

## INSTALLATION AND OPERATING INSTRUCTIONS

Swivel jaws, pneumatic

SB/SBZ series

DDOC00246

THE KNOW-HOW FACTORY



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## 1 Supporting documents

### NOTICE



Read through the installation and operating instructions before installing or working with the product.

The installation and operating instructions contain important notes for your personal safety. They must be read and understood by all persons who work with or handle the product during any phase of the product lifetime.



The documents listed below are available for download on our website [www.zimmer-group.com](http://www.zimmer-group.com).

- Installation and operating instructions
  - Catalogs, drawings, CAD data, performance data
  - Information on accessories
  - Technical data sheets
  - General Terms and Conditions, including warranty information.
- ⇒ Only those documents currently available on the website are valid.

In these installation and operating instructions, "product" refers to the product designation on the title page!

### 1.1 Notices and graphics in the installation and operating instructions

#### DANGER



This notice warns of an imminent danger to the life and health of people. Ignoring these notices can lead to serious injury or even death.

- ▶ You absolutely must comply with the described measures for avoiding these dangers!
- ⇒ The warning symbols are assigned according to the type of danger.

#### WARNING



This notice warns of a situation that is potentially hazardous to personal health. Ignoring these notices can cause serious injury or damage to health.

- ▶ You absolutely must comply with the described measures for avoiding these dangers!
- ⇒ The warning symbols are assigned according to the type of danger.

#### CAUTION



This notice warns of a situation that is potentially hazardous for people or that may result in material or environmental damage. Ignoring these notices may result in slight, temporary injuries or damage to the product or to the environment.

- ▶ You absolutely must comply with the described measures for avoiding these dangers!
- ⇒ The warning symbols are assigned according to the type of danger.

### NOTICE



General notices contain usage tips and valuable information, but no warnings of dangers to health.

### INFORMATION



This category contains useful tips for handling the product efficiently. Failure to observe these tips will not result in damage to the product. This information does not include any information relevant to health or workplace safety.

## 2 Safety notices

### CAUTION



#### **Risk of injury and material damage in case of non-compliance**

Installation, commissioning, maintenance and repairs may only be performed by qualified specialists in accordance with these installation and operating instructions.

The product is state-of-the-art.

It is mounted to industrial machines and is used to position workpieces.

The following are examples of situations in which the product may cause a hazard:

- The product is not properly installed, used or maintained.
- The product is not used for its designated purpose.
- The locally applicable regulations, laws, directives or guidelines are not observed.
- ▶ The product may only be used in accordance with these installation and operating instructions and the product's technical data. Any changes or additions to the intended use of the product, as well as modifications to the product, such as those in the following examples, require the written permission of the manufacturer:
  - Use of the product under extreme conditions, such as aggressive fluids or abrasive dusts
  - Additional drilled holes or threads
- ⇒ Zimmer GmbH shall accept no liability for any damage caused by improper use. The operator bears sole responsibility.
- ▶ Make sure that the power supply is disconnected before you mount, adjust, modify, maintain or repair the product.
- ▶ Whenever work is carried out on the product, make sure that the product cannot be actuated by mistake.
- ▶ Perform maintenance tasks, renovation work or attachment work outside of the machine's danger zone when possible.
- ▶ Do not reach into the operational range of the product.
- ▶ Observe the specified maintenance intervals and specifications regarding the quality of the operating material.
- ▶ When using the product under extreme conditions, adjust the maintenance interval according to the degree of contamination.

### 3 Proper use

#### NOTICE



The product is only to be used in its original state with its original accessories, with no unauthorized changes and within the stipulated parameter limits and operating conditions.

The product is intended to be used exclusively in pairs for picking up workpieces and for swiveling and positioning them according to the technical design.

Any other or secondary use is deemed improper.

- ▶ Operate the product only in compliance with the associated installation and operating instructions.
- ▶ Operate the product only when it is in a technical condition that corresponds to the guaranteed parameters and operating conditions.
- ⇒ Zimmer GmbH shall accept no liability for any damage caused by improper use. The operator bears sole responsibility.

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The product is not suitable for clamping workpieces during a machining process.

The product is designed exclusively for pneumatic operation.

The product is designated for use in closed facilities.

Direct contact with perishable goods/food is not permitted.

### 4 Personnel qualification

Installation, commissioning and maintenance may only be performed by trained specialists. These persons must have read and understood the installation and operating instructions in full.

## 5 Product description

The products are designed for holding, transporting and positioning workpieces.

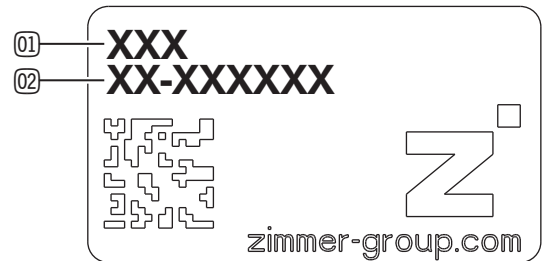
SB series products enable a swivel angle of 90° or 180°, which are set using the end stops.

SBZ series products enable a swivel angle of 90° or 180° depending on the product variant.

### 5.1 Type plate

A type plate is attached to the housing of the product.

The article number and the confirmation number are shown on the type plate.



① Article number

② Confirmation number

### INFORMATION



Please state the confirmation number in the event of damage or a complaint.

► Please contact Zimmer Customer Service if you have any questions.

### INFORMATION



The products of the SB series are delivered in pairs.

The products of the SBZ series can be supplied as a powered swivel jaw with a swivel angle of 90° or 180° as well as a counter bearing without a drive.

## 6 Functional description

The products differ in the mechanics of how force is transmitted and in how the drive works.

