THE SMART
EXTRUSION- AND
FASTENING TECHNOLOGY
The key elements of the Modular Automation System are the unique Extrusion and Fastening Technologies. Extrusions, available in 40 mm and 50 mm size systems, are fully compatible due to a common 14 mm slot size.

In combination with a strong Fastening Technology, the system is unique in its stability and rigidity as well as in its enormous potential for time savings - from design to assembly.

- **One slot size fits all**
  - 13 profile shapes in 40 mm and 50 mm extrusion sizes simplify the application
  - large, uniform 14 mm wide and 14mm deep T-slot
  - same T-slot dimensions for all extrusions in the Modular Automation System
  - Post insertion of heavy duty Drop-in Nuts up to M8 possible

- **Maximum stability**
  - worldwide unique play-free, accurate and centrally aligned connections
  - single fastener provides up to 4 tons of tensile strength
  - tubular honeycomb structure for outstanding torsion and load resistance
  - maximum stability for all your applications

- **One fastener, double value**
  - two-sided fastener provides equal strength on both sides of the connection
  - twice the strength for the price of one
  - no additional connectors needed
  - strength comparable to a welded connection

- **Any hole drilled is one hole too many**
  - all connections made without drilling or milling
  - maximum wall thickness in key areas
  - unlimited re-usability
  - for required hole an integrated location groove guarantees precise and straight drilling

- **Stability increases with every turn**
  - every turn positions centering inserts tighter into the T-slot
  - absolutely play-free, accurate and centrally aligned connection
  - concave surface of extrusion guarantees durable vibration resistance
  - low fastener height saves space in your design

- **Inserting the drop-in nut**
  - Simple and quick insertion of the drop-in nut into the 14 mm wide T-slot
  - leaf spring assembly protects drop-in nut against unintended movement, guaranteed contact surface
  - to position the the drop-in nut, just slide to stop position

- **Anything is possible - even post assembly**
  - simple post-assembly integration of struts without dismantling the frame
  - easy repositioning of struts at any time
  - no cutting of existing structures
  - no surface treatment required

- **Save time, cut cost**
  - minimum assembly time required
  - simple and quick selection of Extrusion and Fastening Technology
  - no measuring of boreholes and no drawings necessary
  - length of the extrusion is the only measurement needed
  - labeled and tapped extrusions allow immediate assembly
The Smart Extrusion Technology

Extrusion, 40 mm Series

- Extrusion 16x40 PIL 1640
  - P. 58

- Extrusion 40x40 PIL 4040
  - P. 58

- Extrusion 40x80 PIL 4080
  - P. 59

- Extrusion 80x80 PIL 8080
  - P. 59

- Lean Line Extrusion 40x40 PIL 4140
  - P. 60

- Lean Line Extrusion 40x80 PIL 4180
  - P. 61

Extrusion, 50 mm Series

- Extrusion 50x50 PIL 5050
  - P. 62

- Extrusion 50x100 PIL 5010
  - P. 62

- Extrusion 50x200 PIL 5020
  - P. 63

- Extrusion 100x100 PIL 1010
  - P. 64

- Extrusion 100x200 PIL 1020
  - P. 64

- Extrusion 25x200 PIL 2520
  - P. 65

- Extrusion 40x40 PIL 4040
  - P. 65

- Extrusion 40x80 PIL 4080
  - P. 65

- Extrusion 80x80 PIL 8080
  - P. 65
### The Strong Fastening Technology

#### Fastening Technology 40 mm Series

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<th>Fastener 16x40</th>
<th>FAS 1641</th>
<th>P. 66</th>
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<td>FAS 404_</td>
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<td>Surface Fastener 40 x 40</td>
<td>FAS 4049</td>
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<td>FAS 4051</td>
<td>P. 68</td>
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</tbody>
</table>

#### Fastening Technology 50 mm Series

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<th>Fastener 50x50</th>
<th>FAS 505_</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Surface Fastener 50x50</td>
<td>FAS 505_</td>
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<tr>
<td>End-to-End Fastener 50x50</td>
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<td>FAS 102_</td>
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</tr>
</tbody>
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<th>GUS 450_</th>
<th>P. 75</th>
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</thead>
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<td>Fixing Bracket 35x25</td>
<td>GUS 4651</td>
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<td>Corner Bracket 100, one side centered</td>
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</tr>
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<td>Drop-In Nut</td>
<td>TIN 45_</td>
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<table>
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<th>Inserter</th>
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<tbody>
<tr>
<td>T-Nut</td>
<td>TIN 60_</td>
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<tr>
<td>T-Nut Bar</td>
<td>TIN _000</td>
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</tr>
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<td>P. 80</td>
</tr>
<tr>
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<td>TIN 4545</td>
<td>P. 81</td>
</tr>
</tbody>
</table>

| Special Fastener | TIN _000 | P. 81 |
PIL 1640  Extrusion 16x40

Application
- Signs, shelves, racks
- Hand rails, guide rails
- MRO equipment
- etc.

Technical Data
Material: EN AW-6063-T66 clear anodized aluminum
Section modulus $W_x$: 2.9 cm$^3$
Section modulus $W_y$: 1.0 cm$^3$
Geometrical moment of inertia:
against $x$ $I_x$: 5.8 cm$^4$
against $y$ $I_y$: 0.8 cm$^4$
against torsion $I_t$: 0.6 cm$^4$
Cross sectional area $A$: 323.6 mm$^2$

Order Code

<table>
<thead>
<tr>
<th>Description</th>
<th>Length</th>
<th>Order Code</th>
<th>Weight/Meter</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extrusion, cut to length, M6 tapped on both ends, 15 mm deep</td>
<td>PIL 1640 SNN</td>
<td>0.890 kg</td>
<td></td>
</tr>
<tr>
<td>Extrusion, stock length: 6050 mm (usable length 6000 mm)</td>
<td>PIL 1640 NNN 6050</td>
<td>0.890 kg</td>
<td></td>
</tr>
</tbody>
</table>

PIL 4040  Extrusion 40x40

Application
- Machine guardings
- Enclosures
- Safety fence panels & doors
- Light weight machine frames
- Shelves, racks, trolleys (MRO equipment)
- etc.

