Product Information

Tolerance compensation unit TCU-Z 050
TCU-Z
Tolerance compensation unit

Compact. Flexible. Productive.

Tolerance compensation unit TCU-Z
For compensation of small locational and positional deviations with mounting and handling applications

Field of application
for universal use in clean and slightly dirty environments, particularly in the fields of assembly automation and tool machine loading

Advantages – Your benefits
Compensation of workpiece-related tolerances and position inaccuracies reduced risk of jamming, necessary assembly forces are reduced and wear of the workpiece and handling device is minimized
Direct assembly of a centric gripper no need for additional adapter plates
Compact design low height and weight
Pneumatic locking long life time of the elastomers, rigid unit during travel
Monitoring of locking for process reliable sequences and shorter cycle times

Sizes
Quantity: 7

Workpiece weight
3 .. 60 kg

Deflection
±1°
Functional description

The function of the tolerance compensation unit (TCU) is based on interaction between the two base plates, which are connected to each other with a set of flexible elastomer elements. As a result, the TCU can compensate tolerances around the X, Y, and Z axes, allowing it to correct angular errors, and causing a rotational compensation.

A pneumatic locking is also available as an option to allow the compensation unit to be set to rigid. As a result, it is possible to prevent the tool or the gripper vibrating during movement of the robot arm or the linear axis. This increases the application's repeat accuracy and extends the service life of the elastomer elements.

1. **Elastomer**
   - allows compensation movement

2. **Locking mechanism**
   - for a rigid connection between the machine and tool sides

3. **Overload pin**
   - to protect the elastomers

4. **Interface machine side**
   - the same mounting pattern as on the tool side

5. **Monitoring groove**
   - for electronic magnetic switch
TCU-Z
Tolerance compensation unit

General notes about the series

**Monitoring:** by magnetic switch

**Actuation:** pneumatic, with filtered compressed air as per ISO 8573-1:2010 [7:4:4].

**Material:** Elastomer material

**Housing:** Aluminum alloy

**Scope of delivery:** Robot-side mounting screws

**Warranty:** 24 months

**Harsh environmental conditions:** Please note that use under harsh environmental conditions (e.g. in the coolant area, cast and grinding dust) can considerably reduce the service life of the units, and we will not take over any warranty. However, in many cases we can find a solution. Please contact us for assistance.

**Handling weight:** is the weight of the total load attached to the flange. When designing, the permissible forces and moments have to be paid attention to. Please note that exceeding the recommended handling weight will shorten the lifespan.

Application example

Insertion tool for assembly of small to medium-sized workpieces. The tool can be used in both clean and dirty environments. Due to its quick-change system, other tools can alternately be fixed to the robot flange.

1. Quick-change system SWS
2. Electric feed-through
3. Tolerance compensation unit TCU-Z
4. 3-finger centric gripper PZN-plus
SCHUNK offers more ...

The following components make the product TCU-Z even more productive – the suitable addition for the highest functionality, flexibility, reliability, and controlled production.

Anti-collision and overload protection sensor
Universal gripper
Magnetic switches

For more information on these products can be found on the following product pages or at schunk.com. Please contact us: SCHUNK technical hotline +49-7133-103-2696

Options and special information

Monitoring of the locking: by magnetic switch
Connections: two plug-in connections for hose
Ambient temperature: −10 °C to 90 °C
Operating pressure: from 4 bar up to 8 bar
TCU-Z 050
Tolerance compensation unit

Dimensions and maximum loads

The forces and torques are maximum values when unlocked and may occur simultaneously. When locked, only the loads caused by the weight and acceleration are permissible.

Technical data

<table>
<thead>
<tr>
<th>Description</th>
<th>TCU-Z-050-3-0V</th>
</tr>
</thead>
<tbody>
<tr>
<td>ID</td>
<td>0324749</td>
</tr>
<tr>
<td>Hardness of the elastomer [Shore]</td>
<td>68</td>
</tr>
<tr>
<td>Deflection X [°]</td>
<td>±1</td>
</tr>
<tr>
<td>Deflection Y [°]</td>
<td>±1</td>
</tr>
<tr>
<td>Deflection Z [°]</td>
<td>±1.5</td>
</tr>
<tr>
<td>Weight [kg]</td>
<td>0.09</td>
</tr>
<tr>
<td>Min./max. ambient temperature [°C]</td>
<td>-10/90</td>
</tr>
<tr>
<td>Max. force $F_d$ [N]</td>
<td>500</td>
</tr>
<tr>
<td>Direct connection to*</td>
<td>P2N-plus 50</td>
</tr>
<tr>
<td>Dimensions Ø D x Z [mm]</td>
<td>50 x 18.6</td>
</tr>
</tbody>
</table>

* also suitable for other grippers with the same screw connection diagram
Main view without centric locking (OV)

The main view shows the unit in its basic version.

1. Robot-side connection
2. Tool-side connection
5. Through hole for connection with screws
66. Included in the scope of delivery
73. Fit for centering pins

Maximum deflection

Deflection (fa) dependent upon the length (L) to the center of mass
The unit is part of a modular system in which various components such as grippers or compliant devices can be threaded to one another directly.
TCU-Z 050
Tolerance compensation unit
Jens Lehmann, German goalkeeper legend, SCHUNK brand ambassador since 2012 for safe, precise gripping and holding.
schunk.com/Lehmann