

ST Tape



(Unit : mm)

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

Ordering example : **ST15A - 1000L**

① ②

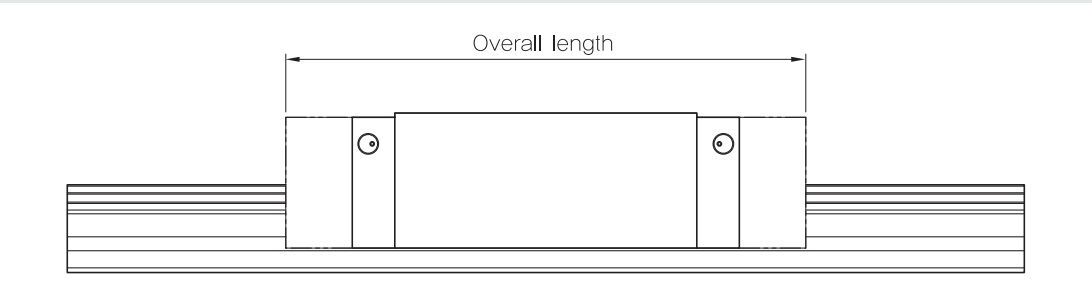
- ① Model number
- ② Length

Linear Rail System

SBI High-load Linear Rail System

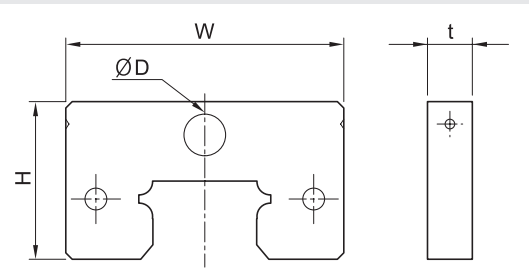
Seal and MF container

[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          |       | 표준          | DD                                  | ZZ    | KK    | MF    | MFDD                | MFZZ  | MFKK    | DF    | DFDD        | DFZZ  | DFKK    |  |
| Indication of seal       |       | E           | E+E                                 | E+S   | E+E+S | F+E   | F+E+E               | F+E+S | F+E+E+S | E+D   | E+E+D       | E+D+S | E+E+D+S |  |
| Overall length with seal | 15V   | 39.9        | 44.5                                | 45.3  | 49.9  | 53.9  | 58.5                | 59.3  | 63.9    | 56.9  | 61.5        | 59.3  | 63.9    |  |
|                          | 15S   | 56.8        | 61.4                                | 62.2  | 66.8  | 70.8  | 75.4                | 76.2  | 80.8    | 73.8  | 78.4        | 76.2  | 80.8    |  |
|                          | 15    | 63.8        | 68.4                                | 69.2  | 73.8  | 77.8  | 82.4                | 83.2  | 87.8    | 80.8  | 85.4        | 83.2  | 87.8    |  |
|                          | 15L   | 79.4        | 84                                  | 84.8  | 89.4  | 93.4  | 98                  | 98.8  | 103.4   | 96.4  | 101         | 98.8  | 103.4   |  |
|                          | 20V   | 49.1        | 54.1                                | 54.5  | 59.5  | 63.1  | 68.1                | 68.5  | 73.5    | 66.1  | 71.1        | 68.5  | 73.5    |  |
|                          | 20CLS | 65.2        | 70.2                                | 70.6  | 75.6  | 79.2  | 84.2                | 84.6  | 89.6    | 82.2  | 87.2        | 84.6  | 89.6    |  |
|                          | 20S   | 73.8        | 78.8                                | 79.2  | 84.2  | 87.8  | 92.8                | 93.2  | 98.2    | 90.8  | 95.8        | 93.2  | 98.2    |  |
|                          | 20    | 78.8        | 83.8                                | 84.2  | 89.2  | 92.8  | 97.8                | 98.2  | 103.2   | 95.8  | 100.8       | 98.2  | 103.2   |  |
|                          | 20L   | 96.4        | 101.4                               | 101.8 | 106.8 | 110.4 | 115.4               | 115.8 | 120.8   | 113.4 | 118.4       | 115.8 | 120.8   |  |
|                          | 25V   | 52.6        | 57.6                                | 58    | 63    | 66.6  | 71.6                | 72    | 77      | 69.6  | 74.6        | 72    | 77      |  |
|                          | 25S   | 83          | 88                                  | 88.4  | 93.4  | 97    | 102                 | 102.4 | 107.4   | 100   | 105         | 102.4 | 107.4   |  |
|                          | 25    | 92          | 97                                  | 97.4  | 102.4 | 106   | 111                 | 111.4 | 116.4   | 109   | 114         | 111.4 | 116.4   |  |
|                          | 25L   | 108         | 113                                 | 113.4 | 118.4 | 122   | 127                 | 127.4 | 132.4   | 125   | 130         | 127.4 | 132.4   |  |
|                          | 30S   | 96.8        | 102.8                               | 103.2 | 109.2 | 112.8 | 118.8               | 119.2 | 125.2   | 116.8 | 122.8       | 119.2 | 125.2   |  |
|                          | 30    | 107.6       | 113.6                               | 114   | 120   | 123.6 | 129.6               | 130   | 136     | 127.6 | 133.6       | 130   | 136     |  |
|                          | 30L   | 131.6       | 137.6                               | 138   | 144   | 147.6 | 153.6               | 154   | 160     | 151.6 | 157.6       | 154   | 160     |  |
|                          | 35S   | 108.2       | 114.2                               | 114.6 | 120.6 | —     | —                   | —     | —       | —     | —           | —     | —       |  |
|                          | 35    | 124.6       | 130.6                               | 131   | 137   | 140.6 | 146.6               | 147   | 153     | 144.6 | 150.6       | 147   | 153     |  |
|                          | 35L   | 152.6       | 158.6                               | 159   | 165   | 168.6 | 174.6               | 175   | 181     | 172.6 | 178.6       | 175   | 181     |  |
|                          | 45    | 142         | 148                                 | 148.4 | 154.4 | 158   | 164                 | 164.4 | 170.4   | 162   | 168         | 164.4 | 170.4   |  |
|                          | 45L   | 174         | 180                                 | 180.4 | 186.4 | 190   | 196                 | 196.4 | 202.4   | 194   | 200         | 196.4 | 202.4   |  |
|                          | 55    | 172.4       | 179.4                               | 179.2 | 186.2 | 190.4 | 197.4               | 197.2 | 204.2   | 194.8 | 201.8       | 197.2 | 204.2   |  |
|                          | 55L   | 211.8       | 218.8                               | 218.6 | 225.6 | 229.8 | 236.8               | 236.6 | 243.6   | 234.2 | 241.2       | 236.6 | 243.6   |  |
|                          | 65    | 219.8       | 226.8                               | 226.6 | 233.6 | 237.8 | 244.8               | 244.6 | 251.6   | 242.2 | 249.2       | 244.6 | 251.6   |  |
|                          | 65L   | 272.2       | 279.2                               | 279   | 286   | 290.2 | 297.2               | 297   | 304     | 294.6 | 301.6       | 297   | 304     |  |

- If block is assembled with MF container, the grease fitting is not supplied. If you would like to feed the grease to the block, please order side grease fitting type.



[Dimension of MF container]

| (Unit : mm) |       |               |                                        |      |   |      |      |
|-------------|-------|---------------|----------------------------------------|------|---|------|------|
| Reference   | Model | Applied model | Block type                             | W    | t | H    | D    |
| DF / MF     | 15A   | SBI15         | FL/FLS/FLL/HL/HLL/HLS/SL/SLL/SLS/FV/SV | 33.4 | 7 | 20.2 | 4    |
|             | 20A   | SBI20         | FL/FLL/FLS/SL/SLL/SLS                  | 43.4 | 7 | 24.6 | 6.5  |
|             | 20B   |               | CL/CLL/FV/SV                           |      |   | 22.6 |      |
|             | 20C   |               | CLS                                    |      |   | 41.4 |      |
|             | 25A   | SBI25         | FL/FLL/FLS/HL/HLL/HLS/SL/SLL/SLS       | 47   | 7 | 29.7 | 6.5  |
|             | 25B   |               | CL/CLL/FV/SV                           |      |   | 26.7 |      |
|             | 30A   | SBI30         | FL/FLL/FLS/HL/HLL/HLS/SL/SLL/SLS       | 59   | 8 | 34.2 | 6.5  |
|             | 35A   | SBI35         | FL/FLL/HL/HLL/SL/SLL                   | 69   | 8 | 39.7 | 6.5  |
|             | 45A   | SBI45         | FL/FLL/HL/HLL/SL/SLL                   | 85   | 8 | 49.7 | 10.5 |
|             | 55A   | SBI55         | FL/FLL/HL/HLL/SL/SLL                   | 98   | 9 | 56   | 10.5 |
|             | 65A   | SBI65         | FL/FLL/SL/SLL                          | 123  | 9 | 69   | 10.5 |

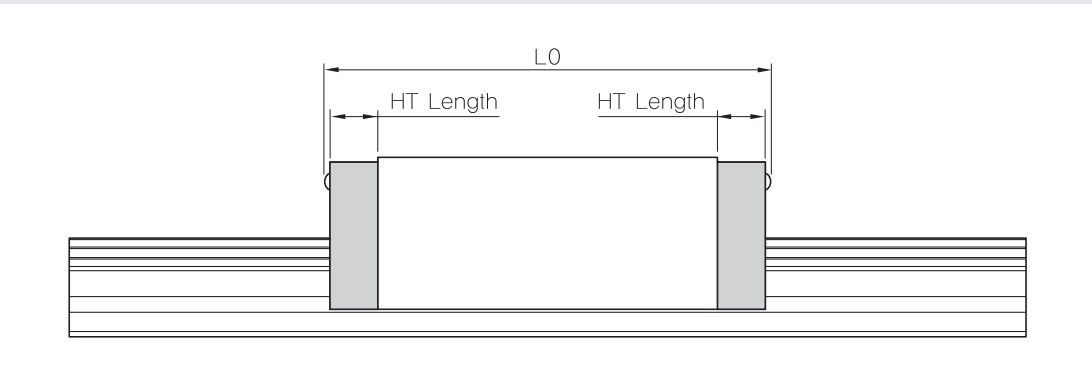
[Seal resistance]

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

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

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

HT high temperature end plate



| (Unit : mm) |           |                |      |               |      |               |       |               |       |               |       |
|-------------|-----------|----------------|------|---------------|------|---------------|-------|---------------|-------|---------------|-------|
| Reference   | HT Length | Overall length |      |               |      |               |       |               |       |               |       |
|             |           | Applied model  | L0   | Applied model | L0   | Applied model | L0    | Applied model | L0    | Applied model | L0    |
| HT 15A      | 6.5       | SBI 15V        | 38.3 | —             | —    | SBI 15S       | 53.2  | SBI 15        | 62.2  | SBI 15L       | 77.8  |
| HT 20A      | 8         | SBI 20V        | 47.1 | SBI 20CLS     | 63.2 | SBI 20S       | 71.8  | SBI 20        | 76.8  | SBI 20L       | 94.4  |
| HT 25A      | 8         | SBI 25V        | 50.6 | —             | —    | SBI 25S       | 81    | SBI 25        | 90    | SBI 25L       | 106   |
| HT 30A      | 10        | —              | —    | —             | —    | SBI 30S       | 94.8  | SBI 30        | 105.6 | SBI 30L       | 129.6 |
| HT 35A      | 11        | —              | —    | —             | —    | SBI 35S       | 106.2 | SBI 35        | 122.6 | SBI 35L       | 150.6 |
| HT 45A      | 13        | —              | —    | —             | —    | —             | —     | SBI 45        | 140   | SBI 45L       | 172   |
| HT 55A      | 16        | —              | —    | —             | —    | —             | —     | SBI 55        | 168.5 | SBI 55L       | 207.9 |
| HT 65A      | 20        | —              | —    | —             | —    | —             | —     | SBI 65        | 215.9 | SBI 65L       | 268.3 |

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

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

※ All plastic components are replace with steel or aluminum in the High Temperature Blocks.  
※ Side grease fitting is not available for high temperature end plates

Grease and nipple specification

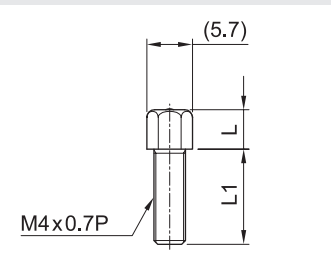
[Grease]

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

[Grease fitting Specification]

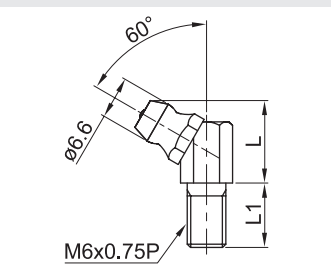
(1) Standard grease fitting (Front grease fitting)

(Unit : mm)



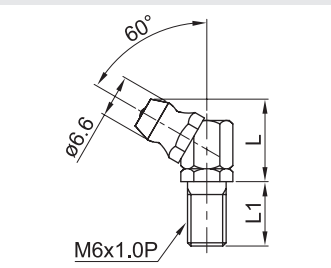
| Specification |                      | M4x0.7P           |   |     |
|---------------|----------------------|-------------------|---|-----|
| Applied model | Grease fitting model | Seal Symbol       | L | L1  |
| SBI 15        | 1N                   | None              | 7 | 5.5 |
|               |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

(Unit : mm)



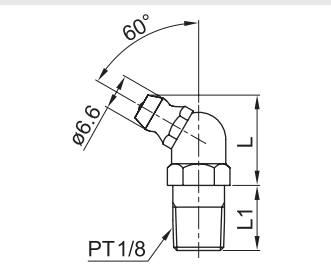
| Specification |                      | M6x0.75P, Asia type |      |    |
|---------------|----------------------|---------------------|------|----|
| Applied model | Grease fitting model | Seal Symbol         | L    | L1 |
| SBI 20~35     | A2N                  | None                | 13.5 | 7  |
|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

(Unit : mm)



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

(Unit : mm)



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

※ We provide M6 x 0.75P for front Grease fitting of SBI 20~35.  
If you need M6 x 1.0P, Please contact SBC.

(2) Side grease fitting

|                      |                  |                      |                 |                      |                |                      |            |
|----------------------|------------------|----------------------|-----------------|----------------------|----------------|----------------------|------------|
|                      |                  |                      |                 |                      |                |                      |            |
| M4x0.7P              | HEX.8<br>M4x0.7P | HEX.8<br>M6x0.75P    | HEX.10<br>PT1/8 |                      |                |                      |            |
| Specification        | M4x0.7P          | Specification        | M4x0.7P         | Specification        | M6x0.75P       | Specification        | PT1/8      |
| Applied model        | SBI 15           | Applied model        | SBI 20, 25      | Applied model        | SBI 30, 35, 45 | Applied model        | SBI 55, 65 |
| Grease fitting model | S1N              | Grease fitting model | S2N             | Grease fitting model | S3N            | Grease fitting model | S4N        |

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

| <table><tr><th>Specification</th><td>M4x0.7P</td></tr><tr><th>Applied model</th><td>SBI 15</td></tr><tr><th>Grease fitting model</th><td>S1C</td></tr></table> | Specification  | M4x0.7P | Applied model | SBI 15 | Grease fitting model | S1C | <table><tr><th>Specification</th><td>M4x0.7P</td></tr><tr><th>Applied model</th><td>SBI 20, 25</td></tr><tr><th>Grease fitting model</th><td>S2C</td></tr></table> | Specification | M4x0.7P | Applied model | SBI 20, 25 | Grease fitting model | S2C | <table><tr><th>Specification</th><td>M6x0.75P</td></tr><tr><th>Applied model</th><td>SBI 30, 35, 45</td></tr><tr><th>Grease fitting model</th><td>S4C</td></tr></table> | Specification | M6x0.75P | Applied model | SBI 30, 35, 45 | Grease fitting model | S4C |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|---------|---------------|--------|----------------------|-----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|---------|---------------|------------|----------------------|-----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|----------|---------------|----------------|----------------------|-----|
| 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                                                                                                                                           | S4C            |         |               |        |                      |     |                                                                                                                                                                    |               |         |               |            |                      |     |                                                                                                                                                                         |               |          |               |                |                      |     |

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

(4) Copper pipe

| <table><tr><th>Input size</th><td>PT1/8</td></tr><tr><th>Output size</th><td>M6x0.75P</td></tr><tr><th>Applied model</th><td>SBI 20, 25, 30, 35</td></tr><tr><th>Grease fitting model</th><td>SB01</td></tr></table> | Input size         | PT1/8 | Output size | M6x0.75P | Applied model | SBI 20, 25, 30, 35 | Grease fitting model | SB01 | <table><tr><th>Input size</th><td>PT1/8</td></tr><tr><th>Output size</th><td>PT1/8</td></tr><tr><th>Applied model</th><td>SBI 45, 55, 65</td></tr><tr><th>Grease fitting model</th><td>SB21</td></tr></table> | Input size | PT1/8 | Output size | PT1/8 | Applied model | SBI 45, 55, 65 | Grease fitting model | SB21 |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|-------|-------------|----------|---------------|--------------------|----------------------|------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|-------|-------------|-------|---------------|----------------|----------------------|------|
| Input size                                                                                                                                                                                                           | PT1/8              |       |             |          |               |                    |                      |      |                                                                                                                                                                                                               |            |       |             |       |               |                |                      |      |
| Output size                                                                                                                                                                                                          | M6x0.75P           |       |             |          |               |                    |                      |      |                                                                                                                                                                                                               |            |       |             |       |               |                |                      |      |
| Applied model                                                                                                                                                                                                        | SBI 20, 25, 30, 35 |       |             |          |               |                    |                      |      |                                                                                                                                                                                                               |            |       |             |       |               |                |                      |      |
| Grease fitting model                                                                                                                                                                                                 | SB01               |       |             |          |               |                    |                      |      |                                                                                                                                                                                                               |            |       |             |       |               |                |                      |      |
| Input size                                                                                                                                                                                                           | PT1/8              |       |             |          |               |                    |                      |      |                                                                                                                                                                                                               |            |       |             |       |               |                |                      |      |
| Output size                                                                                                                                                                                                          | PT1/8              |       |             |          |               |                    |                      |      |                                                                                                                                                                                                               |            |       |             |       |               |                |                      |      |
| Applied model                                                                                                                                                                                                        | SBI 45, 55, 65     |       |             |          |               |                    |                      |      |                                                                                                                                                                                                               |            |       |             |       |               |                |                      |      |
| Grease fitting model                                                                                                                                                                                                 | SB21               |       |             |          |               |                    |                      |      |                                                                                                                                                                                                               |            |       |             |       |               |                |                      |      |

Ordering example

[Ordering example for block]

**SBI20** **FL** – **N** – **DFDD** – **K1** – **KR**  
[1] [2] [3] [4] [5] [6]

- [1] Model
- [2] Block type
- [3] Position of grease fitting : None (front), N (side)
- [4] Option Symbol : No symbol (standard), DF (high dust protection), MF (self lubricant), Seal (DD, ZZ, KK)  
\* Please refer to Option table
- [5] Preload : K0, K1, K2, K3
- [6] Surface treatment : No symbol (standard), KR ( Block surface treatrment )

※ “K3” Preload is not available for SBI 15 type

[Ordering example for rail]

**SBI20** – **1000L** – **RR** – **B**  
[1] [2] [3] [4]

- [1] Model
- [2] Rail length
- [3] Surface treatment : No symbol (standard), RR ( Rail surface treatrment )
- [4] 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** – **MFDD** – **2** – **K1** – **5000** – **J2** – **N** – **AR** – **B** – **II**  
[1] [2] [3] [4] [5] [6] [7] [8] [9] [10] [11] [12]

- [1] Model
- [2] Block type
- [3] Position of grease fitting : None (front), N (side)
- [4] Option Symbol : No symbol (standard), DF (high dust protection), MF (self lubricant), Seal (DD, ZZ, KK)  
\* Please refer to Option table
- [5] Block quantity on rail
- [6] Preload : K0, K1, K2 ,K3
- [7] Rail length
- [8] Rail connection symbol : J2 ( 2PCS of rail ), J3 ( 3PCS of rail ), J4 ( 4PCS of rail )...
- [9] Accuracy : N, H, P
- [10] Surface treatment : No symbol (standard), AR( Block and Rail ), RR ( Rail only ) KR ( Block only )
- [11] (B) Bottom mounting : No symbol (standard), B (bottom mounting rail)
- [12] Rail : number of rails per axis, None=I, 2=II...4=IV etc.

[Option symbol table]

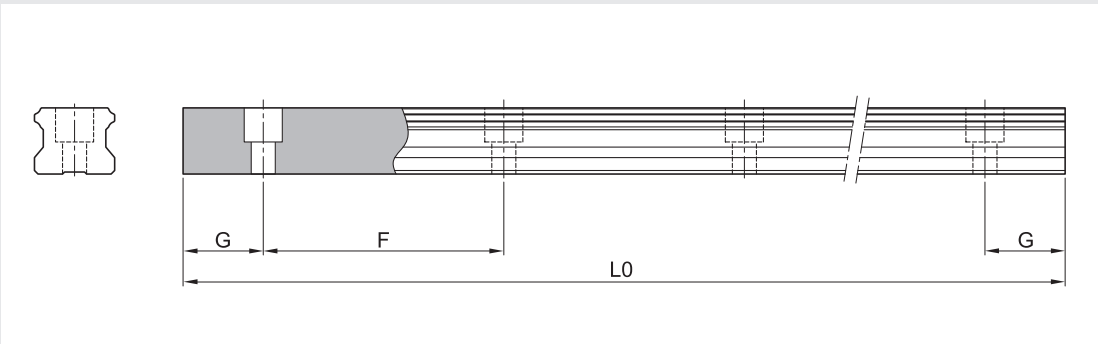
|           |                                 |
|-----------|---------------------------------|
| No symbol | End seal                        |
| DD        | Double seal (End seal+End seal) |
| ZZ        | End seal+Scraper                |
| KK        | Double seal+Scraper             |
| DF        | End seal+DF                     |
| DFDD      | Double seal+DF                  |
| DFZZ      | End seal+DF+Scraper             |
| DFKK      | Double seal+DF+Scraper          |
| MF        | MF+End seal                     |
| MFDD      | MF+Double seal                  |
| MFZZ      | MF+Scraper                      |
| MFKK      | MF+Double seal+Scraper          |
| HT        | High Temperatue End plate       |

- ※ We recommend block and rail assembled to be ordered where high-precision and high- rigidity are required.
- ※ For surface treatment, please mark according to each surface treatment symbol.
- ※ If special G dimension is required, please mark when you place an order.
- ※ Please contact SBC for high temperature order.
- ※ “K3” Preload is not available for SBG, SBS 15 type

Linear Rail System

SBI High-load Linear Rail System

Standard and Max. Length of SBI rail



(Unit : mm)

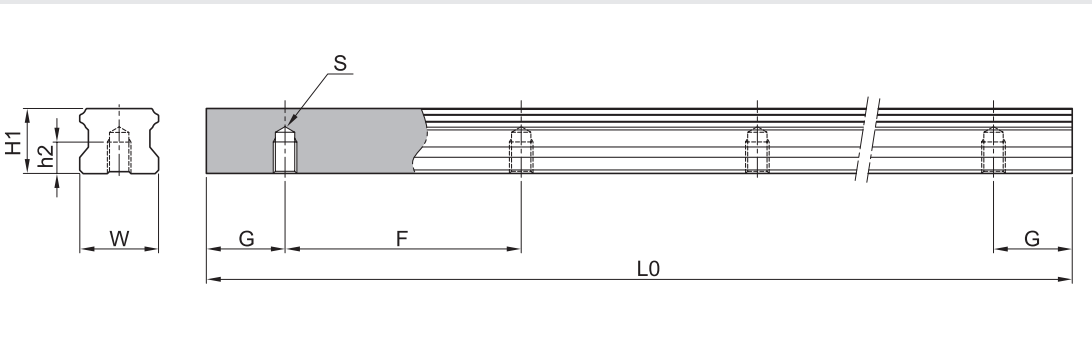
| Model number    | SBI15 | SBI20 | SBI25 | SBI30 | SBI35 | SBI45 | SBI55 | SBI65 |
|-----------------|-------|-------|-------|-------|-------|-------|-------|-------|
| Standard length | 160   | 220   | 220   | 280   | 280   | 570   | 780   | 1270  |
|                 | 220   | 280   | 280   | 440 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

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

Linear Rail System

SBI High-load Linear Rail System

Bottom mounting rail (SBI-B type)

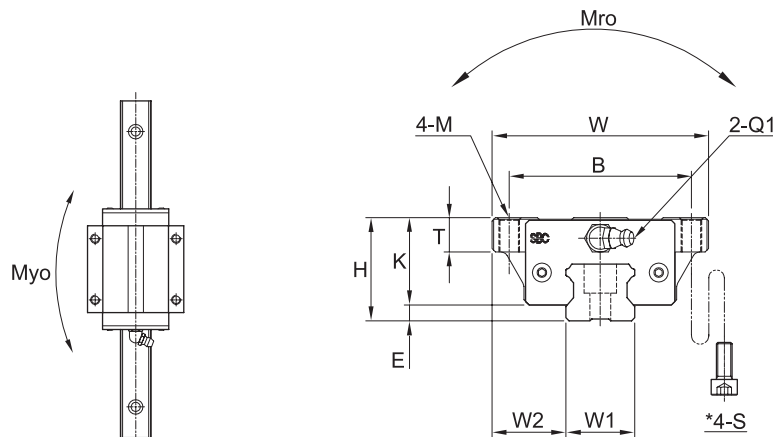


(Unit : mm)

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

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

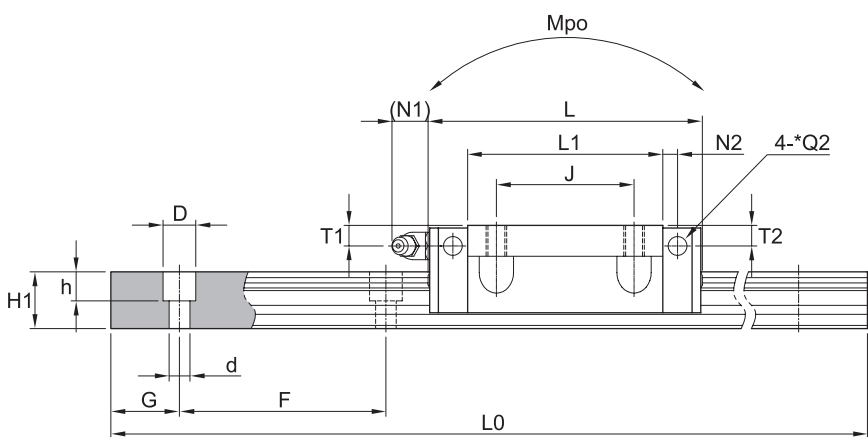
SBI-FL/FLS/FLL



| Model     | Mounting dimension |     |       |     | Block dimensions  |     |     |     |       |      |      |                |      |     |     |         |      |
|-----------|--------------------|-----|-------|-----|-------------------|-----|-----|-----|-------|------|------|----------------|------|-----|-----|---------|------|
|           | H                  | W   | L     | E   | Mounting tap hole |     |     |     | L1    | T±1  | K    | Grease fitting |      |     |     |         |      |
|           |                    |     |       |     | B                 | J   | M   | *S  |       |      |      | T1             | N1   | T2  | N2  | Q1      | *Q2  |
| SBI15 FLS | 24                 | 47  | 56.8  | 3   | 38                | 30  | M5  | M4  | 38.2  | 11   | 21   | 4.5            | 5.5  | 3.8 | 3.8 | M4x0.7  | Ø3.5 |
| SBI15 FL  | 24                 | 47  | 63.8  | 3   | 38                | 30  | M5  | M4  | 45.2  | 9    | 21   | 4.5            | 5.5  | 3.8 | 3.8 | M4x0.7  | Ø3.5 |
| SBI15 FLL | 24                 | 47  | 79.4  | 3   | 38                | 30  | M5  | M4  | 60.8  | 9    | 21   | 4.5            | 5.5  | 3.8 | 3.8 | M4x0.7  | Ø3.5 |
| SBI20 FLS | 30                 | 63  | 73.8  | 4.6 | 53                | 40  | M6  | M5  | 51.8  | 12   | 25.4 | 6              | 12   | 5.8 | 5   | M6x0.75 | Ø3.5 |
| SBI20 FL  | 30                 | 63  | 78.8  | 4.6 | 53                | 40  | M6  | M5  | 56.8  | 12   | 25.4 | 6              | 12   | 5.8 | 5   | M6x0.75 | Ø3.5 |
| SBI20 FLL | 30                 | 63  | 96.4  | 4.6 | 53                | 40  | M6  | M5  | 74.4  | 12   | 25.4 | 6              | 12   | 5.8 | 5   | M6x0.75 | Ø3.5 |
| SBI25 FLS | 36                 | 70  | 83    | 5.5 | 57                | 45  | M8  | M6  | 61    | 13   | 30.5 | 6              | 12   | 5   | 5   | M6x0.75 | Ø3.5 |
| SBI25 FL  | 36                 | 70  | 92    | 5.5 | 57                | 45  | M8  | M6  | 70    | 13   | 30.5 | 6              | 12   | 5   | 5   | M6x0.75 | Ø3.5 |
| SBI25 FLL | 36                 | 70  | 108   | 5.5 | 57                | 45  | M8  | M6  | 86    | 13   | 30.5 | 6              | 12   | 5   | 5   | M6x0.75 | Ø3.5 |
| SBI30 FLS | 42                 | 90  | 96.8  | 7   | 72                | 52  | M10 | M8  | 68.8  | 15.5 | 35   | 8.5            | 12   | 7.8 | 5   | M6x0.75 | Ø5.7 |
| SBI30 FL  | 42                 | 90  | 107.6 | 7   | 72                | 52  | M10 | M8  | 79.6  | 15.5 | 35   | 8.5            | 12   | 7.8 | 5   | M6x0.75 | Ø5.7 |
| SBI30 FLL | 42                 | 90  | 131.6 | 7   | 72                | 52  | M10 | M8  | 103.6 | 15.5 | 35   | 8.5            | 12   | 7.8 | 5   | M6x0.75 | Ø5.7 |
| SBI35 FLS | 48                 | 100 | 108.2 | 8   | 82                | 62  | M10 | M8  | 78.2  | 15   | 40   | 8              | 12   | 8   | 6   | M6x0.75 | Ø5.7 |
| SBI35 FL  | 48                 | 100 | 124.6 | 7.5 | 82                | 62  | M10 | M8  | 94.6  | 15   | 40.5 | 8              | 12   | 8   | 6   | M6x0.75 | Ø5.7 |
| SBI35 FLL | 48                 | 100 | 152.6 | 7.5 | 82                | 62  | M10 | M8  | 122.6 | 15   | 40.5 | 8              | 12   | 8   | 6   | M6x0.75 | Ø5.7 |
| SBI45 FL  | 60                 | 120 | 142   | 9   | 100               | 80  | M12 | M10 | 108   | 18   | 51   | 10.5           | 13.5 | 9.3 | 6.5 | PT1/8   | Ø5.7 |
| SBI45 FLL | 60                 | 120 | 174   | 9   | 100               | 80  | M12 | M10 | 140   | 18   | 51   | 10.5           | 13.5 | 9.3 | 6.5 | PT1/8   | Ø5.7 |
| SBI55 FL  | 70                 | 140 | 172.4 | 12  | 116               | 95  | M14 | M12 | 131   | 22   | 58   | 12             | 13   | 12  | 8   | PT1/8   | Ø8.7 |
| SBI55 FLL | 70                 | 140 | 211.8 | 12  | 116               | 95  | M14 | M12 | 170.4 | 22   | 58   | 12             | 13   | 12  | 8   | PT1/8   | Ø8.7 |
| SBI65 FL  | 90                 | 170 | 219.8 | 19  | 142               | 110 | M16 | M14 | 170.4 | 26   | 71   | 14             | 13   | 14  | 10  | PT1/8   | Ø8.7 |
| SBI65 FLL | 90                 | 170 | 272.2 | 19  | 142               | 110 | M16 | M14 | 222.8 | 26   | 71   | 14             | 13   | 14  | 10  | PT1/8   | Ø8.7 |

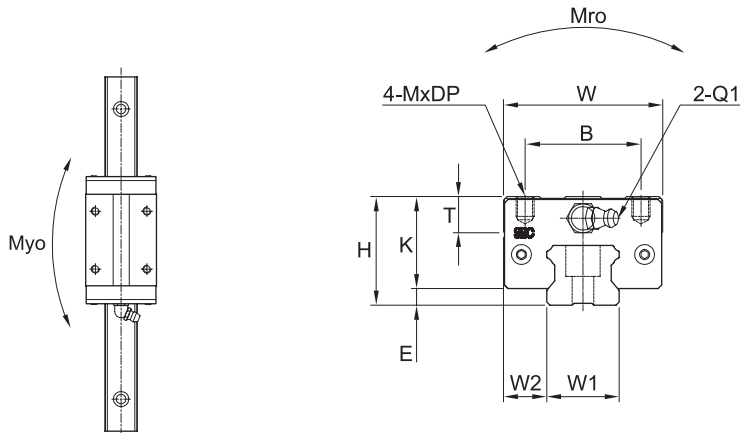
❶ C (Basic dynamic load rating), Co (Basic static load rating)

