

INSTALLATION AND OPERATING INSTRUCTIONS

Angular pivot unit

SWM1000

DDOC00964

THE KNOW-HOW FACTORY

Content

1	Supporting documents	4
1.1	Notices and graphics in the installation and operating instructions	4
2	Safety notices	5
3	Proper use	6
4	Personnel qualification	6
4.1	Electricians	6
4.2	Specialists	6
4.3	Instructed personnel	6
4.4	Service personnel	6
4.5	Additional qualifications	6
5	Product description	7
5.1	Type plate	7
6	Technical data	8
7	Accessories/scope of delivery	8
8	Functional description	8
9	Transportation/storage/preservation	8
10	Installation	9
10.1	Installing the product	10
10.2	Installing the energy supply	10
10.3	Installing accessories	11
10.4	Installing the customer-specific application	11
11	Commissioning	12
11.1	Adjusting the swivel angle	12
11.2	Setting the swivel time without shock absorbers	13
11.3	Setting the swivel time with shock absorbers	13
11.3.1	Adjusting the shock absorber for the 0°/90° position	14
11.4	Setting the sensors	14
12	Error diagnosis	15
13	Maintenance	16
14	Decommissioning/disposal	16
15	Declaration of Incorporation	17

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.

- 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 to persons. Ignoring these notices can cause minor, reversible injuries.

► You absolutely must comply with the described measures for avoiding these dangers!

⇒ The warning symbols are assigned according to the type of danger.

NOTICE



This notice warns of possible material and environmental damage. Ignoring these notices can result in damage to the product or 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.

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 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 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.

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.

- The product is designed exclusively for pneumatic operation.
- The product is intended for use in enclosed rooms for swiveling with position accuracy.
- The product is not suitable for holding workpieces during a machining process.
- Direct contact with perishable goods/food is not permitted.

4 Personnel qualification

WARNING



Injuries and material damage due to inadequate qualification

If inadequately qualified personnel perform work on the product, this can cause serious injuries and significant material damage.

- ▶ All work on the product must be performed by qualified personnel.
- ▶ Before working with the product, read the document in its entirety and make sure that you have understood everything.
- ▶ Observe country-specific accident prevention regulations and the general safety notices.

The following qualifications are a prerequisite for performing various work on the product.

4.1 Electricians

Electricians are able to perform work on electrical systems, can recognize and avoid possible dangers and know the relevant standards and provisions due to their technical training, knowledge and experience.

4.2 Specialists

Specialists are able to perform the assigned work, can recognize and avoid possible dangers and know the relevant standards and provisions due to their technical training, knowledge and experience.

4.3 Instructed personnel

Instructed personnel have been trained by the operating company on the tasks and possible dangers of improper behavior.

4.4 Service personnel

Service personnel are able to perform the assigned work and can recognize and avoid possible dangers due to their technical training, knowledge and experience.

4.5 Additional qualifications

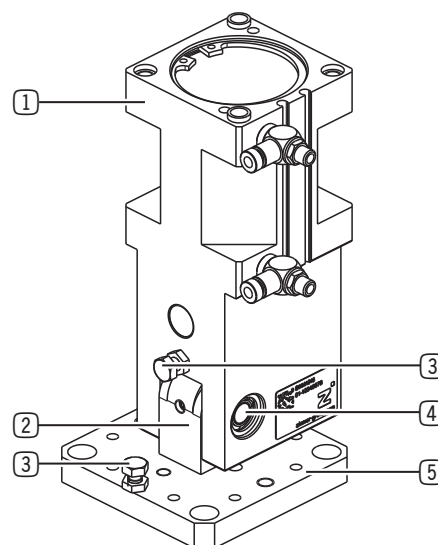
Persons who work with the product must be familiar with the valid safety regulations and laws as well as the standards, guidelines and laws listed in this document.

Personnel who work with the product must have facility-issued authorization to commission, program, configure, operate, maintain and also decommission this product.

5 Product description

The product consists of a pneumatic cylinder and a connecting plate for connecting the customer-specific application. The pneumatic cylinder and connecting plate are linked via a joint and enable a swivel angle of 90°.

- ① Pneumatic cylinder
- ② Joint
- ③ Stop screw
- ④ Bearing pin
- ⑤ Connecting plate

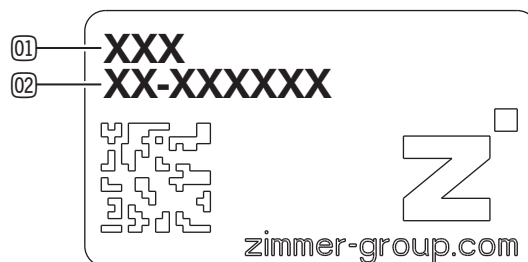


5.1 Type plate

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



6 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 Customer Service if you have any questions.

7 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.

8 Functional description

Alternating ventilation moves the internal drive up and down. The movement generated in this process is transferred to the joint by kinematics, producing the swivel movement of the connecting plate. The stop screws limit the swivel angle.

