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Linear Modules

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## Linear Module

### Product overview

<table>
<thead>
<tr>
<th>Overview of multi axis linear module</th>
<th>Permissible max. pay load</th>
</tr>
</thead>
<tbody>
<tr>
<td>Description</td>
<td>Type</td>
</tr>
<tr>
<td>1 axis linear module-UL type</td>
<td>UL</td>
</tr>
<tr>
<td>2 axis linear module-TL type</td>
<td>TL</td>
</tr>
<tr>
<td>3 axis linear module-CL type</td>
<td>CL</td>
</tr>
<tr>
<td>Wireless linear module-WL type</td>
<td>WL</td>
</tr>
</tbody>
</table>
Linear Module

UL-1

Dimension and Specification

Type UL

1 axis linear module

Technical data UL-1

Payload range [kg]

<table>
<thead>
<tr>
<th>Module Type</th>
<th>Payload range [kg]</th>
</tr>
</thead>
<tbody>
<tr>
<td>UL – 1</td>
<td>60  80  100  120  150  200  250  400</td>
</tr>
<tr>
<td>UL – 2</td>
<td></td>
</tr>
<tr>
<td>UL - 3</td>
<td></td>
</tr>
</tbody>
</table>

$P_{\text{max}} = 150 \text{ kg}$

$P_{\text{max}}$ [kg] : Permissible max. payload
$P_{\text{eff}}$ [kg] : Effective payload (incl. gripper unit)

$P_{\text{eff}} \leq P_{\text{max}}$ [kg]

$P_{\text{max}} = P_r$ [kg]

Payload range for loading position

$P_r$ [kg]
Linear Module
UL-1

Dimension and Specification

1 axis linear module

Key component

<table>
<thead>
<tr>
<th>Description</th>
<th>Type</th>
<th>Weight</th>
<th>See page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Guide roller</td>
<td>GR G 20</td>
<td>0.5 kg</td>
<td>13</td>
</tr>
<tr>
<td>Lubrication wiper</td>
<td>LW G 20</td>
<td>0.05 kg</td>
<td>17</td>
</tr>
<tr>
<td>Plain guide</td>
<td>MPG G 20</td>
<td>3.9 kg/m</td>
<td>11</td>
</tr>
<tr>
<td>Rack guide</td>
<td>MRG G 20</td>
<td>3.8 kg/m</td>
<td>7</td>
</tr>
<tr>
<td>Gearbox AFR075</td>
<td></td>
<td>6.4 kg</td>
<td>19</td>
</tr>
</tbody>
</table>

Please refer to the component catalogue regarding detailed component specification

Payload and drive data

<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
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<th></th>
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</thead>
<tbody>
<tr>
<td>X-axis</td>
<td>60</td>
<td>2.6</td>
<td>5</td>
<td>3:1</td>
<td>4500</td>
<td>±0.05</td>
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<tr>
<td>X-axis</td>
<td>100</td>
<td>2.6</td>
<td>4</td>
<td>3:1</td>
<td>4500</td>
<td></td>
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<tr>
<td>X-axis</td>
<td>150</td>
<td>2.6</td>
<td>3</td>
<td>3:1</td>
<td>4500</td>
<td></td>
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</tbody>
</table>

Axis bending and torsion

<table>
<thead>
<tr>
<th>Axis</th>
<th>Material</th>
<th>Standard</th>
<th>¹Unit weight (kg/m)</th>
<th>⁴lx(cm⁴)</th>
<th>⁴ly(cm⁴)</th>
<th>⁴lt(cm⁴)</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
<td>R50</td>
<td>ISO 3304</td>
<td>58.5</td>
<td>2589</td>
<td>2387</td>
<td>3272</td>
</tr>
</tbody>
</table>

¹Guide assembly
Linear Module
UL-2

Dimension and Specification

1 axis linear module

Technical data UL-2

\[ P_{\text{max}} = 200 \, \text{kg} \]

\( P_{\text{max}} \) [kg]: Permissible max. payload
\( P_{\text{eff}} \) [kg]: Effective payload (incl. gripper unit)

\[ P_{\text{eff}} \leq P_{\text{max}} \]

\[ P_{\text{max}} = P_r \]

Payload range for loading position

Payload and drive data

<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
<td>80</td>
<td>3</td>
<td>7</td>
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<td>±0.05</td>
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<tr>
<td>X</td>
<td>120</td>
<td>3</td>
<td>6</td>
<td>3:1</td>
<td>3000</td>
<td></td>
</tr>
<tr>
<td>X</td>
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Axis bending and torsion