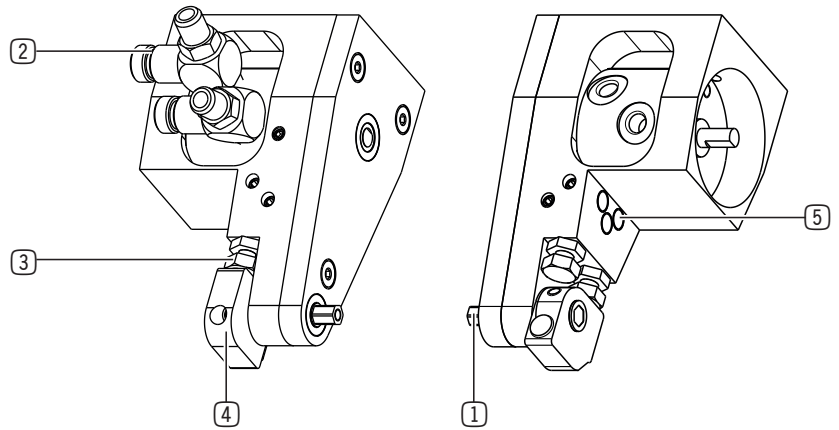
The SB series is driven by a double-acting pneumatic rotary cylinder. The force is transmitted to the output shaft by a toothed belt.

The design of the output shaft depends on the installation size – either a hexagon or shaft with a feather key.

The SBZ series is driven by a double-acting pneumatic linear cylinder. The force is transmitted to the stop shaft by a gear train. The swivel movement is limited by mechanical end stops. Corresponding sensors are available as accessories for position sensing.

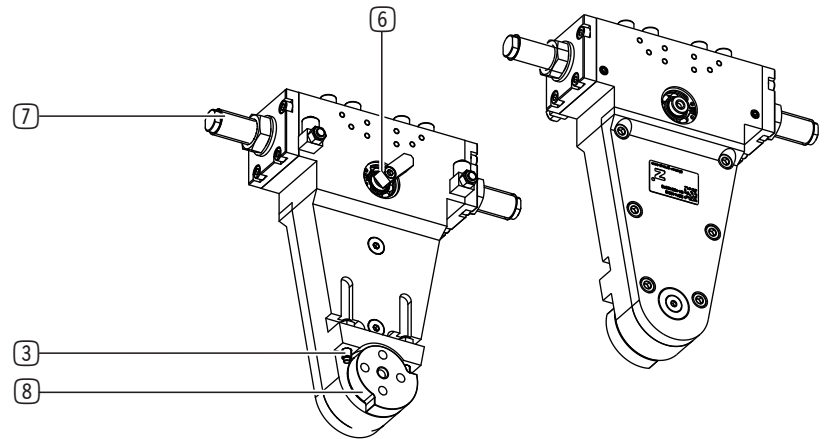
### 6.1 SB series products

- ① Output shaft
- ② Flow control valve
- ③ Stop screw
- ④ Limit stop
- ⑤ Position for sensor



### 6.2 SBZ series products

- ③ Stop screw
- ⑥ Switch cam
- ⑦ Shock absorber
- ⑧ Drive flange





## 7 Technical data

### INFORMATION



- ▶ You can find the information in the technical data sheet on our website.
- This data varies within the series, depending on the specific design.
- ▶ Please contact Zimmer Customer Service if you have any questions.

## 8 Accessories/scope of delivery

### INFORMATION



- If any accessories not sold or authorized by Zimmer GmbH are used, the function of the product cannot be guaranteed. Zimmer GmbH accessories are specifically tailored to the individual products.
- ▶ For optional accessories and those included in the scope of delivery, refer to our website.

## 9 Transportation/storage/preservation

- ▶ Transport and storage of the product must be done only with the original packaging.
- ▶ If the product has already been installed on the superordinate machine unit, care must be taken during transport to ensure that no unexpected movements can occur.
  - ▶ Before commissioning the product and after transport, check all power and communication connections as well as all mechanical connections.
- ▶ If the product is stored for an extended period, the following points are to be observed:
  - ▶ Keep the storage location as dust-free and dry as possible.
  - ▶ Avoid temperature fluctuations.
  - ▶ Avoid wind/drafts/water condensation formation.
  - ▶ Pack the product and do not expose it to direct sunlight during storage.
- ▶ Clean all components. There must be no soiling left on the components.
- ▶ Visually inspect all components.
- ▶ Remove all foreign substances.
- ▶ Properly remove potential corrosion spots.
- ▶ Close electrical connections using suitable covers.

## 10 Installation

### WARNING



#### Risk of injury due to uncontrolled movements

Risk of injury in case of unexpected movement of the machine or system into which the product is to be installed.

- ▶ Switch off the energy supply of the machine before any work.
- ▶ Secure the power supply against being switched on unintentionally.
- ▶ Check the machine for any residual energy that may be present.

### CAUTION



#### Risk of injury due to uncontrolled movements

Risk of injury in the event of uncontrolled movement of the product when the power supply is connected.

- ▶ Switch off the power supply to the machine before carrying out any work.
- ▶ Secure the power supply against being switched on unintentionally.
- ▶ Check the machine for any residual energy that may be present.

### NOTICE



▶ Installation may only be carried out by qualified personnel in accordance with these installation and operating instructions.

▶ Switch off the power supply before any assembly, installation or maintenance work.

▶ Install the product on an appropriate mounting surface in accordance with the flatness specifications.