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.

10 Installation

WARNING



Risk of fatal injury due to unsuitable lifting equipment

- Use suitable lifting equipment for overhead assembly or disassembly of products if the dead weight of the product is > 3 kg.

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.

Assembly requirements

Permissible unevenness [mm]	0,03
Strength class (DIN EN ISO 4762)	8.8

INFORMATION



Further installation information:

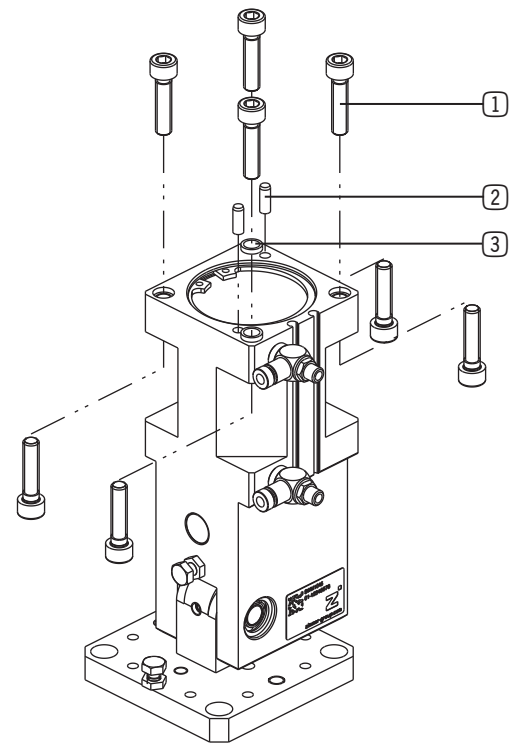
- The mounting screws are not included in the scope of delivery.

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

The product can be installed from multiple sides.

- ▶ Insert the centering sleeves or straight pins into the provided fits on the product.
- ▶ Position the product on the mounting piece.
- ▶ Mount the product on the mounting piece using the appropriate mounting screws.



- ① Mounting screw
- ② Straight pins
- ③ Centering sleeve

10.2 Installing the energy supply

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].

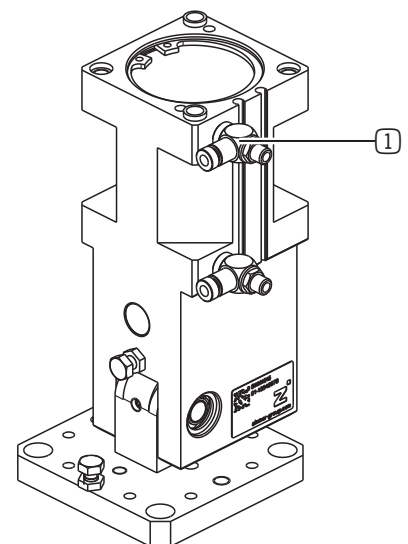
INFORMATION



The flow control valves are already mounted and closed upon delivery. This ensures that no uncontrolled movements take place.

The figure shows the delivered state of the product. Several connections are available for the energy supply.

- ▶ If using the alternative connections, close off the connections pictured with corresponding grub screws.



- ① Flow control valve

10.3 Installing accessories

NOTICE



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

10.4 Installing the customer-specific application

- ▶ Before installation, check whether the application is suitable in terms of weight.
- ▶ Position the application on the product with the straight pins.
- ▶ Install the application on the product using suitable mounting screws.

11 Commissioning

WARNING



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 energy supply of the machine before any work.
- ▶ Switch off the power supply to the machine before carrying out any work.
- ▶ Secure the power supply against being switched on unintentionally.
- ▶ Please note that the product can still move after an emergency stop.

NOTICE



- ▶ Only operate the product throttled by the air flow control valve.

INFORMATION



The product is delivered as standard without shock absorbers.

- ▶ Refer to our website for information about suitable shock absorbers.

11.1 Adjusting the swivel angle

The product can achieve a swivel angle of 90°. The swivel angle can be readjusted by $\pm 3^\circ$ per end stop via the stop screws.

