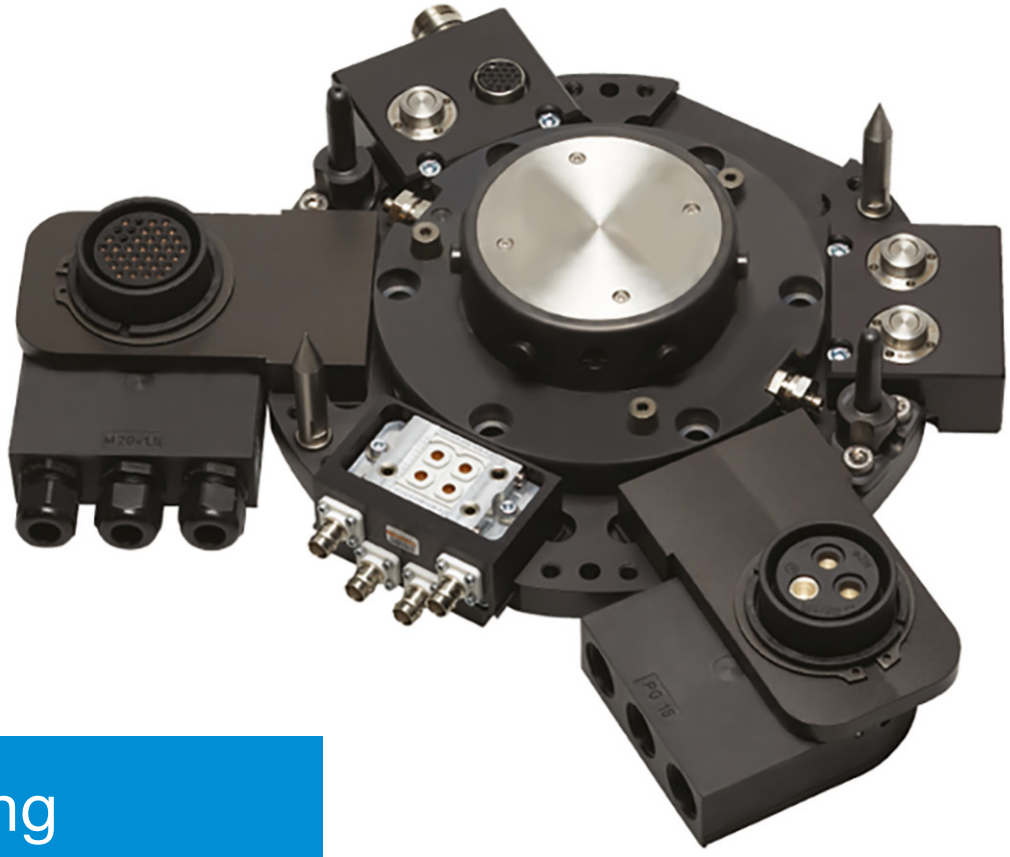
INSTALLATION AND OPERATING INSTRUCTIONS



Handling Technology

WWR1000 series
Pneumatic tool changers

THE KNOW-HOW FACTORY

Contents

Zimmer GmbH • Im Salmenkopf 5 • 77866 Rheinau, Germany • Phone: +49 7844 9138-0 • Fax: +49 7844 9138-80 • www.zimmer-group.de

1 Supporting documents

NOTE:

The following documents are available for download on our Internet site - www.zimmer-group.de.
Only the documents currently available on the website are valid.

- Catalogs, drawings, CAD data, performance data
- Information on accessories
- Detailed installation and operating instructions
- Technical data sheets
- General Terms and Conditions of Business, including warranty information

2 Safety notes

CAUTION:

Non-compliance may result in severe injuries!

These installation and operating instructions are intended for installation and maintenance technicians as well as design engineers requiring the element for applications. 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.

1. Installation, commissioning, maintenance and repairs may only be performed by qualified experts in accordance with the installation and operating instructions.
2. The element is state-of-the-art. It is fitted to industrial machines and is used to hold tools. The following are examples of situations in which the element may cause a hazard:
   - the element is not properly fitted, used or maintained.
   - the element is not used for its intended purpose.
   - local regulations (legislation, ordinances, guidelines), such as the EC Machinery Directive, accident prevention regulations and the installation and operating instructions, are not observed.
3. The element may only be used in accordance with its intended use and technical data. ZIMMER GmbH shall accept no liability for any damage caused by improper use.
4. Any use other than the intended use requires written approval from ZIMMER GmbH.
5. Do not reach into the operating range of the element.
6. Make sure that the energy supply is disconnected before you install, retool, maintain or repair the element.
7. In case of maintenance, renovation or expansion work, remove the element from the machine and carry out the work outside the danger zone.
8. When commissioning or testing, make sure that the element cannot be actuated by mistake.
9. Modifications to the element, such as adding drill holes or threads, may be made only with prior approval from ZIMMER GmbH.
10. The specified maintenance intervals and compressed air quality specifications are to be observed; also refer to the “Maintenance” section. Please contact our service hotline for this purpose.
11. Use of the element under extreme conditions, such as aggressive liquids and abrasive dust, is subject to prior approval from ZIMMER GmbH.
12. When disassembling the element, exercise increased caution due to the always present spring tension.