<table>
<thead>
<tr>
<th>Axis</th>
<th>Material</th>
<th>Standard</th>
<th>Unit weight (kg/m)</th>
<th>*lx(cm)</th>
<th>*ly(cm)</th>
<th>*lt(cm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
<td>R50</td>
<td>ISO 3304</td>
<td>80.5</td>
<td>6536</td>
<td>6106</td>
<td>8208</td>
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</table>
1 axis linear module

Dimensions sheet UL-2

<table>
<thead>
<tr>
<th></th>
<th>View A</th>
<th>View B</th>
<th>View X-X</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lx</td>
<td>475</td>
<td>900</td>
<td>222.2</td>
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<tr>
<td>Sx</td>
<td>120</td>
<td>3500</td>
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</table>

<table>
<thead>
<tr>
<th></th>
<th>min.(mm)</th>
<th>max.(mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>L1</td>
<td>300</td>
<td>1500</td>
</tr>
<tr>
<td>L2</td>
<td>600</td>
<td>8000</td>
</tr>
<tr>
<td>H</td>
<td>900</td>
<td>3500</td>
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</table>

max. value(mm)

<table>
<thead>
<tr>
<th></th>
<th>Lx</th>
<th>Sx</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>50815</td>
<td>50000</td>
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</tbody>
</table>
**Linear Module**

**UL-3**

**Dimension and Specification**

1. **1 axis linear module**
   - **Technical data UL-3**
     
     ![Image of linear module]

     \[P_{\text{max}} = 400 \text{ kg}\]

     \[P_{\text{max}} \text{ [kg]}: \text{Permissible max. payload}\]

     \[P_{\text{eff}} \text{ [kg]: Effective payload (incl. gripper unit)}\]

     \[P_{\text{eff}} \leq P_{\text{max}}\]

     \[P_{\text{max}} = P_{r}\]

   - **Key component**

     | Description       | Type       | Unit weight | See page |
     |-------------------|------------|-------------|----------|
     | Guide roller      | GR G 35   | 2.8 kg      | 15       |
     | Lubrication wiper | LW G 35   | 0.26 kg     | 18       |
     | Plain guide       | MPG G 35  | 11.3 kg/m   | 12       |
     | Rack guide        | MRG G 35  | 10.6 kg/m   | 9        |
     | Gearbox           | AFR140    | 23.7 kg     | 30       |

     Please refer to the component catalogue regarding detailed component specification.

   - **Payload and drive data**

     | Axis   | Xaxis |
     |--------|-------|
     | Effective payload [kg] | 150 | 250 | 400 |
     | Nominal speed [m/s] | 3.3 | 3.3 | 3.3 |
     | Max. acceleration [m/s²] | 8 | 6 | 4.5 |
     | Gearbox ratio [-] | 3:1 | 3:1 | 3:1 |
     | Motor speed [rpm] | 3000 | 3000 | 3000 |
     | Repeatability [mm] | ±0.05 | |

   - **Axis bending and torsion**

     | Axis | Material | Standard | Unit weight [kg/m] | *lx [cm]⁴ | *ly [cm]⁴ | *lt [cm]⁴ |
     |------|----------|----------|--------------------|------------|------------|------------|
     | X    | R50      | ISO 3304 | 162.9              | 29967      | 27894      | 37622      |
Linear Module
UL-3

Dimension and Specification

1 axis linear module

Dimensions sheet UL-3

<table>
<thead>
<tr>
<th></th>
<th>min.(mm)</th>
<th>max.(mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>L1</td>
<td>400</td>
<td>2000</td>
</tr>
<tr>
<td>L2</td>
<td>800</td>
<td>10000</td>
</tr>
<tr>
<td>H</td>
<td>1000</td>
<td>4000</td>
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</tbody>
</table>
# Linear Module

## TL-1

### Dimension and Specification

#### Type TL

![Image of TL-1 module](image)

<table>
<thead>
<tr>
<th>Module Type</th>
<th>Payload range [kg]</th>
</tr>
</thead>
<tbody>
<tr>
<td>TL – 1</td>
<td>20 40 60 100 120 150 200 300</td>
</tr>
<tr>
<td>TL – 2</td>
<td></td>
</tr>
<tr>
<td>TL - 3</td>
<td></td>
</tr>
</tbody>
</table>

#### 2 axis linear module

#### Technical data TL-1

- **Payload range for loading position**

  $$ P_{\text{max}} = \frac{P_{\text{r}}}{(S_z - 1) \cdot 21} \quad \text{[kg]} $$

- **Including gripper**

  $$ P_{\text{eff}} \leq P_{\text{max}} \quad \text{[kg]} $$

- **Case 1:** $S_z < 1m$

- **Case 2:** $S_z > 1m$

- **Pr [kg]:** Permissible max. payload
- **Peff [kg]:** Effective payload (incl. gripper unit)
- **Sz [mm]:** Stroke (Z axis)

