



INSTALLATION AND OPERATING INSTRUCTIONS

Flat swivel unit
MSF

DDOC00963

THE KNOW-HOW FACTORY

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1 Supporting documents

NOTICE



Read through the installation and operating instructions before installing 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:

- Detailed installation and operating instructions
- Declaration of Incorporation
- Catalogs, drawings, CAD data, performance data/exploded drawing
- Information on accessories
- Spare parts list
- Technical data sheets
- General Terms and Conditions of Business, including warranty information

Only those documents currently available on the website are valid.

1.1 Hazard levels of warning notices

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 will not lead to damage to the product. This information does not include any information relevant to health and workplace safety.

2 Safety notices

CAUTION



Risk of injury in the event of improper installation, commissioning or maintenance and improper use.

Non-compliance may result in severe injuries!

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 fitted to industrial machines and is used to hold, transport and store 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 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.

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

- ▶ Make sure that the power cables are disconnected before you install, retool, maintain or repair the product.
- ▶ When the product is used under extreme conditions, the maintenance interval must be adapted depending on the extent of the 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. Any other or more extensive use is 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 user bears sole responsibility.

The product is designed exclusively for pneumatic operation within the agreed-upon parameter limits and conditions of usage. The system is not suitable for operation with operating media other than compressed air. Unauthorized mechanical modifications must not be made. The product is properly used in closed rooms to swivel permitted attachment parts or workpieces. It is not suitable for swiveling workpieces during a machining process or for direct contact with perishable goods.

4 Personnel qualification

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

5 Product description

5.1 Forces and torques

INFORMATION



For information on the forces and torques for the following product, please refer to our website at www.zimmer-group.com:

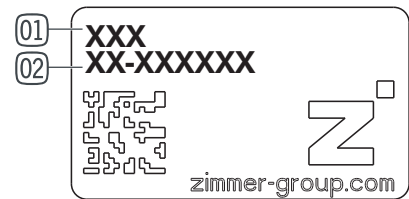
- MSF

Please contact Zimmer Customer Service if you have any questions.

5.2 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.

- ⇒ Article number: ①
- ⇒ Confirmation number: ②



INFORMATION



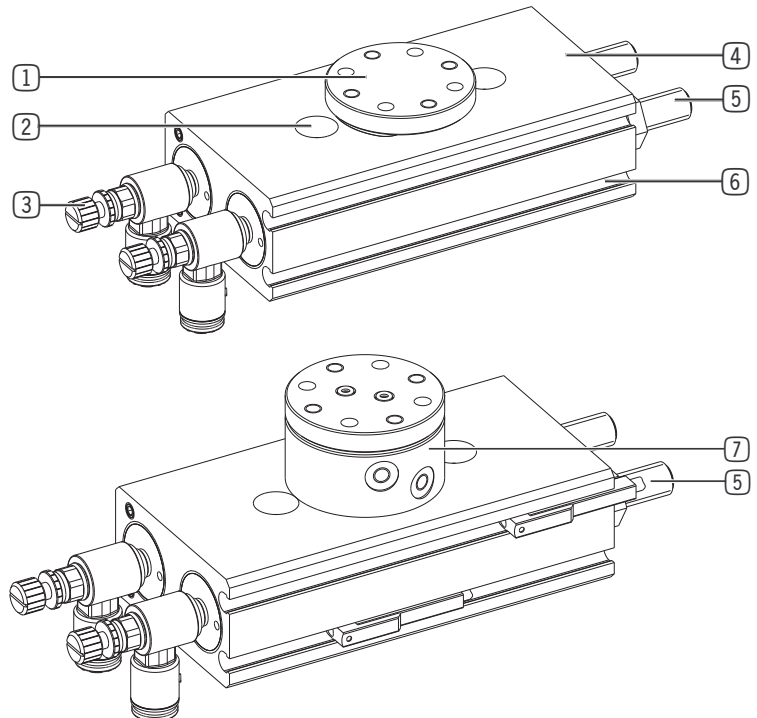
Please indicate the confirmation number in the event of damage or a complaint.

Please contact Zimmer Customer Service if you have any questions.

6 Function

Alternating ventilation sets two pneumatic pistons in motion. The pistons, shaped as a rack, transmit energy to a pinion. This causes a rotary movement of the flange.