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



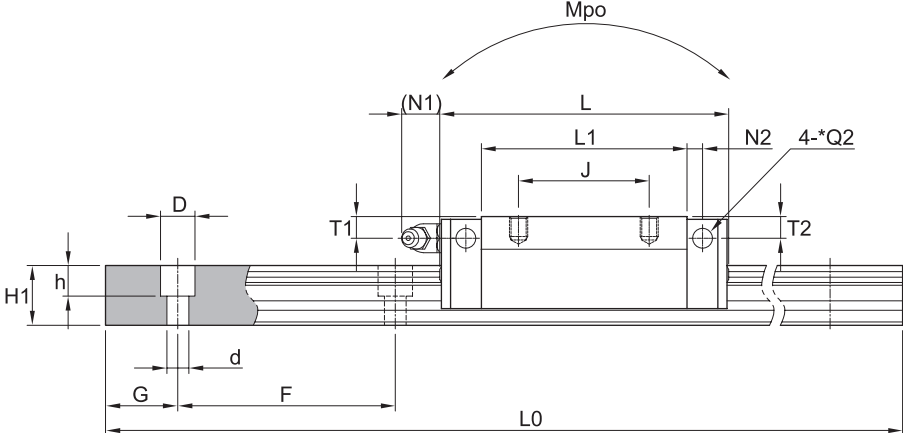
| Rail dimension |      |      |     |           |     |     |      |                    |            | Basic load rating<br>[kN] |       | Permissible static moment<br>[kN • m] |      |       | Mass        |  |
|----------------|------|------|-----|-----------|-----|-----|------|--------------------|------------|---------------------------|-------|---------------------------------------|------|-------|-------------|--|
| W1             | W2   | H1   | F   | Bolt hole |     |     | G    | Max length of rail | Block [kg] |                           |       |                                       |      |       | Rail [kg/m] |  |
|                |      |      |     | d         | D   | h   |      |                    |            |                           |       |                                       |      |       |             |  |
| 15             | 16   | 13   | 60  | 4,5       | 7,5 | 5,5 | 20   | 3000               | 12,3       | 18,3                      | 0,13  | 0,08                                  | 0,08 | 0,20  | 1,3         |  |
| 15             | 16   | 13   | 60  | 4,5       | 7,5 | 5,5 | 20   | 3000               | 14,1       | 24,1                      | 0,16  | 0,17                                  | 0,17 | 0,24  | 1,3         |  |
| 15             | 16   | 13   | 60  | 4,5       | 7,5 | 5,5 | 20   | 3000               | 17,1       | 31,7                      | 0,21  | 0,29                                  | 0,29 | 0,30  | 1,3         |  |
| 20             | 21,5 | 16,5 | 60  | 6         | 9,5 | 8,5 | 20   | 4000               | 20,2       | 29,1                      | 0,29  | 0,18                                  | 0,18 | 0,44  | 2,2         |  |
| 20             | 21,5 | 16,5 | 60  | 6         | 9,5 | 8,5 | 20   | 4000               | 22,2       | 38,2                      | 0,36  | 0,33                                  | 0,33 | 0,46  | 2,2         |  |
| 20             | 21,5 | 16,5 | 60  | 6         | 9,5 | 8,5 | 20   | 4000               | 27,9       | 50                        | 0,47  | 0,56                                  | 0,56 | 0,60  | 2,2         |  |
| 23             | 23,5 | 20   | 60  | 7         | 11  | 9   | 20   | 4000               | 28,9       | 42,8                      | 0,49  | 0,32                                  | 0,32 | 0,66  | 3           |  |
| 23             | 23,5 | 20   | 60  | 7         | 11  | 9   | 20   | 4000               | 31,5       | 52,1                      | 0,56  | 0,56                                  | 0,56 | 0,75  | 3           |  |
| 23             | 23,5 | 20   | 60  | 7         | 11  | 9   | 20   | 4000               | 36,7       | 64,4                      | 0,69  | 0,84                                  | 0,84 | 0,80  | 3           |  |
| 28             | 31   | 23   | 80  | 9         | 14  | 12  | 20   | 4000               | 39,2       | 57,7                      | 0,80  | 0,49                                  | 0,49 | 1,08  | 4,25        |  |
| 28             | 31   | 23   | 80  | 9         | 14  | 12  | 20   | 4000               | 42,8       | 65,4                      | 0,85  | 0,77                                  | 0,77 | 1,25  | 4,25        |  |
| 28             | 31   | 23   | 80  | 9         | 14  | 12  | 20   | 4000               | 51,3       | 84,7                      | 1,10  | 1,30                                  | 1,30 | 1,65  | 4,25        |  |
| 34             | 33   | 26   | 80  | 9         | 14  | 12  | 20   | 4000               | 52,0       | 73,3                      | 1,24  | 0,71                                  | 0,71 | 1,53  | 6,02        |  |
| 34             | 33   | 26   | 80  | 9         | 14  | 12  | 20   | 4000               | 59,5       | 89,1                      | 1,42  | 1,28                                  | 1,28 | 1,92  | 6,02        |  |
| 34             | 33   | 26   | 80  | 9         | 14  | 12  | 20   | 4000               | 71,3       | 115,3                     | 1,83  | 2,12                                  | 2,12 | 2,43  | 6,02        |  |
| 45             | 37,5 | 32   | 105 | 14        | 20  | 17  | 22,5 | 4000               | 79,2       | 116,3                     | 2,48  | 1,90                                  | 1,90 | 3,25  | 9,77        |  |
| 45             | 37,5 | 32   | 105 | 14        | 20  | 17  | 22,5 | 4000               | 94,8       | 150,5                     | 3,21  | 3,14                                  | 3,14 | 4,40  | 9,77        |  |
| 53             | 43,5 | 38   | 120 | 16        | 23  | 20  | 30   | 4000               | 127,3      | 181,8                     | 4,81  | 2,97                                  | 2,97 | 5,08  | 13,72       |  |
| 53             | 43,5 | 38   | 120 | 16        | 23  | 20  | 30   | 4000               | 147,9      | 224,5                     | 5,95  | 4,78                                  | 4,78 | 6,58  | 13,72       |  |
| 63             | 53,5 | 53   | 150 | 18        | 26  | 22  | 35   | 4000               | 188,3      | 261,7                     | 8,24  | 5,57                                  | 5,57 | 10,17 | 23,17       |  |
| 63             | 53,5 | 53   | 150 | 18        | 26  | 22  | 35   | 4000               | 232,5      | 354,1                     | 11,15 | 9,86                                  | 9,86 | 13,29 | 23,17       |  |

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.



| Model     | Mounting dimension |     |       |     | Block dimensions  |     |     |    |       |     |      |                |      |      |     |         |      |
|-----------|--------------------|-----|-------|-----|-------------------|-----|-----|----|-------|-----|------|----------------|------|------|-----|---------|------|
|           | H                  | W   | L     | E   | Mounting tap hole |     |     |    | L1    | T±1 | K    | Grease fitting |      |      |     |         |      |
|           |                    |     |       |     | B                 | J   | M   | DP |       |     |      | T1             | N1   | T2   | N2  | Q1      | *Q2  |
| SBI15 SLS | 28                 | 34  | 56.8  | 3   | 26                | 26  | M4  | 5  | 38.2  | 10  | 25   | 8.5            | 5.5  | 7.8  | 3.8 | M4x0.7  | Ø3.5 |
| SBI15 SL  | 28                 | 34  | 63.8  | 3   | 26                | 26  | M4  | 5  | 45.2  | 10  | 25   | 8.5            | 5.5  | 7.8  | 3.8 | M4x0.7  | Ø3.5 |
| SBI15 SLL | 28                 | 34  | 79.4  | 3   | 26                | 34  | M4  | 5  | 60.8  | 10  | 25   | 8.5            | 5.5  | 7.8  | 3.8 | M4x0.7  | Ø3.5 |
| SBI20 SLS | 30                 | 44  | 73.8  | 4.6 | 32                | 36  | M5  | 5  | 51.8  | 10  | 25.4 | 6              | 12   | 5.8  | 5   | M6x0.75 | Ø3.5 |
| SBI20 SL  | 30                 | 44  | 78.8  | 4.6 | 32                | 36  | M5  | 5  | 56.8  | 10  | 25.4 | 6              | 12   | 5.8  | 5   | M6x0.75 | Ø3.5 |
| SBI20 SLL | 30                 | 44  | 96.4  | 4.6 | 32                | 50  | M5  | 5  | 74.4  | 10  | 25.4 | 6              | 12   | 5.8  | 5   | M6x0.75 | Ø3.5 |
| SBI25 SLS | 40                 | 48  | 83    | 5.5 | 35                | 35  | M6  | 8  | 61    | 16  | 34.5 | 10             | 12   | 9    | 5   | M6x0.75 | Ø3.5 |
| SBI25 SL  | 40                 | 48  | 92    | 5.5 | 35                | 35  | M6  | 8  | 70    | 16  | 34.5 | 10             | 12   | 9    | 5   | M6x0.75 | Ø3.5 |
| SBI25 SLL | 40                 | 48  | 108   | 5.5 | 35                | 50  | M6  | 8  | 86    | 16  | 34.5 | 10             | 12   | 9    | 5   | M6x0.75 | Ø3.5 |
| SBI30 SLS | 45                 | 60  | 96.8  | 7   | 40                | 40  | M8  | 10 | 68.8  | 12  | 38   | 11.5           | 12   | 10.8 | 5   | M6x0.75 | Ø5.7 |
| SBI30 SL  | 45                 | 60  | 107.6 | 7   | 40                | 40  | M8  | 10 | 79.6  | 12  | 38   | 11.5           | 12   | 10.8 | 5   | M6x0.75 | Ø5.7 |
| SBI30 SLL | 45                 | 60  | 131.6 | 7   | 40                | 60  | M8  | 10 | 103.6 | 12  | 38   | 11.5           | 12   | 10.8 | 5   | M6x0.75 | Ø5.7 |
| SBI35 SLS | 55                 | 70  | 108.2 | 8   | 50                | 50  | M8  | 10 | 78.2  | 15  | 47   | 15             | 12   | 15   | 6   | M6x0.75 | Ø5.7 |
| SBI35 SL  | 55                 | 70  | 124.6 | 7.5 | 50                | 50  | M8  | 10 | 94.6  | 15  | 47.5 | 15             | 12   | 15   | 6   | M6x0.75 | Ø5.7 |
| SBI35 SLL | 55                 | 70  | 152.6 | 7.5 | 50                | 72  | M8  | 10 | 122.6 | 15  | 47.5 | 15             | 12   | 15   | 6   | M6x0.75 | Ø5.7 |
| SBI45 SL  | 70                 | 86  | 142   | 9   | 60                | 60  | M10 | 13 | 108   | 17  | 61   | 20.5           | 13.5 | 19.3 | 6.5 | PT1/8   | Ø5.7 |
| SBI45 SLL | 70                 | 86  | 174   | 9   | 60                | 80  | M10 | 13 | 140   | 17  | 61   | 20.5           | 13.5 | 19.3 | 6.5 | PT1/8   | Ø5.7 |
| SBI55 SL  | 80                 | 100 | 172.4 | 12  | 75                | 75  | M12 | 18 | 131   | 21  | 68   | 22             | 13   | 22   | 8   | PT1/8   | Ø8.7 |
| SBI55 SLL | 80                 | 100 | 211.8 | 12  | 75                | 95  | M12 | 18 | 170.4 | 21  | 68   | 22             | 13   | 22   | 8   | PT1/8   | Ø8.7 |
| SBI65 SL  | 90                 | 126 | 219.8 | 19  | 76                | 70  | M16 | 16 | 170.4 | 26  | 71   | 14             | 13   | 14   | 10  | PT1/8   | Ø8.7 |
| SBI65 SLL | 90                 | 126 | 272.2 | 19  | 76                | 120 | M16 | 16 | 222.8 | 26  | 71   | 14             | 13   | 14   | 10  | PT1/8   | Ø8.7 |

① C (Basic dynamic load rating), Co (Basic static load rating)  
② \*Q2: The hole of side grease nipple is not made to prevent a foreign substance from going into inside.  
When you order the side grease nipple, we build it by ourselves.

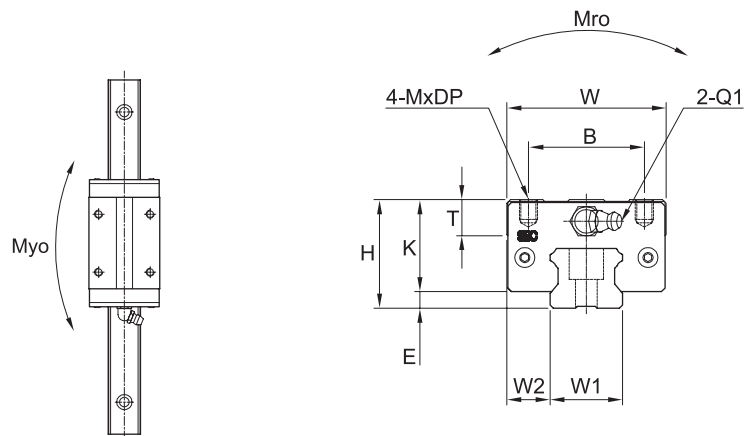


| Rail dimension |      |      |     |           |     |     |      |                    |  | Basic load rating [kN] |       | Permissible static moment [kN · m] |      |      | Mass       |             |
|----------------|------|------|-----|-----------|-----|-----|------|--------------------|--|------------------------|-------|------------------------------------|------|------|------------|-------------|
| W1             | W2   | H1   | F   | Bolt hole |     |     | G    | Max length of rail |  | C                      | Co    | Mro                                | Mpo  | Myo  | Block [kg] | Rail [kg/m] |
|                |      |      |     | d         | D   | h   |      |                    |  |                        |       |                                    |      |      |            |             |
| 15             | 9.5  | 13   | 60  | 4.5       | 7.5 | 5.5 | 20   | 3000               |  | 12.3                   | 18.3  | 0.13                               | 0.08 | 0.08 | 0.19       | 1.3         |
| 15             | 9.5  | 13   | 60  | 4.5       | 7.5 | 5.5 | 20   | 3000               |  | 14.1                   | 24.1  | 0.16                               | 0.17 | 0.17 | 0.23       | 1.3         |
| 15             | 9.5  | 13   | 60  | 4.5       | 7.5 | 5.5 | 20   | 3000               |  | 17.1                   | 31.7  | 0.21                               | 0.29 | 0.29 | 0.31       | 1.3         |
| 20             | 12   | 16.5 | 60  | 6         | 9.5 | 8.5 | 20   | 4000               |  | 20.2                   | 29.1  | 0.29                               | 0.18 | 0.18 | 0.33       | 2.2         |
| 20             | 12   | 16.5 | 60  | 6         | 9.5 | 8.5 | 20   | 4000               |  | 22.2                   | 38.2  | 0.36                               | 0.33 | 0.33 | 0.36       | 2.2         |
| 20             | 12   | 16.5 | 60  | 6         | 9.5 | 8.5 | 20   | 4000               |  | 27.9                   | 50    | 0.47                               | 0.56 | 0.56 | 0.47       | 2.2         |
| 23             | 12.5 | 20   | 60  | 7         | 11  | 9   | 20   | 4000               |  | 28.9                   | 42.8  | 0.49                               | 0.32 | 0.32 | 0.58       | 3           |
| 23             | 12.5 | 20   | 60  | 7         | 11  | 9   | 20   | 4000               |  | 31.5                   | 52.1  | 0.56                               | 0.56 | 0.56 | 0.68       | 3           |
| 23             | 12.5 | 20   | 60  | 7         | 11  | 9   | 20   | 4000               |  | 36.7                   | 64.4  | 0.69                               | 0.84 | 0.84 | 0.82       | 3           |
| 28             | 16   | 23   | 80  | 9         | 14  | 12  | 20   | 4000               |  | 39.2                   | 57.7  | 0.80                               | 0.49 | 0.49 | 0.92       | 4.25        |
| 28             | 16   | 23   | 80  | 9         | 14  | 12  | 20   | 4000               |  | 42.8                   | 65.4  | 0.85                               | 0.77 | 0.77 | 1.06       | 4.25        |
| 28             | 16   | 23   | 80  | 9         | 14  | 12  | 20   | 4000               |  | 51.3                   | 84.7  | 1.10                               | 1.30 | 1.30 | 1.36       | 4.25        |
| 34             | 18   | 26   | 80  | 9         | 14  | 12  | 20   | 4000               |  | 52.0                   | 73.3  | 1.24                               | 0.71 | 0.71 | 1.48       | 6.02        |
| 34             | 18   | 26   | 80  | 9         | 14  | 12  | 20   | 4000               |  | 59.5                   | 89.1  | 1.42                               | 1.28 | 1.28 | 1.82       | 6.02        |
| 34             | 18   | 26   | 80  | 9         | 14  | 12  | 20   | 4000               |  | 71.3                   | 115.3 | 1.83                               | 2.12 | 2.12 | 2.32       | 6.02        |
| 45             | 20.5 | 32   | 105 | 14        | 20  | 17  | 22.5 | 4000               |  | 79.2                   | 116.3 | 2.48                               | 1.90 | 1.90 | 3.08       | 9.77        |
| 45             | 20.5 | 32   | 105 | 14        | 20  | 17  | 22.5 | 4000               |  | 94.8                   | 150.5 | 3.21                               | 3.14 | 3.14 | 4.23       | 9.77        |
| 53             | 23.5 | 38   | 120 | 16        | 23  | 20  | 30   | 4000               |  | 127.3                  | 181.8 | 4.81                               | 2.97 | 2.97 | 5.04       | 13.72       |
| 53             | 23.5 | 38   | 120 | 16        | 23  | 20  | 30   | 4000               |  | 147.9                  | 224.5 | 5.95                               | 4.78 | 4.78 | 5.82       | 13.72       |
| 63             | 31.5 | 53   | 150 | 18        | 26  | 22  | 35   | 4000               |  | 188.3                  | 261.7 | 8.24                               | 5.57 | 5.57 | 9.10       | 23.17       |
| 63             | 31.5 | 53   | 150 | 18        | 26  | 22  | 35   | 4000               |  | 232.5                  | 354.1 | 11.15                              | 9.86 | 9.86 | 11.98      | 23.17       |

Linear Rail System

SBI High-load Linear Rail System

SBI-HL/HLS/HLL



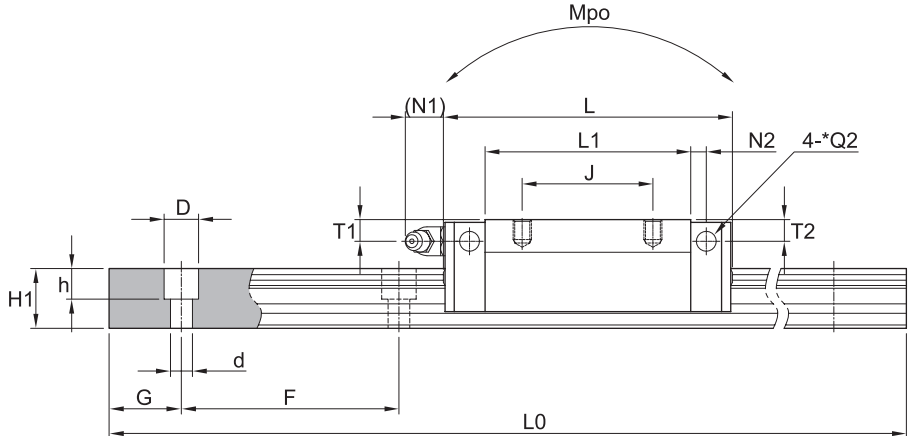
| Model     | Mounting dimension |     |       |     | Block dimensions  |    |     |    |       |     |      |                |      |     |     |         |      |
|-----------|--------------------|-----|-------|-----|-------------------|----|-----|----|-------|-----|------|----------------|------|-----|-----|---------|------|
|           | H                  | W   | L     | E   | Mounting tap hole |    |     |    | L1    | T 1 | K    | Grease fitting |      |     |     |         |      |
|           |                    |     |       |     | B                 | J  | M   | DP |       |     |      | T1             | N1   | T2  | N2  | Q1      | *Q2  |
| SBI15 HLS | 24                 | 34  | 56.8  | 3   | 26                | 26 | M4  | 4  | 38.2  | 6   | 21   | 4,5            | 5,5  | 3,8 | 3,8 | M4x0,7  | Ø3,5 |
| SBI15 HL  | 24                 | 34  | 63.8  | 3   | 26                | 26 | M4  | 4  | 45.2  | 6   | 21   | 4,5            | 5,5  | 3,8 | 3,8 | M4x0,7  | Ø3,5 |
| SBI15 HLL | 24                 | 34  | 79.4  | 3   | 26                | 34 | M4  | 4  | 60.8  | 6   | 21   | 4,5            | 5,5  | 3,8 | 3,8 | M4x0,7  | Ø3,5 |
| SBI25 HLS | 36                 | 48  | 83    | 5.5 | 35                | 35 | M6  | 6  | 61    | 12  | 30,5 | 6              | 12   | 5   | 5,5 | M6x0,75 | Ø3,5 |
| SBI25 HL  | 36                 | 48  | 92    | 5.5 | 35                | 35 | M6  | 6  | 70    | 12  | 30,5 | 6              | 12   | 5   | 5,5 | M6x0,75 | Ø3,5 |
| SBI25 HLL | 36                 | 48  | 108   | 5.5 | 35                | 50 | M6  | 6  | 86    | 12  | 30,5 | 6              | 12   | 5   | 5,5 | M6x0,75 | Ø3,5 |
| SBI30 HLS | 42                 | 60  | 96.8  | 7   | 40                | 40 | M8  | 8  | 68.8  | 12  | 35   | 8,5            | 12   | 7,8 | 5   | M6x0,75 | Ø5,7 |
| SBI30 HL  | 42                 | 60  | 107.6 | 7   | 40                | 40 | M8  | 8  | 79.6  | 12  | 35   | 8,5            | 12   | 7,8 | 5   | M6x0,75 | Ø5,7 |
| SBI30 HLL | 42                 | 60  | 131.6 | 7   | 40                | 60 | M8  | 8  | 103.6 | 12  | 35   | 8,5            | 12   | 7,8 | 5   | M6x0,75 | Ø5,7 |
| SBI35 HLS | 48                 | 70  | 108.2 | 8   | 50                | 50 | M8  | 8  | 78.2  | 15  | 40   | 8              | 12   | 8   | 6   | M6x0,75 | Ø5,7 |
| SBI35 HL  | 48                 | 70  | 124.6 | 7,5 | 50                | 50 | M8  | 8  | 94.6  | 15  | 40,5 | 8              | 12   | 8   | 6   | M6x0,75 | Ø5,7 |
| SBI35 HLL | 48                 | 70  | 152.6 | 7,5 | 50                | 72 | M8  | 8  | 122.6 | 15  | 40,5 | 8              | 12   | 8   | 6   | M6x0,75 | Ø5,7 |
| SBI45 HL  | 60                 | 86  | 142   | 9   | 60                | 60 | M10 | 10 | 108   | 17  | 51   | 10,5           | 13,5 | 9,3 | 6,5 | PT1/8   | Ø5,7 |
| SBI45 HLL | 60                 | 86  | 174   | 9   | 60                | 80 | M10 | 10 | 140   | 17  | 51   | 10,5           | 13,5 | 9,3 | 6,5 | PT1/8   | Ø5,7 |
| SBI55 HL  | 70                 | 100 | 172.4 | 12  | 75                | 75 | M12 | 12 | 131   | 21  | 58   | 12             | 13   | 12  | 8   | PT1/8   | Ø8,7 |
| SBI55 HLL | 70                 | 100 | 211.8 | 12  | 75                | 95 | M12 | 12 | 170.4 | 21  | 58   | 12             | 13   | 12  | 8   | PT1/8   | Ø8,7 |

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

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

Linear Rail System

SBI High-load Linear Rail System

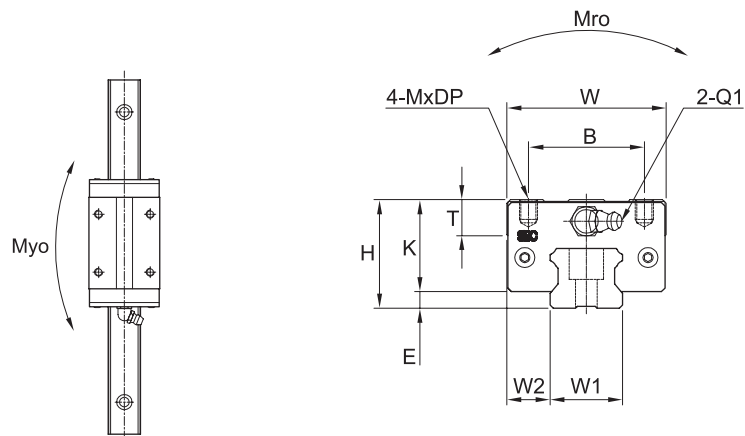


| (Unit : mm)    |      |    |     |           |     |     |      |                          |                           |       |                                       |      |      |               |                |
|----------------|------|----|-----|-----------|-----|-----|------|--------------------------|---------------------------|-------|---------------------------------------|------|------|---------------|----------------|
| Rail dimension |      |    |     |           |     |     |      |                          | Basic load rating<br>[kN] |       | Permissible static moment<br>[kN • m] |      |      | Mass          |                |
| W1             | W2   | H1 | F   | Bolt hole |     |     | G    | Max<br>length<br>of rail |                           |       |                                       |      |      | Block<br>[kg] | Rail<br>[kg/m] |
|                |      |    |     | d         | D   | h   |      |                          |                           |       |                                       |      |      |               |                |
| 15             | 9.5  | 13 | 60  | 4.5       | 7.5 | 5.5 | 20   | 3000                     | 12.3                      | 18.3  | 0.13                                  | 0.08 | 0.08 | 0.15          | 1.3            |
| 15             | 9.5  | 13 | 60  | 4.5       | 7.5 | 5.5 | 20   | 3000                     | 14.1                      | 24.1  | 0.16                                  | 0.17 | 0.17 | 0.18          | 1.3            |
| 15             | 9.5  | 13 | 60  | 4.5       | 7.5 | 5.5 | 20   | 3000                     | 17.1                      | 31.7  | 0.21                                  | 0.29 | 0.29 | 0.24          | 1.3            |
| 23             | 12.5 | 20 | 60  | 7         | 11  | 9   | 20   | 4000                     | 28.9                      | 42.8  | 0.49                                  | 0.32 | 0.32 | 0.47          | 3              |
| 23             | 12.5 | 20 | 60  | 7         | 11  | 9   | 20   | 4000                     | 31.5                      | 52.1  | 0.56                                  | 0.56 | 0.56 | 0.57          | 3              |
| 23             | 12.5 | 20 | 60  | 7         | 11  | 9   | 20   | 4000                     | 36.7                      | 64.4  | 0.69                                  | 0.84 | 0.84 | 0.70          | 3              |
| 28             | 16   | 23 | 80  | 9         | 14  | 12  | 20   | 4000                     | 39.2                      | 57.7  | 0.80                                  | 0.49 | 0.49 | 0.80          | 4.25           |
| 28             | 16   | 23 | 80  | 9         | 14  | 12  | 20   | 4000                     | 42.8                      | 65.4  | 0.85                                  | 0.77 | 0.77 | 0.95          | 4.25           |
| 28             | 16   | 23 | 80  | 9         | 14  | 12  | 20   | 4000                     | 51.3                      | 84.7  | 1.10                                  | 1.30 | 1.30 | 1.22          | 4.25           |
| 34             | 18   | 26 | 80  | 9         | 14  | 12  | 20   | 4000                     | 52.0                      | 73.3  | 1.24                                  | 0.71 | 0.71 | 1.35          | 6.02           |
| 34             | 18   | 26 | 80  | 9         | 14  | 12  | 20   | 4000                     | 59.5                      | 89.1  | 1.42                                  | 1.28 | 1.28 | 1.87          | 6.02           |
| 34             | 18   | 26 | 80  | 9         | 14  | 12  | 20   | 4000                     | 71.3                      | 115.3 | 1.83                                  | 2.12 | 2.12 | 2.04          | 6.02           |
| 45             | 20.5 | 32 | 105 | 14        | 20  | 17  | 22.5 | 4000                     | 79.2                      | 116.3 | 2.48                                  | 1.90 | 1.90 | 2.80          | 9.77           |
| 45             | 20.5 | 32 | 105 | 14        | 20  | 17  | 22.5 | 4000                     | 94.8                      | 150.5 | 3.21                                  | 3.14 | 3.14 | 3.29          | 9.77           |
| 53             | 23.5 | 38 | 120 | 16        | 23  | 20  | 30   | 4000                     | 127.3                     | 181.8 | 4.81                                  | 2.97 | 2.97 | 4.42          | 13.72          |
| 53             | 23.5 | 38 | 120 | 16        | 23  | 20  | 30   | 4000                     | 147.9                     | 224.5 | 5.95                                  | 4.78 | 4.78 | 5.82          | 13.72          |

Linear Rail System

SBI High-load Linear Rail System

SBI-CL/CLS/CLL

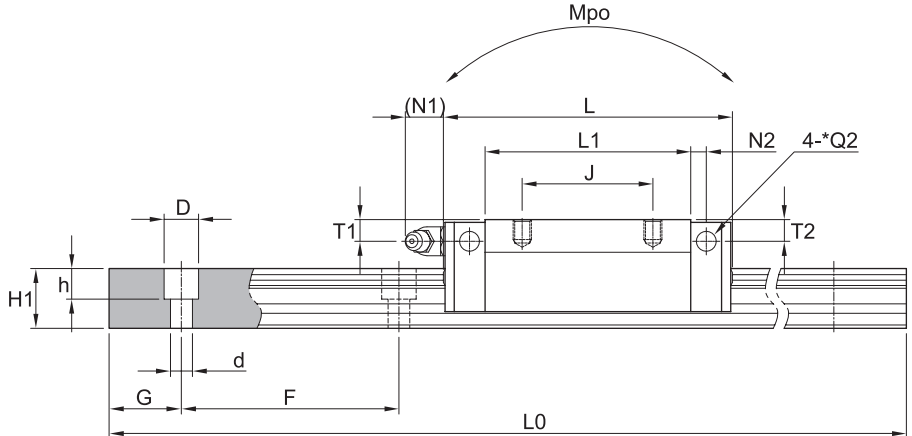


| Model     | Mounting dimension |    |      |     | Block dimensions  |    |    |    |      |     |      |                |    |     |    |         |      |
|-----------|--------------------|----|------|-----|-------------------|----|----|----|------|-----|------|----------------|----|-----|----|---------|------|
|           | H                  | W  | L    | E   | Mounting tap hole |    |    |    | L1   | T±1 | K    | Grease fitting |    |     |    |         |      |
|           |                    |    |      |     | B                 | J  | M  | DP |      |     |      | T1             | N1 | T2  | N2 | Q1      | *Q2  |
| SBI20 CLS | 28                 | 42 | 65.2 | 4.6 | 32                | 32 | M5 | 5  | 43.2 | 7.8 | 23.4 | 4.8            | 12 | 4.3 | 5  | M6x0.75 | Ø3.5 |
| SBI20 CL  | 28                 | 44 | 78.8 | 4.6 | 32                | 32 | M5 | 5  | 56.8 | 7.8 | 23.4 | 4.8            | 12 | 3.8 | 5  | M6x0.75 | Ø3.5 |
| SBI20 CLL | 28                 | 44 | 96.4 | 4.6 | 32                | 50 | M5 | 5  | 74.4 | 7.8 | 23.4 | 4.8            | 12 | 3.8 | 5  | M6x0.75 | Ø3.5 |
| SBI25 CL  | 33                 | 48 | 92   | 5.5 | 35                | 35 | M6 | 6  | 70   | 9   | 27.5 | 5.4            | 12 | 5.4 | 5  | M6x0.75 | Ø3.5 |
| SBI25 CLL | 33                 | 48 | 108  | 5.5 | 35                | 50 | M6 | 6  | 86   | 9   | 27.5 | 5.4            | 12 | 5.4 | 5  | M6x0.75 | Ø3.5 |

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

Linear Rail System

SBI High-load Linear Rail System



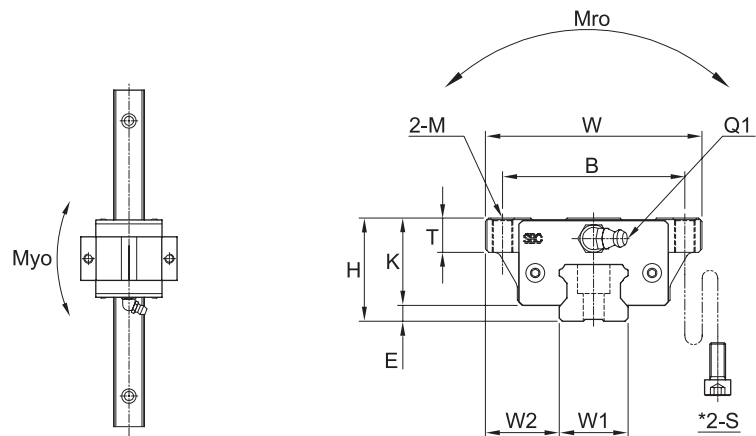
(Unit : mm)

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

Linear Rail System

SBI High-load Linear Rail System

SBI-FV

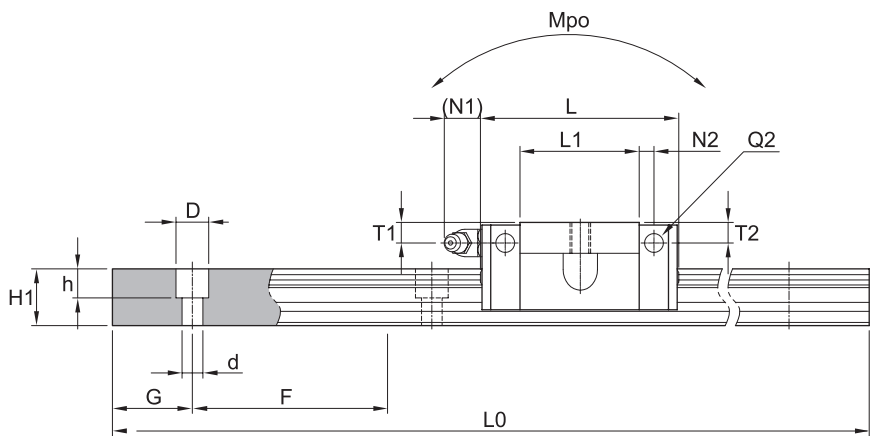


| Model    | Mounting dimension |    |      |     | Block dimensions  |    |    |      |     |      |                |     |     |     |         |      |
|----------|--------------------|----|------|-----|-------------------|----|----|------|-----|------|----------------|-----|-----|-----|---------|------|
|          | H                  | W  | L    | E   | Mounting tap hole |    |    | L1   | T±1 | K    | Grease fitting |     |     |     |         |      |
|          |                    |    |      |     | B                 | M  | *S |      |     |      | T1             | N1  | T2  | N2  | Q1      | *Q2  |
| SBI15 FV | 24                 | 47 | 39.9 | 3   | 38                | M5 | M4 | 21.3 | 9   | 21   | 4.5            | 5.5 | 3.8 | 3.8 | M4x0.7  | Ø3.5 |
| SBI20 FV | 28                 | 63 | 49.1 | 4.6 | 53                | M6 | M5 | 27.1 | 12  | 23.4 | 4.8            | 12  | 3.8 | 5   | M6x0.75 | Ø3.5 |
| SBI25 FV | 33                 | 70 | 52.6 | 5.5 | 57                | M8 | -  | 30.6 | 13  | 27.5 | 5.4            | 12  | 5.4 | 5   | M6x0.75 | Ø3.5 |

- ❶ C (Basic dynamic load rating), Co (Basic static load rating)
- ❷ \*S: Bolt size for bottom mounting type of block.  
\*SBI25FV type can not be mounted from bottom.
- 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

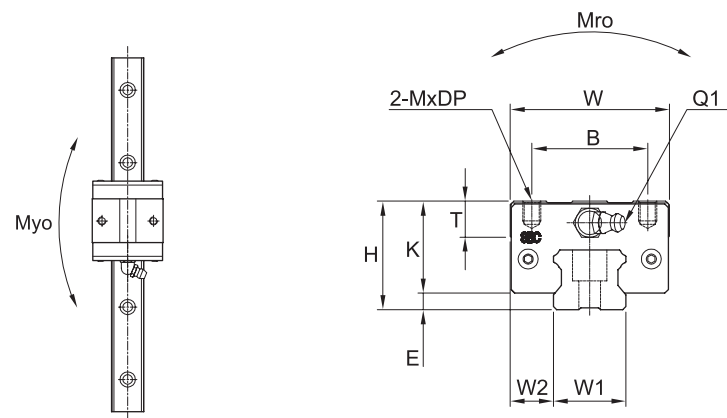
SBI High-load Linear Rail System



(Unit : mm)

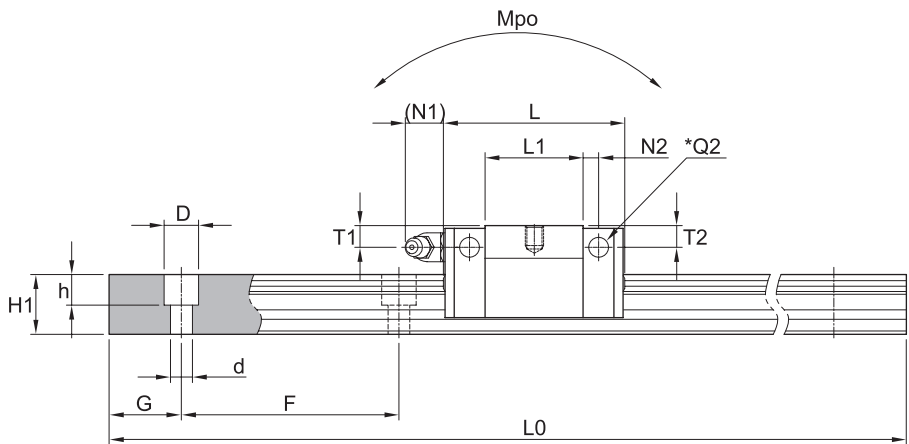
| Rail dimension |      |      |    |           |     |     |    |                       | Basic load rating [kN] |      | Permissible static moment [kN・m] |      |      | Mass       |             |
|----------------|------|------|----|-----------|-----|-----|----|-----------------------|------------------------|------|----------------------------------|------|------|------------|-------------|
| W1             | W2   | H1   | F  | Bolt hole |     |     | G  | Max length of rail L0 | C                      | Co   | Mro                              | Mpo  | Myo  | Block [kg] | Rail [kg/m] |
|                |      |      |    | d         | D   | h   |    |                       |                        |      |                                  |      |      |            |             |
| 15             | 16   | 13   | 60 | 4.5       | 7.5 | 5.5 | 20 | 3000                  | 5.8                    | 12.8 | 0.05                             | 0.03 | 0.03 | 0.11       | 1.3         |
| 20             | 21.5 | 16.5 | 60 | 6         | 9.5 | 8.5 | 20 | 4000                  | 9.4                    | 20.2 | 0.15                             | 0.11 | 0.11 | 0.23       | 2.2         |
| 23             | 23.5 | 20   | 60 | 7         | 11  | 9   | 20 | 4000                  | 12.4                   | 26.1 | 0.21                             | 0.14 | 0.14 | 0.32       | 3           |