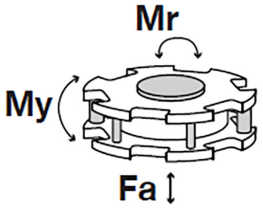
3 Proper use

NOTE:

The WWR1000 series 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 element is designed for operation with compressed air only. It is not suited for operation with other media such as liquids or gases.
The fixed part of the element is intended to be used in closed rooms for handling and holding tool changer loose parts with tools mounted thereon.
Static forces and torques that the element has to absorb must not exceed the recommended parameters.

Models (loose part & fixed part)		WWR1160F	WWR1200F
Torsional moment	Mr [Nm]	6000	12000
Tilting moment	My [Nm]	6000	12000
Max. permitted force	Fa [N]	35000	75000



WARNING:

- Danger of injury if the element is not operated as intended!
- The element must never be operated without compressed air. The built-in spring is used exclusively for locking the device in case of power loss.

⇨Always operate the element with an operating pressure between 6 and 8 bar!

Information:

Depending on the model, there are several transmission options available for transmitting pneumatic and electronic actuators. Optionally, the media transmission can be set up with transmission elements at corresponding interfaces on the element.

4 Personnel qualification

Installation, commissioning and maintenance may only be performed by qualified personnel. They must have read and understood the installation and operating instructions in full.

5 Function

The tool changer is a two-piece machine element. The fixed part ① is installed on a handling system.
The loose part ③ is installed directly on the tool. The connection of both elements is form fit and frictionally fit through the locking bolts ④ in the locking sleeve ⑧. The required stroke is generated by a double-acting pneumatic rotor cylinder ⑤. An integrated spring ⑥ acts as an energy storage and preserves the capability of the tool changer to be locked in the event of a power failure or interruption.
A fixed part can be operated with as many loose parts as desired. That significantly reduces set-up times for changing tools.

①	Fixed part
②	Centering pin
③	Loose part
④	Locking bolt
⑤	Drive
⑥	Integrated spring
⑦	Piston position sensing
⑧	Locking sleeve

Fig. 1: WWR1000 tool changer

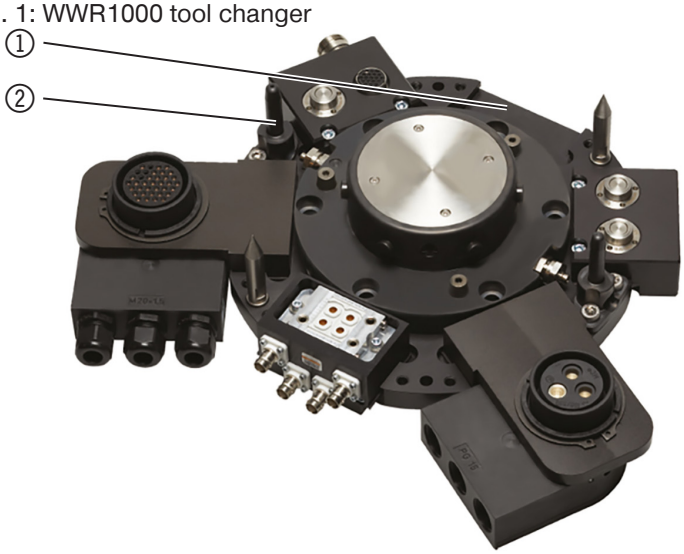
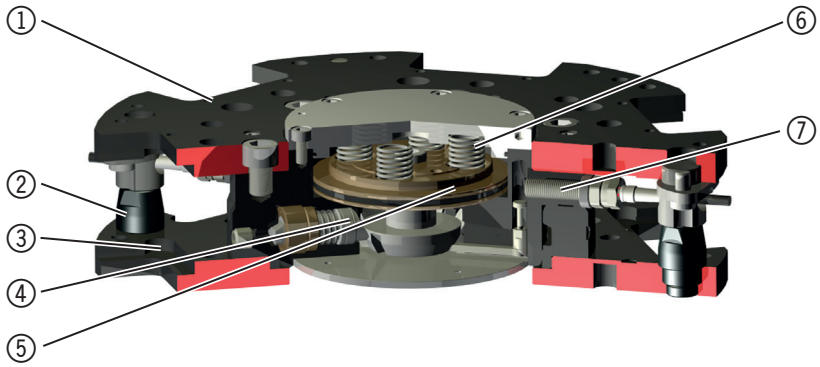


Fig. 2: Cutaway view of the WWR1000 tool changer



6 Installation

NOTE:

Non-compliance may result in damage to the system

Switch off the pneumatic energy supply before any assembly, installation or maintenance work.