### Payload range for loading position

[Graph showing payload range for loading position]
Linear Module
TL-1

Dimension and Specification

2 axis linear module

Key component

<table>
<thead>
<tr>
<th>Description</th>
<th>Type</th>
<th>Unit weight</th>
<th>See page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Guide roller</td>
<td>GR G 20</td>
<td>0.5 kg</td>
<td>13</td>
</tr>
<tr>
<td>Lubrication wiper</td>
<td>LW G 20</td>
<td>0.05 kg</td>
<td>17</td>
</tr>
<tr>
<td>Plain guide</td>
<td>MPG G 20</td>
<td>3.9 kg/m</td>
<td>11</td>
</tr>
<tr>
<td>Rack guide</td>
<td>MRG G 20 (X axis)</td>
<td>3.8 kg/m</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>MRG G 20 H (Z axis)</td>
<td>3.8 kg/m</td>
<td>7</td>
</tr>
<tr>
<td>Gearbox</td>
<td>AFR075</td>
<td>6.4 kg</td>
<td>19</td>
</tr>
</tbody>
</table>

Please refer to the component catalogue regarding detailed component specification

Payload and drive data

<table>
<thead>
<tr>
<th>Axis</th>
<th>X axis</th>
<th>Z axis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Effective payload [kg]</td>
<td>20</td>
<td>40</td>
</tr>
<tr>
<td>Nominal speed [m/s]</td>
<td>2.6</td>
<td>2.6</td>
</tr>
<tr>
<td>Max. acceleration [m/s²]</td>
<td>5</td>
<td>4</td>
</tr>
<tr>
<td>Gearbox ratio [-]</td>
<td>3:1</td>
<td>3:1</td>
</tr>
<tr>
<td>Motor speed [rpm]</td>
<td>4500</td>
<td>4500</td>
</tr>
<tr>
<td>Repeatability [mm]</td>
<td>±0.05</td>
<td></td>
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</table>

Axis bending and torsion

<table>
<thead>
<tr>
<th>Axis</th>
<th>Material</th>
<th>Standard</th>
<th>Unit weight (kg/m³)</th>
<th>lx(cm⁴)</th>
<th>ly(cm⁴)</th>
<th>lt(cm⁴)</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
<td>R50</td>
<td>ISO 3304</td>
<td>58.5</td>
<td>2589</td>
<td>2387</td>
<td>3272</td>
</tr>
<tr>
<td>Z</td>
<td>AlMg0 7Si</td>
<td>ISO 6361</td>
<td>21</td>
<td>900</td>
<td>800</td>
<td>340</td>
</tr>
</tbody>
</table>

*Guide assembly
Linear Module

TL-2

Dimension and Specification

2 axis linear module

**Technical data TL-2**

![Image of a 2 axis linear module]

- **Pmax** = 150 kg
  - **Pmax [kg]**: Permissible max. payload
  - **Peff [kg]**: Effective payload (incl. gripper unit)
  - **Sz [mm]**: Stroke (Z axis)

Including gripper

\[ \text{Peff} \leq \text{Pmax} \] [kg]

**Payload and drive data**

<table>
<thead>
<tr>
<th>Axis</th>
<th>X axis</th>
<th>Z axis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Effective payload [kg]</td>
<td>60</td>
<td>100</td>
</tr>
<tr>
<td>Nominal speed [m/s]</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Max. acceleration [m/s²]</td>
<td>5</td>
<td>4</td>
</tr>
<tr>
<td>Gearbox ratio [-]</td>
<td>3:1</td>
<td>3:1</td>
</tr>
<tr>
<td>Motor speed [rpm]</td>
<td>3000</td>
<td>3000</td>
</tr>
<tr>
<td>Repeatability [mm]</td>
<td>±0.05</td>
<td></td>
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</table>

**Axis bending and torsion**

<table>
<thead>
<tr>
<th>Axis</th>
<th>Material</th>
<th>Standard</th>
<th>*Unlim weight (kg/m)</th>
<th>*lx(cm)</th>
<th>*ly(cm)</th>
<th>*lt(cm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
<td>R50</td>
<td>ISO 3304</td>
<td>80.5</td>
<td>6536</td>
<td>6106</td>
<td>8208</td>
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<tr>
<td>Z</td>
<td>AlMg0.7Si</td>
<td>ISO 6361</td>
<td>24</td>
<td>1510</td>
<td>1250</td>
<td>1300</td>
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</table>