SBI-SV



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

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

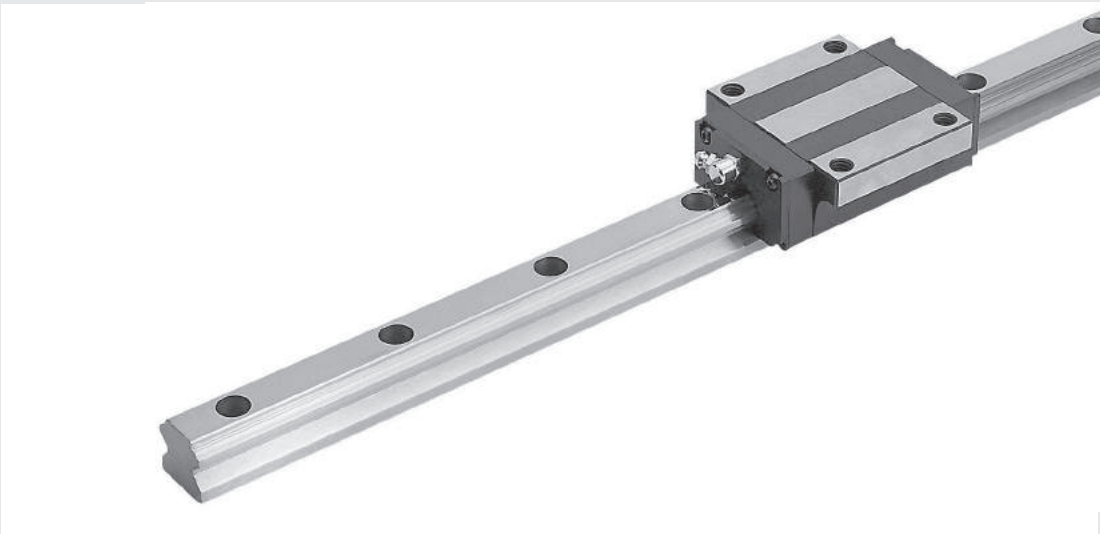


(Unit : mm)

| Rail dimension |      |      |    |           |     |     |    |                       | Basic load rating [kN] |      | Permissible static moment [kN・m] |      |      | Mass       |             |
|----------------|------|------|----|-----------|-----|-----|----|-----------------------|------------------------|------|----------------------------------|------|------|------------|-------------|
| W1             | W2   | H1   | F  | Bolt hole |     |     | G  | Max length of rail L0 | C                      | Co   | Mro                              | Mpo  | Myo  | Block [kg] | Rail [kg/m] |
|                |      |      |    | d         | D   | h   |    |                       |                        |      |                                  |      |      |            |             |
| 15             | 9.5  | 13   | 60 | 4.5       | 7.5 | 5.5 | 20 | 3000                  | 5.8                    | 12.8 | 0.05                             | 0.03 | 0.03 | 0.10       | 1.3         |
| 20             | 12   | 16.5 | 60 | 6         | 9.5 | 8.5 | 20 | 4000                  | 9.4                    | 20.2 | 0.15                             | 0.11 | 0.11 | 0.17       | 2.2         |
| 23             | 12.5 | 20   | 60 | 7         | 11  | 9   | 20 | 4000                  | 12.4                   | 26.1 | 0.21                             | 0.14 | 0.14 | 0.24       | 3           |

# Linear Rail System

## 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.

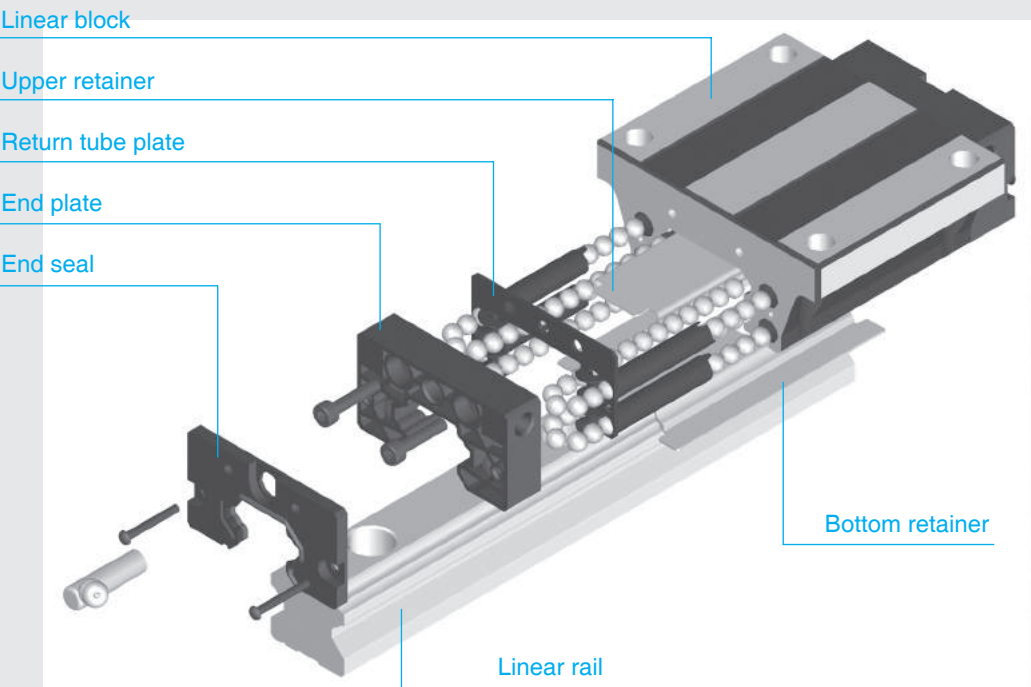
### DF structure

### The same dimension

# Linear Rail System

## SBG Standard Linear Rail System

### The Block Structure



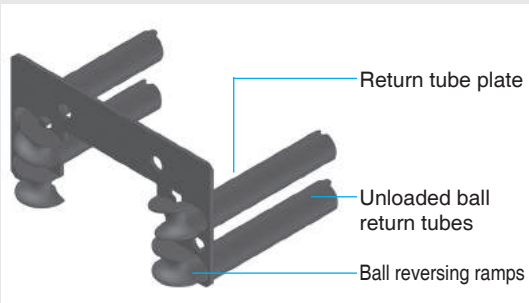
**Linear rail** The same rail profile may be used for every type of block (SBG, SBS, SPG and SPS). SBC uses only high strength and heat-treated special steels in all rails.

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

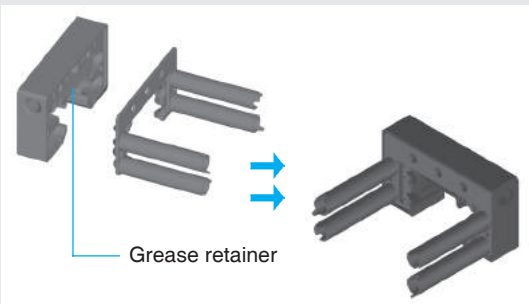
**End seal** New double lip structure which improves resistance to dust and particle contamination.

# Linear Rail System

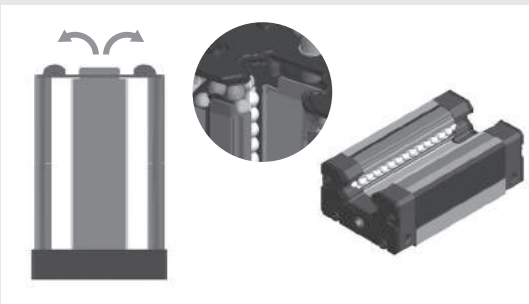
## SBG Standard Linear Rail System



(Structure of return tube plate)



(Close fitting end-plate reduces grease loss)



(Snap assembled)

**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.

**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.

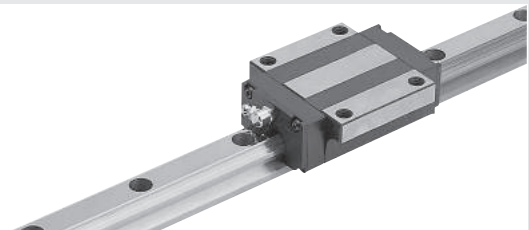
Bottom retainer is one body type with rubber seal to prevent contamination from bottom.

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

# Linear Rail System

## SBG Standard Linear Rail System

### SBG type



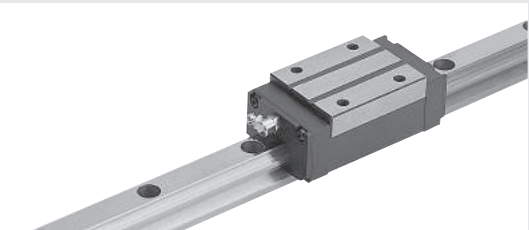
SBG is SBC standard linear block and FL, FLL, SL, SLL are available.

#### SBG-FL/FLL

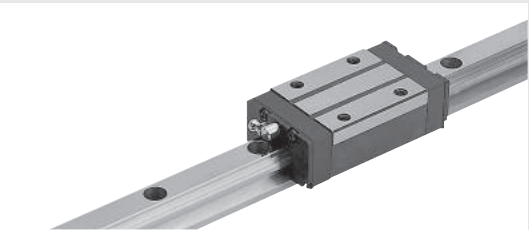
- Flange type
- Size 15~65

#### 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

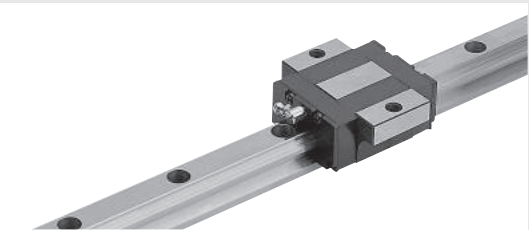
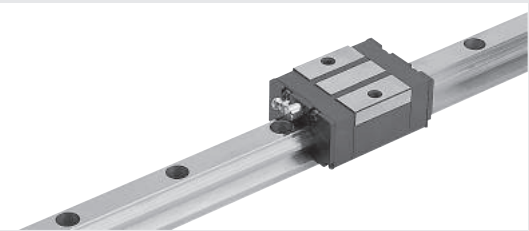
- SBS-SL (Height is higher than SBS-SL/SLL type)
- Size 25

#### SBS-FV

- Flange type with shorter length
- Size 15~25

#### SBS-SV

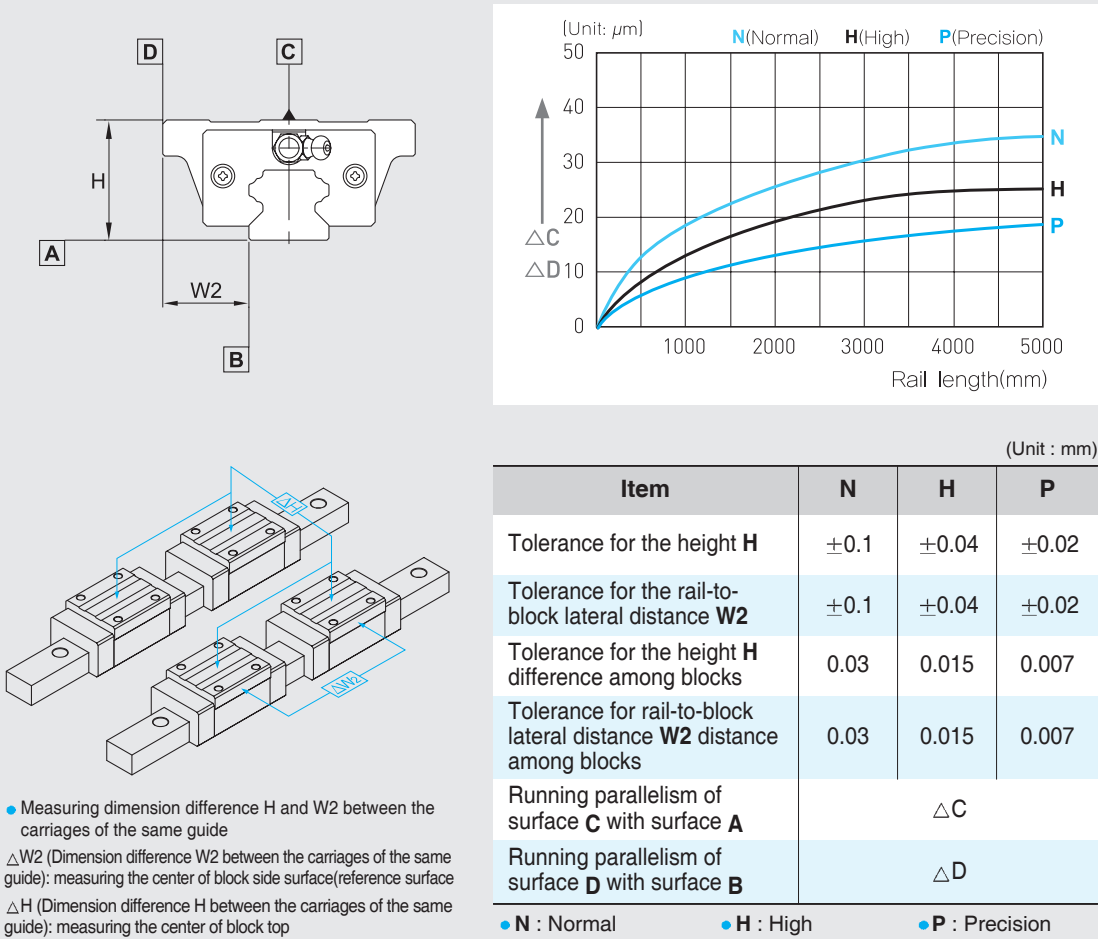
- Slim type with shorter length
- Size 15~25



Linear Rail System

SBG Standard Linear Rail System

Accuracy



Preload

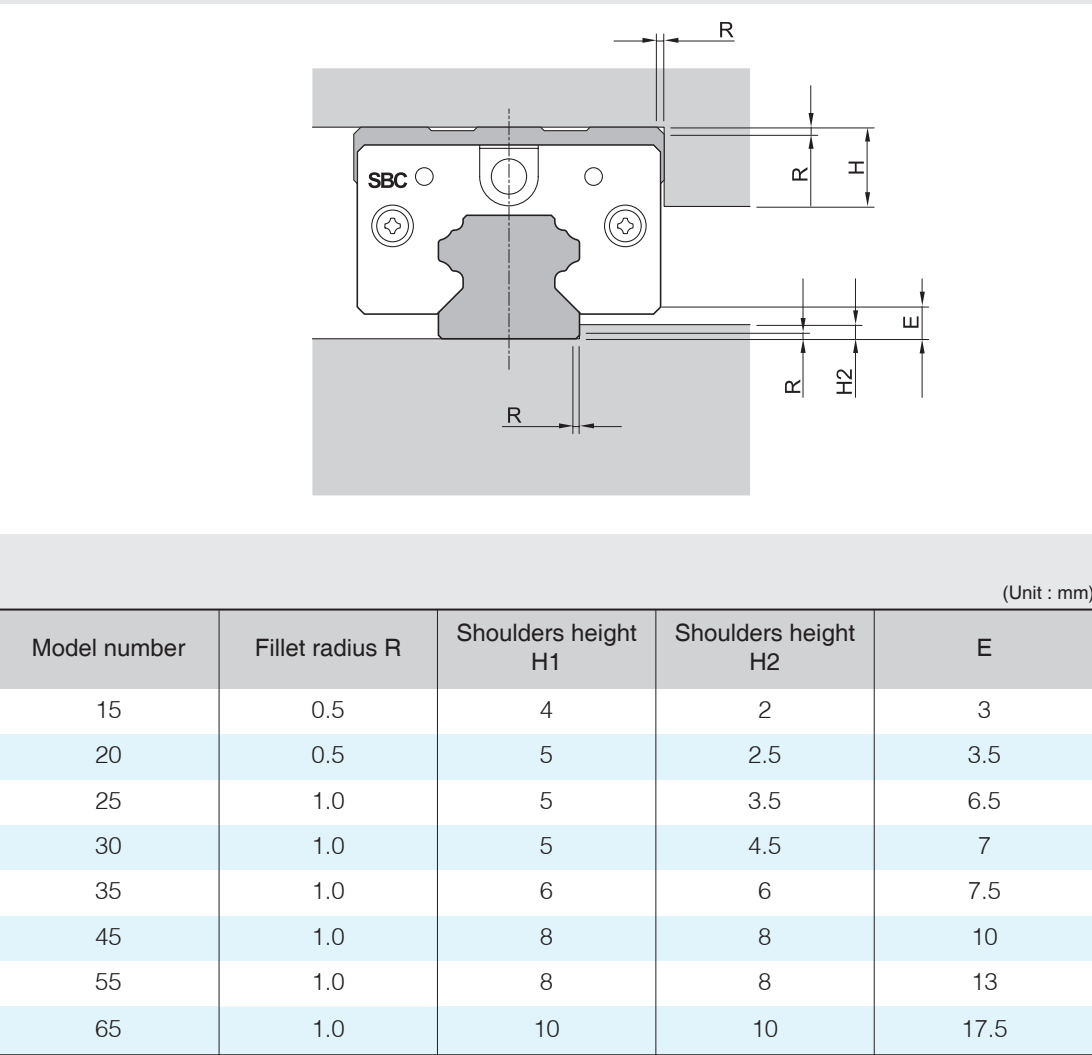
| Reference   | Volume of preload |
|-------------|-------------------|
| K1 (Normal) | Max. 0.02C        |
| K2 (Light)  | 0.04 ~ 0.06C      |
| K3 (Heavy)  | 0.08 ~ 0.10C      |

● C(kN) : Basic dynamic load rating  
※ "K3" Preload is not available for SBG, SBS 15 type

Linear Rail System

SBG Standard Linear Rail System

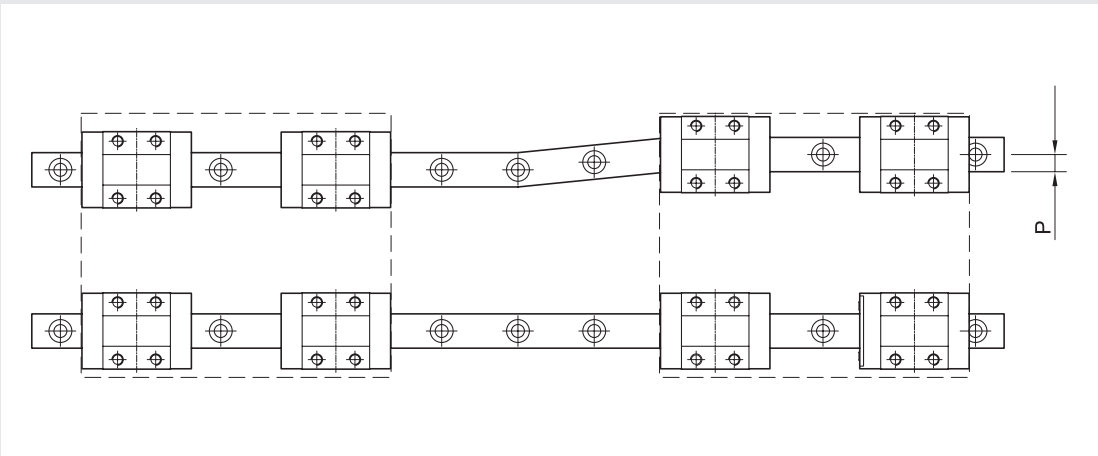
Shoulder height and fillet radius R



Linear Rail System

SBG Standard Linear Rail System

Permissible tolerance (P) of parallelism



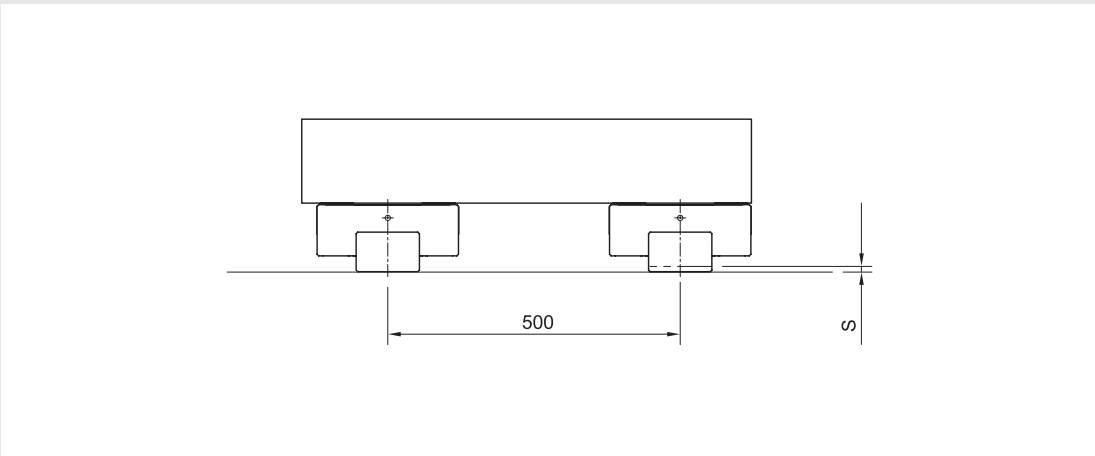
(Unit : mm)

| 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 |

Linear Rail System

SBG Standard Linear Rail System

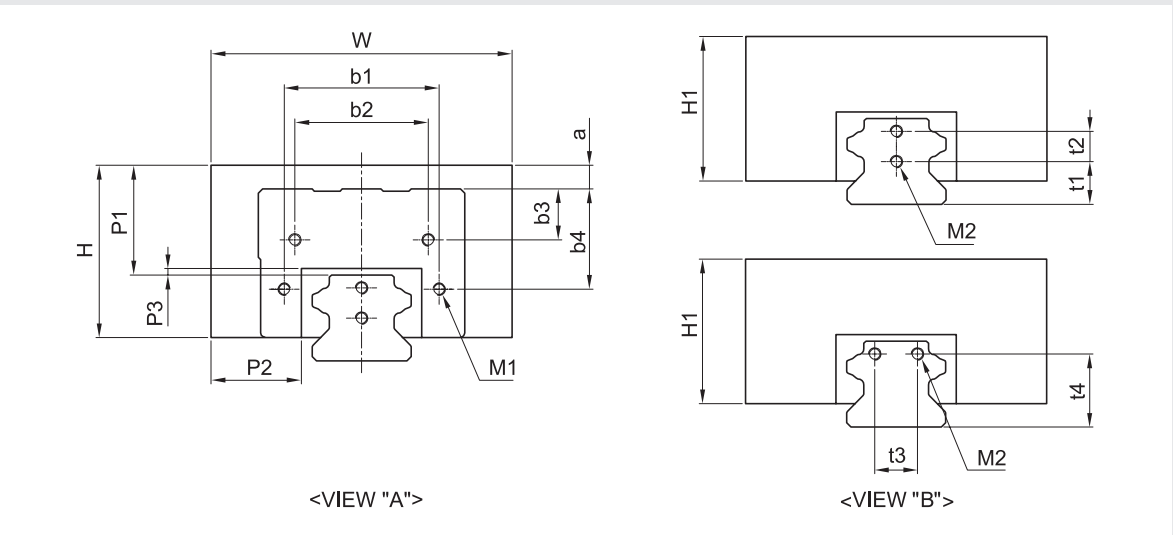
Permissible tolerance (S) of two level offset



(Unit : mm)

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

SH Bellows



| Model number | Applicable type | W   | H    | H1   | P1   | P2   | P3  | a    |       |      |      |      |     | b1   | b2 |
|--------------|-----------------|-----|------|------|------|------|-----|------|-------|------|------|------|-----|------|----|
|              |                 |     |      |      |      |      |     | SBG  |       | SBS  |      |      |     |      |    |
|              |                 |     |      |      |      |      |     | FL   | SL    | SL   | FV   | SV   | HL  |      |    |
| SH15         | SBG(S)15        | 55  | 27   | 27   | 15   | 17   | 1.5 | 6    | 2     | 6    | 6    | 6    | —   | —    | 26 |
| SH20         | SBG(S)20        | 66  | 32   | 32   | 18   | 19   | 3   | 5.5  | 5.5   | 7.5  | 7.5  | 7.5  | —   | 33   | 24 |
| SH25         | SBG(S)25        | 78  | 38   | 38   | 22.7 | 23.5 | 3.7 | 8.5  | 4.5   | 11.5 | 11.5 | 11.5 | 8.5 | 40.8 | 21 |
| SH30         | SBG(S)30        | 84  | 42   | 42   | 24   | 24   | 4   | 7    | 4     | 7    | —    | —    | —   | 53   | 37 |
| SH35         | SBG(S)35        | 88  | 43   | 43   | 21.5 | 22   | 4   | 2.5  | −4.5  | 2.5  | —    | —    | —   | 57   | 57 |
| SH45         | SBG(S)45        | 100 | 50   | 55   | 22   | 22.5 | 4   | 0    | −10   | 0    | —    | —    | —   | 76   | 57 |
| SH55         | SBG55           | 108 | 55.5 | 55.5 | 23.5 | 22.5 | 4.5 | −1.5 | −11.5 | —    | —    | —    | —   | 67   | 62 |
| SH65         | SBG65           | 132 | 71.5 | 71.5 | 30.5 | 28.5 | 6   | −1   | −1    | —    | —    | —    | —   | 92   | 84 |

- \* Same dimension for SBG, SBS, SPG and SPS
- \* The dimension in column “a, b3 and b4” are common for FL=FLL, SL=SLL and HL=HLL.
- \* If SH bellows are applying, rail end mounting holes are necessary.
- \* When you select SH bellows, please select the side grease fitting for lubrication.
- \* Please contact SBC for more information.

[Calculation of bellows length]

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

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

|            | $L_{\min}$      | $L_{\max}$                 |
|------------|-----------------|----------------------------|
| *SBG 15    | Stroke $\div$ 4 | $L_{\min} + \text{Stroke}$ |
| *SBG 20    | Stroke $\div$ 5 |                            |
| *SBG 25~65 | Stroke $\div$ 6 |                            |

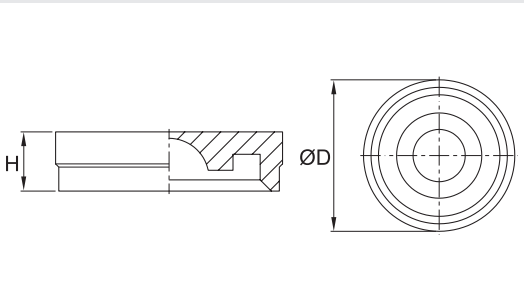
\* Same dimensions for SBG, SBS, SPG, SPS

| (Unit : mm) |      |     |     |     |     |      |      |      |      |      |      |     |    |    |    |                            |           |          |                  |
|-------------|------|-----|-----|-----|-----|------|------|------|------|------|------|-----|----|----|----|----------------------------|-----------|----------|------------------|
| b3          |      |     |     |     |     | b4   |      |      |      |      |      | t1  | t2 | t3 | t4 | Bolt length                |           |          | (Extended ratio) |
| SBG         |      | SBS |     |     |     | SBG  |      | SBS  |      |      |      |     |    |    |    | M1(Block)M2(Block)M3(Rail) |           |          |                  |
| FL          | SL   | SL  | FV  | SV  | HL  | FL   | SL   | SL   | FV   | SV   | HL   |     |    |    |    | M1(Block)                  | M2(Block) | M3(Rail) |                  |
| 10          | 14   | 10  | 10  | 10  | -   | -    | -    | -    | -    | -    | -    | 9   | -  | -  | -  | -                          | M2X8      | M4X8     | 5                |
| 7           | 7    | 5   | 5   | 5   | -   | 14   | 14   | 12   | 12   | 12   | -    | 6.5 | 8  | -  | -  | M2X8                       | M2X8      | M3X6     | 6                |
| 8.2         | 12.2 | 5.2 | 5.2 | 5.2 | 8.2 | 20.2 | 24.2 | 17.2 | 17.2 | 17.2 | 20.2 | 10  | 8  | -  | -  | M2X8                       | M2X8      | M3X6     | 7                |
| 3.5         | 6.5  | 3.5 | -   | -   | -   | 32.5 | 35.5 | 32.5 | -    | -    | -    | 11  | 10 | -  | -  | M3X8                       | M3X8      | M4X8     |                  |
| 3.5         | 10.5 | 3.5 | -   | -   | -   | 37.5 | 44.5 | 37.5 | -    | -    | -    | -   | -  | 14 | 23 | M3X8                       | M3X8      | M4X8     |                  |
| 5           | 15   | 5   | -   | -   | -   | 31.5 | 41.5 | 31.5 | -    | -    | -    | -   | -  | 20 | 29 | M5X10                      | M3X8      | M5X10    |                  |
| 6.3         | 16.3 | -   | -   | -   | -   | 36.5 | 46.5 | -    | -    | -    | -    | -   | -  | 26 | 35 | M5X10                      | M3X8      | M5X10    |                  |
| 6           | 6    | -   | -   | -   | -   | 67.5 | 67.5 | -    | -    | -    | -    | -   | -  | 32 | 42 | M3X8                       | M3X8      | M6X12    |                  |

Ordering example : **SH25 – 70 / 420**  
①      ②      ③

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

RC Cap

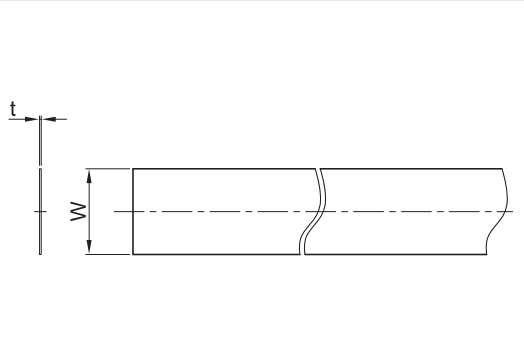


(Unit : mm)

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

- RC 30 is used for 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 | 13  | 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 |

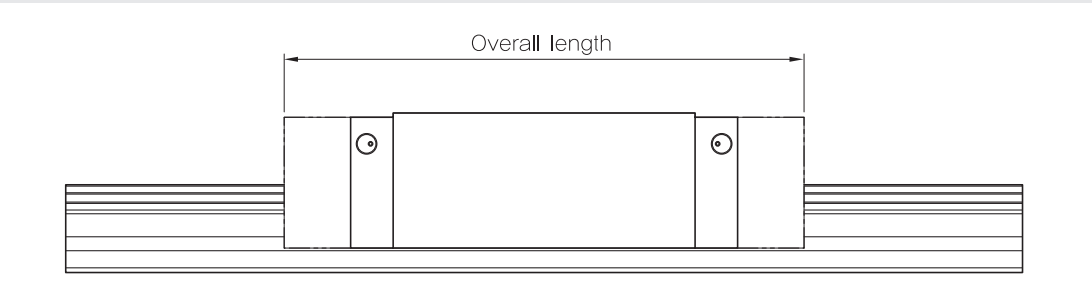
Ordering example : **ST15 - 1000L**  
①      ②

- ① Model number
- ② 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 : MF (Self lubricant) (Unit : mm)

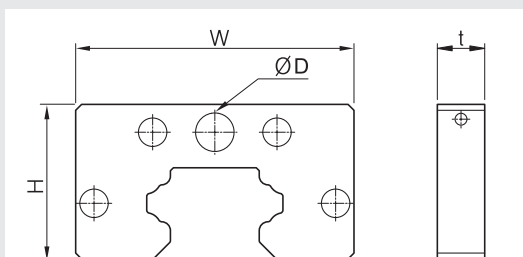
| Additional seal          |     | Standard | DD    | ZZ    | KK    | MF    | MFDD  | MFZZ  | MFKK    |
|--------------------------|-----|----------|-------|-------|-------|-------|-------|-------|---------|
| Indication of seal       |     | E        | E+E   | E+S   | E+E+S | F+E   | F+E+E | F+E+S | F+E+E+S |
| Overall length with seal | 15  | 60.8     | 66.8  | 65.2  | 71.2  | -     | -     | -     | -       |
|                          | 15V | 44.9     | 50.9  | 49.3  | 55.3  | -     | -     | -     | -       |
|                          | 20  | 77.2     | 83.6  | 82.6  | 89    | 93.2  | 99.6  | 98.6  | 105     |
|                          | 20L | 93.2     | 99.6  | 98.6  | 105   | 109.2 | 115.6 | 114.6 | 121     |
|                          | 20V | 54.2     | 60.6  | 59.6  | 66    | 70.2  | 76.6  | 75.6  | 82      |
|                          | 25  | 86.9     | 93.3  | 92.7  | 99.1  | 102.9 | 109.3 | 108.7 | 115.1   |
|                          | 25L | 106.4    | 112.8 | 112.2 | 118.6 | 122.4 | 128.8 | 128.2 | 134.6   |
|                          | 25V | 62.6     | 69    | 68.4  | 74.8  | 78.6  | 85    | 84.4  | 90.8    |
|                          | 30  | 100      | 104.6 | 105.4 | 110   | 116   | 120.6 | 121.4 | 126     |
|                          | 30L | 122.5    | 127.1 | 127.9 | 132.5 | 138.5 | 143.1 | 143.9 | 148.5   |
|                          | 35  | 112.6    | 117.2 | 117.4 | 122   | 128.6 | 133.2 | 133.4 | 138     |
|                          | 35L | 138.1    | 142.7 | 142.9 | 147.5 | 154.1 | 158.7 | 158.9 | 163.5   |
|                          | 45  | 140.3    | 145.1 | 145.2 | 150   | 156.3 | 161.1 | 161.2 | 166     |
|                          | 45L | 172.3    | 177.1 | 177.2 | 182   | 188.3 | 193.1 | 193.2 | 198     |
|                          | 55  | 166.8    | 172.8 | 170.4 | 176.4 | -     | -     | -     | -       |
|                          | 55L | 204.8    | 210.8 | 208.4 | 214.4 | -     | -     | -     | -       |
|                          | 65  | 195.2    | 201.2 | 202.4 | 208.4 | -     | -     | -     | -       |
|                          | 65L | 255.2    | 261.2 | 262.4 | 268.4 | -     | -     | -     | -       |

- 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   |
| 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

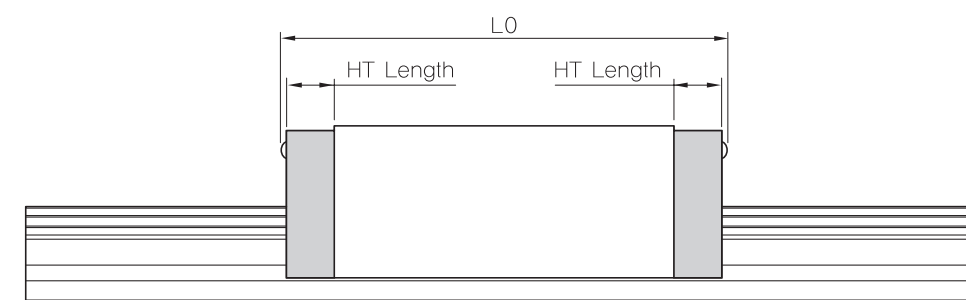
## [Seal resistance]