### INFORMATION



Requirements for a mounting surface with a length  $\leq 100$  mm:

- Permissible unevenness [mm]: 0.02

Requirements for a mounting surface with a length  $> 100$  mm:

- Permissible unevenness [mm]: 0.05

Further installation information:

- The mounting screws are not included in the scope of delivery.
- Strength class of the mounting screws 8.8 (DIN EN ISO 4762)

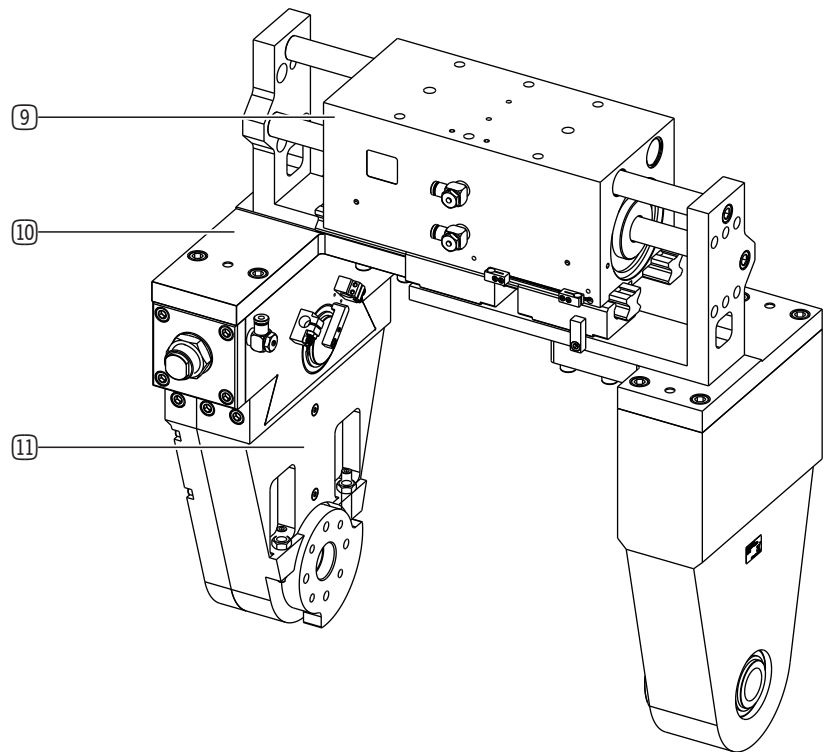
▶ Make sure that the mounting piece is sufficiently rigid.

▶ Observe the tightening torque of the mounting screws.

▶ Verify the permitted load capacity of the required screw connections in accordance with VDI 2230.

### 10.1 Installing the product

- ▶ Position the product on the mounting piece using connecting plates, straight pins and mounting screws.
- ▶ Observe the screw-in depths as well as the strength class of the mounting screws.
- ▶ Mount the product using the straight pins and mounting screws.



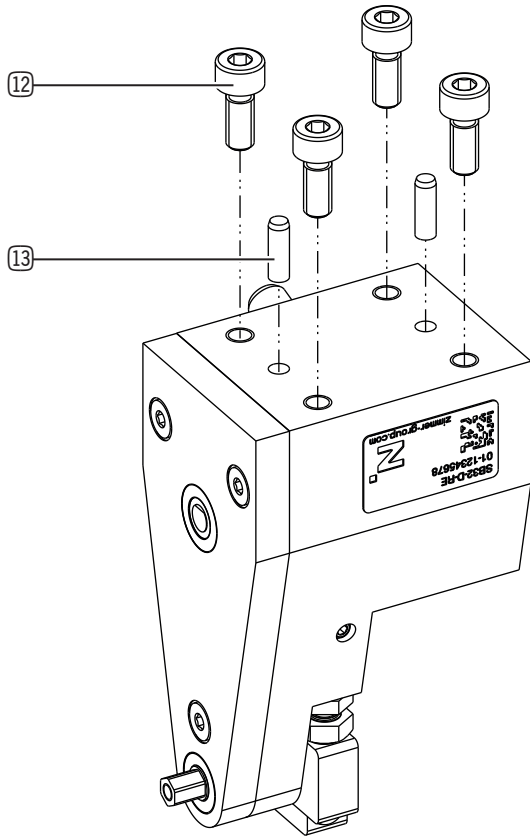
- ⑨ Gripper
- ⑩ Connection plate
- ⑪ Swivel jaw

**INFORMATION**

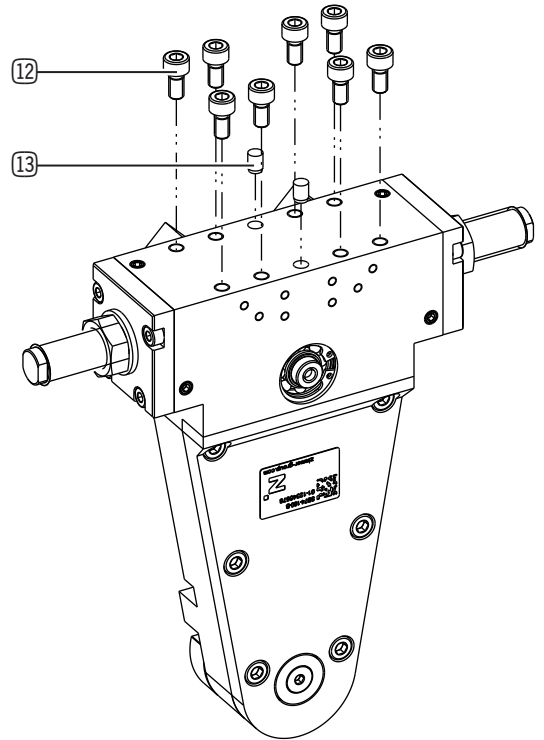


- ▶ Please note that SB series products can only be mounted from below.
- ▶ Please note that SBZ series products can normally only be mounted from below; installation to the interior side surface of the drive is only possible for installation sizes SB150 and SB190.
- ▶ You can find more information in the technical data sheet on our website.