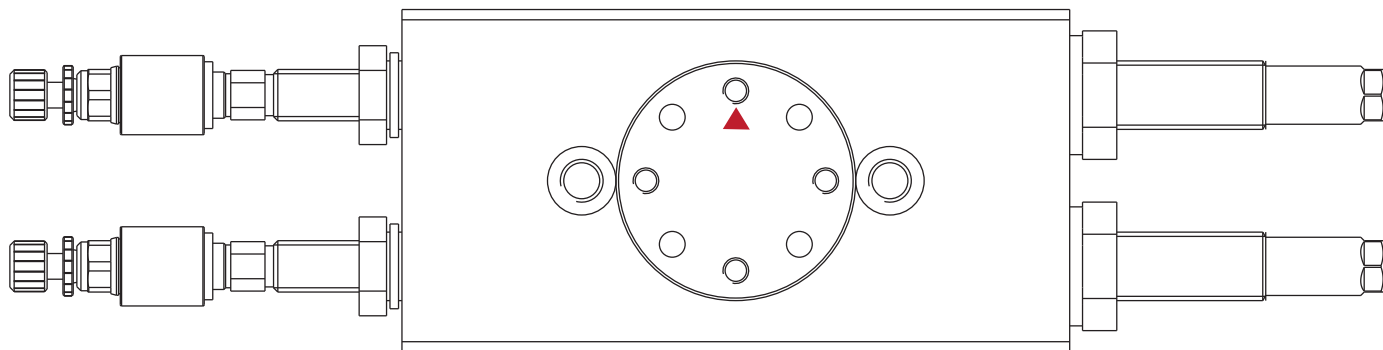
①	Tool holder
②	Mounting and positioning
③	Air flow control valve
④	Housing
⑤	Shock absorber or stop screw
⑥	Integrated slot
⑦	Integrated pneumatic feed-through



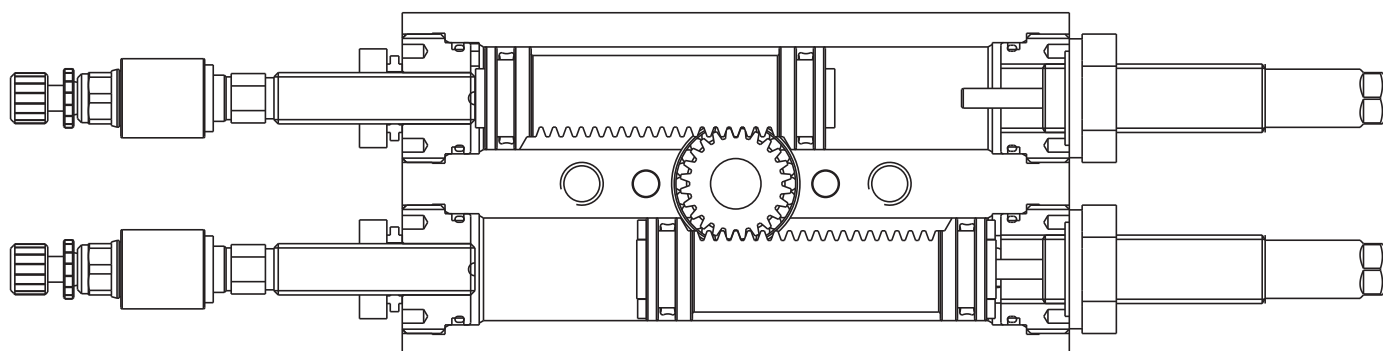
6.1 Operating principle

⇒ Rotation is clockwise.