*Guide assembly

**Key component**

<table>
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<tr>
<th>Description</th>
<th>Type</th>
<th>Unit weight</th>
<th>See page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Guide roller</td>
<td>GR G 25</td>
<td>1.1 kg</td>
<td>14</td>
</tr>
<tr>
<td>Lubrication wiper</td>
<td>LW G 25</td>
<td>0.13 kg</td>
<td>17</td>
</tr>
<tr>
<td>Plain guide</td>
<td>MPG G 25</td>
<td>5.7 kg/m</td>
<td>11</td>
</tr>
<tr>
<td>Rack guide</td>
<td>MRG G 25 (X axis)</td>
<td>5.2 kg/m</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>MRG G 25 H (Z axis)</td>
<td>5.2 kg/m</td>
<td>8</td>
</tr>
<tr>
<td>Gearbox</td>
<td>AFR100</td>
<td>13.9 kg</td>
<td>19</td>
</tr>
</tbody>
</table>

Please refer to the component catalogue regarding detailed component specification.

**Payload range for loading position**

\[ P_{\text{max}} = 150 \text{ kg} \]

\[ P_{\text{max}} = P_r \] [kg]

\[ \text{case 1: } Sz < 1m \]

\[ P_{\text{max}} = P_r - (Sz - 1.2) \cdot 24 \] [kg]

\[ \text{Peff} \leq P_{\text{max}} \] [kg]
Linear Module

TL-2

Dimension and Specification

▶ 2 axis linear module

Dimensions sheet TL-2

• View X-X

• View Z-Z

• View A

• View B

<table>
<thead>
<tr>
<th>max. value (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lx</td>
</tr>
<tr>
<td>Sx</td>
</tr>
<tr>
<td>Lz</td>
</tr>
<tr>
<td>Sz</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>min. (mm)</th>
<th>max. (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>L1</td>
<td>300</td>
</tr>
<tr>
<td>L2</td>
<td>600</td>
</tr>
<tr>
<td>H</td>
<td>900</td>
</tr>
</tbody>
</table>

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Linear Module
TL-3

Dimension and Specification

2 axis linear module

Technical data TL-3

Key component

<table>
<thead>
<tr>
<th>Description</th>
<th>Type</th>
<th>Unit weight</th>
<th>See page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Guide roller</td>
<td>GR G 35</td>
<td>2.8 kg</td>
<td>15</td>
</tr>
<tr>
<td>Lubrication wiper</td>
<td>LW G 35</td>
<td>0.26 kg</td>
<td>18</td>
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<tr>
<td>Plain guide</td>
<td>MPG G 35</td>
<td>11.3 kg/m</td>
<td>12</td>
</tr>
<tr>
<td>Rack guide</td>
<td>MRG G 35 (X axis)</td>
<td>10.6 kg/m</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>MRG G 35 H (Z axis)</td>
<td>10.6 kg/m</td>
<td>9</td>
</tr>
<tr>
<td>Gearbox</td>
<td>AFR140</td>
<td>23.7 kg</td>
<td>20</td>
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Please refer to the component catalogue regarding detailed component specification.

Payload and drive data

<table>
<thead>
<tr>
<th>Axis</th>
<th>X axis</th>
<th>Z axis</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Effective payload [kg]</td>
<td>120</td>
<td>200</td>
</tr>
<tr>
<td>Nominal speed [m/s]</td>
<td>3.3</td>
<td>3.3</td>
</tr>
<tr>
<td>Max. acceleration [m/s²]</td>
<td>6</td>
<td>5</td>
</tr>
<tr>
<td>Gearbox ratio [-]</td>
<td>3:1</td>
<td>3:1</td>
</tr>
<tr>
<td>Motor speed [rpm]</td>
<td>3000</td>
<td>3000</td>
</tr>
<tr>
<td>Repeatability [mm]</td>
<td>±0.05</td>
<td></td>
</tr>
</tbody>
</table>

Payload range for loading position

\[ P_{\text{max}} = 300 \text{ kg} \]

\[ P_{\text{max}}: \text{Permissible max. payload} \]

\[ P_{\text{eff}}: \text{Effective payload (incl. gripper unit)} \]

\[ S_z: \text{Stroke (Z axis)} \]

\[ P_{\text{eff}} \leq P_{\text{max}} \]

Payload range for loading position

\[ P_{\text{eff}} \leq P_{\text{max}} \]

Axis bending and torsion

<table>
<thead>
<tr>
<th>Axis</th>
<th>Material</th>
<th>Standard</th>
<th>*Unit weight (kg/m)</th>
<th>*lx(cm⁴)</th>
<th>*ly(cm⁴)</th>
<th>*lt(cm⁴)</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
<td>R50</td>
<td>ISO 3304</td>
<td>162.9</td>
<td>29967</td>
<td>27894</td>
<td>37622</td>
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<tr>
<td>Z</td>
<td>AlMg0 7Si</td>
<td>ISO 6361</td>
<td>48</td>
<td>6300</td>
<td>5280</td>
<td>5830</td>
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*Guide assembly
Linear Module
TL-3

