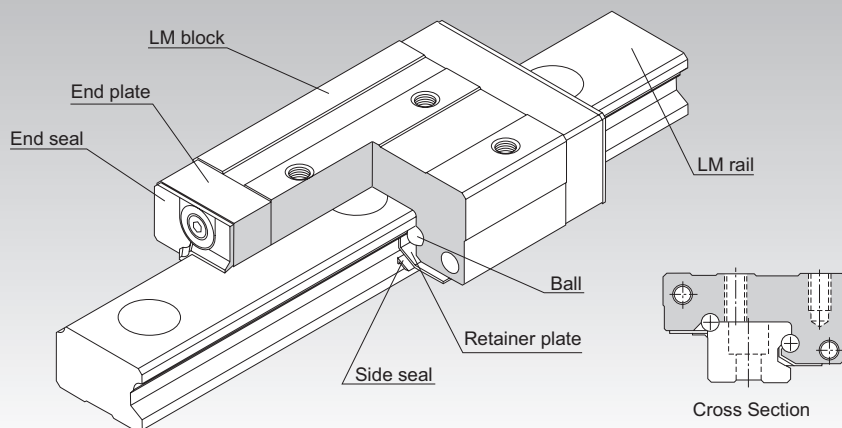


# GSR

## Separate Type (Radial) LM Guide Model GSR



**Selection Criteria** **A1-10**

**Design Highlights** **A1-482**

**Options** **A1-507**

**Model No.** **A1-577**

**Handling Precautions** **A1-583**

**Accessories for Lubrication** **A24-1**

**Mounting Procedure** **B1-89**

**Equivalent Moment Factor** **A1-43**

**Rated Loads in All Directions** **A1-61**

**Equivalent Factor in Each Direction** **A1-63**

**Example of Clearance Adjustment** **A1-297**

**Accuracy Standards** **A1-84**

**Shoulder Height of the Mounting Base and the Corner Radius** **A1-496**

**Reference Error Tolerance for the Mounting Surface** **A1-499**

**Dimensions of Each Model with Options Attached** **A1-521**

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## Structure and Features

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Balls roll in two rows of raceways precision-ground on an LM rail and an LM block, and end plates incorporated in the LM block allow the balls to circulate. Since retainer plates hold the balls, they will not fall out.

Because the top face of the LM block is inclined, clearance is eliminated and an appropriate preload is applied simply by securing the LM block with mounting bolts.

Model GSR has a special contact structure using circular-arc grooves. This increases self-adjusting capability and makes GSR an optimal model for places associated with difficulty establishing high accuracy and for general industrial machinery.

Note: Model GSR cannot be used in single-axis applications.

### Interchangeability

Both the LM block and LM rail are interchangeable and can be stored separately. Therefore, it is possible to store a long-size LM rail and cut it to a desired length before using it.

### Compact

Model GSR's low center of gravity and low overall height help reduce the size of machines.

### Capable of Receiving a Load in any Direction

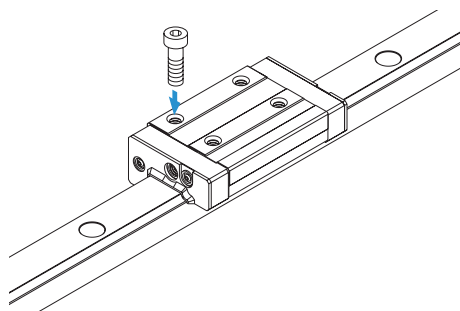
The ball contact angle is designed so that this model can receive a load in any direction. As a result, it can be used in places where a reverse-radial load, lateral load, or a moment in any direction is applied.

## Types and Features

### Model GSR-T

Dimensional Table⇒ **A1-298**

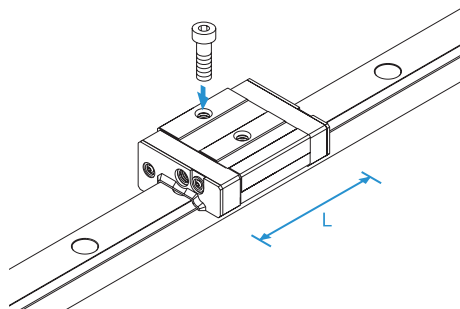
This model is the standard type.