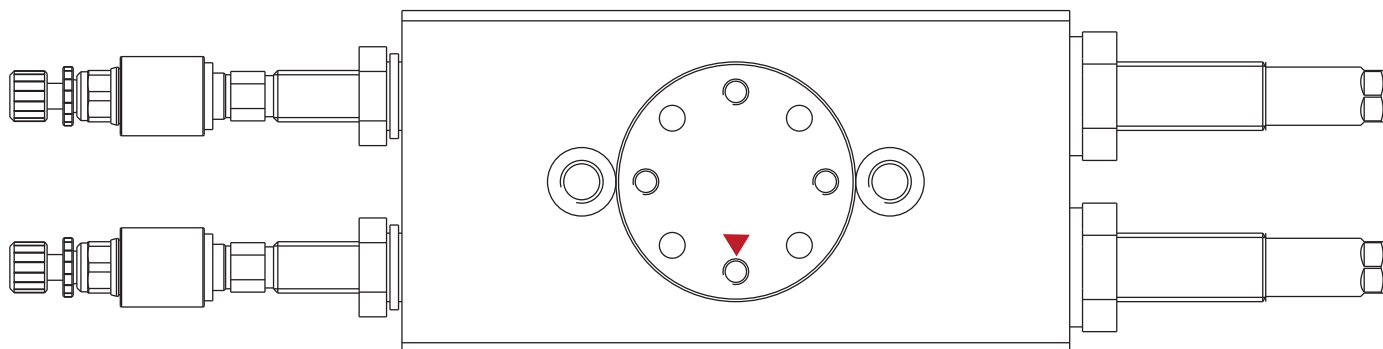
0° POSITION



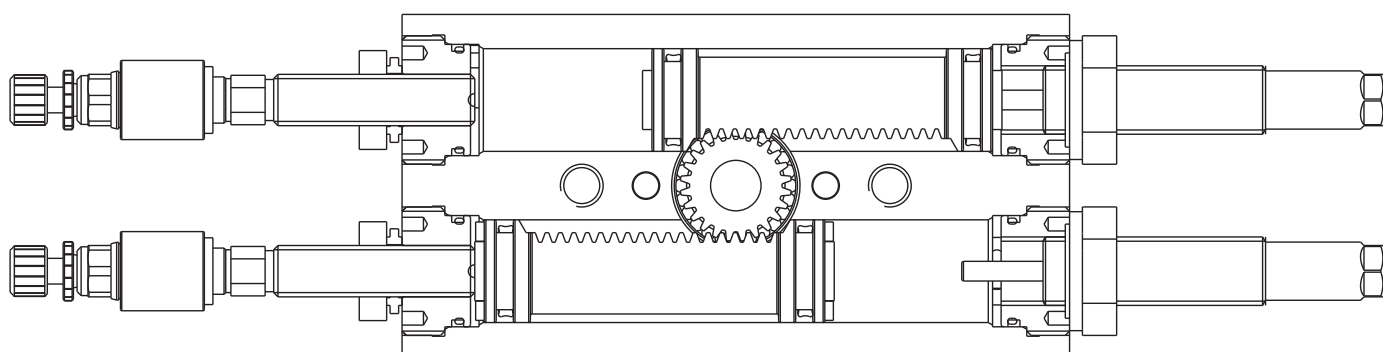
POSITION OF RACKS



180° POSITION



POSITION OF RACKS



6.2 Technical data

INFORMATION



For technical data, refer to our website at www.zimmer-group.com:

- MSF

This data varies within the series, depending on the specific design.

Contact Zimmer Customer Service if you have any questions.

6.3 Protection class

NOTICE



The product achieves protection class IP41 in all mounted positions of installation.

7 Installation

7.1 General installation information

WARNING



Risk of injury when the product is turned

People can get caught when the product is turned and in the event of a power drop.

- ▶ Read through the installation and operating instructions before working with the system!
- ▶ Only permit installation, maintenance and servicing work to be carried out by trained personnel.



Risk of injury due to sudden or unexpected movements

Considerable crushing injuries can result from sudden or unexpected 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 power supply to the product before all work.
- ▶ Switch off the power supply of the machine before all work.
- ▶ Secure the power supply against being switched on unintentionally.
- ▶ Check the machine for any residual energy that may be present.

NOTICE



Intervention of any kind is not permitted and can result in warranty and liability disqualification.

- ▶ 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.

The product must be installed on a suitable mounting surface in accordance with the flatness specifications.

⇒ Permissible flatness imperfection: 0.03

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

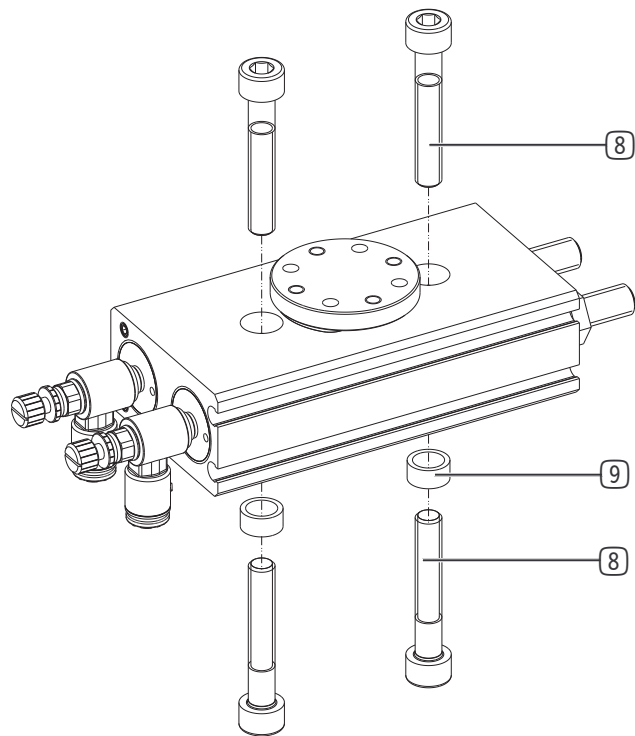
⇒ Zimmer GmbH recommends verifying the permitted load-carrying capacity of the required screw connections in accordance with VDI 2230.

- The exact installation positions can be found on the technical data sheet on our website.

7.2 Installing the product

Observe the following work steps during installation:

- ▶ Insert centering sleeves (9) into the provided fits.
- ▶ Position the product on the mounting piece using the centering sleeves (9).
- ▶ Use suitable mounting screws (8) to secure the product to the mounting piece.



7.3 Installing the custom application

Before installing the custom application, make sure its weight is appropriate for the selected product.

To install the custom application, observe the following work steps:

- ▶ Insert straight pins in the intended fits on the tool holder.
- ▶ Position the custom application on the tool holder using the straight pins.
- ▶ Secure the custom application with suitable mounting screws of strength class 8.8.