Dimension and Specification

2 axis linear module

Dimensions sheet TL-3

- View X-X

- View Z-Z

<table>
<thead>
<tr>
<th>max. value (mm)</th>
</tr>
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<tbody>
<tr>
<td>Lx 81190</td>
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<td>Sx 80000</td>
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<td>Lz 2575</td>
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<tr>
<td>Sz 1600</td>
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</tbody>
</table>

- View A

- View B

<table>
<thead>
<tr>
<th>min. (mm)</th>
<th>max. (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>L1 400</td>
<td>2000</td>
</tr>
<tr>
<td>L2 800</td>
<td>10000</td>
</tr>
<tr>
<td>H 1000</td>
<td>4000</td>
</tr>
</tbody>
</table>
Linear Module

CL-1

Dimension and Specification

◆ Type CL

3 axis linear module

◆ Technical data CL-1

<table>
<thead>
<tr>
<th>Module Type</th>
<th>Payload range [kg]</th>
</tr>
</thead>
<tbody>
<tr>
<td>CL – 1</td>
<td>20 40 60 100 120 150 200 300</td>
</tr>
<tr>
<td>CL – 2</td>
<td></td>
</tr>
<tr>
<td>CL - 3</td>
<td></td>
</tr>
</tbody>
</table>

Pmax = 60 kg

Pmax [kg] : Permissible max. payload
Peff [kg]  : Effective payload (incl. gripper unit)
Sz [mm]    : Stroke(Z axis)

Including gripper

Peff ≤ Pmax [kg]

◆ Payload range for loading position

Př [kg]
# Linear Module

## CL-1

### Dimension and Specification

#### 3 axis linear module

##### Key component

<table>
<thead>
<tr>
<th>Description</th>
<th>Type</th>
<th>Unit weight</th>
<th>See page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Guide roller</td>
<td>GR G 20 (X,Z axis)</td>
<td>0.5 kg</td>
<td>13</td>
</tr>
<tr>
<td></td>
<td>GR G 20 (Y axis)</td>
<td>0.7 kg</td>
<td>13</td>
</tr>
<tr>
<td>Lubrication wiper</td>
<td>LW G 20 (X,Z axis)</td>
<td>0.05 kg</td>
<td>17</td>
</tr>
<tr>
<td></td>
<td>LW F 20 (Y axis)</td>
<td>0.05 kg</td>
<td>17</td>
</tr>
<tr>
<td>Plain guide</td>
<td>MPG G 20 (X axis)</td>
<td>3.9 kg/m</td>
<td>11</td>
</tr>
<tr>
<td></td>
<td>MPG F 20 (Y axis)</td>
<td>4.3 kg/m</td>
<td>11</td>
</tr>
<tr>
<td>Rack guide</td>
<td>MRG G 20 (X axis)</td>
<td>3.8 kg/m</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>MRG G 20 H (Z axis)</td>
<td>3.8 kg/m</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>MRG F 20 (Y axis)</td>
<td>4.1 kg/m</td>
<td>7</td>
</tr>
<tr>
<td>Gearbox</td>
<td>AFR075</td>
<td>6.4 kg</td>
<td>19</td>
</tr>
</tbody>
</table>

Please refer to the component catalogue regarding detailed component specification

##### Payload and drive data

<table>
<thead>
<tr>
<th>Axis</th>
<th>X axis</th>
<th>Z axis</th>
<th>Y axis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Effective payload [kg]</td>
<td>20</td>
<td>40</td>
<td>60</td>
</tr>
<tr>
<td>Nominal speed [m/s]</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Max. acceleration [m/s²]</td>
<td>5</td>
<td>4</td>
<td>3.5</td>
</tr>
<tr>
<td>Gearbox ratio [-]</td>
<td>3:1</td>
<td>3:1</td>
<td>3:1</td>
</tr>
<tr>
<td>Motor speed [rpm]</td>
<td>3000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Repeatability [mm]</td>
<td>±0.05</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

##### Axis bending and torsion

<table>
<thead>
<tr>
<th>Axis</th>
<th>Material</th>
<th>Standard</th>
<th>*Unit weight (kg/m)</th>
<th>*lx(cm⁴)</th>
<th>*ly(cm⁴)</th>
<th>*lt(cm⁴)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Y</td>
<td>R50</td>
<td>ISO 3304</td>
<td>54.9</td>
<td>2619</td>
<td>2077</td>
<td>3272</td>
</tr>
<tr>
<td>X</td>
<td>R50</td>
<td>ISO 3304</td>
<td>58.5</td>
<td>2589</td>
<td>2387</td>
<td>3272</td>
</tr>
<tr>
<td>Z</td>
<td>AlMg0</td>
<td>ISO 6361</td>
<td>21.5</td>
<td>900</td>
<td>800</td>
<td>340</td>
</tr>
</tbody>
</table>