CAUTION:

Non-compliance may result in damage to the system

- Risk of injury in case of unexpected movement of the element when pneumatic energy is connected.
- Switch off the pneumatic energy before all work.
- Secure the pneumatic circuit against being switched on unintentionally.
- Check the pneumatic circuit for any existing residual energy; bleed if necessary.

WARNING:

- Risk of injury in case of unexpected movement of the machine or system into which the element is to be installed.
- Switch off the energy supply to the machine before all work.
- Secure the machine against being switched on unintentionally.
- Check the machine for any residual energy.

6.1 Installation of the element

The element may only be mounted on the surface intended for this purpose.

The following terms and conditions apply for the installation of the loose part on the tool:

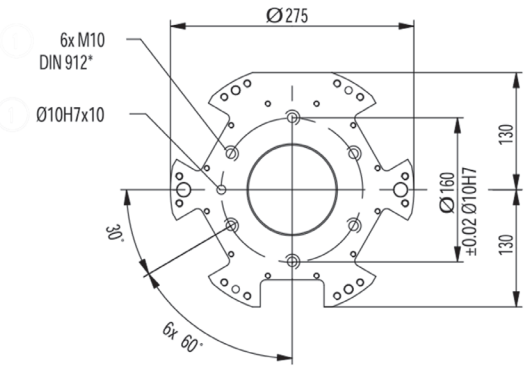
- If the length of the mounting surface is < 100 mm, the permitted unevenness is < 0,02 mm.
- If the length of the mounting surface is > 100 mm, the permitted unevenness is < 0,05 mm.

Depending on the model, cylinder screws from M10 to M16 and of strength class 8.8 in accordance with DIN 912 or ISO 4762 are used.

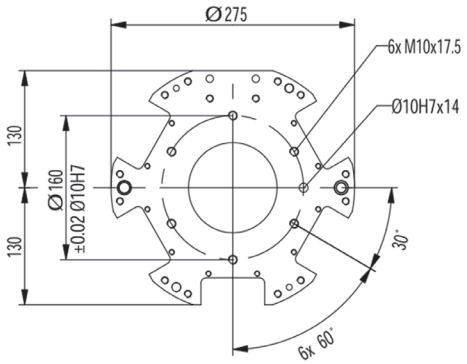
The following tightening torques must be observed upon installation:

Installation size	WWR1160F	WWR1160L	WWR1200F		WWR1200L	
Screw size	6 x M10	6 x M10	6 x M12	6 x M16	6 x M12	6 x M16
Permitted tightening torque [Nm]	49,5	49,5	86,5	215	86,5	215
Pins DIN 6325	NAB11690	NAB11690	NAB12020		NAB12020	

WWR 1160 F



WWR 1160 L



Only the documents currently available on the website are valid.

⇨www.zimmer-group.de

Make the following selections:

Handling Technology/Robot Accessories/Tool changer/pneumatic/WWR1000 Series

Fixed part ⑨:

- ▶ Installation of the fixed part with hexagon socket cylinder screws ⑫ in accordance with DIN912 or ISO4762, strength class 8.8.
- ▶ Insert the fixed part ⑨ against the handling system, with the help of the straight pins ⑬ and the centering diameter on the robot flange.
- ▶ The screw-in depth must be at least 1,5 times the diameter.
- ▶ Observe the permitted tightening torque – see table.

Loose part ⑭:

- ▶ Installation of the loose part using cylinder screws ⑫ (strength class 8.8).
- ▶ The loose part ⑭ is positioned on the tool by means of the straight pins ⑬ and the tapped hole ⑮.
- ▶ The screw-in depth of 17 mm into the loose part must be observed ⇨ depending on model.
- ▶ Observe the permitted tightening torque – see table.

6.2 Checking operational readiness

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

- ▶ Look and listen for leaks in the pneumatic connections.
- ▶ Check all mounting screws for their prescribed tightening torque.
- ▶ Look and listen for leaks in the pressurized element.
- ▶ Check to make sure the element is functioning properly by opening and closing it manually.

CAUTION: Ensure that the loose part is not accidentally ejected!

