

1 Supporting documents

NOTE:

The documents mentioned below are available for download on our website www.zimmer-group.com. Only the documents currently available on the website are valid.

- Catalogs, drawings, CAD data, performance data
- Detailed installation and operating instructions
- General Terms and Conditions of Business with specifications for the warranty entitlement

2 Safety notes

CAUTION:

Non-compliance may result in severe injuries!
Injuries/malfunctions can occur especially with:

- Pinching during installation due to an unsecured mounting piece
- Improperly assembled pneumatic connections
- Pneumatic supply faults, e.g. due to pressure fluctuations
- Damaged or loose pneumatic lines
- Missing or loose mounting screws
- Removal of the cover
- Failure to switch off the working medium during assembly or repair work on the clamping element
- Human error
- Failure to observe the safety and warning instructions during installation and start-up

These installation and operating instructions are intended for installation and maintenance technicians as well as design engineers requiring the element for an application. Please read through all of the installation and operating instructions carefully before start-up and pay special attention to the following hazard warnings and notes.

3 Proper use

NOTE:

The element is only to be used in its original state with its original accessories, with no unauthorized changes and within the scope of its defined parameters for use. Zimmer GmbH shall accept no liability for any damage caused by improper use.

The TPS element is designed for operation with compressed air only. The element is not suited for operation with any other media. In accordance with EN ISO 13849-1, the TPS element is a safety related component of control systems. Furthermore, we can confirm the manufacture of the product using the basic and proven safety principles (EN 13849-2, appendix B.1 and B.2) and thus define the clamping element TPS as a proven component in accordance with EN 13849-1, chap. 6.2.4, para. b. The element can be used without any control engineering measures in control systems of Category B or 1; for category 2 control systems, a test channel must be provided. For use in higher control categories, the control must be implemented using multiple channels, where each channel must implement the safety function for itself. The element may not be used in any application other than those approved by the manufacturer.

Without additional protection or control engineering measures, the element may not:

- be installed in facilities that are used for transporting people (e.g. elevators).
- be used in vehicles.
- be used underwater or in other fluids.
- be used in a corrosive environment (for example, in connection with acids).
- come in contact with abrasive media (such as grinding dust).
- be used in a vacuum.
- come in direct contact with food.
- be used in areas with a potentially explosive atmosphere.

For questions on the use of the TPS series clamping element, please contact Zimmer GmbH.

4 Personnel qualification

DANGER:

Various components of the element are continuously under spring tension. Never open the housing. Intervention is not permitted and can lead to serious injuries.
⇒ Warranty and disclaimer

The installation, commissioning, maintenance and repairs may be undertaken only in accordance with these installation and operating instructions and only by qualified personnel who have the professional expertise and know the conditions, as well as the dangers, of the machine into which the element is being installed.

5 Product description

INFORMATION:

The TPS rotary clamping element may not be dynamically loaded. The pneumatic control system is designed so that in the event of a power supply failure or an emergency situation, the hydraulic pressure in the system is held until the axle or shaft has come to a standstill. Only then may the TPS element be bled (clamped).

The TPS series is designed for the static clamping of axles and shafts. The functions are based on multiple radially arranged elements which create static friction within a cone. Spring accumulator elements push these elements into the cone. The TPS element is open when pressurized. Thus, it works as a safety element because it automatically clamps in the event of a power supply failure. The TPS series is not suitable for dynamic braking processes and may only be used in the rotational-speed range of up to 1000 rpm.

Fig. 1: TPS element

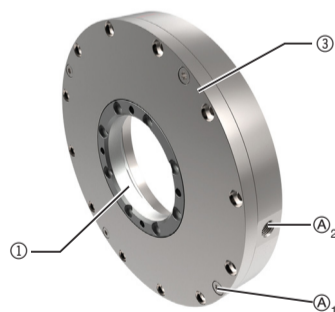
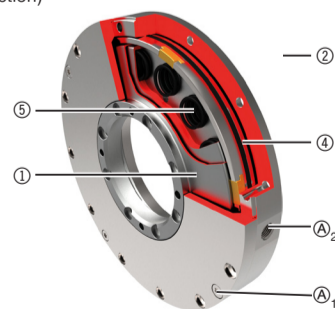


Fig. 2: TPS element (section)



1	Connection with drill holes for installation
2	Clamping segments
3	Housing with drill holes for installation
4	Pneumatic piston
5	Spring energy accumulator
A ₁	M5 air connection
A ₂	G1/8 air connection

6 Installation

- ▶ Check the element for any damage before installing it.
 - The element may only be used in conjunction with rotationally symmetrical elements (shafts, axles).
- ▶ All provided drill holes for installation are to be used for the installation of the clamping element.
 - Make sure the mounting piece has sufficient rigidity and is clean and level.
 - Use cylinder screws with a hexagon socket with a minimum strength class of 8.8.
 - ⇒ <http://www.schrauben-normen.de/anziehmomente.html>
- ▶ The vent holes and filters have to be atmospherically free over their entire cross-section and protected against liquids (oil, grease, etc.) and chips.
 - Suitable pneumatic connections have to be used. We recommend tested compressed air hoses.
- ▶ To ensure a short response time, choose the shortest possible hose length. Insert a quick exhaust valve, if necessary.