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 : N) |          |      |
|------------|----------|------|
| Model      | End seal | MF   |
| SBG 15     | 1.96     | -    |
| SBG 20     | 2.58     | 1.61 |
| SBG 25     | 3.92     | 4.21 |
| SBG 30     | 7.84     | 6.37 |
| SBG 35     | 11.76    | 7.06 |
| SBG 45     | 19.6     | 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      | 54.8  | -             | -     | SBS 15V       | 38.9 |
| HT 20       | 10        | SBG(S) 20      | 70.8  | SBG(S) 20L    | 86.8  | SBS 20V       | 47.8 |
| HT 25       | 10.5      | SBG(S) 25      | 83.9  | SBG(S) 25L    | 103.4 | SBS 25V       | 59.6 |
| HT 30       | 11.5      | SBG(S) 30      | 98.4  | SBG(S) 30L    | 120.9 | -             | -    |
| HT 35       | 12        | SBG(S) 35      | 110.4 | SBG(S) 35L    | 135.9 | -             | -    |
| HT 45       | 16        | SBG(S) 45      | 138   | SBG(S) 45L    | 170   | -             | -    |
| HT 55       | 18        | SBG(S) 55      | 162   | SBG(S) 55L    | 200   | -             | -    |
| HT 65       | 18        | SBG(S) 65      | 194   | SBG(S) 65L    | 254   | -             | -    |

Ordering example : **SBG25FL - HT - 2 - K1 - 800 - N**

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

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

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

※ Material : Aluminum

## Grease and nipple specification

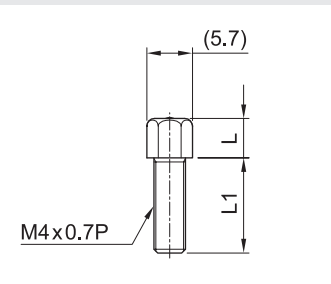
[Grease]

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

[Grease fitting Specification]

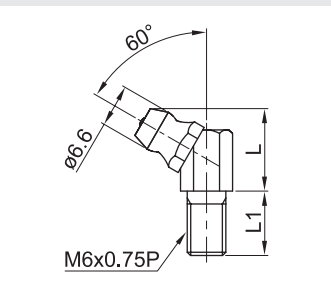
(1) Standard grease fitting (Front grease fitting)

(Unit : mm)



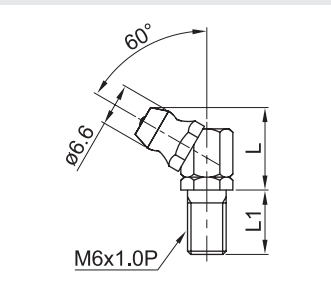
| Specification |                      | M4x0.7P |   |     |
|---------------|----------------------|---------|---|-----|
| Applied model | Grease fitting model | Symbol  | L | L1  |
| SBG(S) 15     | 1N                   | None    | 7 | 5.5 |
|               | 1D                   | DD, ZZ  | 5 | 9   |
|               | 1Z                   | KK      | 5 | 11  |

(Unit : mm)



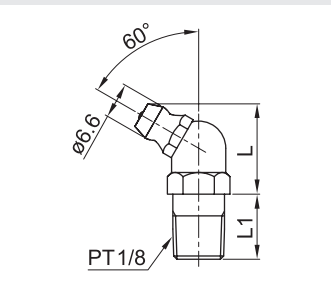
| Specification |                      | M6x0.75P, Asia type |      |    |
|---------------|----------------------|---------------------|------|----|
| Applied model | Grease fitting model | Symbol              | L    | L1 |
| SBG(S) 20~35  | A2N                  | None                | 13.5 | 7  |
|               | A2D                  | DD, ZZ              | 13.5 | 10 |
|               | A2Z                  | KK                  | 13.5 | 13 |

(Unit : mm)



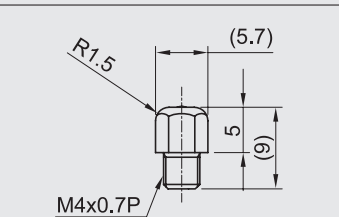
| Specification |                      | M6x1.0P, Europe type |      |    |
|---------------|----------------------|----------------------|------|----|
| Applied model | Grease fitting model | Symbol               | L    | L1 |
| SBG(S) 20~35  | E2N                  | None                 | 13.5 | 7  |
|               | E2D                  | DD, ZZ               | 13.5 | 10 |
|               | E2Z                  | KK                   | 13.5 | 13 |

(Unit : mm)

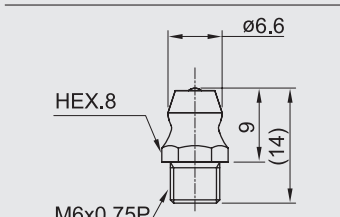


| Specification |                      | PT 1/8       |    |    |
|---------------|----------------------|--------------|----|----|
| Applied model | Grease fitting model | Symbol       | L  | L1 |
| SBG(S) 45~65  | 4N                   | None, DD, ZZ | 17 | 12 |
|               | 4D                   | KK           | 17 | 16 |

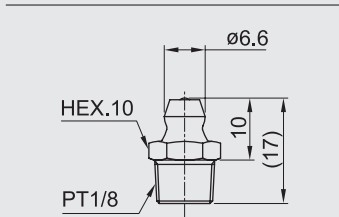
(2) Side grease fitting



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

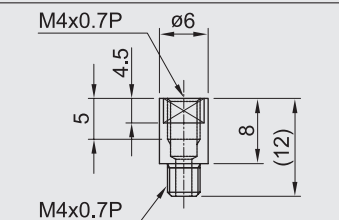


|                      |                       |
|----------------------|-----------------------|
| Specification        | M6x0.75P              |
| Applied model        | SBG(S) 20, 25, 30, 35 |
| Grease fitting model | S3N                   |

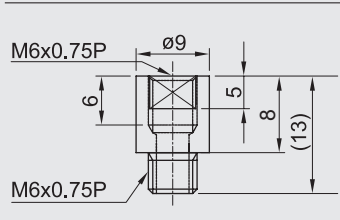


|                      |                   |
|----------------------|-------------------|
| Specification        | PT1/8             |
| Applied model        | SBG(S) 45, 55, 65 |
| Grease fitting model | S4N               |

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



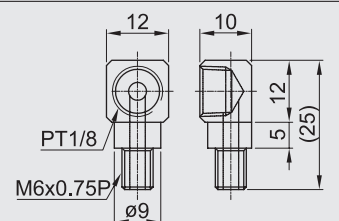
|                      |           |
|----------------------|-----------|
| Specification        | M4x0.7P   |
| Applied model        | SBG(S) 15 |
| Grease fitting model | S1C       |



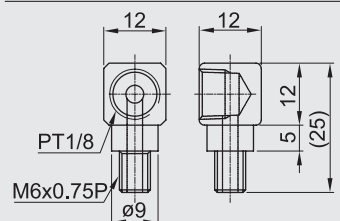
|                      |                       |
|----------------------|-----------------------|
| Specification        | M6x0.75P              |
| Applied model        | SBG(S) 20, 25, 30, 35 |
| Grease fitting model | S4C                   |

\* For size 30~35, two pieces of FS nipple connector are applied.

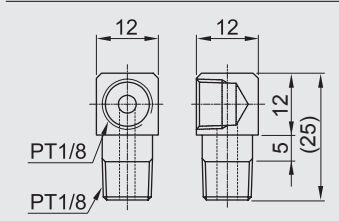
(4) Copper pipe



|                      |           |
|----------------------|-----------|
| Input size           | PT1/8     |
| Output size          | M6x0.75P  |
| Applied model        | SBG(S) 20 |
| Grease fitting model | SB02      |



|                      |                   |
|----------------------|-------------------|
| Input size           | PT1/8             |
| Output size          | M6x0.75P          |
| Applied model        | SBG(S) 25, 30, 35 |
| Grease fitting model | SB01              |



|                      |                   |
|----------------------|-------------------|
| Input size           | PT1/8             |
| Output size          | PT1/8             |
| Applied model        | SBG(S) 45, 55, 65 |
| Grease fitting model | SB21              |

Ordering example

[Ordering example for block]

**SBG20** **FL** – **N** – **DFDD** – **K1** – **KR**  
[1] [2] [3] [4] [5] [6]

- [1] Model
  - [2] Block type
  - [3] Position of grease fitting : None (front), N (side)
  - [4] Option symbol : No symbol (standard), DF (high dust protection), MF (self lubricant), Seal (DD, ZZ, KK)  
\* Please refer to Ooption table
  - [5] Preload : K1, K2, K3
  - [6] Surface treatment : No symbol (Standard), KR (Block surface treatment)
- ※ “K3” Preload is not available for SBG, SBS 15 type

[Ordering example for rail]

**SBG20** – **1000L** – **RR** – **B**  
[1] [2] [3] [4]

- [1] Model
  - [2] Rail length
  - [3] Surface treatment : No symbol (Standard), RR (Block surface treatment)
  - [4] 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** – **MFDD** – **2** – **K1** – **5000** – **J2** – **N** – **AR** – **B** – **II**  
[1] [2] [3] [4] [5] [6] [7] [8] [9] [10] [11] [12]

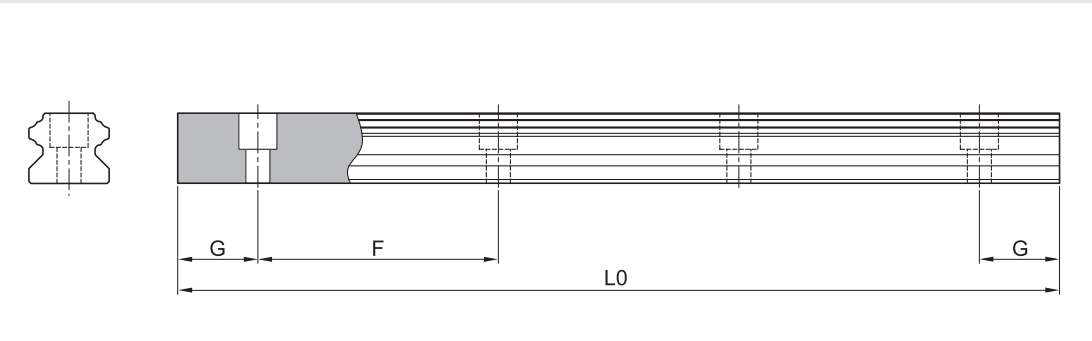
- [1] Model
- [2] Block type
- [3] Position of grease fitting : None (front), N (side)
- [4] Option symbol : No symbol (standard), DF (high dust protection), MF (self lubricant), Seal (DD, ZZ, KK)  
\* Please refer to Ooption table
- [5] Block quantity on rail
- [6] Preload : K1, K2 ,K3
- [7] Rail length
- [8] Rail connection symbol : J2 (2PCS of rail), J3 (3PCS of rail), J4 (4PCS of rail)...
- [9] Accuracy : N, H, P
- [10] Surface treatment : No symbol (Standard), AR (Block and Rail), RR (Rail only) KR (Block only)
- [12] (B) Bottom mounting : No symbol (Standard), B (bottom mounting rail)
- [12] Rail : number of rails per axis, None=I, 2=II... 4=IV etc.

[Option symbol table]

|           |                                 |
|-----------|---------------------------------|
| No symbol | End seal                        |
| DD        | Double seal (End seal+End seal) |
| ZZ        | End seal+Scraper                |
| KK        | Double seal+Scraper             |
| DF        | End seal+DF                     |
| DFDD      | Double seal+DF                  |
| DFZZ      | End seal+DF+Scraper             |
| DFKK      | Double seal+DF+Scraper          |
| MF        | MF+End seal                     |
| MFDD      | MF+Double seal                  |
| MFZZ      | MF+Scraper                      |
| MFKK      | MF+Double seal+Scraper          |
| HT        | High Temperatue End plate       |

- ※ We recommend block and rail assembled to be ordered where high-precision and high- rigidity are required.
- ※ For surface treatment, please mark according to each surface treatment symbol.
- ※ If special G dimension is required, please mark when you place an order.
- ※ Please contact SBC for high temperature order.
- ※ “K3” Preload is not available for SBG, SBS 15 type

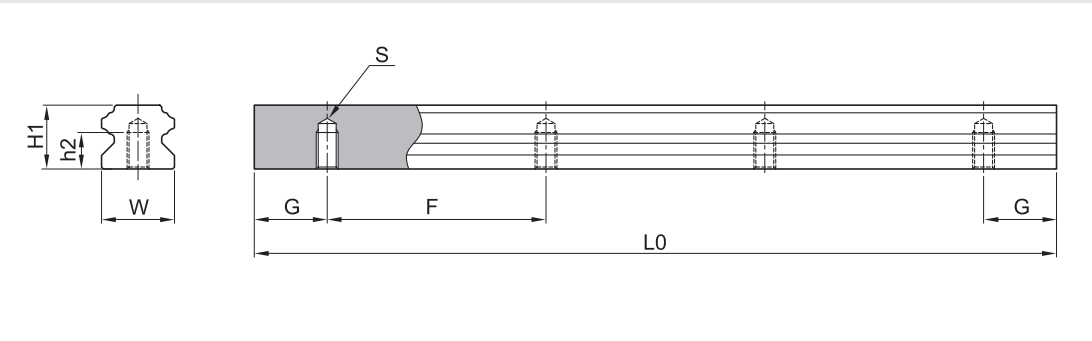
Standard and Max. Length of SBG rail



| (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   | 340   | 340   | 600   | 600   | 1095  | 1020  | 2020  |
|                 | 340   | 460   | 460   | 760   | 760   | 1200  | 1140  | 2470  |
|                 | 460   | 640   | 640   | 1000  | 1000  | 1410  | 1260  | 2620  |
|                 | 640   | 820   | 820   | 1240  | 1240  | 1620  | 1380  | 2920  |
|                 | 820   | 1000  | 1000  | 1480  | 1480  | 1830  | 1500  | 3070  |
|                 | 1000  | 1240  | 1240  | 1640  | 1640  | 2040  | 1620  | —     |
|                 | 1240  | 1480  | 1480  | 1800  | 1800  | 2250  | 1740  | —     |
|                 | 1480  | 1600  | 1600  | 2040  | 2040  | 2460  | 1860  | —     |
|                 | 1600  | 1840  | 1840  | 2200  | 2200  | 2985  | 1980  | —     |
|                 | 1960  | 2080  | 2080  | 2520  | 2520  | 3510  | 2220  | —     |
|                 | 2200  | 2200  | 2200  | 2840  | 2840  | —     | 2580  | —     |
|                 | 2500  | 2500  | 2500  | 3000  | 3000  | —     | 2940  | —     |
|                 | 2860  | 2960  | 2980  | 3480  | 3480  | —     | 3540  | —     |
|                 | —     | 3520  | 3520  | —     | —     | —     | —     | —     |
|                 | —     | 4000  | 4000  | —     | —     | —     | —     | —     |
| F               | 60    | 60    | 60    | 80    | 80    | 105   | 120   | 150   |
| G               | 20    | 20    | 20    | 20    | 20    | 22.5  | 30    | 35    |
| L0(Max length)  | 3,000 | 4,000 | 4,000 | 4,000 | 4,000 | 4,000 | 4,000 | 4,000 |

- \* 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)



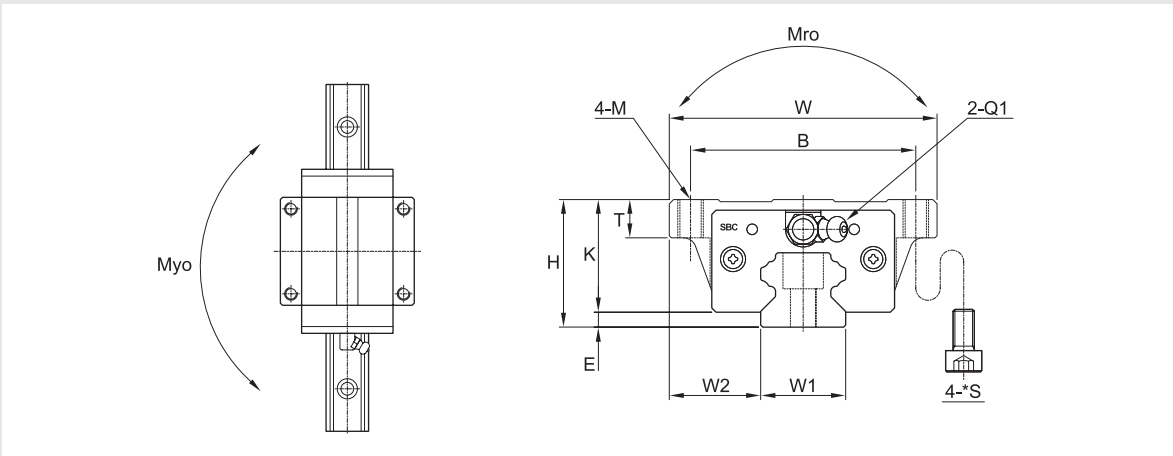
| (Unit : mm)  |    |      |        |    |      |     |                 |               |
|--------------|----|------|--------|----|------|-----|-----------------|---------------|
| Model number | W1 | H1   | S      | h2 | G    | F   | L0 (Max length) | Weight (kg/m) |
| SBG 15-B     | 15 | 15   | M5x0.8 | 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.

Linear Rail System

SBG Standard Linear Rail System

SBG-FL/FLL

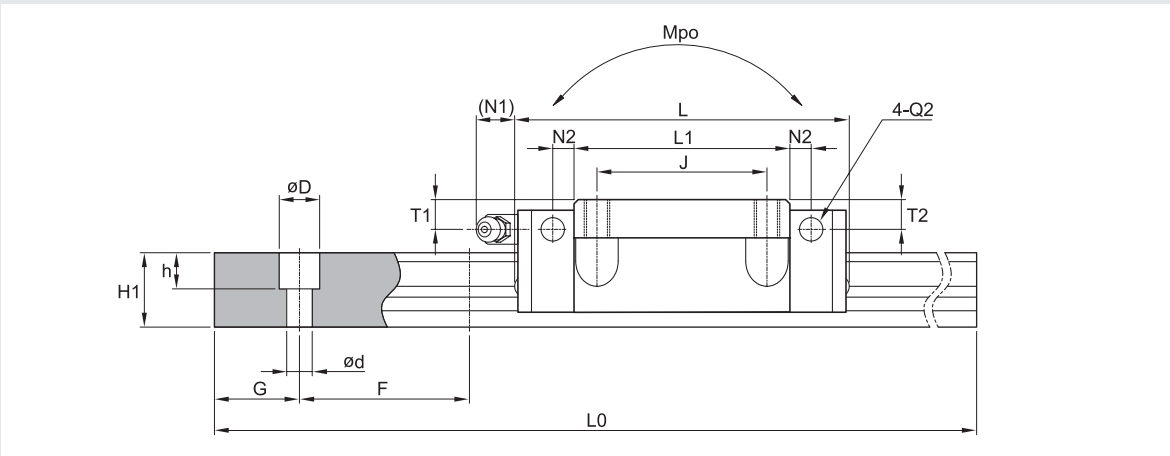


| Model     | Mounting dimension |     |       |      | Block dimensions  |     |     |     |       |     |      |                |      |      |     |         |      |
|-----------|--------------------|-----|-------|------|-------------------|-----|-----|-----|-------|-----|------|----------------|------|------|-----|---------|------|
|           | H                  | W   | L     | E    | Mounting tap hole |     |     |     | L1    | T±1 | K    | Grease fitting |      |      |     |         |      |
|           |                    |     |       |      | B                 | J   | M   | *S  |       |     |      | T1             | N1   | T2   | N2  | Q1      | *Q2  |
| SBG15 FL  | 24                 | 47  | 60.8  | 3    | 38                | 30  | M5  | M4  | 38.8  | 7.2 | 21   | 4              | 5.5  | 4.5  | 4.5 | M4x0.7  | Ø3.5 |
| SBG20 FL  | 30                 | 63  | 77.2  | 3.5  | 53                | 40  | M6  | M5  | 50.8  | 9   | 26.5 | 7              | 12   | 7    | 5   | M6x0.75 | Ø5.5 |
| SBG20 FLL | 30                 | 63  | 93.2  | 3.5  | 53                | 40  | M6  | M5  | 66.8  | 9   | 26.5 | 7              | 12   | 7    | 5   | M6x0.75 | Ø5.5 |
| SBG25 FL  | 36                 | 70  | 86.9  | 6.5  | 57                | 45  | M8  | M6  | 59.5  | 10  | 29.5 | 8.2            | 12   | 8.1  | 5.5 | M6x0.75 | Ø5.5 |
| SBG25 FLL | 36                 | 70  | 106.4 | 6.5  | 57                | 45  | M8  | M6  | 79    | 10  | 29.5 | 8.2            | 12   | 8.1  | 5.5 | M6x0.75 | Ø5.5 |
| SBG30 FL  | 42                 | 90  | 100   | 7    | 72                | 52  | M10 | M8  | 70.4  | 12  | 35   | 8.5            | 12   | 8.5  | 5.5 | M6x0.75 | Ø5.5 |
| SBG30 FLL | 42                 | 90  | 122.5 | 7    | 72                | 52  | M10 | M8  | 92.9  | 12  | 35   | 8.5            | 12   | 8.5  | 5.5 | M6x0.75 | Ø5.5 |
| SBG35 FL  | 48                 | 100 | 112.6 | 7.5  | 82                | 62  | M10 | M8  | 80.4  | 13  | 40.5 | 8              | 12   | 8    | 6   | M6x0.75 | Ø5.5 |
| SBG35 FLL | 48                 | 100 | 138.1 | 7.5  | 82                | 62  | M10 | M8  | 105.9 | 13  | 40.5 | 8              | 12   | 8    | 6   | M6x0.75 | Ø5.5 |
| SBG45 FL  | 60                 | 120 | 140.3 | 10   | 100               | 80  | M12 | M10 | 98    | 15  | 50   | 10             | 16.5 | 10   | 8   | PT1/8   | Ø8.5 |
| SBG45 FLL | 60                 | 120 | 172.3 | 10   | 100               | 80  | M12 | M10 | 130   | 15  | 50   | 10             | 16.5 | 10   | 8   | PT1/8   | Ø8.5 |
| SBG55 FL  | 70                 | 140 | 166.8 | 13   | 116               | 95  | M14 | M12 | 118   | 17  | 57   | 12             | 16.5 | 10.5 | 10  | PT1/8   | Ø8.5 |
| SBG55 FLL | 70                 | 140 | 204.8 | 13   | 116               | 95  | M14 | M12 | 156   | 17  | 57   | 12             | 16.5 | 10.5 | 10  | PT1/8   | Ø8.5 |
| SBG65 FL  | 90                 | 170 | 195.2 | 17.5 | 142               | 110 | M16 | M14 | 147   | 23  | 72.5 | 15             | 16.5 | 12   | 10  | PT1/8   | Ø8.5 |
| SBG65 FLL | 90                 | 170 | 255.2 | 17.5 | 142               | 110 | M16 | M14 | 207   | 23  | 72.5 | 15             | 16.5 | 12   | 10  | PT1/8   | Ø8.5 |

- ① C (Basic dynamic load rating), Co (Basic static load rating)
- ② \*S: Bolt size for bottom mounting type of block.

Linear Rail System

SBG Standard Linear Rail System



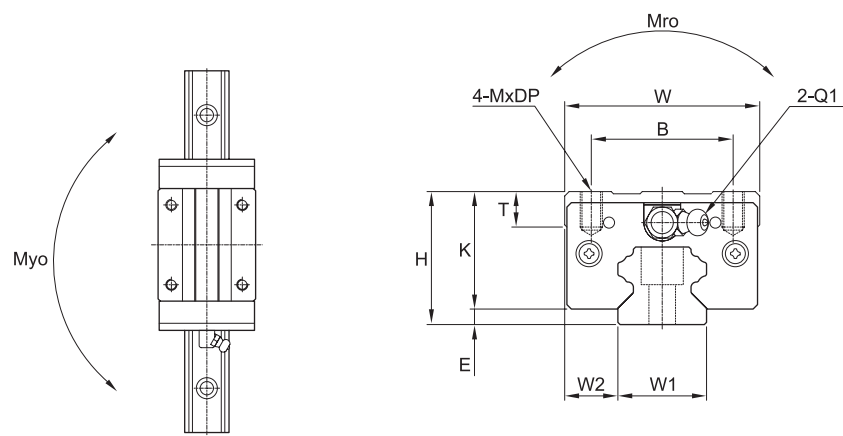
| (Unit : mm)    |      |      |     |           |     |     |      |                                |                           |       |                                       |      |      |               |                |
|----------------|------|------|-----|-----------|-----|-----|------|--------------------------------|---------------------------|-------|---------------------------------------|------|------|---------------|----------------|
| Rail dimension |      |      |     |           |     |     |      |                                | Basic load rating<br>[kN] |       | Permissible static moment<br>[kN · m] |      |      | Mass          |                |
| W1             | W2   | H1   | F   | Bolt hole |     |     | G    | Max<br>length<br>of rail<br>L0 |                           |       |                                       |      |      | Block<br>[kg] | Rail<br>[kg/m] |
|                |      |      |     | d         | D   | h   |      |                                |                           |       |                                       |      |      |               |                |
| 15             | 16   | 15   | 60  | 4,5       | 7,5 | 5,3 | 20   | 3000                           | 8,33                      | 13,4  | 0,07                                  | 0,05 | 0,05 | 0,19          | 1,45           |
| 20             | 21,5 | 17,5 | 60  | 6         | 9,5 | 8,5 | 20   | 4000                           | 14,2                      | 25    | 0,22                                  | 0,18 | 0,18 | 0,45          | 2,2            |
| 20             | 21,5 | 17,5 | 60  | 6         | 9,5 | 8,5 | 20   | 4000                           | 16,9                      | 36,5  | 0,28                                  | 0,31 | 0,31 | 0,52          | 2,2            |
| 23             | 23,5 | 21,8 | 60  | 7         | 11  | 9   | 20   | 4000                           | 20,9                      | 39,2  | 0,35                                  | 0,31 | 0,3  | 0,61          | 3,1            |
| 23             | 23,5 | 21,8 | 60  | 7         | 11  | 9   | 20   | 4000                           | 24,6                      | 48    | 0,43                                  | 0,49 | 0,48 | 0,81          | 3,1            |
| 28             | 31   | 25   | 80  | 9         | 14  | 12  | 20   | 4000                           | 29,2                      | 53,8  | 0,59                                  | 0,49 | 0,48 | 1,07          | 4,45           |
| 28             | 31   | 25   | 80  | 9         | 14  | 12  | 20   | 4000                           | 35,3                      | 67,9  | 0,74                                  | 0,79 | 0,78 | 1,43          | 4,45           |
| 34             | 33   | 29   | 80  | 9         | 14  | 12  | 20   | 4000                           | 38,8                      | 68,6  | 0,94                                  | 0,74 | 0,72 | 1,58          | 6,4            |
| 34             | 33   | 29   | 80  | 9         | 14  | 12  | 20   | 4000                           | 46                        | 90,4  | 1,24                                  | 1,3  | 1,28 | 2,03          | 6,4            |
| 45             | 37,5 | 38   | 105 | 14        | 20  | 17  | 22,5 | 4000                           | 61,6                      | 110,6 | 1,98                                  | 1,56 | 1,54 | 2,79          | 11,25          |
| 45             | 37,5 | 38   | 105 | 14        | 20  | 17  | 22,5 | 4000                           | 75,5                      | 138,5 | 2,45                                  | 2,33 | 2,3  | 4,31          | 11,25          |
| 53             | 43,5 | 45   | 120 | 16        | 23  | 20  | 30   | 4000                           | 91,2                      | 156,9 | 3,37                                  | 2,69 | 2,65 | 4,41          | 15,25          |
| 53             | 43,5 | 45   | 120 | 16        | 23  | 20  | 30   | 4000                           | 111,8                     | 196,6 | 4,19                                  | 4,05 | 3,97 | 5,82          | 15,25          |
| 63             | 53,5 | 58,5 | 150 | 18        | 26  | 22  | 35   | 4000                           | 147,9                     | 240,1 | 6,17                                  | 4,85 | 4,75 | 8,94          | 23,9           |
| 63             | 53,5 | 58,5 | 150 | 18        | 26  | 22  | 35   | 4000                           | 189,1                     | 320,4 | 8,18                                  | 8,34 | 8,14 | 12,68         | 23,9           |

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

Linear Rail System

SBG Standard Linear Rail System

SBG-SL/SLL

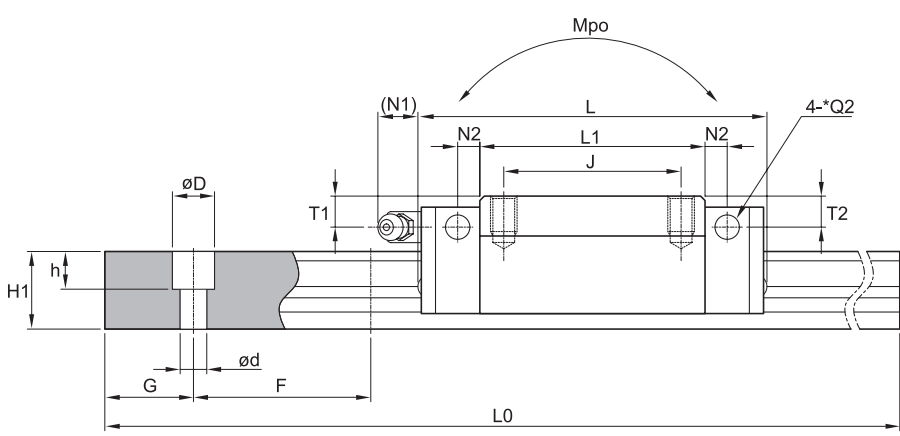


| Model     | Mounting dimension |     |       |      | Block dimensions  |     |     |    |       |     |      |                |      |      |     |         |      |
|-----------|--------------------|-----|-------|------|-------------------|-----|-----|----|-------|-----|------|----------------|------|------|-----|---------|------|
|           | H                  | W   | L     | E    | Mounting tap hole |     |     |    | L1    | T±1 | K    | Grease fitting |      |      |     |         |      |
|           |                    |     |       |      | B                 | J   | M   | DP |       |     |      | T1             | N1   | T2   | N2  | Q1      | *Q2  |
| SBG15 SL  | 28                 | 34  | 60.8  | 3    | 26                | 26  | M4  | 5  | 38.8  | 8   | 25   | 8              | 5.5  | 8.5  | 4.5 | M4x0.7  | Ø3.5 |
| SBG20 SL  | 30                 | 44  | 77.2  | 3.5  | 32                | 36  | M5  | 8  | 50.8  | 8   | 26.5 | 7              | 12   | 7    | 5   | M6x0.75 | Ø5.5 |
| SBG20 SLL | 30                 | 44  | 93.2  | 3.5  | 32                | 50  | M5  | 8  | 66.8  | 8   | 26.5 | 7              | 12   | 7    | 5   | M6x0.75 | Ø5.5 |
| SBG25 SL  | 40                 | 48  | 86.9  | 6.5  | 35                | 35  | M6  | 8  | 59.5  | 12  | 33.5 | 12.2           | 12   | 12.1 | 5.5 | M6x0.75 | Ø5.5 |
| SBG25 SLL | 40                 | 48  | 106.4 | 6.5  | 35                | 50  | M6  | 8  | 79    | 12  | 33.5 | 12.2           | 12   | 12.1 | 5.5 | M6x0.75 | Ø5.5 |
| SBG30 SL  | 45                 | 60  | 100   | 7    | 40                | 40  | M8  | 10 | 70.4  | 12  | 38   | 11.5           | 12   | 11.5 | 5.5 | M6x0.75 | Ø5.5 |
| SBG30 SLL | 45                 | 60  | 122.5 | 7    | 40                | 60  | M8  | 10 | 92.9  | 12  | 38   | 11.5           | 12   | 11.5 | 5.5 | M6x0.75 | Ø5.5 |
| SBG35 SL  | 55                 | 70  | 112.6 | 7.5  | 50                | 50  | M8  | 12 | 80.4  | 15  | 47.5 | 15             | 12   | 15   | 6   | M6x0.75 | Ø5.5 |
| SBG35 SLL | 55                 | 70  | 138.1 | 7.5  | 50                | 72  | M8  | 12 | 105.9 | 15  | 47.5 | 15             | 12   | 15   | 6   | M6x0.75 | Ø5.5 |
| SBG45 SL  | 70                 | 86  | 140.3 | 10   | 60                | 60  | M10 | 13 | 98    | 15  | 60   | 15             | 16.5 | 20   | 8   | PT1/8   | Ø8.5 |
| SBG45 SLL | 70                 | 86  | 172.3 | 10   | 60                | 80  | M10 | 13 | 130   | 15  | 60   | 15             | 16.5 | 20   | 8   | PT1/8   | Ø8.5 |
| SBG55 SL  | 80                 | 100 | 166.8 | 13   | 75                | 75  | M12 | 18 | 118   | 18  | 67   | 18             | 16.5 | 20.5 | 10  | PT1/8   | Ø8.5 |
| SBG55 SLL | 80                 | 100 | 204.8 | 13   | 75                | 95  | M12 | 18 | 156   | 18  | 67   | 18             | 16.5 | 20.5 | 10  | PT1/8   | Ø8.5 |
| SBG65 SL  | 90                 | 126 | 195.2 | 17.5 | 76                | 70  | M16 | 20 | 147   | 23  | 72.5 | 23             | 16.5 | 12   | 10  | PT1/8   | Ø8.5 |
| SBG65 SLL | 90                 | 126 | 255.2 | 17.5 | 76                | 120 | M16 | 20 | 207   | 23  | 72.5 | 23             | 16.5 | 12   | 10  | PT1/8   | Ø8.5 |

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

Linear Rail System

SBG Standard Linear Rail System



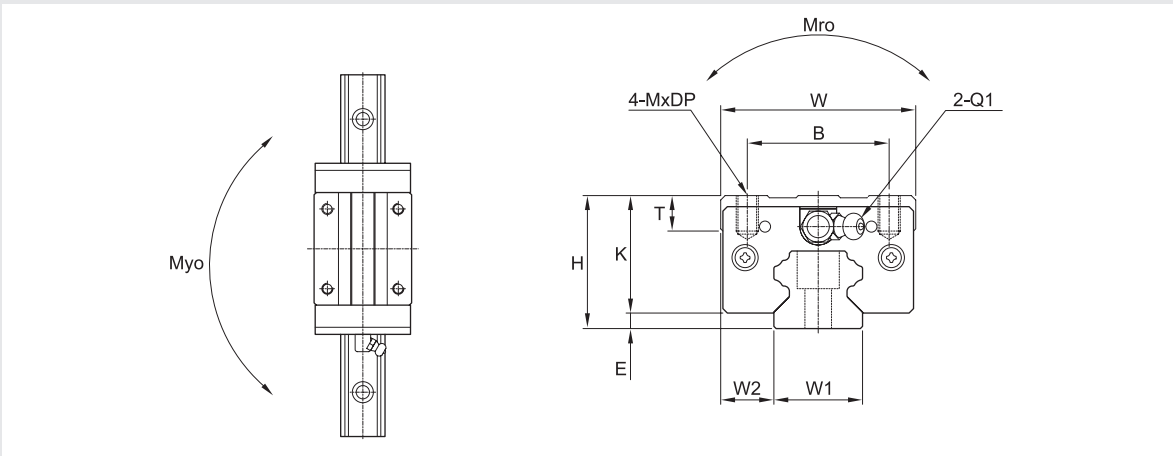
| (Unit : mm)    |      |      |     |           |     |     |      |                                |                           |       |                                       |      |      |               |                |
|----------------|------|------|-----|-----------|-----|-----|------|--------------------------------|---------------------------|-------|---------------------------------------|------|------|---------------|----------------|
| Rail dimension |      |      |     |           |     |     |      |                                | Basic load rating<br>[kN] |       | Permissible static moment<br>[kN • m] |      |      | Mass          |                |
| W1             | W2   | H1   | F   | Bolt hole |     |     | G    | Max<br>length<br>of rail<br>L0 |                           |       |                                       |      |      | Block<br>[kg] | Rail<br>[kg/m] |
|                |      |      |     | d         | D   | h   |      |                                |                           |       |                                       |      |      |               |                |
| 15             | 9.5  | 15   | 60  | 4.5       | 7.5 | 5.3 | 20   | 3000                           | 8.33                      | 13.4  | 0.07                                  | 0.05 | 0.05 | 0.21          | 1.45           |
| 20             | 12   | 17.5 | 60  | 6         | 9.5 | 8.5 | 20   | 4000                           | 14.2                      | 25    | 0.22                                  | 0.18 | 0.18 | 0.34          | 2.2            |
| 20             | 12   | 17.5 | 60  | 6         | 9.5 | 8.5 | 20   | 4000                           | 16.9                      | 36.5  | 0.28                                  | 0.31 | 0.31 | 0.44          | 2.2            |
| 23             | 12.5 | 21.8 | 60  | 7         | 11  | 9   | 20   | 4000                           | 20.9                      | 39.2  | 0.35                                  | 0.31 | 0.3  | 0.57          | 3.1            |
| 23             | 12.5 | 21.8 | 60  | 7         | 11  | 9   | 20   | 4000                           | 24.6                      | 48    | 0.43                                  | 0.49 | 0.48 | 0.74          | 3.1            |
| 28             | 16   | 25   | 80  | 9         | 14  | 12  | 20   | 4000                           | 29.2                      | 53.8  | 0.59                                  | 0.49 | 0.48 | 0.92          | 4.45           |
| 28             | 16   | 25   | 80  | 9         | 14  | 12  | 20   | 4000                           | 35.3                      | 67.9  | 0.74                                  | 0.79 | 0.78 | 1.22          | 4.45           |
| 34             | 18   | 29   | 80  | 9         | 14  | 12  | 20   | 4000                           | 38.8                      | 68.6  | 0.94                                  | 0.74 | 0.72 | 1.57          | 6.4            |
| 34             | 18   | 29   | 80  | 9         | 14  | 12  | 20   | 4000                           | 46                        | 90.4  | 1.24                                  | 1.3  | 1.28 | 2.05          | 6.4            |
| 45             | 20.5 | 38   | 105 | 14        | 20  | 17  | 22.5 | 4000                           | 61.6                      | 110.6 | 1.98                                  | 1.56 | 1.54 | 2.94          | 11.25          |
| 45             | 20.5 | 38   | 105 | 14        | 20  | 17  | 22.5 | 4000                           | 75.5                      | 138.5 | 2.45                                  | 2.33 | 2.3  | 3.87          | 11.25          |
| 53             | 23.5 | 45   | 120 | 16        | 23  | 20  | 30   | 4000                           | 91.2                      | 156.9 | 3.37                                  | 2.69 | 2.65 | 4.51          | 15.25          |
| 53             | 23.5 | 45   | 120 | 16        | 23  | 20  | 30   | 4000                           | 111.8                     | 196.6 | 4.19                                  | 4.05 | 3.97 | 5.68          | 15.25          |
| 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           |
| 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           |