### Model GSR-V

Dimensional Table⇒ **A1-298**

This is a space-saving type that has the same cross-sectional shape as GSR-T, but has a shorter overall LM block length (L).



## Example of Clearance Adjustment

By providing a shoulder on the side face of each LM block and pressing either LM block with a bolt, a preload can be applied and the rigidity increased.

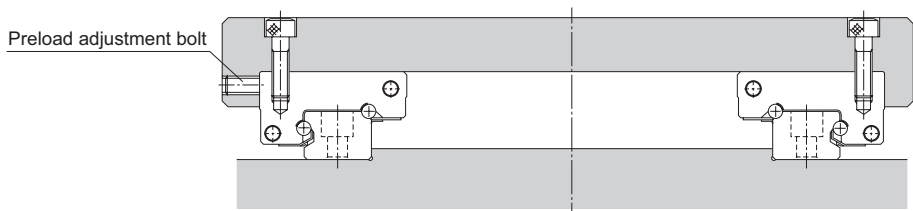
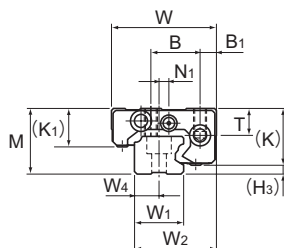
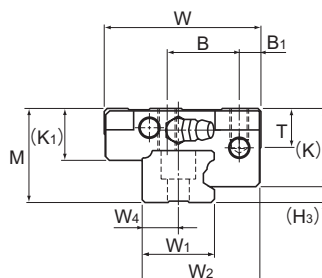


Fig. 1: Example of Adjusting a Preload with a Push Bolt

# Models GSR-T and GSR-V



Model GSR15T/V

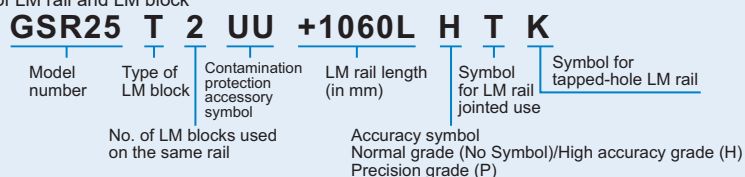


Models GSR20 to 35T, Models GSR20V, and 25V

| Model No.          | Outer dimensions |       |                     | LM block dimensions |    |         |         |                |      |      |                |     |                |     |       | Grease nipple | H <sub>3</sub> |
|--------------------|------------------|-------|---------------------|---------------------|----|---------|---------|----------------|------|------|----------------|-----|----------------|-----|-------|---------------|----------------|
|                    | Height           | Width | Length <sup>1</sup> |                     |    |         |         |                |      |      |                |     |                |     |       |               |                |
|                    | M                | W     | L                   | B <sub>1</sub>      | B  | C       | S × ℓ   | L <sub>1</sub> | T    | K    | K <sub>1</sub> | N   | N <sub>1</sub> | E   |       |               |                |
| GSR 15V<br>GSR 15T | 20               | 32    | 47.1<br>59.8        | 5                   | 15 | —<br>26 | M4 × 7  | 27.5<br>40.2   | 8.25 | 16.8 | 12             | 4.5 | 3              | 5.5 | PB107 | 3.2           |                |
| GSR 20V<br>GSR 20T | 24               | 43    | 58.1<br>74          | 7                   | 20 | —<br>30 | M5 × 8  | 34.3<br>50.2   | 9.7  | 20.6 | 13.6           | 5   | —              | 12  | B-M6F | 3.4           |                |
| GSR 25V<br>GSR 25T | 30               | 50    | 69<br>88            | 7                   | 23 | —<br>40 | M6 × 10 | 41.2<br>60.2   | 12.7 | 25.4 | 16.8           | 7   | —              | 12  | B-M6F | 4.6           |                |
| GSR 30T            | 33               | 57    | 103                 | 8                   | 26 | 45      | M8 × 12 | 70.3           | 14.6 | 28.5 | 18             | 7   | —              | 12  | B-M6F | 4.5           |                |
| GSR 35T            | 38               | 68    | 117                 | 9                   | 32 | 50      | M8 × 15 | 80.3           | 15.6 | 32.5 | 20.5           | 8   | —              | 12  | B-M6F | 5.5           |                |