NOTICE

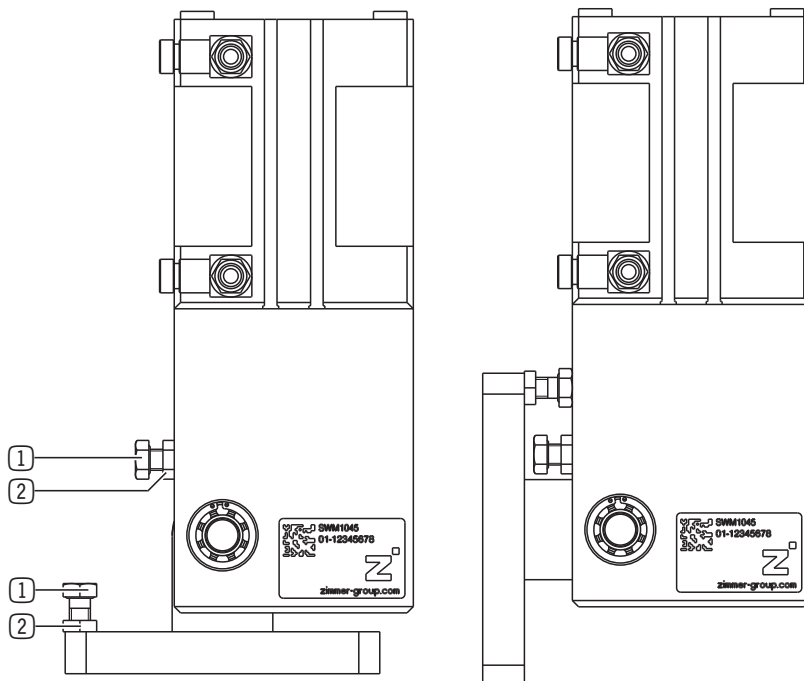


Shock absorbers may not be used as an end stop.

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

- ▶ Perform the following steps for both stop screws.
- ▶ Loosen the lock nut.
- ▶ Swivel the product to the desired position by hand.
- ▶ Screw the stop screw in or out to specify the swivel angle.
- ▶ Tighten the lock nut.

- ① Stop screw
- ② Lock nut



11.2 Setting the swivel time without shock absorbers

The swivel time is regulated via the air flow control.

- ▶ Completely close the adjustment screws of the flow control valve for the first stroke.
- ▶ Slowly fill the pneumatic circuit with compressed air.
- ▶ Slowly open the adjustment screws of the flow control valves until the desired air flow control is reached.

11.3 Setting the swivel time with shock absorbers

When shock absorbers are used as the end position damping, the swivel time is regulated via the air flow control and the shock absorber settings.

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.

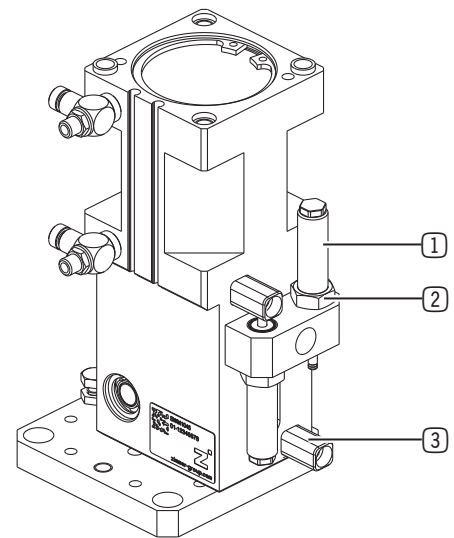
INFORMATION



- ▶ 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.

11.3.1 Adjusting the shock absorber for the 0°/90° position

- ▶ Perform the following steps for both shock absorbers.
- ▶ Switch off the power supply.
- ▶ Swivel the product to the desired position by hand.
- ▶ Loosen the lock nut.
- ▶ Rotate the shock absorber clockwise until the connecting plate moves.
 - ⇒ The piston rod of the shock absorber is pushed in as a result.
- ▶ Unscrew the shock absorber counterclockwise one turn.
 - ⇒ Damping is attenuated.
 - ⇒ The shock absorber is set to maximum effect.
- ▶ Loosely attach the lock nut.
- ▶ Remove persons and objects from the swivel range.
- ▶ Switch on the power supply.
- ▶ Slightly open the adjustment screw of the flow control valve.
- ▶ Apply compressed air to the product.
- ▶ Check the function.
- ▶ Readjust the settings to the flow control valves and the shock absorbers as required.
- ▶ Tighten the lock nut.



- ① Limit stop
- ② Lock nut
- ③ Shock absorber

11.4 Setting the sensors

NOTICE



- ▶ To ensure reliable sensing, only those sensors sold by Zimmer GmbH and listed as accessories may be used.
- ▶ Note that switching point shifts may occur if the sensors are exposed to an additional, external magnetic field.

INFORMATION



- ▶ More information can be found in the installation and operating instructions of the sensor.

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 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 Customer Service.
	• Moving components lubricated too heavily	▶ Please contact Customer Service.

13 Maintenance

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

Maintenance-free operation of the product can be reduced under the following circumstances:

- Operation with impermissible compressed air
- Dirty environment
- Improper use and use that does not comply with the power specifications.
- Permissible temperature range not observed
- ▶ Even though the product is maintenance-free as mentioned above, perform a regular visual inspection to check for any damage or contamination.
- ▶ Have maintenance work be performed by 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

www.zimmer-group.com

We hereby declare that the incomplete machine described below

Product designation: Angular pivot unit

Type designation: SWM1000

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. 1.3.1, 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. 1.6.4, No. 1.7.1, No. 1.7.3, 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, 3/26/2019

(Place and date of issuance)



Martin Zimmer
(Legally binding signature)
Managing Partner