Technical Data
Material: EN AW-6063-T66 clear anodized aluminum
Section modulus $W_x = W_y$: 4.3 cm$^3$
Geometrical moment of inertia:
against $x + y$ $I_{x+y}$: 8.6 cm$^4$
against torsion $I_t$: 0.7 cm$^4$
Cross sectional area $A$: 554.6 mm$^2$

Order Code

<table>
<thead>
<tr>
<th>Description</th>
<th>Length</th>
<th>Order Code</th>
<th>Weight/Meter</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extrusion, cut to length, M8 tapped on both ends, 50 mm deep</td>
<td>PIL 4040 SNN</td>
<td>1.530 kg</td>
<td></td>
</tr>
<tr>
<td>Extrusion, stock length: 6050 mm (usable length 6000 mm)</td>
<td>PIL 4040 NNN 6050</td>
<td>1.530 kg</td>
<td></td>
</tr>
<tr>
<td>Extrusions, 80 units, stock length 6050 mm (usable length 6000 mm)</td>
<td>PIL 4040 PAC 0080</td>
<td>1.530 kg</td>
<td></td>
</tr>
</tbody>
</table>

1) Please complete the order code by adding the desired length.

Drawing dimensions in mm
**PIL 4080**

### Extrusion 40x80

**Application**
- Machine guardings
- Enclosures
- Safety fence panels & doors
- Machine frames
- Workstations
- Shelves, racks, trolleys (MRO equipment)
- etc.

**Technical Data**
- Material: EN AW-6063-T66 clear anodized aluminum
- Section modulus $W_x$: 15.4 cm$^3$
- Section modulus $W_y$: 8.4 cm$^3$
- Geometrical moment of inertia:
  - against $x$: $I_x$: 61.6 cm$^4$
  - against $y$: $I_y$: 16.8 cm$^4$
  - against torsion $I_t$: 9.3 cm$^4$
- Cross sectional area $A$: 1013.2 mm$^2$

**Order Code**

<table>
<thead>
<tr>
<th>Description</th>
<th>Order Code</th>
<th>Length</th>
<th>Weight/Meter</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extrusion, cut to length, M8 tapped on both ends, 50 mm deep</td>
<td>PIL 4080 SNN</td>
<td></td>
<td>2.780 kg</td>
</tr>
<tr>
<td>Extrusion, stock length: 6050 mm (usable length 6000 mm)</td>
<td>PIL 4080 NNN 6050</td>
<td></td>
<td>2.780 kg</td>
</tr>
<tr>
<td>Extrusions, 40 units, stock length 6050 mm (usable length 6000 mm)</td>
<td>PIL 4080 PAC 0040</td>
<td></td>
<td>2.780 kg</td>
</tr>
</tbody>
</table>

**Order Code 1**

1) Please complete the order code by adding the desired length.

**Tolerances and Deflection**
see pages 184 to 185

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**PIL 8080**

### Extrusion 80x80

**Application**
- Machine frames
- Workstations
- Machine guardings
- Enclosures
- Shelves, racks, trolleys (MRO equipment)
- etc.

**Technical Data**
- Material: EN AW-6063-T66 clear anodized aluminum
- Section modulus $W_x$, $W_y$: 28.0 cm$^3$
- Geometrical moment of inertia:
  - against $x + y$: $I_{x+y}$: 112.0 cm$^4$
  - against torsion $I_t$: 59.5 cm$^4$
- Cross sectional area $A$: 1547.0 mm$^2$

**Order Code**

<table>
<thead>
<tr>
<th>Description</th>
<th>Order Code</th>
<th>Length</th>
<th>Weight/Meter</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extrusion, cut to length, M8 tapped on both ends, 50 mm deep</td>
<td>PIL 8080 SNN</td>
<td></td>
<td>4.280 kg</td>
</tr>
<tr>
<td>Extrusion, stock length: 6050 mm (usable length 6000 mm)</td>
<td>PIL 8080 NNN 6050</td>
<td></td>
<td>4.280 kg</td>
</tr>
<tr>
<td>Extrusions, 25 units, stock length 6050 mm (usable length 6000 mm)</td>
<td>PIL 8080 PAC 0025</td>
<td></td>
<td>4.280 kg</td>
</tr>
</tbody>
</table>

**Order Code 1**

1) Please complete the order code by adding the desired length.

**Tolerances and Deflection**
see pages 184 to 185

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**Drawing dimensions in mm**
PIL 4140

Lean Line Extrusion 40x40

Application
- Machine guardings
- Enclosures
- Safety fence panels
- Light weight machine frames
- Workstations
- Shelves, racks, trolleys (MRO equipment)
- etc.