**SB series**



**SBZ series**



- 12 Mounting screw
- 13 Straight pins

## 10.2 Mounting base jaw/workpiece-specific applications

### INFORMATION



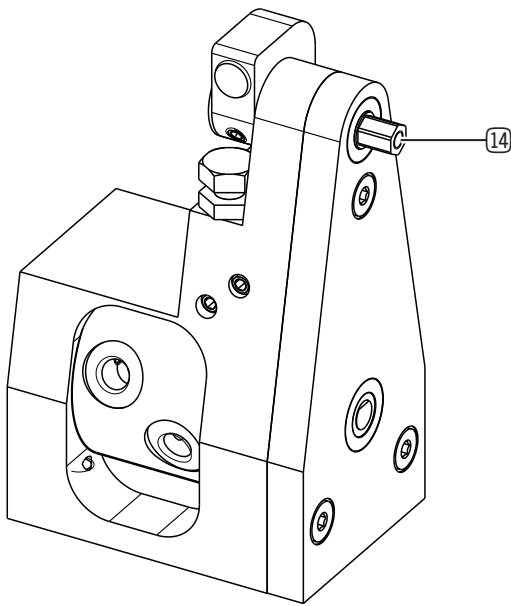
#### SB series

To assist with the installation of a base jaw or a workpiece-specific application, a central threaded hole is provided on the output shaft. The design of the output shaft is hexagon for installation size SB32 and a shaft with a feather key for installation sizes SB40 and SB54.

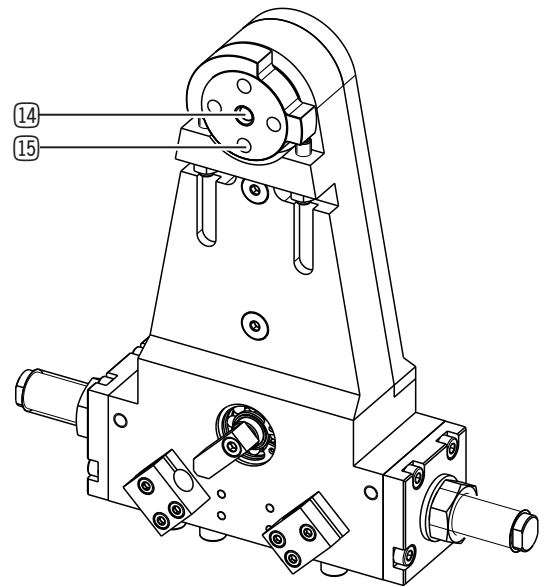
#### SBZ series

Threaded holes and holes for straight pins are provided on the flange of the output shaft for the installation of workpiece-specific applications.

#### SB series



#### SBZ series



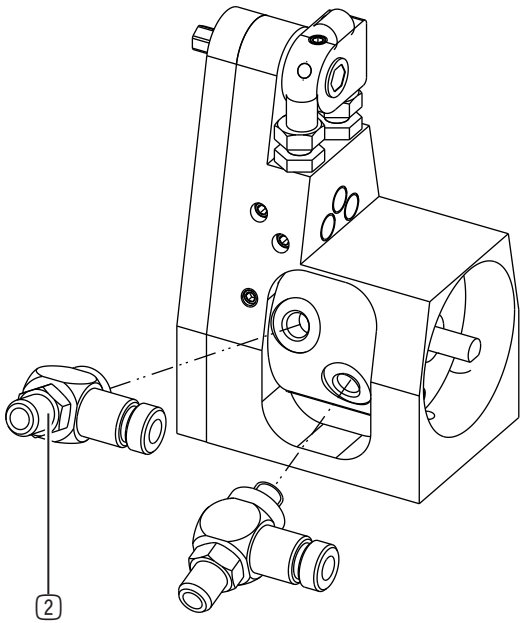
14 Hole for mounting screw

15 Hole for straight pin

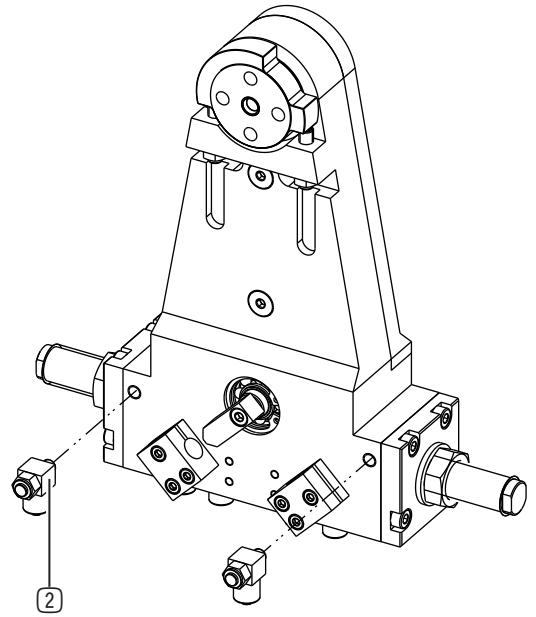
### 10.3 Installing the energy supply

- ▶ Install the flow control valve.

#### SB series



#### SBZ series



- ② Flow control valve

#### NOTICE



- ▶ You can find the information in the technical data sheet on our website.
- ▶ Close off unused connections using pressure-resistant closures.
- ▶ The authorized connections that are available can be found in the accessories list on our website. The necessary ordering information can also be found there.
- ▶ Use compressed air in accordance with DIN ISO 8573-1 [4:4:4].