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

Linear Rail System

SBG Standard Linear Rail System

SBS-SL, HL/SLL, HLL

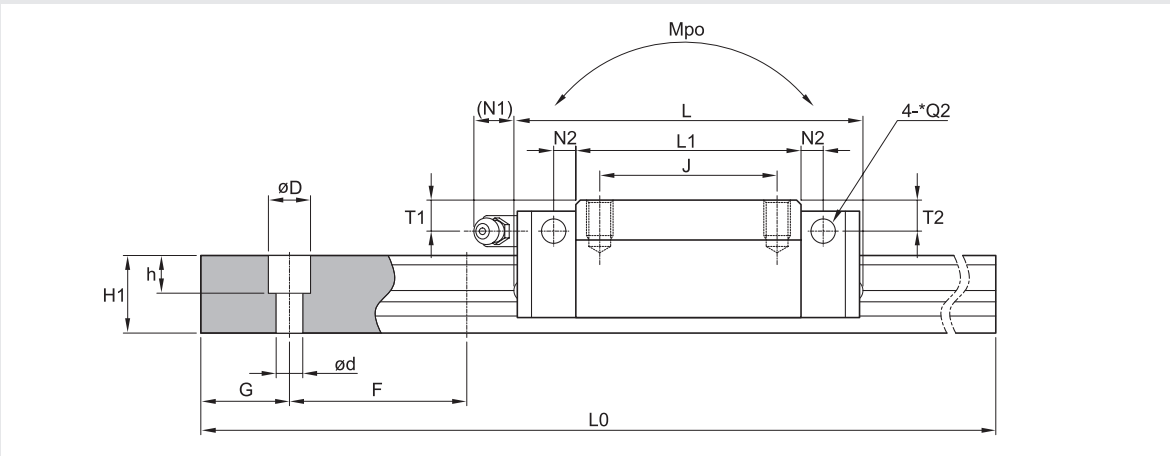


| Model     | Mounting dimension |    |       |     | Block dimensions  |    |     |    |       |     |      |                |      |     |     |         |      |
|-----------|--------------------|----|-------|-----|-------------------|----|-----|----|-------|-----|------|----------------|------|-----|-----|---------|------|
|           | H                  | W  | L     | E   | Mounting tap hole |    |     |    | L1    | T±1 | K    | Grease fitting |      |     |     |         |      |
|           |                    |    |       |     | B                 | J  | M   | DP |       |     |      | T1             | N1   | T2  | N2  | Q1      | *Q2  |
| SBS15 SL  | 24                 | 34 | 60.8  | 3   | 26                | 26 | M4  | 5  | 38.8  | 6   | 21   | 4              | 5.5  | 4.5 | 4.5 | M4x0.7  | Ø3.5 |
| SBS20 SL  | 28                 | 44 | 77.2  | 3.5 | 32                | 32 | M5  | 7  | 50.8  | 7.5 | 24.5 | 5              | 12   | 5   | 5   | M6x0.75 | Ø5.5 |
| SBS20 SLL | 28                 | 44 | 93.2  | 3.5 | 32                | 50 | M5  | 7  | 66.8  | 7.5 | 24.5 | 5              | 12   | 5   | 5   | M6x0.75 | Ø5.5 |
| SBS25 SL  | 33                 | 48 | 86.9  | 6.5 | 35                | 35 | M6  | 6  | 59.5  | 8   | 26.5 | 5.2            | 12   | 5.1 | 5.5 | M6x0.75 | Ø5.5 |
| SBS25 SLL | 33                 | 48 | 106.4 | 6.5 | 35                | 50 | M6  | 6  | 79    | 8   | 26.5 | 5.2            | 12   | 5.1 | 5.5 | M6x0.75 | Ø5.5 |
| SBS25 HL  | 36                 | 48 | 86.9  | 6.5 | 35                | 35 | M6  | 8  | 59.5  | 11  | 29.5 | 8.2            | 12   | 8.1 | 5.5 | M6x0.75 | Ø5.5 |
| SBS25 HLL | 36                 | 48 | 106.4 | 6.5 | 35                | 50 | M6  | 8  | 79    | 11  | 29.5 | 8.2            | 12   | 8.1 | 5.5 | M6x0.75 | Ø5.5 |
| SBS30 SL  | 42                 | 60 | 100   | 7   | 40                | 40 | M8  | 10 | 70.4  | 12  | 35   | 8.5            | 12   | 8.5 | 5.5 | M6x0.75 | Ø5.5 |
| SBS30 SLL | 42                 | 60 | 122.5 | 7   | 40                | 60 | M8  | 10 | 92.9  | 12  | 35   | 8.5            | 12   | 8.5 | 5.5 | M6x0.75 | Ø5.5 |
| SBS35 SL  | 48                 | 70 | 112.6 | 7.5 | 50                | 50 | M8  | 12 | 80.4  | 15  | 40.5 | 8              | 12   | 8   | 6   | M6x0.75 | Ø5.5 |
| SBS35 SLL | 48                 | 70 | 138.1 | 7.5 | 50                | 72 | M8  | 12 | 105.9 | 15  | 40.5 | 8              | 12   | 8   | 6   | M6x0.75 | Ø5.5 |
| SBS45 SL  | 60                 | 86 | 140.3 | 10  | 60                | 60 | M10 | 10 | 98    | 15  | 50   | 10             | 16.5 | 10  | 8   | PT1/8   | Ø8.5 |
| SBS45 SLL | 60                 | 86 | 172.3 | 10  | 60                | 80 | M10 | 10 | 130   | 15  | 50   | 10             | 16.5 | 10  | 8   | PT1/8   | Ø8.5 |

- 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

SBG Standard Linear Rail System

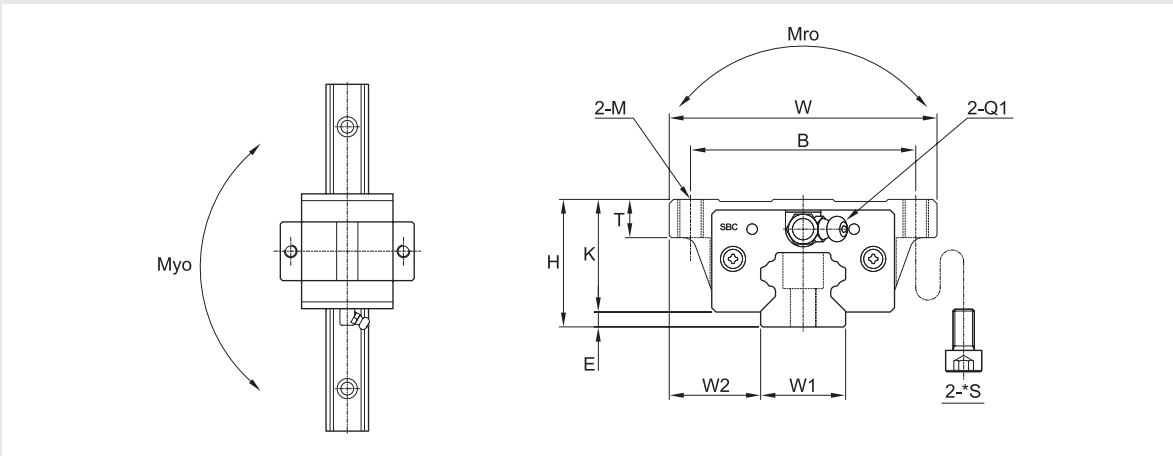


| (Unit : mm)    |      |      |     |           |     |     |      |                       |                           |       |                                       |      |      |            |             |
|----------------|------|------|-----|-----------|-----|-----|------|-----------------------|---------------------------|-------|---------------------------------------|------|------|------------|-------------|
| Rail dimension |      |      |     |           |     |     |      |                       | Basic load rating<br>[kN] |       | Permissible static moment<br>[kN • m] |      |      | Mass       |             |
| W1             | W2   | H1   | F   | Bolt hole |     |     | G    | Max length of rail L0 |                           |       |                                       |      |      | Block [kg] | Rail [kg/m] |
|                |      |      |     | d         | D   | h   |      |                       |                           |       |                                       |      |      |            |             |
| 15             | 9.5  | 15   | 60  | 4.5       | 7.5 | 5.3 | 20   | 3000                  | 8.33                      | 13.4  | 0.07                                  | 0.05 | 0.05 | 0.17       | 1.45        |
| 20             | 12   | 17.5 | 60  | 6         | 9.5 | 8.5 | 20   | 4000                  | 14.2                      | 25    | 0.22                                  | 0.18 | 0.18 | 0.31       | 2.2         |
| 20             | 12   | 17.5 | 60  | 6         | 9.5 | 8.5 | 20   | 4000                  | 16.9                      | 36.5  | 0.28                                  | 0.31 | 0.31 | 0.39       | 2.2         |
| 23             | 12.5 | 21.8 | 60  | 7         | 11  | 9   | 20   | 4000                  | 20.9                      | 39.2  | 0.35                                  | 0.31 | 0.3  | 0.42       | 3.1         |
| 23             | 12.5 | 21.8 | 60  | 7         | 11  | 9   | 20   | 4000                  | 24.6                      | 48    | 0.43                                  | 0.49 | 0.48 | 0.54       | 3.1         |
| 23             | 12.5 | 21.8 | 60  | 7         | 11  | 9   | 20   | 4000                  | 20.9                      | 39.2  | 0.35                                  | 0.31 | 0.3  | 0.49       | 3.1         |
| 23             | 12.5 | 21.8 | 60  | 7         | 11  | 9   | 20   | 4000                  | 24.6                      | 48    | 0.43                                  | 0.49 | 0.48 | 0.62       | 3.1         |
| 28             | 16   | 25   | 80  | 9         | 14  | 12  | 20   | 4000                  | 29.2                      | 53.8  | 0.59                                  | 0.49 | 0.48 | 0.86       | 4.45        |
| 28             | 16   | 25   | 80  | 9         | 14  | 12  | 20   | 4000                  | 35.3                      | 67.9  | 0.74                                  | 0.79 | 0.78 | 1.10       | 4.45        |
| 34             | 18   | 29   | 80  | 9         | 14  | 12  | 20   | 4000                  | 38.8                      | 68.6  | 0.94                                  | 0.74 | 0.72 | 1.27       | 6.4         |
| 34             | 18   | 29   | 80  | 9         | 14  | 12  | 20   | 4000                  | 46                        | 90.4  | 1.24                                  | 1.3  | 1.28 | 1.66       | 6.4         |
| 45             | 20.5 | 38   | 105 | 14        | 20  | 17  | 22.5 | 4000                  | 61.6                      | 110.6 | 1.98                                  | 1.56 | 1.54 | 2.30       | 11.25       |
| 45             | 20.5 | 38   | 105 | 14        | 20  | 17  | 22.5 | 4000                  | 75.5                      | 138.5 | 2.45                                  | 2.33 | 2.3  | 3.0        | 11.25       |

Linear Rail System

SBG Standard Linear Rail System

SBS-FV

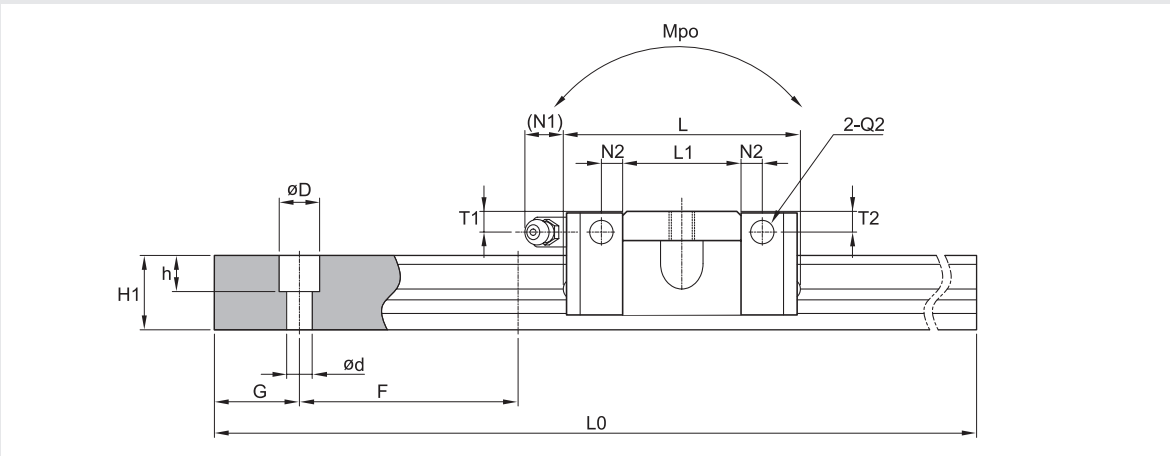


| Model    | Mounting dimension |    |      |     | Block dimensions  |    |    |      |     |      |                |     |     |     |         |      |
|----------|--------------------|----|------|-----|-------------------|----|----|------|-----|------|----------------|-----|-----|-----|---------|------|
|          | H                  | W  | L    | E   | Mounting tap hole |    |    | L1   | T±1 | K    | Grease fitting |     |     |     |         |      |
|          |                    |    |      |     | B                 | M  | *S |      |     |      | T1             | N1  | T2  | N2  | Q1      | *Q2  |
| SBS15 FV | 24                 | 47 | 44.9 | 3   | 38                | M5 | M4 | 22.9 | 7.2 | 21   | 4              | 5.5 | 4.5 | 4.5 | M4x0.7  | Ø3.5 |
| SBS20 FV | 28                 | 63 | 54.2 | 3.5 | 53                | M6 | M5 | 27.8 | 7   | 24.5 | 5              | 12  | 5   | 5   | M6x0.75 | Ø5.5 |
| SBS25 FV | 33                 | 70 | 62.6 | 6.5 | 57                | M8 | M6 | 35.2 | 7   | 26.5 | 5.2            | 12  | 5.1 | 5.5 | M6x0.75 | Ø5.5 |

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

Linear Rail System

SBG Standard Linear Rail System

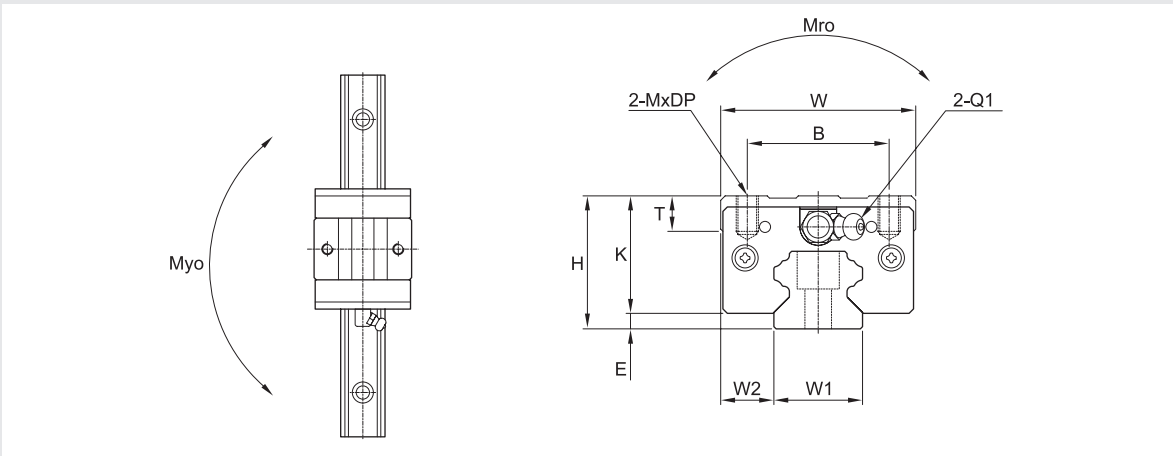


| (Unit : mm)    |      |      |    |           |     |     |    |                                |                           |      |                                       |      |      |               |                |
|----------------|------|------|----|-----------|-----|-----|----|--------------------------------|---------------------------|------|---------------------------------------|------|------|---------------|----------------|
| Rail dimension |      |      |    |           |     |     |    |                                | Basic load rating<br>[kN] |      | Permissible static moment<br>[kN • m] |      |      | Mass          |                |
| W1             | W2   | H1   | F  | Bolt hole |     |     | G  | Max<br>length<br>of rail<br>L0 |                           |      |                                       |      |      | Block<br>[kg] | Rail<br>[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 | 0.12          | 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 | 0.33          | 3.1            |

Linear Rail System

SBG Standard Linear Rail System

SBS-SV

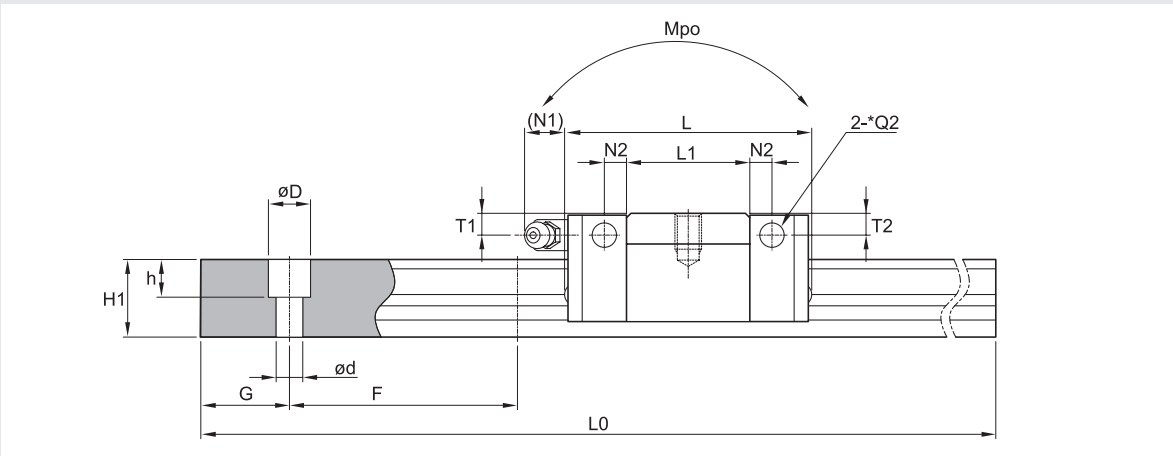


| Model    | Mounting dimension |    |      |     | Block dimensions  |    |    |      |     |      |                |     |     |     |         |      |
|----------|--------------------|----|------|-----|-------------------|----|----|------|-----|------|----------------|-----|-----|-----|---------|------|
|          | H                  | W  | L    | E   | Mounting tap hole |    |    | L1   | T±1 | K    | Grease fitting |     |     |     |         |      |
|          |                    |    |      |     | B                 | M  | DP |      |     |      | T1             | N1  | T2  | N2  | Q1      | *Q2  |
| SBS15 SV | 24                 | 34 | 44.9 | 3   | 26                | M4 | 5  | 22.9 | 6   | 21   | 4              | 5.5 | 4.5 | 4.5 | M4x0.7  | Ø3.5 |
| SBS20 SV | 28                 | 44 | 54.2 | 3.5 | 32                | M5 | 7  | 27.8 | 7.5 | 24.5 | 5              | 12  | 5   | 5   | M6x0.75 | Ø5.5 |
| SBS25 SV | 33                 | 48 | 62.6 | 6.5 | 35                | M6 | 6  | 35.2 | 8   | 26.5 | 5.2            | 12  | 5.1 | 5.5 | M6x0.75 | Ø5.5 |

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

Linear Rail System

SBG Standard Linear Rail System



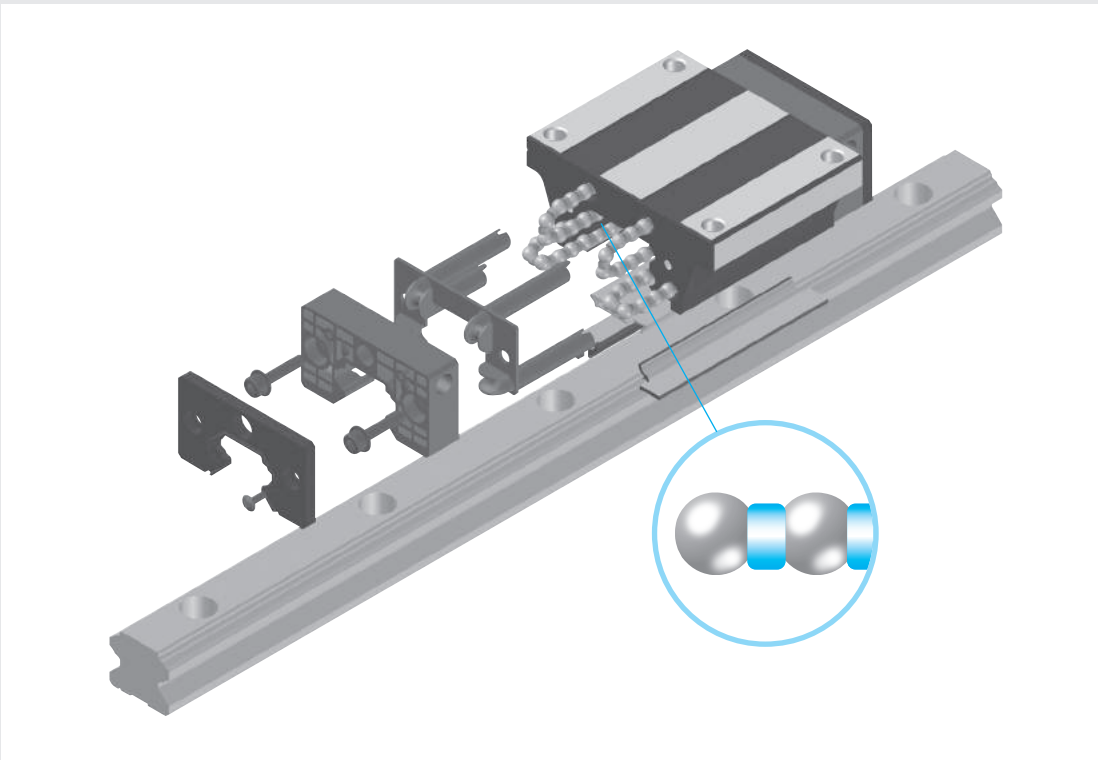
| (Unit : mm)    |      |      |    |           |     |     |    |                                |                           |      |                                       |      |      |               |                |
|----------------|------|------|----|-----------|-----|-----|----|--------------------------------|---------------------------|------|---------------------------------------|------|------|---------------|----------------|
| Rail dimension |      |      |    |           |     |     |    |                                | Basic load rating<br>[kN] |      | Permissible static moment<br>[kN • m] |      |      | Mass          |                |
| W1             | W2   | H1   | F  | Bolt hole |     |     | G  | Max<br>length<br>of rail<br>L0 |                           |      |                                       |      |      | Block<br>[kg] | Rail<br>[kg/m] |
|                |      |      |    | d         | D   | h   |    |                                |                           |      |                                       |      |      |               |                |
| 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           |
| 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 | 0.27          | 3.1            |

# Linear Rail System

# Linear Rail System

## SPG / SPS Spacer Linear Rail System

## SPG / SPS Spacer Linear Rail System



### [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.

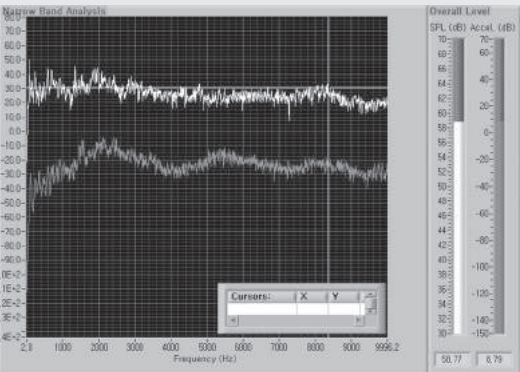
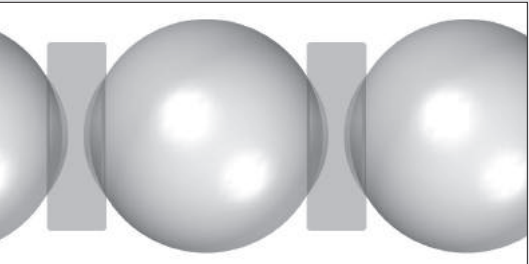
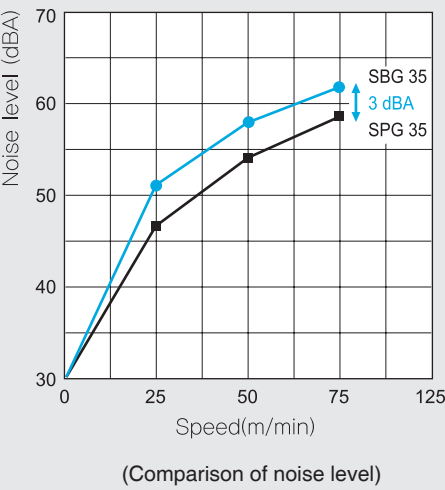
### [Using SBG standard rail]

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]



### [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.

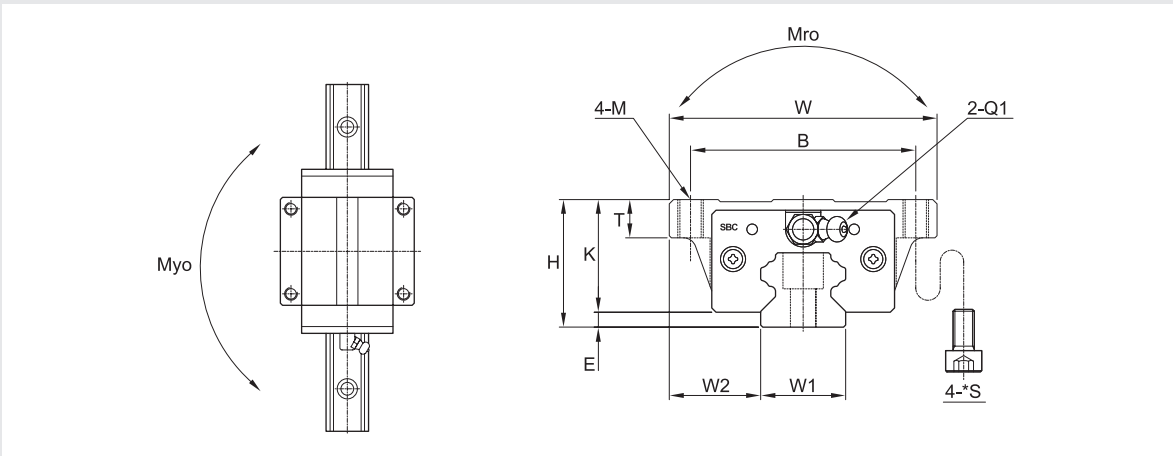
Linear Rail System

Linear Rail System

SPG / SPS Spacer Linear Rail System

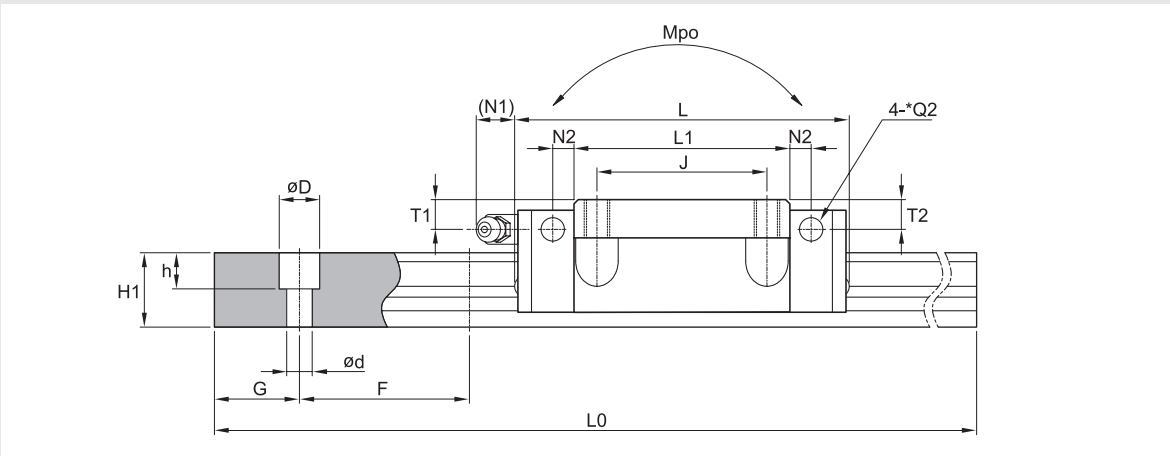
SPG / SPS Spacer Linear Rail System

SPG-FL/FLL



| Model     | Mounting dimension |     |       |     | Block dimensions  |    |     |    |       |     |      |                |    |     |     |         |      |
|-----------|--------------------|-----|-------|-----|-------------------|----|-----|----|-------|-----|------|----------------|----|-----|-----|---------|------|
|           | H                  | W   | L     | E   | Mounting tap hole |    |     |    | L1    | T±1 | K    | Grease fitting |    |     |     |         |      |
|           |                    |     |       |     | B                 | J  | M   | *S |       |     |      | T1             | N1 | T2  | N2  | Q1      | *Q2  |
| SPG20 FL  | 30                 | 63  | 77.2  | 3.5 | 53                | 40 | M6  | M5 | 50.8  | 9   | 26.5 | 7              | 12 | 7   | 5   | M6x0.75 | Ø5.5 |
| SPG20 FLL | 30                 | 63  | 93.2  | 3.5 | 53                | 40 | M6  | M5 | 66.8  | 9   | 26.5 | 7              | 12 | 7   | 5   | M6x0.75 | Ø5.5 |
| SPG25 FL  | 36                 | 70  | 86.9  | 6.5 | 57                | 45 | M8  | M6 | 59.5  | 10  | 29.5 | 8.2            | 12 | 8.1 | 5.5 | M6x0.75 | Ø5.5 |
| SPG25 FLL | 36                 | 70  | 106.4 | 6.5 | 57                | 45 | M8  | M6 | 79    | 10  | 29.5 | 8.2            | 12 | 8.1 | 5.5 | M6x0.75 | Ø5.5 |
| SPG30 FL  | 42                 | 90  | 100   | 7   | 72                | 52 | M10 | M8 | 70.4  | 12  | 35   | 8.5            | 12 | 8.5 | 5.5 | M6x0.75 | Ø5.5 |
| SPG30 FLL | 42                 | 90  | 122.5 | 7   | 72                | 52 | M10 | M8 | 92.9  | 12  | 35   | 8.5            | 12 | 8.5 | 5.5 | M6x0.75 | Ø5.5 |
| SPG35 FL  | 48                 | 100 | 112.6 | 7.5 | 82                | 62 | M10 | M8 | 80.4  | 13  | 40.5 | 8              | 12 | 8   | 6   | M6x0.75 | Ø5.5 |
| SPG35 FLL | 48                 | 100 | 138.1 | 7.5 | 82                | 62 | M10 | M8 | 105.9 | 13  | 40.5 | 8              | 12 | 8   | 6   | M6x0.75 | Ø5.5 |

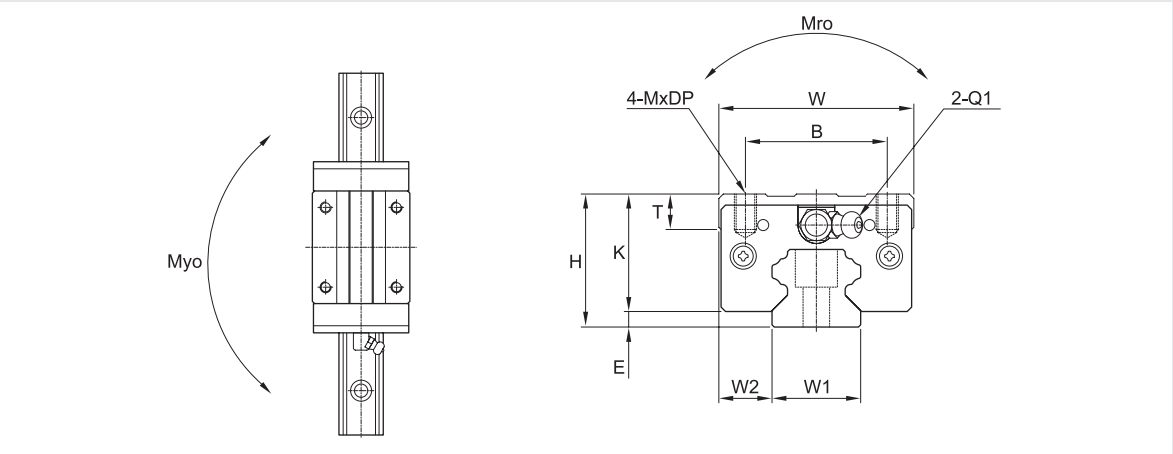
- ❶ C (Basic dynamic load rating), Co (Basic static load rating)
- ❷ \*S: Bolt size for bottom mounting type of block.
- ❸ \*Q2: The hole of side grease nipple is not made to prevent a foreign substance from going into inside.  
When you order the side grease nipple, we build it by ourselves.