7.4 Installing the power supply

NOTICE



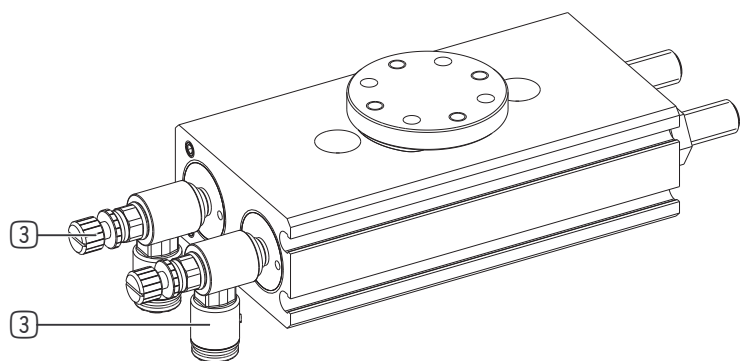
Close off any unused pneumatic connections using suitable dummy plugs.

The authorized pneumatic connections that are available can be found in the accessories list, which is available on our website www.zimmer-group.com. You will also find the necessary ordering information there.

- ▶ Use compressed air in accordance with DIN ISO 8573-1 [4:4:4].

The figure shows the air flow control valves (3) in factory condition.

- ⇒ The air flow control valves are closed in factory condition. This prevents unintentional movements of the product.



7.5 Installing accessories

NOTICE



Before installing an accessory, make sure it is suitable for use with the selected variant.
 For information on all available accessories, please visit our website.
 Zimmer Customer Service is available to provide you with assistance if you have any further questions.

8 Commissioning

WARNING



Risk of injury due to sudden or unexpected movements.

Considerable crushing injuries can result from sudden or unexpected movements.



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

The product can still move after the emergency stop is activated.

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

People can get caught when the product is turned and in the event of a power drop.

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

NOTICE



Intervention of any kind is not permitted and can result in warranty and liability disqualification.

- ▶ Commissioning may be performed only by qualified specialists who have the professional expertise and know the conditions, as well as the dangers, of the machine into which the product is being installed.
- ▶ Commissioning may only be carried out by qualified personnel in accordance with these installation and operating instructions.
- ▶ The specialists are required to have read and understood the installation and operating instructions in full.

INFORMATION



The product may only be used in accordance with its intended use and technical data. Observe the safety regulations valid at the place of installation.

When operating without the provided or corresponding flow control valves, the warranty is voided. The integrated shock absorbers may not be used as a fixed stop.

⇒ Zimmer GmbH accepts no liability for any damage resulting from non-compliance with these installation and operating instructions.

8.1 Adjusting the swivel angle

The product is equipped with internal limit stops. These allow the adjustment of the swivel angle from -3° to 93° for each limit stop.

NOTICE



For products with a shock absorber, the limit stops are integrated into the air supply.
 Products without a shock absorber have limit stops with an elastomer buffer installed instead.

Example: Limiting the swivel angle from 180° to 90°

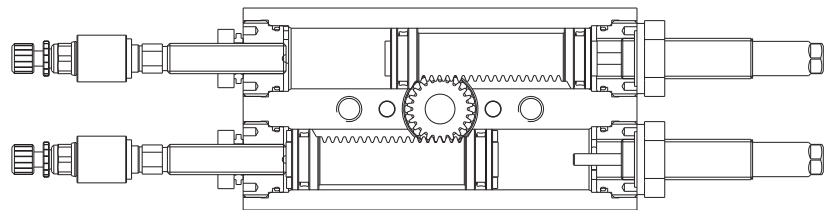
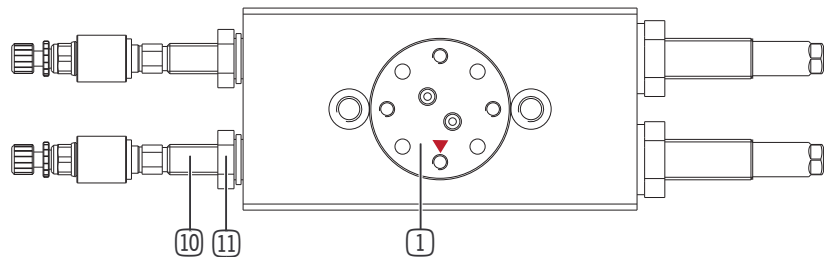
Observe the following work steps:

- ▶ Depressurize the product.
- ▶ Rotate the tool holder ① manually to the 180° position.
- ▶ Unscrew the locknut ⑪ of the internal limit stop on the 180° side.
- ▶ Screw in the adjustment screw ⑩ until the tool holder has rotated into the 90° position.