Technical Data
Material: EN AW-6063-T66 clear anodized aluminum
Section modulus \( W_x = W_y = 3.3 \text{ cm}^3 \)
Geometrical moment of inertia:
- against \( x + y \) \( I_x = I_y = 6.5 \text{ cm}^4 \)
- against torsion \( I_t = 0.6 \text{ cm}^4 \)
Cross sectional area \( A = 431.0 \text{ mm}^2 \)

Order Code

<table>
<thead>
<tr>
<th>Description</th>
<th>Order Code</th>
<th>Length</th>
<th>Weight/Meter</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extrusion, cut to length, M8 tapped on both ends, 50 mm deep</td>
<td>PIL 4140 SNN _____</td>
<td>PIL 4140</td>
<td>1.160 kg</td>
</tr>
<tr>
<td>Extrusion, stock length: 6050 mm (usable length 6000 mm)</td>
<td>PIL 4140 NNN 6050</td>
<td>PIL 4140</td>
<td>1.160 kg</td>
</tr>
<tr>
<td>Extrusions, 80 units, stock length 6050 mm (usable length 6000 mm)</td>
<td>PIL 4140 PAC 0080</td>
<td>PIL 4140</td>
<td>1.160 kg</td>
</tr>
</tbody>
</table>

1) Please complete the order code by adding the desired length.

Drawing dimensions in mm

Tolerances and Deflection
see pages 184 to 185

Order Code
**Lean Line Extrusion 40x80**

**Application**
- Machine guardings
- Enclosures
- Safety fence panels
- Light weight machine frames
- Workstations
- Shelves, racks, trolleys (MRO equipment)
- etc.

**Technical Data**
- Material: EN AW-6063-T66 clear anodized aluminum
- Section modulus $W_x: 11.9 \text{ cm}^3$
- Section modulus $W_y: 6.4 \text{ cm}^3$
- Geometrical moment of inertia:
  - against $x$: $I_x: 47.4 \text{ cm}^4$
  - against $y$: $I_y: 12.8 \text{ cm}^4$
  - against torsion: $I_t: 5.9 \text{ cm}^4$
- Cross sectional area $A: 790.8 \text{ mm}^2$

**Order Code**

<table>
<thead>
<tr>
<th>Description</th>
<th>Length</th>
<th>Weight/Meter</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extrusion, cut to length, M8 tapped on both ends, 50 mm deep</td>
<td>PIL 4180 SNN</td>
<td>2.140 kg</td>
</tr>
<tr>
<td>Extrusion, stock length: 6050 mm (usable length 6000 mm)</td>
<td>PIL 4180 NNN 6050</td>
<td>2.140 kg</td>
</tr>
<tr>
<td>Extrusions, 40 units, stock length 6050 mm (usable length 6000 mm)</td>
<td>PIL 4180 PAC 0040</td>
<td>2.140 kg</td>
</tr>
</tbody>
</table>

1) Please complete the order code by adding the desired length. 
   Drawing dimensions in mm

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*Tolerances and Deflection*

see pages 184 to 185
PIL 5050 Extrusion 50x50

**Application**
- Machine frames
- Robot frame structures
- Workstations
- Machine guardings
- Enclosures
- Shelves, racks, trolleys (MRO equipment)
- etc.

**Technical Data**
Material: EN AW-6063-T66 clear anodized aluminum
Section modulus \( W_x = W_y = 8.0 \, \text{cm}^3 \)
Geometrical moment of inertia:
against \( x + y \) \( I_x = I_y = 20.0 \, \text{cm}^4 \)
against torsion \( I_z = 4.8 \, \text{cm}^4 \)
Cross sectional area \( A = 857.5 \, \text{mm}^2 \)

**Order Code**

<table>
<thead>
<tr>
<th>Description</th>
<th>Order Code</th>
<th>Length</th>
<th>Weight/Meter</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extrusion, cut to length, M10 tapped on both ends, 50 mm deep</td>
<td>PIL 5050 SNN</td>
<td>___</td>
<td>2.350 kg</td>
</tr>
<tr>
<td>Extrusion, stock length: 6050 mm (usable length 6000 mm)</td>
<td>PIL 5050 NNN 6050</td>
<td>6050</td>
<td>2.350 kg</td>
</tr>
<tr>
<td>Extrusions, 64 units, stock length 6050 mm (usable length 6000 mm)</td>
<td>PIL 5050 PAC 0064</td>
<td>0064</td>
<td>2.350 kg</td>
</tr>
</tbody>
</table>

**PIL 5010 Extrusion 50x100**

**Application**
- Machine frames
- Robot frame structures
- Workstations
- Base support for Linear Motion Units & gantries
- Machine guardings
- Enclosures
- Shelves, racks, trolleys (MRO equipment)
- etc.

**Technical Data**
Material: EN AW-6063-T66 clear anodized aluminum
Section modulus \( W_x = 29.7 \, \text{cm}^3 \)
Section modulus \( W_y = 16.6 \, \text{cm}^3 \)
Geometrical moment of inertia:
against \( x \) \( I_x = 148.5 \, \text{cm}^4 \)
against \( y \) \( I_y = 41.4 \, \text{cm}^4 \)
against torsion \( I_z = 370 \, \text{cm}^4 \)
Cross sectional area \( A = 1559.3 \, \text{mm}^2 \)

**Order Code**

<table>
<thead>
<tr>
<th>Description</th>
<th>Order Code</th>
<th>Length</th>
<th>Weight/Meter</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extrusion, cut to length, M10 tapped on both ends, 50 mm deep</td>
<td>PIL 5010 SNN</td>
<td>___</td>
<td>4.290 kg</td>
</tr>
<tr>
<td>Extrusion, stock length: 6050 mm (usable length 6000 mm)</td>
<td>PIL 5010 NNN 6050</td>
<td>6050</td>
<td>4.290 kg</td>
</tr>
<tr>
<td>Extrusions, 32 units, stock length 6050 mm (usable length 6000 mm)</td>
<td>PIL 5010 PAC 0032</td>
<td>0032</td>
<td>4.290 kg</td>
</tr>
</tbody>
</table>

1) Please complete the order code by adding the desired length.

Drawing dimensions in mm
PIL 5020 Extrusion 50x200

Application
- Heavy duty machine frames
- Robot frame structures
- Workstations
- Base support for Linear Motion Units & gantries
- Machine guardings
- Enclosures
- Shelves, racks, trolleys (MRO equipment)
- etc.