### 10.4 Installing accessories

#### NOTICE



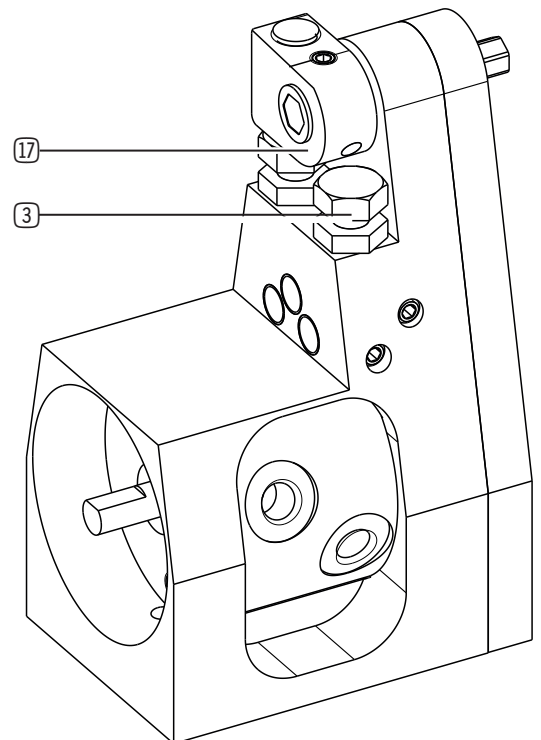
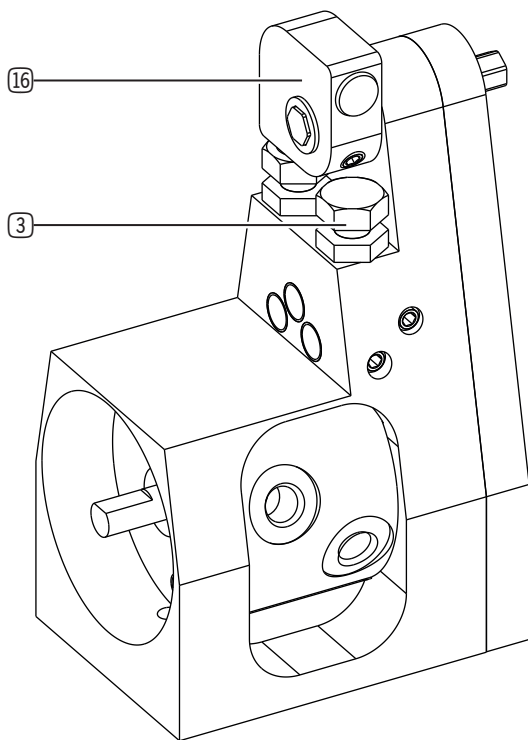
- ▶ Before installing an accessory, make sure it is suitable for use with the selected variant.
- ▶ You can find information on available pneumatic connections on our website.
- ▶ Please contact Zimmer Customer Service if you have any questions.

## 11 Commissioning

### 11.1 Setting the swivel angle for the SB series

The swivel angle is preset to 180° at the factory. You can set the swivel angle to 90° by replacing the factory-installed end stop. The product is equipped with stop screws that can be used to adjust the swivel angle by +/-3°.

- ▶ Switch off the power supply.
- ▶ Replace the mounted end stop.
- ▶ Loosen the lock nut of the stop screw on the desired side.
- ▶ Adjust the stop screw until the desired position is reached.
- ▶ Make sure that the stop screw comes into contact with the respective stop surface.
- ▶ Retighten the lock nut.
- ▶ Repeat the process for the other side.

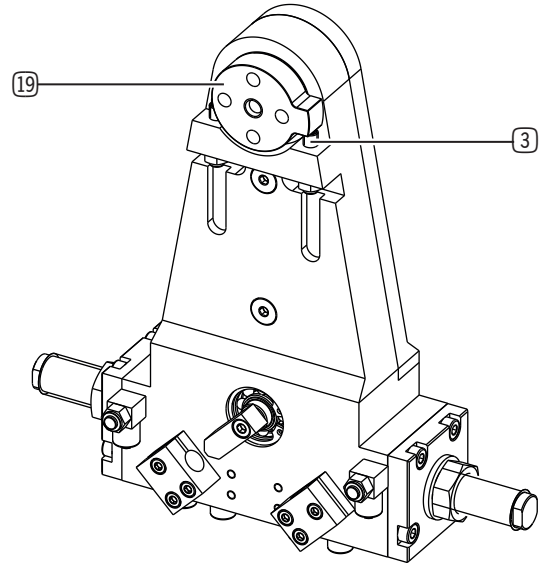
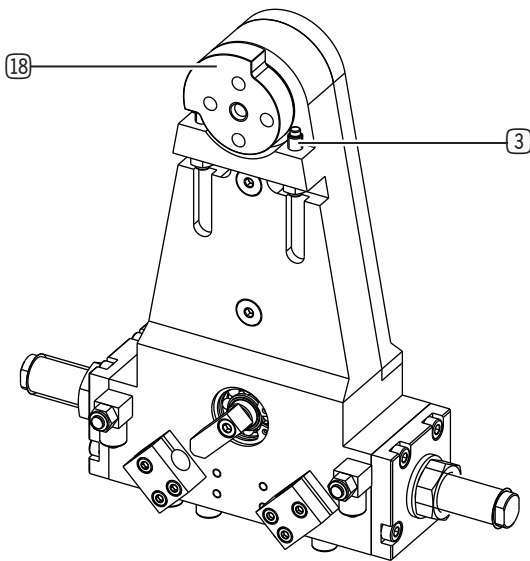


- ③ Stop screw
- ⑬ End stop 90°
- ⑰ End stop 180°

### 11.2 Setting the swivel angle for the SBZ series

The swivel angle is preset by the factory-installed drive flange. The product is equipped with stop screws, which allow an adjustment of the swivel angle of +/- 3° per end stop.