7 Pneumatic connection

The pneumatic connection of the tool changer always takes place at the connections 9 of the fixed part.

- ▶ Air connection A: locked.
- ▶ Air connection B: unlocked.

The following is a description of two possibilities for operating the element in accordance with the rules of the DIN EN ISO 13849-1 standard in different control categories, allowing the required performance level (PL) to be reached:

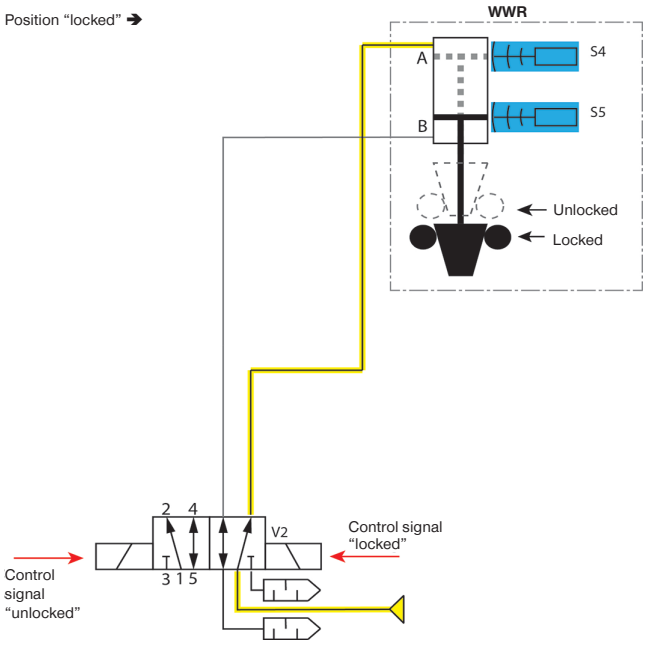
7.1 Control category 1

- Proven components
- Zero defect detection
- PL c accessible

The element is controlled via a 5/2-directional valve.

To implement the safety function, the use of “proven components,” as described in Chapter 6.2.4 of the EN ISO 13849-1, is sufficient.

A simple final position control is possible with the S4 and S5 inductive proximity switches directly at the tool changer (see accessories).



7.2 Control category 3 locked:

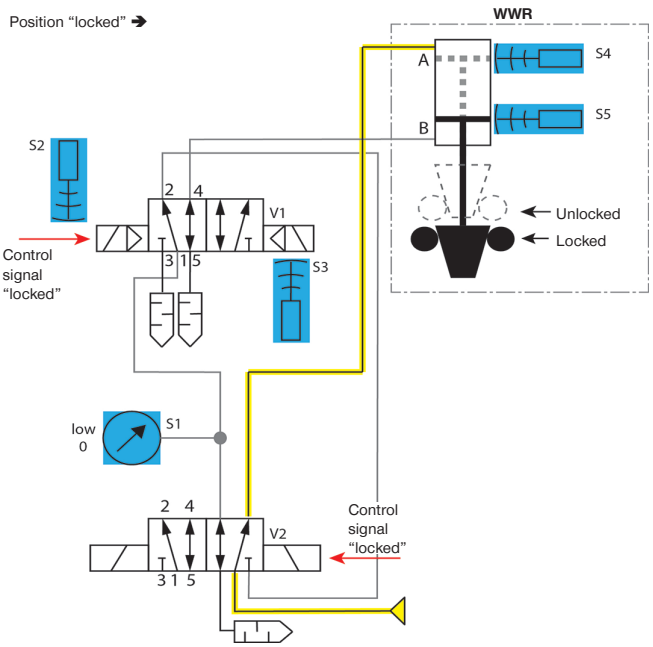
► Two-channel

- Degree of diagnostic coverage (without S4 and S5 sensors): medium
- Without storage position control or tool encoding.

⇨PL d accessible

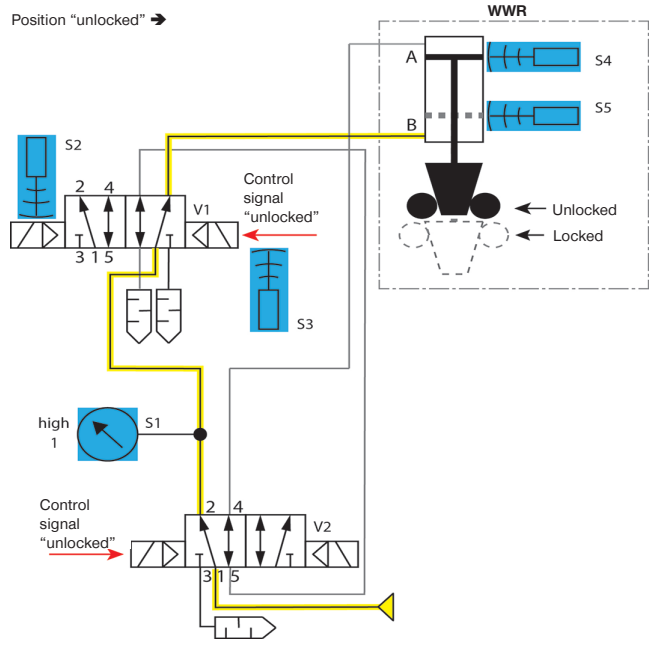
- Degree of diagnostic coverage (with S4 and S5 sensors): high
- Additional storage space control or tool encoding by means of optional transponders