Technical Data
Material: EN AW-6063-T66 clear anodized aluminum
Section modulus \( W_x \): 107.8 cm\(^3\)
Section modulus \( W_y \): 33.6 cm\(^3\)
Geometrical moment of inertia:
against \( x \) \( I_x \): 1077.8 cm\(^4\)
against \( y \) \( I_y \): 84.1 cm\(^4\)
against torsion \( I_t \): 107.0 cm\(^4\)
Cross sectional area \( A \): 2962.8 mm\(^2\)

Order Code

<table>
<thead>
<tr>
<th>Description</th>
<th>Order Code</th>
<th>Length</th>
<th>Weight/Meter</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extrusion, cut to length, M10 tapped on both ends, 50 mm deep</td>
<td>PIL 5020 SNN ____</td>
<td>50 mm deep</td>
<td>8.150 kg</td>
</tr>
<tr>
<td>Extrusion, stock length: 6050 mm (usable length 6000 mm)</td>
<td>PIL 5020 NNN 6050</td>
<td>6050 mm</td>
<td>8.150 kg</td>
</tr>
<tr>
<td>Extrusions, 16 units, stock length 6050 mm (usable length 6000 mm)</td>
<td>PIL 5020 PAC 0016</td>
<td>6050 mm</td>
<td>8.150 kg</td>
</tr>
</tbody>
</table>

1) Please complete the order code by adding the desired length.

Drawing dimensions in mm
**Extrusion 100x100**

**Application**
- Heavy duty machine frames
- Robot frame structures
- Workstations
- Base support for Linear Motion Units & gantries
- Machine guardings
- Enclosures
- Shelves, racks, trolleys (MRO equipment)
- etc.

**Technical Data**
- Material: EN AW-6063-T66 clear anodized aluminum
- Section modulus: $W_x = 61.1 \text{ cm}^3$
- Geometrical moment of inertia:
  - against $x + y$: $I_x = I_y = 305.6 \text{ cm}^4$
  - against torsion: $I_t = 256.0 \text{ cm}^4$
- Cross sectional area: $A = 2714.4 \text{ mm}^2$

**Order Code**

<table>
<thead>
<tr>
<th>Description</th>
<th>Order Code¹</th>
<th>Length</th>
<th>Weight/Meter</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extrusion, cut to length, M10 tapped on both ends, 50 mm deep</td>
<td>PIL 1010 SNN ___</td>
<td>50 mm</td>
<td>7.480 kg</td>
</tr>
<tr>
<td>Extrusion, stock length: 6050 mm (usable length 6000 mm)</td>
<td>PIL 1010 NNN 6050</td>
<td>6050 mm</td>
<td>7.480 kg</td>
</tr>
<tr>
<td>Extrusions, 16 units, stock length 6050 mm (usable length 6000 mm)</td>
<td>PIL 1010 PAC 0016</td>
<td>6050 mm</td>
<td>7.480 kg</td>
</tr>
</tbody>
</table>

1) Please complete the order code by adding the desired length.

**Extrusion 100x200**

**Application**
- Heavy duty machine frames
- Robot frame structures
- Workstations
- Base support for Linear Motion Units & gantries
- Machine guardings
- Machine enclosures
- Shelves, racks, trolleys (MRO equipment)
- etc.

**Technical Data**
- Material: EN AW-6063-T66 clear anodized aluminum
- Section modulus: $W_x = 220.2 \text{ cm}^3$
- Section modulus: $W_y = 132.9 \text{ cm}^3$
- Geometrical moment of inertia:
  - against $x$: $I_x = 2202.2 \text{ cm}^4$
  - against $y$: $I_y = 664.4 \text{ cm}^4$
  - against torsion: $I_t = 794.0 \text{ cm}^4$
- Cross sectional area: $A = 5128.7 \text{ mm}^2$

**Order Code**

<table>
<thead>
<tr>
<th>Description</th>
<th>Order Code¹</th>
<th>Length</th>
<th>Weight/Meter</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extrusion, cut to length, M10 tapped on both ends, 50 mm deep</td>
<td>PIL 1020 SNN ___</td>
<td>50 mm</td>
<td>13.700 kg</td>
</tr>
<tr>
<td>Extrusion, stock length: 6050 mm (usable length 6000 mm)</td>
<td>PIL 1020 NNN 6050</td>
<td>6050 mm</td>
<td>13.700 kg</td>
</tr>
<tr>
<td>Extrusions, 8 units, stock length 6050 mm (usable length 6000 mm)</td>
<td>PIL 1020 PAC 0008</td>
<td>6050 mm</td>
<td>13.700 kg</td>
</tr>
</tbody>
</table>

1) Please complete the order code by adding the desired length.

Drawing dimensions in mm
Application
- Carriage plates for Linear Motion Units
- Workstations
- Shelves, racks, trolleys (MRO equipment)
- etc.