- ▶ Switch off the power supply.
- ▶ Loosen the lock nut of the stop screw on the desired side.
- ▶ Adjust the stop screw until the desired position is reached.
- ▶ Make sure that the stop screw comes into contact with the respective stop surface.
- ▶ Retighten the lock nut.
- ▶ Repeat the process for the other side.



- 3 Stop screw
- 18 Drive flange 90°
- 19 Drive flange 180°



### 11.3 Sensing positions for the SB series

#### NOTICE



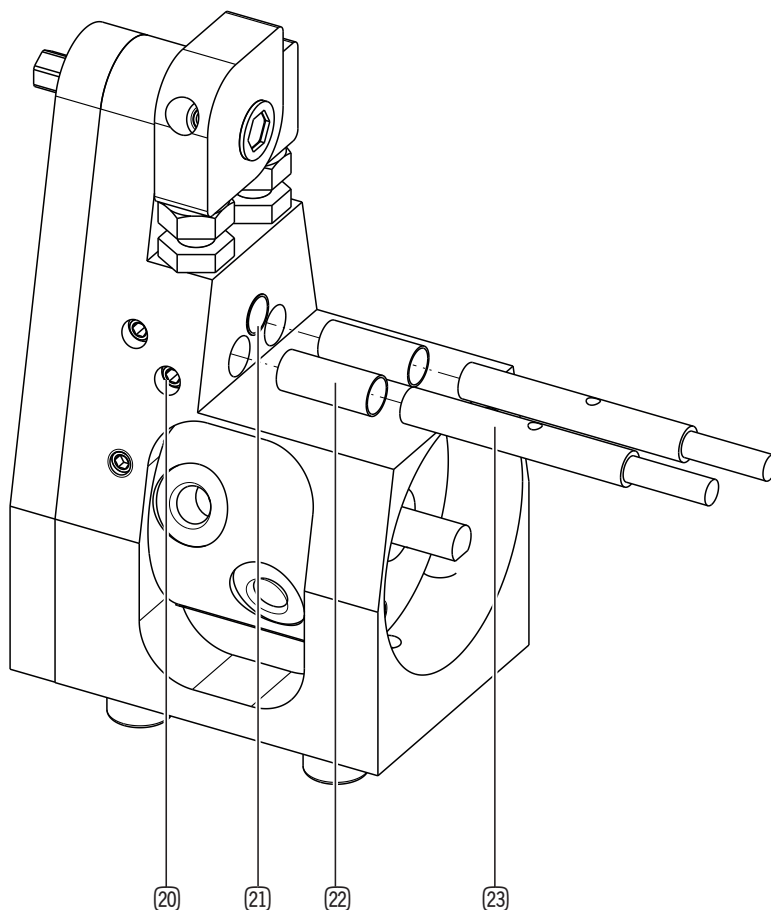
The cables that are used by Zimmer GmbH feature a minimum bending radius of 10 x the outer diameter.

This bending radius must not be undershot!

- ▶ Freely suspended cables must be secured to prevent excessive motion loads or pinching.
  - ▶ The contacts of the energy supply must be dry, clean and undamaged at all times.
- ⇒ Damage to the contacts can result in malfunction of the product.

The figure provides an example of the positioning of sensors for a swivel angle of 180°.

- ▶ Insert the sensor into the protective sleeve.
- ▶ Position the sensor in the desired sensor hole.
- ▶ Securely clamp the sensor using the corresponding grub screw.
- ▶ Close unneeded sensor holes using straight pins.



- 20 Set Screw
- 21 Sensor position for swivel angle 90°
- 22 Protective sleeve
- 23 Sensor

#### INFORMATION



Inductive sensors are available in the following versions:

- 5 m cable with exposed lead
  - 0.3 m cable with plug
  - 0.3 m cable with direct plug orientation
- ▶ Please note that the cable can be shortened or fabricated with plugs in sizes M8 and M12.

## 11.4 Sensing positions for the SBZ series

### NOTICE



The cables that are used by Zimmer GmbH feature a minimum bending radius of 10 x the outer diameter.

This bending radius must not be undershot!

- ▶ Freely suspended cables must be secured to prevent excessive motion loads or pinching.
  - ▶ The contacts of the energy supply must be dry, clean and undamaged at all times.
- ⇒ Damage to the contacts can result in malfunction of the product.