(Unit : mm)

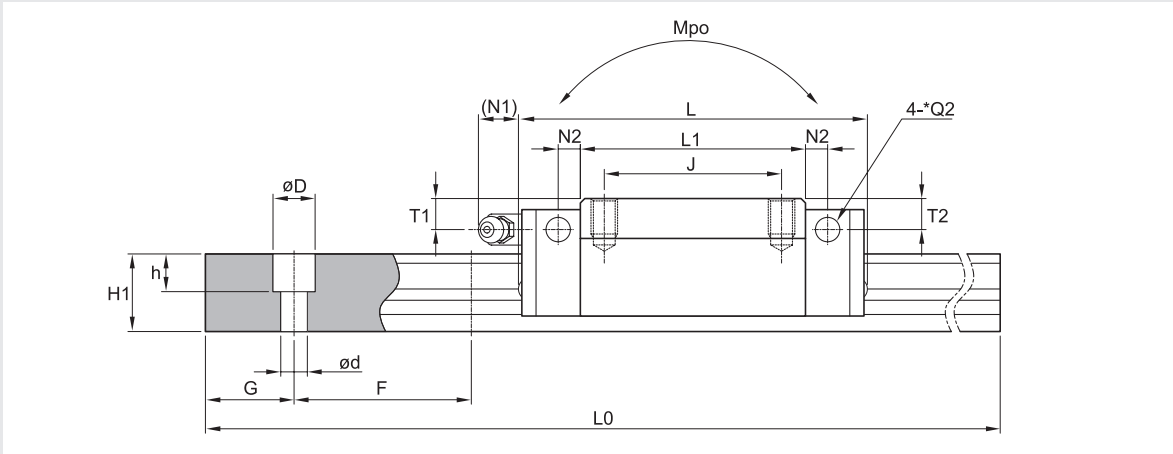
| Rail dimension |      |      |    |           |     |     |    |                       | Basic load rating [kN] |      | Permissible static moment [kN · m] |      |      | Mass       |             |
|----------------|------|------|----|-----------|-----|-----|----|-----------------------|------------------------|------|------------------------------------|------|------|------------|-------------|
| W1             | W2   | H1   | F  | Bolt hole |     |     | G  | Max length of rail L0 | C                      | Co   | Mro                                | Mpo  | Myo  | Block [kg] | Rail [kg/m] |
|                |      |      |    | d         | D   | h   |    |                       |                        |      |                                    |      |      |            |             |
| 20             | 21.5 | 17.5 | 60 | 6         | 9.5 | 8.5 | 20 | 4000                  | 14.2                   | 25   | 0.22                               | 0.18 | 0.18 | 0.45       | 2.2         |
| 20             | 21.5 | 17.5 | 60 | 6         | 9.5 | 8.5 | 20 | 4000                  | 16.9                   | 36.5 | 0.28                               | 0.31 | 0.31 | 0.52       | 2.2         |
| 23             | 23.5 | 21.8 | 60 | 7         | 11  | 9   | 20 | 4000                  | 20.9                   | 39.2 | 0.35                               | 0.31 | 0.3  | 0.61       | 3.1         |
| 23             | 23.5 | 21.8 | 60 | 7         | 11  | 9   | 20 | 4000                  | 24.6                   | 48   | 0.43                               | 0.49 | 0.48 | 0.81       | 3.1         |
| 28             | 31   | 25   | 80 | 9         | 14  | 12  | 20 | 4000                  | 29.2                   | 53.8 | 0.59                               | 0.49 | 0.48 | 1.07       | 4.45        |
| 28             | 31   | 25   | 80 | 9         | 14  | 12  | 20 | 4000                  | 35.3                   | 67.9 | 0.74                               | 0.79 | 0.78 | 1.43       | 4.45        |
| 34             | 33   | 29   | 80 | 9         | 14  | 12  | 20 | 4000                  | 38.8                   | 68.6 | 0.94                               | 0.74 | 0.72 | 1.58       | 6.4         |
| 34             | 33   | 29   | 80 | 9         | 14  | 12  | 20 | 4000                  | 46                     | 90.4 | 1.24                               | 1.3  | 1.28 | 2.03       | 6.4         |

SPG-SL/SL

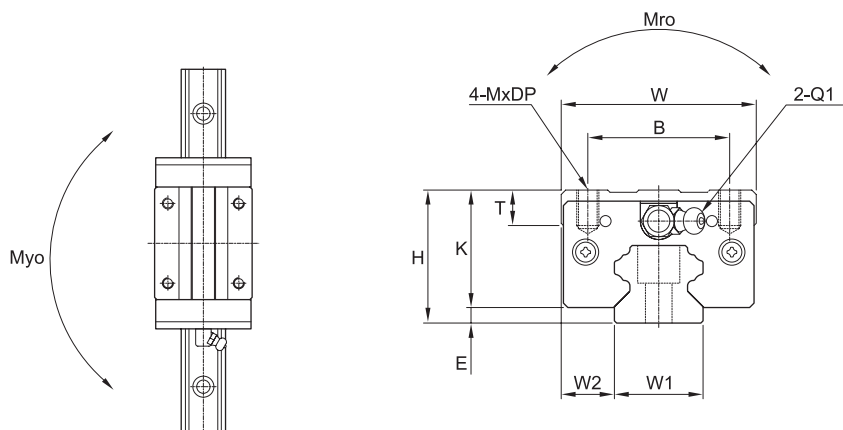


| Model     | Mounting dimension |    |       |     | Block dimensions  |    |    |    |       |     |      |                |    |      |     |         |      |
|-----------|--------------------|----|-------|-----|-------------------|----|----|----|-------|-----|------|----------------|----|------|-----|---------|------|
|           | H                  | W  | L     | E   | Mounting tap hole |    |    |    | L1    | T±1 | K    | Grease fitting |    |      |     |         |      |
|           |                    |    |       |     | B                 | J  | M  | DP |       |     |      | T1             | N1 | T2   | N2  | Q1      | *Q2  |
| SPG20 SL  | 30                 | 44 | 77.2  | 3.5 | 32                | 36 | M5 | 8  | 50.8  | 8   | 26.5 | 8              | 12 | 7    | 5   | M6x0.75 | Ø5.5 |
| SPG20 SLL | 30                 | 44 | 93.2  | 3.5 | 32                | 50 | M5 | 8  | 66.8  | 8   | 26.5 | 8              | 12 | 7    | 5   | M6x0.75 | Ø5.5 |
| SPG25 SL  | 40                 | 48 | 86.9  | 6.5 | 35                | 35 | M6 | 8  | 59.5  | 12  | 33.5 | 12             | 12 | 12.2 | 5.5 | M6x0.75 | Ø5.5 |
| SPG25 SLL | 40                 | 48 | 106.4 | 6.5 | 35                | 50 | M6 | 8  | 79    | 12  | 33.5 | 12             | 12 | 12.2 | 5.5 | M6x0.75 | Ø5.5 |
| SPG30 SL  | 45                 | 60 | 100   | 7   | 40                | 40 | M8 | 10 | 70.4  | 12  | 38   | 12             | 12 | 11.5 | 5.5 | M6x0.75 | Ø5.5 |
| SPG30 SLL | 45                 | 60 | 122.5 | 7   | 40                | 60 | M8 | 10 | 92.9  | 12  | 38   | 12             | 12 | 11.5 | 5.5 | M6x0.75 | Ø5.5 |
| SPG35 SL  | 55                 | 70 | 112.6 | 7.5 | 50                | 50 | M8 | 12 | 80.4  | 15  | 47.5 | 15             | 12 | 15   | 6   | M6x0.75 | Ø5.5 |
| SPG35 SLL | 55                 | 70 | 138.1 | 7.5 | 50                | 72 | M8 | 12 | 105.9 | 15  | 47.5 | 15             | 12 | 15   | 6   | M6x0.75 | Ø5.5 |

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

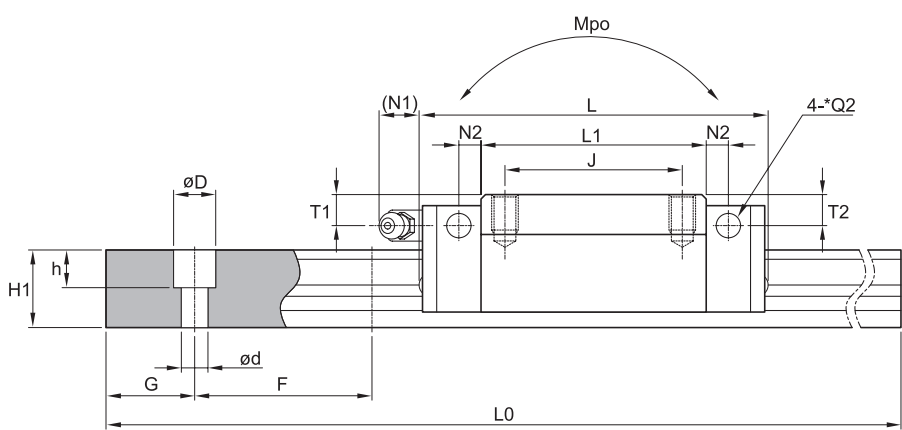


| Rail dimension |      |      |    |           |     |     |    |                       |  | Basic load rating [kN] |      | Permissible static moment [kN・m] |      |      | Mass       |             |
|----------------|------|------|----|-----------|-----|-----|----|-----------------------|--|------------------------|------|----------------------------------|------|------|------------|-------------|
| W1             | W2   | H1   | F  | Bolt hole |     |     | G  | Max length of rail L0 |  | C                      | Co   | Mro                              | Mpo  | Myo  | Block [kg] | Rail [kg/m] |
|                |      |      |    | d         | D   | h   |    |                       |  |                        |      |                                  |      |      |            |             |
| 20             | 12   | 17.5 | 60 | 6         | 9.5 | 8.5 | 20 | 4000                  |  | 14.2                   | 25   | 0.22                             | 0.18 | 0.18 | 0.34       | 2.2         |
| 20             | 12   | 17.5 | 60 | 6         | 9.5 | 8.5 | 20 | 4000                  |  | 16.9                   | 36.5 | 0.28                             | 0.31 | 0.31 | 0.44       | 2.2         |
| 23             | 12.5 | 21.8 | 60 | 7         | 11  | 9   | 20 | 4000                  |  | 20.9                   | 39.2 | 0.35                             | 0.31 | 0.3  | 0.57       | 3.1         |
| 23             | 12.5 | 21.8 | 60 | 7         | 11  | 9   | 20 | 4000                  |  | 24.6                   | 48   | 0.43                             | 0.49 | 0.48 | 0.74       | 3.1         |
| 28             | 16   | 25   | 80 | 9         | 14  | 12  | 20 | 4000                  |  | 29.2                   | 53.8 | 0.59                             | 0.49 | 0.48 | 0.92       | 4.45        |
| 28             | 16   | 25   | 80 | 9         | 14  | 12  | 20 | 4000                  |  | 35.3                   | 67.9 | 0.74                             | 0.79 | 0.78 | 1.22       | 4.45        |
| 34             | 18   | 29   | 80 | 9         | 14  | 12  | 20 | 4000                  |  | 38.8                   | 68.6 | 0.94                             | 0.74 | 0.72 | 1.57       | 6.4         |
| 34             | 18   | 29   | 80 | 9         | 14  | 12  | 20 | 4000                  |  | 46                     | 90.4 | 1.24                             | 1.3  | 1.28 | 2.05       | 6.4         |



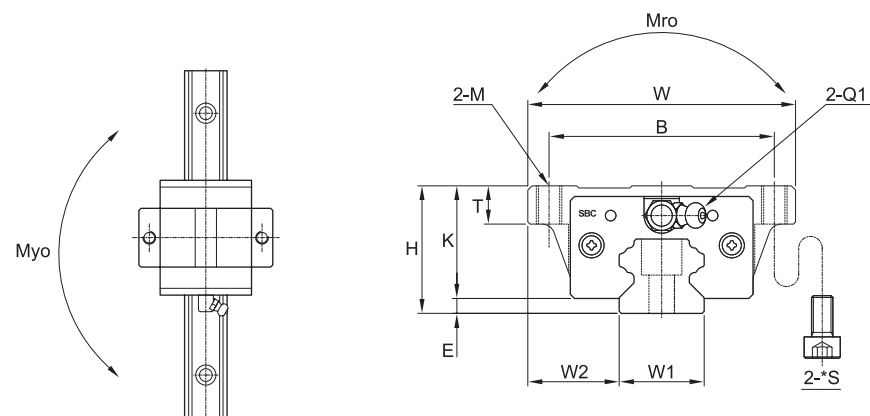
| Model     | Mounting dimension |    |       |     | Block dimensions  |    |    |    |       |     |      |                |    |     |     |         |      |
|-----------|--------------------|----|-------|-----|-------------------|----|----|----|-------|-----|------|----------------|----|-----|-----|---------|------|
|           | H                  | W  | L     | E   | Mounting tap hole |    |    |    | L1    | T±1 | K    | Grease fitting |    |     |     |         |      |
|           |                    |    |       |     | B                 | J  | M  | DP |       |     |      | T1             | N1 | T2  | N2  | Q1      | *Q2  |
| SPS20 SL  | 28                 | 44 | 77.2  | 3.5 | 32                | 32 | M5 | 7  | 50.8  | 7.5 | 24.5 | 5              | 12 | 5   | 5   | M6x0.75 | Ø5.5 |
| SPS20 SLL | 28                 | 44 | 93.2  | 3.5 | 32                | 50 | M5 | 7  | 66.8  | 7.5 | 24.5 | 5              | 12 | 5   | 5   | M6x0.75 | Ø5.5 |
| SPS25 SL  | 33                 | 48 | 86.9  | 6.5 | 35                | 35 | M6 | 6  | 59.5  | 8   | 26.5 | 5.2            | 12 | 5.1 | 5.5 | M6x0.75 | Ø5.5 |
| SPS25 SLL | 33                 | 48 | 106.4 | 6.5 | 35                | 50 | M6 | 6  | 79    | 8   | 26.5 | 5.2            | 12 | 5.1 | 5.5 | M6x0.75 | Ø5.5 |
| SPS25 HL  | 36                 | 48 | 86.9  | 6.5 | 35                | 35 | M6 | 8  | 59.5  | 11  | 29.5 | 8.2            | 12 | 8.1 | 5.5 | M6x0.75 | Ø5.5 |
| SPS25 HLL | 36                 | 48 | 106.4 | 6.5 | 35                | 50 | M6 | 8  | 79    | 11  | 29.5 | 8.2            | 12 | 8.1 | 5.5 | M6x0.75 | Ø5.5 |
| SPS30 SL  | 42                 | 60 | 100   | 7   | 40                | 40 | M8 | 10 | 70.4  | 12  | 35   | 8.5            | 12 | 8.5 | 5.5 | M6x0.75 | Ø5.5 |
| SPS30 SLL | 42                 | 60 | 122.5 | 7   | 40                | 60 | M8 | 10 | 92.9  | 12  | 35   | 8.5            | 12 | 8.5 | 5.5 | M6x0.75 | Ø5.5 |
| SPS35 SL  | 48                 | 70 | 112.6 | 7.5 | 50                | 50 | M8 | 12 | 80.4  | 15  | 40.5 | 8              | 12 | 8   | 6   | M6x0.75 | Ø5.5 |
| SPS35 SLL | 48                 | 70 | 138.1 | 7.5 | 50                | 72 | M8 | 12 | 105.9 | 15  | 40.5 | 8              | 12 | 8   | 6   | M6x0.75 | Ø5.5 |

- 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.



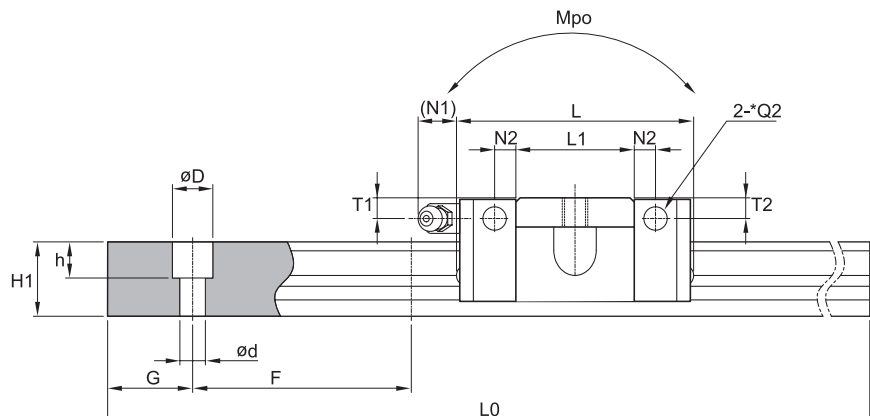
| (Unit : mm)    |      |      |    |           |     |     |    |                                |                           |      |                                       |      |      |               |                |
|----------------|------|------|----|-----------|-----|-----|----|--------------------------------|---------------------------|------|---------------------------------------|------|------|---------------|----------------|
| Rail dimension |      |      |    |           |     |     |    |                                | Basic load rating<br>[kN] |      | Permissible static moment<br>[kN • m] |      |      | Mass          |                |
| W1             | W2   | H1   | F  | Bolt hole |     |     | G  | Max<br>length<br>of rail<br>L0 |                           |      |                                       |      |      | Block<br>[kg] | Rail<br>[kg/m] |
|                |      |      |    | d         | D   | h   |    |                                |                           |      |                                       |      |      |               |                |
| 20             | 12   | 17,5 | 60 | 6         | 9,5 | 8,5 | 20 | 4000                           | 14,2                      | 25   | 0,22                                  | 0,18 | 0,18 | 0,31          | 2,2            |
| 20             | 12   | 17,5 | 60 | 6         | 9,5 | 8,5 | 20 | 4000                           | 16,9                      | 36,5 | 0,28                                  | 0,31 | 0,31 | 0,39          | 2,2            |
| 23             | 12,5 | 21,8 | 60 | 7         | 11  | 9   | 20 | 4000                           | 20,9                      | 39,2 | 0,35                                  | 0,31 | 0,3  | 0,42          | 3,1            |
| 23             | 12,5 | 21,8 | 60 | 7         | 11  | 9   | 20 | 4000                           | 24,6                      | 48   | 0,43                                  | 0,49 | 0,48 | 0,54          | 3,1            |
| 23             | 12,5 | 21,8 | 60 | 7         | 11  | 9   | 20 | 4000                           | 20,9                      | 39,2 | 0,35                                  | 0,31 | 0,3  | 0,49          | 3,1            |
| 23             | 12,5 | 21,8 | 60 | 7         | 11  | 9   | 20 | 4000                           | 24,6                      | 48   | 0,43                                  | 0,49 | 0,48 | 0,62          | 3,1            |
| 28             | 16   | 25   | 80 | 9         | 14  | 12  | 20 | 4000                           | 29,2                      | 53,8 | 0,59                                  | 0,49 | 0,48 | 0,86          | 4,45           |
| 28             | 16   | 25   | 80 | 9         | 14  | 12  | 20 | 4000                           | 35,3                      | 67,9 | 0,74                                  | 0,79 | 0,78 | 1,10          | 4,45           |
| 34             | 18   | 29   | 80 | 9         | 14  | 12  | 20 | 4000                           | 38,8                      | 68,6 | 0,94                                  | 0,74 | 0,72 | 1,27          | 6,4            |
| 34             | 18   | 29   | 80 | 9         | 14  | 12  | 20 | 4000                           | 46                        | 90,4 | 1,24                                  | 1,3  | 1,28 | 1,66          | 6,4            |

SPS-FV



| Model    | Mounting dimension |    |      |     | Block dimensions  |    |    |      |     |      |                |    |     |     |         |      |
|----------|--------------------|----|------|-----|-------------------|----|----|------|-----|------|----------------|----|-----|-----|---------|------|
|          | H                  | W  | L    | E   | Mounting tap hole |    |    | L1   | T±1 | K    | Grease fitting |    |     |     |         |      |
|          |                    |    |      |     | B                 | M  | *S |      |     |      | T1             | N1 | T2  | N2  | Q1      | *Q2  |
| SPS20 FV | 28                 | 63 | 54.2 | 3.5 | 53                | M6 | M5 | 27.8 | 7   | 24.5 | 5              | 12 | 5   | 5   | M6x0.75 | Ø5.5 |
| SPS25 FV | 33                 | 70 | 62.6 | 6.5 | 57                | M8 | M6 | 35.2 | 7   | 26.5 | 5.2            | 12 | 5.1 | 5.5 | M6x0.75 | Ø5.5 |

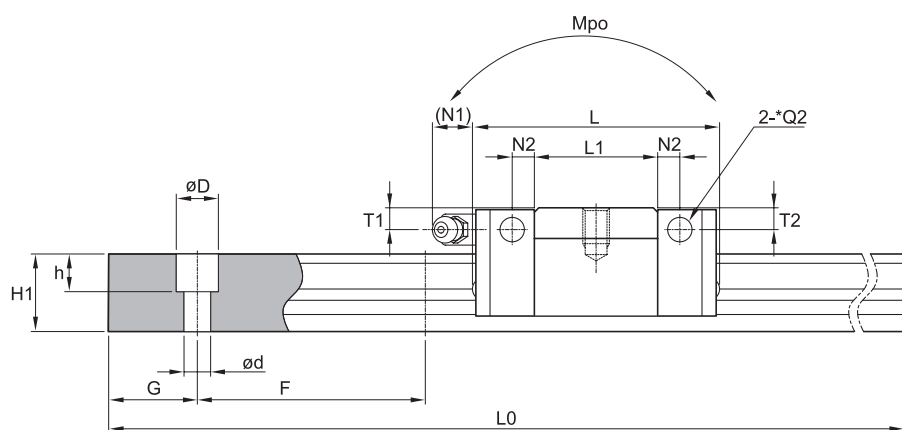
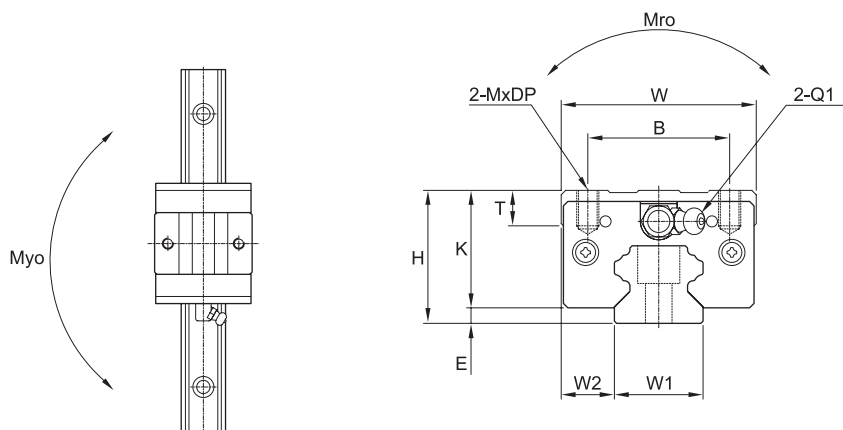
- ① C (Basic dynamic load rating), Co (Basic static load rating)
- ② \*S: Bolt size for bottom mounting type of block.
- ③ \*Q2: The hole of side grease nipple is not made to prevent a foreign substance from going into inside.  
When you order the side grease nipple, we build it by ourselves.



(Unit : mm)

| Rail dimension |      |      |    |           |     |     |    |                       | Basic load rating [kN] |      | Permissible static moment [kN・m] |      |      | Mass       |             |
|----------------|------|------|----|-----------|-----|-----|----|-----------------------|------------------------|------|----------------------------------|------|------|------------|-------------|
| W1             | W2   | H1   | F  | Bolt hole |     |     | G  | Max length of rail L0 | C                      | Co   | Mro                              | Mpo  | Myo  | Block [kg] | Rail [kg/m] |
|                |      |      |    | d         | D   | h   |    |                       |                        |      |                                  |      |      |            |             |
| 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 | 0.33       | 3.1         |

SPS-SV



| Model    | Mounting dimension |    |      |     | Block dimensions  |    |    |      |     |      |                |    |     |     |         |      |
|----------|--------------------|----|------|-----|-------------------|----|----|------|-----|------|----------------|----|-----|-----|---------|------|
|          | H                  | W  | L    | E   | Mounting tap hole |    |    | L1   | T±1 | 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              | 12 | 5   | 5   | M6x0.75 | Ø5.5 |
| SPS25 SV | 33                 | 48 | 62.6 | 6.5 | 35                | M6 | 6  | 35.2 | 8   | 26.5 | 5.2            | 12 | 5.1 | 5.5 | M6x0.75 | Ø5.5 |

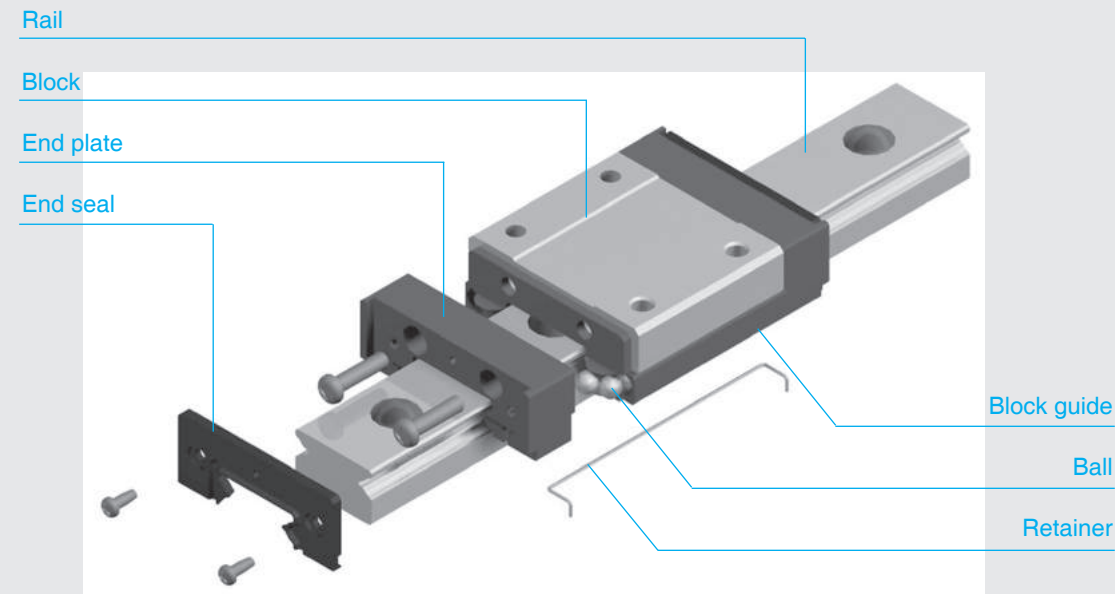
- ① C (Basic dynamic load rating), Co (Basic static load rating)
- ② \*Q2: The hole of side grease nipple is not made to prevent a foreign substance from going into inside.  
When you order the side grease nipple, we build it by ourselves.

(Unit : mm)

| Rail dimension |      |      |    |           |     |     |    |                       | Basic load rating [kN] |      | Permissible static moment [kN・m] |      |      | Mass       |             |
|----------------|------|------|----|-----------|-----|-----|----|-----------------------|------------------------|------|----------------------------------|------|------|------------|-------------|
| W1             | W2   | H1   | F  | Bolt hole |     |     | G  | Max length of rail L0 | C                      | Co   | Mro                              | Mpo  | Myo  | Block [kg] | Rail [kg/m] |
|                |      |      |    | d         | D   | h   |    |                       |                        |      |                                  |      |      |            |             |
| 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 | 0.27       | 3.1         |

# Linear Rail System

## Miniature Linear Rail System



### [Feature of structure]

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

### [Ball retention]

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

### [Low noise]

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

### [Smooth movement]

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

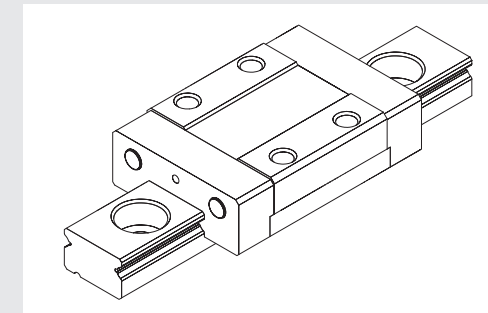
### [Excellent corrosion resistance]

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

# Linear Rail System

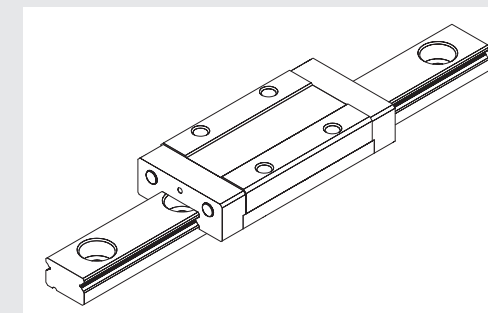
## Miniature Linear Rail System

### Types and features



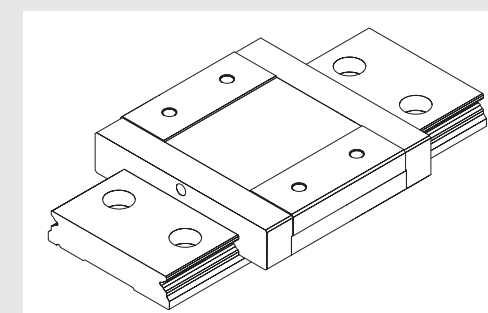
### [SBM type]

Standard type of miniature.



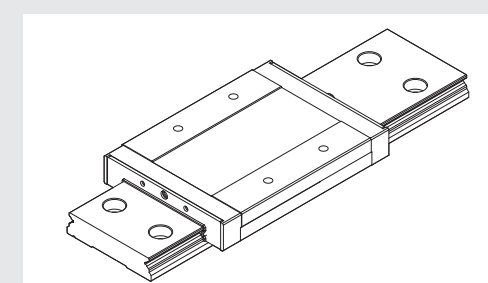
### [SBML type]

Block length is modified type to increase load capacity.



### [SBMW type]

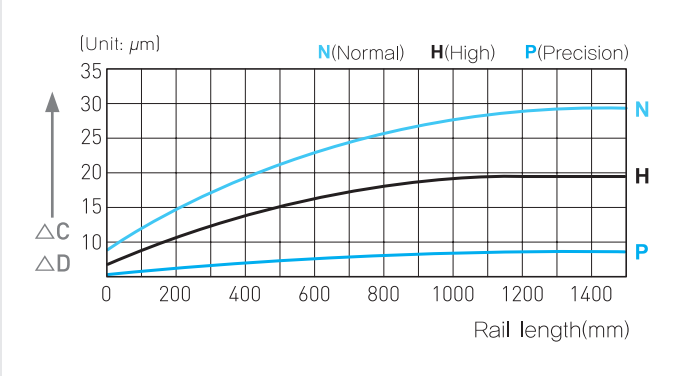
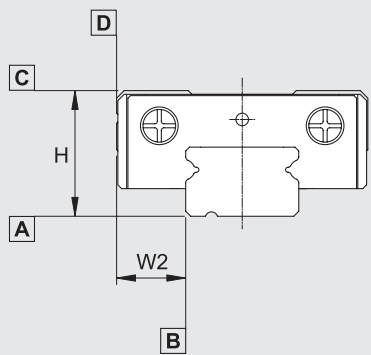
The width and length of linear block and rail are modified to increase load ratings and permissible moments.



### [SBMWL type]

It uses the same rail as SBMW type and it has the longest whole length of a block, making it the largest heavy load type among miniature products.

Accuracy



| (Unit : mm)                                                                  |       |        |        |
|------------------------------------------------------------------------------|-------|--------|--------|
| Item                                                                         | N     | H      | P      |
| Tolerance for the height <b>H</b>                                            | ±0.04 | ±0.02  | ±0.01  |
| Tolerance for the rail-to-block lateral distance <b>W2</b>                   | ±0.04 | ±0.025 | ±0.015 |
| Tolerance for the height <b>H</b> difference among blocks                    | 0.03  | 0.015  | 0.007  |
| Tolerance for rail-to-block lateral distance <b>W2</b> distance among blocks | 0.03  | 0.015  | 0.007  |
| Running parallelism of surface <b>C</b> with surface <b>A</b>                | ΔC    |        |        |
| Running parallelism of surface <b>D</b> with surface <b>B</b>                | ΔD    |        |        |

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

[Preload]

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

● C(kN) : Basic dynamic load rating

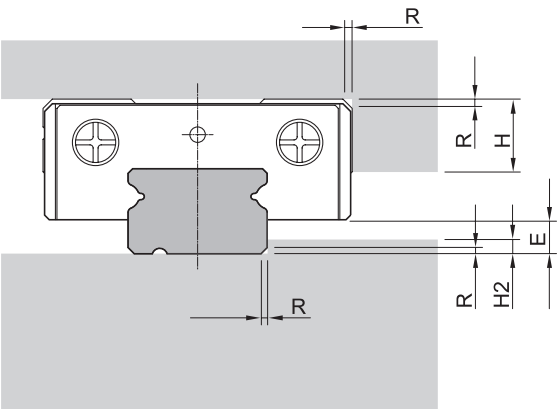
[Seal resistance]

| (Unit : N) |          |      |
|------------|----------|------|
| Reference  | SBM/SBML | SBMW |
| 07         | 0.08     | -    |
| 09         | 0.2      | 0.8  |
| 12         | 0.59     | 1.1  |
| 15         | 1.18     | 1.3  |

[Grease]

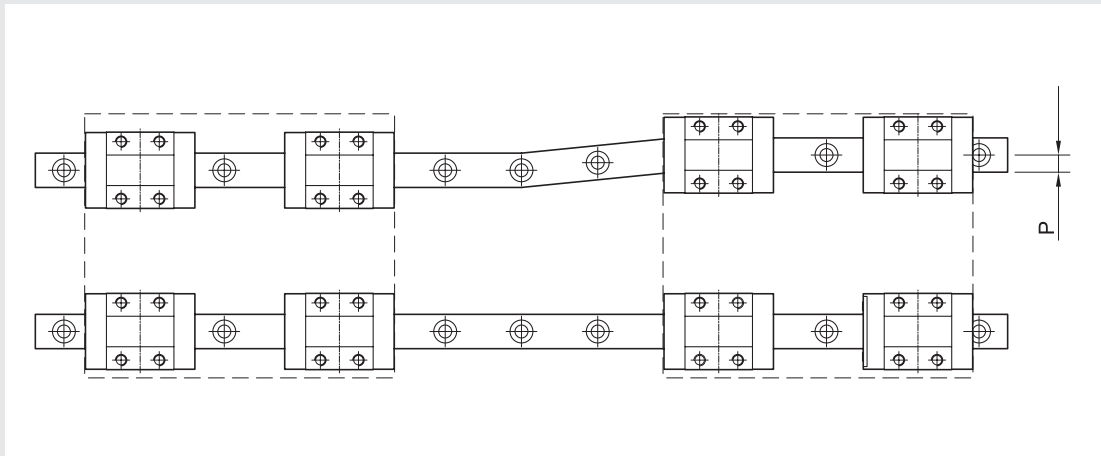
SBM(L), SBMW Uses two types of grease according to working conditions.  
For details, please see the technical data for grease.