Technical Data
Material: EN AW-6063-T66 clear anodized aluminum
Section modulus \( W_x \): 102.8 cm\(^3\)
Section modulus \( W_y \): 14.1 cm\(^3\)
Geometrical moment of inertia:
against \( x \): \( I_x \): 1027.9 cm\(^4\)
against \( y \): \( I_y \): 17.6 cm\(^4\)
against torsion \( I_t \): 9.8 cm\(^4\)
Cross sectional area \( A \): 2891.7 mm\(^2\)

Order Code

<table>
<thead>
<tr>
<th>Description</th>
<th>Length</th>
<th>Weight/Meter</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extrusion, cut to length, M8 tapped on both ends, 15 mm deep</td>
<td>PIL 2520 SNN</td>
<td>7.900 kg</td>
</tr>
<tr>
<td>Extrusion, stock length: 6050 mm (usable length 6000 mm)</td>
<td>PIL 2520 NNN 6050</td>
<td>7.900 kg</td>
</tr>
</tbody>
</table>

1) Please complete the order code by adding the desired length.
Drawing dimensions in mm
FAS 1641

**Fastener 16x40**

**Application**
90° fastener for extrusion PIL 1640

**Technical Data**
Material: clear anodized aluminum, galvanized steel

**Tightening torque**
IBS M06x018 = 10 Nm

---

**Order Code**

<table>
<thead>
<tr>
<th>Description</th>
<th>Scope of Delivery</th>
<th>Order Code</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fastener Kit, 16x40</td>
<td>FAS 1640 TIN 4506 IBS M06x018</td>
<td>FAS 1641</td>
<td>0.045 kg</td>
</tr>
</tbody>
</table>

---

FAS 4040

**Fastener 40x40**

**Application**
90° fastener on 40 mm series for extrusion PIL 4040 and PIL 4080 transverse

**Technical Data**
Material: galvanized GD-Zn, galvanized steel

**Load index**
See page 186

**Tightening torque**
IBS M06x018 = 10 Nm
LKS M08x025 = 12 Nm

**Optional**
40x40 fastener Kit for conductive structures

**Transfer resistance per conductive connection:** 0.4 mΩ

---

**Order Code**

<table>
<thead>
<tr>
<th>Description</th>
<th>Scope of Delivery</th>
<th>Order Code</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fastener Kit, 40x40</td>
<td>FAS 4040 TIN 4506 TIN 4596 IBS M06x018 LKS M08x025</td>
<td>FAS 4041 FAS 4041CP FAS 4043 FAS 4043CP</td>
<td>0.068 kg 0.068 kg 0.068 kg 0.068 kg</td>
</tr>
</tbody>
</table>

---

**Transfer resistance per conductive connection:** 0.4 mΩ

---

**Order Code**

<table>
<thead>
<tr>
<th>Description</th>
<th>Scope of Delivery</th>
<th>Order Code</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fastener Kit, 40x40</td>
<td>FAS 4040 TIN 4506 TIN 4596 IBS M06x018 LKS M08x025</td>
<td>FAS 4041 FAS 4041CP FAS 4043 FAS 4043CP</td>
<td>0.068 kg 0.068 kg 0.068 kg 0.068 kg</td>
</tr>
</tbody>
</table>
FAS 408_ Fastener 40x80

Application
90° fastener on 40 mm series for extrusion
- PIL 4080, longitudinal
- PIL 8080

Technical Data
Material: galvanized GD-Zn, galvanized steel

Load index
See page 186

Tightening torque
IBS M06x018 = 10 Nm
LKS M08x025 = 12 Nm

Optional
40x80 fastener Kit for conductive structures

Transfer resistance per conductive connection: 0.4 mΩ

Order Code

<table>
<thead>
<tr>
<th>Description</th>
<th>Scope of Delivery</th>
<th>Order Code</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fastener Kit, 40x80</td>
<td>1 2 - 2 2</td>
<td>FAS 4081</td>
<td>0.103 kg</td>
</tr>
<tr>
<td>Fastener Kit, 40x80</td>
<td>1 - 2 2</td>
<td>FAS 4081CP</td>
<td>0.103 kg</td>
</tr>
<tr>
<td>Fastener Kit, 40x80, conductive</td>
<td>1 - 2 2</td>
<td>FAS 4083</td>
<td>0.103 kg</td>
</tr>
<tr>
<td>Fastener Kit, 40x80, conductive</td>
<td>1 - 2 2</td>
<td>FAS 4083CP</td>
<td>0.103 kg</td>
</tr>
</tbody>
</table>

1) Packaged in Kit
2) Packaged by type, available for an order quantity of 100 or more

Drawing dimensions in mm

IBS M06x018
FAS 4080
TIN 4506/
TIN 4596
LKS M08x025

Transfer resistance per conductive connection: 0.4 mΩ

Order Code

<table>
<thead>
<tr>
<th>Description</th>
<th>Scope of Delivery</th>
<th>Order Code</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fastener Kit, 40x80</td>
<td>1 2 - 2 2</td>
<td>FAS 4081</td>
<td>0.103 kg</td>
</tr>
<tr>
<td>Fastener Kit, 40x80</td>
<td>1 - 2 2</td>
<td>FAS 4081CP</td>
<td>0.103 kg</td>
</tr>
<tr>
<td>Fastener Kit, 40x80, conductive</td>
<td>1 - 2 2</td>
<td>FAS 4083</td>
<td>0.103 kg</td>
</tr>
<tr>
<td>Fastener Kit, 40x80, conductive</td>
<td>1 - 2 2</td>
<td>FAS 4083CP</td>
<td>0.103 kg</td>
</tr>
</tbody>
</table>

1) Packaged in Kit
2) Packaged by type, available for an order quantity of 100 or more

Drawing dimensions in mm
### Surface Fastener 40x40

**Application**

Used for connections to non-Robotunits surfaces on 40 mm series for extrusion PIL 4040

**Technical Data**

Material: clear anodized aluminum, galvanized steel

**Tightening torque**

SKS M08x030 = 15 Nm

![Diagram](image)

*Example for attaching to steel plates*

---

### Order Code

<table>
<thead>
<tr>
<th>Description</th>
<th>Scope of Delivery</th>
<th>Order Code</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Surface Fastener Kit, 40x40</td>
<td>FAS 4048 SKS M08x030</td>
<td>FAS 4049</td>
<td>0.070 kg</td>
</tr>
</tbody>
</table>