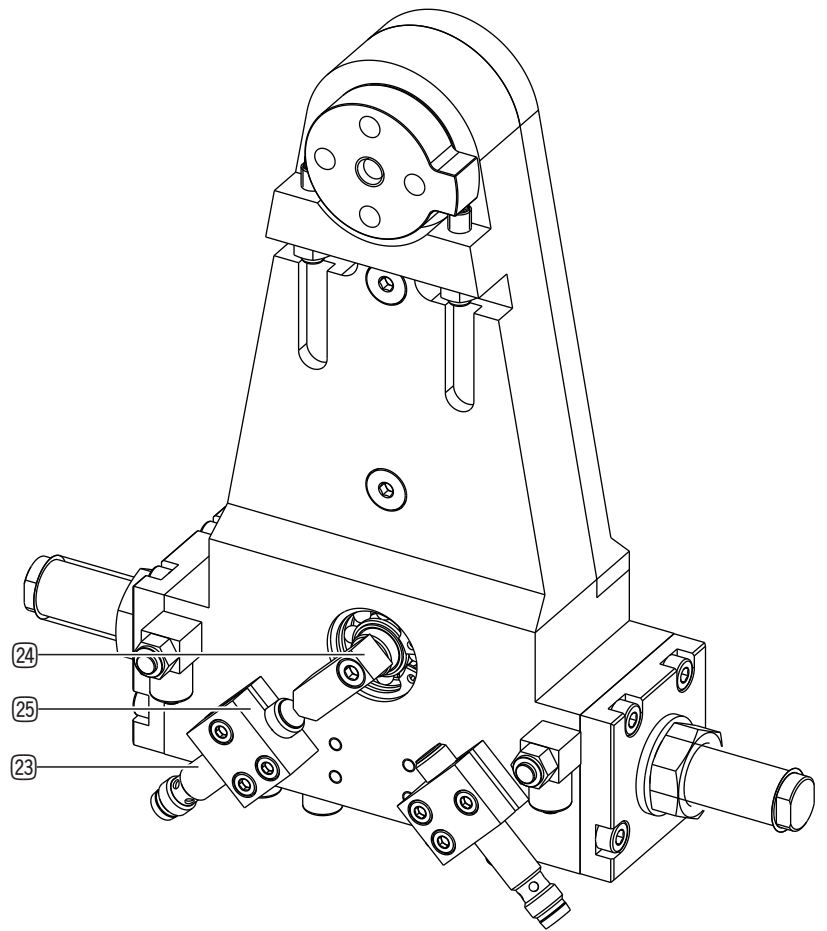
### INFORMATION



The switch cam and the terminal blocks can be installed on the interior as well as exterior of the product.

- ▶ You can find information about the positioning of terminal blocks in the technical data sheet on our website.

- ▶ Install the terminal block.
- ▶ Position the sensor at an appropriate switching distance from the switch cam.
- ▶ Please observe the following distances for the positioning:
  - Rated switching distance  $S_n = 2.0 \text{ mm}$
  - Assured switching distance  $S = 1.6 \text{ mm}$
  - Real switching distance  $S_r = 2.2 \text{ mm}$
- ▶ Clamp the sensor.
- ▶ Repeat the process for the other side.



- 23 Sensor
- 24 Switch cam
- 25 Terminal block

### INFORMATION



Inductive sensors are available in the following versions:

- 5 m cable with exposed lead
  - 0.3 m cable with plug
  - 0.3 m cable with direct plug orientation
- ▶ Please note that the cable can be shortened or fabricated with plugs in sizes M8 and M12.

## 11.5 Setting the end position damping for the SBZ series

### CAUTION



#### Risk of injury due to uncontrolled movements

Risk of injury in the event of uncontrolled movement of the product when the power supply is connected.

- ▶ Switch off the power supply to the machine before carrying out any work.
- ▶ Secure the power supply against being switched on unintentionally.
- ▶ Check the machine for any residual energy that may be present.

### NOTICE



Shock absorbers may not be used as an end stop.

- ▶ Make sure that the stop screws come into contact with the respective stop surfaces.
- ▶ Reset the shock absorber when you change the swivel angle.

### NOTICE

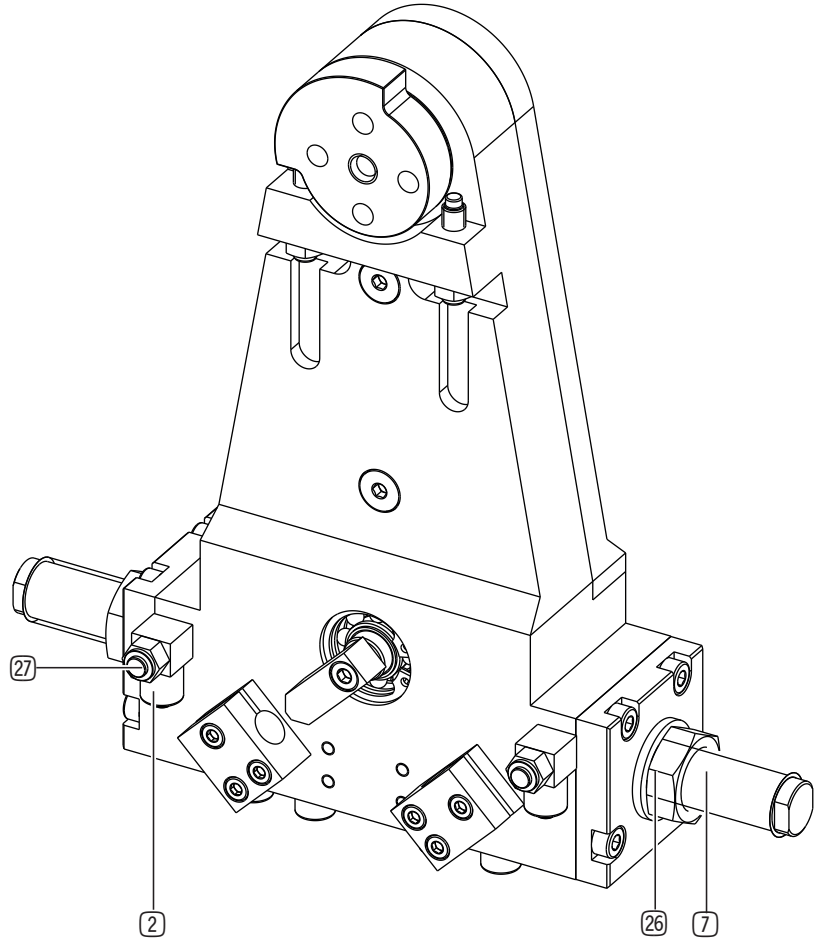


The damping behavior changes as the oil in the shock absorber heats up.

- ▶ Enter the operating temperature settings for the shock absorbers.
  - After approximately 30 cycles in the cycle time that is selected later, the shock absorber reaches operating temperature.
  - If a break time of > 1 minute is exceeded, no shock absorber warm-up is required.