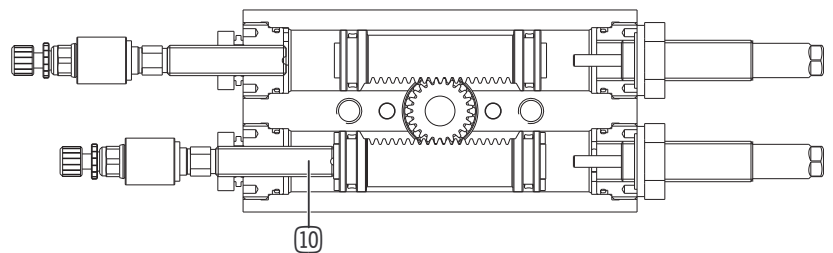
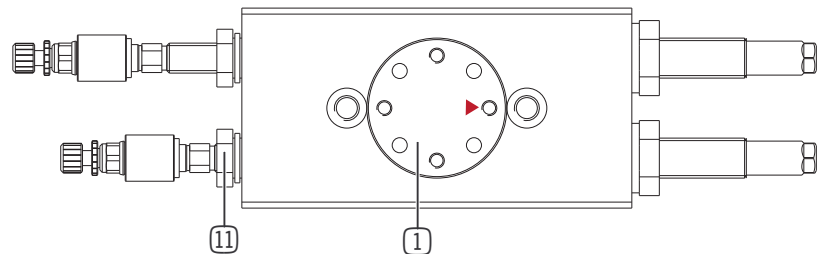
IMPORTANT:

- Make sure the gear is free of play.
- ▶ Tighten the locknut ⑪.

180° POSITION



90° POSITION



8.2 Adjusting the end position damping

INFORMATION



The shock absorbers are set to the maximum upon delivery.

Whenever the swivel angle is adjusted, the setting of the shock absorbers must be checked. Never use the shock absorbers as limit stops.

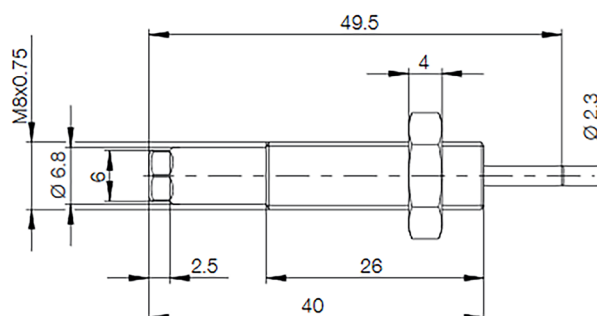
Design of the shock absorber:

At the maximum piston stroke, the piston rod protrudes from the shock absorber.

Example M8x1:

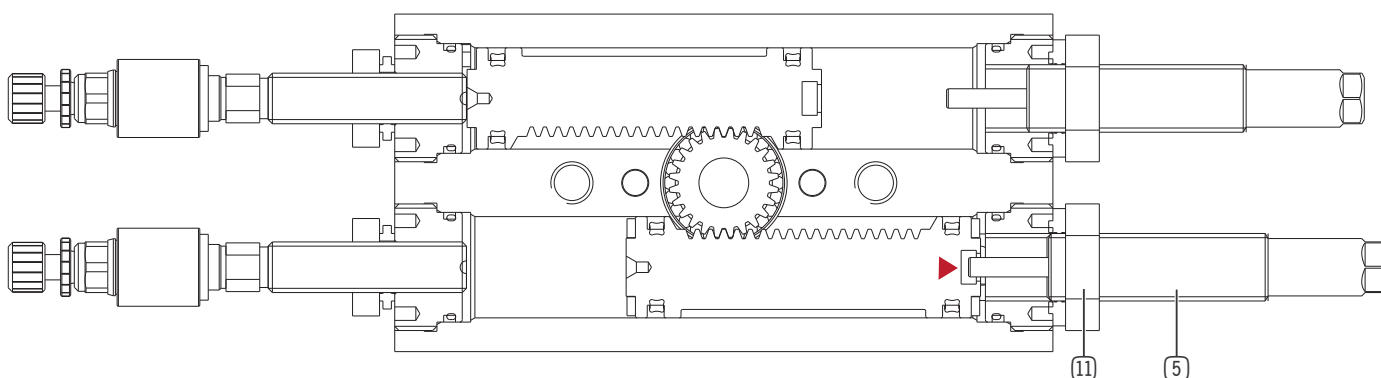
Stroke of the piston rod = 5 mm

Protrusion = 9.5 mm



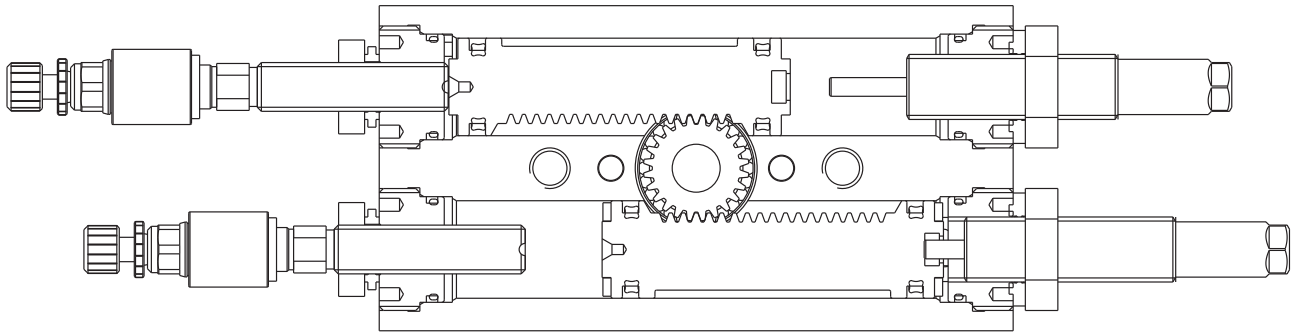
Adjusting the shock absorber for 0° position:

