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

As the top face of the LM block is inclined, a 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.

* 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]
Since model GSR has a low center of gravity structure with a low overall height, the machine can be downsized.

[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
This model is a standard type.

Model GSR-V
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 maybe on the side face of each LM block and pressing either LM block with a bolt, a preload is applied and the rigidity is increased.

Fig.1 Example of Adjusting a Preload with a Push Bolt
## Models GSR-T and GSR-V

### Model Number Coding

Combination of LM Rail and LM Block

<table>
<thead>
<tr>
<th>Model No.</th>
<th>Outer Dimensions</th>
<th>LM Block Dimensions</th>
<th>Grease Nipple</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Height</td>
<td>Width</td>
<td>Length</td>
</tr>
<tr>
<td>GSR 15V</td>
<td>20</td>
<td>32</td>
<td>47.1</td>
</tr>
<tr>
<td>GSR 15T</td>
<td>20</td>
<td>32</td>
<td>59.8</td>
</tr>
<tr>
<td>GSR 20V</td>
<td>24</td>
<td>43</td>
<td>58.1</td>
</tr>
<tr>
<td>GSR 20T</td>
<td>24</td>
<td>43</td>
<td>74</td>
</tr>
<tr>
<td>GSR 25V</td>
<td>30</td>
<td>50</td>
<td>69</td>
</tr>
<tr>
<td>GSR 25T</td>
<td>30</td>
<td>50</td>
<td>88</td>
</tr>
<tr>
<td>GSR 30T</td>
<td>33</td>
<td>57</td>
<td>103</td>
</tr>
<tr>
<td>GSR 35T</td>
<td>38</td>
<td>68</td>
<td>117</td>
</tr>
</tbody>
</table>

### Model Number Format

- **GSR25** T 2 UU +1060L H T K
  - **Model number**: GSR25
  - **Type of LM block**: T
  - **No. of LM blocks used on the same rail**: 2
  - **Contamination protection accessory symbol**: UU
  - **LM rail length (in mm)**: +1060
  - **Symbol for LM rail jointed use**: H
  - **Symbol for tapped-hole LM rail type**: T
  - **Symbol for normal grade (No symbol)/**High accuracy grade (H) precision grade (P)**: K

### Notes

- Note: One set of model GSR: This model number indicates that a single-rail unit constitutes one set.
### Model number coding

**LM block**

- **GSR25 T UU**
  - **Model number**
  - **Contamination protection accessory symbol (\(^*1\))**
  - **Type of LM block**

**LM rail**

- **GSR25 -1060L H K**
  - **Model number**
  - **LM rail length (in mm)**
  - **Symbol for tapped-hole LM rail type**
  - **Accuracy symbol (\(^*2\))**

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

#### LM Guide

- **GSR**

<table>
<thead>
<tr>
<th>Width (W)</th>
<th>Height (W₂)</th>
<th>Pitch (F)</th>
<th>d₁×d₂×h</th>
<th>Length (in mm)</th>
<th>Basic load rating</th>
<th>Static permissible moment (kN-m)</th>
<th>Mass (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>C (kN)</td>
<td>C₀ (kN)</td>
<td>Double blocks</td>
</tr>
<tr>
<td>15</td>
<td>25</td>
<td>7.5</td>
<td>11.5</td>
<td>60</td>
<td>4.5×7.5×5.3</td>
<td>2000</td>
<td>4.31 5.69 8.43 0.0252 0.0525 0.158 0.292 0.0218 0.0452 0.136 0.252 0.08 0.13</td>
</tr>
<tr>
<td>20</td>
<td>33</td>
<td>10</td>
<td>13</td>
<td>60</td>
<td>6×9.5×8.5</td>
<td>3000</td>
<td>7.01 9.22 13.2 0.0498 0.102 0.307 0.564 0.0431 0.0885 0.265 0.486 0.17 0.25</td>
</tr>
<tr>
<td>23</td>
<td>38</td>
<td>11.5</td>
<td>16.5</td>
<td>60</td>
<td>7×11×9</td>
<td>3000</td>
<td>10.29 13.5 12.65 19 0.0858 0.177 0.522 0.965 0.0742 0.152 0.451 0.831 0.29 0.5</td>
</tr>
<tr>
<td>28</td>
<td>44.5</td>
<td>14</td>
<td>19</td>
<td>80</td>
<td>9×14×12</td>
<td>3000</td>
<td>18.8 25.9 0.282 1.54 0.243 1.32 0.6</td>
</tr>
<tr>
<td>34</td>
<td>54</td>
<td>17</td>
<td>22</td>
<td>80</td>
<td>11×17.5×14</td>
<td>3000</td>
<td>25.1 33.8 0.421 2.28 0.362 1.96 1</td>
</tr>
</tbody>
</table>

**Note** A moment in the direction \(M_{c}\) can be received if two rails are used in parallel. However, since it depends on the distance between the two rails, the moment in the direction \(M_{c}\) is omitted here.