- ▶ Switch off the power supply.
- ▶ Loosen the lock nut.
- ▶ Rotate the shock absorber clockwise until the output shaft moves.
  - ▶ During this process, make sure that the piston rod in the shock absorber is pushed in completely.
- ▶ Rotate the shock absorber counter-clockwise one turn.
- ⇒ This achieves maximum damping.
- ▶ Loosely attach the lock nut.
- ▶ Remove persons and objects from the swivel range.
- ▶ Switch on the power supply.
- ▶ Slightly open the adjustment screws of the flow control valves.
- ▶ Apply compressed air to the product on alternating sides.
- ▶ Check to ensure that there is uniform swivel movement and exhaust air flow-controlled movement to the end positions.
  - ▶ If necessary, readjust the adjustment screws and shock absorbers.
- ▶ Tighten the lock nut.

- ② Flow control valve
- ⑦ Shock absorber
- ②⑥ Lock nut
- ②⑦ Adjustment screw



## 12 Error diagnosis

Error	Possible cause	Measure
Product does not move.	• Minimum pressure not met	▶ Increase the air pressure to maximum. ▶ Try to repeat the process.
	• Throttle closed	▶ Slowly open the adjustment screw of the flow control valve until the desired swivel time is reached.
	• Power supply faulty	▶ Check the pneumatic connections.
	• Defective/incorrectly set sensors	▶ Check the sensors and the wiring. ▶ Replace the sensors if defective.
	• Weight of attachment parts/ workpieces too high	▶ Adjust the values to the technical data of the product.
	• Functional components damaged	▶ Please contact Zimmer Customer Service.
	• Unnecessary connections open	▶ Seal pneumatic connections with suitable covers.
Product moves in a jerky manner.	• Minimum pressure not met	▶ Increase the air pressure to maximum. ▶ Try to repeat the process.
	• Compressed air too restricted	▶ Slowly open the adjustment screw of the flow control valve until the desired swivel time is reached.
	• Weight of attachment parts/ workpieces too high	▶ Adjust the values to the technical data of the product.
End positions are not reached.	• Minimum pressure not met	▶ Increase the air pressure to maximum. ▶ Try to repeat the process.
	• Shock absorber used as end stop	▶ Unscrew the shock absorber and then reinsert it and check the damping behavior.
	• Contact surfaces of end stops soiled	▶ Clean the product if it is dirty.
The end positions are hit too hard.	• End position damping set incorrectly	▶ Unscrew the shock absorber and then reinsert it and check the damping behavior.
The torque is not reached.	• Minimum pressure not met	▶ Increase the air pressure to maximum. ▶ Try to repeat the process.
	• Seals overflowing	▶ Please contact Zimmer Customer Service.
	• Moving components lubricated too heavily	▶ Please contact Zimmer Customer Service.

## 13 Maintenance

### CAUTION



#### Risk of injury in case of non-compliance

- ▶ Only perform maintenance on the disassembled product.
- ▶ Switch off the power supply before any assembly, installation or maintenance work.
- ▶ Secure the power supply against being switched on unintentionally.
- ▶ Check the energy supply for residual pressure.

### NOTICE



#### Material damage resulting from blowing out with compressed air

- Blowing out the product with compressed air can cause malfunctions and pose a risk of accidents.
- ▶ Never purge the product with compressed air.

### NOTICE



#### Material damage caused by liquid and solvent-based cleaners

- Liquid and solvent-based cleaning agents can cause malfunctions and pose a risk of accidents.
- ▶ Do not clean the product with any cleaning agents that are liquid or contain solvents.

Maintenance-free operation of the product is guaranteed for up to 10 million cycles.

The maintenance interval may be shortened under the following circumstances:

- Dirty environment
  - Improper use and use that does not comply with the power specifications.
  - Ambient temperature is too high.
  - ▶ Even though the product is maintenance-free as mentioned above, perform a regular visual inspection to check for any corrosion, damage or contamination.
  - ▶ Have maintenance work be performed by Zimmer Customer Service whenever possible.
- ⇒ Dismantling and reassembling the product without authorization may result in complications, as special installation equipment is required in some cases. Zimmer GmbH accepts no liability for any resulting malfunctions or damage.

## 14 Decommissioning/disposal

### INFORMATION



When the product reaches the end of its operational phase, it can be completely disassembled and disposed of.

- ▶ Disconnect the product completely from the power supply.
- ▶ Dispose of the components properly according to the material groups.
- ▶ Comply with the locally applicable environmental and disposal regulations.

## 15 Declaration of Incorporation

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

### Name and address of the manufacturer:

#### Zimmer GmbH

 Im Salmenkopf  
 77866 Rheinau, Germany  
 +49 7844 9138 0  
 [info@zimmer-group.com](mailto:info@zimmer-group.com)  
 [www.zimmer-group.com](http://www.zimmer-group.com)

We hereby declare that the incomplete machine described below

**Product designation:** Swivel jaws, pneumatic

**Type designation:** SB/SBZ series

conform to the requirements of the Machinery Directive, 2006/42/EC, Article 2g, Annex VII.b – Annex II.b, in its design and the version we put on the market.

Basic health and safety requirements:

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. 1.3.9, No. 1.5.3, No. 1.5.4, No. 1.6.3, No. 1.6.4, No. 1.7.1, No. 1.7.4

A full list of applied standards can be obtained from the manufacturer.

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.**

Kurt Ross

Authorized representative for the compilation of relevant technical documents

Rheinau, Germany, 2020-01-10

(Place and date of issuance)



Martin Zimmer  
(Legally binding signature)  
Managing Partner