---

### End-to-End Fastener 40x40

**Application**

Used for end-to-end connections of 40 mm series for extrusion PIL 4040

**Technical Data**

Material: clear anodized aluminum, galvanized steel

**Tightening torque**

SKS M08x030 = 15 Nm

IBS M06x025 = 10 Nm

Drive in grooved pin

Press in nut

![Diagram](image)

---

### Order Code

<table>
<thead>
<tr>
<th>Description</th>
<th>Scope of Delivery</th>
<th>Order Code</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>End-to-End Fastener Kit, 40x40</td>
<td>FAS 4048 FAS 4050 SKS M08x030 IBS M06x025 PKS 004x012</td>
<td>FAS 4051</td>
<td>0.160 kg</td>
</tr>
</tbody>
</table>
GUS 4-41  Elbow Joint 40

Application
For variable angle connections, e.g.:
- Guardings
- Frames
- Swing arms

Technical Data
Material: zinc diecast or galvanized steel
Pivoting range: +/- 90°

Tightening torque
IBS M08x016NIKO = 20 Nm
Clamp screw = 8 Nm

Order Code

<table>
<thead>
<tr>
<th>Description</th>
<th>Scope of Delivery</th>
<th>Order Code</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Elbow Joint 40 Kit</td>
<td>1 - 2 2</td>
<td>GUS 4041</td>
<td>0.135 kg</td>
</tr>
<tr>
<td>Elbow Joint 40 Kit with Clamping Lever</td>
<td>- 1 2 2</td>
<td>GUS 4141</td>
<td>0.205 kg</td>
</tr>
</tbody>
</table>

Drawing dimensions in mm
Application
Used for 90° connections of heavy-duty structures in the 50 mm series for extrusions:
• PIL 5050
• PIL 5010
• PIL 5020

Technical Data
Material: GD-Zn black KTL coated, galvanized steel

Load index
See page 186

Tightening torque
IBS M08x020 = 26 Nm
SKS M10x035 = 40 Nm

Transfer resistance per conductive connection: 0.4 mΩ

Assembly

Order Code

<table>
<thead>
<tr>
<th>Description</th>
<th>Scope of Delivery</th>
<th>Order Code</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fastener Kit, 50x50</td>
<td>FAS 5050 FAS 5052 TIN 4508 TIN 4598 IBS M08x020 SKS M10x035</td>
<td>FAS 5051²</td>
<td>0.223 kg</td>
</tr>
<tr>
<td>Fastener Kit, 50x50, conductive</td>
<td>1 2 2 - 2 1</td>
<td>FAS 5051CP²</td>
<td>0.223 kg</td>
</tr>
<tr>
<td>Fastener Kit, 50x50, conductive</td>
<td>1 2 - 2 2 1</td>
<td>FAS 5053²</td>
<td>0.223 kg</td>
</tr>
<tr>
<td>Fastener Kit, 50x50, conductive</td>
<td>1 2 - 2 2 1</td>
<td>FAS 5053CP²</td>
<td>0.223 kg</td>
</tr>
<tr>
<td>Fastener, 50x50</td>
<td>100 - - - - -</td>
<td>FAS 5050 PAC 0100</td>
<td>14.400 kg</td>
</tr>
</tbody>
</table>

1) Packaged in Kit
2) Packaged by type, available for an order quantity of 100 or more

Drawing dimensions in mm
**Application**
Used for 90° connections of heavy-duty structures in the 50 mm series for extrusions:
- PIL 5010
- PIL 1010
- PIL 5020

**Technical Data**
Material: GD-Zn black KTL coated, galvanized steel

**Load index**
See page 186

**Tightening torque**
IBS M08x020 = 26 Nm
SKS M10x035 = 40 Nm

Transfer resistance per conductive connection: 0.4 mΩ

---

**Assembly**

**Order Code**

<table>
<thead>
<tr>
<th>Description</th>
<th>Scope of Delivery</th>
<th>Order Code</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fastener Kit, 50x50, single-sided</td>
<td>FAS 5050 FAS 5052 TIN 4508 TIN 4598 IBS M08x020 SKS M10x035</td>
<td>FAS 50551</td>
<td>0.185 kg</td>
</tr>
<tr>
<td>Fastener Kit, 50x50, single-sided</td>
<td>1 1 1 - 1 1</td>
<td>FAS 5055CP1</td>
<td>0.185 kg</td>
</tr>
<tr>
<td>Fastener Kit, 50x50, single-sided, cond.</td>
<td>1 1 - 1 1 1</td>
<td>FAS 50571</td>
<td>0.185 kg</td>
</tr>
<tr>
<td>Fastener Kit, 50x50, single-sided, cond.</td>
<td>1 1 - 1 1 1</td>
<td>FAS 5057CP1</td>
<td>0.185 kg</td>
</tr>
<tr>
<td>Fastener, 50x50</td>
<td>100 - - - -</td>
<td>FAS 5050 PAC 0100</td>
<td>14.400 kg</td>
</tr>
</tbody>
</table>

1) Packaged in Kit
2) Packaged by type, available for an order quantity of 100 or more

Drawing dimensions in mm
**Application**
Used for connections to non-Robotunits surfaces. 90° connection for massive structures in the 50 mm series for extrusions
- PIL 5050
- PIL 5010
- PIL 1010
- PIL 5020

**Technical Data**
Material: GD-Zn black KTL coated, galvanized steel

**Tightening torque**
SKS M10x035 = 40 Nm

e.g. for attaching to steel plates

---

**Order Code**

<table>
<thead>
<tr>
<th>Description</th>
<th>Scope of Delivery</th>
<th>Order Code</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Surface Fastener Kit, 50x50</td>
<td>FAS 5050</td>
<td>FAS 5059</td>
<td>0.168 kg</td>
</tr>
<tr>
<td></td>
<td>SKS M10x035</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Drawing dimensions in mm
Application
Used for end-to-end connections of 50 mm series extrusions for
- PIL 5050
- PIL 5010
- PIL 1010
- PIL 5020