6.1 Installation procedure

CAUTION:



If the mounting screws are tightened when the element is not clamped, the element can shift and consequently be unable to achieve the optimum clamping force! Furthermore, the guide rail could become damaged.

- ▶ Remove plug screws.
- ▶ Install the pneumatic connection.
- ▶ Release the element by the application of pressure.
- ▶ Set the element on the shaft.
- ▶ Screw the screws into the mounting drill holes and tighten using the specified torque.
- ▶ Screw the screws into the mounting drill holes of the housing and gently tighten them.
- ▶ Clamp element by pressure relief - as a result, the element is centered.
- ▶ Tighten screws using the specified torque ⇒ <http://www.schrauben-normen.de/anziehmomente.html> ⇒ DIN 912 bzw. ISO 4762

6.2 Checking operational readiness

INFORMATION:



The function of the TPS element can be tested by applying a torque less than or, at most, equal to the holding force of the element. If any rotation of the axle or shaft can be detected, it must be assumed that the inner elements are worn out.

After the element has been properly installed, check whether it is ready to be operated according to the following characteristics:

- Check the ease of movement by manually rotating the shaft with the clamping element pressurized.
- Check the clamping process by manually rotating the shaft with the clamping element depressurized.
- Visually inspect the proper mounting, firmness and flexibility of the pneumatic system tubing.
- Perform a visual inspection for leaks on all pneumatic connections while the element is pressurized.
- Check all mounting screws for the specified tightening torque.

6.3 Disassembly

Disassembly is carried out in the reverse order of that described in section 861.

7 Maintenance

NOTE:



The filters of the exhaust valve and the air filters may not be clogged by contamination.

The element is maintenance-free up to the number of cycles listed in the "Technical Data" table:

- Compressed air quality as per ISO 8573-1 Class 4.
- The air filter must be kept clean and cleaned, if necessary. The element must not be operated without this filter.
- ▶ Even though the element is, as mentioned, maintenance-free, perform a regular visual inspection to check for corrosion, damage and contamination. A readjustment is not required after proper installation, thanks to the factory default contact profiles.
- ▶ Clean the magnetic gripper as needed using a commercially available machine cleaning agent and then apply an anti-corrosion agent to the housing.

8 Technical data

INFORMATION:



Please refer to our website www.zimmer-group.com/en/it-td for technical data. If you should have further questions about products or technical data, please contact ZIMMER GmbH customer service. For this purpose, please call our technology hotline at ☎ +49 7844 9138-5556.

9 Troubleshooting

INFORMATION:



For an accurate and detailed overview of possible faults and their remedies, visit our website at www.zimmer-group.com/en/it-faq. If the described measures for corrective actions are unsuccessful, contact the customer service department at ZIMMER GmbH. For this purpose, please call our technology hotline at ☎ +49 7844 9138-5556.

10 Transport and storage

The clamping element is to be transported and stored only in the packaging supplied by Zimmer GmbH. If the element is stored differently, it must be provided with corrosion protection to prevent any corrosion.

11 Declaration of conformity

in terms of the EU Machinery Directive 2006/42/EC (Annex II 1 A)

Name and address of the manufacturer:

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We hereby declare that the following, identically constructed safety components

Product designation: Clamping and braking element for round guides with spring accumulator
Type designation: TPS
conforms to the requirements of the 2006/42/EC directive in their design and the version we put on the market. The following harmonized standards have been used: (The manufacturer has a full list of the applied standards.)
DIN EN ISO 12100:2011-03 Safety of machinery – General principles – Risk assessment and risk reduction
DIN EN ISO 13849-1 Safety of machinery – Safety-related parts of control systems
DIN EN ISO 4414 Safety-related requirements for pneumatic systems and their components

Authorized representative for compiling the relevant documents:

Michael Hemler	(see manufacturer's address)	Rheinau, Germany 2018-08-06	Martin Zimmer
First name, last name	Address	Place and date of issuance	(Legally binding signature)