⇨Control category 4 possible
⇨PL e ⇨ each error is detected before the “safe locking or unlocking” safety function is requested.



7.3 Control category 3 unlocked:

This control system is designed so that the failure of a valve would not cause the WWR to unlock (and as such, to lose safety functions). Both V1 and V2 valves must always be in the release position to open the tool changer.



8 Installation of accessories

NOTE:

Observe the separate installation and operating instructions for installing the accessories, especially the energy elements.
The installation and operating instructions, as well as an overview of accessories, can be found on our Internet site ⇨ www.zimmer-group.de. If you have further questions regarding accessories, please contact ZIMMER GmbH customer service at ☎ +49 7844 9138-0.

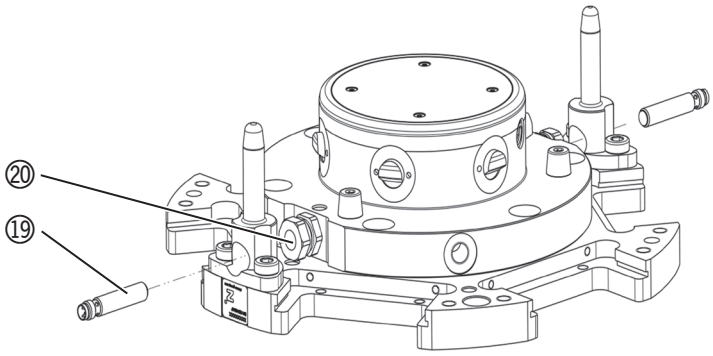
WARNING:

- Risk of injury in case of unexpected movement of the machine or system into which the element has been installed.
- Switch off the energy supply to the machine before all work.
- Secure the machine against being switched on unintentionally.
- Check the machine for any residual energy.

8.1 Installation of inductive proximity switches

The inductive proximity switches ⑲ for sensing the piston position are there to provide safety. The following operation may be started only if a clear signal displays the respective position of the piston. The sensors are not absolutely necessary for the function of the element.
Installation of the inductive proximity switch is done as follows:

► The inductive proximity switch ⑲ must be inserted into the provided intake ⑳ and pushed into the sensor shaft as far as it will go
➔ After that, clamp the element.

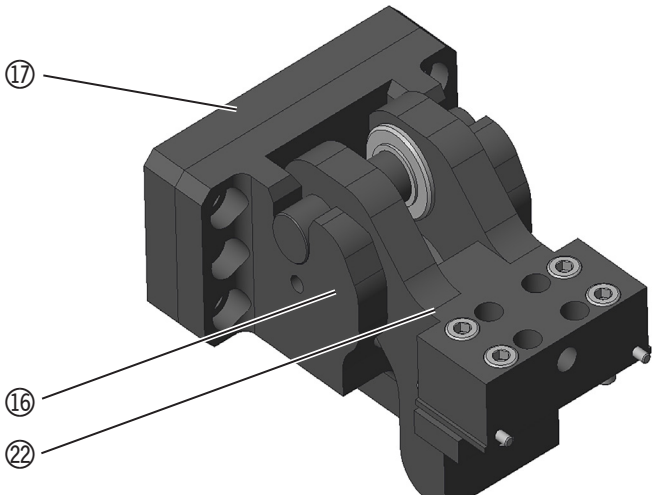


8.2 Installation of the ASLR1-1200 storage station

The storage station is an apparatus in which a completely equipped loose part can be held in readiness in a defined position. Several storage stations can be used to store differently equipped loose parts for operation with a fixed part.
The robot must be programmed to the storage positions.
A storage station includes a holder ⑯, a spacer plate ⑰ (only required for the WWR1160 model) and a claw ㉒ - including all mounting hardware.