*Guide assembly

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Linear Module

CL-2

Dimension and Specification

2 axis linear module

Technical data CL-2

![Image of linear module]

- **Technical data CL-2**

  - **Payload range for loading position**
  
  \[ P_{\text{max}} = 150 \text{ kg} \]

  \[ P_{\text{max}} \text{ [kg]} : \text{Permissible max. payload} \]

  \[ P_{\text{eff}} \text{ [kg]} : \text{Effective payload (incl. gripper unit)} \]

  \[ S_z \text{ [mm]} : \text{Stroke(Z axis)} \]

  Including gripper

  \[ P_{\text{eff}} \leq P_{\text{max}} \text{ [kg]} \]

- **Key component**

<table>
<thead>
<tr>
<th>Description</th>
<th>Type</th>
<th>Unit weight</th>
<th>See page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Guide roller</td>
<td>GR G 25 (X,Z axis)</td>
<td>1.1 kg</td>
<td>14</td>
</tr>
<tr>
<td></td>
<td>GR F 25 (Y axis)</td>
<td>1.1 kg</td>
<td>14</td>
</tr>
<tr>
<td>Lubrication wiper</td>
<td>LW G 25 (X,Z axis)</td>
<td>0.13 kg</td>
<td>17</td>
</tr>
<tr>
<td></td>
<td>LW F 25 (Y axis)</td>
<td>0.13 kg</td>
<td>17</td>
</tr>
<tr>
<td>Plain guide</td>
<td>MPG C 25 (X axis)</td>
<td>5.7 kg/m</td>
<td>11</td>
</tr>
<tr>
<td></td>
<td>MPG F 25 (Y axis)</td>
<td>6.2 kg/m</td>
<td>11</td>
</tr>
<tr>
<td>Rack guide</td>
<td>MRG G 25 (X axis)</td>
<td>5.2 kg/m</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>MRG G 25 H (Z axis)</td>
<td>5.2 kg/m</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>MRG F 25 (Y axis)</td>
<td>5.7 kg/m</td>
<td>8</td>
</tr>
<tr>
<td>Gearbox</td>
<td>AFR100</td>
<td>13.9 kg</td>
<td>19</td>
</tr>
</tbody>
</table>

  Please refer to the component catalogue regarding detailed component specification.

- **Payload and drive data**

<table>
<thead>
<tr>
<th>Axis</th>
<th>X axis</th>
<th>Z axis</th>
<th>Y axis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Effective payload</td>
<td>[kg]</td>
<td>60</td>
<td>100</td>
</tr>
<tr>
<td>Nominal speed</td>
<td>[m/s]</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Max. acceleration</td>
<td>[m/s²]</td>
<td>5</td>
<td>4</td>
</tr>
<tr>
<td>Motor speed</td>
<td>[rpm]</td>
<td>3000</td>
<td></td>
</tr>
<tr>
<td>Repeatability</td>
<td>[mm]</td>
<td>±0.05</td>
<td></td>
</tr>
</tbody>
</table>

- **Axis bending and torsion**

<table>
<thead>
<tr>
<th>Axis</th>
<th>Material</th>
<th>Standard</th>
<th>*Unit weight (kg/m)</th>
<th>*lx(cm⁴)</th>
<th>*ly(cm⁴)</th>
<th>*lt(cm⁴)</th>
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</thead>
<tbody>
<tr>
<td>Y</td>
<td>R50</td>
<td>ISO 3304</td>
<td>75.3</td>
<td>6546</td>
<td>5167</td>
<td>8208</td>
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<tr>
<td>X</td>
<td>R50</td>
<td>ISO 3304</td>
<td>80.5</td>
<td>6536</td>
<td>6106</td>
<td>8208</td>
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<tr>
<td>Z</td>
<td>AlMg0.7Si</td>
<td>ISO 6361</td>
<td>24</td>
<td>1510</td>
<td>1250</td>
<td>1300</td>
</tr>
</tbody>
</table>

  *Guide assembly
3 axis linear module

Dimensions sheet CL-2

<table>
<thead>
<tr>
<th>View</th>
<th>max. value (mm)</th>
<th>min. (mm)</th>
<th>max. (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lx</td>
<td>4641</td>
<td>300</td>
<td>1500</td>
</tr>
<tr>
<td>Sx</td>
<td>3200</td>
<td>600</td>
<td>8000</td>
</tr>
<tr>
<td>Lz</td>
<td>2040</td>
<td>900</td>
<td>4000</td>
</tr>
<tr>
<td>Sz</td>
<td>1200</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ly</td>
<td>50940</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sy</td>
<td>50000</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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**Linear Module**