- ▶ Depressurize the product.
- ▶ Loosen the locknut (11) of the shock absorber.
- ▶ Rotate the shock absorber (5) counterclockwise until the rack no longer makes contact with the absorber.

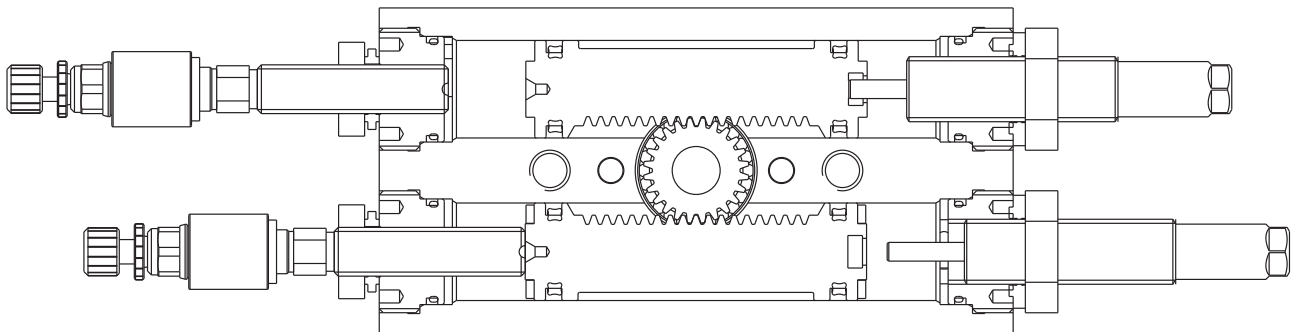


- ▶ Rotate the tool holder manually to the 0° position.
 - ⇒ The 0° position is reached once the rack makes contact with the previously configured limit stop.
 - ▶ Rotate the shock absorber clockwise until the tool holder starts turning.
 - ▶ Turn out the shock absorber in this position by 0.5 to 1 turn.
 - ⇒ Maximum effect of the absorber is configured.
 - ▶ Apply the locknut (11) of the shock absorber.
 - ▶ Remove persons and objects from the swivel range.
 - ▶ Fill the product with appropriately processed compressed air.
 - ▶ Unscrew the adjustment screws of the flow control valves by just a few turns.
 - ⇒ Unscrew it for the first use only.
 - ⇒ Before the first movement after the adjustment, set the control valves to a minimum to prevent the product from bottoming out.
 - ▶ Pressurize the product with compressed air on alternating sides and check the settings.
 - ▶ If necessary, make adjustments using the adjustment screw of the flow control valve and the shock absorber.
 - ▶ Tighten the locknut of the shock absorber.
- ⇒ Shock absorbers are set correctly if a uniform swivel movement and an approach to the limit stop that is throttled by the air flow control valve are ensured.

0° POSITION



90° POSITION



NOTICE



Operate the product throttled by the air flow control valve.

Do not use the shock absorber by itself to travel to the end position.

The damping behavior changes as the oil in the shock absorber heats up during operation. Therefore, configure all settings with the shock absorber at room temperature. After approximately 30 cycles in the cycle time that is selected later, the shock absorber reaches operating temperature (depending on the outside temperature).

If the pause lasts longer than one minute, no warm-up is required.

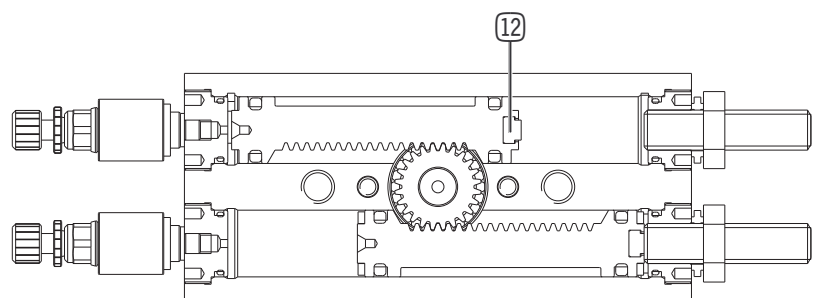
8.3 End position damping with elastomer buffer

These variants are not equipped with shock absorbers, but do have an elastomer buffer (12).