The maximum length under "Length" indicates the standard maximum length of an LM rail. (See A1-296.)

Static permissible moment*: 1 block: static permissible moment value with 1 LM block

Double blocks: static permissible moment value with 2 blocks closely contacting with each other

Clients who require wall-mounted installations or oil lubrication should contact THK.

\(^{*1}\) See contamination protection accessory on A1-510. \(^{*2}\) See A1-82.
**Standard Length and Maximum Length of the LM Rail**

Table 1 shows the standard lengths and the maximum lengths of model GSR variations. In case the required quantity is large and the lengths are not the same, we recommend preparing an LM rail of the maximum length in stock. This is economical since it allows you to cut the rail to the desired length as necessary.

![Image of LM rail](image)

### Table 1 Standard Length and Maximum Length of the LM Rail for Model GSR

<table>
<thead>
<tr>
<th>Model No.</th>
<th>GSR 15</th>
<th>GSR 20</th>
<th>GSR 25</th>
<th>GSR 30</th>
<th>GSR 35</th>
</tr>
</thead>
<tbody>
<tr>
<td>LM rail</td>
<td>460</td>
<td>820</td>
<td>1060</td>
<td>1600</td>
<td>2000</td>
</tr>
<tr>
<td>standard length (L₀)</td>
<td>460</td>
<td>820</td>
<td>1060</td>
<td>1240</td>
<td>1240</td>
</tr>
<tr>
<td>Standard pitch F</td>
<td>60</td>
<td>60</td>
<td>60</td>
<td>80</td>
<td>80</td>
</tr>
<tr>
<td>G</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>20</td>
</tr>
<tr>
<td>Max length</td>
<td>2000</td>
<td>3000</td>
<td>3000</td>
<td>3000</td>
<td>3000</td>
</tr>
</tbody>
</table>

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

### Tapped-hole LM Rail Type of Model GSR

- Since the bottom of the LM rail has a tapped hole, this model can easily be installed on an H-shape steel and channel.
- Since the top face of the LM rail has no mounting hole, the sealability is increased and entrance of foreign material (e.g., cutting chips) can be prevented.

1. Determine the bolt length so that a clearance of 2 to 3 mm is secured between the bolt end and the bottom of the tap (effective tap depth).
2. As shown in Fig. 2, a tapered washer is also available that allows GSR to be mounted on a section steel.
3. For model number coding, see **A1-294** to **A1-295**.

![Image of tapered washer](image)

### Table 2 Tap Position and Depth Shape

<table>
<thead>
<tr>
<th>Model No.</th>
<th>W₁</th>
<th>B₂</th>
<th>M₁</th>
<th>S × ℓ</th>
</tr>
</thead>
<tbody>
<tr>
<td>GSR 15</td>
<td>15</td>
<td>7.5</td>
<td>11.5</td>
<td>M₄×7</td>
</tr>
<tr>
<td>GSR 20</td>
<td>20</td>
<td>10</td>
<td>13</td>
<td>M₅×8</td>
</tr>
<tr>
<td>GSR 25</td>
<td>23</td>
<td>11.5</td>
<td>16.5</td>
<td>M₆×10</td>
</tr>
<tr>
<td>GSR 30</td>
<td>28</td>
<td>14</td>
<td>19</td>
<td>M₈×12</td>
</tr>
<tr>
<td>GSR 35</td>
<td>34</td>
<td>17</td>
<td>22</td>
<td>M₁₀×14</td>
</tr>
</tbody>
</table>
Point of Selection A1-10
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As the top face of the LM block is inclined, a clearance is eliminated and an appropriate preload is applied simply by securing the LM block with mounting bolts.

Model GSR-R is based on model GSR, but has rack teeth on the LM rail. This facilitates the design and assembly of drive mechanisms.

* Model GSR-R cannot be used in single-axis applications.

**[Reduced Machining and Assembly Costs]**
The single-piece structure integrating the LM rail (linear guide) and rack (drive) reduces labor and time for machining the rack mounting surface and assembling and adjusting the guide system, thus to achieve significant cost reduction.

**[Easy Designing]**
The travel distance per turn of the pinion is specified by the integer value. This makes it easy to calculate the travel distance per pulse when the LM Guide is used in combination with a stepping motor or servomotor.

**[Space Saving]**
Since the rail has a rack, the machine size can be reduced.

**[Long Stroke]**
The end faces of the LM rail are machined for jointed use. To obtain a long stroke, simply joint LM rails of the standard length.

**[High Durability]**
The rack tooth has a width equal to the LM rail height, the rack uses high-grade steel with proven performance and the tooth surface are heat-treated, thereby to ensure high durability.
Types and Features

Model GSR-R (Rail with Rack)

Since the thrust load on the pinion shaft can be kept low due to rack-pinion meshing, it is easy to design systems with pinion shaft bearings and tables that are not so rigid.