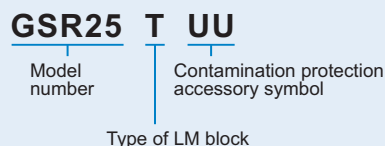
## Model number coding

Combination of LM rail and LM block

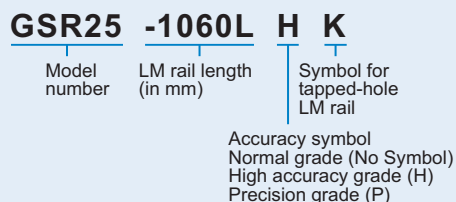


Notes: One set of model GSR. This model number indicates that a single-rail unit constitutes one set.  
See **A1-548** for contamination protection accessories. See **A1-84** for accuracy symbol.

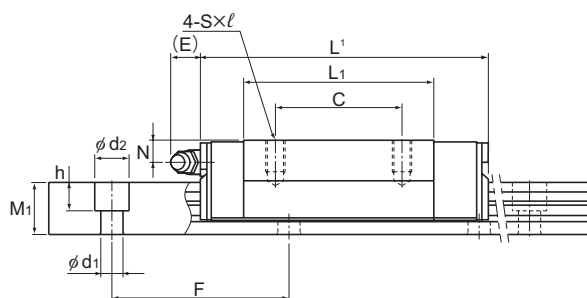
LM block



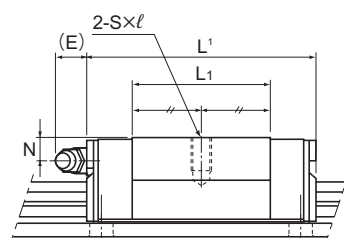
LM rail



Notes: See **A1-548** for contamination protection accessories. See **A1-84** for accuracy symbol.



Models GSR15 to 35T



Models GSR15 to 25V

Unit: mm

| LM rail dimensions |                |                |                |        |                                     |      |                     | Basic load rating <sup>1</sup> |                | Static permissible moment kN·m <sup>4</sup>                                       |                |                                                                                   |                | Mass         |         |
|--------------------|----------------|----------------|----------------|--------|-------------------------------------|------|---------------------|--------------------------------|----------------|-----------------------------------------------------------------------------------|----------------|-----------------------------------------------------------------------------------|----------------|--------------|---------|
| Width              |                |                |                | Height | Pitch                               |      | Length <sup>2</sup> | C                              | C <sub>0</sub> |  |                |  |                | LM block     | LM rail |
| W <sub>1</sub>     | W <sub>2</sub> | W <sub>4</sub> | M <sub>1</sub> | F      | d <sub>1</sub> × d <sub>2</sub> × h | Max  |                     | kN                             | kN             | 1 block                                                                           | 2 blocks       | 1 block                                                                           | 2 blocks       | kg           | kg/m    |
| 15                 | 25             | 7.5            | 11.5           | 60     | 4.5 × 7.5 × 5.3                     | 2000 |                     | 6.51<br>8.42                   | 6.77<br>9.77   | 0.0305<br>0.0606                                                                  | 0.19<br>0.337  | 0.0264<br>0.0523                                                                  | 0.165<br>0.29  | 0.08<br>0.13 | 1.2     |
| 20                 | 33             | 10             | 13             | 60     | 6 × 9.5 × 8.5                       | 3000 |                     | 10.5<br>13.6                   | 10.6<br>15.3   | 0.06<br>0.118                                                                     | 0.368<br>0.652 | 0.052<br>0.102                                                                    | 0.318<br>0.562 | 0.17<br>0.25 | 1.8     |
| 23                 | 38             | 11.5           | 16.5           | 60     | 7 × 11 × 9                          | 3000 |                     | 15.5<br>20                     | 15.2<br>22     | 0.102<br>0.205                                                                    | 0.625<br>1.11  | 0.0891<br>0.176                                                                   | 0.541<br>0.961 | 0.29<br>0.5  | 2.6     |
| 28                 | 44.5           | 14             | 19             | 80     | 9 × 14 × 12                         | 3000 |                     | 27.8                           | 29.9           | 0.325                                                                             | 1.77           | 0.28                                                                              | 1.52           | 0.6          | 3.6     |
| 34                 | 54             | 17             | 22             | 80     | 11 × 17.5 × 14                      | 3000 |                     | 37                             | 39.1           | 0.485                                                                             | 2.63           | 0.419                                                                             | 2.27           | 1            | 5       |

<sup>1</sup> Length L shown in the table is the length with the contamination protection accessories, code UU or SS.