In these variants, adjustment screws are used as internal limit stops. To prevent the racks from bouncing into the end position, the product is operated with a strong air flow control. For this reason, products in these variants are slower.

- ▶ Adjust the swivel angle exactly as for variants with shock absorbers.
- ▶ See Section 8.1.

The damping of the product cannot be adjusted. Only bouncing into the end position can be prevented using air flow control.



9 Sensors

NOTICE



To ensure reliable sensing, use only the sensors sold by Zimmer GmbH and listed as accessories.

- Zimmer GmbH does not guarantee correct function if third-party products are used.
- If the sensors are exposed to an additional external magnetic field - as produced by servo motors - this may affect the switching points.
- Sensors with cast-on cables sold by Zimmer GmbH are all suitable for drag chains. The minimum permissible routing radius is 5 times the cable diameter. For fixed routing, this radius is reduced to 3 times the cable diameter.

9.1 Adjusting the magnetic field sensors

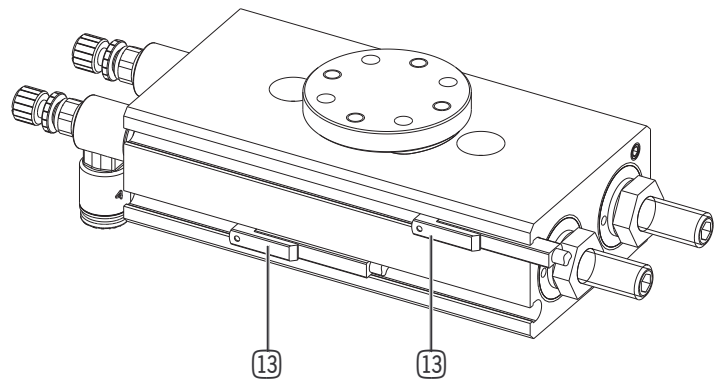
NOTICE



The sensors are available as accessories. You can find the list of accessories on our website at www.zimmer-group.com.

Observe the following work steps:

- ▶ Move the product to one of the end positions.
- ▶ Connect the magnetic field sensor (13) to the power supply.
- ▶ Guide the magnetic field sensor into the groove on the housing.
- ▶ Push the magnetic field sensor to the first switch point.
 - ⇒ LED on
- ▶ Mark the point.
- ▶ Continue to push the magnetic field sensor to the switch-off point.
 - ⇒ LED off
- ▶ Pull the magnetic field sensor back to reach the second switch point.
 - ⇒ LED on
- ▶ Also mark this point.
 - The optimum magnetic field sensor position is between the two switching points.
 - Observe the maximum tightening torque of the fastening screws.
 - ▶ See package insert for the magnetic field sensor.
- ▶ Repeat the process for the other end position.



10 Troubleshooting

Error	Possible causes	Remedy
Product does not move	<ul style="list-style-type: none"> • Minimum pressure not met 	<ul style="list-style-type: none"> • Increase the operating pressure
	<ul style="list-style-type: none"> • Throttles closed (as-delivered state) 	<ul style="list-style-type: none"> • Slowly open throttles until the desired swivel time is reached
	<ul style="list-style-type: none"> • Faulty hose system 	<ul style="list-style-type: none"> • Check compressed air hoses and connections
	<ul style="list-style-type: none"> • Defective or incorrectly set sensors 	<ul style="list-style-type: none"> • Check sensors and wiring, replace if necessary
	<ul style="list-style-type: none"> • Weight of attachment parts or workpieces too high 	<ul style="list-style-type: none"> • Bring weight into conformity with technical data of the product
	<ul style="list-style-type: none"> • Damage to one or more functional parts due to overload 	<ul style="list-style-type: none"> • Disassemble product, replace damaged parts, relubricate and replace seals
	<ul style="list-style-type: none"> • Unnecessary air connections open 	<ul style="list-style-type: none"> • Close air connections properly
Product moves in a jerky manner	<ul style="list-style-type: none"> • Minimum pressure not met 	<ul style="list-style-type: none"> • Increase the operating pressure
	<ul style="list-style-type: none"> • Operating pressure too restricted 	<ul style="list-style-type: none"> • Slowly open throttles until the desired speed is reached
End position is not reached	<ul style="list-style-type: none"> • Weight of attachment parts or workpieces too high 	<ul style="list-style-type: none"> • Bring weight into conformity with technical data of the product
	<ul style="list-style-type: none"> • Operating pressure is too low 	<ul style="list-style-type: none"> • Increase the operating pressure
The limit stops are hit too hard	<ul style="list-style-type: none"> • The shock absorbers function as the end position 	<ul style="list-style-type: none"> • Unscrew shock absorber, reset it and check damping behavior
The torque is not reached	<ul style="list-style-type: none"> • Faulty end position damping settings 	<ul style="list-style-type: none"> • Unscrew shock absorber, reset it and check damping behavior
	<ul style="list-style-type: none"> • Minimum pressure not met 	<ul style="list-style-type: none"> • Increase the operating pressure
	<ul style="list-style-type: none"> • Seals overflowing 	<ul style="list-style-type: none"> • Dismantle unit, replace seals and relubricate
	<ul style="list-style-type: none"> • Too much lubricant on moving parts 	<ul style="list-style-type: none"> • Dismantle unit, clean it, relubricate it and replace seals

11 Maintenance

CAUTION



Risk of injury caused by improper maintenance.