**CL-3**

**Dimension and Specification**

### 3 axis linear module

#### Technical data CL-3

![](image)

- **Pmax = 300 kg**
  
  \[ P_{\text{max}} \text{ [kg]} : \text{Permissible max. payload} \]
  
  \[ P_{\text{eff}} \text{ [kg]} : \text{Effective payload (incl. gripper unit)} \]
  
  \[ S_z \text{ [mm]} : \text{Stroke (Z axis)} \]

- **Including gripper**
  
  \[ P_{\text{eff}} \leq P_{\text{max}} \text{ [kg]} \]

- **Payload range for loading position**

  \[ P_r \text{ [kg]} \]

<table>
<thead>
<tr>
<th>Description</th>
<th>Type</th>
<th>Unit weight</th>
<th>See page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Guide roller</td>
<td>GR G 35 (X,Z axis)</td>
<td>2.8 kg</td>
<td>15</td>
</tr>
<tr>
<td></td>
<td>GR F 35 (Y axis)</td>
<td>3 kg</td>
<td>15</td>
</tr>
<tr>
<td>Lubrication wiper</td>
<td>LW G 35 (X,Z axis)</td>
<td>0.26 kg</td>
<td>18</td>
</tr>
<tr>
<td></td>
<td>LW F 35 (Y axis)</td>
<td>0.26 kg</td>
<td>18</td>
</tr>
<tr>
<td>Plain guide</td>
<td>MPG C 35 (X axis)</td>
<td>11.3 kg/m</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>MPG F 35 (Y axis)</td>
<td>12.1 kg/m</td>
<td>12</td>
</tr>
<tr>
<td>Rack guide</td>
<td>MRG G 35 (X axis)</td>
<td>10.6 kg/m</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>MRG G 35 H (Z axis)</td>
<td>10.6 kg/m</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>MRG F 35 (Y axis)</td>
<td>11.3 kg/m</td>
<td>9</td>
</tr>
<tr>
<td>Gearbox</td>
<td>AFR140</td>
<td>23.7 kg</td>
<td>20</td>
</tr>
</tbody>
</table>

Please refer to the component catalogue regarding detailed component specification.

#### Payload and drive data

<table>
<thead>
<tr>
<th>Axis</th>
<th>X axis</th>
<th>Z axis</th>
<th>Y axis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Effective payload</td>
<td>[kg]</td>
<td>120</td>
<td>200</td>
</tr>
<tr>
<td>Nominal speed</td>
<td>[m/s]</td>
<td>6</td>
<td>5</td>
</tr>
<tr>
<td>Max. acceleration</td>
<td>[m/s²]</td>
<td>6</td>
<td>5</td>
</tr>
<tr>
<td>Motor speed</td>
<td>[rpm]</td>
<td>3000</td>
<td></td>
</tr>
<tr>
<td>Repeatability</td>
<td>[mm]</td>
<td>±0.05</td>
<td></td>
</tr>
</tbody>
</table>

#### Axis bending and torsion

<table>
<thead>
<tr>
<th>Axis</th>
<th>Material</th>
<th>Standard</th>
<th>Unit weight (kg/m)</th>
<th>*tx(cm²)</th>
<th>*ty(cm²)</th>
<th>*tl(cm²)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Y</td>
<td>R50</td>
<td>ISO 3304</td>
<td>75.3</td>
<td>6546</td>
<td>5167</td>
<td>8208</td>
</tr>
<tr>
<td>X</td>
<td>R50</td>
<td>ISO 3304</td>
<td>80.5</td>
<td>6536</td>
<td>6106</td>
<td>8208</td>
</tr>
<tr>
<td>Z</td>
<td>AImg07Si</td>
<td>ISO 6361</td>
<td>24</td>
<td>1510</td>
<td>1250</td>
<td>1300</td>
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</tbody>
</table>

*Guide assembly*
Linear Module
CL-3
Dimension and Specification

3 axis linear module

Dimensions sheet CL-3

<table>
<thead>
<tr>
<th>View</th>
<th>Lx</th>
<th>Sx</th>
<th>Lz</th>
<th>Sz</th>
<th>Ly</th>
<th>Sy</th>
</tr>
</thead>
<tbody>
<tr>
<td>• View Y-Y</td>
<td>6606</td>
<td>4900</td>
<td>2575</td>
<td>1600</td>
<td>81020</td>
<td>80000</td>
</tr>
<tr>
<td>• View X-X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• View Z-Z</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>View</th>
<th>min.(mm)</th>
<th>max.(mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>L1</td>
<td>300</td>
<td>2000</td>
</tr>
<tr>
<td>L2</td>
<td>800</td>
<td>10000</td>
</tr>
<tr>
<td>H</td>
<td>1000</td>
<td>4000</td>
</tr>
</tbody>
</table>