If other contamination protection accessories or lubricant equipment are installed, the total block length will increase. (See **A1-521** or **A1-543**)

<sup>2</sup> The maximum length indicates the standard maximum length of an LM rail. (See **A1-300**.)

<sup>3</sup> The basic load rating is for a load in the radial direction.

Use Table 7 on **A1-61** to calculate the load rating for loads in the reverse-radial direction or lateral direction.

<sup>4</sup> Static permissible moment 1 block: the static permissible moment with one LM block

2 blocks: the static permissible moment with two LM blocks in close contact with each other

A moment in the M<sub>c</sub> direction can be received if two rails are used in parallel. However, since it depends on the distance between the two rails, it has been omitted.

Note: For oil lubrication, be certain to let THK know the mounting orientation and where the LM block piping joint should be attached.

(Mounting orientation: see **A1-12**, Lubricant: see **A24-2**)

## Standard Lengths and Maximum Lengths of LM Rails

Table 1 shows the standard lengths and the maximum lengths of model GSR variations. For customers requiring a large quantity of rails in different lengths, it is more economical to prepare a stock of LM rail of the maximum length and cut the rail to the desired length as necessary.

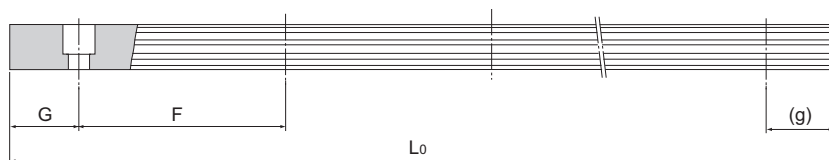


Table 1: Standard Lengths and Maximum Lengths of LM Rails for Model GSR

Unit: mm

| Model No.                                | GSR 15 | GSR 20 | GSR 25 | GSR 30 | GSR 35 |
|------------------------------------------|--------|--------|--------|--------|--------|
| LM rail<br>standard lengths<br>( $L_0$ ) | 460    | 460    | 460    | 1240   | 1240   |
|                                          | 820    | 820    | 820    | 1720   | 1720   |
|                                          | 1060   | 1060   | 1060   | 2200   | 2200   |
|                                          | 1600   | 1600   | 1600   | 3000   | 3000   |
| Standard pitch F                         | 60     | 60     | 60     | 80     | 80     |
| G, g                                     | 20     | 20     | 20     | 20     | 20     |
| Max length                               | 2000   | 3000   | 3000   | 3000   | 3000   |

Note: The maximum length varies with accuracy grades. Contact THK for details.

## Tapped-Hole Type LM Rail

- Since the bottom of the LM rail has a tapped hole, this model can easily be installed on a steel H-beam or channel.
- Since the top face of the LM rail has no mounting hole, it provides a better seal and prevents the entrance of foreign material (e.g., cutting chips).

(1) As shown in Fig. 2, a tapered washer is also available that allows GSR to be mounted on a steel flange.

(2) For model number coding, see **A1-298**.

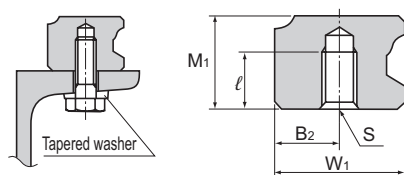


Fig. 2

Table 2: Tap Profile and Depth at Each Position

| Model No. | $W_1$ | $B_2$ | $M_1$ | $S \times \ell$ |
|-----------|-------|-------|-------|-----------------|
| GSR 15    | 15    | 7.5   | 11.5  | M4 × 7          |
| GSR 20    | 20    | 10    | 13    | M5 × 8          |
| GSR 25    | 23    | 11.5  | 16.5  | M6 × 10         |
| GSR 30    | 28    | 14    | 19    | M8 × 12         |
| GSR 35    | 34    | 17    | 22    | M10 × 14        |