Technical Data
Material: GD-Zn black KTL coated, galvanized steel

Tightening torque
IBS M08x020 = 26 Nm
SKS M10x035 = 40 Nm

Order Code

<table>
<thead>
<tr>
<th>Description</th>
<th>Scope of Delivery</th>
<th>Order Code</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>End-To-End Fastener Kit, 50x50</td>
<td>FAS 5050 FAS 5060 IBS M08x025 SKS M10x035</td>
<td>FAS 5061</td>
<td>0.374 kg</td>
</tr>
</tbody>
</table>

Drawing dimensions in mm
**Fastener 100x200**

**Application**
Used for 90° connections of heavy duty structures of PIL 1020

**Technical Data**
Material: black anodized aluminum, galvanized steel

**Tightening torque**
- IBS M08x020 = 26 Nm
- SKS M10x035 = 40 Nm

Transfer resistance per conductive connection: 0.4 mΩ

---

**Cross Fastener**

![Cross Fastener Diagram]

1 units FAS 1021 or FAS 1023 conductive

---

**In-Line Fastener**

![In-Line Fastener Diagram]

1 units FAS 1025 or FAS 1027 conductive

---

**Order Code**

<table>
<thead>
<tr>
<th>Description</th>
<th>Scope of Delivery</th>
<th>Order Code</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cross Fastener Kit, 100x200</td>
<td>FAS 1020</td>
<td>TIN 4508</td>
<td>TIN 4598</td>
</tr>
<tr>
<td>Cross Fastener Kit, 100x200, cond.</td>
<td>1</td>
<td>8</td>
<td>-</td>
</tr>
<tr>
<td>In-Line Fastener Kit, 100x200</td>
<td>1</td>
<td>-</td>
<td>8</td>
</tr>
<tr>
<td>In-Line Fastener Kit, 100x200, cond.</td>
<td>1</td>
<td>4</td>
<td>-</td>
</tr>
</tbody>
</table>

Drawing dimensions in mm
Application

Used for 90° connections and as strengthening element in combination with Robotunits fasteners, for both 40 mm and 50 mm series extrusions, e.g.:

- 40/40 series combination
- 50/50 series combination
- 40/50 series combination

Connections to non-Robotunits extrusions and surfaces, e.g.:

- Mounting of table tops
- Fastening to non-Robotunits extrusions
- Fastening to walls

Technical Data

Material: GD-Zn black KTL coated, galvanized steel

Tightening torque

IBS M08x020NIKO = 20 Nm

By turning the centering insert (GUS 4502), the angle bracket can be used in either the 40 mm or the 50 mm series.

Applications

Order Code

<table>
<thead>
<tr>
<th>Description</th>
<th>Scope of Delivery</th>
<th>Order Code</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corner Bracket 40/50 Kit</td>
<td>GUS 4500 GUS 4502</td>
<td>GUS 45011</td>
<td>0.180 kg</td>
</tr>
<tr>
<td>Corner Bracket 40/50 Kit</td>
<td>TIN 4508 IBS M08x020NIKO BLS M008</td>
<td>GUS 4501CP2</td>
<td>0.180 kg</td>
</tr>
<tr>
<td>Corner Bracket 40/50</td>
<td></td>
<td>GUS 4500 PAC 0080</td>
<td>9.920 kg</td>
</tr>
</tbody>
</table>

1) Packaged in Kit
2) Packaged by type, available for an order quantity of 100 or more

Drawing dimensions in mm
**Application**
Used for 90° connections and as strengthening element in combination with Robotunits extrusion technology with non-Robotunits components. Particularly suitable for fixing table plates and similar surface elements.

**Technical Data**
Material: clear anodized aluminum galvanized steel

**Tightening torque**
SKS M06x020 = 9 Nm

---

**Applications**

- **Table plate fastening**
- **Surface element fastening**

---

**Order Code**

<table>
<thead>
<tr>
<th>Description</th>
<th>Scope of Delivery</th>
<th>Order Code</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fixing Bracket, 35x25 Kit</td>
<td>GUS 4650 1</td>
<td>GUS 4651</td>
<td>0.030 kg</td>
</tr>
<tr>
<td></td>
<td>TIN 4506 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SKS M06x020 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>BLS M006SKS 1</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Drawing dimensions in mm
**GUS 100**

**Corner Bracket 100**

**Application**
Used for 90° connections and as strengthening element in combination with Robotunits fasteners. The GUS 1000 can also be used with 40 mm series extrusions parallel to T-slot centerline.

**Technical Data**
Material: GD-Zn black KTL coated, galvanized steel

**Tightening torque**
IBS M08x020 = 26 Nm

---

**Order Code**

<table>
<thead>
<tr>
<th>Description</th>
<th>Scope of Delivery</th>
<th>Order Code</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corner Bracket 100 Kit</td>
<td>GUS 1000 1  TIN 4508 4  IBS M08x020 4</td>
<td>GUS 10011</td>
<td>0.615 kg</td>
</tr>
<tr>
<td>Corner Bracket 100 Kit</td>
<td></td>
<td>GUS 1001CP2</td>
<td>0.615 kg</td>
</tr>
<tr>
<td>Corner Bracket 100</td>
<td>16 - -</td>
<td>GUS 1000 PAC 0016</td>
<td>9.500 kg</td>
</tr>
</tbody>
</table>

---

**GUS 110**

**Corner Bracket 100, one side centered**

**Application**
Used for 90° connections and as strengthening element in combination with Robotunits fasteners and non-Robotunits extrusions and surfaces. The GUS 1100 can also be used with 40 mm series extrusions parallel to T-slot centerline.