Shoulder height and fillet radius R



| (Unit : mm)  |                 |                     |                     |     |
|--------------|-----------------|---------------------|---------------------|-----|
| Model number | Fillet radius R | Shoulders height H1 | Shoulders height H2 | E   |
| SBM07        | 0.2             | 3                   | 1.2                 | 1.5 |
| SBM(L)09     | 0.3             | 3                   | 1.9                 | 2   |
| SBM(L)12     | 0.3             | 4                   | 2                   | 3   |
| SBM(L)15     | 0.3             | 5                   | 2.5                 | 4   |
| SBMW(L)09    | 0.3             | 3                   | 3.4                 | 3.7 |
| SBMW(L)12    | 0.3             | 4                   | 3.7                 | 4   |
| SBMW(L)15    | 0.3             | 5                   | 3.4                 | 3.7 |

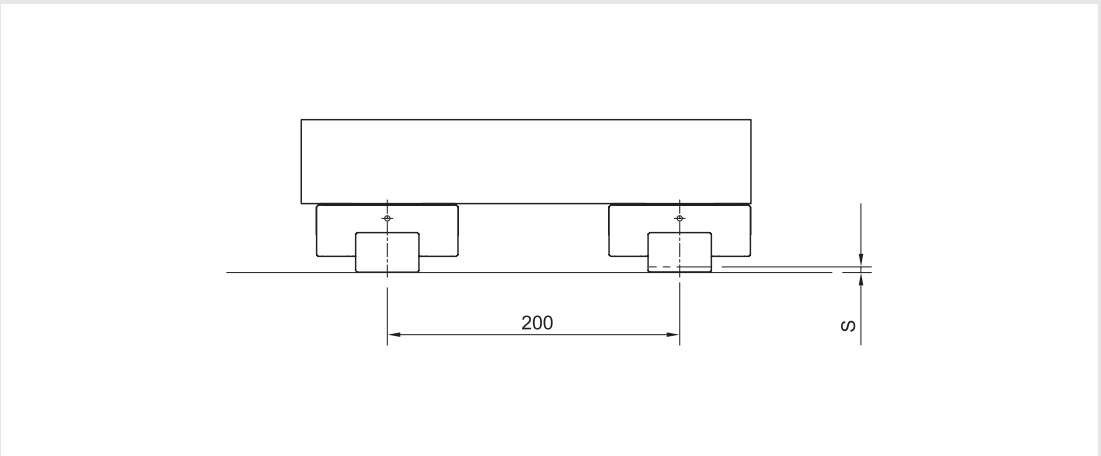
Permissible tolerance (P) of parallelism



(Unit : mm)

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

Permissible tolerance (S) of two level offset



(Unit : mm)

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

[Ordering example for block]

**SBM09**   **- K1**   **- KR**  
[1]                      [2]                      [3]

- [1] Model : SBM, SBML, SBMW  
[2] Preload : K1, K2  
[3] Surface treatment : No symbol (standard),  
KR ( Block surface treatment )

[Ordering example for rail]

**SBM09**   **- 600L**   **- RR**   **- B**  
[1]                      [2]                      [3]                      [4]

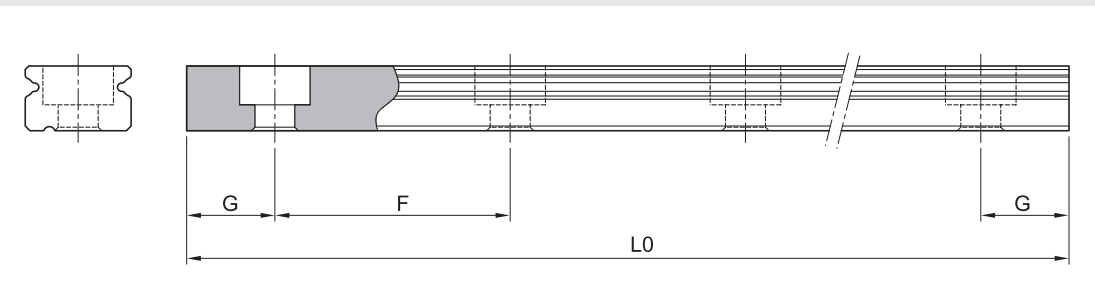
- [1] Model : SBM, SBMW  
[2] Rail length  
[3] Surface treatment : No symbol (standard),  
RR ( Rail surface treatment )  
[4] Through tap hole rail : Standard (No symbol)  
※ If only rail is ordered, N grade is available.

[Ordering for assembled rail and block]

**SBM09**   **- 2**   **- K1**   **- 600 J2**   **- N**   **- AR**   **- B**   **- II**  
[1]                      [2]                      [3]                      [4] [5]                      [6]                      [7]                      [8]                      [8]

- [1] Model : SBM, SBML, SBMW, SBMWL  
[2] Block quantity on rail  
[3] Preload : K1, K2  
[4] Rail length  
[5] Rail connection symbol : J2 ( 2PCS of rail ), J3 ( 3PCS of rail ), J4 ( 4PCS of rail )...  
[6] Accuracy : N, H, P  
[7] Surface treatment : No symbol (standard), AR( Block and Rail ), RR ( Rail only ) KR ( Block only )  
[8] Through tap hole rail : Standard (No symbol)  
[9] Rail : number of rails per axis, None=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 refer to a next page for standard "G dimension"

Standard and Max length

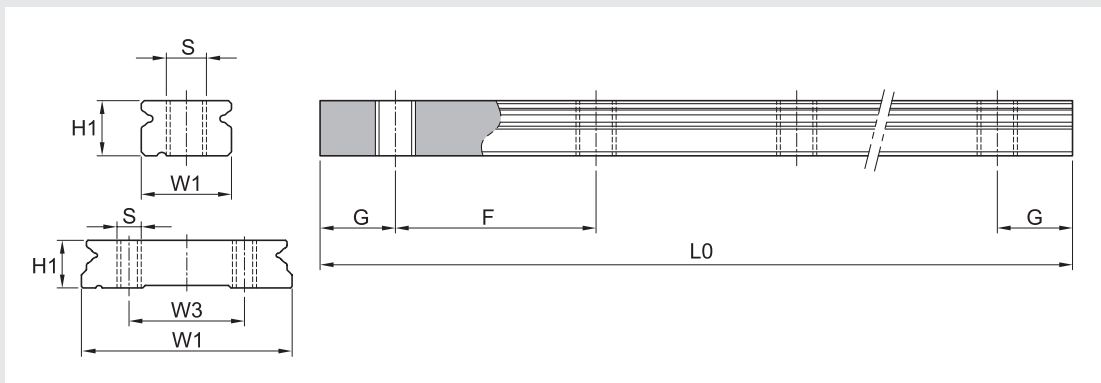


(Unit : mm)

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

\* SBM, SBML use same rail.  
\* If special G dimension is required, please mark when you place an order.

Miniature through tap hole rail

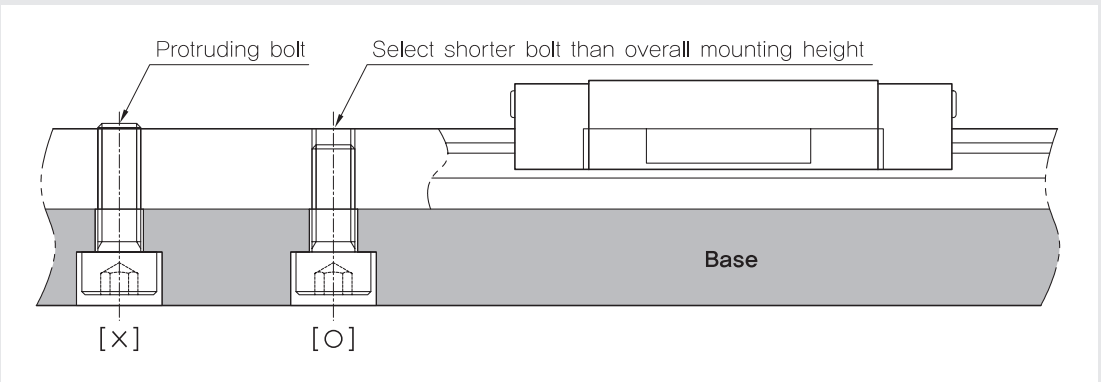


(Unit : mm)

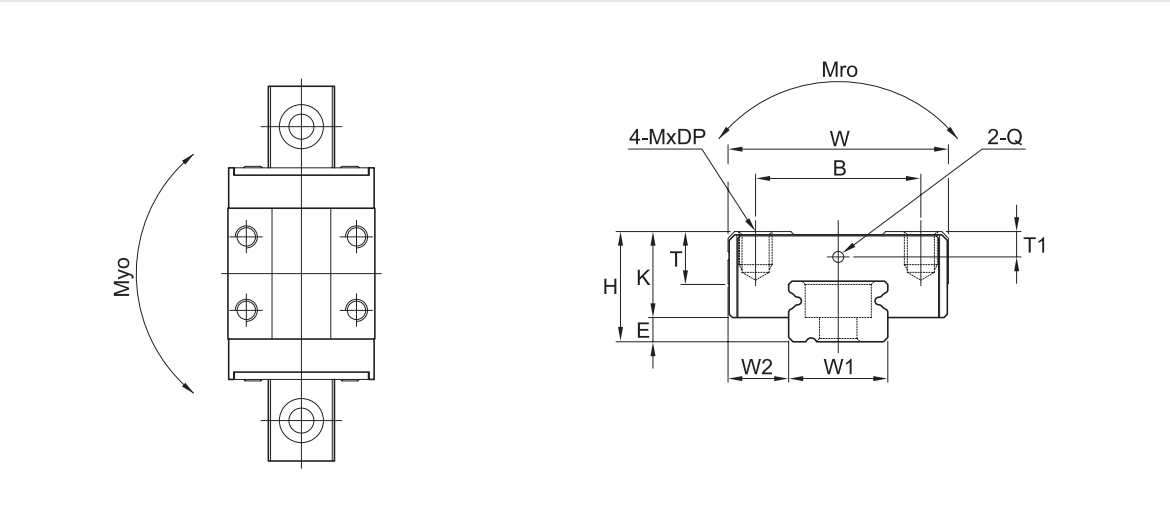
| Model     | W1 | W3 | H1  | S       | G   | F  | L0<br>(Max length) | Mass<br>(kg/m) |
|-----------|----|----|-----|---------|-----|----|--------------------|----------------|
| SBM 07-B  | 7  | -  | 4.7 | M3x0.5P | 5   | 15 | 490                | 0.22           |
| SBM 09-B  | 9  | -  | 5.5 | M4x0.7P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

Caution for mounting miniature through tap hole rail

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

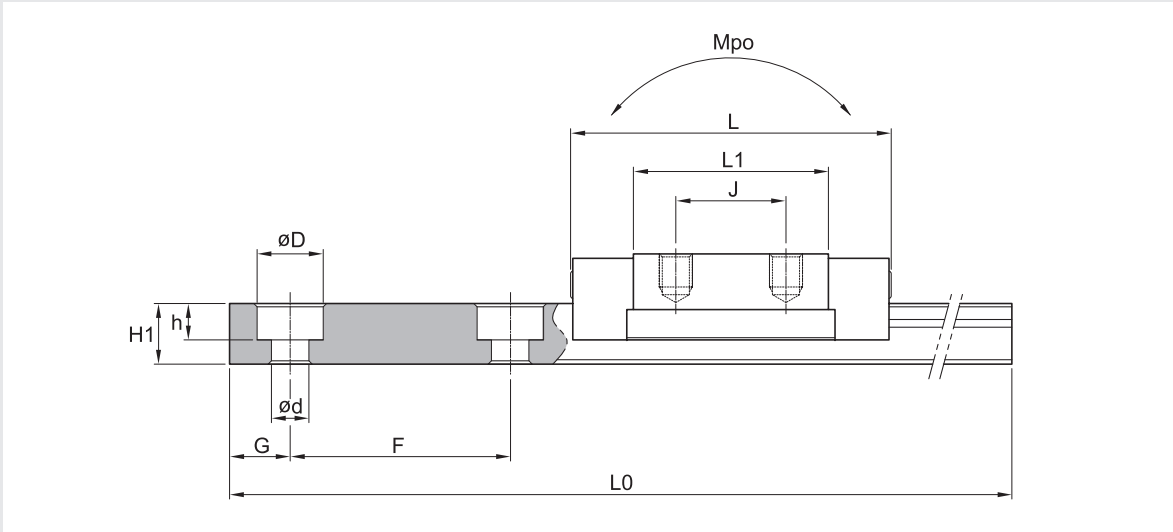


SBM/SBML

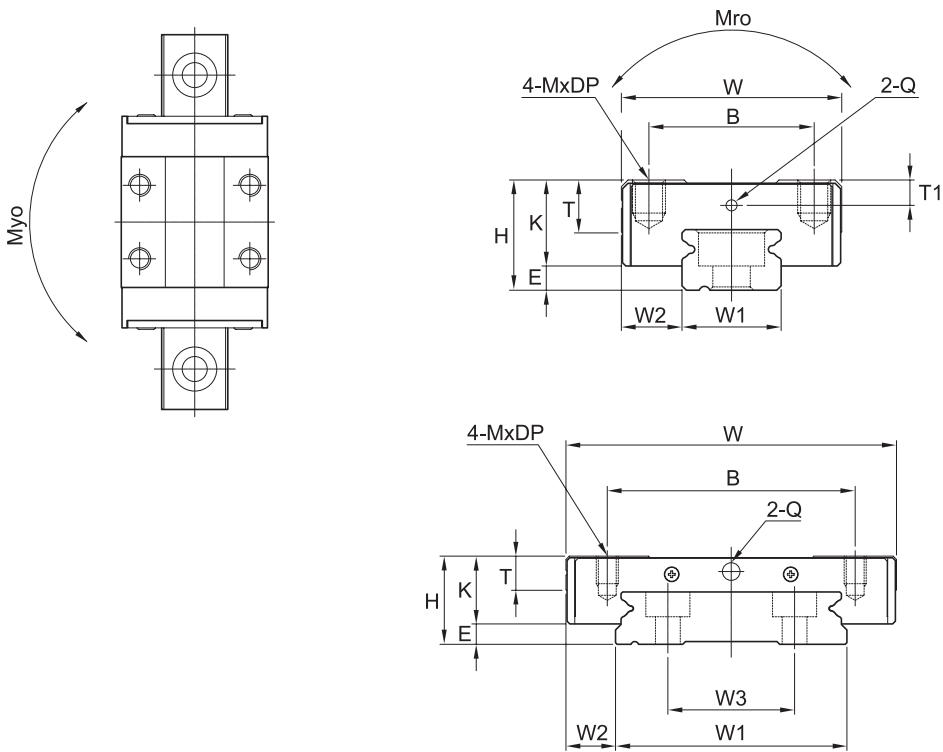


| Model   | Mounting dimension |    |      |     | Block dimensions  |    |    |     |      |     |     |               |    |
|---------|--------------------|----|------|-----|-------------------|----|----|-----|------|-----|-----|---------------|----|
|         | H                  | W  | L    | E   | Mounting tap hole |    |    |     | L1   | T   | K   | Greasing hole |    |
|         |                    |    |      |     | B                 | J  | M  | DP  |      |     |     | T1            | Q  |
| SBM 07  | 8                  | 17 | 22.9 | 1.5 | 12                | 8  | M2 | 2.5 | 13.5 | 3.3 | 6.5 | 1.6           | Ø1 |
| SBML 07 | 8                  | 17 | 32.4 | 1.5 | 12                | 13 | M2 | 2.5 | 23   | 3.3 | 6.5 | 1.6           | Ø1 |
| SBM 09  | 10                 | 20 | 30.1 | 2.0 | 15                | 10 | M3 | 3   | 19.3 | 4.5 | 8   | 2.3           | Ø1 |
| SBML 09 | 10                 | 20 | 39.6 | 2.0 | 15                | 16 | M3 | 3   | 28.8 | 4.5 | 8   | 2.3           | Ø1 |
| SBM 12  | 13                 | 27 | 34.6 | 3   | 20                | 15 | M3 | 3.5 | 21   | 5.5 | 10  | 2.7           | Ø1 |
| SBML 12 | 13                 | 27 | 44.3 | 3   | 20                | 20 | M3 | 3.5 | 30.7 | 5.5 | 10  | 2.7           | Ø1 |
| SBM 15  | 16                 | 32 | 43   | 4   | 25                | 20 | M3 | 4   | 25.4 | 6.5 | 12  | 3.1           | Ø1 |
| SBML 15 | 16                 | 32 | 58.8 | 4   | 25                | 25 | M3 | 4   | 41.2 | 6.5 | 12  | 3.1           | Ø1 |

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

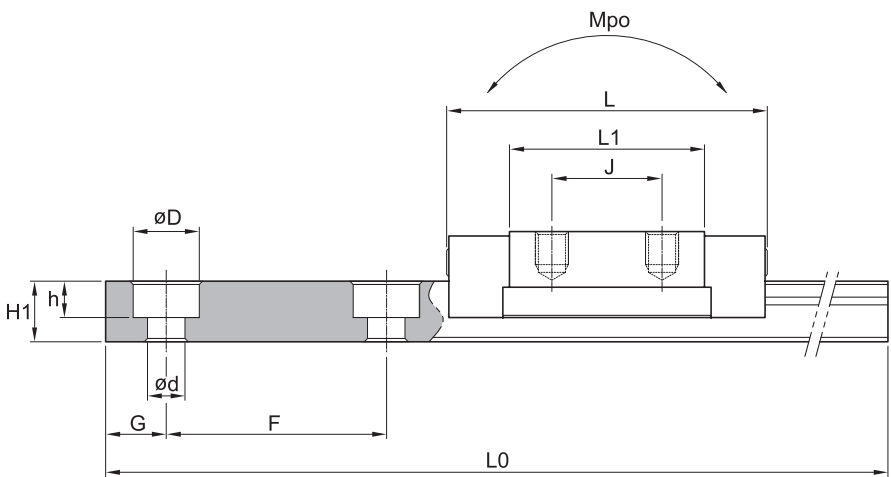


| (Unit : mm)    |     |     |    |           |     |     |     |                          |                           |       |                                    |       |       |               |                |
|----------------|-----|-----|----|-----------|-----|-----|-----|--------------------------|---------------------------|-------|------------------------------------|-------|-------|---------------|----------------|
| Rail dimension |     |     |    |           |     |     |     |                          | Basic load rating<br>[kN] |       | Permissible static moment<br>[N・m] |       |       | Mass          |                |
| W1             | W2  | H1  | F  | Bolt hole |     |     | G   | Max length of rail<br>L0 |                           |       |                                    |       |       | Block<br>[kg] | Rail<br>[kg/m] |
|                |     |     |    | d         | D   | h   |     |                          |                           |       |                                    |       |       |               |                |
| 7              | 5   | 4.7 | 15 | 2.6       | 4.3 | 2.3 | 5   | 490                      | 0.88                      | 1.37  | 4.9                                | 2.94  | 2.94  | 0.006         | 0.23           |
| 7              | 5   | 4.7 | 15 | 2.6       | 4.3 | 2.3 | 5   | 490                      | 1.59                      | 2.5   | 8.82                               | 7.84  | 7.84  | 0.015         | 0.23           |
| 9              | 5.5 | 5.5 | 20 | 4         | 6   | 3.3 | 7.5 | 1195                     | 1.42                      | 2.9   | 10.39                              | 5.1   | 5.1   | 0.013         | 0.32           |
| 9              | 5.5 | 5.5 | 20 | 4         | 6   | 3.3 | 7.5 | 1195                     | 2.59                      | 3.92  | 18.33                              | 17.54 | 14.54 | 0.023         | 0.32           |
| 12             | 7.5 | 7.5 | 25 | 4         | 6   | 4.5 | 10  | 1195                     | 2.46                      | 3.62  | 14.7                               | 8.04  | 8.72  | 0.029         | 0.59           |
| 12             | 7.5 | 7.5 | 25 | 4         | 6   | 4.5 | 10  | 1195                     | 4.21                      | 6.56  | 26.66                              | 24.01 | 26.07 | 0.043         | 0.59           |
| 15             | 8.5 | 9.5 | 40 | 4         | 6   | 4.5 | 15  | 1190                     | 4.02                      | 5.97  | 37.24                              | 16.46 | 17.93 | 0.052         | 0.99           |
| 15             | 8.5 | 9.5 | 40 | 4         | 6   | 4.5 | 15  | 1190                     | 7.15                      | 10.68 | 53.02                              | 49.3  | 53.51 | 0.079         | 0.99           |

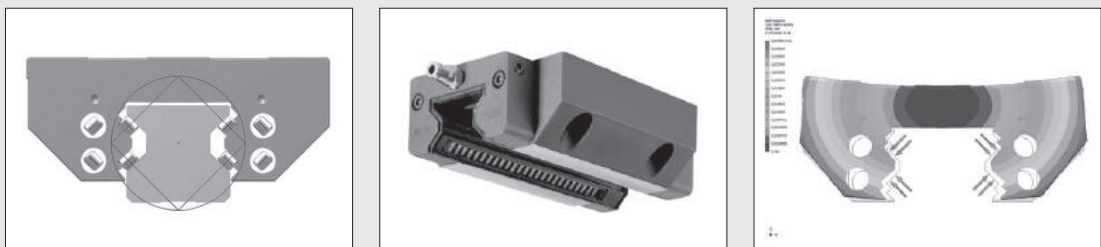


| Model    | Mounting dimension |    |      |     | Block dimensions  |    |    |     |      |     |      |               |      |
|----------|--------------------|----|------|-----|-------------------|----|----|-----|------|-----|------|---------------|------|
|          | H                  | W  | L    | E   | Mounting tap hole |    |    |     | L1   | T   | K    | Greasing hole |      |
|          |                    |    |      |     | B                 | J  | M  | DP  |      |     |      | T1            | Q    |
| SBMW 09  | 12                 | 30 | 42.3 | 3.7 | 21                | 12 | M3 | 3   | 27   | 4.5 | 8.3  | 2             | Ø1   |
| SBMWL09  | 12                 | 30 | 50.3 | 3.7 | 23                | 24 | M3 | 3   | 35   | 4.5 | 8.3  | 2             | Ø1   |
| SBMW 12  | 14                 | 40 | 48.4 | 4   | 28                | 15 | M3 | 3.5 | 30.9 | 5.5 | 10   | 2.4           | Ø1   |
| SBMWL 12 | 14                 | 40 | 59.5 | 4   | 28                | 28 | M3 | 3.5 | 42   | 5.5 | 10   | 2.4           | Ø1   |
| SBMW 15  | 16                 | 60 | 57.5 | 3.7 | 45                | 20 | M4 | 4.5 | 38.9 | 6.5 | 12.3 | 2.6           | Ø2.7 |
| SBMWL 15 | 16                 | 60 | 73.4 | 3.7 | 45                | 35 | M4 | 4.5 | 54.8 | 6.5 | 12.3 | 2.6           | Ø2.7 |

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

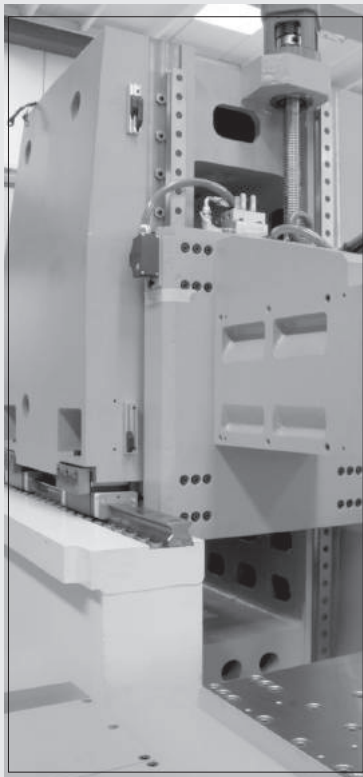
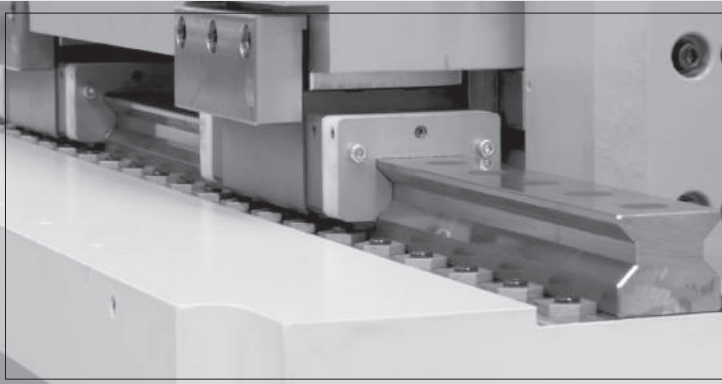
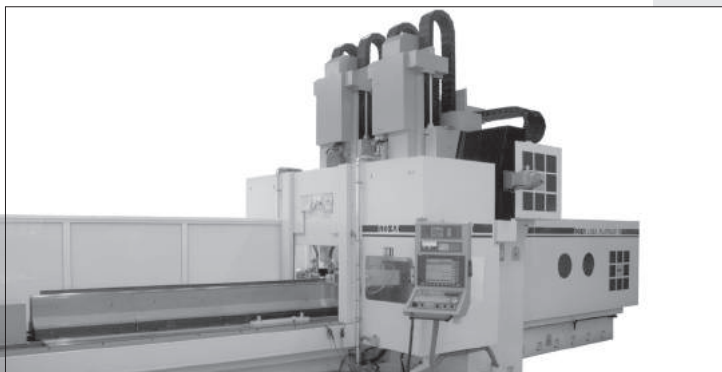


| (Unit : mm)    |    |     |    |    |           |   |     |    |                          |                           |      |                                    |       |       |               |                |
|----------------|----|-----|----|----|-----------|---|-----|----|--------------------------|---------------------------|------|------------------------------------|-------|-------|---------------|----------------|
| Rail dimension |    |     |    |    |           |   |     |    |                          | Basic load rating<br>[kN] |      | Permissible static moment<br>[N・m] |       |       | Mass          |                |
| W1             | W2 | H1  | W3 | F  | Bolt hole |   |     | G  | Max length of rail<br>L0 |                           |      |                                    |       |       | Block<br>[kg] | Rail<br>[kg/m] |
|                |    |     |    |    | d         | D | h   |    |                          |                           |      |                                    |       |       |               |                |
| 18             | 6  | 7.5 | －  | 30 | 4         | 6 | 4.5 | 10 | 1190                     | 2.45                      | 3.92 | 36                                 | 16.27 | 16.27 | 0.03          | 0.99           |
| 18             | 6  | 7.5 | －  | 30 | 4         | 6 | 4.5 | 10 | 1190                     | 3.52                      | 5.37 | 48.41                              | 30.38 | 30.38 | 0.05          | 0.99           |
| 24             | 8  | 8.5 | －  | 40 | 5         | 8 | 4.5 | 15 | 1190                     | 4.02                      | 6.08 | 47.63                              | 17.15 | 18.62 | 0.03          | 1.42           |
| 24             | 8  | 8.5 | －  | 40 | 5         | 8 | 4.5 | 15 | 1190                     | 5.96                      | 9.21 | 89.18                              | 46.35 | 52.82 | 0.1           | 1.42           |
| 42             | 9  | 9.5 | 23 | 40 | 5         | 8 | 4.5 | 15 | 1190                     | 6.66                      | 9.80 | 136.9                              | 35.28 | 38.22 | 0.12          | 2.93           |
| 42             | 9  | 9.5 | 23 | 40 | 5         | 8 | 4.5 | 15 | 1190                     | 9.91                      | 14.9 | 249.9                              | 35.35 | 107.8 | 0.21          | 2.93           |



Advanced technical solutions for high-tech industries

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



The features of SBC-ROSA roller linear rail system

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

(1) Extended life time

2 times longer life time than steel ball

In case of steel ball : 50km

In case of roller : 100km

(2) Designed with FEM analysis

[Streamlined roller slide ways]

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

[Roller]

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

(3) Innovative Lubrication System

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

(4) Sliding Uniformity

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

(5) Innovative Design

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

1. Calculating the applied loads

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

2. Life Calculation

[Calculation of nominal life]

The equation of nominal life is shown as below.

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

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

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

[Life calculation]

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

- $L_h$  (h) : Hours of nominal life
- L (km) : Nominal life
- $l_s$  (N) : Stroke
- $n_1$  (min<sup>-1</sup>) : Reciprocation cycles per minute

3. Calculation of the static safety coefficient

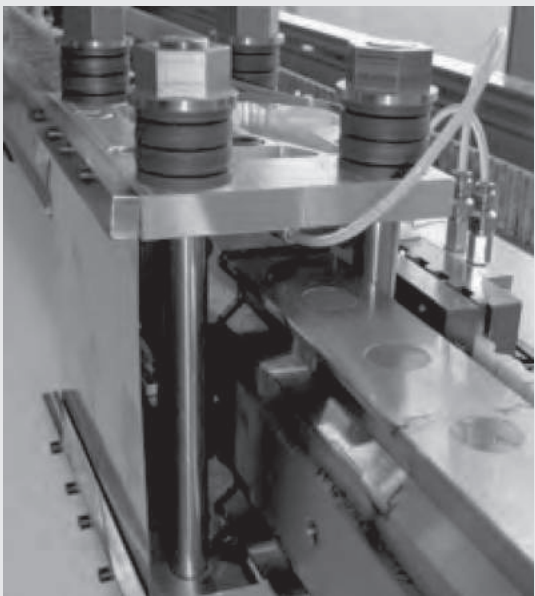
| Conditions of use                                                | Lower limit of $F_s$ |
|------------------------------------------------------------------|----------------------|
| Maximum stiffness, great impact stresses and vibrations          | $\geq 6$             |
| High stiffness, variable and average impact stresses, vibrations | $\geq 4$             |
| Uniform stresses, light vibrations                               | $\geq 3$             |

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

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

4. Durability test

[Test conditions]



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

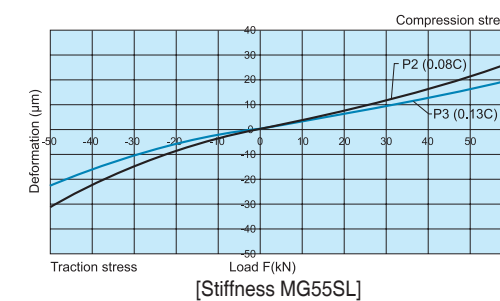
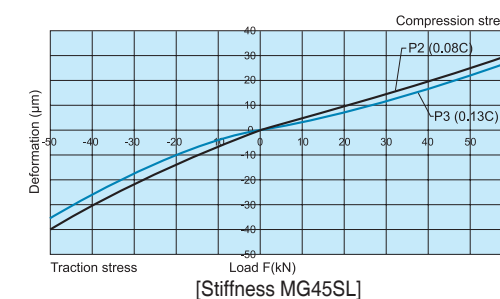
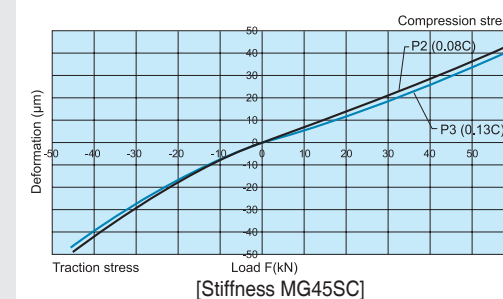
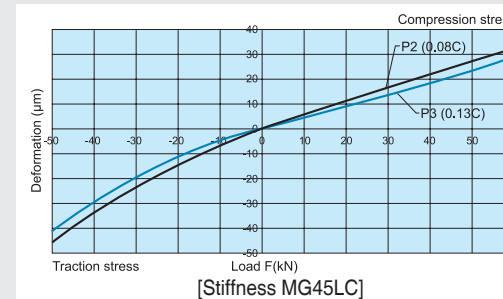
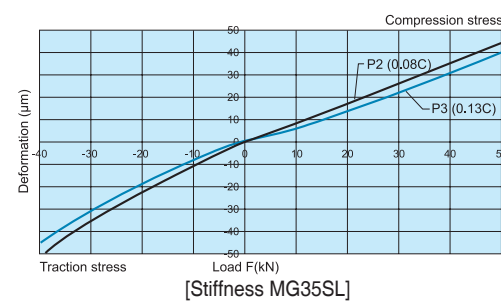
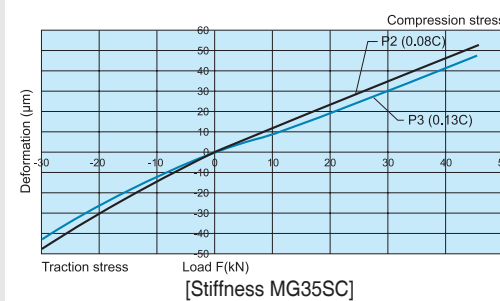
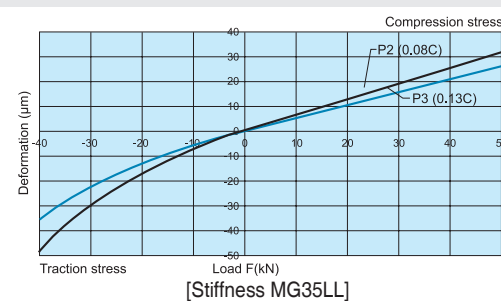
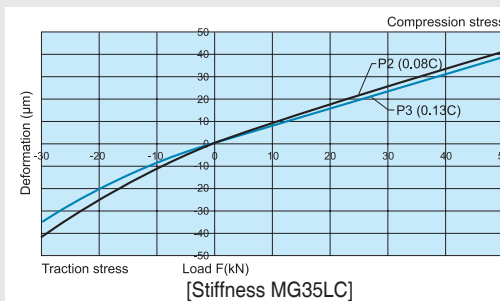
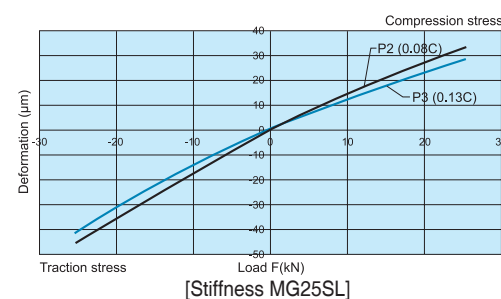
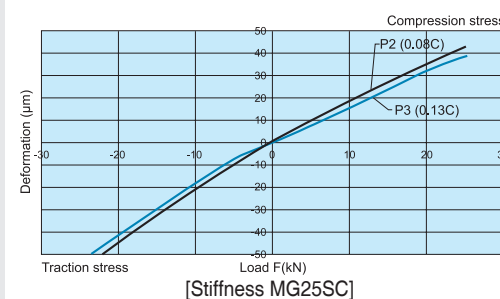
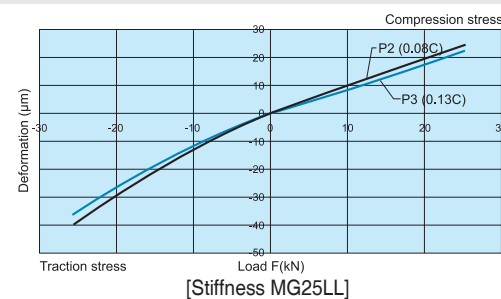
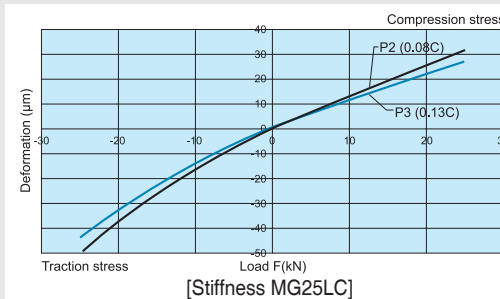
According to the DIN 631 standards, endurance is considered as to be achieved if the surfaces of the slide ways have no Pitting > 0.3 x roller diameter.