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### Linear Module

#### WL-1

**Dimension and Specification**

#### Type WL

![3 axis linear module](image)

#### Technical data CL-1

**Payload range [kg]**

<table>
<thead>
<tr>
<th>Module Type</th>
<th>WL – 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Payload range [kg]</td>
<td>60</td>
</tr>
</tbody>
</table>

**Technical data CL-1**

- **Pmax [kg]**: Permissible max. payload
- **Peff [kg]**: Effective payload (incl. gripper unit)
- **Sz [mm]**: Stroke (Z axis)

**Peff ≤ Pmax [kg]**

- **case 1**: Sz < 1m  
  \[ P_{max} = P_{r} \] [kg]

- **case 2**: Sz > 1m  
  \[ P_{max} = P_{r} - (Sz - 1.0) \cdot 21 \] [kg]

**Pmax = 60 kg**

- Including gripper

**Payload range for loading position**

![Graph](image)
Linear Module
WL-1

Dimension and Specification

Wireless linear module

Technical data WL-1

Key component

<table>
<thead>
<tr>
<th>Description</th>
<th>Type</th>
<th>Unit weight</th>
<th>See page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Guide roller</td>
<td>GR G 25</td>
<td>1.1 kg</td>
<td>14 25</td>
</tr>
<tr>
<td>Lubrication wiper</td>
<td>LW G 25</td>
<td>0.13 kg</td>
<td>17 27</td>
</tr>
<tr>
<td>Plain guide</td>
<td>MPG G 25</td>
<td>5.7 kg</td>
<td>11 24</td>
</tr>
<tr>
<td>Rack guide</td>
<td>MRG G 25 (X axis)</td>
<td>5.2 kg</td>
<td>8 23</td>
</tr>
<tr>
<td></td>
<td>MRG G 25 H (Z axis)</td>
<td>5.2 kg</td>
<td>8 23</td>
</tr>
<tr>
<td>Gearbox</td>
<td>AFR140</td>
<td>23.7 kg</td>
<td>20 28</td>
</tr>
</tbody>
</table>

Please refer to the component catalogue regarding detailed component specification.

Payload and drive data

<table>
<thead>
<tr>
<th>Axis</th>
<th>X axis</th>
<th>Z axis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Effective payload [kg]</td>
<td>60</td>
<td>100</td>
</tr>
<tr>
<td>Nominal speed [m/s]</td>
<td>2.5</td>
<td>2.5</td>
</tr>
<tr>
<td>Max. acceleration [m/s²]</td>
<td>4</td>
<td>3.5</td>
</tr>
<tr>
<td>Gearbox ratio [-]</td>
<td>3:1</td>
<td>3:1</td>
</tr>
<tr>
<td>Motor speed [rpm]</td>
<td>3000</td>
<td>3000</td>
</tr>
<tr>
<td>Repeatability [mm]</td>
<td>±0.05</td>
<td></td>
</tr>
</tbody>
</table>

Axis bending and torsion

<table>
<thead>
<tr>
<th>Axis</th>
<th>Material</th>
<th>Standard</th>
<th>*Unit weight (kg/m)</th>
<th>*Ix(cm⁴)</th>
<th>*Iy(cm⁴)</th>
<th>*It(cm⁴)</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
<td>R50</td>
<td>ISO 3304</td>
<td>157.5</td>
<td>29812</td>
<td>28620</td>
<td>37622</td>
</tr>
<tr>
<td>Z</td>
<td>AlMg0.7Si</td>
<td>ISO 6361</td>
<td>48</td>
<td>6300</td>
<td>4488</td>
<td>5830</td>
</tr>
</tbody>
</table>

*Guide assembly

Payload range for loading position

\[ P_{\text{max}} = 150 \text{ kg} \]

\[ P_{\text{max}} \text{ [kg]} : \text{Permissible max. payload} \]

\[ P_{\text{eff}} \text{ [kg]} : \text{Effective payload (incl. gripper unit)} \]

\[ S_z \text{ [mm]} : \text{Stroke(Z axis)} \]

\[ P_{\text{eff}} \leq P_{\text{max}} \text{ [kg]} \]

*Including gripper

- case 1 : \( S_z < 1 \text{ m} \)
  \[ P_{\text{max}} = P_{\text{r}} \text{ [kg]} \]
- case 2 : \( S_z > 1 \text{ m} \)
  \[ P_{\text{max}} = P_{\text{r}} - (S_z - 1) \cdot 22 \text{ [kg]} \]

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