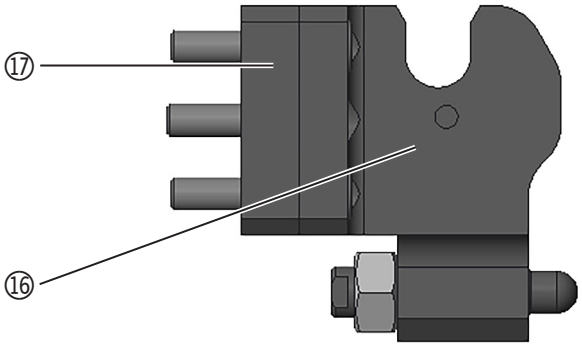
→ No spacer plate is required for the use of the WWR1200 model storage station!

The spacer plate is always included within the scope of delivery of the storage station.



8.2.1 Installation of the ALSR1-1200 holder

- ► Mount the holder ⑯ (spacer plate ⑰ required only for the WWR1160) onto a support structure (customer-specific engineering).
- → The support structure must meet the requirements/loads of the function.
- ► To mount the holder ⑯ on the support system, all mounting drill holes (M10, strength class at least 8.8) must be used.



8.2.2 Installation of the ALSR1-1200 on the loose part

IMAGE 1

- ▶ Put the claw ㉒ together with the loose part ⑭.
  - → The clamping plate ㉓ is inserted into the provided groove.
  - → Slide the claw ㉒ with the clamping plate ⑭ onto the loose part ⑭.

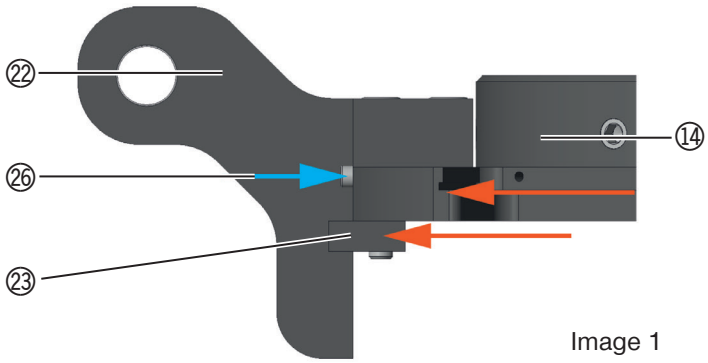


Image 1

IMAGE 2

- ▶ Put the claw ㉒, the loose part ⑭ and the clamping plate ㉓ together using the supplied cylinder screws ㉔, ㉕ and ㉖.
  - → The correct tightening torques must be observed.
  - → http://www.schrauben-normen.de/anziehmomente.html

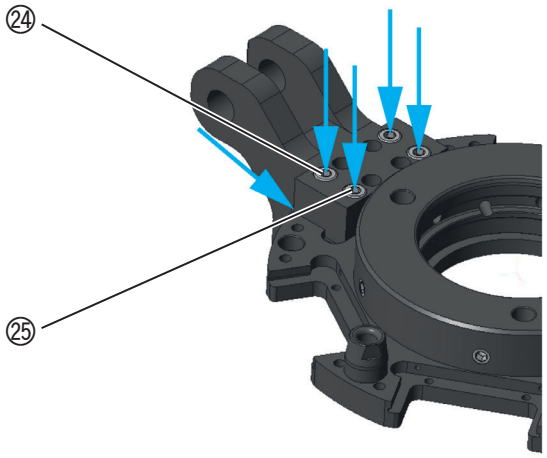


Image 2

IMAGE 3

- ▶ Here, the installed loose part ⑭ can be viewed with claw ㉒ from below.

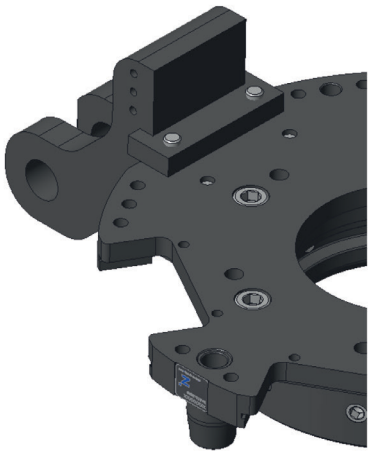


Image 3

IMAGE 4

- ▶ Place the claw ㉒ with fitted loose part ⑭ and bolt ㉗ in the holder 16.