**Technical Data**
Material: GD-Zn black KTL coated, galvanized steel

**Tightening torque**
IBS M08x020 = 26 Nm

---

**Order Code**

<table>
<thead>
<tr>
<th>Description</th>
<th>Scope of Delivery</th>
<th>Order Code</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corner Bracket 100 Kit, one side centered</td>
<td>GUS 1100 1  TIN 4508 4  IBS M08x020 4</td>
<td>GUS 11011</td>
<td>0.615 kg</td>
</tr>
<tr>
<td>Corner Bracket 100 Kit, one side centered</td>
<td></td>
<td>GUS 1101CP2</td>
<td>0.615 kg</td>
</tr>
<tr>
<td>Corner Bracket 100, one side centered</td>
<td>16 - -</td>
<td>GUS 1100 PAC 0016</td>
<td>9.500 kg</td>
</tr>
</tbody>
</table>
**TIN 45**

### Drop-in Nut

**Application**
Used for 40 mm and 50 mm series extrusions
- Self-centering
- Slip protection (leaf springs)
- Anti-twist safeguard

**Technical Data**
Material: galvanized steel

### Order Code

<table>
<thead>
<tr>
<th>Description</th>
<th>F</th>
<th>Order Code</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drop-in Nut M4</td>
<td>1500 N</td>
<td>TIN 4504</td>
<td>0.010 kg</td>
</tr>
<tr>
<td>Drop-in Nut M4, conductive</td>
<td>1500 N</td>
<td>TIN 4594</td>
<td>0.010 kg</td>
</tr>
<tr>
<td>Drop-in Nut M5</td>
<td>3000 N</td>
<td>TIN 4505</td>
<td>0.010 kg</td>
</tr>
<tr>
<td>Drop-in Nut M5, conductive</td>
<td>3000 N</td>
<td>TIN 4595</td>
<td>0.010 kg</td>
</tr>
<tr>
<td>Drop-in Nut M6</td>
<td>4500 N</td>
<td>TIN 4506</td>
<td>0.010 kg</td>
</tr>
<tr>
<td>Drop-in Nut M6, conductive</td>
<td>4500 N</td>
<td>TIN 4596</td>
<td>0.010 kg</td>
</tr>
<tr>
<td>Drop-in Nut M8</td>
<td>6000 N</td>
<td>TIN 4508</td>
<td>0.010 kg</td>
</tr>
<tr>
<td>Drop-in Nut M8, conductive</td>
<td>6000 N</td>
<td>TIN 4598</td>
<td>0.010 kg</td>
</tr>
</tbody>
</table>

**TIN 9990**

### Inserter

**Application**
Assembly tool for inserting Drop-in Nuts into T-slot.

**Technical Data**
Material: galvanized steel

### Order Code

<table>
<thead>
<tr>
<th>Description</th>
<th>Order Code</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inserter</td>
<td>TIN 9990</td>
<td>0.045 kg</td>
</tr>
</tbody>
</table>

1) Pull-out values are based on screw quality 8.8
Order Code

<table>
<thead>
<tr>
<th>Description</th>
<th>F&lt;sub&gt;t&lt;/sub&gt;</th>
<th>Order Code</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>T-Nut M8</td>
<td>7500 N</td>
<td>TIN 6008</td>
<td>0.027 kg</td>
</tr>
<tr>
<td>T-Nut M10</td>
<td>7500 N</td>
<td>TIN 6010</td>
<td>0.025 kg</td>
</tr>
</tbody>
</table>

1) Pull-out values are based on screw quality 8.8

Drawing dimensions in mm
**TIN _000**

**T-Nut Bar**

**Application**
Used for specific applications with 40 mm and 50 mm series extrusions

**Technical Data**
Material: untreated steel
Stock length: 1000 or 3030 mm

---

**Order Code**

<table>
<thead>
<tr>
<th>Description</th>
<th>Order Code</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>T-Nut Bar, stock length: 1000 mm</td>
<td>TIN 1000</td>
<td>1.125 kg</td>
</tr>
<tr>
<td>T-Nut Bar, stock length: 3030 mm</td>
<td>TIN 3000</td>
<td>3.375 kg</td>
</tr>
</tbody>
</table>

**TIN 0171**

**T-Nut In-Line Fastener**

**Application**
Used for end-to-end connections of 40 mm and 50 mm series extrusions

**Technical Data**
Material: galvanized steel

---

**Order Code**

<table>
<thead>
<tr>
<th>Description</th>
<th>Scope of Delivery</th>
<th>Order Code</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>T-Nut In-Line Fastener</td>
<td>Base Part GST M08x012 SPI</td>
<td>TIN 0171</td>
<td>0.196 kg</td>
</tr>
</tbody>
</table>

Drawing dimensions in mm
**TIN 4545**

**Miter Fastener**

**Application**
Fasteners for extrusions with miter cuts

**Technical Data**
Material: galvanized steel

---

**Order Code**

<table>
<thead>
<tr>
<th>Description</th>
<th>Scope of Delivery</th>
<th>Order Code</th>
<th>Weight</th>
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<td>Base Part countersink 1</td>
<td>TIN 4545</td>
<td>0.098 kg</td>
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</tbody>
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**TIN _000**

**Special Fastener**

**Application**
For mounting parts onto Robotunits extrusions where no holes are to be seen from the outside of the assembly

In contrast with all other Robotunits fasteners, this fastener requires drilling.

**Technical Data**
Material: galvanized steel, NBR

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**Order Code**

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<th>Description</th>
<th>GL</th>
<th>SW</th>
<th>M</th>
<th>d</th>
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