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

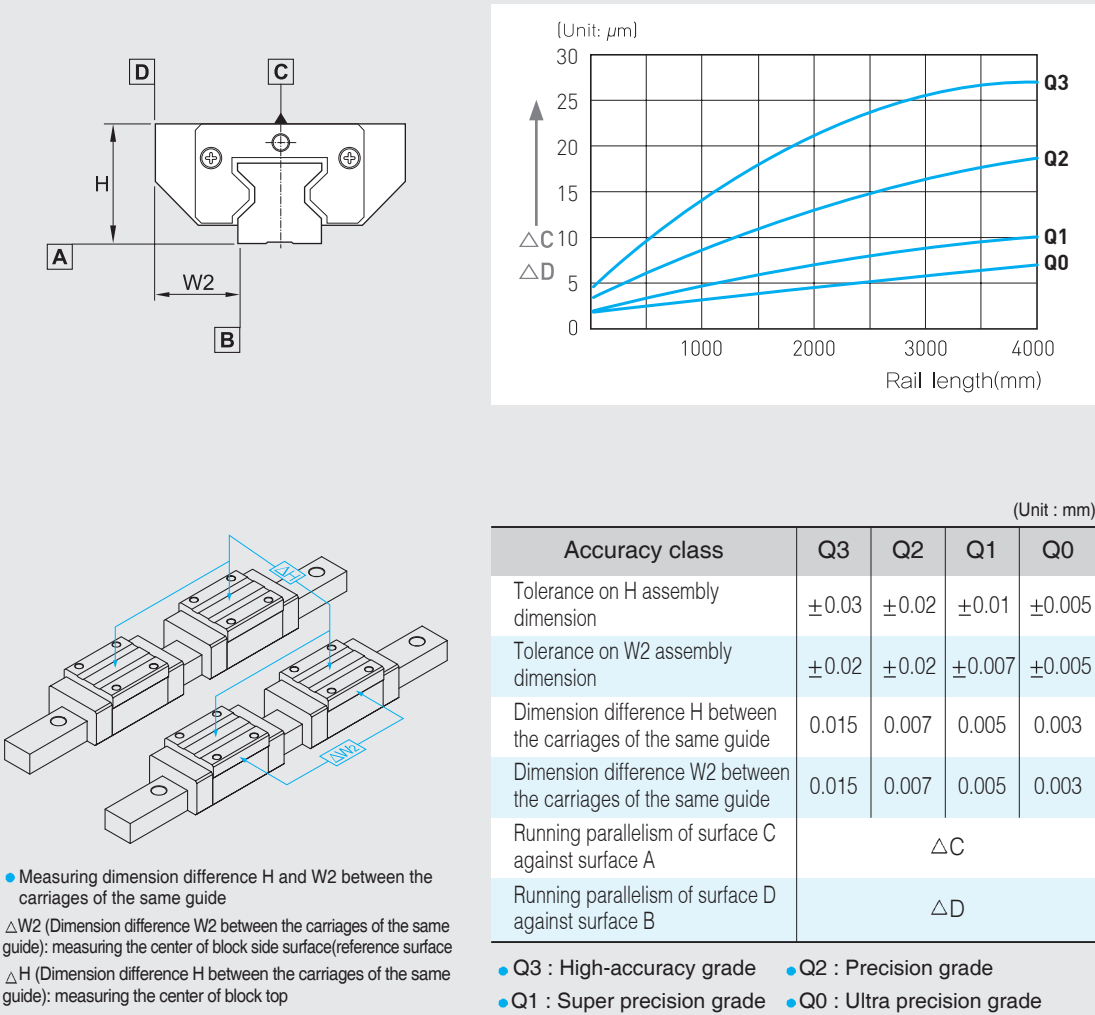
## Linear Rail System

## SBC-ROSA Roller Linear Rail System

## 5. Stiffness diagram



6. Accuracy classes

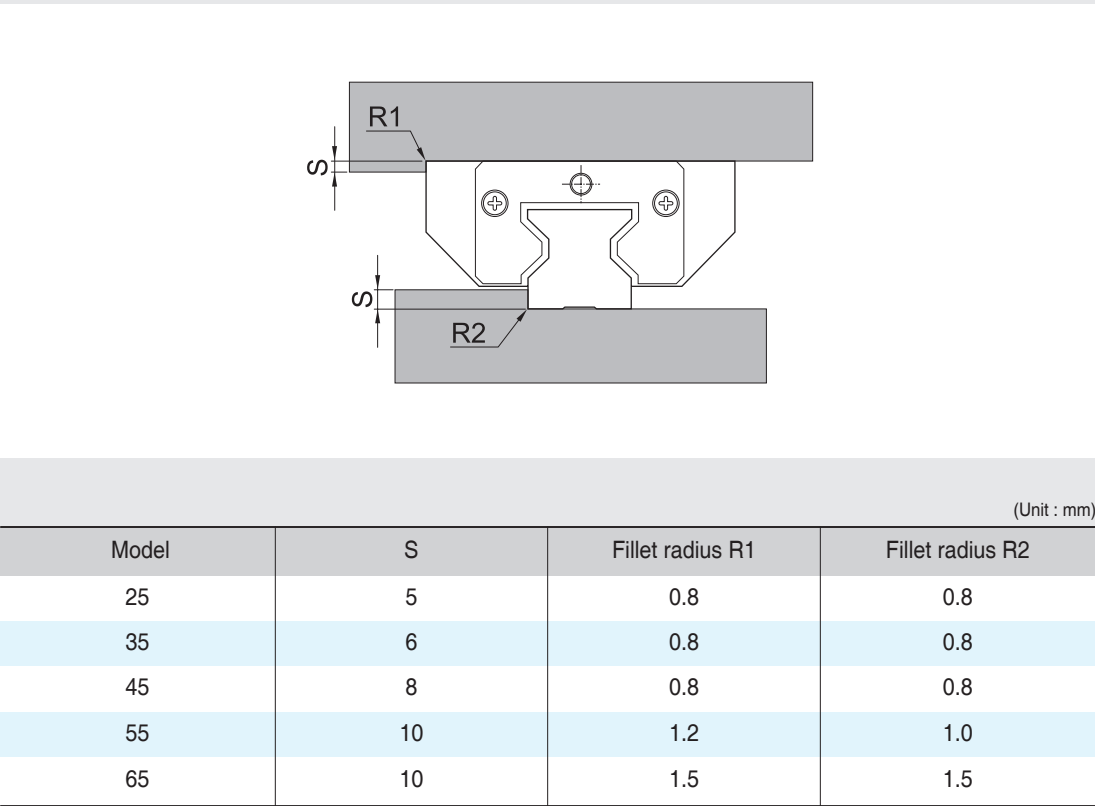


7. Preload classes

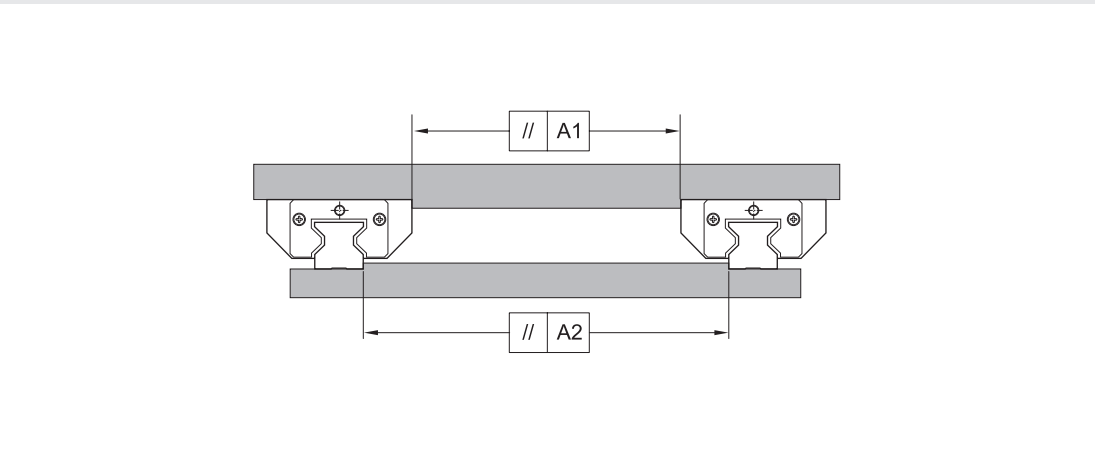
| Preload calss | Preload |
|---------------|---------|
| P2 (Light)    | 0.08C   |
| P3 (Heavy)    | 0.13C   |

● C(N) : Basic dynamic load rating

8. Shoulder height and fillet radius R



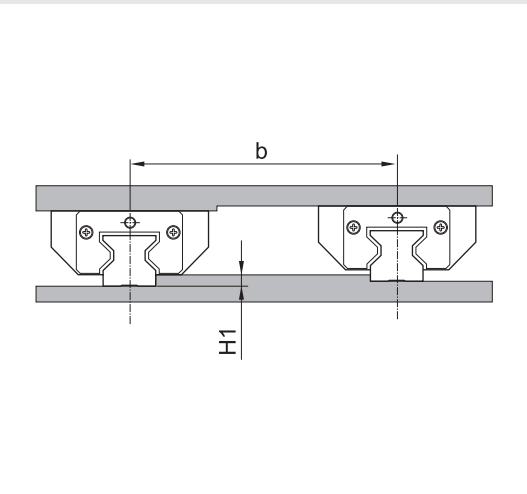
9. Parallelism tolerance for shoulder surface



(Unit : mm)

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

10. Maximum allowable deviation in height



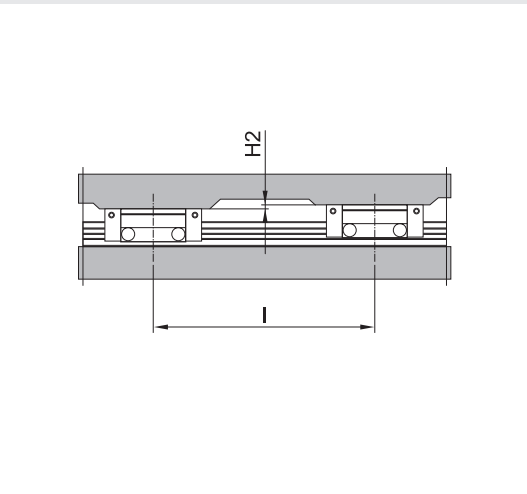
To obtain the maximum allowable deviation value in height, subtract the tolerance value of the dimension H (see the table about the accuracy classes on page ③/142) from the value H1 obtained by means of the following formula:

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

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

| Preload class          | P2 (Light)           | P3 (Heavy)           |
|------------------------|----------------------|----------------------|
| X (Calculation factor) | $1.7 \times 10^{-4}$ | $1.2 \times 10^{-4}$ |

11. Maximum allowable deviation in longitudinal direction



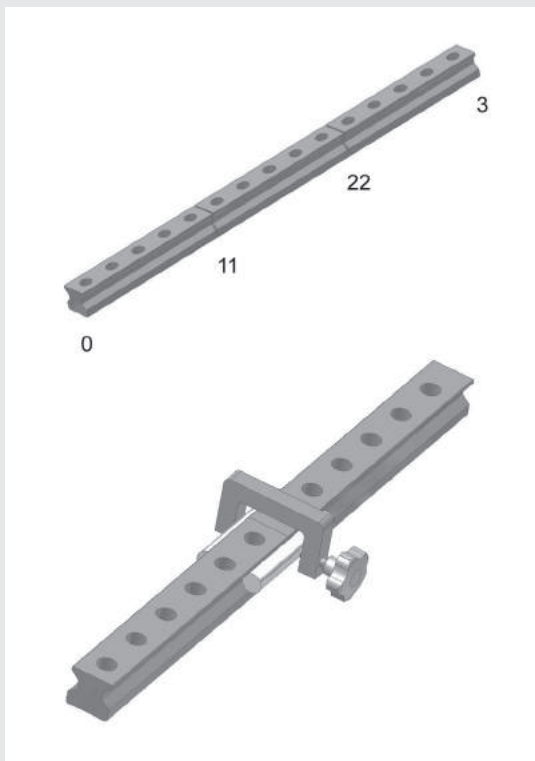
To obtain maximum allowable deviation value in longitudinal direction, subtract the tolerance value of the dimension H (see the table about the accuracy classes on page ③/142) from the value H2 obtained by means of the following formula

$\Delta H2 = Y \cdot l$

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

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

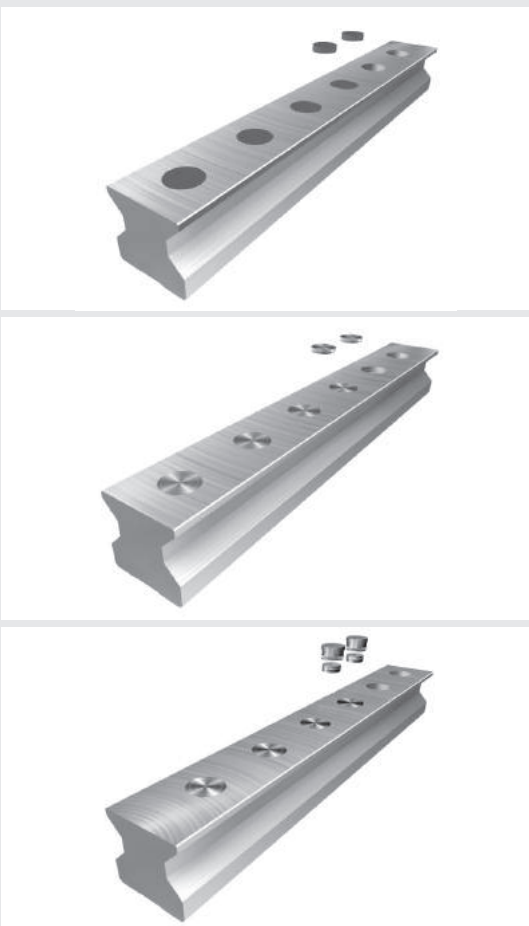
General instructions for the assembly of the guides



[Comply with the following instructions]

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

Mono-guide accessories



[Rail hole caps]

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



SBC-ROSA Roller Linear Rail System

SBC-ROSA Roller Linear Rail System

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



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

It is supplied on demand in the order

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

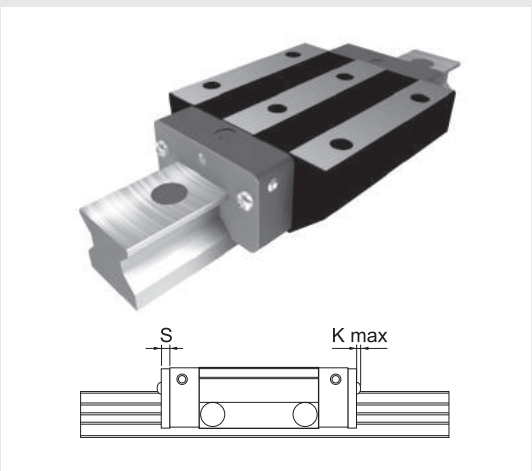


The use of the covering strip considerably simplifies the performance of the operations during the fastening of the mono-guide. After having assembled and aligned it on the bedplate of machine, the protect strip will be introduced into the groove of the guide, and then fastened with two heads at the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

- Advantages -

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

[End seal TPA]

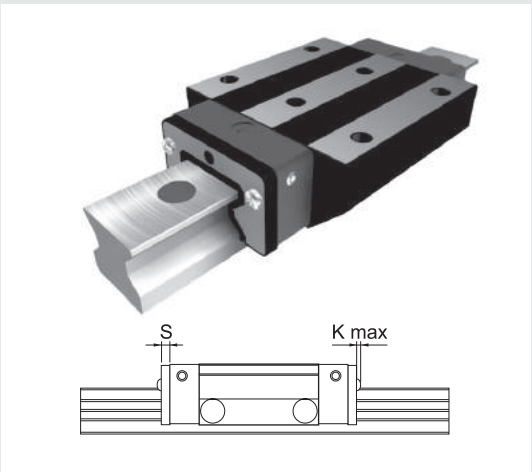


The stainless steel wiper protects the scraper rings that are built-in in the front heads of the carriage and for possible additional end seals TPNBR/TPVIT.

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

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

[Additional end seal TPNBR/TPVIT]



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

- Features of the NBR version -

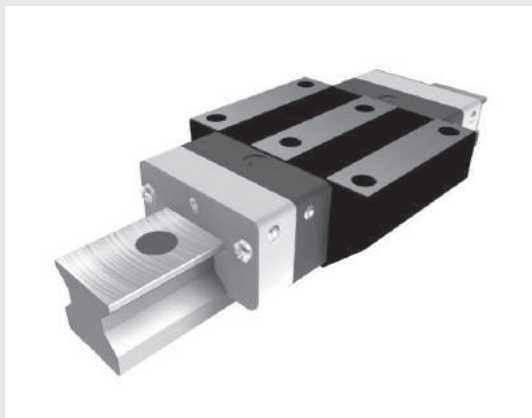
- Excellent stability in the presence of oil
- Excellent mechanical features
- Working temperature from -30°C to +110°C

- Features of the VITON version -

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

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

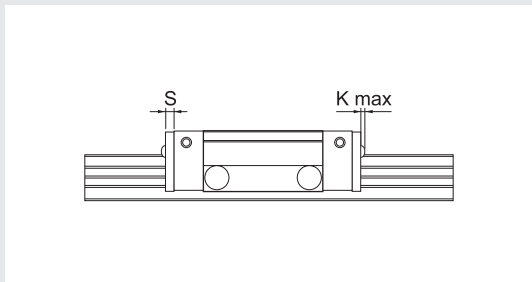
Long-life lubrication cartridge TLL



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

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

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



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

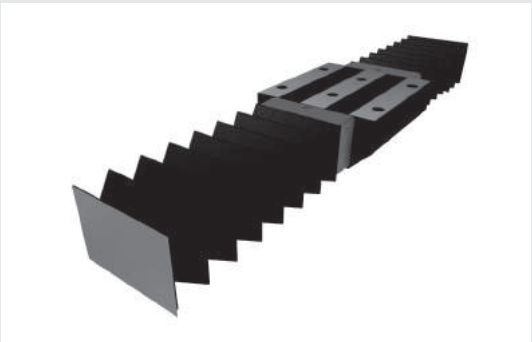
Lin Clamp clamping system



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

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

Bellows



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

Assembly guide



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

Greasing

[Recommend grease and oil]

It is advisable to use the following grease and oil types

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

[Initial lubrication before the start-up]

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

| Quantity<br>(cm³/carriage) | MG25   |     | MG35   |     | MG45   |     | MG55   |     | MG65   |     |
|----------------------------|--------|-----|--------|-----|--------|-----|--------|-----|--------|-----|
|                            | Grease | Oil | Grease | Oil | Grease | Oil | Grease | Oil | Grease | Oil |
| LC/SC                      | 1.9    | 0.8 | 2.9    | 1.0 | 5.3    | 1.4 | 8.4    | 1.8 | 15     | 3.6 |
| LL/SL                      | 2.2    |     | 3.7    |     | 6.6    |     | 10.6   |     | 18.9   |     |

[Recommended lubrication interval and lubrication values]

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

| Load    | MG25   |                | MG35   |                | MG45   |                | MG55   |                | MG65   |               |
|---------|--------|----------------|--------|----------------|--------|----------------|--------|----------------|--------|---------------|
|         | Grease | Oil            | Grease | Oil            | Grease | Oil            | Grease | Oil            | Grease | Oil           |
| C/P>8   | 800 km | 400 km /1.2cm³ | 500km  | 250 km /1.2cm³ | 300 km | 125 km /1.2cm³ | 200 km | 100 km /1.5cm³ | 100 km | 50 km /1.5cm³ |
| 5≤C/P<8 | 500 km | 250 km /0.7cm³ | 300 km | 180 km /1.0cm³ | 150 km | 90 km /0.9cm³  | 100 km | 60 km /1.2cm³  | 50 km  | 40 km /1.5cm³ |
| 3≤C/P<5 | 200 km | 100 km /0.4cm³ | 150 km | 80 km /0.6cm³  | 80 km  | 40 km /0.45cm³ | 50 km  | 30 km /0.5cm³  | 25 km  | 20 km /0.6cm³ |
| 2≤C/P<3 | 120 km | 40 km /0.2cm³  | 80 km  | 30 km /0.25cm³ | 40 km  | 20 km /0.25cm³ | 25 km  | 15 km /0.25cm³ | 15 km  | 10 km /0.3cm³ |

(Recommended lubrication interval and lubrication values)

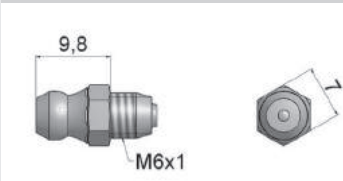
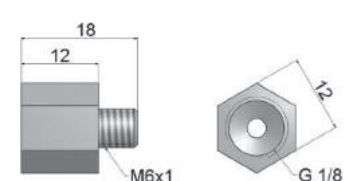
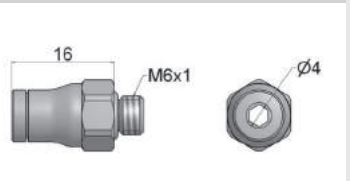
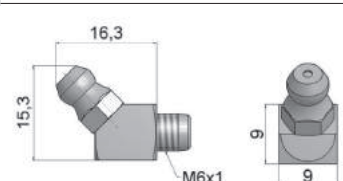
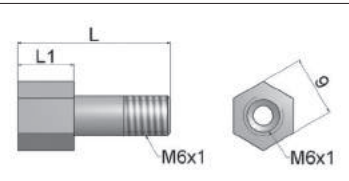
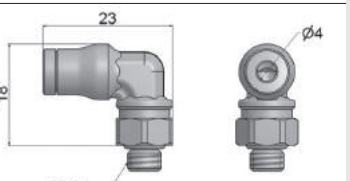
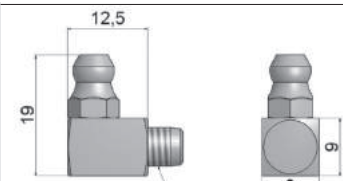
| Quantity (cm3/carriage) | MG25 | MG35 | MG45 | MG55 | MG65 |
|-------------------------|------|------|------|------|------|
| LC/SC                   | 0.5  | 1.2  | 2.2  | 3.2  | 5.9  |
| LL/SL                   | 0.6  | 1.4  | 2.6  | 4    | 7.4  |

(Minimum quantity of oil allowed by impulse)

| cm3/impuls                     | MG25 | MG35 | MG45 | MG55 | MG65 |
|--------------------------------|------|------|------|------|------|
| Horizontal                     | 0.06 | 0.1  | 0.1  | 0.16 | 0.2  |
| Vertical                       | 0.06 | 0.1  | 0.1  | 0.16 | 0.2  |
| Horizontal-Vertical, Crosswise | 0.08 | 0.15 | 0.15 | 0.25 | 0.3  |

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

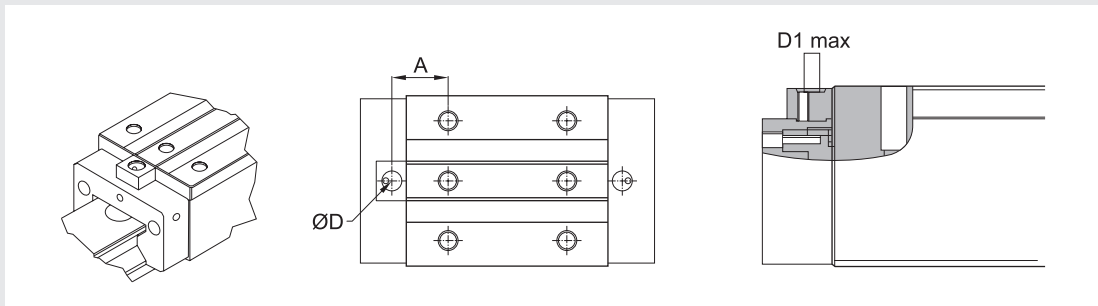
Nipple

| Grease nipple                                                                         | Connector                                                                             | Quick couplings                                                                       |
|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
|  |  |  |
|  |  |  |
|  |                                                                                       |                                                                                       |

[Top lubrication]

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

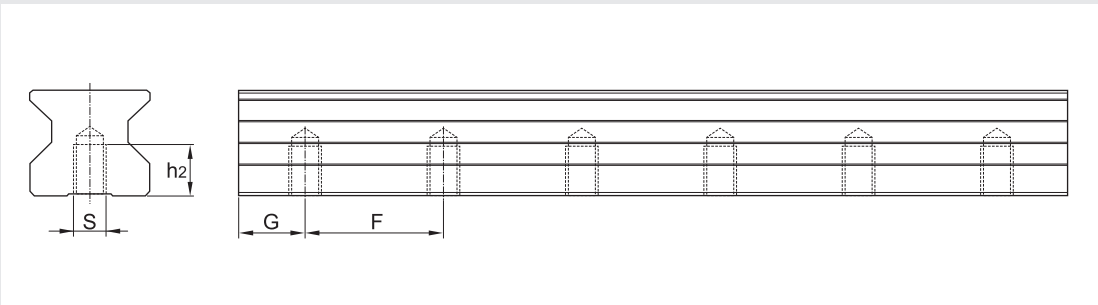
It is not possible to drill the heads after the assembly, as the chips created during this operation may clog the lubrication channels.



(Unit : mm)

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

Bottom mounting rail



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

Ordering example

**MG35 SC – N – TB – 2 – P2 – 5000 J2 – Q1 – AR – II**  
[1] [2] [3] [4] [5] [6] [7] [8] [9] [10] [11]

- [1] Model
- [2] Block type : LC, LL, SC, SL
- [3] Position of grease fitting : None (front), N (side)
- [4] Option Symbol : No symbol (standard)  
\* Please refer to Option table
- [5] Block quantity on rail
- [6] Preload : P2, P3
- [7] Rail length
- [8] Rail connection symbol : J2 ( 2PCS of rail ), J3 ( 3PCS of rail ), J4 ( 4PCS of rail )...
- [9] Accuracy class : Q3, Q2, Q1, Q0
- [10] Surface treatment : No symbol (standard), AR( Block and Rail ), RR ( Rail only ) KR ( Block only )
- [11] Number of rails per axis : None (I), 2=II...4=IV etc.

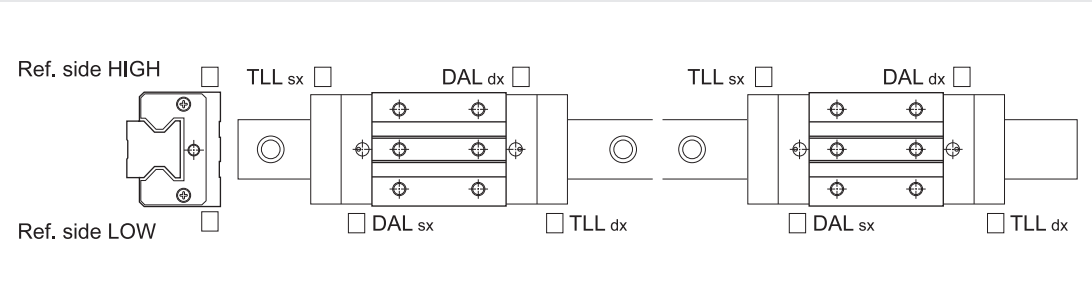
Opitioin symbol tableness

|           |                                                          |
|-----------|----------------------------------------------------------|
| No symbol | Standard                                                 |
| TP        | TPA (instead of scraper)                                 |
| TB        | TPNBR (nitro resin seal)                                 |
| TV        | TPVIT (fluoro resin seal)                                |
| TAB       | TPA+TPNBR                                                |
| TAV       | TPA+TPVIT                                                |
| TLL       | TPA+TLL(self lubricating for long maintenance intervals) |

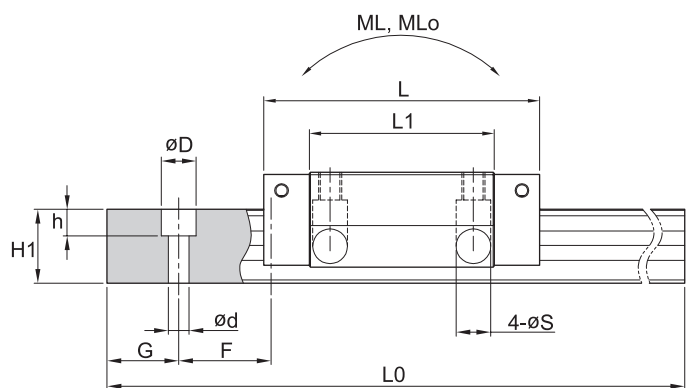
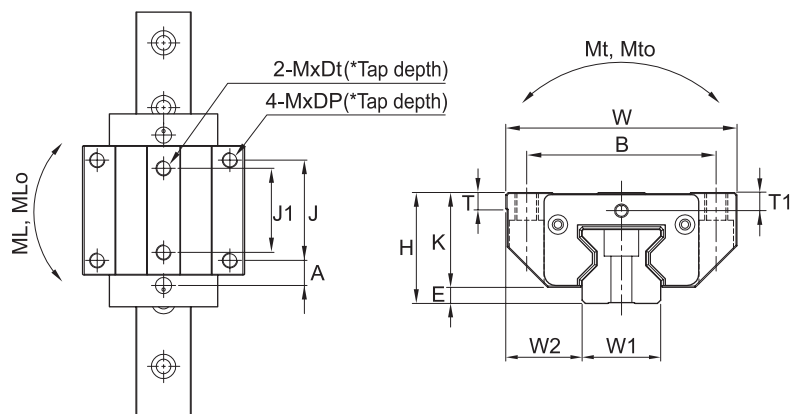
- ※ We recommend purchasing the block and rail as assembled set if high accuracy and high stiffness are required.
- ※ Please indicate the G (distance from rail end to first hole) dimension if G is not standard
- ※ Please mark the type of surface treatment separately after writing applicable symbol

Ordering sheet

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



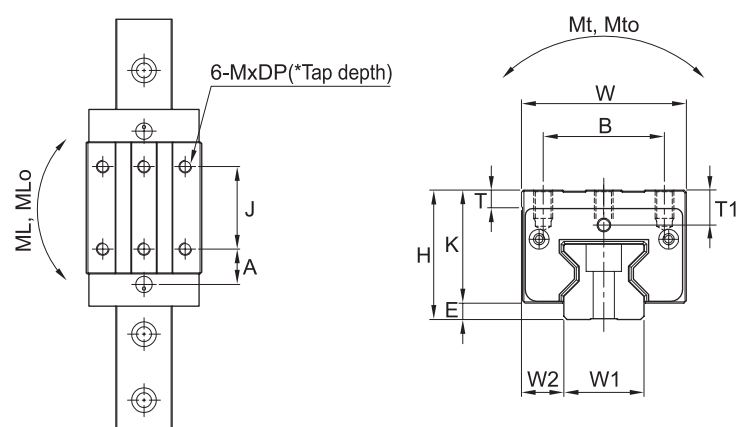
MG-LC/LL



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

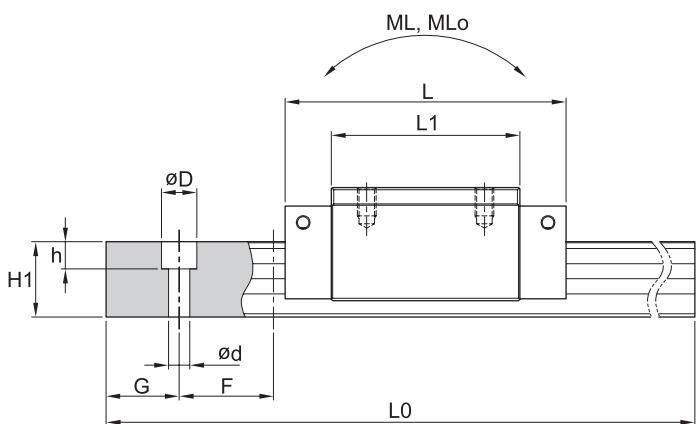
- ① C (Basic dynamic load rating), Co (Basic static load rating)  
② Mt (Torsional moment of dynamic load), Mto (Torsional moment of static load)  
③ ML(Longitudinal moment of dynamic load), MLo (Longitudinal moment of static load)

| (Unit : mm)    |      |      |      |           |    |      |      |                             |                           |       |                   |       |      |       |               |                |
|----------------|------|------|------|-----------|----|------|------|-----------------------------|---------------------------|-------|-------------------|-------|------|-------|---------------|----------------|
| Rail dimension |      |      |      |           |    |      |      |                             | Basic load rating<br>[kN] |       | Moment<br>[kN •m] |       |      |       | Mass          |                |
| W1             | W2   | H1   | F    | Bolt hole |    |      | G    | Max<br>length of rail<br>L0 |                           |       |                   |       |      |       | Block<br>[kg] | Rail<br>[kg/m] |
|                |      |      |      | d         | D  | h    |      |                             |                           |       |                   |       |      |       |               |                |
| 23             | 23,5 | 24,5 | 30   | 7         | 11 | 11,5 | 14   | 4000                        | 28,7                      | 57,6  | 0,43              | 0,86  | 0,28 | 0,57  | 0,7           | 3,4            |
| 23             | 23,5 | 24,5 | 30   | 7         | 11 | 11,5 | 14   | 4000                        | 38,9                      | 76,8  | 0,58              | 1,15  | 0,49 | 0,97  | 0,9           | 3,4            |
| 34             | 33   | 32   | 40   | 9         | 15 | 17   | 19   | 4000                        | 53,3                      | 99    | 1,17              | 2,19  | 0,67 | 1,25  | 1,7           | 6,5            |
| 34             | 33   | 32   | 40   | 9         | 15 | 17   | 19   | 4000                        | 72,6                      | 136   | 1,59              | 3,01  | 1,18 | 2,24  | 2,2           | 6,5            |
| 45             | 37,5 | 40   | 52,5 | 14        | 20 | 19   | 25   | 4000                        | 95                        | 184   | 2,61              | 5,07  | 1,53 | 2,97  | 3,3           | 10,7           |
| 45             | 37,5 | 40   | 52,5 | 14        | 20 | 19   | 25   | 4000                        | 119,5                     | 242,2 | 3,29              | 6,67  | 2,44 | 4,95  | 4,3           | 10,7           |
| 53             | 43,5 | 48   | 60   | 16        | 24 | 22   | 29   | 4000                        | 132,6                     | 256   | 4,50              | 8,70  | 2,57 | 4,98  | 5,1           | 15,2           |
| 53             | 43,5 | 48   | 60   | 16        | 24 | 22   | 29   | 4000                        | 176                       | 351   | 5,97              | 11,91 | 4,47 | 8,91  | 7             | 15,2           |
| 63             | 53,5 | 55   | 75   | 18        | 26 | 26   | 36,5 | 4000                        | 212                       | 414   | 8,10              | 15,78 | 5,21 | 10,14 | 9,3           | 22,5           |
| 63             | 53,5 | 55   | 75   | 18        | 26 | 26   | 36,5 | 4000                        | 276                       | 579   | 10,53             | 22,10 | 8,98 | 11,84 | 13,5          | 22,5           |



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

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



| (Unit : mm)    |      |      |      |           |    |      |      |                                |                           |       |                   |       |      |       |               |                |
|----------------|------|------|------|-----------|----|------|------|--------------------------------|---------------------------|-------|-------------------|-------|------|-------|---------------|----------------|
| Rail dimension |      |      |      |           |    |      |      |                                | Basic load rating<br>[kN] |       | Moment<br>[kN ·m] |       |      |       | Mass          |                |
| W1             | W2   | H1   | F    | Bolt hole |    |      | G    | Max<br>length<br>of rail<br>L0 |                           |       |                   |       |      |       | Block<br>[kg] | Rail<br>[kg/m] |
|                |      |      |      | d         | D  | h    |      |                                |                           |       |                   |       |      |       |               |                |
| 23             | 12,5 | 24,5 | 30   | 7         | 11 | 11,5 | 14   | 4000                           | 28,7                      | 57,6  | 0,43              | 0,86  | 0,28 | 0,57  | 0,6           | 3,4            |
| 23             | 12,5 | 24,5 | 30   | 7         | 11 | 11,5 | 14   | 4000                           | 38,9                      | 76,8  | 0,58              | 1,15  | 0,49 | 0,97  | 0,8           | 3,4            |
| 34             | 18   | 32   | 40   | 9         | 15 | 17   | 19   | 4000                           | 53,3                      | 99    | 1,17              | 2,19  | 0,67 | 1,25  | 1,6           | 6,5            |
| 34             | 18   | 32   | 40   | 9         | 15 | 17   | 19   | 4000                           | 72,6                      | 136   | 1,59              | 3,01  | 1,18 | 2,24  | 2             | 6,5            |
| 45             | 20,5 | 40   | 52,5 | 14        | 20 | 19   | 25   | 4000                           | 95                        | 184   | 2,61              | 5,07  | 1,53 | 2,97  | 3,1           | 10,7           |
| 45             | 20,5 | 40   | 52,5 | 14        | 20 | 19   | 25   | 4000                           | 119,5                     | 242,2 | 3,29              | 6,67  | 2,44 | 4,95  | 4,1           | 10,7           |
| 53             | 23,5 | 48   | 60   | 16        | 24 | 22   | 29   | 4000                           | 132,6                     | 256   | 4,50              | 8,70  | 2,57 | 4,98  | 4,7           | 15,2           |
| 53             | 23,5 | 48   | 60   | 16        | 24 | 22   | 29   | 4000                           | 176                       | 351   | 5,97              | 11,91 | 4,47 | 8,91  | 6,2           | 15,2           |
| 63             | 31,5 | 55   | 75   | 18        | 26 | 26   | 36,5 | 4000                           | 212                       | 414   | 8,10              | 15,78 | 5,21 | 10,14 | 8,5           | 22,5           |
| 63             | 31,5 | 55   | 75   | 18        | 26 | 26   | 36,5 | 4000                           | 276                       | 579   | 10,53             | 22,10 | 8,98 | 11,84 | 12,7          | 22,5           |