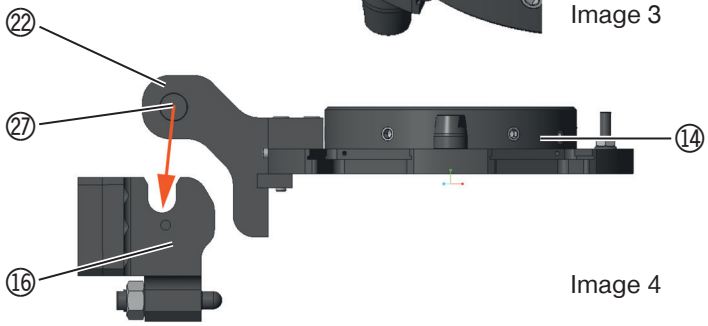


Image 4

IMAGE 5

- ▶ The tilt of the storage position can be changed by twisting the adjustment bolt ㉖ ⇨ The position is fixed by tightening the locknut.

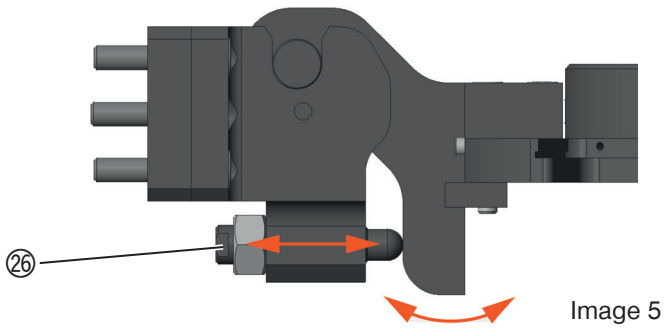
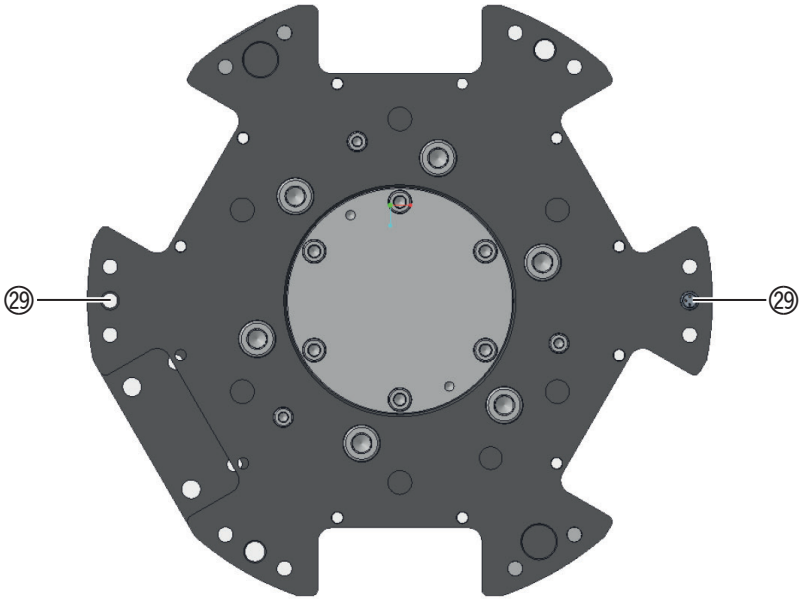
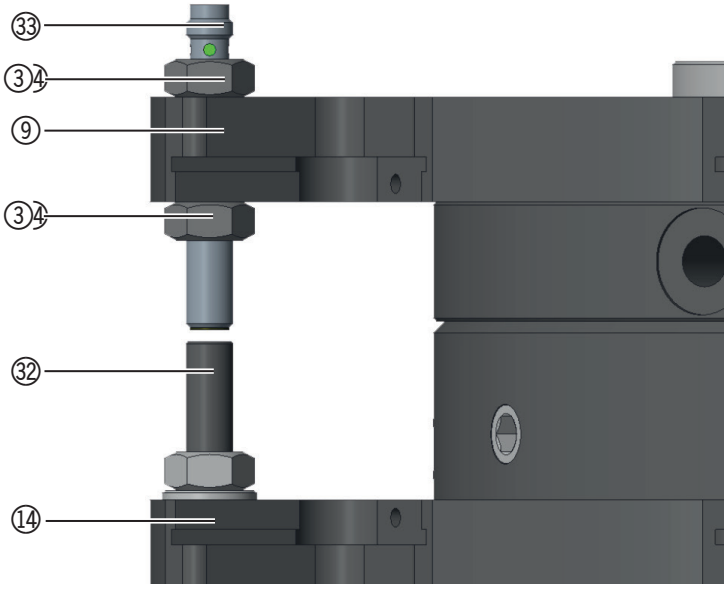


Image 5

8.3 Loose part presence sensing

- ▶ Insert the inductive proximity switch ㉞ in to the provided pilot hole ㉙ and position or fix using the corresponding locknuts ㉜.
  - → You can find more information on accessories on our website ⇨ www.zimmer-group.de
  - → The inductive proximity switch can be installed at two positions ㉙ in the fixed part ⑨.
- ▶ The bolt ㉟ is the dampening element of the sensor.