- ▶ During maintenance of the product, observe the locally valid workplace safety regulations.
- ▶ Only appoint trained personnel.
- ▶ Switch off the power supply.

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

The maintenance interval may shorten under the following circumstances:

- Dirty environment
- Improper use and use that does not comply with the power specifications.
- Observe the ambient temperature; lubricants harden faster!

Even though the product is maintenance-free as mentioned above, perform a regular visual inspection to check for any corrosion, damage or contamination.

We recommend allowing maintenance and seal replacement to be carried out by Zimmer Customer Service.

Dismantling and reassembling the product without authorization may result in complications as special installation equipment is required in some cases.

Zimmer GmbH shall not be liable in the event of unauthorized dismantling and reassembling of the product or in the event of any malfunction or damage resulting from this.

12 Accessories/scope of delivery

INFORMATION



If any accessories not sold or authorized by Zimmer Group are used, the function of the product cannot be guaranteed. Zimmer Group accessories are specifically tailored to the individual products.

Optional accessories and those included in the scope of delivery can be found at www.zimmer-group.com.

13 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 unintentional movements can occur. Before commissioning the machine 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/observe and adhere to the temperature range.
 - 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 of the components.
- ▶ Remove all foreign substances.
- ▶ Properly remove potential corrosion spots.
- ▶ Close electrical connections using suitable covers.

14 Decommissioning/disposal

INFORMATION



When the product reaches the end of its operational phase, it can be completely disassembled and disposed of. Completely disconnect the product from the power supply. The product can be disassembled and properly disposed of according to material groups. When disposing of it, observe the locally applicable environmental regulations and codes and regulations for disposal.

15 RoHS declaration

in terms of the EU Directive 2011/65/EU

Name and address of the manufacturer:

Zimmer GmbH
 77866 Rheinau, Germany, Im Salmenkopf 5
 +49 7844 9138 0
 +49 7844 9138 80
www.zimmer-group.com

We hereby declare that the incomplete machine described below

Product designation: **Swivel unit, pneumatic**

Type designation: **MSF series**

conforms to the requirements of the directive in its design and the version we put on the market.

Authorized representative for the compilation of relevant technical documents

Michael Hoch	See manufacturer's address	Rheinau, Germany, 5/25/2020	Martin Zimmer
First name, last name	Address	(Place and date of issuance)	(Legally binding signature) Managing Partner

16 REACH declaration

in terms of the EU Regulation 1907/2006

Name and address of the manufacturer:

Zimmer GmbH
 77866 Rheinau, Germany, Im Salmenkopf 5
 +49 7844 9138 0
 +49 7844 9138 80
www.zimmer-group.com

REACH stands for **R**egistration, **E**valuation, **A**uthorisation and **R**estriction of **C**hemicals.

A full declaration of REACH can be obtained from the manufacturer due to the duty to notify in accordance with Art. 33 of the REACH regulation ("Duty to communicate information on substances in articles").

Authorized representative for the compilation of relevant technical documents

Michael Hoch	See manufacturer's address	Rheinau, Germany, 5/25/2020	Martin Zimmer
First name, last name	Address	(Place and date of issuance)	(Legally binding signature) Managing Partner

DE / 2020-11-23

DDOC00963

17 Declaration of Incorporation

in terms of the EC Directive 2014/30/EC on electromagnetic compatibility

Name and address of the manufacturer:

Zimmer GmbH

📍 77866 Rheinau, Germany, Im Salmenkopf 5

☎ +49 7844 9138 0

📠 +49 7844 9138 80

www.zimmer-group.com

We hereby declare that the incomplete machines described below

Product designation: **Swivel unit, pneumatic**

Type designation: **MSF series**

conform to the requirements of the Machinery Directive

2006/42/EG, Article 2g, Appendix VII,b - Appendix II,b in their 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. 1.5.3., No. 1.5.4., No. 1.5.8., 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 the

incomplete machine's special documents in electronic form via our documentation department upon justified request.

The incomplete machine may only be commissioned if it has been determined that the machine or system, in which the incomplete machine described above is to be installed, complies with the provisions of the EC Machinery Directive 2006/42/EC and has been produced in accordance with the EC Declaration of Conformity Annex II 1 A.

Authorized representative for the compilation of relevant technical documents



Kurt Ross	See manufacturer's address	Rheinau, Germany, 11/23/2020	Martin Zimmer
First name, last name	Address	(Place and date of issuance)	(Legally binding signature) Managing Partner