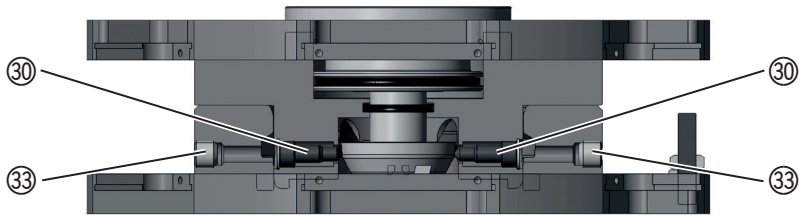


9 Emergency release

If the loose part ⑭ cannot be disengaged on an occasion (e.g. crash), it can be manually disengaged at the following points.

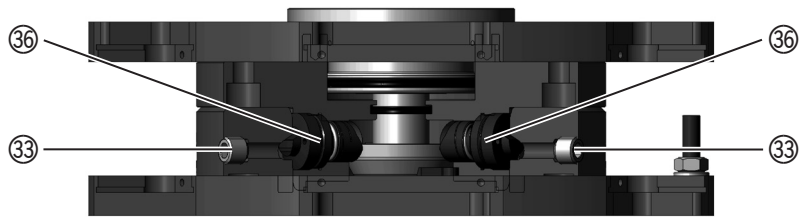
9.1 Plug screw (piston resetting)

- ▶ Unscrew and pull out the setscrews ㉝ completely.
- ▶ Screw the emergency pins ㉚ in on both sides in unison, using the tool.
- ▶ By screwing in the emergency pins ㉚, the loose part ⑭ can be removed.



9.2 Plug screw (bolt resetting)

- ▶ Unscrew and pull out the setscrews ㉝ completely.
- ▶ Press the stop bolts ㊱ inward using the tool.
- ▶ By pressing the stop bolts ㊱ inward, the loose part ⑭ can be removed.



10 Technical data

INFORMATION:

Please refer to our website ⇨ www.zimmer-group.de for “Technical data.”
This data varies within the series depending on the specific design. If you should have further questions about products or “Technical Data,” please contact ZIMMER GmbH customer service.
☎ +49 7844 9138 -0.

11 Maintenance

Maintenance-free operation of the element is guaranteed for up to 5 million cycles.

The maintenance interval may shorten under the following circumstances:
- Drive with non-filtered compressed air (10 µm) – dry or lubricated.
- Unclean environment.
- Use not in accordance with performance data.
- Ambient temperature above 60 °C; lubricants harden faster.

Each time the element is serviced, the seals should be replaced, while the mechanical parts and cylinder should be lubricated.
We recommend having Zimmer Group service carry out this work.
Dismantling and reassembling the element without authorization may result in complications, as special installation equipment is required in some cases.

For relubrication, ZIMMER GmbH recommends:
- Mechanical parts: MOLYKOTE BR2plus or an equivalent lubricant.
- Cylinder: RENOLIT HLT2 or an equivalent lubricant.

12 Installer's declaration

In terms of the EU Machinery Directive 2006/42/EC (Annex II 1 B).

Name and address of the manufacturer:
ZIMMER GmbH • Im Salmenkopf 5 • D-77866 Rheinau, Germany • Phone: +49 7844 9138 0 • Fax: +49 7844 9138 80 • www.zimmer-group.de

We hereby declare that the incomplete machine described below,

Product designation: **Pneumatic tool changer**
Type designation: **WWR1☐☐☐**

satisfies the following basic requirements of the Machinery Directive 2006/42/EC:
No. 1.1.2., No. 1.1.3., No. 1.1.5., No. 1.3.2., No. 1.3.4., No. 1.3.7., No. 1.5.3., No. 1.5.4., No. 1.5.8., No. 1.6.4., No. 1.7.1., No. 1.7.4.

We also declare that the specific technical documents were produced in accordance with Annex VII Part B of this Directive.
We undertake to provide the market supervisory bodies with electronic versions of special documents for the incomplete machine through our documentation department, should they have reason to request them.

The incomplete machine may only be commissioned if it has been ascertained, if applicable, that the machine or system in which the incomplete machine is to be installed satisfies the requirements of Directive 2006/42/EC on Machinery and an EC declaration of conformity has been drawn up in accordance with Annex II 1 A.

Authorized representative for compiling relevant technical documents.

Kurt Ross	See manufacturer's address	Rheinau, Germany, 2018-06-25	Martin Zimmer, Managing Director
First name, last name	Address	(Place and date of issuance)	(Legally binding signature)

13 Your notes

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